

Sustainable Australian Cities and Communities

Synthesis of workshop and interview inputs



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CONTENTS

INTRODUCTION	1
VISIONING, STRATEGIES, PLANS, AND PERFORMANCE	1
STAKEHOLDER AND COMMUNITY ENGAGEMENT	4
INSTITUTIONS AND GOVERNANCE	5
GOVERNMENT	5
PRIVATE SECTOR	6
COLLABORATION ACROSS AND WITHIN LEVELS	6
URBAN INVESTMENT BUSINESS CASES AND DECISION-MAKING	7
KNOWLEDGE	8
KNOWLEDGE CO-PRODUCTION AND UPTAKE	8
FRAGMENTED KNOWLEDGE RESOURCES	9
KNOWLEDGE CAPABILITIES AND INFRASTRUCTURE	10
REFERENCES	13
APPENDIX	14



INTRODUCTION

This document synthesises inputs received from the process of national consultation conducted by Future Earth Australia (FEA). Information from workshops and interviews provided the major stakeholder inputs for co-development of a National Strategy to enable urban systems transformation towards more sustainable Australian cities and regions (O'Donnell et al. 2019).

The extensive engagement process included all sectors, including federal, state/territory and local governments, urban professionals, the private sector, non-government organisations (NGOs), community representatives, and researchers. It recognised that 'urban' is about smaller regional cities and settlements as well as major cities, and the connections these settlements have locally, nationally, and internationally.

An inclusive approach was adopted in acknowledgement of the need to understand the widest possible variety of urban experience and perspectives. The work aimed to establish the views of a very diverse range of urban stakeholders and communities on their aspirations for Australian urban cities and settlements of the future, on current urban issues being experienced, and on the barriers and potential enablers and strategies to move towards their aspirations.

Nine multi-stakeholder and whole-day workshops were held during 2018 and 2019 in all state and territory capital cities (except Hobart) and in Alice Springs, with individual workshop outcome reports produced and published [on the FEA website](#). Around 400 people participated in workshops representing different sectoral and knowledge perspectives.

In addition, 40 semi-structured interviews were held with key stakeholders at all levels, but with an emphasis on the national, including government departments or agencies, professions' peak bodies, industry and business peak bodies, and NGOs.

There were also a number of one-on-one interviews with individual researchers around a National Symposium held in May 2018, with representatives of all major urban research programs in Australia (see the [National Symposium outcome report](#)).

The outcomes of these engagement processes have been mapped in this synthesis in four dimensions of urban systems transformation that emerged from an earlier co-design and framing exercise (Webb et al. 2018).

VISIONING, STRATEGIES, PLANS, AND PERFORMANCE

A consistent message from participants was the need for more shared urban visioning and goals that would provide common language and collective understanding and buy in at all levels, and that these be longer term to persist beyond political cycles and short-term commercial interests. Word cloud visioning was carried out with the participants at each city workshop, with a focus on longer term (2030 and beyond) issues and aspirations for their city.

Summary findings from this visioning exercise were:

- There were many common themes across all cities, and together these represented well the major urban issues, priorities for the Sustainable Development Goals (SDGs), and the Quadruple Bottom Line compass as summarised in Table 1, (see Table 2 in appendix for further detail). There was also acknowledgement that all were valid aspirations, with the key differences being about the relative weighting, and beliefs as to the feasibility of meeting all of the multiple goals, there being very little evidence available on synergies and tradeoffs. Collaborative visioning was seen as a practical vehicle to gain better understanding and negotiation of urban systems interdependencies, especially if supported by systems-based modelling approaches that help identify and evaluate key synergies and trade-offs.
- There were several components of these themes that varied significantly in emphasis between cities (see examples in the summary at Table 1). This pointed to the need for visioning and goal/target-setting to be place-based even though there are also common higher-level themes.
- There were a number of 'vision words' that subsequent discussion revealed had multiple interpretations among the participants, demonstrating the importance of unpacking what people really mean and value in any visioning exercise.

Workshops, interviews, and other engagement processes naturally elaborated on outcomes of the visioning exercise. More extensive visioning combined with participative scenario development was seen as providing a stronger basis for setting coherent, desirable, and feasible urban goals.

- Visions would ideally be increasingly linked to delivery on the UN SDGs, as translated to the local context.
- The need to gain better understanding and negotiation of urban systems interdependencies, supported by systems-based modelling approaches that help identify and evaluate key synergies and trade-offs.
- A greater emphasis on environmental goals and limits, potential for regeneration, and recognition that environment is an enabler and increasingly a prerequisite of socio-economic goals, not a trade-off.
- Scenarios and narratives that explored alternative national and city settlement strategies, alternative land use, transport and densification strategies (e.g. Infrastructure Australia 2018; CSIRO 2019), low carbon living options (e.g. Candy et al. 2017), and alternative governance and socio-cultural values scenarios (Moglia et al. 2018).

State and territory governments have played a key role in developing various metropolitan strategic plans, and requiring local government strategies and plans, with broad goal statements that mostly resonate at a high level with the SDGs. However, in practice these plans were seen by participants as having several limitations. For example, they have not always incorporated long-term alternative scenario planning, diverse values assessment, and flexible pathways or adaptive learning. Various goals are rarely translated into self-consistent targets that are actively monitored, strategies usually represent shorter term step-out actions rather than flexible pathways towards longer term aspirations, implementation on the ground often diverges from the plans' intent (often due to overriding by political and commercial interests), siloed governance, and community engagement is seen as inadequate.

