Creating Liveable and Accessible Social and Affordable Higher Density Housing: the case of Green Square, Brisbane

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Abstract. Ensuring 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 investigates and develops our understanding of liveable and accessible social and affordable housing, with a focus on medium- and high-density urban precincts. The paper presents the findings of a Queensland, Australia case study undertaken in the Green Square Close precinct in Fortitude Valley, Brisbane. The findings of this research are derived from a literature review and a series of in-depth interviews with key stakeholders from the housing industry and government. The results inform the creation of a liveability framework for social and affordable medium to high density housing utilising five key elements. These elements include; 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 liveability framework also establishes a range of sub-elements across these five elements to improve understanding of whole of life needs. The development of a liveability framework for social and affordable medium and high-density housing presents opportunities for decision making in the co-creation of, and investment in this critically needed housing.

1. Introduction

The shortage of accessible residential housing in Australia has significant implications for the 4.4 million Australians living with disability, older Australians and their carers and families [1, p.1]. There are urgent calls for more liveable and accessible medium- to high-density urban housing and precincts to minimise future risks to the broader community [2].

This research aims to evaluate key elements of social and affordable higher density housing, with a focus on liveability and accessibility outcomes. The research question addresses how to improve pathways for the adoption of these outcomes through: (i) clarifying the value equation (both tangible and intangible) to enable delivery of whole-of-life solutions; and (ii) building community acceptance of such investment in affordable homes and urban precincts. Early research informed the selection of the five elements of the liveability framework: 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. These elements were established through a comprehensive literature review conducted by the research team [3]. Each of these includes several sub-elements.

The findings of this research are derived from a comprehensive literature review and complementary case study supported by a series of in-depth interviews with key stakeholders from the housing industry and government. These research methods helped form the basis of a liveability framework for social and affordable medium to high density housing utilising five key elements. The Australian case study was undertaken in the Green Square Close precinct in Fortitude Valley, Brisbane, Queensland. Green Square Close, including 5 Green Square Close was developed and managed by Brisbane Housing Company. The focus of the research was on the larger precinct interaction, in addition to a sole focus on the housing itself. Through this case study and the development of the Liveability Framework, the authors contribute to the body of knowledge and practice which highlights the key elements of social and affordable higher density housing. The findings can also 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

An extensive review of academic and industry literature on social and affordable housing was undertaken in 2020. Reflecting on the history of inclusive housing policies, and worthy of highlight in this paper, were influential changes that emerged in 1960s and 1970s housing policies in Nordic countries. These policies began to better integrate people with disabilities into 'ordinary environments' [4]. The changing Nordic policies was the result of advocates for people with disabilities arguing for inclusive and equal treatment, as a part of the move away from institutional care [4]. 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 sought to achieve nation-wide universal design and increase accessibility by 2020 [5]. Legislative, market and administrative powers continue being implemented to achieve this outcome, illustrating a nation-wide, long-term, integrated, cross-sectoral approach to overcoming some of the persistent barriers highlighted in this literature review. This comprehensive approach has targeted four areas: building and construction; planning and outdoor areas; transport; and sector-overarching reforms. The positive impacts of this focussed effort, suggesting that 'universal design is included in 63 laws and regulations and practice in several sectors of society' further highlights that the 'theoretical concept of universal design has been tested extensively in real-life environments', with both community and industry 2018 survey data finding showing greater community and industry acceptance of universal and sustainable design [6].

Considering the global precedents and barriers to the integration of liveability and accessibility into housing markets, the authors focussed their research towards creating a more holistic approach with greater community benefits. Addressing the research gap with an integrated approach which incorporates liveability and accessibility, this study develops a holistic liveability framework for medium- and high-density urban precincts. It draws heavily on case study evidence demonstrating 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 1 synthesizes some of the key literature which has informed these five elements.

