Geelong Microvillage Project:
Viability of Affordable Compact Homes for People Seeking Sustainable and Socially Connected Lives
We wish to acknowledge the Wadawurrung people of the Kulin nations, the traditional owners of the land on which this research was conducted.

We pay our respects to their Country, and to their Elders: past, present, and future.

Deakin University CRICOS Provider Code: 00113B
## Contributing Researchers

<table>
<thead>
<tr>
<th>Name and Role</th>
<th>Deakin University Faculty/School</th>
</tr>
</thead>
</table>
| Professor Richard Tucker  
(Joint Project Leader) | Architecture and Built Environment             |
| Dr Fiona Andrews  
(Joint Project Leader) | Health and Social Development                   |
| Honorary Professor Louise Johnson  
(Humanities Team Leader) | Humanities and Social Sciences                  |
| Dr Nicole Johnston  
(Business Team Leader) | Business                                          |
| Professor Steve Allender  
(Systems Thinking Team Leader) | Health and Social Development                   |
| Associate Professor Adrian Lee | Business                                          |
| Dr Josh Hayward  
(Systems Thinking Facilitator) | Health and Social Development                   |
| Honorary Professor Ursula de Jong | Architecture and Built Environment             |
| Professor of Practice Fabienne Michaux | Business                                          |
| Dr Elyse Warner | Health and Social Development                   |
| Lauren Chambers  
(Student Contributor) | Health and Social Development                   |
| Anahita Sal Moslehian  
(Student Contributor) | Architecture and Built Environment             |
| Aremel Tibayan  
(Student Contributor) | Architecture and Built Environment             |

Cover image: Prefab 21, winning student design project by Andrew Galea

First and foremost, the research team wishes to thank all the participants who contributed to the knowledge created during this study. We acknowledge their work and thank them all for their invaluable insights, expertise, and passion for change.

Through regular meetings with the project team, a Taskforce of community stakeholders provided crucial direction and advice to guide this research project. Led by two members of Geelong Sustainability, Vicki Perrett (President) and Peter Clapinski, the Microvillage Geelong Taskforce contributed expertise, experience, and insights that were integral to the research.

We would also like to acknowledge the support of the two organisations that provided funds for this research via competitive grants programs: the Geelong Community Foundation, and the Lord Mayor’s Charitable Foundation.
## CONTENTS

**EXECUTIVE SUMMARY**

**Page i**

Project Overview  
Scope and Terminology  
Methodology  
Findings  
Outcomes  
Conclusion

**RECOMMENDATIONS**

**Page viii**

Co-Design Exemplar Projects  
Educate Stakeholders to Change Negative Perceptions  
Planning Reform  
Assess Current Demand  
Promote Benefits, Reduce Costs, Remove Barriers, Increase Access  
What’s Next?

**INTRODUCTION**

**Page 1**

Background  
Project Aims and Objectives  
Research Team  
Project Scope  
Report Structure

**PART ONE**

**Page 6**

**EVIDENCE REVIEWS**

Detailed List of Contents  
The Tiny House Movement: An Overview  
Building Regulatory Context  
Planning Regulatory Context  
Financial Context  
Community Integration Context

**PART TWO**

**Page 61**

**ANALYSIS: GEOGRAPHICAL CONTEXT**

Detailed List of Contents  
Geelong: Census Data 2016  
Income and Housing Costs in Australia 2020  
Inequality in Australia 2020

**PART THREE**

**Page 75**

**METHOD: COMMUNITY ENGAGEMENT RESEARCH**

Detailed List of Contents  
Research Methodology  
Analytical Framework

**PART FOUR**

**Page 91**

**FINDINGS: COMMUNITY ENGAGEMENT RESEARCH**

Detailed List of Contents  
Focus Groups  
Interviews  
STICKE Workshops

**PART FIVE**

**Page 132**

**DISCUSSION AND CONCLUSION**

Detailed List of Contents  
Recap  
Synthesis of Findings  
Recommendations (full version)  
Study Challenges and Limitations  
Long-Term Evaluation  
Conclusion

**APPENDICES**

**Page 162**

Appendix A: Building Regulations Analysis  
Appendix B: Prefab 21 (Winning Student Design Project)  
Appendix C: Case Studies  
Appendix D: Cohousing as a Model for Social Health: A Scoping Review  
Appendix E: Leverage Points Analysis  
Appendix F: Excel Workbook Calculator (Cost Comparison Scenarios)
EXECUTIVE SUMMARY

Project Overview

The Microvillage Project explores the viability of increasing the supply of affordable, small houses. It focuses on people with limited funds who want to live in homes that minimise consumption of building materials, land, and energy, and which integrate and link with the community in meaningful ways.

Our study context is the growing public interest in “tiny homes”, with increased marketing, media coverage, and availability of this dwelling type. There has been a recent upswell in community groups and specialist businesses based around tiny homes, along with magazines, documentary films, and even a reality TV series dedicated to the topic. This publicity has prompted questions about whether tiny houses can offer a viable affordable housing model. The Microvillage Project seeks to address this question by investigating the viability of tiny dwellings in relation to four key issues:

1. Building and design
2. Regulatory planning barriers
3. Finance, and

The project seeks to construct an evidence base to inform the possible development of small home models. It comes at a time when both local councils and Victoria’s State Government are open to exploring innovative solutions to increase the supply of affordable housing, and a range of passionate stakeholders are eager to build.

This research project followed two lines of investigation. While separately funded, these two enquiries ran in parallel, with overlapping goals and outcomes:

- **Grey Nesters: Exploring the Viability of Affordable Small Houses for Those with Limited Funds and a Desire for Modestly Sized Homes.** Funded by the Lord Mayor’s Charitable Foundation, this research focused on the planning regulatory framework, financial modelling, viability, and design options for sustainability and ageing-in-place.

- **Homes for Grey Nesters: Social Integration of a Microvillage of Small Houses Supporting Community Wellbeing in Geelong.** Funded by the Geelong Community Foundation, this research looked at appropriate and effective ways to enable a microvillage to integrate and thrive within an existing community.

Our research found that it is difficult to untangle the range of issues and possible solutions associated with the design, building, financing, and community integration of innovative housing models. Thus, this report presents the combined findings from both enquiries.

For the duration of the project, the HOME Research Hub collaborated with the Microvillage Geelong Taskforce, a group of like-minded individuals supported by Geelong Sustainability, who provided insight and guidance throughout the process.

---

1 Including universal design (for ageing in place) and environmental performance.
Scope and Terminology

In this study we focus on Tiny Homes on Wheels (THOWs) and Tiny Homes on Foundations (THOFs). We consider housing models ranging from 20 sqm for THOWs, up to 48sqm for THOFs. In this report we use the term “small homes” to describe this full range of options (that is, from 20sqm to 48sqm). As the study progressed via stakeholder input, our focus shifted to a preferred model: clusters of stand-alone, permanent homes (THOFs) of 40sqm–48sqm. This latter size is the smallest area for a fixed foundation home designed according to universal design (UD) principles – that is, usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. For this preferred size range of THOFs (40sqm to 48sqm) we use the more accurate term “compact homes”. As a cluster of compact homes, the proposed microvillage falls under a housing type commonly referred to as Tiny Home Communities (THCs).

Methodology

At the heart of this research is a fundamental challenge: people’s housing needs are diverse, complex, and individual. This makes it difficult to address the lack of affordable housing models in a holistic way.

To address this complexity, we used a mixed methodology that prioritised meaningful community engagement with key informants in Victoria, particularly Geelong, to understand the issues they face. The project team conducted a series of focus groups and interviews with community stakeholders and experts in the fields of planning, finance, and design, along with interviews and workshops with potential residents. Our aim was to seed a “collective impact” approach (i.e., where stakeholders enable a shared vision to be developed and then addressed through collaborative strategies and approaches) for implementing any Recommendations arising from this study. To this end, we used a systems thinking tool called STICKE to run workshops with participants. Designed by Deakin University researchers in collaboration with the World Health Organisation, the Systems Thinking in Community Knowledge Exchange (STICKE) app facilitates community knowledge exchange to foster shared understandings of complex problems.

Using STICKE enabled us to engage a wide range of stakeholders across the housing sector and offered three key advantages: (1) directly sharing knowledge and experience between people with and without precarious housing security; (2) allowing diverse stakeholders to generate a mutually agreed plan of action; and (3) maximising the sustainability of change by providing opportunities for positive attitude shift towards innovative housing models that challenge sector norms.

Before commencing this primary data collection, we conducted an evidence review of the existing research literature pertaining to tiny homes (see Part 1 of this report). To generate our Recommendations, we synthesised the findings from our primary data collection (community engagement research) and our review of the academic research literature. This was a six-stage process:

**Stage 1:** Review the research on tiny homes. Our evidence review uncovered a limited pool of academic literature, with much of the recent work focused on lack of recognition of THOWs in local government planning schemes. Most research did not include formal empirical evaluation, so it largely lacks critical appraisal of the viability of tiny homes beyond meeting a niche demand. There are some research gaps, particularly around lack of viable finance, hostility from
neighbouring communities, environmental performance, reducing construction costs, and poor adaptability and accessibility for ageing in place.

**Stage 2:** Consult with community members and other stakeholders. Our focus groups and interviews with project Taskforce members and potential residents revealed two preferred models of tiny/compact home development (see Key Findings, below).

**Stage 3:** From two STICKE workshops, participants used systems thinking to generate a consolidated list of 21 actions to improve the supply of compact, affordable housing in the Geelong region.

**Stage 4:** In collaboration with the research team, workshop participants then ranked these 21 actions according to their predicted impact and feasibility. As a result, 12 were identified as “priority actions” (see Table 4.17).

**Stage 5:** These 12 priority actions were analysed using Meadows’ (1999) “leverage points” framework for systems analysis to establish the hierarchy and relationships between them.

**Stage 6:** Finally, the viability of the 12 priority actions was assessed by qualifying them against the findings of research Stages 1 and 2 (above).

**Key Findings**

Community stakeholders identified two preferred models for small-home developments. In both models, the notion of “tiny homes” was rejected as a long-term living option in favour of permanent “compact homes” on foundations of 40sqm to 48sqm. There was also a preference for a microvillage (i.e., a form of intentional community), made up of 8–30 compact homes, which fosters community integration via careful consideration for people (especially diversity of residents), place (with communal spaces for activities and shared resources), and processes that instil a sense of community and ensure the homes meet diverse needs.

- The clearly preferred development model was co-ownership with a community housing provider (CHP), which removes some of the financial and managerial burdens of ownership. The chief issue here is finding a community housing provider that is willing and able to co-fund a small microvillage development, especially in light of issues around this model’s financial feasibility, as highlighted in our financial analysis.

- The second preference was a residential park “ownership” model, whereby microvillage residents do not own the land. This model requires either a change in State law, similar to provisions in Queensland, or a local government willing to provide land with a 99-year lease.

The synthesis and validation process outlined above (under Methodology) informed five Recommendations to increase the supply of affordable, sustainable compact homes that foster residents’ sense of community and are well connected to local neighbourhoods.

Below we briefly summarise the key findings that informed our Recommendations. Findings are grouped under the four principal areas of enquiry: building and design, planning, financing, and community integration. Our study findings are synthesised in Part 5.2 of this report.
Building and Design

The narratives of “less is more” and “debt-free living” promoted by tiny house advocates contradict a dominant principle that underpins Australian housing norms: the need to prioritise investment return. Our workshop participants saw this opposition in both positive and negative terms: while tiny and compact homes could disrupt a market norm that equates size with quality, this disruptive potential may elicit resistance from the construction and housing finance sectors.

Participants from the financial sector suggested this resistance could be partially alleviated by shifting the common perception that compact homes are of lower quality than larger homes. The research literature also identifies significant cost barriers to improving the viability of financing small homes. Exemplar projects can help counter the widespread belief that tiny and compact homes have poor quality design and construction.

There is a need for further research and design work in three main areas: (1) explore and evaluate the design characteristics that help achieve a sense of community for villages of compact homes; (2) develop co-design processes that meet individual and community needs; and (3) address conspicuous knowledge gaps around tiny and compact houses, including: a rigorous empirical assessment of their environmental footprint; increase energy efficiency; construction innovation to improve Bushfire Attack Level (BAL); and reduce costs and improve performance via prefabrication and mass production.

Looking at comparative costs, a professionally built Tiny House on Wheels (THOW) can currently cost three times more per square metre than a standard house. Moreover, our financial modelling demonstrates that over 20 years, a 6-Star rated Tiny House on Foundations (THOF) measuring 40sqm or 48sqm currently costs over 50 percent more than owning a one-bedroom apartment in Geelong. This is principally due to high construction and financing costs. Owning a THOF, however, compares favourably to renting (see Tables 1.2, 1.3 and 1.4).

Planning

In view of the often-negative local responses to proposals for Tiny Home Communities (THCs), and the current lack of definitions around dwelling types, there is a need to revisit and reform planning frameworks. Planning nomenclature should be amended to included definitions of “tiny”, “small”, or “compact homes”, and “microvillages” or “THCs” made up of such homes. There is also a need to ease the prescriptive requirements around car parking, setbacks, and open space, and reconsider the scope of third party appeals. Popular acceptance could be increased if one locality – such as the City of Greater Geelong, as part of its Social Housing Policy – made land available for the construction of an exemplar microvillage that could be used as a model for other LGAs in Victoria.

Financing

On the face of it, microvillages of compact homes seem to represent a viable dwelling option for people on lower incomes due to their reduced size and perceived affordability. Smaller individual dwellings are theoretically cheaper to construct and have a smaller footprint than traditional houses. However, costs and barriers to entry can be higher than they appear on the surface: the costs of land, construction, site remediation, common services, and infrastructure must be funded. Meeting the needs of an ageing...
cohort by building to universal design and high energy standards increases the cost and reduces this perceived benefit.

Shared facilities bring economies of scale and may reduce overall space requirements, enabling more homes to be located on the same site. However, these facilities add extra costs, including ongoing maintenance, and are much less economically feasible in the context of smaller developments where extra costs are split between a small number of residents. Microvillage developments are also more likely to require governance structures (for example, strata), which impose additional costs. The non-standard nature of the dwellings also raises serious challenges for financing, particularly where residents are older people and/or people on low incomes.

The financing solutions we identify as applicable to a microvillage model rely mostly on private-sector solutions that require little to no government incentives, such as relaxing planning restrictions and using social impact developers. However, without additional government or philanthropic support, many of these options may not be viable in the proposed context – that is, low-density microvillages for older residents on low incomes.

**Community Integration**

Our research found that a co-designed exemplar project – involving potential residents and the existing community, supported by key stakeholders, such as local government – is essential to developing a successful community-integrated microvillage. Aligning with the findings of our evidence review, residents identified a set of design features that were key to supporting this community integration. These included a design that complements and provides good access to an existing neighbourhood, a balance of private and communal indoor and outdoor spaces, and communal space that allows connection with the existing community. While there was some flexibility amongst participants regarding the ideal size and layout of Tiny Home Communities (THCs), our evidence review (Part 1) suggests clusters of 20–30 units are optimal for supporting social connections.

Showcasing an exemplar model could provide a form of stakeholder-wide education, assisting community integration by breaking down resistance, stigmatisation, and/or stereotyping of present and future cohousing initiatives. More targeted education of local governments is also needed to reduce resistance to planning applications and increase support for any future microvillage model.

Finally, our research highlights the importance of people for the successful community integration of any future microvillage. Internal governance processes and key personal attributes of residents were identified as important factors here. Furthermore, while our informants had a strong interest in this model, an integrated community was seen as one that was open to a diverse group of residents. Thus, further research is required to explore the broader demand for compact homes, particularly among vulnerable groups who are not well served by existing housing options.

**Outcomes**

Along with our five Recommendations (see next section), this study has also led to other valuable outcomes. In bringing together novel research teams, the study has helped forge new collaborative structures and facilitated attitudinal transformation. Collaboration between HOME’s interdisciplinary
team, individual external stakeholders, and representatives from housing organisations has led to knowledge-sharing, knowledge creation, and new partnerships that promise sustained and fruitful collaboration beyond the lifespan of this study. Moreover, the HOME research team has evidenced its capacity to achieve the primary aim of interdisciplinary research: addressing complex problems in fundamentally new ways.

Over the course of the project, the HOME research team and stakeholder Taskforce directly informed the brief and outcomes of a Deakin University student competition to build and design a compact home. Prefab 21 (described in detail here) was a partnership between Deakin’s School of Architecture and Built Environment, HOME, FormFlow, and Samaritan House, a Geelong-based organisation providing crisis accommodation and support for men experiencing homelessness. The project focused on the design and fabrication of a prototype small house based on new construction technologies developed by FormFlow at Deakin Manu Futures. The Prefab 21 compact home was built and displayed as part of the Geelong Design Week. The overall project has received funding from the Victorian State Government to develop a microvillage of seven units for Samaritan House to provide transitional housing for men experiencing homelessness.

**Conclusion**

At a time when climate change requires us to significantly reduce our resource consumption, Australia is building the biggest houses in the world. The average new house built in 2019–2020 measured 235.8sqm, up 2.9 percent on the previous year, and the biggest increase in 11 years (James & Felsman, 2020). This expansion is occurring in tandem with widespread housing stress, with 11.5 percent of Australian households spending 30–50 percent of their gross income on housing costs, and another 5.5 percent spending 50 percent or more (ABS 2019).

This project sought to determine the viability of increasing the supply of affordable housing for people with limited funds and a desire to live in modest-sized homes that minimise consumption of building materials, land, and energy, and which integrate and link with the community in meaningful ways. The context for the study is the increasing marketing, availability, and media promotion of tiny homes which position them as a possible affordable housing solution for people with limited income and wealth.

Our findings show that tiny and compact homes are not currently a viable affordable housing option for people with limited funds who wish to live in sustainable and socially connected ways. We found that the viability of small-house models is being hindered by a range of barriers in four key areas: building and design (including universal design (for ageing in place) and environmental performance), regulatory planning barriers, finance, and community integration. The chief deterrent is regulatory barriers, particularly in the planning realm. As a recently published study explains, there is clear scope to “review, simplify and change the regulatory regimes across Australia that affect tiny houses so that they are more consistent and so that tiny houses are not treated prima facie as undesirable or as a problematic planning outcome” (Shearer & Burton, 2021b, p. 17). However, in opening the way for building smaller homes, planners are advised to be wary of the possible gradual erosion of amenity standards.

After regulatory barriers, the next challenge is financial. Small homes are relatively expensive to build, and unless situated on owned land, offer little to no return on investment, so financers are unwilling to lend. In addition, small home designers have yet to prove that they can meet the diverse needs of
residents at all life stages, or shift the attitudes of existing residents who see small homes as an inferior or low-quality form of housing. Our research participants have helped frame solutions to overcoming these barriers. These proposed solutions are captured in our Recommendations.

Five Recommendations are set out in the following section. In brief, our Recommendations are to: advance the issue via research into and co-design of exemplar pilot projects; educate stakeholders to shift negative attitudes towards compact homes amongst builders, financiers, regulators, and the wider community; undertake planning reform to permit tiny and compact homes to occupy space on appropriate properties; conduct research to determine actual demand for tiny and compact homes; and reduce costs, remove existing financial barriers, improve accessibility for buyers and renters on low incomes, and publicise the benefits of and demand for well-designed compact homes. To effect real and lasting change in the housing sector, these five Recommendations cannot be implemented in isolation, but must be actioned in combination, in a systemic and holistic way.

As Australia faces the dual crises of climate change and housing affordability, a radical shift is clearly needed if the housing sector is to provide an expanded choice of affordable, high-quality compact homes suitable for residents across their lifespan. This study provides an evidence base to inform the possible development of compact, affordable housing models. The findings are timely, given local councils in Victoria are now open to exploring innovative models for increasing the supply of affordable housing, and with passionate stakeholders eager to build a cluster of 6–12 compact homes in Geelong.
RECOMMENDATIONS

Based on the findings from our evidence reviews, focus groups, and interviews, our research participants identified, qualified, and refined 12 priority actions. Developed during two STICKE (systems thinking) workshops, these priority actions form the basis of the five Recommendations set out below. Importantly, to be effective, these Recommendations should not be approached in isolation: rather, they should be implemented in a systemic and holistic way, at different leverage points across the system. Our Recommendations are summarised below and described in full in Part 5.3.

**Recommendation 1: Co-Design Exemplar Projects with Potential Residents and Neighbouring Communities**

Work with potential residents and neighbouring communities to co-design exemplar projects for clusters of tiny homes. Actively involve all stakeholders. Prioritise high-quality design outcomes that are affordable, exemplify sustainable and universal design principles, and thus meet the varying and long-term needs of a diversity of residents. These projects should be informed by the best global precedents for achieving an affordable, sustainable, ecofriendly, safe, and community-focused way of living.

Research for these exemplar projects will also need to explore ownership and design models that enable resident diversity, and construction innovations that achieve both high-level energy performance and cost reductions via prefabrication and mass production techniques. The projects will need to be empirically evaluated to determine their environmental performance, including construction and running costs, and to assess their social performance in terms of improving social connectedness, both between residents and with neighbouring communities.

**Recommendation 2: Educate Stakeholders to Change Negative Perceptions of Compact Homes**

Stigma, stereotypes, and negative public attitudes present a significant barrier to wider acceptance of compact homes and microvillages as viable affordable housing options. This barrier should be addressed via education strategies to promote the environmental, financial, and community benefits of living in compact homes, with a view to increasing both acceptance and demand. Education should target a range of stakeholders including builders, financiers, regulators, and the wider community. Activities could include public writings, events, online campaigns, advocacy, and lobbying. These education strategies should seek to:

- Showcase global exemplars of different models in different contexts, including both individual compact homes and clustered models (microvillages)
- Publicise well-designed compact homes that meet diverse needs
- Demonstrate demand for compact homes and microvillages as a choice, rather than a need
- Disrupt the cultural norm of aspiring to own a large house, and
- Catalyse demand, thus providing impetus to develop innovative production technologies to reduce costs and improve environmental performance.
Recommendation 3: Planning Reform

To make compact homes a viable affordable housing option, planning reform is required at both nationwide and local level.

Recommendation 3.1: Nationwide Reform
- Across Australia, all state and territory planning systems should be revised to explicitly define and permit the construction of smaller homes (down to 40sqm) and microvillages within designated Residential Zones.
- Local governments should be educated about the many benefits of compact homes to alleviate stigma and reduce resistance in planning applications.

Recommendation 3.2: Local Reform
- The City of Greater Geelong should amend its existing Planning Scheme to include definitions of a range of acceptable dwellings in Residential Zones, including small homes (down to 40sqm).
- The City of Greater Geelong should amend its existing Planning Scheme to allow the waiver or modification of prescriptive car parking, setback, and open space requirements where these can be met in alternative ways.
- The City of Greater Geelong (CoGG) should work with applicants to approve construction of a microvillage on well-located surplus land within the existing Planning Scheme. This work should be undertaken in the context of CoGG’s Social Housing Policy and the Victorian State Government’s commitment to expand the supply of affordable housing.

Recommendation 4: Conduct Research to Assess Demand for Tiny and Compact Homes in Geelong and Australia

To date, there has been no empirical research to assess the demand for different models of compact homes in Australia. There is a pressing need to address this gap in knowledge in order to help build an evidence base for future action. This is particularly pertinent as governments begin to prioritise affordable housing, and Australians revaluate the suitability of our housing in the face of the climate change crisis and the COVID-19 pandemic.

Recommendation 5: Promote Benefits, Reduce Costs, Remove Financial Barriers, and Increase Access to Compact Homes for People on Low Incomes

Existing financial barriers place smaller homes out of reach for many would-be purchasers and renters on low incomes. To make compact homes a viable affordable housing option, there is a need to remove financial barriers and reduce costs. Demonstrating the benefits of well-designed compact homes also presents an opportunity to stimulate demand, which may contribute to cost reductions.

Recommendation 5.1: Publicise the social, environmental, and economic benefits of smaller homes. Increasing awareness by promoting the benefits of well-designed, prefabricated dwellings could increase demand, reduce costs, and make compact housing options more affordable and feasible.
Recommendation 5.2: Provide financial incentives and/or remove existing financial disincentives to developing, building, and owning well-designed, energy-efficient compact homes (possible mechanisms include planning regulations and personal taxation).

Recommendation 5.3: Increase the supply of high-quality social housing and intentional communities designed for ageing in place, with a focus on housing single-person households on very low incomes. Home ownership will likely remain unattainable for this group, and they are increasingly locked out of the private rental market.

Recommendation 5.4: Assess the feasibility of a government loan or guarantee scheme for aspiring owners of compact homes. The scheme would seek to reduce barriers, mitigate lender aversion to borrower characteristics and security property, and contribute to an evidence base and track record.

Recommendation 5.5: Continue pursuing tenancy reform to strengthen tenant rights and improve security of tenure. This issue came up repeatedly during our study, with participants equating security of tenure solely with home ownership, not renting.

What’s Next?

While our research has found that the appeal of tiny homes may currently be limited, compact homes clearly have potential to provide a viable alternative to market norms. This is particularly relevant given Australia’s housing affordability crisis and the need to drastically reduce the carbon footprint of housing. In a recently published study, Shearer and Burton (2021b) conclude that tiny houses may:

- provide greater diversity and choice in the wider Australian housing market and are consistent with the policy agendas of more mainstream housing advocates, such as increasing affordable housing supply and building at greater density in certain areas.

In sum, the compact home model is worth further investigation. As the evidence base builds, our hope is to facilitate future funding to research the design, construction, and evaluation of an exemplar project: a microvillage of compact homes for 6–12 residents in the Geelong region. The proposed project would be founded on co-design principles and community engagement processes to inform the harmonious integration of the village with the local community and environment.

The aim would be to develop a “living village” model that can evolve over time to support people as needed, thus providing an opportunity for residents to age in place. Flexibility in design would allow the dwellings to be adapted to support different age groups, modes of mobility, and changing circumstances. Ultimately, the aim is to work with prospective residents and their neighbours to determine what factors enable strong community connections to support positive health outcomes and meaningful social engagement.
INTRODUCTION

Background

A significant number of Australians on low incomes find it difficult to secure affordable rental properties (defined as less than 30 percent of gross household income) in metropolitan centres. This group includes the 2.4 million Australian pensioners who do not own homes and have limited additional private income. In 2017–2018, some 47.8 percent of low-income households in greater capital city areas were in rental stress (defined as spending more than 30 percent of gross household income on housing costs) (Health & Welfare, 2020). Along with the perpetual insecurity of fixed-term leases, housing costs are a source of enormous anxiety and distress for older Australians (Morris, 2016).

In 2018, the Bellarine Tiny Homes Group (now amalgamated with Geelong Sustainability) identified equivalent problems in the local housing market, with many elderly people paying most of their pensions in rent, leaving little money for food, bills, and other costs. Their rental properties were often of low quality, and many were not suited for the needs of the elderly. Pensioners had poor security of tenure and had to move regularly, which had an isolating effect and negatively impacted their physical and mental health.

To help address these problems, the Bellarine Tiny Homes Group initially wanted to build Tiny Homes on Wheels (THOWs). The group contacted the HOME Research Hub at Deakin University to discuss a potential project based on this idea. However, upon investigation, this option was found to be unviable: it did not present a permanent housing solution, current planning laws posed a barrier, and THOW structures are difficult and expensive to build sustainably in terms of energy performance.

While the Tiny House Movement (THM) is a growing trend worldwide, in 2018 the model was unviable in Geelong, because THOWs are not allowed to remain on sites for more than one year. Even if a suitable site could be found and planning restrictions theoretically waived (a possibility that currently remains far out of reach), there is no clear mechanism for enabling social integration with neighbouring communities. Historically, a lack of community integration and consultation around the design and building of various forms of tiny houses – including caravans, “trailers”, and motorhomes – has created stigma around these housing models. As a result, there is community reluctance to support these alternative forms of housing.

In discussions with HOME researchers, group members outlined their needs: they wanted a small, secure home where they could age in place; a place of their own, consisting of a bed/sitting room, kitchenette, and ensuite. A shared dining space, lounge, laundry, and guest room could potentially be incorporated into a separate communal hub positioned amongst a cluster of small homes.

This concept of a “microvillage” of tiny homes raised questions around planning and building regulations, community integration and consultation, sustainability, and the challenge of securing local government support. Over the next two years, HOME carried out two interlocking studies to address these questions. These two research projects are outlined below. This report encapsulates both studies.
Project Aims and Objectives

The Microvillage Geelong Project is an in-depth study comprised of two overlapping research projects.

Project 1: Grey Nesters: Exploring the Viability of Affordable Small Houses for Those with Limited Funds and a Desire for Modestly Sized Homes

In this research project, the HOME Research Hub explored the viability of affordable tiny-house alternatives in relation to three key issues:

1. **Regulatory barriers**: state-wide planning schemes and local council regulations
2. **Environmental design performance**: integration with passive and active energy systems, and
3. **Financial modelling** in relation to:
   - Likely initial, recurring, and exit costs for individual residents (e.g., if their circumstances change, the lease terminates, or terms change significantly)
   - Comparison of financial and non-financial outcomes for residents of tiny homes, small houses, and people living in other alternative housing
   - Identification of key differences between tiny homes and traditional residential property ownership in relation to capital appreciation/depreciation, mortgage finance accessibility, insurance availability and cost, and maintenance and running costs, and
   - Opportunity costs to residents using a limited capital base to finance the purchase.

The HOME research team consulted with a project Taskforce made up of regulatory and end-user stakeholders to clarify barriers relating to the financing, planning, regulation, and building of small homes. We determined the viability of affordable small house models, and how a preferred model might look, and identified alternatives and future priorities. The objectives of the project were to:

- Evaluate a small homes model of affordable housing through analysis of key issues pertaining to urban planning and building regulations
- Investigate viable solutions for improving environmental performance via integration with passive and active energy systems, and
- Evaluate the financial viability and sustainability of small homes, taking a scenario-based approach to test sensitivity to changes in key assumptions (e.g., how different ownership structures, built forms, and shared versus private space and facilities may impact financial outcomes). This work facilitates the ability to undertake a cost-benefit analysis of various design and construct options to determine their feasibility, given affordability, sustainability, accessibility, and liveability goals.

The project was funded by the Lord Mayor’s Charitable Foundation. This research informed a second project that considered community integration issues for clusters or communities of small houses (see below). In the longer term, the Microvillage Geelong Taskforce hopes these interlocking investigations will inform the design and evaluation of a prototype microvillage of compact homes with support from the City of Greater Geelong (CoGG) and local community groups. This prototype is intended to meet the needs of a dozen retirees – the “grey nesters” – who approached HOME with the ideas that informed this study (initially known as the Bellarine Tiny Homes Group, this collective is now amalgamated with Geelong Sustainability).
Project 2: Homes for “Grey Nesters”: Social Integration of a Micro-Village of Small Houses Supporting Community Wellbeing in Geelong

This project focused on the community integration aspects of a potential microvillage – both in terms of the social health needs of potential residents, and the need to integrate the microvillage within the context of an existing community.

HOME researchers used focus groups, interviews, and an innovative, consultative systems thinking tool (STICKE) to engage a wide range of stakeholders. The aim was to identify the community benefits and challenges of integrating a microvillage of small, affordable homes into the Geelong community. This research project was funded by the Geelong Community Foundation.

The objectives of the project were to:

- identify and engage with a wide range of stakeholders, including local government, business, service providers, potential residents and the broader Geelong community to understand/discern the demand for and obstacles to building clusters of small houses in existing neighbourhoods, and
- combine co-creation and participatory research processes, with innovative consultative systems-thinking methods, to develop agreed action priorities for creating socially integrated clusters of small homes.

Research Team

HOME is a multidisciplinary research hub based at Deakin University’s School of Architecture and Built Environment. The HOME Research Hub seeks to develop solutions to deliver well-designed, affordable, sustainable, and connected housing for all Australians. HOME consists of 30 researchers who provide a range of expertise required to gain a comprehensive understanding of “wicked” housing problems. HOME researchers work with a range of organisations and individuals to investigate complex problems and devise innovative solutions. Spanning health, the social sciences, business and law, arts, and the built environment, we offer a uniquely agile and adaptable research approach: collaboratively designed solutions addressing the specific needs of communities.

The HOME team for the combined projects comprised ten researchers:

- Professor Richard Tucker (project leader: “Grey Nesters: Viability of Affordable Small Houses”). Richard researches sustainable/passive design, universal design, relationships between health and the built environment, the impact of planning on social interaction, and the impact of sustainable design on children.
- Dr Fiona Andrews (project leader: “Grey Nesters: Social Integration of a Microvillage”). Fiona researches public health, relationships between the built environment and health, how families’ homes and neighbourhoods effect social inclusion, evaluation of community-based initiatives (e.g., Best Start for the City of Whittlesea, Liveable Yarra).
- Honorary Professor Ursula de Jong. Ursula researches place, cross-generational communities’ valuing of place, neighbourhood character, and the impact of planning provisions and housing typologies.
• Honorary Professor Louise Johnson. Louise is a human geographer who researches suburban housing, the dynamics of Australian regional economies, and social polarisation in Geelong to inform policy development and service interventions.
• Professor of Practice Fabienne Michaux. Fab researches impact investment models, with a focus on housing and homelessness, and is a non-executive director of Housing Choices Australia Ltd.
• Dr Nicole Johnston (financial analysis team leader). Nicole researches property law, socio-legal issues, conflicts of interest and legal relationships, and multiple aspects of strata titling, including governance and management.
• Professor Steve Allender (systems thinking team leader). Steve researches the burden of disease and obesity prevention. He has a particular interest in the use of complex systems methodologies in community-based interventions.
• Associate Professor Adrian Lee. Adrian researches financial technology and real estate.
• Dr Elyse Warner. Elyse researches the relationship between housing and health, including how changes in families across the life course relate to their choices in, and experiences of, housing.
• Dr Josh Hayward (systems thinking team facilitator). Josh researches tools and analytic techniques to synthesise community knowledge.

Project Scope

Design Scope

While there is no clear or unanimous definition of exactly what constitutes a tiny home, there is broad agreement that these dwellings are significantly smaller than standard housing options, and are normally suited to housing just one or two residents per unit (Evans, 2019; Gabbe, 2015; Iglesias, 2014; Infranca, 2014; McAllister, 2017; Penfold, Waitt & McGuirk, 2019; Turner, 2019; Shearer & Burton, 2018). Along with size, the construction and mobility of these dwellings also play a part in their categorisation (Shearer & Burton, 2018). Tiny houses often (but not always) exhibit a high-level design aesthetic and a considered use of construction materials.

Due to this lack of a clear definition, the legal status of tiny homes is fluid, and varies across jurisdictions. This makes it complex for tiny home builders to know which codes, if any, they must follow (Anson, 2019). Tiny homes can be fixed or mobile. Tiny homes built on fixed foundations face stricter construction laws than those on wheel-beds. Building regulation of fixed tiny homes includes minimum floor spaces, ventilation and light, and access to utilities and waste removal services (Turner, 2017).