It was also recognised that strategies, plans and even longer-term visions and goals need to adapt to the reality that urban systems are complex, with emergent and therefore intrinsically uncertain outcomes, requiring flexible navigation rather than rigid plans. The workshop participants in particular stressed the opportunity for local, experimental, or pilot initiatives that could meet local needs but also have more general value. A common proposal was the development of local 'Knowledge and Innovation Hubs' or equivalent that could facilitate such initiatives and also help in the sharing of knowledge and feeding learning back into goals and pathways.

These insights led to a focus not only on how cities and regions develop flexible pathways towards visions, but also on how performance is measured and monitored. There were many relevant initiatives identified, such as:

- the federal National Cities Performance Framework (NCPF),
- the Transforming Australia website,
- Various frameworks which acknowledge and integrate diverse types of capital,
- National Waste Accounts and State of Environment assessments,
- Global Covenant of Mayors and the ICLEI Greenhouse Gas framework,
- Localisation of Planetary Boundaries via Planetary Accounting Framework.

These provide promising leads, but progress is fragmented and lacking in any widely accepted and used overarching framework to guide and monitor strategy, planning, implementation and local initiatives at the metropolitan, regional and local levels.

Evidence- and data-driven decision-making is favoured, and there are many tools, dashboards, and Key Performance Indicator (KPI) options available. A common core set of KPIs would be useful, but the main challenge was seen to be to set good targets and desired outcomes to drive decisions and behaviours. There is a need for a better and more widely agreed national performance framework (building on the NCPF) to measure performance in respect to agreed targets and outcomes, with appropriate local variations.

While there was a consistent call throughout for collaborative visioning and better planning, including transparent negotiation between sometimes conflicting aspirations, there was also a growing recognition by participants that unpredictable external drivers and events and the intrinsic complexity of urban systems, would require continuing navigation towards co-evolving visions, goals, and plans.

Table 1 Summary of current issues and 2030-50 visions based on the city workshop visioning exercises

Issues and Vision		Typical 2030-50 vision words (and tensions)	
Dimension	Issues common across cities	Issues differentiated across cities	
Overall images of the future	Lack of sustainability, resilience, liveability, transformative capabilities		transformed, transitioning, emerging, resilient, adaptive, confusing, controversial, chaotic, "Mad Max" <i>Tension: utopian vs dystopian?</i>
Environmental and natural resources futures	Natural resources overuse. Excessive waste, pollution, greenhouse gas emissions. Land and water supply and quality. Loss of green space. Degraded vegetation. Biodiversity loss.	Specific climate change risks. Heat in Western Sydney, Darwin, and South-East Queensland (SEQ), bushfires around Canberra, water supply and quality issues in SEQ, Western Sydney, Perth, and Darwin.	sustainable, intergenerational, within planetary boundaries, regenerative, blue/green/ biophilic infrastructure, climate ready, cool, decarbonised - net zero/positive carbon
Social, cultural, and psychological futures	Social justice, inclusiveness, and growing inequity – poverty, access to services, housing. Cultural diversity as challenge and opportunity. Culture and heritage undervalued	Cost of living drivers. Housing in Sydney, Melbourne, Canberra, and SEQ, Food and fuel in Darwin. Indigenous proportion of population (Darwin, Alice Springs) Nature of local identity	safe/secure, equitable/fair, inclusive, socially connected, tolerant, attuned to diverse cultures, cultural, liveable, healthy, confident, courageous, vibrant, dynamic, relaxed, familiar
Economic, growth, employment, and technology futures	Managing innovative but disruptive industry, technology, and work change, including for energy, circular economy, smart cities	Extent of vulnerability to economic change and boom-bust cycles greater for Adelaide, Perth and Darwin Different sectors having economic challenges and opportunities	Prosperous, new economy/ employment opportunities, innovation, automation, de-growth, beyond GDP, disruption of work <i>Tension: growth vs degrowth?</i> <i>Tension: secure vs disrupted employment?</i>
Governance, engagement, and decision making	Overcoming siloes. Need to reflect integrated urban systems, tradeoffs, and synergies. Low trust in institutions. Urban Plans implementation gaps	Different metropolitan structures between Sydney's Greater Sydney Commission, Melbourne Councils Partnerships and larger size of Brisbane City Council	Well governed, collaborative, shared value, community voice, empowered, integrated, system-based decisions, evidence-based outcomes, science-based targets
Urban form, infrastructure, and services futures	Need for national urban settlement strategy. Managing population growth and aging. Excessive urban sprawl but poorly designed densification, need place-based design with public spaces. Need more integrated land use and transport, active transport, congestion reduction. Access to employment, services, affordable housing.	Extent of growth, sprawl, and liveability pressures, which are greater for Sydney, Melbourne, and SEQ. Proximity of significant regional centres, which is less relevant for Adelaide, Perth, and Darwin.	Sense of place, compact, connected (socially, physically, virtually, environmentally), with more public spaces and active/ attractive streets, accessible, walkable, localised

STAKEHOLDER AND COMMUNITY ENGAGEMENT

Many examples of effective urban stakeholder and community engagement were identified by participants, but there was general agreement that too often engagement is not well tailored to the highly diverse urban issue contexts. Part of such context is the relevant scale of the issue and the related range of stakeholders and communities involved. The variety of examples provided demonstrated that there can be multiple reasons for engaging, including better understanding of stakeholder and community practical experience of an issue, or of their actual behaviours, or of the values they hold.

