The future of the Digital CBD: Melbourne and beyond

RMIT Blockchain Innovation Hub

RMIT Centre for Cyber Security Research & Innovation

RMIT Digital Ethnography Research Centre

RMIT UNIVERSITY

Published by:

Contributors:

Distinguished Professor Jason Potts
Associate Professor Chris Berg
Professor Annette Markham
Professor Matt Warren
Professor Tania Lewis
Dr Max Parasol
Dr Alexia Maddox
Dr Darcy Allen
Dr Ahmad Salehi Shahraki
Mr Tulley Kearney

Published on: 1 December 2021
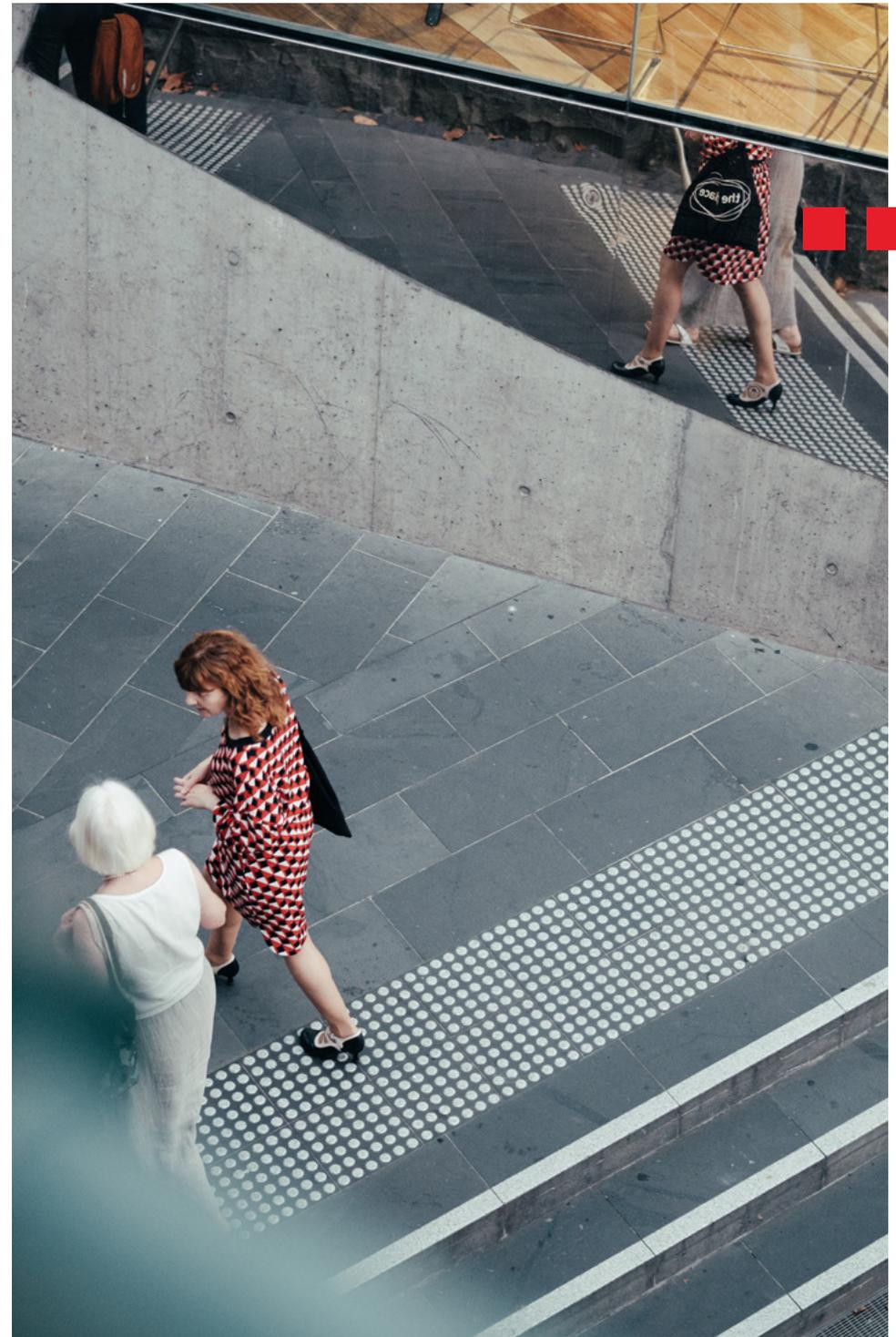
Foreword

from Julie Cogin

It is my distinct pleasure to introduce this report, the first in a series of five – The future of the Digital CBD: Melbourne and beyond. The College of Business and Law, along with the College of Design and Social Context at RMIT University is home to world-class research on digital business and the technologies underpinning the future of the digital economy. We are proud to offer our services to help shape Melbourne's future, its Central Business District, and the broader regional economy.

Commissioned by the Victorian Higher Education State Investment Fund, these reports aim to provide a roadmap and strategic analysis of how Melbourne can be reimagined and reinvented as a digital economy and digital society, following the massive shock to our city over the past two years.

Over the next 15 months, further reports will be produced by leading digital economy research centres in RMIT's College of Business and Law and the College of Design and Social Context. These reports will cover a range of critical areas and topics that will shape how we think about cities, and the sorts of institutions that live within cities, such as major research universities.

RMIT University is a microcosm of the Melbourne CBD and shares its same fate in an important sense. We have been here since 1887 and are the major university in the CBD. As a significant employer and land-owner, RMIT has a deeply shared interest in the Melbourne CBD and its success. And as a university of technology, we have long intimately connected with and contributed to the transformations that have shaped the city and its economy that powers it. And like the city, we too, have been deeply and profoundly affected by the COVID-19 shock.

For years, decades even, RMIT, like all universities, has pushed and pulled to bring the frontiers of digital technology into how we deliver not only higher education in the classroom but also research and engagement with our community. Despite its importance, the process of digital transformation has been challenging. But then suddenly, in 2020, we no longer had the luxury of moving slowly and carefully and had to gather all our staff and students and all our other friends and hold hands and simply jump into the future. And so we did.
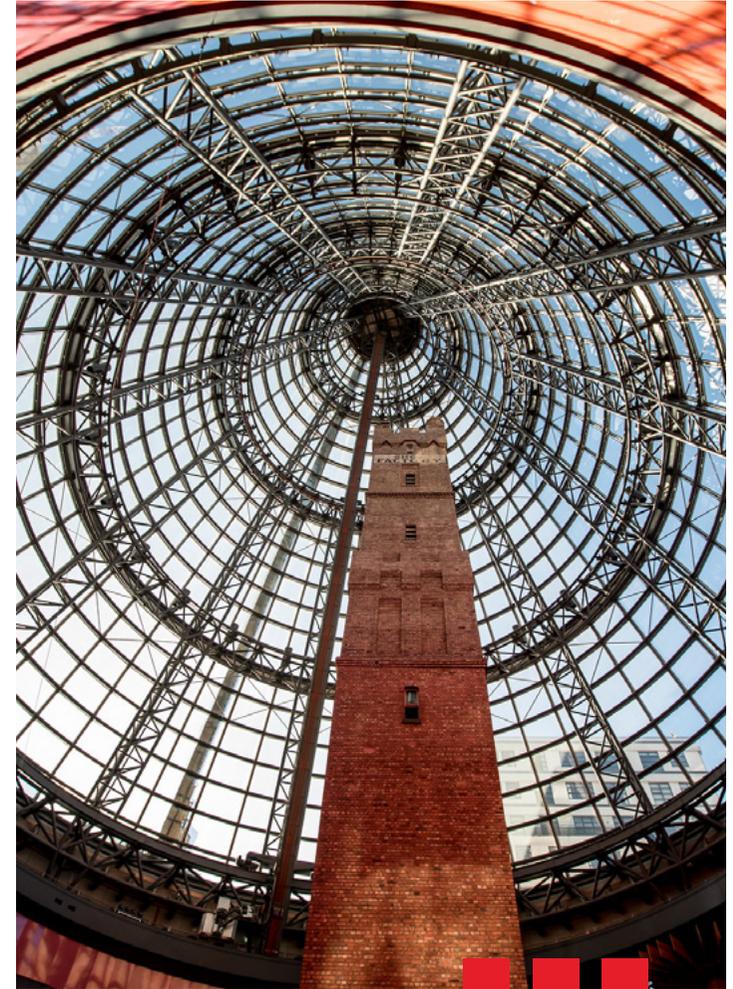
The Digital CBD project is interested in what happens when an entire city does that? Or an entire economy? How can we do it well? What will happen to jobs, to businesses, to society? And what does government need to do to facilitate this transition?

The College of Business and Law at RMIT University has world class research capabilities in digital business, digital society and the digital economy, and so we are in a strong position to help answer these questions. We have the Blockchain Innovation Hub, recently ranked #2 globally for education and academic research impacting blockchain technology in a ranking exercise conducted by Coinbase in conjunction with Stanford University. We also have the Centre for Cyber Security Research and Innovation and play a central role in the CRC in Digital Finance. In addition, we have the AWS Cloud Innovation Centre. All our researchers within these centres closely align with the ARC Centre of Excellence in Automated Decision Making and Society, and the Digital Ethnography Research Centre.

RMIT University has cutting edge research capabilities in numerous frontiers of digital technologies, including applications to space, materials, sensors and digital health. The great opportunity of this project is to combine and integrate all of these research capabilities about the applications of digital technologies to focus on a wicked pressing problem: the future of the city.

Economic change and technological innovation are never smooth and linear but move slowly and suddenly are characterised by disruption. Likewise, socio-cultural transformation also moves in a similar nonlinear fashion, reaching critical tipping points of change. This economic and socio-cultural disruption process, where things break and remake, is happening to our universities and our cities right now.

Amidst the disruption and uncertainty lies a prime opportunity to accelerate into the future by building on new knowledge. These reports, the first of which you have before you now, contribute to that creative process. Cities and economies adapt to disruptive change through the ingenuity, imagination and determination of their people. It is the role of the university, as our public duty, to help facilitate that process. And not just for ourselves, but for our students and those who come after us, who will live and work in the digital city. At RMIT University, we are excited to be playing a vital role in the reinvention of the city as a human-centred digital technology infrastructure.

Professor Julie Cogin
Deputy Vice Chancellor (College of Business and Law) & Vice President RMIT University, Melbourne

At RMIT University, we are excited to be playing a key role in the reinvention of the city as a human-centred digital technology infrastructure.

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Executive Summary

This report provides the multi-disciplinary context for, and approach to building a Digital CBD (Central Business District), led by the RMIT Blockchain Innovation Hub, the RMIT Centre for Cyber Security Research and Innovation, and the RMIT Digital Ethnography Research Centre. The report draws together expertise surrounding digital technologies and cities from economics, law, the social sciences, media and communications, and cybersecurity to identify Melbourne's challenges, transition points, and opportunities.

Melbourne, right now, is the perfect case study for a Digital CBD. It is a dynamic and inventive city with creative and talented people at its core. But, in the face of the pandemic effects, now is the time to reset Melbourne, build upon its unique strengths and foster a thriving, connected and responsive city.

We set forward an economic rejuvenation agenda with an inclusive focus on fairer outcomes, advancing shared goals such as equality and sustainability, and ensuring the Digital CBD will support the public good.

In this foundational report, we identify four transition points that shape our understanding of why Melbourne is in the perfect position to build a Digital CBD:

The adoption of digital technologies has rapidly accelerated following the need to work, study and socialise from home;

A changing local and global economy is demonstrating the need for substantial entrepreneurial adjustment to discover a prosperous post-COVID economy;

A powered-up process of economic evolution is rapidly selecting different sectors and types of firms; and

A re-ordering of institutional and political forces is occurring.

The report sets the scene for the opportunities and challenges ahead relating to infrastructure demands, cyber security issues, supply chains, digital skills, and regions and precincts. The key strategic question the report raises is how Victoria's position in the global economy will change as a result of global digital uptake and how we might optimise that transformation.

The report is the first in a series that will unpack key opportunities for how Melbourne can respond to the twin shocks of the COVID-19 pandemic and digital era.

Introduction

This report will consider Melbourne's current adaptive challenges through the twin shocks of the rapidly accelerated technology adoption in response to the COVID-19 pandemic and the arrival and logic of a digital economy and society. It puts forward the context for why Melbourne is in the perfect and timely position to re-imagine itself through a Digital CBD.