Three types of tiny home are identified in the academic literature. Broadly, they are: (2) Tiny Homes on Wheels (THOWs), (2) micro-apartments, and (3) Accessory Dwelling Units (a second small dwelling on the same grounds as single-family house, such as a “granny-flat.” In this study we also consider Tiny Homes on Foundations (THOFs) which are stand-alone, detached, permanent dwellings of 40sqm–48sqm. We refer to these dwellings by the more accurate term “compact homes”. This research project considers housing models ranging from a 20sqm THOW to a 48sqm THOF. The latter size is the smallest area for a fixed-foundation home that meets universal design principles – that is, usable by all people, to the greatest extent possible, without needing adaptation or specialised design.
Geographical Scope

This study focuses on the community represented by our Microvillage Geelong Taskforce, namely the regional city of Geelong. For data collection purposes, “Geelong” is delineated as the City of Greater Geelong, in south-western Victoria, about 75 kilometres south-west of Melbourne’s CBD. Greater Geelong is bounded by Moorabool Shire in the north, Wyndham City and the Borough of Queenscliffe in the east, Bass Strait in the south, and Surf Coast Shire and Golden Plains Shire in the west.

While our discussions with community stakeholders tended to consider housing models for suburbs near the Geelong CBD, many of the obstacles and actions identified in this study are not geographically specific, and are applicable across Victoria and nationwide. Our evidence review also takes an international perspective, contextualising this study within the global Tiny House Movement (THM).

Report Structure

Following this Introduction, the report is divided into five Parts. To aid navigation, a detailed list of contents is provided on the opening page of each Part. The report is structured as follows:

PART ONE | Evidence Reviews
- The Tiny House Movement: An Overview
- Building/Design Regulatory Context
- Planning Regulatory Context
- Financial Context
- Community Integration Context

PART TWO | Analysis: Geographical Context
- Relevant ABS Census data for Geelong
- Income and Housing Costs in Australia 2020
- Income Inequality and Wealth Inequality in Australia 2020

PART THREE | Method: Community Engagement Research
- Research Methodology
- Analytical Framework

PART FOUR | Findings: Community Engagement Research
- Focus Groups
- Interviews
- STICKE Workshops

PART FIVE | Discussion and Conclusion
- Recap
- Synthesis of Findings
- Recommendations (full version)
- Study Challenges and Limitations
- Long-Term Evaluation
- Conclusion

REFERENCES AND APPENDICES
## PART ONE | EVIDENCE REVIEWS

### Contents

1. **1.1 THE TINY HOUSE MOVEMENT: AN OVERVIEW** ................................................................. 7
   1.1.1 Background ............................................................................................................................ 7
   1.1.2 Defining a Tiny Home ............................................................................................................. 8
   1.1.3 Building a Tiny Home ............................................................................................................ 10
   1.1.4 Locating a Tiny Home ............................................................................................................ 11
   1.1.5 Capacities of the Tiny House Movement (THM) ................................................................. 12
   1.1.6 Future Potential of Tiny Home Communities (THCs) ......................................................... 13
   1.1.7 Conclusion ............................................................................................................................ 15

2. **1.2 BUILDING/DESIGN REGULATORY CONTEXT** ............................................................. 17
   1.2.1 Background .......................................................................................................................... 17
   1.2.2 National Construction Code (NCC) .................................................................................... 17
   1.2.3 Energy Efficiency and Residential Buildings ................................................................. 18
   1.2.4 Regulation of Tiny Homes: Design, Construction, and Movement .................................. 20
   1.2.5 Universal Design for Tiny Homes ....................................................................................... 22
   1.2.6 Victorian Case Studies ......................................................................................................... 24
   1.2.7 Tiny Home Construction: Enablers, Barriers, and Opportunities ........................................ 28
   1.2.8 Cost Comparisons ............................................................................................................... 30
   1.2.9 Conclusion ............................................................................................................................ 42

3. **1.3 PLANNING REGULATORY CONTEXT** ............................................................................. 43
   1.3.1 Background .......................................................................................................................... 43
   1.3.2 Victorian Planning Context ................................................................................................. 43
   1.3.3 Geelong Planning Context .................................................................................................. 46
   1.3.4 Microvillages and THOWs: Planning Enablers, Barriers, and Opportunities ...................... 47
   1.3.5 Conclusion ............................................................................................................................ 51

4. **1.4 FINANCIAL CONTEXT** .................................................................................................... 52
   1.4.1 Background .......................................................................................................................... 52
   1.4.2 Government Housing Assistance Schemes ......................................................................... 53
   1.4.3 Traditional Financing from Banks ...................................................................................... 54
   1.4.4 Innovative Housing Developers ......................................................................................... 54
   1.4.5 Social Impact Investment .................................................................................................... 54
   1.4.6 Conclusion ............................................................................................................................ 56

5. **1.5 COMMUNITY INTEGRATION CONTEXT** ..................................................................... 57
   1.5.1 Background .......................................................................................................................... 57
   1.5.2 Cohousing and Social Health: Summary of Findings ......................................................... 58
   1.5.3 Cohousing and Social Health: Enablers, Barriers, and Opportunities ................................. 59
   1.5.4 Conclusion ............................................................................................................................ 59
In this first section, we review evidence pertaining to the building, planning, financial, and community contexts that impact the viability of tiny homes as an affordable housing option. For the current project, our assumed resident group comprises people with limited funds and a desire for homes that minimise consumption. Before presenting a detailed discussion of this evidence, we provide background on the global Tiny House Movement.

1.1 The Tiny House Movement: An Overview

We begin by giving a general overview of the published academic literature on the global Tiny House Movement (THM). The THM is principally focused on keeping the “quality of living high while homeowners intentionally decide to downsize” (Boeckermann, Kaczynski, & King, 2019, p. 62). The academic literature reflects the growing publicity around the movement, in that most studies are quite recent, and overall they are largely supportive of the potential for living in tiny homes. Nearly all the academic literature has been published over the past six years, with close to half dating from 2019 or later. Much of the recent research has focused on a conspicuous problem: the lack of recognition of THOWs in local government planning schemes (Shearer & Burton, 2021b).

Importantly, most of the existing research is missing formal and empirical evaluation, but this is not unexpected for a phenomenon with a short history. The research is also largely lacking critical appraisal of the viability of tiny homes beyond meeting a niche demand. As this section demonstrates, while the THM is explained in relation to four resident motivations (economic factors, security of tenure, sustainable community and lifestyle, and freedom) (Shearer & Burton, 2021b), very few (if any) studies determine whether these aims are fulfilled beyond the short term.

While some aspects of tiny house living are deemed to have the “potential to drive positive changes in the way developers and house builders consider more diverse housing products” (Shearer & Burton, 2021b, p. 3), this potential remains untested, and the factors that compromise its advance are sidelined. These factors include “lack of finance and the potential for hostility from neighbours” (Shearer & Burton, 2021b, p. 9), poor environmental performance of THOWs, high cost of construction per square meter compared to volume-built houses, a lack of of community integration, and poor adaptability and accessibility, meaning that ageing in place is impractical for tiny home residents.

1.1.1 Background

Tiny homes have gained popularity over the past decade, with a growing number of lifestyle-based TV programs and increasing social media coverage dedicated to the phenomenon (Anson, 2018). Tiny houses are emerging as a popular alternative to traditional forms of housing because of their potential to offer a more affordable, lower environmental impact form of dwelling (Butt & Stephenson, 2019). This burgeoning interest is driven in part by a desire for a less materialistic, “simpler” way of living, achieved through the downsizing of possessions and shrinking of the spaces in which living occurs (Evans, 2019). The tiny house movement (THM) gained particular traction in the wake of the 2007–2008 Global Financial Crisis, presenting an affordable alternative to the traditional housing market (Brokenshire, 2018). Tiny houses also provide an opportunity for a contemporary re-imagining of the
“good life”, promising inhabitants greater economic freedom, mobility, and new ways of living both individually and collectively (Mangold & Zschau, 2019).

In developed countries such as Australia and the US, people typically live in tiny homes by choice, not necessity, and already enjoy a “higher standard of living” than the average citizen (Evans, 2019, p. 210). The THM echoes other socially driven, back-to-basics, craftivist, and bespoke construction movements, offering opportunities for individual expression via the construction of dwellings tailored to fit residents’ needs and reflect their values (Byram, 2017; Penfold, Waitt, & McGuirk, 2018). This lifestyle draws influence from 1960s and 1970s counter-cultural social movements, as Evans (2018b, p. 2) explains:

> Though the impetus behind downsized living is frequently attributed to affordability, there are tiny house enthusiasts who are pursuing the movement in order to pursue meaningful lifestyles. Some are choosing small living in order to decrease their environmental footprint, to have more personal freedom, or to pursue a lifestyle of adventure, artistic expression, or advocacy work.

A wide range of people from differing socioeconomic backgrounds have become interested in tiny homes as a possible alternative to traditional forms of housing (Gabbe, 2015; Infranca, 2016). One characteristic shared by tiny home residents is a desire to explore ways of living that deviate from established social norms and challenge preconceptions of what a home is, or can be (Shearer & Burton, 2018). A tiny home is a departure from traditional forms of housing, and offers a lower mortgage and greater economic freedom compared to larger dwellings (Bozorg & Miller, 2014). Tiny homes also provide opportunities to access housing that might not otherwise be available, enabling people to own property and, where tiny homes are clustered, create community identity, by sharing common spaces and fostering connections to place (Alexander, 2017).

This evidence review synthesises 32 peer-reviewed academic articles exploring the Tiny House Movement (THM). It presents an overview of current understandings of what tiny homes are, and potentially can be. We first discuss definitions of tiny homes, then address some key construction and planning considerations for building and locating these structures, examine the capacity of the Tiny House Movement (THM), and conclude with a reflection on the future potential of Tiny House Communities (THCs) as an alternative housing model.

As several other researchers have noted, to date most of the literature on tiny homes comes from non-academic sources. Previous literature reviews on the topic have drawn from both academic and grey literature, but a recent increase in research has generated new academic articles on the THM. This literature review updates previous reviews, while focusing solely on peer-reviewed articles. To identify relevant articles, we used key terms to conduct cross-referenced searches in Google Scholar.

### 1.1.2 Defining a Tiny Home

There is no clear definition of what constitutes a tiny home, other than a broad agreement that they are significantly smaller than standard housing options, and are normally suited to housing just one to two residents per dwelling (Evans, 2019; Gabbe, 2015; Iglesias, 2014; Infranca, 2016; McAllister, 2017; Penfold et al., 2018; Shearer & Burton, 2018; Turner, 2016). That said, size is not the only factor that determines whether a home is deemed “tiny”: the design, construction, and mobility of dwellings also play a part in their categorisation (Shearer & Burton, 2018). Tiny houses are typically differentiated from
other forms of smaller dwelling by their higher-level design aesthetic and choice of construction materials, as Butt and Stephenson observe (2019, p. 2):

The Tiny House Movement’s emphasis on unique design and (often) on self-build models require consideration of how current building and planning systems address housing alternatives as products and systems, not simply as different built forms.

Due to this lack of clear definitions, the legal status of tiny homes is fluid and varies across jurisdictions, making it complex for tiny home builders to know which codes, if any, they are required to follow (Anson, 2018). Tiny homes can be either fixed or mobile, and these two broad categories signal some clear distinctions between various forms (Shearer, Bares, Pieters, Winkle, & Meathrel, 2019; Shearer & Burton, 2018). Tiny homes set on permanent foundations face stricter construction laws than those built on wheel-beds. Building regulations for fixed tiny homes include minimum floor spaces, ventilation and light, and access to utilities and waste removal services (Turner, 2016).

Three types of tiny home are identified across the academic literature. Broadly, these are: tiny homes on wheels (THOWs), micro-apartments, and accessory dwelling units (ADUs, which can include THOWs and THOFs).

**Tiny Homes on Wheels (THOWs)**

A THOW is any dwelling that is built on a wheel-bed and is transportable. While parallels can be drawn between mobile homes, caravans, and THOWs, they are distinct forms (Anson, 2018; Bozorg & Miller, 2014; Shearer & Burton, 2018). THOWs typically have a higher standard of design, construction, and utility, and offer a form of housing that can be built “off-grid” (Calluari & Alonso-Marroquín, 2017; Evans, 2018b). However, THOWs pose unique regulatory challenges. Under current building codes they are not necessarily classified as either a mobile home or a tiny home, which can result in illegal construction by people unaware of which legal framework governs their dwelling (Evans, 2018a). THOWs can be placed on lots that are not viable for larger dwellings. They can also be clustered together on public or private land to create tiny house communities (THCs) (Shearer et al., 2019).

**Micro-Apartments**

A micro-apartment is generally considered to be smaller than a one-bedroom apartment. However, there is no clear distinction between studio apartments, bedsits, and micro-apartments (Clinton, 2018; Infranca, 2016; Tim Wong, 2018). Micro-apartments are usually located in urban areas where there is a high demand for housing, limited stock, and reasonable access to services. They can provide an affordable option for people willing to compromise on housing space in exchange for access to external amenities (Clinton, 2018). They can offer a housing alternative for a range of populations, whether as an urban in-fill strategy, or for young professionals, retirees, or marginalised groups (Gabbe, 2015; Infranca, 2016). Micro-apartment residents have cited lower rental costs and better access to amenities as primary motivators for choosing smaller dwellings (Clinton, 2018). Critics claim micro-apartments are not necessarily cheaper in cities, and can inflate rents and property prices (Infranca, 2014, 2016). Micro-apartments hold some potential to meet the diverse housing needs of urban populations, but are not always the panacea some media and academic discourse might suggest (Clinton, 2018).
Accessory Dwelling Units (ADUs)

Accessory Dwelling Units (ADUs) are fixed dwellings that can be built on existing lots or commissioned for a specific purpose, such as emergency or low-income housing (Bozorg & Miller, 2014). ADUs come in a range of forms, including granny flats and bungalows. While existing planning codes make some provision for these structures, there is wide variation between jurisdictions, which limits the diversity of forms ADUs take (Butt & Stephenson, 2019; Evans, 2018a; Gabbe, 2015; Iglesias, 2014; Infranca, 2014, 2016; McAllister, 2017; Shearer et al., 2019). The integration of tiny homes in existing urban areas needs to prioritise housing affordability. This is particularly true in suburbs with large lots and decreasing household sizes, where ADUs could easily be established, as they pose a viable form of urban infill that can increase an area’s residential density (Evans, 2018b). One of the biggest barriers to the uptake of ADUs centres on the perceptions of existing residents (Withers, 2012). Relaxing regulation around the construction of ADUs would support urban densification strategies and help address housing issues faced by marginalised and low-income groups, while also providing an alternative form of housing for people concerned with the environmental impacts of traditional homes (Shearer et al., 2019).

1.1.3 Building a Tiny Home

Tiny homes challenge definitional norms of what a house or dwelling is, or potentially can be. While they can offer an affordable alternative to traditional forms of housing, tiny homes are not always considered “proper” dwellings, dependent on geographic location and local planning codes. Within Australia these codes vary at both the municipal and state level, resulting in an uneven regulatory landscape and confusion around tiny home construction.

Due to multiple and inconsistent definitions of what constitutes a tiny home, the required building standards can vary, dependent on whether the home is mobile or fixed, its rate of occupation, and its location (Butt & Stephenson, 2019). In regional settings, this includes consideration of whether a dwelling can be connected to utilities and wastewater systems, and whether it may compromise other, pre-existing land uses (Butt & Stephenson, 2019).

In addition to this regulatory murkiness, the cost of building a tiny house can vary dramatically, depending on the design process and construction materials used (Shearer et al., 2019). The potential for this form of dwelling to minimise environmental impact is reflected in a trend for incorporating sustainable design and living systems that can enable a tiny home to be taken “off-grid” (Calluari & Alonso-Marroquin, 2017; Mangold & Zschau, 2019; Penfold et al., 2018).

Building codes ensure that dwellings meet minimum environmental and safety standards. These codes can be adapted to address the unique requirements of tiny homes and their restricted amenities (Evans, 2018a). The rapid growth of Tiny House construction has created a need to develop specific regulation that addresses their quality and habitation standards, considering their novel construction requirements (Alexander, 2017; Wenban, 2019). De Chastel (2018) argues that state governments in Australia need to consider building standards that specifically address the requirements for tiny homes (de Chastel, 2018). In contrast, Turner (2017) states that imposing minimum floor space standards on tiny home construction would impede the potential of tiny homes and limit where they can be located.
Tiny homes can be designed in ways that improve surrounding property values. A study by Evans (2019) investigates visual preferences for tiny housing, identifying aesthetic features that may help foster community support for changes in land use policies and building codes. Respondents expressed a preference for tiny homes that echo traditional architectural features, use wood in their construction and are spread out, not clustered together (Evans, 2018b, 2019).

There is a strong “DIY” building ethic associated with tiny homes, and occupiers often choose to use recycled and reclaimed materials to reduce both costs and environmental impacts (Anson, 2018; Butt & Stephenson, 2019). There is also growing commercial interest in tiny home construction, reflected in the increasing numbers of companies offering construction services specifically aimed at this market, ranging from basic prefabricated shelters to high-tech architecturally designed dwellings (Shearer & Burton, 2018; Withers, 2012).

Tiny homes are more affordable than traditional homes, requiring less land and fewer construction materials (Gabbe, 2015; Iglesias, 2014; McAllister, 2017; Penfold et al., 2018; Turner, 2016; Wenban, 2019). Tiny home ownership offers the benefits and securities of large home ownership, while also creating opportunities to build communities around principles of sharing and common living (Bozorg & Miller, 2014). The lower construction cost of tiny homes has led to local and state governments exploring their potential as a temporary or permanent solution to housing issues (Butt & Stephenson, 2019). Tiny homes present a potential solution by providing a flexible, cheaper alternative to conventional housing stock (de Chastel, 2018; Shearer et al., 2019).

However, despite their representation as a cheaper alternative to traditional dwellings, tiny homes are not accessible for everyone: construction costs and the challenge of finding suitable land often put them out of reach for people on low incomes. Beyond financial constraints, smaller dwellings also present physical limitations, including accessibility issues for people who are elderly or disabled (Byram, 2017). As outlined in Part 1.4, tiny homesteaders may face difficulties securing finance from banks and coverage from insurance companies (Infranca, 2014, 2016), due to a perception that conventional homes offer a more stable likelihood of return and better security for investors (Evans, 2018a).

1.1.4 Locating a Tiny Home

Restrictive zoning laws and land-use covenants can impede the construction and location of tiny homes (Evans, 2018a; Gabbe, 2015; Iglesias, 2014; McAllister, 2017; Shearer et al., 2019; Turner, 2016). As noted, tiny homes exist in a regulatory grey area, with governance frameworks varying between municipalities and states, and tiny homesteaders may face difficulties securing finance and insurance. Land zoning regulations, building codes and government housing strategies lack clear definition of what constitutes a tiny home, which creates an uneven policy landscape for owners of these dwellings (Evans, 2018b; Withers, 2012). Difficulties include finding a permanent site where the tiny home can be located without contravening existing land-use regulations and statutory requirements, which could leave owners facing the prospect of being unable to inhabit their homes (Anson, 2018).

The “success” of tiny home communities (THCs) is largely dependent on the regulatory frameworks developed by policy makers. To support the full scope of social and environmental benefits offered by these types of communities, innovative approaches that challenge current land-use and zoning practices are needed (Alexander, 2017). Planning systems in Australia emphasise the size and quality of dwellings,
with a focus on avoiding conditions that would contribute to sub-standard housing and the formation of “slums” (Butt & Stephenson, 2019). Local governments in NSW are required to develop housing strategies that begin to address the immediate needs of local populations.

Tiny homes provide one option to address social and economic issues, but the development of THCs requires a willingness by local government to consider land-use and zoning reforms (de Chastel, 2018). Changes to land zoning can potentially enable infill development of tiny homes and foster “economically diverse communities” (Evans, 2018a, 2019; Iglesias, 2014; Infranca, 2014, 2016; Withers, 2012).

1.1.5 Capacities of the Tiny House Movement (THM)

Small dwellings have been a part of Australian cities for many decades. However, through the 1980s, 1990s, and into the 2000s, the average Australian home has been expanding in size, with commensurate increases in household resource use and consumption patterns. Tiny houses represent a movement away from the prevailing trend for ever larger homes, and offer an alternate, lower environmental-impact lifestyle option (Evans, 2018b; Turner, 2016; Wotton, Skates, & Shutter, 2019). Shearer and Burton (2018) observe that larger homes have a bigger environmental and spatial footprint than smaller ones, and are typically located further from urban centres, which increases fuel consumption and traffic congestion (Shearer & Burton, 2018).

The choice to downsize living spaces can be understood as a practice of sufficiency: the household has consciously evaluated their living conditions and chosen to live with less. Lower consumptive lifestyles result in lower spending patterns, and an expansion of “alternate” economies. Tiny homes have a smaller environmental footprint than traditional structures, require fewer resources to run efficiently (Bozorg & Miller, 2014; Gabbe, 2015; Iglesias, 2014; Infranca, 2014, 2016; McAllister, 2017; Penfold et al., 2018; Shearer & Burton, 2018), and encourage lower-consumption lifestyles (Sandberg, 2018).

With the potential for shared facilities and outdoor spaces, tiny homes can be planned to minimise their environmental impact and resource use (Butt & Stephenson, 2019). They can also be built as “off-grid” homes, further decreasing their environmental impact and appealing to people concerned about the impact of conventional homes (Calluari & Alonso-Marroquin, 2017). Media outlets and online spaces often frame this as a narrative of sustainable living and being in touch with the outdoors (Byram, 2017).

Within the housing market, the social push towards increased consumption is evident in the increasing size of the average home (Anson, 2018; Wotton et al., 2019). By contrast, the movement towards “degrowth”, as reflected through the uptake of tiny homes, demonstrates a growing dissatisfaction with this scenario. Shearer et.al. (2019) argue that tiny houses offer a more affordable and sustainable way of living, enabling people to live a “lower impact” lifestyle, whereby their actions have reduced spatial, financial and environmental consequences. Elsewhere, Shearer and Burton (2018, p.14) argue that:

The environmental drivers that motivate tiny house living are complex and include not only the building material but also the desire to live more sustainably, general environmental values, wanting to downsize and minimize possessions and to live off the grid. Minimization and the lack of space in a tiny house mean that consuming is a conscious choice, with every new purchase evaluated for necessity, and for environmental and social harm. Tiny house advocates opine that stuff makes people unhappy; ties them down, costs money and is largely unused,
while conscious consuming aims to reduce debt and possessions and prevent environmental degradation and waste.

Tiny homes offer scope to address a diverse range of social and environmental issues, and a variety of needs – from post-disaster shelters to rapid relief for people facing homelessness or economic marginalisation, to sustainable intentional communities (Bozorg & Miller, 2014; de Chastel, 2018; Turner, 2016). While tiny homes and THCs are certainly not a panacea for homelessness (Alexander, 2017, p.41), they do present alternative options for both temporary shelter and permanent housing, and scope for communities to develop shared visions of what home can be. By working effectively with marginalised communities to develop THCs, government and not-for-profit organisations can potentially facilitate “user-led” design and construction processes that place people at the centre of decision-making processes that impact their wellbeing. This approach can potentially empower people, creating positive outcomes and meeting their material and social needs more effectively than conventional housing strategies (Alexander, 2017). Alexander (2017, p.41) argues that these projects:

represent a return to the self-directed and empowering approaches to politically engaged CED [community economic development] that began the CED movement. These projects move organically from protest to self-help development, to creative social media-driven fundraising, to engagement with local city officials for zoning and land use permits.

Framing THCs in this way – as sites with emancipatory potential for improving social and environmental outcomes – positions them within a wider socio-historic context of social movements and intentional communities. The THM presents an opportunity to shift away from economic assumptions of continual growth, and towards an alternative value system – one that links consumption choices with environmental impacts, is driven by a desire to transcend dominant social and economic expectations and explores how simplicity and minimalism can enable a “good life” (Anson, 2018).

A wide range of socioeconomic groups have expressed interest in tiny homes, from individuals seeking alternative ways of living, to marginalised communities seeking more affordable forms of housing, to government departments and the private sector exploring the potential to create new types of community housing (Shearer et al., 2019). THCs can create strong bonds between community members; less space inside typically means more time spent outside, increasing the likelihood and frequency of interaction between neighbours (for a detailed discussion on community integration, see Part 1.5).

Beyond their use as a primary dwelling, tiny homes can also be used to diversify an owner’s income through short-term letting or other uses (Shearer & Burton, 2018). Drawing on principles from the “sharing economy”, many THCs have communal facilities and common areas, reducing the need to duplicate appliances and creating more space within each dwelling for other facilities. While offering a versatile form of affordable housing, THCs can also provide opportunities for micro-enterprises and skill sharing through communal workspaces and facilities for residents (Alexander, 2017).

1.1.6 Future Potential of Tiny Home Communities (THCs)

Tiny homes can provide both temporary and longer-term housing solutions for regional and urban areas, offering low overheads, flexibility in design, and reduced energy consumption requirements. In regulating tiny homes and THCs, planning systems need to consider connections to utilities and services
– particularly in regional areas, where these connections are less readily available than they are in cities (Butt & Stephenson, 2019).

Tiny homes present an option to increase dwelling numbers in established urban areas that are facing housing stress. Deployed in urban infill sites, tiny houses and THCs can help diversify housing stock, resulting in more housing options, cheaper entry points and more diverse neighbourhoods (Evans, 2018a). Tiny homes provide alternatives for people seeking to minimise both the economic costs of securing housing and the environmental impacts of their housing choices. They may also hold emancipatory potential for marginalised communities and individuals who struggle to access the conventional housing market (Alexander, 2017).

Gaining resident support is key to facilitating the development of tiny housing options in established communities. Zoning laws are often used to inhibit construction of tiny homes and formation of THCs. These restrictions seek to protect the economic and social concerns of pre-existing residents, and can create impenetrable enclaves where new developments are discouraged and resisted (Evans, 2018b). Overcoming NIMBYism and stigmatisation of THCs is central to acceptance by the wider community.

THCs can be categorised in different ways, and their level of social acceptability depends largely on how they are branded and marketed to the local community (Shearer & Burton, 2018) (see also section 1.5). Negative perceptions include concerns that tiny houses are poorly constructed, lack proper amenities or are a second-rate substitute for more traditional forms of housing (Sandberg, 2018). Tiny homes also face the same stigmas as rooming houses and low-income housing. The perceived threats of THCs include perceptions they will attract an influx of transient and low-income residents, bring “undesirable” people into an area, lead to anti-social behaviours, cause a loss of amenity and neighbourhood identity, and lower property prices (Bozorg & Miller, 2014; Evans, 2018b; Infranca, 2014, 2016; Withers, 2012).

In addition, tiny houses and the sharing economy challenge established social norms, and thus may face opposition from some sectors of traditional housing and economic markets (Infranca, 2016). In particular, THCs for marginalised groups require a willingness from civil society and policy makers to support their development and social acceptability (Alexander, 2017).

More broadly, increasing public awareness of tiny homes and their potential will help affirm their place within the fabric of diverse communities (de Chastel, 2018). One key potential benefit of tiny homes and THCs lies in their capacities to connect people. In planning and building these dwellings, communities come together online and in-person to share skills and knowledge. This further catalyses practices of sharing, crafting and being in-common that move beyond the built structure, creating communities of people living in ways that incorporate their social and environmental value systems (Byram, 2017), approaches that reframe them as aspirational sites of future potential (Evans, 2018a) (see also Part 1.5).

Establishing more formalised planning definitions and practices around the regulation of tiny homes will help legitimate their acceptability within local communities (Butt & Stephenson, 2019). Eliminating minimum parking requirements would help foster social and political acceptance of increasing urban density through tiny homes (Gabbe, 2015). Rezoning sites as “campgrounds” could help establish temporary THCs when a specific social issue or environmental disaster calls for short-term accommodation solutions (Turner, 2016).
Tiny homes have the potential to subvert the negative preconceptions associated with caravan parks and transient accommodation. Improved aesthetic and design standards comprise one important step towards this goal. However, regulation must take care to avoid prescriptive building standards that would restrict lower-income communities’ access to tiny homes by mandating costly features (Evans, 2018a). Reframing THCs as aspirational sites of future potential, rather than as clusters of “undesirable” housing, can also help counter stigma and foster greater public acceptance (Evans, 2018a).

If supported by regulatory reform, tiny homes hold a potentially “revolutionary” capacity to reframe conventional notions of home and place, creating space for the emergence of alternate communities based on degrowth and reduced consumption. By engaging with the principles of degrowth, the tiny home model is well positioned to avoid co-option and commodification by the wider economic system. THCs provide a genuine model for groups keen to downsize and explore options for common living (Anson, 2018). Working together, governments and non-state actors could scale-up the development and regulation of THCs to offer meaningful alternatives for both marginalised and low-income groups, and people seeking more intentional and low-impact ways of living (Bozorg & Miller, 2014).

1.1.7 Conclusion

While tiny houses are significantly smaller than conventional housing stock, there is no fixed definition in policy or academic research on exactly what constitutes a tiny home. Over the past decade these small dwellings have grown in popularity, and are increasingly being adopted by residents, not-for-profits, the private sector and government as an alternative housing solution to address a range of social, economic and environmental issues. In media representations, the choice to downsize to a tiny home is often framed as a return to basics, a way of simplifying lifestyle and reducing the environmental impact of housing. These accounts range from a focus on DIY construction practices and reclaimed or recycled materials, to the potential of tiny homes as “off-grid” forms of accommodation.

Tiny homes require less power and water than traditional homes, and some designs use solar power, composting toilets, and rainwater collection to minimise their environmental footprint. THCs can contribute to creating more walkable neighbourhoods, decreasing reliance on cars and other non-active transport (Withers, 2012), depending on their location. But while governments are willing to adopt tiny homes in times of need, there is significant lag between the growing interest in their potential and the regulatory frameworks governing their construction and location (Bozorg & Miller, 2014). As migration from larger metropolitan centres to regional urbanised areas increases, councils and planning authorities must contend with definitional issues around tiny homes (Bozorg & Miller, 2014).

Most tiny house residents view their home as a permanent dwelling, not a temporary form of shelter (McAllister, 2017; Wenban, 2019). This view contrasts with the use of tiny homes as a form of disaster relief shelter, or as temporary accommodation for marginalised groups (Butt & Stephenson, 2019; de Chastel, 2018; Turner, 2016). THCs can form webs of social and economic interaction as individuals and organisations move between communities, sharing skills, knowledge and experiences (Alexander, 2017). Living in tiny homes can give residents a sense of agency and independence, transcending the dominant tropes of contemporary consumer culture (Anson, 2018).

In representing tiny homes, developers and popular media have capitalised on the desire for a simpler, more straightforward way of living, which has in turn helped spark a plurality of tiny home forms and...
the emergence of THCs (Mangold & Zschau, 2019). Penfold et al. (2019) observe that media representations of tiny homes tend to frame them as providing economic freedom and an alternative lifestyle. This representation helps to shape public perceptions of tiny homes, morphing individual housing choices into a growing social movement against the dominant influences of neoliberal capitalism and its hyper-consumptive living patterns.

The tiny home model is limited by the current regulatory environment, and this curbs the potential to realise truly radical alternatives to the traditional housing market (Anson, 2018). Changes to land use zoning and building codes will further the development of tiny homes as an alternative housing option. Planning codes for THCs need to be sensitive to pre-existing residents’ concerns, including potential loss of property value and amenity impacts, while also working to reduce the stigmatisation THCs can face (Evans, 2019). Effective public awareness campaigns would help enhance the social and political will to reform zoning laws and increase support for tiny homes (Evans, 2019; Withers, 2012).

Financing and insurance options for tiny home residents also need to be revised, with recognition from financial institutions that a small home is a viable investment (Evans, 2018b). It is also important to note that while tiny homes may offer solutions to economic and environmental concerns, they are not a universal housing option, as their physical limits can impact accessibility and amenity (Byram, 2017).

To date, there is very limited empirical academic research evaluating tiny homes or THCs, and so little is known about their environmental performance over time, the experiences of tiny house residents, the formation of communities around these diminutive structures, or their long-term financial or tenure security. The DIY and minimalist ethos of the THM also requires further investigation to test whether the realities of living in these dwellings match the narratives of back-to-basics living and environmental sustainability that are so heavily promoted in media discourse (Penfold et al., 2018).

Future research will help shape policy outcomes around tiny homes, and contribute to the social acceptance of these dwellings and the communities that inhabit them (Shearer & Burton, 2018). As research in this field matures, it is crucial to conduct objective and realistic appraisals of whether tiny and compact homes can offer a viable, high-volume alternative for people who want to live well while downsizing and minimising their consumption.
1.2 Building/Design Regulatory Context

This evidence review explores the impacts and restrictions of building and planning regulations on the construction of tiny homes. It primarily focuses on building regulations, but also considers some planning regulations that impact size, form, and construction. In line with the focus of the current project, it also addresses the question of energy efficiency.

We begin with an outline of the National Construction Code (NCC), followed by a summary of key guidelines and regulations relating to energy efficiency requirements. We then turn to the specific regulations relating to tiny homes. Relevant sections of the NCC Vol 2 are detailed, with a focus on the potential to achieve these requirements in tiny houses. Next, we examine the Australian Design Rules, the Vehicle Standards Bulletin, and Victorian planning schemes and concerns relevant to the construction of this housing form. We then discuss the requirements for universal design in tiny homes. Finally, we present three case studies of small homes built in Victoria, summarise the barriers and benefits of various construction models, and provide some cost comparisons.

1.2.1 Background

There are currently no regulations specifically targeting tiny house construction. This is because Tiny Homes on Wheels (THOWs) are not governed by building regulations, as they are not recognised as buildings, while Tiny Homes on Foundations (THOFs) are governed by the same prescriptive requirements that apply to mainstream housing models (Butt & Stephenson, 2019). These existing regulations may not necessarily meet future requirements, especially for THOFs (Tatam & Davies, 2017). Regulators to be wary of the possible erosion of amenity standards when considering the relaxation of regulation to promote the development of small or “compact” dwelling types (Clinton, 2018, p. 196).

This evidence review focuses on published regulations, grey literature, and peer-reviewed articles that describe the restrictions and opportunities of the building regulatory framework when constructing tiny homes. The importance of construction for tiny houses has only recently been recognised, and articles on the topic have proposed some modifications to building regulations.

Articles were identified using backward and forward snowballing, which requires comprehensive cross-referenced searches in citation-tracking databases (Google Scholar, Scopus, and Web of Science Core Collection). The titles and abstracts of all identified articles were then examined. Forward and backward iterations were concluded after three cycles.

Having reviewed the key studies, we posit that the main construction impacts that need to be considered relate to three factors: 1) performance; 2) size; and 3) quality. This section concludes with a matrix that tabulates findings from the evaluation of a THOW compared to five projected THOF models.

1.2.2 National Construction Code (NCC)

The Australian Building Codes Board’s (ABCB) Building Code of Australia (BCA) has been published since 1996. In 2010, the National Construction Code (NCC) was established as a consolidation of the BCA through the incorporation of the Plumbing Code of Australia (PCA) into the BCA. The uniform set of construction standards for all aspects of building performance are enshrined in the NCC (Volumes 1 and
The NCC Vol 2 is a performance-based code that provides the minimum necessary construction standards for housing, including structural safety, safety from fire, health and amenity, safe movement and access, and sustainability. In Victoria, the state’s Building Regulations (2006) make references to the NCC, with the aim of enhancing building performance outcomes in vital areas such as health, safety, sustainability, and amenity (Moore & Holdsworth, 2019; State of Victoria, 2018).

Two key strategies are widely used to ensure compliance with NCC performance requirements at the design stage: a) following a generic prescribed solution; b) developing a unique performance solution to facilitate the efficient use of energy (Armstrong, Wright, Ashe, & Nielsen, 2017; O’Leary, Whaley, & Belusko, 2018). Enker (2015) argues that the code is deliberately flexible in order to motivate the design of more innovative and cost-effective solutions.