Participants provided examples of engagement at different levels, including national (e.g. the Cities Reference Group), metropolitan and regional (e.g. strategy development by the Greater Sydney Commission, and the Sydney Resilience Strategy development), and numerous local government and community activities. Key themes included:

- Stakeholder engagement is essential across all stages, in early stages to influence the framing of the issues and as an ongoing practice to build trust. Emphasis was placed on processes being genuine and transparent,
- Engagement must be followed up and not ignored, need to build long term consistency over time,
- Community engagement needs to be inclusive in both invitation and process to elicit diverse values, noting it is difficult to avoid representation bias under self-selection and difficult to access the disadvantaged and the 'silent majority',
- Community leaders need to be identified to promote local action, and involve positive messages of hope, motivation, and communication of benefits,
- Local governments can nudge incrementally, with small local actions that can make a difference,
- There is a risk of over engagement, so they need to be coordinated and clear in their purpose,
- Need to be culturally attuned, particularly in respect to First Peoples. There are valuable guidelines available, including in the Alice Springs Healthy Country Planning and Clean Air and Urban Living (CAUL) Hub processes,

- Messages and information need to be contextualised and localised,
- Engagement must be tailored to the circumstances and character of the community.

There is a need to position appropriate engagement along the engagement spectrum (IAP2 2018). The best positioning along this spectrum depends on the specific issue and context and there is a need for better guidance on this, but overall, there was a view that the emphasis needs to shift towards the collaborative end of the spectrum. Getting this right requires strong engagement strategy design, including the full diversity of interests.

There is also a need for more than one 'toolbox' to support the variety of engagement situations. For example,

- Surveys, focus groups and community meetings,
- Deliberative democracy techniques and events to build common ground among participants,
- Future scenarios and story mapping, which includes business-as-usual scenarios,
- Urban Living Labs or Knowledge and Innovation Hubs as collaborative spaces for local case studies,
- Visualisation techniques to support engagement, including interdisciplinary model-based simulations and visualisation. Examples of existing work in this space includes the iHub, Urban Development Institute of Australia AI-algorithms/pinboard for 3D spatial layers liveability mapping, game/simulation showing how projects will affect the region or location and videos,
- Creative visualisation, for example, engaging artists and filmmakers for visualisation of outcomes,
- Social media.

There was especially strong interest in the concept of a number of individual city/region Knowledge and Innovation Hubs for engagement on new urban initiatives and innovations.

The workshops, interviews and survey indicated that for serious engagement more use should be made of deliberative processes, focus groups and visualisation techniques and independent intermediaries or facilitators, to complement the less personal consultation, submissions, town hall style.

It was commented that decision makers often turn to consultants who may not be acquainted with the most recent methodological developments and latest evidence, whereas researchers can struggle to prove the relevance of their research and to identify with the decision-makers realities. Use of independent or neutral intermediaries was seen as having high potential to broker boundary-spanning understanding, develop mutual trust, and facilitate collaborative processes.

INSTITUTIONS AND GOVERNANCE

City and regional settlements are impacted by decisions made at all spatial scales and across sectors, so institutional and governance issues featured heavily in the participants' inputs. Institutional issues were often seen as the main barriers to achieving better societal and environmental outcomes, and a need is seen for significant institutional and governance redesign and innovation including more effective top-down leadership to complement bottom-up or local leadership.

GOVERNMENT

National, state and territory governments and coherence

The respective roles of the federal and state/territory governments need to be more clearly articulated and there is growing support for a more active Commonwealth role (see also Commonwealth House of Representatives 2018). This is not seen to be fully acknowledged by different governments.

There are promising beginnings of national initiatives (e.g. City and Regional Deals, National Cities Performance Framework, Smart Cities and Suburbs program, population and regional planning by federal and state/territory governments), although many commented on the loss of momentum by new governments discontinuing several very supportive previous government programs (e.g. Better Cities Program, National Urban Policy, Urban Design Protocol). In particular, there is a lack of continuity over time of government urban policies, programs and investments and inconsistency across levels. These lead to a consistent call for bipartisan support for coherent and sustained national urban directions.

There are also horizontal coordination issues across agencies. At the federal level, several agencies have key roles relevant to urban and regional development, but

none has an overall integrating or coordinating role for urban strategy and planning. This is true to a slightly less extent at state and territory levels, although at this level there are always urban planning or equivalent agencies, and the Premiers departments sometimes take at least a partial coordinating role. Siloed approaches are seen to be reinforced by siloed funding and perverse performance expectations and incentives.

Regional, metropolitan and local scale governance and differentiation

There was also common participant feedback that fragmented governance at metropolitan and regional level was a significant barrier to more integrated planning and implementation, especially for larger cities. Metropolitan scale governance initiatives were noted (e.g. the Greater Sydney Commission for strategic planning, Resilience Strategy development for Melbourne and Sydney, various coordinating roles of some sub-metropolitan groupings of councils). These were generally considered worthwhile, but either too recent or lacking in statutory clout to have yet proven their value. The state and territory plans produced for major cities are clearly relevant, but as mentioned in Section 1 these have major limitations.

In larger cities, there are different perspectives and priorities evident between central city and CBD areas, middle suburbs, greyfield areas, outer city suburbs, greenfield, and peri-urban areas, and nearby but separate regional centres. Similarly, individual cities have particular character which defines major opportunities and challenges.

It is also possible to classify regional settlements according to various characteristics as shown by the Regional Australia Institute. Especially for regional settlements, there is a significant disconnect between statutory planning (e.g. Local Environment Plans LEPs) and regional development or economic planning. It was considered that State governments could be more creative in planning for development of regional cities with leading 'infrastructure' decisions, for example, facilitating land release that will facilitate growth, and jobs development strategies, to attract people.

