SUBMISSION TO THE HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON INFRASTRUCTURE, TRANSPORT AND CITIES INQUIRY INTO THE AUSTRALIAN GOVERNMENT’S ROLE IN THE DEVELOPMENT OF CITIES

1. Sustainability Transitions in Existing Cities

I welcome the opportunity to provide input to the House of Representatives Standing Committee on Infrastructure, Transport and Cities Inquiry into the Australian Government’s role in the development of cities.

My submission focuses primarily on a sustainability transition for Australia’s existing cities – in particular its capitals – which continue to be the principal focus for accommodating population growth. A forecast doubling of capital city populations by mid 21st century requires greater focus on urban infill and on how Australian cities can be retrofitted in a manner that is regenerative: enhancing liveability while shrinking ecological, carbon and urban footprints.

It draws on Transitions research that I have led over the past 25 years as a Chief Research Scientist at CSIRO (until 2007) and then Research Professor in Sustainable Urbanism at Swinburne University (while connected with all six national urban research networks: CRC for Low Carbon Living, CRC for Spatial Information, CRC for Water Sensitive Cities, AHURI, AURIN and Sustainable Built Environment National Research Centre).

Peter W. Newton, PhD, FASSA

Research Professor in Sustainable Urbanism, Centre for Urban Transitions, Swinburne University

EW Building, Serpells Lane, Hawthorn 3146, Melbourne

E: pnewton@swin.edu.au; T: 03-9214-4769
The Challenge of Delivering Sustainability Transitions in Existing Cities

1. Why Cities attract the population and not regions? High Speed Rail and growth of provincial cities: can the major capitals decant some of their growth to provincial cities?

Until the federal government undertakes a comprehensive nation-building planning study of high speed (>370kph) rail (HSR) options in relation to its capacity to re-shape significant parts of the national settlement system, especially focused on the two largest cities of Sydney and Melbourne, decentralisation will remain elusive. Traditional 20th century policies focused on attempts to create new basic industries or relocate federal or state government offices will not succeed. 21st century agglomeration economies favour large cities and will continue to do so until provincial cities become part of a functional mega-metropolitan region centred on a major capital city [1,2] connected via high speed rail (HSR) that converts their CBD travel times to 30 minutes (the Marchetti constant) – equivalent to an average metropolitan work commute [3]:

![Travel times under various high speed ground transport modes along Melbourne – Canberra corridors (Minutes from Melbourne)](source: [3])

Which provincial cities to connect (and what the implications for stimulating population and economic growth could be) would await the outcome of a major study appropriate for Infrastructure Australia. One scenario would involve provincial cities that lie on a HSR route between Sydney and Melbourne. The CSIRO undertook pioneering research in the early 1980s on a VFT link between these capital cities in relation to a coastal and an inland route [4]. For a range of political reasons an inland route was favoured over the initial coastal route that emerged from CSIRO analyses – a route that reflects the market forces and population preferences that have favoured coastal locations in Australia since its European colonisation and will continue to do so into the future. Another scenario could look at which provincial cities to link to a major capital via HSR (eg. for Melbourne, options...
such as Geelong, Traralgon, Ballarat/Bendigo are frontrunners). The objective: to build a national settlement system that is more sustainable, productive and liveable.

The NBN represents another critical national infrastructure for the 21st century. High speed broadband networks (fibre and wireless) are settlement shaping to the extent that they enable organisations (as well as households) to explore locational options previously not viable. Pioneering studies by CSIRO and CIB [5, 6, 7, 8, 9] established that high speed networks supported centralisation (of non-routine, specialist, information and creative services that require face-to-face contact) together with decentralisation (of routine, lower cost services) of economic activity. Decentralisation (eg. back office functions) was initially outer suburban in the early 1990s, but is now a global option. Centralisation is also a global option for headquarters functions. Telepresence supports multiple configurations for business in future, including options for ‘electronically’ importing as well as exporting labour.

Airports as well as HSR are both critical for supporting face-to-face contact – and together with high speed broadband are core infrastructures for productive 21st century economies.

2. Why is a sustainability transition necessary for Australia’s cities?

Australia’s major capitals have been regularly assessed by the Economist Intelligence Unit (EIU) as being in the top 10 of world’s most liveable cities [10]. There have been academic critiques of this index on methodological grounds - in particular, its failure to represent the level of intra-metropolitan variation in social advantage/disadvantage [11]. Notwithstanding, the EIU Liveability ranking has become a favourite of Australian politicians in city marketing, but masks major deficiencies in the performance of the nation’s cities on environmental, social and productivity grounds.