It is noteworthy that the Australian Building Codes Board (2019) is developing a project to enhance the application of performance solutions (Armstrong et al., 2017), such as advancing the Verification Method (VM) for the fabric aspect of performance requirements. The VM compares the proposed energy use of a design to the energy use of a reference building that reflects the Deemed-to-Satisfy (DTS) Provisions (Australian Building Codes Board, 2016). Given that assessing energy efficiency is a newly established and evolving part of building design, the introduction of VM into the Code leads to formalising alternative analytical methods to evaluate the compliance of performance solutions (Armstrong et al., 2017; O’Leary et al., 2018). While VM has been developed and employed by energy raters, the Nationwide House Energy Rating Scheme (NatHERS) administration has recently stated that “NatHERS does not accredit tools for use under other NCC compliance pathways” (NatHERS, 2017).

1.2.3 Energy Efficiency and Residential Buildings

In keeping with the desire to minimise consumption, this section outlines energy-efficiency standards and regulations relevant to the design and construction of tiny homes in Australia and Victoria.

Australia’s Nationwide House Energy Rating Scheme

Australia’s Nationwide House Energy Rating Scheme (NatHERS, 2020) was developed in 1993 as a structure to evaluate the thermal performance of residential buildings via a nationally consistent framework for accredited software tools. Established by the Australian Government, NatHERS is a star rating system that grades the energy efficiency of a home based on the building’s design, using a scale of one to ten. The NCC Volume 2 refers to NatHERS as an adequate tool for assessing the compliance of energy performance (specific to climate zone), with the mandated 6-Star stringency level. The building design’s star rating is calculated by modelling a house using accredited third-party software such as AccuRate, FirstRate5, and BERS Pro (National Construction Code (NCC), 2019, p. 363). Initially, NatHERS only considered heating and cooling energy requirements, based on the design and construction materials of the house. In 2010 it was expanded to cover the provisions of fixed lighting and hot water (Berry & Marker, 2015; Heffernan, Beazley, McCarthy, & Sohel, 2017; Moore & Holdsworth, 2019).
The NatHERS rating software simulates the building’s performance by considering the physical characteristics of the building envelope and occupancy level, in the context of its site location and climatic conditions. Ratings range from a minimum of zero stars to a maximum ten stars (which theoretically represents a building with no need for external energy input for heating or cooling) (Enker, 2015). Enker and Morrison (2017) propose three pivotal functions for the NatHERS structure from a policy viewpoint: a) developing a regulatory software tool accredited by the NCC; b) facilitating comparisons of energy efficiency between different designs; and c) promoting enhancements in the performance-based design of residential buildings. Notably, NatHERS modelling software goes beyond compliance. For designers seeking to generate NCC-compliant Performance Solutions, NatHERS also offers a flexible design tool to improve energy efficiency.

**Victoria’s Residential Energy Efficiency Regulations**

In 1991, after the Department of Planning and Urban Growth (1990) published a document indicating the costs and benefits of new regulations, the State of Victoria established energy efficiency requirements for residential buildings. These guidelines proposed prescriptive strategies to achieve the equivalent of a 3-Star NatHERS rating for newly constructed buildings (Enker, 2015). These regulations, which largely governed insulation levels, were reformed in 2001 when the Victorian Government sought to lower greenhouse gas emissions via the Victorian Greenhouse Strategy (2001–2002).

In 2002, when new regulations were introduced against pivotal sectors of the Victorian economy (including transport, buildings, and manufacturing), the Minister for Planning released new residential energy efficiency standards that ushered in the use of software tools for assessments. In 2004, Victoria set a 5-Star NatHERS rating as the minimum performance requirement for new houses. This raised the energy performance of residential buildings from a nominal 2-Star rating, resulting in a 40 percent reduction in permissible energy usage. This pattern was reflected in other states and territories, until the current 6-Star NatHERS rating was set as the minimum requirement across the board in 2011 (Enker, 2015; Enker & Morrison, 2017; Moore & Holdsworth, 2019).

**Low-Energy Housing in Victoria**

While adopting the 6-Star NatHERS rating as the minimum energy performance for Australian houses was a major step forward, this standard still presents challenges for the transition to a low-energy/low-carbon future (Moore, 2012). For example, a 6-Star NatHERS rating still requires significant energy for heating and cooling. Not until a house rates close to a 9-Star standard is the requirement for mechanical heating and cooling removed. Moreover, current requirements emphasise thermal efficiency and fail to consider other energy consumption, including the substantial contribution of home appliances.

The Council of Australian Government (COAG) aims to enhance energy efficiency policy via national consensus. However, in the absence of any increase to the minimum NatHERS energy rating, local government planners have developed state-based performance requirements to make residential buildings more sustainable (Berry & Marker, 2015; Moore & Holdsworth, 2019). In Victoria, for example, the Apartment Design Guidelines were introduced to increase thermal and energy performance requirements via additional design principles (DELWP (VIC), 2016). Also in Victoria, a group of local councils have established the Building Environment Sustainability Scorecard (BESS) to guide the planning stage of residential buildings. Also in Victoria, a group of local councils have established the
Building Environment Sustainability Scorecard (BESS) to guide the planning stage of residential buildings (Moore, Moloney, Hurley, & Doyon, 2017).

Planning laws have also sought to impact the energy performance of housing. Clause 22.17: Environmentally Sustainable Development (ESD) was developed by six councils in Melbourne and introduced to their planning schemes by Victorian ministerial approval and formal gazettal (Moore et al., 2017). The goal of ESD is to embed sustainable practice, from the design stage through to operation. It applies to a wide range of buildings, including single dwellings, apartments, townhouses, commercial buildings, and warehouse conversions. It focuses on optimising natural light and shadow, cross-ventilation, and material selection in accordance with energy efficiency criteria (Berry & Marker, 2015; Moore & Holdsworth, 2019).

1.2.4 Regulation of Tiny Homes: Design, Construction, and Movement

In Appendix A we describe in detail the building principles, guidelines, and regulations that impact the design, construction, and movement of tiny homes. We outline the relevant regulations, and also highlight some key points that should be considered in designing and building both THOFs and THOWs. Given the absence of housing regulations specifically tailored to tiny home construction, we focus on the current Australian regulations that have the greatest influence on tiny houses. These include the Building Code of Australia: National Construction Code (NCC) (2019), Vol 2 for Class 1 Buildings (Housing); Australian Design Rules (ADR) and Vehicle Standards Bulletin (VSB); and planning schemes (Evans, 2018b; Shearer et al., 2019; Strachan, 2019; Weetman, 2019; Wenban, 2019).

The National Construction Code (NCC): Barriers for Tiny Homes

The Australian Building Codes Board (ABCB), which oversees the ongoing development of the National Construction Code (NCC), has proposed a set of reforms to the Code. These reforms include “making the NCC available free online; digitizing the NCC; moving to a three-year amendment cycle; and including quantified performance measures in the 2019 NCC amendment cycle”. Yet the ABCB has not considered the need to review of revise the current housing energy provisions, and has decreased opportunities for improvements by changing to a three-year cycle (Enker & Morrison, 2017). Looking ahead, a Verification Method (VM) for tiny homes may offer a way forward to address compliance with some of the performance-based requirements in the Building Code of Australia (BCA).

In addition, while the NCC-mandated star rating for building energy performance is understandable, some have argued that simulated household energy use has not been correlated with actual likely use (Daniel, Soebarto, & Williamson, 2015; Daniel, Williamson, & Soebarto, 2017). Several surveys have also indicated that the assumptions and modelled energy use of NatHERS software do not necessarily conform to existing energy use data (Ambrose, James, Law, Osman, & White, 2013; O’Leary, Belusko, Whaley, & Bruno, 2016). The system’s suitability for assessing low-energy houses has also been questioned (Daniel et al., 2017; O’Leary et al., 2018). When comparing tiny homes to more traditional homes, using the same data as a basis for comparison, these inconsistencies and inaccuracies could potentially be at their most extreme – especially given that Australia builds the largest houses globally.

Further, O’Leary et al. (2018) argue that there are other inconsistencies in Australia’s regulatory approach to achieving energy-efficient design, as a compliance test can yield quite different results.
depending on the assessment method used. They suggest that “procurement options for dwellings particularly the single-detached style and unique allotment housing of major Australian cities and regional areas can impact the pathway adopted for compliance”. This failure to clearly differentiate between housing types in assessment methodologies can disadvantage non-standard or energy-efficient building approaches, including tiny homes and passive design.

Planning Schemes and Tiny Home Construction

The Victorian Planning System is anchored in a series of Acts (including, primarily, the Planning and Environment Act 1987), state-wide references (the Victorian Planning Provisions [VPP]), and municipality planning schemes (Local Planning Provisions [LPP]). The main aim of this system is to develop a framework for “planning the use, development and protection of land in Victoria”, which can be applied to a wide range of accommodation definitions, from “temporary accommodation, tourism type accommodation, supported accommodation (for those requiring support from an occupant of the primary dwelling) to conventional housing” (Butt & Stephenson, 2019; Department of Environment, 2015, p. 5). However, the Australian planning regulations have not considered tiny houses as a specific class of dwelling (Butt & Stephenson, 2019; Shearer et al., 2019; Weetman, 2019).

Australia’s planning systems have long been concerned with housing quality, size, and form. As previously noted, they primarily emphasise dwelling size and quality, with a focus on avoiding conditions that could result in sub-standard housing and “slum” formation. Here, regulatory processes control housing quality not through design considerations, but rather via land-use change, service provision, and utilities access. Our current planning regulatory environment does not draw any design quality distinctions between small houses, caravans, and cabins (Butt & Stephenson, 2019).

Size and Form as Planning Concerns for Building Tiny Houses

Part 1.3 of this report examines the planning regulatory contexts that impact tiny homes. Here, we discuss some key planning issues relevant to tiny home construction. While the Australian planning framework offers no formal definition of a tiny house, “Appendix Q Tiny Houses” of the International Residential Code 2018 stipulates a maximum floor area of 37sqm for a THOF, and 20sqm for a THOW (Bares, 2017).

The Victorian Planning Provisions (VPP) definition of a dwelling does not specifically refer to size, but simply describes a “building used as a self-contained residence which must include: a kitchen sink; food preparation area; a bath or shower; a closet pan and wash basin” (Victorian State Government, 2021, p. 960). In addition, a residential building is defined in the VPP as “land used to accommodate persons, but does not include camping and caravan park, corrective institution, dependent person’s unit, dwelling, group accommodation, host farm, residential village or retirement village” (Victorian State Government, 2021, p. 972). In theory at least, this provision could admit the possibility of a tiny house residential village being approved. The VPP also considers a dwelling in relation to other uses, for example controls aimed at providing appropriate amenities and access to essential infrastructure, ensuring compatibility with neighbourhood character, conforming with overlays, and protecting the land from risks and hazards such as bushfires and floods.
In this context, the definition of a “dwelling” comprises both the structure and land use. Thus, as Butt and Stephenson point out (2019, p. 4), “to determine that land is being used as a dwelling it is necessary to establish both that the building contains all the facilities included in the definition and also that the building is being used as a self-contained residence (Cotsonis & Ors v Darebin City Council, [2005, VCAT 232]). This has ensured that development applications privilege housing standards. Indeed, “there is no longer any basis in the definitions in the planning scheme for drawing a distinction between types of dwellings” (Butt & Stephenson, 2019, p. 4). This ambiguity means planning provisions for dwellings tend to be applied in a piecemeal way, and by interpretation, in various local government areas.

In sum, the VPP definition of a dwelling is consistent with the intent and structure of a tiny home, provided the component service inclusions exist (Butt & Stephenson, 2019, p. 5). Moreover, as Butt and Stephenson argue, excluding THOWs from the category of “dwelling” based purely on “the presence of wheels or the position of the house on a trailer fails to fully consider the land use question” (Butt & Stephenson, 2019, p. 5).

1.2.5 Universal Design for Tiny Homes

It is widely understood that the built environment plays a significant role in people’s health, wellbeing, security, performance, and social participation. However, simply being able to access a built environment is not enough: ideally, that environment should also meet people’s needs. Given the increasing diversity of age, culture, language, and ability within urban populations, universal design (UD) highlights the need for environments and products to be designed in a way that meets the demands of most members of society, to the greatest extent possible, without any modifications during the person’s lifespan (Connell et al., 1997; Law, 2002; Watchorn et al., 2019). UD contributes to improvements in cultural expression, patterns of interaction, social inclusion, equality, and human rights (Imrie, 2012; Steinfeld & Maisel, 2012; Watchorn et al., 2020).

In 2006, the United Nations adopted the Convention on the Rights of Persons with Disabilities. In 2008 Australia established the National Disability Strategy (NDS), based on the principles of the Convention, and comprising six policy areas. The first policy area uses the term “universal design” and highlights the need for inclusive and accessible housing for all community members, without the need for specialised adaptations. In policy terms, this was a substantial shift toward considering the needs of the population beyond physical impairments. However, in Australia, the main Federal law pertaining to the universal design of built environments is the Disability Discrimination Act 1992 (Canberra, Commonwealth of Australia), which emphasises the accessibility of public premises, but does not consider the health and wellbeing impacts of poor design (Larkin, Hitch, Watchorn, & Ang, 2015).

In 2009, the Disability Investment Group (DIG) strongly advised the Federal Government to strengthen national building standards to increase the supply of universally designed dwellings that will meet the future needs of an ageing population. DIG recommended a minimum set of low-cost access features for Australian housing, including:

- A continuous accessible path of travel linking a parking area or allotment boundary and a level entry into the home
- A bathroom on the ground floor with reinforced walls, to allow for future adaptation, and a hobless, step-free shower recess
• External and internal doorways with a minimum 850mm width
• Corridors on the entry level with a minimum 1000mm width
• Ground floor spaces that can be used as a bedroom and living area, and
• A kitchen area that can be adapted to provide sufficient turning space between benches.

In 2010, the Australian Government brought together the national housing industry and community sector leaders to develop nationally agreed guidelines and plans to tackle the absence of inclusive dwellings (Ward & Bringolf, 2018; Ward, Jill M. Franz, & Adkins, 2014). This group was known as the National Dialogue on Universal Housing Design. The resulting agreement, the Livable Housing Design (LHD) Guidelines, was a national initiative that set best practice standards for the design and construction of inclusive housing to “better meet the changing needs of occupants over their lifetimes” (Livable Housing Australia (LHA), 2012). The National Dialogue set a target for all new housing to meet the LHD Guidelines by 2020, but adherence was voluntary. The Guidelines are overseen by Livable Housing Australia (LHA), which provides advocacy, education, and certification by accredited assessors.

Despite the LHD’s significant role in supporting universal housing design, Australia’s housing industry, as a whole, has achieved an insignificant portion of the National Dialogue’s 2020 target (Ward & Bringolf, 2018; Ward et al., 2014). Four main barriers are widely considered to hinder the implementation of universal design (UD) in Australia: first, the application of UD is not legislated in Australian policy, and the minimum accessibility regulations are only applied to public premises (Larkin et al., 2015); second, the stakeholders generally do not have a broad understanding of UD and the subjective lived experience of people with diverse needs; third, financial constraints (Watchorn et al., 2019); and fourth, the gap between knowledge development and its translation into practice (Watchorn et al., 2020).

The Australian Network for Universal Housing Design (ANUHD) has stated that the Australian Building Codes Board (ABCB) is undertaking a Regulatory Impact Assessment (RIA) to explore options for developing a potential set of minimum accessibility requirements for housing. These requirements would be applied through the NCC by May 2022. The Accessible Housing Project will contribute to the design and construction of homes that are usable by and marketable to almost everyone throughout their life stages. The ANUHD recommends eight proposed guidelines, which are based on the seven principles of universal design. These seven UD principles are: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use (Connell et al., 1997).

Investigating ANUHD’s eight proposed guidelines is beyond the scope of this report. Instead, the Livable Housing Design Guidelines are detailed in the final section of Appendix A. The Livable Housing Design (LHD) Guidelines (2012) were developed by the in a consensus agreement by industry, community, and human rights organisations. Livable Housing Australia (LHA) (2012) proposed four key easy living features for the design of Australian homes: homes should be easy to enter; easy to move in and around; capable of easy and cost-effective adaptation; and designed to anticipate and respond to the changing needs of home occupants.
1.2.6 Victorian Case Studies

Below we present three case studies of recent tiny and compact house projects built in Victoria. The first case study profiles a rapid interim housing model for people recovering from spinal cord and brain injuries. The second features clustered permanent housing for people who have experienced homelessness, while the third is transitional housing for men experiencing homelessness in Geelong.

Case studies of formal clusters of tiny and compact homes are few and far between. Published examples are largely restricted to the grey literature. Peer-reviewed empirical evaluations are even more rare. This paucity of empirical evaluation points to the pressing need for research into compact homes to determine their environmental performance, construction and running costs, and social performance – in terms of building both social connectedness between residents, and between residents and neighbouring communities.

The three case studies below profile examples of single and clustered small homes designed and built for specific groups of residents. To provide additional context for the models we evaluate in this study, we present three further sets of case studies in Appendix C. The first set looks at international precedents, focusing on formal and informal clusters of small homes; it reveals that in many places outside Australia, living in small dwellings is a long-established practice, especially where resources are limited. The second set of case studies presents short descriptions of other compact housing clusters in Geelong and across Australia; these models encompass eco-villages, cohousing developments, a specialist aged care facility, and permanent tiny housing for people experiencing homelessness. The third set briefly discusses the cohousing model and lists 12 examples of cohousing projects in Victoria.

Summer Foundation Accessible Tiny Home Project: Rapid Interim Housing

The Summer Foundation is a not-for-profit organisation that works to resolve the issue of younger people living in Australia’s aged care system. In mid-2019 the Summer Foundation worked with Oscar Building and Stretchy Tech to develop an accessible housing unit to support people with acquired brain injury (ABI) and spinal cord injury (SCI) to leave hospital, rehab, or aged care more quickly. Patients who are unable to return to the community, and who experience reduced physical capabilities, uncertainty, and pain from medical procedures, are known to suffer increased stress and adverse impacts on their healing process (Ampt, Harris, & Maxwell, 2008; Jha, Frye, & Schlimgen, 2017). Financed through a combination of philanthropic funding and support from the Transport Accident Commission (TAC), the Interim Housing project seeks to address the lack of visitable, affordable, relocatable, and prefabricated units in mainstream Australian housing.

The prototype is designed to meet both Livable Housing Australia’s LHD Platinum standard and the NDIS Specialist Disability Accommodation requirements. Assistive technologies are used to improve user independence. The unit is designed so it can be installed behind an existing standard home or co-located on one lot with three to six similar units. It is designed to provide temporary accommodation for tenants, depending on their needs, for a period between four weeks and 12 months. The floor area (see Figure 1.1, below) is approximately 38sqm, with almost 8sqm for the porch and entrance ramp. Residents of rapid interim housing on shared blocks can also utilise an NDIS Supported Independent Living (SIL) provider while still maintaining privacy and independence (Summer Foundation, 2019).
Figure 1.1: Aim of Interim Housing (Summer Foundation, 2019)

Figure 1.2: Interim Housing Prototype (Summer Foundation, 2019)
The Summer Foundation proposes several features for this rapid interim housing:

- Rapid installation on a suitable site
- An undercover entrance
- Wide doorways and generous circulation space to suit motorised wheelchair users
- A flexible bedroom space, with ensuite bathroom
- Kitchen with adjustable cabinetry and other accessible features
- European-style laundry
- Provisions for hoist and other assistive technology (such as voice-controlled lighting, cooling and heating, TV and audio streaming), and
- Relocatable when no longer required (Summer Foundation, 2019).

**Launch–Harris Transportable Housing Project**

In early 2019, community housing provider Launch Housing and philanthropic organisation Harris Capital established the Harris Transportable Housing Project. The initial outcome was the construction of six permanent tiny homes in Melbourne’s inner west, with funding from the Victorian Property Fund. There are now 57 tiny homes located in nine parcels of vacant VicRoads land in the suburbs of Footscray and Maidstone. The Harris Transportable Housing project provides prefabricated houses designed sustainably to meet the tenant requirements of people who have experienced homelessness.

![Figure 1.3: Harris Transportable Housing Project (Launch Housing, 2019)](image)

The homes measure 20sqm inside, and each is set on a 60–90sqm block of land, with a balcony, kitchen, bathroom, and separate secure courtyard. The units comply with 6-Star NatHERS energy rating, with focus on unit orientation, location of windows, and solar hot water. Floor space limits restricted the scope for accessible design, so the units are not intended to support independent living for people with physical disabilities. Locating six to 12 homes on each of the nine sites results in the creation of small communities within a larger community, thus offering new social relationships and supports. However, the lack of shared space and facilities limits interaction between residents.

The main goal of this project was to show how unused government land can be used to address homelessness with cost-effective tiny homes (Launch Housing, 2019). The cost of these units has been reported as being between $80,000 to $130,000 per house when fully connected and installed (Yarra City Council, 2019). This reported value is likely to equate to around $80 000 per unit with up to $50 000 of site costs. Meanwhile, the cost to build a small, permanent one-bedroom unit in Melbourne ranges from around $115,000 to $160,000. The Launch–Harris Transportable Housing Project was awarded an Award for Planning Excellence: Best Planning Ideas (Small Project) at the 2019 Planning Institute Australia PIA National Awards. See Appendix C for more detail on the project.
Prefab 21: Compact Homes for Transitional Housing

Prefab 21 was a partnership between Deakin University’s School of Architecture and Built Environment, HOME Research Hub, FormFlow, and Samaritan House, a Geelong-based organisation providing crisis accommodation and support for men experiencing homelessness. This design/build project focused on the design and fabrication of a prototype compact house based on new construction technologies developed by FormFlow at Deakin ManuFutures.

This transdisciplinary project was accomplished by Deakin architecture students, who worked collaboratively with FormFlow (as builder) and Samaritan House (as client) to produce a prototype prefabricated Independent Living Unit (ILU). Via an interim review, the Microvillage Geelong Taskforce evaluated and provided feedback to student teams, who competed to provide a winning scheme to be built with FormFlow. The winning student scheme is included in Appendix B of this report.

Working as part of a collaborative design and construction team that emulated professional processes, the students designed, documented, and built a pilot ILU; they also designed a microvillage comprised of seven ILUs. The students interacted with builders and clients to realise the project, using a prefabricated system design that is materially innovative and satisfies the client’s needs (see Figure 1.4). The design and development process included research into historical and contemporary approaches to prefabrication, and synthesis of this knowledge into a real-world design/build project.

The Prefab 21 prototype addresses fundamental social needs in a way that is both ecologically and economically sustainable, while providing access to beautiful and functional temporary housing for men experiencing homelessness. The team integrated the project goals of providing shelter and helping to address Australia’s housing affordability crisis; providing solutions for reducing the carbon footprint of future homes (during the build and lifetime of a house); reducing waste through Industry 4.0 approaches, lean manufacturing principles, prefabrication, modular design for reuse, and recycled/recyclable materials (circular economy).

The project has received funding from the Victorian State Government to proceed with the development of the proposed microvillage. Due for occupation in September of 2021, the cluster of Prefab 21 units will include seven single small units providing transitional accommodation for men experiencing homelessness. In August 2020, the project was profiled in a webinar presented by the Deakin Alumni Engagement team. The presenters were Professor James Doerfler from Deakin’s School of Architecture and Built Environment, Professor Richard Tucker from HOME, Dr Matt Dingle from FormFlow, and Brian Sherwell from Samaritan House.
1.2.7 Tiny Home Construction: Enablers, Barriers, and Opportunities

Here we summarise the barriers and benefits of the most viable construction models presently available. Table 1.1 (below) presents findings from an evaluation of a THOW compared to five projected THOF models. In the section that follows (see 1.2.8), we also provide a range of estimated cost comparisons based on different built-form options and scenarios, using available data. It should be noted that construction costs for tiny homes vary greatly, depending on quality, size, and whether they are self-built or contractor built. The possibilities of prefabrication and mass production could, of course, lead to considerable cost reductions.

The following production scale factors are important when considering the stated sums:

- Unlike Europe and the US, in Australia prefabrication cannot compete with the volume builder market, ostensibly due to low volumes. Production numbers are the key to Australian pricing, as our building costs are dominated by labour costs, rather than materials. However, materials are also more expensive and limited in range here compared to Europe and the US.
- There is a critical intersection between cost effectiveness (rate) versus relative cheapness (end price). That is, there is a difference between a product’s end price and the rate price it can be produced for. Increasing production volume is inversely proportional to cost effectiveness; it lowers the rate price but not necessarily the end price, depending on size, quality, and finish.
- Design time will increase costs for a specialist (bespoke) product, such as a tiny home, compared to volume building, because design time is expensive for builders.
- Smaller dwellings do attract a premium, unless a level of efficiency is introduced via process repetition. This applies to both design and construction.
### Table 1.1: Summary of Enablers, Barriers, and Opportunities for Tiny Home Construction

<table>
<thead>
<tr>
<th>Enablers</th>
<th>THOW (Self-built, no land)</th>
<th>THOF-1a Prefab-21 Universal Design</th>
<th>THOF-1b Prefab-21 Universal Design</th>
<th>THOF-2 10-Star NatHERS</th>
<th>THOF-3 Prefab-21 Universal Design</th>
<th>THOF-4 Universal Design + 10-Star NatHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction of Verification Method (VM)</strong> would enable the construction of THOWs in compliance with housing provisions (Armstrong et al., 2017).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Revision of quality standards in planning schemes.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Defining microvillages, which could comprise a number of small houses on one lot (approximately 4–8) and would be similar to medium-density developments (Shearer et al., 2019).</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Building regulations</strong></td>
<td>THOWs face the greatest hurdles to tiny/small house integration due to lack of consensus on what a THOW is, and thus on how they should be regulated (Evans, 2018b).</td>
<td>Given growing popularity of tiny houses in Australia, any changes to BCA will come after current construction wave (Butt &amp; Stephenson, 2019; Wenban, 2019).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must meet construction standards for light truck or caravan, as per Motor Vehicle Standards Act 1989.</td>
<td>Must perform to same level as mainstream housing, as per NCC Vol 2.</td>
<td>Must perform to same level as mainstream housing, as per NCC Vol 2.</td>
<td>Must perform to same level as mainstream housing, as per NCC Vol 2.</td>
<td>Must perform to same level as mainstream housing, as per NCC Vol 2.</td>
<td>Must perform to same level as mainstream housing, as per NCC Vol 2.</td>
<td></td>
</tr>
<tr>
<td><strong>Energy performance</strong></td>
<td>No requirements. THOW no longer regulated as permanent structure, instead classified as light truck or caravan.</td>
<td>THOWs face the greatest hurdles to tiny/small house integration due to lack of consensus on what a THOW is, and thus on how they should be regulated (Evans, 2018b).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No right to the land.</td>
<td>THOWs must perform to same level as mainstream housing (6-Star NatHERS).</td>
<td>Must be highly energy efficient and fully powered from on- and/or off-site renewable energy.</td>
<td>Must be usable by all people, to greatest extent possible, without need for adaptation or specialised design.</td>
<td>Must be highly energy efficient and fully powered from on- and/or off-site renewable energy.</td>
<td>Must be usable by all people, to greatest extent possible, without need for adaptation or specialised design.</td>
<td></td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
<td>Width&lt;2.5m; Length&lt;12.5m; Height&lt;4.3m. No right to the land.</td>
</tr>
<tr>
<td><strong>Upfront unit cost</strong></td>
<td>$50K</td>
<td>$150K</td>
<td>$150K</td>
<td>$150K</td>
<td>$150K</td>
<td>$150K</td>
</tr>
<tr>
<td><strong>Present value of 20-year housing costs (owner occupier)</strong></td>
<td>$374K (treated as chattel, so maximum loan term 7 years)</td>
<td>$336K–$548K includes land and civil works</td>
<td>$353K–$523K</td>
<td>$366K–$541K</td>
<td>$371K–$548K</td>
<td>$456K–$644K</td>
</tr>
<tr>
<td><strong>Securing finance</strong></td>
<td>Tiny homesteaders face difficulties securing bank finance and insurance coverage, due in part to perception that conventional homes offer higher investor security and more stable likelihood of return (Evans, 2018b). THOW loan costs would be equivalent to car loan. THOW mortgages would likely be short duration to mitigate risk (due to depreciation on THOW, which behaves like a vehicle). Insurance for THOWs would be high (reflecting risk).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>Provides flexibility; can relocate if desired (Evans, 2018b).</td>
<td>Relocatable, so greater personal freedom.</td>
<td>Lower energy consumption, so environmentally sustainable.</td>
<td>Lower energy consumption, so environmentally sustainable.</td>
<td>Lower energy consumption, so environmentally sustainable.</td>
<td>Lower energy consumption, so environmentally sustainable.</td>
</tr>
<tr>
<td><strong>Affordability.</strong></td>
<td>Affordability.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated energy use not correlated with actual use (NatHER modelling may not match energy use data) (O’Leary et al., 2018). Introducing a VM for THOF may resolve this.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourages collaborative community projects and use of non-conventional materials and approaches.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Table 1.1: Summary of Enablers, Barriers, and Opportunities for Tiny Home Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.2.8 Cost Comparisons

Below we present a comparison of the 20-year costs for 11 small-home options for Geelong, with Options 3–7 being for five different dwelling types that would be part of a microvillage:

1. THOW (20sqm), self-built, excluding lease or land purchase costs, and assumes pre-existing connection to services such as sewerage, electricity etc. (i.e., no civil or infrastructure costs)
2. THOW (20sqm), contractor-built, excluding lease or land purchase costs, and assumes pre-existing connection to sewerage, electricity services etc. (i.e., no civil or infrastructure costs)
3. THOF-1(a) (20sqm), 6-Star NatHERS contractor-built, on 60sqm and 90sqm land
4. THOF-1(b) Prefab21, 6-Star NatHERS (40sqm), on 80sqm and 110sqm land
5. THOF-2 10-Star NatHERS (40sqm), on 80sqm and 110sqm land
6. THOF-3 Prefab21, universal design, 6-Star NatHERS (48sqm), on 90sqm and 120sqm land
7. THOF-4, universal design, 10-Star NatHERS (48sqm), on 90sqm and 1200sqm land
8. One-bedroom unit (40sqm)
9. One-bedroom apartment (41sqm)
10. Volume-builder house (75.5sqm)
11. Renting one-bedroom apartment in Geelong: market rent $240–$400/week

Land is assumed to cost $789 per sqm, based on North Geelong’s average price. For Options 3–7, we estimated relative costs for two alternative microvillage ownership/financing models (discussed below), based on:

- Whether land is provided on a peppercorn lease basis or purchased
- The size of the land per dwelling (at either a smaller plot size or larger plot sized, based on the size of the dwelling in each option)
- Whether or not each dwelling has land for an adjacent car space (an additional 20sqm), and
- Whether or not the microvillage has shared facilities (400sqm for a village green with a 60sqm community centre, the cost of which is assumed to be shared across 12 dwellings).

This results in 10 Scenarios for each of Options 3–7, as per the two ownership/financing models:

- Scenario 1: free land, no shared facilities, with or without car parking
- Scenario 2: free land, shared facilities, with or without car parking
- Scenario 3: smaller land size at $789 per sqm, no shared facilities, without car parking
- Scenario 4: smaller land size at $789 per sqm, no shared facilities, with car parking
- Scenario 5: smaller land size at $789, shared facilities, without car parking
- Scenario 6: smaller land size at $789, shared facilities, with car parking
- Scenario 7: larger land size at $789 per sqm, no shared facilities, without car parking
- Scenario 8: larger land size at $789 per sqm, no shared facilities, with car parking
- Scenario 9: larger land size at $789 per sqm, shared facilities, without car parking
- Scenario 10: larger land size at $789 per sqm, shared facilities, with car parking

We estimated 20-year average costs and feasibility for Options 1–11, including each of the 10 scenarios provided for Options 3–7. We present relative costs for two alternative ownership/financing models. In Model A (owner-occupied), a resident buys a single compact home. In Model B (social housing), a community housing provider (CHP) develops, owns, and operates a microvillage of compact homes as social housing rentals. In the following tables, “unit cost” refers to individual dwelling built-form cost.
The results from Option 3, Scenario 1 provide a good proxy for the residential park ownership structure. However, the cost of leasing the plot within the residential park would need to be included (that Option assumes a peppercorn lease for the land). Subject to the resident’s income and assets, and the quantum of rent for the plot, they may also be eligible to receive Commonwealth Rent Assistance (CRA).

Included in our cost comparison scenarios are upfront costs including build costs, land costs (where relevant), infrastructure and civil works (where relevant), and ongoing costs including owners’ corporation fees (where relevant), energy, water, maintenance, finance costs, Council rates, and insurances, which we assume will inflate over time. In the resident owner-occupied model, we have not assumed any major capital works or increased maintenance costs over time – over and above inflation, that is. However, we have made a modest allowance for non-responsive maintenance and long-term asset management in the community housing provider-owned model.

These cost-comparison scenarios are not based on a specific development, and as such rest upon assumptions that may or may not eventuate in reality. They serve to compare different options on a relative basis; however, each development will need to be assessed on its own merits, and cost and financing arrangements will be specific to the lender, property, and borrower. Results for these cost-comparison scenarios under the two financing models are summarised below. Detailed results of each scenario, and the assumptions we used, are provided in an accompanying Excel workbook (see Appendix F for the link). The model we used to calculate these cost comparisons is also outlined.

**Cost Comparison Results, Model A (Owner-Occupied): Resident Purchases Property**

In this financing model, the resident buys the property, assuming the development is strata titled (excluding THOWs). For all fixed-foundation dwellings, we assume a standard 30-year amortising mortgage loan with a minimum 20 percent deposit to avoid lenders’ mortgage insurance (LMI), which can cost thousands of dollars. There is a caveat: borrowers need to meet lender deposit requirements and loan serviceability thresholds, and older borrowers may have difficulty securing a 30-year loan.

For THOWs, we assume seven-year fully amortising loans with a 30 percent minimum deposit, at a higher interest rate. This is because lenders treat THOWs as chattels (akin to personal vehicles, which depreciate in value over time), not as residential properties. We assume constant interest rates for both THOWs and THOFs at 7 percent and 3 percent respectively. Options 1, 2, and 8–11 are provided as comparators to the resident owner-occupied purchase financing model. Detailed results are provided in the Excel workbook (see Appendix F for link).

The results of the cost comparison scenarios highlight the challenges of addressing housing security through home ownership for Australians on low incomes (results are summarised in Tables 1.2–1.6). For pensioners and other very low-income households (annual household income of $24,770–$37,340) only Options 1 and 2 offer any financial viability in terms of home ownership. However, these two options are not suitable for ageing in place. Financial feasibility for owner occupiers improves at annual household incomes of $50,000 or more, with viability across all the THOF Options. However, the inclusion of larger lot sizes and shared community facilities is most likely out of reach for people at the lower end of the income range on the more expensive 10-Star NatHERS Options – the increased cost of which exceeds the benefits of lower energy costs over the 20-year period. This highlights the challenges we face in transitioning to a low-carbon and more sustainable future.
The net total cost estimations after taking into account the property value at year 20 net of outstanding mortgage debt at year 20 demonstrates the benefits of home ownership where land is a more significant proportion of the upfront overall property value. This is also borne out in the THOW options (Options 1 and 2), where there is no land component to the value, and the value of the THOW is expected to depreciate to $0 over a 7-year horizon. Further, Option 9 illustrates the impact of additional recurring costs through company title and high dwelling/low land composition of property value which reduces property appreciation potential over time.