These multiple variations point to the importance of place-based (vs sectoral) approaches both to urban renewal and new development, and therefore the potential role for local governments. Participants observed that more integrated systems thinking occurred most naturally at the local level and becomes harder to achieve at higher institutional

levels. Local government and community groups often grasped the need for more integrated approaches more readily than higher levels of government as it is at the local level that the impacts of siloed decision come together and are felt most acutely.

Individual local governments vary enormously in capacity and resources and there is imbalance in revenue raising capacity across levels of government. It was stated that just 4% of government revenue is raised by local government. Of the 537 local governments in Australia, it was stated that only about 10% are considered to have significant capacity to respond effectively to major change issues like climate change and technology, notwithstanding the support of various local government associations.

Across scales and locations, there is also potential for federal and state governments to use policy and programmes to enable local initiatives, for example through large scale public transport projects, facilitating education and technology precincts, and designated employment centres.

As with the workshop visioning summarised in Section 1 above, this feedback reiterated the need for both top down and bottom-up initiatives.

PRIVATE SECTOR

There was much emphasis on bringing out the role of the private sector given the significant role it plays in infrastructure development.

There was a popular view that that much of the poor implementation of well-designed urban plans was driven by the short-term commercial interests of developers and other private sector interests, accentuated by 'neoliberal' philosophy and policy settings of governments over a long period of time. This included a view that the role of urban planners has been degraded vis-a-vis the private sector, and that they have been forced into procedural rather than strategic planning, monitoring and adaptive learning roles. There were suggestions that better mandatory requirements and incentives (e.g. government co-funding to required outcomes as per City Deals) were required, rather than relying on voluntary and discretionary expectations, in order to encourage private sector compliance to deliver on a plan's stated intent and the public good.

Some of the private sector representatives were doubtful about over-reliance on mandatory requirements. However, many leading business organisations and larger developers have been supportive of more sustainable urban development including the Australian Sustainable Built Environment Council, Business Council for Sustainable Development Australia, Investor Group on Climate Change, and Property Council of Australia.

Reinforcement of broader benefits assessment and possible incentives for both private and public sector development is supported by independent sustainability rating and performance assessment organisations such as Green Building Council of Australia and the Infrastructure Sustainability Council of Australia. Such ratings are increasingly linked to the SDGs, can cover 'planning-design-as built-operational' stages, and they usefully influence private sector markets, valuations, and innovation.

COLLABORATION ACROSS AND WITHIN LEVELS

City and regional deals

There was general recognition of the potential for improved urban development from the various City and Regional Deals being developed under the leadership of the federal government in partnership with the relevant state/territory and local governments. Currently, Townsville, Launceston, Darwin, Hobart, Adelaide, Perth, South East Queensland, Western Sydney and Geelong have Deals, with planning being undertaken for other cities. City Deals has thus included several regional cities, and smaller deals were also being developed for smaller scale settlements (e.g. Berkeley, Wide Bay).

Participants believed that the commitment of all three levels of government would break down some of the previous barriers, provide some continuity across political cycles and address priority sustainable development issues. Although it is early days, and feedback was very positive about the potential of these Deals, there were some reservations about how some are being scoped and implemented in practice. For example, they might be too top-down with limited broader stakeholder and community engagement, weak in shared visioning, goal setting and outcome indicators, political rather than based in sustainable development and evidence, need somewhat longer-term outcomes and commitments, and not addressing broader city needs (for example, Western Sydney Deal not addressing affordable housing and liveability).

Local initiatives

There was great interest in using disruptive opportunities and innovative ideas and financing combined with trialling and testing initiatives locally. The workshops in particular provided many examples of, and ideas for local collaborative ideas and initiatives.

Overall great potential was seen for more empowerment of local governments, businesses, and communities to collaboratively develop and govern local solutions. However, centralised funding and power, risk aversion, and any reluctance to admit and learn from past mistakes works against devolved place-based solutions.

Some examples of local collaboration facilitated by NGOs were noted (e.g. UN Global Compact Network Australia), where the intent is to accelerate initiatives that might involve local councils, private sector, community groups and researchers, developing a self-resourcing business model and economic case to attract longer term investment, and demonstrating ongoing value for partners. These are often characterised by being place-based, multi partner, multi sector innovative initiatives that require local leadership and mutual trust building over time.

While there were many examples of successful local innovation and solutions cited, especially were supported by top-down resourcing and/or collaborative research, the workshop participants and most interviewees indicated that there was very limited knowledge of these beyond the people directly involved and so very little effort to share the learning and upscale these for broader impact.

URBAN INVESTMENT BUSINESS CASES AND DECISION-MAKING

There was considerable input on how individual urban development and Infrastructure business cases are developed and decisions made, by both the public and private sectors.

The perceived over-politicisation, inconsistency in approach, and siloed thinking and decision-making noted extends to key individual infrastructure investments, which typically require substantial funding from federal and state/territory governments. Stated priorities often do not align across levels, and political campaigns often include opposing views on infrastructure investments. There was a view that public sector decision making not transparent enough, politically-rather than evidence-based, risk averse, and based on current legislation and conditions not future needs.

Participants also sought broader issue framing early to take account of a systems view of synergies and trade-offs, and related to this, inclusion in business cases of wider economic and non-economic costs and benefits.

