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A Liveability Framework for Medium to High Density Social and Affordable Housing: An Australian Housing Case Study

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ABSTRACT

The private rental market costs are placing a burden on household budgets, thus significant pressure is on governments and private housing organisations to supply more social and affordable housing solutions. This research evaluates the key elements of medium- and high-density liveable and accessible social and affordable urban housing precincts. Focusing on investigations into an Australian housing case study, the authors establish a liveability framework to improve understanding of whole-of-life needs. Through a comprehensive literature review, a case study and a series of in-depth interviews with key stakeholders from the housing sector five key elements were identified. These key elements include: (1) Liveability, (2) Accessibility, (3) Value equation, (4) Regulatory and policy environment, and (5) Adoption and overcoming barriers. The liveability framework will form the basis of a set of quality standards that can be used to guide precinct planning, design development and management.

摘要

私人租赁市场的成本给家庭预算造成了负担，因此政府和私人住房组织面临着提供更多社会和经济适用房解决方案的巨大压力。本研究评估了中高密度宜居和无障碍社会经济适用房城市住宅区的关键要素。通过对澳大利亚住房案例的调查，作者建立了一个宜居性框架，以提高对整个生活需求的理解。通过全面的文献综述、案例研究以及对住房领域主要利益相关者的一系列深入访谈，作者确定了五个关键要素。这些关键要素包括：（1）宜居性；（2）可达性；（3）价值等式；（4）监管和政策环境；以及（5）采用和克服障碍。宜居性框架将成为一整套质量标准的基础，可用于指导区域规划、设计开发和管理。

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1. Introduction

There is a critical shortage of accessible residential housing in Australia that has implications for the 4.4 million Australians living with disability, older Australians and their carers and families (Australian Building Codes Board 2020, p. 1). Accessible housing is considered as “*any housing that includes features which enable use by people either with a disability or transitioning through their life stages*” (Queenslanders with Disability Network, QDN 2017, p. 7). Considering the current

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and projected national prevalence of populations with functional impairments and trends of ageing, the WHO Housing and Health Guidelines established that an adequate proportion of the housing stock should be accessible to people with functional impairments (WHO 2018).

The COVID-19 pandemic has further highlighted the need to ensure the liveability of higher density urban housing. Liveability refers to “*the degree to which a place, be it a neighbourhood, town or city, supports quality of life, health and wellbeing for the people who live, work or visit*” (London Commission for Architecture and the Built Environment as cited in Wu *et al.* 2018, p. 772). There is an urgent need for more liveable and accessible medium- to high-density urban housing precincts to enhance quality of life. While accessibility is people-centric, it is also place-dependent. Hence, planning for liveability is paramount to ensure accessible housing and the people within those housing have access to features that support the quality of life.

The challenge is compounded as many of these Australians requiring accessible housing are under financial stress and reliant on social and affordable housing (SAH). In Australia, the primary providers of SAH are state governments and private housing organisations. However, state social housing registries highlight demand outstrips supply across Australia, and in many other countries (Pawson and Gilmour 2010).

Key challenges to embedding accessibility principles in SAH include 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 of analysis (Crabtree and Hess 2009, Häkkinen and Belloni 2011). Information about these characteristics within SAH, particularly in high density precincts, is dispersed and incomplete. This research sought to address how to better embed these features in SAH and improve pathways for the adoption of these outcomes through: (i) clarifying the value equation (both tangible and intangible) to enable the delivery of whole-of-life solutions; and (ii) building community acceptance of such investment in homes and urban precincts.

The findings of this research were derived from a comprehensive literature review, a case study and 12 in-depth interviews with key stakeholders from the housing sector (public, private and not-for-profit). The findings form the basis of a Liveability Framework for Social and Affordable Medium to High Density Housing (see Figure 4 and Appendix 2) utilising five key elements: (1) Liveability – place-based and community focused, (2) Accessibility – person centred and community focused, (3) Value equation – cost benefit, (4) Regulatory and policy environment, and (5) Adoption and overcoming barriers. The Australian case study was undertaken in the Green Square Close precinct in Fortitude Valley, Brisbane, which includes 80 social and affordable homes, developed and managed by Brisbane Housing Company (Reid *et al.* 2022). The case study focus was on the larger precinct interaction rather than on the housing itself, thus integrating a people centred precinct approach.

The research and development of the Liveability Framework, contributes to the SAH body of knowledge and practice, highlighting key elements of social and affordable higher density housing. The framework also includes a series of guidelines to 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.

2. Literature Review

2.1. Emergence of Accessible Housing and Design Considerations

Design plays a significant role in the delivery of accessible dwellings. Easthope (2020) pinpoint design quality, both at the building and neighbourhood scale, as critical in medium and higher density housing and precincts to build strong social infrastructure. Easthope *et al.*, building on Parkinson (2014), links the quality of apartment design and the presence of good infrastructure to residents’ wellbeing and satisfaction.

Table 1. AHURI research summary.

Categories	Key lessons
Design and governance	<ul style="list-style-type: none"> • The high-density precincts are dependent on the delivery of infrastructure (community, transport and social). • Quality of apartment design has an impact on resident wellbeing. • Governance of the delivery process and contracting impacts building performance. • Accessible features in housing negatively impact value at the selling point.
Integrated services and housing	<ul style="list-style-type: none"> • Diversity of responses is required to meet the different needs. • Age of housing stock impacts opportunity for refurbishment to meet accessibility standards. • Difficult to locate/track accessible housing in the marketplace Apartment supply needs to focus on a better owner-occupier approach based on quality and design.

Local services and facilities are also drivers for social networks, creating processes of commonality that support a sense of control of local public space (Atkinson 2008). Maclennan *et al.* (2015, p. 36) suggest that “*public investment in infrastructure and this includes housing, can have subtle, sometimes small but catalytic effects for people and place*”. 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.* (2015) 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*” may impact health outcomes for neighbourhoods (Maclennan *et al.* 2015, p. 41).

The global COVID-19 pandemic has further highlighted the impact of “living locally”. Specifically, access to open space and appropriate social infrastructure is integral for residents of SAH (AHURI 2020a). AHURI’s research has been crucial to creating an understanding of the main issues related to these areas, and how the interaction of the different forces has 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. Key lessons highlighted in the above AHURI research are summarised in Table 1.

2.1.1. Barriers and Challenges to Delivering Social and Affordable Housing

There are significant constraints in the delivery of infrastructure and amenities within high density neighbourhoods. The planning process and coordination, as well as securing funding (i.e. developer contributions, voluntary and/or negotiated agreements) between State and locally managed urban re/developments are complex. State-led projects have higher coherence in the governance of processes and outcomes but lack local engagement; while the locally led processes present the opposite problem. Research has highlighted the importance of connectivity in overcoming some of these planning and process challenges (Easthope 2020). Whilst there is a strong emphasis on public and active transportation in design there is often a lack of parking areas and car congestion within many high density housing precincts. Researchers have also called for a rethink of the physical connection between employment opportunities, affordable housing and transportation for low-income households to enhance urban productivity (Easthope 2020, Pill 2020). This highlights the importance of a strong link between good strategic spatial designs and governance.