Table 1: Summary of key literature relevant to the elements of the liveability framework

Item	Elements	Key literature
1.0	Liveability – place-based & community-focused	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' [7].
2.0	Accessibility – person-centred & community-focussed	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". QDN 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; 6. deliver innovative solutions that lead to greater home ownership; 7. plan and build inclusive residential neighborhoods; 8. provide

		priority pathways out of congregate care arrangements; 9. take a national approach to home modifications and assistive technology; 10. deliver housing advocacy services which have a dedicated focus on people with disability; 11. implement specific strategies that address the needs of rural and remote Queenslanders, including people from Aboriginal and Torres Strait Islander backgrounds [8, P. 7].
3.0	Social, environmental and economic value – building the value equation	Design for dignity [9]; Universal design New York and Universal design New York 2 [10, 11]; Submissions to the Australian Building Codes Board Options Paper [12].
4.0	Regulatory and policy environment	From consumer perspective not enough education about what NDIS is all means. 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. Key documents include: Queensland Housing Strategy 2017-2027; Social Housing Design Guide to Design Standards for Social Housing. (under review); Housing Matters - A Companion discussion paper on social housing design; Person-centred Post-occupancy Evaluations; Housing principles for inclusive communities; Healthy Places, Healthy People; Health and Wellbeing Strategic Framework 2017 to 2026. [13]; and Healthy and Active Communities: walkable neighbourhoods.
5.0	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 [14]. Needs to be considered across technical, social and regulatory barriers, using legislative, market and administrative powers [4, 5]. 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 whole of life needs, best practice examples and pilot projects; build market share to enable greater product availability; innovation in design and construct solutions, best practice examples and pilot projects [14].

Barriers to the uptake of liveability and accessibility features into 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 [15, 16]. Häkkinen and Belloni note that 'hindrances can be reduced by learning what kind of decision-making phases, new tasks, actors, roles and ways of networking are needed'[16]. The cost burden and impact of integrating sustainable design features into homes has been a long-term challenge, and like that around the uptake of accessibility features in homes and precincts, often focuses on up-front versus whole-of-life costs. It was also clear that building high-density housing without considering liveability of both the home and the surrounding community, is no longer viable. Through this literature review, it was evident there remains a lack of knowledge of a holistic and integrated need in delivering affordable and social housing in higher-density urban precincts. Therefore, outcomes from this research further develop our understanding of liveable and affordable higher density housing precincts. Based on the literature review analysis, a preliminary framework was developed and validated through the interviews described in the following section.

3. Research Methodology
The research method adopted for this case study is based on describing and then analysing the scenario in order to develop and validate the framework, rather than producing replicable findings. This is primarily due to resource and time constraints, and also acknowledges the validity of description and narrative in informing policy development. The research design also reflected the industry-led focus of this research. The study includes the following stages: 1) build on the findings of the review of literature including the draft framework; 2) case study precinct selection in conjunction with core project partners; 3) case study investigation including semi-formal stakeholder interviews; and 4) refining the framework. The case study was selected based on a number of characteristics including existing development, active and passive transports options, other mixed-use, suitable scale, links to partners to assist with investigation and interviews, and links to social and support service.

3.1. Case profile

The property at 5 Green Square Close provides affordable housing for 80 households and is a Brisbane Housing Company (BHCL) designed, developed and managed residential development. It was opened in 2010 as part of a Brisbane City Council (BCC) led development. The larger precinct includes government and commercial offices, social support services and ground level retail outlets. It is immediately adjacent to a Queensland government declared Priority Development Area. Fortitude Valley, and the adjacent Bowen Hills precinct has undergone significant urban renewal and redevelopment over the last decade, of which this precinct is considered a primary catalyst. Green Square Close is one of BHCL's 1,700 wholly owned affordable housing properties. Since incorporation in 2002, and a registered Tier 1 Community Housing Provider (CHP), BHCL has earned a reputation as a solid and reliable organisation, built through effective working relationships and a personalised approach to customer service.

3.2. Data collection

Semi-structured interviews were undertaken with twelve representatives [coded as SI1-SI12] of several network groups (State government, community housing providers, advocates, industry associations and not-for-profit providers). This was done to test and develop the draft liveability framework by considering features of an existing urban housing precinct. The interview question guide was developed to help the research team inform and test the draft liveability framework. Different priorities were placed for particular questions by the interviewer based upon the specific role of the interviewee. The five themes link to the major elements of the draft liveability framework initially developed by the research team derived from the review of the literature. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee (GU ref no: 2020/246).