We define Melbourne as encompassing the entire metropolitan area, referring to the CBD, including the Docklands precinct. Though we note below that "mini-Melbournes" exist within Melbourne. Similarly, regional areas and towns in the broader state of Victoria define themselves in relation to Melbourne, and offer essential provisions and services to the Melbourne CBD, whether through food or energy supplies.

The report then focuses on the pivotal points of transition that shape our understanding of the opportunities for Melbourne to take the global lead as a Digital CBD. These points of transition include accelerated digital adoption, an entrepreneurial adjustment, a powered-up economic evolution, and a re-ordering of institutional and political forces. Finally, we consider four opportunities this regeneration and reinvention of Melbourne into a Digital CBD presents in the areas of infrastructural demands, secure supply chains, digital skills, and regions and precincts.
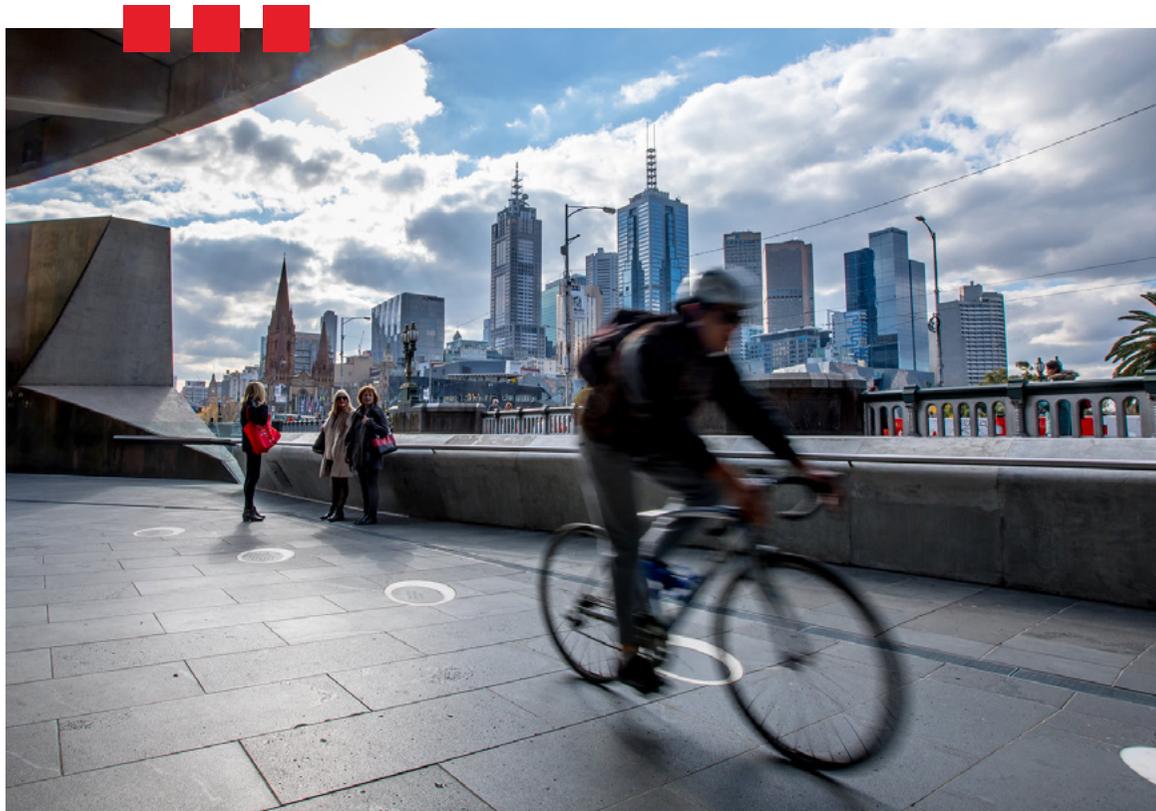
A. The Challenge

The State of Melbourne's CBD Today

Melbourne: coffee appreciation, hipsters dressed head to toe in black, and world-class street art. Melbourne frequently tops the Global Liveability Index and has a diverse and multicultural population. The sporting, food, culture and events capital of Australia, Melbourne is known as a tourism hotspot for suburban, interstate and international tourists. Like many global cities, the pandemic may have changed Melbourne forever, but this would not be the first time (see Figure 1 for Melbourne's noteworthy transition points since its founding).

The twin shocks of COVID-19 and rapidly accelerated technology adoption have impacted workplaces, work practices, supply chains and the wider economy - alongside radically changing our experiences of everyday life. The COVID-19 pandemic, and the associated lockdowns immobilising the public and businesses, has prompted the radical restructuring of economic activity and forced rapid digital adoption. As a result, companies may no longer look the same, and many may never return to a pre-COVID status quo.

The Australian economy is currently undergoing a profound evolutionary transition from an industrial economy to a digital economy. Estimates suggest that Australia progressed five years forward in consumer and business digital adoption in around two months[1].

This transition represents a fundamental shift in the way businesses, governments, charities and not-for-profits, workers, customers and citizens interact, and a likely permanent restructuring of the economy. COVID-19 impacts have accelerated this transition, but the foundations of digitisation, globalisation, and innovation have accumulated and assembled for the last two decades.

Figure 1: Melbourne CBD's noteworthy transition points since founding

Founded in 1835 and for much of its history, Melbourne has been Australia's largest manufacturing centre:

- Processing primary products produced in rural Victoria, often for export fellmongering, wool-washing, tallow manufacture
- Flour milling and other food processing, agricultural machinery production
- Manufacturing local consumer demand products such as clothing, boots and shoes, beer & biscuits

1835

During World War I, the government becomes a manufacturer, establishing clothing factories

By the 1920s
- The first espresso machine in Australia was installed by Rinaldo Massoni at the Café Florentino in 1928 and over the decades Melbourne's famed café culture began to emerge
- By 1921, 38% of all its workers were in the manufacturing industry stimulating urban growth
- During the 1920s Melbourne converts to using electricity and the linkages were extensive, ranging from copper mining and Smelting to the manufacture of electric refrigerators, radios and vacuum cleaners

WWI

The rag trade thrives

- The rag trade kicks off in Flinders Lane as Melbourne becomes a fashion capital
- At the 1951 Census more than 40% of all wage earners were in manufacturing
- By 1966 it had fallen marginally to 37% before a steeper decline set in to 31% by 1971, 24% in 1981, and 17% in 1991
- From the late 1970s onwards, the number of jobs in manufacturing in Victoria began to decline

1940s-1970s

Corporate Melbourne grows

- Docklands Stadium is built and many corporates move headquarters to the Docklands precinct
- Melbourne becomes known globally as the most liveable city in the world

2000s

Post-1850s

Post-1850s gold rush, Port Melbourne becomes the world's busiest port and the richest city on earth

- Manufacturing became the biggest sector and the main source of employment
- By 1871 more than 30% male and female wage-earners in Melbourne worked in manufacturing, the largest single category
- By 1881 two-thirds of Victoria's 2500 factories were in Melbourne
- 1890s a quarter of the Victorian manufacturing workforce was in the categories of metals, machinery and carriages, another 23% were in building materials and furniture, 19% in clothing and textiles

WWII

World War II meant imports dried up and there was a renewed drive for self-sufficiency: notably military manufacturing in greater Melbourne

1980s-1990s

Knowledge economy and creative economy emerges

- The shift to a modern city with shopping precincts and business headquarters emerged
- This ramps up the famed hospitality and cultural scene
- Melbourne also becomes a global education and health tech exporter
- In the 1990s, Melbourne's iconic laneways are rejuvenated by design, Melbourne becomes known for world class street art
- Melbourne amps up to a "full stack city" and a centre of business

The twin shocks of COVID-19 and rapidly accelerated technology adoption

We are moving into what the authors of this report term an era of the Digital CBD: where many people may no longer enter the city every day for work, instead plugging into its pulse remotely and living in 20-minute urban neighbourhoods[2] or regional areas. Since the onset of COVID-19, the distribution of people and capital has changed dramatically. Household and consumer behaviours have been transformed as people rely increasingly on online purchasing and the delivery of parcels in the post. Panic buying and hoarding will be long remembered, and many people will likely stock up on a few extra toilet rolls going forward.

But beyond these knee jerk reactions among consumers, how will the accelerated shift to online consumption, remote work, and digital adoption more broadly reshape Victoria's CBD and urban landscape? What will be the benefits and affordances of shifting online, and what might be the challenges and barriers to this for Melbourne's residents?

The associated challenges caused by COVID-19 are clear. Melbourne ranks among the cities to have faced the longest and most arduous series of lockdowns globally.[3] A deserted CBD during lockdown(s) (see Figure 2 on foot traffic decline), associated unemployment (see Figure 3 on job decline) as businesses shut or struggled[4], and intensification of mental health considerations occurred during the pandemic in Melbourne across two years (2020-2021).

Figure 2: The rapid decline in foot traffic in Melbourne CBD during COVID-19 lockdowns. Data is taken from Q3 of each year only. Source: City of Melbourne (2021)
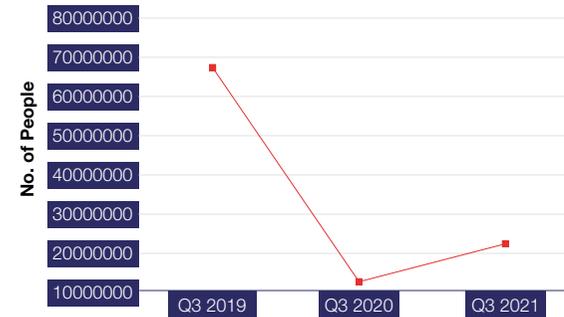

Figure 3: Declining jobs in Melbourne municipality due to COVID-19 lockdowns. Source: City of Melbourne (2020)

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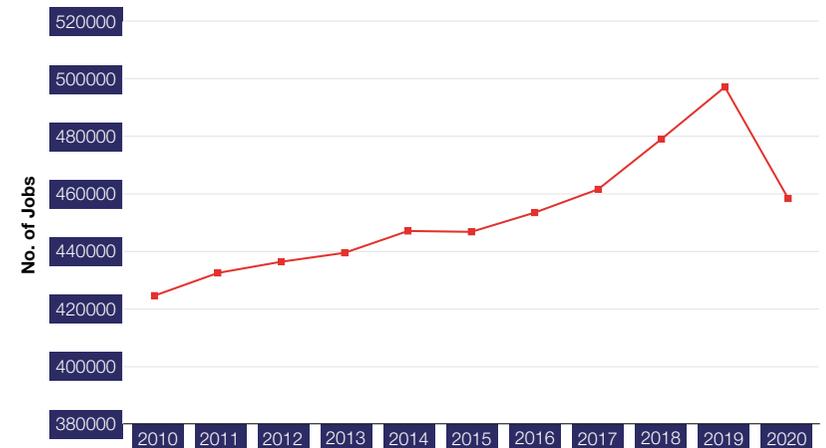
2   https://www.planmelbourne.vic.gov.au/current-projects/20-minute-neighbourhoods
3   https://www.abc.net.au/news/2021-10-25/fact-check-is-melbourne-most-locked-down-city/100560172
4   In 2020, MCC recorded 458,400 jobs in Melbourne, a decline of 39,000 jobs or 8 per cent compared to 2019 and the lowest number of jobs recorded in the municipality since 2016. There were 15,000 business establishments, a decline of 1,700 or 10 per cent compared to 2019. This is the smallest number of business establishments recorded since 2007. Around 60 per cent of the jobs lost in the last year in the municipality resulted from businesses ceasing their operations within the municipality. The remaining 40 per cent were the result of businesses shedding some jobs but continuing to operate within the municipality. Melbourne City Council (2020) Census of Land Use and Employment: 2020 Summary report. https://www.melbourne.vic.gov.au/SiteCollectionDocuments/clue-2020-summary-report.pdf

In response to mandated lockdowns and social distancing requirements, people physically distanced themselves from their friends, families and colleagues and lost access to in-person social support and engagement with live entertainment, places to play, eat and socialise. Borders have separated families for extended periods, missing births, marriages and funerals or engaging with them online. The building industry became an outbreak hotspot and, under pressure of long lockdowns and mobility restrictions, riots and protests broke out in the streets. Beyond that, the challenge of homeschooling kids for working parents unable to leave home has proved one of the hardest experiences faced by working families.[5]

Alongside this decline in foot traffic in the CBD and increase in remote work has been the challenge of domestic infrastructure, with companies heavily reliant on their employees' (often uneven) internet connectivity and data capacity, which can vary substantially depending on people's data plans and location. The Australian Digital Inclusion Index[6] shows that affordability remains a key barrier to equitable outcomes in the digital economy, 14% of Australians would have to pay more than 10% of their household income to gain quality and reliable connectivity, with this growing to 67% of those in the lowest income quintile. Although these problems may be easy to see, they are complex challenges.

