MacroPlanDimasi
Understanding today, Anticipating tomorrow

SUSTAINABILITY TRANSITIONS IN EXISTING CITIES

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MACROPLAN
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Contents

TRAJECTIORIES OF EXISTING AUSTRALIAN CITIES

'Poorly understood. Australia needs to reset its urban agenda'

'Australian cities are stuck in an 80's and 90's planning mould. Artificial Intelligence, PropTech and Automated Vehicles will bust open that mould by 2020'.

'Urban and environmental planners and economists still think that development contributions growth boundaries, environmental controls and artificial land supply controls will not increase land and property prices. THEY ARE WRONG. JUST LOOK AT LAND AND HOUSING PRICES'.

Key Points

1. Australian cities and towns are on significantly different growth trajectories and are at different stages of city-lifecycle.

2. A significant increase in employment in the Business and Household services sector is forecast. Business services are critically important for Australia to support the export of services (MacroPlan, Reserve Bank of Australia, Destructive Cities). Future settlement planning for Australian cities should focus on supporting Business and Household services exports.

3. A significant increase in traffic congestion is forecast (Infrastructure Australia Audit 2015) in all cities. This will cost over $50 billion annually.

4. Land prices are forecast to increase faster than inflation due to a lack of practical supply. Lot sizes and dwelling sizes will continue to decline.

5. Housing occupancy costs are forecast to remain high but relatively stable due to low interest rates (MacroPlan, ABS) until 2020. As interest rates increase major levels of housing stress will occur.

6. Household sizes will increase to mid-2020's then decline due to an ageing population.

7. Population aged 70+ to double by 2051.

		Total Pop	Pop Aged 60+	Pop Aged 65+	Pop aged 70+
2017	Series A	24,917,746	5,154,808	3,806,152	2,619,524
	Series B	24,781,121	5,152,420	3,804,770	2,618,691
2051	Series A	42,499,981	11,303,696	9,013,694	6,916,826
	Series B	37,955,917	10,166,330	7,989,835	5,993,181
Growth 2017-2051 (Proportion of 2017)	Series A	171%	219%	237%	264%
	Series B	153%	197%	210%	229%

(Proportion of 2017 Population)

Source: ABS Projections

8. Workforce participation rate for 60+ to increase significantly.

9. Retirement age is likely to increase to 75 years by 2041.

10. Automated vehicles will predominate by 2035. Fully driverless car fleets will have significant impacts on public transport and will, unmanaged, significantly increase traffic congestion (evidence suggests 30% increase in vehicles above current forecast increase in travel times of 30% prepared by Infrastructure Australia.) No new metropolitan strategies Plan Melbourne (2017), Greater Sydney 2056 (2017)[1], Shaping South East Queensland (2017) take AVs into account. Mobility patterns inside Australian cities will change dramatically. Car ownership will decline dramatically. Commuting distances will increase dramatically. I have included my new book *Autropolis – The Diverse Mobility Revolution (see Appendix 1)*, which makes the argument that a National Diverse Mobility Authority should be initiated by the Commonwealth to manage the introduction of AVs (Commonwealth Role).

[1] AVs are cited, Page 32 of Draft Greater Sydney Region Plan, 'Objective 3'

Managed introduction of AVs will improve the social sustainability of urban fringes and regional cities.

11. Inequality will continue to increase in cities as the inner and middle ring 10km 'fortress walls' continue to grow in the form of price barriers. These price barriers are driven by an increasing value being put on human capital. MacroPlan research for the UDIA in Sydney for example demonstrated that 50% of persons asked in Parramatta (commuting to Sydney CBD) whether they would take the same jobs in Parramatta if they were available said no. This is because Sydney CBD has the professional networks, job densities, education and potential for career enhancement, personal improvement and higher wages. Technology and the services economy are driving increasing centralisation in the inner 10km and this trend is being supported by Federal and State infrastructure plans. This centralisation drives high levels of productivity and high levels of inequality. Urban fringes and regional cities and towns are forced to rely primarily on low paid population driven jobs (e.g. retail, health, education, police). *(See attached MacroPlan ICTC report Appendix 2 and MacroPlan UDIA report Appendix 3)*. This seriously affects the economic and social sustainability of urban fringes and regional cities.

12. There is a low level of understanding of the future of employment and the services sector. Planning philosophy in Australia is still firmly based on 'garden city' outcomes rather than affordable / low cost, equitable and productive urban living. MacroPlan have developed a tool for the Victorian Government which estimates job increases due to project investment as a starting point to understand the potential and opportunity to better distribute high income / high productivity jobs,

13. Artificial intelligence (AI) will fundamentally alter urban life and property development in a range of ways not yet articulated. This includes AI which is already more advanced in many industries than imagined. Key industries include:

    - Online retail – e.g. Amazon and intuitive purchase options suggested freight delivery routes, etc
    - Intelligent shopping e.g. remote / AI product selection
    - Automated Vehicles – e.g. computer vision, sensor negotiation, global positioning systems
    - Healthcare – remote diagnosis, personal diagnosis

- Surveillance automation (security)
- Online platforms (Google, Baidu, Alibaba, Amazon with vertically integrated value chains)
- Financial services – Fintech going global
- Robotics – in early phases of operation
- Personal Assistant – e.g. Google, Alexa Machine based voice and sight recognition are anticipated to reach 90% accuracy by 2020

'No transparency objectives or output standards have been produced for AI'.

The growth in non-routine cognitive employment will be driven by AI. To attract these jobs this will be underpinned by high amenity, collaborative, productive urban areas *(See attached ICTC paper Appendix 2).* Currently Sydney and Melbourne are the key cities attracting the professional, scientific and technical sector, the communication and information technology sectors and high level research sectors (e.g. medical research).

The Commonwealth has many roles to play to reset Australia's urban agenda. These are summarised as:

A. Evidence based planning / 'futures' based planning not trend planning. Setting objectives and KPI's for cities.
B. Monitoring change in cities over say10 years to monitor urban outcomes.

C. Sustainability stretch targets for urban areas should be set and financial incentives used (e.g. reduced water usage, reduced energy, reduced private vehicle usage) to reward cities.

D. Global connectivity targets (e.g. Australian Airport underspend Vs NZ, number of highly skilled migrants etc).

E. Taxation should be reviewed along current research lines and stamp duties phased out in preference to land tax. This is consistent with the Henry Tax Review. States should be encouraged to reduce or delete heavy taxes on urban fringe development (e.g. levies, growth area infrastructure charges,

development contributions, section 94 contributions etc) to support 'low cost' cities which can attract the world's best talent.

F. New business models for urban development need to be conceptualised. Destructive Cities points out that adherence to 'Garden City' planning philosophies supported by taxation of urban development has resulted in 'high cost' cities in Australia. Appendix 4 to this submission includes the basis for a new property and planning paradigms for Australia with a number of roles for the Commonwealth. (*See Appendix 4 – Destructive Cities)*

G. Property market structures are a key driver in the trajectories of existing cities in particular:
   - Monopolistic control of major development fronts and the archaic nature of existing property markets. Major international corporates are moving to control urban fringe land supply. The lack of a Property Futures market confines purchasers often to high 'spot prices' for land. For example it is not possible to forward purchase land for future delivery at current prices. This leads to artificial levels of short land supply despite 'claimed' significant 'theoretical' levels of land supply. Land and housing prices cannot increase if supply is sufficient
   - Land prices and house and land package prices should be monitored and published to contain housing prices and enable the possibility of sustainability transitions. Property futures markets could make a significant contribution to 'smoothing' land and housing price increases

H. Institutional urban planning frameworks mitigate against equity and sustainability. Existing town planning statutory frameworks are based on 'additional' cost models. For example costs for higher standards of water sensitive urban design, higher quality open space, bike paths etc are passed onto consumers. Development contributions and infrastructure costs including profit margins and interest costs are passed onto consumers. Planning agencies cannot control actual land supply which generally operates at supply levels below which supply can contain price increases. Public sector policy frameworks are out of control and driving up housing and land prices.

For example, there is no requirement on planning, environmental and infrastructure agencies to contain regulatory requirements and costs of development. Accordingly Australian land markets 'price in' significant risk and take advantage of localised land supply shortages. This occurs both in the use of fringe urban land and brownfields development sites.

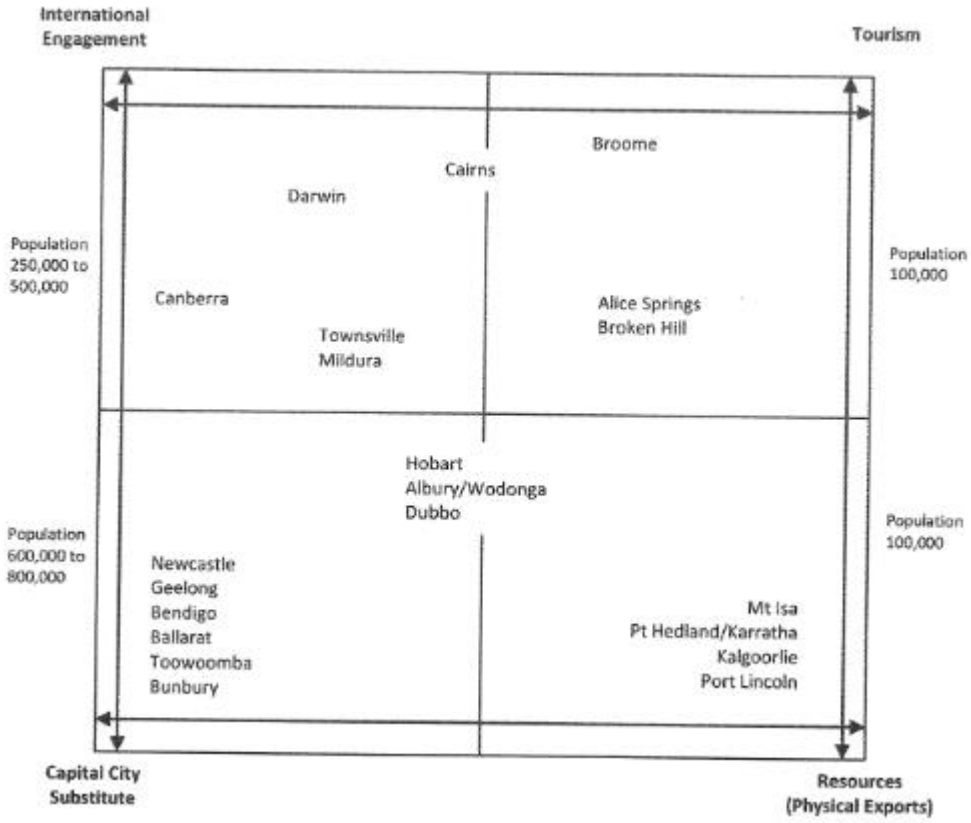
GROWING AND TRANSITIONING SUSTAINABLE REGIONAL CITIES AND TOWNS

'Private investment is the key. The public sector does not have the funds available'

Key Points

1. From an economic perspective there are currently three types of regional cities and towns. Peri-urban (e.g. Ballarat, Wollongong), freestanding (Newcastle, Cairns) and Hinterland related (e.g. Kalgoorlie, Dubbo). In the future the concept of a new national urban grid could be considered to help direct policy making.

A New National Urban Grid for 2050



Source: Page 219, Australia 2050: Big Australia? Brian Haratsis

2. Most regional cities lack basic infrastructure e.g. public transport.

3. Re-direction of urbanisation to these cities should not be done by increasing land / housing prices in capital cities (e.g. by utilising urban growth boundaries or through the use of punitive levies and infrastructure contributions). Positive policies can include new employment, increased land supply in regional areas and greater self-determination.

4. Significant taxation benefits for private investment in regional areas (outside of peri-urban areas) should be considered as a substitute for lack of public funding.

5. State and Federal Government agencies should be significantly relocated outside of capital cities. State Government account for over 70% of public sector employment numbers. *(See Appendix 5)*

6. Population driven services provided by Government should be benchmarked so that regional centres get an equitable share of not only customer service jobs (e.g. school teachers) but 'back of house' white collar professional jobs. MacroPlan has delivered an audit and diagnostics planning tool for regional Victoria which calculates infrastructure, service gaps, estimates and future service requirements based on an equitable share of the services sector. *(Refer to Appendix 5)*

7. Business services and technology are critical to the future of regional Australia. Identifying sectors which can be located in regional Australia 'naturally' from an economic perspective are important. Key focus areas should be:

- Defence (e.g. procurement)
- Education (e.g. international)
- Agricultural technology
- Health (e.g. not only acute but the full range of allied health)
- Freight + logistics

8. There are examples where some of these sectors combine to create vibrant freestanding economies (e.g. Newcastle, Cairns). However public underinvestment, particularly in tertiary education and health means that many regional cities cannot grow and/or retain the talent necessary to grow business services sectors.
9. Regional information and data availability is poor. It is often difficult for the private sector to invest due to the lack of relevant data. This is exacerbated by low levels of local self-determination.
10. Regional cities and towns are ideal to trial and introduce Automated Vehicles, specifically automated shuttle buses for reliable, affordable, inexpensive public transport. Details of the shuttles are contained in Appendix 1. Exciting trials of AV's (now built in New Zealand) by HMI Technologies are underway in three capital cities. *(Refer to Appendix 1)*

PLANNING TOOLS, MODELS, INDICATORS AND ALTERNATE FUNDING OPTIONS

1. The table below identified notable reports influencing settlement policy since 1975. Appendix 4 contains a review of the 'population versus environment' fallacy in Australia. According to the Department of Agriculture and Water Resources, less than 0.2% of Australia's landmass is urban and this number increased to 0.41% if rural residential land is also included.

Land use 2010-11	Area(sq.km)	Percent (%)
Nature conservation	604,671	7.87%
Indigenous + Other protected	1,163,676	15.14%
Minimal use	1,172,679	15.26%
Grazing natural vegetation	3,448,896	44.87%
Production forestry	103,494	1.35%
Plantation forestry	25,752	0.34%
Grazing modified pastures	710,265	9.24%
Dryland cropping	275,928	3.59%
Dryland horticulture	743	0.01%
Irrigated pastures	6,048	0.08%
Irrigated cropping	9,765	0.13%
Irrigated horticulture	4,552	0.06%
Intensive agriculture	1,414	0.02%
Intensive uses (mainly urban)	13,806	0.18%
Rural residential	17,632	0.23%
Waste and mining	1,860	0.02%
Water	125,542	1.63%
No data	401	0.01%
Total	7,687,124	100.00%

Source - Land Use of Australia 2010-11, Version 5, ABARES 2016

2. Understanding future settlement patterns in Australia has moved on from purely geographic and environmental factors to understanding globalisation and technology. There is a major role for the Commonwealth in providing data and interpretation of the likely spatial impacts of global value chains, global investment in urban and non-urban areas and technology. For example 'platform' technology offers such as Amazon which vertically integrates freight and logistics internal to the organisation has already resulted in new global value chains.
3. Future settlement patterns should also be based on understanding economic cycles and waves. Settlement patterns are an outcome of Commonwealth, State + Local policies. Transitioning for sustainability should provide tools for collaboration rather than a deterministic settlement pattern. *(see 'Projected Globalisation Wave' table next page)*
4. The Commonwealth can promote or show leadership in the emerging PropTech sector by creating a spatial data warehouse (see for example the Data Republic Model) and by curating a web based platform which focuses on urban and regional growth and development (see *Programmable cities / ScoopIT*). Collaboration requires quality data.

Projected Globalisation Wave – 1990 to 2050: Three Cycles of Change

1990–2010 Pre-globalisation cycle	• Emergence of an open economy, global interdependence • Existing nation, region and city building methods not delivering economic, social or environmental outcomes
2010–2030 Globalisation and ageing cycle	• Initial integration with world economies based on free trade agreements and industry labour market requirements • Fast population growth and fast ageing population • Remote and regional development and infrastructure investment (particularly north of the Tropic of Capricorn) need hard and soft infrastructure and low-cost housing to become key priorities for nation and city building • Major infrastructure investment and planning to accommodate population and economic growth becomes essential
2030–2050 Global integration and technology cycle	• Comprehensive integration with world economies and global economic regulatory frameworks and the beginning of a new intergenerational era defined by a rapidly ageing international population • Significant increase in retirees and fast growth in the Pacific Rim, China and India • Re-urbanisation and densification of urban areas to accommodate aged and frail aged along with freight and logistics • Remote and regional development becomes the focus for nation and city building • The beginning of a new, technologically wired, Australia

Source: Page 189, Australia 2050: Big Australia?

5. Basic monitoring of urban regional outcomes should be re-initiated. This was historically undertaken by BITRE albeit on a spasmodic basis. The Major Cities Unit approach focusing on report writing did not provide 'self-help' tools for regional Australia to prosecute a case for change. For example bi-annual aerial photography of urban growth and change would provide quality data. Computer based interpretive tools could be developed on an 'open source'

basis. There are emerging PropTech tools such as MapCloud which utilise this type of approach and are now used widely on a commercial basis. (*See Appendix 5)*. Successful transitioning for sustainability will require quality data, the right interpretive tools and collaboration. A ten year project could be designed to meet these objectives.

6. AHURI has teamed up with MacroPlan to implement a project known as the Urban Living Initiative. The aim of the project is to monitor the performance of urban growth areas over time. The project complements the successful HILDA project (Household, Income and Labour Dynamics in Australia) which is funded by the private and public sector and provides longitudinal data on the lives of Australian residents. The Urban Living Initiative will provide longitudinal data on the performance and function of fringe urban areas.
7. Significant research has been undertaken by MacroPlan and other economists into wider economic benefits generated by agglomeration economies in urban areas. Settlement planning should understand and extend this field of endeavour to create a new paradigm because it has resulted in infrastructure investment being focused in capital cities and mainly benefiting inner and CBD areas.

APPENDIX 1: AUTROPOLIS – THE DIVERSE MOBILITY REVOLUTION

CHAPTER 2: UNDERSTANDING THE AV PROBLEM

Australian cities have been designed and built to accommodate and facilitate traditional motor vehicle based economies (freeways and road investment, manufacturing plants, fuel storage and distribution, car parking etc.) and motor vehicle based social networks (suburbia). Motor vehicles or horseless carriages with internal combustion engines (ICE) as they were known in the late 1800's replaced horse driven transport based on comfort and efficiency. Faster travel times, longer distances, plus multiple vehicle ownership increased gross domestic product, city populations and suburban areas but essentially horseless carriages performed the same function as horse driven vehicles. From an economic perspective until the late 1980's motor vehicles serviced the needs of modern economies based on manufacturing and export base of primary and secondary goods and still accounted for over 80% of all journeys to work.

The first oil crisis in 1973 and the energy crisis of the 2000's was a timely reminder that the internal combustion engine value chains became more difficult to function as ICE motor vehicles grew in numbers. 'Peak oil' production, rising fuel costs, traffic congestion, pollution and the geographic expansion of suburbia led major capital cities to review metropolitan strategies. In essence the new planning principles and strategies attempted to implement 'sustainable development' and 'sustainable transport' outcomes to protect cities from carbon pollution, traffic congestion and to protect low income groups from high fuel prices (primarily through improved public transport networks).
In 2017 Australian urban planning and transport planning strategies still reflect the economic benefits of traditional motor vehicles (acknowledging the costs such as road deaths and hospitalisations) as modified by improvements in public transport.

The late 20th century saw the emergence of the service sector in Australia and despite the most significant mining boom in Australian history, the 21st century has confirmed pre-eminence of this trend driven by the fast growth in information and communications technologies, professional and scientific services.

Source: Autropolis, The Diverse Mobility Revolution Page 27

CHAPTER 2: UNDERSTANDING THE AV PROBLEM

For AVs there are three stages in the cycle of innovation:

1. **Automated Driver Assistance Systems (ADAS)**
   - ADAS are the foundation of AV technology and include Mobileye products such as lane departing warning, forward collision warning, speed limit sign recognition, radar / adaptive cruise control, self parking etc.

2. **Ride Hailing & Ride Sharing creating a critical mass and lowering transport costs for future Mobility as a Service platforms**
   - The key to cost effective AVs is the introduction initially of driverless vehicles including ICE (internal Combustion Engine) and highly efficient EVs (Electric Vehicle). For example Uber is trialling driverless ICE taxi's in Pittsburgh to reduce mobility costs and increase profits
   - Pooling share vehicles and potentially privately owned vehicles (Pre Mobility as a Service) as per Uber Pool to significantly reduce travel costs per kilometre and create initial price driven conditions where car ownership levels begin to reduce significantly due to improved service levels. Initially households will be more able to save costs by disposing of second and third vehicles as price competiveness and availability of ride share and car share improves
   - Pooling specific use vehicles e.g. The Tesla Tesloop service which provides share inter-city mobility services (e.g. Los Angeles to Las Vegas)
   - Critical mass in demand for EVs generated by ride hailing and ride sharing which drives down EV capital costs and allows significantly lower operating costs to feedback to even higher demand for EVs and higher demand for mobility

3. **Driverless Automated Vehicle 'domination' of the car fleet. Full adoption of Mobility as a Service. This includes:**
   - 'Back to base' technology for vehicles. This requires vehicles to be permitted to operate without an occupant
   - Mobility as a Service dominating travel kilometres and AVs taking market share from public transport
   - Individually owned vehicles owned in only around 30-40% of households (2011 / 90%) and the number of vehicles per household dropping from 1.6 per household (2011 / Capital Cities) to 1 per household in capital cities by 2035

From a technical perspective the classification systems developed by the American Society of Engineers (see levels of Automation) is adopted globally to establish a common language. This system establishes the first three levels in which the human driver monitors the environment and the second three levels where the vehicle monitors the environment. Driverless vehicles refer to Level 4

and to Level 5 (SAE Classification) automation. Level 5 refers to driverless vehicles with no requirement for a driver.

Source: Autropolis, The Diverse Mobility Revolution Page 40

CHAPTER 3: HOW AVs WILL TRANSFORM AUSTRALIA

CAVs include private vehicles and trucks. There are significant efficiency gains desired due to 'platooning' or connecting trucks wirelessly (15% less fuel, significant reduction in drivers, maintenance and insurance estimated at over 50% for EVs). Tesla has announced it would launch an electric prime mover by September 2017. This has been followed by an announcement by Cummins that it will introduce a fully electrified powertrain for urban transportation in 2019 and extended range in 2020. The company indicated that electric powertrains for pickup and delivery would follow.

In relation to software and Artificial Intelligence, a raft of companies are investing heavily. This includes Google, Apple, Intel and Nvidia to name a few. Artificial Intelligence (AI) development is occurring across the spectrum due to its criticality in terms of real time decision making. The development of AI which is critical to AVs, is driving much broader outcomes in AI development because the complexity of AI required is significantly higher than the majority of AI applications. In 2016 the world's top ten carmakers submitted 9700 patent applications up 110% from 2012[2]. OEMs such as BMW, Mercedes Benz, Bosch and Mobility as a Service platforms are investing heavily in AI, so that CAVs can learn (from trials) and continue to learn, make good decisions and operate via simple yet efficient Human Machine Interfaces. Over time the AI will become valuable as the foundation for a wide range of applications.

Mobility as a Service Platforms

Mobility as a service platforms seek to provide complex multi modal mobility solutions for consumers. The concept of the 'platform' is to allow consumers to:

- Choose the type of route in terms of fastest, most environmentally friendly, most active, lowest cost etc
- Choose the preferred travel modes
- Pay 'as you go' or pay a monthly service fee

In its most simple form, the 'platform' can only work if:

[2] *The Australian*, 20 September 2017

- Data and back of house real time transport information is not only available but can be shared
- Payment agreements with service providers can be struck and integrated payment systems can be operationalised

In terms of an overall policy framework the following chart prepared by Richard Harris (2017, HMI Technologies) identifies the key themes and inputs necessary to operationalise MaaS platforms. Conceptually MaaS is delivered as an app and mobility companion, tracking elements of the proposed journey and is also the payment system. In theory MaaS could deliver better service levels then a private car.
In Europe the MaaS Alliance, a public private partnership has been set up to create the foundations for a common approach to MaaS and to help unlock necessary economies of scale. Finnish firm MaaS Global has developed an app for Finland which includes payment of a flat fee for unlimited use of any public transport mode, including buses, trains, bicycles and a pre-set amount of taxi rides. The company has dubbed the concept the 'Netflix of Transportation'.

Source: Autropolis, The Diverse Mobility Revolution Page 113

CHAPTER 4: WHEN AVs WILL TRANSFORM AUSTRALIA

The timing of AV take up depends on AV technology, regulation and consumer acceptance. As discussed AV technology will be trialled and operational by 2020 in Australia for Level 4 (designated roads) usage. This is relatively slow given that Level 4 AVs were legalised in Germany in 2017. This chapter reviews some of the regulatory issues including current legislation, insurance, cybersecurity and big data. This is followed by a review of current market research into AV consumer acceptance. Taking these factors into account and reviewing existing literature (including technology diffusion rates) guidance is offered into Level 4 and Level 5 AV introduction and timing in Australia.

Source: Autropolis, The Diverse Mobility Revolution Page 119

In Germany, current liability provisions exist, with the driver remaining liable unless drivers can establish lawful use of automated driving mode (the legislation requires AVs to include a black box to monitor the situation). While the legislation has been criticised for being vague it has been written to achieve national objectives in relation to maintaining the global competiveness of the German automotive industry OEMs.

The UK on the other hand has not taken an OEM industry support approach. Rather, the Modern Transport Bill (2017), The Vehicle Technology and Aviation Bill (2017) and new

guidelines for AV cyber security seek to achieve the UK goal to be at the forefront of the international technology revolution, both in terms of developing driverless cars and launching a commercial space port. This Bill extends the motor insurance requirement to include automated vehicle owners, set standards for charge points, mandate provision of electric vehicle infrastructure and protect AVs from cyber terrorist attacks. The UK approach includes major public funding to put the UK at the forefront of autonomous and driverless vehicles usage and to develop the technology in the UK. The UK approach therefore focuses on accelerated AV take up as part of a broadly based economic development strategy.