Successive Australian State of Environment Reports on Human Settlements/Built Environment since their inception in 1996 [12-16] as well as multiple other reviews [17] have pointed to the increasing un-sustainability of Australia’s cities in respect of both ecological footprint (levels of resource use and carbon emissions) and urban footprint (spread of built up area).

A mapping of EIU’s Liveability Index with WWF’s Ecological Footprint for 140 world cities [18, 19-p212] clearly revealed the fact that Australia’s major cities have achieved their liveability as a result of high resource consumption in both the construction and operation of their built environments as well as in the household consumption behaviour of city residents. Here the urban context in which residents live (size and quality of dwelling, relative access to public transport, walkable neighbourhoods etc) when combined with debt-fuelled lifestyles and a clear gap between environmental attitudes and actual behaviour of urban residents add up to an ecological footprint (EF) three times the world average [20,21,22]. Australia’s world-leading per capita carbon emissions form part of this equation [23].

The urban form of Australia’s cities is one of the major contributors to this situation [24, 25]. More compact European cities (comprising different housing typologies and sizes as well as greater public transport access) have similar levels of liveability, but EFs half that of those in Australia.
The negative consequences of reliance on greenfield development as a continuing demographic absorber for urban population growth have been well established, spanning economic, environmental and social performance indicators.

The economic cost of providing new physical infrastructures to greenfield development has been estimated as two to three times that for redevelopment in established areas [26,27]. Outer suburban residents in cities such as Melbourne also drive over 60% more kilometres per household as driver or passenger compared with inner city residents – a growing time and productivity impost for both the household and metropolitan economy [28].

Environmental costs of continued urban sprawl are considerable. National per capita carbon footprints continue to be world leading, variations of the order of 50% exist between inner city and outer suburban households in relation to carbon emissions – a direct reflection of the urban built environment context in which they live [29-31]. The urban footprint of Australian cities has also been identified as a major concern in the latest national State of Environment report [16], highlighting the continued loss of productive agricultural land on the peri-urban fringe to greenfield development – reducing an important source of fresh produce close to the city, increasing food miles and carbon footprints.
**Socio-spatial disadvantage** has increased markedly over the past 20 years and is now clearly evident in Sydney [32] and Melbourne [33]. It is multi-faced and combines: concentrations of low income; poor access to jobs, public transport, education and health care services; and a spatial concentration of social problems. It is weakening the social fabric as well as the productivity of Australian cities. Construction of more affordable housing in established suburbs is now a bi-partisan political objective, but remains elusive as an implementable objective (Australian capital cities currently have the most unaffordable housing internationally; Fig 3).

![Fig. 3 Liveability-Affordability Nexus (Source: [34])](image)

3. **Transition to Sustainable Urban Development**

Faced with these challenges, critical and inter-related transitions are required in Australia’s major cities [35,36,37]. These include:

- **transition to more compact cities** - from a low density suburban city form to an urban form and fabric, more characteristic of European cities that deliver urban liveability more sustainably than those in Australia and North America as a result of their smaller sized and higher density housing and more active forms of transport [38]. Figure 3 clearly indicates the scale of change required. Sydney is Australia’s most densely populated city at 36 persons/ha – twice that of Perth; and at 26 persons/ha Melbourne is half that of Vancouver and one fifth the density of Vienna (with equivalent levels of liveability).

- **transition in type and scale of urban housing redevelopment.** Infill needs to assume a dominant role in increasing the supply of medium density housing - the ‘missing middle’ - in the established middle ring low density suburbs – and at a scale of redevelopment beyond that of knock-down-rebuild: ie. Precinct scale [39,40,41].
• transition to more sustainable, regenerative built environments linked to precinct scale residential infill and densification, taking advantage of new distributed/ decentralised technologies related to energy and water infrastructures, alternative mobility/travel platforms and waste management systems [CRC Low Carbon Living: http://www.lowcarbonlivingcrc.com.au/; CRC Water Sensitive Cities: https://watersensitivecities.org.au/].

‘Compact city’ has been a goal of successive metro strategic plans in the major capitals; but failure of implementation as well as deficiencies in redevelopment policy has meant that such goals have not been realised [37].