The governance and financing support for housing and services is essential. Pinnegar (2011) identified a range of international examples where cross-sectoral partnerships have been used within the housing and urban policy context. Their 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 to facilitate delivery and renewal.

Barriers to the uptake of liveability and accessibility features in housing markets are considered by some to be institutional rather than technological. Research highlights these impediments 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 of analysis (Crabtree and Hess 2009, Häkkinen and Belloni 2011). Häkkinen and Belloni (2011, p. 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*”.

2.1.2. Role of Frameworks in Assessing and Understanding Liveability and Research Gap

There is a need for comprehensive assessment combining social, functional and aesthetic dimensions and relationship between city fabric and residential environment. Giap *et al.* (2014) present a comprehensive assessment of residential environment liveability as a composition of external factors affecting the individual, or group of individuals, impacting their personal development, health, well-being, and the positive development of the entire society.

Table 2. Summary of key literature.

	Elements	Key literature
Liveability – place-based & community-focused	<i>“The degree to which a place, be it a neighbourhood, town or city, supports quality of life, health and wellbeing for the people who live, work or visit. Integrate the physical planning processes, the human-oriented planning processes and the financial planning processes”</i> (Newman 2020, p. 15).	Newman 2020, p. 15
Accessibility – person-centred & community-focussed	Key recommendations to drive future actions include: “1. adopt the guiding principles of rights, choice, inclusion and control; 2. enhance partnerships and information sharing; 3. increase the supply of accessible, affordable housing; 4. improve access to affordable private rental housing; 5. improve access to social housing” (Queenslanders with Disability Network 2017, p. 7).	Queenslanders with Disability Network 2017, p. 7
Social, environmental, and economic value – building the value equation	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 needs, and the form of the development project.	Danford and Tauke 2001, Levine 2003, ABCB 2019
Regulatory and policy environment	State government housing agencies provide extensive details regarding accessibility requirements for social housing, in line with the national Liveable Housing Guideline. From a consumer perspective there is a lack of information about the Commonwealth Government’s National Disability Insurance and what it might look like for a person (limiting uptake).	Queensland Housing Strategy 2017–2027, Queensland Health 2019, Livable Housing Australia 2012
Improving adoption	Design and construct efficiencies and risk; regulatory burden; costs burden i.e. who pays the cost; costs impact i.e. how much something costs; industry perceptions of need. Needs to be considered across technical, social and regulatory barriers, using legislative, market and administrative powers (Norwegian Ministry of Children and Equality 2009, Bringa 2019). Also: skills development, industry training, best practice examples and pilot projects; long term integrated, cross-sector; broader assessment of return on investment; economies of scale; education around the whole of life needs, best practice examples and pilot projects ().	Kraatz 2020, Norwegian Ministry of Children and Equality 2009, Bringa 2019; Anon.

While there are studies focussed on residential environments in general, there is limited research focussing on a comprehensive framework for assessing SAH. Considering the global and local precedents and barriers to the integration of liveability and accessibility into the housing markets there is a need for a more holistic approach. Addressing the research gap with an integrated approach that incorporates liveability and accessibility, this study develops a holistic liveability framework for medium- and high-density urban precincts.

Case study evidence is utilised to demonstrate across the five key elements of liveability, accessibility, social, environmental and economic value (to build the value equation), the regulatory and policy environment, and improving adoption. [Table 2](#) synthesises some of the key literature which has informed these five elements.

The economic and social burden and impact of integrating sustainable design features into homes have been a long-term discussion for policymakers, industry and consumers (Edenhofer *et al.* 2014). Debate has focussed on up-front versus whole-of-life costs (ABCB 2019). It is also evident that building high-density housing, without considering liveability of both the home and the surrounding community, is no longer viable (Reid *et al.* 2022). There remains a lack of knowledge of a holistic and integrated need to deliver affordable and social housing in higher-density urban precincts. The outcomes of this research develop our understanding of liveable and affordable higher density housing precincts.

2.1.3. Proposed Conceptual Framework

Based on the literature review a conceptual framework (presented in [Figure 1](#)) was developed that identified five elements ([Table 2](#)). The goal of a conceptual framework was to identify, describe concepts and see the interrelationships between concepts (Rocco and Plakhotnik 2009). The conceptual framework provides 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. The conceptual framework grounds the study in the existing knowledge bases, through the literature and empirical research, to advance knowledge.

3. Research Approach

An exploratory research approach was undertaken in this study. This approach allows evaluation of key elements of the liveability framework and provides groundwork for further research. The

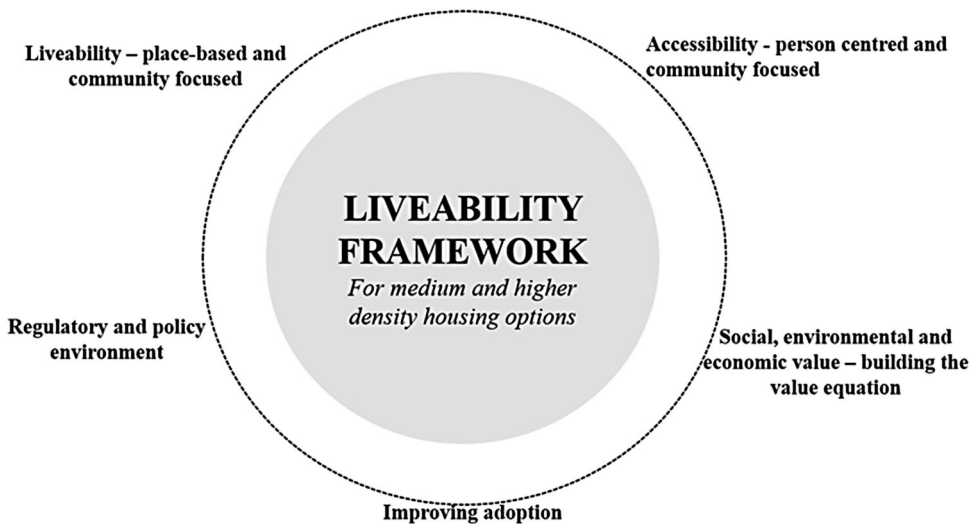


Figure 1. Conceptual framework.

