Sustainable Built Environment National Research Centre AUSTRALIA

Liveable Social and Affordable Higher Density Housing: Review of Literature and Conceptual Framework

Report No. 1

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EXECUTIVE SUMMARY

Liveability and accessibility in higher density urban housing and precincts is critical to maximise investment and minimise future risks to our community. This research project will deliver a *Liveability Framework for Medium to High-density Social and Affordable Housing,* which can be used to develop project and precinct-based, value-focussed standards and targets to drive adoption of better outcomes and promote community acceptance of delivering whole-of-life solutions.

This research project is investigating and developing our understanding of liveable and accessible social and affordable housing[1] and associated opportunities with a focus on medium- and high-density urban precincts. Topics addressed include: key liveability outcomes; the adoption of liveable design outcomes; better understanding the value equation; and forward thinking. In-depth exploration of these topics is needed in order to maximise future infrastructure benefits and minimise future risks. The three key focus areas for this research are: built form and urban design, and the creation of social and economic value; building an understanding of government's role in shaping industry structure and driving new urban forms; and improving the adoption of liveable design outcomes**.**

This report presents the findings of a review of literature, which has informed the conceptual framework presented in Section 2 and the draft liveability framework included in Appendix E. This review has considered the available literature around: liveability; accessibility; cost benefit including broader social implications; the regulatory and policy environments effecting both Queensland and Western Australia; adoption and barriers to the uptake of liveable and accessible design; and a series of best practice examples. These findings will also guide two case studies, which will be undertaken from October 2020 to May 2021 in Queensland and Western Australia, designed to develop and test the final framework.

This investigation has also been informed by prior Sustainable Built Environment National Research Centre research including: the 9 impact domains (Rethinking Social Housing - Project 1.31); the *composite return on investment approach* (Valuing Social Housing - Project 1.41); diversity in housing typologies and social procurement criteria (Procuring Social and Affordable Housing - Project 1.54) how to better leverage innovation through industry transformation (Integrated Project Environments - Project 2.24); network groupings and elements (Mapping the Australian Social and Affordable Housing Network Project 1.61) and the *precinct design framework* (Sustainable Cities of Tomorrow - Project 1.62).

All these inputs will inform the final *Liveability Framework for Medium to High-density Social and Affordable Housing.* This draft matrix (Appendix E), developed in parallel to the review, will be further developed and tested in the coming case studies. The matrix currently has five key elements: liveability (place-based); accessibility (person-centred); the value equation (cost benefit); the regulatory and policy environment; and adoption and overcoming barriers. Within these elements there are currently over 30 sub-elements. For each of these the relationship to various *network stakeholder groups* and *impact domains* are identified. This will provide an understanding of parties with whom engagement will need to occur and in what context impacts can be considered to guide uptake and adoption of improved liveability and accessibility in urban housing precincts.

[1] See Appendix B Dwelling typologies - for examples of medium and higher density housing typologies.

1 BACKGROUND

Liveability and accessibility in medium- to high-density urban housing and precincts is critical to maximise investment and minimise future risks to our community. This research project will deliver a *Liveability Framework for Medium to High-density Social and Affordable Housing,* which can be used to develop project and precinct-based, value focussed standards and targets to drive adoption of better outcomes and promote community acceptance of delivering whole-life-solutions.

The project is investigating and developing our understanding of liveable[2] and affordable higher density housing[3] and opportunities, with a focus on medium- and high-density urban precincts (including transport hubs), through addressing:

1) Key liveability outcomes: accessibility in both medium- and high-density social and affordable housing developments and urban precincts.
2) Adoption of liveable design elements – including highlighting successful best practice examples and identifying pathways for adoption and barriers preventing uptake of liveable design features in homes and urban precincts.
3) Understanding the value equation – capturing and demonstrating social and economic benefits to the broader community (including whole of life costing)
4) Next generation thinking: forward thinking is needed in order to maximise future infrastructure benefits and minimise future risks associated with medium- and high-density mixed tenancy urban environment. Being responsive to changing demographics is also central to this thinking.

The three key focus areas for this research are:

1) *Built form and urban design and the creation of social and economic value* – through the lens of liveability. Nine domains identified in Project 1.31 (community and culture, economy, education, environment, employment, health and well-being, social engagement and urban amenity) will inform this area and identify social, cultural and economic value of housing.
2) Build an understanding of *government's role* in shaping industry structure and driving new urban forms (around next level liveable housing outcomes and livability issues for higher density urban precincts) especially with regards to regulation and adoption (with an awareness of tax/funding models)[4].
3) *Improved adoption of liveable design* **-** to better ensure universal access the need exists to go beyond the implementation of minimum housing standards for liveable design (e.g. corridor widths, hob-less showers, door widths to avoid retrofit, potential noise and visual stimuli) for specific cohorts. This research will take a 'what next' approach premised on the need for enhanced access in housing and urban areas across many stages on a person's life (e.g. disability, aging, child rearing). Key issues to be considered are: beyond the minimum; how to drive adoption; how to demonstrate value and benefits.

This report presents the findings of a review of literature (both academic and industry) which has informed the conceptual framework presented in Section 2 and the draft liveability framework included in draft form in Appendix G. These findings are also guiding the two case studies which will

[2] This term is inclusive of universal housing design and additional urban based liveable design feature to be detailed in the *Liveable Social and Affordable Higher Density Housing* framework currently under development.
[3] See Appendix B Dwelling typologies - for examples of medium and higher density housing typologies.
[4] P1.54 *Funding and Financing* Report and P1.61 network maps and analysis can inform this.

be undertaken from October 2020 to May 2021. All these inputs will inform the final *Liveability Framework for Medium to High-density Social and Affordable Housing.*

> *These are complex problems and the indicators used to identify the number of people affected, and other information relied on to quantify the benefits, are imperfect. As such, there is significant uncertainty around our estimate of the size of the problem and for some problems we have estimated a range.* ■ *Based on the information available, we estimate that the costs associated with a lack of accessible housing could be in a range between $2.2 billion and $2.7 billion per year, with a central case estimate of around $2.5 billion (based on 2018 data) (table 1). As we have primarily relied on data from the SDAC, this mostly includes the costs for people with permanent disabilities (defined as longer than 6 months).* ■ *If these costs increase in proportion to the number of people with accessibility needs, we estimate that these costs could reach around $4.5 billion over the next 40 years (chart 2.28). The 'size of the issue' can be thought of as the societal costs — including social and financial costs incurred by people with mobility-related disability and their families and friends, costs incurred by governments, as well as broader societal costs — that could be avoided if everyone lived in accessible housing. Given that much of the existing housing stock does not include all relevant accessibility features, it would not be possible to achieve these potential benefits through changes to the NCC, which apply only to new buildings and new building work.* (Centre for International Economics 2020, 3)

Table 1 Estimated Size of the problem

	Low estimate	*Central case*	*High estimate*
	$ million	*$ million*	*$ million*
Safety-related costs	*41.85*	*57.35*	*71.30*
Additional time in hospital/transition care	*234.59*	*234.59*	*234.59*
Loneliness-related costs	*85.78*	*194.27*	*302.76*
Home modification costs	*599.63*	*599.63*	*599.63*
Additional carer-related costs	*699.42*	*699.42*	*699.42*
Additional moving costs	*14.27*	*28.73*	*43.18*
Premature/inappropriate entry into aged care	*170.17*	*263.04*	*381.24*
Loss to the community	*388.82*	*388.82*	*388.82*
Total	*2 234.52*	*2 465.83*	*2 720.93*

Source: CIE estimates. (Centre for International Economics 2020, 3)

CIE report recommendations:

Based on the preliminary evidence gathered for the Consultation RIS, the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits under the central estimates for all of the Options tested. ■ *Given the uncertainty around the feasibility of some Options, we recommend that consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternatives* (Centre for International Economics 2020, 11)

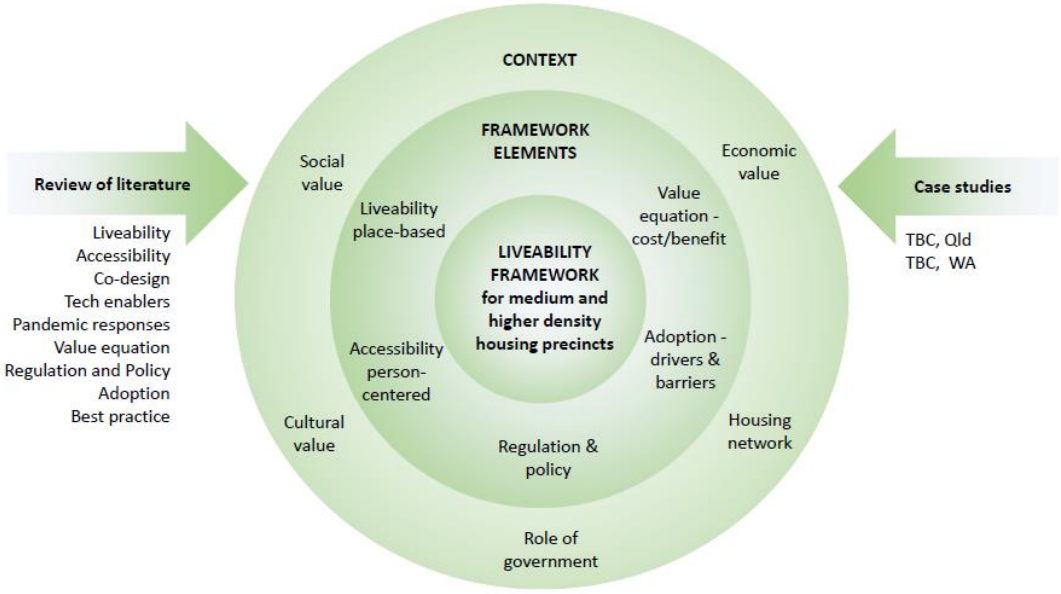
2 CONCEPTUAL FRAMEWORK

The conceptual framework (Figure 1) and the final *Liveability Framework for Higher Density Social and Affordable Housing* (draft in Appendix G) will be developed through inputs from this review of literature.

This investigation has been informed by prior Sustainable Built Environment National Research Centre research including:

- Integrated Project Environments - Project 2.24 - leveraging innovation through industry transformation.
- Rethinking Social Housing - Project 1.31 - the 9 impact domains.
- Valuing Social Housing - Project 1.41 - the Composite Return on Investment approach.
- Procuring Social and Affordable Housing - Project 1.54 - diversity in housing typologies and social procurement criteria.
- Mapping the Australian Social and Affordable Housing Network - Project 1.61 – social and affordable housing network participant groupings and elements.
- Sustainable Cities of Tomorrow - Project 1.62 - Precinct Design Framework for Sustainable Centres of Tomorrow

Figure 1 – Draft conceptual framework for liveability framework



The liveability framework has been developed and cross-referenced in parallel with the review of literature to ensure alignment with the various academic and industry inputs including regulations, policies, strategies, guidelines and best practice examples.

Key principals underlining this framework include:

1) Housing should meet whole-of-life needs across a range of ages and abilities, and support people who choose to age in place.
2) Medium and higher density housing precincts should foster integration and inclusion, and not lead to physical or social segregation.

Five key headings have been identified to date for the framework:

1) Liveability – place based
2) Accessibility – person centred
3) Value equation and cost benefit
4) Regulation and policy environment
5) Adoption and overcoming barriers

3 LIVEABILITY AND LIVEABLE DESIGN

The Australian Institute of Health and Welfare (AIHW) define disability as 'an umbrella term for any or all of the following components, all of which may also be influenced by environmental and personal factors: impairment—problems in body function or structure; activity limitation—difficulties in executing activities; participation restriction—problems an individual may experience in involvement in life situations' (Australian Institute of Health and Welfare 2020). They highlight the following:

1) 1 in 5 Australians are estimated to have a disability, which approximately equates to 4.3million people.
2) 24 percent of adults with disability experience very good or excellent health, compared with 65 percent of adults without disability.
3) 32 percent of adults with disability experience high/very high psychological distress, compared with 8 percent without disability.
4) 48 percent of working-age (aged 15–64) people with disability are employed, compared with 79 percent without disability.

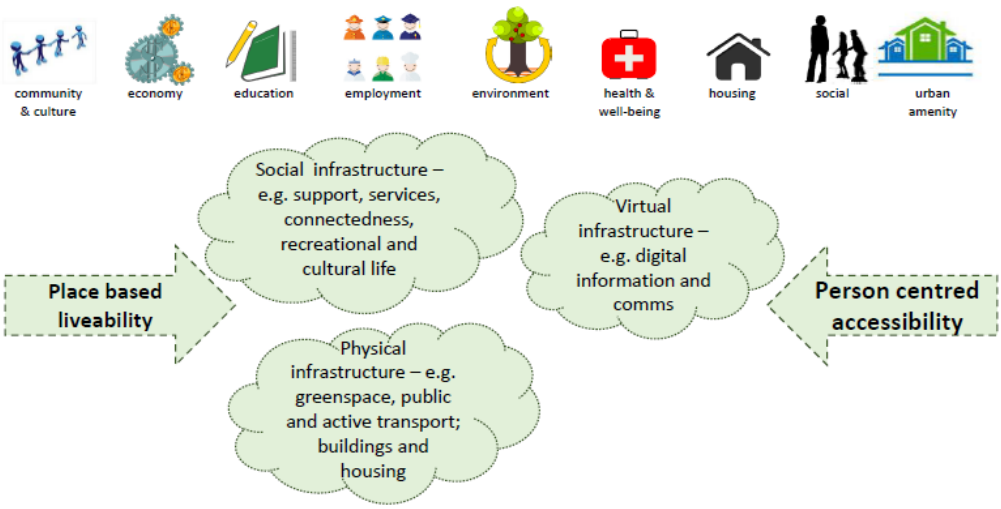
Liveability in the context of this research considers two key themes: (i) place-based liveability; and (ii) person-centred accessibility.

This review of literature builds upon this foundation with the aim of establishing the set of elements and sub-elements identified for inclusion in the draft liveability framework. The following points highlight some of the other high-level inputs, which also inform the framework,, which are further expanded in the body of this report.

1) Research undertaken in the context of the nine impact domains established in the previous *Rethinking Social Housing* project.
2) The first of the six priorities listed in the *National Disability Strategy* i.e. 'inclusive and accessible communities - the physical environment including public transport; parks, buildings and housing; digital information and communications technologies; civic life including social, sporting, recreational and cultural life (Council of Australian Governments 2011, 10).
3) AHURI note three elements of liveablility being: domestic comfort and health; access to open space; and access to appropriate social infrastructure (AHURI 2020a).

To this, we add access to appropriate physical and virtual infrastructure (Figure 2).

Figure 2 – Key themes - liveability and accessibility



Stakeholder feedback from the Australian Building Codes Board (ABCB) Accessible Housing Regulation Impact Statement (RIS) process has also been reviewed as a part this research. Elements of importance highlighted as part of the consultation include (Australian Building Codes Board 2019a):

1) Housing affordability
2) Equity and fostering independence
3) International obligations
4) Homes that are safer and easier to use
5) Aged care reform; principals of universal design
6) Policy evolution and cultural change
7) Alternatives to regulation.

The ABCB Accessible Housing Options Paper – Consultation Report highlights 'people who can be disadvantaged by current housing stock can include: people with disability; people affected by another's disability; seniors; parents with infant children; people recovering from injury or surgical procedures, carers and support workers; taxpayers funding home modifications under the NDIS or other government schemes' (Australian Building Codes Board 2019, 38).

Section 14 of the above report also notes the following benefits: health benefits; community participation and inclusion; and qualitative and societal benefits. The submission to the Options Paper by Dr Penny Galbraith suggests that 'over 1/3rd of Australian households contain a person with a disability; 45% of all Australian households contain a person living with a long term health condition; 1 in 5 Australian reported living with a disability, mostly a physical condition; 40% of the population either identify with disability or have a long-term health condition, such as arthritis or back problems' (Australian Building Codes Board 2019, 39).

The Australian Network for Universal Housing Design (ANUHD) found that '*Most people live in the community. Currently, 36% of households have a person with a disability (including older people) yet accessibility is required by a much broader cohort. Disability impacts on the household, especially carers, who are mainly women and children. Eighty percent of older people and people with disability rely on informal support from family, friends and neighbours. Pregnant women, parents with prams, toddlers, and people with illness or injuries also need accessible housing'.* (Australian Building Codes Board 2019, 38)

The precinct focus of this research is highlighted by a report on an evaluation of the WA 'Liveable Neighbourhoods' planning policy (Hooper, Knuiman et al. 2015). Whilst the focus is primarily suburban, insights can be gained from this. The paper includes a listing of 'objective measures of the community design, movement network, lot layout and public parkland requirements from the Liveable Neighbourhoods policy' (Table 2). The table includes additional details regarding each of the below items, which can be used to inform the liveability framework.

Table 2 – Compiled from Objective measures of the community design, movement network, lot layout and public parkland requirements from the Liveable Neighbourhoods policy

COMMUNITY DESIGN
Access to Neighbourhood Centres
Configuration of Neighbourhood centre accessible within 1600 m
Diversity of Destinations within Neighbourhood Centres
Access to Public Transport
Access to Primary Schools
MOVEMENT NETWORK
Connectivity of the Street Networks
External Connectivity
Total footpath provision
Cycling networks

Streetscapes – Trees along footpaths
LOT LAYOUT
Residential lot size
Lots near neighbourhood centres (within 400 m service areas)
Housing diversity development-wide
Dwelling types near neighbourhood centres (within 400 m service areas)
PUBLIC PARKLAND
Amount and type of parks
Access to parks

Source: (Hooper, Knuiman et al. 2015)

3.1 Building on AHURI research

The delivery of accessible and liveable high-density social and affordable housing is strongly linked to economic constraints and financial drivers, planning regulations and governance as well as regulated design principles and building legislation. The research produced with the AHURI support has been crucial to creating a solid understanding of the main issues related to these areas, and how the interaction of the different forces have over time shaped Australian housing stock. We can divide the AHURI literature covering these issues into two main subjects: (i) design and governance; and (ii) integrated services and housing.

3.1.1 Design and governance

Design plays a significant role in the delivery of accessible dwellings. The latest research by Easthope et al. (2020) pinpoints design quality, both at the building and neighbourhood scale, as critical in medium and higher density housing and precincts. In particular, the enquiry into apartment living in Melbourne and Sydney reveals how, for lower-income residents, accessibility to a variety of physical infrastructure are essential in building a strong social infrastructure. Above all, local community supporting community engagement programs and community-led activities are important. Easthope et al., building on Parkinson et al. (2014), links the quality of apartment design and the presence of good infrastructure, to residents' wellbeing and satisfaction.

Local services and facilities are also considered as drivers for social networks, creating processes of commonality that supports a sense of control of local public space (Atkinson 2008). The literature review produced by Maclennan et al. (2015, 36) suggests that 'public investment in infrastructure and this includes housing, can have subtle, sometimes small but catalytic effects for people and places'. For example, housing and neighbourhood outcomes can impact inhabitants' health, and childhood learning (e.g. school dropout rates and overall performance) and development (e.g. sense of safety, belonging and pro-social behaviour). Maclennan et al. also highlight how neighbourhood and locational choices may also impact health through a range of mechanisms, in particular, the relationships between walkability and health. The report highlights walkability, which is not only related to residents' physical activity but 'reflects land use patterns, residential densities and street layouts, as well as access to public transport' (Maclennan et al. 2015, 41). This research also pinpoints the link between high-density environments (housing and infrastructure) and productivity. It identifies an increase of literature speculating on how high-density environments appeal to managerial and professional workers, particularly those belonging to younger age cohorts. This is based on the assumption that proximity can support productivity, encouraging the formation of new business relationships and/or promoting their continuation.

The research conducted by Easthope et al. (2020), however, identifies significant constraints in the delivery of infrastructure and amenities. This relates to the planning process and coordination as well as securing funding (i.e. developer contributions, voluntary and/or negotiated agreements) between State and local managed urban re/developments. State-led projects had higher coherence in the governance of process and outcomes, but lack in local engagement; while the locally-led processes present the opposite problem.

Easthope et al. (2020) also discuss the importance of connectivity. While the case studies were designed with a strong emphasis on public and active transportation, they all suffered from a lack of parking areas and car congestion. The authors identify two leading causes: (i) proximity and easy access to major roads; and (ii) geographical location strongly connected to the job market that requires car use. These findings tie in with the Pill et al. (2020) enquiry on strategic spatial planning opportunities (i.e. place-based models such as 'city deals'). These authors call for a rethink of the physical connection between employment opportunities, affordable housing and transportation for low-income households. They also highlight the importance of a strong link between good strategic spatial designs and governance.

A 2020 AHURI Brief examines the impacts of 'living locally' in light of COVID-19. Especially of interest are issues of access to open space and appropriate social infrastructure (AHURI 2020a).

With regard to governance and providing adequate financing support to housing and services, Pinnegar at al. (2011) discuss a range of international examples where cross-sectoral partnerships have been used within the housing and urban policy context. While the broader housing supply/housing market issues addressed by this report are beyond the scope of this research, their findings provide useful inputs to the framework of this research project. In particular, the case study demonstrates that a flexible approach to financing rules and policy based on mixed financing strategies are critical in the successful delivery of mixed-tenure housing and neighbourhoods; as well as facilitate delivery and renewal. The WA case study, in particular, suggests how the government can play a crucial role in shaping industry outcome by putting in place contractual clauses on performance standards that encourage building optimal performance.

3.1.2 Integrated services and housing

The role for government and delivery of adequate infrastructure are particularly relevant in the delivery of housing integrated services and accessible housing. Key areas of AHURI research identified here relate to meeting the needs of Indigenous Australians including those with disabilities.

Current research related to the delivery and accessibility of housing services for urban Indigenous households predominantly aims to contribute to 'closing the gap' in Indigenous disadvantages with a specific focus on social housing (Milligan et al. 2011). Milligan et al. identify 'diversity of housing design, size and location to meet local needs, climate and lifestyles' and 'physical environment and service delivery [that respect] cultural diversity' (2011, 9) as two key required areas of research. While their research does not consider housing typology (and associated density), it highlights how the overall delivery of homes respond only to the immediate need for shelter. The study identified a lack of a broad understanding of the implication of integrated services, and how they can contribute to household 'wellbeing and rights to economic and social participation' (Milligan et al. 2011, 98). This situation seems to be exacerbated for those requiring housing with a disability. More recent research by Grant et al. (2017) specifically investigates appropriate housing for Indigenous Australians living with disabilities. The research examines the conditions and locations of housing, availability and suitability of housing modifications as well as of community infrastructure. The study reports that in the urban setting (Geelong case study), regardless of density, the challenges related to accessibility were due to age and design of the dwelling. 'The age of the housing stock was a major factor, raising concerns about the efficiency and effectiveness of modifications—where residents were aware of and able to procure these—and strategies in place to ensure liveable housing for frail, aged and disabled members of the Victorian Aboriginal community' (Grant et al. 2017, 95-6).

Sharam et al. (2018, 31) note that the failure of the Australian market to provide adequate housing for people with a physical disability is aggravated by 'numerous barriers to discoverability'. Their research highlights that this 'loss of accessible housing' together with the shortage of available stock destabilizes 'new, voluntary supply of accessible housing' (31). Policy review shows that local governments can require a certain percentage of new apartments to achieve an accessible level both on a regular or case-by-case basis. However, there is no track record/inventory of these dwellings, nor the ones that

have been modified in time to enable disabled people to continue living in their homes and communities. Moreover, Sharam et al. (2018, 35) note that it is unlikely 'that developers would market these properties as accessible'. Therefore, while there is a stock of available, accessible housing on the market, this is lost to those in need of it. The report also points out that, as accessible dwellings require specific features (e.g. appropriate bathroom, toilet and kitchen design) this can detract from the property value at the selling point, pushing the vendor to remove them before selling. Sharam et al. (2018, 36) suggest that 'in redesigning the private market for accessible housing, a key objective would be providing incentives for owners of accessible housing to reveal the information they hold about their properties'. The study recommends the use of digital platforms, similar to Airbnb, to overcome the mismatch between demands and needs. Specifically, concerning apartment supply for low to middle-income earners, the study suggests the matching markets system should focus on a better owner-occupier approach based on quality and design, to better link demand with supply.

3.1.3 Lesson learned from AHURI research

Key lessons highlighted in the above AHURI research include:

1) The high-density precincts are dependent on the delivery of infrastructure (community, transport and social).
2) Quality of apartment design has an impact on resident wellbeing.
3) Diversity of responses is required to meet the different needs.
4) Governance of the delivery process and contracting impacts building performance.
5) Age of housing stock impacts opportunity for refurbishment to meet accessibility standards.
6) Difficult to locate/track accessible housing in the marketplace.
7) Accessible features in housing negatively impact value at the selling point.
8) Apartment supply needs to focus on a better owner-occupier approach based on quality and design.

3.2 Building on SBEnrc *Sustainable centres of tomorrow*

The Sustainable Built Environment National Research Centre (SBEnrc) conducted a review of how urban centres, not just suburbs, adapt and respond to the challenges of climate change, economic development and social inclusion. This led to the development of Project 1.62 Sustainable Centres for Tomorrow. The aim of the project was to reflect on "global best practices in prioritising thriving, productive, sustainable, liveable centres, towards unlocking such potential in our Australian cities" (Caldera et al. 2019, 6), and apply the resultant framework across four urban fabrics, or case studies.

The theory of urban fabrics acknowledges 'transport-related lifestyles and functions that have needed certain physical elements and environments to enable them' (Newman et al. 2016, 431). The urban fabric consists of spatial relationships, typology of buildings and land use patterns based on their transport infrastructure priorities that are overlapping in nature. These fall within the domains of walking, transit, automobile or a combination and overlapping of all three urban fabrics. Table 3 highlights the elements and qualities of these urban fabric elements.

Table 3 - Fabric qualities across the urban fabric elements

Urban Fabric Element	Walking City	Transit City	Automotive City
1. Urban form qualities			
▪ Density	High	Medium	Low
▪ Mix	High	Medium	Low
2. Transport qualities			
▪ Car ownership	Low	Medium	High
▪ Level of service	High l.o.s for pedestrians	High l.o.s. for transit users	High l.o.s. for car users
▪ Transport activity	High ped activity	High transit activity	High car activity
3. Economic qualities			
▪ Infrastructure costs per capita	Low - Medium	Medium - Low	High
▪ Gross domestic product per capita	High	Medium	Low
▪ Labour intensity	High	Medium	Low
4. Social qualities			
▪ Difference between rich and poor	Low	Medium	High
▪ Ability to help car-less	High	Medium	Low
▪ Health due to walking	High	Medium	Low
▪ Social capital	High	Medium	Low
▪ Personal security	Variable	Variable	Variable
▪ Traffic fatalities	Low	Low	Medium to High
5. Environmental qualities			
▪ Greenhouse gases and oil per capita	Low	Medium	High
▪ Waste per capita (buildings, households)	Low	Medium	High
▪ Footprint per capita	Low	Medium	High

Source: Newman et. al., 2016, 450.

Project 1.62 developed a framework of core principles and practices that could be utilised to create outcomes from the regeneration of centres around transport nodes (Table 4). In total, seven core principles and twenty-one associated core practices were identified to ensure that urban design and infrastructure development priorities were considered.

Table 4 - Precinct Design Framework for Sustainable Centres of Tomorrow: Core Principles and Practices

Core Principles	Core Practices
1. Precinct safety and accessibility The development should be safe and healthy for people waiting to access transport nodes	▪ Human centred design ▪ Walkable urban design ▪ Place and movement design
2. Carbon neutral - positive approach The development should aim for carbon positive, being at least zero carbon, in both power and transport	▪ Solar passive design ▪ Solar active design ▪ Carbon neutral analysis
3. Local shared mobility The development should encourage diverse local modal services to access the transit service, with defined spaces	▪ Local mobility design ▪ Feeder transport design ▪ Mobility as a service
4. Property diversity The density and urban mix should contribute to urban regeneration	▪ Community engaged planning ▪ Agglomeration economy analysis ▪ Financial modelling

5. Property affordability The development should include diverse property options to provide affordable living as well as affordable housing	▪ Social housing analysis ▪ Life cycle assessment ▪ Sustainability operational analysis
6. Nature-loving and biodiverse spaces The development should include and connect biophilic and biodiverse greenspaces, supporting endemic species and habitat	▪ Biophilic design ▪ Water sensitive design ▪ Landscape oriented design
7. Inclusive, integrated place-based planning Planning, design and implementation (operation, maintenance) should involve diverse stakeholders and all tiers of government to provide an integrated place-based approach.	▪ Joined up governance analysis ▪ Partnership analysis ▪ Procurement option analysis

Source: (Caldera et al. 2019, 20)

These principles, in particular the urban fabric elements/qualities, also have application beyond the immediate urban neighbourhood to broader considerations of city/regional connectedness, and associated economic performance.

A number of case studies applied this framework across different towns, regions and settings. One of these case studies was Townsville, in northeast Queensland. A summary of the seven principles within the Framework (Table 5) highlights that priority design considerations, demonstrating a strong commitment to inclusive, integrated place-based planning processes, are integral.

Table 5 - Place-Making Framework design prompts: Flinders St - Charters Towers Rd – Ross River Road TOD corridor in Townsville

1. Precinct safety and accessibility: *The development should be safe and healthy for people waiting to access transport nodes* [Human centred design | Walkable urban design | Place and movement design]	
▪ Safe and accessible connectivity to nodes ▪ Cool and comfortable (shelters, pathways) ▪ Safe, natural and open spaces	▪ Frequent and integrated ▪ Resilient (supporting economic recovery)
2. Carbon neutral - positive approach: The development should aim for carbon positive, being at least zero carbon, in both power and transport [Solar passive design | Solar active design | Carbon neutral analysis]	
▪ Solar powered with energy storage ▪ Low carbon transport approach ▪ Hydrogen fuel cell vehicles	▪ Sustainable urban design ▪ Low embodied energy infrastructure
3. Local shared mobility: *The development should encourage diverse local modal services to access the transit service, with defined spaces* [Local mobility design | Feeder transport design | Mobility as a service]	
▪ Modernised systems – electronic ticketing ▪ Real-time data available to all	▪ Walking/jogging/bike paths that connect housing to communal amenity
4. Property diversity: *The density and urban mix should contribute to urban regeneration* [Community engaged planning | Agglomeration economy analysis | Financial modelling]	
▪ Robust and current survey data ▪ Mapped population clusters, by type	▪ Long term planning considerations
5. Property affordability: *The development should include diverse property options to provide affordable living as well as affordable housing* [Social housing analysis | Life cycle assessment | Sustainability operational analysis]	
▪ A mix of social and affordable housing lines (rent, purchase) ▪ Housing choice and diversity	▪ Medium density residential housing

6. Nature-loving and biodiverse spaces: *The development should include and connect biophilic and biodiverse greenspaces, supporting endemic species and habitat* [Biophilic design | Water sensitive design | Landscape oriented design]	
▪ Cool and comfortable ▪ Water sensitive design	▪ Natural and open spaces along and connecting corridors
7. Inclusive, integrated place-based planning: *Planning, design and implementation (operation, maintenance) should involve diverse stakeholders and all tiers of government, for an integrated place-based outcome* [Joined up governance analysis | Partnership analysis | Procurement option analysis]	
▪ Collaboration among key stakeholders ▪ Inclusive governance	▪ Working across agencies ▪ Working in partnership with the community

Source: Caldera, Desha et al. 2020, 3.

From the place-making assessment of transport and urban centres context, it is concluded that trackless tram technology and the associated enhancement of stops (nodes) along the route would provide an urban renewal mechanism for helping Townsville's residents, visitors and student populations to connect with education, services and retail. The Townsville project was focussed on well-integrated transit-oriented development routes as a novel and engaging urban renewal mechanism. As such, this research though including items relating to property diversity, property affordability and inclusive, integrated place-based planning, did not explore these items beyond their capacity to provide a mix of housing choice and to socially and economically stimulate a declining regional centre.

Further recommended reading:

1) The City of Sydney *On the Go: How women travel around our city* report is also recommended (Women4Climate 2020).

3.3 Additional inputs to liveable design outcomes

The followng have been identified as sources of additional relevant material to inform the development of the final framework:

1) Codesign – emerging approach to delivering social value in procurment.
2) Co-housing - provides a good example of how co-design can work in practice.
3) Active by design – long-standing Heart Foundation initiative.
4) Design for dignity – developed for *Barangaroo* in New South Wales.
5) US universal design guidelines – brief introduction to 2 examples in the United States (US)
6) Community building – examples of impact of apartment living on social relationships

3.3.1 Co-design

Alexander et al. (2020) highlight the need to new approaches to procurement. In order to deliver on social and environmental, along with economic outcomes, various social procurement approaches are emerging which also address the blurring of responsibilities between public, private and not-for-profit (NFP) sectors. Co-design is one of the five components in their *blueprint for delivering social value through infrastructure investment*. This approach acknowledges people as being the *experts in their own lives*. Co-design facilitates the integration of lived experience into infrastructure solutions, and empowers 'local communities and people with the platforms, skills, resources and tools to co-design their own environments, enabling decision makers and designers to challenge their own assumptions about the place-based problems' (Alexander et al. 2020, 32). This approach ensures the solutions are human-centric and facilitates a sense of shared ownership that ascertains the 'social value' created is enduring. The authors note that the level of engagement in this process 'will vary for

individual projects depending on risk appetite, project timeframe and resourcing needed to foster meaningful community agency and/or insight' (32). They note several methods for this approach, including: 'embedding human-centred methods into existing infrastructure design processes' to 'partnering with local communities to co-design and oversee infrastructure projects' (32).

The Western Australian Alliance to End Homelessness (WAAEH) aims to build capacity in that State with the publication of a review of literature and practice, including toolkits to assist in this process (WA Alliance to End Homelessness 2019). They highlight the need for the co-design of services and systems 'in response to complex issues' (8) and to optimise outcomes. Importantly they note that this approach is broadly about building a mutual understanding across the delivery system to ensure outcomes that are more effective.

Co-design can also operate in the delivery of policy along with built environment outcomes. In 2016, the WA Housing Authority undertook the *Assisted Rental Pathways Pilot* to explore new ways of offering pathways from social housing to the private rental market. The Western Australian Council of Social Service (WACOSS) partnered with Shelter WA in order 'to work with community services organisations to co-design the Pilot, drawing on the sector's expertise in delivering tailored support services for different client groups' (West Australian Department of Communities 2016). The pilot was seeking to provide pathways for up to 200 people/families (WA Housing Authority 2016). More recently, the WA Department of Communities undertook a co-design approach to their *No Wrong Door* initiative (WA Department of Communities 2020).

The co-design approach offers an opportunity to build community in higher density urban precincts. The UK Ministry of Housing, Communities and Local Government commissioned the London School of Economics and consortia of universities to undertake research into whether community housing had a positive impact on reported loneliness. They reported that "Cohousing, community land trusts, co-ops and other types of community-led housing emphasise connectedness and neighbourly support—indeed, many of them define themselves as 'intentional communities'" (London School of Economics 2020). The end date for the survey was recently extended to seek feedback on COVID19 impacts.

3.3.1.1 Co-housing

Co-housing provides a good example of how co-design can work in practice. In a review of the *Older Women's Cohousing* (OWCH) project, Helen Hopwood and Farhana Mann (2018) conclude that – especially for older people, 'cohousing may have the potential to promote socialisation and neighbourliness and improve factors affecting loneliness such as helping residents feel valued, useful and part of a community. Policymakers should consider the potential health and social benefits of cohousing to support housing strategies' (Hopwood and Mann 2018). In relation to the architectural and organisational structure of the project, 'the design of the facilities is vital in promoting social use and engagement. The architect worked with OWCH to consider acoustics and size and flow of spaces. Availability, visibility and accessibility of communal spaces support voluntary and planned interactions while layout of shared walkways, territorial boundaries, density or proximity between units and restrictions on private space can force unplanned or spontaneous interactions' (Hopwood and Mann 2018).