The federal government's Infrastructure Australia (IA) was widely seen as a voice of reason. Participants particularly endorsed IA's efforts to:

- Extend the scope of infrastructure from its traditional focus to include social and other forms of infrastructure
- Extend business cases to include up-front scenarios development and scoping
- Wider economic benefits and some consideration of non-economic benefits through 'strategic cases' that extend beyond the economic business case, and,
- Sustainability and resilience framing.

The professions and NGOs were generally very supportive of such approaches, seeing that they can counter political and developer-based decisions and provide strategic support for local governments.

KNOWLEDGE

There was recognition that all stakeholders should be seen as both knowledge providers and knowledge users (see Figure 1).

Figure 1 Schematic of knowledge holders and users

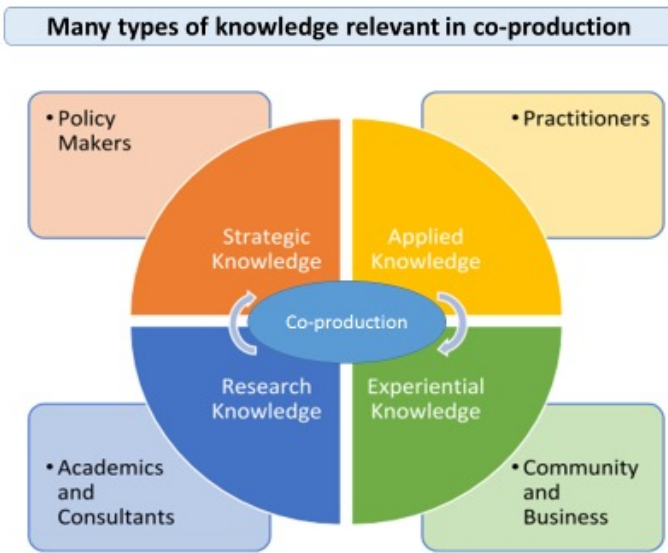
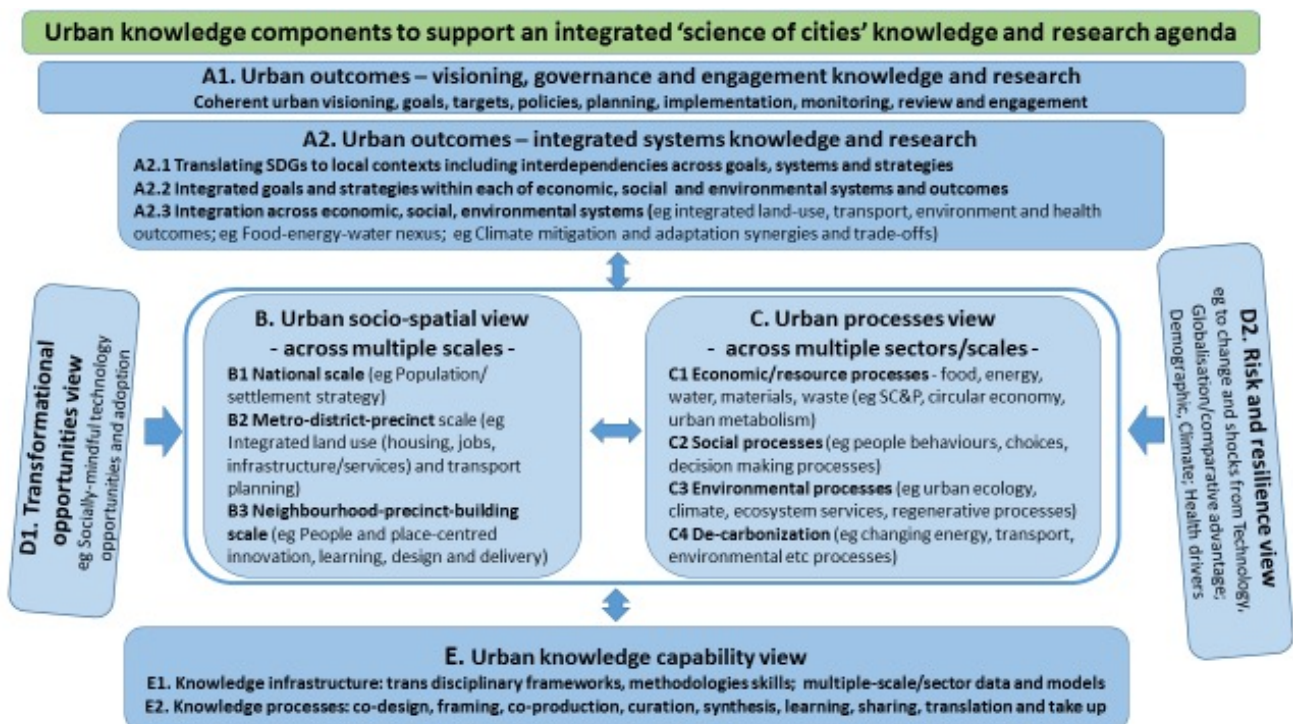


Figure 2 Urban systems knowledge and research: identifying components that could support development of an integrated 'Science of Cities' agenda



KNOWLEDGE CO-PRODUCTION AND UPTAKE

Lack of research overview and prioritisation

Participants believe that the federal government has not prioritised urban research in any way and there is no overall coherent national urban research agenda or priorities.

However the CSIRO-led Australian National Outlook (CSIRO 2019) concluded that Australia will need to undergo five major shifts in order to move to a more desirable trajectory - shifts in industrial composition, urban development, energy, land use and culture - so emphasising 'urban development' as being central to national outcomes.

