URBAN SYSTEMS TRANSFORMATION

PERTH

futureearth AUSTRALIA

Australian Academy of Science

THE URBAN CHALLENGE

Future Earth Australia, hosted by the Australian Academy of Science, is leading a process to co-design a national strategy for Australian sustainable cities.

Australia is already one of the most urbanised countries in the world, with 89% of the population living in urban areas (UNDESA, 2014) and 67% living in the capital cities. Australia's estimated resident population of 24.6 million people (June 2017) is projected to increase to between 37.4 and 49.2 million people by 2066 (ABS, 2018a). All capital cities are projected to grow at a greater pace than the rest of their respective state or territory (ABS, 2018a). Some are seeking to constrain growth; others, including many regional centres, are looking for extra or renewed growth.

Our urban environments are an interrelated system comprising social, economic, ecological and technical spheres. Urban systems transformation is needed to ensure that people can move around efficiently, live in safe and healthy homes, receive adequate education and medical care and enjoy lives of social equity in a healthy and biodiverse environment.

The metropolitan plans for most Australian capital cities include consistent sustainability planning and design principles such as containing urban sprawl, reducing car dependency and providing greater housing choices. However, in practice, urban decision-making is subject to numerous complex drivers—social, environmental, economic, institutional, technological—with the potential to create barriers to sustainable development.

The challenge lies in ensuring effective and consistent urban policy and decision-making in the complex urban institutional environment (across spatial scales and decision-making levels, and across sectors), with genuine stakeholder and community engagement that understands the many and varied underlying aspirations and values. In turn, this process needs to be guided by a shared vision of our urban futures, underpinned by approaches to co-produce, share and implement knowledge to inform decision-making. In this context all decision-makers and stakeholders are both providers and users of knowledge.

However, current urban development and decision-making is characterised by a lack of shared vision and excessive fragmentation in institutional arrangements and in relevant knowledge development, translation and use.

RESPONDING TO THE CHALLENGE

Future Earth Australia is working to improve the appreciation of the underlying barriers and enablers to sustainable urban development, and the supporting development, synthesis, translation, accessibility and application of relevant knowledge. Through a nationwide consultative process, it is co-developing a national strategy for the sustainable development of Australia's cities and communities over the coming decades.

Through a series of workshops in the capital cities, Future Earth Australia asked policymakers, practitioners, researchers, businesses and community stakeholders to contribute to the development of local and national strategies. Each workshop included a special focus on the specific city and the surrounding region, as well as implications for a national approach.

THE IMPORTANCE OF A NATIONAL STRATEGY

To be successful, transformational strategies will need to include shared urban visions of feasible and desirable futures, with a focus on:

- key systemic leverage opportunities
- collaborative and aligned urban governance integrated across systems, sectors and scales
- effective stakeholder and community engagement across multiple goals and diverse values
- co-produced knowledge development and use by policy and urban decision-makers.

These elements should all be supported by continuing learning and adaptive management. A national strategy will provide governments, practitioners, business, communities and researchers with recommendations for cost-effective and integrated urban systems transformation.

To help us achieve these goals, workshop participants are asked to consider:

- current issues and future visions for their city and region
- how to improve engagement outcomes with stakeholder and community groups by policy and decision-makers
- actions that if taken locally (at state/territory level) and nationally would increase the sustainable development of the city/region
- how such actions might contribute to a national strategy for urban systems transformation.

A national strategy will also help Australia meet our commitments under the United Nations' Sustainable Development Goals (SDGs). SDG 11 is to 'make cities and human settlements inclusive, safe, resilient and sustainable', but transformation is underpinned by integration of all 17 of the goals.

Perth workshop

On 22 February 2019 Future Earth Australia held the ninth in a series of national workshops for its project 'Urban systems transformation: sustainable cities'. The Perth workshop was hosted by Curtin University and Professor Peter Newman at the Old Perth Boys School. Thirty-one stakeholders from territory government, city councils, local businesses, NGOs and research groups participated. This document summarises discussions grouped under the following workshop themes: urban visioning initiatives and pathways; collaborative governance and decision-making; stakeholder and community engagement; and co-produced knowledge development usage and learning.