A study by Studio Weave Architects and the Royal Institute of British Architects (RIBA) discovered that many co-housing projects (where a component of co-design was intrinsic) were successful and incorporated high levels of social support and were less 'rare' than much commentary assumed (Ahn et al. 2018). They add that 'this is significant in that the prevailing discourse around the "exceptionalism" of co-housing in many ways rings untrue' . It may even be harmful, in that it reinforces perceptions of co-housing as uniquely challenging, calling for specialised skills distinct from those required to deliver 'standard' housing, and could even be contributing, in some small part, to its marginalisation. They go on to comment that 'the diversity of these motivations and forms of "living with more" are interesting in that they illustrate that while some forms of living closer together have

arisen from economic necessity, others have clearly emerged from shifting norms—and sheer determination—to forge alternative and more desirable ways to live'. In conclusion they express surprise that, 'at a time when "the market" provides an ever wider selection—and price points—for most goods and services, it feels odd that options for where and how we live remain so limited.'

3.3.2 Active by design

The *Australian Heart Foundation's Healthy Active by Design* website provides a source of information for public open space, community spaces, buildings, movement networks, housing diversity, and buildings. They note that 'higher density and a mix of housing produces a more diverse range of residents and this increased population, density and vibrancy tends to mean a broader range of services can be supported within walking or cycling distance' (Heart Foundation 2020a). This webpage highlights benefits including: that public transport linking areas of higher residential density forms a network of conveniently accessible destinations; higher residential density near parks and other public open spaces encourages passive surveillance; and aged-care accommodation co-located with mixed-use centres gives older residents easier access to services.

They identify the need for good movement networks to allow people to travel safely and conveniently between home, work, school and other important destinations within and between neighbourhoods (Heart Foundation 2020b). They define a *movement network* as an 'interconnected system of streets, roads and paths that accommodates pedestrians and cyclists, on-road public transport, emergency and private vehicles'. Good practice means providing movement networks that: are safe and connected; prioritise walking, cycling and public transport modes of transport, and integrate these routes to local destinations; and provide opportunities for planned and incidental physical activity.

3.3.3 Design for dignity

Design for Dignity Guidelines Barangaroo – This document includes advice from the Disability Council of NSW to inform engagement processes. It identifies the following as essential: ensure there is a balanced cross-section of representation; develop an agreed engagement protocol; provide flexibility to enable stakeholders to contribute; check to ensure engagement information is communicated in accessible formats; actively listen; close the loop on engagement; and follow through on agreed actions (Lendlease 2015).

3.3.4 US universal design guidelines

Two documents, *Universal design New York* and *Universal design New York 2* relate to universal access in that city (Danford and Tauke 2001, Levine 2003). The 2001 report proposes five building issues which need to be addressed, including: circulation systems; entering and exiting; wayfinding; obtaining products and services; and using public amenities. Together these reports provide tangible and pragmatic inputs. Table 6 lists the documents' key principles.

Table 6 – Universal design New York – Key principles

Principal 1: Equitable Use	The building is usable by anyone. It does not disadvantage, stigmatize or privilege any group of users.
Principle 2: Flexibility in Use	The building accommodates not only a wide range of individual user preferences but also users' varying functional abilities.
Principle 3: Simple and Intuitive	How to use the building is easy to understand regardless of the user's experience, knowledge, language skills or concentration level.
Principle 4: Perceptible Information	The building communicates all necessary information effectively to all users regardless of ambient conditions or the users' varying intellectual or sensory abilities.
Principle 5: Tolerance for Error	The building minimizes hazards and adverse consequences of accidental or unintended actions by all users.
Principle 6: Low Physical Effort	Everyone can use the building efficiently, comfortably and with minimal fatigue.

Principle 7: Size and Space for Approach and Use	The building provides appropriate size and space for approach, reach, manipulation and use regardless of the users' body size, posture, or functional abilities.

Source: Compiled from (Danford and Tauke 2001, Levine 2003).

The United States (US) *Centre for Inclusive Design and Environmental Access* also note 12 common universal design features in public spaces including: tactile guide paths; drinking fountains grouped with other amenities to make them easier to locate; directional signage/wayfinding cues throughout; lighting provided along outdoor pathways; nodes connected directly by pathways; resting places throughout the site; restrooms appropriately sized to support large numbers of users at the same time; signage placed within sight lines, and in alternate languages; visual and tactile warning surfaces; and walls, fences, and landscape features used for guidance to key destinations (Maisel and Ranahan 2017).

3.3.5 Community building

Gu (2020, 1363) brought together a collection of separate studies to provide insights into 'how the unique socio-spatial characteristics of Korean apartments have impacts on the social relationships among the residents based on recently conducted empirical studies'. Gu highlights that studies comparing apartment housing and detached housing have 'consistently found that the residents in detached housing have better social relations with their neighbours', suggesting that the 'the physical characteristics of apartment housing were mostly pointed out as possible reasons for this difference' (1372). Studies regarding the effects of spatial characteristics consistently 'confirm that close attention must be paid to the design of high-rise apartment housing' and that 'spatial configurations which afford casual encounters and diverse community facilities which enhance social activities will be significant for better social relations among residents' (1378). The following points from Gu's paper highlight:

a. Less distinction in layouts between public and private estates, the central location of parks and facilities, and the similar exterior design of the buildings helped with better social relations.
b. The circulation of inner roads in apartment complexes has an effect on the social lives of residents, e.g. cul de sacs.
c. The layout of outdoor spaces such as central squares in the apartment complexes located so as to be more open to the residents improved the sense of community.
d. Small open spaces, playgrounds, and plazas located in the centre of the complexes and well connected to each apartment building were better utilised and led to improved neighbour relationships.
e. Though based on limited studies, parking lots located on the ground area appear to have better community outcomes than apartments with underground parking lots.
f. When more use was made of green spaces in apartment complexes or other community facilities there was a higher sense of community and better social relations.
g. 'Facilities such as libraries and day care centres helped social interaction among residents' (1374).
h. Online communities 'played a complementary role for the offline community of apartment residents' (1374).

Chang et al. (2020) undertook a review of literature related to community attachment. They provide both quantitative and qualitative outcomes from surveys of residents in both private (commodity) and public high-density housing with some of the latter being in mixed communities. They found that additional action beyond the construction and provision of public housing are needed to enhance community attachment. This includes 'improving the layout to better meet resident needs; creating community public space that can provide opportunities for social interaction; and increasing the number of street lights, alarms, and security monitoring facilities that can enhance residents' sense of security' (Chang et al. 2020, 1354). Other relevant findings include:

a. Living in public housing did not influence community attachment.
b. Those with higher incomes are less attached to their communities, likely due to greater mobility and choice.
c. 'Perceived housing conditions and sense of security have significant positive effects on community attachment' (1341).
d. 'Lower quality of housing conditions, public services, security facilities, etc., can weaken residents' community attachment' (1354).

3.4 Pandemic responses

Whilst this element is outside the original scope for this project, feedback was sought from our partners to inform the development of the liveability framework.

'For the past decades, those looking at the intersections of planning, design, and public health have focused less on infectious diseases and more on chronic disease, hazards and disasters, and the vulnerable. The current pandemic brings the question of designing for infectious diseases back to the forefront and raises important questions for future research and practice' https://www.gsd.harvard.edu/2020/03/what-role-do-planning-and-design-play-in-a-pandemic-ann-forsyth-reflects-on-covid-19s-impact-on-the-future-of-urban-life/ (Forsyth 2020)

3.4.1 Using vacant infrastructure

In March 2020 the WA Government undertook a *Hotels with Heart* pilot, with 28 people experiencing homelessness being accommodated in Perth's Pan Pacific hotel for an initial 4 week trial period. Additional accommodation was provided for around 12 Aboriginal people at Woodman Point camp, near Fremantle. This enabled many with chronic health issues to self-isolate, get access to support services, and potentially stay out of hospital. The intent, if successful, was to scale up this pilot (Government of Western Australia 2020, Juanola 2020). The dual aim was to address health outcomes and provide economic stimulus.

The South Australian Government has also undertaken a similar initiative, housing '223 people experiencing homelessness into emergency accommodation in motels across inner metropolitan Adelaide, with food to be delivered by the Hutt Street Centre and Baptist Care SA' (Siebert 2020).

In Queensland, Atira student accommodation was used as crisis housing under the guidance of Qld Health, and with around-the-clock security and support, with meals and laundry services provided. This was undertaken in collaboration with Bric Housing, St Vincent de Paul, Mission Australia, and the Salvation Army (Boucher 2020).

3.4.2 Public Housing Estates, Flemington Melbourne

On Friday 3rd of July public housing residents in nine high-density housing estates in Flemington Melbourne were placed in a hard lockdown for an initial period of five days, without notice, to enable testing (Murray-Atfield 2020). This has affected 3000 people. These are small units without balconies, and many housing families. The Department of Housing had advised that they have been undertaking deep cleaning of properties since the beginning of the pandemic. Factors affecting the decision to do a hard lock down include:

- 'It's not about the people who are there, it's about the entire environment and the way that people interact and the issue of how easily this virus spreads', Professor Sutton said (Murray-Atfield 2020).
- Residents often share facilities like lifts, corridors, rubbish facilities and laundry rooms.
- The virus is known to last longer on surfaces with lower humidity and less sunlight.
- With social distancing rules applied, the building lifts can hold 2 people a time. These lifts service 180 apartments with nine flats on every floor.
- The vulnerability of residents.

- The Doherty Institute's Professor Lewin said that while the physical environment was one factor, it was just part of the picture. 'A lot of people in these housing estates in Victoria particularly, are in work that's essential, so they're often more likely to be exposed to infection', she said (Murray-Atfield 2020).

Also reported was a lack of hand sanitisers around the building, as well as a lack of information in languages other than English.

This case highlights the role building design needs to play in mitigating the spread of disease based on contact (and airborne, to an extent). This impacts on density typologies circulation bottlenecks, need for accessible outdoor areas (at ground or elevated) and cross ventilation. The high-density tower design typology reliant on elevators and shows little resilience in this situation. In addition, this typology, if not equipped with outdoor space standards (semi-private and private), can contribute to individual and community distress in such situations.

Further safety design issues include: enabling testing and medical support in situ while mitigating risks for further spread; implementing control measures with mitigated risks for controllers; and maintaining appropriate minimum standards for cultural social habits as fundamental part of wellbeing in order to prevent/mitigate high mental health risks.

Weedon (2020) provides a broad picture analysis of this lockdown, noting that the 'vulnerability' cited for this ranged from issues of physical layout, the health and demographics of residents and vulnerability in the governance systems surrounding public housing (Weedon 2020). This article provides multiple angles for consideration and reflection.

3.4.3 Western Australia

The WA Department of Communities provided an information pack, *Impact of COVID-19 on the WA community*, in May 2020 (Western Australia Department of Communities 2020). This highlighted short and long term socio-economic impacts and impacts around: isolation and restrictions; increased pressure on housing services, and rental and public housing supply; issues around family and domestic violence, and child protection; corrective services; regional and remote communities; financial impacts on agencies; and reductions in State revenue. It addressed these issues across a broad spectrum of cohorts including Aboriginal people, those with a disability, non-residents, children and youth and the aging cohort. Detailed data and trend information is included in this pack[5].

3.4.4 Queensland

The Queensland Department of Housing and Public Works (HPW) 'established an Immediate Response Fund of $24.7 million from existing resources to deliver enhanced housing support' (Queensland Department of Housing and Public Works 2020). An eight-point plan was stablished to support vulnerable Queendslanders. This included:

1) **Additional funding for specialist homelessness services** for those in urgent housing need to access additional services including motel or hotel accommodation and for those who need to self-isolate or need temporary accommodation.
2) **Direct assistance to identified vulnerable people** who require assistance to do so.
3) **Enhanced outreach services** to people sleeping rough in nine priority areas to encourage their continued engagement with the service system
4) Bringing forward Round 5 of the our **Dignity First Fund**.
5) **Support for older Queenslanders and people with a disability** to safely remain in their homes, self-isolate and continue to access the essential services.

[5] https://www.shelterwa.org.au/wp-content/uploads/2020/05/PUBLISHED_2020522-Social-Impact.pdf

6) **Support the private rental market** with access to bond loans, bond loan plus and rental grants for people impacted by COVID-19, using discretion in approving products for people who are not ordinarily eligible.
7) **Support for frontline housing and homelessness service providers to access and pay for casual replacement staff**, where staff are unable to come to work due to illness or self-isolation.
8) Support specialist homelessness services/providers and Crisis Accommodation Program properties to: **deep clean properties** should a COVID-19 outbreak be identified; to purchase **cleaning equipment and personal protective equipment** if required; and assisting private boarding house accommodation providers in obtaining **cleaning services**.
9) Work to **increase opportunities for social distancing for people in crisis-accommodation** through a rapid housing response, and move quickly to transfer vulnerable people currently living in congregate living arrangements, where amenities are shared, into self-contained accommodation.

3.4.4.1 Brisbane Common Ground (BCG)

Sonya Keep (CEO of BCG) noted that 'the supportive housing model is perfectly positioned to support people to stay home and keep safe' (Keep 2020). Key points from her email included:

a) *Communications* - many BCG tenants are highly vulnerable due to their age, poor health and disability. Together with the onsite support staff, BCG was able to put plans in place and communicate with tenants very quickly to minimise and respond to the emerging risks and help reduce anxiety.
b) *Single point entry* - the 24/7 concierge was able to engage with tenants regularly, reinforce hygiene and social distancing messages, identify people who may have been unwell, monitor tenants who were self-isolating, provide hand gel and entrance and exits.
c) *Visitors* – BCG was able to put in place and enforce the recommended visitor restrictions. Feedback from their tenants (both formerly homeless and affordable housing) regarding these measures was overwhelmingly positive as they felt protected. BCG usually averages +2500 visitors a month to their building. In April they had just over 600, the bulk of which were people who are providing care or support to tenants.
d) *If unwell* - tenants have been advised to stay in their home if they are feeling unwell and to call the concierge desk. The onsite nurse is able to visit them in their home and organise for medical assessment if necessary. Tenants are supported to safely exit and enter the building, attend testing, and self-isolate with any needs being looked after by support services. CGQ are able to immediately deep clean floors or touch points where tenants, who are unwell, live or have travelled.
e) *Cleaning* - put in place hand sanitiser throughout the common areas, hourly cleaning of foyer and lifts, regular cleaning of touch points throughout the building. BCG have been able to offer paid work to tenants to do some of this additional cleaning.

3.4.5 Research responces

3.4.5.1 AHURI

The AHURI COVID Research Agenda aims to deliver findings in the second half of 2020, and includes research on the following topics (AHURI 2020b). Further details can be found at https://www.ahuri.edu.au/housing/covid-19-research-agenda:

a) After the pandemic, can building homes rebuild Australia?
b) Renting in the time of COVID-19: understanding the impacts.
c) Supporting Australia's housing system: modelling pandemic policy responses.
d) Housing affordability stress during COVID-19.
e) Pathways to regional recovery from COVID-19.

f) Policy coordination and housing outcomes during COVID-19.
g) Post pandemic landlord-renter relationships in Australia.
h) Marginal housing during COVID-19.

Additional AHURI resources include *How is the coronavirus pandemic affecting housing policy in Australia?* - https://www.ahuri.edu.au/policy/ahuri-briefs/how-is-the-coronavirus-pandemic-affecting-housing-policy-in-australia (AHURI 2020)

3.4.5.2 Household, Income and Labour Dynamics panel survey

The Household, Income and Labour Dynamics in Australia (HILDA) panel study resesearchers have released a discussion paper *Responding to the COVID-19 Pandemic in the HILDA Survey* (Wooden 2020). This survey is historically undertaken as a face-to-face survey, but will now be conducted by phone. It will also draw on survey responses from around the globe with regards to COVID-19. It will include a coronovirus module detailing impacts on sample members. Table 7 provides a summary of proposed content.

Table 7 - Summary of proposed coronavirus-specific content

Topic	Description
COVID-19 infection	Whether diagnosed with infection / Perceived risk of getting infected.
General impact	Summary measure of impact of coronavirus on life.
Paid work	Impact of coronavirus on employment and working arrangements, and if self-employed, on business activity.
Home life	Impact on eight behaviours, and on strength of relationship with partner.
Social distancing	Frequency of practicing social distancing.
Pro-social behaviour	Whether installed COVIDSafe app on phone.
Health and medical care	Whether has serious health condition / Whether medical treatments deferred or cancelled.
Finances	Impact of coronavirus on superannuation withdrawal, sale of assets, and savings.
Education	For those at school: Extent, and impact, of studying from home. For those enrolled in post-school study: Impact on enrolment and course completion.
Digital technology	Satisfaction with internet connection / Adequacy of digital devices.
Income supplements	Whether received Economic Support Payment / Whether withdrew superannuation under COVID-19 early release scheme (and how much).
Children's education	Extent, and impact, of studying from home (including impact on parents).
Housing costs	Whether and for how long rent / mortgage payments or reduced.
Resilience	Two-item version of the Connor-Davidson Resilience Scale.
Self-reliance	Two items taken from the Conformity of Masculinity Norms Inventory.

Source: (Wooden 2020, 10)

3.4.5.3 United States Department of Health and Human Services data collection tools

The United States Department of Health and Human Services is providing 'access to COVID-19 related data collection tools (CRFs, DCFs, instruments, surveys, questionnaires) that are currently in use' (U.S. Department of Health and Human Services 2020). The intent is that researchers will use these verified tools rather than developing alternatives. They are also seeking to 'provide access to study protocols/study designs and data dictionaries to enhance timeliness for end use, as well as data interoperability and harmonization - https://dr2.nlm.nih.gov/tools-resources. This includes the US National Institutes of Health (NIH) Repository of COVID-19 Research Tools:

- *COVID-19 Collection Tools* - search of the DR2 Repository provides access to surveys, questionnaires, protocols, data dictionaries, etc.

- *COVID-19 Tools by Topic* - Excel file: Collection tools in the DR2 repository categorized by one of ten topic areas (i.e. Mental Health, Symptoms, Environmental Factors)
- *COVID-19 Collection Tools* - specific questions from collection tools in DR2 Repository, broken into modules by topic and subtopic, curated in the PhenX Toolkit

4 THE VALUE EQUATION

Research has highlighted that the changing demographics, with aging populations, is having a significant effect on the functionality and useability of living in place. Research undertaken in the USA suggests that there is a '60% probability that a newly built single-family detached unit will house at least one person with a disability' (defined as mobility impairments) during its expected lifetime (Smith et al, 2008, 6). If visitors are taken into account, the figure rises to 91% . As disability and accessibility is experienced in a multitude of forms, this influences the experiences of liveability for residents.

This section aims to identify how the additional value of providing liveable design outcomes can be:

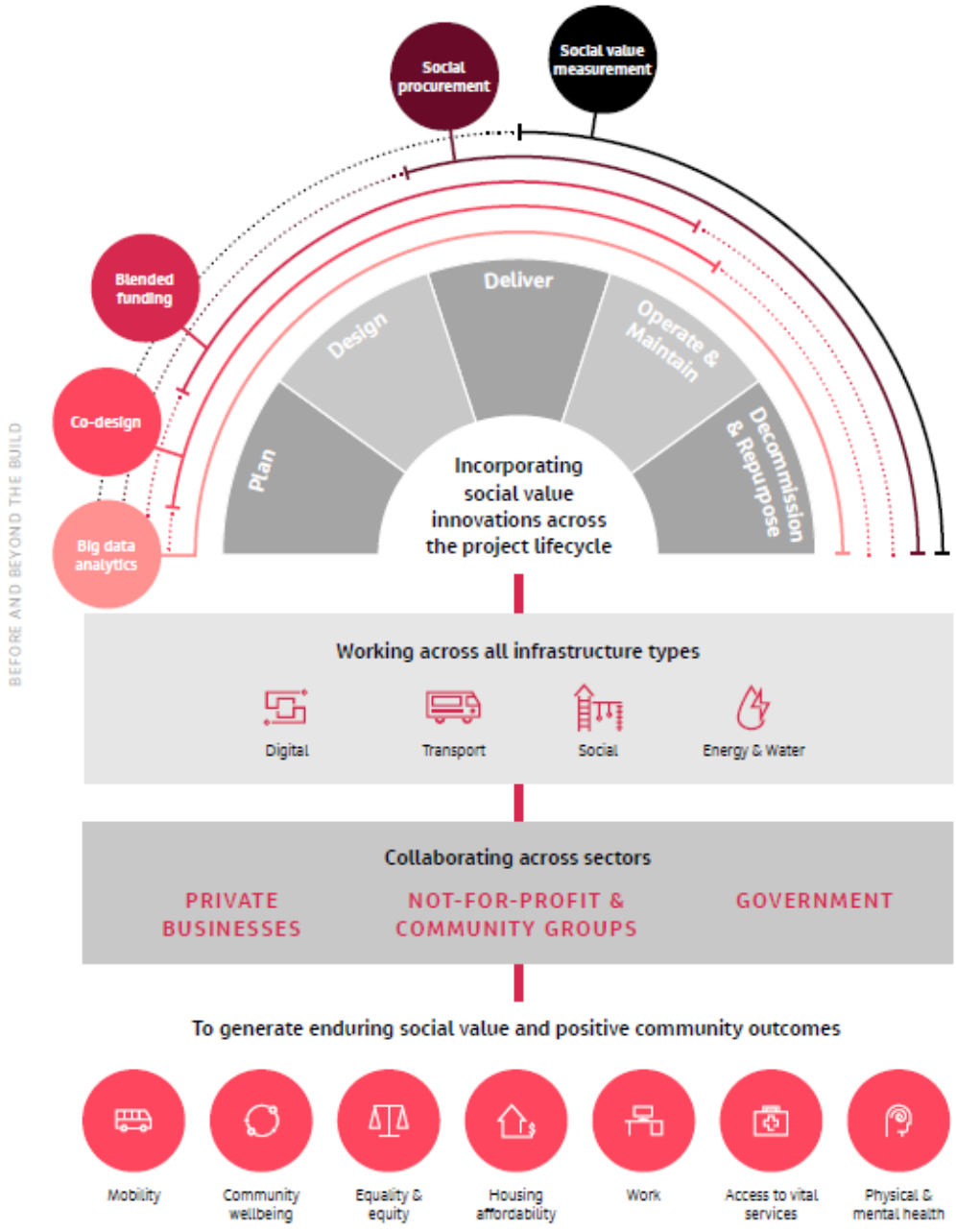
1) Captured by government to effectively test value capture strategies.
2) Balanced with whole-of-life benefits to justify investment for/to developers and the community.

A *value equation* describes a function to predict the value of something to a person, organisation, or other stakeholder. That value normally results from investment by one or more stakeholders. The value of a potential *liveable social and affordable higher density housing* development depends heavily on who would receive (or perceives that they would receive) that value, based on their particular needs, and on the form of the development project. In order for a housing project to come to fruition, there needs to be sufficient value in the project for the various involved stakeholders to engage and participate in the project in ways necessary to bring the project to a successful conclusion. That is, there will be different value equations for different types of projects and for the different stakeholders in those projects. Moreover, the kind of value to be derived will vary significantly between different stakeholder groups.

It is thus intended that the liveability framework developed as an outcome of this research can be applied across the housing spectrum, including public, community, private rental and private ownership housing. Build to rent models will also be considered in developing and testing the final framework. Importantly, accessibility in the context of this framework will be considered across a range of life needs, including providing for those with temporary or permanent disabilities, the aging, and young families. The breadth of stakeholders for whom the value equation needs to be considered is thus expansive, as highlighted in previous SBEnrc research, *Mapping the social and affordable housing network*.

SBEnrc social and affordable housing research to date has provided an expansive focus for understanding value. Recent research by Jacobs and Simetrica (cited in Alexander et al. 2020) reinforce this approach (Figure 3). They present 'a blueprint for generating social value through infrastructure investments' (26), and introduce five components for consideration across the project lifecycle: big data analytics, co-design and self-determinism, progressive infrastructure financing and funding, social procurement, and robust measurement practices (Jacobs and Simetrica cited in Alexander et al. 2020). Co-design and social procurement are discussed elsewhere in this report. The next section outlines the *composite return on investment approach*, and *social procurement criteria* developed in this earlier SBEnrc research, highlighting the complexity and breadth of criteria, which are required to build a value equation that reflects appropriate consideration of externalities and time frames for return.

Figure 3 Jacobs blueprint for generating social value through infrastructure investments



Source: (Alexander et al. 2020, 26)

The following section will summarise and consider:

1) The Composite Return on Investment (CROI) approach (SBEnrc P1.41).
2) Social procurement criteria (SBEnrc P1.54).
3) Models for housing provision.
4) How the value equation varies according to the different stakeholder.
5) A matrix analysing and contrasting the value of different forms of housing projects for different stakeholders.

4.1 Building on previous SBEnrc research

4.1.1 Composite return on investment (CROI) approach

This approach is an outcome of the SBEnrc P1.41 *Valuing Social Housing* research project (Kraatz and Thomson 2017, Kraatz 2019). The aim was to establish a robust methodology for valuing the return on investment of providing social housing, in order to build the case for on-going investment.

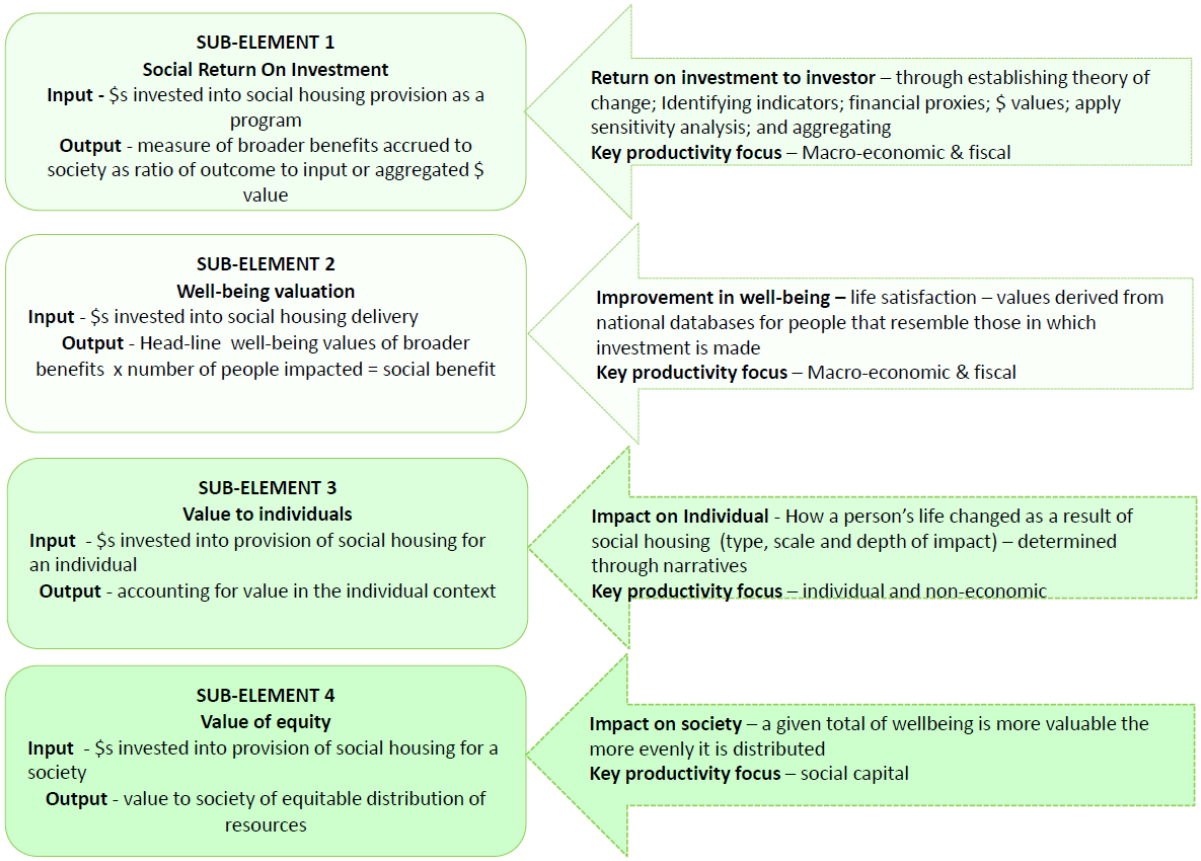
Why a composite approach? It is proposed that a single method does not capture the complex nature of the value returned to society and the individual of having access to safe and secure housing. The composite approach also embraces the productivity based conceptual framework developed in our previous research[6]. Four elements, which could be used in parallel to understand and articulate the broad value of the provision of social housing, are proposed in order to address this complexity. These four aspects of productive return are: individual; macroeconomic; fiscal; and non-financial.

1. Element 1 – Social Return on Investment (SROI) - used to provide a ratio of impact to $ input and/or an aggregated dollar return on investment for defined ***benefits to society*** which may accrue from the provision of social housing. This is determined through: identifying key outcomes, indicators, and impacts; establishing financial proxies for these; and determining a dollar value for this benefit. A detailed guide to this methodology is available on the Social Value UK website[7].
2. Element 2 – Well-being valuation - The Organisation for Economic Co-operation and Development (OECD) has been developing an approach to measuring well-being for several years. In the UK, a well-being valuation analysis method has been developed for community housing associations to measure the impact of their investment in terms of well-being. This method addresses the ***impact*** of the broader non-housing benefits of access to safe and secure housing ***on an average person's well-being***, and places a dollar value on these benefits. On-line UK-based tools are available for community housing providers[8] to undertake this analysis.
3. Element 3 – Value to the individual – individuals' narratives can be used to understand the value of both the housing and non-housing benefits of safe and secure housing. The value a person places on a given amenity such as a home (or a job) varies depending on their life situation. These rich narratives are currently captured in annual reports, and also more increasingly in digital stories.
4. Element 4 – Value of equity - Comparing, understanding and aggregating the value different people place on such social infrastructure can lead to understanding the broader value to society of providing more equitable access to such resources. Published work by the International Panel for Climate Change provides the grounding for future research on this third element (Kolstad et al. 2014). Additionally, the OECD report *All on Board* explores this further (Organisation for Economic Co-operation and Development 2015a).

Figure 4 illustrates how value can be determined by using four different methods, providing examples, available tools and the kind of data required to support this approach.

[6] http://www.sbenrc.com.au/research-programs/1-31-rethinking-social-housing-effective-efficient-equitable-e3/
[7] http://www.socialvalueuk.org/resources/guide-to-sroi/
[8] http://www.hact.org.uk/social-value-bank

Figure 4 - Composite approach to return on investment



CROI Elements in detail

Sub-element 1 - social return on investment analysis (SROI)

The SROI process establishes financial proxies for key indicators along with valuations for impacts. These can then provide a total $ value for the social return on investment, from which a ratio of inputs to impacts can be derived. For example, 'the Victorian Woman's Housing Association delivers $3.14 of social value for every $1.00 invested' (Kliger et al. 2011, 2). This can be determined from organisational data for establishing scope; identifying stakeholders; mapping relationships between inputs, outputs and outcomes; data to support outcomes and valuing this; establishing impact (e.g., excluding what would have happened anyway); summing the benefits, subtracting the negatives and comparing the result to the original investment (various sensitivity analyses can be applied here); reporting and using results.

SROI can be used to evaluate past investments or forecast future investment returns across housing and non-housing outcomes for providing safe and secure housing.

Key issues with this approach include:

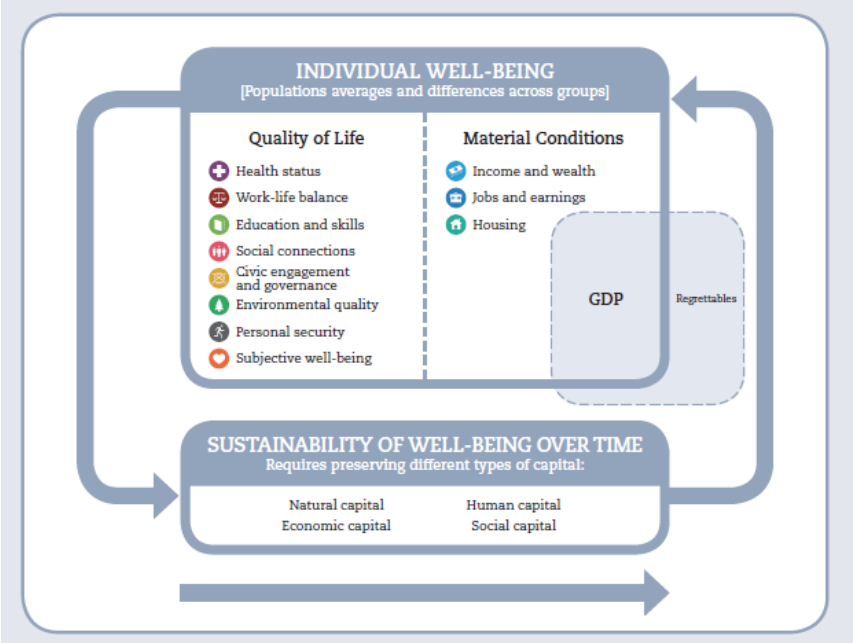
- Identifying the *scope* of the analysis and the appropriate *indicators*.
- The need to understand the extent to which non-housing outcomes can be attributed to the provision of, i.e., *percentage attribution*.
- Gathering *data* across the nine domains on change, duration of change, appropriate financial proxies.
- Identifying financial proxies for each indicator and assigning $ values - in the UK the HACT Social Value Bank can assist with this - http://www.hact.org.uk/social-value-bank
- *Deadweight* and *Drop-off* - what would have happened anyway and does the outcome drop off over time.

Social Value UK[9] provides good guidance on the SROI process. Additionally, there are several accredited organisations in Australia that can undertake SROI analysis.

Sub-element 2 - Well-being valuation

The Organisation for Economic Co-operation and Development (OECD) has been actively developing methods and guidelines for several years around the measurement of well-being[10]. This relates to 'how people experience and evaluate their life as a whole' (Organisation for Economic Coorperation and Development 2013) (Figure 5). They have established eleven dimensions related to material conditions and quality of life (OECD 2013). In the UK, a well-being valuation methodology, specifically developed for community housing providers, to enable them to measure success based on improvement in a person's well-being (Trotter et al. 2015).

Figure 5 - OECD Framework for measuring well-being and progress



Source: (OECD 2013, 4)

Kolstad et al. (2014) also discuss several different approaches to well-being and its measurement (see section 3.4.3 and 3.6 of that report).

Extending this approach, the UK-based *Well-Being Valuation* (WV) analysis works on the basis of monitising the improvement in a person's well-being (Trotter et al. 2015). Community housing providers in the UK can access the *Social Value Bank*[11] (drawing on data from four national datasets) to undertake a valuation of their social impact. A *Value Calculator*[12] is available for download from HACT UK for this purpose. Crucial to this approach is the use of de-identified longitudinal data from four national datasets: British Household Panel Survey; Understanding Society; Crime Survey for England and Wales; and the Taking Part Survey.