Urban infill has emerged as a high level policy objective for all the major capital cities in recent years in relation to compact city goals. Its objective is redirecting population and housing inwards rather than outwards. Infill targets have also been set for new housing construction: Adelaide – 85% (infill); Sydney – 70%; Melbourne – 70%; SEQ – 60%; Perth – 47%. However, in cities where monitoring is occurring, greenfields is where most net new housing is occurring [42,43]. As one of the critical KPIs for sustainable urban development, annual reporting on city infill performance using validated methods and open data should become one of the federal smart city indicators; but is currently missing from the National Cities Performance Framework[https://cities.dpmc.gov.au/performance-framework/documents; [44].
Current strategic metropolitan planning policies demonstrate a lack of understanding of the different processes that are driving ‘urban infill’ as it relates to housing [42,46]. It continues to be used as a blanket term in government documents, but it is critical to differentiate brownfields from greyfields [Fig. 5]; and within greyfields to differentiate residential redevelopment occurring in designated higher density activity centres and transport corridors from the low density, fragmented and sub-optimal knock-down-rebuild based on small lot subdivision that is spreading like a virus through the established middle suburbs of Australia’s major cities with its attendant negative effects (low yield of new dwellings, lack of variety, loss of greenspace and permeable surfaces, increased traffic, increased pressure on municipal services – avoids development charges etc).

**Fig. 5: Urban Development Domains (Source: [47])**

**Brownfields** are internationally recognised as a focus for urban redevelopment / renewal. They are typically found in well located areas of cities that have been associated with an earlier era of economic activity (eg. old docklands, manufacturing and abandoned retailing sites); are owned by a single party, usually government or industry; of a scale which is closer to that provided by greenfield sites for development; contaminated to some degree, depending upon the nature of prior use; and typically unoccupied, obviating the need for community engagement at a level required of greyfields. In Australia, well understood development models have operated since the 1990s – as a direct result of the Building Better Cities program which was initiated and funded by the federal government [49]. Brownfields provide opportunity for significant (regenerative) innovation at a precinct level, but have not been realised in recent projects such as Docklands in Melbourne [50].

**Research synthesis** studies pioneered by CRC for Water Sensitive Cities have created a new research ecology that can focus on visionary solutions to a particular urban planning problem by bringing key government and industry stakeholders together with experts in a process that delivers innovative blueprints for regenerative precinct development within a short timeframe (see Ideas for Fishermans Bend [51] – a collaboration between CRC for Water Sensitive Cities and CRC for Low Carbon Living).
Greyfields are markedly different. They are much more extensive and lie predominantly between the CBD and inner city housing markets and the more recently developed greenfield suburbs. Their location provides superior access to employment, public transport and services than the latter zone; and they have demonstrably higher amenity and liveability. Greyfields in the Australian context have been defined as those ageing but occupied tracts of low density suburbia that are physically, technologically and environmentally failing and where value resides in the land (generally >70%; which we label as having ‘high redevelopment potential’) rather than the building - representing a vastly under-capitalised real estate asset [46]. There is now increasing recognition that new urban development models are needed to better align a city’s built environment with its future population by better managing the land available for development; especially in established built up areas where pressure for re-development is strong [52] This is increasingly the case in fast-growing cities, where it is argued that poor land use planning and regulation is creating a scarcity of land in particular locations, inhibiting their capacity to accommodate growth in a manner that is environmentally sustainable, economically efficient and socially equitable [53]. There is a significant volume of greyfield residential property in Australian cities, estimated at over three quarter of a million dwellings for Melbourne and concentrated primarily in the middle ring suburbs [47]. Figure 6 reveals that at least one third of Melbourne’s local government areas have a majority of their residential properties where more than 70% of value is in the land. However, most of these municipalities are restrictively zoned in a manner that, to date, precludes more intensive forms of redevelopment, much less regeneration and reactivation. In a recent audit of infill redevelopment in Melbourne, Newton and Glackin [42] found that greenfield development still represented approximately 50% of net new dwelling construction; brownfields were contributing around 25%, predominantly via high rise apartments; and the greyfields the remaining 25%. Here, almost half were ‘knock-down-rebuild’ (KDR; ie. 1:1 or 2-4:1) where detached housing is demolished and replaced by one large dwelling (the McMansion...Australian new homes now the world’s largest), or between 2 to 4 townhouses – dwelling types that can be accommodated within existing planning and building regulations. Less than 15% is medium density. It represents the ‘missing middle’ of Australia’s housing stock (see Fig. 11).