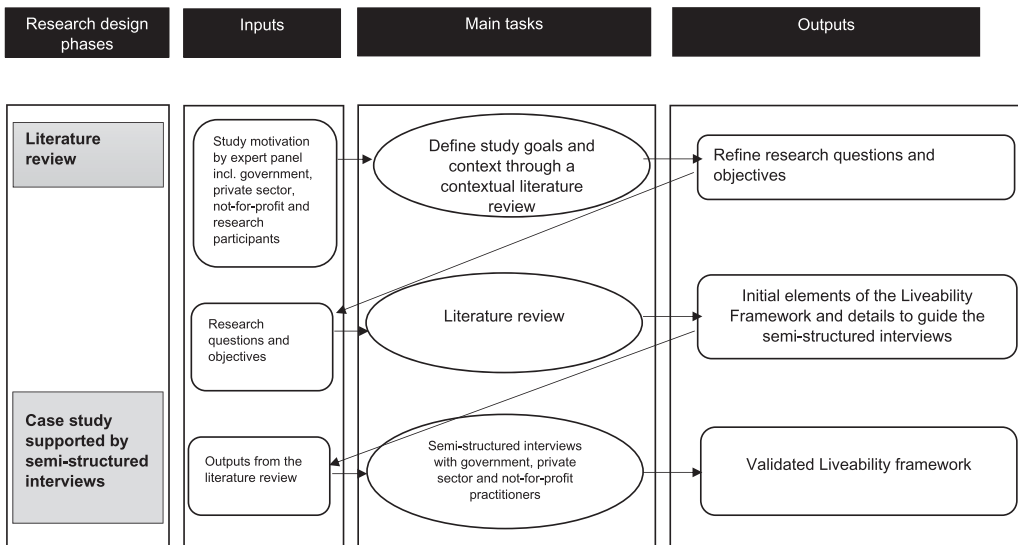


Figure 2. Summary of the research approach.

research approach consists of two key methods including a comprehensive literature review and a case study supported by semi-structured interviews. The research methods adopted are based on describing the situation to develop and validate the framework, rather than producing replicable findings (Johansson 2007). Exploratory research approaches are effective in identifying and describing narratives to inform policy development.

Figure 2 illustrates the key design phases, inputs, tasks and outputs. Firstly, the study goals were defined and a contextual literature review was carried out. Through the literature review, the initial five elements of the liveability framework were identified. Secondly, a case study was selected and a series of semi-structured interviews with expert stakeholders were carried out to evaluate and refine the key elements/sub-elements of the liveability framework.

3.1 Case Study Description

The Green Square Close precinct (Figure 3) was selected for this case study due to the opportunities it offers to test and develop the liveability framework. Situated in Fortitude Valley, approximately 1.5 kilometres from the Brisbane Central Business District, in the state of Queensland, Australia. Fortitude Valley and the adjacent Bowen Hills precinct have undergone significant urban renewal and redevelopment over the last decade. The precinct offers a demonstration of a planned urban environment, with consideration for design quality from social and environmental along with commercial perspectives, and offers opportunities for local, neighbourhood and district scale assessment. Finally, the precinct provides considerable opportunities for connectivity and urban amenity in this area, though not necessarily accessible.

Green Square Close is home to a multi-storey SAH property, for 80 households, that was designed, developed and operated by Brisbane Housing Company (BHC). Opened in 2010 the property was part of a Brisbane City Council (BCC) led development that incorporates within the larger precinct government and commercial offices, social support services and ground level retail outlets. Green Square Close is one of BHC's 1,700 wholly owned social and affordable housing properties (Minnery and Greenhalgh 2016). Incorporated in 2002, BHC is a registered Tier 1 Community Housing Provider (CHP) that has earned a reputation as a solid and reliable organisation, built through effective working relationships and a personalised approach to customer service (Brisbane Housing Company Limited 2022).



Figure 3. Green Square Close (November 2020).

3.2 Data Collection: Semi-Structured Interviews

Qualitative interviews were undertaken to test and develop the conceptual framework through considering features of an existing urban housing precinct from the expert lived perspective. Semi-structured interviews were undertaken with 12 representatives [coded as SI1-SI12] of expert stakeholder groups as evidenced in [Table 3](#). The interview question guide (Appendix 1), derived from the literature review, was developed to inform discussion and test the conceptual liveability framework. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee.

Table 3. Interview participant details.

Stakeholder interviewee code	Title	Organisation	Interview duration (minutes)
SI1	Manager	Industry – Developer	35
SI2	Manager	Government	50
SI3	Manager	Community Housing Provider	30
SI4	Chief Operating Officer	Community Housing Provider	25
SI5	Executive Director	Industry Body	35
SI6	Social Worker	Not for profit	45
SI7	Manager	Community Housing Provider	30
SI8	Policy expert	Industry network	50
SI9	Policy officer	Industry network	50
SI10	Manager	Community Housing Provider	45
SI11	Director	Industry – Private architecture company	35
SI12	Architect	Government	50

3.3 Data Analysis: Thematic Analysis of Qualitative Data

Interviews were conducted online, digitally recorded and transcribed. Data reduction methods were used to analyse the information (Miles and Huberman 1994). A thematic analysis method was applied to identify emerging themes with a combination of inductive and deductive reasoning approaches (Braun and Clarke 2006). The analysis began with a deductive or theory-driven coding system (A-priori codes) using the elements of the liveability framework, while creating additional new nodes/elements (In-vivo codes) inductively from emerging interview data. Content analysis was carried out on the company and related websites, site visit notes, and company tenant survey results, to triangulate data.

4. Findings and Discussion

The five elements from the conceptual liveability framework were used to guide the thematic analyses and form the structure for this section: (1) liveability – place-based and community-focused, (2) accessibility – person centred and community focused, (3) value equation – cost benefit, (4) regulatory and policy environment and (5) adoption and overcoming barriers.

4.1 Liveability – Place-Based and Community-Focussed

Stakeholder insights on liveability features were evident across the key elements of integrated and inclusive place-based planning, connectivity to nature, biodiversity, ventilated spaces, safety (design and awareness), connectedness (natural, social, physical, and virtual), community and social well-being, and continuous improvement. Table 4 highlights some stakeholder comments relating to this element.

Stakeholders noted the value of meeting places and green space, with accessibility being important (e.g. level thresholds, compliant ramps). Community engagement and buy-in were essential along with engagement with multiple stakeholders to help deliver sustainable and green outcomes.

The value of connectivity to nature, social networks, and the physical and virtual realms was highlighted. Access to internal green space and significant cross-ventilation, along with alternate circulation routes (especially in a pandemic environment) provide significant benefits. Mesh security doors provide a transition to the unit, moderating ventilation, privacy and access. For example, *“Splitting building in and cross and long-way ventilation enable flyscreen doors as transition to the*

Table 4. Liveability sub-elements and selected stakeholder comments.

Sub-elements of liveability	Selected supporting interview quote extracts
Integrated and inclusive place-based planning-	<ul style="list-style-type: none"> • A variety of restaurants and meeting places, greenspace across the road [S18, S19] • Community engagement and buy-in is key [S112]
Value of connectivity to nature, social networks, and the physical and virtual realms	<ul style="list-style-type: none"> • Constance Street housing with internal atrium [S12] • No Wi-Fi – unaffordable – many on disability support pensions. [S110]
Design for and awareness of safety	<ul style="list-style-type: none"> • Secure access via swipe card [S110] • Complex that has lift access [S17]
Community and social wellbeing	<ul style="list-style-type: none"> • Having mental health support for people experiencing chronic homelessness [S16] • Nothing is widely advertised, really good to have a central hub or go to an agency [S16]
Continuous improvement	<ul style="list-style-type: none"> • Evidence gathered through a post-occupancy survey – worked out well [S111] • Feedback on long term tenancy [S111] • Hard data (evidence-based decision making) is equally difficult – one can go down a data rabbit hole – can get very convoluted and complicated [S112]

unit” [SI11]. Gardens on private balconies and communal areas can provide residents with opportunities to choose their own plants. The benefits of generous open and communal spaces, and access to support services and activated spaces, were also noted. Virtual access was highlighted as problematic, with wi-fi being unaffordable among many residents on support pensions.