### Table 1.2: Long-term Cost Comparisons of Small Home Options – Model A: Owner-Occupied

<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Upfront total cost/price (includes dwelling, infrastructure, civil and land costs &amp; any shared facilities)*</th>
<th>Present value of total cost over 20 years (resident purchase) *</th>
<th>Residual property value at year 20 (value minus outstanding mortgage loan balance)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION 1: THOW (20sqm)</strong></td>
<td>$50K</td>
<td>$174K</td>
<td>0</td>
</tr>
<tr>
<td>Self-built, no lease or land purchase costs, no connection to services (sewerage, electricity etc.), unit cost $50K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OPTION 2: THOW (20sqm)</strong></td>
<td>$82.7K</td>
<td>$223K</td>
<td>0</td>
</tr>
<tr>
<td>Contractor-built, no lease or land purchase costs, no service connection, unit cost $82.7K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor-built, unit cost $150K–$235K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefab21, unit cost $160K–$255K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Star NatHERS, unit cost $200K–$300K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefab21 (universal design), unit cost $175K–$275K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universal design + 10-Star NatHERS, unit cost $290K–$402K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OPTION 8: One-bedroom unit (40sqm)</strong></td>
<td>$251.9K</td>
<td>$482K–$488K</td>
<td>$219K</td>
</tr>
<tr>
<td><strong>OPTION 9: One-bedroom apartment (41sqm)</strong></td>
<td>$257.8K</td>
<td>$549K–$555K</td>
<td>$166K</td>
</tr>
<tr>
<td><strong>OPTION 10: Volume-builder house (75.5sqm)</strong></td>
<td>$406.9K</td>
<td>$669K–$676K</td>
<td>$463K</td>
</tr>
<tr>
<td><strong>OPTION 11: Renting one-bedroom apartment in Geelong ($240–$400/week)</strong></td>
<td>n/a</td>
<td>$368K–$585K</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* Individual dwelling construction cost, including civil and engineering costs (+ 1/12 share of community centre build, if relevant).
* In Options 3–10, results depend on scenario and whether owner is a pensioner (pensioners qualify for reduced LGA rates).
** Lower bound of residual property value could be lower, as property value at year 20 for Scenarios 1 and 2 (Options 3–7) depends on lease terms and time remaining. Residents could also be required to return land to its pre-occupancy condition.
(See Excel workbook for detailed results of each scenario: Appendix F)
<table>
<thead>
<tr>
<th>Dwelling Scenario</th>
<th>Upfront total cost/price +</th>
<th>Present value of total cost over 20 years (resident purchase) *</th>
<th>Residual property value at year 20 (value minus outstanding mortgage loan balance)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario 1</strong>: peppercorn-leased land, no shared facilities, with or without car parking</td>
<td>$150K–$290K</td>
<td>$336K–$462K</td>
<td>$48K–$105K **</td>
</tr>
<tr>
<td><strong>Scenario 2</strong>: peppercorn-leased land, shared facilities, with or without car parking</td>
<td>$163K–$315K</td>
<td>$348K–$518K</td>
<td>$52K–$114K **</td>
</tr>
<tr>
<td><strong>Scenario 3</strong>: smaller land size at $789 per sqm, no shared facilities, without car parking</td>
<td>$197K–$361K</td>
<td>$382K–$532K</td>
<td>$96K–$212K</td>
</tr>
<tr>
<td><strong>Scenario 4</strong>: smaller land size at $789 per sqm, no shared facilities, with car parking</td>
<td>$213K–$377K</td>
<td>$398K–$548K</td>
<td>$113K–$235K</td>
</tr>
<tr>
<td><strong>Scenario 5</strong>: smaller land size at $789 per sqm, shared facilities, without car parking</td>
<td>$237K–$412K</td>
<td>$435K–$615K</td>
<td>$128K–$260K</td>
</tr>
<tr>
<td><strong>Scenario 6</strong>: smaller land size at $789 per sqm, shared facilities, with car parking</td>
<td>$252K–$428K</td>
<td>$469K–$630K</td>
<td>$114K–$284K</td>
</tr>
<tr>
<td><strong>Scenario 7</strong>: larger land size at $789 per sqm, no shared facilities, without car parking</td>
<td>$221K–$385K</td>
<td>$406K–$558K</td>
<td>$121K–$247K</td>
</tr>
<tr>
<td><strong>Scenario 8</strong>: larger land size at $789 per sqm, no shared facilities, with car parking</td>
<td>$237K–$400K</td>
<td>$421K–$571K</td>
<td>$137K–$271K</td>
</tr>
<tr>
<td><strong>Scenario 9</strong>: larger land size at $789 per sqm, shared facilities, without car parking</td>
<td>$260K–$436K</td>
<td>$476K–$638K</td>
<td>$152K–$296K</td>
</tr>
<tr>
<td><strong>Scenario 10</strong>: larger land size at $789 per sqm, shared facilities, with car parking</td>
<td>$276K–$452K</td>
<td>$492K–$654K</td>
<td>$168K–$319K</td>
</tr>
</tbody>
</table>

Table 1.3: Long-term Cost Comparisons of Small Home Options by Scenario – Model A: Owner-Occupied (Options 3–10)

+ Individual dwelling construction cost, including civil and engineering costs (+ 1/12 share of community centre build, if relevant).
* In Options 3–10, results depend on scenario and whether owner is a pensioner (pensioners qualify for reduced LGA rates).
** Lower bound of residual property value could be lower, as property value at year 20 for Scenarios 1 and 2 (Options 3–7) depends on lease terms and time remaining. Residents could also be required to return land to its pre-occupancy condition. (See Excel workbook for detailed results of each scenario: Appendix F)
Cost Comparison Results, Model B (Social Housing): CHP Develops, Owns, Operates Microvillage

In this financing model, the microvillage is developed, owned, and financed by a private investor, assuming the development is strata titled. We have assumed the developer/owner/operator is a registered community housing provider (CHP) to make best use of several factors: tax status (GST exempt, and able to claim GST on inputs for social housing supply, for example on development costs); access to Commonwealth Rent Assistance (CRA), cheap long-term fixed-rate financing through the National Housing Finance and Investment Corporation (NHFIC); and expertise in managing social/affordable housing and community-building).

Residents rent the dwellings as social housing tenants, paying income-capped rents at 30 percent of household income, subject to the rent cap being no more than 75 percent of market rental rates. Social housing is generally assumed to have an effective life of 40 years, so we have assumed loans are over a 40-year period. Where land is leased, the loan will need to be fully repaid out of free cashflows before the lease term ends and the property is handed back to the owner.

It should be noted that access to social housing and income-capped rents through CHPs is subject to strict eligibility criteria based on household income and asset levels. The waiting list for social housing tenancies is lengthy, with current waiting periods often extending to several years. The Victorian Government recently announced its Big Housing Build Strategy as part of its post COVID-19 recovery package, which will increase the supply of social housing in Victoria, but probably not sufficiently to fully alleviate demand. Community housing providers in Victoria are required to offer a certain proportion of their managed properties to people who are on the Victorian Housing Register’s priority list (that is, people who have been deemed to be most in need of social housing).

Our results for the social impact investor ownership/financing model demonstrate the challenges CHP face in increasing housing supply in Australia. While the NHFIC has been a welcome addition, and larger CHPs have moved to refinance existing debt and issue additional debt (benefiting from lower interest rates and longer loan tenors), this is in effect a once-off benefit. Due to the constraints on debt service coverage ratios imposed by low-income rents, even at historically low interest rates, CHPs can only leverage their owned assets to very modest levels (10–25 percent loan-to-valuation ratios, depending on the income distribution of the residents in their portfolios).

To improve feasibility, CHPs often work towards having a blended tenant mix, according to income; in effect, couple households and households on somewhat higher incomes help to cross-subsidise single person households on lower incomes. Notwithstanding this practice, generating new housing assets in the CHP sector is usually dependent on receiving government and/or philanthropic grants – either in the form of upfront grants that reduce the debt required to finance the development, or annual subsidies to supplement the income-capped rents and Commonwealth Rent Assistance received from residents, thus enabling the CHP to service more of the debt on the development.

To enable comparison between the two financing models – Model A (resident owner-occupied), and Model B (CHP-owned and operated social housing) – we have provided results for the latter based on the net present value of total cost over a 20-year period. Where relevant, we have highlighted the quantum of upfront grant that would be required for the net present cost to equal zero. (Government support to assist CHPs to develop new social housing supply is generally provided via upfront grants,
annual subsidies, and/or access to “free” land.) However, even where the 20-year net present value of various options is positive, this primarily reflects the residual property value at year 20. This is most notably influenced by the amount of land in each built form option and related scenario, which is assumed to appreciate in value over time, and masks annual cashflow operating deficits.

To determine feasibility, CHPs will consider the overall cost and net present value over the life of the project. However, they will also take into account, and be constrained by:

- the need to limit cashflow operating deficits (which otherwise would need to be funded by additional debt or selling other properties to free up cashflow to mitigate the deficit), and
- the need to comply with debt service coverage and loan-to-valuation ratio covenants set by their lenders (which may require CHPs to provide additional unencumbered assets as security for the loan, that they may or may not have access to).

The results set out in Tables 1.4 and 1.5 (below) highlight the sensitivity of the CHP business model on tenancy mix by income, and the reliance on additional capital and/or subsidy support to make the development of new housing supply in the community housing sector feasible. The results also help to explain why it is challenging to find CHP partners to fund microvillages or compact home communities, unless the development attracts significant government support.
<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Upfront total cost (includes dwelling, infrastructure, civil and land costs &amp; any shared facilities; assumes CHP pays no GST on development costs) +</th>
<th>Present value of total cost over 20 years (to CHP) *</th>
<th>Upfront grant required to achieve NPV of $0</th>
<th>Upfront grant as a proportion of total upfront cost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION 3: THOF-1A (20sqm)</strong> Contractor-built, unit cost $150K–$235K</td>
<td>$1,691K–$3,199K</td>
<td>(1) $786K–$2,058K (2) $342K–$1,375K (3) $438K–$1,279K (4/5) $603K–$1,114K</td>
<td>(1) $616K–$1,831K (2) $0–$1,076K (3) $0–$1,002K (4/5) $0–$872K</td>
<td>(1) 20.8%–&gt;100% (2) 0–58.8% (3) 0–54.7% (4/5) 0.476%</td>
</tr>
<tr>
<td><strong>OPTION 4: THOF-1B (40sqm)</strong> Prefab21, unit cost $160K–$255K</td>
<td>$1,800K–$3,496K</td>
<td>(1) $696K–$2,655K (2) $433K–$1,526K (3) $528K–$1,431K (4/5) $693K–$1,266K</td>
<td>(1) $601K–$1,950K (2) $0–$1,196K (3) $0–$1,121K (4/5) $0–$992K</td>
<td>(1) 17.2%–&gt;100% (2) 0–61.3% (3) 0–57.5% (4/5) 0–50.9%</td>
</tr>
<tr>
<td><strong>OPTION 5: THOF-2 (40sqm)</strong> 10-Star NatHERS, unit cost $200K–$300K</td>
<td>$2,236K–$3,987K</td>
<td>(1) $791K–$3,287K (2) $129K–$2,159K (3) $34K–$2,063K (4/5) $131K–$1,899K</td>
<td>(1) $986K–$2,440K (2) $101K–$1,692K (3) $27K–$1,617K (4/5) $0–$1,488K</td>
<td>(1) 27.5%–&gt;100% (2) 2.9%–69.3% (3) 0.8%–66.3% (4/5) 0–61.0%</td>
</tr>
<tr>
<td><strong>OPTION 6: THOF-3 (48sqm)</strong> Prefab21 (universal design), unit cost $175K–$275K</td>
<td>$1,964K–$3,747K</td>
<td>(1) $791K–$2,855K (2) $338K–$1,727K (3) $432K–$1,632K (4/5) $598K–$1,467K</td>
<td>(1) $620K–$2,106K (2) $0–$1,353K (3) $0–$1,279K (4/5) $0–$1,149K</td>
<td>(1) 17.8% – &gt;100% (2) 0%–64.3% (3) 0 – 60.7% (4/5) 0 – 54.6%</td>
</tr>
<tr>
<td><strong>OPTION 7: THOF-4 (48sqm)</strong> Universal design + 10-Star NatHERS, unit cost $290K–$402K</td>
<td>$2,956K–$4,870K</td>
<td>(1) $2,070K–$4,303K (2) $941K–$3,171K (3) $846K–$3,079K (4/5) $681K–$2,914K</td>
<td>(1) $1,622K–$3,229K (2) $738K–$2,488K (3) $663K–$2,413K (4/5) $534K–$2,284K</td>
<td>(1) 37.0%–&gt;100% (2) 17.2%–77.0% (3) 15.5%–74.7% (4/5) 12.5%–70.7%</td>
</tr>
</tbody>
</table>

Table 1.4: Long-term Cost Comparisons of Small Home Options by Built Form and Resident Income Profile – Model B: Social Housing
+ Individual dwelling construction cost including civil and engineering costs and community centre construction, where relevant.
* Varies by scenario (i.e., Scenarios 1–10 for each option)
(1) Single pension household, eligible for CRA, rent capped at 30 percent of income
(2) Couple pension household, eligible for CRA, rent capped at 30 percent of income
(3) Household with total annual income of $50K, not eligible for CRA, rent capped at 30 percent of income
(4) Household with total annual income of $75K, not eligible for CRA, rent capped at 75 percent of market rental
(5) Household with Australian median annual household income of $95,732 as at June 2020
(See Excel workbook for detailed results of each scenario: Appendix F)
## Dwelling Type

<table>
<thead>
<tr>
<th>Scenario 1: peppercorn-leased land, no shared facilities, with or without car parking</th>
<th>Upfront total cost (dwelling, infrastructure, civil and land costs, shared facilities; CHP pays no GST on development costs) +</th>
<th>Present value of total cost over 20 years (to CHP) *</th>
<th>Upfront grant required to achieve NPV of $0</th>
<th>Upfront grant as proportion of total upfront cost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,691K–2,956K</td>
<td>(1) $2,058K–$3,689K&lt;br&gt;(2) $929K–$2,560K&lt;br&gt;(3) $834K–$2,464K&lt;br&gt;(4/5) $669K–$2,300K</td>
<td>(1) $1,612K–$2,891K&lt;br&gt;(2) $728K–$2,006K&lt;br&gt;(3) $654K–$1,932K&lt;br&gt;(4/5) $524K–$1,803K</td>
<td>(1) 95.4%–97.8%&lt;br&gt;(2) 43.1%–67.9%&lt;br&gt;(3) 38.7%–65.3%&lt;br&gt;(4/5) 31.0%–61.0%</td>
<td></td>
</tr>
</tbody>
</table>

| Scenario 2: peppercorn-leased land, shared facilities, with or without car parking | $1,832K–$3,229K | (1) $2,502K–$4,303K<br>(2) $1,374K–$3,174K<br>(3) $1,279K–$3,079K<br>(4/5) $1,114K–$2,914K | (1) $1,832K–$3,229K<br>(2) $1,077K–$2,488K<br>(3) $1,022K–$2,413K<br>(4/5) $873K–$2,284K | (1) >100%<br>(2) 58.8%–77.0%<br>(3) 54.7%–74.7%<br>(4/5) 47.6%–70.7% |

| Scenario 3: smaller land size at $789 per sqm, no shared facilities, without car parking | $2,259K–$3,808K | (1) $1,364K–$2,648K<br>(2) $235K–$1,519K<br>(3) $50K–$1,424K<br>(4/5) +$115K–$1,259K | (1) $998K–$2,075K<br>(2) $114K–$1,191K<br>(3) $39K–$1,116K<br>(4/5) $0–$987K | (1) 38.1%–54.5%<br>(2) 4.4%–31.3%<br>(3) 1.5%–29.3%<br>(4/5) 0–25.9% |

| Scenario 4: smaller land size at $789 per sqm, no shared facilities, with car parking | $2,448K–$3,998K | (1) $1,133K–$2,417K<br>(2) +$86K–$1,288K<br>(3) +$181K–$1,193K<br>(4/5) +$346K–$1,028K | (1) $817K–$2,074K<br>(2) $0–$1,010K<br>(3) $0–$935K<br>(4/5) $0–$806K | (1) 29.7%–47.4%<br>(2) 0–25.3%<br>(3) 0–23.4%<br>(4/5) 0–20.2% |

| Scenario 5: smaller land size at $789, shared facilities, without car parking | $2,715K–$4,397K | (1) $1,344K–$2,877K<br>(2) $216K–$1,748K<br>(3) $121K–$1,653K<br>(4/5) +$44K–$1,488K | (1) $1,054K–$2,255K<br>(2) $169K–$1,370K<br>(3) $95K–$1,296K<br>(4/5) $0–$1,166K | (1) 34.2%–51.3%<br>(2) 5.6%–31.2%<br>(3) 3.1%–29.5%<br>(4/5) 0–26.5% |

| Scenario 6: smaller land size at $789, shared facilities, with car parking | $2,905K–$4,586K | (1) $1,113K–$2,646K<br>(2) +$16K–$1,517K<br>(3) +$111K–$1,422K<br>(4/5) +$276K–$1,257K | (1) $873K–$2,074K<br>(2) $0–$1,189K<br>(3) $0–$848K<br>(4/5) $0–$715K | (1) 27.1%–45.2%<br>(2) 0–25.9%<br>(3) 0–24.3%<br>(4/5) 0–21.5% |

| Scenario 7: larger land size at $789 per sqm, no shared facilities, without car parking | $2,543K–$4,093K | (1) $927K–$2,301K<br>(2) +$202K–$1,173K<br>(3) +$297K–$1,078K<br>(4/5) +$462K–$913K | (1) $797K–$1,804K<br>(2) $0–$919K<br>(3) $0–$848K<br>(4/5) $0–$715K | (1) 25.6%–44.1%<br>(2) 0–22.5%<br>(3) 0–20.6%<br>(4/5) 0–17.5% |
### Table 1.5: Long-term Summary Cost Comparisons of Small Home Options by Built Form and Resident Income Profile – Model B: Social Housing

| Scenario 8: larger land size at $789 per sqm, no shared facilities, with car parking | (1) $696K–$2,070K | (1) $545K–$1,622K | (1) 18.0%–37.9% |
| (2) $433K–$941K | (2) $0–$738K | (2) 0–17.2% |
| (3) $528K–$846K | (3) $0–$663K | (3) 0–15.5% |
| (4/5) $693K–$681K | (4/5) $0–$534K | (4/5) 0–12.5% |

$2,732K–$4,282K

| Scenario 9: larger land size at $789 per sqm, shared facilities, without car parking | (1) $998K–$2,530K | (1) $782K–$1,983K | (1) 23.6%–42.4% |
| (2) $131K–$1,401K | (2) $0–$1,098K | (2) 0–23.5% |
| (3) $226K–$1,307K | (3) $0–$1,024K | (3) 0–21.9% |
| (4/5) $391K–$1,141K | (4/5) $0–$895K | (4/5) 0–19.1% |

$3,000K–$4,681K

| Scenario 10: larger land size at $789 per sqm, shared facilities, with car parking | (1) $766K–$2,299K | (1) $600K–$1,802K | (1) 17.2%–37.0% |
| (2) $363K–$1,170K | (2) $0–$917K | (2) 0–18.8% |
| (3) $458K–$1,075K | (3) $0–$843K | (3) 0–17.3% |
| (4/5) $623K–$910K | (4/5) $0–$713K | (4/5) 0–14.6% |

$3,189K–$4,870K

* Individual dwelling construction cost including civil and engineering costs, and community centre construction.

* Results depend on built form (Options 3–7)

1. Single pension household, eligible for CRA, rent capped at 30 percent of income
2. Couple pension household, eligible for CRA, rent capped at 30 percent of income
3. Household with total annual income of $50K, not eligible for CRA, rent capped at 30 percent of income
4. Household with total annual income of $75K, not eligible for CRA, rent capped at 75 percent of market rental
5. Household with Australian median annual household income of $95,732 as at June 2020

(See Excel workbook for detailed results of each scenario: Appendix F)
Cost Comparison Results: Model A (owner-occupied) vs. Model B (social housing)

Finally, Table 1.6 (below) demonstrates the variation in affordability of the various built-form options, and between the two financing models (Model A: resident owner-occupied purchase; and Model B: CHP built/owned/operated as social housing rental stock).

The table clearly shows that all the resident owner-occupied purchase options that are suitable for ageing in place are currently unaffordable for single pensioner households with limited assets. Only the more modest microvillage scenarios are affordable for couple pensioner households. This is especially the case when compared with social housing tenancies, which offer eligible residents income-capped rents and high security of tenure. Furthermore, many people who are approaching retirement age or already retired find it very difficult to secure a 30-year mortgage.

We note that while moving to a 10-Star NatHERS rated option does not yet seem financially rational for homeowners under Model A (owner-occupier), it does have a significant impact on overall housing costs for residents in Model B (CHP-owned and operated social housing). Energy poverty amongst residents is a key concern for many CHPs, but the increased building costs for a 10-Star NatHERS dwelling must be weighed against the opportunity cost of increasing housing supply for additional residents. This balancing act is especially relevant given the current high degree of unmet demand for social housing, and the need to transition to a low-carbon and more sustainable future.
<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Annual average total housing cost (including financing, rates, utilities, owner corp, maintenance) as a percentage of total average household income for Model (A): Owner-occupier* and Model (B): social housing rental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual household income</td>
<td>Single pension household ($24,770 household income)</td>
</tr>
<tr>
<td><strong>OPTION 1: THOW (20sqm)</strong></td>
<td>Self-built, no lease or land purchase costs, no connection to services (sewerage, electricity etc.)</td>
</tr>
<tr>
<td>(A) 29.6%</td>
<td>(A) 19.7%</td>
</tr>
<tr>
<td>(B) n/a</td>
<td>(B) n/a</td>
</tr>
<tr>
<td><strong>OPTION 2: THOW (20sqm)</strong></td>
<td>Contractor-built, no lease or land purchase costs, no service connection.</td>
</tr>
<tr>
<td>(A) 38.0%</td>
<td>(A) 25.2%</td>
</tr>
<tr>
<td>(B) n/a</td>
<td>(B) n/a</td>
</tr>
<tr>
<td><strong>OPTION 3: THOF-1A (20sqm)</strong></td>
<td>Contractor-built, unit cost</td>
</tr>
<tr>
<td>Prefab21</td>
<td></td>
</tr>
<tr>
<td>(A) 57.3%-84.0%</td>
<td>(A) 38.0%-55.7%</td>
</tr>
<tr>
<td>(B) 40.2%</td>
<td>(B) 37.8%</td>
</tr>
<tr>
<td><strong>OPTION 4: THOF-1B (40sqm)</strong></td>
<td>Prefab21 (universal design)</td>
</tr>
<tr>
<td>(A) 60.3%-89.8%</td>
<td>(A) 40.0%-59.6%</td>
</tr>
<tr>
<td>(B) 41.4%</td>
<td>(B) 38.6%</td>
</tr>
<tr>
<td><strong>OPTION 5: THOF-2 (40sqm)</strong></td>
<td>Universal design + 10-Star NatHERS</td>
</tr>
<tr>
<td>(A) 62.5%-92.9%</td>
<td>(A) 41.5%-61.6%</td>
</tr>
<tr>
<td>(B) 36.9%</td>
<td>(B) 35.6%</td>
</tr>
<tr>
<td><strong>OPTION 6: THOF-3 (48sqm)</strong></td>
<td>Prefab21 (universal design)</td>
</tr>
<tr>
<td>(A) 63.4%-94.2%</td>
<td>(A) 42.1%-62.5%</td>
</tr>
<tr>
<td>(B) 41.9%</td>
<td>(B) 38.9%</td>
</tr>
<tr>
<td><strong>OPTION 7: THOF-4</strong></td>
<td>Universal design + 10-Star NatHERS</td>
</tr>
<tr>
<td>(A) 77.8%-110.6%</td>
<td>(A) 51.6%-73.4%</td>
</tr>
<tr>
<td>(B) 36.9%</td>
<td>(B) 35.6%</td>
</tr>
<tr>
<td><strong>OPTION 8: One-bedroom unit (40sqm)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>82.4%</td>
</tr>
<tr>
<td><strong>OPTION 9: One-bedroom apartment (41sqm)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>93.8%</td>
</tr>
<tr>
<td><strong>OPTION 10: Volume-builder house (75.5sqm)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>114.4%</td>
</tr>
<tr>
<td><strong>OPTION 11: One-bedroom rental apartment, Geelong ($240–$400/week)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>62.8–99.9%</td>
</tr>
</tbody>
</table>

Table 1.6: Affordability of Options for Residents by Income Level, for Both Model A (Owner-Occupied) and Model B (CHP-Owned Social Housing)

* Range provided, as outcome depends on the scenario (i.e., scenarios 1–10 for each of built form Options 3–7)
(A) Model A: Resident owner-occupied, strata-titled, purchase financing model
(B) Model B: CHP-developed, owned, and operated as social housing rental stock financing model
(See Excel workbook for detailed results of each scenario: Appendix F)
Other Ownership Structures and Financing Models

Shared equity: Several members of the Geelong Microvillage Taskforce indicated they have a modest amount of savings (in the vicinity of $50,000) that they could contribute to the microvillage development via shared equity. A co-ownership model with a community housing provider (CHP) was favoured by focus group and STICKE workshop participants. When we started modelling co-ownership structures, we found that the shared equity model with low-income households and CHPs is not a viable option for CHPs. The proportional reduction in rent, and the obligation to pay out the shared equity component and any appreciation to the resident at the end of the term, put additional stress on an already-challenged business model, and further reduced the feasibility of this option for CHPs. Consequently, we did not provide cost comparison results for this option, but instead modelled CHP ownership with dwellings provided to residents on a social housing tenancy basis (Model B, above).

Peppercorn land leases: As the results of our cost comparison scenarios show, while obtaining land at peppercorn-lease rates reduces up-front costs, it also reduces the viability/attractiveness of the option for the dwelling owner, as the dwelling’s value tends to depreciate over time, while the land value tends to appreciate over time. This is especially problematic when housing is provided to households on low incomes, as the return on these assets is insufficient to fully maintain the properties over time and reinvest in capital works when they reach the end of their useful lives (generally considered to be about 40 years for social housing assets). Even removing the cost of land from the equation, some form of grant contribution (either an upfront grant or an ongoing subsidy) is typically required to make these developments feasible for CHPs – especially if they are accommodating people at the low end of the income spectrum. CHPs often try to manage this constraint by also housing some people who are further up the income spectrum, but this must be balanced by CHPs’ mission and obligation to source a certain proportion of their tenancies from the Victorian Housing Register’s “Priority Access” list.

Government grants: The Victorian State Government has often supported potential homeowners with grants to build or purchase an owner-occupied dwelling. These incentives are typically geared towards first homeowners. Given the financial and other wellbeing benefits of home ownership, there is an argument for offering higher levels of more targeted support to people on low incomes who aspire to home ownership and have sufficient income to manage repayments, even if they have previously been homeowners. For example, women over 50 who find themselves without secure housing after relationship breakdown.

Increased supply of social housing: As our cost comparison scenarios demonstrate, housing options for people on very low incomes (for example, single pensioners, people living with a disability, people who are excluded from the workforce) are very limited. Both home ownership and market-based rents are significantly out of reach. For many in this cohort, social housing is currently the only viable option to secure safe and affordable housing. Given the recent major investment in social housing announced by the Victorian State Government, this presents an opportunity to consider alternative models of social and affordable housing. This includes microvillages of high-quality, prefabricated, modestly priced compact homes designed for ageing in place, targeted at residents who are seeking to live in a sustainably and socially connected way. This model could be used to increase the supply of affordable housing, particularly if it has a lower cost to government and the community housing sector, and/or offers increased sustainability and lower energy costs for residents over time.
Strengthened tenancy rights: A key theme for study participants was the desire for security of tenure, with an implicit assumption that this is only attainable as a homeowner or in some form of co-ownership arrangement. With a growing number of Australian households becoming long-term renters, there are strong arguments for further strengthening renters’ tenancy rights in the private rental market, while also institutionalising a build-to-rent market that includes a high proportion of affordable housing options for lower-income households. It is worth noting here that community housing providers (CHPs) typically provide stronger security of tenure than the private rental market.

1.2.9 Conclusion

This evidence review explores the complexities and potential contradictions of tiny/compact houses within the current building regulatory framework. As outlined, the regulations governing the construction and occupancy of tiny homes comprise building standards relating to the structure itself, planning schemes relating to amenity and land use, and traffic regulations associated with the mobile nature of THOWs (Butt & Stephenson, 2019; Wenban, 2019).

In Australia, most building regulations and planning schemes overlook tiny houses. Analysing the compliance of tiny houses (THOWs and THOFs) against the regulatory framework reveals their capacity to meet many performance criteria. That said, several factors call for novel performance solutions and/or some adjustments to the existing regulatory codes: these factors include the compact nature of tiny homes, a need for universal design to enable ageing in place, and the moveability of THOWs.

While this evidence review shows that tiny homes on permanent foundations (THOWs) face stricter construction regulations than those built on wheel-beds (THOFs), it remains unfeasible for THOW design to adhere to some current regulatory requirements, particularly for ceiling height, stairways, and environmental performance.

Given the considerable willingness of tiny house residents to inhabit their homes permanently, Wenban (2019) argues that the Australian regulatory framework needs to incorporate tiny home standards into the Building Code of Australia (BCA) to provide a potential path to permanent occupancy of tiny houses in all states and territories.
1.3 Planning Regulatory Context

1.3.1 Background

The evidence review below examines the relevant planning contexts for tiny homes and microvillages. We begin with a discussion of the Victorian planning context, then focus on the planning situation in Geelong. We then summarise the main planning barriers, enablers, and opportunities for tiny homes and microvillages. Finally, we present case studies of comparable housing projects from Geelong and elsewhere in Australia, and discuss the relevance of the cohousing model, with links to a selection of cohousing projects in Victoria.

1.3.2 Victorian Planning Context

The Victorian planning system operates through a nested array of provisions, schemes, and regulations. At the highest levels are State plans for metropolitan areas, as well as the Victorian Planning Provisions. These lead to Municipal Strategic Statements and Local Planning Frameworks. Each locality must then produce its own planning schemes and statements in accordance with these higher-level regulations, while also accommodating local conditions.

Thus, Geelong has the Greater Geelong Planning Scheme, which both conforms to and enacts the general and more localised provisions. In addition, there are a series of overlays which must be incorporated and respected in any planning scheme amendment that would change what already exists. These include overlays for Vegetation Protection, Heritage, Bushfire Management, Parking, Development Contributions, and Design and Development.

Policies set out in planning documents signal an intention and direction for the future support of specific actions. But unless these actions are explicitly mentioned and described in the Municipal Strategic Statement (MSS) in the Planning Scheme, or within development plan overlays, planning provisions or zoning regulations, they will have a lower status in any appeals made to the Victorian Civil and Administrative Tribunal (VCAT).

Other planning-related mechanisms, such as a Development Application or Permit Application, can be used to specify variations – for example, the inclusion of cohousing and communal living arrangements, including structure plans, masterplans, urban design frameworks, and rezoning requirements. These mechanisms could be used to designate particular spaces or precincts as areas in which specific housing typologies might be supported. Guidelines and requirements can be mandated in these plans and frameworks. These may include car parking, bicycle storage, communal water, or shared energy grids, such as peer-to-peer energy trading.

In relation to planning considerations, Shearer et al. (2019, p. 4) note the following major barriers to normalising tiny homes as a form of housing tenure:

The most problematic are that LGA planning scheme provisions do not support tiny houses as a feasible housing option, and it is difficult for them to comply with the Building Code of Australia/National Construction Code... Notably, planning schemes in themselves do not create barriers to tiny houses, it is just that this form of housing has never been seriously contemplated.
for a range of reasons. Barriers also include the cost of purchasing or renting land in urban areas, and in areas zoned for multiple dwellings, it is not the highest and best use to build lower density structures such as tiny house villages. Finally, most LGAs restrict letting part of a property to a THOW and there is no precedent in property law for this.

When considering tiny homes in a village-type layout, Shearer et al. (2019, pp. 6–7) make the following points (italics added for emphasis):

Tiny villages could comprise a number of tiny houses on one lot (approximately 4–8) and would be similar to medium density developments. The resident would purchase the house under a Community Titles Scheme, and pay Body Corporate fees, and it could be let out. The owner would have rights to the land, as in current community titles schemes. *Planning schemes do not currently support small units of accommodation, and market forces dictate that this type of proposal is mostly not the highest and best use...*

Tiny house parks are similar to caravan parks and are more suitable for THOWs. Under this model, the owner has no rights to the land. Existing caravan parks could easily incorporate sections dedicated to tiny houses, with little, if any, change to legislation. Of note, caravan parks in desirable areas (i.e., with attractive amenity, or close to the beachside or the CBD) are under significant development pressure, and tiny houses may not be the highest and best use of the land. Caravan parks in less desirable areas often have limited access to services and high frequency public transportation and may be stigmatised as places for “permanents”, who for various reasons, cannot access the rental market.

Examining the Victorian planning context, Butt and Stephenson (2019, p. 1) consulted case studies in law (that is, decisions and definitions) to interrogate how “non-conforming housing models have been addressed in rural settings”. They suggest that what they call “varied housing” is in fact possible and at times “enabled by the planning system”, but that the primary inhibitors to the mobility, permanence, and impact of dwellings and developments remain in place.

Dwelling size has been an ever-present concern for planners, a likely legacy of the historical discourse around slum creation and overcrowding in late 19th and early 20th-century Australia. Minimum housing sizes were first implemented to curb the creep of sub-standard, cramped housing, and they remain in place today. Despite this broad tendency, housing size controls remain varied and unevenly regulated within the Australian planning framework. Residential development in Victoria is controlled through a set of provisions and tools known as the Rescode. The Rescode is the prescriptive framework that ensures housing size remains regulated.

The Victorian Planning Provisions (VPP) traditionally define accommodation through various descriptors – for example, detached house, flat, row house, attached cluster house, and detached cluster house. However, in recent times, the Provisions have been homogenised to include the following defining criteria for a dwelling:

- A kitchen sink
- Food preparation facilities
- A bath or shower, and
- A closet pan and wash basin.
This shift has ensured that housing *standards*, rather than house *types*, are privileged in development applications. But as noted in Part 1.2.4 of this report, it also means the Planning Provisions are applied in a piecemeal way, and by interpretation, in different local government areas. In the Victorian context, the “dwelling definition within the … system is therefore considered to accommodate the intent and structure of a Tiny House” (Butt & Stephenson, 2019, p. 5).

When land tenure issues have come before VCAT, tiny homes may be easily accommodated by defining the dwelling and land use under the “caravan park” category. Butt and Stephenson (2019, p. 5) state:

In Greater Shepparton City Council v Trio Parks Vic Pty Ltd [2018, VCAT 1470] it was found that the development of a number of new, high quality, but moveable, cabins that may be used for permanent accommodation, did not result in a change of land use from camping and caravan park to residential village or retirement village. VCAT determined that because the majority of accommodation on the site would remain short term, and the infrastructure and facilities on site were consistent with that of a camping and caravan park, they were satisfied in that situation there was no change of land use. In the case of National Lifestyle Villages Pty v Wyndham City Council [2006] VCAT 798 and Wilbow Corporation v Kingston City Council [2005] VCAT 2699, developments that may appear to be camping and caravan parks on initial appearance of land tenure and form of buildings were found to be residential villages due to the permanency of residents and lack of relationship to tourism. These examples, as well as the Launch Housing (tiny house) proposal (Glynn and Glossop 2017), demonstrate that the Victorian planning system can accommodate proposals involving multiple small houses.