Most greyfield housing redevelopment is located outside of the designated zones where state and local governments are seeking higher density forms of residential redevelopment: along major transport arterials, near railway stations and within a range of activity centres - the Residential Growth Zones (Figure 7). These key features of recent strategic metropolitan plans are necessary but are demonstrably not sufficient to: halt sprawl, achieve infill targets and result in a regenerative development of Australia’s largest cities. Piecemeal KDR is occurring in the two major residential zones (Neighbourhood Residential Zone and General Residential Zone) as virus-like sub-optimal development. It is not: providing an adequate yield of new housing, nor variety in dwelling required of current and emerging urban socio-demographics; reducing traffic congestion in the middle suburbs (rather, is significantly adding to it, with considerable space continuing to be devoted to accommodating cars on site, even when redevelopment is close to public transport); or maintaining green space (with almost wholesale loss of private gardens and established trees associated with KDR). Moreover, it is not regenerative. There is a limit to the extent to which redevelopment of individual buildings can be eco-positive for energy, water, transport and waste management.
Fig. 6: Percentage of greyfield residential properties in Melbourne municipalities with residential redevelopment potential above 0.7
Source: [54]

Fig. 7: Location of urban infill housing projects in a section of Maroondah, a middle ring suburb in Melbourne (Source: [54])
Australia’s cities have, for the most part, been built as precincts and according to some broader plan, as distinct from collections of buildings. For the era in which most of Australia’s pre-war (2) built environment was laid down, there was better co-ordination in city planning between land use and (public) transport, resulting in better connection between housing and jobs and services. The resultant (‘compact city’) urban forms are artefacts of this earlier era of city building. For the last 40 years of the 21st century, Australian city planning was dominated by the American model of low density, car dependent urban development (‘sprawl city’). In the current era involving the re-building, re-designing and retrofitting of cities – with an increasing set of exogenous and endogenous drivers to accommodate – precincts need to retain their significance as an organising framework for urban planning and design. KDR represents a major challenge to more sustainable urban development. Creation of an alternative – precinct scale -property development model for urban regeneration in the greyfields is required.

The model that has been proposed is greyfield precinct renewal (GPR), and is at the heart of a 10-year Greening the Greyfields project (GtG; http://infrastructuremagazine.com.au/2017/03/20/greening-the-greyfields/). Greyfield precinct renewal delivers multiple benefits compared to KDR: added housing yield and more varied housing typologies; zero carbon energy linked to distributed renewable energy and storage; integrated stormwater and wastewater systems; recycling food waste to compost; more walkable neighbourhood with fewer cars; maintaining greenspace and enhancing community space by re-designing and re-activating the streetscape. But it faced multiple challenges.

Greyfield Precinct Renewal (GPR) has been conceived as a new property development and process model designed to enable (a citizen-led) aggregation of individual residential properties into a consolidated precinct capable of being redeveloped under a new class of zoning (GPR Zone or development overlay) that enables regenerative medium density precinct redevelopment. GtG was initiated in 2009 as an urban transitions project – an area where there is a growing focus in planning studies [35, 54-56] that reflect the magnitude of challenges now facing cities and the transformative responses required to achieve sustainable urban development. It combines the socio-technical urban transition theories of Grin et al [57] and Newton [18,37] with the transition management methods and sets of participatory processes articulated by Loorbach [58] by which a model for change involving niche innovation is identified, examined and implemented. In the GtG project, several domains where specific innovation related to GPR was required were identified from an initial 12 month engagement with over 70 thought leaders and front-runners in a series of workshops that created the over-arching programmatic framework [47]. It was centred around developing implementable tools, instruments and processes linked to four fundamental questions:

- **Where** to encourage GPR? This necessitated development of multi-criteria spatial analytic tools (ENVISION; see Fig. 8) that could be used to locate contiguous residential land parcels with high redevelopment potential. These have been developed and applied at metropolitan and municipal levels in Australia and New Zealand [59].
What to design for the precinct? Focus here is on urban designs for medium density redevelopment that provides higher yield and is regenerative for energy, water, waste, mobility and greenspace [36, 37]. Aligned to this, it was also critical to ensure that precinct designs could be assessed against performance benchmarks (beyond BAU) by software developed specifically for this purpose [38].
Who will be attracted to this type of housing? A significant and identifiable market has been identified for new medium density housing in the established suburbs of Australian cities. Recent surveys (61,41,54) indicate that there are significant markets for ‘urban’ as well as ‘suburban’ living. Indeed, preferences for both are now equally matched (see Table 1).