Source: Autropolis, The Diverse Mobility Revolution Page 128

APPENDIX 2: ICTC REPORT

International Cities Town Centres & Communities Society Conference

BIG CITIES VS REGIONS
'IS IT THE END FOR REGIONAL CITIES?'

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ORGANISATION OF PRESENTATION

- I firstly set out what the state of play is in the big city – regional city divide using data & analysis
- [We know we have a problem or we wouldn't have all come to this conference]

- Next, I talk about recent research & analysis on this subject I have done in my book, "Destructive Cities" & reference relevant new research from Reserve Bank of Australia, Bank of Japan & OECD
- I will then talk about regional city success stories & key differences between peri-urban & regional cities with free-standing economies
- Then I will end with some concrete strategies about what to do to address the prosperity of regional cities

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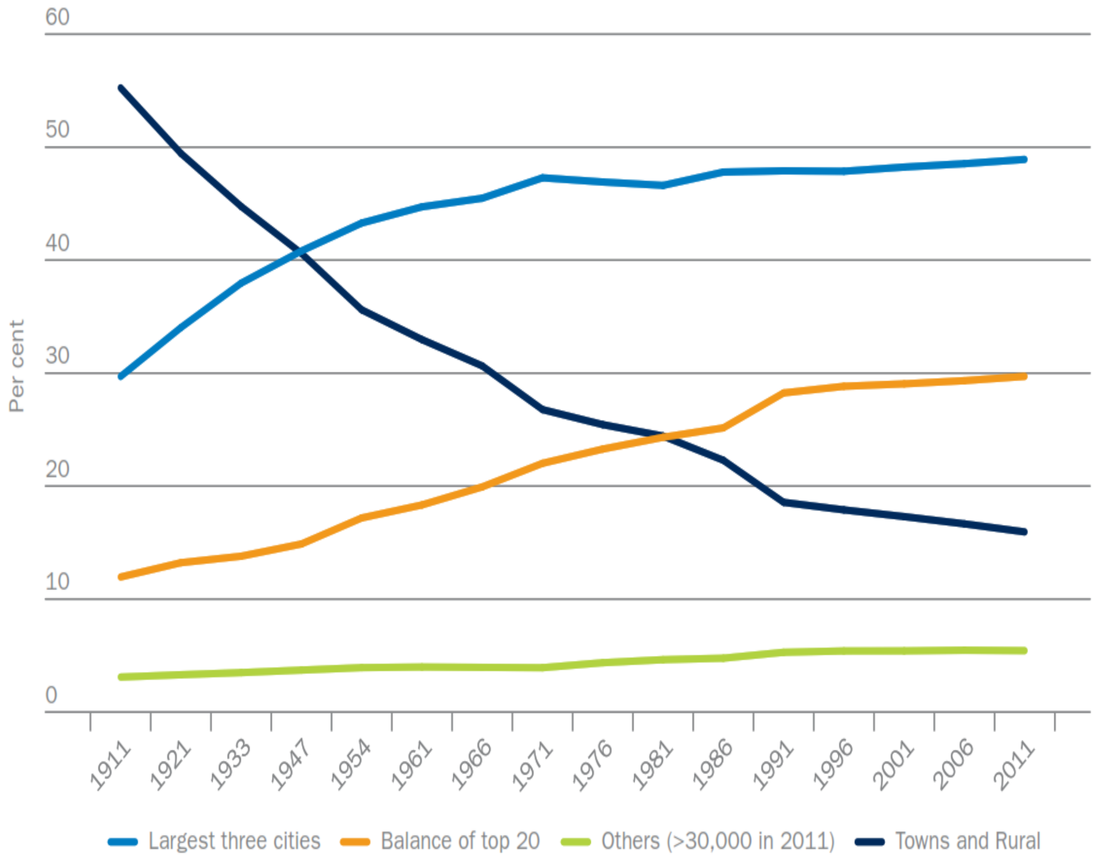
AUSTRALIAN POPULATION BY SETTLEMENT TYPE



- Decreasing role & function of regional cities in Australia over the last century
- Largest 3 cities represents half the Australian population

Source: ABS 2014

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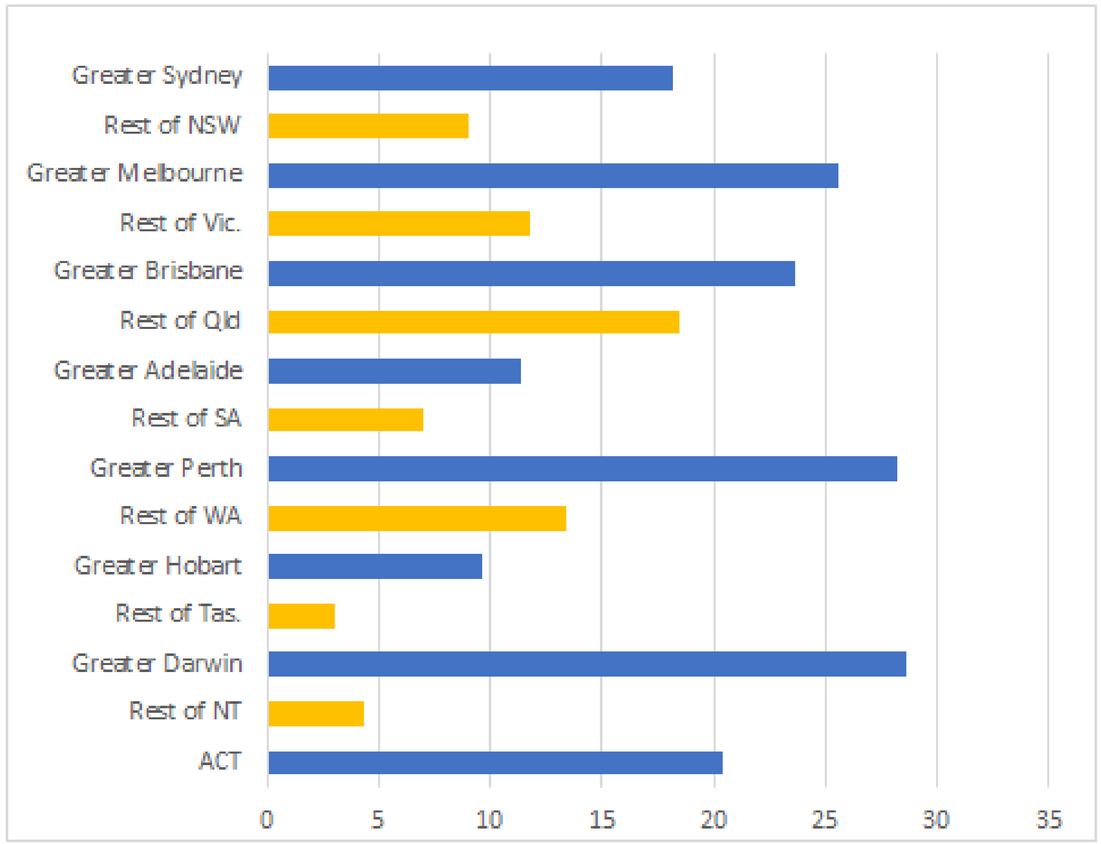
REGIONAL POPULATION GROWTH 2006 - 2016



Source: ABS Regional Population Growth, Australia 2016

- Strong population growth in the capital cities is under-pinning Australian economic growth

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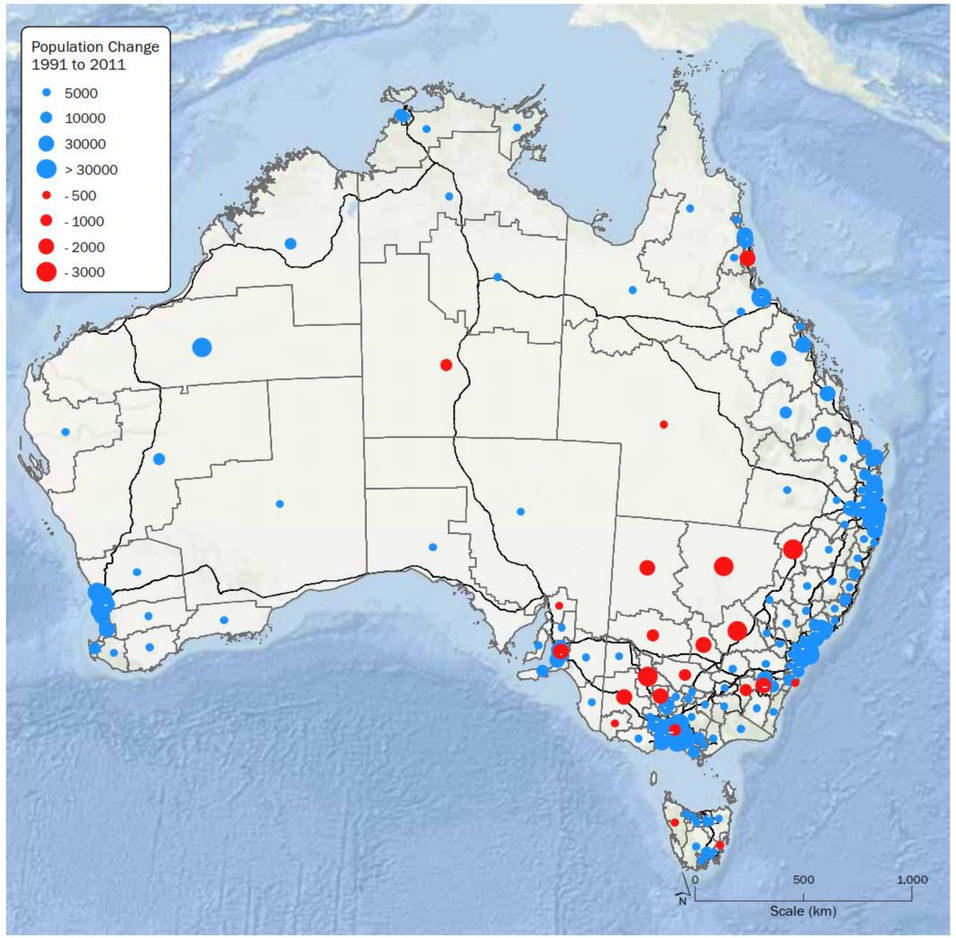
POPULATION DISTRIBUTION



Source: SGS Economics & Planning Pty Ltd.

- Coastal strip from Noosa to Geelong becoming one long conurbation
- Cities & towns west of the Great Dividing Range shrinking

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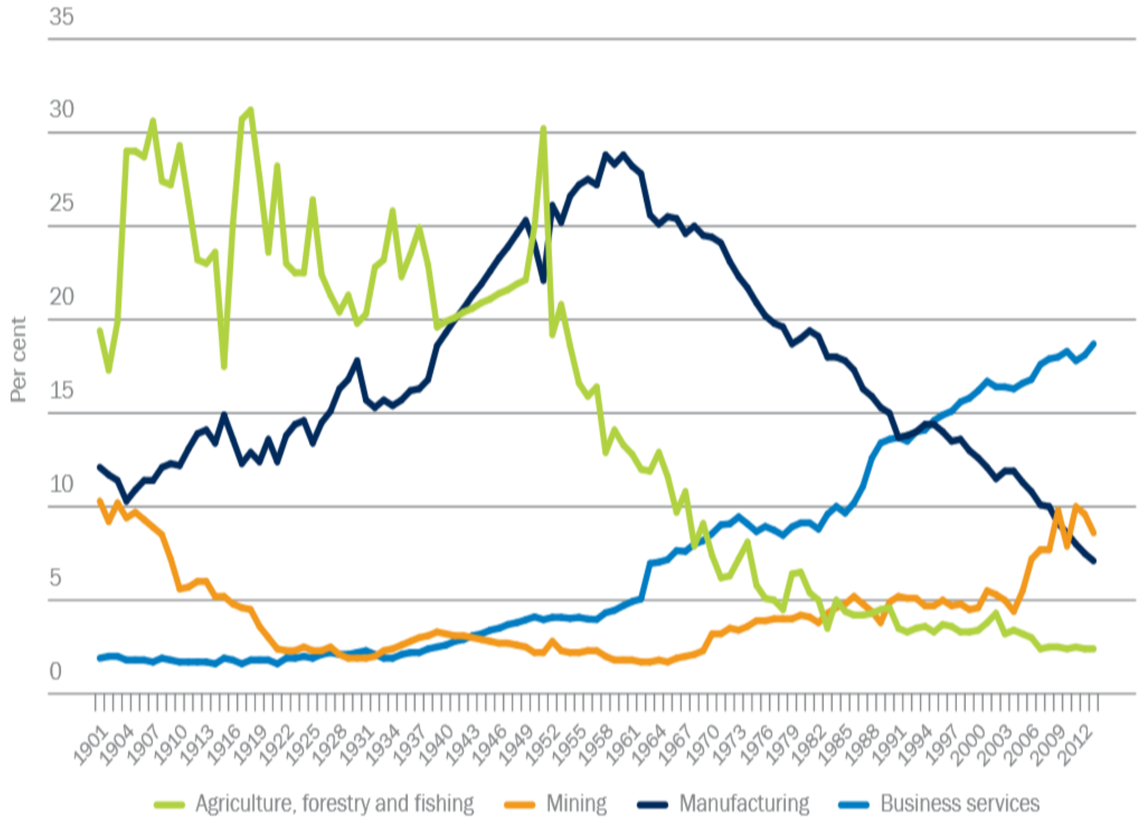
INDUSTRY SHARE OF GROSS DOMESTIC PRODUCT



- Growth of business services
- Rapid decline of mining and agriculture
- Volatility of mining

Source ABS 2013

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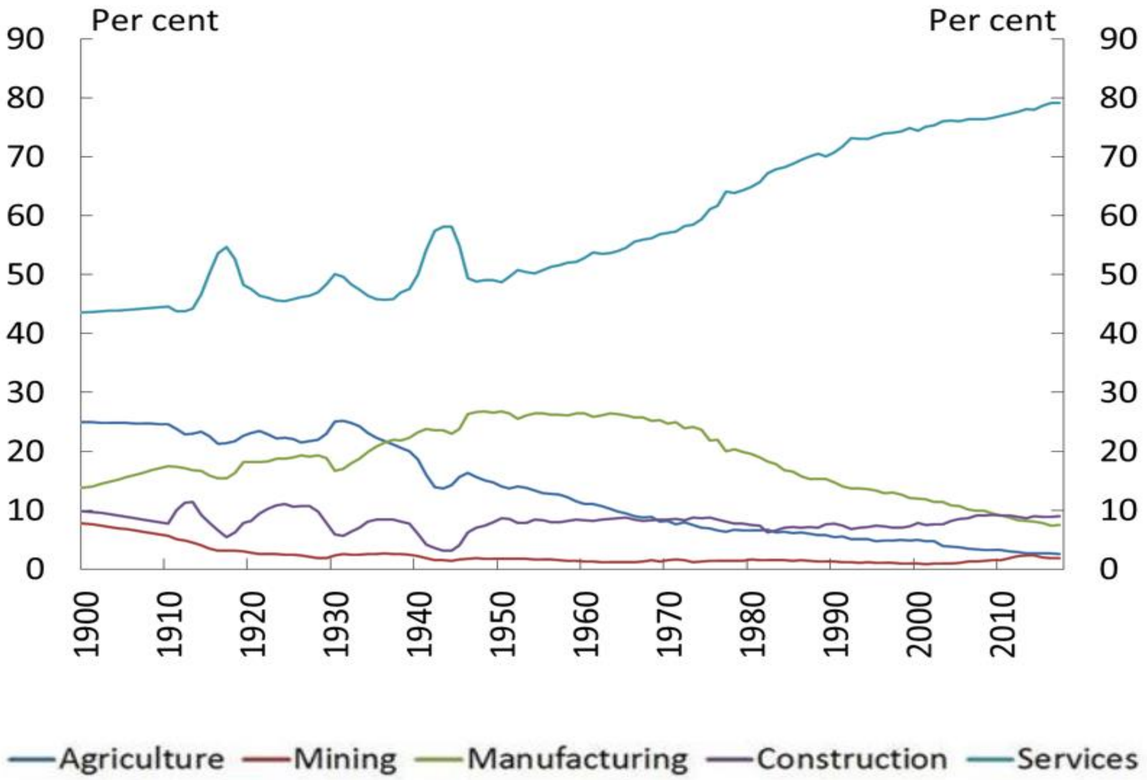
SHARES OF EMPLOYMENT BY SECTOR



Source: RBA Connolly and Lewis 2010 and 2017, ABS, Withers, Endres and Parry 1985.

- The services sector **is** the jobs story

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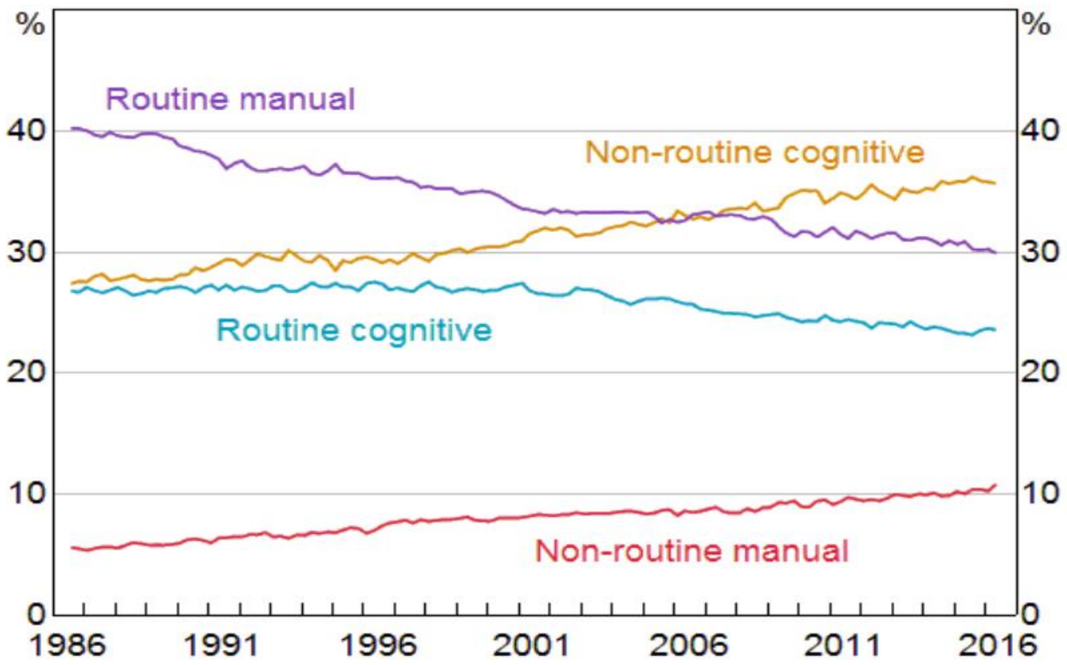
JOB SHARES BY WORK TYPOLOGY



Source: RBA Heath, A 2016.

- Job characteristics are determining which jobs are susceptible to automation
- Routine white collar jobs now under threat

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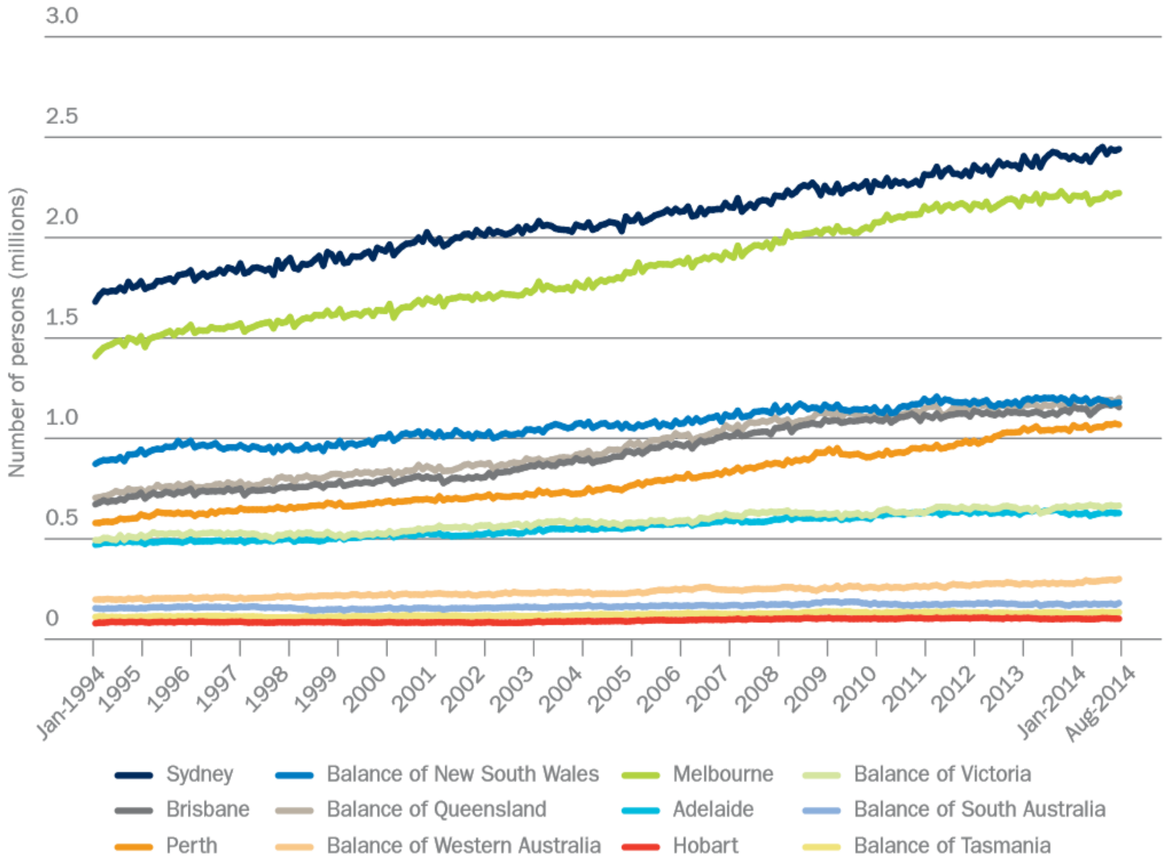
JOB DISTRIBUTION BY CAPITAL CITY & BALANCE OF STATE



Source: ABS 2013

- Jobs highly concentrated in Sydney & Melbourne
- Balance of each state performing comparatively well against their respective capital cities

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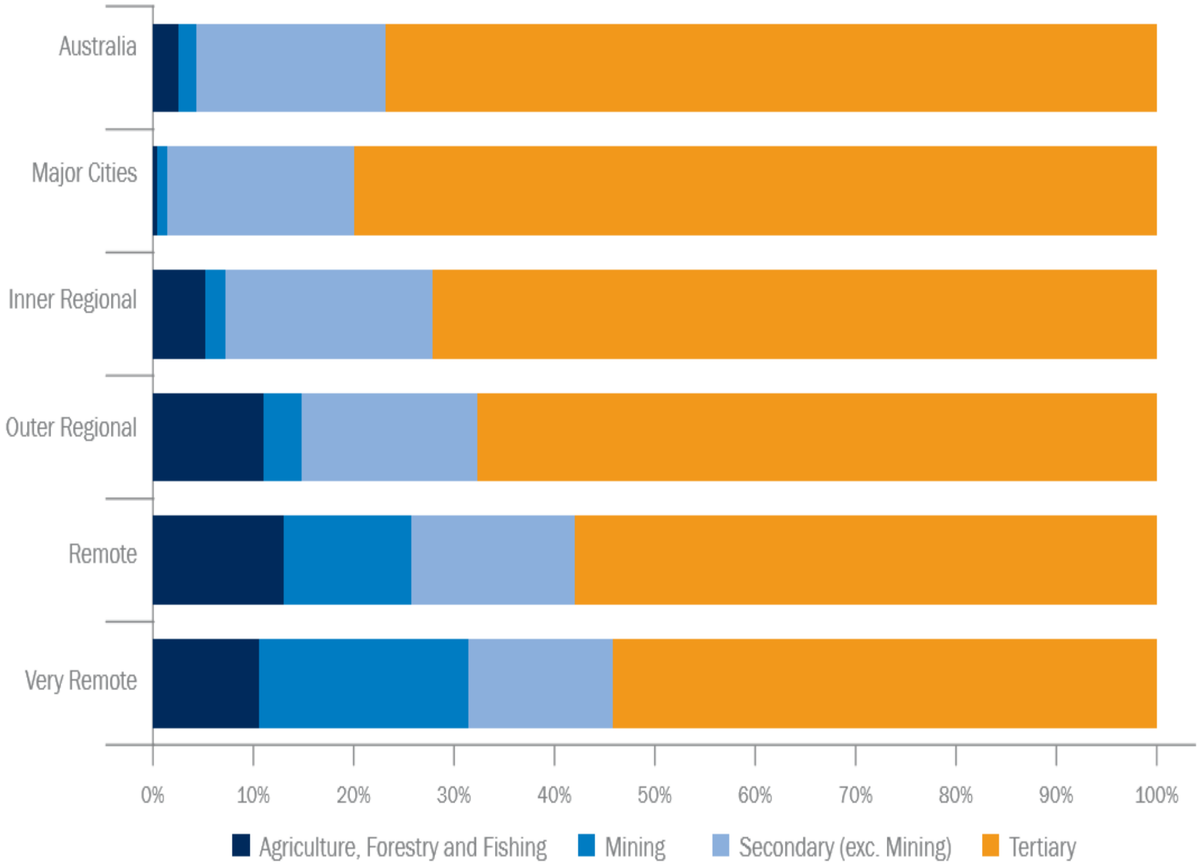
EMPLOYMENT SHARE BY INDUSTRY AND REMOTENESS



Source: ABS 2011

- What matters more than numbers is the quality & industry sector of jobs
- High paying tertiary sector jobs are heavily weighted to the 20 major cities with populations greater than 100,000
- They decrease the further you move from the capital city of each state.