Design for and awareness of safety is crucial with secure entry, lift and floor access (via swipe card) important features. Mechanisms discussed include onsite management and staff (24/7 preferable), cameras, access passes and gates. Building a relationship between residents and local police to talk about personal and community safety was also a benefit.

Community and social well-being benefits from having access to mental health support services onsite, and demonstrating an understanding of liveability, provides dignified opportunities for residents. A central hub or “go-to” housing support agency is needed. For example, “*The substring residents do tend to connect with Communitify as one of the key support in the area*” [SI7].

Continuous improvement is an important element in a changing environment. Evidence of the need for improvement can be gathered via post-occupancy surveys, regular resident surveys, informal feedback and incident reports. Effective ways of managing such data, however, remain a challenge for resource constrained community housing providers.

The case study demonstrated evidence across these five sub-elements, especially with common characteristics such as inclusive spaces (on-site community spaces), connectedness (through natural green spaces, communal areas and activating spaces) and safety design features (swipe card accesses, safety support and awareness) that influences the social wellbeing of residents. The findings align and add to the people and place design framework which defines liveability as the degree to which a place, be it a neighbourhood, town or city, supports quality of life, health and wellbeing for the people who live there (Newman 2020).

4.2 Accessibility – Person-Centred and Community-Focused

Accessibility in the context of this study was considered across a range of life needs, including providing for those with temporary or permanent disabilities, aging, and young residents. Accessibility was examined under the five key elements: (1) walkability; (2) accessibility to employment; (3) precinct accessibility; (4) equitable access, and (5) visitability. Most interview participants highlighted access to amenities as a critical enabler towards person centred and community focussed outcomes.

There is a need for accessible and easy-to-negotiate ground planes and footpaths to help enhance walkability in higher density precincts. Siting housing precincts close to train and bus services, community services or other resources to enable easy access for residents, particularly for those with no cars, is needed. Walkability can also help reduce passive commute times and facilitate access to employment to improve quality of life. Equitable, clear and obvious access, for people in wheelchairs, and also the hearing and vision impaired, is important. For example, “*Footpaths are pretty accessible through large motorised wheelchairs, lots of tactile markers [SI9]*”. It was highlighted that Specialist Disability Accommodation (SDA) options available through the National Disability Insurance Scheme (NDIS) needs clarity, with accessible housing options remaining problematic. Car parking spaces are also needed to enable drop-off/collection points for those needing support to get to shops, transport or work.

Precinct access to services including health facilities, diverse social support services and free inner-city transport were highlighted, particularly in the context of site selection. Visitability can be improved with dual lift access, easy access to public transport, and access to parking for visitors, disability and support services and maintenance workers. Table 5 provides examples of quotes elicited from the interviews to support each sub-component.

The emergent sub-elements complement the QDN key recommendations to drive future actions including improving access to affordable private rental housing and improving access to social

Table 5. Accessibility sub-elements and selected stakeholder comments.

Sub-elements of accessibility	Supporting interview quote extracts
Walkability	<ul style="list-style-type: none"> • Guaranteed car parking space, paramount in higher density living that there is adequate space to drop someone off, to have dropped off and collection point for freedom of movement [S18-9] • Access to shops, transport and walk to work [S12] • Close to those kinds of major health facilities [S17] • There is Visible Ink, which is a huge support. [S17] • You've got Heart for Housing (Community) – mainly provide immediate kind of emergency support, rough sleeping and things like that homeless [S17]
Access to employment	<ul style="list-style-type: none"> • Guaranteed car parking space, paramount in higher density living that there is adequate space to drop someone off, to have dropped off and collection point for freedom of movement [S18-9] • Access to shops, transport and walk to work [S12]
Equitable, clear and obvious access	<ul style="list-style-type: none"> • Clear and obvious access points and equitable access for someone with a disability – beyond wheelchair to hearing and sight loss. [S13] • NDIS investigate the link with independent housing options [S18-9] • Availability of disability parking always an issue [S18-9]
Precinct access	<ul style="list-style-type: none"> • Precinct is quite close to the train station [S14] • Proximity to community services or other resources that people can access • Close to Fortitude Valley train station [S17]
Visitability	<ul style="list-style-type: none"> • Important for visitors too – who might have access requirements but don't live there [S18-9]

housing to deliver housing advocacy services that have a dedicated focus on people with disability (QDN 2017). This is particularly pertinent due to the aging nature of many societies.

4.3 Social, Environmental and Economic Value – Building the Value Equation

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 needs, and the form of the development project. This theme was evaluated under four sub-elements: (1) whole-of-life benefits, (2) balancing upfront costs, (3) social and economic participation, and (4) long-term sustainability. These elements are further detailed in Table 6 with key quotes elicited from the case study.

Table 6. Value equation sub-elements and selected stakeholder comments.

Sub-elements of the value equation	Supporting interview quote extracts
Whole life benefits	<ul style="list-style-type: none"> • Whole of life assessment in business case across all sectors important – and where they reside in mixed-use development. Easier if asset owner retains over a long time [S112] • Lead by demonstration [S112]
Balancing upfront costs	<ul style="list-style-type: none"> • Healthier environment, healthy people and takes the burden off the system over time. • Engaging epidemiologists etc to show direct correlation and \$ values between health and urban outcome [S112] • Cost-benefit analysis is hard for govt. to say if we deliver this discrete piece of infrastructure will have this benefit over 30 yr [S112] • Manage investment trusts so they pay 30% just residential investments, but only 15% on industrial retail commercial. So that's a disincentive to invest as well [S15] • Land tax is phenomenal on build to rent assets like if it was carved up as Built to sell that he wouldn't pay land tax [S15] • Unlocking underutilised government land and using that to deliver on SAH outcomes [S15] • All know it's more costly to retrofit [S18-9]
Social and economic participation	<ul style="list-style-type: none"> • Need to take into account the social benefit and economic participation [S18-9] • Diversity of community where will it occur and what's the upfront cost versus adapting homes [S112]
Long-term sustainability	<ul style="list-style-type: none"> • Long term sustainability of lower 2 levels – provides enough floor space to be commercially viable [S111] • Can't charge given the cohort of the client, you wouldn't charge more for accessible units than ones that aren't other than the way that BHC does [S14]

A whole-of-life benefits assessment in the business case stage is important, especially in mixed-use developments. This is better facilitated in situations where the asset owner retains the asset (e.g. government agencies, CHPs) as the opportunity exists to lead by demonstration. Considerable evidence demonstrates that it is more costly to retrofit, but the cost benefit of doing this is not the only driver (e.g. homeowner resistance). There are also different value equations for different projects, so benefits can be difficult to demonstrate as the value to be derived will vary significantly among the different stakeholder groups.