Further to this, residential villages have become a more common land use arrangement for small homes in regional centres. Greater Shepparton City Council v Trio Parks Vic Pty Ltd was a case brought before VCAT that saw the conversion of multiple caravan parks to more permanent forms of accommodation.

Small homes clustered in a village-type setting could be covered by the Victorian Planning Provisions (VPP) if characterised as follows:

- **Group Accommodation:** Land, in one ownership, containing a number of dwellings used to accommodate persons away from their normal place of residence.
- **Residential Building:** Land used to accommodate persons, but does not include camping, a caravan park, corrective institution, dependent person’s unit, dwelling, group accommodation, host farm, residential village, or retirement village.
- **Residential Village:** Land, in one ownership, containing a number of dwellings, providing permanent accommodation and communal, recreation, or medical facilities for residents.
- **Retirement Village:** Land used to provide permanent accommodation for retired or elderly people; may include communal recreational or medical facilities for residents.
- **Rooming House:** Can have a total floor area of 300sqm, with no more than 12 persons accommodated in a maximum of nine bedrooms. Bedrooms must be accessed from within the building, which also has a shared entry and common areas, including kitchen and living areas.

Under the Victorian Planning Provisions (VPP), these configurations are allowable within Low Density Zones, Mixed Use Zones, and Townships (which can also accommodate higher-density housing), and General and Neighbourhood Residential Zones, often without a permit. Overall, with both the current
land use regime in the VPP and the definition of a “dwelling” open to local interpretation, there is a legitimate potential for tiny houses to be included in most residential areas, particularly regional areas with a higher number of caravan parks.

A study by Riedy et al. makes an important contribution to the discussion around cohousing for seniors. This research specifically examined the key concerns, limitations, and enablers for senior-orientated self-driven communities (Riedy et al., 2017). In the context of Sydney’s planning system, the study notes that small-scale cohousing on a single site would be possible within current planning controls for a range of typical Sydney sites. Key barriers related to inflexible controls for setbacks, building envelope, and overlooking. Some level of flexibility in the controls is needed – for example, encouraging local governments to adopt a performance-based focus rather than prescriptive measures.

1.3.3 Geelong Planning Context

The City of Greater Geelong (CoGG) has a legislative requirement to produce the following plans and documents:

- Municipal Strategic Statement in the Greater Geelong Planning Scheme
- Council Plan 2018–2022
- Municipal Public Health and Wellbeing Plan 2018–2021, and
- Social Housing Policy and Plan 2018–2036.

All these policy instruments affect and direct the local planning process. An affordable housing strategy, such as CoGG’s Social Housing Policy and Plan 2018–2036, is the most appropriate tool to drive action for supporting alternative forms of housing and communities – namely, cohousing and microvillages comprised of small homes. Unfortunately, this policy does not include specific mention of “cohousing”. However, it does allude to a broad definition in relation to the spatial design of “social housing”, which may include this type of living arrangement:

Social housing may be provided as single dwellings, distributed throughout the community. Social housing may also be provided in multi-dwelling clusters (which could be located in courts), and could be single storey units, or two storey townhouses. Some designs may facilitate interaction between residents, for example for older people or single parent families who can benefit from living in small communities (p. 29).

In the case of the Geelong Microvillage Project, CoGG’s social housing policy does identify this specific type of collective housing – microvillages for ageing populations – as a possible initiative “related to increasing the supply of social housing in the Geelong area” (p. 40). Specific mention of alternative housing types that could be supported in the local area’s planning framework is a major factor in giving weight to action. A microvillage is not specifically excluded from consideration within residential-zoned areas, and therefore could be approved, but this would be discretionary and would require a permit. Approval would also depend on the application meeting other dwelling requirements (for example, around car parking, open space, and neighbourhood character).

More generalised statements present across the current planning scheme could be used to support the inclusion of these housing types, as these documents include references to a lack of housing diversity, affordability, rising costs of living, social isolation, community cohesion and resilience, and
environmentally sustainable housing. A persuasive argument could therefore be made to approve such a development as a “residential village”, but it would not be a straightforward process, likely eliciting caution, perhaps confusion or swift rejection, and potentially objections from others.

**Caravan Parks in Greater Geelong**

Under the City of Greater Geelong’s planning laws, you can only live in a caravan on your property for 30 days in a year, and only if facilities are available on the property for access. In Geelong, no-one can live permanently in a caravan on private property. Visitors can stay for a maximum of one month in a year, but no longer than this.

According to the *Residential Tenancies Act 1997*, a “movable dwelling” means a dwelling that is designed to be movable, but it does not include a dwelling that cannot be placed on and removed from a site within 24 hours. As such, any building that cannot be removed within 24 hours cannot be registered within the caravan park planning regulations. Thus, as it stands, the microvillage model cannot be classified as a caravan park.

**1.3.4 Microvillages and THOWs: Planning Enablers, Barriers, and Opportunities**

There are two recent enablers within the Geelong and Victorian Planning systems, both of which bode well for the approval of a microvillage:

- The 2017 amendment of Victoria’s *Planning and Environment Act 1987* will encourage an increase in affordable housing via local councils seeking a voluntary affordable housing contribution as part of the planning process. This is to occur via Section 173 Agreements.
- In the process of developing its new Social Housing Policy, the City of Greater Geelong commissioned an audit of unmet need and surplus land across the region (3000 sites were identified, over 60 of which might be available). CoGG is clearly committed to enacting this policy and open to supporting innovative ideas for affordable/social housing.

**Enablers in the Victorian Planning Provisions**

The Victorian Planning Provisions (VPP) set out a number of Principles that can be invoked to make the case for the microvillage, while the Greater Geelong Planning Scheme includes specific zones and clauses to be addressed. Specifically, the following sections of the VPP offer promising scope for developing microvillages.

**Subdivision Design** (15.01-3S 31/07/2018 VC148). In the development of new residential areas and in the redevelopment of existing areas, subdivisions should be designed to create liveable and sustainable communities by:

- creating compact neighbourhoods that have walkable distances between activities
- creating urban places with a strong sense of place that are functional, safe, and attractive
- providing a range of lot sizes to suit a variety of dwelling and household types to meet the needs and aspirations of different groups of people, and
- being accessible to people with disabilities.
**Housing** (16.31/07/2018 VC148):
- Planning should provide for housing diversity.
- Planning for housing should include the provision of land for affordable housing.

**Integrated Housing** (16.01-1S 31/07/2018 VC148):
- Increase the supply of housing in existing urban areas by facilitating increased housing yield in appropriate locations, including under-utilised urban land.

**Housing Diversity** (16.01-3S 31/07/2018 VC148):
- Ensure housing stock matches changing demand by widening housing choice.
- Facilitate diverse housing that offers choice and meets changing household needs through:
  - a mix of housing types
  - adaptable internal dwelling design
  - universal design.
- Encourage the development of well-designed medium-density housing that:
  - respects the neighbourhood character
  - improves housing choice
  - makes better use of existing infrastructure
  - improves energy efficiency of housing.
- Support opportunities for a range of income groups to choose housing in well-serviced locations.

**Housing Affordability** (16.01-4S 31/07/2018 VC148)
- Increasing choice in housing type, tenure, and cost to meet the needs of households as they move through lifecycle changes and to support diverse communities.
- Promoting good housing and urban design to minimise negative environmental impacts and keep costs down for residents and the wider community.
- Encouraging a significant proportion of new development to be affordable for households on very low to moderate incomes.
- Increase the supply of well-located affordable housing by:
  - facilitating a mix of private, affordable, and social housing in suburbs, activity centres, and urban renewal precincts.

**Enablers in the Greater Geelong Planning Scheme**

The Greater Geelong Planning Scheme includes several elements that could theoretically accommodate the proposed microvillage. The following sections are particularly relevant.

**Settlement and Housing** (21.06.01): The ageing of the population will contribute substantially to the increase in demand for low maintenance dwellings and retirement accommodation. This... will need to be close to urban services...there is (also) a need to provide for a range of housing typologies including unit, townhouse, multilevel and apartments. New infill should be directed to well serviced areas and should be of a high quality and respond to the locality.
Urban Growth (21.06.02): Improve housing affordability through the maintenance of appropriate land supplies, the promotion of competition in the housing market and the development of a diverse range of well-located housing stock.

Urban Consolidation (21.06-3): Provide in a managed way. To encourage an appropriate range of development densities and improve accessibility to urban services.

Geelong has several types of designated Zones that could accommodate the proposed microvillage, sometimes with a permit and sometimes not (depending on the model finally adopted and the actual site chosen). The candidates are as follows:

- **Low Density Residential Zone** (VPP 32.03 LDRZ): this Zone aims “to provide low density residential development on lots (preferably with reticulated waste removal)”. In this Zone, a permit is required for accommodation of more than two dwellings and for land subdivision.

- **Neighbourhood Residential Zone** (NRZ) has the same stipulation as the LDRZ: a permit is required for accommodation of more than two dwellings and for land subdivision.

- **Residential Growth Zone** (RGZ): can provide housing of higher densities (up to four storeys) to encourage diversity of housing types in accessible localities. A permit is not required for a single dwelling, Residential Aged Care Facility, or Rooming House. A permit is required for land subdivision and for more than two dwellings.

- **General Residential Zones** (GRZ, R1Z, R2Z, R3Z) exist to respect neighbourhood character and encourage a diversity of housing types, especially in locations offering good access to services and transport. This Zone type shares the same stipulations as the RGZ (above). Medium-density housing could be readily accommodated here.

For a multi-unit site, a Planning Permit will need to be issued, and an argument put forward under Section 32 of the Local Government Provision/Greater Geelong Planning Scheme. Extensive work will thus need to be done to meet requirements around zoning, depending on the location of the block chosen. Considerations include:

- Site analysis
- Necessary earthworks or decontamination
- Specification of design guidelines, including fencing, car parking, and interfaces with neighbours
- Urban design masterplan, integrated with water and transport management plans, open space, landscaping, and residential design.

Table 1.7 (below) provides a summary of the main planning-based enablers, barriers, and opportunities for microvillages and Tiny Homes on Wheels (THOWs).
<table>
<thead>
<tr>
<th>Enablers</th>
<th>Barriers</th>
<th>Opportunities</th>
</tr>
</thead>
</table>
| Microvillage | • Recent amendment to *Planning and Environment Act 1987* to promote social housing via Section 173 Agreements.  
• Timely: Geelong’s new Social Housing Policy argues strongly for social housing and meeting need via pilot projects.  
• Has been done in a range of jurisdictions  
• “Underutilised” land in Geelong (60 lots listed in audit).  
• Great design, plus early and open consultation, can foster acceptance and approval by third parties.  
• Sustainable and affordable, so meets real social needs and planning objectives.  
• Fits with efforts to increase social and affordable housing in existing urban envelope.  
• Can be designated as Group Housing, Residential Village or a Multi-Unit Development in certain areas zoned for General Residential, Residential Growth, Township, and Mixed Use. | • Zoning restrictions (e.g., in Low Density Residential Zone and Farm areas).  
• Regulations for car parking and open space.  
• Overlays and their requirements.  
• Time for planning approval if Planning Scheme Amendment is required (vs. Permit) or VCAT appeal.  
• Costs of preparing planning applications.  
• Developer contributions to open space and services (may need to be waived or negotiated). Up to 10% for more than 10 lot subdivisions but only 5% for 2–9 lots | • A number of residential zones do not prohibit the model.  
• Fits with planning push to increase urban density, diversity, and affordability.  
• Fits with State and local commitment to increase social and affordable housing in existing urban envelope.  
• Suspend third party appeal rights on the grounds of a greater good (meeting a social need).  
• Waive or vary requirements for car parking to maximise active transport.  
• Reduce minimum dwelling requirements.  
• Can be designated Group Accommodation, Residential Village, or Retirement Village. |
| THOWs | • Perceived popularity and acceptability.  
• Affordable (relatively cheap).  
• Don’t need large site costs, relatively self-contained.  
• Mobility offers freedom to relocate. | • Cannot legally be placed long term in a caravan park (in Geelong, no more than 30 days per year on one site). | • Can be clustered.  
• If regulations changed in line with other locations, could legally be placed in caravan parks to gain access to shared facilities. |

Table 1.7: Summary of Planning Enablers, Barriers, and Opportunities (Microvillages and THOWs)
1.3.5 Conclusion

A wide range of planning frameworks exist across Australia, meaning the regulatory context in which a microvillage might be developed varies by jurisdiction. However, most local and state governments have committed to enhancing housing diversity, affordability, and sustainability while also increasing urban density, usually through consolidation.

In Victoria, there is no clear definition of a tiny/compact house or microvillage, and no explicit exclusion or inclusion possibilities within the Victorian Planning Provisions. However, a range of enablers within the current planning provisions would make a microvillage possible, such as defining a “dwelling” in terms of its internal minimum service configuration, rather than size, and defining a “residence” only in terms of it being self-contained and fitting into a neighbourhood.

The Geelong Planning Scheme also contains a host of zones that could accommodate a micro-village (primarily variants on the Residential Zone), and again this housing model is not explicitly excluded. However, microvillages are also not named, defined, or included in this Scheme, which leaves the situation ambiguous at best, and without a foundation for approval at worst.

There is scope to add definitions of a tiny/compact house and microvillage to the Victorian Planning Provisions, and to enable the possibility of such dwelling types being approved for residential areas in the City of Greater Geelong.
1.4 Financial Context

1.4.1 Background

This evidence review explores the financial context for developing microvillages as a form of affordable housing. There is limited research literature on microvillages, so this review examines a subset of financing models that would be applicable to this form of housing.

At first glance, microvillages appear to represent a viable dwelling option due to their compact size and perceived affordability. The individual dwellings are small, and so cheaper to construct than traditional houses. However, as outlined elsewhere in this report, meeting the needs of an ageing cohort by building to universal design and high energy standards reduces this perceived benefit. Shared facilities bring economies of scale and may reduce overall space requirements, allowing for more homes to be located on the same site. However, these facilities add extra costs and maintenance burdens over time, and are much less economically feasible in the context of smaller developments, where the additional costs are shared between a small number of residents.

The research literature highlights a key difficulty for the development of microvillages: the affordability and availability of financing. Boeckermann, Kaczynski and King (2019) cite lack of financing opportunities as a barrier to the formation of tiny house communities. Reasons can include the low repayment ability of potential owners (2016), and lenders being less able or willing to lend to non-credit worthy borrowers (including limitations imposed on lenders by the National Credit Code); lenders being reluctant to lend against non-standard forms of collateral; and difficulties in insuring tiny houses – although the latter is primarily a constraint for Tiny Homes on Wheels (THOWs), not Tiny Homes on Foundations (THOFs).

The two main financing problems for microvillages are owner credit worthiness and lack of financing options due to tiny homes being a non-standard form of collateral. The former problem is particularly pervasive for households in the first, second, and third income quintiles, and is exacerbated by an ageing cohort who may not be eligible for standard 30-year mortgage terms, even if they meet minimum income thresholds. While several affordable options theoretically exist (for example, build-to-rent and co-ownership models), in practice their availability is limited, and they have failed to achieve scale. However, for tiny homes, the additional problem of non-standard housing further limits the financing options. For example, some investment fund mandates may preclude non-traditional or uninsurable residential housing from their portfolios.

Despite these problems, there are several potential avenues for financing microvillages. However, options for people on low incomes, the options are more limited. Below we examine a range of financing options for this form of housing, including current government assistance policies, traditional financing from banks, innovative housing developers, and social impact investment.
### 1.4.2 Government Housing Assistance Schemes

Some Federal and State Government support may be available to microvillage tenants. Table 1.8 (below) outlines a set of government housing assistance schemes and policies currently in operation.

<table>
<thead>
<tr>
<th>Government Scheme</th>
<th>Description</th>
</tr>
</thead>
</table>
| National Housing Finance and Investment Corporation (NHFIC) (Federal):            | • The NHFIC is a government business enterprise financial intermediary. Part of Federal Government’s Reducing Pressure on Housing Affordability Plan.  
• The AHBA provides low cost, long-term loans to registered community housing providers to support provision of social/affordable housing, and aggregates and finances loans by issuing government guaranteed bonds.  
• The NHIF is a five-year, $1 billion facility to help finance/fund critical infrastructure (e.g., electricity and gas, water, sewerage and stormwater, transport and roads, telecommunications, site remediation, onsite and linking infrastructure) via low-cost loans, grants, and equity investments. |
| National Partnership Agreement on Homelessness (NPAH) (Federal)                  | • Federal Government provides $115 million per year (not indexed), with matching funds required by states and territories.  
• More focused on provision of support services.                                                                                       |
| National Housing and Homelessness Agreement (NHHA) (Federal)                     | • Federal Government currently provides over $1.3 billion a year.  
• Will provide $4.6 billion over three years, including $375 million of new homelessness funding (indexed annually).                                                  |
| National Rental Affordability Scheme (NRAS) (Federal)                           | • Offers low to moderate income earners opportunity to rent homes at a rate at least 20 percent below market value, for up to 10 years.  
• No further rounds since 2014–2015 Federal Budget. Scheme will wind down in 2026.                                                                 |
| Commonwealth Rent Assistance (CRA) (Federal)                                    | • Non-taxable income supplement for eligible low-income renters.  
• Maximum rent assistance payment is up to $3500 per annum. Can be used to fund rent of caravan park site where dwelling is owned. |
| First Home Owners Grants (FHOG) (State)                                         | • Direct grants to first homeowners, with possible stamp duty exemptions. In Victoria the current grant is $20,000 for regional areas ($10,000 for non-regional). The home must be less than five years old.  
Stamp duty exemptions for homes priced below $600,000, and concessions for homes priced between $600,000 and $700,000. |
| The Big Housing Build (Victoria)                                                 | • $5.3 billion to build 12,000+ new social and affordable homes in Victoria; includes 2900 affordable market homes for first-home buyers and renters and more than 9300 new social housing dwellings, with 25% of funds directed to regional and rural Victoria. |

Table 1.8: Government Housing Assistance Schemes Currently in Operation
1.4.3 Traditional Financing from Banks

Traditional financing from banks takes the form of mortgages. Lending criteria are set by the Australian Prudential Regulatory Authority (APRA).\(^1\) There are several reasons why traditional financing may not be available for microvillages:

- The dwelling may not be classified as a residential property (e.g., company title; THOW; only the dwelling, not land, available as collateral for the loan).
- The borrower is deemed too old to access a mortgage.
- The borrower is on a low income. Banks will not lend if the borrower’s income cannot cover the mortgage repayments.
- The borrower does not have a large enough deposit.

1.4.4 Innovative Housing Developers

Over the past decade, some housing developers have sought to achieve social impact by building and selling homes with a focus on affordability, sustainability, and community. These private developers can access funding and investment from social impact financiers, including banks, benevolent societies, and social impact funds. Depending on their structure, they may also be able to access concessions (for example, stamp duty savings).

These financing models are not available to traditional for-profit developers. This means social impact housing developers can provide lower-cost housing, which in some instances may be self-sustainable and self-sufficient, without government subsidies – albeit for people with higher assets and incomes than the potential residents who are the primary focus of this report. Table 1.9 (below) lists examples of projects by social impact housing developers in Australia, along with the amounts funded and the funding bodies. This information has been sourced from developer websites and Muir et al. (2018).

1.4.5 Social Impact Investment

As Muir et al. (2018) point out, housing supply bonds, property funds, and social impact loans are all promising Social Impact Investment (SII) models to support the provision of affordable housing in Australia. However, given the limited income of borrowers/tenants, most successful models to date have used blended finance approaches to achieve financial viability. This can include the strategic use of government grants or subsidies, development finance, philanthropic funds, preferential tax status of not-for-profit operators (such as community housing providers), and/or concessional finance to mobilise private capital flows towards impact.

Within the private sector, there is little interest in funding affordable housing initiatives (Yates, 2016). Drawing on interviews with institutional investors, Milligan et al. (2015, p. 3) identify four barriers, none of which has any immediate solution:

1. Lower yields than competing investment options (in part due to competition with “mum and dad” investors, who benefit from generous negative gearing concessions)
2. Lack of industry knowledge of rental housing products and performance
3. The small scale and fragmented nature of deals on offer, coupled with insufficient liquidity, and
<table>
<thead>
<tr>
<th>Project</th>
<th>Location</th>
<th>Funding (AUD$m)</th>
<th>Funders/Financiers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horizon Housing</strong></td>
<td>Robina, QLD</td>
<td>6.7</td>
<td>Horizon Housing Solutions, Social Ventures Australia (SVA), Diversified Impact Fund, HESTA</td>
</tr>
<tr>
<td><strong>(Finance purchase of management rights for 995 existing affordable housing properties [NRAS] and development of up to 60 social and affordable homes.)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nightingale 1</strong></td>
<td>Melbourne, VIC</td>
<td>6</td>
<td>Social Enterprise Finance Australia (SEFA), SVA, Christian Super</td>
</tr>
<tr>
<td><strong>(Licencing model to architects for multi-residential housing in urban areas; environmentally sustainable, financially affordable, and socially inclusive).</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nightingale 2</strong></td>
<td>Melbourne, VIC</td>
<td>0.9 (SEFA only)</td>
<td>SEFA, National Australia Bank (NAB), Brightlight</td>
</tr>
<tr>
<td><strong>Nightingale 3</strong></td>
<td>Melbourne, VIC</td>
<td>3 (SEFA)</td>
<td>SEFA, NAB, Brightlight</td>
</tr>
<tr>
<td><strong>Nightingale Fremantle</strong></td>
<td>Freemantle, WA</td>
<td>n/a</td>
<td>EHDO, Fini Sustainability</td>
</tr>
<tr>
<td><strong>Nightingale Village</strong></td>
<td>Melbourne, VIC</td>
<td>n/a</td>
<td>SEFA, NAB</td>
</tr>
<tr>
<td><strong>Nightingale Brunswick East</strong></td>
<td>Melbourne, VIC</td>
<td>n/a</td>
<td>SEFA, NAB</td>
</tr>
<tr>
<td><strong>Sustain Community Housing: Colyton Project</strong></td>
<td>Sydney, NSW</td>
<td>2.1</td>
<td>SVA, SEFA</td>
</tr>
<tr>
<td>(Land redevelopment creating six dwellings. Four sold to private buyers off plan, two kept for social housing for people with disabilities. Profits recycled for similar future projects to increase social housing/reduce wait lists.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MiHaven</strong></td>
<td>North QLD</td>
<td>4.6</td>
<td>MiHaven Social Impact Property Fund</td>
</tr>
<tr>
<td>(Social enterprise: construction industry training and employment for Indigenous people. Properties sold on open market to fund future opportunities, so not delivering affordable housing.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Habitat for Humanity</strong></td>
<td>VIC, SA, NSW</td>
<td>Various</td>
<td>SEFA, Foresters Community Finance</td>
</tr>
<tr>
<td>(Buyers commit “sweat equity”: reduces cost, effectively becomes deposit; concessional loans to finance purchase. Repayments recycled to give future buyers same opportunity.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WA Keystart (Aust), Indigenous Business Australia, Homestart Finance SA</strong></td>
<td>Various</td>
<td>Various</td>
<td>Various government business entities</td>
</tr>
<tr>
<td>(Affordable finance for excluded populations: concessional terms and rates.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connect Housing</strong></td>
<td>QLD</td>
<td>n/a</td>
<td>Concessional return equity investors and non-concessionary debt</td>
</tr>
<tr>
<td>(Four homes for households that qualify for public housing.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lifestyle Solutions</strong></td>
<td>NSW</td>
<td>$1.2m loan</td>
<td>SEFA</td>
</tr>
<tr>
<td>(One home for four young people with autism.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Myrtle Park</strong></td>
<td>TAS</td>
<td>$500K loan</td>
<td>SEFA</td>
</tr>
<tr>
<td>(Four retirement units.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Project4change</strong></td>
<td>QLD</td>
<td>n/a</td>
<td>Concessional return equity investors and non-concessionary debt</td>
</tr>
<tr>
<td>(Homes for households that qualify for public housing.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.9: Examples of Social Impact Housing Projects in Australia
1.4.6 Conclusion

Tiny or compact homes are theoretically cheaper to build and have a smaller footprint than regular homes, so at first glance may seem like an obvious affordable housing solution. However, as noted elsewhere in this report, costs can be higher than they appear on the surface: the cost of land, construction, site remediation, common services, and infrastructure must be funded. Microvillage developments are also more likely to require governance structures (for example, strata), which impose additional costs. The non-standard nature of the dwellings also raises serious challenges for financing, particularly where residents are older people and/or people on low incomes.

This section has examined financing solutions that would be applicable to the microvillage housing model. In the main, it proposes private market solutions that require no to little government incentives. These include the use of social impact developers and relaxing planning restrictions. However, as we have outlined, many of these options may not be viable in the proposed context – that is, low-density microvillages for older residents on low incomes.
1.5 Community Integration Context

1.5.1 Background

For this evidence review, we initially sought to explore the links between Tiny Home Communities (THCs) and community integration. However, database searches found there is no published research examining the intersection of these two concepts. Given the clear affinities between cohousing approaches and Tiny Home Communities (THCs), we refocused this evidence review to explore cohousing models. We concentrated on peer-reviewed academic journal articles that address cohousing, including both primary research and literature reviews. The cohousing research literature is interdisciplinary, which aligns with the multifaceted approach required by this project.

In addition, to capture all aspects of community integration, we also widened our evidence review to explore the concept of social health. In this review, social health is defined as “the ability to develop and benefit from meaningful connections with others”. To our knowledge, no research to date has explicitly analysed the links between cohousing models and social health. Our review draws on a social capital framework that describes how the components of social capital (reciprocity, shared norms, social agency, social networks, trust, and social connectedness) are all interlinked to influence an individual’s social health. This framework is outlined in Figure 1.5 (below).

![Figure 1.5: Social Health](adapted from Edgar, cited in Kelly, 2012)
Specifically, our review examines how cohousing promotes social capital, and explores the implications for residents’ social health, wellbeing, and integration with existing neighbours. In the following section we provide a condensed summary of our key findings. The full version of our evidence review has been accepted for publication in the academic journal *Cities & Health* (see screenshot of article abstract in Figure 1.6, below, and full version in Appendix D).

1.5.2 Cohousing and Social Health: Summary of Findings

The research literature features repeated claims that cohousing promotes social connections and social capital, arising through both communal structures and physical design (Fromm, 2012; Ruiu, 2016b). Social capital includes reciprocity, trust, social norms, shared ownership over resources, social agency, and participation in social networks (Onyx & Bullen, 2000). It can be conceptualised in three forms: bonding, bridging, and linking (Szreter & Woolcock, 2004).

In terms of this “bonding” aspect, being involved in the planning and development of a cohousing community allows residents to reach agreement on their vision for the project and creates a sense of shared resource ownership (Devlin, Douglas, & Reynolds, 2015). It also seems to establish grounds for ongoing contributions via participation in committees and boards, communal events, and maintenance activities (Jarvis, 2015). Living in close proximity allows neighbourly reciprocal relationships to develop, with several studies describing the mutual help and support residents offer each other (Glass, 2009, 2013, 2016; Jarvis, 2011, 2015; Jolanki & Vilkko, 2015; Wechuli, 2017). Knowing that people are nearby to assist in times of need also creates a sense of safety and security, while evidently fostering the development of trust between residents (Glass, 2013; Jolanki & Vilkko, 2015).
However, some studies identify the possibility of conflict and exclusion, often in relation to differences between owners and renters, or older and newer residents (Glass, 2013; Jarvis, 2015; Ruiu, 2016a). Issues may arise around lack of shared ownership where neither renters nor new residents were engaged in the process of establishing and developing the community (Glass, 2013). More specifically, conflict can emerge around renters’ use of common facilities when they have not invested financially in these spaces (Glass, 2013). New residents may disrupt existing social connections when they want changes made in the community (Pedersen, 2015), do not use the common house, or fail to adhere to expected norms around the use of shared spaces (including parking) (Ruiu, 2016a). Spatial layout can also contribute to segregation, particularly where there are different levels of dwellings (Glass, 2012), or new residences added after the initial construction phase (Ruiu, 2016a).

While much of the literature focuses on the connections between residents in cohousing communities, integration between residents and the broader local community is also relevant to social health. Once established, cohousing communities can contribute to a neighbourhood’s wider “social life” and foster bridging and linking social capital by inviting neighbours to organised activities (sport, entertainment, cultural, leisure, social events) and opening up communal facilities, such as green spaces and common rooms, for them to use as parks, garden allotments, and meeting rooms (Droste 2015, Ruiu 2015).

It is worth noting, however, that some researchers express concerns around a lack of integration between cohousing communities and their surrounding neighbourhoods (Chiodelli and Baglione 2014). The nature of cohousing communities – which are often physically introverted and lack social heterogeneity due to resident self-selection – can potentially cause segregation (Weeks et al. 2019), and attract scepticism from potential residents (Riedy et al. 2019), initial suspicion from neighbours, and opposition from policymakers and local authorities (Ruiu 2014, 2016b, Droste 2015, Pedersen 2015).

1.5.3 Cohousing and Social Health: Enablers, Barriers, and Opportunities

Table 1.10 (below) summarises some key enablers, barriers, and opportunities for Tiny Home Communities (THCs), with a focus on the connections between cohousing and social health. The table summarises these factors for a microvillage of permanent tiny homes (a cluster of eight permanent THOFs, each measuring 20–40sqm, on a 1000sqm suburban block, with a common house and shared outdoor space, plus some private outdoor space). We also provide a summary for a cluster of THOWs.

1.5.4 Conclusion

The research literature underlines the cohousing model’s potential to contribute positively to social capital, and therefore to residents’ health and wellbeing. However, the exact extent of this impact remains unclear. One reason is that prior research is predominantly based on short-term studies exploring the perspectives of small groups of cohousing residents. More rigorous evaluations could establish stronger links between cohousing and social health. In turn, this could encourage investors, policy makers, and administrators – as well as potential residents – to consider this housing model as a way of preventing social isolation.
<table>
<thead>
<tr>
<th>Model</th>
<th>Enablers</th>
<th>Barriers</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster of permanent THOFs</strong>&lt;br&gt;Specs: 20&lt;40sqm, cluster of eight, on 1000sqm suburban block, with common house and shared outdoor space (plus some private outdoor space).</td>
<td>• Models with 20–30 units can enhance social cohesion of group while still respecting privacy.  &lt;br&gt;• Cluster design: small private units around shared open space (Jarvis, 2011; Sargisson, 2012; Sullivan, 2016).  &lt;br&gt;• Carparking on periphery can encourage social interaction as people walk home.  &lt;br&gt;• Common space for communal activities and socialising (kitchen, living and dining area, guestroom; laundry, mailroom, games area, office, workshop, storage room).  &lt;br&gt;• Private dwellings with porches where residents can sit and neighbours stop by.  &lt;br&gt;• Resident involvement in planning and developing the community ensures agreement on project vision and creates sense of shared resource ownership.  &lt;br&gt;• Resident involvement in managing the community builds relationships.  &lt;br&gt;• Collaborative ethos means residents support and help each another (especially useful in ageing groups).  &lt;br&gt;• Engagement with broader neighbourhood.</td>
<td>• Designs with different levels of dwellings or new residences added after initial construction phase.  &lt;br&gt;• Carparking at the periphery does not support older residents, who can be confined to their dwellings in adverse weather conditions.  &lt;br&gt;• Second-storey dwellings facing away from common green spaces.  &lt;br&gt;• Potential for conflict between owners and renters around managing/financing/using communal facilities.  &lt;br&gt;• Communities can be perceived as elitist, given their origins in a shared vision and potential lack of diversity in terms of economics, social and cultural backgrounds.  &lt;br&gt;• Communities can be physically introverted and self-sufficient in their function and relationships, and thus have the potential to segregate themselves.</td>
<td>• Translating model for the public can help to avoid political refusal, stigmatisation, and stereotyping.  &lt;br&gt;• Community needs to engage local councils from the outset.  &lt;br&gt;• Once established, community can foster social ties by inviting residents to organised activities and opening communal facilities for other neighbours to use as parks, garden allotments, and meeting rooms.</td>
</tr>
<tr>
<td><strong>Cluster of THOWs</strong></td>
<td>• Potential for connectedness due to shared vision (e.g., sustainable, “off-grid”).  &lt;br&gt;• Transportability means residents can move between tiny home communities, thus building networks.  &lt;br&gt;• More diverse residents may mean less opposition from broader neighbourhood (e.g., not seen as elitist).</td>
<td>• Management of site/land may restrict regulatory processes or cause conflict (e.g., owner vs renter).  &lt;br&gt;• No process for establishing a community means different values – may cause conflict.  &lt;br&gt;• No formal communal spaces to encourage interactions between residents.  &lt;br&gt;• May face negative associations from locals around caravan parks and transient accommodation.</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.10: Cohousing and Social Health: Enablers, Barriers, and Opportunities (Microvillages)
PART TWO | ANALYSIS: GEOGRAPHICAL CONTEXT

Contents

2.1 OVERVIEW ......................................................................................................................................... 62
2.2 GEELONG: CENSUS DATA 2016 .......................................................................................................... 64
  2.2.1 Age and Education .......................................................................................................................... 64
  2.2.2 Income and Employment ................................................................................................................. 66
  2.2.3 Rent Payments and Mortgage Repayments .................................................................................... 67
2.3 INCOME AND HOUSING COSTS IN AUSTRALIA IN 2020 ................................................................. 68
2.4 INEQUALITY IN AUSTRALIA IN 2020 ................................................................................................. 69
  2.4.1 Income Inequality ........................................................................................................................... 69
  2.4.2 Wealth Inequality .......................................................................................................................... 72
PART TWO | ANALYSIS: GEOGRAPHICAL CONTEXT

2.1 Overview

The analysis that follows examines the research context that prompted this study – namely, the extent to which access to affordable housing is a problem in Australia and, where data is available, in Geelong. We focus on the group with the poorest security of housing tenure: people aged over 55 years who are classified in the low-income band – that is, those who are retired or are approaching retirement, and have low income, minimal wealth, and/or are living in poverty.

This cohort is increasingly vulnerable to housing insecurity. In the five years to 2016, the number of Australians experiencing homelessness rose 14 percent; over that same period, the number of homeless Australians aged 55 and over rose 28 percent – twice the average rate (Australian Bureau of Statistics, 2016; Pawson et al., 2018, p.9; Simon-Davies, 2018). For older people who do not own homes and have limited financial reserves, “crises in later life interacted with Australia’s small social housing sector and limited affordable housing in the private sector have created the conditions for homelessness or risk of homelessness” (Petersen & Parsell, 2015, p. 370). This older cohort also reflects the people who prompted this study: a group of retirees seeking to investigate whether compact homes might provide a viable affordable housing model.

This contextual analysis is presented in three sections. It considers:

1. The Australian Bureau of Statistics (2016) demographic Census data on Geelong (SA4) in relation to four key factors: age spread, education, household income and employment, and housing costs (rent payments and mortgage repayments)
2. Income and housing costs in Australia in 2020: the growing gap between “median weekly household income” and “median weekly housing costs” (Randolph, Liu, & Bradbury, 2020), and
3. Inequality in Australia in 2020 (income and wealth) (Davidson et al., 2020a, 2020b).