1. British Household Panel Survey – focuses on *social and economic* changes in individuals and households. Data has been gathered since 1991 - https://www.iser.essex.ac.uk/bhps

[9] http://www.socialvalueuk.org/resources/guide-to-sroi/
[10] http://www.oecd.org/statistics/measuring-well-being-and-progress.htm
[11] http://www.hact.org.uk/social-value-bank
[12] http://www.hact.org.uk/value-calculator

2. Understanding Society – a longitudinal study of 40,000 households following *social and economic circumstances, attitudes, behaviours and health* - https://www.understandingsociety.ac.uk/
3. Crime Survey for England and Wales – evaluates and develops *crime reduction policies* and provides information about the changing levels of crime- http://www.crimesurvey.co.uk/
4. The Taking Part survey – collects data on *leisure, culture and sport* in England, along with a range of socio-demographic information on respondents – https://www.gov.uk/government/collections/taking-part

This approach provides specific financial proxies with headline well-being values for improvement in individual well-being for the average person, based on their access to community housing.

Key issues include:

- Ready access to data and values to undertake such an analysis.
- Resources to build equivalent tools for Australia using the OECD guidelines to enable international comparison.
- The average person rather than members of a cohort likely to need social housing, especially where residualised, are represented.
- Chapter 3 of the Intergovernmental Panel on Climate Change (Kolstad et al. 2014) provides a discussion on temporal and lifetime well-being.
- The 2016 Overcoming Indigenous Disadvantage Key Indicators Report addresses well-being, providing the potential for future measurement (Australian Productivity Commission 2016).

Well-being valuations would need to be established for an Australian context, drawing on national and state databases. Ideally, these valuations would be accessible in a similar way to other online resources such as: HACT UK Value Calculator; the Global Value Exchange[13]; and the OECD Better Life Index tool and website[14]. The Australian Social Value Bank is starting to do this - https://asvb.com.au/

Element 3 – value to the individual

The intent of this sub-element is twofold: (i) to determine and account for the nature of the *impact on an individual* (type, scale and depth); and (ii) to articulate to society the value of improving the quality of life for all.

1. *type of impact*—the nature of the impact(s) on each person or organization - as outputs or outcomes;
2. *scale of impact*—the number of people or organizations affected;
3. *depth of impact*—the amount or intensity of change experienced, per type of impact, per person affected - i.e., change in subjectively experienced well-being (McCreless and Trelstad 2012).

This value can be determined from qualitative narratives gathered via housing providers, commissioned reports, interviews, surveys, case studies and the like (facilitated by the use of mobile technologies for data gathering).

Issues include the resources required to gather, analyse and communicate information and data, and how best to capture the complexity of this data and to present it in a manner which informs policy and delivery.

Sub-element 4 - value of equity

[13] http://www.globalvaluexchange.org/news/b07bcb501c
[14] http://www.oecdbetterlifeindex.org/#/11111111111

Inclusive growth is defined by the OECD as 'economic growth that creates opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non-monetary terms fairly across society' (OECD 2015). 'Non-income dimensions are important because they also stand for opportunities and choices that matter for people's participation in economic life and society (Organisation for Economic Cooperation and Development 2014).

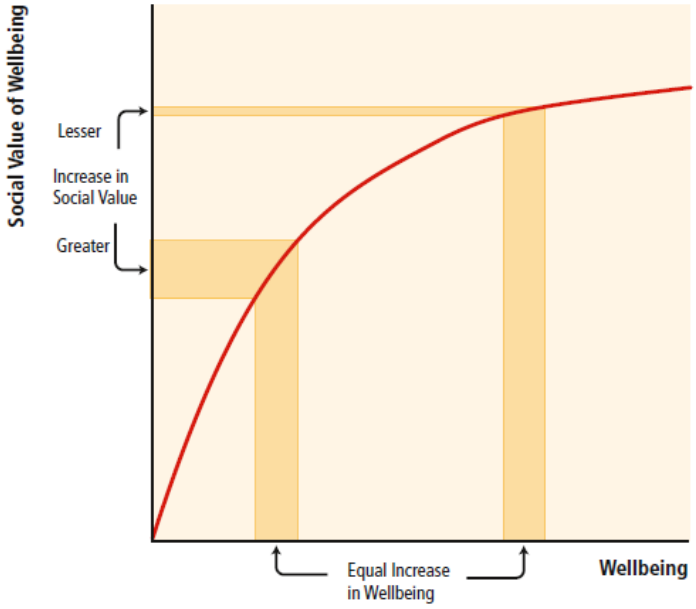
Further theoretical research is required in order to explore this concept in the context of social housing. This consideration is grounded in two realms: (i) the OECD approach to inclusive growth; and (ii) issues of distributive justice and differential value as reported on by the International Panel on Climate Change (IPCC) (Kolstad et al. 2014).

The OECD report maintains that inequality in non-income outcomes (refer the nine impact domains) can undermine long-term growth. 'Inequalities and the problems to which they give rise have a spatial dimension. Better transport and housing infrastructure can spur growth and improve inclusiveness in cities, providing vital access assets for economically deprived areas to high-quality jobs and education' (OECD and Ford Foundation 2015). The following are a few points to note when considering this approach:

1. There is an apparent divergence between the growth in multidimensional living standards (for the average Australian) alongside a reduction in economic growth (OECD and Ford Foundation 2015), potentially signaling (complex) policy settings which are not in balance.
2. Inclusions in multidimensional well-being address current well-being (material living conditions and quality of life); and well-being over time (or for future generations) across economic, natural, human and social capital.
3. It is necessary to include the non-monetary dimensions of well-being and to assess the impact of policies on different social groups in terms of employment, health and educational issues and outcomes. For example, those most disadvantaged often live shorter lives and experience difficulty breaking away from problematic educational and employment outcomes (see also Ianchovichina and Lundstrom 2009).
4. 'Sustained, high growth rates and poverty reduction, however, can be realized only when the sources of growth are expanding, and an increasing share of the labour force is included in the growth process in an efficient way. From a static point of view, growth associated with progressive distributional changes will have a greater impact in reducing poverty than growth which leaves distribution unchanged' (Ianchovichina and Lundstrom 2009, 4).

The IPCC approach provides a further dimension, capturing knowledge and data relevant to the impact on individual outcomes, for specific circumstances (e.g., abilities, point in time, etc.) and in given locations. It also provides an avenue to compare one person's well-being with another's. Kolstad et al. (2014) discuss this method, which aggregates a person's well-being at a point in time to create *lifetime well-being* for individuals, which can be aggregated across people to determine an overall value to society. Though contentious, Kolstad et al. (2014) further explore this approach to consider the idea of distributive justice (that equality of well-being does have value). This approach implies that a given total of wellbeing is more valuable the more equally it is distributed (Kolstad et al. 2014). Once the lifetime wellbeing of an individual is established, this can then be aggregated to determine an overall value for society. Figure 6 highlights that, 'according to prioritarianism, improving a person's wellbeing contributes more to social welfare if the person is badly off than if they are well off' (Kolstad et al. (2014, 222-223).

Figure 6 - The prioritarian view of social welfare. The figure compares the social value of increases in well-being for a better-off and worse-off person.



Source: (Kolstad et al. 2014, 223)

Fleurbaey (2009) adds to this, discussimg the way in which the effect of social change on individuals, at a point in time, can be determined (Fleurbaey 2009).

Key issues with valuing equity include:

1. The resources required to gather, analyse and communicate information and data. Tools such as Lean Data[15] might provide insights into cost effective, individualised data gathering.
2. How best to capture the complexity of this data but present it in a manner which informs policy and delivery?

4.1.2 Social procurement criteria

The previous SBEnrc P1.54 *Procuring social and affordable housing* research project highlighted several ways in which social and affordable housing is procured, both in Australia and overseas (Kraatz 2018):

- Planning mechanisms
- Public housing transfers and renewal
- Housing for those with a disability
- Partnerships and joint ventures
- Community Housing Provider models
- Shared equity/ownership models
- Cooperatives
- Social impact/benefit bonds
- Build to rent
- Using vacant infrastructure
- Common Ground model

We need to consider how each of these approaches can provide tangible social benefits for complex problems, along with creating more effective links between economic and social policy and outcomes, whilst ensuring the efficient use of resources. Issues of liveability and accessibility are critical elements, which need to be considered in the context of procurement with network wide implications.

The 19 *social procurement criteria* developed in this research are intended to provide support in developing policy initiatives (Table 8) and delivering program outcomes related to social and affordable

[15] http://ssir.org/articles/entry/the_power_of_lean_data

housing in Australia. They provide a checklist that aims to ensure expansive and agile thinking, and to leverage (possibly latent) opportunities.

Table 8 – Social Procurement Criteria

System focus	Builds partnerships
	Builds housing pathways
	Builds diversity in housing stock
	Builds financial capacity of system
Supply chain focus	Stimulates industry-wide innovation
	Supply chain maturity
	Builds sector capacity
	Successful models/pilots
Organisational focus	Benefits/outcomes measurement (life trajectory and financial)
	Time frame for benefits realisation
	Integrated service and asset delivery
	Manages risk distribution
Person focus	Addresses diverse cohort needs
	Addresses diversity, choice and aspirations in housing needs
	Builds financial capacity of individuals
	Supports sustainable and affordable living outcomes
Flexibility	Agility and responsiveness
	Appropriate scalability
	Location-specific responsiveness

Source: (Kraatz 2018, 4)

In the context of liveability and accessibility, these criteria can be used to test both of these aspects of higher density housing and the liveability framework being developed in this project. The criteria can be considered as a checklist to help align the social procurement approach with desired benefits to help optimise the investment risk equation.

4.2 Understanding the value equation

The ABCB Accessible Housing Options paper provides estimates of the likely additional construction costs 'associated with the adoption of and compliance with the LHDG Silver and Gold level specifications (Options 2 and 3), applied as part of constructing a new Class 1a house or Class 2 apartment building' (Australian Building Codes Board 2018a, 25). This paper also highlighted several submissions which commented on the costs associated with home modifications including avoided costs, long completion times, feasibility of modifications, and repetition (i.e. people having to make modifications every time they move house) (Australian Building Codes Board 2019). In the most recent update on this review of regulations, the ABCB provided a further report by the Centre for International Economics. which provided the following preliminary recommendations (Centre for International Economics 2020, 11):

- 'Based on the preliminary evidence gathered for the Consultation RIS, the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits under the central estimates for all of the Options tested'.
- 'Given the uncertainty around the feasibility of some Options, we recommend that consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternatives'.

The ANUHD submission to the ACBC Options Paper proposed 4 levels of assessment for costs and benefits, to better establish return: (i) developers and buyers of new housing construction; (ii) residents and visitors throughout the life of the dwelling and the industries providing modifications and assistive technology; (iii) acute and ongoing health and support services; and (iv) Australian

governments and communities 'in normalising the presence of a wider range of people being included and participating in family and community life' (Australian Building Codes Board 2019). More recently Judy Kraatz, as Project leader of this current research, has provided feedback to the ACBC 2020 consultation round, that the context for the *Accessible Housing Regulation Impact Assessment* is too narrow, and does not consider the broader impacts to society of providing accessible housing. The quantitative costing data contained within the ABCB reports will be further considered in the context of the upcoming case studies.

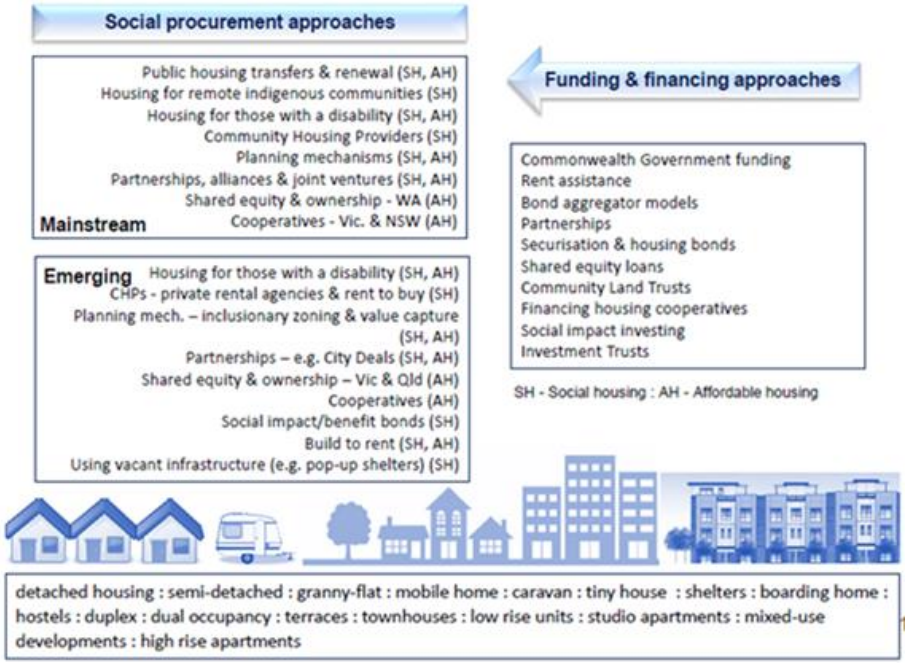
A further evaluation report of Brisbane Common Ground, undertaken by Parsell et al. in 2015, provides useful insights. Some of the aims of this evaluation were to assess the effectiveness of the BCG supportive housing service; examine the value for money of the model; and inform future investment decisions (Parsell et al. 2015). They note that this model includes three key components: 'ownership costs not payable by the lessee (the Department of Housing and Public Works); the property and tenancy management costs include lease costs (Common Ground Queensland); and the support costs (Micah Projects)' (119). Section 7 of that report details these costs, and Section 8 details cost offsets, to 'empirically identify whether tenants patterns of service utilisation changed in the year they were Brisbane Common Ground tenants compared to the year they were homeless' (123). This included mental and physical health services, corrective and police services, and specialist homelessness services. 'Tenants who were allocated housing at Brisbane Common Ground because of chronic homelessness used less services, often considerably less, in the first year residing at Brisbane Common Ground compared to the year prior to commencing their tenancy when they were homeless' (132). It is this broader approach to determining return on investment that is needed.

The following sub-sections provide an overview of models of housing provision relevant to the development and testing of the liveability framework, and the breadth of stakeholders for whom the value equation needs to be considered.

4.2.1 Models for housing provision

Previous SBEnrc research, *Procuring Social and Affordable Housing*, summarised mainstream and emerging social procurement approaches, and highlighted different housing typologies including medium and higher density options (Kraatz and Jayawardana 2018) (Figure 7).

Figure 7 Social procurement approaches for delivering a range of housing types.



Source: Kraatz and Jayawardana (2018, 11)

In this context, four main forms of investment in higher density housing environments will be considered in developing the liveability framework:

1) Social housing - government/NFP/philanthropic for ownership and delivery.Best practice examples of this includes homes, for example, for those with a disability and the aging.
2) Affordable housing - public/private partnership for ownership and delivery - for affordable rent and income (for profit).
3) Private rental income housing (for profit) – including the emerging build to rent market.
4) Private ownership – i.e. person/family purchased and owned.

Best practice examples included in Section 7 incorporate each of the four forms of investment. A mix of these tenure arrangements will also be considered when developing the framework.

4.2.2 The value equation by network participant

There are multiple stakeholders/particpants involved in the delivery of any housing project.For example: stakeholders who fund or otherwise contribute to the investment necessary for a project; those who carry out the project; those who are the intended beneficiaries of the project; and those who are otherwise affected (positively and/or negatively) by the project. The previous SBEnrc *Mapping the Australian Social and Affordable Housing Network* project identified 11 different kinds of network participant groups in housing projects in Queensland and Western Australian contexts (Kraatz and Jayawardena 2020):

1) Person/Family
2) Commonwealth Government
3) State Government
4) Local Government
5) Peak body/industry association
6) Advocates
7) Community Housing Providers
8) Not-for-profit providers
9) Research
10) Industry
11) Philanthropic
12) Informal

This identification of network participants is expansive. For example it includes those within the person/family group who have accessibility needs (e.g. those with disabilities, the aging and affected family members). Affected family members may include children and others reliant on other people, including those with disability. Direct and indirect caregivers to those within the family group can include professionals and volunteers working as advocates/CHPs and/or NFPs, and family members as informal participants. It is also important to recognise that abilities are not a constant throughout a person's life, and change with learning, age, illness, and the like. Whilst we are not limiting consideration to specific disabilities these may include visual impairment, hearing impairment, and various forms of motor and neurological impairment (e.g. balance, strength, agility).

Table 9 below identifies roles that are played by some of these stakeholders.

Table 9 – Summary of variables for further consideration - example

Investment by whom
• Government – federal, state, local. Different roles e.g. PM, Ministers, Agencies, taxpayers
• Land owners – government and private
• Industry stakeholders – e.g. builders, contractors, architects
Form of investment
• Donation of public land, existing buildings
• Cash
• Labour (paid and in-kind)
Return (and benefit) for whom – e.g.
• Government
• Taxpayers

- Builders/contractors
- Owners/purchasers
- Citizens/public (General and Local)
- Specific cohorts including: elderly; children/young; Indigenous peoples; people with a disability or chronically ill; migrants; unemployed; those experiencing or at risk of homelessness; single parents.
- People requiring enhanced accessibility – many as above.
- People requiring social or affordable housing options – many as above.

Form of return (for comprehensive listing refer SBEnrc Valuing Social Housing)

- Expenditure savings – for example
  - Health care costs – government and individual costs
  - Unemployment benefit costs
  - Policing, court, and incarceration costs
  - Reduced travel/commuting costs
- Monetary benefits/income
  - Higher disposable income (individual)
  - Increased economic activity with multiplier effect (society)
  - Increased tax base, taxes (government, taxpayers, citizens)
- Improved Social Conditions
  - Health and well-being
    - More healthy population
  - Improved engagement in education (stay in school longer)
  - Improved engagement in employment
  - Improved family structure
  - Improved social engagement
  - Happiness
- Improved Environment
  - Improved housing outcomes
  - Greater resource efficiency

4.2.3 Value equation matrix

As mentioned in the introduction to this section, there will be different value equations for different types of projects and for the different stakeholders in those projects. The following matrix aims to provide an anecdotal example of the differing nature and levels of return on investment across both social and economic dimensions (e.g. high, medium, low). The matrix highlights the way in which return varies across network participants/stakeholders (Table 10). This understanding will inform the development of the final liveability framework.

Table 10 – ROI across social and economic dimensions by network participant – example only

Network Participant Grouping	Example Network Participant	Social housing – Govt / NFP / Philanthropic	Affordable housing – Public / NFP / Private	Private rental - incl. build to rent	Private ownership
Person/Family	Individual	SH, EH	SH, EH	SH, EH	SH, EH
Common-wealth Government	Dept. of Social Services	SH, EH	SM, EM	-	-
State Government	HPW	SH, EH	SH, EH	-	-
Local Government	Fremantle City Council	SH, EL	SH, EH	SH, EH	SH, EH
Peak body/industry association	ACOSS	SH, EM	SH, EM	SH, EM	SH, EM
Advocates	Shelter	SH	SH	SH	SH

Community Housing Providers (CHPs)	BCHL	SH, EH	SH, EH	-	-
Not-for-profit (NFP) providers	Micah	SH, EM	-	-	-
Research	SBEnrc				
Industry	Building Contractor	SH, EH	SM, EH	SM, EH	SM, EH
Philanthropic		SH, EL	SH, EL	-	-
Informal	Bank of Mum and Dad	-	SH, EH	SH, EH	SH, EH

Notes:
Social dimension - SH – High; SM – Medium; SL - Low
Economic dimension - EH high; EM – medium; EL - low

5 REGULATORY AND POLICY ENVIRONMENT

Urban precincts providing medium- and high-density housing are blurring the lines between the public and private realms. Conventions, legislations, regulations, policy and guidelines around accessibility and liveability differ across these two realms, but need to be reassessed in the context of higher density living to ensure equitable access through the home and precinct. The trend towards renting rather than home ownership in Australia as the dominant housing option also require of us to reassess issues around liveability and accessibility.

Regulatory and policy responsibilities across the three layers of government in Australia also need to be clarified (Table 11).

Table 11 – Regulatory and policy responsibilities by layer of government

Level	Regulation responsibilities (primary)	Policy responsibilities (primary)
Commonwealth	International conventions and protocols and related legislation – e.g. United Nations Convention on the Rights of Persons with Disability and the Disability Discrimination Act 1992 (DDA), Australian Building Code Board (ABCB)* Australia Standards National Disability Insurance Scheme (NDIS)^ Care packages	Affordable housing Aging in place
State / Territory (see also Section 5.2)	State/Territory building legislation – e.g. National Construction Code ABCB* NDIS^	Growth strategies Infrastructure planning and strategy Social housing Design guidelines
Local	ABCB* Planning	Infrastructure management Managing population pressure and demographics changes in local areas

* Joint responsibilities Commonwealth/States/Territories/Local

^ Joint responsibilities Commonwealth/States/Territories

Sources: (Australian Building Codes Board 2019, James, Rowley et al. 2020)

5.1 The national regulatory and policy environment

5.1.1 Australian Building Codes Board (ABCB)

'The Australian Building Codes Board (ABCB) is a joint initiative of all levels of government in Australia, together with the building and plumbing industries. Its key objective is to oversee issues relating to health, safety, amenity and accessibility, and sustainability in buildings. The ABCB promotes efficiency in the design, construction and performance of buildings and plumbing systems through the National Construction Code (NCC), and the development of effective regulatory and non-regulatory approaches. The ABCB aims to establish minimum, performance based, proportional and cost effective codes and standards, as well as promote regulatory systems that are consistent, as far as practicable, between States and Territories' (Australia Building Codes Board 2019b,2).

The ABCB *Accessible Housing* project commenced in 2018, with the aim of undertaking a Regulation Impact Assessment (RIA) of options meeting minimum accessibility standards to be potentially applied through the National Construction Code (NCC)[16] (Australian Building Codes Board 2018a). This

[16] 'The NCC is a performance-based code containing all Performance Requirements for the construction of buildings. It is built around a hierarchy of guidance and code compliance levels, with the Performance

assessment 'will consider the Livable Housing Design Guidelines Silver and Gold level specifications as possible options for a minimum accessibility standard, and additional options identified through consultation' (Australian Building Codes Board 2018b, 1). This is being considered for Class 1a (houses, townhouses, row houses, villa units and the like, and Class 2 (multi-storey reisdential apartment buildings) (Australian Building Codes Board 2018a). The former currently has no requirements, and requirments for the latter relate to access to, but not within, apartments. Variations in costing have been tested through the RIA, and this has been discussed further in Section **Error! Reference source not found.**.

Table 12 – ABCB Accessible Housing – Project Timeline

2018	Accessible Housing Options Paper released for public comment Accessible Housing National Consultation Forums
2019	Consultation Outcomes Report Work begins on RIS
2020	Conclusion of RIS process Development of content for NCC 2022 (if directed by Governments)
2021	Consultation on NCC 2022 public comment draft Decision on inclusion of accessible housing provisions ABCB Board determines NCC provisions if Governments decide to proceed
2022	NCC takes effect in all States and Territories on 1 May

Source: (Australian Building Codes Board 2020a)

The Accessible Housing Options Paper: Consultation Report provides accounts of stakeholder feedback. These stakeholder insights have been used throughout this report to inform our thinking and recommendations. For example, some suggested non-regulatory alternatives including: financial incentives; explanatory information/commentary; reference to New Zealand Design for Access and Mobility Standard (NZS 4121) (Standards New Zealand 2001) that covers universal design for housing, to be adopted on a voluntary basis; an ABCB non-mandatory Handbook that covers accessibility for housing; pilot projects to test market appetite and minimise additional costs; and better resourcing of existing voluntary approaches (Australian Building Codes Board 2019).

In July 2020, the ABCB progressed to the final stage of consultation. This has been accompanied by a report commissioned from the Centre for International Economics (Centre for International Economics 2020). A submission to this round of consultations has been made by Judy Kraatz, addressing the research undertaken as a part of this, and past SBEnrc research. The key message is that the consideration of cost benefit needs to be expanded, in line with the composite return on investment approach, with a sector wide, multi-stakeholder roadmap needed which addresses the full spectrum of technical, social and regulatory barriers (see Appendix C).

5.1.2 Australian and International Standards

Standards Australia[17] is an independent, non-governmental organisation responsible for developing standards. They do not enforce, regulate or certify compliance with those standards. The International Standards Organisation (ISO) is an independent, non-governmental international organization with a membership of 164 national standards bodies[18]. Table 13 includes a summary of key standards.

Requirements being the minimum level that buildings, building elements, and plumbing and drainage systems must meet'. https://ncc.abcb.gov.au/ncc-online/NCC

[17] https://www.standards.org.au/

[18] https://www.iso.org/about-us.html

Table 13 Relevant Australian and International Standards

Name and Number	Abstract
AS 1428 Design for Access and Mobility[19].	1428.1 Part 1: General requirements for access — Buildings 1428.2 Part 2: Enhanced and additional requirements — Buildings and facilities 1428.3 Part 3: Requirements for children and adolescents with physical disabilities 1428.4 Part 4: Tactile ground surface indicators for the orientation of people with vision impairment 1428.1 Supp 1: General requirements for access — Buildings — Commentary
AS 4299-1995 Adaptable Housing[20].	'This document relates to residential, rather than to public buildings. It provides a more complete reference document and draws on the material contained in AS 1428.1 and AS 1428.2. To date no housing-specific research on access for people with disabilities has been carried out. Until such research is undertaken, AS 1428.1 and AS 1428.2 are considered to contain useful guidelines' (2).
AS 1735.12 – 1999: Lifts, Elevators, Moving Walks. Part 12: Facilities for persons with disabilities[21].	'This Standard sets out requirements for facilities in passenger lifts that are specifically designed to assist persons with disabilities. It is complementary to AS 1735.1, AS 1735.2 and AS 1735.3' (5).
ISO 21801-1:2020 Cognitive Accessibility[22]	'This document presents guidelines for the design and development of cognitively accessible systems, including products and services and built environments. This document is relevant to mainstream systems as well as those designed specifically for people with disability'.
Disability (access to Premises – Buildings) Standards 2010[23].	'The objects of these Standards are: (a) to ensure that dignified, equitable, cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with a disability; and (b) to give certainty to building certifiers, building developers and building managers that, if access to buildings is provided in accordance with these Standards, the provision of that access, to the extent covered by these Standards, will not be unlawful under the Act' (Australian Government Federal Register of Legislation 2010). The Human Rights Commission provide a guide to this standard (Australian Human Rights Commission 2013). Whilst private housing is not covered this should still be considered in this report.
ISO 21542:20100 Building construction-Accessibility and usability of the built environment[24]	'Specifies a range of requirements and recommendations for many of the elements of construction, assemblies, components and fittings which comprise the built environment. These requirements relate to the constructional aspects of access to buildings, to circulation within buildings, to egress from buildings in the normal course of events and evacuation in the event of an emergency. It also deals with aspects of accessibility management in buildings'.

5.1.3 Other relevant guidelines, schemes, strategies and networks

Table 14 summarises other key guidelines, schemes, strategies and networks relevant to understanding the regulatory and policy environment in Australia around liveable and accessible housing.

[19] https://www.standards.org.au/standards-catalogue/sa-snz/building/me-064
[20] https://www.saiglobal.com/PDFTemp/Previews/OSH/As/as4000/4200/4299.pdf
[21] https://www.saiglobal.com/PDFTemp/Previews/OSH/As/as1000/1700/n173512.pdf
[22] https://www.iso.org/standard/71711.html
[23] https://www.legislation.gov.au/Details/F2010L00668
[24] https://www.iso.org/standard/50498.html

Table 14 – Summary of relevant guidelines, schemes, strategies and networks

	Details	Type
Livable Housing Design Guidelines (LHDG) - Silver and Gold level specifications	Livable Housing Australia (LHA) is responsible for developing and maintaining Livable Housing Design Guidelines (LHDG). LHA is a partnership between community and consumer groups, government and industry, which champions the mainstream adoption of livable housing design principles in new homes. (Livable Housing Australia 2017).	Voluntary guideline (National)
Specialist Disability Accommodation (SDA) - National Disability Insurance Scheme (NDIS)	'SDA refers to accommodation for people who require specialist housing solutions, including to assist with the delivery of supports that cater for their extreme functional impairment or very high support needs' (National Disability Insurance Scheme 2020). The NDIS Specialist Disability Accommodation Design Standard 'sets out the detailed Design requirements that shall be incorporated into new built Specialist Disability Accommodation under the National Disability Insurance Scheme. This SDA Design Standard document is based on the four categories of SDA design which are set out in the SDA Rules, namely: improved liveability; robust; fully accessible; and high physical support (National Disability Insurance Scheme 2019). See also Home modifications (National Disability Insurance Scheme 2020)	Scheme (Commonwealth / States)
National Disability Strategy	The first of six priorities listed in this strategy is 'inclusive and accessible communities - the physical environment including public transport; parks, buildings and housing; digital information and communications technologies; civic life including social, sporting, recreational and cultural life (Council of Australian Governments 2011, 10).	Strategy (National)
Living Longer Living Better	'The Living Longer Living Better reforms in aged care have identified that the home will be the predominant place where people age, age for many years longer than is currently the case, and will also receive services. This reflects the preference of the vast majority of people, and also the fiscal reality, that it is simply too expensive to accommodate people in congregate care nursing homes' (Australian Building Codes Board 2019, 20). 'Australia's ageing population is placing significant pressures on the aged care sector. With an increase in demand for aged care services, older Australians are also seeking greater flexibility in aged care, including independent living arrangements and increased choice' (Australian Government 2013, 2)	Strategy (Commonwealth)
Australian Network on Disability (AND)	'National, membership based, for-purpose organisation that makes it easier for organisations to welcome people with disability in all aspects of business' (Australian Network on Disability 2020). They provide the following resources: disability statistics; employer guide: campaigns and awareness days for inclusion of people with disability at work; factsheets; publications; business benefits of hiring people with disability; information about employing people with disability; information about welcoming customers with disability; case studies; surveys; and videos	Network (National)
Australian Network for Universal Housing Design	Provides links to relevant information, examples and documentation.	Network (National)
Council of the Aging (COTA)	COTA's five principals include: maximise the economic, social and political participation of older Australians and challenge	Network (National)

	ageism; promote positive views of ageing, reject ageism and challenge negative stereotypes; promote interdependence and consciousness across generations; redress disadvantage and discrimination; and protect and extend services and programs that are used and valued by older people living in Australia (Council of the Aging 2020).	
Healthy Active by Design	Provides resources as a practical guide - includes evidence, advice and examples to assist with the development of healthy and active neighbourhoods (Heart Foundation 2020a, Heart Foundation 2020b, Heart Foundation 2020c).	National resource
Your Home website	'Housing of the future will be flexible, adaptable and resilient' (Your Home 2013).	National resource

5.2 State-based regulatory and policy environments

The effective integration between national, and State and Territory planning policies is required to avoid overlaps and conflicts.

5.2.1 Queensland

Several strategies and documents exist to regulate and/or guide requirements around higher density social and affordable housing in Queensland, including with input from the Office of Queensland Government Architect (OQGA) (Queensland Department of Housing and Public Works 2019). Relevant inputs are summarised and detailed further in Table 15 below.

Table 15 – Queensland regulation, policy, strategies and guidelines.

Document	Intent and deliverables
Density and Diversity Done Well	Ideas competition for increasing suburban densities.
Social Housing Design Guide to Design Standards for Social Housing (under review)	Simplifies and harmonises several earlier state government documents. Specifies housing design.
Queensland Housing Strategy 2017-2027	10 year strategy highlighting priority areas around growth, prosperity, connection and confidence.
Housing principles for inclusive communities	Housing principles associated with inclusive communities: rights, choice, control and inclusion. These align with the above strategy and the intent of United Nations Convention on the Rights of Persons with Disabilities and the National Disability Insurance Scheme.
Shaping SEQ South East Queensland Regional Plan 2017	Encouraging growth within the current urban footprint.
Economic Development Queensland (EDQ)	Partners with local governments, industry and the community to help deliver a range of projects on urban sites which support renewal.
Queensland Urban Design and Places Panel	Provides independent expert advice on the design of major infrastructure and urban-planning projects.
Healthy Places, Healthy People: Creating great places to keep Queenslanders healthy.	Mechanism for government agencies to consider/integrate health outcomes into policies, practices and investment decisions.
Health and Wellbeing Strategic Framework 2017 to 2026	Promoting and monitoring various physical activity indicators as a part of this strategy.
State Planning Policy 2017 (under review)	Considers housing supply and diversity, planning for safety and resilience, and planning for infrastructure.
State Planning Policy – state interest guidance material - Liveable communities (under review)	Considers: the characteristics of the built and natural environments; access to employment, goods and services, and open space; and resilience to natural hazards and the effects of climate change.

Healthy and Active Communities: walkable neighbourhoods.	Benchmarks for assessing new residential subdivisions to: connectivity; block lengths; footpaths; park or open space; and street trees.
HPW Housing Projects Office Design team	Currently under development – elements of a post occupancy review methodology. HPW to provide further information.

5.2.1.1 Density and Diversity Done Well

A suburban-based competition, Density and Diversity Done Well, provided participants with a neighbourhood block containing 20 dwellings (and 60 people). Seven winners were selected from across Australia, whose proposed projects increased density from 20 dwellings to up to 100 dwellings. For example in Laneway Tower Housing (20 to 100) 'a series of social and outdoor spaces have been carefully integrated to help build stronger communities while the introduction of small retail/café/studio spaces at ground can leverage the increased density to provide economic benefit', using sub-tropical corridors (Cox Architects 2019). The Inter-Urban Diver-City submission (20 to 100) has a focus on intergenerational spaces including adaptability and accessibility (Gresley Abas Architects (WA) 2019). The Eco-nesting submission (20 to 70) targeted the creation of several aspects including 'climatically responsive places, healthy and safe public and private places, inter-generational places, entrepreneurial places, and total energy places' (Arcologic Design (WA) 2019). A central theme throughout all of these was the maintenance of access to open spaces and sunlight.

5.2.1.2 Social Housing Design Guide Minimum Standards and Requirements

This guide is intended to simplify and harmonise existing guides to provide consistency and clarity: *Design Standards for New Construction; Social Housing: Homes and Apartments December 2015*; *Product Standards, Social Housing Dwellings*; and *Minimum Standards for building products, fixtures, fittings and other items typically required for dwellings* (Queensland Department of Housing and Public Works 2017). It also incorporates *Livable Housing Design Guidelines* criteria for social housing with varying requirements for apartments and housing. These standards, beyond the threshold requirement, are internally focussed. The equitable design section of these guidelines note that 'the design of each dwelling in a group must help create the feeling that each household "got a fair go" or is "a little special" … the design must seek to avoid anyone feeling that some units are significantly better than others' (11). Social Housing Design Guide also discusses sustainability (including heat island and microclimate responses) and indoor/outdoor connections, as well as specifies many of the services, layouts, fixtures, fittings, furniture and the like.

5.2.1.3 Queensland Housing Strategy 2017-2027

This strategy aims to redefine housing delivery 'to support urban renewal, generate new jobs, provide affordable housing, and drive innovative housing design that responds to contemporary housing needs' (Queensland Government 2017a, 4). There are four foci for the strategy: growth (more housing, better planning and stronger partnerships), prosperity (reduced barriers to tenancy, pathways to independence, closing the gap and building on strengths), connections (seamless service delivery and collaboration), and confidence (reform and modernise regulatory framework including consumer protection, livable and sustainable housing design).

5.2.1.4 Housing principles for inclusive communities

The Qld Government has developed four housing principles associated with inclusive communities: rights, choice, control and inclusion. They align with the above strategy and the intent of United Nations Convention on the Rights of Persons with Disabilities and the National Disability Insurance Scheme. The four principals were developed following consultation and in conjunction with other government agencies, Griffith University, National Shelter and the Queenslanders with Disability Network (QDN). Detail of each of these four principals are provided at the associated HPW webpage.