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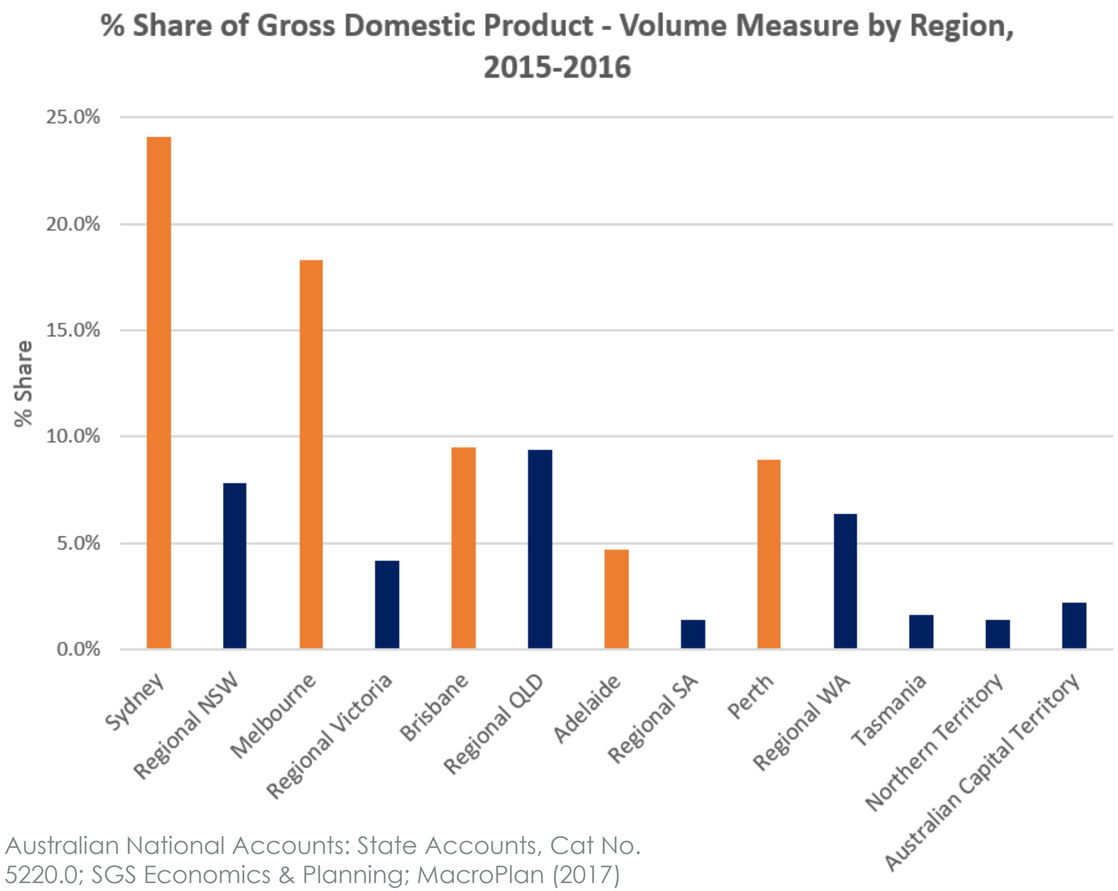
CAPITAL CITY & REMAINDER OF STATE CONTRIBUTION TO GROSS DOMESTIC PRODUCT GROWTH



- Regional Australia's contribution to the national economy is modest at about 15%

Australian National Accounts: State Accounts, Cat No. 5220.0; SGS Economics & Planning; MacroPlan (2017)

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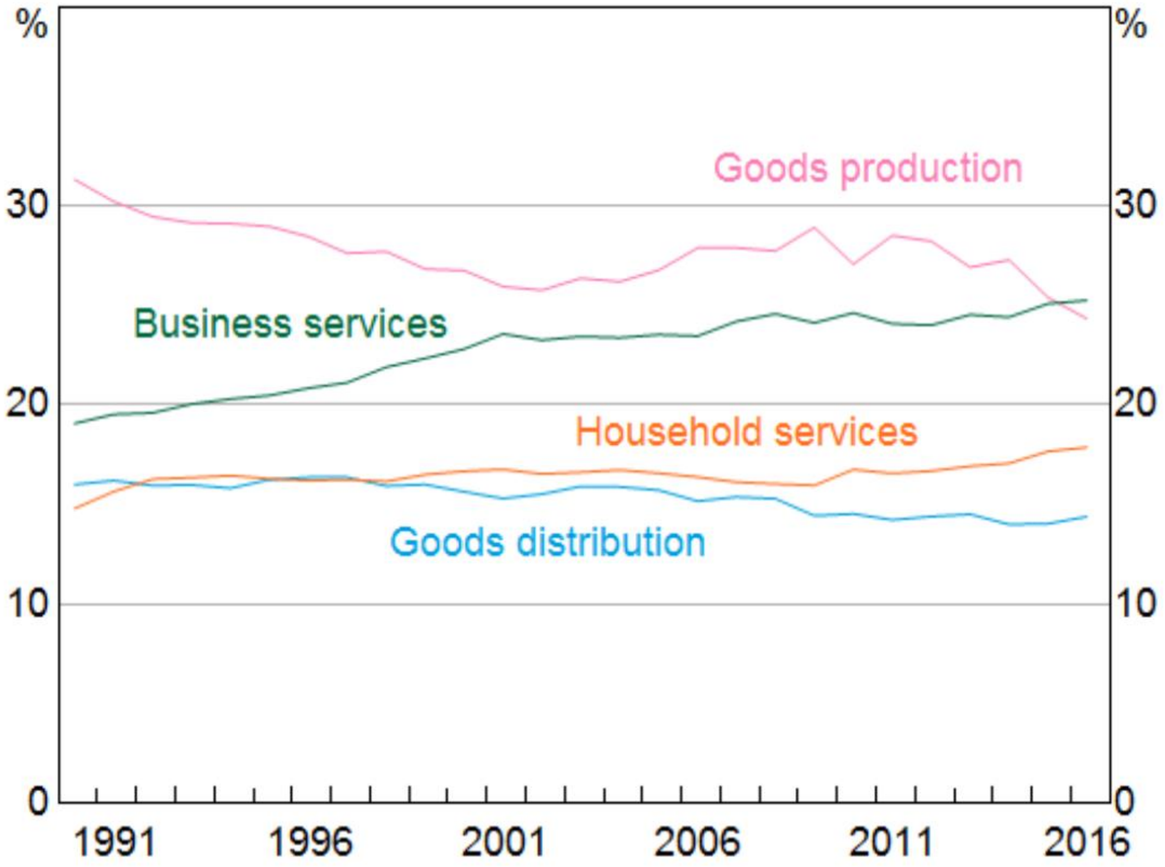
INDUSTRY GROSS VALUE ADDED



Source: ABS, RBA

- The rise of business services is the jobs story of the new millennium
- Requires higher levels of education & skills
- Produces more wealth for individuals, firms & the economy

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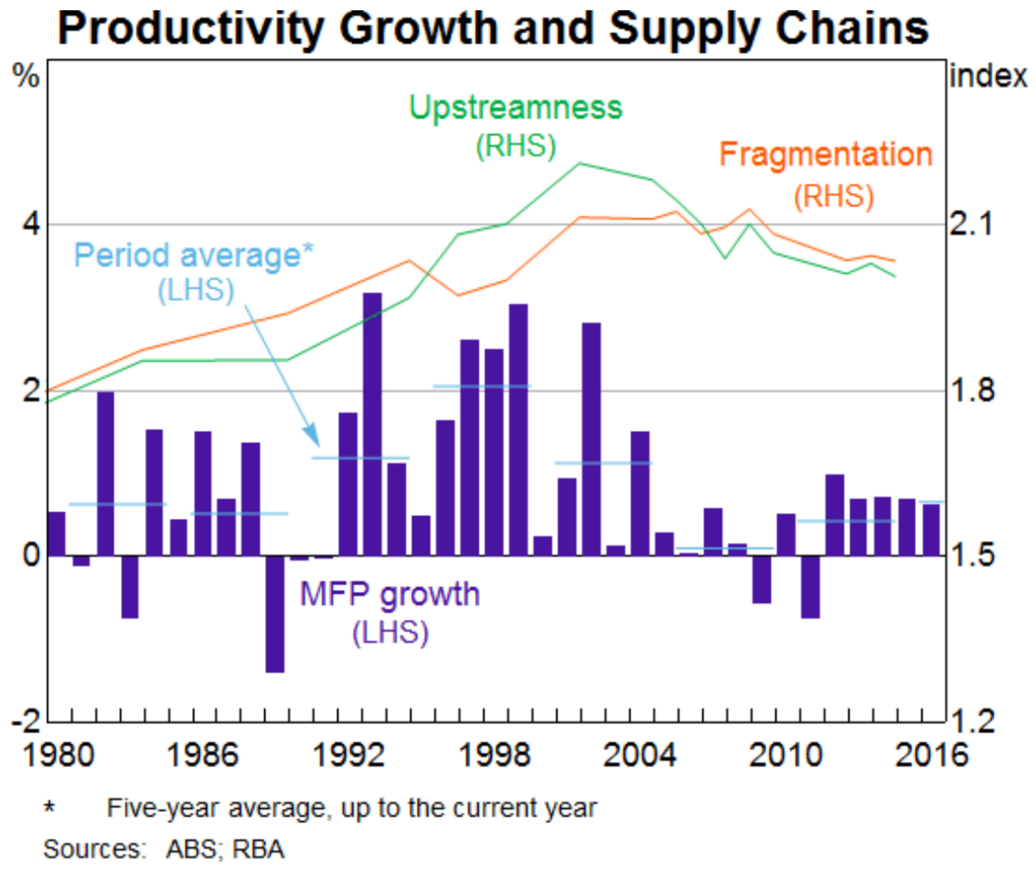
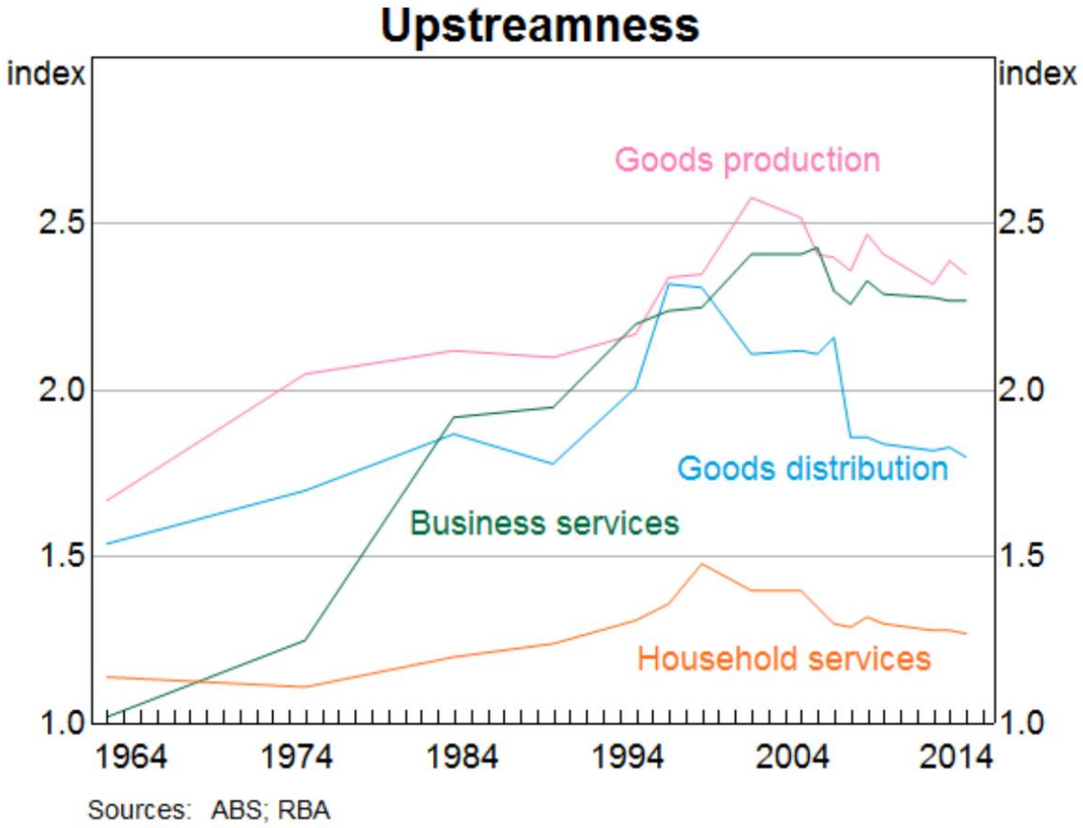
RECENT RESEARCH BY RESERVE BANK OF AUSTRALIA



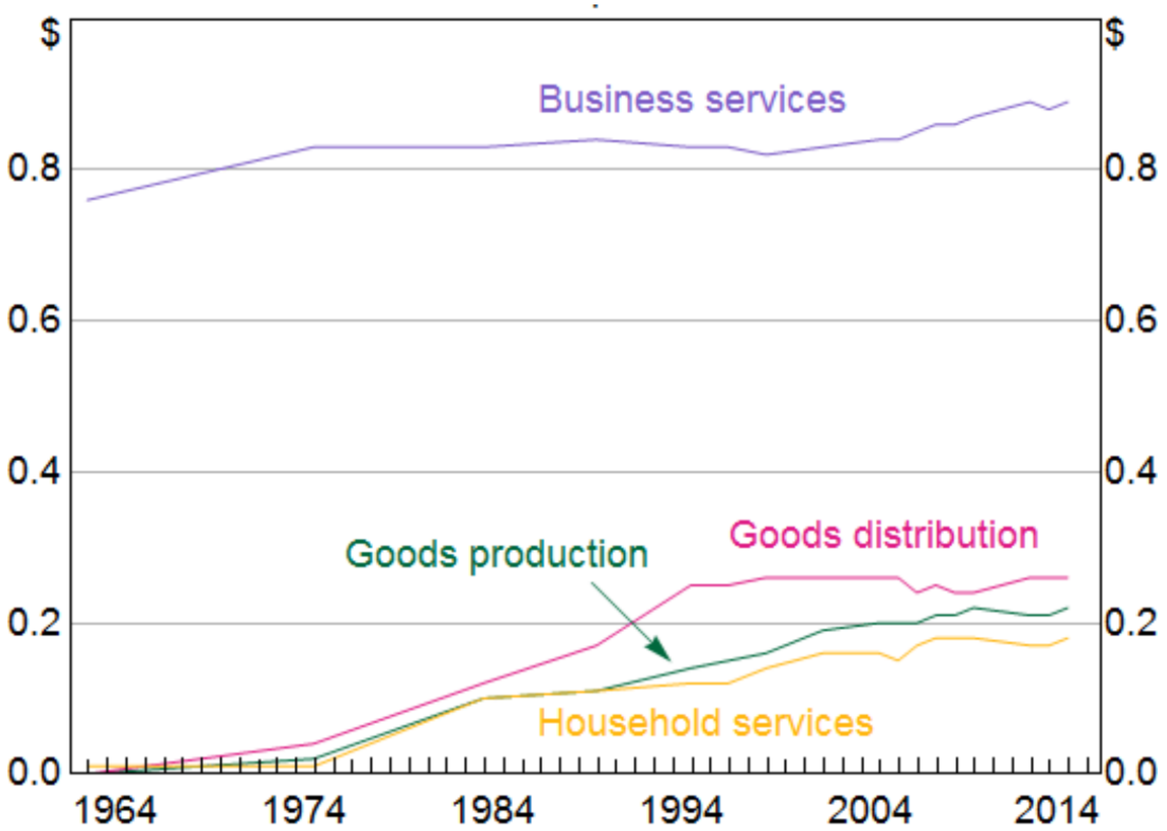
- Australia has substantially moved from a goods-producing economy towards a services-oriented economy
- Australians are producing more services, consuming more services & trading more services than ever before
- One of the reasons for this is Australian households have experienced remarkable growth in their real incomes
- As incomes rise, households spend more income on household services, such as health, education & restaurant meals, than on goods
- As technology & GDP increase businesses spend more on business services

RECENT RESEARCH BY RESERVE BANK OF AUSTRALIA



- Businesses that produce goods have become more specialised in their core activities
- They have outsourced their **non**-core activities to the business services sector
- Technological change has lowered the costs of communication, logistics & automated processes
- And created new businesses & value chains
- Outsourcing has delivered efficiency gains
- C.I.T. is now fundamental to all businesses
- C.I.T. & Professional, Scientific & Tech jobs are increasingly concentrated & centralised within large cities

RBA: BUSINESS SERVICES AS AN INTERMEDIATE INPUT



Source: ABS, RBA

- Business services are at the centre of how technological change is transforming the Australian economy
- Longer value chains provide more opportunities for firms to provide intermediate inputs

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RECENT RESEARCH BY BANK OF JAPAN

- Value chains have become increasingly global, fragmented & specialised
- Most value & profit is created upstream in value chains
- iPhone is the classic example of this new paradigm
- United States, where research & design takes place, creates the most value & profit
- Japan & South Korea, where high-end components are produced for iPhone, creates moderate value & profit
- China, where assembly takes place, creates least value & profit.

BANK OF JAPAN

RESEARCH BY OECD

- OECD research shows how regions can profit from global value chains
- Increasing importance of knowledge based capital within value chains, coupled with increased fragmentation, has opened up opportunities for new players
- SMEs in middle & higher income countries are engaging through high skilled & specialized niche activities
- Innovation is key for SME's successful participation in global value chains
- Process & organizational innovation increases firm productivity by reducing production costs
- Product innovation generates new & upgraded products expected in global value chains

OECD
BETTER POLICIES FOR BETTER LIVES

PRODUCTIVITY COMMISSION DRAFT REPORT: "TRANSITIONING REGIONAL ECONOMIES" APRIL 2017

- About 80 per cent of regions have had positive employment growth over the past five years
- Despite this, regions have historically had highly variable growth in employment
- Factors shaping capacity of regions to adapt to changing economic conditions include:
- people-related factors (educational achievement, employment rates, skill levels)
- accessibility to infrastructure and services
- natural endowments (such as agricultural land) and industry diversity

Australian Government
Productivity Commission

MacroPlan Dimasi

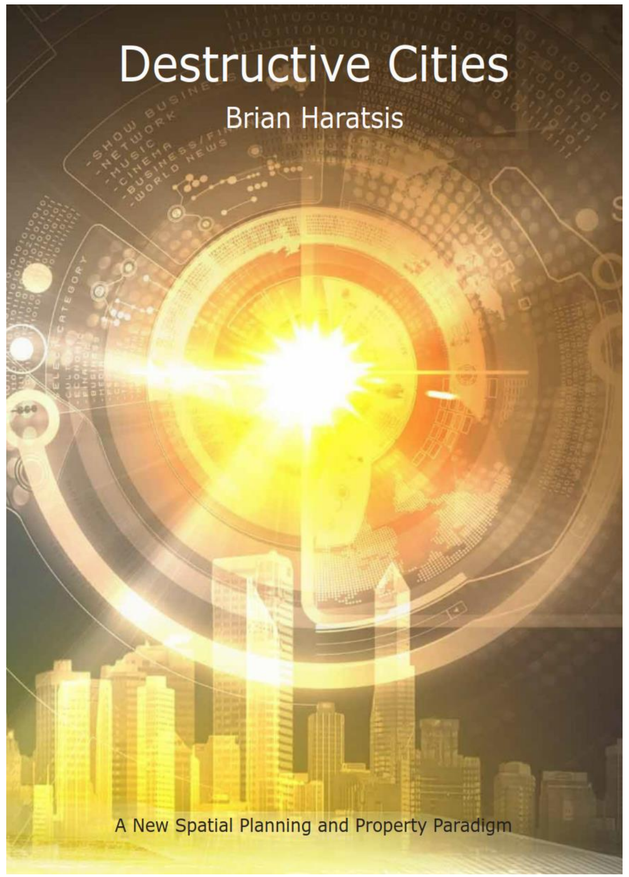
PRODUCTIVITY COMMISSION DRAFT REPORT: "TRANSITIONING REGIONAL ECONOMIES"

There is no 'one size fits all' approach that will promote successful adaptation in all regions, although there are 'no-regrets' strategies that should be pursued as soon as practicable

These include:

- initiatives should be identified and led by the local community, in partnership with all levels of government
- aligned with the region's relative strengths
- supported by targeted investment in developing the capacity of the people to deal with transition & adaptation
- designed with clear objectives and rigorous evaluation

RESEARCH: "DESTRUCTIVE CITIES"



What does the services boom & deepening global value chains mean for Australian cities?

Need to better understand:

- How big is the services boom?
- What are the components of the services sector?
- What are national & global value chains?
- How to prepare & position for effective engagement
- What skills are required?

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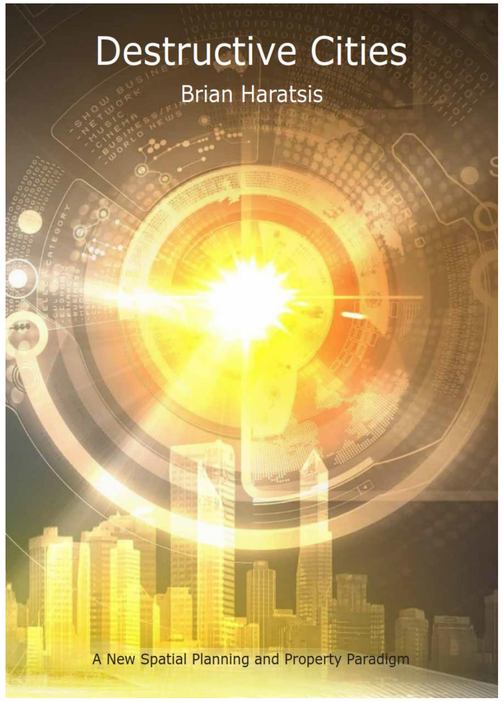
RESEARCH: "DESTRUCTIVE CITIES"

What is happening in big Capital Cities?

- Their economies have been turbo-charged by the rise of the services economy & participating in global value chains
- There have been serious costs – "Destructive Cities"
- Amongst highest housing prices in the world
- An increasing number of renters
- Commercial rents amongst highest in the world
- Serious traffic congestion- cost estimated at over $50bn pa



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AUSTRALIAN INFRASTRUCTURE PLAN

- The focus of investment is Sydney, Melbourne, Brisbane & Perth
- The proposed infrastructure spend is ‘catch up’ only
- The Veitch Lister traffic forecast ‘carmageddon’ for major cities by 2030 with travel times increasing on average by 15% - 20%
- Despite current public transport investments, cars will still perform 94% of journey to work task
- This is triggering community resentment e.g. Sydney is “full”

Australian Government | Infrastructure Australia

MacroPlan Dimasi

WHAT CAN BE DONE?

- Long-term planning should focus on low-cost cities & low-cost city life as world labour costs begin to equalise provides opportunities for regional cities
- The key objective should be low-cost ‘people cities’ rather than expensive hi-tech cities
- Planning for large-scale infrastructure should focus no further than 2030 because of likely large ‘scale’ changes in city building as technology transforms cities & city life

OPPORTUNITIES FOR REGIONAL CITIES

- Regional cities can offer a higher quality of life
- Need to understand how to tap into new business services value chains
- Businesses still benefit from sizable labour pools & local supply chains
- Clever strategies can grow human capital with partnerships with universities, teaching hospitals & health networks
- Regional cities can benefit from the services boom through effective engagement with national & global value chains

GETTING ON TO THE GLOBAL STAGE

The need for competitive advantage.

In order to achieve global significance and continue to:

- Sustain employment growth
- Attain investment
- Breed innovation
- Attract SMEs

GETTING ON TO THE GLOBAL STAGE

Regional cities need a competitive advantage in the form of:

- A broadly based strategy
- Globally recognised firms
- A deep industry structure facilitating the growth of SME's
- Anchor infrastructure
- Points of difference

UNDERSTANDING THE VALUE CHAIN & MULTIPLIERS

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THE VALUE CHAIN

Understanding the **Health** Value Chain

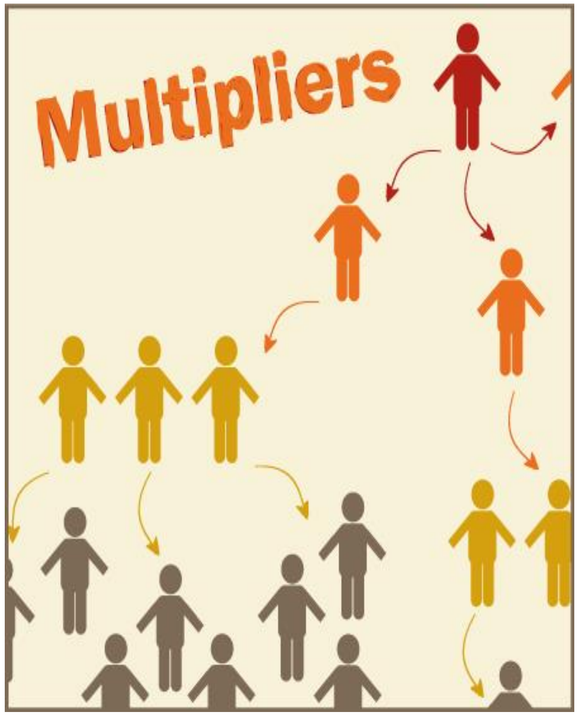
- Extensive and complex
- Significantly more than just hospitals and primary healthcare

SIGNIFICANT MULTIPLIERS

Employment Multipliers

For instance, for every $1 million dollars that is spent in the health industry:

- 6.4 high valued health industry jobs are created and sustained
- An additional 2.29 jobs are created (production induced effects
- A further 9.15 jobs are supported due to the wider ‘ripple’ effect



KEY LEARNINGS FROM MACROPLAN RESEARCH

Each regional city is unique but there are a range of principles which define the DNA of successful Regional Cities. They include:

- To realise the 'ripple effect' a clearly articulated & understood mission, with designated short-term, medium-term & long-term goals is essential. This will enable a local industry structure which creates opportunities for SME's
- The mission must be supported by fit-for-purpose governance arrangements – not a "one-size-fits-all" approach
- Strong and effective leadership with "fit-for-purpose" management & facilitation skills
- Clear terms of engagement around resources & roles
- An engagement strategy for stakeholders & the community

KEY LEARNINGS FROM MACROPLAN RESEARCH (CONT.)