Healthier environments and people can take the burden off the system over time, helping to balance upfront costs. Cost–benefit analysis is difficult, however, for a housing development it is envisaged that the benefits accrue over the long term (e.g. 30 years). The difference in returns between residential and industrial/retail/commercial managed investments is also a disincentive to invest, along with land taxes on build-to-rent assets. For example, asset owners “*Tend to build, own and manage the long-term needs as housing agency – in it for the long game so demonstrate benefit*” [SI12]

Long-term sustainability can be improved in several ways. Floor space on lower levels can be integrated for commercial purposes and to balance the cost of housing above. However, social delinquency issues arise with building vitality if these commercial spaces are not occupied.

The elements identified under the value equation align and further contribute to social, environmental and economic values highlighted in Universal Design New York (Danford and Tauke 2001, Levine 2003) and a Submission to the Australian Building Codes options paper (ABCB 2019). One participant highlighted how challenging it is to demonstrate value creation in non-for-profit organisations. It was clear that there will be different value equations for different types of projects, and that the kind of value to be derived will vary significantly between different stakeholder groups.

4.4 Regulatory and Policy Environment

There was consensus from interviewees on the need for continued state government commitment to accessible housing and an achievable housing standard. This element includes three sub-elements relating to: (1) local, national and state level regulatory issues, (2) lack of whole of life business case and (3) future priority areas. These elements are further detailed in the Table 7.

Table 7. Regulatory and policy environment sub-elements of and selected stakeholder comments.

Sub-elements of regulatory and policy environment	Supporting interview quote extracts
Regulatory and policy issues – local/ state and national	<ul style="list-style-type: none"> • Campaigned prior to the State election – advocate for accessible housing and a need for SAH to accessible standard [SI8-9] • Always difficult in terms of how to fund regulations and operationalise these things – waxes and wanes at all levels depending on appetite for playing in the space or not – depends on how we value these things – depends on equation around jobs and growth and longer-term issues [SI12] • Political cycles presents a good opportunity in the state – federally more difficult – more about funding mechanisms and then how you localise [SI12] • Provide advice at the earliest opportunity rather than at the business case stage. Synergies between the local level and federal funding and how you operationalise this [SI12]
Whole of life business case	<ul style="list-style-type: none"> • Need whole of life business cases asap. Easier when asset owner has longer time perspective [SI12] • Fire issues – large internal hanging gardens over 8 levels (fire regs require isolation every 3 levels), and internal street enable natural ventilation
Key priority areas	<ul style="list-style-type: none"> • NDIS – investment linked with independent living options [SI8-9] • Need to be in mental health, domestic violence or disability cohorts. People won't be approved for housing without this number, which gives them \$20 off rent there, even if living in a car [SI10] • Interaction with national regulations via building code – the building code seems to make sense. In terms of the National Construction Code, rarely finds issues [SI2]

Continued advocacy is needed for SAH to be of an accessible standard. Advocacy is difficult in terms of how to operationalise, as it depends on how it is valued. Building synergies between the local outcomes and federal funding is important, with political cycles potentially presenting opportunities. Project-specific negotiated outcomes in terms of liveability (e.g. internal street, hanging gardens and natural ventilation) need to be embedded in future regulations.

To establish a whole-of-life business case, government agencies need to provide advice at the earliest opportunity (even before the business case stage). This would be easier when the asset owner has a longer time perspective. A whole-of-life business case includes embedding diversity into the community, leading to better outcomes for everyone.

The NDIS and SDA were highlighted as key priority areas which are problematic. Clarification is needed of investment linked with independent living options. The link between eligibility for public and community housing was also noted as problematic. The conflict between town planning requirements and the various state development codes was also problematic. For example, *“There’s obviously a conflict between the Council town planning requirements and the state development code. Federally I imagine primarily would come through the NDIS or the NDIA”* [S14].

From a consumer perspective there is confusion or a lack of education about what the NDIS is. There is a lack of information about what it is all about and what it might look like for a person which could explain lack of uptake. These findings support existing bodies of work including Queensland Housing Strategy 2017–2027 and Healthy Places, Healthy People; Health and Well-being Strategic Framework 2017–2026 (Queensland Health 2019).

With medium to high-density housing becoming the predominant property development choice it is critical to address the regulatory and policy issues across local, national and state levels. In parallel, it is important to focus on key priority areas such as consistent planning requirements and meaningful interaction with national regulations, via building codes, if the government and private housing organisations are to achieve inclusive outcomes.

4.5 Improving Adoption

Interviewees highlighted a range of barriers related to liveability, including the utilisation of community spaces and engagement within the building and precinct. Similarly, accessibility barriers focused on internal access, access to community spaces in both the building and precinct, and active and public transport options. Significant barriers within SAH inclusion were identified relating to mixed tenure, financial, regulatory, limited evidence, and accessibility. The findings highlighted that gaps to implementation are also impacted by a lack of developing a whole-of-life business, identifying a suite of targeted design criteria, creating best practice examples, mandatory standards, and forming private and public partnerships for effective investments (Table 8).

(a) Liveability

Mixed tenure is currently seen as a missed opportunity, especially in the Central Business District, where partnerships are being driven by others with a potential contribution back via SAH opportunities. Struggles exist, however, in terms of leasing or selling mixed tenure commercial and retail space, as well as mixed tenure housing options.

Economic barriers exist in delivering accessibility. For example, spending money on common outdoor spaces (though this discussion has changed in light of COVID-19) increases the cost per dwelling. For example, one participant stated *“... spending money on common outdoor spaces – cost per dwelling and the higher the proportion of outside space lifts the cost per dwelling and yield is a barrier for projects they deliver”* [S12].

Table 8. Improving adoption sub-elements and selected stakeholder comments.

Sub-elements of adoption and overcoming barriers		Supporting interview quote extracts
Liveability	Barriers related to mixed tenure	<ul style="list-style-type: none"> • Greater missed opportunity/barrier is not being a part of CBD mixed tenure where partnerships being driven by others with contribution back via product [S12] • The struggle with mixed tenure if the leasing or selling of commercial and retail space, or shared spaces for community services [S12]
	Economic barriers	<ul style="list-style-type: none"> • Financial hardship – affordable housing residents on low incomes and financial barrier, and for instance, we’re having things like Oz harvest and food drop [S17] • Wi-Fi – they don’t have disposable cash. When they do stop paying rent, it’s for the electricity for Wi-Fi and for the water you know, so it makes it [S110]
	Regulatory barriers	<ul style="list-style-type: none"> • Fire regulations – Set back rules or couldn’t have got central space [S111] • Perverse issues at times in terms of Qld Development Code and train lines and properties which end up with heavy glazing and the like [S12]
	Lack of evidence and tools to aid decision making	<ul style="list-style-type: none"> • Issues with building vitality if not occupied. Not sufficient tools available to aid decision-making [S12] • More housing, or if that is not an option more subsidised housing needed – NRAS coming to end, not sure where that is now [S16] • The bottom line is more accessibility to low set housing – the population is aging – modifying buildings needed [S16]
Accessibility	Attitudinal and behavioural barriers	<ul style="list-style-type: none"> • Attitudinal – people don’t want to think that regulatory authority can dictate what your house looks like – but these are just guiding design features [S18-9] • Anti-social behaviour – the affordable people move into the complex is because they see all this type of behaviour and they’re like I don’t want to be part of this [S110]
	Market uptake barriers	<ul style="list-style-type: none"> • Securing development opportunity – there’s a lot of land that they owned by the government or community groups or not, for-profits or whatever [S11]

The adoption of sustainable technologies, such as new ways of storing renewable energy, is also important and requires more capital investments to become affordable. Financial hardship impacts residents on low incomes to access services, like wi-fi, as many residents do not have disposable cash.