Melbourne ranks among the cities to have faced the longest and most arduous series of lockdowns globally.

5 https://www.abc.net.au/news/2021-09-02/parents-struggle-work-and-home-learning-lockdown/100421816
AIFS. 2020. Families in Australia Survey: Life During COVID-19: Report no. 1. Australian Institute of Family Studies, Australian Government. https://aifs.gov.au/publications/families-australia-survey-life-during-covid-19
6 Thomas, J., Barraket, J., Parkinson, S., Wilson, C., Holcombe-James, I., Kennedy, J., Mannell, K., Brydon, A. (2021). Australian Digital Inclusion Index: 2021. Melbourne: RMIT, Swinburne University of Technology, and Telstra; https://www.digitalinclusionindex.org.au/

To this picture, we can add the broader economic shocks of landlord-tenant rent re-negotiations often leading to associated cash flow and working capital problems for both parties, and ultimately empty storefronts, empty buildings (see Figure 4) and a redistribution of capital. Café and restaurant preferences have changed, guided more by geographic proximity than cuisine or loyalty. At the same time, the online food delivery market has grown exponentially, with drivers becoming front line workers in cities and suburbs and some restaurants and cafes becoming 'dark' or 'cloud' kitchens.[7]

The ripple effects of even larger global shocks have seen supply chain breakdowns, causing colossal wait times for deliveries of everything from vegetables to vehicles. These were compounded by the slowdown of air traffic globally, ports being closed, and border regulation changes that occurred without predictability. This overall and unpredictable global insecurity kept people and enterprises in a holding pattern, locked in indecision and massive inertia —a strange counterpoint to the rapid digitalisation of economic and social practices.

Figure 4: Comparative changes in built space use for offices, retail and unused spaces between 2019/2020 in Melbourne CBD. Source: City of Melbourne (2020)
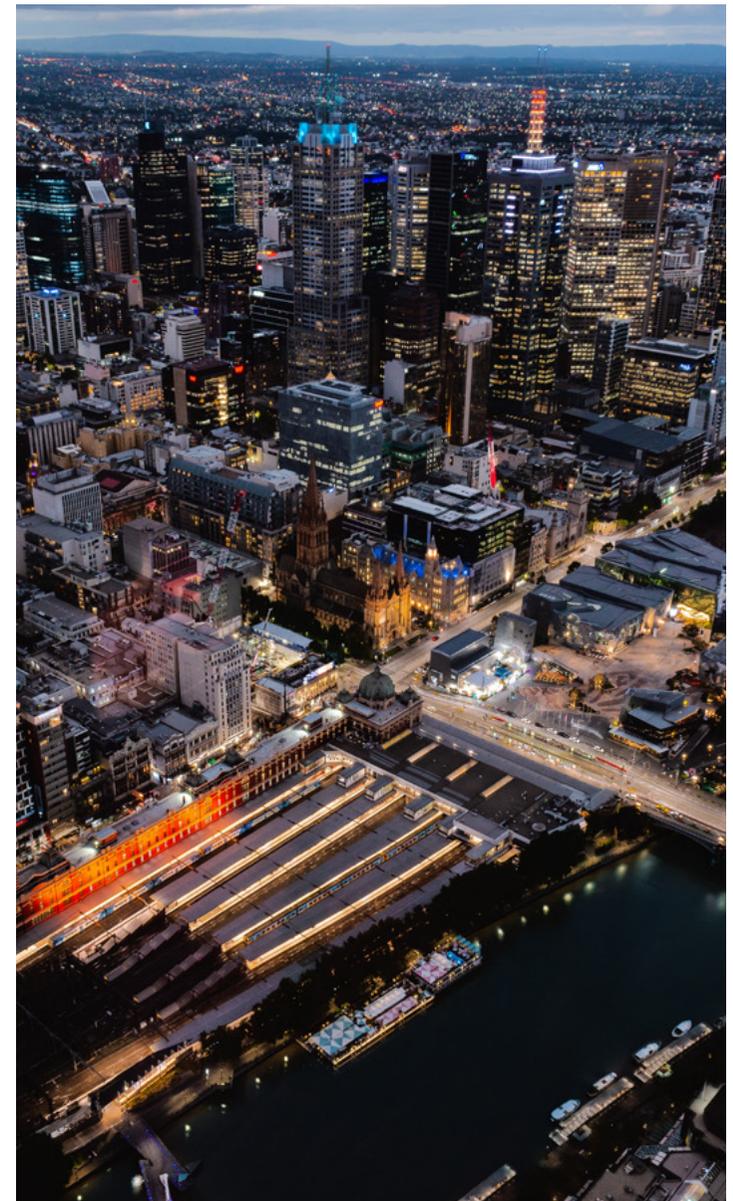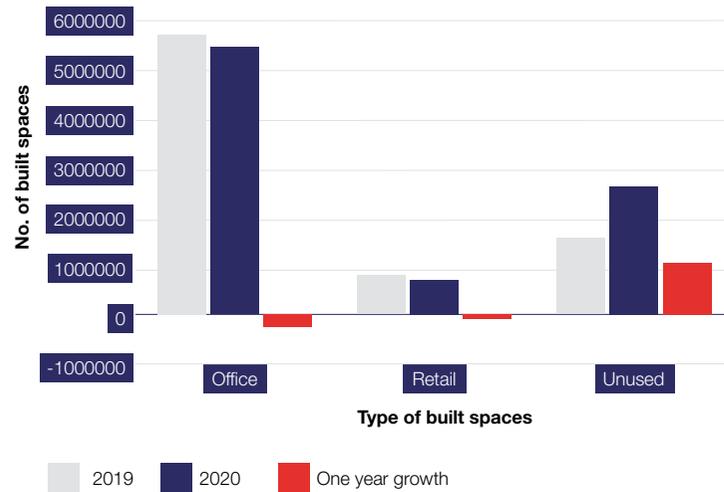
The challenge is clear: we are still in a period of transition marked by disrupted labour markets, movements away from the CBD and a newly emerging distributed digital economic and social architecture that reshapes and reforms the living pulse of Melbourne.[8]

7 Tania Lewis. 2020. Digital Food: From Paddock to Platform. London,: Bloomsbury Publishing Plc. doi:10.5040/9781350055131.
8 https://www.abc.net.au/news/2021-09-24/the-great-resignation-post-pandemic-work-life-balance/100478866

Yet, with challenges come opportunities

While the pandemic response has been notable as a digital adoption accelerator, Australia's economy was already transitioning from an industrial to a digital economy, albeit at the uneven speed of organisational change and in the face of the stagnation in labour practices. The many affordances of existing and emerging digital technologies can act to fundamentally transform business and economic infrastructure: they may make start-ups easier, create opportunities for new types of businesses, push automation deep into economic administration for potential efficiency gains and the release of time, and disrupt existing businesses and structures of economic organisation.

As the vaccine rollout continues, many companies are already moving towards various new distributed work models and digitally native companies, or cloud-based companies, have cemented their niche. This is particularly so in light of the reverse migration out of cities as workers prioritise lifestyle, home life and wellbeing while holding on to city jobs. This trend may not be fully reversed; however, it points to the connection people retain with their city-based employers.[9] Digital productivity tools and automated performance monitoring have increasingly become the management toolkit for supporting employee performance across located and remote contexts. Companies that decide to return to some semblance of office-based work will have to boost morale and create new cultures.[10] In addition, further outbreaks will continue to affect predictive models of rejuvenation. Yet, the twin shocks present an opportunity to drive digital technology into new areas to increase the resilience of the CBD by being more responsive and dynamic.

9   https://www.pc.gov.au/research/completed/working-from-home/working-from-home.pdf
10 Discovering our digital CBD - https://www.rmit.edu.au/news/acumen/digitalcbd
    https://www.bloomberg.com/news/articles/2021-04-22/yes-working-from-home-makes-you-more-productive-study-finds

The forthcoming reports outlined in this initial report seek to help Melbourne and Melburnians re-imagine, re-organise and plan more successful economic, social and cultural endeavours. This process will form the foundation for building a Digital CBD and optimally position Melbourne within the global context of increasing digitalisation.

We know there has been an economic shock and a disruption of everyday life routines and habits. We don't know what the future will look like. However, we do know the digital infrastructures, applications and data we have available and their demonstrated or speculative use cases. We will engage in dialogue with Melburnians in this process of re-imagining. An analysis of the potential implications of this for the Digital CBD becomes the framework for our recommendations.

For this re-imagining, we will draw on the World Economic Forum Great Reset agenda[11] to enhance the economic and social rejuvenation agenda through an inclusive focus on fairer outcomes, advancing shared goals such as equality and sustainability, and ensuring the Digital CBD will support both Melbourne's economic wellbeing/welfare and the public good.

Through these shared values, we aim to rebuild public and commercial confidence in the Melbourne CBD. Smart technology and Internet of Things (IoT) technology and their protection play a critical role here, coupled with broader exercises in building civic re-engagement and re-connection. It's essential to generate resilience by helping to create trust in the digital tools that will keep us safe, and well informed. For us, resilience includes the ability for businesses and organisations to prepare for, respond to, and recover from disruptive events such as cyber-attacks upon the digital city infrastructure and mass data breaches whilst continuing to operate effectively. Our digital credentials will be important. Our COVID-safe systems must include trust and appropriate cybersecurity/privacy designs. However, a vital part of this digital resilience will be the relationship between the government and the citizens through policies covering privacy and security in the Digital CBD. Policy-making can enable the government to mandate cybersecurity controls, roles and registration processes, and would allow citizens to better protect their information using their own policies.

To understand what the CBD will look like for Melbournians post-COVID, we seek to outline:

The key role of engagement with Melbournians to re-imagine the Digital CBD;

Why people will continue to enter the CBD;

What role a smart, interactive, AI data driven CBD might play;

How the relations between urban centres and regional and rural contexts are shifting;

How to help businesses forecast working capital;

The new secure supply chains powering the city;

The new labour markets forming;

The importance of digital access, skills, and the affordability of these;

The cybersecurity/privacy challenges;

How we will integrate trust and cybersecurity/privacy designs in everything we build;

How we rethink the city as a built environment, from physical space to code;

How outdoor spaces could be repurposed and how private spaces might be opening up for public/civic engagement;

The redeployment of capital and creative approaches in rejuvenating distinct regions of Melbourne; and

Reinventing a sense of city ownership, drawing from public and private sector understandings.

Therefore, one key preliminary question must extend beyond our parochialism and love for Melbourne.

What are Melbourne's unique selling points? How will the CBD add new value in the future and how can we re-envision these unique selling points for a digital era?

These are tough but exciting challenges that require collaboration between communities, governments and industry. This project seeks to provide the roadmap not just for those conversations but also for actionable change and the development of a world-class Digital CBD. We aim to propose small workable pilots such as data "oracles" that will lead to public finances and private capital being redirected to create new innovative CBD-centric economies. We anticipate the use of participatory and decentralised (meaning distributed from a central, authoritative location or group) approaches, which will build civility and civic-mindedness into data sharing and use while ensuring the security and privacy of that data.

We see our universities playing a leading role in generating economic activity in the CBD, through their central presence and connection with the regions. This role is enhanced by the knowledge brokering and the intermediation Universities do between and across communities, governments and industry. So our aims include community building to support public engagement and social inclusion, education and training, and ultimately encouraging digital low-cost business experimentation.

B. The Transition

Building a Digital CBD

Cities

Cities are places where humans thrive and are remarkable human inventions. They are engines of creative productivity because they concentrate social, cultural and economic value in and around places. It is well understood that cities are a key engine of modern cultural and economic prosperity.[12] This project seeks to expand how cities are also socio-technical engines, with complex ecologies. The current trends toward urbanisation (globally), + integration of secure IoT/smart infrastructures, + COVID-sponsored remote/hybrid forms of work and interaction, create a complex ecology that requires multiple metric systems to evaluate and encourages an ecological approach toward flexible/adaptive infrastructures. A great city, its dynamism and complexity is animated by millions of decisions made by city residents each day. It is both a physical environment of traditionally built city spaces, and a digital and symbolic hub of economic and political power and productivity.