Table 1: Preference for urban living arrangements (Source: 54)

<table>
<thead>
<tr>
<th>If you had to choose between the three living arrangements below, which would you prefer?</th>
<th>Sydney</th>
<th>Melbourne</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate dwelling with a garden in a suburb where there is poor public transport</td>
<td>Count</td>
<td>432</td>
<td>452</td>
</tr>
<tr>
<td>%</td>
<td>45.2%</td>
<td>46.1%</td>
<td>45.7%</td>
</tr>
<tr>
<td>Medium-density dwelling with no garden, but close to public transport</td>
<td>Count</td>
<td>435</td>
<td>448</td>
</tr>
<tr>
<td>%</td>
<td>45.5%</td>
<td>45.7%</td>
<td>45.6%</td>
</tr>
<tr>
<td>High rise apartment in CBD or surrounding inner city neighbourhood</td>
<td>Count</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>%</td>
<td>9.3%</td>
<td>8.2%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>956</td>
<td>980</td>
</tr>
<tr>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The supply side of the housing market is also beginning to respond as revealed by recent trends in dwelling approvals, where units (predominantly inner city high rise apartments) are now accounting for more than half of all approvals in the major capital cities [62,63]. Medium density developments (low and mid-rise) are lagging in all cities, however, as a type of product (the ‘missing middle’; Fig. 10) as well as the scale on which it is delivered (most medium density occurs as a knock-down-rebuild on a small lot subdivision resulting in between 2 and 4 new townhouses (Fig 11).

There appears to be a market failure in relation to the current cost premium associated with delivering mid-rise medium density housing in the middle suburbs of the major cities (Fig 12). This inhibits downsizing among the two thirds of households aged 60-80 that are living in under-utilised residential property [47].
• How to achieve acceptance of GPR by the four principal stakeholder groups (state and local government, property developers, community) in a liberal democratic society with 3rd party planning provisions and an increasingly volatile electorate when exposed to planning proposals for local change (NIMBYism). Over the past six years GtG Project has been engaged in development of innovative approaches to implementation of GPR (Greyfield Precinct Renewal) involving additional applied research related to:
  • New processes and instruments for stakeholder engagement
  • New planning instruments at state and local government level capable of enabling GPR

In 2016, the Victorian state government responsible for metropolitan planning of Melbourne introduced a new policy statement in Plan Melbourne Refresh ([64] p.44-45): "...supporting greyfield renewal and investigating planning scheme mechanisms to achieve coordinated and sustainable renewal of established suburbs... Greyfields are residential areas where the building stock is near or

---

Fig. 11 Urban infill- what’s actually happening (Source: [34])

<table>
<thead>
<tr>
<th>Residential Infill yields of Projects, Melbourne, 2004-2010 (% total field)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownfield</td>
</tr>
<tr>
<td>Greyfield</td>
</tr>
<tr>
<td>Totals (%)</td>
</tr>
<tr>
<td>(N)</td>
</tr>
</tbody>
</table>

Fig. Cost differential in delivering new housing in greenfields and greyfields (Source; [34, 47])

- Net new housing infill < 50% (Metb.)
- Brownfields attractive for high rise
- Most greyfield redevelopment - KDR (low yield)
- Public transport access not a magnet for attracting high levels of infill
- CBD is only activity centre with high infill
- Medium density dwelling types likely to be in precinct scale projects significantly under represented in Metropolitan infill

Source: Newton & Glavich (2014) Understanding Infill

[Image: Fig. 11 Urban infill- what’s actually happening (Source: [34])]

[Image: Fig. Cost differential in delivering new housing in greenfields and greyfields (Source; [34, 47])]
ending its physical life and land values make redevelopment attractive. Melbourne has many residential areas like this that are typically subject to uncoordinated small-scale infill development which delivers a suboptimal outcome…Greyfield areas are a vision of precinct planned infill that provides local government and the community with a framework to better direct and achieve more sustainable outcomes from small scale cumulative change in residential areas. While greyfield renewal is a new and untested concept, over time with appropriate policy support this may change. The concept of renewing industrial areas (brownfield renewal) is only 25 years old but is now well understood and accepted. Plan Melbourne can help initiate this form of innovation which will become more feasible and attractive as the city’s housing stock ages”.

In May 2017, the Victorian government released Plan Melbourne 2017-2050 – its strategic plan for Melbourne’s long term development – and incorporated greyfields redevelopment as an explicit policy for the first time (Policy Direction 2.2.4 [65]).

We are now at a critical juncture in relation to accelerating and scaling up precinct scale greyfield residential renewal into a broader based urban transition process. It is at this stage where a gap appears in transition theory and transition management (TM) models capable of guiding the niche innovations created and trialled in a ‘shadow’ TM process into the urban mainstream. Transformative capacity is that gap.