- Brand recognition / pulling power through embracing size and scale – brand, marketing & communications must elevate to provide global reach.
- High concentration of specialisation / expertise and standing.
- Capacity to navigate complexity / accommodate diversity of contributions from stakeholders.
- Industry connections, connectivity and relevance – active engagement of business & industry
- A neutral broker is needed who functions to organise & facilitate relationships

KEY LEARNINGS FROM MACROPLAN RESEARCH (CONT.)

- Porous / permeable boundaries which promote a clear focus on market & outcome domains over institutional domains – essential to ensure commercial participation
- Incentives geared towards outcomes – reward for effort and application, not just participation
- "3D" approach to use of land and space – more than one use per space; vertical spaces and focus on integration / collaboration
- Shared and creative "playspaces" / "innovation" spaces" are essential

OPPORTUNITIES FOR REGIONAL CITIES

- Finding a way to nurture start-ups e.g. Christchurch & Automated Vehicles
- New technologies are creating new concepts of ‘work’, ‘lifestyle’ & access to national & global value chains e.g. NBN, AVs, FaceTime
- Millennials will account for half the workforce by 2021 & this group are demanding new lifestyle options
- Attracting & retaining talent & building human capital

Australia’s broadband network

A SIMPLE BUT EFFECTIVE REGIONAL GROWTH MODEL

- Increase productivity & efficiency
- Increase workforce capacity & participation
- Increase lifestyle amenity
- Focus on business services in national & global value chains

REGIONAL CITY STRATEGIES

- Centralising economy
- Clean Energy sector
- Clean Tech
- Information technology
- Building business networks into Asia
- Talent attraction initiatives
- Building local human capital
- Support start-up businesses
- Building smart business eco-systems

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REGIONAL CITY STRATEGIES

- Regions are evolving at a faster pace than current regulatory or planning systems are capable of addressing
- They need to be more responsive to the triggers of growth such as inbound mobility based on housing affordability, competitive land supply & changing business requirements
- An investment framework that supports labour mobility, innovation supported by more flexible land-uses & access to national and international markets
- Facilitating self-determining regional city culture

REGIONAL CITY STRATEGIES

- Provide a destination for major investment – particularly Core Plus Assets (A-REIT)
- Provide opportunities for major national & international branch offices (i.e. port, freight & logistics, niche manufacturing, business services)
- Enhance lifestyle amenity through place-making to attract & retain talent
- Improved natural & built form environments
- Increased entrainment and tourism infrastructure
- Connect to sectors & business services (health, education, defence, etc)

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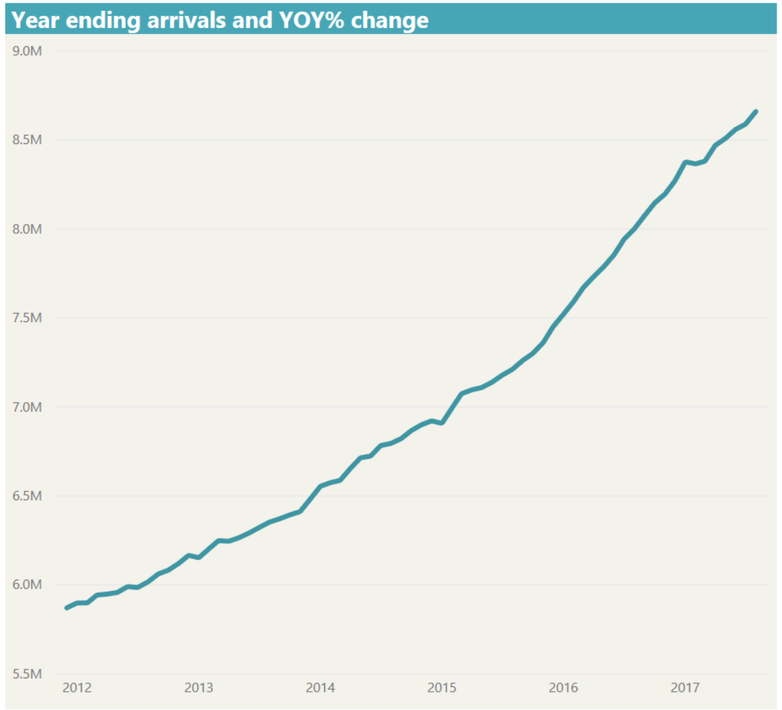
REGIONAL CITY SUCCESS STORIES

- Hunter Hospital network is a good example of spreading high value jobs
- Cairns Convention Centre – a serious tourism attractor
- Bendigo Art Gallery – delivers abundant returns on investment & builds national profile
- Renew Newcastle initiative - connects people with empty city spaces & generates significant new economic activity
- Sunshine Coast Health Precinct incorporating Sunshine Coast University Hospital, Sunshine Coast Health Institute co-located with the Ramsay-owned University Private Hospital - Australia's leading regional health precinct
- Geelong's Deakin University Carbon Nexus Research Facility – a world leader in carbon technology



Tourism Australia 2017 ABS 2017

TOURISM AUSTRALIA

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GOVERNMENT FUNCTION REGIONALISATION

- State governments use jobs to generate growth e.g. Parramatta with 15,000 new jobs (Police, Water Authority, Juvenile Justice, etc)
- Aligning the right labour market responses to the right geographies is critical for success
- For example, it makes sense to move business units that promote best in class Australian tropical expertise to Townsville where one of the world's best tropical based universities is headquartered
- Or moving government back office functions to Wollongong that has specialised in this expertise by building labour market supply chains with tertiary sector support & training & fit for purpose commercial buildings
- Newcastle where there has been substantial investment in health & education facilities & services and high tech manufacturing
- Bendigo where there is a substantial cultural services sector

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CONCLUSION

- Regional Australia needs to demonstrate its economic value to Australia in relation to the business services sector
- New thinking is required to attract physical and human capital to regional Australia
- Expenditures on key infrastructure including accessibility
- Expend on place-making to attract talent
- Focus on business services value chains including health, education & defense where applicable

CONTACT

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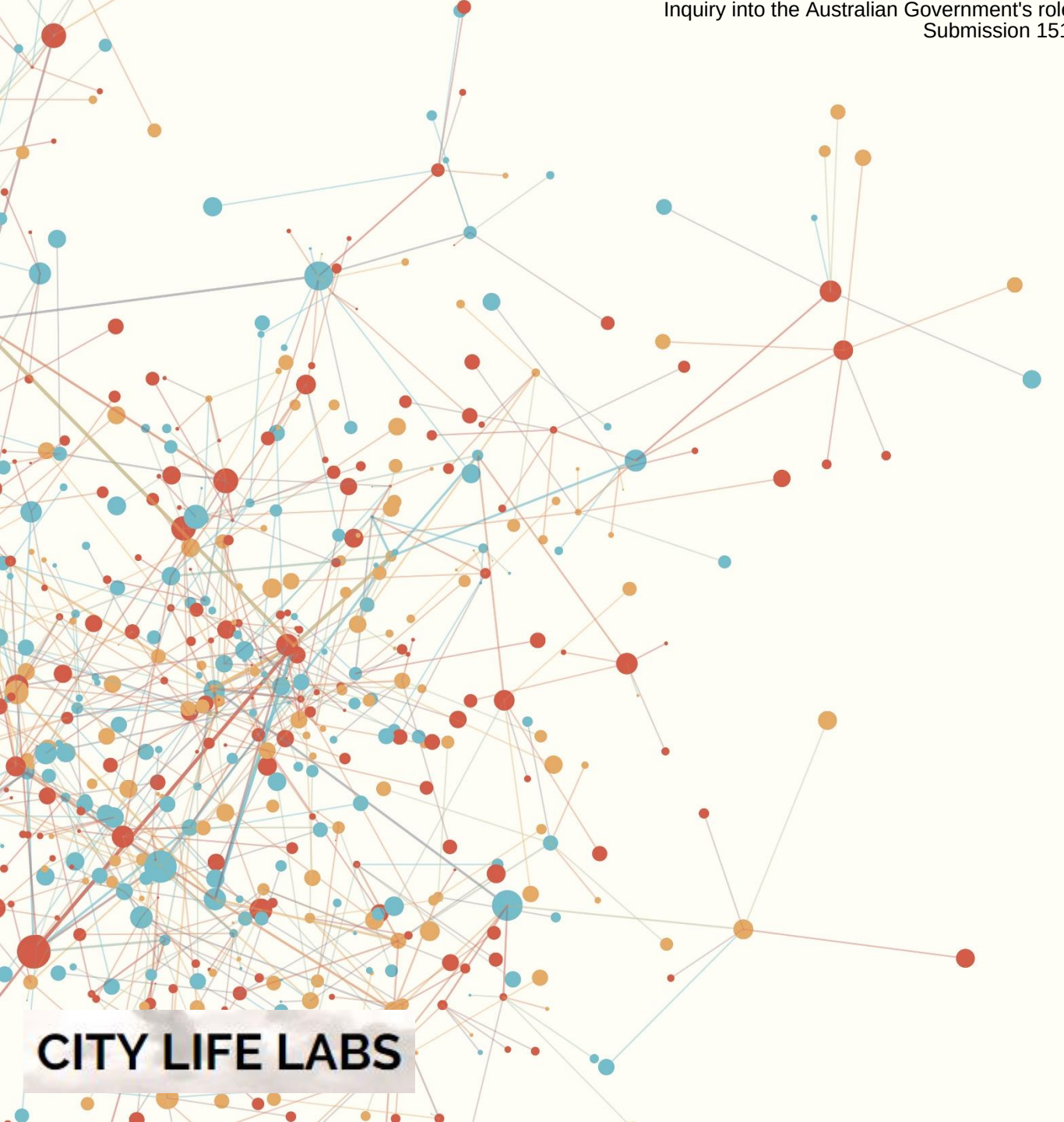
APPENDIX 3: MACROPLAN UDIA REPORT



POLYCENTRIC SYDNEY:
NOT YET?

CITY LIFE LABS

MacroPlanDimasi

OVERVIEW - IS SYDNEY POLYCENTRIC?

- A polycentric Sydney in 2036 means a Sydney with three centres supported by a wide range of high amenity centres and precincts which may accommodate start-up businesses.

- Three questions naturally follow from this observation.
  - *First, is Sydney currently polycentric?*
  - *If not, then how does Sydney achieve true polycentricity?*
  - *And third, in what way can technology help in this endeavor?*

Poly – Centric

Poly Centric — (Many) (Centres)

- **Technology** is not only a significant enabler but also the root of many forces driving systemic transformation between and within all industries – providing both significant opportunity and risk for all stakeholders
- Given the rapid pace and scope of these changes, urban planning and policy need to keep up.
- Without adaptation, a ***truly polycentric Sydney will remain a pipe dream.***

OVERVIEW

- Sydney's future competitiveness, and potential for tangible improvements in affordability, require the achievement of efficient land and public capital resource use outcomes.

- Western Sydney could and should become a key partner in a tripartite polycentric strategy, along with Parramatta and the existing Sydney central business district - Western Sydney needs to invent a new 'CBD', in effect 'reinventing' Sydney.

- Western Sydney should be subjected to strategic thinking and, in particular, the urban shape should be influenced by automated vehicles (e.g. automated shuttle buses), electronic vehicles and the Internet of Things.

- In short, Western Sydney should become the showcase in Australia, and potentially globally, for the introduction and integration of technology in city-building.

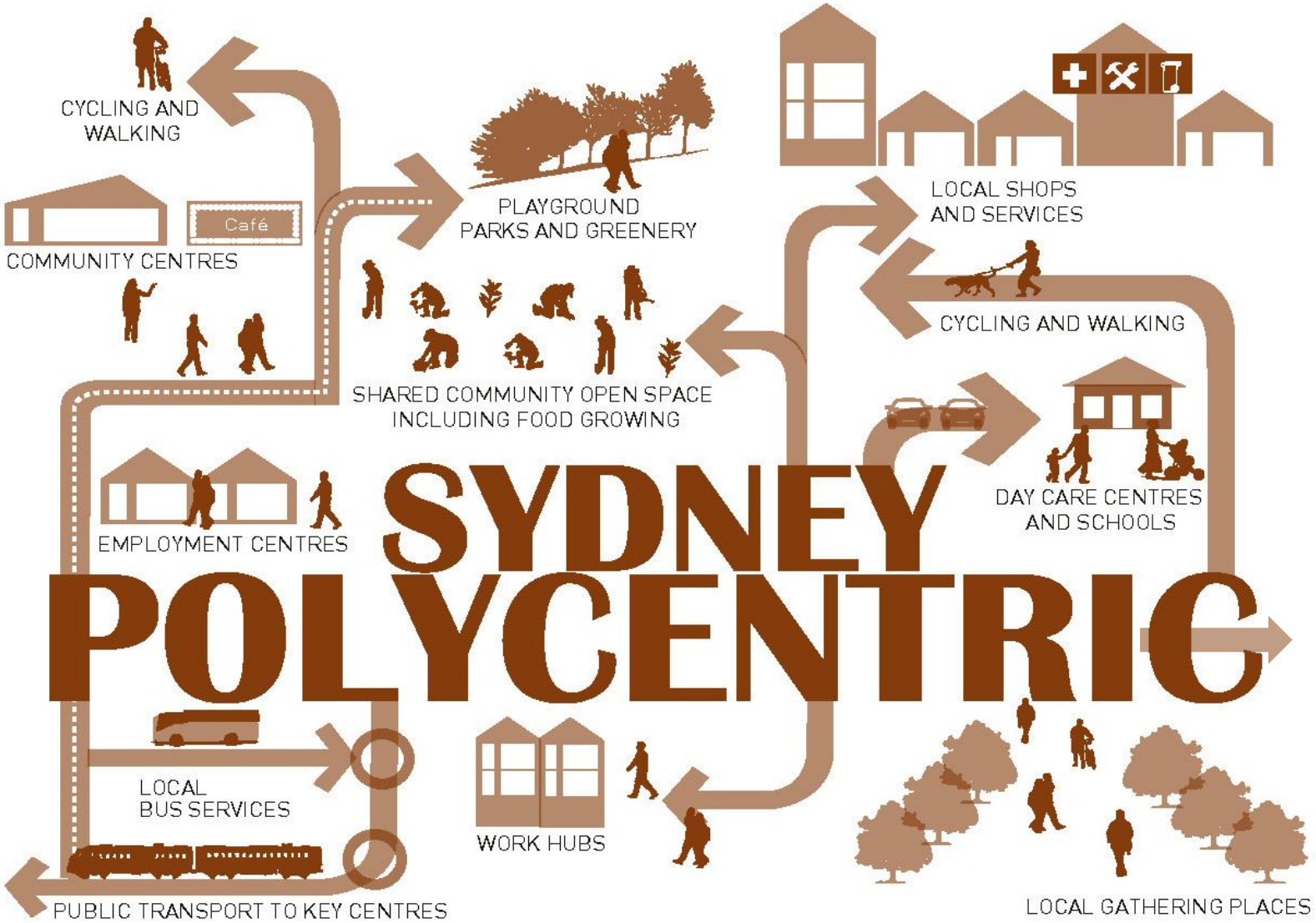
WHY POLYCENTRIC SYDNEY?

- Sydney has grown rapidly in recent years - together with greater traffic congestion, a lack of employment, and poor levels of social and physical infrastructure in outer suburban areas, this has meant the relative value and price of housing in inner and middle ring suburbs has increased significantly.

True polycentricity may help alleviate these pressures. If successfully implemented, a polycentric Sydney presents the opportunity to:

1. Reduce infrastructure expenditure by replacing and integrating substantial elements of public transport with autonomous vehicles, replacing 'owned' cars with 'shared' cars;
2. Increase employment through the growth of microbusinesses, contractors and SMEs which do not require CBD type locations; and
3. Increase residential density by providing affordable dwellings in a range of locations which allow access to a range of experiences and employment opportunities

The polycentric city model aims to increase affordability by increasing local employment, reducing traffic congestion and commuting time, and increasing development density in key locations.

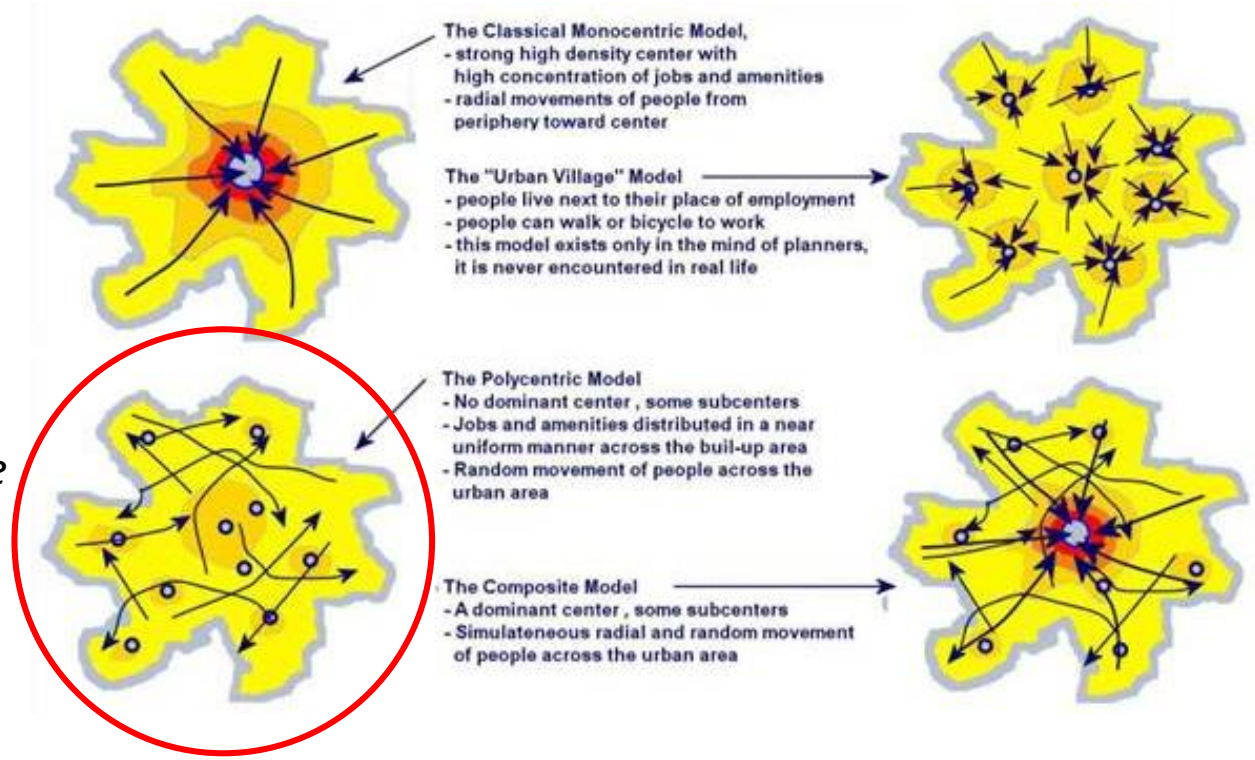


POST CENTRIC?

UNDERSTANDING POLYCENTRIC

"As they grow in size, the original monocentric structure of large metropolises tends with time to dissolve progressively into a polycentric structure. The CBD loses its primacy, and clusters of activities generating trips are spreading within the built-up area. Large cities are not born polycentric; they may evolve in that direction. Monocentric and polycentric cities are animals from the same specie observed at a different time during their evolutionary process."

(World Development Report 2003: Dynamic Development in a Sustainable World, World Bank)



UNDERSTANDING POLYCENTRIC SYDNEY

- Economic and policy understanding of polycentric has changed over time
- The following definition sets out the objective of polycentricism very clearly:

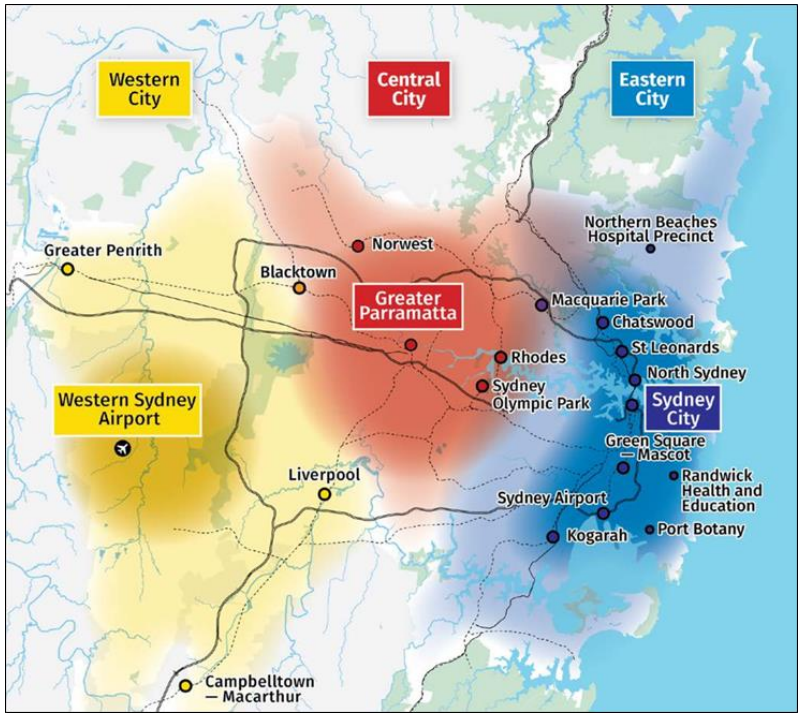
"The polycentric city model aims to increase affordability by increasing local employment, reducing traffic congestion and commuting time, and increasing residential density." (Brian Haratsis, 2016).

- Polycentricism has been part of strategic planning for Sydney for over a century
- Every strategic plan since 1948 has proposed a series of centres to be established to service new growth areas and take pressure off the central CBD
- Shopping malls in Sydney have created a well-spaced series of regional and subregional centres which serve equally distributed catchments – a polycentric metropolis

CURRENT POLYCENTRIC SYDNEY

'Towards our Greater Sydney 2056' (Greater Sydney Commission, 2016) re-conceptualises Greater Sydney as a metropolis of three cities:

- *Eastern City* – Sydney City and economic corridor from Macquarie Park to Kogarah
- *Central City* – Greater Parramatta and Olympic Park (GPOP)
- *Western City* – centred on proposed 'Aerotropolis' around the Western Sydney Airport



Source: Greater Sydney Commission, 2016

Plans reinforce three principles to create a ***'30-minute city'***

- **Principle 1:** Increasing housing choice around all centres through urban renewal
- **Principle 2:** Stronger economic development in strategic centres and transport gateways
- **Principle 3:** Connecting centres with a networked transport system

Plans provide specifically for the Western Sydney Airport and surrounding Aerotropolis

- 'Western Sydney Priority Growth Area', to be supported by Penrith, Blacktown, Liverpool and Campbelltown-Macarthur
- **Aim** is to create a polycentric city of jobs and opportunity around the WSA
- 'Smart Liverpool' to be fostered as a city of business innovation, health and education excellence
- Campbelltown to be grown as an emerging health and medical university city

IS SYDNEY POLYCENTRIC? - COMMUTER PERSPECTIVE

- **Primary research** was commissioned exclusively for this report – a survey of over **500 commuters** to the Sydney or Parramatta CBDs to investigate whether Sydney was operating as a polycentric Sydney from a commuter or resident perspective.

Findings indicate that:

- Commute times are lengthy for a significant portion of residents
- Commuters want to be close to the Sydney CBD jobs pool.
- Many commuters appreciate the impact of mobile internet and cloud technology, however the role of processing power, Big Data and the Internet of Things are not yet fully understood

IS SYDNEY POLYCENTRIC? - COMMUTER PERSPECTIVE

Sydney is <u>not</u> considered polycentric from a consumer commuter perspective

This is an **important finding** as it points to:

- Key drivers for house prices being transport, job progression and limits to connectivity;
- Increasing traffic and public transport congestion because of the attachment to the Sydney CBD and inner ring; and
- The need to increase employment in the Parramatta CBD to increase job specialisation and to potentially introduce tradable services.

- Interestingly, most commuters were willing to commute up to 45 minutes to work before considering shifting where they work or live suggesting that **achieving the 30 minute ambition may be an unnecessary imposition on resources.**

QUESTION 1

How long does your journey to work take? (door to door)

- It takes 41.8% of respondents more than **45 minutes** each way to get to work
- That's at least **345 hours of travel** (based on 46 week working year) **or 14.375 days per year**
- 4.2% of workers travel for longer than 1.5 hours to work each morning. This is **690 hours or 28.75 days per year of travel**
- BITRE's recently released its Lengthy Commutes in Australia report. The main data source is the national Household Income and Labour Dynamics in Australia (HILDA) survey. In addition, the Productivity Commission (PC) Community Survey and the NSW Bureau of Transport Statistics' Household Travel Survey (HTS).
- The report states that the average commuting time in Australia is 29 minutes. Nearly a quarter of commuters, more that 2 million people, **travel for 45 minutes or more one way.**

BITRE LENGTHY COMMUTES IN AUSTRALIA

Key findings

- Commuting times rise with income and skills. Twenty six percent of employed people with a Batchelor degree or higher are lengthy commuters compared to16 per cent of those with Year 11 or below qualifications. Those earning more than $150 000 a year have an average commuting time of 36 minutes while those earning between $20 000-30 000 commute for an average of 26 minutes.