3.3. Data analysis

The interviews were conducted via Microsoft Teams and digitally recorded. Data reduction methods were used to analyse the information [17]. A thematic analysis method was applied to identify emerging themes [18] with a combination of inductive and deductive reasoning approaches employed [18]. 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. A 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 findings of the case study are derived from the semi-structured interviews conducted with key stakeholders. The five elements from the liveability framework were used to guide the thematic analyses: 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

Given that social and affordable housing is critical to maximise investment and minimise future risks to our community, all interviewed stakeholders expressed a common appreciation towards the liveability of housing. Liveability in the context of this research considers both place-based liveability and person-centred accessibility. Stakeholder insights on liveability features were examined under the key elements of integrated and inclusive place-based planning, connectivity to nature-loving,

biodiverse, and ventilated spaces, safety (design and awareness), connectedness (natural, social, physical, and virtual), community and social wellbeing and continuous improvement. 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) which influences the social wellbeing of residents.

4.2. Accessibility – person-centred and community-focused

All interviewees acknowledged that accessibility is a critical characteristic for social and affordable housing to achieve inclusive outcomes. 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'[19]. Accessibility in the context of this study was considered across a range of life needs, including providing for those with temporary or permanent disabilities, the 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. The case study showed evidence of purposefully designed assets to support walkability enabling easy access to employment and amenities with a specific focus on equitable access for disabled residents.

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

Several interview participants highlighted the importance of balancing the upfront costs of incorporating liveability features to create healthy, place-based environments for residents. 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. 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 achieve intended outcomes. One participant highlighted how challenging it is to demonstrate value creation in non-for-profit organisations. While it was clear that there will be different value equations for different types of projects, the kind of value to be derived will vary significantly between different stakeholder groups.

4.4. Regulatory and policy environment

With escalating housing prices and economic uncertainty, many Australians are at their financial limit with COVID exacerbating housing challenges for individuals and families (NHFIC 2021). This continuing demand is placing significant pressure on the government and private housing organisations to supply more social and affordable housing solutions. Across the interviewed stakeholders, there was consensus on the need for state government commitment to the provision of affordable housing. This theme includes sub-elements relating to regulatory and policy issues, whole of life business case and key priority areas. 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 code if the government and private housing organisations are to achieve inclusive outcomes.

4.5. Improving adoption

Stakeholder 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. A range of barriers related to mixed tenure, financial, regulatory, limited evidence, and the accessibility were identified. This includes 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. Among several approaches for overcoming barriers, economy of scale in planning and procurement strategies was highlighted as a key lever.

This in-depth exploration of key stakeholder viewpoints offers rich insights to government decision-makers and public and private housing companies to better understand the key features and benefits of social and affordable housing. 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.

4.6. Emergent liveability framework
The resultant Liveability Framework and Guidelines (Figure 1 and Tables 2-6) target the delivery of social and affordable higher density urban housing and precincts, responsive to both person and place.
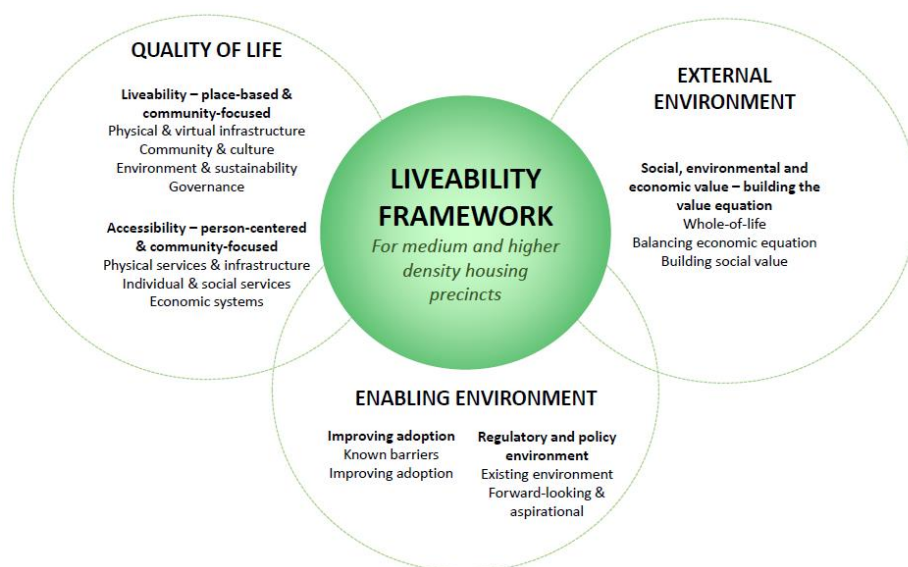

Figure 1: The Liveability Framework for Social and Affordable Higher Density Housing

The framework integrates findings from a review of government, academic and industry literature and a case study including 12 interviews from key sector stakeholders in Queensland. The following tables synthesize key findings. They include relevant interview participant codes to indicate the stakeholder contribution to the liveability and accessibility elements.