SPEAKERS

Professor Peter Newman, Curtin University

Professor Newman began by reminding the audience that sustainable cities have been discussed since the 1980s. At that time the focus was on diminishing resource inputs and waste outputs while increasing liveability. Today, we need to reach beyond this goal and clean up the messes that have been made in the past. However, it is possible to reduce our footprint while also increasing wealth, as has been done in Denmark, which has seen a growth in wealth alongside a reduction in the use of oil and coal.

The solution is disruptive innovation. Recharging aquifers, restoring soils and regenerating biodiversity are important goals, which can be achieved through biophilic buildings and green infrastructure. There are also innovations, such as carbon-negative construction, that will be available in the near future, which could actively absorb carbon dioxide in cities.

Bioregions around Perth contain materials that can be used in batteries. Thus, there is a responsibility to make these materials available in a way that is traceable and ethical to help divest away from fossil fuels. Indeed, Lithium Valley could be the California of the new energy economy.

These ideas are all incorporated into the concept of 'planetary boundaries', or the idea that the Earth system contains environmental boundaries that must be managed. The Planetary Accounting Framework, proposed by Professor Newman and Dr Kate Meyer, is a way to scale down sustainability from planetary to city levels. By setting quotas for carbon, nitrogen, water and land, this system creates accountability for environmental footprints.

Mr David McLennan, Chief Executive Officer, City of Vincent

Mr McLennan noted that, while Perth is entirely connected to the global digital world, there need to be connections to community and personal experience—this is where local government can play a role. Mr McLennan's local community wants an accessible city, connected communities, thriving places, sensitive design and an enhanced environment. However, while it is easy to learn what people want, it is much more difficult to change the decision-making process.

Perth is well above the national average for energy and water consumption, as well as carbon dioxide emissions and waste production. This is due to people living far from their jobs, as workplaces are clustered in the city centre. This means that there need to be options like active transport, as opposed to the current system which solely prioritises free proximate parking.

Historically, people would live separate from their work because workplaces were so polluting. The situation now needs to be reversed in order to address local public health and global sustainability challenges.

Mr Piers Verstegen, Chief Executive Officer, Conservation Council of Western Australia

Mr Verstegen spoke about how Perth fits within a cultural, economic and political context. The ecology and culture of Perth are focused on water, but climate change has reduced stream flow by 80%, making the area extremely vulnerable. While desalination might be a solution for maintaining drinking water levels, it cannot repair ecosystems.

Similarly, the oil and gas industries are woven into the fabric of the city, as Perth is the administrative centre for the expansion of industry. Perth will need to address pollution from gas processing in Western Australia in the near future.

Finally, Australia is considered a global biodiversity hotspot, one of 12 around the world. It is crucial that wildlife is not lost to extinction because of many small decisions that slice away at the ecology of a place. Initiatives like 'Boorna Waanginy: The trees speak', an immersive light and sound show in King's Park that told stories of six seasons from Noongar culture, have been successful at engaging local communities and need to be built into our understanding of the local environment.

VISIONS FOR PERTH

Participants were asked to consider their vision for a sustainable future in Perth and to use their devices to enter applicable words into an online poll to generate a word cloud.

The most popular answers to the question 'What is your vision for a sustainable future in Perth?' were *liveable* (six entries), *connected* and *healthy* (five entries), *green* and *urban forest* (four entries) and *walkable* and *resilient* (three entries) (word cloud 1).

The term *connected* was interpreted in several ways. To some, it referred to the physical connections of communities, such that people live, work and play in the same spaces to facilitate connections, and developers building communities rather than houses. Others thought of virtual connections and how data sharing and the Internet of Things can allow people to work together across physical distances. It was also noted that online connectedness can facilitate community connectedness, such as through Facebook community groups.

Health scored highly, though some people drew a distinction between personal health and community health. Health was also suggested as an alternative for the term 'sustainability', which may be dismissed as a buzzword. Instead, *health* can serve as a connection between the health of green spaces and human physical and mental health.