'Through these principles, we aim to significantly improve the lives of people with disability and older people who face greater barriers in accessing safe, accessible and affordable housing' (Queensland Department of Housing and Public Works 2020).

5.2.1.5 Shaping SEQ South East Queensland Regional Plan 2017

This plan is 'encouraging growth within the current Urban Footprint. This means housing is focused where people can take advantage of existing infrastructure and ensuring easier, more affordable access to services. Most importantly, this kind of development means people can live closer to their jobs, decreasing commutes and encouraging a healthier, happier population' (Queensland Department of Infrastructure 2017, 4). In this context this plan provides guidance with regards to many of the key accessibility and liveability themes already highlighted (Table 16). Strategies associated with each of these elements are included in the plan.

Table 16 Goals and elements for the next 25 years in the Shaping SEQ Regional Plan

Goal 1: Grow - Sustainably accommodating a growing population	1 Efficient land use 2 Focusing residential density 3 New communities 4 Housing diversity 5 Growing rural towns and villages
Goal 2: Prosper - A globally competitive economic powerhouse	1 High-performing outward-focused economy 2 Regional economic clusters 3 Regional activity centres network 4 Knowledge and technology precincts 5 Major enterprise and industrial areas 6 Tourism 7 Special uses 8 Rural prosperity
Goal 3: Connect - Moving people, products and information efficiently	1 An efficient movement system 2 Active transport 3 Integrated planning 4 Prioritised infrastructure investment 5 Regional infrastructure networks 6 Digital infrastructure
Goal 4: Sustain - Promoting ecological and social sustainability	1 Aboriginal and Torres Strait Islander people 2 Biodiversity 3 Koala conservation 4 Regional landscapes 5 Water sensitive communities 6 Natural economic resources 7 health and wellbeing fairness climate change 10 safety 11 affordable living
Goal 5: Live - Living in better designed communities	1 Valuing good design 2 Working with the weather 3 Inspiration from local character 4 Working with natural systems 5 Creating legible and connected streets and spaces 6 Embedding opportunities for adaptation and change 7 The power of place-making

Source: (Queensland Department of Infrastructure 2017, 27)

5.2.1.6 Economic Development Queensland – Priroity Development Areas

Economic Development Queensland (EDQ) is the State's land use planning and property development division working to create quality urban outcomes in partnership with local governments, industry and the community (Department of State Development 2020). They oversee the declaration and devlopment of Priority Development Areas (PDAs) based on factors including: supporting economic growth; need for accelerated development; special purpose developments; unlocking under-utilised and surplus government owned land; and driving development for community purposes. Development schemes are crafted in conjunction with local government and other stakeholders.

5.2.1.7 Queensland Urban Design and Places Panel

This independent expert panel provides the government with advice on major infrastructure and urban design projects in terms of best-practice design and place-making (Queensland Government 2020).

5.2.1.8 Healthy Places, Healthy People

This framework was developed through collaboration between government and industry to highlight links between the built and natural environment, and health (Figure 8). Indicators, informed by evidence, data and policy, were developed, while those demonstrating value through links between investment and productivity were considered.

Figure 8 – Qld Healthy Places, Healthy people framework

Source: (Queensland Department of Health and Office of the Queensland Government Architect 2019, 2)

5.2.1.9 Health and Wellbeing Strategic Framework 2017 to 2026

This framework includes a series of health and wellbeing indicators. Those most relevant to this review include:

a) Indicator 17 - Evidence of change in state-level policies that facilitate physical activity (cycling and walking strategies) needs expansion to cover a wider range of options

b) Indicator 18 - Evidence of environmental change to support physical activity in adults and children – including heart foundation walking and 10,000 steps – also needs expansion to be more inclusive.

Sunsafe, behavioural change and healthy eating are also elements, which can be considered further in the context of accessible and livable precincts.

5.2.1.10 State Planning Policy 2017

The housing supply and diversity, planning for safety and resilience and *planning for infrastructure* sections of this report are highlighted here (Figure 9). *Liveable communities* are considered further in the below section. The *housing supply and diversity* section includes detail on: climate responsive design, resilience and adaptability; access to transport options; and building siting and orientation; providing housing choice and adaptability which meets demographic need (Queensland Department of Infrastructure 2017b). *Planning for safety and resilience* considers planning for extreme weather events. *Planning for infrastructure* section considers the role infrastructure provision has in influencing urban form, access to employment and services, community connectivity and recreational opportunities.

Figure 9 – The state's interest in land use planning and development

Source: (Queensland Department of Infrastructure 2017b, 17)

5.2.1.11 State Planning Policy – state interest guidance material - Liveable communities

The current policy discusses *complete communities*, as 'communities where residents have good access locally to a range of everyday goods, services and employment opportunities. Complete communities support economic and social opportunity without residents having to commute long

distances to access the basic elements that help sustain a community' (Queensland Department of Infrastructure 2017a, 67). This includes seven state interest policies (below) along with assessment benchmarks and examples of planning scheme provisions, which should be further reviewed in the context of the Qld case study.

- State interest policy (1) Built and natural environment: High quality urban design and place making outcomes are facilitated and promote: (a) affordable living and sustainable and complete communities; (b) attractive, adaptable, accessible and inclusive built environments; (c) personal safety and security; (d) functional, accessible, legible and connected spaces; (e) community identity through considering local features, character, needs and aspirations.
- State interest policy (2) Built and natural environment: Vibrant places and spaces, and diverse communities that meet lifestyle needs are facilitated by: (a) good neighbourhood planning and centre design; (b) a mix of land uses that meet the diverse demographic, social, cultural, economic and lifestyle needs of the community; (c) consolidating urban development in and around existing settlements; (d) higher density development in accessible and well-serviced locations; (e) efficient use of established infrastructure and services; (f) supporting a range of formal and informal sporting, recreational and community activities.
- State interest policy (3) Built and natural environment: Development is designed to: (a) value and nurture local landscape character and the natural environment; (b) maintain or enhance important cultural landscapes and areas of high scenic amenity, including important views and vistas that contribute to natural and visual amenity; (c) maintain or enhance opportunities for public access and use of the natural environment.
- State interest policy (4) Infrastructure and services: Connected pedestrian, cycling and public transport infrastructure networks are facilitated and provided.
- State interest policy (5) Infrastructure and services: Community facilities and services, including education facilities (state and non-state providers), health facilities, emergency services, arts and cultural infrastructure, and sport, recreation and cultural facilities are well-located, cost-effective and multi-functional.
- State interest policy (6) Infrastructure and services: Connection to fibre-optic telecommunications infrastructure (e.g. broadband) is supported in greenfield areas.
- State interest policy (7) Infrastructure and services: All development accessed by common private title is provided with appropriate fire hydrant infrastructure and has unimpeded access for emergency service vehicles to protect people, property and the environment.

5.2.1.12 Healthy and Active Communities: walkable neighbourhoods.

From 28th of September 2020, new residential subdivisions in Queensland will be assessed against benchmarks relating to: connectivity; block lengths; footpaths; park or open space; and street trees (Queensland Department of State Development 2020). The available technical guidance material includes:

- *Street Design Manual* - comprising planning and design guidelines (Institute of Public Works Engineering Australia 2020).
- *Model code for neighbourhood design* – 'set of example provisions which supports healthy and active communities and promotes the creation of walkable neighbourhoods' (Queensland Treasury 2020a, 3).
- *Walkability Improvement Tool* – 'provides built environment professionals with a methodology to identify and prioritise walkability improvements in existing neighbourhoods' (Queensland Treasury 2020b)

5.2.2 Western Australia

The regulatory framework in WA is currently subject to a comprehensive review, which the Minister of Planning initiated in 2017. The new Planning Reform process falls under the Department of Lands,

Planning and Heritage. The process of consultation will be completed later in 2020 and will consider in its response to stakeholder the wider and complex context of COVID-19 (WA Department of Planning 2020).

The reform is focussed on three key topics - design standards, planning instruments, and consultation processes with particular regard to early community engagement, and includes a revision of 'Planning and Development Act 2005, Planning and Development (Local Planning Scheme) Regulations 2015 and State planning policies to create a more flexible, responsive and contemporary planning system that can support Western Australia's economic recovery. This is the culmination of more than three years of consultation across all sectors and the community to deliver high quality and sustainable development, create new employment and business opportunities, and ensure people have their say early about future development in their communities … Under the existing system, the focus continually falls on individual projects, rather than on the scheme or planning framework under which these projects are delivered. The aim of these reforms is to ensure the planning framework – including the scheme – has been developed in consultation with the community and is guided by a local panning strategy to develop liveable and attractive precincts' (Government of Western Australia 2020).

Rethinking the role of local planning strategies is assuming a particular importance since the early stage of the reform process. 'Proposed amendments to the Planning and Development Act 2005 will elevate the status of local planning strategies to ensure all local governments have a clear, contemporary and consolidated planning and development vision for their local area. Meaningful community consultation and engagement throughout the process is integral to the preparation of a local planning strategy to alleviate confusion and ensure there are no surprises about the types of development that can occur within our suburbs. Currently, there is no reference to a local strategy within planning legislation meaning the importance of articulating aspirations and setting a future vision can be underestimated and misunderstood' (WA PLH 2005, 2).

The three main objectives of the WA Planning reform stem from the values of sustainable liveability and prosperity outlined in the document 'Our Priorities: Shared Prosperity'. Its goals include an increased housing choice to satisfy different needs of population and more diverse households, high amenity and safety to increase liveable and healthy communities, efficient use of infrastructure to reduce cost of new housing and cost of living, increased connectivity and protection of agricultural land and other valuable ecosystems (WA Department of Planning 2019, 6).

The three main objectives of the reform are:

- Ensuring the planning tools and processes are fit-for-purpose to respond to the challenges of the next phase of WA's growth.
- Make the planning system easier to understand and enable the community to be more engaged in strategic planning.
- Support new ways to reduce the red tape in the operational processes.

In the context of this research, the following sub-objectives, amongst others, are of particular interest for this research.

1) 'Give local planning strategies the highest level of importance in community planning and development'. To this end, the department will develop a new Community Engagement Toolkit to support and improve engagement and consultation practices.
2) 'Extend the minimum period of community consultation for a local planning strategy from 21 to 35 days, providing more time for people to provide their feedback'.

In addition, enabling planning documents to be published online, as opposed to only being available for inspection, is another initiative devised to support the process.

The Department of Planning, Lands and Heritage will finalise and review planning policies for residential design codes and activity centres after releasing draft policies for medium density and liveable neighbourhoods in mid-2020 for public consultation.

Of particular interest is *Objective A4 - Good design is required and design excellence*, encouraged in *Action Plan for Planning Reform*. This objective aims to deliver better places and good design through both prescriptive and performative design policy and guidance. Over the past year, the structure and role of design review processes has been more clearly defined and more widely promoted to achieve quality outcomes in the development of our towns and cities. To this end, the WA Department of Planning, Lands and Heritage (DPLH) refer to the review of the R-Codes and other policies, which will establish more consistent consultation requirements for residential projects and reduce red tape for industry through more clear and simple guidance. To date, however, there is not yet evidence of a further review of this code in light of the impact of COVID-19 on housing design policy.

Table 17**Error! Reference source not found.** provides a summary of WA regulations, policies, strategies and guidelines considered in this section.

Table 17 - Western Australia regulation, policy, strategies and guidelines.

Regulatory body WA	Ministerial reporting line	Focus (Housing relevant)	Document	Intent and deliverables
Department of Communities	Housing Community Services Disability services Youth Seniors and Ageing	Disability services, child protection and family support, housing, youth justice, community initiatives	WA Affordable Housing Strategy 2010-2020 And 2020-2030 (Ongoing)	'The strategy is a call to action for all sectors to work together to improve housing choices and pathways. It will consider how to improve access to suitable and affordable homes and respond to current and future need. The strategy will be supported by three implementation plans: an affordable housing implementation plan, a remote and regional implementation plan and a social housing framework' (WA Department of Communities, 2020).
			Affordable Housing Action Plan 2017-18 to 2019-20	The aim of this plan 'is to achieve better outcomes for individuals and families, deliver inclusive and connected communities and create a housing system that is more responsive to a broader range of needs' (Government of Western Australia 2018)
Housing Authority				The Housing Authority is now part of the new Department of Communities
Department of Housing	Housing			The Department of Housing is now part of the new Department of Communities
Department of Planning, Lands and Heritage (DPLH)	Planning Heritage Aboriginal affairs and Lands	Review of the R-Codes; consultation requirements for residential projects	Action plan for Planning reform (2019)	The Action Plan has been designed to: provide clear strategic direction across the planning framework; enable the community to be more involved; support new ways of working; and ensure the planning system is fit-for-purpose and can meet the challenges of the next phase of WA's growth (WA Department of Lands Planning and Heritage 2019).
Western Australian Planning Commission (WAPC)		Density increase Infill housing Liveable cities with quality public and private spaces	WAPC Strategic Plan 2018-2021	WAPC is a statutory authority which responds to the strategic direction of government on urban, rural and regional land use planning and land development matters throughout Western Australia. Amongst its priorities, WAPC facilitates infill development and sustainable urban growth; address barriers to affordable living and housing diversity through policy; enable affordable, accessible and safe communities.
Design WA + DPLH + (WAPC)	Planning	Housing design policies development and implementation	State Planning Policy 7.0 Design of the Built Environment	Through the State Planning Policy 7.0 Design of the Built Environment, Design WA addresses design quality and built form outcomes in WA. It seeks to deliver the broad economic, environmental, social and cultural benefits that derive from good design outcomes and supports consistent and robust design review and assessment processes across the State (Design WA, WA Department of lands Planning and Heritage et al. 2019).

DPLH + WAPC	Planning		State planning policy 7.3.1 R-Codes Volume 1	As an integral part of the Planning Reform, this document is part of the new Design Codes. It provides residential and mixed-use development through appropriate residential design; future residents with opportunities for better living choices and affordability; variety and diversity (WA Department of Lands Planning and Heritage and WA Planning Commission 2018). It sets regulations for all single houses and dwellings under R40, and defines residential density ratio from low to high-density.
DPLH + WAPC	Planning		State planning Policy 7.3 R-Codes Volume 2	Similar to SPP 7.3.1, this document provides planning and design standards for residential apartments (multiple dwellings) in areas coded R40 and above, with mixed use and development and activity centres. It assists also in the preparation of local councils' design guidelines and informs the community about the ten principles, which underpin the Good Design strategy of the WA State planning authorities.
Development WA	Treasurer; Finance; Aboriginal affairs and Lands Planning Transport Heritage	Complex urban projects; Affordable housing in mixed use and residential developments		Development WA is WA's 'central development agency, with a diverse portfolio of industrial, commercial and residential projects. They operate under the Western Australian Land Authority, Metropolitan Redevelopment Authority and Hope Valley-Wattleup Redevelopment legislation. Their work includes the creation of new cities and communities, precinct-scale urban renewal and major destination projects to support and shape WA's growth' (DevelopmentWA 2020)

5.2.2.1 WA housing Strategy 2020-2030

The WA Department of Communities is currently developing the new WA Housing Strategy 2020-2030 (WA Department of Communities 2020a). The strategy will set the direction for the next ten years, aiming to create a more sustainable and responsive housing system for WA. The strategy was planned to be delivered in the first half of 2020; however, due to the pandemic, the release of the strategy has been postponed.

Affordable Housing Strategy 2010-20: Opening Doors to Affordable Housing and the 2017 Action Plan provide foundations on which this strategy will be built. The strategy also seeks to evolve an approach to housing and service delivery (WA Department of Communities 2020b). The WA 2020-2030 housing policy will be shaped around the priorities established in the Ageing with Choice Future directions for seniors housing 2019-2024 (released in October 2019) and the recent homelessness strategy, All Paths Lead to a Home - Western Australia's 10-Year Strategy on Homelessness 2020-2030. The first, Ageing with Choice, is framed within the Affordable Housing Action Plans 2017-18 and 2019-20, and addresses the needs of older Western Australians to access affordable, manageable and stable homes. In particular, the strategy aims to support senior Australians ageing in their communities, thus remaining connected with families and friends by: (i) improving partnerships with the private and community sectors to deliver affordable homes; (ii) delivering diversity of housing options for older people; and (iii) improving housing assistance and information services (WA Department of Communities 2019a). The second policy, the homelessness strategy, sets out a ten-year vision for all levels of government as well as the community sector and broader community to address the following four main goals: improving Aboriginal wellbeing; providing safe, secure and stable homes; preventing homelessness; and strengthening and coordinating our responses and impact (WA Department of Communities 2019b). These priorities will inform the development of the WA Housing Strategy 2020-2030.

To date, the Department of Communities, with the support of Shelter WA, has held several rounds of consultations with key specific stakeholders (these includes: State and Federal government agencies, peak and academic bodies, industry and builders), mixed groups and regional private and public agencies as well as local government association and Aboriginal community. Key insights and themes emerging from the various rounds of consultations are:

- needs for a more holistic approach to housing aiming to build capacity and community, a "place-based" and "community-centred" approach;
- critique of previous policy for being too homeownership orientated;
- definition of clear measurable targets.

In October 2019, the WA Department of Communities completed a short survey amongst members of the public. Survey results showed preference for increasing the supply of social housing; having a responsive housing system as more important than affordability; providing public housing to the most vulnerable in the community; and providing a diverse mix of housing types and price points.

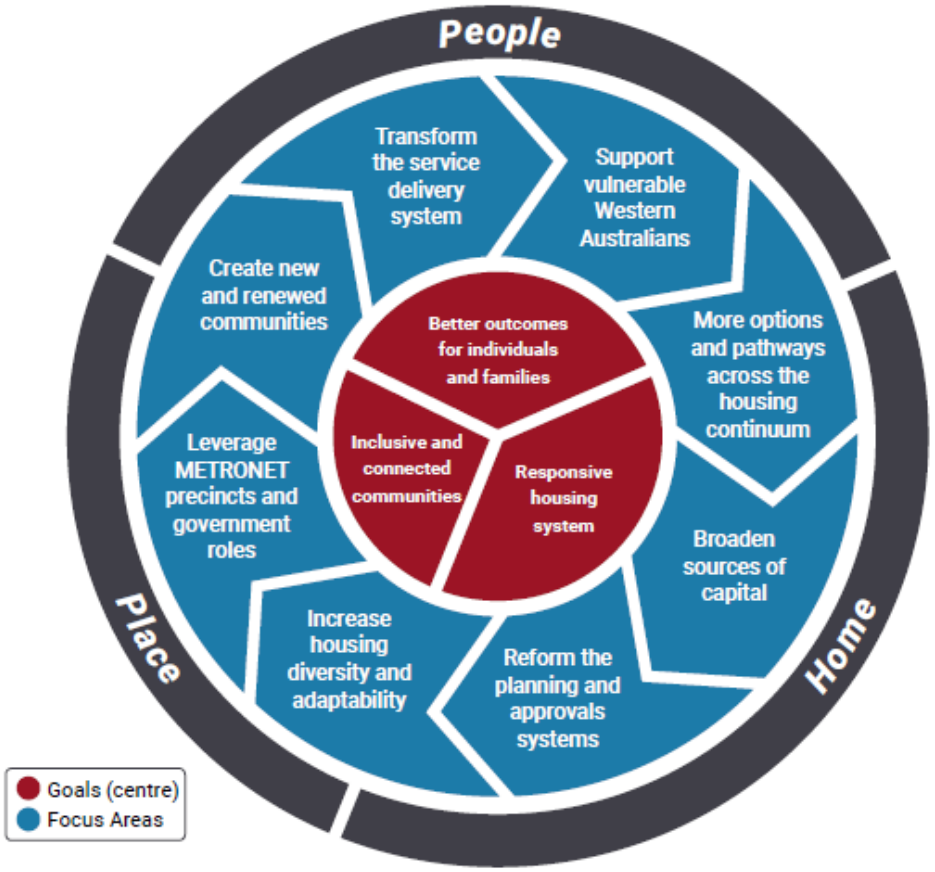
5.2.2.2 Affordable Housing Action Plan 2017-18 to 2019-20

The WA Government's *Affordable Housing Action Plan 2017-18 to 2019-202*0 follows in line with the intervention set by the Affordable Housing Strategy 2010-20 (WA Department of Communities 2018). It delineates clear actions to achieve the 2010-20 strategy main goals of increasing the range of 'AAA' – Available, Affordable and Appropriate housing opportunities for those on low to moderate incomes (Western Australia Department of Housing 2010) (Figure 10). Both the strategy and the action are in response to a crisis of the housing market that, following the economic boom of the early 2000s, has become structural rather than cyclical.

Despite WA experiencing an oversupply of housing over the past 20 years, the supply-demand dynamic of the private market did not self-correct (WA Housing Authority 2016). The cause can be identified in the price range

of dwellings. According to the WA Housing Authority (2016) data, 50 percent of dwellings sold between 2013 and 2015 were aimed at high income households and linked to the type and location of housing supplied (Ong et al. 2017).

Figure 10 The interconnected goals and focus areas of the Affordable Housing Action Plan



Source: (WA Department of Communities 2018, 3)

The action plan takes on the concept of housing continuum set in the Affordable Housing Strategy 2010-2020. The strategy focuses on creating more options for low to moderate income households across this continuum in relation to product delivered and locations—from homelessness through to home ownership, placing 'emphasis on where people live and not just what people live in' (WA Department of Communities 2018, 2). The document identified 8 main areas of focus, of which the following are directly relevant to this research: reform the planning and approvals systems to address the delivery of higher densities; increase housing diversity and adaptability; increase the number of new homes that incorporate liveable design standards; and leverage the METRONET[25] precincts and government land to deliver diverse and inclusive developments.

More broadly, the strategic goal of the plan is to support the Minister of Housing's commitment to delivering 7,700 homes for people on low to moderate incomes, as well as investing in new construction that will support $2.3 billion in economic activity and almost 6,000 jobs over the three-year plan. It also increased the previous 2010-2020 target of 30,000 affordable housing opportunities to a minimum of 35,000 by 2020.

[25]Metronet is a WA multi-government agency formed in 2017 and it is responsible for managing extensions to Perth's transport network.

5.2.2.3 State Planning Policy 7.0 Design of the Built Environment

Building on the report *Better Places, Better Spaces, a policy for the Built Environment in Western Australia,* the State Planning Policy SPP 7.0 Design of the Built Environment has developed the basis for a set of residential and non-residential codes focussing on achieving Good Design outcomes (WA Office of the Government Architect 2013). Developed in collaboration with Design WA, such an approach is informed by two principles:

1) The definition of good design.
2) The formalization of a consultative process during the approval process, based on international best practice policies, e.g. good design is understood via the definition of ten design principles. Albeit the principles are intended to apply to a diverse range of projects, they include a conspicuous number of insights concerning housing.

The SPP 7.0 explicitly defines good design as a set measurable outcomes (Table 18).

Table 18 - **The 10 Good Design Principles.**

Principle 1: Context and character- Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.	1 Built features 2 Socio/economic conditions 3 Environmental conditions 4 Aboriginal culture and post settlement heritage
Principle 2: Landscape quality Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.	1 Public spaces – parks, reserves, green infrastructures 2 protection of ecosystems/promotion of biodiversity 3 water and soil management 4 solar access and microclimate 5 tree canopy, Urban Heat Island impacts
Principle 3: Built form and scale - Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.	1 orientation, proportion, composition of buildings 2 definition of public domain 3 contribution to the streetscape character 4 Provision of good amenity at ground level
Principle 4: Functionality and build quality - Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.	1 Functional environments and spaces fit for purpose 2 Be resilient to wear and tear expected from its intended use 3 Easy to upgrade and maintain 4 Receptive of life cycle 5 Integrating building services without detriment of functionality, use and appearance.
Principle 5: Sustainability - Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.	1 Landscape and urban design with minimal impacts on existing ecosystems 2 Provide optimal orientation, shading 3 Provide thermal performance and natural ventilation 4 Reduce reliance on technology for heating/cooling 5 Minimise energy use spaces and operating costs 6 Reduce resource consumption over building life-cycle 7 Re-use of materials and buildings
Principle 6: Amenity - Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.	1 Mix use to respond to diverse community 2 Offer range of activities throughout different times of the day and week 3 Universally accessible designed spaces 4 Avoid overshadowing, overlooking, glare, noise 5 Provide internal rooms adequately sized, comfortable, easy to furnish and use, with good levels of natural ventilation, daylight, acoustic protection, storage space, outlook and privacy.
Principle 7 – Legibility - Good design results in buildings and places that are legible, with	1 Priority to pedestrian and bicycle movement over vehicular 2 Precincts, sites and buildings logical and intuitive to use

clear connections and easily identifiable elements to help people find their way around.	3 A clear hierarchy of spaces within buildings with identifiable entries and clear wayfinding 4 Clear distinction between public and private spaces.
Principle 8 – Safety - Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.	1 Passive surveillance of public and communal areas 2 well-lit, secure access points 3 integrate safety in vehicular routes to mitigate impact on pedestrian amenity
Principle 9 – Community - Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.	1 places adaptable to changing demographics 2 respond to ageing population, new uses and disability 3 residential mix of dwelling types 4 Single housing proposals to include housing choice for different demographics, living needs and household budgets
Principle 10 – Aesthetics - Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.	1 elegant and coherent outcome 2 address all scales 3 coherence of design beyond style and appearance

Source: WAPLH and WAPC 2019

The second principle underpinning good design is the consultative process, whereby the role of design experts is pivotal to success of good quality outcomes. One of the examples is the UK CAPE, where policy starts from the assumption that good design outcomes can be achieved when a competent and skilled architect or building designer is engaged for the design in a consultative planning process, the *design review*. The design review is an independent and impartial evaluation process regulated via the Planning and Development Regulations 2015 or the WAPC Design Review Guide. During the review, a panel of experts on the built environment assesses the design of a proposal, before the proposal is officially submitted for approval to the statutory authority (WA Department of Lands Planning and Heritage and WA Planning Commission 2019). The panel's feedback is then incorporated into the final version of the project to achieve the quality necessary for the approval.

Hooper et al. (2015) provide an evaluation of the WA 'Liveable Neighbourhoods' planning policy. Whilst the focus of this policy is primarily suburban, more general insights can be gained from it. The paper includes a listing of 'objective measures of the community design, movement network, lot layout and public parkland requirements from the Liveable Neighbourhoods policy' Hooper et al. (2015, 4-5), which can be compared to the 10 Good Design principles of the SPP 7.0 policy document (Table 19). They table includes additional details regarding each of the below items, which can be used to inform the liveability framework.

Table 19 – **Extract** - **Objective measures of the community design, movement network, lot layout and public parkland requirements from the Liveable Neighbourhoods policy.**

COMMUNITY DESIGN
Access to Neighbourhood Centres
Configuration of Neighbourhood centre accessible within 1600 m
Diversity of Destinations within Neighbourhood Centres
Access to Public Transport
Access to Primary Schools
MOVEMENT NETWORK
Connectivity of the Street Networks
External Connectivity
Total footpath provision
Cycling networks
Streetscapes – Trees along footpaths
LOT LAYOUT
Residential lot size
Lots near neighbourhood centres (within 400 m service areas)

Housing diversity development-wide
Dwelling types near neighbourhood centres (within 400 m service areas)
PUBLIC PARKLAND
Amount and type of parks
Access to parks

Source: (Hooper et al. 2015)

5.2.2.4 State Planning Policy 7.3 Residentail Design Codes Volume 1

The R-Codes state policy is a mainly technical document, the purpose of which is to enable control of residential development design processes and outcomes in Western Australia. State Planning Policy 3.1 Residential Design Codes is prepared under section 26 of the Planning and Development Act 2005 and focuses on Residential Design codes, which regulate the approval for single house, single houses on small lots and developments designs (Sections 1-3) (WAPLH 2019a).

The document includes consultation procedures (Section 4), and the possibility for local council to demand, with the approval of the WAPC and fundamental design principles, quality outcomes with which every proposal needs to comply. Design principles relate to site, building, garage and lot boundary setback, building height, open and communal space, street surveillance and sight lines. They also regulate outdoor living areas, landscaping, access and parking and apply in a different manner according to density. Density is defined by the Residential code (R-Code), that is the Number of Dwelling per hectare, where: R40 = 40 dwellings per Hectare. The R-codes are currently applied as a default setting to provisions defined in local planning instruments. Part 5 refers to dwelling areas less than R40, Part 6 refers to R40 and above. The R40 threshold seems therefore to constitute a reference for a distinction between low density and higher density from the statutory body's perspective.

The *density thresholds* seem to be confirmed by the Standard Policy 7.3, released on February 2019, which relates to grouped dwellings in areas coded less than R40, while for areas above R40 an innovative policy has been released in mid-2019 (SPP7.3 Volume 2). The SPP7.3 Vol 1 replaces SPP3.1. Table 20 details standard guide areas selection for lower to higher density residential developments.

Table 20 - General requirements for all singles house(s) and grouped dwellings: and multiple dwellings in areas coded

1 R-Code	2 Dwelling type	3 Minimum site area per dwelling (m^2)	4 Minimum lot area/rear battle-axe (m^2)	5 Minimum frontage (m)	6 Open space		7 Minimum setbacks (m)		
					min total (% of site)	min outdoor living(m^2)	primary street	Secondary street	other/ rear
R2	Single house or grouped dwelling	Min 5000	-	50	80	-	20	10	10
R2.5	Single house or grouped dwelling	Min 4000	-	40	80	-	15	7.5	7.5
R5	Single house or grouped dwelling	Min 2000	-	30	70	-	12	6	*/6
R10	Single house or grouped dwelling	Min 875 Av 1000	925	20	60	-	7.5	3	*/6
	Multiple dwelling	1000	-	-	60	-	7.5	3	*/6
R12.5	Single house or grouped dwelling	Min 700 Av 800	762.5	17	55	-	7.5	2	*/6
	Multiple dwelling	800	-	-	55	-	7.5	2	*/6
R15	Single house or grouped dwelling	Min 580 Av 666	655	12	50	-	6	1.5	*/6
	Multiple dwelling	666	-	-	50	-	6	1.5	*
R17.5	Single house or grouped dwelling	Min 500 Av 571	587.5	12	50	36	6	1.5	*
	Multiple dwelling	571	-	-	-	-	6	1.5	*
R20	Single house or grouped dwelling	Min 350 Av 450	450	10	50	30	6	1.5	*
	Multiple dwelling	450	-	-	50	-	6	1.5	*

R25	Single house or grouped dwelling	Min 300 Av 350	425	8	50	30	6	1.5	*
	Multiple dwelling	350		- -	50	-	6	1.5	*
R30	Single house or grouped dwelling	Min 260 Av 300	410	-	45	24	4	1.5	*
	Multiple dwelling	300		- -	45	-	4	1.5	*
R35	Single house or grouped dwelling	Min 220 Av 260	395	-	45	24	4	1.5	*
	Multiple dwelling	260		- -	45	-	4	1.5	*
R40	Single house or grouped dwelling	Min 180 Av 220	380	-	45	20	4	1	*
R50	Single house or grouped dwelling	Min 160 Av 180	380	-	40	16	2	1	*
R60	Single house or grouped dwelling	Min 120 Av 150	380	-	40	16	2	1	*
R80	Single house or grouped dwelling	Min 100 Av 120	380		30	16	1	1	*
All standards for single house or grouped dwellings within R100, R160 and R-AC areas are as for the R80 Code									

Source: (WAPLH and WAPC 2019, 47)

NOTE 1: in the context of this research, it is worth to note that Density is a relative measure, and it is applied as incremental/decremental value to an existing contextual condition, whereas a residential intervention increases or decreases the pre-existing density value.

NOTE 2: Currently, the WAPC is reviewing ad interim the State Policy 7.3 Volume 1 as part of the State Government package of planning reforms to assist with economic recovery in response to COVID-19 pandemic impact. A further comprehensive review of the R-codes will take place to implement the WA medium Density Housing Policy.

From the above table, it also appears that R80 seems to constitute a further threshold towards high-density, as all standards for dwellings rated R100-R160 follow consistent standards.

5.2.2.5 State Planning Policy 7.3 Residential Design Codes Volume 2 - Appartments

This document, released in conjunction with the SPP7.3 Volume 1, applies to R-codes deemed R40 and above and complements the set of compliance rules established by the SPP7.3 Volume 1 through a performance based rather than prescriptive based approach (WA Department of Lands Planning and Heritage and WA Planning Commission 2019b).

Under this provision, high-density is defined as R100 and above to a max of R160, with plot ratio between 1.3 and 2.0. Mid-rise is between R60 and R80 with plot ratio between 0.8 and 1.0. The R-AC codes apply where designated by local governments in local planning schemes, activity centre plans, structure plans, and local developments. Under these regulations (R-Codes Appendix 1 p.53 definitions), the following space types are defined:

1) Active habitable space – any habitable room with a floor area greater than 10m2 and any balcony, veranda, terrace or other outdoor living area raised more than 0.5m above natural ground level.
2) Activity centre - community focal points. They include activities such as commercial, retail, higher density housing, entertainment, tourism, civic/ community, higher education, and medical services. Activity centres vary in size and diversity and are designed to be well-serviced by public transport.
3) Activity centre plan - An activity centre structure plan is a statutory document required by State Planning Policy 4.2 for strategic metropolitan centres, secondary centres, district and specialised centres but not for neighbourhood or local centres (State Planning Policy 4.2 Table 2: Activity Centre Hierarchy). It can be prepared by local government, a landowner, landowner's representative or a government agency.

The quality performance indicators for achieving good design outcomes in housing, in response to the ten principles of good design, are addressed through a number of elements and objectives (Table 21). For each

element, key objectives and acceptable outcomes are identified to orient and facilitate residential design (See Appendix C). They offer a comprehensive list of criteria to consider and address when designing higher density apartments.

Table 21 - Elements and Objectives to achieve good design in residential projects

SECTIONS	ELEMENTS
Primary Controls	Building heights; street setbacks; side and rear setbacks; plot ratio; building depth; building separation.
Siting Development	Site analysis and design response; orientation; tree canopy and deep soil areas; community open space; visual privacy; public domain interface; pedestrian access and entries; vehicle access; car and bicycle parking.
Designing the building	Solar and day light access; natural ventilation; size and layout of dwellings; private open space and balconies; circulation and common spaces; storage; managing noise impact; dwelling mix; universal design; façade design; roof design; landscape design; adaptive reuse; mixed use; energy efficiency; water management and conservation; waste management; utilities.