The COVID-19 pandemic has provided the impetus for a reset, but it was decades in the making. We have reset many of the relationships in our city, during which existing inequalities were amplified and made even more apparent. The restructuring of the economy was already underway prior to COVID-19, rapidly disrupting Melbourne's path dependence. The onset of COVID-19 accelerated these changes. We know where this economy is going now, and have an opportunity to develop an intellectual framework to inform economic development from here on out. We are also well-positioned to create a value framework that will guide the path forward towards fairer outcomes, advancing shared goals such as equality and sustainability, and directing the innovations of the digital era to support the public good, particularly in the arena of health and social challenges.[13]
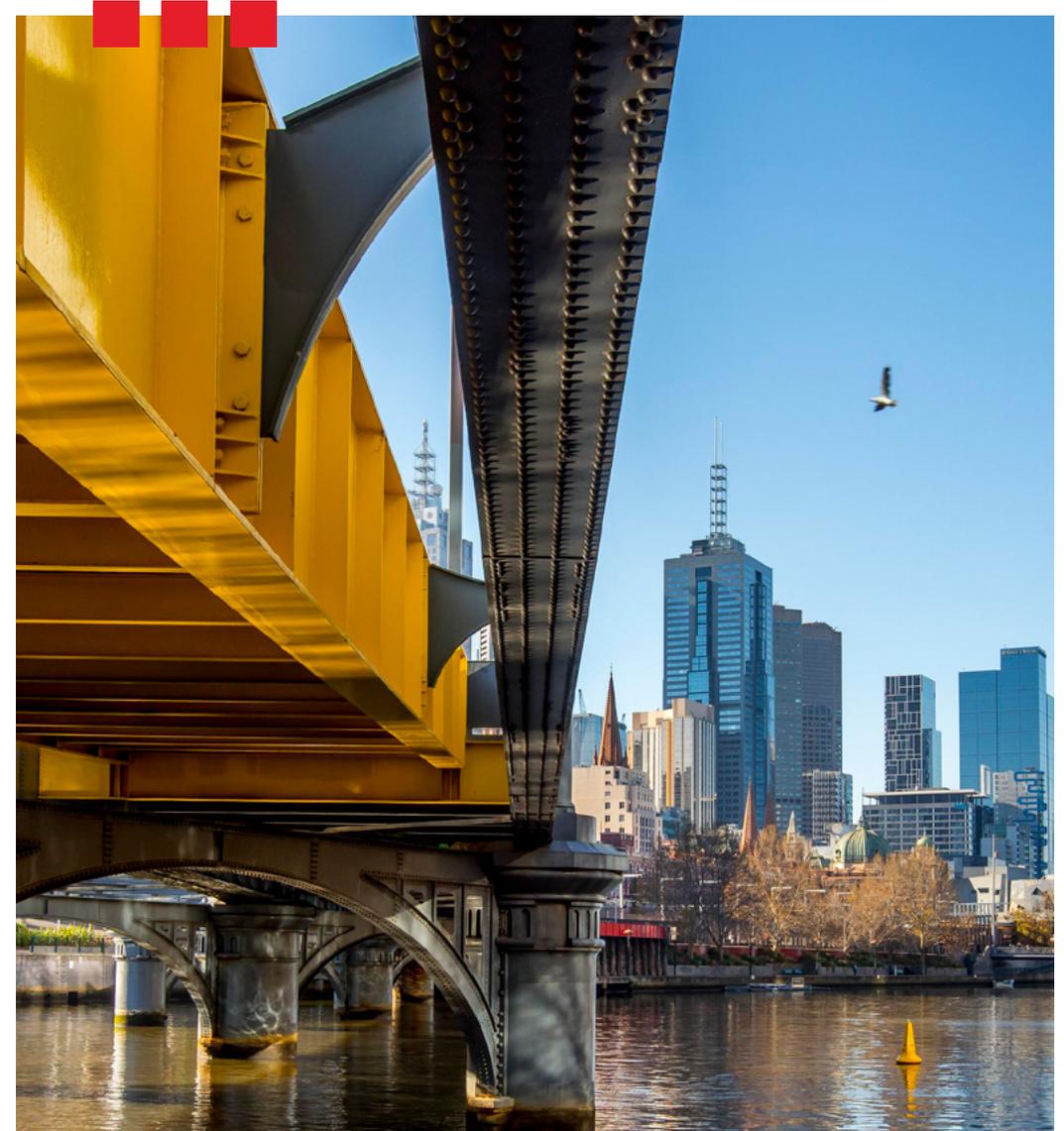
[12] Hartley, John, Jason Potts, and Trent MacDonald. 2012. "CCI - Creative City Index: Final Report." Cultural Science Journal 5 (1). https://culturalscience.org/articles/abstract/10.5334/csci.41/

[13] https://www.capgemini.com/au-en/news/research-global-citizens-favor-smart-cities-and-call-for-their-hometowns-to-be-sustainable/

Building a Digital CBD...

In the first section of this report we observed the juncture at which Melbourne (and many global cities) currently finds itself.

The idea that we can simply return Melbourne to its former glory is admirable, nostalgic, and mistaken. Melbourne has changed forever. We have seen that Melbournians have different preferences, they want to work, socialise, care and collaborate in different ways. They demand different things from other people, and from the city in which they live. Each of these changes provides great opportunities, many of which can be facilitated through digital technologies. But before we realise that growth and prosperity at an economic, social and cultural level, we need to transition the way we operate, at all levels and across all domains.

The Digital CBD that we are transitioning towards will look different to the industrial CBD of the past. But we don't yet know what it will look like, so this is our opportunity to re-imagine future visions beyond conventional conceptions of the contemporary CBD. Our task today, and in this roadmap, is to find ways with which to facilitate the transition to a digitally embedded CBD that scaffolds the built environment of the CBD.

A Digital CBD primarily exists in physical space, but that physical space is constructed and datafied by digital technologies. Those digital technologies augment and can improve the way we search, seek, communicate and collaborate, and ultimately the ways that we choose to live our lives. The Digital CBD consists of layers: layers of digital infrastructures; layers of applications including cybersecurity protection and layers of data with all the layers interconnected.

The question today is what activities will remain digital, what activities will remain in a physical space, and how the combination of these different activities can be best used to create a vibrant CBD.

Crypto-cities

We look to other cities' leading innovative approaches when integrating crypto and blockchain technologies into governance practices and city functions. Including Seoul's move into the metaverse, Miami City and its initiative to become the world's crypto-capital and New York's plan to establish a city-wide cryptocurrency.

Additionally, there are pilots underway that explore the different ways cities can harness the supercluster of technology to provide rapid responses to long-running problems and changes in people's underlying needs. These pilots are the beginning of what Vitalik Buterin refers to as "Crypto Cities"; where web 3 technology is used to support these pilots given the mainstreaming of crypto ideas such as coins, non-fungible tokens (NFTs), and decentralised autonomous organisations (DAOs).

Existing projects include: CitiCoins, city tokens that form a local medium of exchange linked to the city government; selling tickets to Art Festivals as NFTs; and creating crypto-oriented cities from scratch (CityDAO). Given that smart city initiatives often raise concerns around centralised governance, lack of transparency and data privacy, blockchain and cryptographic technologies are a promising key ingredient for a more open and participatory way forward. Three categories of application include using blockchains to:

1. Create more trusted, transparent, and verifiable versions of existing processes;

2. Implement new and experimental forms of ownership for land and other scarce assets; and

3. Implement new and experimental forms of democratic governance.

Before we develop a roadmap to a Digital CBD, we must understand what makes cities vibrant. We know that cities are dynamic adaptive systems that are both complex and incomplete. These features enable life-project making (and remaking) of residents, a key factor behind the long-term transformations and ongoing centrality of cities.[14] Saskia Sassen, a scholar of global cities, argues that in this incomplete-ness lies the possibility of making — making the urban, the political, the civic, and in our case the making of a Digital CBD. Cities can have ecological resilience due to the complex human systems within a confined geographic space. Schumpeter's famed theory of "creative destruction"[15] posits that there is no such thing as smooth mechanical growth, but that growth in all complex systems involves tearing things down and destruction. The pandemic has been catastrophically destabilising, but we argue a flourishing of innovation could likely follow.

The Digital CBD roadmap we outline in this report series is not a static blueprint but an open-ended toolkit. We do not take a clear and concise vision of what a Digital CBD is, and is not, and provide recommendations to get there. Rather, our roadmap to a Digital CBD is informed by the understanding that CBDs are complex, living spaces where people undertake and make their life projects. To discover the Digital CBD that we are transitioning towards, we need policies and skills that power entrepreneurial discovery. We need tools and experimental approaches to identifying, forming, testing and applying new ideas and systems to social benefit.

14 Sassen, Saskia. 2013. "Does the City Have Speech?" Public Culture 25 (2 70):209-221. doi: 10.1215/08992363-2020557.
15 Schumpeter, Joseph A. 1950. Capitalism, Socialism and Democracy. 3rd ed. New York: Harper-Collins. Diamond, Arthur M., Jr. 2006. "Schumpeter's creative destruction: a review of the evidence *." Journal of Private Enterprise, 2006 Fall.

The structural changes caused by COVID-19

Next, we offer four changes that have significant consequences for policymakers, entrepreneurs, and employees. The transition towards a Digital CBD occurs within a dynamic context. And so before we propose some opportunities created through a Digital CBD, it is useful to understand the underlying trends and drivers that leave us at a transition point. These are not simply the effects of COVID-19 and the current context in November 2021; they are the broader currents shaping our city.

In this section we identify four underappreciated trends:

1. Accelerated digital adoption

2. An entrepreneurial adjustment

3. A powered-up economic evolution and

4. A re-ordering of institutional and political forces.

Each of these trends have profound consequences for policymakers, entrepreneurs and employees.

COVID-19 has irreversibly accelerated the adoption of digital technology to facilitate our daily lives, our homes and the function of the city – its services and businesses under physical distancing and other lockdown measures that constrained mobility and in-person interactions in Victoria.

One consequence of this accelerated digital uptake is increased decentralisation, a foundational function of the internet era. The incoming digital era is often spoken about but not well understood. It is a continuation of an ongoing shift from the internet era that impacted social and economic realities, such as the capabilities of the internet to increase global networking, accessibility, and mobility. Another foundational shift was the exponential development of processing power, leading to the portability of powerful analytical tools (greater analytic capabilities for individuals) and the integration of embedded systems, especially in digital cities.

Technology adoption typically follows a particular diffusion trajectory, and acceptance is linked to the availability of digital infrastructures, perceived usefulness and the skill levels, literacies and capacities of adopting populations. Digital technologies with significant scale effects must overcome behavioural and institutional resistance, and be effective in eliciting adoption and acceptance of technology at scale through meaningful applications. This means that the productivity benefits from widespread technology adoption, especially infrastructural and production technology, can be very slow to realise.

COVID-19 arrived at a critical time in the history of technology, when a supercluster of digital technologies were forming (blockchain, artificial intelligence and machine learning, cybersecurity, quantum computing, virtual reality, 5/6G communication, Internet of Things, and low-cost 3D printing), poised to disrupt the underlying infrastructure of the economy. This suite of digital platforms and technologies had been developing for the past several decades, and these technologies are being scaled into digital cities.

But society had run into innovation constraints caused by coordination adoption problems, regulatory barriers and a degree of organisational, social and cultural inertia. From March 2020, many of these constraints were rapidly overcome in Melbourne. The spread of online education and telemedicine, which had been until then a multi-decade process, occurred in a matter of weeks as Melbournians moved mountains to make this possible. Another big change was the rapid transition to remote working. This was a global, multisector, virtually-instantaneous coordinated adoption of digital technology. The COVID-19 period has been unique in the history of technology adoption.

WFH adoption and the shift to innovation in the home

There are several implications on the shift to working from home – not just on technologies but also on social practices. Firstly, it facilitates greater co-production of value. This is because more household resources, including local and personal information, are being mixed into production.

Secondly, the place that innovation occurs has been shifted to the commons rather than markets and organisations. As such, trusted decentralised networks are required to combat cyber security threats, increasing the demand and use of distributed innovation and technology and institutions.

While we have seen the impacts of the decentralisation of production and innovation, we have also seen the decentralisation of value systems related to "productivity" and "innovation". This reconceptualisation will allow new measurement tools for value creation that will likely include different factors, which orientate towards both individuals and communities working independently of formal institutions and industrial era measures like GDP.

Thirdly, new economics will be required to make sense of these new behaviours and digital forms of capital and value creation. It will also require new dispute resolution mechanisms as traditional courts are not equipped to deal with this.