In sum, the substantial unmet need for affordable housing in Australia, and particularly in Geelong (SA4), is clearly evidenced by the demographic data and research on poverty, homelessness, income, and wealth inequality. In sum, the data indicates that:

- People aged 55 years and over make up around 31 percent of the population, of which 40 percent are aged between 55–65 years. The Geelong suburbs with the highest proportion of over-55s are Ocean Grove–Barwon Heads, Corio–Norlane, Grovedale, and Highton.
- Almost half of Geelong’s population has not pursued study after finishing either primary or secondary school. The lower Year 12 completion rate means the region has a less highly skilled workforce than, for example, Melbourne. This may also contribute to lower levels of full-time employment, with one-third of Geelong’s workforce employed part-time and 6 percent unemployed.
- Ten percent of renting households in Geelong are under housing stress (paying 30 percent or more of household income in rent). This proportion is highest in Corio–Norlane (17
percent of households). Six percent of Geelong households with mortgages are under housing stress.

- In Australia there is a widening gap between people in the highest 20 percent of income earners and those in the lowest percent. About 40 percent of over-65s are in the lowest 20 percent by household income, and nearly 70 percent of this age group are in the lowest 40. The highest 20 percent earns nearly six times the income of the lowest 20 percent. The income gap is commonly understood to impact physical and psychological health, particularly for people aged 55 and over.

- COVID-19 has had profound impacts on unemployment and income inequality, with a 10 percent decrease in paid hours worked and a 6 percent decrease in the employment rate. These impacts were greatest for households renting privately, where 40 percent were at the risk of job loss and 36 percent experienced reduced working hours.

- The highest 20 percent of Australian income earners have 90 times the average wealth of the lowest 20 percent, and hold over 55 percent of total owner-occupied housing wealth.

- While home ownership is less common among the low wealth band (comprising only 27 percent of their wealth), it is a key factor in protecting older people on the Age Pension from crossing the poverty line. Given the exponential growth of the housing market over the past two decades, elderly Australians who were unable to buy a home decades ago are experiencing historically high levels of housing stress.
2.2 Geelong: Census Data 2016

2.2.1 Age and Education

In 2016 the population of Geelong (Statistical Area Level 4) comprised 135,813 males and 143,119 females, with a median age of 40 years. Children aged 0–14 made up 18.6 percent of the population, while people aged 65-plus were overrepresented at 18.4 percent. Almost 31 percent of the population were aged 55 and over (see Table 2.1). Nearly half of those aged 15-plus were married, 12 percent were divorced or separated, and one-third had never been married (Australian Bureau of Statistics, 2016).

<table>
<thead>
<tr>
<th>Age</th>
<th>Geelong</th>
<th>%</th>
<th>Victoria</th>
<th>%</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Age</td>
<td>40</td>
<td>6</td>
<td>379,220</td>
<td>6.3</td>
<td>1,464,779</td>
<td>6.3</td>
</tr>
<tr>
<td>0–4 years</td>
<td>17,250</td>
<td>6.2</td>
<td>371,220</td>
<td>6.3</td>
<td>1,502,646</td>
<td>6.4</td>
</tr>
<tr>
<td>5–9 years</td>
<td>17,636</td>
<td>6.3</td>
<td>368,631</td>
<td>6.2</td>
<td>1,397,183</td>
<td>6.0</td>
</tr>
<tr>
<td>10–14 years</td>
<td>16,918</td>
<td>6.1</td>
<td>341,063</td>
<td>5.8</td>
<td>1,397,183</td>
<td>6.0</td>
</tr>
<tr>
<td>15–19 years</td>
<td>17,118</td>
<td>6.1</td>
<td>356,340</td>
<td>6.0</td>
<td>1,421,595</td>
<td>6.1</td>
</tr>
<tr>
<td>20–24 years</td>
<td>17,452</td>
<td>6.1</td>
<td>413,792</td>
<td>7.0</td>
<td>1,566,793</td>
<td>6.7</td>
</tr>
<tr>
<td>25–29 years</td>
<td>16,701</td>
<td>6.0</td>
<td>447,266</td>
<td>7.4</td>
<td>1,664,620</td>
<td>7.1</td>
</tr>
<tr>
<td>30–34 years</td>
<td>17,390</td>
<td>6.2</td>
<td>447,927</td>
<td>7.6</td>
<td>1,703,847</td>
<td>7.3</td>
</tr>
<tr>
<td>35–39 years</td>
<td>16,910</td>
<td>6.1</td>
<td>404,026</td>
<td>6.8</td>
<td>1,561,679</td>
<td>6.7</td>
</tr>
<tr>
<td>40–44 years</td>
<td>18,633</td>
<td>6.7</td>
<td>401,887</td>
<td>6.8</td>
<td>1,581,257</td>
<td>6.8</td>
</tr>
<tr>
<td>45–49 years</td>
<td>18,369</td>
<td>6.6</td>
<td>402,043</td>
<td>6.8</td>
<td>1,581,455</td>
<td>6.8</td>
</tr>
<tr>
<td>50–54 years</td>
<td>18,094</td>
<td>6.5</td>
<td>378,371</td>
<td>6.4</td>
<td>1,523,551</td>
<td>6.5</td>
</tr>
<tr>
<td>55–59 years</td>
<td>17,927</td>
<td>6.4</td>
<td>357,616</td>
<td>6.0</td>
<td>1,454,332</td>
<td>6.2</td>
</tr>
<tr>
<td>60–64 years</td>
<td>17,180</td>
<td>6.2</td>
<td>319,840</td>
<td>5.4</td>
<td>1,299,397</td>
<td>5.6</td>
</tr>
<tr>
<td>65–69 years</td>
<td>16,314</td>
<td>5.8</td>
<td>291,397</td>
<td>4.9</td>
<td>1,188,999</td>
<td>5.1</td>
</tr>
<tr>
<td>70–74 years</td>
<td>12,212</td>
<td>4.4</td>
<td>218,203</td>
<td>3.7</td>
<td>887,716</td>
<td>3.8</td>
</tr>
<tr>
<td>75–79 years</td>
<td>8,973</td>
<td>3.2</td>
<td>165,115</td>
<td>2.8</td>
<td>652,657</td>
<td>2.8</td>
</tr>
<tr>
<td>80–84 years</td>
<td>6,525</td>
<td>2.3</td>
<td>119,895</td>
<td>2.0</td>
<td>460,549</td>
<td>2.0</td>
</tr>
<tr>
<td>85 years and over</td>
<td>7,326</td>
<td>2.6</td>
<td>127,993</td>
<td>2.2</td>
<td>486,842</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Table 2.1: Age Spread in Geelong SA4 (Australian Bureau of Statistics, 2016)

Figure 2.1 (below) maps the population of residents aged 55–65 years across 20 Statistical Area Level 2 (SA2) regions in Geelong in 2016. The highest population figures in this age bracket were in Corio–Norlane, Ocean Grove–Barwon Heads, and Highton (3186, 3167, and 2655 respectively). Bannockburn has the lowest number of people in this cohort (447). Some 12.58 percent of Geelong’s residents were aged 55–65, considerably higher than the Victorian average (11.43 percent).

Figure 2.2 (below) shows the number of people aged 65-plus in each region. Grovedale, Ocean Grove–Barwon Heads, and Corio–Norlane had the highest number of 65-plus residents (4322, 1406, and 4042 respectively). Bannockburn (at 601) and Golden Plains–South (at 931) had the lowest figures in this cohort. Geelong’s ratio of over-65s (18.40 percent) was notably higher than Victoria’s (15.56 percent).
Figure 2.1: Number of People Aged 55–65 in Each SA2-Level Statistical Region of Geelong (ABS, 2016)

Figure 2.2: Number of People Aged 65+ in Each SA2-Level Statistical Region, Geelong (ABS, 2016)
Education access and level are key factors impacting access to affordable housing (Mueller & Tighe, 2007). In 2016, 30 percent of people in Geelong attended an educational institution. Almost 55 percent of residents did not continue study after finishing either primary or secondary education (see Table 2.2). Of the remainder, 18.2 percent completed a Certificate III or IV, and around 10 percent completed an Advanced Diploma or Diploma. Notably, the percentage of Geelong residents who hold a university or tertiary qualification (14.3 percent) is considerably lower than the State average (17.8 percent).

<table>
<thead>
<tr>
<th>Education</th>
<th>Geelong</th>
<th>%</th>
<th>Victoria</th>
<th>%</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>4612</td>
<td>5.5</td>
<td>94,970</td>
<td>5.2</td>
<td>347,621</td>
<td>4.8</td>
</tr>
<tr>
<td>Primary school – government</td>
<td>15,396</td>
<td>18.4</td>
<td>313,881</td>
<td>17.2</td>
<td>1,314,787</td>
<td>18.2</td>
</tr>
<tr>
<td>Primary school – government</td>
<td>4799</td>
<td>5.7</td>
<td>102,778</td>
<td>5.6</td>
<td>380,604</td>
<td>5.3</td>
</tr>
<tr>
<td>Primary school – other non-government</td>
<td>2552</td>
<td>3.0</td>
<td>52,041</td>
<td>2.8</td>
<td>231,490</td>
<td>3.2</td>
</tr>
<tr>
<td>Secondary school – government</td>
<td>8552</td>
<td>10.2</td>
<td>201,166</td>
<td>11.0</td>
<td>827,505</td>
<td>11.5</td>
</tr>
<tr>
<td>Secondary school – government</td>
<td>4934</td>
<td>5.9</td>
<td>88,999</td>
<td>4.9</td>
<td>338,384</td>
<td>4.7</td>
</tr>
<tr>
<td>Secondary school – other non-government</td>
<td>4425</td>
<td>5.3</td>
<td>73,973</td>
<td>4.0</td>
<td>280,618</td>
<td>3.9</td>
</tr>
<tr>
<td>Technical or further education institution</td>
<td>4735</td>
<td>5.7</td>
<td>103,685</td>
<td>5.7</td>
<td>424,869</td>
<td>5.9</td>
</tr>
<tr>
<td>University or tertiary institution</td>
<td>11972</td>
<td>14.3</td>
<td>325,051</td>
<td>17.8</td>
<td>1,160,626</td>
<td>16.1</td>
</tr>
<tr>
<td>Other</td>
<td>2256</td>
<td>2.7</td>
<td>59,498</td>
<td>3.3</td>
<td>198,383</td>
<td>2.8</td>
</tr>
<tr>
<td>Not stated</td>
<td>19445</td>
<td>23.2</td>
<td>413,199</td>
<td>22.6</td>
<td>1,707,023</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Table 2.2: Education Background in SA4 (Australian Bureau of Statistics, 2016)

### 2.2.2 Income and Employment

In 2016, Geelong had 132,942 residents aged 15 years and over in the labour force, of which one-third were employed part-time and 6 percent were unemployed (see Table 2.3, below). About 25 percent of part-time employees worked fewer than 15 hours per week, 20 percent worked 16–24 hours per week, and 22 percent work 25–34 hours per week (Australian Bureau of Statistics, 2016).

<table>
<thead>
<tr>
<th>Employment</th>
<th>Geelong</th>
<th>%</th>
<th>Victoria</th>
<th>%</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working full time</td>
<td>71,046</td>
<td>53.4</td>
<td>1,670,556</td>
<td>57.0</td>
<td>6,623,065</td>
<td>57.7</td>
</tr>
<tr>
<td>Working part time</td>
<td>46,725</td>
<td>35.1</td>
<td>920,875</td>
<td>31.4</td>
<td>3,491,503</td>
<td>30.4</td>
</tr>
<tr>
<td>Away from work</td>
<td>7254</td>
<td>5.5</td>
<td>144,696</td>
<td>4.9</td>
<td>569,276</td>
<td>5.0</td>
</tr>
<tr>
<td>Unemployed</td>
<td>7917</td>
<td>6.0</td>
<td>193,465</td>
<td>6.6</td>
<td>787,452</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Table 2.3: Employment Status in SA4, Geelong (Australian Bureau of Statistics, 2016)
Looking at earnings, 22.3 percent of Geelong households had a weekly household income of less than $650 in 2016, while the median weekly household income in Victoria was $1419 (Table 2.4, below).

<table>
<thead>
<tr>
<th>Gross Weekly Household Income</th>
<th>Geelong</th>
<th>Victoria</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $650</td>
<td>–</td>
<td>22.3</td>
<td>–</td>
<td>20.0</td>
</tr>
<tr>
<td>More than $3000</td>
<td>–</td>
<td>11.6</td>
<td>–</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Table 2.4: Household Income in SA4, Geelong (Australian Bureau of Statistics, 2016)

2.2.3 Rent Payments and Mortgage Repayments

In 2016 the typology of occupied private dwellings in Geelong included separate houses; semi-detached, row houses, and townhouses; and apartments. Of occupied private dwellings, around 35 percent were owned with a mortgage, and 26 percent were rented (see Table 2.5, below). Given the high percentage of people renting privately, it is important to examine rent and mortgage payments (Australian Bureau of Statistics, 2016).

<table>
<thead>
<tr>
<th>Tenure</th>
<th>Geelong</th>
<th>Victoria</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned outright</td>
<td>36,196</td>
<td>35.3</td>
<td>682,685</td>
<td>32.3</td>
</tr>
<tr>
<td>Owned with a mortgage</td>
<td>36,068</td>
<td>35.1</td>
<td>746,502</td>
<td>35.3</td>
</tr>
<tr>
<td>Rented</td>
<td>26,852</td>
<td>26.2</td>
<td>607,354</td>
<td>28.7</td>
</tr>
<tr>
<td>Other tenure type</td>
<td>811</td>
<td>0.8</td>
<td>17,178</td>
<td>0.8</td>
</tr>
<tr>
<td>Tenure type not stated</td>
<td>2,701</td>
<td>2.6</td>
<td>58,983</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Table 2.5: Tenure Status, Occupied Private Dwellings, SA4, Geelong (Australian Bureau of Statistics, 2016)

Table 2.6 (below) shows median weekly rent payments and monthly mortgage repayments in Geelong, and the proportion of households where housing costs were equal to or greater than 30 percent of household income (indicating housing stress). Around 10 percent of households paid rents that were 30 percent or more of household income, and 6.2 percent of households with mortgages repaid more than 30 percent of household income. This means 17.1 percent of Geelong households were in housing stress.

<table>
<thead>
<tr>
<th>Weekly Rent Payments</th>
<th>Geelong</th>
<th>Victoria</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median rent</td>
<td>288</td>
<td>–</td>
<td>325</td>
<td>–</td>
</tr>
<tr>
<td>Households with rent payments more than/equal to 30% of household income</td>
<td>–</td>
<td>9.9</td>
<td>10.4</td>
<td>– 11.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monthly Mortgage Repayments</th>
<th>Geelong</th>
<th>Victoria</th>
<th>Australia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median mortgage repayments</td>
<td>1560</td>
<td>–</td>
<td>1728</td>
<td>– 1755</td>
</tr>
<tr>
<td>Households with mortgage repayments more than/equal to 30% of household income</td>
<td>–</td>
<td>6.2</td>
<td>7.5</td>
<td>– 7.2</td>
</tr>
<tr>
<td>Households in housing stress</td>
<td>17.1</td>
<td>17.9</td>
<td>18.7</td>
<td>–</td>
</tr>
</tbody>
</table>

Table 2.6: Weekly Rent Payments + Monthly Mortgage Repayments, Private Dwellings, SA4 (ABS, 2016)
Figure 2.3 (below) indicates the proportion of Geelong households in which rental payments were greater than or equal to 30 percent of household income in 2016. These households can be considered to have the least secure housing in Geelong. Nearly 17 percent of households renting in Corio–Norlane were under housing stress, compared to approximately 12–14 percent in Newcomb–Moolap, Geelong, Belmont, and Geelong West–Hamlyn Heights. Less than 5 percent of households renting in Winchelsea and Golden Plains–South were in housing stress.

**Figure 2.3: Proportion of Total Number of Households in Each SA2-Level Statistical Region of Geelong Where Rent Payment is More than or Equal to 30% of Household Income (ABS, 2016)**

### 2.3 Income and Housing Costs in Australia in 2020

According to Randolph et al. (2020, p. 29), the gap between income and housing costs has widened considerably in Australia over the two-decade period since 1996. While median weekly household income doubled from $809 to $1955, median weekly housing costs were four-and-a-half times higher (from $67 to $306) by the end of that 20-year period. This growing gap, particularly in areas with high rents, has had substantial adverse impacts on people with low incomes. As a result, housing stress amongst low-income earners is at far higher levels than it was 20 years ago (see Figure 2.4, below).
Many households classified in the lowest income group are aged pensioners living in homes they own outright; they thus have relatively high wealth and low housing costs, so are not considered to be in housing stress. Housing stress is most severe for renters, both pensioners and non-pensioners. Saunders (2017, p. 753) argue that high housing costs are the key factor in driving those people below the poverty line. This is particularly evident in an 18.1 percent increase in poverty amongst public renters, up from 30.7 percent in 1995–1996 to 48.8 percent in 2015–16 (Randolph et al., 2020).

2.4 Inequality in Australia in 2020

Australia’s increasingly unequal distribution of income and wealth across different population groups is widely acknowledges to be an important issue (Davidson et al., 2020b). The problem is largely driven by growth in the value of asset types (investment property, superannuation, and shares), and is only being exacerbated by the significant impacts of Covid-19 on the lowest 20 percent of income earners.

2.4.1 Income Inequality

The average household after-tax income for the highest 20 percent of Australian income earners ($4166) is six times higher than that of the lowest 20 percent ($753) (Davidson et al., 2020b, p. 12). Between 1996 and 2016, the income gap widened over periods of income growth and remained steady over periods of income stagnation. In general, the highest 20 percent of Australian income earners saw overall income growth of 48 percent, compared to growth of 40 percent for the middle 20 percent, and just 36 percent growth for the lowest 20 percent (Davidson et al., 2020b, p. 30) (see Figure 2.5, below).
Figure 2.5: Trends in Average Weekly After-Tax Income, 1999–2017 (in $2017) (Davidson et al., 2020b)

Figure 2.6 (below) illustrates the income gap by splitting overall household income into five income bands. Here, the highest 20 percent is responsible for about 40 percent of all household after-tax income, more than the lowest 60 percent combined (Davidson et al., 2020b, p. 22).

Figure 2.6: Shares of National Household Income (% of total in 2017) (Davidson et al., 2020b)
While 25 percent of people aged 25–54 are in the highest 20 percent of income earners, 40 percent of people aged over 65 years are found in lowest 20 percent, and two-thirds of people that older cohort are in the lowest 40 percent (Davidson et al., 2020a, p. 24). Figure 2.7 (below) shows the proportion of people in different low-income groups in relation to income support payments.

![Figure 2.7: Distribution of People by Income Support Payment of Household Reference Person (% of People in 2017) (Davidson et al., 2020b)](image)

The average income of the lowest 20 percent of income earners in Australia is $753 per week, and 52 percent of this group receive the Age Pension. A typical single person on an Age Pension in this income group earned $452 per week in total. Here, home ownership and modest superannuation provided a degree of protection from poverty for many people receiving the maximum Age Pension, but not for people who were living in rental homes (Davidson et al., 2020a, p. 11).

**Impacts of COVID-19 on Income Inequality**

In Australia, the COVID-19 pandemic and government-ordered lockdowns have hit employment and earnings hard. From March to May 2020 there were considerable drops in both paid hours worked (down 10 percent) and the employment rate (down 6 percent). This led to a combined increase of 8.3 percent in people who were unemployed, under-employed, and out of the paid workforce (Davidson, 2020, p. 9). While this situation became less severe in June 2020, with a modest recovery in paid working hours, the unemployment rate was continuing to grow by December.

Figure 2.8 (below) shows different groups of people by household type whose jobs were directly or indirectly impacted by COVID-19. Here, more than 40 percent of private renters and 30 percent of young people were at risk of job loss. People living in private rental were also more likely to experience reduced hours of employment. In addition, the average household income for paid workers in indirectly affected industries (pre-COVID-19) was 26 percent less than that of the least affected cohort.
These figures suggest that while the Federal Government has tried to compensate for these problems via employment-related payments such as JobSeeker, Youth Allowance, and the Parenting Payment, the COVID-19 situation and associated lockdowns have significantly increased income inequality (Davidson, 2020, p. 11). Other COVID-related Federal Government payments offered temporary relief – specifically the JobKeeper wage subsidy and the JobSeeker Coronavirus Supplement – but these payments were gradually wound back, and discontinued in late March 2021.

### 2.4.2 Wealth Inequality

Looking at international standards of household wealth, Australia is classified in the top category, averaging more than $1 million per household. However, this wealth is distributed unequally across the community, with the highest 20 percent of households (with $3.3 million) enjoying six times the average wealth of the middle 20 percent (with $565,000), and 90 times that of the lowest 20 percent (with $36,000). The highest 5 percent of households (with $6.8 million) hold almost two-thirds of all wealth in Australia. This group held more than 12 times the average wealth of the middle 20 percent (with $565,000), and 90 times that of the lowest 20 percent ($36,000) (Davidson et al., 2020b, p. 13).

This wealth gap has widened significantly over the past two decades, with the average wealth of the top 20 percent increasing 10 times faster than the bottom 20 percent. Figure 2.9 (below) shows that from 2003–2017, the average wealth of the highest 20 percent grew almost twice as fast (up 68 percent) as that of the middle 20 percent (up 38 percent), leaving the lowest 20 percent well behind (with a growth rate of just 6 percent). This mostly reflects the exponential growth in the value of the asset types held disproportionately by the top 20 percent (investment property, superannuation, and shares) (Davidson et al., 2020b, p. 11).
Figure 2.9: Trends in Average Wealth, by Wealth Group, 2003 – 2017 ($000s) (Davidson et al., 2020b)

Figure 2.10 (below) illustrates the allocation of household wealth in terms of different asset types. Notably, real estate possessions account for half of Australian household wealth (39 percent in the main home, and 21 percent in investment properties); 42 percent of wealth is held in financial investments (21 percent in superannuation, and 20 percent in shares and other financial investments), and 9 percent is held in non-financial assets, such as cars (Davidson et al., 2020b, p. 13).

Figure 2.10: Types of Household Wealth (% of all Wealth in 2017–2018) (Davidson et al., 2020b)

Considering asset distribution, the highest 20 percent of households own over 55 percent of owner-occupied housing wealth, and 61 percent of superannuation wealth (Davidson et al., 2020b, p. 13). The lowest 60 percent of households held just 6 percent of the wealth of the richest 10 percent; this bottom 60 percent held average wealth of $277,000, with $120,000 in their homes (noting that many were not home-owners), and $157,000 in other assets (Davidson et al., 2020a, p. 16). Home ownership was less
common amongst people in the low wealth band (27 percent of their wealth), for whom superannuation (34 percent) and other non-financial assets such as cars (34 percent) represented a noticeably higher proportion of wealth (Davidson et al., 2020a, p. 42).

Looking at age, for people over 65, the wealth gap between the highest 20 percent and lowest 20 percent of households (seven times) is much lower than it is for working-age households (17 times). The main reason for this lower inequality amongst over-65s is “their widespread home ownership” (Davidson et al., 2020a, p. 45). Figure 2.11 (below) shows that for people aged over 65, the wealthiest 20 percent of households make up 45 percent of the overall value of owner-occupied housing; for working-age households, the figure is 60 percent. In addition, the over-65s had approximately 50 percent more wealth than working-age households. More than half of this difference in wealth inequality was accounted for by the value of homes (Davidson et al., 2020a, p. 18).

While housing wealth generally accumulates as people grow older, this fact has only benefited those who were able to buy their home decades ago.

![Figure 2.11: Distribution of Wealth by Source Across Wealth Groups (% of All Wealth in Each Age Group, 2017) (Davidson et al., 2020a)](image)
## Contents

3.1 PARTICIPANT RECRUITMENT ................................................................................................................................. 76

3.1.1 Recruitment for Focus Groups ............................................................................................................................. 76

3.1.2 Recruitment for Interviews .................................................................................................................................... 77

3.1.3 Recruitment for Systems Thinking (STICKE) Workshops .................................................................................. 77

3.2 RESEARCH PROCESS .................................................................................................................................................. 78

3.2.1 Process for Focus Groups ........................................................................................................................................ 78

3.2.2 Process for Interviews ............................................................................................................................................... 86

3.2.3 Process for STICKE Workshops ............................................................................................................................... 87

3.3 ANALYTICAL FRAMEWORK ..................................................................................................................................... 89

3.3.1 Systems Thinking ..................................................................................................................................................... 89

3.3.2 Leverage Points ....................................................................................................................................................... 89
PART THREE | METHOD: COMMUNITY ENGAGEMENT RESEARCH

This section describes our methodology for empirical data collection. It consists of two subsections:

- Recruitment (participants for focus groups, interviews, and STICKE workshops), and
- Processes (design and delivery of focus groups, interviews, and STICKE workshops).

Our empirical research complies with the National Statement on Ethical Conduct in Human Research (2007). Ethics approval [STEC-62-2019-TUCKER-MOD05] was granted by the Deakin University Human Research Ethics Committee (DUHREC); initial approval was granted on 31 October 2019, and the fifth modification was approved on 16 October 2020.

3.1 Participant Recruitment

Recruiting participants for this study posed many challenges for the research team. This was intensified by the compaction of the data collection period due to COVID-19 restrictions. Initially, around 100 organisations and individual stakeholders were identified as holding representational roles in the community, especially within the housing supply, advocacy, and policy sector. These candidates were first contacted via email or telephone.

3.1.1 Recruitment for Focus Groups

Four focus groups were conducted with the following participants:

- Focus Group 1: financial and legal sector stakeholders. Invited organisations included a law firm, national insurer, charitable community foundation, bank, and not-for-profit housing provider.
- Focus Group 2: Microvillage Geelong Taskforce members with expertise in the construction, planning, legal, and financial aspects of housing.
- Focus Group 3: potential residents (a subgroup of the Microvillage Geelong Taskforce).
- Focus Group 4: wider interested potential residents.

Key community contacts worked with the research team to disseminate the aims of the research and focus groups. Potential participants were asked to contact the research team to register their interest in participating; logistical information was then distributed. Due to COVID-19 restrictions, a switch from face-to-face to online participation was eventually deemed necessary for Focus Groups 2 and 4. Participation details are noted below (see Table 3.1).
### Focus Group Participants

<table>
<thead>
<tr>
<th>Focus Group Number</th>
<th>Cohort</th>
<th>Date</th>
<th># Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financial, legal and insurance sector.</td>
<td>9.12.2019</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Microvillage Taskforce (members with planning, construction, legal, and financial experience).</td>
<td>20.10.2020</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Microvillage Taskforce (potential residents).</td>
<td>26.2.2020</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Other interested potential residents.</td>
<td>21.10.2020</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3.1: Focus Group Participants

#### 3.1.2 Recruitment for Interviews

While this role was not part of the original funding application, we were fortunate to attract an Honours student, Lauren Chambers, to work on the project. Under the supervision of Dr Andrews and Dr Warner, Lauren explored concepts of ageing in place amongst potential microvillage residents as her thesis topic. Given that the original brief was to explore a model of housing for older residents on lower incomes, the HOME team felt this supplementary research would complement the overall study.

The decision was made to focus on older women on lower incomes, as this group was the “fastest growing cohort of homeless people” from 2011–2016 (Patterson, Proft & Maxwell 2019, p. 15).

Community contacts worked with the researchers to disseminate the research and interview aims. Potential participants were asked to contact the student researcher to register their interest; logistical information was then distributed. Six participants were recruited. Interviews took place in July–August 2020, during Victoria’s COVID-19 lockdowns, so were conducted via a digital conferencing tool (Zoom).

#### 3.1.3 Recruitment for Systems Thinking (STICKE) Workshops

An initial recruitment email was sent to more than 90 individual stakeholders and organisations (52 for STICKE Workshop A and 38 for STICKE Workshop B) in October and November 2020, promoting the study and inviting people to register their interest in participating in one of the workshops.

In sending invitations to potential participants, effort was made to target key stakeholder organisations, including but not limited to:

- Baptcare, Barwon South-West Homelessness Network, Bethany Community Support, Brightlight, City of Darebin, City of Greater Geelong, Cohousing Australia, Common Equity Housing Limited, Community Housing Industry Association, Council on the Ageing, Diversitat, FormFlow, Foundation 61, G21, Gateways, Geelong Sustainability, GenU, Green Design Solutions, GreenForm Energy, Hamlan Homes, Hanson Partnerships, Housing Choices AU, K2 Planning, Kids Under Cover, Launch Housing, MacKillop Family Services, MACS (Multicultural Aged Care), Make Ventures, Moreland City Council, Nightingale Housing, Ninedots Consulting, North Geelong Rental Housing Co-op, Novo Planning, Office, Plan A Planning, SalvoConnect, Samaritan House, Schored Architecture, Sirovilla Retirement Village, Social Enterprise Finance Australia, Social Ventures Australia, Soft Loud Architects, Springdale Neighbourhood Centre, The...
3.2 Research Process

The following section details the research process we followed to conduct our data collection activities: two focus groups, six interviews, and two systems thinking (STICKE) workshops.

3.2.1 Process for Focus Groups

Four focus groups were conducted with different participant groups. The research process we followed for each focus group is outlined below.

Focus Group 1: Financial and Legal Sector

In the first focus group, seven participants met face to face, with the goal of identifying and discussing the legal, financial, and risk implications associated with establishing a microvillage. Participants included a strata lawyer, a property lawyer, an insurer, representatives from two not-for-profit housing providers, a bank representative, and a representative from a charitable community foundation. The focus group took two hours and was facilitated by three researchers with expertise in property law and finance. The session was recorded with the permission of participants and transcribed verbatim.

A week before the focus group, all participants were emailed a preparation document that outlined some of the key areas for discussion. They were asked to think about the various barriers, opportunities, and incentives that need to be considered in modelling a micro-village for a cohort described as “low-income grey nesters”. Legal considerations included land tenure, ownership structures, and other regulatory conditions. Insurance considerations included home and contents, and shared communal property and facility risk. Financial considerations included lending and borrowing models, rental assistance and site costs, ongoing costs and expenses, entry and exit costs, and taxes and duties.

Focus Group 2: Microvillage Taskforce Members (Construction, Planning, Legal, Financial)

The second focus group aimed to accommodate up to 10 participants. While initially intended to be held face to face, the session was conducted online via Zoom due to restrictions imposed by COVID-19. Participants were members of the Microvillage Geelong Taskforce who had experience/expertise in the...
areas of construction, planning, legal, or financial issues. They were invited to take part via an email highlighting the need for expert or experiential feedback on the issues being discussed.

The goal of Focus Group 2 was to analyse viable design/construction options to determine feasibility, taking account of goals around affordability, sustainability, accessibility, and liveability. The focus group took two hours and was co-facilitated by five researchers representing the different discipline areas required to communicate the issues of focus: construction, planning, legal, and financial structures.

Five participants attended, but one was unable to actively contribute due to technical difficulties. Two participants were built environment/engineering professionals, one was a member of a grassroots environmental organisation, one worked for an organisation that supports people who are experiencing or at risk of homelessness, and the other participant identified as a community member passionate about the idea of living in small homes.

Prior to the session, attendees were sent a factsheet summarising the barriers and benefits of the most viable currently available models for clusters of compact homes, with a focus on legal structures, financing, construction, and planning. These models were derived from two sources: our evidence reviews (see Part 1 of this report), and our findings from Focus Group 1.

As explained to participants, the session sought to address the following overall objective:

- Analyse various design and construction options to determine feasibility (given affordability, sustainability, accessibility, and liveability goals)

The researchers gave a short presentation to contextualise the session within the overall research project. The focus group addressed two specific questions:

- How feasible are the options described for financing, construction, and planning?
- What could be changed to increase the feasibility of these options?

The session proceeded as follows:

- The researchers outlined four options, which were described as “models”. The first model was outlined merely to provide context, as it was the simplest but least viable option.
- The other three models were then evaluated in turn by participants, via the following process:
  - Researchers described each model in terms of its associated legal, financial, construction, and planning enablers and barriers.
  - Each participant was asked to rate the model for feasibility on a scale of 1 to 10, and to then explain what informed their score.
  - The group was then asked to discuss: “What changes to the financial, construction, and planning contexts would make this option more feasible?”
- Finally, participants were invited ask questions or raise issues they felt had not been addressed.

The models were primarily described in terms of their legal and financial structures (summarised below); these were developed as an output of Focus Group 1. For each model, barriers, opportunities, and enablers are identified in Tables 3.3, 3.4, 3.5 and 3.6 (see below).
Model 1: Individual Ownership with Standard Subdivision

This legal structure consists of “fee simple lots” that are individually owned. It is a standard suburban subdivision where all the common parts, including the roads and footpaths, are controlled by the relevant Local Government Authority (LGA). The potential barriers for this type of model include:

- Limited communally owned facilities. It is highly unlikely that a LGA would provide such facilities, due to ongoing maintenance and repair obligations, and security and access considerations.
- The homes would require a larger building footprint to absorb the lack of communal facilities.
- Without the protection of architectural guidelines or governing rules, there would be limited restrictions on community design and upkeep.

The potential benefits of this model include:

- Low level of regulatory intervention.
- Insurance and maintenance are choice-driven, as there is no regulatory mandate.
- No overarching private governing regime or management structure.

In considering this individual ownership model, it is important to note the following points: the responsibility and liability is individualised, and therefore limited (to each owner’s home); there is low regulatory oversight, no private governance requirements, and no overarching management requirements. These factors can lead to lower annual costs associated with home ownership.

Model 2: Co-Ownership

This legal structure is a subdivision governed by an owners’ corporation. This ownership model is generally referred to as a “strata title scheme” (hereafter abbreviated to “strata”). Strata is a useful land subdivision model for co-ownership, because a property owner buys not just an individual “fee simple lot” (apartment, house, unit, and so on), but also a proportionate share in the common property – that is, property that sits outside the fabric of the lot.

The proportionate share of common property is what makes this structure a co-ownership model: all the lot owners also co-own the common property. Common property includes all internal roads, pathways, communal facilities, and gardens (where relevant). Strata is the most commonly used legal structure for property ownership including communal facilities. Table 3.3 (below) highlights the barriers, opportunities, and enablers associated with this legal property structure.

In considering this co-ownership model, it is important to note the following: all strata schemes are highly regulated and require oversight by a private governing entity. Lot owners are the ultimate liable party and must participate (to some extent) in the governing and management of the property scheme.

For big developments with many owners, this model allows for a spread of responsibility, liability, and participation. For a smaller scheme (for example, 12 lots), responsibility, liability, and participation levels must be high for the scheme to function effectively. The position of the legal boundary between the privately owned lot and common property also impacts cost. The more common property and facilities, the higher the likely costs, due to the need for regulatory oversight. Conversely, if shared facilities are limited (for example, via bigger houses), the financial implications shift onto the individual lot owner.
Table 3.3: Strata: Financial Barriers, Opportunities, and Enablers

Model 3: Co-Ownership with Community Housing Provider

This legal structure is the same as Model 2 (above). However, it incorporates a specific type of property owner: a community housing provider (CHA). A community housing provider may help alleviate some of the regulatory oversight that often falls to individual lot owners, or may take ownership of the common facilities. The CHP would likely own a number of properties.

Table 3.4: Strata with CHP as Cohousing Funder: Financial Barriers, Opportunities, and Enablers

Model 4: Residential Park

This legal structure is a departure from Models 1 to 3, as it features a clear disconnect between land ownership and home ownership. Under the Residential Park model, the land is owned by a third party, and the home is considered a chattel (an asset separated from the land). In this context, homeowners usually pay a site fee (through a lease agreement) to place their home on a dedicated site. Table 3.5 (below) highlights the barriers, opportunities, and enablers associated with this legal structure.