Table 2: The detailed elements of the liveability framework elicited from the literature review and case study (interview) findings

* the relevant participant codes [P1-P12] are used to indicate the stakeholder interview findings

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 [SI2, SI3]
	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. [SI8, SI9, SI12]
	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)[20] [S7, S10]
	Futureproofing	Access to passive ventilation and natural lighting. Sell affordable living, not just affordable housing. Ability to modify for unknown future needs [SI11]
Community and culture	Integrated and inclusive place-based planning	Resident and community engagement and buy-in. Prioritise appropriate site selection [SI12].
	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) [SI3]
Environment and sustainability	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.[21]
	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.[SI2]
Governance	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." [10]
	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. [SI12]
	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). [SI7]
	Cohort-appropriate environment/community	Match resident needs with locations. Maintain diversity [SI12]

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. [SI8-9]
	Precinct safety	Consider for both day and night. See CPTED guidelines. Swipe-card entry to resident level. Build relationship with police. [SI7]
	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) [SI2, SI7]
	Integrated service provision	Onsite housing and support services management. Integrate with offsite providers (e.g., OZHarvest, BlueCare).
	Access to vital services	Include food outlets and supermarkets, onsite and offsite community, social and health support services, wi-fi[SI4, SI7,SI8, SI9]
Individual and social services	Walkability	Accessible footpaths including for motorised wheelchairs, walkie-wheelers, tactile markers and other wayfinding aids. [SI4, SI7,SI8, SI9]

	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. [SI4, SI7,SI8, SI9]
	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".[10]
	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. [SI2, SI6, SI8, SI9]
	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).[SI4]

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 [SI12].
	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.[SI12]
	Property diversity	Mixed-tenure, mixed-use development, as partnership among government, not-for-profits and private sector provides opportunities to increase supply of social and affordable housing. 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.[SI12]
	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 social and affordable housing 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 social and affordable housing important. [SI8,SI9,SI12]
	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 [SI7]
	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 SBEnrc research.
Building social value	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 [SI12].
	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.[1] 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.
	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.

Main elements	Sub-elements	Details elicited from literature and stakeholder interviews
Forward- looking / aspirational	Managing jurisdictional conflicts	Address conflicts between state development codes and local government planning requirements. Operationalise synergies between the local level and federal funding [SI11, SI12].
	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 [SI12]
	Evidence for continuous improvement	Embed successful innovative outcomes into regulations. Integrate results of resident surveys[SI11]
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 [SI2]
	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 [SI2, SI7]
	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 [SI8, SI9, SI10]
Improving adoption	Adoption levers and market uptake	Nationwide, long-term, cross-sectoral approach to implementing change [SI1, SI4].
	Building mixed-tenure environments	Decision-making tool required. Research into maximising benefits and minimising risks (social and financial) required [SI12]

5. Conclusions and Further Research

This case study developed and validated the Liveability Framework for Medium to High Density Social and Affordable Housing including a set of innovative, value focussed elements and sub-elements. The framework will help drive adoption of better outcomes and promote community acceptance of delivering whole-life-solutions. The framework includes a range of sub-elements and guidelines, across the 5 main elements and forms the basis of a checklist which will accompany the final research documentation available at the project website. It is intended that both 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 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.

The findings highlighted the complexity of the social and affordable housing system so that policy and strategic settings can be better addressed by both practitioners and government decision makers. 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. The findings of this research are intended to guide practitioners and decision makers, and the social and affordable housing sector generally to support decision-making around the design and development of more effective social and affordable higher density housing.

The research team also identified that there is a critical need for a targeted approach to enable purposeful investment in social and affordable housing to measure co-benefits across the various elements, rather than focussing on the cost of provision. This is now the basis for further investigation as a part of an ongoing research agenda focussed on liveability and accessibility in medium- to high-density affordable and social housing.

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Acknowledgments