Regulatory barriers include those around fire regulations and the creation of internal streets and some development codes. For example, if a property is near train lines, heavy glazing is required. Management plans rather than prescriptions are considered the way forward. Better provision of information on accessibility features and their value, even if not immediately needed, may increase demand. Tax incentives may also increase demand for accessibility features.

There is a lack of evidence and tools to aid decision-making in budgets for accessibility and liveability features. Best-practice examples can help change lifestyles and can orient consumers towards investment in sustainable and affordable living.

(b) Accessibility

Attitudinal and behavioural barriers were evidenced in that “*people don’t want to think that regulatory authority can dictate what your house looks like – but these are just guiding design features*” [S18-9]. There is behavioural resistance to grab rails etc., unless you need them, as people do not want to live in a home that looks like a hospital. There also remains a lack of willingness to pay upfront for intangible benefits of sustainability.

There is also still a preference by some to want low-set housing with access to gardens. Anti-social behaviour was also perceived as a deterrent for SAH with people not wanting to be aligned with such behaviours.

Securing development opportunities and suitable sites remains a barrier to market. Unless quantifiable, then accessibility is not included in the equation. In terms of the NDIS, high physical support needs can be funded as part of packages; however, if modifications are to be useful and helpful, they need to be tailored to the needs of the individual. Awareness among plan designers of the NDIS SDA needs improvement. Interview participants suggested a range of approaches to overcome the barriers shown in [Table 8](#).

The emergent related to the adoption and overcoming barriers align with the needs to be considered across technical, social and regulatory barriers, using legislative, market and administrative powers highlighted in previous research (Norwegian Ministry of Children and Equality 2009, Bringa 2019).

Stakeholder viewpoints offer insights to government decision-makers and public and private housing companies to better understand the key features and benefits of SAH. It also provides an important up-front understanding of various parties with whom engagement will need to be undertaken to improve uptake and adoption of liveability and accessibility in urban housing precincts. Medium to high density SAH must have purposefully integrated liveability and accessibility elements to maximise benefits of investment and minimise future risks to communities.

The resultant Liveability Framework and Guidelines ([Figure 4](#) and [Appendix 2](#)) target the delivery of social and affordable higher density urban housing and precincts, responsive to both person and place. The Liveability Framework integrates three key domains: (1) quality of life (i.e. liveability – place based and community focussed; accessibility – person centred, and community focussed); (2) the external environment (i.e. social, environmental, and economic value – building on value equation); and (3) the enabling environment (i.e. improving adoption, regulatory and policy environment).

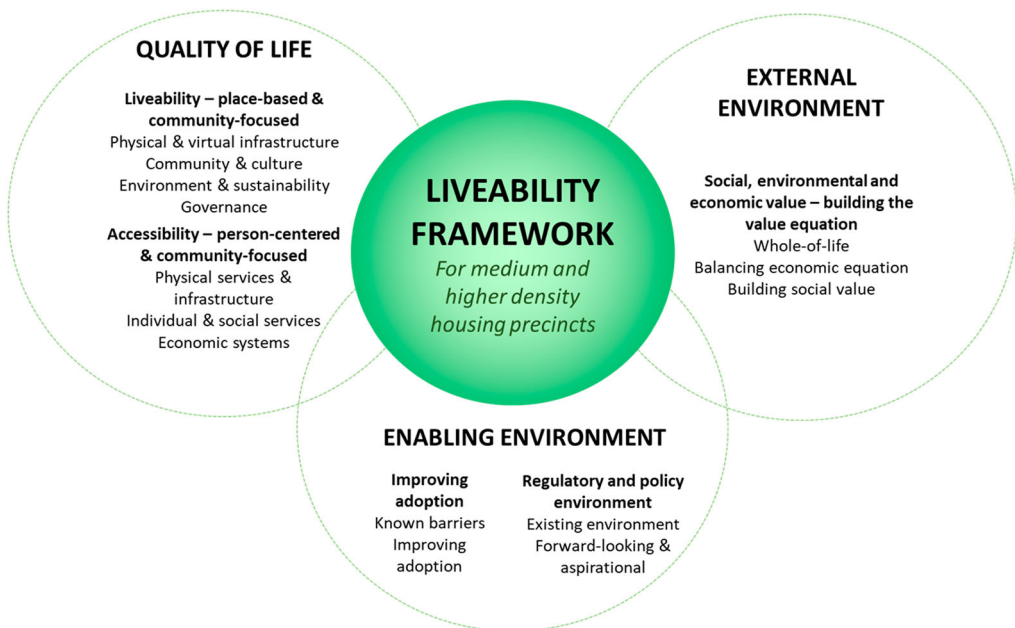


Figure 4. The Liveability Framework for Social and Affordable Higher Density Housing.

5. Conclusions and Future Outlook

Through this case study and the development of the Liveability Framework, the authors contribute to the body of knowledge on liveable and accessible SAH. The research also contributes to practice with the Liveability Framework presenting a suite of essential elements to consider in designing and delivering social and affordable higher density housing. The findings 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 Liveability Framework includes a range of sub-elements and guidelines, across the 5 main elements of liveability, accessibility, value equation, regulatory and policy environment, and adoption and overcoming barriers (see Appendix 2). The findings also highlighted the complexity of the SAH system so that policy and strategic settings can be better addressed by those in the public, private and not-for-profit sector designing and delivering SAH.

Understanding the inter-relatedness of various elements of housing provision in a person-centred, place-based policy environment has also been further advanced through stakeholder insights. This research is intended to guide practitioners and decision makers, and the SAH sector generally, and support decision-making around the design and development of more effective social and affordable higher density housing. It is intended that outputs be modified by users, for example, early in the project development, to communicate intent to a design team, or as a completed project appraisal tool to close the loop on project-based learnings. Thus, not all of the five elements may be relevant for the specific project at a point in time, with relevance to be identified, for example by the project team or client. Organisations are encouraged to take this framework and make it their own through aligning it with their internal systems and processes.

This exploratory study has implications for academics and industry practitioners working in the SAH sector, as well as urban policy and urban research. The development of the framework assists urban policy makers in a comprehensive list of factors that influence the development of liveable and accessible SAH in high density precincts. Clear knowledge of this will influence policy makers and the building codes around building design. In addition, this is integral for the creation of liveable and accessible medium to high density SAH precincts and homes in urban areas that are struggling to keep up with demand and supply.