Word cloud 1: Vision for a sustainable future in Perth

When asked to describe a vision for Perth for the years 2030 to 2050, the words *change* and *revolution* were the most popular, with seven and five entries respectively. This sparked a debate about the utility of these phrases, as some participants thought that this language could have connotations of fear and violence, particularly the term *revolution*. Others argued that scary language is necessary and that young people in particular are emboldened by the concept of revolution. Many participants agreed that passion rather than fear would engender change, and some pointed to hope as being essential to preventing despair and inaction.

It was also suggested that cities like Perth need to consider their problems in the context of larger global themes. For instance, the concept of the 'third industrial revolution' was proposed by American economist Jeremy Rifkin to describe the transition of the world economy to renewable energy. This transition will affect cities globally, including Perth, and thus Perth should consider energy transitions in its city-specific sustainability initiatives.

Word cloud 2: Vision for Perth in 2030/2050

When describing a vision for a sustainable future nationally, *evidence based* was entered five times, *innovative*, *kind* and *global leaders* were entered four times each and *regenerative*, *responsive*, *equitable* and *unified* were entered three times each.

The importance of evidence was emphasised both for communities and leaders. Some participants wanted more and easier access for communities to evidence-based information on issues like water. Others wanted more accountability for public servants, in particular seeking consequences for politicians who promote ideas that are not evidence based.

The term *responsive* had multiple meanings for participants. Some saw it as referring to the upcoming challenges of adapting to climate change. Others thought of changing demographics within the city and being responsive to different generations as their values change.

Kindness was used for describing a sustainable national future. It could refer to the social environment as well as the built environment. It was also connected to the idea of hope, as a positive narrative that will

help younger generations feel empowered rather than disillusioned.

Word cloud 3: Vision for a sustainable future nationally

KNOWLEDGE GAPS

It is necessary to pinpoint where decisions are being made within leadership and policy. This will identify leverage points at which to apply the biggest force in order to create change. Similarly, we need more information about systems and how they are connected. It is also important to ensure that decision-makers represent the people and that there is more participatory democracy.

To change behaviours and encourage sustainability, there needs to be a better understanding of the behaviours, motivations and fears of local communities. This information can help progress innovative sustainability measures without creating a threat. Research is also needed on ways to create hope and overcome apathy. It was suggested that sustainability initiatives could be mainstreamed by using marketing techniques, such as incorporating notions from psychology and sociology. Importantly, trust and social license can only be built and maintained through accurate messaging.

CO-PRODUCED SOLUTIONS

The co-production of knowledge and research is an emerging method for addressing sustainability issues, prevalent in other countries but less so in Australia. More resources and institutional support for making co-production easier would be ideal. There are currently barriers preventing co-production, such as gaps between local government and university spaces. These gaps may be closed by creating networking opportunities, such as events like these workshops, but partnerships will be more stable if these meetings are regular rather than one-off.

COLLABORATIVE GOVERNANCE AND DECISION-MAKING

Collaborative governance relies on links between local, state and, to some degree, federal government. However, useful ideas also come from academics and other institutions, such as schools and non-government organisations. Industry can be a useful financial connection, as early injections of funding from the private sector could launch a campaign, attracting government interest and funding. Finally, early intervention is key to ensuring the involvement of the local community. Participatory planning, rather than surveys, will encourage people to become engaged in developing their communities.

From a legislative perspective, initiatives like City Deals are meant to engage with all levels of government and industry to ensure the best outcomes; ones that have benefited from broad participation from the outset. However, local decisions should be made by local governments, with less decision-making coming from federal government.

Potential barriers to collaborative governance are silos between government, industry and communities, and the risk-averse culture that exists in some agencies. One possible solution to this aversion to risk would be trialling and testing initiatives and implementing them at a minimal scale, rather than immediately rolling out full-scale initiatives.

STAKEHOLDER AND COMMUNITY ENGAGEMENT

When engaging with the community and local stakeholders, a diversity of values and inputs is crucial to understanding the whole picture. Different tools, such as social media, can be used to reach out to and interact with different groups. It is also crucial to work and engage with Indigenous land owners.