- Based on the HILDA 2012 survey, more males undertook lengthy commuting than females and overseas-born Australians have longer commuting times than Australian born commuters. Commuting times rose with age up to about age forty and then started to decline, particularly for females.

- Lengthy commuting has a significant negative impact on subjective overall life satisfaction, controlling for other relevant factors. Higher levels of overall job satisfaction, higher levels of satisfaction with the amount of free time a person has and higher levels of satisfaction with job flexibility are also associated with a lower probability of being a lengthy commuter.

- Lengthy commuting is a mostly temporary situation. However, the most important factors associated with longer or shorter lengthy commuting stints are: sex, age, employment and place of residence. Changing residences appears to be the key adaptation mechanism.

QUESTION 5*

Thinking about the time you spend commuting, if a similar work opportunity became available closer to where you live, would you trade jobs?

There was an **even split of yes** (40.9%) and **no** (41.5%) answers

The highest proportion of responses was 31% for “probably not” followed by “probably yes” with 23.3%.

The results were similar across the different age brackets, however, the 51 years + category had a 33.3% : 50.7% split for yes : no, which would be expected due to career progressions.

QUESTION 5*

Thinking about the time you spend commuting, if a similar work opportunity became available closer to where you live, would you trade jobs?

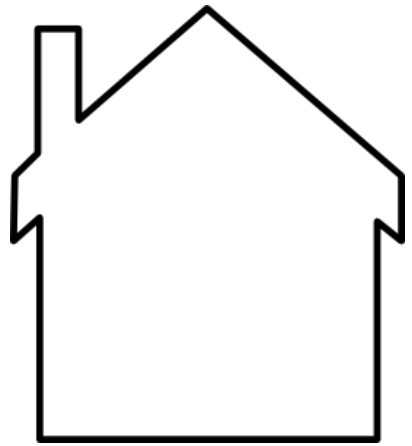
<u>This is an important finding.</u>

- This means that most workers have regard for their careers professional networks and prefer to maintain these than risk changing their networks due to potential job location change, albeit one which represents a shorter commute.
- Whilst this is counter intuitive to polycentricity, it highlights that an attractive range of jobs, wages and networks still exists only in the Sydney CBD.

QUESTION 7*

Are you or have you been looking for a job closer to home?

An **overwhelming proportion** of responses were "**No, I am happy in my current job**" -- (75%) – consistent across all age groups.



- Approximately **16%** had been **looking for a job closer to home**.
- This highlights the importance of the trade off between **human capital and commute time.**

QUESTION 8*

Which of the following did you consider when deciding where to live?

“It is close to public transport” was most selected with 55.4%.

Followed by **“It is close to shops and services”** at 39.4%

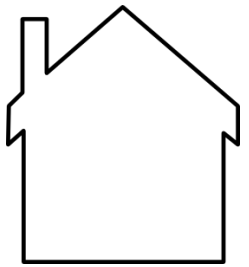
- Notable because people want to be close to the jobs pool.
- People want good public transport in areas close to jobs pool at an affordable rate. Median house price growth has been double the rate in inner areas compared with outer areas. Access to job pools, quality education and health, business, networks and land infrastructure (public transport) is driving housing prices. Since 1991 inner city median house prices in Sydney have increased by 7.6 times the middle ring by 7.0 times and outer areas by 3.7 times

QUESTION 9

Would you prefer your workplace to be close to…

“Public transport” was again the focus here across all age groups, with 65% of respondents selecting it as an answer.

“Close to home” was the second most valued factor, at 54.1% overall, which was fairly consistent across age groups, although of more importance to the 51+ bracket at 62.7%, reflecting the tendency of this age group to travel by car to work.



QUESTION 10

What do you most like about your current work location?

Yet again, **public transport** was the focus here, with 48.2% of respondents indicating that they most liked the fact that there was "better public transport in their work location than elsewhere.

The **"offer of better career opportunities"** was highly valued by the two middle age brackets at 40.4% and 40.2% for the 22-35and 36-50 groups respectively

QUESTION 11*

What do you least like about your current work location?

Complaints were concerned with commuting, and were consistent across age groups, with 41.3% having a problem with the **commuting time** specifically, and 34.3% disliking the "**sacrifice on my family/personal time** due to commuting"

BITRE - Lengthy commuting has a significant negative impact on subjective overall life satisfaction, controlling for other relevant factors. Higher levels of overall job satisfaction, higher levels of satisfaction with the amount of free time a person has and higher levels of satisfaction with job flexibility are also associated with a lower probability of being a lengthy commuter.

QUESTION 13

Out of the following new technologies, which do you think will have the most significant impact on your job?

83% of respondents believe that **"Mobile internet and cloud technology"** will have a significant impact on their job;

37.9% answered **"Processing power, Big Data"**;

28% selected the **"Internet of things"**

QUESTION 14

Thinking about new technologies, how do you think they will most likely impact where you work?

Working from home was again a strong focus here, with 49.7% of respondents believing that they will have **“more opportunities for working from home”.**

More contemporarily, 39.4% of respondents believed that their office would become a place of **“regular physical collaboration and less a place of permanent work”**

DRIVING FORCES SHAPING SYDNEY

- Sydney is not considered Polycentric, based on primary research, given the large disparity between the dominance of Sydney CBD and other centres.
- Acknowledging this, to ensure the future prosperity and liveability of Greater Sydney, it is imperative to understand the **forces driving change** within the region and their (potential) impact on spatial dispersion and planning.

- In particular, the ***potential role of technology based disruption and change must be better understood.***

The report identifies the following forces and examines examine their effect on land use and patterns of human behavior.

1. Globalisation and Servicisation
2. Demand for Social Infrastructure
3. Demand for Smart Infrastructure
4. The Digital Revolution
5. New Employment Patterns
6. Housing Affordability
7. The Aerotropolis (of Western Sydney)

1. GLOBALISATION AND SERVICISATION

- Globalisation has fragmented industrial activity and adversely impacted traditional manufacturing

- Greater Sydney is well positioned to take advantage of opportunities in high value add manufacturing

The services sector in Australia has been the backbone of economic growth over the last 20 years (Haratsis, 2016)

- Sydney accommodates the bulk of Australia's global services sector

City design and spatial planning are crucial to overall service sector competitiveness:

1. Urban amenity attracts the world's best talent; and
2. Urban structure supports start-ups and competition

Technological innovation and the sharing economy is likely to see movement towards a range of nodes

- Financial services (tradeable jobs) are less likely to move operations outside the CBD

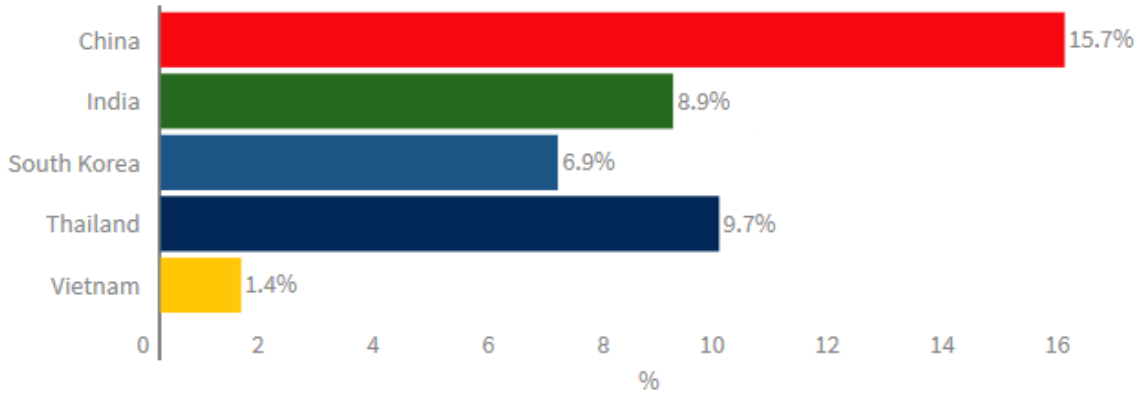
- Other sectors (health, medical research and IT etc.) are seeking connected inner ring (Macquarie Park, Redfern) or niche locations (Airport, university, freights nodes etc.)

- Outer nodes will provide flexible working arrangements due to increased connectivity and new operating models

2. DEMAND FOR SOCIAL INFRASTRUCTURE

- Social infrastructure will prove integral as Australia moves toward a more advanced, serviced based economy
- Investment into strong social infrastructure will foster high value add industries – such as advanced manufacturing and technology firms.
- Sydney is well placed given the strength and reputation of its education system and performance in relation to international student enrolment growth (Figure 7)
- Sydney's population is expected to grow by more than 2 million people by 2036 to 6.4 million people, increasing pressure on existing hard infrastructure.
- Congestion has a very real cost - avoidable congestion costs Australian capital cities $16.5 billion a year in lost productivity, forecast to increase to $27.7 billion by 2030.
- Limited tolerance of travel times (BITRE, 2016) means that workers will seek employment outside the heavily congested Sydney CBD, which will contribute to both 'push' and 'pull' factors delivering polycentricity.

Figure 7: International Student Enrolment Growth 2015-2016



Source: Department of Education, 2016

3. DEMAND FOR SMART INFRASTRUCTURE

Cities are making mass transit more appealing and roadways less congested by adopting advanced analytics and smart technologies;

Sydney - 7.7 million Opal cards utilising the ticketless smart payment system, facilitating 13 million trips per week

Seoul - Wi-Fi and 4G in all subway stations, Digital View terminals to find optimal routes, and virtual grocery stores

Dublin - data detected by sensors assist residents to move efficiently through the city's extensive network of roads, tramways and bus lanes

At the Local State government level, councils are steadily adopting smart technology.

Examples of smart tech by Australian councils:

- Adelaide - WiFi network basis for innovation hub
- Ballarat - Smart Waste Management
- Brisbane – Digital Brisbane
- Canberra – Smart parking
- NSW - Smart Work Hubs
- Perth investigates free WiFi for public transport
- Queensland - Smart water infrastructure
- SE Queensland - Smart streetlights (and more)
- Sunshine Coast leading the smart city movement

4. THE DIGITAL REVOLUTION

Technological innovation provides a **clear opportunity for growth**

- Gentrification, incubation hubs and flexible planning will allow centres to leverage the rise of the shared economy
- Creates increased employment opportunities outside CBD and Parramatta locations
- Dispersed start up activity in NSW reflects the 'placeless' nature of business growth
- Highlights the future importance of distribution points

Internet of Things (IoT) – involves Machine to Machine (M2M) communication, cutting out the human 'middle-man' element

- IoT and M2M have the potential to expand the global economy by $11.1 trillion by 2025 (McKinsey, 2015)

Autonomous vehicles (AV) – automobiles powered by autonomous technologies and capable of operating without human control

2017 - driverless 'Intellibuses' buses are already on the road
2018 - General Motors plans to deploy test fleets of self driving electric cars
2025 - AVs will be operational on designated roads

- AVs operating together with smart infrastructure and the IoT represent the future of telecommuting
- AV technology will affect spatial planning and challenge regulatory and structural environments

5. NEW EMPLOYMENT PATTERNS

- The unique nature of Australian job creation has been highlighted in a recent report – start-ups contribute disproportionately, with 40% of job creation in the economy coming from young SMEs.
- Over the period of 2006 – 2011 it is estimated that 1.04 million full time equivalent jobs were created - of these jobs, start-ups (firms aged 0-2) created 1.44 million and older firms (3+ years) shed 400,000.
- Australia has relatively high start-up activity, but this activity has been declining - a lack of obvious start-up locations and increased cost of office space was cited as the underlying reason for this change.
- The impact of technology on the spatial distribution of employment remains unclear – however there are observable trends hinting towards both job dispersion and primary centre concentration
- Secondary centres appear to be population driven and a vibrant tech industry already exists within Sydney.
- Implementation of the NBN, combined with the rise of the sharing and online economy and increased focus from both state and Federal governments on innovation and agility, provides a clear case for future growth of traditional tech companies, advanced manufacturing (robotics, R&D) and start-ups (sharing and online economy).

5. NEW EMPLOYMENT PATTERNS

- The new geography of the first phase of servicisation has not been researched or understood in an Australian context, but the second new geography will be driven by interconnectedness and robotisation (Haratsis, 2016)

- The timing of the first (disruptive technology) and second (transformative technology) phases should drive thinking about future settlement patterns and urban structures.

- An approach which could be adopted for Parramatta and/or Western Sydney has been successfully implemented in the UK.

- A cluster of tech start-ups in east London birthed a tech-city in the last five years and changed the UK's digital economy beyond recognition.

- The cluster spread - 70% of digital-based businesses are based outside the London – and the UK is now one of the most developed digital economies in the world, earning £145 billion a year from digital technology from an average spend of £1500 per person each year.

- ***City structure is an obvious key contributor to employment - Parramatta should be the immediate focus.***

6. HOUSING AFFORDABILITY

A desirable outcome from implementing polycentric Sydney is to alleviate housing affordability pressures.

- Housing affordability remains a key area of concern
- Continued upward pressure on house prices and median rents remain a barrier to future growth.
- Lack of housing affordability is driving people to settle in geographic locations further out of Sydney's centre which can work *if* local jobs are available.
- Analysis of median sale prices from Housing NSW for the period 2008 – 2014 shows the following.

Inner Ring

- Absolute growth of dwelling prices of 57% over the period with an average annual growth rate of 7.9%.

Middle Ring

- Absolute growth of 80% and annual average growth of 10.3%

Outer Ring

- Absolute growth of 55%, annual average growth of 7.6%

- Growth in middle and outer ring prices is reflective of the dispersion of people who are looking for more affordable housing outside the inner ring
- **This arbitrage opportunity, arising from the difference in prices, makes polycentrism worthwhile**

7. THE WESTERN SYDNEY 'AEROTROPOLIS'

- "Roads first, airport second" - Initial public investment towards an airport in Western Sydney has commenced with $3.6 billion committed to major road infrastructure upgrades via the Western Sydney Infrastructure Plan (WSIP).
- The Badgerys Creek Airport is viewed as a key leverage piece within the greater Western Sydney Priority Growth Area
- The Sydney Chamber of Commerce see the Western Sydney Aerotropolis as accommodating 57,000 new commercial and industrial jobs in the next 30 years, with the potential for hosting up to 212,000 jobs at full build-out.
- 15 employment zones have been planned together with expansive residential zones to house a growing Aerotropolis workforce

- ***However,*** Australia has no track record in delivering the Aerotropolis model.
- The aims and priorities associated with the private ownership model in existence throughout Australia's airports are **not necessarily consistent** with delivery of an Aerotropolis.
- So, while the Aerotropolis model may nonetheless proceed, its development will be a very long term process.

HOW DO WE ACHIEVE A POLYCENTRIC SYDNEY?

- Multiple forces are driving seismic changes in our lived experience, however the spatial implications of these are not yet fully understood.
- These forces are already affecting the demands on Sydney, however it is not clear in what way decision makers – planners, urban policy makers, politicians – are responding
- Strategic planners and public policy makers must adapt to, or at least be aware of, these forces if we are to leverage the opportunities, and mitigate the various strategic and economic risks, they bring to the table.

➢ After considering the effect of the forces currently shaping Sydney, and their expected impact looking forward, we can begin to identify principles to guide policy makers in turning turn the vision of polycentric Sydney into a reality.

PRINCIPLES GUIDING IMPLEMENTATION

Three key considerations **must be at the front and centre of strategic planning and policy making to successfully implement a polycentric city-shape for the Sydney region:**

1. **Early infrastructure planning and investment** is the key to unlocking the potential of future centres

2. **Parramatta** must become a real completed CBD, at least doubling its employment by 2036 - this requires improvements in **planning flexibility**

3. **Western Sydney Airport** and the surrounding 'Aerotropolis' should be considered as a new 'centre' for Western Sydney

Critically, these principles require implementation enabled by an **understanding, acceptance and response to technology based disruption and change.** In relation to the **three guiding principles:**

a) Early infrastructure development and planned **integration with AV and smart technology** is critical to maximizing the benefits from the digital revolution

b) Parramatta has the potential to gain a strong a **competitive advantage from digital disruption**

c) **AV technology** is crucial to **connecting** the **Western Sydney** 'centre'

1. INFRASTRUCTURE PLANNING AND INVESTMENT

Early infrastructure planning and investment is critical

- Better spatial understanding of the requirements of start-ups and mixed use precincts is required - freight and logistics multipliers must be understood
- Infrastructure will assist agglomeration to promote the optimal mix of tradable and population-based non-tradable employment

Avoidable congestion costs Australian capital cities $16.5 billion a year in lost productivity, forecast to increase to $27.7bn by 2030

- Increased investment into connecting infrastructure can decentralize population driven employment

Early investment in transport and freight infrastructure, particularly in Western Sydney is a **key enabler of polycentric Sydney**

- Pressure can be relieved from key corridors, decreasing congestion and increasing productivity
- Future accessibility of skilled jobs can be unlocked
- Optimal mix of tradable and non-tradable employment can be supported

1A. EARLY INTRODUCTION OF AUTOMATED VEHICLES

Early understanding and planning for the **rollout of AVs** is crucial

- Policy makers must identify appropriate regulation and deregulation to allow seamless integration with current infrastructure
- Real spatial implications of new technology are not known - policy makers must develop mobility scenarios
- Without a managed introduction, AVs will initially increase on road vehicles by 10% to 20% (Haratsis, 2016)
- Productivity, efficiency and innovation improvements may be forgone
- Investment into 'smart infrastructure' along with AVs can reduce lengthy commutes and increase productivity in greater Sydney
- Recent research indicated that early take up could result not only in better safety and infrastructure outcomes (e.g. integration with public transport), but also up to 15,000 additional jobs

1A. EARLY INTRODUCTION OF AUTOMATED VEHICLES

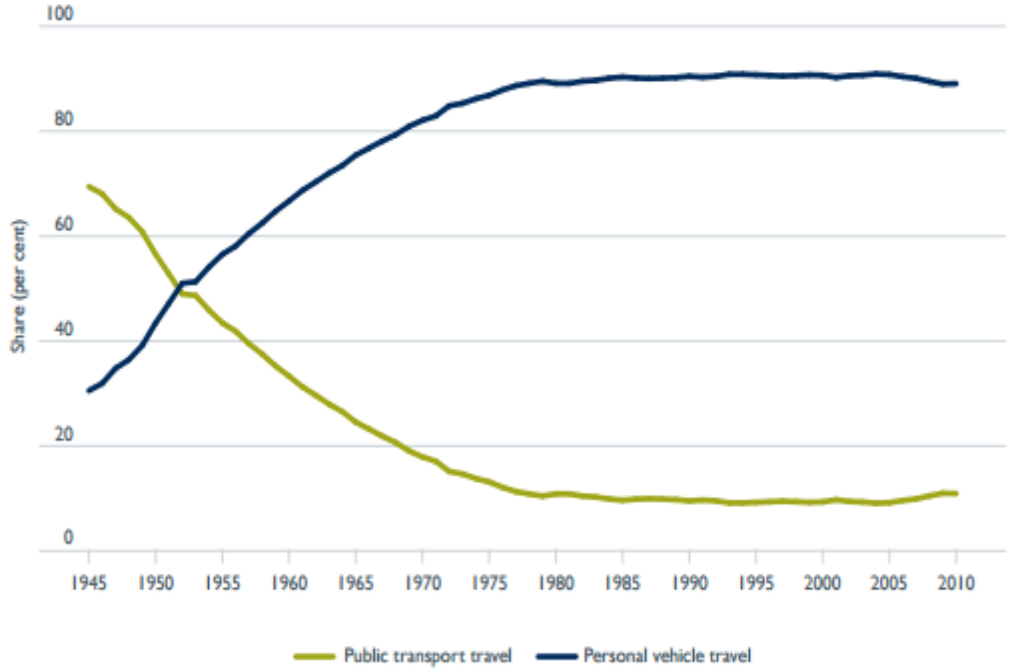
- The transition to the mobility ecosystem but will occur over a period of years as AV technology evolves and government and planners implement appropriate management measures and infrastructure.

- Short term (2017 – 2020): likely to be growth in low level autonomy with technology like lane assist and traffic light co-ordination.

- 2020– 2025: Uptake of AVs likely to increase as technology becomes more affordable, similar to the transition to personal vehicles (Figure 8)

- By 2035: Large connected networks (smart infrastructure) will transform mobility, allowing for increased user uptake and greater user experience

Figure 8: Passenger Transport Share (per cent) for all capital cities, 1945-2010



2. INCREASED PLANNING FLEXIBILITY IN PARRAMATTA

Australia has relatively high but declining start-up activity, due to lack of obvious start-up locations and increased cost of office space

- City structure is an obvious key contributor to employment - **Parramatta should be the immediate focus**
- Parramatta is growing well but needs to at least double its employment by 2036.
- Must match the vibrancy of Pyrmont, Surry Hills and Redfern to attract entrepreneurial, SME and incubator based employment
- Councils must be proactive and allow for **planning flexibility**
- Mixed-zone planning and gentrification will foster new employment hubs and higher residential densities

2A. TAKING ADVANTAGE OF DIGITAL DISRUPTION

Autonomous vehicles represent a paradigm shift in terms of the new economy.

- AV and other new technology will disrupt established industries
- Agile SMEs and entrepreneurial start-ups will benefit from digital disruption
- Young firms and start-ups contribute disproportionally to net job creation, and so employment should grow
- **If improved planning flexibility** and densification brings such businesses to Parramatta, the area could gain a strong competitive advantage

The spatial impacts of AVs will transcend the direct on road impacts

- Shared self-driving fleets are likely to emerge, providing a cost effective alternative to public transport systems
- Decreased need for parking could free up land for redevelopment, further shaping Parramatta and other nodes

3. ESTABLISHING A CENTRE IN WESTERN SYDNEY

Given the size of Western Sydney, and the uncertainty about the implementation of the proposed Aerotropolis, it is imperative that a view be taken on the location and 'shape' of the third major centre in the polycentric city structure.

For example, is it:

a) a single centre comprising the Western Sydney Airport and Aerotropolis plus all major adjoining land; or

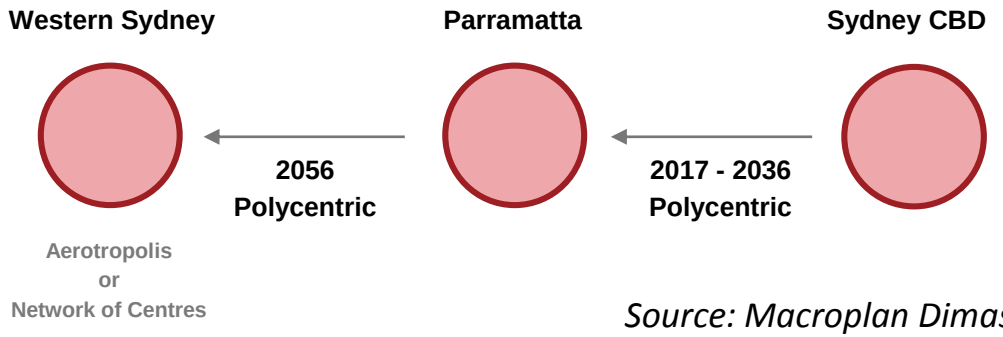
b) A network of centres (Liverpool, Campbelltown and Penrith) integrated with autonomous vehicles, autonomous shuttles and diverse mobility solutions including car sharing, ride sharing and high quality active transport?

3A. CONNECTING WESTERN SYDNEY WITH AUTONOMOUS VEHICLES

Given the size of Western Sydney, the **introduction of an AV industry** would be commercially sensible.

- Connectivity between economic centres is crucial to achieving the agglomeration benefits
- Network of centres could be integrated with AVs, autonomous shuttles and diverse mobility solutions
- Early implementation of automated shuttle buses should be key feature of growing Western Sydney

- Consideration should be given to both a near-medium term view, and a longer term view of what polycentric Sydney may look like. This is depicted in the schematic below:



Source: Macroplan Dimasi, 2016

CONCLUSIONS

If successfully implemented, a **polycentric Sydney** presents the opportunity to:

- Reduce infrastructure expenditure by replacing and integrating substantial elements of public transport with autonomous vehicles
- Increase employment through the growth of microbusinesses, contractors and SMEs which do not require CBD type locations; and
- Increase residential density by providing affordable dwellings in a range of locations which allow access to a range of experiences and employment opportunities

Autonomous vehicles represent both challenges and opportunities to policy makers and consumers

- The potential to decrease congestion in greater Sydney and also reduce road deaths can reduce a very real economic and social burden.
- In an age of digital disruption and constant change, the introduction of AV technology will benefit the very SMEs and start-ups that a polycentric model hopes to foster and grow.
- Given the contribution to employment creation of SMEs and start-ups to the Australian economy, this presents a real opportunity for policy makers to further assist in the transition to the new economy.
- It also represents an opportunity for a well-established, connected-network framework for AV implementation and management in Sydney.

CONCLUSIONS

- Immediate consideration should be given to the establishment of a framework for the implementation and management of well-connected automated vehicle network in Sydney's West
- Infrastructure's role in implementation cannot be overstated.
- The infrastructure solution must generate genuine polycentricity to ensure that Western Sydney can attract tradeable jobs in professional, scientific and technical services, tourism, health, finance and information technology
- Western Sydney Airport must be balanced with a highly networked and efficient public transport between centres in Western Sydney to trap economic multipliers in the west
- We may not be able to foresee which version of Polycentric Sydney should be adopted given the rate of change in technology.
- However, ***understanding the options and forces driving change is essential today*** to facilitate the process of moving Sydney towards a polycentric model.

NEXT STEPS

The implementation of a polycentric Sydney is a multidimensional process with three discernible steps.