In *Unfreeze (2020)* we argued that there is an urgent need for entrepreneurs to adapt to the post-COVID-19 world. Economies are made of connections, information, contracts, webs of value, and relationships. As we restart the economy, much of this connective tissue has changed.[16] The rapid technological acceleration driven by the crisis creates its own unique needs for adaptation. We are already seeing the formation of new consumer preferences, new types of jobs, new types of business models with new cost and demand structures, new patterns of supply, and new regulatory and legal uncertainties.

But this implies that a significant amount of human capital and physical capital (built for industrial-era technologies and business models) has rapidly devalued.

The first priority for entrepreneurs in the post-COVID-19 economy will be understanding how particular markets, jobs and administrative functions have changed. For example, many restaurants moved to take-away only during the Melbourne lockdowns. Will consumers want, and expect, these new services to continue, and how might we shape these expectations?

Entrepreneurship, whether economic and/or social, is not something that governments can supply. But it can be supported and marginalised, accelerated or inhibited. So policymakers have to ensure they are facilitating — not impeding — entrepreneurial adaptation to the accelerated digital adoption triggered by COVID-19.
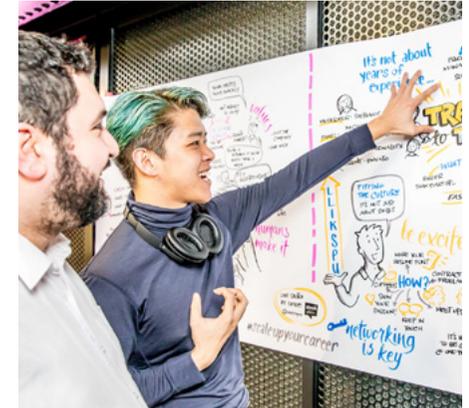
Digital inclusion/exclusion for cultural sector

The cultural sector, so reliant on live events, ephemeral performance and in-person engagements of crowds, has incorporated virtual platforms, AR experiences and the use of social media platforms, such as Twitch, to replicate the experience of live performance at a distance. At the same time, they have sought to use these technologies to maintain relationships with existing audiences and build new distributed audiences. This has opened new and inclusive spaces for cultural access and social engagement for those previously excluded from live events due to health or mobility conditions. Will audiences demand that this virtual interactive presence remains, and will some artists even return to

venue-based audience engagement? Simultaneously, however, the ability of cultural workers and institutions to make this 'digital pivot' was reliant on pre-existing digital inclusion that remains remarkably unevenly distributed. So while this 'digital only' moment has enabled accessibility for some, others are being left behind. Addressing this unevenness will be critical for ensuring Melbourne's vibrant cultural economy is as strong as it can be – both online and off.

Entrepreneurial skills are essential during periods of rapid change, as can be seen from the digital pivot many artists have taken to engage their audiences digitally.

16 Allen, Darcy WE, Chris Berg, Sinclair Davidson, Aaron M Lane, and Jason Potts. 2020. Unfreeze: How to Create a High Growth Economy After the Pandemic: American Institute for Economic Research.

The pandemic has produced an economic environment and related policy responses, becoming a powerful evolutionary selection mechanism passing over the global economy and through each sector.

This brutal selection mechanism is causing job losses, contract terminations or renegotiations, demand reductions, business closures and bankruptcy, fire sales, credit shrinkage, asset repricing, factor substitution, and other distinct forms of economic destruction that will play out over the coming months and years.

These market forces, economic and in some cases selective policy mechanisms, have boosted digitally-enabled businesses and sectors, because they are well-adapted to the new environment. We also acknowledge that other factors, such as the preferences of the powerful, also shape the market. However, the principle stands that bigger firms with better capitalisation (or better political connections) will do better, and smaller firms, while potentially more agile, may be selected against, unless there is a reduction in regulatory and capital infrastructure constraints.

In labour markets, some positions are more vulnerable than others, notably casual or part-time workers or contractors, and those in the gig economy. While many workers and firms are on temporary support through public sector subsidy of wages or quasi-partial nationalisations, a proportion of those positions or organisations being kept afloat will fail when that support is removed.

This brutal selection mechanism is causing economic destruction that will play out over the coming months and years.
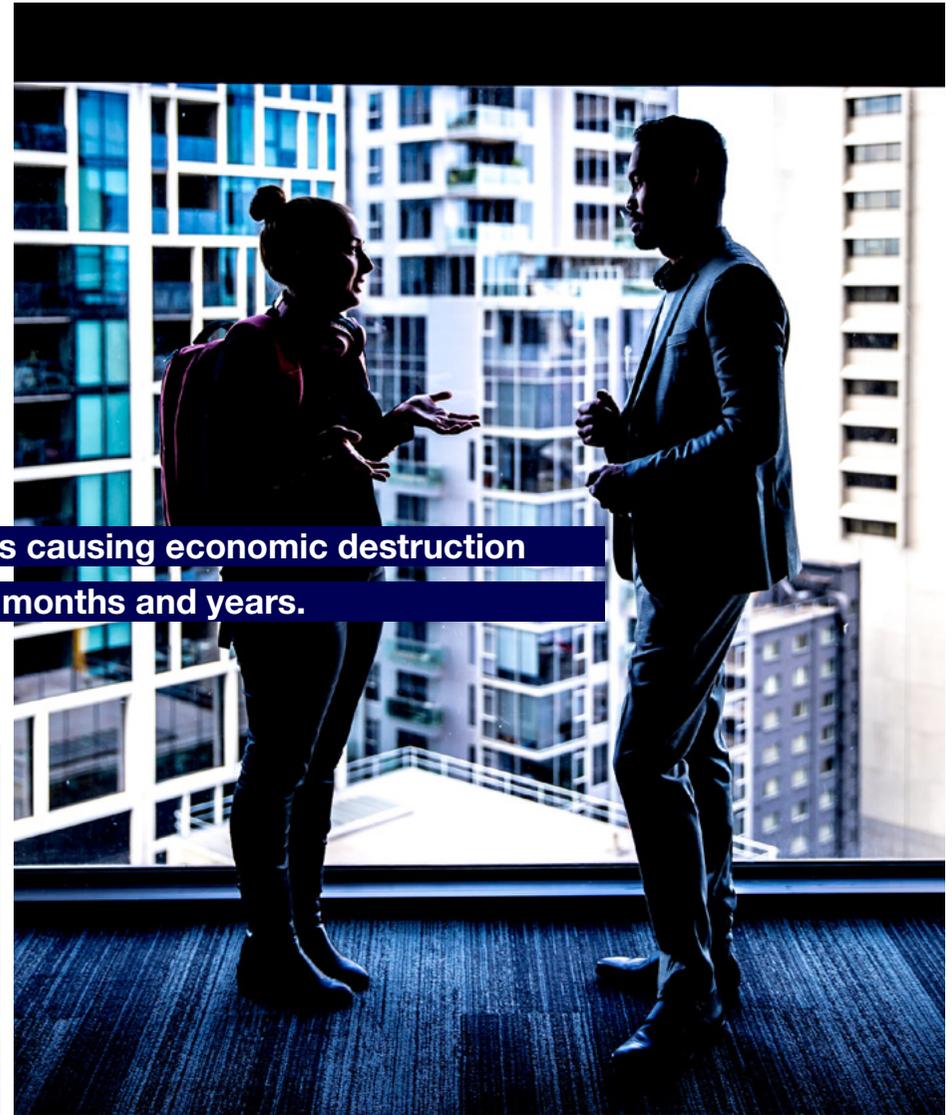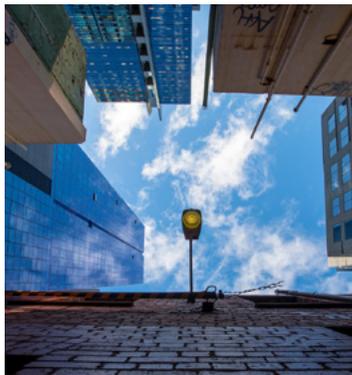
Similarly, there will be much bad debt on company books that will be realised in market revaluations over the coming periods; these debts may lead to collapses that will release resources for subsequent entrepreneurial reconstitution and reinvention.

But we should also expect consolidation of existing markets and resources among surviving players. This may actually result in higher growth and profits among large adaptive companies — mainly technology-driven companies. So a period of global economic destruction is not inconsistent with a booming share market.

The real alternative to conventional policy levers isn't necessarily different policies (like quantitative easing, negative interest rates, or universal basic income) but in part lies with better institutional technologies. Blockchain, in particular, offers a new administrative and governance base layer of the economy.[17]

A digital infrastructure base layer of industry utilities and digital platforms may provide a more agile foundation for targeted economic policy and entrepreneurial adaptation.

[17] Davidson, S., De Filippi, P., & Potts, J. (2018). Blockchains and the economic institutions of capitalism. Journal of Institutional Economics, 14(4), 639-658. doi:10.1017/S1744137417000200
Allen, Darcy WE, Chris Berg, and Aaron M Lane. 2019. Cryptodemocracy: How Blockchain Can Radically Expand Democratic Choice: Rowman & Littlefield.
Berg, Chris, Sinclair Davidson, and Jason Potts. 2019. "Blockchain Technology as Economic Infrastructure: Revisiting the Electronic Markets Hypothesis." Frontiers in Blockchain 2 (22). doi: 10.3389/fbloc.2019.00022.
https://medium.com/cryptoeconomics-australia/the-blockchain-economy-a-beginners-guide-to-institutional-cryptoeconomics-64bf2f2beec4

Institutional policy reform and technology as ways to help with public debt

The economic impacts of COVID-19 also look to fundamentally break the standard monetary and fiscal policy levers that have been used to manage business cycles over the 20th century.

From a public finance perspective, the magnitude of the committed policy actions is already unprecedented. The levels of public debt committed to avoiding a market catastrophe via subsidies and bail outs is unlike ever before. Not to mention the massive collapse in tax receipts the government is facing. The implications for public finance are catastrophic, with a huge increase in public debt, a vastly worse central bank balance sheet, and looming inflation.

This is beyond the capabilities of traditional monetary and fiscal levers. We will require institutional policy reforms to deal with the crisis. However, institutional policy is politically much harder to achieve and highlights the limitations of these policy levers. The pandemic has brought into sharp relief the limits and constraints of this centralised public infrastructure and the technocratic foundations of the macroeconomic policy mechanisms built upon them.

One of the most powerful institutional forces over the past several centuries, and which has underpinned global economic prosperity in the industrial era, was the development of global trading infrastructure for commodities and capital. It was built around the Westphalian system of nation-state record-keeping and intra-nation state treaty-based institutional governance (i.e. trade zones). But it has come to a virtual halt in the crisis.

In the short and medium term, the global trading order will rebuild around a different order, namely provable health identity and data to facilitate the safe movement and interaction of people. Where that can safely happen, so can economic activity. Health zones may become the basis for trade zones and "travel bubbles".

Green zones (or cordon sanitaire) have long been used in pandemics,[18] and as the health zone grows, so too can the trade zone. Economic zones can then build on the decentralised identity and data infrastructure created to construct a health zone. The result will be redrawing physical and network boundaries, even eliminating artificial economic borders, to develop integrated trade zones. As we rethink human and commodity flows, there may also be a range of unexpected benefits from the disruption of global trading infrastructures and remapping of global trade, including environmental benefits.

The costs of COVID-19, economically and beyond, do not fall evenly across the population. The health risks fall heavily on some groups (the elderly, and those with comorbidities, marginalised populations and culturally and linguistically diverse communities), and the costs of economic lockdown fall on different groups and will be experienced differently. The differential impact by sector, jobs, education, human capital investments or physical or financial capital write-downs shape how the costs are distributed across society.

The virus imposes huge private costs that will be in part socialised through political bargaining.[19] The outcome of these politically mediated bargains and transfers will shape politics for years to come.

The development of global trading infrastructure for commodities and capital has come to a virtual halt in the crisis.

[18] Oliu-Barton, Miquel, Bary Pradelski, and Luc Attia. 2020. Exit strategy: from self-confinement to green zones. EsadeEcPol - Center for Economic Policy & Political Economy. https://www.esade.edu/itemsweb/wi/research/ecpol/EsadeEcPol_Insigth6_Exit_Strategy.pdf

[19] Allen, Darcy WE, Chris Berg, Sinclair Davidson, and Jason Potts. 2020. "On Coase and COVID-19." Available at SSRN 3585509. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3585509

But the pandemic also shifts some of the anchor points of the political economy and provides us with the opportunity to reselect the values upon which these anchor points rest. Regardless, the sudden growth of the welfare state, unemployment insurance and wage-support, healthcare provision and childcare, or even social housing are unlikely to be easily rolled back. So there will be a higher demand for social welfare safety nets.