4. Implementation Challenges: Enhancing Transformative Capacity of Stakeholder Groups

Urban (greyfield precinct) regeneration clearly requires a level of transformative capacity to be present in the four stakeholder groups identified. Here transformative capacity refers to an ability to anticipate and plan for change in the context of slow burn pressures such as population growth and climate change as well as to disturbances associated with extreme events, where adaptive capacity tends to be the more critical focus [66]. In the long run, slow burn urban pressures can be more disruptive if transformative capacity is lacking within the city system. According to Griffith [67] transformative capacity can also be seen to embrace both forced transformations, such as those imposed by governments as a result of planning decisions such as re-zoning; and active transformations that are intentionally instigated from ‘within’ stakeholder groups in response to perceived threats or change to their domains (eg. resident reaction to changing ‘character’ of neighbourhood). The topic examined in this paper required a meshing of transition theory and planning theory, especially in relation to attempts made by the latter to integrate ‘top down’ with ‘bottom up’ planning paradigms [68,69].

State government capacity

In Australia, state governments have the responsibility for urban land use planning and development devolved from the federal government under the Constitution. A review of current metropolitan strategic plans for all the major cities reveals uniformity in their aspirational goals linked to the Council of Australian Government’s (circa 2009) objectives for Australian city performance: competitive, productive, liveable, sustainable, resilient and inclusive; as well as more recent additions that include creative, smart, safe etc. There are also a set of spatial goals, including compact city and 30 minute city. There is significant alignment to the New Urban Agenda Goals articulated at Habitat 3 (https://habitat3.org/the-new-urban-agenda). State governments have
struggled, however, to realise these goals via their recent sequence of metropolitan strategic plans and implementation mechanisms. There are a number of reasons for this, prime among them being a lack of capacity to undertake urban planning that is vertically and horizontally integrated. Horizontal integration is hampered by the existence of multiple ministries, each of which have roles and responsibilities in planning parts of an urban system: industry, housing, transport, energy, water, waste, education, health etc. Vertical integration involves ensuring important connections exist between state, federal and local governments, where jurisdictional and political differences frequently interfere with a ‘joined up’ approach to city planning and development. Until recently, the Australian government had absented itself from the ‘cities’ arena, despite the fact that over 80% of both the nation’s population and GDP are concentrated there [35].

Another major reason why urban innovation and change is slow and disjointed is due to the strength of regimes that are associated with the property development industry that lobby state governments on planning instruments (eg. zoning, building performance regulations etc) and projects (much capital city development is developer-led and therefore not necessarily delivering optimal city-wide or community benefit). These regime pressures are unlikely to diminish. However, there are signs from recent decisions associated with the establishment of the Greater Sydney Commission (http://www.greater.sydney/) of the need to be more radical and transformative in city planning metropolitan governance capacity. Time will tell.

Local Government Capacity

In a comprehensive review of Australian local government planning agencies by the Productivity Commission [48], the increasing complexity of the urban development process was noted along with the often conflicting needs of different stakeholders – the result being that the costs of reaching community consensus are high in liberal democratic societies, especially those that also have third party appeal planning provisions. In an urban planning system that remains strongly top-down, local government provides the principal interface to the local community and property developers as a result of their role in the development approval process. They are under-resourced for this. It is not unexpected therefore, that community attitudes to local government’s effectiveness in city planning are negative. Extensive surveys conducted by the Productivity Commission [70, p.xxxviii] revealed only 15% of Sydney residents considered their local governments to be ‘effective in planning’; 14% in Melbourne; 17% in Brisbane and 21% in Perth.

As the third tier of government, municipalities have a limited source of revenue linked to levying rates on property – overseen (and capped) by state government. This translates into a comparatively weak capacity to respond to the multiple challenges associated with urban redevelopment in established suburbs. Prime among these is a general lack of ability as well as willingness to vertically align with state government’s strategic planning policy for municipalities within the metropolitan region. Council officers have difficulties with Development Approval (DA) submissions that attempt to push the envelope, frequently abdicating their responsibility and leaving it to the third party arbiter (in Melbourne the Victorian Civil and Administrative Tribunal) to adjudicate [71]. New GPR projects are exerting pressure on municipal planning officers in relation to their ability to develop and align their local development strategies, assess new medium density precinct proposals in relation to their performance on key sustainability dimensions (viz. determining the community cost-benefit) and engage with property owners and developers in this process. Given the general
reluctance of residents to embrace neighbourhood change, elected municipal councillors tend to align with their ratepayer voters in resisting change to ‘neighbourhood character’ and ‘overdevelopment’. Often this is reflected in municipal government’s gaming of the state government’s residential zoning schemes to ensure housing is ‘locked up’ in minimal change zones [39]; effectively indicating that more intensive infill housing should happen ‘somewhere else’ (typical NIMBY syndrome).