The need for a nationally co-developed and agreed urban research agenda with some degree of prioritisation was widely supported by participants. Many key urban challenges and associated knowledge areas or themes were identified (see Figure 2 for a high-level summary of urban knowledge components or themes identified throughout the engagement process). The potential was also recognised to address some of the major urban challenges through more integrated systems-oriented 'research missions,' each of which might draw on several of the themes summarised in Figure 2.

Together, these approaches might help in making progress towards an overarching urban systems knowledge and research ('science of cities') agenda development. However, the most immediate need seen now was to convene key stakeholders and researchers to collectively develop broader 'mission-focused' urban research agendas and some suggested priorities to best inform policy and practice.

Knowledge co-production and uptake

Increasing co-production and uptake of knowledge was seen as crucial, and leadership in seeking this would desirably increasingly come more from the governments and/or other stakeholders and communities.

There is a vast body of knowledge about cities with much quality research, but major issues include:

- How to ensure knowledge produced is relevant as researchers often have limited awareness of how decisions are made in practice,
- How to carry out a collaborative co-development study with and for multiple purposes and users, and,
- Improving understanding and uptake of knowledge by decision-makers while accounting for loss of institutional knowledge and relationships as important individuals move.

This needs a collaborative evidence-based approach from the outset so that the latest evidence available is used in initial issue framing, including to help break down traditional institutional and disciplinary siloes, provide a reasoned critique of current policy/approaches, and ensure that initial proposals also includes how any initiative is to be assessed.

Individual projects often co-develop local knowledge-based solutions but with little effort to generalise to broader urban influence, noting that findings always needs to be translated to the local situation. Knowledge uptake, and broader access and translation approaches need to be articulated as part of the initiating research proposals.

FRAGMENTED KNOWLEDGE RESOURCES

Urban knowledge and research sources

Although there has to date been no overarching national approach, a wide range of urban research sources were identified in Australia. Most urban research is commissioned through:

- Government funding (e.g. CSIRO, Australian Housing and Urban Research Institute, Clean Air and Urban Landscapes lab, work in universities),
- Joint funding between government and industry (e.g. through Cooperative Research Centres for Low Carbon Living, Water Sensitive Cities, Spatial Information, iMOVE; and the Sustainable Built Environment National Research Centre), or,

- Peak bodies (e.g. Australian Local Government Association, National Growth Areas Alliance, Regional Australia Institute).

Many of the above sources have limited life funding and none currently has the charter, program, or funding to develop a more integrated systems view of urban development or to provide an ongoing synthesis of and access to the broader range of urban knowledge. The project-basis of most funding also means that there is little resource allocated for reflection and learning, essential to both integrated systems thinking and effective translation and upscaling of experience. Yet each of these capabilities is clearly sought by many stakeholder participants.

There is also no mapping of current research 'centres' and areas of expertise. Many councils are keen to participate in co-design, experimental and pilot projects locally but don't know which research institutions have the interest, capabilities and resources to link with.

The current competitiveness in the research area mitigates against more collaborative approaches across research institutions, and progress towards greater national and local coordination would need to be carefully sequenced and managed to gain collective trust and confidence.

Urban data and modelling sources

The research effort depends on reliable data, and in some cases, analytics and modelling using such data. The Australian Urban Research Information Network (AURIN) is a federal government funded body with the charter to enable widespread access to curated urban data for use in urban research, practice, and policy. AURIN itself identified a number of critical issues going forward:

- Access to private and some government sector data is still often an issue due to Intellectual Property claims, licensing challenges and risk averse governments with limited data management capacities,
- The need to cover a broader range of data types and applications, including socio-economic and environmental as well as physical data, data on urban processes and metabolisms as well as spatial data, new strategic and real time operational technologies and data linked to smart cities initiatives,
- Value added urban modelling, decision support tools, and prototypes have typically been encouraged by AURIN and developed by university centres external

to AURIN (e.g. under the Australian Research Council, CSIRO or other project funding), but when funding stops they are often no longer maintained or supported,

- The value adding can for example be through spatio-process-statistical analytics (e.g. various CSIRO Data61, AURIN projects; land use and transport modelling), spatio-process-temporal modelling (e.g. CSIRO's Australian National Outlook-related urban modelling linked to national and regional Integrated Assessment Models, and various Agent Based Models for social and behavioural modelling at the local level), and digital twins (e.g. NSW Government for Western Sydney).

To help address some of the above data needs, there was a proposal that a nationally coordinated but distributed platform be developed to support the discovery, access, sharing, integration and re-use of urban information, including open data policies, and shared metadata, infrastructure, AI/machine learning services, analysis/modelling and visualisation tools, and key urban indicator definitions.

For analytic, modelling and visualisation tools, and while it was recognised that the range of possible tools and research was likely to remain very diverse, there was also increasing interest in at least providing more coordinated access to the range of initiatives and products, and to seek opportunities to consolidate and share effort and infrastructure where possible.

Knowledge and research institutional and disciplinary fragmentation

It was widely agreed that addressing the current fragmentation across knowledge, data and modelling would need more collaboration and sharing and less competition between knowledge and research institutions. It would also require more mature, long-term, and open partnerships between governments and the urban research and innovation community.

Within the research community, it needs to be better recognised that a range of different, but complementary approaches are needed to tackle the diversity of urban issues and knowledge (e.g. more qualitative structural critical analysis as well as more quantitative empirical positivist studies, social and environmental sciences as well as physical sciences and engineering). This will also assist in the research community taking more coherent voices

to government and other key stakeholders, in order to influence national and local policy, strategy, and change.