But to pay for this, along with the urgent need to address the extensive deterioration of public balance sheets, economic policy will need a pro-market agenda enabled by and through socially and environmentally sustainable economic prosperity. Politically, one potential route this might take is a pivot to the centre with very 'dry' economic policy and 'wet' social policy — what was called the 'third way' in the 1990s, but with many more social and environmental checks and balances in place.

The counterpoint to that centre-pivot is that many of the high-cost political projects of both the right and left will be abandoned. Reduced economic growth means we can afford fewer of the luxuries of advanced capitalism.

This is a vision of a new kind of social-digital capitalism to be built after the reset, from the government-led physical infrastructure of the industrial era, to a digital era built on secure, decentralised, open and communally developed technology platforms. This vision will respond to a commitment to fairer markets, sustainable and equitable investment, and a focus on the public good; the three prongs of the Great Reset put forward by the World Economic Forum to promote the shift to a fairer stakeholder economy.

There will be a higher demand for social welfare safety nets.

Finally, the economic consequences of the COVID-19 pandemic are often discussed in terms of potential macroeconomic policy response to dealing with the economic destruction that the public health strategy necessitates. This is talk of the V-shaped, U-shaped, L-shaped or W-shaped recoveries. In *Unfreeze* we wrote of the need for a square root shaped recovery; after the reopening, we will need a long period of high economic growth to return to the prosperity of 2019.

Our forthcoming reports seek to explain that COVID-19 has accelerated structural evolutionary change in the economy. The accelerated adoption of digital economic infrastructure during the crisis will leave a lasting mark on the social, political and economic system of the future. This provides many opportunities for economic recovery.

4 Opportunities for a Digital Melbourne CBD

Our vision toward a Digital CBD proposes a staged regenerative strategy, an evolutionary strategy.

We are now at the beginning of recovery and rebuilding the entire economy, as well as reimagining social and community life. In this phase the foundational infrastructure of the economy - money, property, identity, registries, assets, contracts, regulations, organisations, markets - are constructed out of the full digital economy stack of blockchain, cyber security, artificial intelligence and machine learning, quantum computing, virtual reality, 5/6G communication, Internet of Things, and low cost 3D printing. Toward this, the Australian Federal Government has set out a Digital Economy 2030 Policy Agenda.[20]

The digital era is where we have started to economise not just communication costs but everything, from trust to our relationship with the material world, which will have long term structural implications for the economy.

In the past, communication technologies were the key economic drivers. Yet, now there is a need to enter the terrain of the digital city - which requires extensive infrastructure and investment in a combination of the Internet of Things, data science, cybersecurity, privacy, and artificial intelligence. The economy has crossed a point of no return, and it will need to become digital in its DNA. The digital economy is built upon layers of infrastructures and utilises the invisible motility of code to drive economic progress. So innovative technology in the digital age is mostly about building digital infrastructure.

Our vision toward a Digital CBD proposes a staged regenerative strategy, an evolutionary strategy. This speaks to the central tenets of the government's COVID-19 Reactivation and Recovery Plan.[21] The strategy will require deep policy changes and support of entrepreneurial discovery, significant investment, and experimental pilots and living labs that will engender further innovations.

There are important opportunities both in the Digital CBD, and issues that need to be solved in the transition to that Digital CBD, such as cybersecurity, fraud, hacks, cybersurveillance/data protection.

Below, we propose four opportunities for a digital Melbourne CBD relating to infrastructure demands, secure supply chains, digital skills and regions and precincts.

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20 This is what the Australian Government is preparing for with its Digital Economy Strategy 2030, the Digital Economy Taskforce, the National Blockchain Roadmap, and roadmaps for artificial intelligence and quantum computing. It is the substance of almost every report from Deloitte, KPMG, EY and PwC over the past 5 years on the future of business.
21 https://www.melbourne.vic.gov.au/sitecollectiondocuments/covid-19-reactivation-recovery-plan.pdf
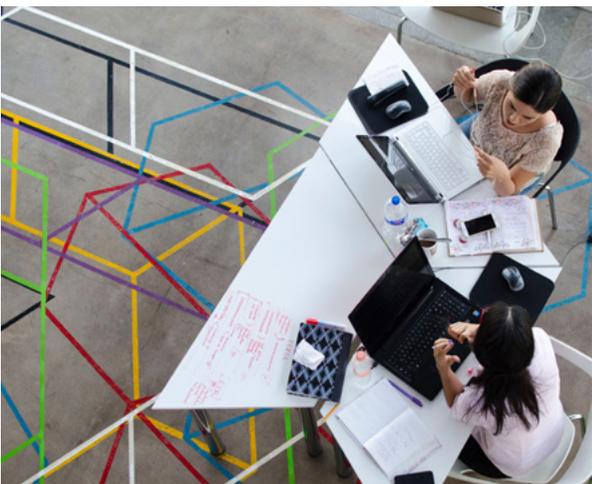
The infrastructure demands of a Digital CBD begin with the relationships between layers of technology, applications and data with the place and people. This layered view presents the layer of Internet of Things (IoT) technologies usually associated with the smart city technology, followed by the ways that the application layer (cybersecurity, data science and AI) address scalability issues, while the data layer (in terms of Web 3-based blockchain technologies) enables cities to run and operate. These layers make up the functional needs of the city for digital business, to support social and cultural life and to connect these into the operation and maintenance of the city streets and buildings, including dealing with pollution, congestion and waste. These layers also play a role in Australia's critical infrastructure through supply chain, banking and transportation aspects and raise, from a security perspective, the range of vulnerabilities and dependencies that need to be addressed through digital upskilling (see Opportunity 3).

As lockdowns eased in October 2021, people returned to the CBD en masse. There was a 2000% increase in foot traffic occurring immediately.[22] Melburnians will continue to wish to eat, shop, celebrate, play and attend Melbourne's iconic sports and cultural precincts and live entertainment scene. Our world-class hospitals, health care systems and universities will again be able to serve more people through both their digital and physical infrastructures. Our botanical gardens, zoos and tourist attractions will once again engage visitors through their physical locations and social media presence. These reinvigorated lifestyle practices and experiences will translate to the question of livability and housing in the CBD. How we coordinate, respond to and enhance these experiences within a Digital CBD will be key to the roadmap of pilots and policy experiments we provide.

[22] https://www.heraldsun.com.au/coronavirus/melbournes-southeast-now-states-new-covid-epicentre/news-story/3ef4994189ffdfcffc0da66956ae7347

The way residents, shoppers, tourists and workers move through the city, and how they engage with businesses, hospitality and entertainment venues, public transport and workplaces, will be reliant on COVID-safe secure digital infrastructures including contactless payments, QR code check-ins and information points, vaccination status verifications and secure data sharing amongst IoT technologies.

Most important is to start by rebuilding public confidence in the safety of the CBD.

Our COVID-safe systems must engender trust in their utility, accessibility, inclusiveness, fairness, cybersecurity and privacy. In addition, citizens and international visitors must be comfortable utilising their data to access and experience the city.

People are now more willing to engage with these digital infrastructures, given the technology transition that the pandemic has forced through our daily lives. Applying the supercluster of technologies identified in this report within the Digital CBD will prompt their adoption and integration into social practice, from the CBD outwards. While risks come with the opportunities (e.g. cybersecurity/privacy risks and further outbreaks slowing the ability to meet together) as we transition to a Digital CBD, we cannot ignore that some behaviours will be changed forever.
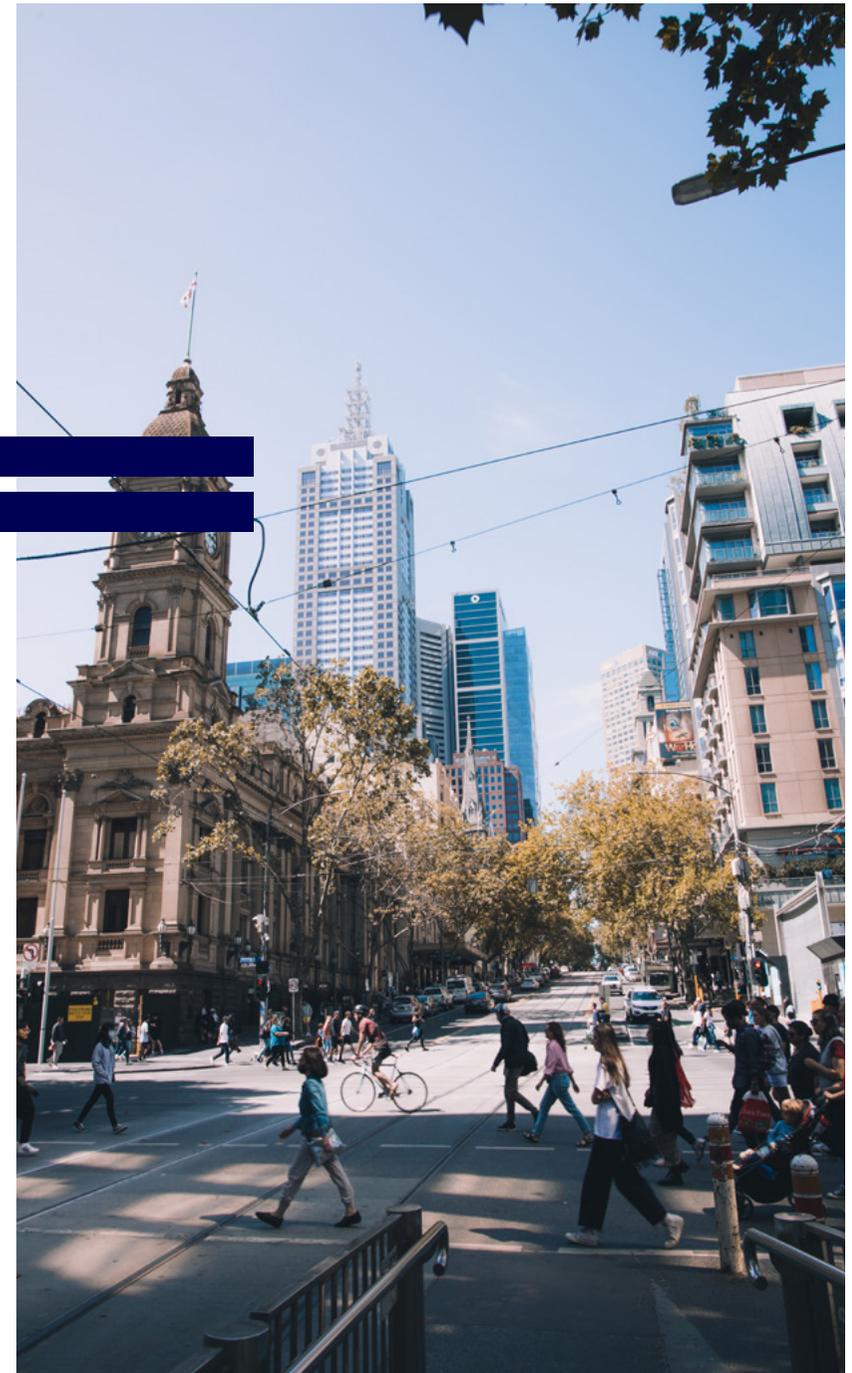
Thus, there are a few technology and data scenarios we seek to consider including:

The resilience of Digital CBD infrastructure through the ability for government, businesses and organisations, and citizens to prepare for, respond to, and recover from disruptive events such as cyberattacks and data breaches;

The role of decentralised systems in supporting robust digital infrastructure that incorporates considerations of privacy, voluntary and inclusive participation, collective practices and accountability measures to stakeholders and citizens;

Forecasting working capital for businesses, alongside observing changing labour markets;

Understanding property rental and ownership dynamics, and considering the role of digital infrastructure in shaping their associated economic impact;

Innovations in secure digital infrastructures that can assist problem-solving, decision-making and service delivery in the arenas of health and social challenges; and

Taking a user-centric design focus in pilots to enhance potential acceptance and adoption of digital infrastructures.

Finally, this opportunity will unpack the infrastructural considerations for the Digital CBD that can contribute to advancing our shared goals around equity and sustainability and the public good.

The twin shocks have impacted local, domestic and international supply chains greatly, with non-food retailers and manufacturers the most affected.[23] As purchasers have moved to online purchasing (including panic buying), distribution of people and capital has been diverted. The pandemic has brought to light previously unseen vulnerabilities, such as limited domestic production alternatives and 'demand risk' to supply chains, in which a sudden surge in demand catches manufacturers and retailers by surprise. This raises the need for a deeper understanding as to what the twin shocks do to supply chains, value chains and location of the city as a junction point where all value passes through.