Property Development Industry Capacity

As is common with many sectors of Australian industry, property development tends to be risk averse and has low investment in research and innovation [72]. Even more so in the housing sector, where its two major industry associations, the Master Builders Association and the Housing Industry Association, represent the public face of an industry that opposes most government attempts to introduce new standards and regulations designed to lift minimum performance of buildings much less drive for world’s best practice. It required a federally funded Building Better Cities Program in the early 1990s to bring government (at state and local levels) and property developers together to create a model for higher density brownfield redevelopment that is now in widespread use [49, 51]. The current challenge for urban infill centres on the need for a model process to guide precinct scale medium density redevelopment in the greyfield suburbs where there is a major undersupply of this type of dwelling – now referred to as ‘the missing middle’ [52,54]. Development guidelines for medium density precincts are now being released for comment in both Sydney [73] and Melbourne [74].

Engagement with property developers at the outset of the GtG Project clearly identified the barriers to GPR, principal among them being the absence of urban design guidelines and related statutory planning instruments for medium density precinct redevelopment that would establish an ‘as of right’ building envelope (the development model), areas appropriately zoned for such redevelopment (thereby minimising resident appeals) and the time (cost) involved in consolidating land parcels. The pattern of medium density approvals in Australia’s four largest cities reflects the barriers that this class of development has faced to date to achieving greater take-up: slow recognition of underlying demand by industry [75,76]; poor urban design responses [77] and restrictive government policies. KDR on individual greyfield sites, however, has been quickly embraced by the property development industry since it represented the application of a well-established greenfield model of housing design and delivery appropriate to existing planning and building regulations in the low density greyfield suburbs where infill was being encouraged.

There is a deeper problem, however, related to the capacity of the building industry to respond to the urban infill medium density challenge. A leader of the Australian building and construction industry has summarised it thus: “Australia’s housing industry has some serious shortcomings that can no longer be avoided. This goes beyond the way land is subdivided. The capabilities needed to design and build small scaled medium density housing projects of three to 10 dwellings up to three storeys atop below grade parking have yet to be developed. If medium density dwellings of the type described here are to make up a third of the housing landscape, a new marketing platform and delivery model will be required. These will not be offered from the traditional builder display village. New design, procurement and construction skills will be necessary. Only financially viable builders who display a new level of professionalism will be trusted to take on these projects. The industry
must shift from its current level of denial of these realities. If governments are seriously minded to harvest the potential of grey-field sites and the urban middle, they will not only need to bring the community along in support of these more modest densification initiatives, they will need to be proactive in making sure the housing industry has the capabilities to deliver them. This is a challenge for the housing industry. It is not a market that general contractors understand or have an aptitude for. This is an opportunity for the first movers in this space to realise the potential of adapting their old project housing delivery model into a modern version of ‘build to order’ multi-unit.” [78].

Community Resident Capacity for Change

For over a century, the urban fabric of Australian cities has been able to transition from that of a walking city to a transit city and subsequently to an auto city as a result of the transport technologies and land use configurations they have been able to support within the average 30 minute daily travel time commute [58, 59]. Residential densities declined, as lower priced land in greenfield developments offered households access to house and land packages with private front and back yards in a garden city environment. This constituted the Australian dream for the traditional nuclear family of the 20th century. A review of housing preference studies that date to the early 1990s confirms this, with detached housing consistently nominated as the favoured dwelling type by approximately 90% of capital city residents in all surveys [79].

Late 20th century forces were challenging the sustainability of continued urban sprawl as a means of accommodating population growth. Significant shifts in demographics, lifestyles, and urban economics were signalling a need to reconsider how cities were being planned, with increasing calls for urban consolidation, more compact cities and greater variety in housing provision.