KNOWLEDGE CAPABILITIES AND INFRASTRUCTURE

Knowledge synthesis, learning, sharing, brokering, and usage

Although most of the research institutions and individual researchers publish their research, it is commonly through listings on individual institutional websites, or in hard to access journals. In reality these are rarely read or translated by decision-makers or even their advisers.

There is little synthesis or sharing of experience beyond the initial project or institution and their partners. Councils, for example, are keen to have peer-peer learning but require a safe space to explore failures and learnings. This means the wider potential value of research and innovations, by out-scaling (peer to peer) or up-scaling (influencing higher level policy or directions) is not realised. During the consultation processes, numerous examples of good and bad outcome case studies were raised, but there was little or no formal sharing of learning and good practices from these.

Some individual urban research centres have been creating 'knowledge hubs or platforms' to improve accessibility of their research but siloing remains problematic. Different areas of focus do not speak to each other, and most potential end-users need some form of broker to distil what is most relevant and help translate this into each local context. There are isolated examples of more integrated approaches (e.g. Cooperative Research Centre for Low Carbon Living and Water Sensitive Cities combining on 'Ideas for Fisherman's Bend'), but these are the exceptions.

Many other organisations could potentially provide some brokering (e.g. industry associations, environmental and social NGOs, and think tanks), but these have another primary role and so are not really focused on integrated knowledge translation.

Given the above fragmentation and limited access, synthesis, and translation, there was a strong belief among participants that great progress could be made just by providing better access to and understanding of current knowledge. Decisions can be based on imperfect information, and more use made of existing knowledge as well as experimentation, trials, pilots, and learning.

This often led to ideas for more integrated knowledge hubs which could facilitate the access to and translation of

knowledge across the current siloes, as well as facilitating collaborative local innovations and experiments and the development of new knowledge. This matched up with the similar participant ideas noted above in Section 3 in the context of facilitating local innovation, empowerment, and leadership. Participants identified a range of possible functions for such 'urban Knowledge and Innovation hubs' consistent with the above.

The concept was that such hubs were local to a particular city and region and provided a link across all the existing knowledge and research activities and urban user sectors in that region. This could help address urban systems issues across traditional boundaries from a user perspective, while also being part of a growing nationally coordinated network and associated open knowledge platforms to aggregate and facilitate knowledge sharing nationally and internationally.

Knowledge people and practice capabilities

There was a recognised need to continually develop people and institutional knowledge capabilities of policymakers, practitioners, and researchers, including capabilities in collaborative engagement and issue framing, and knowledge co-production, interpretation, dissemination, translation, and learning. This includes improved interaction between these three groups.

Policy and practice capabilities

The linkages between policy and decision makers and expert practitioners or professionals are generally reasonably direct and developed. However, it was widely perceived that in urban policy and development decisions the input of experts is too often overridden by political and private sector interests, and that even expert practitioners are rarely able to incorporate new research findings into their advice. Federal and state governments miss an opportunity by rarely incorporating funding for research and wider learning in association with major urban investments and programs.

Practitioners and policy makers do not look at 'urban planning' research as highly relevant, with decision-makers in this area often going to consultants rather than academics. This partly reflects a lack of awareness about the availability of expertise and knowledge, and where to access it.

Consultants were often seen as competitors to researchers for government work. At a more strategic level, participants from consultancy and other professional peak bodies often argued for the similar approaches as researchers. For

example, the need to overcome risk averse cultures in urban decision-making and to better translate new insights and learning into current practices and the next generation.

Professional bodies like the Planning Institute of Australia (PIA) are active in seeking to boost the role and skills of the planning profession. The profession was not seen as having the recognised or practical power in guiding urban development that it used to, and the urban problems associated with this are becoming evident. At the same time there is increasing recognition that more integrated outcomes-focussed urban planning will pull the profession into new fields and issues. The increasing expectation of collaborative stakeholder and community engagement also places new demands on the profession.

Specific ideas to address some of the above issues especially on policy and practice linking to research included

- Dedicated scholarships funded by governments and private sector for policy and practice professionals to undertake secondments, fellowships, research masters and PhD programs within urban research sector institutions, aligned to national priorities,
- Professional bodies supported to strengthen practitioner capability in procuring, guiding, and appraising research in policy and practice formulation, implementation, and review, and require a research component within accredited professional degree qualifications and continuing professional development,
- Development of local and national communities of practice in integrated urban systems, potentially linked to the idea of Knowledge and Innovation Hubs.

Research capabilities

The ongoing research capability is strong in those research bodies and centres (often sector or topic focussed) with critical mass, but otherwise fragmented with individual expertise spread throughout the university sector.

Within universities the urban planning research capacity depends heavily on PhD students, with many students coming from international locations with their own desired topics, so not much driven by Australian users. Planning researchers' success rate in obtaining Australian Research Council funding is not believed to be high. Being practice oriented, planning academics often have smaller research CVs than others which can be a barrier in the ARC context.

Research staff and students must be better trained in direct engagement with policymakers, urban industry professionals and other stakeholders. Urban studies also increasingly need people who understand the human psyche for mass change – social scientists, psychiatrists, symbols, cognitive discourse, and the sort of AI understanding of social patterns and behaviours used increasingly by the private sector.