The study also highlights opportunities for further research to address clear research gaps. For example, further testing and refinement of the Liveability Framework across multiple case study sites is required. The framework would also benefit from research to understand the practical challenges and barriers of implementation within private, public and not-for-profit sectors. The inter-relationships, antecedents and links between different elements within the Liveability Framework also need further research and modelling. Finally, the Liveability Framework is but one tool that organisations can utilise in driving or enabling future investment in SAH. Questions arise as to why accessibility is not regulated or incorporated into SAH when so many of our most vulnerable citizens require it.

The authors acknowledge the limitations related to the lack of consumer/tenant voice in the paper and propose future research to specifically focus on consumer perspectives. Furthermore, if liveability is desired by tenants and considered best practice why is value and costs constantly used to overcome liveability provisions. There is a critical need for a targeted approach to enable purposeful investment in SAH to measure co-benefits across the various elements, rather than focussing on the cost of provision.

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Appendix

1. Interview guide

Liveability

1. Describe your understanding of the key *liveability* features of this precinct. This might be in relation to: domestic comfort and health; access to open space; access to social, physical and virtual infrastructure; and access to identified communal areas or community resources.
2. What are your key sources of information and knowledge regarding liveability elements of buildings and precincts (e.g. with whom do you consult, primary on-line sources, industry associations and peak bodies)?

Accessibility

3. Describe your understanding of the key *accessibility* features of this precinct relating to: domestic comfort and health; access to open space; access to social, physical and virtual infrastructure; and access to identified communal areas or community resources.
4. What are your key sources of information and knowledge regarding accessibility elements of buildings and precincts (e.g. with whom do you consult, primary on-line sources, industry associations and peak bodies)?

Value Equation / Cost Benefit

5. How did or would you balance the upfront costs of incorporating *liveability* features with long term benefits. Consider physical, social/community, and technological features/benefits. For example, garden spaces and external shading with ongoing maintenance costs (physical and social), or increased insulation levels, solar water/photo voltaic provision with energy costs (technological).
6. How did or would you balance the initial costs of *accessibility* features incorporated in this building/precinct with long term benefits. Consider physical, social/community, and technological features/benefits. For example, wider internal doors and corridors and an accessible toilet or bathroom (physical), a concierge and on-site support services (social and community), and wayfinding such as indoor positioning systems (technology).
7. What features do you consider a priority for both liveability and accessibility?

Regulatory and Policy Environment

8. What issues relating to the regulatory environment (national, state and/or local) impact upon your decision-making with regards to creating liveable and accessible homes and precincts such as Green Square Close. Consider this in terms of policy, design, management and maintenance.
9. What issues and/or features do you consider should be prioritised from a regulatory point of view?

Adoption and overcoming barriers

10. What do you see as the major barriers in terms of *liveability* in Green Square Close and the adjacent precinct? For example, in terms of community spaces, engagement within the building and precinct.
11. What do you see as the major barriers in terms of *accessibility* in Green Square Close and the adjacent precinct? For example, in terms of internal access, and access to community spaces in both the building and precinct, including active and public transport options.
12. How has Green Square Close functioned in the current COVID 19 environment? For example, consider this in terms of space planning performance for community spaces; the ability to engage visually/verbally despite social distancing measures; which spaces or spatial relationships of the precinct proved to be more successful than others.
13. What recommendations do you have to improve the building/precinct design to better address an isolation/lock down environment?

2. Liveability framework for social and affordable housing

Liveability: place-based and community-focused		
Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Physical and virtual infrastructure	Physical connectedness to social infrastructure	Prioritise appropriate site selection. Connection for informal and formal opportunities (e.g. meeting places, green space, active recreation). Onsite community spaces (each level and whole building) are important [S12, S13]
	Virtual connectedness	Wi-Fi considered an essential service [S10]
	Asset maintenance	Low maintenance for physical durability, yet resident-friendly materials and fixtures. Minimise disruption to residents of maintenance works through building design. Cost-effective consumables (e.g. light bulbs).
	Healthy by design	Connection to active and passive exercise options – walkways, bike ways, public pools. Design to allow for social distancing without undue isolation. Healthier environment, healthy people and takes burden off the system over time. [S18, S19, S112]
	Safety by design/safety awareness (addressing anti-social behaviours)	Screen entry doors to enable ventilation, security and connection. Safe environment (e.g. sight lines, no dead ends, no traps – especially external fire stairs – and no blind corners). Controlled access to building and floor. Community engagement and buy-in. Onsite management. Build relationships and engagement with local police. Minimise possible impacts via design. Follow Crime Prevention through Environmental Design Guidelines (e.g. those developed for Queensland). ¹ [S7, S10]
Community and culture	Futureproofing	Access to passive ventilation and natural lighting. Sell affordable living, not just affordable housing. Ability to modify for unknown future needs [S111]
	Integrated and inclusive place-based planning	Resident and community engagement and buy-in. Prioritise appropriate site selection [S112].

(Continued)

Continued.

Liveability: place-based and community-focused		
Environment and sustainability	Community, character and culture	Use of design to create places/spaces which enable resident engagement (e.g. planting). Create desirable spaces and places. Economic diversity is important in spatial planning of larger precincts.
	Community and social wellbeing	Opportunities for informal interaction, and protection from unwanted interaction. Designing for privacy. Community and social support opportunities in building. Onsite building management and support.
	Community in mixed tenure environments	Further research needed. Critical to not create class structure (e.g. in entry and onsite facilities).
	Social connectedness	Community spaces for resident-led activities. Precinct-based spaces are important (e.g. access to youth space, libraries) [S13]
	Carbon neutral-positive approach	Passive design, appropriate orientation and access to natural daylight. Ready access to public and active transport options. Issue with solar and becoming an energy provider.
	Climate resilience	Moderate building and precinct microclimate (e.g. irregular design enabling shade). Access to fresh air, open spaces, ventilation and sunlight. Choice between active and passive systems. Brisbane City Council's Buildings that Breathe initiative captures key issues. ²
Governance	Connectivity to nature-loving and biodiverse spaces	Immediate access to resident-based planting/gardening options; internal planting options (e.g. balconies, internal green streets). Precinct access to biodiverse green space. [S12]
	Addressing overcrowding	Building owners/managers to align resident needs to homes offered.
	Equality and equity	Critical in a mixed-tenure environment – further research needed. "The means by which people use the building should be the same ... if it cannot be identical the several means provided must be equivalent in terms of their privacy, security, safety and convenience." ³
	Pandemic responsiveness	Circulation to enable social distancing. Access to green space from a unit/in building. Access to Wi-Fi. Enable safe social connection. Touch-free entry. Role of onsite manager is important. Inner-city precincts challenged by COVID-19 in terms of loss of workers/economic activity. [S12]
	Collaboration	Onsite managers and service providers. Build relationships with neighbours and community. Provide easy access for service and social support providers (e.g. OZHarvest, BlueCare, Second Chance). [S17]
	Cohort-appropriate environment/ community	Match resident needs with locations. Maintain diversity [S112]
Accessibility: person-centred and community-focused		
Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Physical services and infrastructure	Whole-of-life accessibility	More consumer education around NDIS and SDA. Clear and obvious entry points and equitable access. Vehicle access/parking/drop-off and collection points essential for support services, maintenance people and visitors. Dual lifts (minimum) required, with no step-ups. Accessibility to become part of the commercial cost model. [S18-9]
	Precinct safety	Consider for both day and night. See CPTED guidelines. Swipe-card entry to resident level. Build relationship with police. [S17]
	Precinct accessibility	Accessible ground plane (e.g. level thresholds, compliant ramps, extended ends of balustrades and wayfinding elements). Choice of site and traffic planning to enable accessibility. Access to public, active and passive transport options. Going beyond the wheelchair is important (e.g. consider hearing and vision impaired) [S12, S17]
	Integrated service provision	Onsite housing and support services management. Integrate with onsite providers (e.g. OZHarvest, BlueCare).