Source: (WAPLH and WAPC 2019c)

The following provides an example of the application of this policy (WAPLH and WAPC 2019a, v):

> **ELEMENT OBJECTIVES -** *Development is to achieve the following Element Objectives:*
> **O 4.8.1** A range of dwelling types, sizes and configurations is provided that caters for diverse household types and changing community demographics.
> **ACCEPTABLE OUTCOMES -** *Acceptable Outcomes are likely to assist in satisfying the objectives but are not a comprehensive 'deemed-to-comply' list. In order to achieve the Element Objectives, proposals may require additional and/or alternative design solutions in response to the site conditions, streetscape and design approach.*
> **A 4.8.1**
> **(a)** Dwelling mix is provided in accordance with the objectives, proportions or targets specified in a local housing strategy or relevant local planning instrument
> **OR**
> **(b)** Where there is no local housing strategy, developments of greater than 10 dwellings include at least 20 per cent of apartments of differing bedroom numbers.
> **A 4.8.2** Different dwelling types are well distributed throughout the development, including a mix of dwelling types on each floor.
> **DESIGN GUIDANCE -** *Potential alternative solutions to satisfy the Element Objectives will be considered on a performance basis.*
> **DG 4.8.1** When considering the preferred dwelling mix appropriate to the development location, take into consideration:
> - objectives and demographic trends identified in a local housing strategy or other relevant local planning instrument
> - current and projected community demographics, the profile of existing housing stock and market data
> - employment, education and community services in the locality and the housing demand associated with those services
> - unmet housing need in the locality including a demand for affordable or accessible housing.
>
> **DG 4.8.2** A diverse dwelling mix may include dwellings designed to suit singles, couples, unrelated adult sharers, families, multi-generation households, seniors ageing in place and people with disabilities. Consider flexible configurations of space that can respond to changes in household composition and work/life arrangements. Examples include:
> - increased provision of adaptable/accessible
> - dwellings
> - larger rooms that are generic in form and suited to a variety of uses and functions
> - dual master bedroom apartments with separate bathrooms
> - dwellings with a street front room suited for use as a home business
> - larger apartments with multiple living spaces

- open plan, 'loft' style apartments with only a fixed kitchen, laundry and bathroom to
- accommodate temporary partitioning of space by occupants
- larger apartments with access to larger outdoor courtyards or terraces to meet the needs of families.

DG 4.8.3 Ground floor dwellings are particularly suited to assist with providing greater housing diversity. Good accessibility means they are also well suited to aged or disabled occupants who require adaptable or universally designed dwellings.

5.3 The strata-title environment

Property is predominantly regulated at state and territory level, with limited constitutional power granted to the Commonwealth. One form of medium- and high-density housing that has dominated property ownership in Australia is strata titling. Strata and community titling is the vertical and or horizontal subdivision of a building to allow for multiple ownership (Easthope, Warnken et al. 2014). Lot owners purchase a strata title property that gives them ownership over a specified lot as well as a share, with all other lot owners, in the common property of the scheme. Unique to this form of titling is the legislative requirement to self-govern the scheme through a body corporate or owners corporation.

Each state and territory throughout Australia have their own unique strata titling legislations. In Queensland 'community titles scheme', encompassing strata and community titles, involve:

1) at least 2 lots; and
2) common property; and
3) a single body corporate; and
4) a single community management statement.

These schemes are regulated by the *Body Corporate and Community Management Act 1997* (Qld) (Qld Government 1997). The primary object of the BCCMA 'is to provide for flexible and contemporary communally based arrangements for the use of freehold land, having regard to the secondary objects'. Queensland's property laws, including the BCCMA, have been under review since 2013 although at writing recommendations are still forthcoming. In WA, strata titling is dealt with under the *Strata Titles Act 1985* (WA) (STA), with significant amendments to the STA coming into effect on 1st of May 2020.

An understanding of strata titling, whilst important from a property titling/ownership perspective, also has relevance within the value equation domain and as part of social and affordable housing provision. Residential strata title sales are a rapidly growing sector of the AUD$7.138 trillion property market (Australian Bureau of Statistics 2020a). In 2018 the Australian apartment market had an approximate value of close to AUD$1 trillion (Easthope et al. 2018), representing a significant contributor to the overall property value of the Australian economy. Medium to high-density housing have become the predominant property development choice as government policies and planning legislation provide the regulatory imperative for increasing densification in Australian cities. In response, for the first time since data collection began 50 years ago, multi owned properties (apartment, units, townhouse) developments outpaced building approvals for single dwelling housing in 2016 (Australian Bureau of Statistics 2020b).

From a development perspective, strata titling enables the property developer to sell lots *off the plan,* offsetting the development risk of a project. *Off the plan* is a colloquial term for the entry into a contract to acquire real property where title to that property has not been issued at the date of the contract (Queensland Government 2019). Thus, lots within a development can be sold to many different investors/future residents demonstrating to project financiers that there is a lower level of financial and development risk in funding the remainder of the project. This ensures some certainty of income from the development prior to construction. From a consumer's perspective, it may be an opportunity to secure lots at today's prices in markets where values are increasing, while construction is forecast to be completed in the coming months or years.

As a stakeholder in the provision of social and affordable housing, numerous local councils or state governments (i.e. through areas of state significant development) have approved relaxations to existing planning controls if the developer incorporates a proportion of social and/or affordable housing (Gurran et al. 2008). Diversity of housing tenures (social, affordable and market driven housing) mixed within these apartment buildings has abound as developers respond to reduced state government investment in housing provision, local government planning incentives and housing

policy. The mix of social (public or not for profit housing supplied for vulnerable groups), affordable (housing discounted by 20% to market rates) and market led (predominantly strata titled) housing options has the potential of creating further social challenges. Residents are having to negotiate living within close proximity to tenants from a range of different socioeconomic and cultural backgrounds (Liu et al. 2018). Theoretically, increased densities should lead to a higher probability of social interaction, a pre-cursor to developing a sense of community (Reid 2015). However, research has shown that apartment living often leads to residents being disengaged socially from the community, with an affective and psychological impact.

Incentivising developers to incorporate social and affordable housing has also facilitated new models of procurement funding. As already noted reduced state government spending on social and affordable housing has resulted in a need for and increased demand supplied by the private rental market. Interestingly, individual property investors are purchasing much of the strata title stock in Australia with approximately 67% of such properties being investor owned (Easthope et. al., 2018). This is doing little for housing affordability, diversity of housing stock and the creation of sustainable residential communities for residents. Many of these investors are *Mum and Dad* investors, with few sophisticated investors in residential property in Australia. Unlike other countries, such as the United States and the United Kingdom, the residential property market in Australia has not attracted widespread institutional investment. The *Build to Rent* model is in preliminary stages of adoption and activation following on from the conversion of the Commonwealth Games Athletes Village to residential apartments.

Despite the widespread development of strata title properties and their growing popularity as a housing choice, there are few regulatory provisions facilitating or enabling liveability. Much of the regulation in the various jurisdictions relates to the ongoing management and maintenance of schemes. The guidelines for apartment design and planning are not legislatively enforced. However, Commonwealth legislation around Discrimination (i.e. *Age Discrimination Act 2004, Australian Human Rights Commission Act 1986, Disability Discrimination Act 1992, Racial Discrimination Act 1975, Sex Discrimination Act 1984*), as well as state and territory equal opportunity and anti-discrimination seek to protect individuals.

A recent Supreme Court of Victoria case (*Owners Corporation v Anne* Black) has found that owners corporations have 'obligations towards people with a disability, including making sure they can access their home and public spaces' (Bromley 2018). Reasonable adjustments for tenants, residents and visitors with a disability are required. Reasonableness depends on individual circumstances such as the size of the owners corporation, the nature of adjustments required and their cost (Disability Access Consultants 2018). This ruling takes body corporate obligations around accessibility beyond the Common Property.

However, developers continue to build investor grade stock of predominantly one and two bedroom apartments with little regard to widespread accessible and liveable design features. Anecdotally, some developers indicate that there is not widespread demand for that product and there is an additional cost associated that is not returned by the market price. To date, limited research has sought to examine the rationale and value equation of providing liveable social and affordable medium to high-density strata title product.

6 ADOPTION – BARRIERS AND LEVERS

The adoption of liveability and accessibility elements in Australian homes has been limited in past decades due, in part, to a perceived imbalance between costs and benefits. The ABCB has been undertaking a regulatory analysis since 2018, specifically to 'consider the Livable Housing Design Guidelines Silver and Gold level specifications as possible options for a minimum accessibility standard, and additional options identified through consultation' (Australian Building Codes Board 2018b, 1). This analysis relates to new builds of Class 1a (houses, townhouses, row houses, etc.) and Class 2 (apartment buildings) dwellings. For Class 1a buildings, the NCC does not set any accessibility requirements.

This SBEnrc research project is addressing liveability and accessibility in medium and higher density social and affordable housing, and is looking at the precinct scale rather than the internal elements. Given that the historic adoption of accessibility has proven to be problematic in current low and medium density environments, embedding this in an evolving higher density environment will experience similar, or more acute hurdles.

Dr Penny Galbraith's submission to the ABCB highlighted that 'market-based demand is problematic because ageing and disability are not aspirational. Whereas purchasing a home is aspirational; the entertaining deck; the stone bench tops; the media room; dual vanities; place for the boat… [are] all aspirational.... Market demand for 'accessible/liveable' features is [therefore] not a reliable measure of the need for these features in dwellings' (Australian Building Codes Board 2019, 40). Along with community motivation and perceptions, industry uptake, regulatory burden and cost burden are significant issues. Regulatory burden is described in that report as: time spent demonstrating compliance; additional consultants; costs related to the use of performance solutions; and cost burden (refers to who pays that cost, i.e. who carries the 'burden'), as distinct from cost impact, which describes how much something costs.

Bringolf (2011a) summarises two key themes for the lack of uptake of universal design[26] in housing (especially mass market housing): (i) the consideration that people with disabilities and older people require special housing types; and (ii) the 'tightly structured technical efficiencies in the delivery chain' where mass housing is treated as an off-the-shelf product (Bringolf 2011a, 268). Bringolf summarises barriers to adoption as being: societal attitudes; technical efficiencies of industry with change required throughout the delivery chain; myths abound about difficulty and cost; aesthetic impact; and consumers are not demanding universal design (Bringolf 2011b). She proposes that regulation is needed for change to occur and highlights the Norwegian example of the system wide change.

In addition, recent industry stakeholder feedback to the Queensland Government's Department of Housing and Public Work's Building Legislation and Policy group on the accessible housing C-RIS suggests that cost-benefit analysis for accessible housing has historically been focused on detached housing. This indicates that this current research on accessibility in medium to high-density housing is welcome. Feedback noted that there were particular challenges with developing accessible car parking in multi-residential developments and providing lift access for 2 and 3 storey walk-up multi-residential buildings (Building Legislation and Policy 2020).

6.1 Lessons from others

6.1.1 Norway universally designed by 2025

In the 1960's and 70's housing policies in Nordic countries began to change to better integrate people with disabilities into 'ordinary environments' (Bringa 2019). This was the result of the work of advocates for people with disabilities arguing for inclusion and equal treatment, as a part of the move

[26] UD extends accessibility requirements – see Section 9 - Definitions.

away from institutional care (Bringa 2019). In 2009, the Norwegian government adopted an integrated, cross-sectoral approach involving 16 ministries working on detailed action plans and strategies to define an action plan that is to achieve nation-wide universal design and increased accessibility by 2020 (Norwegian Ministry of Children and Equality 2009). Legislative, market and administrative powers are being used to achieve this outcome. This example is provided to illustrate a nation-wide, long-term, integrated, cross-sectoral approach to implementing change in this area to overcome some of the barriers highlighted in this section.

During the past few years, several Acts and regulations have been amended in order to ensure universal design and increased accessibility. These include: • The Planning and Building Act • The Universities and University Colleges Act • The Vocational Training College Education Act • The County College Act • The Primary and Secondary Schools Education Act • The Public Procurement Act • Education-sector legislation • Regulations concerning a framework plan for kindergartens' contents and tasks • Regulations concerning the universal design of the transport sector. • Regulations concerning impact assessments • Regulations concerning basic loans from the Norwegian Housing Bank (Norwegian Ministry of Children and Equality 2009)

This comprehensive approach has targeted four areas: building and construction; planning and outdoor areas; transport; and sector-overarching reforms (Table 22). Duncan (2019) briefly outlines the positive impacts of this focussed effort, suggesting that 'universal design is included in 63 laws and regulations and in practice in several sectors of society' further highlighting that the 'theoretical concept of universal design has been tested extensively in real-life environments' (Duncan 2019), with both community and industry 2018 survey data finding greater community and industry acceptance of universal design.

Table 22 – Norway universally designed by 2025 priority areas

Four priority areas	Goals (Measures for sector overarching priorities)
Building and construction	Pursuant to the Planning and Building Act, regulations may be issued concerning the upgrading of categories of buildings, facilities and outdoor areas intended for the general public within given deadlines. Existing buildings managed by Statsbygg are to be upgraded successively in accordance with Statsbygg's action plan. The measure is to be continued until the universal design requirements have been met in line with the vision, i.e. by the end of 2025. See Appendix D extract.
Planning and outdoor areas	All local authorities should have adopted a municipal plan containing universal design guidelines by 2015. Universal design should be an integral principle of all regional plans by 2015. All county councils and 25% of all the local authorities should actively take part in a national development project with efforts aimed at municipalities and counties by 2014. All local authorities should have actively taken part in guidance on the new Planning and Building Act by 2010.
Transport	NSB AS (Norwegian State Railways) has entered into a contract for the delivery of 50 new train sets that meet the universal design requirements. These train sets are to be put into operation in 2012. Older train materials that will be in use after 2010/2011 will be upgraded to as high an accessibility level as possible. Scheduled town buses that are registered after 2004 are to be universally designed. The aim is to issue regulations concerning the universal design of commuter and express buses (motor vehicles in licensed transport), etc, by the end of 2009. On the main road network, almost 100 intersections and around 1,500-2,000 out of a total of 6,500 bus stops will be upgraded to the desired standard by 2019. The Public Roads Administration and National Rail Administration will in 2009 prepare an action plan for the National Transport Plan 2010-2019.

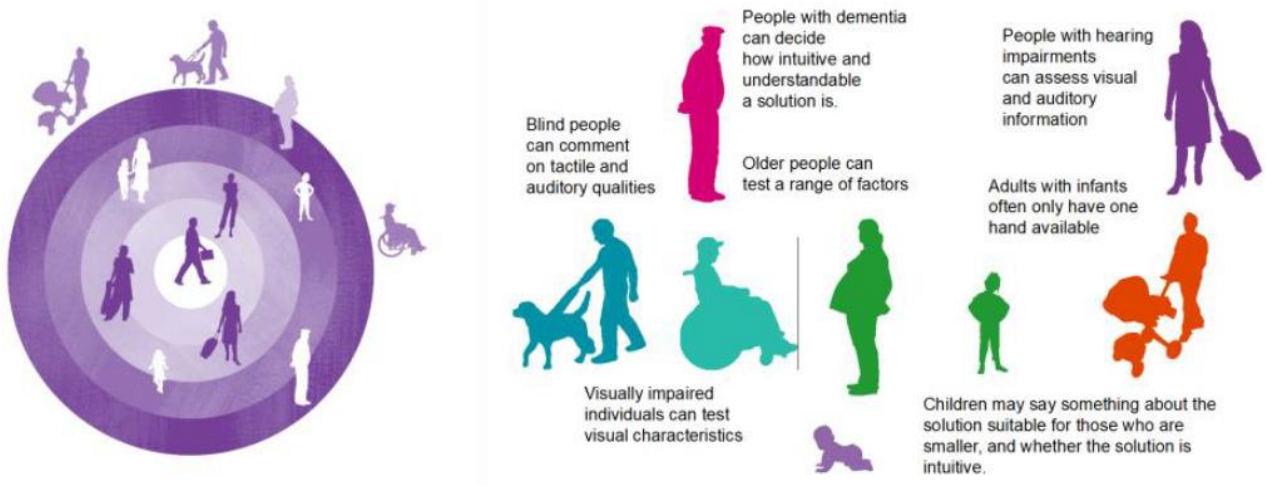
Sector-overarching measures	Including: local authority measures; development of indicators and standards; communication policy; children and young people; and research and development.

Source: (Norwegian Ministry of Children and Equality 2009, 13)

As at July 2020, the Ministry of Children and Equality is developing a new 5 year action plan, that 'will present actions on most relevant sectors of society including housing and the urban and social infrastructure. Some amendments were recently passed in the non-discrimination act (which contains requirements for universal design of buildings) to secure better compliance from owners of buildings' (Bringa 2020, 1).

Mikus et al. discuss the lead user analysis, which forms a part of Design and Architecture Norway (DOGA) approach (Figure 11). This approach depicts 'a bulls-eye image of possible user groups (left) and examples of user groups with descriptive attributes (right). The bulls-eye diagram on the left (based on work by Professor Jeremy Myerson, RCA Helen Hamlyn Centre for Design) represents all possible user groups. "Average users" are found in the center, and a variety of users are found around the perimeter. By aiming to design for the people on the outer edges, designers can include a broader market. The user groups depicted on the right are based on a DOGA visual that highlights possible design capabilities according to "outer edge" user groups'.

Figure 11 – Design and Architecture Norway (DOGA) lead user definition visuals



Source: (Mikus et al. 2020, 6)

Similarly in Ireland, the Centre for Excellence in Universal Design (CEUD) was established by the National Disability Authority (NDA) in 2007 under that country's Disability Act 2005. Dedicated to the principle of universal access in Ireland, the centre has a three-fold remit to address standards, education and professional development and awareness building (National Disability Authority Ireland 2020a)**.**

6.1.2 America's Fair Housing Act of 1968

'In the US, non-discrimination is the rationale behind certain types of accessible housing requirements (e.g., in multifamily projects[27]) while welfare for the citizens has been the motivation in the Nordic countries' (Bringa 2019).

Bringa (2019) highlights the 1988 *Amendments to America's Fair Housing Act of 1968*, which increased accessibility via seven accessibility requirements: for entrances to some buildings with dwellings, the public use areas, doors, routes, environmental controls, bathrooms and kitchens. In addition,

[27] Multifamily dwellings in the US equates to unit/apartment blocks in Australia.

Schwemm (2006) argues that, 'in order to help guarantee persons with disabilities equal access to housing, Congress in the 1988 Fair Housing Amendments Act provided in § 3604(f)(3)(C) that virtually all new multi-family housing be designed and constructed with certain accessibility features' (863). This was followed by states and localities adopting provisions to include the same requirement. Despite this, a great proportion of multi-family housing does not comply with these provisions. Schwemm considers developers, architects, and builders, engineers, subcontractors, and anyone else who is a substantial participant in the design-and-construction process, including original and subsequent owners, as legally liable for this failure.

This highlights the need for a beyond regulation approach to greater adoption.

6.1.3 Sustainable design uptake

Barriers to the integration of sustainability into the housing markets are considered by some to be institutional rather than technological, and include: economics; a lack of client understanding; process (procurement and tendering, timing, cooperation and networking); knowledge and the lack of a common language; and the availability of methods and tools (Crabtree and Hess 2009; Häkkinen and Belloni 2011). Häkkinen and Belloni (2011, 240) note that 'hindrances can be reduced by learning what kind of decision-making phases, new tasks, actors, roles and ways of networking are needed'.

The cost burden and impact of integrating sustainable design features into homes has been a long-term discussion, often focussing around up-front versus whole-of-life costs in a similar way to the current issue of accessible design. The following quote from Crabtree and Hess could also apply to accessibility.

'The immediate priority for the industry should be on developing and packaging environmental product that is cost-competitive, has a range of benefits, and minimizes the trade-offs in terms of aspects such as style and functionality. This can be reinforced by promotion connecting products to specific environmental outcomes and highlighting the full array of benefits that environmentally-friendly housing can offer. Further, the language and imagery of such promotion may best focus on the lifestyle, comfort and stylistic benefits of sustainable design' (Crabtree and Hess 2009, 223).

Addressing these issues has focussed around each of the areas proposed for the greater adoption of liveability and accessibility, and as a potential road map is being developed, further investigation of efforts to improve the uptake of sustainability is recommended.

6.1.4 Building Information Modelling (BIM) uptake

Previous SBEnrc research, *Integrated Project Environments – Leveraging Innovation for Productivity Gain through Industry Transformation*, investigated the need for system wide change at a national level to improve industry-wide productivity. Sanchez et al. (2014) detailed the UK government strategy as a part of that research. The UK government identified BIM as a critical part of improving construction industry productivity. They facilitated a concerted effort between government and industry peak bodies to bring about a series of legal, economic and operational reforms with the direct participation of industry stakeholders through a nationally based push-pull strategy with a number of reforms to be undertaken over a number of years as a part of a predefined roadmap. A similar approach was undertaken in Finland, which through a coordinated research, development and standardisation effort, pioneered in this area with activities dating back to 1982. Finland now requires the use of BIM for government procurement. This report highlighted that: '(i) industry takes action when the government demonstrates clear leadership; (ii) a national strategy facilitates the adoption of new information technologies such as BIM; and (iii) collaboration with industry is required to implement this strategy' (Sanchez et al. 2014, 9).

6.2 Improving adoption – a cross-sector, multi-stakeholder roadmap for implementation

The ABCB Accessible Housing Consultation Regulatory Impact Statement 'explicitly considers how accessibility could be improved through the following options' (Centre for International Economics 2020, 5).

- Status quo: No changes to existing policy settings. This option is used as a baseline against which the costs and benefits of the other options are assessed.
- Option 1: Accessibility standard, broadly reflecting LHDG silver standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- Option 2: Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 1a and Class 2 buildings.
- Option 3: Accessibility standard, broadly reflecting LHDG gold standard (with some platinum features), in the NCC applying to all new Class 1a and Class 2 buildings.
- Option 4: Accessibility standard, broadly reflecting LHDG Gold standard, in the NCC applying to all new Class 2 buildings only.
- Option 5: A subsidy program to encourage additional availability of accessible rental properties.
- Option 6: An enhanced approach to voluntary guidance, which includes turning the current proposals into a non-regulatory ABCB handbook and other measures to encourage additional uptake of universal design principles, including: a search engine for dwellings certified as complying with the LHDGs and provision of information at the point of sale.

The Centre for International Economics report, which accompanies the 2020 round of ACBC consultations, makes the following two preliminary recommendations:

1) Based on the preliminary evidence gathered for the Consultation RIS, *the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits* under the central estimates for all of the Options tested.
2) Given the uncertainty around the feasibility of some Options, we recommend that *consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternatives*.

This essentially indicates that the status quo will remain. It is thus proposed that activity is required, similar to the Norwegian model, to activate both industry and community understanding of the broader benefits to balance the cost/benefit outcomes of the RIS.

Recent SBEnrc research, *Mapping the Australian Social and Affordable Housing Network (2018)* helped visualise the complex housing network in Australia. Building understanding across this network is needed to address this issue. To help represent this complex sector 13 elements and 11 participant groupings were identified, all in the context of the 9 impact domains previously discussed (Table 23).

Table 23 – Housing network complexity

Impact domains	Network participant groupings	Network elements
Community and culture	Person/Family	Policy drivers and players
Economy	Focal participant (e.g. Government Agency)	Funding
Education	Commonwealth government	Financing
Employment	State government	Procurement and delivery
Environment	Local government	Metrics, indicators and data
Health and wellbeing	Peak body/industry association	Labour market dynamics and housing
Housing	Advocates	Changing demographics
Social engagement	Community Housing Providers	Housing typologies

Urban amenity	Not-for-profit providers Research Industry	Socio/environmental systems Integrated, shared & disruptive tech. Housing asset management Production supply chain Skills, knowledge and capacity building

Source: (Kraatz and Jayawardena 2020)

This highlights that a single approach, for example through regulation, is unlikely to result in the required level of change across the network, as seen in America. Adoption needs to be considered in the broad context of addressing change across the spectrum of technical, social and regulatory barriers, as being attempted in Norway, using legislative, market and administrative powers.

Table 24 summaries the barriers and associated levers for change discussed in this section, and highlights the overlap between the technical, social and regulatory realms, which require cross-sectoral solutions to address.

Table 24 – Barriers and levers summary matrix

Identified barriers				Possible levers for change
	Technical	Social	Regulatory	
Design and construct efficiencies and risk	*			L/M/A - Skills development, industry training, best practice examples and pilot projects
Regulatory burden	*		*	L/A - Long term integrated, cross-sector strategy e.g. Norway
Costs burden i.e. who pays the cost	*	*	*	L/M/A - Broader assessment of return on investment e.g. CROI approach
Costs impact i.e. how much something costs	*		*	M - Economies of scale
Industry perceptions of need	*	*		L/M - Broader education around whole of life needs, best practice examples and pilot projects
Market demand – accessibility not aspirational	*	*	*	L/M - Broader education around whole of life needs, best practice examples and pilot projects
Societal attitudes, aspirations and acceptance (overcoming myths	*	*	*	L/M - Long term integrated, cross-sector strategy e.g. Norway, best practice examples and pilot projects. ACBC Regulatory Impact Analysis as a starting point
Aesthetic impact	*	*		M - Build market share to enable greater product availability Innovation in design and construct solutions, best practice examples and pilot projects

Notes: L – legislative powers; M - market powers; A - administrative powers

These elements could potentially form a part of a roadmap used by government, industry and community stakeholders, to develop, adopt and implement an accessible housing strategy over a period of years.

7 BEST-PRACTICE EXAMPLES

The aim of this section has been to identify key accessibility and liveability features, which can inform the Liveability Framework. Best practice examples have been selected from a desk top scan of projects in Queensland, Western Australia, and internationally. Each of these provides a different perspective of various elements, which contribute to liveability and accessibility. Summary tables are provided in each section, offering overview information, followed by additional details. These examples will be referred to again within the refined framework in the subsequent stages of this project.

Five south-east Qld and two WA projects are highlighted in this section (Table 25). These five examples have been selected to represent a diversity of provision.

1) Jingeri, Enoggera - home for people living with disabilities with ageing adult carers – medium density suburban.
2) Common Ground, South Brisbane - supportive housing in a high-density inner city location.
3) Parklands Project, Southport - former Commonwealth Games village, now a mixed-use development.
4) Health City One, Springfield - homes for those with high needs disabilities.
5) Aveo, Newstead - luxury residential aged care.
6) Oxford Street Youth Foyer, Perth.
7) Bennett Street Housing, Perth – providing studio and 1 bedroom appartments with own facilities.

Table 25 – Queensland best-practice examples

	Description	Procured	Building Features	Precinct Linkages	Sustainability targets/features	Unit mix	Tenure split	Urban morphology	Shared amenities
Jingeri, Enoggera (opened 2019)	Purpose built for people living with disabilities.	Partnership between BCHL, Qld Depts of Communities and HPW	Medium density suburban – 3 storeys; Gold Standard Liveable Housing Design (2).	Ready access to train and bus.	NA	10 units	NA	Streetscape integration.	NA
Common Ground, South Brisbane (opened 2012)	Supportive housing for those on low to medium income.	Partnership - State and Common-wealth Government, Grocon Pty Ltd, Micah Projects and Common Ground Queensland Ltd (1).	High-density inner city; onsite 24/7 concierge and support services.	Bus and train stations adjacent; Wi-Fi via adjacent government owned facilities; access to training at local Southbank TAFE.	Natural ventilation to main corridor spaces in residential levels; private balconies.	146 units - 135 studio and 11, 1 bed one bedroom units.	100 percent supported housing.	Fourteen story building high-rise. Commercial and retail space available for lease on ground floor.	Roof top garden, games room, computer room, function room, tenant lounge, art room, library and meeting rooms. Every two floors are linked, sharing a lobby space with garden.
Parklands Project, Southport	Former Common-wealth Games village; now mixed use development.	Grocon Pty Ltd developer	Apartments meet LHD Gold Level; townhouses meet LHD Silver Level.	Part of health and knowledge precinct.	6-star green star communities rating achieved; acknowledgement and integration of culture, heritage and community identity	1,252 dwellings with a mix of apartments and townhouses.		Village environment with extensive green space.	7 hectares public open space; 1.3 hectares of streetscapes.

	Description	Procured	Building Features	Precinct Linkages	Sustainability targets/features	Unit mix	Tenure split	Urban morphology	Shared amenities
Health City One, Springfield (opened 2019)	High needs disability housing.	Springfield Development.	Part of mixed-use development including medical and office suites; Quest Apartment Hotel; ground level retail; and child-care centre.	Part of Health City precinct; including business, education and research facilities, and adjacent Mater Private Hospital.	NA	18 apartments.	NA	Stand-alone 5 level block as part of health precinct.	NA
Aveo, Newstead, Brisbane	Luxury retirement living and aged care community.	Aveo	Medical and well-being facilities; recreational, cultural and social facilities; WiFi and entertainment packages; pet friendly.	Easy access to bus, ferry and train.	NA	Independent living units and serviced apartments; mix of 1, 2 and 3 bedroom.	NA	Inner city high-rise.	Dining spaces; hobby garden; workshop.
Oxford Street Foyer, Perth WA (4, 5)	Youth Foyer.	Foundation Housing with WA Dept. of Communities and LotteryWest Funding.	Transitional housing for young people. On-site support and case worker services, coordinated with education, training facilities and	Located within Central Institute of Technology campus. Part of Leederville entertainment precinct. Offers space for café, retail and offices.	No mechanical ventilation or air conditioning for residential units Naturally ventilated car park below grade Openable windows in residential units, offices and training rooms	98 studio and one-bedroom apartments for up to 74 young people and 24 young parents and their children.	NA	Consistent with City of Vincent Leederville Town Centre Masterplan & Built Form Guidelines, and the Oxford Centre Study.	Support services. Large private courtyard for residents to make social connections.

	Description	Procured	Building Features	Precinct Linkages	Sustainability targets/features	Unit mix	Tenure split	Urban morphology	Shared amenities
			other essential services.		Light voids and thermal chimneys Removal of coal tar contamination.				
Bennett Street Housing, Perth WA (5, 6)	Affordable / social housing development.	Foundation Housing with WA Dept. of Communities.	Communal terraces with views, ground floor space available for resident and community engagement projects.	NA	NA	70 fully self-contained studio and one bedroom apartments.	52 self-contained lodging rooms, 17 one bedroom apartments.	11 storey apartment building.	Communal gardens, large ground floor space available for resident and community engagement projects.

Notes:
(1) (Parsell et al. 2015); (2) (Livable Housing Australia 2012); (3) (WSP 2017); NA – not available on-line; (4) (Chindarsi Architects 2014, Architecture and Design 2015); (5) (Foundation Housing); (6) (Passivhaus Perth 2017)

7.1.1 Jingeri, Brisbane Housing Company Ltd

BHCL was incorporated in 2002 and is an independent, not-for-profit charity providing affordable rental accommodation. They have a portfolio of over 1700 homes in key growth locations with the largest wholly-owned, purpose-built affordable housing portfolio in Queensland (Brisbane Housing Company Ltd 2020).

Figure 12 – Jingeri, Brisbane (Source: BCHL)

Jingeri, in Enoggera, Brisbane, provides '10 modern homes [that] challenge preconceptions about what accessible housing looks like. It is changing lives by providing a place to call home for people living with disabilities and peace of mind for their ageing adult carers' (Brisbane Housing Company Ltd 2020b). This project was a joint venture with the Queensland Departments of Communities, Disability Services and Seniors and the Department of Housing and Public Works as a part of the *Elderly Parent Carer Innovation Initiative*[28]. Architects were KO&Co Architecture. Jingeri provides purpose-built accommodation to the Gold Standard Livable Housing Design, for people living with a disability who were previously residing with elderly parents.

In 2020, the UDIA awarded this project the Affordable Development Award in the Wingate National Awards for Excellence. The judges noted that BCHL provided homes, which sit comfortably within the local streetscape; have screened balconies with privacy to the street; landscaping and fencing treatments that make it indistinguishable from a conventional project; have a train and bus station to the rear with direct access via a public lane on a side boundary (Urban Devlopment Institute of Australia 2020).

7.1.2 Brisbane Common Ground (BCG) South Brisbane

BCG was designed by Nettleton Tribe architects and completed in 2010. 'Brisbane Common Ground is a model of supportive housing comprising 146 units (135 studio and 11 one bedroom units) in a fourteen story building located in South Brisbane' (Parsell et al. 2015, 1). In a 2015 evaluation report for BCG, Parsell et al. note a key intent was to provide 'secure long term housing with linked voluntary support services' (2). Key features include a concierge service for both security and tenant service needs and collaboration between tenancy and support services providers.

BCG is a flagship initiative under the National Partnership Agreement on Homelessness. 'Central to the policy aim is the provision of programs offering integrated support to people with high and complex needs; these include innovative housing models that offer secure housing and wrap around support' (Parsell et al. 2015, 7). It has been funded and is delivered through a partnership between the

[28] https://bhcl.com.au/tenants/disability-housing/elderly-parent-carer-innovation-initiative-epcii/

Commonwealth and State Governments, Grocon Pty Ltd (building contractor), Micah Projects and Common Ground Queensland Ltd.

'The implementation of Brisbane Common Ground has benefited from a long standing intention to provide a home. Stakeholders have widely reported their understanding was to develop and implement Brisbane Common Ground, not as a homeless facility, rather decisions about how Brisbane Common Ground is implemented and operationalised are underpinned by the objective of creating homes for tenants' (Parsell et al. 2015, 42).

A survey of residents undertaken as a part of the Parsell et al. (2015) evaluation include: 93 percent felt Common Ground was their home; 60 percent counted more than two other tenants as friends; 71 percent socialised with other tenants at least once a week; 86 percent of tenants felt satisfied with their safety; access to training had improved; increase in participation in employment; improvement in mental and physical health; improved satisfaction with life.

Some of the key learnings identified by Parsell et al. (2015), and relevant to this current research include:

a) Supportive housing, rather than housing and support providers working separately or working towards separate objectives, is a key determiner in the success at BCG.
b) Providing a safe living environment for vulnerable tenants is critical. Tenants' needs for safety and physical security meant that the presence of concierge, onsite support services and CCTV for example, were not often described as intrusive.
c) Tenants desired and achieved friendships and mutual networks of supports among other tenants. Many also participated in formal activities and utilised the communal spaces in the building.
d) Tenants reported significant concern about other tenants behaving in intimidating, aggressive and rude ways in communal spaces, and reported a preference for onsite staff to assertively deal with the negative behaviour of other tenants.
e) BCG has been implemented according to key principles of supportive housing in the published literature, these include: stable and affordable housing, safety, accessible and voluntary support services, and tenant independence;
f) For people who experience chronic homelessness with high use of health, criminal justice and homelessness services, a tenancy at BCG is associated with a reduction in service use that constitutes a cost offset of $13,100 per person per year.
g) The mean of the scores for 'The Satisfaction with Life' amongst tenants with a history of homelessness are similar to representative data of Australian adults. This indicates that despite the level of mental or physical disabilities apparent in this sample (two thirds), life satisfaction is only slightly lower than the general population and much higher than a sample of psychiatric patients.
h) Provision of common use facilities (Table 26).

Table 26 – Use of common facilities in BCG

	Never	Few times a year	Once a month	Once a week	2-3 times a week	Daily
Common computer room	32	10	24	12	17	18
Shared roof top garden*	24	28	17	14	20	13
Rooftop tenants' lounge	35	26	16	18	13	7
Common balconies on individual levels	63	19	9	8	4	13

Source: (Parsell et al. 2015) Self-reported (number of residents who responded = 113; 146 units in total).
* Equipped with undercover seating and a lawn funded through the Gambling Community Benefit Fund in 2014, the space allows for a variety of purposes.
Features relevant to our current research are highlighted in Table 27 below.

Table 27 – BCG features

Social infrastructure	Common use facilities to encourage engagement.
	Ready access to social support, including health services (on-site).
	Facilitating access to training and education.
	On-site formal social activities.
	Open House Brisbane – participation raises awareness of the supportive housing mode
Physical infrastructure	24/7 concierge to manage security and tenant issues.
	Rise Gym (with volunteer instructor) Building design encourages informal social interaction, e.g. every two floors are linked, sharing a lobby space with garden.
	Ready access to active and public transport (walkways, cycle paths, and bus and train stations).
	Common use roof top garden; meeting, computer, art and games rooms.
Virtual infrastructure	Virtual connections provided via pro-bono Wi-Fi services.
	Common use computer room.

Sources: (Parsell et al. 2015; Common Ground Queensland 2019; Grocon 2020)

BCG received the 2011 Excellence in Community Practices ANZ BRW Private Business Awards and 2011 Community Award Australian Business Awards.