When considering this model, it is important to note the following: the ownership is not “fee simple”, so property rights are substantially diminished. On the other hand, duties, levies, taxes, and regulatory oversight are also significantly diminished, or potentially absent. In general, this model tends to afford increased consumer protections.
Table 3.5: Residential Park: Financial Barriers, Opportunities, and Enablers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Financing difficult: lenders prefer growth assets, not chattels.</td>
<td>• Fewer regulatory obligations and more consumer protection (via RTA).</td>
<td>• No stamp duty.</td>
</tr>
<tr>
<td>• Depreciating asset.</td>
<td>• Liability limited: no obligations to others or community.</td>
<td>• CRA subject to eligibility.</td>
</tr>
<tr>
<td>• Costs of moving chattel.</td>
<td>• Easier to move location if community not fit for purpose, or unhappy with resident mix.</td>
<td>• No land tax.</td>
</tr>
<tr>
<td>• Community housing providers not interested in this model.</td>
<td></td>
<td>• Lease arrangement.</td>
</tr>
<tr>
<td>• No legacy of asset.</td>
<td></td>
<td>• External management.</td>
</tr>
<tr>
<td>• Zoning of land for purpose may limit availability.</td>
<td></td>
<td>• Freeing of capital expenditure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enclosed estate (provides security).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Good option for very low SE residents.</td>
</tr>
</tbody>
</table>

Model 5: Community Housing Provider Owner/Operator

This legal structure was added after the focus groups had been completed, when financial analysis demonstrated that the co-ownership model outlined in Model 3 is not financially feasible. Model 5 is essentially the same as Models 2 and 3 (above), except for two factors: incorporates a specific property owner – a community housing provider – and there is no co-ownership structure with residents. The community housing provider (CHP) owns and operates all units in the development, and rents them to eligible residents on income-capped or discount to market rental rates, depending on residents’ income and assets levels. CHPs generally provide good security of tenure, especially compared with market rentals. A CHP may also help alleviate some of the regulatory oversight that often falls to individual lot owners, or may take ownership of the common facilities. The CHP would likely own several properties.

Table 3.6: Strata with CHP as Owner/Operator: Financial Barriers, Opportunities, and Enablers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Low income from capped or discounted rents.</td>
<td>• Statutory requirements minimise financial risk.</td>
<td>• Social or community housing provider involvement.</td>
</tr>
<tr>
<td>• Residents must meet social housing eligibility criteria, and waiting lists are long.</td>
<td>• Collective cost savings: buying in bulk and sharing facilities.</td>
<td>• CHPs can access cheap long-term debt via NHFIC.</td>
</tr>
<tr>
<td>• Cost of community facilities</td>
<td></td>
<td>• CHPs have preferential GST status.</td>
</tr>
<tr>
<td>• No ownership stake or opportunity for capital appreciation/legacy of asset.</td>
<td></td>
<td>• More affordable than buying for lower-income households.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Security of tenure compared to market rental.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• (Plus other enablers identified under strata model.)</td>
</tr>
</tbody>
</table>

Table 3.6: Strata with CHP as Owner/Operator: Financial Barriers, Opportunities, and Enablers

Construction Models

Focus group participants were informed that most Australian building regulations and planning schemes overlook tiny and compact houses, especially Tiny Houses on Wheels (THOWs). While THOWs do have capacity to meet many performance criteria, their compactness, moveability, and difficulties in meeting universal design standards to enable ageing in place require novel performance solutions. These novel solutions would require adjustments to the current regulatory schemes and codes.
This means a home of 20sqm or less will always remain a niche market; the model is only viable if located singly on the land of another property. Design and construction standards are very unlikely to allow less than 40sqm as a minimum standard size. Moreover, financers are unlikely to provide a long-term mortgage on any dwelling under 40sqm (mortgages are near-unobtainable below 50sqm), and community housing providers are unlikely to be able to fund anything smaller. Universal design principles require around 48sqm. The various construction models are summarised in Part 1.2.7 of this report (see Table 1.1).

**Cost Comparisons**

Focus group participants were given information about the comparison of 20-year costs for various small home options in Geelong (see Part 1.2.8 of this report). These long-term costs include land costs, infrastructure and civil works, owners’ corporation fees, energy, water, maintenance, finance costs, LGA rates, and insurances. Participants in Focus Group 2 were provided with a costs calculator that adjusts for low, medium, and high costs for each of these variables, for each of the built-form options outlined.

**Planning Models**

Two recent enablers within the Geelong and Victorian Planning systems were described as boding well for the approval of a microvillage of THOFs (Tiny Homes on Foundations):

1. Recent amendments to the Victorian *Planning and Environment Act 1987* “to encourage an increase in affordable housing via local councils seeking a voluntary affordable housing contribution as part of the planning process”. This is to occur via Section 173 Agreements.
2. The City of Greater Geelong (CoGG) has commissioned and recently adopted a Social Housing Policy. In preparation for this, an audit was conducted of both unmet need and surplus land across the region (3000 sites were identified, over 30 of which might be available). CoGG is now committed to enacting this policy, so is likely to be open to supporting innovative ideas to increase the supply of affordable and social housing.

Participants were presented with a summary of current planning enablers, barriers, and opportunities (see Table 3.7, below). In addition, the research team also explained that only a small number of zoned areas can accommodate a microvillage or similar development. Specifically, under Victoria’s planning regulations, a cluster of small homes can only be located within areas with the following zoning designations:

- General Residential Zone (GRZ, R1Z, R2Z, R3Z)
- Neighbourhood Residential Zone (NRZ)
- Residential Growth Zones (TZ), and
- Mixed Use Zone (MUZ).
<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Enablers</th>
<th>Barriers</th>
<th>Opportunities</th>
</tr>
</thead>
</table>
| Microvillage  | • Recent changes to *Planning and Environment Act 1987* to promote social housing via Section 173 Agreements.  
• CoGG’s Social Housing Policy argues strongly for more social housing and meeting need via innovation (local examples include CSIRO’s Sirovilla development).  
• Surplus/free/underutilised land.  
• Great design can facilitate acceptance and approval.  
• Sustainable.  
• More affordable, so meets real social needs.  
• Aligns with State and local push to increase social and affordable housing in existing urban envelope. | • Zoning restrictions (e.g., in Mixed Use, Farm, and Low Density Residential Zones).  
• Cost of large sites and competition with developers.  
• Site costs: remediation, preparation, services.  
• Opposition from neighbours (NIMBYism).  
• Regulations around car parking.  
• Developer contributions to open space and services (need to be waived). | • Residential Zones do not prohibit the model.  
• Planning push to raise urban densities.  
• Aligns with State and local push to increase social and affordable housing in existing urban envelope.  
• Co-design shared facilities with neighbours.  
• Suspend third party appeal rights on grounds of greater good (meeting a social need).  
• Reduce minimum dwelling size.  
• Can be designated Group Accommodation, Residential Village, or Retirement Village. |
| Tiny Houses on Wheels (THOW) | • Perceived popularity and acceptability.  
• Affordability: relatively cheap.  
• No large site costs: relatively self-contained.  
• Mobility: freedom to relocate. | • Cannot legally be placed long-term in a caravan park (in Geelong, no longer than 30 days per year on one site).  
• Often not well integrated socially with neighbours or services.  
• Depreciating asset: no capital gains possible  
• Inflexible internal spaces.  
• Difficult to age in place; does not usually meet universal design principles.  
• Unsustainable designs. | • Can be clustered.  
• Can legally be placed in caravan parks in some other local and state legislatures and use shared facilities.  
• Caravan parks are often well located (in or near good natural environments).  
• Affordable, appealing, mobile, can be put on private land. |

Table 3.7: Planning Enablers, Barriers, and Opportunities (Summary for Focus Group Participants)
Focus Groups 3 and 4: Potential Residents

Processes for the third and fourth focus groups are outlined here together, as both sessions followed the same format. The only difference was that Focus Group 3 was held face to face in Geelong, whereas Focus Group 4 was held online (via Zoom) due to COVID-19 restrictions. Both focus groups took around two hours and were co-facilitated by one researcher, with two other researchers taking notes.

These focus groups sought to explore potential residents’ perspectives on issues of community integration, both amongst microvillage residents, and between the microvillage and the existing community. Focus Group 3 participants were drawn from members of the Microvillage Geelong Taskforce via an email highlighting the need for input from potential residents. Focus Group 4 participants were recruited from the wider Geelong community by promoting the session via existing community contacts. Table 3.8 (below) presents a demographic profile of participants.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Demographic Details</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age span</td>
<td>31–70 years</td>
<td>n/a</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>8</td>
</tr>
<tr>
<td>Place of birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Overseas</td>
<td>4</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Employed full time</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Self-employed</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Casually employed</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>1</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>University degree</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Year 12</td>
<td>1</td>
</tr>
<tr>
<td>Total weekly income</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than $399</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>$400–799</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>$800–$1249</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>$1250–1999</td>
<td>1</td>
</tr>
<tr>
<td>Pension status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aged Pension</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>JobSeeker</td>
<td>1</td>
</tr>
<tr>
<td>Current relationship status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single (never married)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>5</td>
</tr>
<tr>
<td>Current household composition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependent children</td>
<td>1</td>
</tr>
<tr>
<td>Current housing tenure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private rental</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Homeowner</td>
<td>3</td>
</tr>
<tr>
<td>Years at current address</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than 5 years</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>More than 10 years</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>More than 20 years</td>
<td>1</td>
</tr>
<tr>
<td>Type of housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detached house</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Apartment</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Tiny house</td>
<td>1</td>
</tr>
<tr>
<td>Number of times moved to a new house in adulthood</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1–3 times</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4–10 times</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>More than 10 times</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 3.8: Demographics: Focus Groups with Potential Residents
The researchers began these focus group sessions by presenting a brief description of the overall project, and explaining that the session aimed to explore the following overarching research question:

- What are potential residents’ perspectives on community integration – both within a microvillage, and between the microvillage and the surrounding community?

The focus group directly considered four questions:

- Can you tell me about what attracts you to consider living in a microvillage?
- If you were to live in the village, who would you like to see living there?
- If you were to live in the village, what would you like to see it look like?
- Can you tell me about where you would like to see the village located?

The sessions were recorded with permission of participants, transcribed verbatim, and analysed thematically following the six steps of thematic analysis described by Braun and Clark (2016).

3.2.2 Process for Interviews

The interviews sought to explore experiences and perceptions of ageing in place amongst low-income women who are interested in living in a future microvillage in Geelong. The interviews were guided by two research questions:

- How do participants describe ageing in place?
- What do women feel that living in a microvillage would offer in relation to ageing in place?

Six participants were recruited via existing community contacts. Table 3.9 (below) presents a demographic profile of our interview participants.

An interview schedule with associated probes was used to encourage deeper levels of discussion. Interview questions included:

1. How would you describe your current housing situation?
2. What are some of the difficulties you’ve faced finding suitable housing in Geelong?
3. What does ageing in place mean to you?
4. How do you feel the microvillage might contribute to your experience of ageing in place?

Interviews were recorded with participants’ permission, transcribed verbatim, and analysed thematically, following the six steps of thematic analysis described by Braun and Clark (2016). Pseudonyms were assigned to all participants to protect anonymity.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Demographic Details</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>61-65</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>66-70</td>
<td>4</td>
</tr>
<tr>
<td><strong>Place of birth</strong></td>
<td>Australia</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>New Zealand</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Europe</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>South America</td>
<td>1</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td>Retired</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>1</td>
</tr>
<tr>
<td><strong>Highest level of education</strong></td>
<td>Year 10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Diploma/Advanced Diploma</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>2</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>Aged Pension</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Widow’s Pension</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>JobSeeker Allowance</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No income</td>
<td>1</td>
</tr>
<tr>
<td><strong>Current relationship status</strong></td>
<td>Single (never married)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Single (divorced/separated)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Single (widowed)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Current household composition</strong></td>
<td>Living alone</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Living with a friend</td>
<td>1</td>
</tr>
<tr>
<td><strong>Current housing tenure</strong></td>
<td>Private rental</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Homeowner</td>
<td>1</td>
</tr>
<tr>
<td><strong>Years at current address</strong></td>
<td>Less than 12 months</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3 years</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5 years</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10 years</td>
<td>1</td>
</tr>
<tr>
<td><strong>Type of housing</strong></td>
<td>Apartment</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Townhouse</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>House</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Granny flat</td>
<td>1</td>
</tr>
<tr>
<td><strong>Number of times moved to a new house in adulthood</strong></td>
<td>More than 10</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3.9: Demographics: Interviews with Potential Residents

3.2.3 Process for STICKE Workshops

The research team used the Systems Thinking in Community Knowledge Exchange (STICKE) tool to facilitate the workshops. The use of this tool enabled us to engage a broad range of stakeholders, and allow them to express a wide range of views. The mix of participants was crucial to ensure representation of diverse experience and expertise across the system network under consideration.

Recognising the complexity of housing issues, we decided to hold multiple workshops, each of which would concentrate on a separate “system”. A system is a representation of the sources of influence over a particular problem, and of the individual relationships between these components. We sought a balance between delineating between problem domains, representing a traditional division of stakeholder expertise, and minimising separation of the systems context overall. We held two STICKE workshops, each of which lasted five hours in total; each workshop was divided into two sessions of
equal length, held two days apart. While STICKE workshops are normally conducted face to face workshops, COVID-19 restrictions enforced a shift to an online format using Zoom, a digital conferencing tool. Each workshop focused on one of two topics, with two specific research questions:

**STICKE Workshop A: Building, Planning, and Financing Compact Homes:**
- What are the key issues that need to be addressed in relation to building, planning, and financing villages of/single compact (40 to 48sqm) homes to increase supply over the next 10 years of well-designed, freestanding, affordable, and accessible homes?

**STICKE Workshop B: Community Integration of Compact Homes**
- What is needed to increase community integration of villages of tiny homes into existing communities within the next ten years?

STICKE workshops are based on group model building (GMB) methodology. The GMB methodology guides a stakeholder group through a series of participatory tasks to examine participants’ mental models (cognitive representations of interdependent causes and effects) of a given situation or problem. The specific tasks to be carried out are described in documents called GMB scripts.

The workshops took the form of a series of guided activities facilitated by a small team of trained researchers. During the guided activities, participants were introduced to the nature and scope of the problem being investigated, worked to identify the various factors contributing to the problem over time, and finally identified the interconnections between those factors. Throughout these sessions, researchers made written notes of the discussion and points raised by participants.

**Step 1: Group Model Building**

In the first session, a GMB exercise was conducted with key stakeholders to produce an initial “causal loop diagram”. The session ran for two and a half hours. Participants developed a setting-specific systems map capturing the key points arising from the discussion (how to increase the supply of affordable, socially integrated compact homes in Victoria). During the session, participants’ input was used to develop a visual representation of the various sources of influence over the problem under investigation, and the many relationships between those influences, creating what is known as a causal loop diagram (see Part 4.3.1 of this report). A casual loop diagram indicates how different variables in a system are interrelated.

**Step 2: Review and Develop Model**

Guided by the researchers, participants then further developed and refined the causal loop diagram. First, participants visually clarified the initial model. Based on the written workshop notes, they then reviewed the content of the model to ensure it accurately reflected the discussion and did not omit any points raised, or any other outputs from the first session. This process ensured that any discussion points not captured during the initial modelling (Step 1) could be retrospectively added into the model.

**Step 3: Confirm System Map and Generate Action Ideas**

At the start of each workshop’s second session, participants were led through a summarised version of Step 1 findings to validate and finalise the revised map from Step 2. We then gave them some
theoretical background on how to identify potential points for intervention within causal loop diagrams, and they spent some time generating and prioritising actions.

3.3 Analytical Framework

In this section we outline the analytical framework underpinning the STICKE workshops. Our approach was based on systems thinking and Meadows’ (1999, p. 1) “leverage points” framework.

3.3.1 Systems Thinking

Systems thinking is an analytical approach to complexity that is applied to issues, problems, and contexts where there are many possible solutions or ways of creating solutions. Systems thinking is nested within the field of system dynamics. At its most basic, system dynamics is defined as a “method for understanding the dynamic behaviour of complex systems” (de Rome & Meadows, 1972, p. 2); it involves “forest thinking” (Richmond, 2000, p. 3), whereby individual factors are not viewed in isolation from the whole.

There are two main components of systems thinking: first, a topographical perspective that encompasses a view of specific factors and components; and second, thinking about those individual factors and components as a part of a system imbued with interlocking relations. As a tool, systems thinking is most useful when intuitive approaches previously applied to correct undesirable system behaviours have failed to produce the meaningful and satisfactory change they seek.

When applied to community-based stakeholder engagement, systems thinking engages stakeholders in a shared process of identifying problems, their causes, and relationships to other factors, and understanding how stakeholders – personally and collectively – can intervene. While a systems framework can produce a feasibility analysis for of policymakers and practitioners, it also builds the capacity of community stakeholders to drive and promote action.

3.3.2 Leverage Points

Once a system has reached a perceived level of complexity, the task is then to ascertain leverage points where an intervention can be most impactful or successful. In this study, the research team used elaborated on systems thinking to identify the highest-impact and most feasible leverage points in the given system. We adopted Meadows’ (1999, p. 1) framework for identifying these “leverage points” or “points of power” to measure the effectiveness of particular actions to bring about desired changes to the state of a system. Actions are ranked from least effective (12-point value) to most effective actions (1-point value); see Table 3.10 (below).

Using a generalised example action to increase the supply of affordable housing, in Appendix E we discuss how these 12 leverage points were used to evaluate the priority actions produced in workshops.
<table>
<thead>
<tr>
<th>Level of Intervention</th>
<th>Place to Intervene in a System</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Constants, parameters, numbers (such as subsidies, taxes, standards)</td>
</tr>
<tr>
<td>11</td>
<td>Sizes of buffers and other stabilising stocks, relative to their flows</td>
</tr>
<tr>
<td>10</td>
<td>Structure of material stocks and flows (such as transport networks, population age structures)</td>
</tr>
<tr>
<td>9</td>
<td>Lengths of delays, relative to the rate of system change</td>
</tr>
<tr>
<td>8</td>
<td>Strength of negative feedback loops, relative to the impacts they are trying to correct against</td>
</tr>
<tr>
<td>7</td>
<td>Gain around driving positive feedback loops</td>
</tr>
<tr>
<td>6</td>
<td>Structure of information flows (who can/cannot access information)</td>
</tr>
<tr>
<td>5</td>
<td>Rules of the system (such as incentives, punishments, constraints)</td>
</tr>
<tr>
<td>4</td>
<td>Power to add, change, evolve or self-organise system structure</td>
</tr>
<tr>
<td>3</td>
<td>Goals of the system</td>
</tr>
<tr>
<td>2</td>
<td>Mindset or paradigm from which the system — its goals, structure, rules, delays, parameters — arises</td>
</tr>
<tr>
<td>1</td>
<td>Power to transcend paradigms</td>
</tr>
</tbody>
</table>

Table 3.10: Places to Intervene in a System
## Contents

4.1 FOCUS GROUP FINDINGS ................................................................................................................... 92

4.1.1 Focus Group One Findings .............................................................................................................. 92

4.1.2 Focus Group Two Findings ............................................................................................................ 100

4.1.3 Focus Groups Three + Four Findings .............................................................................................. 102

4.2 INTERVIEW FINDINGS ...................................................................................................................... 106

4.2.1 Ageing in Place in a Microvillage ................................................................................................... 106

4.3 STICKE WORKSHOP FINDINGS ......................................................................................................... 109

4.3.1 STICKE Workshop A Findings: Building, Planning, and Financing ................................................... 109

4.3.2 STICKE Workshop B Findings: Community Integration ................................................................... 117

4.3.3 Priority Actions ............................................................................................................................. 123

4.3.4 Systems Thinking Analysis of Priority Actions ............................................................................... 125
This section of the report outlines the findings from our community engagement research. As outlined in Part 3, our data collection process involved four focus groups, six interviews, and two systems thinking (STICKE) workshops. A diverse range of community stakeholders and experts participated.

4.1 Focus Group Findings

We begin by setting out the findings of the four focus groups. For details of the research process we followed to collect this data, see Part 3.

4.1.1 Focus Group One Findings

Participants in our first focus group were professionals working in the financial, legal, and insurance sectors. In this section, our findings are organised by:

- Legal structure (the various models likely to be used in a microvillage environment: standard subdivision, company title, strata title, retirement village, recreation part (moveable dwelling)
- Core areas of impact (funding availability, tax or subsidy implications, regulatory impact, imposed governance/management structures, financial implications, and feasibility), and
- Barriers, opportunities, and enablers.

While a range of barriers, opportunities, and enablers exist for each type of legal structure, it is unlikely that a standard subdivision, company title, or retirement village structure would be used. Why not? We identified three reasons:

- **Standard subdivision**: there was limited discussion of this development structure. In any event, land costs would be prohibitive, and there is no clear avenue to include communal facilities.
- **Company title**: under this ownership structure, a company owns all the assets within a development, and shareholders have rights to occupy a particular property lot through a leasing or licensing arrangement. The company is regulated by the Commonwealth Corporations Act 2001. The group canvassed no real opportunities to use this structure. The clear barrier was that mortgage access would be both difficult (due to age and lack of paid employment) and costly (treated as a corporate activity entity, not as lending against a residential housing asset – lenders are required to hold more capital against such loans, so interest rates are higher).
- **Retirement village**: this model is a highly regulated property scheme whereby a commercial or charitable entity operates the village. While the deferred management fees are both an opportunity and a barrier, there are onerous legal obligations, high and ongoing management fees, and a devaluing component due to age restriction on title. The only real opportunity is that deferred management fees can reduce up-front entry costs. However, the resident may have little to no return on their initial investment.

Our findings from Focus Group 1 are summarised below (see Tables 4.1–4.6)
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| **Funding availability** | • Mortgage access (age/not in workforce).  
• Social value not a factor in bank lending: risk adverse, potential reputational damage of foreclosing on vulnerable households.  
• Banks hamstrung by regulators; conservative.  
• Non-standard property products.  
• No cheap capital for smaller developments.  
• Loans unaffordable for low-income cohorts.  
• Income-capped rents limit CHP borrowing (interest coverage ratios, no free equity).  
• Cost of equity or equity-like debt from alternate providers (e.g., superannuation funds) prohibitive and inefficient. | • Lenders may consider blended financing arrangements.  
• Unused land donations to ease costs.  
• Co-equity/shared equity/delayed second mortgage models – but banks have limited capacity, as core business is lending, not owning residential property/direct exposure to market (regulators don’t encourage this).  
• Revolving door funds (philanthropic capital to provide concessional lending terms, recycled for future outcomes). | • CHPs seen as good conduit between lender and resident.  
• CHPs can access cheap, long-term debt via NHFIC (may not meet residents’ desire for ownership/security/appreciation).  
• Government subsidies to fill CFP funding gap over loan term for higher leverage ratios (e.g., $10–20K per property/year for 10–30 years).  
• Accessing GST/stamp duty concessions to reduce cost by developing via registered charities/public benevolent institutions.  
• Scheme like Defence Housing Australia: private ownership, government lease cashflow. |
| **Tax/subsidy implications** | • No access to CRA if purchasing. | • May qualify for First Home Owners’ Grant. | • Tax incentives for socially minded investors.  
• If residents have access to SDA (disability housing subsidy).  
• Extend First Home Owner’s Grant to prior homeowners who have lost their home via circumstance (e.g., divorce). |
| **Regulatory impact** | | • Inclusionary zoning/planning restrictions so alternate developer land use does not render projects unaffordable. |
| **Imposed governance structure** | | |
| **Financial implications** | • Cost of land. | |
| **Feasibility** | • CHP rental model may not meet residents’ desire for ownership/security/legacy.  
• Residents may be eligible for social housing. | • Easier structure due to low level of complexity. |

Table 4.1: Standard Subdivision (without common property) (Focus Group 1)
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| **Funding availability** | • Mortgage access (age/not in workforce).  
• Social value not a factor in bank lending: risk adverse, potential reputational damage of foreclosing on vulnerable households.  
• Not treated as lending against residential housing for bank regulatory capital calculations; treated as lending for corporate activity; thus attracts higher capital charge, and higher lending margins/costs (i.e., rates probably 2–2.5% higher than residential mortgage finance).  
• Loans not affordable for low-income cohorts. | | • Accessing GST/stamp duty concessions to reduce cost by developing via registered charities/public benevolent institutions. |
| **Tax/subsidy implications** | • No access to CRA. | |
| **Regulatory impact** | | • Inclusionary zoning/planning restrictions so alternate developer land use does not render projects unaffordable. |
| **Imposed governance structure** | | |
| **Financial implications** | • Insurance challenges due to corporate structure.  
• Cost of land. | |
| **Feasibility** | • Low if residents owe company. | |

Table 4.2: Company Title (company owns entire property scheme, residents are shareholders with leasing or licensing rights) (Focus Group 1)
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| **Funding availability** | • Mortgage access (age/not in workforce).  
• Social value not a factor in bank lending: risk adverse, potential reputational damage of foreclosing on vulnerable households.  
• Banks hamstrung by regulators; conservative.  
• Non-standard property products.  
• No cheap capital for smaller developments.  
• Loans unaffordable for low-income cohorts.  
• Income-capped rents limit CHP borrowing (interest coverage ratios, no free equity).  
• Cost of equity or equity-like debt from alternate providers (e.g., superannuation funds) prohibitive and inefficient. | • Capital gains = security.  
• Lenders may consider blended finance.  
• Unused land donations to ease costs.  
• Co-equity/shared equity/delayed second mortgage models – but banks have limited capacity, as core business is lending, not owning residential property/direct exposure to market (regulators don’t encourage this).  
• Revolving door funds (philanthropic capital to provide concessional lending terms, recycled for future outcomes). | • CHPs seen as good conduit between lender and resident.  
• CHPs can access cheap, long-term debt via NHFIC (but may not meet residents’ desire for ownership/security/appreciation).  
• Government subsidies to fill CFP funding gap over loan term for higher leverage ratios (e.g., $10–20K per property/year for 10–30 years).  
• Access GST/stamp duty concessions to reduce cost by developing via registered charities/public benevolent institutions.  
• CHPs aim for quality, sustainable building forms.  
• Lenders prefer strata structures (in perpetuity).  
• Alternate investors (social good). |
| **Tax/subsidy implications** | • No access to CRA if purchasing. | • Government or external subsidies.  
• May qualify for First Home Owners’ grant.  
• Extend First Home Owner’s grant to prior owners who’ve lost home via circumstance (e.g., divorce).  
• Resident access to SDA (disability housing subsidy).  
• Tax incentives for socially minded investors. |
| **Regulatory impact** | • Onerous legal obligations. | • Formalised, regulated structure ensures good upkeep. Self-choice or unregulated: problematic.  
• Inclusionary zoning/planning restrictions so alternate developer land use does not render projects unaffordable or incentivise sale to unlock land redevelopment value. |
| **Imposed governance structure** | • Owners ignorant of governance structure and therefore responsibility.  
• Misunderstanding property boundaries.  
• Unqualified asset manager. | |
| Financial implications | • Cost of land.  
• Costs of community facilities unexpectedly high (especially for smaller communities).  
• Paying for “community” is a cost.  
• Unlimited liability (owners guarantee debts).  
• Insurances (replacement, reinstatement, public liability for common areas)  
• Repair/maintenance of common property.  
• Extraordinary and unforeseen repairs.  
• Paying contractors.  
• Hidden costs.  
• Leads to difficulties with budgeting for levies.  
• Perception units are cheaper – but can cost more; resident cannot control costs/timing. | • Statutory requirement to insure minimises financial risk to collective ownership.  
• Collective cost savings: bulk-buy services.  
• Offset costs via community self-management: use cohort skills to undertake work.  
• Shared facilities can reduce cost (dependent on scale).  
• Rates exemptions (depends on LGA). | • Inexperience with this development type.  
• Highly dependent on land (size, location).  
• Not necessarily a cheap alternative.  
• Insurers have not considered these development types.  
• Succession planning for ageing (facilities).  
• Facilities not being used.  
• One-size-fits-all model difficult to achieve.  
• CHP rental model may not meet residents’ desire for ownership/security/legacy.  
• Residents may not qualify for social housing.  
• Semi-rural or rural areas.  
• New development: ensure inclusion of correct and useable facilities.  
• If legislative change allows grants (e.g., First Home Owners Grant) or stamp duty exemptions. |

Table 4.3: Strata Title (land subdivision with at least two lots tied to common property; governed by private owners’ corporation) (Focus Group 1)
<table>
<thead>
<tr>
<th><strong>Barriers</strong></th>
<th><strong>Opportunities</strong></th>
<th><strong>Enablers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding availability</td>
<td>• Social value not a factor in bank lending: risk adverse, potential reputational damage of foreclosing on vulnerable households.</td>
<td>• Deferred management fee (but problematic from consumer protection perspective); depends on time of stay (10 years+).</td>
</tr>
<tr>
<td>Tax/subsidy implications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory impact</td>
<td>• Fairly onerous legal obligations.</td>
<td></td>
</tr>
<tr>
<td>Imposed governance structure</td>
<td>• External manager with profit incentive; absorbed by community (risks for vulnerable cohorts).</td>
<td></td>
</tr>
<tr>
<td>Financial implications</td>
<td>• Deferred management fee reduces legacy (also problematic from consumer protection perspective).</td>
<td>• Deferred management fee can reduce up-front entry costs. • Access to benefits of capital appreciation (deferred management fee model). • Incoming contribution models (but may reduce return at exit to zero).</td>
</tr>
<tr>
<td>Feasibility</td>
<td>• Devaluing component due to age restriction on title. • Deferred management fee model increasingly seen as unsustainable due to increasing life expectancy (occupancy not financially sustainable beyond 10–12 years).</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.4: Retirement Village (usually overlaid with strata title, so barriers, opportunities, and enablers for strata should be considered here) (Focus Group 1)
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding availability</td>
<td>• Lenders prefer growth assets (i.e., land) not depreciating assets (i.e., chattels).</td>
<td>• Unused land donations to ease costs.</td>
</tr>
<tr>
<td>Tax/subsidy implications</td>
<td></td>
<td>• No stamp duty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No land tax.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Commonwealth Rental Assistance (may offset management fees).</td>
</tr>
<tr>
<td>Regulatory impact</td>
<td>• Less obligatory (differs from onerous obligations of strata).</td>
<td>• Regulated in conjunction with <em>Residential Tenancies Act</em> (consumer protections for residents)</td>
</tr>
<tr>
<td></td>
<td>• More consumer protection.</td>
<td>• Lease arrangement</td>
</tr>
<tr>
<td>Imposed governance structure</td>
<td></td>
<td>• External management provider; keeps facilities operational.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inclusionary zoning/planning restrictions so alternate developer land use does not render projects unaffordable or incentivise sale to unlock land redevelopment value.</td>
</tr>
<tr>
<td>Financial implications</td>
<td>• Relocation costs if site becomes unavailable or want to move (especially if dwelling larger – built for ageing in place, universal design).</td>
<td>• Liability is limited (no obligations to community financial management).</td>
</tr>
<tr>
<td></td>
<td>• If dwelling is bought, likely to depreciate not appreciate in value.</td>
<td>• Freeing of capital expenditure.</td>
</tr>
<tr>
<td>Feasibility</td>
<td>• CHPs not interested in this model.</td>
<td>• Flexible: can move location if not fit for purpose or unhappy with resident mix.</td>
</tr>
<tr>
<td></td>
<td>• If client wants freehold title and legacy asset.</td>
<td>• Good for lower SE residents.</td>
</tr>
<tr>
<td></td>
<td>• Inexperience with these development types.</td>
<td>• Enclosed estate offers residents security.</td>
</tr>
<tr>
<td></td>
<td>• Recreation Park zoning impacts land availability.</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5: Recreation Park (moveable dwelling) (Focus Group 1)
In terms of viability, participants felt the strata title ownership and Recreation Park (moveable dwelling) structures were of particular interest. Table 4.6 (below) highlights the main barriers, opportunities, and enablers for these two structures.

<table>
<thead>
<tr>
<th>Legal Structure</th>
<th>Barriers</th>
<th>Opportunities</th>
<th>Enablers</th>
</tr>
</thead>
</table>
| Strata          | • Mortgage access.  
• Legal obligations.  
• Cost of land.  
• Cost of community facilities.  
• Unlimited liability (collectivism).  
| • Capital growth.  
• Blended finance arrangements.  
• Co-equity models.  
• Statutory requirements minimise financial risk.  
• Collective cost savings: buying in bulk and sharing facilities.  
• Rates exemption (potentially).  
| • CHP involvement.  
• CHPs can access cheap long-term debt.  
• Lender-preferred model.  
• Government and external subsidies.  
• Regulated structure ensures good upkeep.  
| Recreation Park | • Difficult to get finance: lenders prefer growth assets, not chattels.  
• Depreciating asset.  
• Costs of moving chattel.  
• CHPs not interested in this model.  
• No legacy of asset.  
• Recreation Park zoning impacts land availability.  
| • Less regulatory obligations and more consumer protection (via RTA).  
• Liability is limited: no obligations to others or community.  
• Easier to move location if community is not fit for purpose or unhappy with resident mix.  
| • No stamp duty.  
• No land tax.  
• Commonwealth Rent Assistance (CRA).  
• Lease arrangement.  
• External management provider.  
• Freeing of capital expenditure.  
• Enclosed estate offers residents security.  
• Good option for very low SE residents.  

Table 4.6: Barriers, Opportunities, and Enablers for Legal Structures (Strata and Recreation Park) (Focus Group 1)
4.1.2 Focus Group Two Findings

Focus Group 2 participants were members of the Microvillage Geelong Taskforce who have expertise or experience in construction, planning, legal, and financial issues. Participants discussed and evaluated the four options: Model 1: Individual Ownership; Model 2: Co-Ownership; Model 3: Co-Ownership with Community Housing Provider (CHP); and Model 4: Residential Park. Each model was scored out of 40.

Model Evaluation

Table 4.7 (below) outlines the key findings from Focus Group 2’s evaluation of the four models. In sum, participants identified two preferred models for the proposed microvillage:

- **Model 3: Co-Ownership with a Community Housing Provider (CHP)** was the clearly preferred option, as it removes some of the financial and managerial burdens of individual ownership; this could make it more affordable for low-income residents. Participants also highlighted this model’s capacity to increase resident diversity. The chief issue with this model is finding a CHP willing and able to co-fund a small development (around 12 units), especially in light of the issues this study identified around the model’s financial feasibility; and

- **Model 4: Residential Park** was the second preference. Under this “ownership” model, residents do not own land. This requires either a change in Victorian State law similar to that operating in Queensland, or a local government willing to provide land with a 99-year lease.

- **Importantly, for both models:** participants rejected the notion of “tiny” homes for long-term living in favour of “compact”, permanent homes on foundations of 40sqm–48sqm (the latter being the smallest area able to meet universal design principles); they also expressed a preference for microvillages of 8–30 homes that foster community integration via careful consideration for people, place (including communal spaces for activities and shared resources), and processes.

Models 2 and 4 (Individual Ownership and Residential Park) received very similar scores (28 and 28.5 respectively), with reservations and positives expressed around each. While co-ownership was seen as the most secure and straightforward option, its high start-up costs and slowness were significant issues. Model 4 (Residential Park) was viewed slightly more favourably, but again, it required either a change in State law like that enacted in Queensland, or an LGA willing to provide land with a 99-year lease.

Additional Thoughts at the End of the Session

While all participants were positive about what they learned from the focus group, one summed up a mood of frustration from a long period of advocacy in this area.