(Continued)

Continued.

Accessibility: person-centred and community-focused		
Individual and social services	Access to vital services	Include food outlets and supermarkets, onsite and offsite community, social and health support services, wi-fi [S14, S17, S18, S19]
	Walkability	Accessible footpaths including for motorised wheelchairs, walkie-wheelers, tactile markers and other wayfinding aids. [S14, S17, S18, S19]
	Universal design / equitable access	Improved housing options for those with disability, visitors and service providers, and for general population (e.g. short-term incapacity, child rearing, ageing in place). Clear, obvious and equitable access – beyond wheelchair is important (e.g. to include hearing, sight loss, dementia).
	Visitability	Vehicle access/parking/drop-off and collection points essential for support services, maintenance people and visitors. [S14, S17, S18, S19]
	Simple, intuitive and perceptible elements	“Make it easy for everyone to understand the purpose of each design feature and how to use it ... means of use should be intuitively obvious”. ⁴
	Local shared mobility	Access to public, passive and active options (e.g. bikes and hire scooters limited by need for smartphone app).
Economic systems	Tracking accessible housing in marketplace	Up-to-date online data, especially for specialist disability accommodation, needs improvement. Need a specific element of the market that captures accessible housing. Targeted approach for advertising required. Increased demand for accessible housing will lead to improved ROI.
	Accessibility to employment	Diversity of employment in proximity, enabling residents to commute to work easily. Access via public transport is critical. Transit time to employment/childcare/schools is important. Work from home options increase participation. [S12, S16, S18, S19]
	Spaces for learning and working	Work/study from home options to be facilitated to improve engagement (issues around lighting, noise and wi-fi need to be considered). [S14]

Social, environmental, and economic value – building the value equation

Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Whole-of-life	Whole-of-life accessibility	Increased demand for accessible housing can improve ROI and drive down costs. Accessibility features need to be integrated in the design phase to maximise cost-effectiveness. Adaptive design can assist where accessible design is not considered viable/desirable. Good management is integral to financial success [S12].
	Balancing upfront costs with long-term benefits	Cost-benefit analysis is difficult on a discrete, small-scale pieces of infrastructure that will provide benefit over 30 years. Composite ROI approach required. Government incentives needed to convert assets to accessible housing and demonstrate long-term opportunities and benefits. [S12]
	Property diversity	Mixed-tenure, mixed-use development, as partnership among government, not-for-profits and private sector provides opportunities to increase supply of SAH. Investment framework required. Need to ensure viability of mixed-use option. Examine different housing options within medium- to high-density precincts. Diversity of choice for residents essential (e.g. location to match needs). Adding social diversity to local communities can improve system value and performance. [S12]
	Asset maintenance	Cost-effective, robust and people-friendly materials, fixtures and fittings for physical durability and low maintenance. Maintenance with minimal disruption to residents.
Balancing economic equation	Value capture	Unlock underutilised government land for SAH outcomes. Careful capitalisation of investment during the planning/design essential. Revenue-generating models of the investment can help with opportunities. Planning relaxation for private investors incorporating SAH important. [S18, S19, S112]

(Continued)

Continued.

Social, environmental, and economic value – building the value equation		
Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Building social value	Property affordability	Need for a targeted investment framework enabling both private and government investment. Funding mix is important to ensure long-term viability. Construction techniques, materials and fixture selections are important [S17]
	Composite ROI	Includes social return, wellbeing valuation, rich narratives and value of equity to society and Gross Domestic Product. Research and operationalisation required to build on conceptual framework from previous research.
	Economic stimuli for local community	Creating people-oriented local environments to enhance social diversity and housing is important, including community spaces and cafes. Role for mixed-use and mixed tenure [S112].
	Improving social and economic participation – creating demand	Need to take account of the social benefit of economic participation and people being able to work/study from home. Build partnerships to facilitate. Social service provision aids in increasing liveability in these precincts.
Regulatory and policy environment		
Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Existing environment	National regulatory and policy issues	Clarify NDIS and SDA in terms of investment in appropriate independent living options. Adoption of innovation, environmental impact reduction strategies can generate a point of difference in the market. Impact of upfront costs needs addressing. See Australian Building Codes Board for further details. ⁵ Performance guidelines rather than mandatory prescriptions can improve behaviour and lifestyle.
	State regulatory and policy issues	Role of states/territories vary across Australia. Liveability outcomes negotiated on a case-by-case basis – successful innovation needs embedding.
Forward- looking / aspirational	Local regulatory and policy issues	Greater local government involvement is desirable. Not-for-profit organisations would benefit from council engagement, as they work to improve outcomes.
	Managing jurisdictional conflicts	Address conflicts between state development codes and local government planning requirements. Operationalise synergies between the local level and federal funding [S111, S112].
	Enabling diversity of outcomes	More clarity around NDIS SDA, with investment linked with independent living options. Take advantage of mixed-tenure opportunities. Whole-of-life business cases [S112]
	Evidence for continuous improvement	Embed successful innovative outcomes into regulations. Integrate results of resident surveys.[S111]
Adoption improvement		
Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Known barriers	Barriers to uptake of liveability features	Not being part of mixed-tenure and commercial centre opportunities. Need to negotiate on a one-off basis for liveability outcomes (e.g. fire compliance, opening windows). Issues of vitality if commercial spaces not leased [S12]
	Barriers to uptake of accessibility features	Residents do not want to live in a home that looks like a hospital. People do not want regulatory authority dictating what their home looks like.
	Economic barriers	Delivering accessibility in terms of a broader issue of liveability (e.g. common outdoor spaces and lifts). Willingness to pay upfront costs for long-term benefit [S12, S17]
	Attitudinal and behavioural barriers	Ageing and disability is not aspirational. People not willing to pay upfront for intangible benefits in terms of liveability and sustainability [S18, S19, S110]
Improving adoption	Adoption levers and market uptake	Nationwide, long-term, cross-sectoral approach to implementing change [S11, S14].
	Building mixed-tenure environments	Decision-making tool required. Research into maximising benefits and minimising risks (social and financial) required [S112]

Note: the relevant participant codes [S1–S12] are used to indicate the stakeholder interview findings.