7.1.3 Parklands Project, Southport

The original 29-hectare Parklands Priority Development Area (PDA) was selected to facilitate development of the Gold Coast 2018 Commonwealth Games Village and legacy development related to the Gold Coast Health and Knowledge Precinct (Queensland Department of State Development 2020). Following the Games, the now 14 hectare site has become 'one of Australia's first build-to-rent developments, with 1,252 apartments and townhouses available to rent from early 2019' (Lat27 2020).

Figure 13 – Parklands, Southport

Source: Lat27 2020

This is a mixed-use master planned development and includes 'more than 1,252 dwellings with a mix of apartments and townhouses, a 5,840m^2 retail precinct and green landscaped spaces (including lakes, water features and waterways), all situated around a central "Village Heart"' (Lat27).

The Parklands master plan includes seven hectares of public open space, 1.3 hectares of new streetscapes and 4 hectares of private residential gardens (Lat27 2020). Features include: apartments which meet LHD Gold Level; townhouses which meet LHD Silver Level; an environment that encourages

social and community prosperity and provides community gardens and landscape design sympathetic to the local environment (Grocon 2016).

To achieve a 6-Star Green Star Communities, the project adopted several sustainable features including: using green building design such as building orientation; accessible public toilets; designing for Australia's Liveable Housing Guidelines; planting 136,420 new trees across the site; establishing a construction waste recycling target; re-establishing a natural creek and floodplain; and adopting smart metering that aims to decrease energy and water consumption (WSP 2017).

7.1.4 Health City One, Springfield

Health City is a 52 hectares development located 33 kms from the Brisbane CBD. This is a new suburb in Greater Springfield with an expected completion date of 2030. The masterplan includes 'an existing hotel and medical buildings, an expansion to the existing Mater Hospital and retirement accommodation' (Your neighbourhood 2020). The development will also include business, education and research facilities, along with facilities dedicated to geriatric care, hospitality and wellness and 2500 retirement apartments (Your neighbourhood 2020).

Health City One is a mixed-used development including medical and office suites, close to the adjacent Mater Private Hospital; a Quest Apartment Hotel (82 apartments over five storeys); ground level retail; and a first level child-care centre with an open-air play area (Deike Richards 2020). It also includes eighteen apartments for Multiple Sclerosis Queensland, customised to suit people living with disability in the Springfield health and wellness precinct. (Australian Network for Universal Housing Design 2020; Kane Constructions 2020). These were the first homes to be built by *Project Dignity 120* (MS Queensland 2020).

Figure 14 Health City One, Springfield

Source: (Deike Richards 2020)

7.1.5 Aveo, Newstead

Whilst considered luxurious rather than affordable, this high-density, innercity example has been included to showcase facilities provided intenitionally to create an aged care community (Table 28). The property, a 19 storey integrated luxury retirement living and aged care community, includes a mix of 1, 2 and 3 bedroom appartments ($200M construction cost).

Table 28 – Aveo, Newstead facilities

	Physical infrastructure	Services	Social infrastucture
Medical	GP Clinic Pharmacy	GP clinic 24 hr nursing Dementia and palliative care Care and case managers	
Social, cultural and recreational	Gardens including hobby Workshop Day Spa Lounge & bar Library Cinema Reflection room for religious practices Restaurant & café Rooftop lounge	Group exercise classes Lifestyle coordinators Hairdressing & beauty salon	Passive and active social activities Pet friendly
Connectivity	Close to bus, ferry and train facilities	WiFi and entertainment packages	

Source: (Aged care online 2020).

In 2018, this community received the *Award for Design Excellence at the National Retirement Living* for 'its world-class community and building typology, combining premium independent living with sophisticated aged care options and first-class lifestyle amenities above a vibrant urban village' (Aveo 2018). It was also a finalist in the *nettletontribe Award for Best Design Excellence.*

Figure 15 Aveo Newstead

Source: (Aged care guide 2020)

7.1.6 Oxford Street Foyer, Perth

This project is the outcome of a 'joint partnership between Foundation Housing, Anglicare WA and Central Institute of Technology' with Chindarsi Architects, GHD Pty Ltd and GHD Woodhead as key project consultants (Chindarsi Architects 2014). The proposal is, and has been, warmly received by the City of Vincent Council. The building design provides residents with views 'while shielding the west-facing aspect from the worst of the sun' (Chindarsi Architects 2014). A common 'back-yard' provides opportunity for engagement. The project was awarded the UDIA Award for Excellence in 2014 for this design, in the Sustainable Urban Development category.

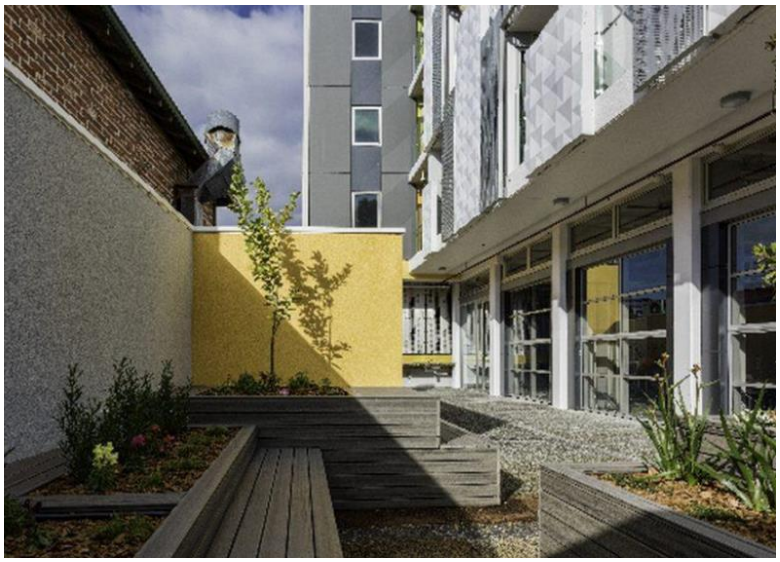
Figure 16 – Oxford Street Foyer, Perth.

Source: (Foundation Housing)

7.1.7 Bennett Street housing, Perth

This eleven storey building comprises 70 studio and one bedroom affordable, inner city apartments (Foundation Housing). Importantly, 'all studio rooms are fully self-contained' with many residents moving from shared facilities elsewhere (Foundation Housing 2016).

Figure 17 – Bennett Street housing, Perth.



Images courtesy of JCY Architects & Urban Designers. Photography by Rob Ramsay.
Source: (Foundation Housing)

7.2 International examples

Several international best-practice examples are included in this section (Table 29).

- Marmalade Lane, Cambridge, UK
- Sonnwendviertel Development, Vienna, Austria
- New Ground, Barnet, London, UK
- Vaudeville Court, Islington London, UK
- Goldsmith Street, Norwich, UK
- La Borda, Can Batllo, Barcelona, Spain
- Grand Parc Bordeaux, France

7.2.1 Marmalade Lane, Cambridge, United Kingdom

This co-housing development, which is adjacent to public transport, offers a pedestrian-friendly environment with communal facilities, gardens and social spaces.

Further detail is available at:

- https://www.architecturetoday.co.uk/common-purpose/
- https://www.molearchitects.co.uk/projects/housing/k1-cambridge-co-housing/
- https://marmaladelane.co.uk/
- https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-east-award-winners/2019/marmalade-lane
- www.theguardian.com%2Fartanddesign%2F2019%2Fmay%2F08%2Fmarmalade-lane-co-housing-cambridge&usg=AOvVaw08g5LvsdLdBtphogsU7YMP

7.2.2 Sonnwendviertel Development, Vienna, Austria

This block, amongst a planned urban high-density development, is intended as mixed-use, car-free urban quarter. It provides integrated housing and facilities adjacent to Vienna's main train station.

Further detail is available at:

- https://www.vlst.at/en/prj/sonnwendviertel/#1
- https://www.franzundsue.at/en/projects/city-quarter-building-architecture-cluster-in-sonnwendviertel-vienna/
- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi0gOvvju_rAhV78HMBHXLWCEMQFjACegQIARAB&url=https%3A%2F%2Fwww.wohnfonds.wien.at%2Fmedia%2Ffile%2Fenglish%2FBroschure_Sonnwendviertel_2018_englisch_web.pdf&usg=AOvVaw1Lms4fLHOX9lBIuBp-o-Rg

Table 29 – International best-practice examples

	Description	Procured	Building Features	Precinct Linkages	Sustainability targets/features	Tenure Split	Unit Mix	Urban Morphology	Shared amenities
Marmalade Lane, Cambridge, UK	Co-Housing Development.	Local Authority (State) Cambridge City Council & K1 Housing Assoc. to create SPV.	Pedestrian-friendly environment; communal facilities and gardens; social spaces; sophisticated architectural response.	Adjacent to Cambridge Guided Busway	Approaching Passivhaus (1) - airtightness, triple-glazing; air source heat pumps, factory off-site manufactured. Social sustainability emphasised.	Co-housing - ownership and shared-ownership	NA	Develops existing streetscape and architectural language of context.	Communal living space with kitchen; guest apartment.
Sonnwendviertel Development, example block, Vienna, Austria	Overall development intended as mixed-use, car-free urban quarter.	City & State Government.	Integrated housing and facilities; project adjacent to train station; deck access with storage areas to public.	Adjacent to Vienna's main train station.	Passivhaus (1)	Mixed inter-generational social and assisted rental.	42 units.	New build city quarter - up to 8 stories; perimeter courtyard and slab blocks.	Shared courtyard and shared storage spaces at deck access levels as part of common space.
New Ground, Barnet, London, UK	Co-Housing Older Women's Co-Housing.	Housing Association supported and (Tudor Trust) capital grant supported SPV.	For women +50, range of income levels. All units have views to garden.	Adjacent to three local bus routes.	Code for Sustainable Homes Level 4.	17 private market; 8 socially rented units.	25 total: 11x1bed; 11x2bed; 3x3bed.	NA	Communal common room, kitchen, dining, laundry, drying space, guest room, garden mobility scooter store.

	Description	Procured	Building Features	Precinct Linkages	Sustainability targets/features	Tenure Split	Unit Mix	Urban Morphology	Shared amenities
Vaudeville Court, Islington London, UK	Social / affordable housing.	Local Authority.	Family houses and apartments on tight urban site.	Close to train station and local bus routes.	Code for Sustainable Homes Level 4 (embedded upgradeability to Level 5).	100% social housing.	13 units.	Extremely efficient planning and design to eke out usability in a tight urban location.	NA
Goldsmith Street, Norwich, UK	Social / affordable housing.	Local Authority.	Low-rise, high-density development; Passivhaus (1).	Close to bus routes.	Passivhaus (1).	100% social housing.	40x2 bed houses; 5x4 bed houses; 3x2 bed flats; 45x1 bed flats; (Phase 2 1x3 bed flat; 11x1 bed flats).	Low-rise and traditional; integrating with context; alleys used as safe, shared play spaces for children.	Extremely low energy use life-costs as mandated by Local Authority; air-tightness and heat pumps etc.
La Borda, Can Batllo, Barcelona	Co-housing, co-operative housing development.	Co-Housing Company.	Flexible 'modular' layout allowing multiple unit configuration; 6-storey structure and central atrium.	Close to tram and bus.	High level - approaching Passivhaus (1).	Subsidised rental equivalent (approx. 20% below context market rate).	28 varying size units.	NA	100m² multipurpose space; shared kitchen / dining; two rooms for guests; laundry; large central circulation space; bicycle parking and outdoor terraces.

Notes: (1) http://passivehouse.com.au/page/passivhaus; NA – not available online

7.2.3 New Ground, Barnet, London, UK

This Older Women's Co-Housing mixed tenure development is adjacent to three local bus routes. The development provides 25 apartments to the Code for Sustainable Homes Level 4 (See Appendix F). It has been awarded: Evening Standard New Homes Award 2017; Housing Design Custom-build Award 2017; Housing Design Award 2017; and the Housing Design HAPPI Project Award 2016.

Further detail is available at:

- https://www.owch.org.uk/architecture
- https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/new-ground
- https://www.architectsjournal.co.uk/buildings/we-are-making-history-uks-first-senior-cohousing-completed-by-pte
- https://cohousing.org.uk/case-study/new-ground-cohousing-development-inspiring-example-not-might-live-get-older-live-cities/

7.2.4 Vaudeville Court, Islington London, UK

This social and affordable housing development provides family homes on a constrained urban site. The development adopts the 'every square millimetre' design philosophy with highly efficient planning and sophisticated street scale design.

Further detail is available at:

- https://www.levittbernstein.co.uk/project-stories/vaudeville-court-islington/
- https://www.archdaily.com/602610/inventive-council-housing-levitt-bernstein
- https://archello.com/project/vaudeville-court
- https://brickarchitecture.com/projects/vaudeville-court-levitt-bernstein

7.2.5 Goldsmith Street, Norwich, UK

This is a low-rise, high-density social and affordable housing following Passivhaus design principals with extremely low energy running costs and proximity to public transport. Safe, shared places for children to play are an additional feature of note.

Further detail is available at:

- https://www.architecture.com/awards-and-competitions-landing-page/awards/riba-regional-awards/riba-east-award-winners/2019/goldsmith-street
- http://www.mikhailriches.com/project/goldsmith-street/#slide-2
- https://www.theguardian.com/artanddesign/2019/oct/08/stirling-prize-architecture-goldsmith-street-norwich-council-houses
- https://www.theguardian.com/commentisfree/2019/oct/10/architects-council-homes-stirling-prize-goldsmith-street-norwich
- https://www.floornature.com/mikhail-riches-designs-energy-efficient-social-housing-golds-15001/

7.2.6 La Borda, Can Batllo, Barcelona, Spain

This six storey co-operative housing development provides a flexible and modular layout allowing multiple unit configuration and is close to both bus and tram services. Design-wise, it reflects earlier Catalan social housing typologies

Further detail is available at:

- https://grassrootsbarcelona.wordpress.com/case-studies/can-batllo/
- https://urbannext.net/la-borda-housing-cooperative/
- http://www.laborda.coop/en/project/can-batllo/
- https://xximagazine.com/c/new-forms-of-conviviality
- https://www.architectsjournal.co.uk/buildings/sustainable-building-sustainable-living-la-borda-barcelona-by-lacol

7.2.7 Grand Parc Bordeaux

This project included the transformation of 530 Dwellings within a 1960s housing in France by Frédéric Druot Architecture, Lacaton & Vassal Architectes and Christophe Hutin Architecture (Block 2019, Raynor, Pert et al. 2020) (**Error! Reference source not found.**). Some key highlights include:

1) addition of 3.8-metre-deep winter gardens and open-air balconies to each apartment.
2) Small windows replaced by large glass sliding doors opening on to the winter gardens and outdoor areas.
3) Residents remained in their homes during the work, with extensions made using prefabricated modules, hoisted into place by cranes.
4) New facades covered in lightweight corrugated polycarbonate panels and windows in aluminium frames.
5) New lifts provided and access halls renovated.
6) Each apartment took between just 12 and 16 days to renovate.
7) Rents were kept at the same rate as before.

8 DISCUSSION

This report presents the findings of a review of literature, which has informed the conceptual framework presented in Section 2 and the draft liveability framework included in Appendix G.

This review has considered the available literature around:

1) Liveability and acccesibility - drawing on inputs from SBEnrc and AHURI research and literature around: co-design; technology enablers; the Heart Foundation's Active by Design; Design for Dignity; universal design guidelines from the US; and community building. It also includes reference to pandamic resources;
2) The value equation – drawing again on previous SBEnrc research especially the CROI approach, and literature around stakeholder identification and cost benefits;
3) The regulatory and policy environments effecting both Queensland and Western Australia, including overarching national regulations, schemes and guidelines;
4) Adoption and barriers to the uptake of liveable and accessible design, proposing a cross-sector, multi-stakeholder roadmap approach for improved implementation;
5) A series of best practice examples, based on desk-top research, from Qld, WA and internationally.

The insights provided in this report will now guide two case studies to be undertaken from October 2020 to May 2021 in Queensland and Western Australia.

This investigation has also been informed by prior Sustainable Built Environment National Research Centre research including: the 9 impact domains (Rethinking Social Housing - Project 1.31); the *composite return on investment approach* (Valuing Social Housing - Project 1.41); diversity in housing typologies and social procurement criteria (Procuring Social and Affordable Housing - Project 1.54) how to better leverage innovation through industry transformation (Integrated Project Environments - Project 2.24); network groupings and elements (Mapping the Australian Social and Affordable Housing Network Project 1.61) and the *precinct design framework* (Sustainable Cities of Tomorrow - Project 1.62).

All these inputs will inform the final *Liveability Framework for Medium to High-density Social and Affordable Housing,* to be finalised in September 2021. The draft framework matrix currently has five key elements: liveability (place-based); accessibility (person-centred); the value equation (cost benefit); the regulatory and policy environment; and adoption and overcoming barriers. Within these elements there are currently over 30 sub-elements (Table 30).

Table 30 – Draft Liveability Framework – Elements and sub-elements

1.0	LIVEABILITY – PLACE BASED
1.1	Inclusive place-based planning e.g. governance, partnerships, social procurement, co-design
1.2	Integrated place-based planning leading to complete communities e.g. governance, partnerships, social procurement, co-design
1.3	Carbon neutral-positive approach e.g. passive, active and carbon neutral design and analysis, microclimatic analysis, heat sink
1.4	Climate resilience e.g. insulation, cross ventilation, microclimatic responses
1.5	Connectivity to nature-loving and biodiverse spaces e.g. biophilic, water sensitive and landscape oriented design
1.6	Community, character and culture e.g. heritage, diversity, role of precinct layout, vibrancy
	Community wellbeing e.g. connectedness, cohesion and safety
1.7	Equality and equity, e.g. equitable design that seeks to avoid anyone feeling that some units are significantly better than others
1.8	Pandemic response e.g. space planning performance; ability to engage; access to outdoor space; ability to manage outbreaks
1.9	Social infrastructure / connectedness e.g. schools and neighbourhood centres

1.10	Virtual infrastructure e.g. Wi-Fi
1.11	Asset maintenance both building and urban fabric e.g. soft landscaping
1.12	Healthy by design e.g. walkability
1.13	Safety by design e.g. CPTED (crime prevention through environmental design) principles
1.14	Others…
2.0	ACCESSIBILITY – PERSON CENTRED
2.1	Whole of life accessibility e.g. comfort and health; access to open space, social, physical and virtual infrastructure, communal resources. See also (Queensland Department of Housing and Public Works 2020, National Disability Authority Ireland 2020a, National Disability Authority Ireland 2020b)
2.2	Visitability e.g. people who use mobility aids having the same rights to visit friends and family in their homes; wayfinding both passive and active
2.3	Simple, intuitive and perceptible elements
2.4	Precinct safety e.g. human centred, walkable
2.5	Precinct accessibility e.g. place and movement design (active and passive)
2.6	Local shared mobility e.g. local mobility and feeder transport design; mobility as a service
2.7	Integrated service provision e.g. for person centred delivery
2.8	Tracking accessible housing in the marketplace
2.9	Accessibility to work e.g. security, availability and meaning
2.10	Access to vital services e.g. food, water, energy and health
2.11	Others ….
3.0	VALUE EQUATION – COST BENEFIT
3.1	Whole of life accessibility e.g. whole-of-life running-cost reduction features
3.2	Balancing initial costs of accessibility and liveability features with long-term benefits e.g. physical, social / community and tech. features, and on-going maintenance costs
3.3	Value capture e.g. opportunities and methodology
3.4	Property diversity e.g. community engaged planning; agglomeration economy analysis; financial modelling.
3.5	Property affordability e.g. social and affordable housing analysis; life cycle assessment; operational analysis
3.6	Economic stimuli for local community e.g. mixed use opportunities
3.7	Asset maintenance
3.8	Others…
4.0	REGULATORY AND POLICY ENVIRONMENT
4.1	Regulatory and policy issues – national
4.2	Regulatory and policy issues – state
4.3	Regulatory and policy issues – local
4.4	Jurisdictional conflicts
4.5	Livable Housing Design Guidelines
4.6	Enabling diversity of outcomes
4.7	Other guidelines
4.8	Others…
5.0	ADOPTION AND OVERCOMING BARRIERS
5.1	Barriers to uptake of liveability and accessibility features e.g. domestic and shared spaces; engagement and privacy
5.2	Adoption levers e.g. tax and funding models, economic stimuli
5.3	Mixed tenancy
5.4	Others…

Note: Specific references which have informed the above, and which will be further examined to inform the liveability framework are listed in Appendix G with the draft framework.

For each of these elements and sub-elements, the relationship to various *network stakeholder groups* and *9 impact domains* are identified. This will provide an understanding of parties with whom engagement will need to occur and in what context impacts can be considered in order to guide uptake and adoption of improved liveability and accessibility in urban housing precincts.

Network stakeholder groups were identified in the SBEnrc *Mapping the Australian Social and Affordable Housing Network* project completed in April 2020. These are: person/family; commonwealth, state and local government; peak bodies / industry associations; advocates; CHPs; not for profits; research and industry organisations; and philanthropic and informal participants.

9 DEFINITIONS

Accessible housing 'is any housing that includes features which enable use by people either with a disability or transitioning through their life stages. Other similar (but not identical) terms include "visitable", "adaptable", "livable" and "universal"'. (Australian Building Codes Board 2018a)

Accessible Housing in general 'means that the dwelling meets prescribed requirements such as wide doors, sufficient clear floor space for wheelchairs, entrances free of steps and stairs, knee spaces under sinks and an accessible path through the dwelling. Most "accessible" features are permanently fixed in place and apparent' (Centre for Universal Design College of Design North Carolina State University, 2006, 1 cited in Queensland Department of Housing and Public Works 2017, 5).

Adaptable Housing 'is an approach to residential housing design in which homes can be modified (at minimal cost) to meet occupants' changing needs over time and helping people stay in their own homes through illness, injury and aging' (Centre for Universal Design College of Design North Carolina State University, 2006, 2 cited in Queensland Department of Housing and Public Works 2017, 5).

Co-design - 'Applying co-design and human-centred methods and processes to design infrastructure that generates social value and/or prevents social issues in the local community where the infrastructure is located' (Alexander et al. 2020, 32).

Density '(also referred to as residential density) is usually expressed as the number of dwellings per hectare (dw/ha). This ratio shows how compact or dense an area is… Site density – the total number of dwellings in a development, divided by the site area (the property on which the building(s) are constructed, not including roads, footpaths or parks). This is often calculated on a per-hectare basis, and will be represented in this form throughout this handbook. An example of site density would be 10 dwellings, sitting on a 0.3ha site (10 dwelling divided by the site area of 0.3ha), would equal 33.33dw/ha. Net residential density – the total number of dwellings divided by the combined area of residential lots, local parks, internal roads and half the roads bordering the site. This measure is useful when considering the density of larger developments, such as residential subdivisions' (Brisbane City Council and Queensland Department of Local Government and Planning 2011, 6).

Disability 'an umbrella term for any or all of the following components, all of which may also be influenced by environmental and personal factors: impairment—problems in body function or structure; activity limitation—difficulties in executing activities; participation restriction—problems an individual may experience in involvement in life situations' (Australian Institute of Health and Welfare 2020, 1)

Individual site 'is a single lot or an amalgamation of several lots that can support individual or groups of residential flat buildings. The size, shape and orientation of individual sites directly inform the possible building types and development capacity' (NSW Department of Planning and Environment 2015, 24).

Precincts 'are characterised by large land parcels or a group of larger sites undergoing extensive change. These sites often need to be restructured to support a change of land use mix, building height and density. Precinct plans typically incorporate new streets and infrastructure, through-site links and public open spaces that relate in scale, location and character to the local context. The subdivision of large land parcels into smaller ones assists in creating a finer urban grain and achieving greater diversity in building design. It can also assist with the staging of redevelopment' (NSW Department of Planning and Environment 2015, 25).

Universal design 'is an international design philosophy that enables people to continue living in the same home by ensuring that apartments are able to change with the needs of the occupants.

Universally designed apartments are safer and easier to enter, move around and live in' (NSW Department of Planning and Environment 2015, 118).

Universal design 'is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design' (Australian Network for Universal Housing Design 2020).

Universal housing 'addresses the scope of accessibility and suggests making all elements and spaces accessible and usable by all people to the greatest extent possible. Items that are usable by most people regardless of their level of ability or disability can be considered universally usable. Many accessible and adaptable features are universally usable' (Centre for Universal Design College of Design North Carolina State University, 2006, 3 cited in Queensland Department of Housing and Public Works 2017, 5).

Public spaces refers to facilities open to the public including retail areas, restaurants, parks and other recreation facilities, street rights-of-way, and transportation systems. They are a critical domain for universal design for participation and engagement in civic affairs, employment, recreation, education, and community mobility.

Visitable housing, visitability 'are essentially about people who use mobility aids having the same rights to visit friends and family in their homes. It doesn't necessarily mean they can live there or stay overnight. The three key features associated with visitability are a step free entrance, wider doorways and a usable toilet on the entry level' (Centre for Universal Design Australia)

10 APPENDIX A – Snapshots

10.1 Cities of tommorrow snapshot

This document is one of a series of information snapshots provided in conjunction with a detailed review of literature associated with Liveable Social and Affordable Higher Density Housing SBEnrc research project.

INTRODUCTION

The *Liveable Social and Affordable Higher Density Housing* project is investigating liveable and affordable higher density housing opportunities, with a focus on urban precincts. Key topics reviewed include:

1) Liveability outcomes, including accessibility in both medium- and high-density housing and the urban precinct.
2) Adoption of liveable design elements, highlighting successful best practice examples, and identifying pathways for adoption and barriers to uptake.
3) Understanding the value equation through capturing and demonstrating social and economic benefits to the broader community.
4) Exploring next generation thinking in order to maximise future infrastructure benefits and minimise future risks.

This snapshot outlines previous SBEnrc research *Project 1.62 Sustainable Centres of Tomorrow*, which undertook a review of how urban centres adapt and respond to the challenges of climate change, economic development and social inclusion. The aim of that project was to reflect on 'global best practices in prioritising thriving, productive, sustainable, liveable centres, towards unlocking such potential in our Australian cities' (Caldera, Desha et al. 2019), and apply the resultant framework across four urban fabrics as case studies.

THE URBAN FABRIC

Urban fabric elements

The theory of urban fabrics acknowledges that 'transport-related lifestyles and functions … have needed certain physical elements and environments to enable them' (Newman, Kosonen et al. 2016). The urban fabric consists of spatial relationships, typology of buildings and land use patterns based on their transport infrastructure priorities that are overlapping in nature. These fall within the domains of walking, transit, automobile or a combination and overlapping of all three urban fabrics.

Fabric qualities across the urban fabric elements

Urban Fabric Element	Walking City	Transit City	Automotive City
1. Urban form qualities			
▪ Density	High	Medium	Low
▪ Mix	High	Medium	Low
2. Transport qualities			
▪ Car ownership	Low	Medium	High
▪ Level of service	High for pedestrians	High for transit users	High for car users
▪ Transport activity	High ped activity	High transit activity	High car activity
3. Economic qualities			
▪ Infrastructure costs per capita	Low - Medium	Medium - Low	High
▪ GDP per capita	High	Medium	Low
▪ Labour intensity	High	Medium	Low

Fabric qualities across the urban fabric elements cont'd			
4. Social qualities			
▪ Difference between rich and poor	Low	Medium	High
▪ Ability to help car-less	High	Medium	Low
▪ Health due to walking	High	Medium	Low
▪ Social capital	High	Medium	Low
▪ Personal security	Variable	Variable	Variable
▪ Traffic fatalities	Low	Low	Medium to High
5. Environmental qualities			
▪ Greenhouse gases and oil per capita	Low	Medium	High
▪ Waste per capita	Low	Medium	High
▪ Footprint per capita	Low	Medium	High

Source: Newman et. al., 2016, 450.

Precinct design framework

The *Sustainable Centres for Tomorrow* project developed a framework of core principles and practices that can be utilised to create outcomes from the regeneration of centres around transport nodes. This aims to ensure that urban design and infrastructure development priorities are considered.

Precinct Design Framework for Sustainable Centres of Tomorrow: Core Principles and Practices

Core Principles	Core Practices
1. Precinct safety and accessibility The development should be safe and healthy for people waiting to access transport nodes.	Human centred design Walkable urban design Place and movement design
2. Carbon neutral - positive approach The development should aim for carbon positive, being at least zero carbon, in both power and transport.	Solar passive design Solar active design Carbon neutral analysis
3. Local shared mobility The development should encourage diverse local modal services to access the transit service, with defined spaces.	Local mobility design Feeder transport design Mobility as a service
4. Property diversity The density and urban mix should contribute to urban regeneration.	Community engaged planning Agglomeration economy analysis Financial modelling
5. Property affordability The development should include diverse property options to provide affordable living as well as affordable housing.	Social housing analysis Life cycle assessment Sustainability operational analysis
6. Nature-loving and biodiverse spaces The development should include and connect biophilic and biodiverse greenspaces, supporting endemic species and habitat.	Biophilic design Water sensitive design Landscape oriented design
7. Inclusive, integrated place-based planning Planning, design and implementation (operation, maintenance) should involve diverse stakeholders and all tiers of government to provide an integrated place-based approach.	Joined up governance analysis Partnership analysis Procurement option analysis

Source: Caldera, Desha et al. 2019

These principles, in particular the urban fabric elements/qualities, also have application beyond the immediate urban neighbourhood to broader considerations of city/regional connectedness, and associated economic performance.

A number of case studies applied this framework across different towns, regions and settings. One of these case studies was in Townsville, Qld. The below summary of the seven principles within the *Place-Making Framework* highlights that priority design considerations demonstrating a strong commitment to inclusive, integrated place-based planning processes are integral.

***Place-Making Framework* design prompts: Flinders St - Charters Towers Rd - Ross River Road transit-oriented development corridor.**

1. Precinct safety and accessibility: *The development should be safe and healthy for people waiting to access transport nodes* [Human centred design | Walkable urban design | Place and movement design]	
Safe and accessible connectivity to nodes Cool and comfortable (shelters, pathways) Safe, natural and open spaces	Frequent and integrated Resilient (supporting economic recovery)
2. Carbon neutral - positive approach: *The development should aim for carbon positive, being at least zero carbon, in both power and transport* [Solar passive design | Solar active design | Carbon neutral analysis]	
Solar powered with energy storage Low carbon transport approach Hydrogen fuel cell vehicles	Sustainable urban design Low embodied energy infrastructure
3. Local shared mobility: *The development should encourage diverse local modal services to access the transit service, with defined spaces* [Local mobility design | Feeder transport design | Mobility as a service]	
Modernised systems – electronic ticketing Real-time data available to all	Walking/jogging/bike paths that connect housing to communal amenity
4. Property diversity: *The density and urban mix should contribute to urban regeneration* [Community engaged planning | Agglomeration economy analysis | Financial modelling]	
Robust and current survey data Mapped population clusters, by type	Long term planning considerations
5. Property affordability: *The development should include diverse property options to provide affordable living as well as affordable housing* [Social housing analysis | Life cycle assessment | Sustainability operational analysis]	
A mix of social and affordable housing lines (rent, purchase) Housing choice and diversity	Medium density residential housing
6. Nature-loving and biodiverse spaces: *The development should include and connect biophilic and biodiverse greenspaces, supporting endemic species and habitat* [Biophilic design | Water sensitive design | Landscape oriented design]	
Cool and comfortable Water sensitive design	Natural and open spaces along and connecting corridors
7. Inclusive, integrated place-based planning: *Planning, design and implementation (operation, maintenance) should involve diverse stakeholders and all tiers of government, for an integrated place-based outcome* [Joined up governance analysis | Partnership analysis | Procurement option analysis]	
Collaboration among key stakeholders Inclusive governance	Working across agencies Working in partnership with the community

Source: Caldera, Desha et al. 2020

In conclusion:

The approach and outcomes from this previous SBEnrc research will be used to inform the development of the *Liveability Framework for Social and Affordable Higher Density Housing* being developed in the current research project. In particular, the core principles and practices from the *Precinct Design Framework* will contribute to the developing criteria for the liveability framework.

Further detail on the *Sustainable centres of tomorrow* project is available at the project website: https://sbenrc.com.au/research-programs/1-62/ or contact Sacha Reid: s.reid@griffith.edu.au

Further information on the *Liveable Social and Affordable Higher Density Housing* project is available at https://sbenrc.com.au/research-programs/1-71/ or contact Judy Kraatz: j.kraatz@griffith.edu.au

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Newman, P., L. Kosonen and J. Kenworthy (2016). 'Theory of urban fabrics: Planning the walking, transit/public transport and automobile/motor car cities for reduced car dependency'. Town Planning Review 87(4): 429-458.

10.2 Composite return on investment approach snapshot

This document is one of a series of information snapshots to be provided in conjunction with a detailed review of literature associated with this current SBEnrc research project.

INTRODUCTION

The *Composite Return on Investment (CROI) approach* is an outcome of the SBEnrc *Valuing Social Housing* research project. The aim of that project was to establish a robust methodology for valuing the return on investment of providing social housing, in order to build the case for on-going investment. This composite approach is proposed in response to findings outlined in SBEnrc *Rethinking Social Housing* research which highlighted that a single method fails to capture the complex nature of the value returned to society and the individual of having access to safe and secure housing.

To address this complexity, a productivity-based conceptual framework was developed where four aspects of productive return were identified: individual; macroeconomic; fiscal; and non-financial. The *Value Social Housing* research identified four areas of benefit being: (i) transformation benefits to an individual; (ii) economic and social benefits to the average individual; (iii) economic and social benefits to the organisation; (iv) and economic and social benefits to society.

THE CROI APPROACH

Elements of the approach

The *Composite Return on Investment (CROI)* approach outlined in detail in *Valuing Social Housing* report was one element of the *strategic evaluation framework* developed in that project. Four different sub-elements were then identified as a part of the CROI approach, to be used in parallel to understand and articulate the broad value of the provision of social housing and to better reflect the return on investment of providing safe and secure housing:

- Sub-element 1 - Social Return on Investment (SROI) - economic and social benefits to organisation.
- Sub-element 2 - Well-being valuation (WV) - economic and social benefits to the average individual.
- Sub-element 3 - Value to the individual - transformational benefits to an individual.
- Sub-element 4 - Value of equity - economic and social benefits to society.

Sub-element 1 - Social Return on Investment (SROI)

SROI is 'used to provide a ratio of impact to $ input and/or an aggregated dollar return on investment for defined benefits to an organisation which may accrue from the provision of social housing. This is determined through: identifying key outcomes, indicators, and impacts; establishing financial proxies for these; determining a dollar value for this benefit. A detailed guide to this methodology is available on the Social Value UK website' (SBEnrc 1.41 2017). The SROI approach 'establishes financial proxies for key indicators along with valuations for impacts. These can then provide a total $ value for the social return on investment, from which a ratio of inputs to impacts can be derived. For example, 'the Victorian Woman's Housing Association delivers $3.14 of social value for every $1.00 invested' (Kliger, Large et al. 2011). This can be determined from organisational data for establishing scope; identifying stakeholders; mapping relationships between inputs, outputs and outcomes; data to support outcomes and valuing this; establishing impact (e.g., excluding what would have happened anyway); summing the benefits, subtracting the negatives and comparing the result to the original investment (various sensitivity analyses can be applied here); reporting and using results' (SBEnrc 1.41 2017).