1. **Specify and agree on the key ingredients** of a polycentric centre
2. **Formulate an action plan** incorporating:

- Comprehensive, periodical reviews and monitoring of the impacts of key city shaping technologies
- A regularly updated data set capturing key metrics to inform policy makers and the private sector

3. **Commit to transparency** around the around the identification of productivity improvements for the freight and logistics sector expected to be generated by relevant major transport infrastructure items

- It is also critical that provision of key infrastructure is prioritised to areas of greatest need and/or where the greatest benefits can be realised.

APPENDIX 4: DESTRUCTIVE CITIES – CHAPTER 10

In my book *Australia 2050*, I endeavoured to make two points. First, Australia's population was likely to grow more quickly than forecast. Second, Australia's demographic and economic growth trajectory was out of sync with the institutional frameworks designed to control urban and regional development. The two issues were, and still are, causing severely disruptive and unintended consequences: the world's highest land and housing prices, the world's highest cost cities, underinvestment in infrastructure, uncompetitive industry and employment outcomes, uncompetitive resource development outcomes, and declining fortunes (based on national income) for most Australians. Urban and regional policies and regulatory practices are strangling Australia to the point where, after one of the biggest mining booms in Australian history, most people feel worse off.

At the time of writing *Australia 2050* (2008/9), the third Federal Government Intergenerational Report was published (Australian Government, 2010) and in 2015 the fourth report (Australian Government, 2015) was produced with the same message. The costs of health and ageing are highlighted as the biggest single budget challenge to Australia, forcing the nation into a structural budgetary deficit (i.e. a deficit that can only be addressed by changing institutional frameworks, industry structure and the regulatory frameworks by 2030). Despite four intergenerational reports, Australia's post-war urban and regional policy frameworks still do not address the issues of health and ageing. In 2015, the primary national discourse on the need to review city-building practices is contained in the Harper competition policy review (Harper, 2015).[3]

Australia 2050 observed the major initial spatial impact of the global financial crisis (GFC). The acceleration of the services revolution and implications for regions and cities was not understood in 2008. *Destructive Cities* straddles the post-GFC period of unconventional economic policy (known as quantitative easing (QE), which increases liquidity and reduces interest rates) and the shift to global economic stabilisation.

Free trade agreements have been struck by 2015 with Japan, China, South Korea and the Indian FTA is imminent. The mining construction super-cycle is receding and Australia must create a long-term urban and regional policy framework to support a globally competitive services sector – education, health, tourism, information technology, retailing, business and scientific services and public administration.

Recapping, why is the services sector critical? Why must the services sector be expanded? This book argues that the deregulation of the Australian dollar in the 1980s, removal of tariffs and financial deregulation exposed manufacturing, resources and agriculture to global competition. This is not the case for the services sector (particularly the 'sticky' non-tradeable sector because a high percentage of jobs cannot be offshored as they can in manufacturing). This has resulted in long periods of low productivity and high inflation caused by this sector.

A competitive services sector is a critical part of the Australian economy. Unfortunately, the post-war 'Australian Settlement' institutional framework, which has persisted since the 1950s

[3] Recommendation 9, Planning and Zoning, seeks to constrain retail land use regulation, increase business zone uses and simplify development approvals processes.

(i.e. populate or perish by expanding manufacturing and agriculture in a highly protected economy), never imagined the rise and rise of the services sector. Neither did urban and regional planning or environmental policy based on the garden city model.

The new services sector is driven by techno-globalisation i.e. technology, globalisation, population growth and ultimately economic growth. We live in a community, not an economy, so why don't we just reduce economic growth by stopping immigration? There are four major reasons.

1. The competitiveness of much of the services sector relies on innovation, scale and competition. Major elements of key service sectors such as retailing, banking, finance and airline travel require scale. The sectors often have built-in protection without competition. Uncompetitive practices in Australia come in the form of land use zoning, restriction of residential land supply, industry concentration (e.g. airport monopoly), landing rights and banking regulation, to name a few, (see Harper Competition Review 2015). The Productivity Commission draft report (2015) Barriers to Growth in Service Exports identifies many barriers to growing exports in the tourism, international student, professional services and information technology sectors.

2. The 8.5 million Australians already working in the services sector need better jobs, more secure jobs (i.e. not offshored) or at risk from robotics, and to have the opportunity to start a business. The services sector must be given the opportunity to continue to invent itself post-2016 style with innovative, capital-light business models. This is recognised in Australia by both the Productivity Commission and the Office of the Chief Economist. Services sector transformation is likely to be a generational (30-year) project requiring stable economic growth and new financial, economic and spatial policy frameworks to encourage entrepreneurial risk taking; this is in effect a new social contract. Urban and regional policy will be a key driver because it is actually a core part of the services sector revolution and a key foundation.

3. The imminent challenge is to confront and digest the mainly publicly funded 130% increase in the costs of health and ageing forecast by the fourth intergenerational report (Australian Government, 2015) in the next 40 years. The prime cost issue in the sector is staff. From 2013 to 2020 the Productivity Commission forecasts 229,000 new jobs in the fastest growing sector, i.e. health. Much of the growth is in low-paying jobs (care, cleaning and administration) where wages (currently $15 to $30 per hour) will increase with demand. Low cost housing is necessary to accommodate low paid essential services workers.

4. Integrating Australia into the global services value chain is essential to establish its long-term competitiveness given the lack of domestic scale.

With long term labour force participation rates forecast to drop in Australia (despite recent increases), without a larger labour force, wages will rise in the medium term. This will hasten offshoring and robotics. It is important to achieve the right rate of change. The resources sector super-cycle has provided an intergenerational opportunity through increasing resource

exports to 'fund' the transformation of the services sector. The challenge is to take the opportunity.

A globally competitive services sector (i.e. one that becomes a significant export earner) ultimately reduces pressure to expand exports via resource development and agricultural production. It provides economic growth and diversification, entrepreneurialism and innovation, and can create, over time, stronger global understanding and cultural linkages through education and tourism.

10.2 Entrepreneurialism

A landmark longitudinal study undertaken by the Office of the Chief Economist and the Australian Bureau of Statistics,[4] in conjunction with the OECD (2001/2 to 2012/13) observed the following key points.

As firms age they contribute less to job creation and more to job destruction. Young firms in Australia contribute disproportionality to net job creation. Although employing a small fraction of the Australian workforce (15 per cent) young SMEs generated the largest share of total job creation (40 per cent) in the economy.

Over the period 2006-2011 they estimate that 1.04 million full time equivalent (FTE) jobs were added to the economy. Start-ups (firms aged 0-2 years) added 1.44 million FTE jobs to the economy whereas older firms (3+ years) shed around 400,000 FTE jobs over the same period.

Most micro-start-ups (new firms with 0-3 employees) either exit or grow very little (96.8 per cent). A very small fraction (3.2 per cent) of these micro start-ups grow dramatically over five years post-entry and these firms account for the majority (77 per cent) of total post-entry job creation of all micro-start-ups in their cohort. These high growth start-ups are found in all sectors of the economy.

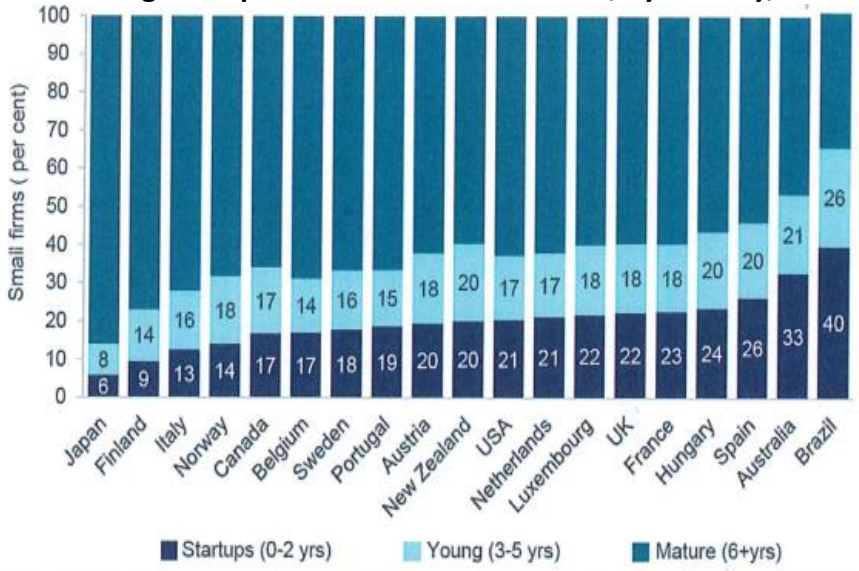
Australia has relatively high start-up activity but this activity has been declining. This could be due to the gentrification of CBDs and inner areas and a lack of obvious start-up locations.

Australia relies on new firm start-ups much more than OECD member countries in terms of net job creation. The ratio of start-up businesses in the economy indicates this (see following graphs). This means that affordable access to employers and premises is significantly important to the Australian economy. As the graphs indicate 33% of small businesses in Australia are start-ups compared with 21% in the USA and 22% in the UK. In addition Australian start-ups add more employment to the economy than in other OECD countries.

The structure of Australian cities is therefore a key contributor to employment. Over time however, planned gentrification of inner city 'incubator' suburbs such as Southbank in Melbourne, Victoria Park in Sydney and Fortitude Valley in Brisbane plus increased residential densities will force start-ups and SMEs into other locations or reduce the number of start-ups (as has been observed in the longitudinal study). This observation has been part of the motivation in strategies such as Growing Sydney and Plan Melbourne to create employment clusters outside the CBD.

[4] The Employment Dynamics of Australian Entrepreneurialship (2015) Office of the Chief Economist, Research Paper 4/2015.

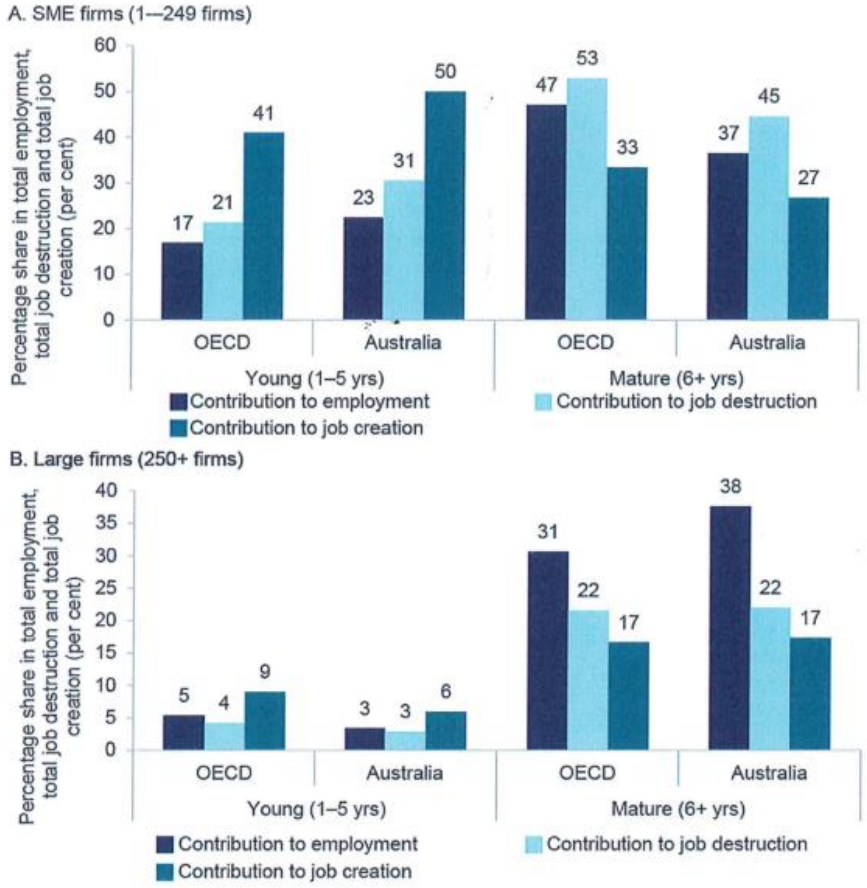
Figure 10.1: Age Composition of small businesses, by country, 2001-2011



Notes: The graph shows the share of firms by different age groups in the total number of micro and small firms (below 50 employees) in each economy on average over the available years. The period covered is 2001–2011 for Australia, Belgium, Canada, Finland, Hungary, the Netherlands, the United Kingdom and the United States; 2001–2010 for Austria, Brazil, Spain, Italy, Luxembourg, Norway and Sweden; 2001–2009 for Japan and New Zealand; 2001–2007 for France; and 2006–2011 for Portugal. Sectors covered are: manufacturing, construction, and non-financial business services. Owing to methodological differences, figures may deviate from officially published national statistics. For Japan data are at the establishment level, for other countries at the firm level. Data for Canada refer only to organic employment changes and exclude merger and acquisition activity.

Source: Criscuolo el al. (2014) and ABS (2015) Expanded Analytical Business Longitudinal Database 2001-02 to 2012-12

Figure 10.2: Employment, job creation and no destruction for SME (panel A) and Large firms (panel B) by firm age, OECD vs. Australia, 2001-2011



Notes: The graph reports the contribution to total employment, gross job creation and job destruction by firms in the reported age-size groups on average across all available years and countries. For the purposes of OECD comparisons headcount measures are used rather than Full Time Equivalents. Size classes are Small to Medium (1–249 employees) and Large (250+ employees). Age classes are Young (1–5 years old) and Mature (6+ years old). The period covered is 2001–2011 for Australia, Belgium, Finland, Hungary, the Netherlands, the United Kingdom and the United States; 2001–2010 for Austria, Brazil, Spain, Italy, Luxembourg, Norway and Sweden; 2001–2009 for Canada, Japan and New Zealand; 2001–2007 for France; and 2006–2011 for Portugal. Sectors covered are: manufacturing, construction, and non-financial business services. Owing to methodological differences, figures may deviate from officially published national statistics. For Japan data are at the establishment level, for other countries at the firm level. Data for Canada refer only to organic employment changes and exclude merger and acquisition activity.

Source: Criscuolo el al. (2014) and ABS (2015) Expanded Analytical Business Longitudinal Database 2001-02 to 2012-12

10.3 Destructive/Regenerative Cities

Three strands of spatial thinking arise from techno-globalisation driven by the global services revolution. The first is that new urban and regional planning, rezoning and subdivisional frameworks and private sector driven processes are necessary to support globally competitive services sector value chains. The second is the need for institutional reform to integrate the private sector into future infrastructure planning and delivery. This would include major roads as a Regulated Asset Base as well as deregulation and incentives for major infrastructure investments e.g. new international airports. Third, the thinking behind the urban planning and infrastructure reforms should include equitable shelter and a circular economy for ecological resilience.

The concept of creative destruction relates well to city building, because it was used to describe the ongoing entry of innovative new firms created by entrepreneurs as the key to long-term economic growth, despite the fact that it destroyed the value of established companies. The process of inner-city gentrification has destroyed established communities and local economies in many cities and planning systems have prevented regeneration. The monopolistic nature of city form and infrastructure provision in Australia is created and promoted through regulatory frameworks, which in turn were based on 20th century 'garden city' models of city building – an entirely inappropriate model in the 21st century. This is why the Harper competition policy review (2015) recommended the review of zoning and planning practices in Australia. Given that the property sector accounts for around 11% of national gross value added and that Australia is the 12th highest investment destination for corporate real estate there is a strong case for a national regulation for the property industry.

Several rules of economic development for Melbourne and Sydney that have been researched by Dr. Peter Bain and reproduced in Delivering Sustainable Urban Mobility 2015 (ACOLA, Appendix 1) are helpful in understanding the spatial outcomes which should be delivered by new institutional structures. Some key propositions which have been proven empirically are:

- There is increasing inequity in regional economic performance, with fringe urban areas at an increasing disadvantage.
- The greater the level of economic activity in a regional catchment the greater economic benefit (i.e. income) for residents in the catchment.
- The capital stock per capita in a region is a fundamental factor that determines the level of economic activity.
- The increased scale of a metropolitan area will increase the opportunities to increase productivity.
- If the metropolitan area of a major city is to maximise the increase in its productivity, the scale of the central region will have to increase, at least proportionally to the increase in metropolitan scale.
- The capacity to export out of region is the core proximate driver of economic activity.

To develop a policy framework to acknowledge these outcomes in the light of the services revolution, globalisation and technological disruption and transformation requires a new approach to city building.

The concept of destruction/regeneration adopted for this book envisages cities renewing themselves continuously. This is to be achieved not through traditional processes of urban renewal (i.e. brownfields redevelopment, rezoning, strategic plans/design, development/structure plans and infrastructure charges), but by inventing new planning strategies and processes that allow and direct incentive for property owners to redevelop, renovate or renew properties to accommodate a very wide range of uses. The initial planning approval and strategy could embody and plan for change in site use on a rolling 30-year basis for example.

In Australia, because there is a relative abundance of land, there is an incentive to under-capitalise or under-develop, i.e. build single-storey shopping centres because building costs outweigh land costs. This outcome tends to reduce medium and high-density, mixed-use outcomes. Intensive future redevelopment should be mandated and pre-agreed at the time of initial approval.

Destructive/regenerative cities require value creation and capture through institutional reform of infrastructure delivery, evolutionary zoning and taxation regimes that provide incentives for maximum development, mixed-use development and place making, which maximises social innovation and economic outcomes. These outcomes are actively prevented in Australia due to the primary philosophies driving urban planning outcomes – protect the short-term value of property, maintain bureaucratic and political control over infrastructure provision and property development, and stick to an uncontroversial garden city planning model. These philosophies prevent systemic changes to infrastructure delivery, planning and zoning. Destructive/regenerative city planning would create a new social contract and development outcomes on a long-term basis.[5]

Cities should no longer be run as increasing cost monopolies, but as a competitive network of opportunities and a seedbed of mixed uses. Part of the post-2030 city building strategic approach should be competitive land markets with a new property taxation regime to promote world-competitive pricing and the world's best infrastructure and integrated live, work and play outcomes.

Expecting the public sector to be the medium for change in city building is unrealistic. The job is too complex and too large. The politics are too difficult. Greenfields, brownfields and major new projects should be planned for techno-redundancy. New tenure types in exchange for development rights should be part of institutional reform. The implementation of floor space ratio controls (FSRs) is essential to effectively fund infrastructure and to efficiently secure and incentivise regeneration as is congestion charging.

[5] For example the new social contract could be built on achieving agreed outcomes which 'force' institutional change. This would support major roads as a regulated asset base and an open investment opportunity for automated/driverless vehicles plus planning reform to create new locations for parking and approaches to parking charges as private transport continues to dominate.

Destructive/regenerative cities require new principles and strategies. For example, major small lot Greenfield mono-use residential projects have limited or no ability for mixed use or high density redevelopment. This means that major areas in the city cannot be regenerated. In 2016, given that the number of dwellings in Melbourne and Sydney will double between 2011 and 2036 and that 95% of all new jobs will be in the services sector, this planning approach is outdated. All projects, for example, retail centres that under-develop should pay infrastructure levies over time as if they were fully developed. The assumption should be to 'finish' unfinished business, not to leave regeneration to the next generation.

Strategies wrapping around destructive/regenerative city thinking should focus in the short and medium term (2020 and 2030 respectively) on spatial strategies to generate growth in new infrastructures and capital investment, tradeable services and low cost housing, and to secure intergenerational change post 2030. This includes:

- Spatial plans for the introduction of federally recognised private public partnerships and value creation and capture.
- Spatial plans that look past 'catch up' infrastructure and seek to develop post 2050 cities.
- Infrastructure 'light' solutions and city building innovation solutions.
- Spatial plans for tourism, education and health sectors, business and professional sectors. These in turn drive new infrastructure strategies
- A sub national spatial and mobility plan to link Sydney, Canberra ad Melbourne and their hinterland to maximise social environmental and economic outcomes in line with thinking in the Infrastructure Australia (2016) plan.
- A new policy framework which encourages the private sector to drive urban renewal and infrastructure development (e.g. regulated asset base for roads).
- Spatial plans for low entry cost business.
- Spatial opportunities for economic (technology) clusters in non-urban locations.
- Infrastructure plans to maximise capacity (not the price of airports, ports, roads and rails) to support the growth of the services sector.
- Land use, taxation and infrastructure incentives to produce low cost housing.
- Aggressive social and community housing strategies based on value creation.
- Major investment and growth in selected regional cities.
- Attracting the world's best talent.

A range of land use and property development strategies for global competitiveness are contemplated in the next section.

10.4 Before the Luck Runs Out: Institutional Reform, The Circular Economy and the Gateway Cities Opportunity

The focus of this book is the need for multi-dimensional urban reform. In this context the following section focuses on the need for institutional reform to achieve national state and local outcomes. Sydney versus Melbourne rivalry is dead. Capital city rivalry in Australia is over. The new global cities phenomenon shows the old rivals not only need each other but actively complement each other and could become focal points of a Gateway Cities Network. (Initially Sydney, Melbourne plus hinterlands and Canberra, extending over time to integrate Brisbane and Adelaide).

Sydney is the engine room of growth for globally competitive services in Australia. In 2015, over 160,000 jobs were added. This is the highest (+4.8%) numerical increase post war and over 50% of new jobs in Australia. The performance was driven by fast jobs growth increases in dwellings, construction, above average population growth, leading national investment in equipment and fastest increase in home lending. Melbourne leads in population growth (1.8%) and gross state product, i.e. population driven services. The ACT is third highest performing economy driven by construction. The Sydney/Melbourne corridor is likely to be the focus for service sector growth for at least 10 to 15 years because it contains the key business services professional and scientific export sectors.

Sydney and Melbourne account for 60% of GDP and in 2015, 70 million flights were accounted for. The key services sectors include tourism, retail, health, education, professional, technical and scientific services (technology) and the service sector is booming with the Australian dollar at 70¢ US. In Sydney financial services and global high tech businesses like Atlassian are transforming the national economy.

By 2020 Melbourne and Sydney will accommodate 10 million people. Together this combination would rate as around the 15th largest combination in the world, but Sydney in 2016 was rated the second most expensive location in the world for housing – Melbourne is fourth. Median land prices on the urban fringe in Sydney ($380,000) are almost double, that of Melbourne ($211,000).

The Australian economy continues its fast transition to the tradeable (tourism, finance, professional and scientific services) and non-tradable services sectors, (healthcare, retail centres). In 2017 Australia is likely to produce its first ever trade surplus in services. At AUD 70¢ US the services sector in Australia is forecast to increase in size by 50% by 2030 and drive employment growth. This in turn will put pressure on housing markets and without the right polices reduce affordability because housing markets are unable to respond to demand at feasible prices.

Sydney and Melbourne need each other to capture international growth in the tradeable service sector. Canberra plus the hinterland is essential to create new business models for urban development which in turn underpin affordable housing built in a social, economic and culturally rich environment.

Both Sydney and Melbourne are building new airports and new commuter rail systems. Sydney is building new infrastructure to support a truly polycentric city. Westconnex, Northconnex, CBD light rail, Badgerys Creek arterial road network, Moorebank Intermodal and

the Waterloo to Sydney link rail. Plan Melbourne envisages accommodating 1 million residents and 1 million jobs in inner Melbourne by 2040 and utilising 600 hectares of inner urban brownfields including social housing, reduced urban emissions, reduced resource use and climate change measures. Sydney is a generation ahead (30 years) in the pursuit of a polycentric city with 50,000 jobs in Parramatta, 1.5 million people in Western Sydney and major emerging centres in Chatswood, Blacktown, Macquarie Park/North Ryde, Rouse Hill, Penrith, Liverpool and Bella Vista/Norwest Business Park.

By 2050 the Gateway Cities of Australia will include Sydney, Brisbane, Melbourne and Canberra accounting for 24 million people or double the current population. In this timeframe based on observed patterns, Australia is likely to endure six economic cycles and two major trade episodes. Technology through driverless cars, the Internet of Things and robotics is likely to completely spatially restructure all capital cities from garden cities, to polycentric services cities, then to post-centric lifestyle networks.

Australia can lead the way to post-centric cities utilising the Sydney, Melbourne, Brisbane, Adelaide and Canberra combination of the best technologies and the best environments in the world in which to live i.e. a Gateway Cities Network. The alternatives are to follow Europe into the development of dense cities or the US and Japan/China into dense and multiple cities. Australia has an opportunity to create major new characteristics – urban lifestyles in networks of small towns and regional cities supported by globally linked, competitive capital cities.

Australia has many reasons to seek a new urban model. These include supporting the growth of a globally competitive services sector, reducing the price of housing, attracting the world's best talent, exporting our city building and design expertise and cementing Australia as a world leading innovator. A Federal approach and sub-national Gateway Cities Plan should be put in place with a sense of urgency based on achieving circular economic outcomes i.e. using technology to secure ecological resilience. Strong urban growth and investment is possible in the next 5 years concurrent with strong growth in China, Korea, Asia (broadly) and the US. The investment dollars are available, Australia needs infrastructure and Australia needs a 'single step' move to high tech urbanisation which includes low carbon, low energy and low resource usage combined with a wide range of affordable living options, not low tech garden cities with expensive heavy rail systems, endemic traffic congestion and high cost housing.

High tech post-centric urbanisation can be a key federal innovation outcome. Much of this outcome can be driven by value capture and creation based on expected demographic and economic growth. Accelerated growth in infrastructure increases productivity, economic efficiency and produces scale economies. If the marketplace is convinced that a bipartisan economic approach (politically) driven and influenced by the Federal Government in collaboration with the States will occur in the long run, then large scale long term investment will follow, with major benefits in urban productivity, efficiency and innovation.