We explore the ways and technologies underpinning secure digital supply networks can enhance collaboration, agility and optimisation whilst embedding just and fairer practices into digital processes. For example, companies may begin seeking greater supply chain visibility, efficiency and resilience and anticipate the future of supply chains as being digital and autonomous.[24]

We consider how real-time data on the changing ways people use the CBD can be linked with secure digital supply chains and create new value chains of efficiency and innovation. For example, real-time data can change the way we use, plan and make decisions in our great city. Imagine a Banh-mi sandwich bar on the ground floor of a building knowing that level 7 of a major corporate consulting firm only worked in the city on Thursdays? In response, they could plan their inventory and perishable stock, and also perhaps offer certain specials? Further, food wastage of both businesses and produce could be reduced, helping all parties with their working capital.

Thus, scenarios we seek to consider include supply chain hubs and decentralised V-form organisations[25] that are structured around secure supply chains of information. This means that the infrastructural layers of technology, applications and data constituting the Digital CBD city envisaged in Opportunity 1 will provide meaningful intelligence for the specific purpose of creating new, innovative and more efficient local supply chains.

[23] https://www.rba.gov.au/publications/smp/2021/may/pdf/box-b-supply-chains-during-the-covid-19-pandemic.pdf
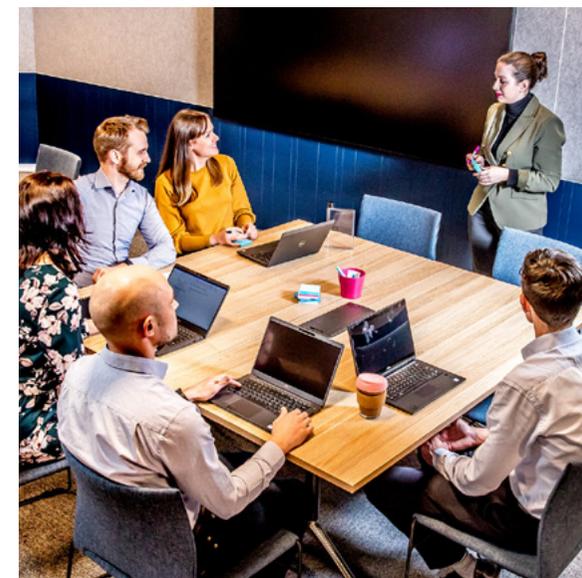
[24] https://www.ey.com/en_au/supply-chain/how-covid-19-impacted-supply-chains-and-what-comes-next

[25] Allen, Darcy WE, Alastair Berg, and Brendan Markey-Towler. 2019. "Blockchain and supply chains: V-form organisations, value redistributions, de-commoditisation and quality proxies." The Journal of the British Blockchain Association 2 (1):1-8.

The digital economy is disrupting the 20th-century education and life model, which was optimised for an industrial and corporate economy. There is a need for updated digital skills in Victoria that are in lockstep with the technology, applications and data produced through the technology supercluster that is the backbone of a Digital CBD. This can make Melbourne one of the most digitally connected cities in the world. However, fast-developing emerging technologies, particularly in the Digital CBD, are creating a considerable amount of critical and sensitive data plus cybersecurity, privacy, and trust issues and ethical challenges. In a Digital CBD, the vulnerable action of an organisation and/or objects (e.g. Internet of Things and smart devices) can put the rest of CBD and urban areas at high risk (e.g., personal data leakage and cybersecurity attacks). Thus, to respond to the general acceptance of the rapid development of technologies and Digital CBD, cybersecurity must develop in the same direction. This is because a new generation of technology gives new opportunities to cyber attackers and introduces a range of new threats and risks.

In practice, there are several areas such as education, government, healthcare, environment, industry, people, living, public service, and transportation that a Digital CBD can provide benefit to in different ways. Within Melbourne CBD, there are also a diverse array of sectors engaging with digital infrastructure that will need to be upskilled. Ensuring security, privacy, and trust in a Digital CBD means maintaining IoT and smart device connections within and between domains and keeping the privacy of personal information from any attacks and harmful actions. To tackle these issues and challenges in a Digital CBD, we need to recognise cybersecurity challenges and threats to citizens' privacy.

Employment profile of Melbourne

The City of Melbourne's Census of Land Use and Employment provides a breakdown of employment types in the city, and will be drawn on to identify the sectors most impacted by the twin shocks and thus cohorts who will be targeted to explore digital skills requirements in the city. The major employing industries in the Melbourne municipality are Business Services, and Finance and Insurance Services. Together these account for 31% of the municipality's employment. Other significant employing industries include public administration and safety, Health Care and Social Assistance, Information Media and Telecommunications, and Food and Beverage Services.

Initially, we see two distinct cohorts:

1. A postgraduate, mid-career cohort that seeks to upskill professionals across sectors in the technology supercluster, including Web3, cybersecurity and associated data analytics opportunities to implement within their own organisations or spin up their own new ventures. This allows professionals currently working in the field to have their experience professionally recognised, at the same time building on their knowledge with the latest Digital CBD and best of industry practice; and

2. An undergraduate cohort seeking engaging, project-based learning with a view to pursuing their own opportunities in the digital economy. This also helps them to explore core themes including technological entrepreneurship and innovation, design thinking and collaborative practice in Digital CBD.

The reskilled postgraduate cohort will improve the productivity of Australia's administrative workforce and the performance of Australia's leading companies. The undergraduate cohort will work in one of the new digital technology fields and launch new businesses or develop projects to take to market. Thus, educating the undergraduate and postgraduate sectors about cybersecurity and the new generation of technology is very important. This training permits them to understand how they play a critical role for the future of Victoria in protecting not only their personal information but also other sensitive information generated by other people, organisations, objects, and companies. This is where training about cybersecurity and new technology is a must because of the advantages and disadvantages of technology's rapid development in Victoria and beyond.

For both markets, the technology sector is a major source of job growth in Australia and a major source of new generational wealth. We need to develop the education offerings to develop and guide this talent to start the next generation of businesses and organisations and redesign and rebuild our existing ones.

In relation to this opportunity, there are a few scenarios we seek to consider:

Steps/approaches for government;

Connecting a post-COVID innovation ecosystem;

Small workable pilots;

Literacy in coordination and supportive technologies - Artificial Intelligence, blockchain, Cybersecurity, Privacy, Internet of Things;

Cybersecurity, Bring Your Own Device (BYOD) and government policies; and

Rapid training programs for needed skills.

To conclude, it is very significant to remember that the fast development of the next generation of technologies (e.g. smartphones, automobiles, green technology, healthcare, and artificial intelligence) is prominent for our society; however, this always raises cybersecurity issues and challenges. The Digital CBD agenda entails enhancing Victorian's quality of life, strengthening and diversifying the economy while prioritising environmental sustainability through the adoption of smart and high-quality security solutions.

Opportunity **4**

How will Victoria's position in the global economy change as a result of global digital uptake?

What does the Digital CBD mean for Victoria's regions and precincts?

Melbourne City Council's latest 20-year-forecast for jobs, population and building in central Melbourne expects the city to come back, with precincts such as Docklands and North Melbourne to almost double their populations by 2040.[26] However, the move online has created mobile labour markets, broadening our scope to collaborate with those that are in similar and overlapping time zones, not just similar geographic regions.

The arrival of a digital economy, digital business, digital society, and culture setting will structurally change the industrial economy, especially for urban geographies. Regions and precincts could be seen as hubs for particular aspects that drew back participation from the wider public. We may even see these merge with the development of Mini Cities as was forecast in 2018 when Melbourne surpassed a population of 5 million.[27]
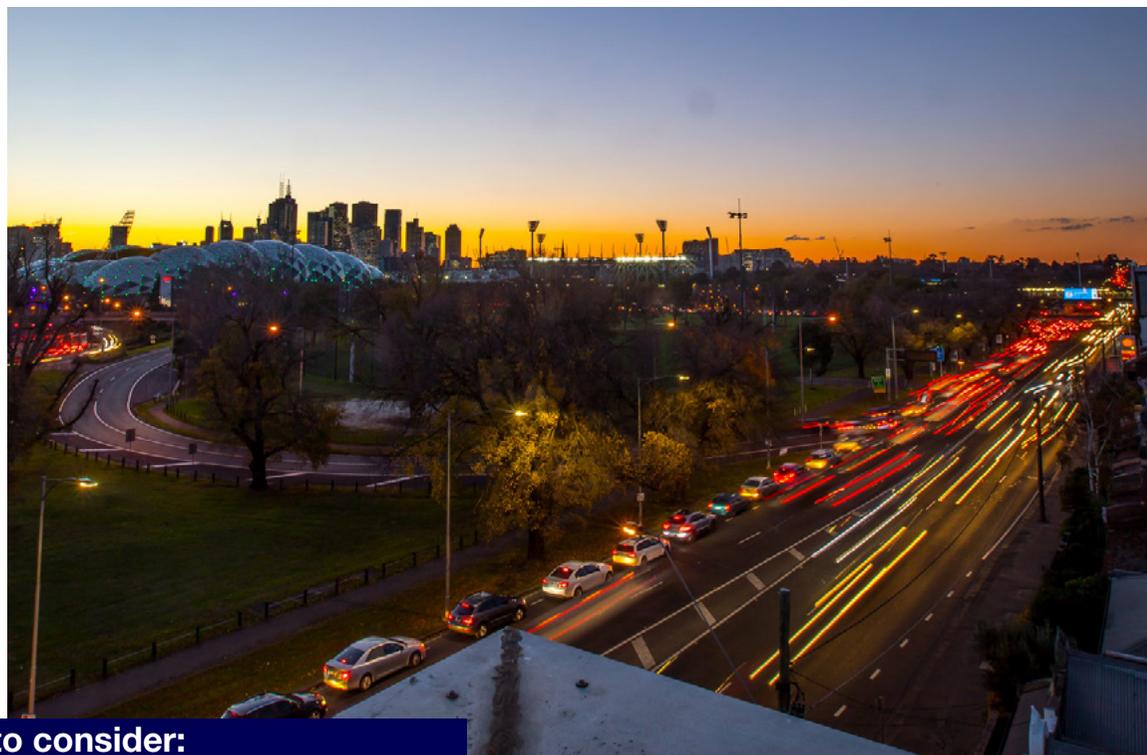
There are a few scenarios we seek to consider:

Imagining interconnected CBD precincts that diffuse into regions or sub-cities;

A city of policy experiments, focal points for pilots;

Tax breaks for certain industries;

Special data zones;

A changing impact for universities in the CBD;

Repurposed real estate;

Public spaces/events and crypto economics such as tokenised incentives;

A 15 or 20 minute CBD;[28] and

Experimental initiatives with the Docklands precinct.

Drawing on these scenarios and data gathered for the previously identified opportunities, we will develop measures toward an index that focuses on the digital infrastructures, supply chains, skill sets and other relevant indicators such as policy and adoption/readiness in order to benchmark Melbourne, its regions and precincts, with its position in the global digital economy.

[26] https://www.melbourne.vic.gov.au/about-melbourne/research-and-statistics/pages/city-forecasts.aspx
[27] https://www.abc.net.au/news/2018-10-16/melbourne-population-growth-plans-for-mini-cbds/10373640
[28] https://www.planmelbourne.vic.gov.au/current-projects/20-minute-neighbourhoods

The Desired Outcomes

For Melbourne's residents, the challenge they face is twofold.

For centuries, cities have acted as hubs of trade, growth and culture. As places where people meet, engage and collaborate, cities have promoted both cultural cohesion and innovation. But in 2020, this entrenched model of the city was suddenly disrupted. A series of deep structural changes, catalysed by a global pandemic, altered the patterns and bonds that held our cities together. We quickly adopted frontier digital technologies to work, study and socialise from home. Entrepreneurs and business owners adapted to this new environment, discovering how to service the changing and erratic demands of consumers, and how to engage in business in a digital-first world. And the forces of economic evolution selected on new margins, benefiting some business models and rendering others obsolete.