Sub-element 2 - Well-being valuation

Well-being valuation method can provide 'headline well-being values for specific financial proxies for improvement in individual well-being for the average person, based on their access to community

housing' (SBEnrc 1.41 2017). The Organisation for Economic Co-operation and Development (OECD) has been developing an approach to measuring well-being for several years. Their method explores 'how people experience and evaluate their life as a whole' (OECD 2013) and is based on 'eleven dimensions related to material conditions and quality of life' that they established (SBEnrc 1.41 2017). This method has been further developed in the United Kingdom (UK) to assist community housing associations in measuring the impact of their investment in terms of well-being. The UK approach addresses the impact of the broader non-housing benefits of access to safe and secure housing on an average person's well-being, and places a dollar value on these benefits. On-line UK-based tools are available for community housing providers to undertake this analysis, which enables them 'to measure the success of a social intervention by how much it increases a person's well-being' (Trotter, Vine et al. 2015). Other approaches to well-being and its measurement are discussed by Kolstad et al. (2014) (see section 3.4.3 and 3.6 of that report).

The UK-based *Well-Being Valuation* analysis builds on the above outlined UK approach and works on the basis of 'finding from the data the equivalent amount of money needed to increase someone's well-being by the same amount' (Trotter, Vine et al. 2015). 'Community housing providers in the UK can access the *Social Value Bank* (drawing on data from four national datasets) to undertake a valuation of their social impact. A *Value Calculator* is available for download from HACT UK for this purpose' (SBEnrc 1.41 2017). Crucial to this approach is the use of de-identified longitudinal data sets from four national datasets: British Household Panel Survey; Understanding Society; Crime Survey for England and Wales; and the Taking Part Survey. These respectively focus on: (i) *social and economic* changes in individuals and households since 1991; (ii) *social and economic circumstances, attitudes, behaviours and health* of over 40,000 households; (iii) evaluation and development of *crime reduction policies* and provision of information about the changing levels of crime; and (iv) collection of data on *leisure, culture and sport* in England, along with a range of other socio-demographic information.

Sub-element 3–Value to the individual

Individual 'narratives can be used to understand the value of both the housing and non-housing benefits of safe and secure housing. The value a person places on a given amenity such as a home (or a job) varies depending on their life situation. These rich narratives are currently captured in annual reports, and also more increasingly in digital stories' (SBEnrc 1.41 2017). The intent of this sub-element is twofold, to firstly 'determine and account for the nature of the impact on an individual', and secondly 'to articulate to society the value of improving the quality of life for all' (SBEnrc 1.41 2017).

Sub-element 4 - Value of equity

Ianchovichina and Lundstrom (2009) propose that 'sustained, high growth rates and poverty reduction' can only be realised when 'an increasing share of the labour force is included in the growth process in an efficient way'. The International Panel for Climate Change (IPCC) and the OECD provide inputs for the theoretical grounding for this element:

- Inclusive growth - defined by the OECD as 'economic growth that creates opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non-monetary terms fairly across society' (OECD 2015).
- Considering non-income related dimensions - represent 'opportunities and choices that matter for people's participation in economic life and society' (OECD 2014). The 2015 OECD 'report maintains that inequality in non-income outcomes can undermine long term growth' (SBEnrc 1.41 2017, 29). This can have a spatial dimension, for example, 'better transport and housing infrastructure can spur growth and improve inclusiveness in our cities, providing vital access assets for economically deprived areas to high-quality jobs and education' (OECD and Ford Foundation 2015).
- Issues of distributive justice and differential value (Kolstad, Urama et al. 2014). The IPCC approach considers 'knowledge and data relevant to the impact on individual outcomes, for specific circumstances (e.g., abilities, point in time, etc.) and in given locations' (SBEnrc 1.41

2017, 30). This provides a way to compare one person's well-being with another's through aggregating a person's well-being at a point in time to create *lifetime well-being* for individuals, and then further aggregated this across people to determine an overall value to society (Kolstad et al. 2014). They also note that 'improving a person's well-being contributed more to social welfare if the person is badly off than if they are well off'. The approach 'implies that a given total of wellbeing is more valuable the more equally it is distributed' (SBEnrc 1.41 2017, 30).

Further development of the CROI approach

Further work is required for each of the elements, and then their combination, to enable this approach to be applied within an organisation to determine the CROI.

Sub-element 1 is the most accessible of these elements. 'SROI can be used to evaluate past investments or forecast future investment returns across housing and non-housing outcomes for providing safe and secure housing' (SBEnrc 1.41 2017, 25). 'Social Value UK provides good guidance on the SROI process. There are also several accredited organisations in Australia which can undertake SROI analysis' (SBEnrc 1.41 2017, 26).

For sub-element 2, 'well-being valuations need to be established for an Australian context, drawing on national and state databases. Ideally, these valuations would be accessible in a similar way to other online resources such as: HACT UK Value Calculator; the Global Value Exchange; and the OECD Better Life Index tool and website' (SBEnrc 1.41 2017, 28). The Australian Social Value Bank is starting to do this.

For sub-element 3, impact needs to be further understood and quantified. This can be further considered through:

1. *type of impact*—the nature of the impact(s) on each person or organization - as outputs or outcomes
2. *scale of impact*—the number of people or organizations affected
3. *depth of impact*—the amount or intensity of change experienced, per type of impact, per person affected - i.e., change in subjectively experienced well-being (McCreless and Trelstad 2012).

'These dimensions of impact can be determined from qualitative narratives to be gathered via housing providers, commissioned reports, interviews, surveys and case studies and the like (facilitated by the use of mobile technologies for data gathering)' (SBEnrc 1.41 2017, 28).

Sub-element 4 is the most challenging. Understanding and determining a value for equity aims to build understanding of the importance of adressing differential impacts and quantifying the value different people place on social infrastructure. This can lead to 'understanding the broader value to society of providing more equitable access to such resources' (SBEnrc 1.41 2017, 24) across the nine impact domains (as identified in the SBEnrc *Rethinking Social Housing* research). The OECD and Ford Foundtaion note the importance of including 'non-monetary dimensions of well-being and to assess the impact of policies on different social groups in terms of employment, health and educational issues and outcomes. For example, those most disadvantaged often live shorter lives and experience difficulty breaking away for problematic educational and employment outcomes' (SBEnrc 1.41 2017, 29). Kolstad et al. further explore this approach to consider the idea of distributive justice (that equality of well-being does have value). And Fleurbaey (2009) can provide a focus for further investigation, noting that 'the effect of a change in social value at a particular time is calculated by aggregating the monetary value of the change to each person, weighted by the social marginal value of money to the person, which is the product of the marginal benefit of money to that person and the marginal social value of their wellbeing'.

In conclusion:

Further detail on the CROI approach and supporting literature is available in previous research reports, and the current project documents. In addition, more information on this project is available at the

project website: https://sbenrc.com.au/research-programs/1-71/ or contact Judy Kraatz, Project Leader: j.kraatz@griffith.edu.au

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10.3 Regulation and policy snapshot

This document is one of a series of information snapshots provided in conjunction with a detailed review of literature associated with Liveable Social and Affordable Higher Density Housing SBEnrc research project.

INTRODUCTION

The *Liveable Social and Affordable Higher Density Housing* SBEnrc project is investigating liveable[29] and affordable higher density housing opportunities, with a focus on urban precincts. Key topics reviewed include:

5) Liveability outcomes, including accessibility in both medium- and high-density housing and the urban precinct.
6) Adoption of liveable design elements, highlighting successful best practice examples, and identifying pathways for adoption and barriers to uptake.
7) Understanding the value equation through capturing and demonstrating social and economic benefits to the broader community.
8) Exploring next generation thinking in order to maximise future infrastructure benefits and minimise future risks.

Regulations, national and international standards, government policy and cross-sectoral guidelines all inform the development and delivery of liveable and accessible housing and urban precincts in Australia. This legislative and policy environment is entwined with industry and community expectations, and return on investment decisions made on a daily basis, which together shape the built environment outcomes.

This snapshot provides an overview of the current regulatory and policy environment at a national level, and specifically at Queensland (Qld) and Western Australian (WA) state level. Additional details provided in the review of literature are available on the project website - https://sbenrc.com.au/research-programs/1-71/. This analysis of regulatory and policy environment will inform the *Liveability Framework for Medium and Higher Density* Housing that is currently under development as one of the outcomes of this research.

THE AUSTRALIAN REGULATORY AND POLICY ENVIRONMENT

Australian Building Codes Board (ABCB)

The ABCB 'is a joint initiative of all levels of government in Australia, together with the building and plumbing industries. Its key objective is to oversee issues relating to health, safety, amenity and accessibility, and sustainability in buildings.' (ABCB 2019).

ABCB Accessible Housing Project and Project Timeline

The ABCB *Accessible Housing* project commenced in 2018**.** Its main aim was to undertake a Regulation Impact Assessment (RIA) of options meeting minimum accessibility standards to be potentially applied through the National Construction Code (NCC)[30] (ABCB 2018a). The RIA assessment 'will consider the Livable Housing Design Guidelines Silver and Gold level specifications as possible options for a minimum accessibility standard, and additional options identified through consultation' (ABCB 2020a).

[29] Inclusive of universal housing design and urban based liveable design features to be detailed in the *Liveable Social and Affordable Higher Density Housing* framework currently under development.

[30] 'The NCC is a performance-based code containing all Performance Requirements for the construction of buildings. It is built around a hierarchy of guidance and code compliance levels, with the Performance Requirements being the minimum level that buildings, building elements, and plumbing and drainage systems must meet'. https://ncc.abcb.gov.au/ncc-online/NCC

ABCB Accessible Housing Project Timeline

2018	Accessible Housing Options Paper released for public comment; Accessible Housing National Consultation Forums.
2019	Consultation Outcomes Report; Work begins on RIS.
2020	Conclusion of RIS process; Development of content for NCC 2022 (if directed by Governments).
2021	Consultation on NCC 2022 public comment draft; Decision on inclusion of accessible housing provisions; ABCB Board determines NCC provisions if Governments decide to proceed.
2022	NCC takes effect in all States and Territories on 1 May.

Source: (ABCB 2020a)

The associated Consultation Regulatory Impact Statement (C-RIS) is currently out for public consultation, closing 31 August 2020. Any decisions as to whether to include a minimum accessible housing standard for private housing in the 2022 National Construction Code (NCC) based on this assessment will inform the current SBEnrc research on *Liveable Social and Affordable Higher Density Housing*.

Australian and International Standards

As part of the development of regulatory and policy framework for liveable social and affordable higher density housing, key standards of relevance developed by Standards Australia[31] and International Standards Organisation (ISO)[32]were considered and include:

- AS 1428 Design for Access and Mobility:
  - Part 1: General requirements for access — Buildings;
  - Part 2: Enhanced and additional requirements — Buildings and facilities;
  - Part 3: Requirements for children and adolescents with physical disabilities; and
  - Part 4: Tactile ground surface indicators for the orientation of people with vision impairment.
- AS 4299 1995 Adaptable Housing - relates to residential, rather than to public buildings. Draws upon AS 1428 Design for Access and Mobility Pats 1 & 2.
- AS 1735.12 1999: Lifts, Elevators, Moving Walks - Part 12: Facilities for persons with disabilities.
- ISO 21801-1:2020 Cognitive Accessibility –guidelines for the design and development of cognitively accessible systems, including products, services and built environments.
- Disability (Access to Premises – Buildings) Standards 2010 – in line with the Disability Discrimination Act 1992. The Human Rights Commission provides a guide to this standard (Australian Human Rights Commission 2013). Whilst private housing is not covered this should still be considered in this report.
- ISO 21542:20100 Building construction - Accessibility and usability of the built environment - specifies a range of requirements and recommendations for many of the elements of construction, assemblies, components and fittings which comprise the built environment.

Other relevant guidelines, schemes, strategies and networks

The following tableTable 14 summarises other key national guidelines, schemes, strategies and networks relevant to understanding the regulatory and policy environment in Australia around liveable and accessible housing.

[31] Standards Australia is an independent, non-governmental organisation responsible for developing standards (https://www.standards.org.au/).

[32] The International Standards Organisation (ISO) is an independent, non-governmental international organization with a membership of 164 national standards bodies (https://www.iso.org/about-us.html).

Summary of relevant national guidelines, schemes, strategies and networks

Document	Description
Livable Housing Design Guidelines (LHDG)	Developed by Livable Housing Australia (LHA) - a partnership of community and consumer groups, government and industry. LHDG champions the mainstream adoption of livable housing design principles in new homes (LHA 2017).
Specialist Disability Accommodation (SDA) - National Disability Insurance Scheme	The SDA Design Standard outlines detailed design requirements based on the four categories of SDA design: improved liveability; robust; fully accessible; and high physical support (National Disability Insurance Scheme 2019).
National Disability Strategy	NDS is the Commonwealth Government initiative whose priorities include 'the physical environment including public transport; parks, buildings and housing; digital information and communications technologies; civic life including social, sporting, recreational and cultural life (COAG 2011)
Living Longer, Living Better	Commonwealth Government's 'Living Longer, Living Better' (2012) program is informed by reforms in aged care, which have identified that the home will be the predominant place where people age and for longer than is currently the case (ABCB 2019).
Australian Network on Disability (AND)	AND is a national, membership based, for-purpose organisation that is focussed on enabling people with disability to engage in all aspects of business' (AND 2020).
Australian Network for Universal Housing Design	Provides links to relevant information, examples and documentation.
Council of the Aging (COTA)	COTA's key principals include: maximise economic, social and political participation of older Australians; promote positive views of ageing and interdependence and consciousness across generations; redress disadvantage and discrimination; and protect and extend services and programs (COTA, 2020).
Healthy Active by Design	Provides resources as a practical guide - includes evidence, advice and examples to assist with the development of healthy and active neighbourhoods Heart Foundations 2020 a, b & c)

State-based regulatory and policy environments

The effective integration between national and state and territory planning policies is required in order to avoid overlaps and conflicts. The following tables highlight some of the strategies and documents which exist to regulate and/or guide requirements around higher density social and affordable housing in both Queensland and Western Australia.

Key strategies and documents – Qld

Documents	Intent and deliverables
Density and Diversity Done Well	Ideas competition for increasing suburban densities.
Social Housing Design Guide to Design Standards for Social Housing (under review)	Simplifies and harmonises several earlier state government documents. Specifies housing design.
Queensland Housing Strategy 2017-2027	10 year strategy highlighting priority areas around growth, prosperity, connection and confidence.
Housing principles for inclusive communities	Housing principles associated with inclusive communities: rights, choice, control and inclusion. These align with the above strategy and the intent of United Nations Convention on the Rights of Persons with Disabilities and the National Disability Insurance Scheme.
Shaping SEQ South East Queensland Regional Plan 2017	Encouraging growth within the current urban footprint.
Economic Development Queensland (EDQ)	Partners with local governments, industry and the community to help deliver a range of projects on urban sites which support renewal.
Queensland Urban Design and Places Panel	Provides independent expert advice on the design of major infrastructure and urban-planning projects.
Healthy Places, Healthy People:	Mechanism for government agencies to consider/integrate health outcomes into policies, practices and investment decisions.

Creating great places to keep Queenslanders healthy.	
Health and Wellbeing Strategic Framework 2017 to 2026	Promoting and monitoring various physical activity indicators as a part of this strategy.
State Planning Policy 2017 (under review)	Considers housing supply and diversity, planning for safety and resilience, and planning for infrastructure.
State Planning Policy – state interest guidance material - Liveable communities (under review)	Considers: the characteristics of the built and natural environments; access to employment, goods and services, and open space; and resilience to natural hazards and the effects of climate change.

In WA, the regulatory framework is currently subject to a comprehensive review. The process of consultation will be completed in 2020 and will consider, in its response to stakeholders' inputs, the wider and complex context of COVID-19 (WA DLPH 2019 & 2020). The reform is focussing on design standards, planning instruments, and consultation processes with particular regard to early community engagement. The aim of these reforms is to ensure the planning framework has been developed in consultation with the community and is guided by a strategy to develop liveable and attractive precincts (Government of WA, 2020).

Key strategies and documents – WA

Documents	Intent and deliverables
WA Housing Strategy 2020-2030	Considers how to improve access to suitable and affordable homes and respond to current and future need. (WA Department of Communities, 2020).
Affordable Housing Action Plan 2017-18 to 2019-20	This plan aims 'to achieve better outcomes for individuals and families, deliver inclusive and connected communities and create a housing system that is more responsive to a broader range of needs' (Government of Western Australia, 2018).
State planning policy 3.1 R-Codes	Provides for residential and mixed-use developments; residential design; future opportunities for better living choices and affordability; variety and diversity (WA DLPH and WA Planning Commission, 2018).
Design WA and Office of the Government Architect	State Planning Policy 7.0 Design of the Built Environment - addresses design quality and built form outcomes across economic, environmental, social and cultural benefits (Design WA 2019).
	Design Review Guide - 'best-practice model for the establishment of new design review panels' (WA DLPH 2019).
DevelopmentWA	Has a diverse portfolio of industrial, commercial and residential projects including the creation of new cities and communities, precinct-scale urban renewal and major destination projects (DevelopmentWA 2020).
Action plan for Planning Reform (2019)	Provides strategic direction across the planning framework; enabling community involvement; and ensures planning system is fit-for-purpose and can meet the challenges of growth (WA DLPH 2019).
Western Australian Planning Commission Strategic Plan 2018-2021	WAPC facilitates infill development and sustainable urban growth; address barriers to affordable living and housing diversity through policy; enable affordable, accessible and safe communities.
State Planning Policy 7.0 Design of the Built Environment	Addresses design quality and built form outcomes. Seeks to deliver the broad economic, environmental, social and cultural benefits deriving from good design outcomes and supports consistent and design review and assessment processes (Design WA, WA DLPH et al., 2019).
State planning policy 7.3.1 R-Codes Volume 1 & 2	Provide for residential and mixed-use development through appropriate residential design; future residents' opportunities for better living choices and affordability; variety and diversity (WA DLPH and WAPC 2018).
DevelopmentWA	Has a portfolio of industrial, commercial and residential projects. 'Their work includes the creation of new cities and communities, precinct-scale urban renewal and major destination projects to support and shape WA's growth' (DevelopmentWA 2020).

Informing the framework

The regulatory and guidance materials summarised above will inform the liveability framework being developed by the research team. Furthermore, the *Accessible Housing Options Paper: Consultation Report* (ACBC 2019), which provides accounts of stakeholder feedback, has been used to inform thinking and recommendations. In addition, the team will undertake further stakeholder interviews to test and finalise the framework.

IN CONCLUSION:

Further details on this snapshot and supporting literature is available on the project website: https://sbenrc.com.au/research-programs/1-71/.

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10.4 Adoption snapshot

This document is one of a series of information snapshots provided in conjunction with a detailed review of literature associated with Liveable Social and Affordable Higher Density Housing SBEnrc research project.

INTRODUCTION

Liveable Social and Affordable Higher Density Housing SBEnrc project is investigating liveable and affordable higher density housing opportunities, with a focus on urban precincts. Key topics considered in this project include:

1) Liveability outcomes, including accessibility in both medium- and high-density housing and the urban precinct.
2) Adoption of liveable design elements, highlighting successful best practice examples, and identifying pathways for adoption and barriers to uptake.
3) Understanding the value equation through capturing and demonstrating social and economic benefits to the broader community.
4) Exploring next generation thinking in order to maximise future infrastructure benefits and minimise future risks.

The adoption of liveability and accessibility outcomes and elements in Australian homes has been limited in past decades due, in part, to a perceived imbalance between costs and benefits. Given that adoption of accessibility has been problematic in current low and medium density environments, embedding accessibility elements in an evolving higher density environment will experience similar, if not more acute hurdles.

This research has included a review of literature, along with the consideration of best practice examples, to identify barriers to past adoption of liveability and accessibility elements and provide options for future activity.

CLARIFYING THE ISSUES

A review of current literature has highlighted the ongoing regulatory impact analysis being undertaken by the Australian Building and Construction Board (ABCB) since 2018 to 'consider the Livable Housing Design Guidelines Silver and Gold level specifications as possible options for a minimum accessibility standard, and additional options identified through consultation' (ABCB 2018, 1). This analysis relates to new Class 1a (houses, townhouses, row houses, etc) and Class 2 (apartment buildings) dwellings. For Class 1a buildings the National Construction Code (NCC) does not currently set any accessibility requirements.

Current issues highlighted in terms of the adoption of accessibility features include:

1) Community and societal motivations - Dr Galbraith's submission to the ABCB notes that 'market-based demand is problematic because ageing and disability are not aspirational' (ABCB 2019, 40).
2) Community and societal perceptions - Bringolf (2011a) suggests that there is a perception that people with disabilities and older people require special housing types, along with aesthetic impacts of incorporating accessibility features and hardware.
3) Industry uptake - Bringolf (2011a, 268) further argues that the 'tightly structured technical efficiencies in the delivery chain' where mass housing is treated as an off-the-shelf product has led to a very slow industry uptake of accessibility features in housing designs.
4) Regulatory burden - time spent demonstrating compliance; additional consultants; costs related to the use of performance solutions are equally seen as hindering the adoption of accessibility features in housing designs (ABCB 2019).

5) Cost burden - both real and percieved, refers to who pays that cost (i.e. who carries the 'burden'), as distinct from cost impact (i.e. how much something costs) (ABCB 2019).
6) Challenges with developing accessible carparking in multi-residential developments - recent industry stakeholder feedback to the Queensland Government's Department of Housing and Public Work's Building Legislation and Policy group on the accessible housing C-RIS suggests that cost-benefit analysis for accessible housing has historically been focused on detached housing rather than on accessibility in medium to high-density housing. Feedback noted that there were particular challenges with developing accessible carparking in multi-residential developments and providing lift access for 2 and 3 storey walk-up multi-residential buildings (BLP, 2020).

Lessons from others

Four examples are provided to inform this investigation: (i) the benefits of the comprehensive Norwegian approach to embedding universal design; (ii) the shortfalls in the US regulation-only approach; and the lessons from the uptake of both (iii) sustainable design and (iv) building information modelling (BIM).

Norway universally designed by 2025
In the 1960's and 70's housing policies in Nordic countries began to change to better integrate people with disabilities into 'ordinary environments' (Bringa 2019). In 2009 the Norwegian government adopted an integrated, cross-sectoral approach involving 16 ministries working on detailed action plans and strategies to define an action plan that is to achieve nation-wide universal design and increased accessibility by 2020 (Norwegian Ministry of Children and Equality 2009). Legislative, market and administrative powers are being used to achieve this outcome. This example is provided to illustrate a nation-wide, long-term, integrated, cross-sectoral approach of implementing change in this area to overcome some of the known barriers to the adoption of accessibility features in our homes. This comprehensive approach targeted four areas: building and construction; planning and outdoor areas; transport; and sector-overarching reforms. Richard Duncan (2019) outlines the positive impacts of this focussed effort, suggesting that 'universal design is included in 63 laws and regulations and in practice in several sectors of society' further highlighting that the 'theoretical concept of universal design has been tested extensively in real-life environments', with both community and industry 2018 survey data finding greater community and industry acceptance of universal design. As at July 2020, the Ministry of Children and Equality is developing a new 5 year action plan, that 'will present actions on most relevant sectors of society including housing and the urban and social infrastructure' (Bringa 2020, 1).

America's Fair Housing Act of 1968
'In the US, non-discrimination is the rationale behind certain types of accessible housing requirements (e.g., in multifamily projects[33]) while welfare for the citizens has been the motivation in the Nordic countries' (Bringa 2019).

In his blog entry titled 'Moving Towards the Universal Design Home: Part 1', Bringa (2019) highlights the 1988 Amendments to *America's Fair Housing Act of 1968* which increased accessibility via seven accessibility requirements for entrances to some buildings with dwellings, the public use areas, doors, routes, environmental controls, bathrooms and kitchens. In addition, Schwemm (2006) argues that 'in order to help guarantee persons with disabilities equal access to housing, Congress in the 1988 Fair Housing Amendments Act provided … that virtually all new multi-family housing be designed and constructed with certain accessibility features' (863). This was followed by states and localities adopting provisions to include the same requirement. Despite this, a great proportion of multi-family housing does not comply with these provisions. According to Schwemm (2006) developers, architects,

[33] Multifamily dwellings in the US equates to unit/apartment blocks in Australia.

and builders, engineers, subcontractors, and anyone else who is a substantial participant in the design-and-construction process, including original and subsequent owners, are legally liable for this failure, thus highlighting the need for a beyond regulation, cross sector approach to improve adoption of accessible housing requirements in America.

Sustainable design uptake

Barriers to the integration of sustainability into the housing markets are considered to be institutional rather than technological, and include: economics (cost burden and impact); a lack of client understanding; sector-wide processes; knowledge and the lack of a common language; trade-offs in terms of aspects such as style and functionality; and the availability of methods and tools (Crabtree and Hess 2009, Häkkinen and Belloni 2011). Häkkinen and Belloni (2011) note that 'hindrances can be reduced by learning what kind of decision-making phases, new tasks, actors, roles and ways of networking are needed' (240). This list is similar to that for accessibility, thus supporting the earlier made proposition for a broader, cross-sector approach to addressing barriers and improving adoption.

Building Information Modelling (BIM) uptake

Previous SBEnrc research, *Integrated Project Environments – Leveraging Innovation for Productivity Gain through Industry Transformation*, investigated the need for system-wide change at a national level to improve industry-wide productivity in the construction sector. Sanchez, Kraatz et al. (2014) detailed the UK government strategy as a part of that research. The UK government identified BIM as a critical part of improving construction industry productivity. They facilitated a concerted effort between government and industry peak bodies to bring about a series of legal, economic and operational reforms with the direct participation of industry stakeholders through a nationally based strategy with various reforms to be undertaken over a number of years as a part of a predefined roadmap. A similar approach was undertaken in Finland, which through a coordinated research, development and standardisation effort pioneered in this area with activities dating back to 1982. In their analysis of integrated project environments, Sanchez, Kraatz et al. highlighted that: '(i) industry takes action when the government demonstrates clear leadership; (ii) a national strategy facilitates the adoption of new information technologies such as BIM; and (iii) collaboration with industry is required to implement this strategy'.

Improving adoption – a cross-sector, multi-stakeholder roadmap for implementation

The ABCB Accessible Housing Consultation Regulatory Impact Statement explicitly considers how accessibility could be improved through several options presented in the consultation report (Centre for International Economics 2020). The options include: maintain a status quo approach; four proposals addressing the adoption of various levels and combinations of the *Livable Housing Design Guidelines*; a subsidy program for rental properties; and an enhanced approach to voluntary guidance. The Centre for International Economics report which accompanies the 2020 round of ACBC consultation, makes the following 2 preliminary recommendations: (i) that 'the costs associated with including an accessible housing standard in the NCC are estimated to outweigh the benefits'; and (ii) 'that consultation be used to seek feedback and more information on the assumptions, methods and suitability of alternatives'. This essentially indicates that the status quo will remain.

MOVING FORWARD

It is proposed that activity is required, similar to the Norwegian model, to activate both industry and community understanding of the broader benefits of the adoption of improved accessibility requirements in Class 1a and 2 buildings.

Recent SBEnrc research, *Mapping the Australian Social and Affordable Housing Network* (2018) helped visualise the complex housing network in Australia that was needed to understand and address the issue of social and affordable housing in Australia. To help represent this complex sector, 13 elements

and 11 participant groupings were identified, all in the context of the 9 impact domains as outlined in the table below.

Impact domains	Network participant groupings	Network elements
Community and culture Economy Education Employment Environment Health and wellbeing Housing Social engagement Urban amenity	Person/Family Focal participant Commonwealth government State government Local government Peak body/industry association Advocates Community Housing Providers Not-for-profit providers Research Industry	Policy drivers and players Funding Financing Procurement and delivery Metrics, indicators and data Labour market dynamics and housing Changing demographics Housing typologies Socio/environmental systems Integrated, shared & disruptive tech. Housing asset management Production supply chain Skills, knowledge and capacity building

The mapping of impact domains, network participant groupings and elements highlights that a single approach, for example through regulation, is unlikely to result in the required level of change across the network, as seen in America. In addition, and as the example of Norway demonstrates, adoption needs to be considered in the broad context of addressing change across the spectrum of technical, social and regulatory barriers, using legislative, market and administrative powers.

The table below summarises the barriers and associated levers for change discussed in this section, highlighting the overlap between the technical, social and regulatory realms, which require cross-sectoral solutions to address.

Identified barriers				Possible levers for change
	Technical	Social	Regulatory	
Design and construct efficiencies and risk.	*			L/M/A - Skills development, industry training, best practice examples, pilots.
Regulatory burden.	*		*	L/A - Long term integrated, cross-sector strategy e.g. Norway.
Costs burden i.e. who pays the cost.	*	*	*	L/M/A - Broader assessment of return on investment e.g. CROI approach.
Costs impact i.e. how much something costs.	*		*	M - Economies of scale.
Industry perceptions of need.	*	*		L/M - Broader education - whole of life needs, best practice examples, pilots.
Market demand – accessibility not aspirational.	*	*	*	L/M - Broader education around whole of life needs, best practice examples and pilot projects.
Societal attitudes, aspirations and acceptance (overcoming myths.	*	*	*	L/M - Long term integrated, cross-sector strategy e.g. Norway, best practice examples and pilot projects. ACBC Regulatory Impact Analysis as a starting point.
Aesthetic impact.	*	*		M - Build market share to enable greater product availability Innovation in design/construct, best practice examples, pilots.

Notes: L – legislative powers; M - market powers; A - administrative powers

These elements could potentially form a part of a roadmap used by government, industry and community stakeholders, to develop, adopt and implement an accessible housing strategy over a period of years.

Further information on this project is available at the project website: https://sbenrc.com.au/research-programs/1-71/ or contact Judy Kraatz, Project Leader, j.kraatz@griffith.edu.au

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11 APPENDIX B – Dwelling typologies

Figure 18 – Dwelling typologies

Detached house – A single or two-storey dwelling that stands within its own grounds and includes private open space. It is not attached to any other dwelling.

Duplex – A single or two-storey dwelling that maintains private open space but is attached to one other dwelling by a common wall.

Attached house – A single, two or three storey dwelling, with private open space and/or access to communal open space that is part of a group of dwellings, each of which is attached to another dwelling or other dwellings by one or more common walls. This type includes row houses, terrace houses (such as those along Petrie Terrace in Brisbane), and townhouses.

Low-rise apartment – A dwelling that is part of a group of self-contained dwellings in a building up to three storeys in height. A building such as this may include shared facilities such as swimming pools or car parking spaces.

Medium-rise apartment – A dwelling that is part of a group of self-contained dwellings in a building which is between four and ten storeys in height. Shared facilities such as a swimming pool or car parking may be provided.

High-rise apartment – A dwelling that is part of a group of self-contained dwellings in a building which is more than ten storeys in height. Shared facilities such as communal laundries, a swimming pool or car parking may be provided.

Very high-rise apartment – A dwelling that is part of a group of self contained dwellings in a building which is fifteen to twenty storeys and greater in height. Shared facilities such as communal laundries, a swimming pool or car parking may be provided.

* Each of the apartment dwelling type may include non-residential uses on the ground and lower floors.
** The installation of lifts is subject to the height of the building. Reference 'Building Code of Australia 2010 – Volume 1, Australian Building Codes Board
The 'Dwelling Types' noted above were adapted from a document produced by the New South Wales Department of Urban Affairs and Planning, titled *'Residential Densities: A handbook illustrating the Urban Design Characteristics of Different Densities.*

Source: (Brisbane City Council and Queensland Department of Local Government and Planning 2011)

12 APPENDIC C – Elements and objectives: WA SPP 7.3

Source: (WA Department of Lands Planning and Heritage and WA Planning Commission 2019)

A6 – Objectives summary (1/4) This summary assists proponents and assessors to explain and assess the development against the Element Objectives listed in this policy.
PART 2 – PRIMARY CONTROLS
2.2 Building height O 2.2.1 The height of development responds to the desired future scale and character of the street and local area, including existing buildings that are unlikely to change. O 2.2.2 The height of buildings within a development responds to changes in topography. O 2.2.3 Development incorporates articulated roof design and/or roof top communal open space where appropriate. O 2.2.4 The height of development recognises the need for daylight and solar access to adjoining and nearby residential development, communal open space and in some cases, public spaces.
2.3 Street setbacks O 2.3.1 The setback of the development from the street reinforces and/or complements the existing or proposed landscape character of the street. O 2.3.2 The street setback provides a clear transition between the public and private realm. O 2.3.3 The street setback assists in achieving visual privacy to apartments from the street. O 2.3.4 The setback of the development enables passive surveillance and outlook to the street.
2.4 Side and rear setbacks O 2.4.1 Building boundary setbacks provide for adequate separation between neighbouring properties. O 2.4.2 Building boundary setbacks are consistent with the existing streetscape pattern or the desired streetscape character. O 2.4.3 The setback of development from side and rear boundaries enables retention of existing trees and provision of deep soil areas that reinforce the landscape character of the area, support tree canopy and assist with stormwater management. O 2.4.4 The setback of development from side and rear boundaries provides a transition between sites with different land uses or intensity of development.
2.5 Plot ratio O 2.5.1 The overall bulk and scale of development is appropriate for the existing or planned character of the area.
2.6 Building depth O 2.6.1 Building depth supports apartment layouts that optimise daylight and solar access and natural ventilation. O 2.6.2 Articulation of building form to allow adequate access to daylight and natural ventilation where greater building depths are proposed. O 2.6.3 Room depths and / or ceiling heights optimise daylight and solar access and natural ventilation.
2.7 Building separation O 2.7.1 New development supports the desired future streetscape character with spaces between buildings. O 2.7.2 Building separation is in proportion to building height. O 2.7.3 Buildings are separated sufficiently to provide for residential amenity including visual and acoustic privacy, natural ventilation, sunlight and daylight access and outlook. O 2.7.4 Suitable areas are provided for communal and private open space, deep soil areas and landscaping between buildings.

A6 – Objectives summary (2/4)
PART 3 – SITING THE DEVELOPMENT
3.2 Orientation **O 3.2.1** Building layouts respond to the streetscape, topography and site attributes while optimising solar and daylight access within the development. **O 3.2.2** Building form and orientation minimises overshadowing of the habitable rooms, open space and solar collectors of neighbouring properties during mid-winter.
3.3 Tree canopy and deep soil areas **O 3.3.1** Site planning maximises retention of existing healthy and appropriate trees and protects the viability of adjoining trees. **O 3.3.2** Adequate measures are taken to improve tree canopy (long term) or to offset reduction of tree canopy from pre-development condition. **O 3.3.3** Development includes deep soil areas, or other infrastructure to support planting on structures, with sufficient area and volume to sustain healthy plant and tree growth.
3.4 Communal open space **O 3.4.1** Provision of quality communal open space that enhances resident amenity and provides opportunities for landscaping, tree retention and deep soil areas. **O 3.4.2** Communal open space is safe, universally accessible and provides a high level of amenity for residents. **O 3.4.3** Communal open space is designed and oriented to minimise impacts on the habitable rooms and private open space within the site and of neighbouring properties.
3.5 Visual privacy **O 3.5.1** The orientation and design of buildings, windows and balconies minimises direct overlooking of habitable rooms and private outdoor living areas within the site and of neighbouring properties, while maintaining daylight and solar access, ventilation and the external outlook of habitable rooms.
3.6 Public domain interface **O 3.6.1** The transition between the private and public domain enhances the privacy and safety of residents. **O 3.6.2** Street facing development and landscape design retains and enhances the amenity and safety of the adjoining public domain, including the provision of shade.
3.7 Pedestrian access and entries **O 3.7.1** Entries and pathways are universally accessible, easy to identify and safe for residents and visitors. **O 3.7.2** Entries to the development connect to and address the public domain with an attractive street presence.
3.8 Vehicle access **O 3.8.1** Vehicle access points are designed and located to provide safe access and egress for vehicles and to avoid conflict with pedestrians, cyclists and other vehicles. **O 3.8.2** Vehicle access points are designed and located to reduce visual impact on the streetscape.
3.9 Car and bicycle parking **O 3.9.1** Parking and facilities are provided for cyclists and other modes of transport. **O 3.9.2** Car parking provision is appropriate to the location, with reduced provision possible in areas that are highly walkable and/or have good public transport or cycle networks and/or are close to employment centres. **O 3.9.3** Car parking is designed to be safe and accessible. **O 3.9.4** The design and location of car parking minimises negative visual and environmental impacts on amenity and the streetscape.