Resident attitudes to neighbourhood change and densification were antithetical, however [80], leading to the formation of ‘Save our Suburbs’ movements involving local communities banding together to resist what they considered to be ‘overdevelopment’ and urban designs that changed the ‘neighbourhood character’. Transitioning from suburban to urban fabrics via more intensive forms of urban infill represented a challenge to the residents of established, more accessible suburbs to share their higher amenity space. During this period, housing in Australia’s largest cities was also becoming increasingly unaffordable, and urban research was indicating that fewer than half the residents surveyed in Sydney and Melbourne said they would prefer to live in a detached house [55]. Yet these stated preferences for medium density were not being reflected in supply. It is clear that understanding resident attitudes towards neighbourhood change and medium density housing market options constitutes an important indicator of community capacity and willingness to be positively involved in an ‘active transformation’ of the suburban fabric.
5. **Recommendations**

The recommendations advanced below flow from the research presented above and relate to potential federal level initiatives:

- **Greyfields regeneration** has emerged as a greater challenge in transitioning cities than brownfields in the late 1980s in Australia; a ‘wicked’ challenge. An equivalent program to that of *Building Better Cities* is required, since there are multiple challenges involving multiple stakeholders if precinct scale redevelopment is to be triggered, based on citizen-led property amalgamation. *Greening the Greyfields* has pioneered necessary innovation in multiple domains, but requires scaling up and accelerating under Smart Cities and Suburbs (or equivalent) Programs.

- Assembling *research expertise* in a timely fashion to address a range of urban development challenges is a pressing issue. There are several federally-funded national urban research networks (CRC for Low Carbon Living, CRC for Water Sensitive Cities, CRC for Spatial Information, Bushfire & Natural Hazards CRC, AURIN, AHURI etc., as well as more than a dozen university urban research Centres) that could be better engaged, if there was a process capable of focusing the expertise. **Research Synthesis studies** pioneered by CRC for Water Sensitive Cities have created a new research ecology that can focus on visionary solutions to a particular urban planning problem by bringing key government and industry stakeholders together with experts in a process that delivers innovative blueprints for regenerative precinct development within a short timeframe (see Ideas for Fishermans Bend [51] – a collaboration between CRC for Water Sensitive Cities and CRC for Low Carbon Living).

- The federal government has initiated a National **Cities Performance** Framework and produced an interim report. This is to be commended and it should form the basis for more probing State of Australian Cities Reports (identifying problems and hot spots; tracking progress etc.). There are critical gaps, however, as illustrated in this submission eg. tracking key urban performance targets such as urban infill, cost of delivering (constructing) different dwelling typologies, at different scale of project in different locations etc....all based on data held by governments at different levels. A continuing deficiency is in Australian State of Built Environment reporting which is meant to report every 5 years on the quality (liveability) of the physical (built) environment in which all Australians live. There has been continuous under-resourcing of this process since its inception. A nested approach that capitalises on local and state government activity in this space, co-ordinated and ‘scaled-up’ by federal government would appear to be a more efficient and effective approach.

- There are a set of **urban analytics**, urban design, urban performance assessment and visualisation tools developed independently across several CRCs (Low Carbon Living, Spatial Information, Water Sensitive Cities and Bushfire & Natural Hazards) that need to become better integrated as part of a national digital built environment platform for supporting BIM, PIM and CIM – via a digital urban pinboard - a necessary resource for 21st urban planning and urban design that can engage experts as well as citizens in transitioning Australian cities.
References


4. P.Newton (2016) Delays at Canberra: why Australia should have built fast rail decades ago, The Conversation, April 13


10. Economist Intelligence Unit (2017) Liveability Index


16. Coleman, S. Australia state of the environment 2016: built environment, independent report to the Australian Government Minister for the Environment and


34. Newton, Peter “Unlocking the Greyfields” at AHURI National Conference on Affordability and Liveability in Our Cities, Melbourne Convention and Exhibition Centre, 29 June, 2017
38. Shrinkthatfootprint 2017 http://shrinkthatfootprint.com/how-big-is-a-house
43. S. Glackin and P. Newton (2017) Assessing the capacity for urban infill in Australian cities, Architecture, Media, Politics & Society
44. Australian Government, 2017, National Cities Performance framework, Govt of Australia, Canberra
47. Peter Newton, Shane Murray, Ron Wakefield, Catherine Murphy, Lee-Anne Khor and Tom Morgan (2011) Towards a New Development Model for Housing Regeneration in Greyfield Residential Precincts, Final Report no. 171, Australian Housing and Urban Research Institute, Melbourne


63. HIA Economics (2014) Dwelling unit commencements for states and territories [Online],


69. Pissourios, I. Top down and bottom up urban and regional planning, European Spatial Research and Policy, 2014, 21, 83-99.


71. Morris, S Third party participation in the planning permit process, VCAT, Melbourne, 2005.


78. Chandler, D. Shutting the garage door after the car has bolted, Sourceable, 2016, November 10; https://sourceable.net/shutting-the-garage-door-after-the-car-has-bolted/