For Melbourne's residents, workers, business owners and policymakers, the challenge they face is twofold. The first challenge is to envisage the future of Melbourne's CBD. It is becoming increasingly clear that Melbourne will not return to what it was in February 2020. But if we are not returning to nostalgic pre-pandemic Melbourne life, then where do we head now? What will be the long-term implications of digital adoption, and the changing viability of different business models? What does it mean for residents to live in a hybrid Digital CBD? The second challenge is to discover the steps necessary to bring that Digital CBD into reality. What are the roles of policymakers in ushering in new technologies, or clearing away barriers to entrepreneurial adjustment? How can innovators be incentivised to invest and adapt to rejuvenate Melbourne?

The purpose of this initial report has not been to provide some specific pathway or framework towards Melbourne's CBD. We have aimed to make two main contributions. The first is to review and understand the transition points at which Melbourne finds itself. It would be easy to focus only on Melbourne's specific challenges today, obscuring away from deeper trends. Our approach was not just to observe the particular pandemic-related challenges, but to place this within a broader context of the transition from an industrial to a digital economy through new technologies. Our analysis identified four main trends and structural changes that are impacting Melbourne, relating to the speed and nature of technological adoption, entrepreneurial discovery, economic evolution, and institutional re-ordering.

Our second contribution was to lay out the opportunities that emerge from those structural changes. Firstly, the opportunity to develop and adopt new infrastructures across the Digital CBD that are more resilient and robust to pressures. The development and adoption of these infrastructures will need to include cybersecurity capabilities to prepare for, respond to, and recover from cyberattacks and data breaches.

This will ensure that anyone using this infrastructure, including organisations, businesses, and citizens, can operate effectively without interruption during and after disruptive events. Our existing infrastructures already had challenges, and we now have the opportunity to resolve them. Secondly, the re-ordering of supply chains and trading networks that better serve the demands of consumers and businesses in a secure way.

Thirdly, the re-skilling of workers including cybersecurity capabilities, as we move from an industrial to the digital economy, and from a Melbourne CBD to a Digital CBD. And lastly, a changing (and perhaps more powerful and integrated) role of Melbourne and Victoria in a global context.
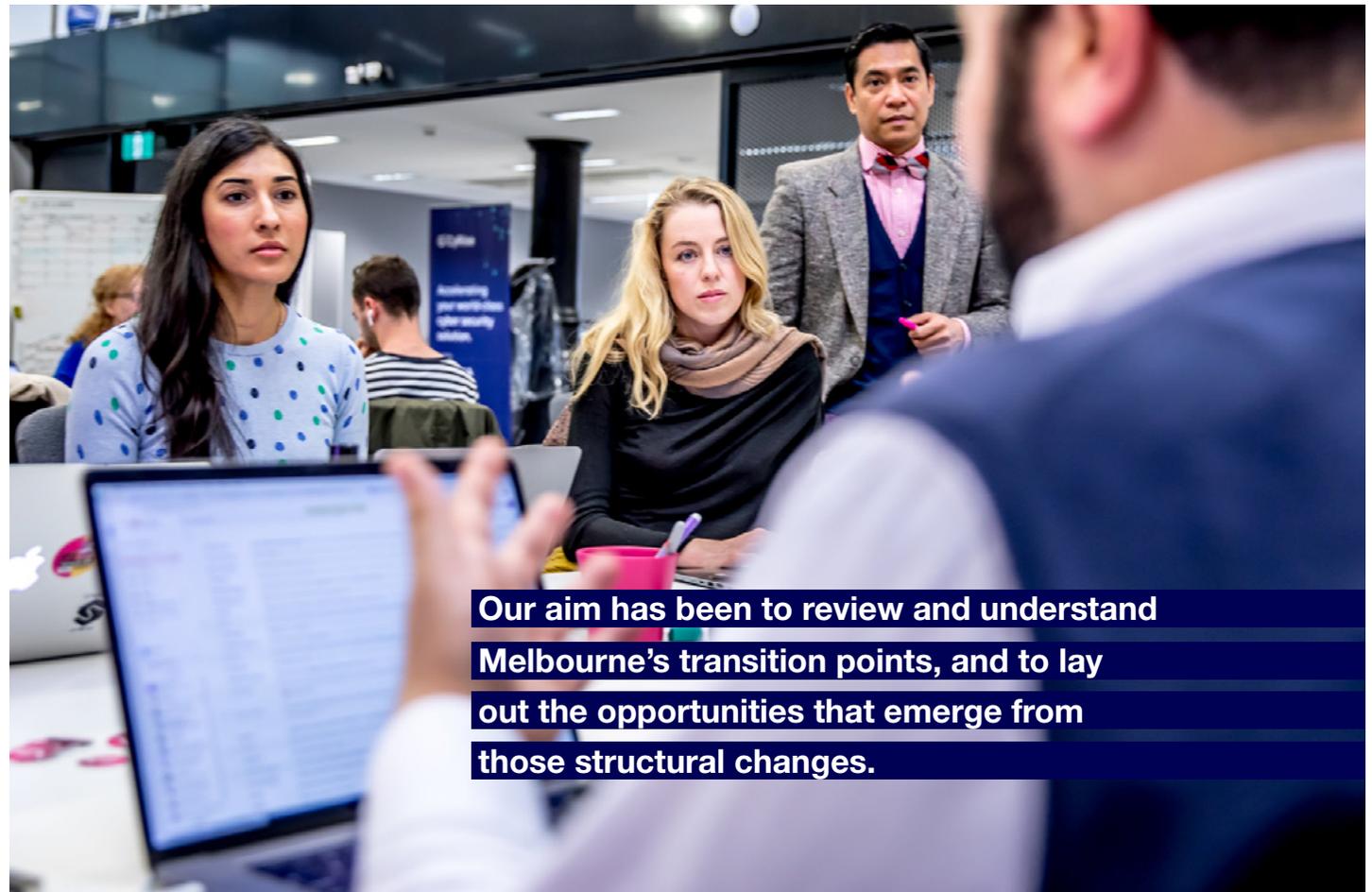
Our aim has been to review and understand Melbourne's transition points, and to lay out the opportunities that emerge from those structural changes.

Our reports will not shy away from ambitious ideas. As noted above, many cities around the world have recently launched their ideas, such as Seoul as a virtual Metaverse that will even have a mayoral office,[29] and Miami as a hub for Bitcoin with its MiamiCoin notably grabbing headlines.[30] And then New York proposing its own NY cryptocurrency[31] in response to Miami's. Bold digital visions are being discussed and created right now. But they are not new. Vilnius made its mark in 2018, launching a blockchain hub in the Lithuanian capital.[32]

The opportunities of a Digital CBD, however, are not self-fulfilling. Nor will the path to a Digital CBD be straight and flat. The transition to a Digital CBD will require inputs from policymakers and regulators to make responsible reforms. Existing businesses and startups will need the incentives to invest and adapt, and foreign entrepreneurs will need to see Melbourne as an attractive place to build their businesses. These efforts must be made to understand the existing context and the changing demands and desires of Melbournians (and future Melbournians). This introductory report sets the foundations for an ongoing research program around the future of Melbourne's Digital CBD. In subsequent reports, we will provide: deeper insights into the opportunities of a Melbourne Digital CBD and the digital economy more broadly; benchmarks to examine and quantify Melbourne's unique place and advancement towards a Digital CBD; and practical policy tools and approaches to achieve our goal of a more prosperous, open, diverse and dynamic Melbourne.

The twin shocks present tough challenges that require collaboration between academics, governments and industry. This project seeks to provide the roadmap not just for those conversations, but for actionable change and the development of a world-class Digital CBD.

There is a role for government as a catalyst, but beyond that there is a need for attracting private sector investment, and the redeployment of capital for returns to attract companies to the CBD.

Our series of reports seek to outline our ambitious proposals for a Digital CBD and we won't hold back.

[29] https://cities-today.com/seoul-the-blockchain-city/
[30] https://www.forbes.com/sites/marisadellatto/2021/11/03/mayor-elect-eric-adams-wants-to-create-a-new-york-city-cryptocurrency/?sh=7edf76a55886
[31] https://www.nytimes.com/2021/03/23/business/dealbook/miami-suarez-crypto.html
[32] https://blockchaincentre.io/
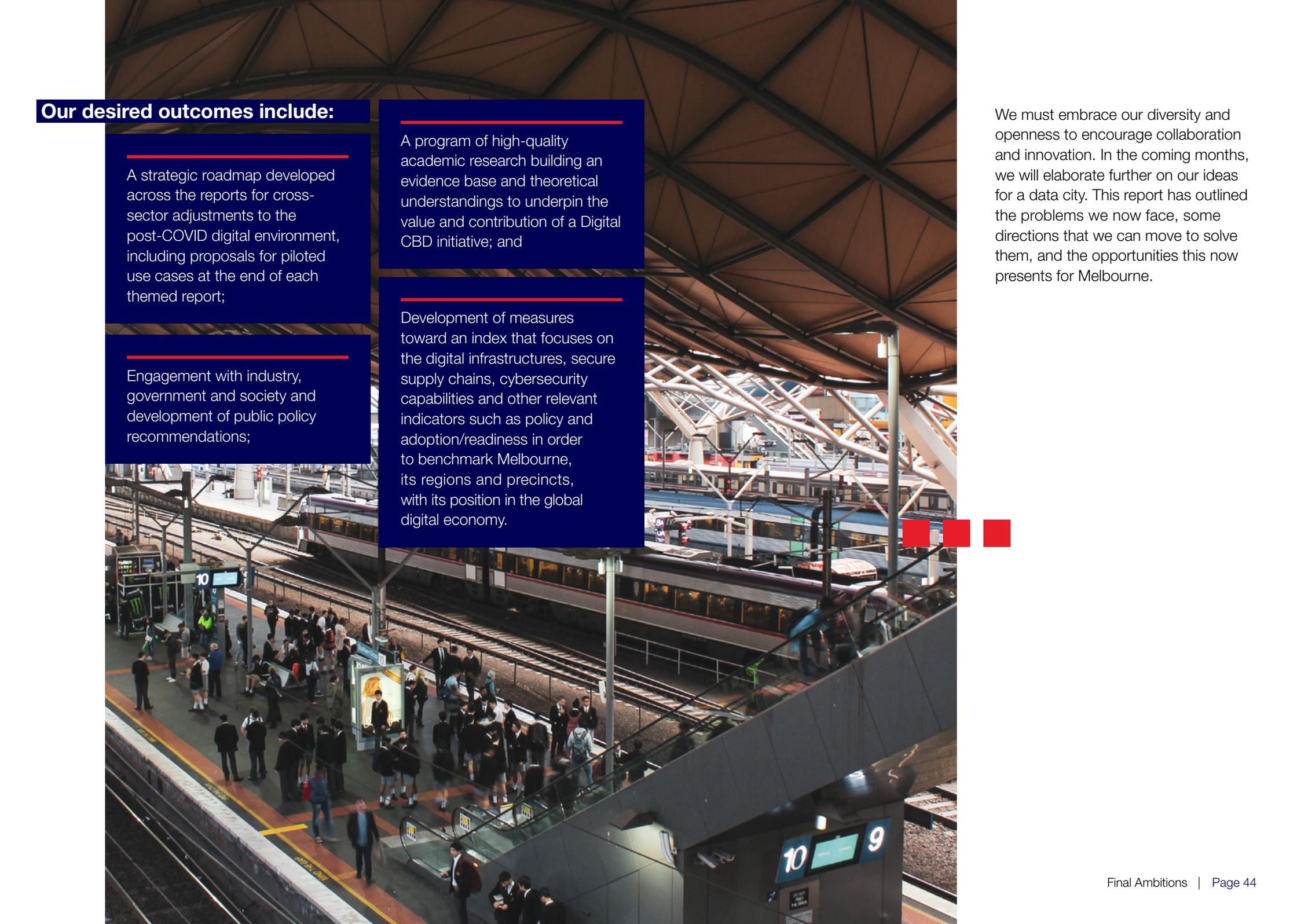
Our desired outcomes include:

A strategic roadmap developed across the reports for cross-sector adjustments to the post-COVID digital environment, including proposals for piloted use cases at the end of each themed report;

Engagement with industry, government and society and development of public policy recommendations;

A program of high-quality academic research building an evidence base and theoretical understandings to underpin the value and contribution of a Digital CBD initiative; and

Development of measures toward an index that focuses on the digital infrastructures, secure supply chains, cybersecurity capabilities and other relevant indicators such as policy and adoption/readiness in order to benchmark Melbourne, its regions and precincts, with its position in the global digital economy.

We must embrace our diversity and openness to encourage collaboration and innovation. In the coming months, we will elaborate further on our ideas for a data city. This report has outlined the problems we now face, some directions that we can move to solve them, and the opportunities this now presents for Melbourne.