A6 – Objectives summary (3/4)

PART 4 - DESIGNING THE BUILDING

4.1 Solar and daylight access

O 4.1.1 In climate zones 4, 5 and 6: the development is sited and designed to optimise the number of dwellings receiving winter sunlight to private open space and via windows to habitable rooms.

O 4.1.2 Windows are designed and positioned to optimise daylight access for habitable rooms.

O 4.1.3 The development incorporates shading and glare control to minimise heat gain and glare:

- from mid-spring to autumn in climate zones 4, 5 and 6 **AND**
- year-round in climate zones 1 and 3.

4.2 Natural ventilation

O 4.2.1 Development maximises the number of apartments with natural ventilation.

O 4.2.2 Individual dwellings are designed to optimise natural ventilation of habitable rooms.

O 4.2.3 Single aspect apartments are designed to maximise and benefit from natural ventilation.

4.3 Size and layout of dwellings

O 4.3.1 The internal size and layout of dwellings is functional with the ability to flexibly accommodate furniture settings and personal goods, appropriate to the expected household size.

O 4.3.2 Ceiling heights and room dimensions provide for well-proportioned spaces that facilitate good natural ventilation and daylight access.

4.4 Private open space and balconies

O 4.4.1 Dwellings have good access to appropriately sized private open space that enhances residential amenity.

O 4.4.2 Private open space is sited, oriented and designed to enhance liveability for residents.

O 4.4.3 Private open space and balconies are integrated into the overall architectural form and detail of the building.

4.5 Circulation and common spaces

O 4.5.1 Circulation spaces have adequate size and capacity to provide safe and convenient access for all residents and visitors.

O 4.5.2 Circulation and common spaces are attractive, have good amenity and support opportunities for social interaction between residents.

4.6 Storage

O 4.6.1 Well-designed, functional and conveniently located storage is provided for each dwelling.

4.7 Managing the impact of noise

O 4.7.1 The siting and layout of development minimises the impact of external noise sources and provides appropriate acoustic privacy to dwellings and on-site open space.

O 4.7.2 Acoustic treatments are used to reduce sound transfer within and between dwellings and to reduce noise transmission from external noise sources.

4.8 Dwelling mix

O 4.8.1 A range of dwelling types, sizes and configurations is provided that caters for diverse household types and changing community demographics.

4.9 Universal design

O 4.9.1 Development includes dwellings with universal design features providing dwelling options for people living with disabilities or limited mobility and/or to facilitate ageing in place.

4.10 Façade design

O4.10.1 Building façades incorporate proportions, materials and design elements that respect and reference the character of the local area.

O4.10.2 Building façades express internal functions and provide visual interest when viewed from the public realm.

A6 – Objectives summary (4/4)
PART 4 - DESIGNING THE BUILDING (CONTINUED)
4.11 Roof design **O4.11.1** Roof forms are well integrated into the building design and respond positively to the street. **O4.11.2** Where possible, roof spaces are utilised to add open space, amenity, solar energy generation or other benefits to the development.
4.12 Landscape design **O4.12.1** Landscape design enhances streetscape and pedestrian amenity; improves the visual appeal and comfort of open space areas; and provides an attractive outlook for habitable rooms. **O4.12.2** Plant selection is appropriate to the orientation, exposure and site conditions and is suitable for the adjoining uses. **O4.12.3** Landscape design includes water efficient irrigation systems and, where appropriate, incorporates water harvesting or water re-use technologies. **O4.12.2** Landscape design is integrated with the design intent of the architecture including its built form, materiality, key functional areas and sustainability strategies.
4.13 Adaptive reuse **O4.13.1** New additions to existing buildings are contemporary and complementary and do not detract from the character and scale of the existing building. **O4.13.2** Residential dwellings within an adapted building provide good amenity for residents, generally in accordance with the requirements of this policy.
4.14 Mixed use **O4.14.1** Mixed use development enhances the streetscape and activates the street. **O4.14.2** A safe and secure living environment for residents is maintained through the design and management of the impacts of non-residential uses such as noise, light, odour, traffic and waste.
4.15 Energy efficiency **O4.15.1** Reduce energy consumption and greenhouse gas emissions from the development.
4.16 Water management and conservation **O4.16.1** Minimise potable water consumption throughout the development. **O4.16.2** Stormwater runoff from small rainfall events is managed on-site, wherever practical. **O4.16.3** Reduce the risk of flooding so that the likely impacts of major rainfall events will be minimal.
4.17 Waste management **O4.17.1** Waste storage facilities minimise negative impacts on the streetscape, building entries and the amenity of residents. **O4.17.2** Waste to landfill is minimised by providing safe and convenient bins and information for the separation and recycling of waste.
4.18 Utilities **O4.18.1** The site is serviced with power, water, gas (where available), wastewater, fire services and telecommunications/broadband services that are fit for purpose and meet current performance and access requirements of service providers. **O4.18.2** All utilities are located such that they are accessible for maintenance and do not restrict safe movement of vehicles or pedestrians. **O4.18.3** Utilities, such as distribution boxes, power and water meters are integrated into design of buildings and landscape so that they are not visually obtrusive from the street or open space within the development. **O4.18.4** Utilities within individual dwellings are of a functional size and layout and located to minimise noise or air quality impacts on habitable rooms and balconies.

A6 – Objectives summary (4/4)

PART 4 - DESIGNING THE BUILDING (CONTINUED)

4.11 Roof design

O4.11.1 Roof forms are well integrated into the building design and respond positively to the street.

O4.11.2 Where possible, roof spaces are utilised to add open space, amenity, solar energy generation or other benefits to the development.

4.12 Landscape design

O4.12.1 Landscape design enhances streetscape and pedestrian amenity; improves the visual appeal and comfort of open space areas; and provides an attractive outlook for habitable rooms.

O4.12.2 Plant selection is appropriate to the orientation, exposure and site conditions and is suitable for the adjoining uses.

O4.12.3 Landscape design includes water efficient irrigation systems and, where appropriate, incorporates water harvesting or water re-use technologies.

O4.12.2 Landscape design is integrated with the design intent of the architecture including its built form, materiality, key functional areas and sustainability strategies.

4.13 Adaptive reuse

O4.13.1 New additions to existing buildings are contemporary and complementary and do not detract from the character and scale of the existing building.

O4.13.2 Residential dwellings within an adapted building provide good amenity for residents, generally in accordance with the requirements of this policy.

4.14 Mixed use

O4.14.1 Mixed use development enhances the streetscape and activates the street.

O4.14.2 A safe and secure living environment for residents is maintained through the design and management of the impacts of non-residential uses such as noise, light, odour, traffic and waste.

4.15 Energy efficiency

O4.15.1 Reduce energy consumption and greenhouse gas emissions from the development.

4.16 Water management and conservation

O4.16.1 Minimise potable water consumption throughout the development.

O4.16.2 Stormwater runoff from small rainfall events is managed on-site, wherever practical.

O4.16.3 Reduce the risk of flooding so that the likely impacts of major rainfall events will be minimal.

4.17 Waste management

O4.17.1 Waste storage facilities minimise negative impacts on the streetscape, building entries and the amenity of residents.

O4.17.2 Waste to landfill is minimised by providing safe and convenient bins and information for the separation and recycling of waste.

4.18 Utilities

O4.18.1 The site is serviced with power, water, gas (where available), wastewater, fire services and telecommunications/broadband services that are fit for purpose and meet current performance and access requirements of service providers.

O4.18.2 All utilities are located such that they are accessible for maintenance and do not restrict safe movement of vehicles or pedestrians.

O4.18.3 Utilities, such as distribution boxes, power and water meters are integrated into design of buildings and landscape so that they are not visually obtrusive from the street or open space within the development.

O4.18.4 Utilities within individual dwellings are of a functional size and layout and located to minimise noise or air quality impacts on habitable rooms and balconies.

13 APPENDIX D – Response to ABCB accessible housing consultation

Response provided by Judy Kraatz

Understanding and quantifying the problem

A key element of a RIS is understanding the nature and size of the problem that government intervention would address through a regulatory proposal.
Housing that is inaccessible for people with mobility limitations can impose various costs on those people and their families and the community more broadly. These costs include:

- *safety-related costs, where people with mobility limitations remain living in housing that does not meet their accessibility needs, they are at higher risk of falls*
- *costs associated with additional care needs where people with accessibility needs remain living in housing that does not meet their accessibility needs*
- *unnecessarily high costs associated with home modifications*
- *costs associated with avoidable moves to more suitable accommodation*
- *costs associated with longer stays in hospital and transition care, where discharge is delayed due to their home lacking accessibility features*
- *costs associated with loneliness, where people with accessibility needs are unable to leave their own house as frequently as they would like or are unable to visit friends and relatives*
- *additional costs associated with inappropriate or premature entry into residential aged care (or other institutional care) due to dwellings lacking accessibility features.*

The questions in this section are focused on the Consultation RIS' description of 'the problem' and the costs it imposes due to a lack of accessible housing.

The Consultation RIS uses the term 'accessible' to describe the options that are intended to make a home easier and safer to use for the broadest range of occupants. The regulatory proposals are based on universal design principles and the Livable Housing Design Guidelines. LHDG describe this as housing that is designed to be:

- *easy to enter*
- *easy to navigate in and around*
- *capable of easy and cost-effective adaptation; and*
- *responsive to the changing needs of home occupants.*

Q8 Do you agree that the problem is adequately established?

Yes
No

Please indicate below your opinion, whether the issues described under the problem section (its nature) adequately establish a case for action, or if there are other problems not identified under the status quo:

Visitability is also a consideration, i.e. are people with mobility limitations able to visit others whose homes may not enable this.

Q9 In general, do you agree the Consultation RIS adequately describes the extent of these problems?

Yes
No

Please explain your answer below and if you have other evidence that can assist:

As housing density increases, issues of accessibility beyond the front door and into surrounding precincts become more profound. For example, access to green space might have once been achieved within a detached housing block, and could be accommodated by private home modifications, whereas in higher density environments access to green space may be at a building level (subject to body corporate or other decision-making), or a neighbourhood level. This requires a broader approach.

Q10 The impact of a lack of accessible housing on equity, dignity and employment outcomes is difficult to fully measure. How does a lack of accessible housing contribute to these issues?

Please describe how and to what extent:

The Australian Sustainable Built Environment National Research Centre (SBEnrc) has been undertaking research into social and affordable housing since 2014. This research identified 9 domains across which a lack of safe and secure housing can impact: community and culture, economy, education, environment, employment, health and well-being, housing, social engagement and urban amenity. The lack of accessible housing limits options of people to fully engage across these 9 domains - Rethinking social housing - http://sbenrc.com.au/research-programs/1-31/ and Valuing social housing - https://sbenrc.com.au/research-programs/1-41/

Q11 Are the assumptions made to estimate the costs to the community from a lack of accessible housing (set out in Appendices A to H) appropriate?

○ Yes ○ No

Please explain your answer below and what other evidence could be considered:

A Composite Return on Investment (CROI) approach was developed in the Valuing Social Housing research project to help build a more accurate understanding of costs and benefits. This included 4 sub-elements: sub-element 1 - Social Return on Investment (SROI) being economic and social benefits to organisation; sub-element 2 - well-being valuation (WV) – being economic and social benefits to the average individual; sub-element 3 - value to the individual - transformational benefits to an individual; and sub-element 4 - value of equity – being the value of equitable economic and social benefits to society. See Valuing social housing for detail - https://sbenrc.com.au/research-programs/1-41/ . This is currently being further developed in our current research project - *Liveable social and affordable higher density housing* - https://sbenrc.com.au/research-programs/1-71/ which is exploring both liveability and accessibility in urban housing precincts.

Q12 What other information could be used to estimate the costs associated with a lack of accessible housing to make estimates more reliable?

Please provide your response below:

Following on from the above, SROI is mainstream in Australia, and well-being valuation starting to be used, but the value of individual transformational narratives, and the value of equity to a society are still not mainstream in our economic and political systems. There is an inherent difficulty in considering these, but this should not exclude them from consideration.

Q13 Do you have information about the type and cost of home modifications that are made to improve the accessibility of a home?

Yes

No

If yes, please provide sources below:

Not at this time, though as our SBEnrc research project continues we will be looking at various cost benefit scenarios.

14. In your opinion what is main contributor to a lack of uptake of universal design principles in new dwellings:

buyers failing to think about their future accessibility needs

volume builders being reluctant to deviate from standard plans

other barriers

If other barriers exist, please describe these below:

We are still exploring this in greater detail in our current research. Initial insights are being reviewed from the Norway, where the government defined an action plan in 2009 to achieve nation-wide universal design and increased accessibility by 2020. This is an integrated, cross-sectoral approach with 16 ministries being involved, with detailed action plans and strategies. Legislative, market and administrative powers were to be used to achieve outcomes. This example is provided to illustrate a nation-wide, long-term, integrated, cross-sectoral approach to implementing change in this area to overcome some of the barriers highlighted in this section - https://www.regjeringen.no/globalassets/upload/bld/nedsatt-funksjonsevne/norway-universally-designed-by-2025-web.pdf

Objectives of intervention and Options

COAG principles require a RIS to examine a range of viable options, including, as appropriate, non-regulatory, self-regulatory and co-regulatory options.

The Consultation RIS explicitly considers the impacts of the following options (measured from the status quo baseline).

- ***Status quo***
- ***Option 1:*** *Accessibility standard, broadly reflecting LHDG silver standard, in the NCC applying to all new Class 1a and Class 2 buildings.*
- ***Option 2:*** *Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 1a and Class 2 buildings.*
- ***Option 3:*** *Accessibility standard, broadly reflecting LHDG gold standard (plus some platinum features), in the NCC applying to all new Class 1a and Class 2 buildings.*
- ***Option 4:*** *Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 2 buildings.*
- ***Option 5:*** *A subsidy program to encourage additional availability of accessible rental properties to LHDG Gold standard.*
- ***Option 6:*** *An enhanced approach to voluntary guidance, including:*
    - *a non-regulatory ABCB handbook*
    - *information provision at the point of sale*
    - *better matching services.*

15. Of the options considered by the Consultation RIS, select from the list below those that are feasible:

Status Quo: No change to the NCC.

Option 1: Accessibility standard, broadly reflecting LHDG silver standard, in the NCC applying to all new Class 1a and Class 2 buildings.

Option 2: Accessibility standard, broadly reflecting LHDG gold standard, in the NCC applying to all new Class 1a and Class 2 buildings.

Option 3: Accessibility standard, broadly reflecting LHDG gold standard (with some platinum features), in the NCC applying to all new Class 1a and Class 2 buildings.

Option 4: Accessibility standard, broadly reflecting LHDG Gold standard, in the NCC applying to all new Class 2 buildings only.

Option 5: A subsidy program to encourage additional availability of accessible rental properties.

Option 6: An enhanced approach to voluntary guidance, which includes turning the current proposals into a non-regulatory ABCB handbook and other measures to encourage additional uptake of universal design principles, including: a search engine for dwellings certified as complying with the LHDGs and provision of information at the point of sale.

16. Are there other feasible regulatory or non-regulatory options with the potential to meet the objective that should be considered?

☐ *Applying the accessibility standards to only residential Class 1a (single detached house, row house, town house, terrace house or villa unit) or Class 2 (multi-storey residential) buildings?* ☐ *Applying the accessibility standards to only a proportion of residential Class 1a (single detached house, rowhouse town house, terrace house or villa unit) or Class 2 (multi-storey residential) buildings?*

☐ *Applying a different combination of the LHDG elements?*

☐ *Applying a subset of the LHDG elements (e.g. step-free entry, wider doorways only)?* ☐ *Another option?*

Please provide additional information to support your response (for example, how these options would be delivered in practice) below:

A current SBEnrc research project, Liveable Social and Affordable Higher Density Housing - https://sbenrc.com.au/research-programs/1-71/ - is exploring liveability and accessibility needs for medium and higher density housing precincts. As densities increase the issues of accessibility moves well beyond the front door, so a much broader consideration of issues is required. Findings of this research will be available in late 2021. We are happy to share research findings as they develop. My contact is j.kraatz@griffith.edu.au.

17. Which of the options, in your opinion, have the ability to meet the objective? (select all options which in your opinion can meet the objective from the list below)

Objective of the proposal

The objective of the regulatory proposal is to ensure that housing is designed to meet the needs of the community, including older Australians and others with mobility limitations.

☐ ***Status quo*** ☐ ***Option 1*** ☐ ***Option 2*** ☐ ***Option 3*** ☐ ***Option 4*** ☐ ***Option 5*** ☐ ***Option 6***

☑ ***Other Option***

How could the selected options be further enhanced?

This is a broad and aspirational objective, which requires an equally broad and aspirational response. This cannot be achieved by regulation alone. The ABCB is however in a key position to take leadership for a broader, long term strategy which engages with participants across the network to address change across the spectrum of technical, social and regulatory barriers, using legislative, market and administrative powers.

18. Are there any less intuitive or unintended consequences likely to arise from the adoption of any of these options?

○ *Yes* ○ *No*

If yes, please elaborate below:

The housing network is a complex system. One way to minimise unintended consequences to maximise engagement across the network. Past SBEnrc research, Mapping the Australian Social and Affordable Housing network, helps to identify this complexity - http://sbenrc.com.au/research-programs/1-61/

19. Which option is your preferred option?

○ *Status quo* ○ *Option 1* ○ *Option 2* ○ *Option 3* ○ *Option 4* ○ *Option 5* ○ *Option 6* ○ *Other Option*

If 'Other', please describe below:

As per previous comments

Estimating the cost of the proposals

In accordance with best practice, the proposed changes to the NCC (and other options) were examined under a cost benefit analysis (CBA) framework. Costs in the following questions relate to the Consultation RIS estimates for complying with the proposed accessibility standards. These include:

- *Additional construction costs*
- *Loss of space – where some areas of a dwelling (such as bathrooms and hallways) expand to meet the proposed standards, this space must come from either:*
  - *expanding the footprint of the building, which means either expanding lot sizes or loss of outdoor/garden space, or*
  - *loss of living and/or bedroom spaces where the additional hallway and bathroom space is accommodated within the existing building footprint (such were the scope to expand the building footprint is limited due to lot size).*
  - *Potential costs associated with additional excavation work on sloped lots.*
- *Transition costs:*
  - *Other industry transition costs — this includes the cost of various industry professionals familiarising themselves with the new NCC requirements.*
  - *Transition costs for volume builders, including the costs associated with re-designing the a standard design offering and rebuilding display homes.*

Related Information

20. Are the scenarios of possible impact (as described in the DCWC report) broadly representative of the scale of adjustments required to comply with the proposed accessibility standards (Options 1-3)?

Yes No

21. For each of the building types, are the weighted average cost estimates broadly representative of the additional construction costs to comply with the proposed accessibility standards (Options 1-3)?

Yes No

If no, please clearly describe which classification of building and Option your comment relates to and if you can provide evidence to inform the weightings:

22. Do you agree with the approach taken to valuing the opportunity cost of the additional space required?

Yes No

Please indicate what alternative methodologies you suggest be considered below:

23. Are additional excavation costs likely to be required in order to provide homes that comply with the regulatory options (Options 1-3)?

Highly unlikely Unlikely Likely Highly likely

Describe where in your opinion this will occur (e.g. which option and building type) and what you have based your answer on below:

24. Are the excavation cost estimates presented in table 5.12 reasonable?

Yes No

If not, what are your alternative estimates and the basis for the estimates?

25. Are there any other costs (e.g. transition costs) not identified for builders to transition to a new accessibility standard under the regulatory Options (Options 1-3)?

Yes No

If yes, please describe the costs, their extent and who they apply to below:

26. Can you provide any other relevant information on costs to inform the impacts of the Options?

Please describe other cost information below:

Given the broad nature of the objective of the regulatory proposal "to ensure that housing is designed to meet the needs of the community, including older Australians and others with mobility limitations", the cost benefit approach is considered too narrow. Previous SBEnrc research identified a Composite Return on Investment (discussed earlier in Q11). This is being expanded further in our current research project - Liveable social and affordable higher density housing - https://sbenrc.com.au/research-programs/1-71/ which is exploring both liveability and accessibility in urban housing precincts. Whilst this is still theoretical, it could help to inform a long term change strategy.

Estimating the benefits

The benefits generated under each of the options have been estimated using two different approaches, which are compared through the Consultation RIS:

The central approach based on the extent to which it would be expected the proposed changes to the NCC (and other options) address the extent of the various issues discussed in the problem section.

The alternative approach was based on estimates of a household's 'willingness to pay' for various accessibility features when choosing a home to buy or rent. These estimates were derived from the stated preference survey using questions that offered hypothetical choices between homes with differing accessibility features and rents.

Both methods produced similar results when benefits were aggregated over people with a mobility-related disability. Both methods include estimates of extent to which households are willing to pay to see better outcomes for Australians with a mobility-related disability. These benefits to the wider community are referred to as 'societal benefits' in the analysis.

The questions below are focused on the central approach and the assumptions in Appendix A-H.

Related Information

27. Are the assumptions relating to the occupation of accessible housing by owner occupiers and renters over time reasonable?

More Information - The analysis discusses the process through which an increasing share of the population would occupy accessible housing is influenced by:

- *the number of newly acquired disabilities, which are a small share of total disabilities in any given period; and*
- *the number of new accessible dwellings, which are initially a small share of the total housing stock; and*
- *the differences between the choices owner occupiers and renters face.*

Yes
No

Please outline your assumptions and what evidence could be considered to make the assumptions more robust:

I am unsure of your definition of newly acquired disabilities. Better access (and ultimately universal design) can benefit many people including those with differing levels of ability such as the aging, parents with small children, those with a short term disability and the like. Over the life of a single dwelling it is reasonable to assume that some level of increased accessible might be beneficial - I do not have figures to support this.

28. Do you agree with the assumption of the extent features are currently not provided in new dwellings?

Yes
No
Please explain the reasons for your answer below:

29. Do you have any other evidence of the extent that accessibility features similar to those required by Options 1-3 are provided in new dwellings under current arrangements?

More Information

Please describe what evidence has informed your view below:

30. Where dwellings have some accessibility features but not others, would this reduce the size of the problem?

Yes
No
In your opinion, by how much? (please provide your reasoning/data for your estimate below):

This approach still places limitations on where people can choose to live, and who they can have as visitors, which does not fulfil universal design aspirations.

31. Do you agree with the assumption that additional features required under accessibility standards in Option 2 and Option 3 would increase the number of beneficiaries compared to Option 1?
Yes
No
Please explain your response and describe what you have based your answer on below:

32. To what extent would better information provision and promotion of an enhanced non-regulatory approach (Option 6) be effective in encouraging the voluntary uptake of universal design principles in new dwellings?

Not effective
Somewhat effective
Very effective
Unsure
Please describe the extent this would be effective and your reasoning below:

Please refer to earlier comments about the need for an overarching approach, as per the Norwegian example. A non-regulatory approach involving network wide consultation would be an essential part of a broader, long term strategy which engages with participants across the network to address change across the spectrum of technical, social and regulatory barriers, using legislative, market and administrative powers.

33. To avoid attributing benefits to accessibility features already installed in dwellings under current arrangements, the impacts of the proposal have been reduced in proportion to those elements assumed prevalence and weighted average cost. What additional evidence could we consider to make this assumption more robust?

Please provide any evidence that can inform the assumption:

34. There is a mismatch between the amount of accessible housing being built and the apparent willingness of many survey respondents (including households without any persons with limited mobility) to pay above cost for Option 1. What explanations are there that could explain this mismatch? Is this a reflection of the market failure?

Explain your reasoning for your answer below:

This may represent the conflict between individual and household aspirations, and realities in terms of costs, installation, aesthetic and the like. This could be an important level in change.

35. Do you have any other evidence that would make the estimates in the analysis more robust?

Please outline the specific assumption your comment relates to below:

Current SBEnrc research is in part looking at this. Our research findings will be available in late 2021.

36. Please upload your submission, or any relevant information or data related to your previous responses.

Please provide supporting documentation in .doc, docx or PDF format. All submissions will be published, or not, in accordance with your preference indicated in the Information Collection section.

14 APPENDIX E – Extract Norwegian 2017 Regulations

Following is an example from the 2017 *Regulations on technical requirements for construction works.*

Section 12-2 Requirements concerning accessible dwelling units:

(1) Dwelling units in a building that is required to have a lift shall have all the primary functions on the entrance level of the dwelling unit. The entrance level shall be accessible to people with disabilities pursuant to the provisions in the Regulation.

(2) In a building subject that is required to have a lift, cf. section 12-3, it is nonetheless sufficient that at least 50% of the dwelling units with a gross internal area of up to 50 m² meet the requirement relating to accessible dwelling units and the requirement relating to the design of bathrooms and toilets in section 12-9, first paragraph. When applying for permit to build several buildings, the exemption applies to all the buildings together.

(3) Dwelling units in a building that does not require a lift and that have all the primary functions on the entrance level of the building, shall be accessible at the entrance level pursuant to the provisions in the Regulation, unless the pedestrian access meets the conditions for exemption in section 8-5, second paragraph. (Norwegian Building Authority 2017)

15 APPENDIX F – Extract of UK Code for Sustainable Homes Level 4

The Code for Sustainable Homes has now been withdrawn (aside from the management of legacy cases) and has been replaced by new national technical standards which comprise new additional optional Building Regulations regarding water and access as well as a new national space standard (this is in addition to the existing mandatory Building Regulations). These additional options (which are comparable with the requirements for the former Code for Sustainable Homes Level 4) can be required by a planning permission. For example, Requirement G2 of the Building Regulations concerns water efficiency. The current Regulations state that the potential water consumption by occupants of a new dwelling must not exceed 125 litres per person per day. This Regulation remains in place but there is now also an optional higher standard which states that the potential water consumption by occupants of a new dwelling must not exceed 110 litres per person per day. This higher standard may be imposed by planning condition. With regard to access, for Requirement M4 of the Building Regulations (sanitary conveniences in dwellings) there are now three categories; M4(1), M4(2) and M4(3). M4(1) is the lowest level of standard and represents the mandatory requirements. Levels M4(2) and M4(3) represent increasingly higher levels of standards and one of these may be imposed by planning condition.

1. The Space Heating Energy Demand is not to exceed 15 kWh per square meter of net living space (treated floor area) per year or 10 W per square meter peak demand. In climates where active cooling is needed, the Space Cooling Energy Demand requirement roughly matches the heat demand requirements above, with an additional allowance for dehumidification.

2. The Renewable Primary Energy Demand (PER, according to PHI method), the total energy to be used for all domestic applications (heating, hot water and domestic electricity) must not exceed 60 kWh per square meter of treated floor area per year for Passive House Classic.

3. In terms of Airtightness, a maximum of 0.6 air changes per hour at 50 Pascals pressure (ACH50), as verified with an onsite pressure test (in both pressurized and depressurized states).

4. Thermal comfort must be met for all living areas during winter as well as in summer, with not more than 10 % of the hours in a given year over 25 °C. For a complete overview of general quality requirements (soft criteria) see Passipedia.

All of the above criteria are achieved through implementation of the 5 Passive House principles:

Thermal insulation - All opaque building components of the exterior envelope of the house must be very well-insulated. For most cool-temperate climates, this means a heat transfer coefficient (U-value) of 0.15 W/(m²K) at the most, i.e. a maximum of 0.15 watts per degree of temperature difference and per square metre of exterior surface are lost.

Passive House windows - The window frames must be well insulated and fitted with low-e glazing filled with argon or krypton to prevent heat transfer. For most cool-temperate climates, this means a U-value of 0.80 W/(m²K) or less, with g-values around 50% (g-value= total solar transmittance, proportion of the solar energy available for the room).

Ventilation heat recovery - Efficient heat recovery ventilation is key, allowing for a good indoor air quality and saving energy. In Passive House, at least 75% of the heat from the exhaust air is transferred to the fresh air again by means of a heat exchanger.

Airtightness of the building - Uncontrolled leakage through gaps must be smaller than 0.6 of the total house volume per hour during a pressure test at 50 Pascal (both pressurised and depressurised).

Absence of thermal bridges - All edges, corners, connections and penetrations must be planned and executed with great care, so that thermal bridges can be avoided. Thermal bridges which cannot be avoided must be minimised as far as possible.

16 APPENDIX G – Liveability framework – working draft

This draft table has been developed to help build the liveability framework as a tool to: develop and input criteria; show alignment with the nine impact domains; and as a key word repository for linking supporting information as we develop this and the literature review (Table 31). This has been established in the context of the nine impact domains (below) established in the SBEnrc Rethinking Social Housing project (Kraatz, Mitchell et al. 2015). These domains are referenced in the body of the matrix (i.e. D1).

References listed at the end of this table will be further explored in the development of the final framework.

Table 31 – Draft Liveability Framework for Social and Affordable Higher Density Housing

D1 Community & culture

D2 Economy

D3 Education

D4 Employment

D5 Environment

D6 Health & wellbeing

D7 Housing

D8 Social engageme

D9 Urban amenity

Element	Sub- element	Detail inputs	Issues of note	Responsible network participants (1.61)	Context - Impact Domain (1.31)
ELEMENT 1 - LIVEABILITY – PLACE BASED					
1.1	**Inclusive place-based planning (2)** e.g. governance, partnerships, social procurement, co-design.				**D1, 5, 8 & 9**
1.2	**Integrated place-based planning leading to *complete communities* (**2, 22) e.g. governance, partnerships, social procurement, co-design				
1.3	**Carbon neutral-positive approach (2)** e.g. passive, active and carbon neutral design and analysis, microclimatic analysis, heat sink				**D2, 5 & 7**

Element	Sub- element	Detail inputs	Issues of note	Responsible network participants (1.61)	Context - Impact Domain (1.31)
1.4	**Climate** resilience e.g. insulation, cross ventilation, microclimatic responses				
1.5	**Connectivity to nature-loving and biodiverse spaces(2)** e.g. biophilic, water sensitive and landscape oriented design.				
1.6	**Community, character and culture** e.g. heritage, diversity, role of precinct layout (1), vibrancy				
	Community wellbeing e.g. connectedness, cohesion and safety (14)				
1.7	**Equality and equity** – e.g. Equitable design (3, 14) design seeks to avoid anyone feeling that some units are significantly better than others.				
1.8	**Pandemic response e**.g. space planning performance; ability to engage; access to outdoor space; ability to manage outbreaks				
1.9	**Social infrastructure /** connectedness e.g. schools and neighbourhood centres (5)				
1.10	**Virtual infrastructure e.g. wifi**				
1.11	**Asset maintenance** both building and urban fabric e.g. soft landscaping				
1.12	**Healthy by design** e.g. walkability **(7, 15, 16)**				

Element	Sub- element	Detail inputs	Issues of note	Responsible network participants (1.61)	Context - Impact Domain (1.31)
	Safety by design e.g. CPTED (crime prevention through environmental design) principles				
ELEMENT 2 - ACCESSIBILITY – PERSON CENTRED					
2.1	**Whole of life accessibility** e.g. comfort and health; access to open space, social, physical and virtual infrastructure, communal resources (20, 21)				
2.2	**Visitability** e.g. people who use mobility aids having the same rights to visit friends and family in their homes; wayfinding both passive and active (6, 19)				
2.3	**Simple, intuitive and perceptible elements** (11)				
2.4	**Precinct safety** (2, 12) e.g. human centred, walkable.				
2.5	**Precinct accessibility(2, 10)** e.g. and place and movement design – see also (Maisel and Ranahan 2017)				
2.6	**Local shared mobility(2)** e.g. local mobility and feeder transport design; mobility as a service.				
2.7	**Integrated service provision e**.g. for person centred delivery				
2.8	**Tracking accessible housing in market place**				

Element	Sub- element	Detail inputs	Issues of note	Responsible network participants (1.61)	Context - Impact Domain (1.31)
	Accessibility to work e.g. security, availability and meaning (14)				
	Access to vital services e.g. food, water, energy and health (14)				
2.9					
ELEMENT 3 - VALUE EQUATION – COST BENEFIT					
3.1	**Whole of life accessibility** e.g. whole-of-life running-cost reduction features.				
3.2	**Balancing initial costs of accessibility and liveability features with long term benefits** e.g. physical, social / community and tech. features, and on-going maintenance costs (4, 17, 18)				
3.3	**Value capture e.g.** opportunities and methodology				
3.4	**Property diversity (2)** e.g. community engaged planning; agglomeration economy analysis; financial modelling.				
3.5	**Property affordability (2, 17, 18)** e.g. social and affordable housing analysis; life cycle assessment; operational analysis.				
3.6	**Economic stimuli for local community e.g.** mixed use opportunities				
3.7	**Asset maintenance**				
ELEMENT 4 - REGULATORY AND POLICY ENVIRONMENT					

Element	Sub- element	Detail inputs	Issues of note	Responsible network participants (1.61)	Context - Impact Domain (1.31)
4.1	**Regulatory and policy issues** – national				
4.2	**Regulatory and policy issues** – state				
4.3	**Regulatory and policy issues** – local				
4.4	**Jurisdictional conflicts**				
4.5	**Livable Housing Design Guidelines**				
4.6	**Enabling diversity of outcomes**				
4.7	**Other guidelines**				
ELEMENT 5 - ADOPTION AND OVERCOMING					
5.1	**Barriers to uptake of liveability and accessibility features** e.g. domestic and shared spaces; engagement and privacy**.**				
5.2	**Adoption levers** e.g. tax and funding models, economic stimuli				
5.3	**Mixed tenancy environments**				
5.4					

Table references for further follow up during framework development:
(1) (Gu 2020)
(2) Criteria adopted and adapted from SBEnrc 1.62 (Caldera, Desha et al. 2019)
(3) Qld Government Social Housing Design Guide (Queensland Department of Housing and Public Works 2017)
(4) (Parsell, Petersen et al. 2015, London School of Economics 2020)
(5)(London School of Economics 2020)
(6) (Danford and Tauke 2001, Levine 2003, Lendlease 2015)

(7) (Hooper, Knuiman et al. 2015, Heart Foundation 2020a, Heart Foundation 2020b, Heart Foundation 2020c)
(8) (Kraatz and Jayawardena 2020)
(9) (Kraatz, Mitchell et al. 2015)
(10) (AHURI 2020d)
(11) (Danford and Tauke 2001)
(12) (Maisel and Ranahan 2017)
(13) (Queensland Department of Infrastructure 2017a)
(14)(Alexander, McCoy et al. 2020)
(15) (Institute of Public Works Engineering Australia 2020)
(16)(Queensland Treasury 2020a) and (Queensland Treasury 2020b)
(17) (Centre for International Economics 2020)
(18) (Australian Building Codes Board 2018a)
(19) (Nasar and Elmer 2015)
(20) (Landcom 2008)
(21) (National Disability Authority Ireland 2020a, National Disability Authority Ireland 2020b)
(22) (WA Department of Lands Planning and Heritage and WA Planning Commission 2019)

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