Ideas put forward to address the above included:

- Policy engagement skills incorporated into university teaching programs to improve policy relevance of research and its applicability,
- A nationally funded program of PhD scholarships (linked to the APA scheme) for a new transdisciplinary, cross-institutional PhD program linked to national urban research priorities; along with a national PhD program of residential training in urban theory methodology and research-to-policy translation,
- A national program of funded fellowships and secondments across early-, mid-, and senior-career levels established for urban researchers to undertake policy-related research in collaboration with policy and practice organisations, and in some cases, embedded within policy and practice organisations,
- A national researcher's body to work with professional bodies and Australia and New Zealand Association of Planning Schools on a national urban education and development agenda.

International knowledge

Individual research bodies and researchers have extensive international connections, but overall, the links and especially learnings are siloed and fragmented. This applies also to urban policy and practice international networks.

The diversity and increasing drive and support of such networking was encouraged but, as with the national co-development and sharing of knowledge within Australia, there is a potential role for a proposed integrator or aggregator (possibly linked to a network of Knowledge and Innovation Hubs) to help broker international relations and knowledge, including building links with national and international institutions (e.g. Future Earth Urban Knowledge-Action Network).

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APPENDIX

Table 2: Synthesis of word clouds for 'Visions for your city for 2030-50'

A. Overall images of the future city	<i>Images of the future</i> <ul style="list-style-type: none">• Brave-new-world, Transformed, Transition, Emerging, Adaptation, Revitalised• Different, Revolution, Confusing, Controversial, Chaos, Mad-Max, On Mars, Survival• Resilient, Adaptive, Responsive, Agile, Versatile, Self-sufficiency
B. Environmental futures	<i>Environmental and natural resources futures</i> <ul style="list-style-type: none">• Sustainable, Intergenerational, Carers-of-everything, Holocene-restored, Limits, Within social and planetary boundaries, Regenerative, Net positive• Environmentally sustainable, Environmental leader, Nature, Ecosystem, Eco-aware, Biophilic, Deep ecology, Permaculture, Green, Green corridors, Tree-lined, Urban forest, Vegetated, Biodiverse, Rewilding, Eco-restoration, Green-buildings• Climate-ready, Designed-for-climate, Cool, Cooler, Shady• Climate change, Growing carbon-positive, Zero-carbon, Fuelled renewably, Hydrogen economy, Energy efficient• Clean, Fresh, Unpolluted, Swimmable• Circular economies, Waste-free, Zero-waste Water reuse, Sewage, Plastics
C. Social, cultural, and psychological futures	<i>Social and cultural futures</i> <ul style="list-style-type: none">• Security, Safe, Unafraid, Sheltered, Trust, Low-crime, Refrain from war• Just, Fair, Responsible, Ethical, Inclusive, Equitable, Egalitarian, Affordable, Famine, Hunger-free, Equitable housing, Frustrated-youth, Proactive Socialism• Socially connected, Community, Neighbourhoods, Decentralised, Local, Communal-vs-individual, Personal, Family• Humane, Caring, Nurturing, Kind, Compassionate, Tolerant, Respectful, Accommodating, Understanding, Valued, Harmony, Mindful• Acknowledge-history, Indigenous, Treaty, Heritage, Multicultural, Diverse, Socially diverse• Cultivated, Cultural, Arts• Understanding inter-generational drivers: GenX, GenY, Millennials, GenZ <p><i>Emotional/psychological futures (some potential tensions evident here in personal aspirations)</i></p> <ul style="list-style-type: none">• Liveable, Healthy, Wellbeing, Healthy-Mind-Body-Spirit, Soul, Beautiful, Aesthetics• Comfortable, Relaxed, Stress-free, Familiar, More mature, Serene, Slow, Peace• Confident, Open-minded, Positive, Embracing, Progressive, Embracing change, Enlightened, Courageous, Freedom• Vibrant, Dynamic, Active, Alive, Energetic, Flourishing, Joyous, Happy, Fun, Convivial

D. Economic and technology futures

Economics, growth and employment futures (some clear tensions evident here)

- Prosperous, Rich, Enriched, Economic driver, New economy, Networks-not-markets, Services-not-goods, Business opportunities, Added-value, Good supply chains
- Strong links between jobs and population growth, Employed, Universal-employment, Disruption of work, Secure-employment, Career-of-everything, Skilled, Industrious, Efficient
- Low growth, Zero growth, De-growth, Reduced-population, abandon-growth-mantra, Growth Beyond GDP

Technological futures

- Technology, Innovative, Smart, Digital, Automated, Automation, AI, Cashless

E. Governance futures

Governance and decision-making futures

- New-leaders, Clarity-of-purpose, Well-planned, Well governed, Improvements-in-governance-and-politics
- In tune government, Collaborative, Cooperative, Unified, Bi-partisan, Shared-value, Balance
- Integrated, Joined-up, Cross border links, System-based decisions
- Evidence-based outcomes, Science based targets, Research, Communities-of-practice
- Community-voice, Representational, Empowered, Self-determining

F. Urban form, infrastructure, and services futures

Images of urban form, infrastructure, and service futures

- Well-infrastructure, Serviced
- Sense of place, Better suburbs, Compact
- Connected (socially, physically, virtually, environmentally), Interconnected, Accessible
- Public transport-rich, Metro-served, Passenger and freight segregation, Car-free, Uncongested
- Active transport, Cycle friendly, Pedestrian-friendly, Walkable

G. Other images of our city in the future

Images we and others will have of our city

- International, Links to Asia Pacific region, linked to other regions, Cosmopolitan, Feels like a big city not a small town, Politically-powerful
 - Leader, Frontrunner, Exemplar, Showcase, Famous, Pride, No cultural cringe
 - Welcoming, Friendly, Loved, Destination
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