A strong design is essential for ensuring successful community engagement. For instance, creating a clear picture of the groups involved in consultation processes and subsequent reporting back to the community will help people feel confident that their contributions will be seriously considered. Similarly, acknowledging the skills of people in the room can place everyone on an equal footing. Investing in a good facilitator can ensure that communication is clear and smooth between all parties. Even choosing the location of consultation events can

be an opportunity for innovation—while a town hall may be an easy meeting point, consider going to locations where stakeholders feel most comfortable, as this could increase participation and openness. Finally, metrics for success should be decided by the stakeholders.

Of course, Perth is a large city with a population of two million, and not every community member will be able to attend stakeholder meetings. Instead, messages decided at meetings can be disseminated across the region, possibly by taking advantage of the 24-hour news cycle. Messaging should be consistent and long term, rather than based on the four-year political cycle, but tailored messages can be targeted at different demographics. Broad concepts like climate change can be scaled down and contextualised to the area. How would a changing climate affect Perth?

EMERGING THEMES AND TAKE-HOME MESSAGES

An issue relevant for local sustainability is migration. This is happening on a global scale, with many causes. For instance, drawn by job opportunities, many people are moving from rural areas to cities, which means that many rural areas become unsustainable. At the same time, more pressure is put onto the cities' resources. Additionally, global warming will cause migrations on a global scale, redistributing people and resources. Ultimately, though, the shifts in population are less important to achieving true sustainability than the proper use of resources.

Dr Michael Mouritz, Curtin University

Dr Mouritz spoke about integrating the SDGs into social and societal settings and noted that the challenge was to scale up solutions. For cities, this means they should aim to be regenerative—giving back more than they take, as Professor Newman also suggested.

In terms of visioning, this workshop has generated wording around health and liveability that are similar to the goals of the Directions 2031 report, indicating that current trajectories are aligned with stakeholder desires. However, there are large gaps between aspirations and implementations that need to be addressed.

The City Deals and other partnerships can be used as a model for collaborative governance. Still, joint government agency work is not easy, so incentives could make them a more attractive option. Finally, to make every step of sustainable development meaningful, prototypes and smaller projects should be created and then scaled up.

PERTH

Perth is the capital of Western Australia, located on the south-west coast of the state on the Swan Coastal Plain, a strip of land between the Indian Ocean and the Darling Scarp. Perth is considered to be one of the most remote capital cities in the world of its size; it is so remote in Australia that it is closer to East Timor (2785 km) and Jakarta (3001 km) than Sydney (3291 km). However, it is in the most populous time-zone, GMT+8, shared with China. It is also Australia's link to Indian Ocean nations.

Figure 1: Aerial photo of Perth CBD

FACTS AND FIGURES

The area of Perth settled by Europeans is the traditional lands of the Nyoongar people, a group made up of 14 different language groups. The languages present in the regions from Geraldton to Albany and Esperance share many features, but are recognised as individual languages (South West Aboriginal Land & Sea Council, 2019). The area is an ancient landscape with extremely high biodiversity.

Greater Perth (the significant urban area measured in the last census) has a population of 1.9 million people (ABS, 2018b). It is Australia's fourth largest city, made up of 29 local governments (Government of Western Australia, 2005).

Most of the population is Australian born (57%), but other major countries of origin include England (8.5%), New Zealand (3%), India (2.4%), South Africa (1.8%) and Malaysia (1.5%) (Government of Western Australia, 2005).

Perth was established in 1829, but its economy did not flourish until the gold rush during the 1890s. It had a series of population booms after World War II resulting from the growth of the mining industry. Since the 1970s, mining of iron ore and other commodities has been the major source of economic prosperity for Perth and Western Australia more broadly. This has been facilitated by exporting to Asian countries, particularly China and Japan. In 2018, 52% of national expenditure in mining was spent in Western Australia (WA Department of Mines, Industry Regulation and Safety, 2019).