Urban productivity can be increased by:

- Increasing tradeable (export) services through new urban structures (e.g. economic clusters, networked cities, etc.).
- Reducing traffic congestion and travel time to create economic opportunities.
- Increasing investment, particularly private investment in infrastructure.
- Reducing services production costs (e.g. shared vehicles, collaborative spaces, education/business collaboration, local finance options, combining non-work welfare with business development).
- Increasing affordable living by reducing housing costs.
- Reducing non-productive dwelling investment.
- Creating new urban mobility ecosystems which are exportable.
- Creating super 'creative' and collaborative environments.
- Securing the world's best talent.
- Learning to integrate the natural environment with urban living.

Urban efficiency can be increased through:

- Scale economies in terms of major city size and CBD (inner city) size.
- Better use of land (40% of land is road space and car parking).
- Identification of new requirements for urban infrastructure investment by the private sector (e.g. driverless cars, on-demand driverless buses and light rail networks).
- Reduced resource use (water, energy).
- Reduced carbon usage.
- Introduction of new network technologies e.g. Wi-Fi.
- Development of new distribution systems and networks e.g. middle and inner ring urban freight networks.
- Introduction of new land use categories for new business types (e.g. 'black' supermarkets for home delivery).

Urban innovation can be secured by:

Developing and harnessing new technologies which shape polycentric and post-centric lifestyle outcomes including:

- Harnessing 'big data' in a creative and equitable manner.
- The Internet of Things.
- Creating new mobility ecosystems which can be exported.
- Creating robotics in areas such as homecare for the frail/aged.

- Replacing 'ownership' environments with sharing, collaborative, cultural and natural environments.
- Encouraging multidimensional planning and architecture which spans public and private land and places.
- Early integration of physical and digital space leading to multidimensional living.
- Creating urban development companies which must deliver multiple outcomes not just property development outcomes and which are measured and monitored.

10.5 Spatial Implications of Competitive Services Sector Cities

Spatially, services sector-driven cities would be different to current Australian capital cities. Without policy direction, the focus for population and employment will increasingly concentrate in capital cities and for the next 15 years this will mean Melbourne and Sydney, (including their hinterland and Canberra) followed in the long term by Brisbane and Adelaide. City development models will follow Infrastructure Australia funding plan which solves past problems but does not create new city structures

National Spatial Planning Implications

At a national level, towns and cities should be geographically distributed in parallel with more concentrated metropolitan development. This will generate population-driven services in areas that could form the foundation for tradeable services in the longer run. This could include, for example, coastal areas, alpine areas and areas of high natural value, which ultimately could become attractive to professional talent and innovation, as well international tourists and drive growth. In addition:

- The spatial distribution of cities would counter existing and future market forces and infrastructure expenditure that would seek to concentrate services only in capital cities. This principle would actively drive population from capital cities.
- Future network infrastructures (e.g. fast rail) should be considered as key policy mechanisms to open up the potential for non-capital city service production and income distribution[6]. This would include regional freight nodes that could be a focal point for local bespoke industries (e.g. specialty food production/manufacturing) plus high-value agricultural services to increase productivity and a wide range of experiences/industries (e.g. vineyards with specialty foods and accommodation), which could form the basis for highly differentiated tourist experiences.
- At an international level, creating access to unique towns and natural environments will attract talent and creatives.

[6] The 2016 Infrastructure Australia Priority Infrastructure List includes this project as an initiative.

- At a national level, distributing population-driven services to major regional towns that can act as substitute residential locations to metropolitan areas. This type of service distribution could provide critical mass for regional infrastructure (transit systems, airports).
- Melbourne and Sydney can divert significant population numbers to regional towns and cities instead of seeking to achieve populations of nine million by 2060. Planning for major regional cities would require medium-term service populations of 200,000 to 300,000 with ultimate minimum populations of 400,000 to 600,000 persons to provide a full range of services (population driven and basic tradeable). This is consistent with the experience of both the Gold Coast and to a lesser extent Canberra, with international airports, light rail, universities and tourism offers.

Capital Cities

- Spatial planning for capital cities would distribute population-driven services to the middle ring and urban fringes and create the basis for major private sector development opportunities. This could include edge cities, aero towns, port cities, freight cities and retail malls as well as brownfield economic clusters. The rationale is to distribute employment and economic opportunity rather than to concentrate the opportunities in relatively elite CBD and inner-city areas. This type of 'outside-in' planning would challenge metropolitan plans in Australia.
- New urban mobility ecosystems including active transport, personal on demand transport, automated and driverless vehicles would be planned immediately and working experiments conducted to support the earliest introduction.
- In 2015 the National League of Cities in the USA produced a City of the Future: Technology and Mobility. The transportation plans for 68 major cities were reviewed. Only 3% of the plans considered the impacts of transportation network companies (such as Uber and Lyft Bridge) despite the fact that they were operational in 60% of the markets. Only 6% of the plans considered the potential impact of driverless cars and automated vehicles despite the fact that this technology has millennial spatial impacts.
- Where possible, 'second' CBDs should be planned to distribute service jobs and create lower-cost 'outboard' living opportunities as part of a genuine move to polycentric cities. This, as is the case of Sydney and Parramatta, creates reverse commuting plus options to live in less expensive areas on the urban fringe such as Penrith.
- Economic clusters, such as the global cluster in Sydney and the national employment clusters in Melbourne, should be proposed as highly deregulated mixed-use areas with lower-price commercial and residential rental and occupancy costs. These locations would replace Australia's inner-city areas (which have been gentrified) as incubators for business, innovation and the creative arts.

- Every effort should be made to create a wide range of business and mixed use zones to maximise the distribution of people-driven services and to create opportunities for small businesses to leverage off the activity levels created.
- Primary and secondary arterial roads would become business incubators as well as people movers.

Services Sector

- Key services sector 'winners' can be identified (e.g. tourism, education, health, scientific, professional and business services) and spatial plans can be created to maximise Australia's global competitiveness. This would include reimagining CBDs and inner areas (for example, creating the Yarra River in Melbourne as an activated tourist experience on and off water) and providing incentives to build hotels and attractions. For major regional towns, this means major public investment in CBDs and areas of natural beauty, plus adding convention and exhibition centres at a minimum. The opportunity to develop casino tourism (integrated resorts) should be available to all major regional towns.
- Australia can leverage its service sector expertise to create economic clusters based on specific industries such as tourism, financial and health services hubs.
- The spatial opportunities created by the Internet of Things should be analysed and working experiments including encouraging use of robotics should be funded and promoted in conjunction with the private sector.

10.6 A Spatial Framework for Global Australia

The period from 2015 to 2030 could determine the property paradigm for Australia to 2100 as Australia geographically breaks into two parts driven by market forces – the Gateway Cities Network (Sydney, Melbourne, Brisbane and potentially Adelaide) and Regional Australia.

The Gateway Cities Network population is likely to grow from 10 million to 14 million between 2015 and 2031 and to 25-30 million by 2060.[7] The network will include capital city 'influenced' regional cities such as Geelong, Bendigo, Ballarat, Newcastle, Wollongong, Gold Coast, Sunshine Coast and so on. The Regional Australia population is likely to decline in all areas except key export regions (Darwin, Gladstone and Darling Downs), Perth, and a handful of key service centres with ports and airports.

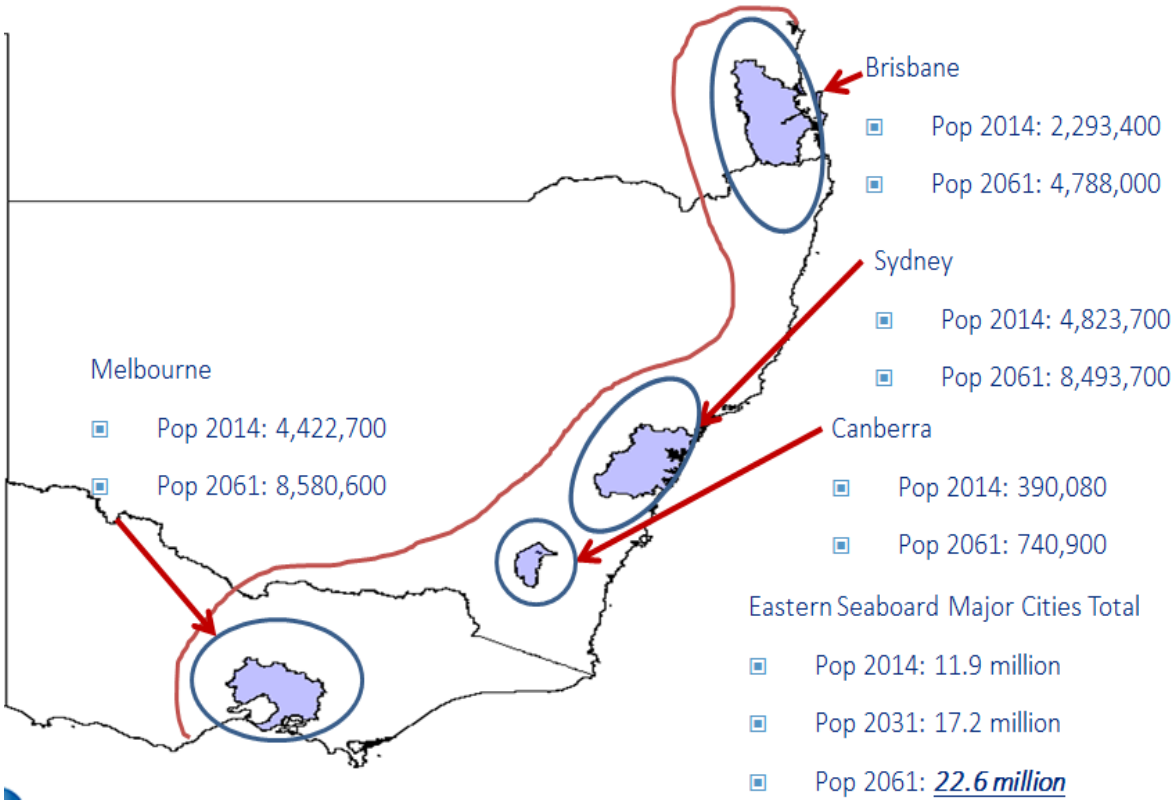
This book argues that two overarching sub national urban and regional policy frameworks can significantly add to social, environmental and economic outcomes for all Australians. These two policy frameworks are outside the remit of any single state.

[7] On the assumption Adelaide does not link up until after 2031.

Framework 1

First, a capital cities spatial strategic framework policy and guiding organisation is required to create a globally competitive services sector for Australia. Two former federal agencies, Infrastructure Australia and the Major Cities Unit, tried to develop frameworks to help drive urban and regional policy and infrastructure delivery. In theory, this was to be driven by the Council of Australian Governments (COAG), but a combination of state politics and lack of popular support resulted in the demise of the Major Cities Unit and corporatisation of Infrastructure Australia. This is not surprising - the institutional framework driving infrastructure in Australia has remained with federal and state treasuries in the post-war period, despite many attempts to remove it.

Figure 10.3: Gateway Cities



Source: ABS, MacroPlan
Note: Excludes Adelaide and regional cities.

Fifty years ago the Vernon Committee of Inquiry into the Australian Economy (1965) recommended the establishment of a Special Projects Commission (read Infrastructure Australia with teeth) and an Advisory Council on Economic Growth. This was scuttled on the advice of Treasury.

Fifty years on we have the same problem. Politicians and bureaucrats do not have the interests of Australia at heart as our infrastructure drifts aimlessly, but our need for hard and soft infrastructure increases exponentially. The Vernon Committee also argued for 100,000 annual migrants. This was also rejected by the then Prime Minister Sir Robert Menzies. No Labor or

Liberal regime has been able to break hopelessly out of touch Treasury dogma or to create an institutional framework driving public and private investment into infrastructure.

For Australia in the next 15 years employment growth will depend on our services sectors (tourism, education, health, business services, etc.). These sectors rely on high-quality globally competitive infrastructure. The federal and state governments need a fast attitude change or the global services value chain boom phase of economic history we are in will pass Australia by.

Framework 2

A Regional Australia policy framework that recognises readiness for resources booms is essential. It should facilitate resource and agricultural exports, set out investment and innovation opportunities, basic infrastructure requirements, the role of federal, state and local government, known barriers to growth and future value-adding opportunities (e.g. agricultural research and technological development).

This spatial framework would address agriculture, resource development and tourism as key exports and generate a transparent community understanding of opportunities rather than adversarial/rent-seeking behaviour in localised areas.[8] The need for nationally driven, state-agreed, high-level regional strategies is widely understood. Policy attempts have been mostly meagre, with 'pork bellying' on a project-by-project basis remaining the modus operandi.

The overarching interconnectedness of Australia's water resources (e.g., Ord River in WA/NT, Murray Darling Basin in four states) has continually thwarted long-term regional planning. Unfortunately, without another resources boom (terms of trade episode) in the next 10 years regional Australia will struggle to create jobs.

The services sector is the engine for future metropolitan global economic growth and social development. This is also the case for regional Australia. The services sector requires strong urban and regional policies supported by infrastructure to create:

- Liveability, which attracts global talent.
- Affordability, which retains local talent.
- Internationally competitive rents and property prices, which enable new businesses to establish.

[8] As of 2015, indigenous land use is still driven by native title, one-off reports (e.g. Developing Australia's North), small-scale policy making (Regional Australian Institute), environmental adversarialism and one-off Aboriginal land rights successes (e.g. The Yawuru in Broome). Electorally driven regional grants programs have caused chaotic outcomes instead of creating a policy framework guiding regional Australia to facilitate both long-term export potential and to reimagine Aboriginal social and economic development. Indigenous development opportunities require substantially better community understanding and community support if change is to occur. The likely widespread rural and remote area European depopulation over the next 15 years could generate the potential for funding Aboriginal corporations and local government to invent new approaches to indigenous economic and social development.

- Opportunities for small and micro businesses, which encourage growth.
- Cultural and creative engagement, which strengthens educational and tourism outcomes.
- Cradle-to-grave communities, which create a social contract
- Innovation, which drives competitiveness.
- Investability, which is a key part of the greater long-term Asian growth story.

Cities Strategic Framework Options

Analysis in this book suggests debating three potential spatial framework scenarios, all of which highlight the need for strategic planning and infrastructure planning guidance. The first is a 'Big Cities' or trend scenario that essentially supports the growth of Melbourne and Sydney to become the same size as Chicago. The second scenario, Major Regional Cities, suggests significant growth outside the capital cities. The third scenario imagines a Gateway City Network seeking to deliver a new social, environmental and economic outcome for a global city/region.

1. Big Cities/Trend Scenario

This trend scenario will result in Sydney and Melbourne growing to the size of present-day Chicago (nine million people) and Brisbane at four million by 2060. The trend scenario would need to address:

- Significant housing and land price increases/lack of affordability.
- CBD and new secondary CBD capacities i.e. major expansion.
- Congestion costs.
- Infrastructure costs.
- Competitive services sector delivery.
- Liveability and amenity effects of doubling capital city populations.
- Cultural/place making effects of changing the 'look and feel' of cities.

2. Major Regional City Satellite Scenario

This scenario could actively divert population, economic growth and infrastructure development from capital cities to a limited number of regional cities to achieve a critical mass of at 400,000 to 600,000 persons per city. Candidates could at a minimum include Hobart, Wollongong, Newcastle, Geelong, Ballarat, Albury/Wodonga, Gold Coast (up to 1 million persons), Sunshine Coast, Toowoomba, Bunbury, Darwin and Cairns.

The major regional cities scenario needs to address:

- Real population-carrying capacity for each of the identified regional cities.

- Access to airports/ports or feasible provision of this infrastructure.
- Liveability, amenity and competitiveness in the current built form and environment.
- Existing quality of services (health, education) and services infrastructure.
- Internal public transport quality and availability or potentiality.
- High-speed capital city linkages, feasibility or existence.
- Upfront capital investment requirement to create infrastructure capacity and amenity.

This strategy would require strong redirection of population growth based services (tradeable and non-tradeable) and credible infrastructure plans (e.g. public transport) that are actually delivered. It relies on the distributed services sector being an investment option for the private sector and that the diversion of tradeable services at the scale required for international competitiveness can be achieved.

3. Gateway Cities Network

This scenario uses the population critical mass potential of 25-30 million people that could be generated by linking Brisbane, Sydney and Melbourne (and potentially Adelaide). It integrates future growth and development potential in intervening regional areas to create a new social, environmental and economic outcome that could transform the concept of urban living nationally and globally. This model seeks to leverage capital city competitive economic advantage into regional Australia, beginning with the key gateway capital cities.

This concept could leverage the unique environments from alpine to subtropical, coastal to mountain, to create a series of networked and connected lifestyle and business opportunities. It would be a distributed network of environments with sufficient capital city/CBD critical mass to generate a foundation for globally connected tradeable services.

Conceptually, Australia would shift global thinking from the garden city model of 'liveable cities' to 'creative networks' and 'cohesive communities'. The key objective is to attract the world's best talent to live in the safest and best environments in the world, not just focus on the single aim of high residential density.

This concept would require the NBN and a high-speed rail network to connect the expected population of around 30 million by 2060. (The three most populous states in the US on 2014 figures are California at 38.8 million, Texas 27 million and New York State 20.7 million.) The primary foundation of the concept is access to many environments using the world's best fast rail and bus network.
This scenario needs to address:

- Cost and funding for high-speed rail.
- A new approach to urban planning and place making.
- A new approach to innovation and economic clusters.
- High speed broadband connectivity.

- Bipartisan support for a long-term fast rail network plan.[9]
- New integration and understanding of the potential of quality environmental, social and economic outcomes.
- A whole-of-network approach to planning and integrating rail, road, air travel, freight and logistics.
- Cost of building infrastructure capacity in regional and smaller communities and linking communities.
- The need for goodwill between states and territories to create a governance model to deliver the concept.
- Replanning capital cities to divert growth from the 'outer suburbs' garden city model to the innovation and networked 'places' cluster model.
- Conceptualising a wide range of places, environments and designs to create a new lifestyle tapestry.

EPILOGUE: Creative Destruction: A New Approach to City Building

Australian cities are built to last forever. They do not. As societies, economies, cultures and technologies evolve, cities should evolve. They do not. A key ethos for city building is retention of the past through a myriad of heritage regulations. Understanding or building for the future in Australia is given very little thought. For example despite the inevitability of the use of driverless cars (automated driving) in Australia little action has been taken. In comparison, four American states have enacted legislation, and it is under consideration in a further 10 states. Additionally, the UK the Department of Transport produced "The Pathway to Driverless Cars Summary Report and Action Plan" (2015) - A key aspect of which is that driverless cars can be tested on public roads in the UK in 2015. As a result of this, the UK is uniquely positioned to become a premium global location for the development of these technologies.

Urban renewal is regarded as the primary modus operandi to help cities evolve to match the functional requirements of communities and economies. This approach has been unsuccessful in Australia and with major unintended impacts. For example inner city gentrification of housing has created social and economic dislocation of mammoth proportions. Not only have dwelling prices risen but the public sector has spent billions of

9 Since the 1980s there have been seven attempts to initiate a fast rail project linking Brisbane, Sydney and Melbourne. (The benefit/cost rationales and project viability are argued to be insufficient.) Hundreds of reports and articles have been written albeit asking and answering the wrong question – namely, 'how can the project be economically viable given current settlement patterns?' We should instead try to identify a desired future settlement and how to grow it. The Infrastructure Australia 2016 report has identified the project as an initiative.

dollars on urban renewal with (some) architectural and (some) economic outcomes but with limited social outcomes.

The example of driverless cars which will reshape urban mobility and investment in public transport demonstrates the limitations of 'urban renewal' which is based on land use, design and project by project investment. Destructive Cities has highlighted that Australia produces expensive, high cost cities which rate well on traditional liveability indices. These cities have become destructive because the 'garden cities' town planning model with significant development regulations generates ever increasing land prices, traffic congestion and social dislocation.

Most importantly the key lever driving change in the 'garden city' plans, undercapitalised urban renewal agencies are now inadequate and arguably in Australia have always been inadequate.

The lack of social housing, elitist dwelling types, lack of relevant local jobs, lack of innovation, little contribution to social or economic outcomes are among the important unresolved urban renewal and urban fringe development issues.

Moving forward from 2016 the concept of 'creative destruction' could usefully be applied to Australia's urban planning frameworks. This would address the 'Disruptive Technologies' impacts likely to be apparent until 2025-2030. This book has argued that applying this thinking to key parts of the services sector would highlight the need for:

- Significant deregulation of planning and development
- New models for fringe urban development which require social, cultural and economic rich development funded by affordable housing and commercial development.
- Significant re-regulation and deregulation of retail planning and zoning to allow Australia's bricks and mortar retailers compete with on-line retailing.
- Significant increases in mixed use zoning to characteristically improve the options for localised 'live, work and play'.
- Significant rezoning of older industrial which are no longer relevant to the Australian economy.
- Major investment in public infrastructure to meet 2030 capacity requirements. Not 2050 capacity requirements because of the likely step change in Transformative Technologies (driverless cars/robotics/smart machines) by this time.
- Visionary planning which not only must focus on major underinvestment in infrastructure in Australian cities but which visualises Australia as the greatest place on earth to live in 2050.

Visualizing and responding to the impacts of transformative technologies post 2025/2030 will require radical new approaches to city planning, city building, urban governance and infrastructure investment. Such is the scale of the challenge and the size of the 'prize' that serious consideration should be given to a public/private joint venture to begin to visualise

urban futures and to reverse engineer institutional frameworks and market structures necessary to deliver 21str century cites.

Driverless cars provide an insightful case study. Where and how would it be implemented? Who will 'own' the controlling digital urban traffic management system? Who will pay for it? Will congestion taxes be integrated? Will the traffic data be available? Who can access the data? Can the data be isolated to a single vehicle? Will required road upgrades/electronic devices be user pays or taxes? What does this mean for the value of road space? Can we fund a public/private venture in 2016 to initiate thinking?

As this book has argued job creation and job mobility should drive future urban planning frameworks. For example thinking through the implications of smart machines and robotics on job numbers and job types is just beginning. Thinking about these implications on city planning and shape are not in view.

Funding and planning for major road, rail, air and port investment in Australia has been a political football since 1965 as this book has found. The fundamental control of the Australian Treasury and the politics of Australia imply that this case will persist. The COAG Model for city building clearly does not work. It seems that the best short term option is to drive change through powerful new non-government organisations (NGO's) such as the independent Greater Sydney Commission (to oversee implementation of a plan for growing Sydney) or the Metropolitan Planning Authority (which is overseeing the implementation of Plan Melbourne) and which is about to become the Victorian Planning Authority whilst 'reverse engineering' institutional frameworks and market structures to deliver 21sr century cities.

APPENDIX 5: REGIONAL DEVELOPMENT

6248.0.55.002 - EMPLOYMENT AND EARNINGS, PUBLIC SECTOR, AUSTRALIA, 2016-17

KEY FIGURES

	Employees June 2017	Cash wages and salaries 2016-17
	'000	$m
Commonwealth Government	239.8	21 073.4
State Government	1 527.6	119 000.6
Local Government	189.5	12 486.3
Total Public Sector	1 956.8	152 560.3

KEY POINTS

In June 2017 there were 1,956,800 public sector employees. There were 239,800 employees in Commonwealth government, 1,527,600 in state government and 189,500 in local government.

In 2016-17, the total cash wages and salaries for the public sector was $152,560.3 million.

COVERAGE

This collection covers public sector organisations, including Commonwealth and state/territory government organisations, local government authorities, public corporations, universities, non-profit institutions controlled by the government, government marketing boards, legislative courts, municipal authorities and other statutory authorities. Organisations are classified to Level of Government by determining the institutional unit (i.e. Commonwealth, state or local government) deemed to exercise control. The estimates in this release may differ from other available information due to differences in coverage and/or the classification of organisations. For further details, refer to paragraphs 30-35 of the Explanatory Notes.

REVISIONS

Previously published estimates for 2015-16 have been revised as a result of new information received from organisations. The extent of revisions may differ between data items,

states/territories, level of government and industries. These revisions are reflected in Tables 1, 2 and 3, and the associated time series spreadsheet.

INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070. The ABS Privacy Policy outlines how the ABS will handle any personal information that you provide to us.

Source - http://www.abs.gov.au/ausstats/abs@.nsf/mf/6248.0.55.002

6248.0.55.002 - EMPLOYMENT AND EARNINGS, PUBLIC SECTOR, AUSTRALIA, 2016-17

1. PUBLIC SECTOR EMPLOYEES, LEVEL OF GOVERNMENT - STATES AND TERRITORIES

	June 2016(a)				June 2017			
	Commonwealth	State	Local	Total	Commonwealth	State	Local	Total
	'000	'000	'000	'000	'000	'000	'000	'000
New South Wales	56.1	463.0	54.3	573.4	53.4	469.1	55.9	578.3
Victoria	47.2	351.9	51.6	450.7	46.3	358.3	50.9	455.5
Queensland	28.6	310.3	40.9	379.8	28.6	322.3	41.8	392.7
South Australia	15.3	116.3	10.9	142.5	14.8	115.8	11.3	141.9
Western Australia	12.9	167.5	21.9	202.3	12.3	171.9	22.7	207.0
Tasmania	5.2	np	np	47.1	5.2	np	np	48.2
Northern Territory	4.3	26.6	2.9	33.8	4.1	27.1	3.0	34.3
Australian Capital Territory	73.6	np	np	98.6	75.0	np	np	99.0
Australia	243.2	1 498.5	186.5	1 928.1	239.8	1 527.6	189.5	1 956.8

np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Data have been revised

2. PUBLIC SECTOR CASH WAGES AND SALARIES, Level of government - States and territories

	2015-16(a)				2016-17			
	Commonwealth	State	Local	Total	Commonwealth	State	Local	Total
	$m	$m	$m	$m	$m	$m	$m	$m
New South Wales	4 613.0	34 730.8	3 558.1	42 901.9	4 582.8	35 913.9	3 739.6	44 236.3
Victoria	3 864.9	25 306.7	3 021.7	32 193.3	3 948.9	26 569.6	3 104.0	33 622.5
Queensland	2 282.2	24 135.8	2 999.9	29 417.8	2 284.0	25 526.5	3 078.9	30 889.3
South Australia	1 287.9	8 736.2	735.1	10 759.1	1 284.5	9 014.0	784.5	11 082.9
Western Australia	969.1	14 369.2	1 311.6	16 649.9	948.4	14 404.3	1 376.3	16 729.0
Tasmania	399.2	np	np	3 537.5	406.4	np	np	3 618.8
Northern Territory	321.1	2 436.8	154.4	2 912.3	319.4	2 515.0	161.6	2 996.0
Australian Capital Territory	7 241.3	np	np	9 383.1	7 299.1	np	np	9 385.5
Australia	20 978.7	114 760.2	12 016.2	147 755.0	21 073.4	119 000.6	12 486.3	152 560.3

np not available for publication but included in totals where applicable, unless otherwise indicated
(a) Data have been revised

3. PUBLIC SECTOR EMLOYEES AND CASH WAGES AND SALARIES, Industry

	Employees		Cash wages and salaries	
	June 2016(a)	June 2017	2015-16(a)	2016-17
	'000	'000	$m	$m
Electricity, gas, water and waste services	54.5	48.7	6 040.2	5 539.0
Construction	6.3	8.7	571.1	836.5
Transport, postal and warehousing	83.5	80.4	7 195.5	7 021.2
Information media and telecommunications	15.8	16.8	1 456.2	1 655.4
Financial and insurance services	11.1	13.0	1 177.6	1 428.4
Rental, hiring and real estate services	5.2	5.1	425.5	417.9
Professional, scientific and technical services	30.8	26.6	2 599.3	2 511.6
Public administration and safety	607.0	616.1	49 361.0	50 539.3
Education and training	603.8	616.9	40 102.3	41 391.0
Health care and social assistance	479.0	492.9	36 835.1	39 112.5
Arts and recreation services	16.5	16.5	940.8	973.0
Other industries(b)	14.6	15.1	1 050.3	1 134.5
All industries	1 928.1	1 956.8	147 755.0	152 560.3

(a) Data have been revised
(b) Includes Agriculture, forestry and fishing, Mining, Manufacturing, Wholesale trade, Retail trade, Accommodation and food services, Administrative and support services and Other services.

Source -http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/6248.0.55.002Main%20Features22016-17?opendocument&tabname=Summary&prodno=6248.0.55.002&issue=2016-17&num=&view

GEOGRAPHIC DISTRIBUTION OF THE APS

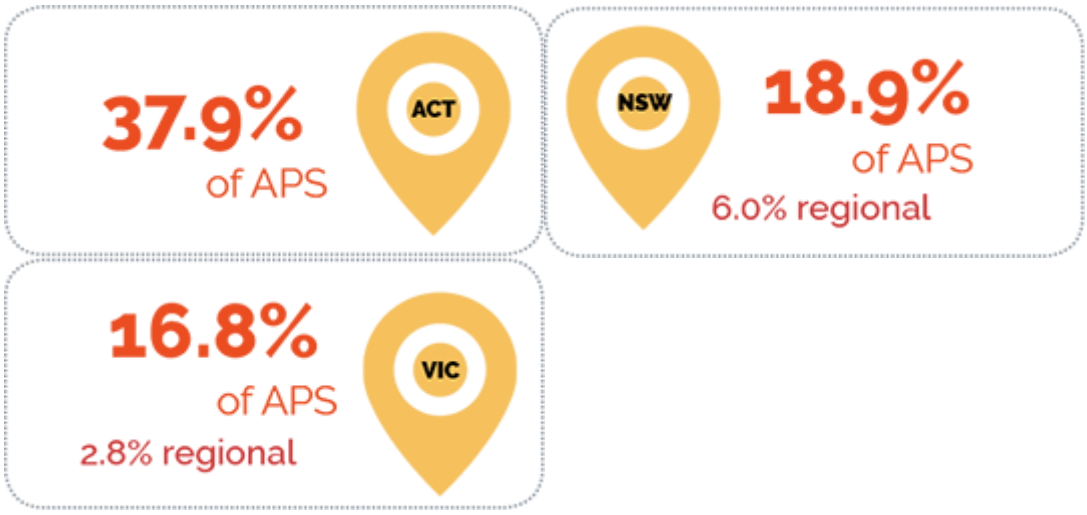
LAST UPDATED: 26 SEP 2017

THIS PAGE IS: CURRENT

HomeAt a glanceIntroductionSizeShapeDiversityGenderMobility and tenureGeographyAppendixes

37.9% of the APS are based in the ACT and comprise over a quarter of the ACT labour force1. The next highest populations are in NSW which has 18.9% of the APS, of which 6% are in regional areas, and Victoria which has 16.8%, of which 2.8% are in regional areas.

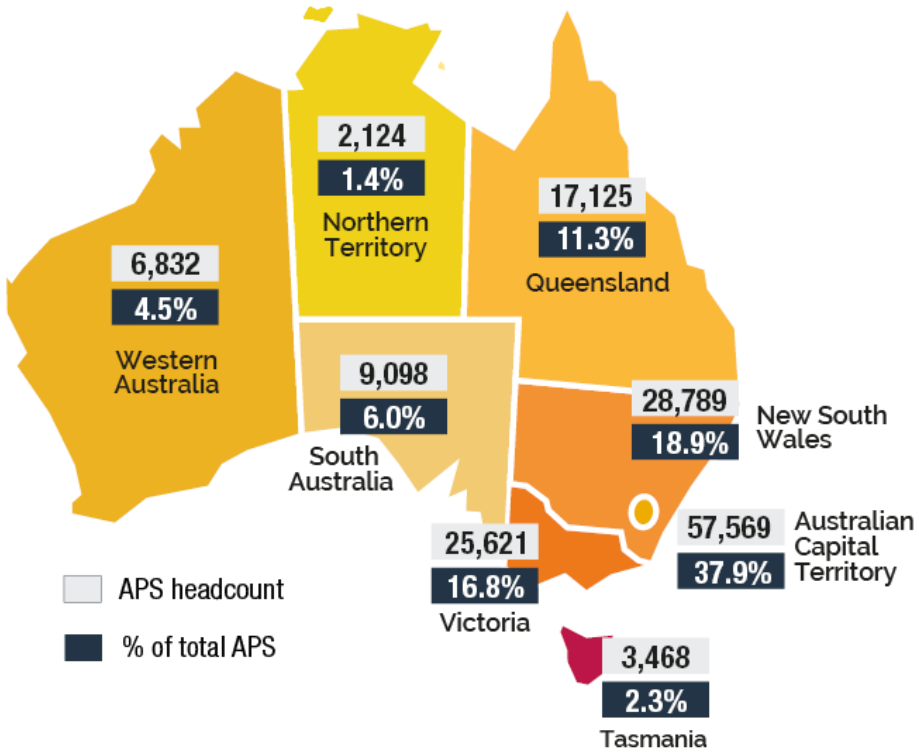
- ACT, NSW and Victoria have the highest proportion of APS employees and their combined populations account for almost three quarters of total APS numbers.
- In the ACT, APS employees represent 27% of the labour force. In NSW, QLD and Victoria, the proportion of APS employees is less than 1% of the labour force with the lowest representation in WA at 0.5%.
- Regional distribution varies between States with NSW having the highest number of employees based in regional areas at 6%.



Distribution of APS employees by state

At 30 June 2017, 37.9% of APS employees worked in the ACT (Figure 7.1). The proportion of employees working in the ACT has remained relatively consistent over the previous decade ranging from a high of 39.7% in 2012 to a low of 36.5% in 2008. There were also significant propotions of APS employees in NSW (18.9%) and Victoria (16.8%). In total these three jurisdictions employed almost three quarters (73.6%) of the APS.

Figure 7.1: Geographic distribution of APS employees by State as at 30 June 2017

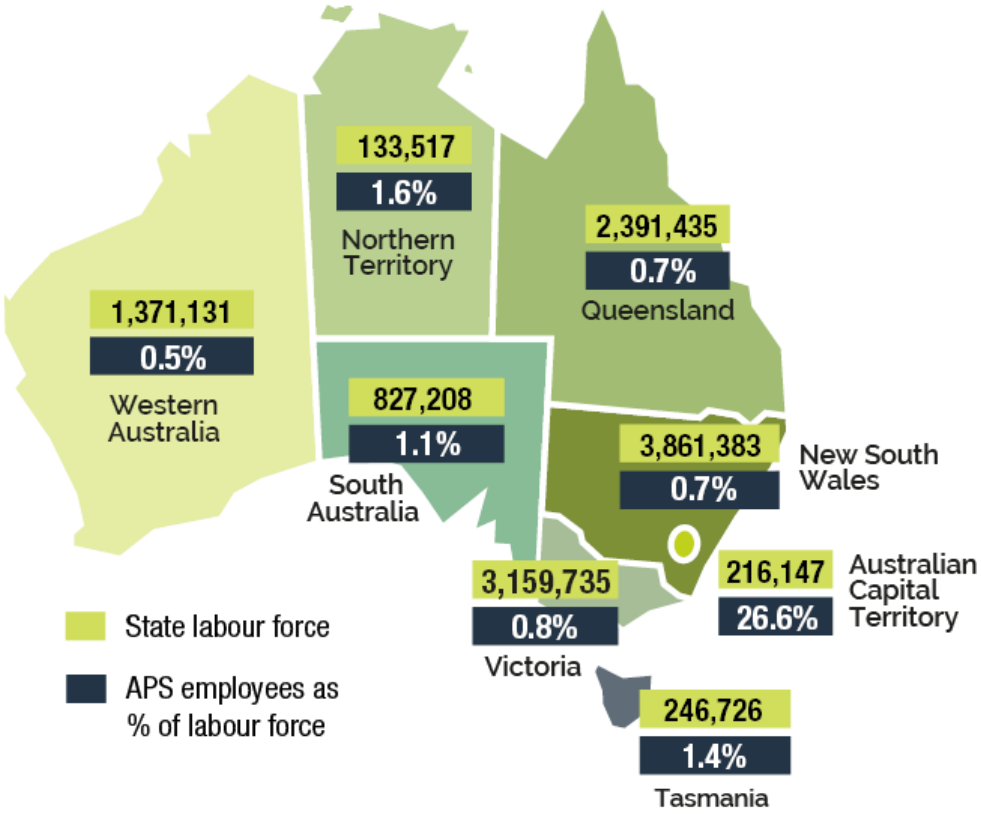


Source: APS Statistical Bulletin 2016-17 – data tables, Table 7a

APS employment as a proportion of the State labour force

In June 2017, APS employees comprised 26.6% of the ACT labour force which indicates a high dependence on public service employment in this jurisdiction. NSW had 18.9% of the APS population overall but this only represented 0.7% of their labour force. Similarly Western Australia had 4.5% of the APS which comprised just 0.5% of their labour force. Note that the APS headcounts exclude state public sector employees.

Figure 7.2: APS headcount as a % of State labour force as at 30 June 2017

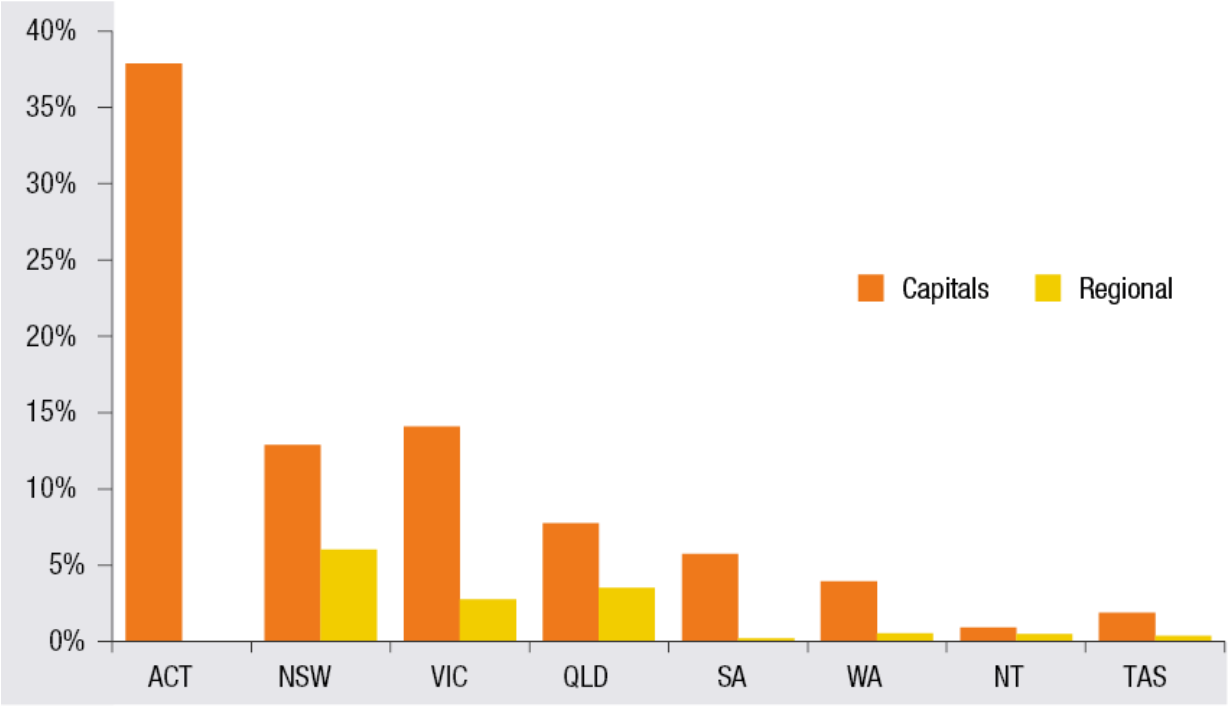


Source: APS Statistical Bulletin 2016-17 – data tables, Table 7a and Australian Bureau of Statistics. 6291.0.55.001 Labour Force, Australia, Detailed. June 2017

Regional distribution of the APS by State

The highest proportion of APS employed in regional areas was in NSW (6%) and the lowest in SA where only 0.2% of APS employees were in regional areas.

Figure 7.3: Regional distribution of the APS by State as at 30 June 2017



Source: APS Statistical Bulletin 2016-17 – data tables, Table 7b.

Asset ID: #99192

Source: http://www.apsc.gov.au/about-the-apsc/parliamentary/aps-statistical-bulletin/statisticalbulletin16-17/geography

APPENDIX 6: MAPCLOUD

‘Big Data’ Means Big Opportunities

There’s a new era in visualising property & demographic information ahead. MacroPlan have turned to the skies in the form of an online cloud mapping solution called ***MapCloud***.

For those who aren’t particularly tech savvy like me, this soon to be released interface simply offers our clients a suite of visual data tools that give client’s unprecedented access to up-to-date information anywhere, anytime.

Subscription to Mapcloud services will enable users to see data mapped on their own handheld devices and PCs without having to engage or wait.

Initially, Mapcloud is composed of two components: **Landshark** and **Mapped**, each offering their own specialised data and customisation options. We are also pleased to now offer bespoke interfaces for those with specific requirements.

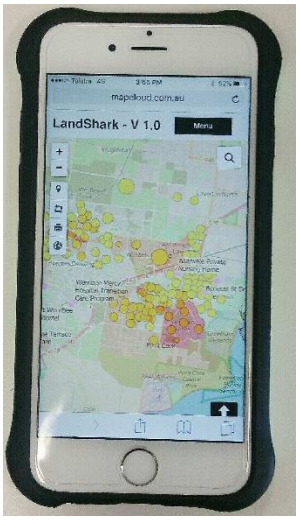
Why Cloud? Traditionally data processing is left to the guy in the back office, who plugs away at multiple excel spreadsheets. However in this data rich age there is too much opportunity to leave the analytics locked away in the back office- instead at MacroPlan we are making it a ‘mainstream’ business tool.

Our mapping tools are about bringing too life the data traditionally housed in reports, spreadsheets and presentations- turning it into an easily understood visual representation accessible anywhere.

In the information data age we are increasingly seeing on tap demand for “real time” data information. Whether you are a property developer, aged care provider, retailer or institution, having access to integrated data allows for easy visualisation of key factors such as demographics, planning overlays, structure plans and competitors. The online ‘cloud’ based platform allows clients to access locational intelligence essentially on demand.

Client benefits:

- Accessibility
- Immediate Value
- Enriched customer experience- visual
- Locational intelligence- better decision making
- Productivity- cost effective locational insights
- First to market opportunities
- The customisation of property and demographic data



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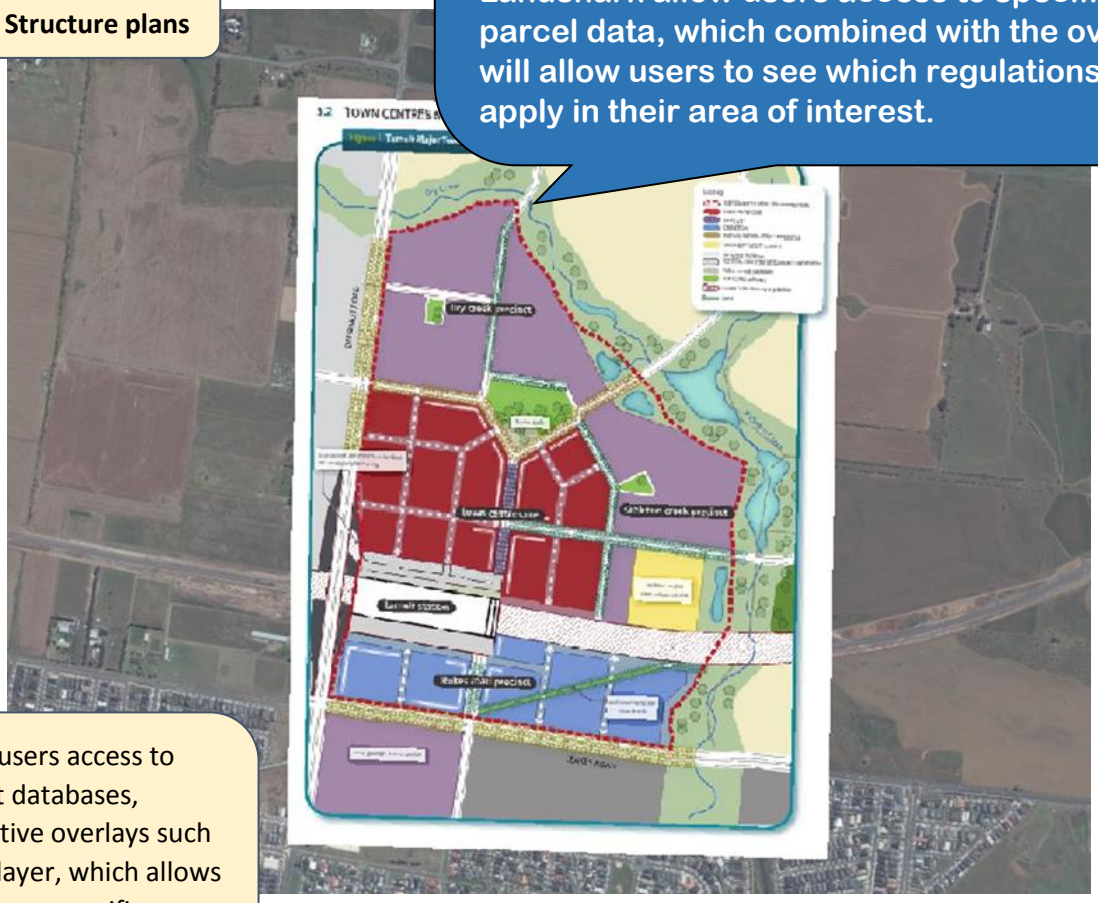
LandShark

Your next development opportunity

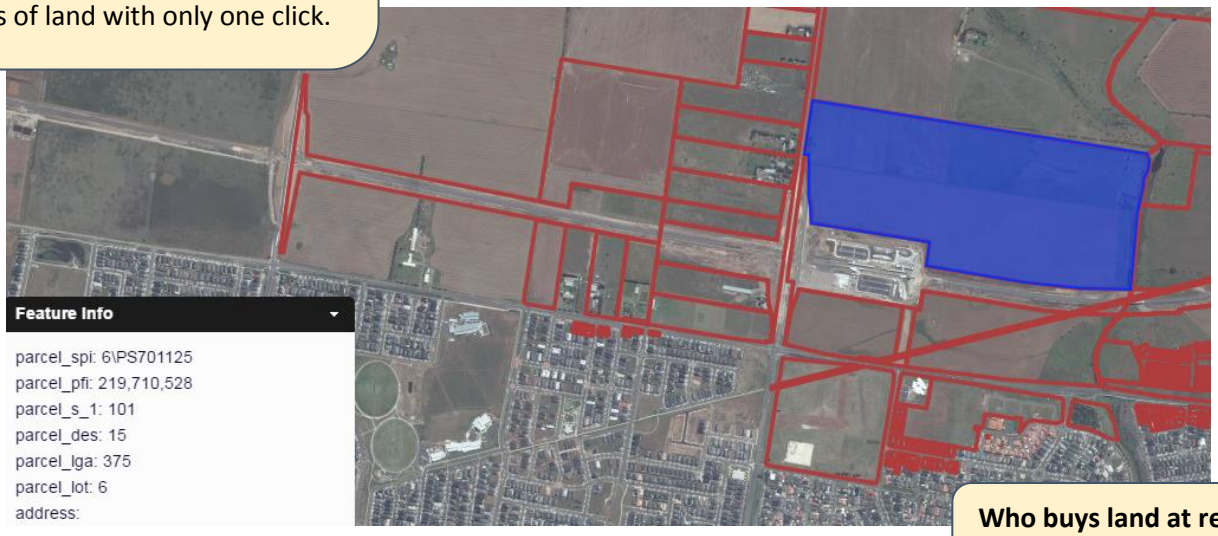
The Landshark tool is a service that offers access to up to date satellite imagery with detailed overlays such as zoning and Precinct Structure Plan (PSP) maps available in real time.

The cadastral layer that comes bundled with Landshark allow users access to specific parcel data, which combined with the overlays will allow users to see which regulations may apply in their area of interest.

Planning overlays e.g. Structure plans



Landshark gives users access to MacroPlan's vast databases, including interactive overlays such as the cadastral layer, which allows users to find data on specific parcels of land with only one click.



Who buys land at retail price anymore?

MacroPlanDimasi

mapped

Mapped generates heat-map visualisation, which allows users to see metrics relevant to their interests plotted on the map in an accessible format e.g. aged-care centres, supermarkets, fuel stations etc.

Client Sectors:

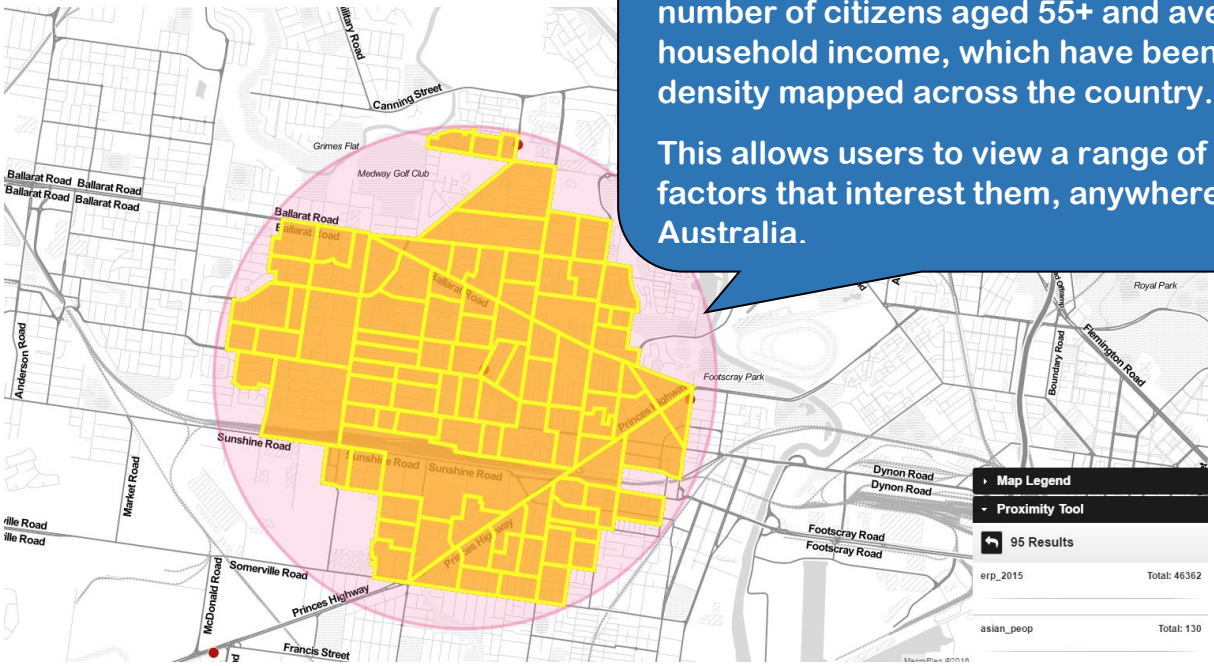
- Mining
- Industrial/ Manufacturing
- Utilities
- Construction and Development
- Wholesale and Retail Trade
- Accommodation and Tourism
- Transport and Storage
- Communication and Finance
- Government
- Education
- Health and Community Services
- Real Estate

Mapped combines the visual simplicity of a heat map with MacroPlan's vast database to provide purpose built maps, accessible anywhere.

Querying capabilities:

Mapped is a collection of key demographic data overlays, such as number of citizens aged 55+ and average household income, which have been density mapped across the country.

This allows users to view a range of key factors that interest them, anywhere in Australia.



Find out more

At MacroPlan we couldn't hold our excitement, with Joel eager to inform our clients of these new cloud based products.

Each is currently in the development phase and will be launching soon. If you would like to know more about this exciting venture, please contact us to arrange a presentation.

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