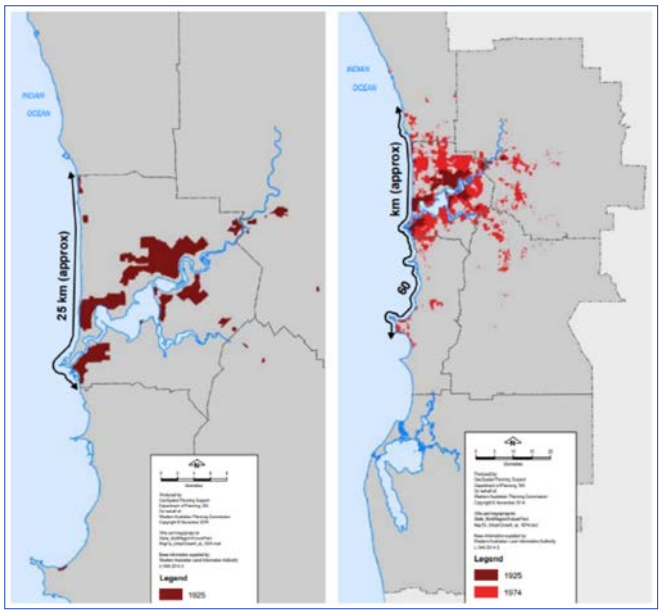

Figure 2: Perth's urban expansion from 1925-2012 (Government of Western Australia, 2018)

REGIONAL CHALLENGES

Economic Transitions

While Perth and Western Australia experienced a mining boom in the early 2000s, declining iron ore prices and the conclusion of construction projects resulted in unemployment hitting a 17-year high in 2019 (ABS, 2019). This decrease of traditional mining has changed the landscape and economy of Perth. However, transitions within the mining industry are possible, such as a move towards lithium mining to supply battery technology for electronic vehicles and energy storage (Western Australia Department of Jobs, Tourism, Science and Innovation, 2019).

Congestion and growth linkages

Perth has dealt with chronic congestion issues due to high dependence on private vehicle use, with one of the highest car use rates in the world (Government of Western Australia, 2018). The cost of this congestion was estimated to be nearly $1 billion in 2009, and estimates indicate that this could increase to $2.1 billion by 2020 (Government of Western Australia, 2018). The City of Perth secured funding to improve public transportation through METRONET, a plan to improve infrastructure through 72 kilometres of new passenger rail and up to 18 new stations (Public Transport Authority of Western Australia, 2019).

Population density

The Perth and Peel regions are expected to reach a population of 3.5 million by 2050, and some 800 000 new homes will be required to accommodate this growth (Government of Western Australia, 2018). Currently, the region is a sprawling city, with a density of 12 residents per hectare, compared to Sydney at 20 residents per hectare (Newman and Kenworthy, 2009). Almost three quarters of new development is occurring on the urban fringes on greenfield land. As a result, plans in the *Perth and Peel @ 3.5 million* report include a target for 47% of new developments to be infill, or occurring within currently existing city limits, to promote connectivity of the region.

Climate change

The 2015 *City of Perth Environment Strategy* listed the following potential issues facing Perth associated with a changing climate:

- greater influence of urban heat on community and assets
- increase in hot days over 35ºC from 28 to 67 days by 2070
- increased disruption from climate-related events, such as heatwaves and flooding
- decrease in mean annual rainfall and water runoff.

MAJOR PLANNING DOCUMENTS

Perth and Peel @ 3.5 million

Released in 2018 by the Western Australian Department of Planning, Lands and Heritage, *Perth and Peel @ 3.5 million* details the systematic objectives, strategy and priorities guiding population growth in the Perth and Peel regions to 2050. It outlines the social, environmental and economic priorities to guide this change for government agencies and local governments in the region. This and other sub-regional planning frameworks are set to be recognised with the *State Planning Policy 1 State Planning Framework*.

Directions 2031

This document looks specifically at how population growth will be spatially managed to balance urban landscape change with ecological priorities. Through the framework and goals it sets out, *Direction 2031* prioritises urban consolidation and encouraging nodes for economic and social activity.

Capital City Planning Framework

The Capital City Planning Framework, published in 2013, constitutes the key planning strategy for central Perth and gives direction on how it should perform as the capital of Western Austalia (Government of Western Australia, 2013). It is underpinned by the objective that central Perth be 'a world-class liveable central city; green, vibrant, compact and accessible with a unique sense of place'.

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