“It does just highlight how damn complex and hard it is to do this. You need to have more diversity of residential housing options, so... I think heads have got to get banged together somewhere along the line within government, because it shouldn’t be this hard. It just really needs to happen on economic, environmental, social fronts. And it’s frustrating, it’s so difficult!”
<table>
<thead>
<tr>
<th>Model and Feasibility Scores</th>
<th>What Informed the Feasibility Score?</th>
<th>Potential Changes to Improve Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL 1: Individual Ownership Feasibility Scores: n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
| MODEL 2: Co-Ownership Feasibility Scores: 6.5 | • High costs and regulation counterbalanced by security of familiar ownership and financial structures.  
• Possible co-equity (several people own unit, which is leased).  
• Good model for people who can afford it: security around common areas, community aspect. But unaffordable for people with low equity and income.  
• Straightforward, but impractical for vulnerable cohorts, as it imposes responsibility to be involved in management. Owners’ corporation membership might be unfeasible for this cohort, so group decision-making problematic.  
• Apathy around joint responsibility.  
• Slow start-up due to high costs | • Additional support in the form of grants or co-equity model.  
• Co-investors don’t necessarily want to live in the houses.  
• Greater transparency from LGAs (possibly encouraged by State government pressure) around making land available.  
• Establish a company structure that owns all land and shared facilities. Residents or investors hold shares in the company. |
| 8 | 7 | 7 | 7 | TOTAL: 28.5 |
| MODEL 3: Co-Ownership with CHP Feasibility Scores: 9 | • More affordable, especially if common areas limited.  
• Support of CHP makes it viable (if CHP open to this model).  
• Social housing investor might enable good social mix.  
• Part ownership: housing provider owns 2-4 units in group of 12; remainder owned by other people and/or residents.  
• Shared management of site might be difficult.  
• CHP can access cheap long-term debt and do governance. | • Ready identification of partners willing to fund such initiatives.  
• Willingness of CHPS to co-fund small-scale developments (more likely to be smaller providers.)  
• Overcoming the debt ratio of lenders (typically requires CHPs and co-investors to fund 80% of development costs). |
| 8 | 8 | 8 | 8 | TOTAL: 33 |
| MODEL 4: Residential Park Feasibility Scores: 7 | • For a small park (12 units), costs would be high for operator (company co-owned by residents).  
• Concerns around liveability if costs kept low for small park.  
• Start-up might be quicker than other options if LGA agrees.  
• May not be an exemplar of sustainability, liveability, and connected communities. | • Change of Victorian legislation as per Queensland.  
• LGA planning schemes allowing long-term residency.  
• Availability of 99-year leases.  
• Land provided cheaply by LGA for 99-year lease. |
| 6 | 8 | 7 | TOTAL: 28 |

Table 4:7 Model Evaluation (Focus Group 2)
4.1.3 Focus Groups Three + Four Findings

Participants in the third and fourth focus groups were potential residents interested in living in a microvillage. These sessions addressed the following overall research question:

- What are potential residents’ perspectives on community integration – both within a microvillage, and between the village and the surrounding community?

From these focus groups, three main themes emerged: People, Place, and Processes. Before discussing these themes, it is important to note that, not unexpectedly, all participants aspired to live in a setting that fostered a sense of community. However, they arrived at this aspiration in different ways, which reflected their varied backgrounds and past experiences.

Two participants from culturally and linguistically diverse backgrounds spoke of how early experiences of being raised in more collective societies overseas has shaped their desire for a sense of community. For others, their aspirations related to being deeply involved with community movements or group, such as Transition Towns and Men’s Sheds in Australia. One participant spoke of observing the benefits of communal living by visiting existing cohousing communities, both overseas and in Australia:

“...what attracted me to the concept was my trip to England...there was a village and they’d built these tiny houses as a place for the farm workers to retire to. And they had their little garden out the back and their social meeting and their village green where they’d have all these activities and stuff. And I thought, what a great way to live. To be able to live in part of a community like that.

So, when I came back to Australia, I tried to look at places where that was happening here, and I ended up going to Maleny in Queensland... where there was a co-op, another co-op, another co-op. Four co-ops in Maleny as I went through. I thought wow...” (Jack).

For most participants – Jack, Carol, Louise, and Anna – their interest in community living was not only personal, but also relevant to people they know who are missing out on decent housing in the current market. As Jack explained:

“He’s on a very limited income and the room that he can afford is just a tiny little box and he’s locked into there every day... He sits in this dark room by himself, goes a little bit silly, gets depressed, illnesses follow, and they end their life rather quickly. So, that’s basically why I’m being sort of involved in this to try and get out of his situation... I think there’s got to be a better option than what he’s faced with...”

The following tables summarise findings in relation to the three identified themes:

- Focus Group Theme 1: People
- Focus Group Theme 2: Place, and
- Focus Group Theme 3: Processes.
**Theme 1: People (Community Integration)**

In Focus Groups 3 and 4, the first theme that emerged was “People”. Table 4.8 (below) summarises participants’ requirements around the people (fellow residents) in a potential microvillage, with the aim fostering community integration. Quotes are provided as examples of participants’ views and preferences.

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shared values</strong></td>
<td>Residents with shared values. Includes having a social conscience, respect for each other, being willing to participate, and being likeminded:</td>
</tr>
<tr>
<td></td>
<td>“People who are community-minded, basically” (Louise).</td>
</tr>
<tr>
<td><strong>Diversity</strong></td>
<td>A diversity of residents (age, cultural backgrounds, abilities):</td>
</tr>
<tr>
<td></td>
<td>“…it would be nice to have little kids and even be able to babysit and just hear the laughter of children, and therefore also helping out a young single mum” (Anna).</td>
</tr>
<tr>
<td><strong>Reciprocity</strong></td>
<td>Residents who would help each other out in a reciprocal way:</td>
</tr>
<tr>
<td></td>
<td>‘being able to learn from each other, because when you live in a community you all have different strengths and interests...’ (Rebekah)</td>
</tr>
<tr>
<td><strong>Practical sharing</strong></td>
<td>People who are happy to share practical resources such as tools, vacuum cleaners, kitchen items, and books.</td>
</tr>
<tr>
<td><strong>Shared activities</strong></td>
<td>Residents who are willing to undertake some shared activities together to help build community integration:</td>
</tr>
<tr>
<td></td>
<td>“That shared...involvement, giving you a reason to get together. It may be cycling, it may be rock and roll but... it is very important to have activities, interests...all of those things will make the community function better I think” (Jack).</td>
</tr>
<tr>
<td><strong>Different resident needs</strong></td>
<td>Recognition that residents may have different needs that should be accommodated; potential points of difference included pet ownership, and preferences around car ownership and parking:</td>
</tr>
<tr>
<td></td>
<td>“My cat...likes to hang out with people... Some people may not like that, so that is a potential problem’ (Karen).</td>
</tr>
<tr>
<td></td>
<td>Some people preferred shared cars parked away from the microvillage; others preferred to park their own cars near their unit. See “Processes” theme (Table 4.10, below) for how these differences might be resolved to support community integration.</td>
</tr>
</tbody>
</table>

*Table 4.8: “People” Theme: Requirements for Community Integration (Focus Groups 3 + 4)*
Theme 2: Place (Community Integration)

In Focus Groups 3 and 4, the second theme that arose was “Place”. Table 4.9 (below) summarises participants’ requirements around the place-based aspects of a potential microvillage, with the aim fostering of community integration. Quotes are provided as examples of participants’ views and preferences.

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Good design</strong></td>
<td>A well-designed microvillage that provides simple affordable homes, meets a range of abilities and needs, and “respects the land that it’s on in the first place” (Phillip). Participants were open to a range of design options (see “Layout of village”, below).</td>
</tr>
<tr>
<td><strong>Proximity to facilities/services</strong></td>
<td>Near public transport, within walkable distance of shops, green space, and other key community facilities, and away from unsafe areas. Opinions differed on ideal location (see “Location of village”, below).</td>
</tr>
<tr>
<td><strong>Connecting with local neighbourhood</strong></td>
<td>Not a standalone community – must be connected to local neighbourhood. Suggestions: invite neighbours to visit; and use communal space to run language and cooking classes, operate a Men’s Shed, or host a small business venture providing services for the local neighbourhood: “[Existing neighbours] would be watching the whole process and thinking, ‘What on earth is going to happen here?’ Maybe it’d be a welcome to invite the close neighbours to, once it’s up and running, come in and have a cup of tea and meet us.’ (Julia). “We could set up our own repair cafe there…helping each other out” (Pauline).</td>
</tr>
<tr>
<td><strong>Communal outdoor spaces</strong></td>
<td>Strong desire for high-quality, communal outdoor spaces (both for aesthetic qualities and to promote community integration): “…a little veggie garden, some flowers… A shed with the communal [gardening] tools, and a pergola maybe with a BBQ and some chairs so that we can actually meet and have our little babbies and get together and afternoon teas there. Or have our families over” (Anna).</td>
</tr>
<tr>
<td><strong>Communal indoor spaces</strong></td>
<td>Indoor gathering spaces that are multifunctional and help to build community: “…The centre of life will be the communal centre. And I think whether we have shared meals, whether we have shared laundries or shared whatever, it needs to be a gathering place which is multifunctional” (Phillip).</td>
</tr>
<tr>
<td><strong>Private space</strong></td>
<td>Sufficient private space also important for community integration: “I also need my private space. So, I love having kids around but there’s a time where…I need that serenity, I need that bit away” (Pauline).</td>
</tr>
<tr>
<td><strong>Layout of village</strong></td>
<td>Much discussion, but no firm consensus (besides communal spaces). Range of preferences: one-storey units; two storeys or more (if made accessible); units surrounding communal space; star-shaped design; green space behind units, indoor communal space fronting street.</td>
</tr>
<tr>
<td><strong>Location of village</strong></td>
<td>Much discussion, no firm consensus. Preferences ranged from a suburban or city location, to a semi-rural or beachside locale. Group agreed that location would depend on land available. Nobody favoured an isolated setting.</td>
</tr>
<tr>
<td><strong>Size of village</strong></td>
<td>Ranged from 6–8 units, to 15–20, to 30-plus. Size determines what communal spaces are offered, but above a certain size, community is lost: “The number of units, and the size of the land available…determine[s] how many things you could have as community or private” (Louise). “[There is] a maximum number where it becomes not a community. Where people don’t know each other… It can become too big” (Leah).</td>
</tr>
<tr>
<td><strong>Showcasing the microvillage</strong></td>
<td>The microvillage could showcase a different way of living to the wider community: “This is a different type of gentrification where it’s not about big developers picking up on design styles that are cool in other parts of the world and trying to make a mint out of it… More ‘Let’s try to pave a way forward in a more sustainable, ecofriendly, intentional, community kind of way’… That could be a really bright thing for people to see in front of them, that would be amazing… It would be a beacon” (Jack).</td>
</tr>
</tbody>
</table>

Table 4.9: “Place” Theme: Requirements for Community Integration (Focus Groups 3 + 4)
Theme 3: Process (Community Integration)

The final theme arising from Focus Groups 3 and 4 relates to the “Processes” required to foster community integration in a potential microvillage. Participants recognised that the microvillage would not be a static arrangement, and that there could be ongoing changes to the resident population and even the design of the village as the community evolves. Table 4.10 (below) summarises a range of proposed processes to ensure continued community integration.

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| Selection of residents       | In line with the desire for common values (see Table 4.8, above), some felt there should be a formal selection process for residents. However, this could be challenging:  
   “I think there’s going to have to be a system where there’s a connection or a commonality between the people living in the village... So...people of like mind who were similar – perhaps not in every respect, but basic goals, basic values that are in line with how I think and how I want to live my life. Not easy to do and I suppose implying that there’s going to be a selection process” (Jack). |
| Managing turnover            | Some saw a need to extend this selection process to assessing new residents:  
   “When people have to leave or a new person wants to come in, there’s going to have to be some system where you can say, ‘Well, this is what we’re about. If it’s okay with you, fits in with your philosophies, well, you’re very welcome’” (Jack). |
| Learning from other communities | Residents could learn from other communities that had developed good processes (e.g., for decision-making):  
   “The community in Denmark were very good on disputes... They had a whole heap of stuff written down about that, which was interesting... We’ve looked at various villages and how they were set up, but that one struck me as being particularly good....” (Carol). |
| Setting up processes early    | Processes for decision-making and resident selection should be developed prior to occupants moving in:  
   “Having the values and principles set out straight from the start is important for either the start of a new community or when welcoming new people in if people are moving out” (Phillip). |
| Small decision-making        | Smaller decisions could be handled via a more gradual, organic process:  
   “I was thinking these things would grow organically depending on the people living there. For instance, you might like to have a library with a coffee machine in it, and that just depends on the people...” (Louise). |

Table 4.10: “Process” Theme: Requirements for Community Integration (Focus Groups 3 + 4)
In summary, findings from Focus Groups 3 and 4 indicated that fostering community integration in a future microvillage would require consideration for the people, place, and processes involved. On the “People” theme, there was a desire for fellow residents who were diverse, but also had shared values, and were committed to sharing. On the “Place” theme, important considerations included the design of the microvillage, proximity to services and facilities, connection with the existing community, and a balance of shared and private spaces. While there was no consensus on the ideal layout, size, or location of the microvillage, participants agreed it could showcase a different way of living in Geelong. Finally, they highlighted a range of processes that would support community integration, including processes around selection of residents, decision-making, and learning from other similar communities.

4.2 Interview Findings

Our interviews with six older women addressed the following research questions:

- How do low-income women interested in living in a future microvillage in Geelong describe ageing in place?
- In relation to ageing in place, what do participants feel living in a microvillage would offer?

Interview analysis identified the following three themes:

- Interview Theme 1: “I am over moving” (tired of moving house)
- Interview Theme 2: “Maintaining my independence”, and
- Interview Theme 3: “Discrete but sharing”.

4.2.1 Ageing in Place in a Microvillage

For the purposes of this report, we deal with the first theme briefly, and emphasise the second and third themes, which address requirements for the microvillage. In relation to Theme 1, “I’m over moving”, we found that all six of the women recruited for this study had experienced challenging housing situations. They had all moved house at least 10 times in their adult lives (and three having moved 20–30 times), and all relied on government benefits as their only source of income (or were waiting to be age eligible). They had mostly lived in private rental accommodation throughout their adult lives, at the behest of short-term leases. As Linda explained:

I think that’s the biggest thing about this housing situation that impacts me. The perpetual move… I am over moving… I don’t want to move anymore, as I’m getting old, I want to find a place where I can stay, [where] no-one’s going to sell it out from underneath me. I can feel safe and secure.

As such, the women’s reported experiences of ageing in place were profoundly negative. The insecurity of their housing situations had an enormous emotional impact, with every participant experiencing anxiety, depression, or both. In her battle to find housing, Susan became so depressed that she wondered if it would be “better to be homeless”. Pam recalled a recent conversation with a friend about her future housing situation:

She said, “Pam, what are you going to do? What’s your retirement plan?” and I said, “Die young.” I meant it.
Our findings confirmed a need for alternative accommodation options such as the microvillage. The women all highlighted the limited availability of housing for their cohort, with Susan explaining how they “don’t belong” to current housing options:

... private [rental is] too expensive. Because my Widows Pension is lower than a normal pension. That’s one point. The other one is not many places really to rent... I went into nursing homes to see if I can live there. So they [said] that they need all my pension. But it’s not time for me to be there, because I don’t have enough money from the pension to live there. So that’s what is really disgusting. And they say to me, “Oh yes but you have to wait for some length of time.” But I say that I couldn’t cope. I keep crying and crying every day. I cannot live in this way any longer... So I applied to Housing Commission. At Housing Commission I have to wait for about 20 years. Emergency [refuge] accommodation – they say “Yeah, but again but you only live here, so you are not in an emergency...” So I say, “I have to be bashed up?”

In sum, interviewees all had similar negative experiences of ageing in place. The women’s vision for a microvillage that would support a more positive experience of ageing in place included safe, affordable, and appropriate housing that was close to amenities. They also had a strong desire for housing that fostered a sense of community and had a mix of private and communal places. Their specific requirements are summarised in the next two tables. Table 4.11 (below) outlines their vision for the more general features of the microvillage (especially relating to Interview Theme 2: “Maintaining my independence”), while Table 4.12 (overleaf) summarises features specific to the question of community.

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security of tenure</td>
<td>Being able to remain in one home (rented or owned) was a key requirement: “We won’t have to worry about the roof over our heads... We’re not going to get kicked out. We will be able to grow as old as we can in that one place. (Barbara)</td>
</tr>
<tr>
<td>Affordable for people with limited financial resources</td>
<td>Cost should reflect what people can pay, rather than the market: “It would have to be affordable for somebody like me...financially, it has to be geared to, ‘Okay, this is how much the pension [or] income is’ ...equitable according to your capacity, rather than, ‘Well that’s what the dollar market says’” (Pam).</td>
</tr>
<tr>
<td>Close to amenities</td>
<td>Ability to independently access shops, medical services, family, and friends was vital. Access to transport also important, both for safety (coming home at night) and practicality (bringing groceries home). Some wanted to be near public transport, or access to a share car; others wanted carparks near each unit.</td>
</tr>
<tr>
<td>Appropriate design for ageing</td>
<td>Accessible design is vital to support independence, ageing in place, and reduced mobility. Features included open plan spaces, grab rails, and no stairs or baths: “enough autonomy so that you can take care of yourself and don’t have to rely on anyone else. I mean, it’s nice if people want to help, but...I never, ever ask for help... So it’s sort of being able to maintain your independence for as long as possible... My biggest fear is losing that independence” (Deborah).</td>
</tr>
<tr>
<td>A small, simple place to call home</td>
<td>A small development, suited to their life stage, shaped by their input and choices: “It will have a bedroom. A little place to sit to have your meals. Separate bathroom.... Somewhere to put some books... And a little bit of wall space to hang a few things. And a comfy couch. Yeah, that’s all I need” (Barbara).</td>
</tr>
</tbody>
</table>

Table 4.11: General Requirements for the Microvillage (Interviews)
<table>
<thead>
<tr>
<th>Key Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhere for guests to stay</td>
<td>Family was important to interviewees’ happiness, and maintaining these connections was highly valued. They wanted space for shared meals, and overnight stays by children, grandchildren, and extended family</td>
</tr>
<tr>
<td>A place that fosters a sense of community</td>
<td>All interviewees felt positive about making new connections with fellow residents. Similar age and proximity were seen as key benefits; sense of community was often lacking in their current lives: “Just to actually have some time for fun, and to have a laugh. I haven’t had much time for that” (Deborah).</td>
</tr>
<tr>
<td>A place of safety</td>
<td>Linked to their insecure housing histories, all the women wanted a microvillage that provided physical safety through community as they aged: “Security too. Knowing that there’s somebody right there. So everybody looking out for each other...So there’s that safety too...So you know, so you can just phone someone right there and then and you’re like too, you know, in next door and you can help out. So there’s safety in that if someone has a fall or is ill” (Nancy).</td>
</tr>
<tr>
<td>A multi-generational community</td>
<td>Interviewees were open to resident diversity: “The thought of having children around... It would be nice if you could have multigenerational...even young people who have just left home. Having that community support, so that you’re supporting each other” (Linda).</td>
</tr>
<tr>
<td>Shared spaces and resources</td>
<td>Mutual benefit in sharing items and spaces (garden tools, community garden, laundry, car) – offers practical and financial advantages, reflects desire to support environmentally sustainable practices.</td>
</tr>
<tr>
<td>Mix of private and shared spaces</td>
<td>A need for shared spaces and facilities, but also private spaces: “To me, the ideal situation would be maybe six eco units built [around a] common garden area. And everybody’s got their own discrete space... There’d be a place we could gather and would want regularly to do so, but then you can say ‘No, I want to read in bed today. Just leave me alone’... Discrete but sharing is my ideal” (Pam).</td>
</tr>
</tbody>
</table>

Table 4.12: Community-Related Requirements of the Microvillage (Interviews)
4.3 STICKE Workshop Findings

The process for the two STICKE workshops is outlined in the previous section (see Part 3.2.3). During each workshop, Step 3 of the process involved participants confirming a systems map and generating action ideas. Systems maps capture the whole system as participants evaluate it; within that system there are subsystems and factors. A subsystem is made up of multiple factors that are related to, or part of, a causal loop.

Two systems maps were confirmed (one for each workshop). Each systems map produced unique causal loops, which generate differing levels of complexity and subsystems. These subsystems were grouped by a common theme (Table 4.13).

Three themes were common across both confirmed systems maps:

- Regulatory context (planning and building)
- Financing, and
- Community perceptions.

Given the centrality of these three themes to their respective workshop maps, and their ubiquity across the two workshops, these themes can be regarded as paradigmatic in that they have an enlarged capacity to influence how the overall system operates. A change in how these three themes are structured will exact a meaningful change to the system, more so than with any other theme.

<table>
<thead>
<tr>
<th>STICKE Workshop</th>
<th>Themes Grouped During Connection Circle Modelling</th>
</tr>
</thead>
</table>
| **STICKE Workshop A:** Building, Planning, and Financing Compact Homes | • Ongoing historical property market trend.  
• Production and the construction sector.  
• Financing and the finance sector.  
• Regulation and land availability, and  
• Social perspectives and perceptions. |
| **STICKE Workshop B:** Community Integration of Compact Homes            | • Markets, regulations, and the banks.  
• Community perceptions and connection.  
• Quality and visibility of tiny homes, and  
• Design, inclusion, and industry. |

Table 4.13: STICKE Workshops and Key Themes

4.3.1 STICKE Workshop A Findings: Building, Planning, and Financing

The first STICKE workshop was with local government, planners, housing suppliers, and financers. Participants considered the problem of our current inadequate supply of affordable, compact homes designed for ageing in place.

Key to a STICKE workshop is the research question participants are considering. Importantly, participants are asked to record how the factors that relate to a problem have changed over time, and how they might be addressed within a given time frame. The question posed for the first workshop was:
What are the key issues that need to be addressed in relation to building, planning, and financing single units or villages of compact homes (40 to 48sqm) to increase supply over the next 10 years of well-designed, freestanding, affordable, and accessible homes?

Figure 4.1 (below) depicts the participant-driven systems map generated in STICKE Workshop A (Building, Planning, and Financing Compact Homes).

Figure 4.1: System Map from STICKE Workshop A (Building, Planning, and Financing)

Five key themes (factors) emerge from this map:

- Ongoing historical property market trend
- Production and the construction sector
- Financing and the finance sector
- Regulation and land availability, and
- Social perspectives and perceptions.

The maps presented below address each of these themes in turn. For each map, our findings are framed in terms of the “story” that emerges from the data linked to each theme.
**Factor 1: Ongoing Historical Property Market Trend**

The first story centred on growth and investment in property:

- In the initial part of this story, we heard that historically, as property prices have risen, people naturally want leverage that growth – to live in or own large homes as an investment. This has sustained the historical growth in property prices.
- In addition, this growth prompts people to think about the implications for their family and future generations; this helps embed a desire to leave behind assets a build a legacy for family, which in turn further bolsters the desire to leverage the growth in larger homes.
- Another contributor is the pressure and focus on being self-sufficient in retirement – not to end up reliant on welfare. This can be a major driver for people to ensure they own a home as a large and appreciating asset.

![Figure 4:2 Factor 1 from STICKE Workshop A (Building, Planning, and Financing)](image-url)
Factor 2: Production and the Construction Sector

The next story centred on demand and production challenges, and public perception:

- The ongoing appetite for growth in the conventional market (see Factor 1, above) is one of the things restricting demand in the compact home market. With lower demand, production is held low, meaning the construction sector cannot benefit from economies of scale and efficiency in design conventions. This means compact home development puts pressure on the sector, as it is relatively inefficient. Because development in this space is difficult, it can result in poor quality development by “dodgy” developers (not always – but it increases the frequency). This contributes to the public perception that smaller homes are substandard, or at least inferior to a large home, which keeps demand low.

- Also relevant here is a social shift: entertainment and leisure activities are continually trending indoors, driving a demand for more space inside the home, and contributing to the perception that smaller homes are substandard.

Figure 4:3 Factor 1 from STICKE Workshop A (Building, Planning, and Financing)
Factor 3: Financing and the Finance Sector

Continuing on from Factor 2 (above), production and efficiency were also tied to development costs, the behaviour of banks, and finance availability:

- With builders unable to benefit from scale and efficiency, development and building costs remain higher. This means clients must take on more debt as a proportion of the total development cost; this is further exacerbated by the fact that financially vulnerable populations are one of the client groups who potentially stand to benefit from affordable compact housing. In turn, taking on a greater proportion of debt makes financing less available, reducing the willingness of banks to finance compact homes, and creating barriers to construction. Further, low production of compact homes means the banks are not familiar enough with these developments to see them as “usual business”; banks thus view compact homes as a relative unknown, and once again, are therefore less likely to finance them.

Figure 4.4: Factor 3 from STICKE Workshop A (Building, Planning, and Financing)
Factor 4: Regulation and Land Availability

Next, there was a discussion around land regulation and availability:

- Historical growth in conventional property types has caused significant suburban sprawl, which continually reduces the land available for developing compact homes. This pushes compact homes developments out towards the fringes, decreasing proximity to the required infrastructure and services – further contributing to development costs.
- The normalisation of suburban living also creates a bias that we should by default be seeking to build compact homes in urban areas; this reduces the land options being considered as viable locations for compact homes, and also places them in the urban regulatory environment, which can further limit the available land on which they might be developed.
- Finally, protective policies aimed at preserving agriculture in rural areas can also act as a “push” factor, reinforcing the bias toward developing urban compact homes.
Factor 5: Social Perspectives and Perceptions

The final story was around community resistance to compact homes:

- Enabled by regulatory obstacles (such as easy third party appeal processes), and guided by misperceptions about the quality and suitability of compact homes, some sectors of the community actively resist compact home development. This one of the factors limiting production of compact homes.

Figure 4.6: Factor 5 from STICKE Workshop A (Building, Planning, and Financing)
Priority Actions: STICKE Workshop A (Building, Planning, and Financing)

Below is a full list of the 16 actions suggested by participants in STICKE Workshop A (Building, Planning, and Financing Compact Homes).

<table>
<thead>
<tr>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield study to inform developers about benefits of building this form of housing on greenfield sites.</td>
</tr>
<tr>
<td>Microfinancing (around cost rather than value).</td>
</tr>
<tr>
<td>Mainstream supplied mixed villages (offering a disruptive approach like Nightingale).</td>
</tr>
<tr>
<td>Regulatory reform: find a definition for the typology of compact homes.</td>
</tr>
<tr>
<td>Regulatory reform: change Victoria’s laws to allow a secondary dwelling as of right on an existing block.</td>
</tr>
<tr>
<td>Clear translation of housing priorities from State to local.</td>
</tr>
<tr>
<td>Lobbying and advocacy at local and state level around recognising the demand for compact homes.</td>
</tr>
<tr>
<td>An investment model for compact homes, to maximise assets and lessen resistance.</td>
</tr>
<tr>
<td>Stakeholder education needs to focus on small houses being a choice rather than a need.</td>
</tr>
<tr>
<td>Educate LGAs to reduce planning applications resistance and the stigma of compact homes.</td>
</tr>
<tr>
<td>Council fast-tracking of knockdown rebuilds where smaller houses are desired (to allow ageing in place, realisation of value and income from a second dwelling).</td>
</tr>
<tr>
<td>Exemplar project on urban site to sell and evaluate idea (and to take advantage of private sector’s willingness).</td>
</tr>
<tr>
<td>Change prescriptive nature of some of planning requirements (e.g., parking, garden area, setback).</td>
</tr>
<tr>
<td>Remove third party appeal rights when building regulations are met.</td>
</tr>
<tr>
<td>Design work on models for a cluster of homes (around safety and ownership).</td>
</tr>
<tr>
<td>Explore and overcome rural land restrictions to allow further subdivision.</td>
</tr>
</tbody>
</table>

Table 4.14: Actions Suggested in STICKE Workshop A (Building, Planning, and Financing)
4.3.2 STICKE Workshop B Findings: Community Integration

The second STICKE workshop examined existing barriers for housing providers, planners, and policy makers in relation to community integration. The following research question was posed:

- What is needed to increase community integration of villages of tiny homes into existing communities within the next ten years?

Figure 4.7 (below) depicts the participant-driven systems map generated at STICKE Workshop B (Community Integration of Compact Homes).

![Figure 4.7: Systems Map from STICKE Workshop B (Community Integration)](image)

Four key themes emerge from this map:

- Markets, regulations, and the banks
- Community perceptions and connection
- Quality and visibility of tiny homes, and
- Design, inclusion, and industry.

The maps below address each of these themes in turn. For each map, our findings are framed in terms of the “story” that emerges from the data linked to each theme.
Factor 1: Markets, Regulations, and the Banks

The first part of the map below (Figure 4.8) tells a story about the behaviour of markets, regulations, and the banks. This first story is not strictly community-focussed, but participants told us that these market forces were an important driver of many of the more directly community-level issues and perceptions affecting tiny home integration:

- A key driver is the relative dominance of the conventional housing market compared to the market for compact homes. While this dominance persists, it reduces the number of compact homes being developed over a given period. With fewer compact homes being built, the banks see them as unusual or uncommon; the institutional unfamiliarity of compact homes means banks are reluctant to lend against their construction. In turn, this reluctance by banks helps to preserve the dominance of conventional housing over time.

- The low rate of compact home development means the policy and regulatory environment around housing construction is geared heavily toward conventional dwellings. These policies and regulations are often not well suited to smaller homes, and impose restrictions affecting development. In turn, this policy environment provides another disincentive for the banks to participate in compact home development.

- The entrenched dominance of conventional housing also means there is a fear of backlash against any kind of regulatory reform that could upset the dominance of the conventional housing sector. This reduces the effectiveness of any lobbying that might be done, which hinders efforts to make the policy environment more favourable to compact homes.

- Lastly, the long-term dominance of conventional housing and its accompanying growth has created a desire to participate in that market and leverage the growth in housing prices for financial gain. This has created a societal aspiration/norm that people should strive to own a large and valuable home.
Factor 2: Community Perceptions and Connection

The next map connects Factor 1 (above) to community perceptions and connection.

- Because the conventional housing market is so dominant, there is a perception that smaller homes are a fundamentally new and different idea. This is exacerbated by the fact that the dominance of the conventional housing market serves to hide the existing stock of small homes from the community, who do not currently have a strong recognition that these dwellings already exist.
- The perception that a compact home is something new and different, combined with the aspirational norm that people should desires a large and valuable home, produce a generally negative connotation of “tiny homes” as a brand.
- The stronger the negative public perceptions are around tiny/compact homes, the less acceptable the idea of downsizing or living within a smaller footprint becomes, and the less accepting communities are to villages of small homes.

Figure 4.9: Factor 2 from STICKE Workshop B (Community Integration)
Factor 3: Quality and Visibility of Tiny Homes

The next theme in the map addresses quality and visibility of tiny/compact homes, and public understanding of their potential benefits.

- When banks are reluctant to participate in the construction of compact homes, there are fewer opportunities to build good quality small home developments (both in terms of sound structures, and good/modern/suitable/desirable internal amenities). With fewer opportunities for good quality developments, we are left with fewer visible exemplars of microvillages. With fewer high-visibility exemplars, our opportunities to effectively market and promote the benefits of tiny homes are reduced; this makes it difficult to build a community-level understanding of the sustainability benefits of compact living (which would make people more receptive to the idea of downsizing, counter negative associations with “tiny homes” as a concept, and help address the societal norm that a larger house is better).
- Similarly, having few visible exemplars of microvillages means we cannot generate evidence to build understanding around the economic benefits of compact homes. Without this evidence, banks remain reluctant to engage in small home development.

Figure 4.10: Factor 3 from STICK Workshop B (Community Integration)
Factor 4: Design, Inclusion, and Industry

The final theme connects several stories around the construction industry and design of compact homes, and the ability to emphasise inclusivity and access in development:

- With continued reluctance from banks to lend against compact home construction, and ongoing financial insecurity in the wider population, some groups have poor access to finance to take advantage of compact homes that would otherwise present a more achievable model of home ownership than a conventional house. Poor access to financing is one of the reasons compact homes have a lower appeal to younger demographics, who are one of the key cohorts who could benefit from compact homes in the current housing crisis.
- Poor access to financing also limits the ability to deliver good, supportive design for a diverse range of client needs (cultural diversity, accessibility, affordability, number of residents, etc.) The lack of diversity in design makes it more difficult to house clients in a compact home that meets their needs and is well-integrated with existing services and infrastructure; this raises building and construction costs, making finance even harder to obtain in some cases.
- The low number of compact homes being built means the construction sector cannot benefit from economies of scale and efficiency in design; this contributes to the difficulties in designing for diversity, and perpetuates a focus on ageing in place in the compact home market. While this cohort is an important client base who can benefit from compact homes, this situation does perpetuate public perceptions that compact homes are meant for retirees, which discourages younger demographics from considering them as a housing option.

Figure 4.11: Factor 4 from STICKE Workshop B (Community Integration)
Priority Actions: STICKE Workshop B (Community Integration)

Table 4.15 (below) provides a full list of the 21 actions suggested by participants in STICKE Workshop B (Community Integration of Compact Homes).

<table>
<thead>
<tr>
<th>Suggested Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial incentives for people to consider buying into or moving into smaller homes.</td>
</tr>
<tr>
<td>Educate stakeholders to promote small-home living (via writing, events, online campaigns, etc.).</td>
</tr>
<tr>
<td>Review and highlight examples (within Australia and overseas) where the concept has worked.</td>
</tr>
<tr>
<td>A small homes government grant (to give the wider community opportunities to repurpose their own land to free up some of their equity to use for their retirement).</td>
</tr>
<tr>
<td>Financial incentives for building and renting smaller homes.</td>
</tr>
<tr>
<td>An exemplar project on an urban site to sell and evaluate the idea.</td>
</tr>
<tr>
<td>Ensure all new urban renewal master plans have inclusion rezoning development contribution to set aside space for a small home community.</td>
</tr>
<tr>
<td>Planning regulation change to enable building of small homes as affordable housing.</td>
</tr>
<tr>
<td>Engagement with mortgage suppliers to address financing reluctance.</td>
</tr>
<tr>
<td>Determine the demand for small homes.</td>
</tr>
<tr>
<td>Determine government’s willingness to support the concept.</td>
</tr>
<tr>
<td>Design work on cluster models (around safety, ownership, sharing of facilities, sustainability credentials, and diversity of built form for resident diversity – ages, stages, abilities, cultural).</td>
</tr>
<tr>
<td>Investigate non-village models: compact homes inserted into other fabrics.</td>
</tr>
<tr>
<td>Co-design with potential residents and neighbouring communities.</td>
</tr>
<tr>
<td>Enable government rental support to finance purchase.</td>
</tr>
<tr>
<td>Publish the economic benefits of compact homes.</td>
</tr>
<tr>
<td>Free up existing land, including in people’s backyards.</td>
</tr>
<tr>
<td>NDIA independent living options: mix of community and informal support to decrease required funding. Work with NDIA to trial.</td>
</tr>
<tr>
<td>Source crowdfunding and work with governments to create/develop the concept.</td>
</tr>
<tr>
<td>Develop/provide microfinance options.</td>
</tr>
<tr>
<td>Persuade an LGA to provide land; if one local government develops a model and proves its success, others may follow.</td>
</tr>
</tbody>
</table>

Table 4.15: Actions Suggested in STICKE Workshop B (Community Integration)
4.3.3 Priority Actions

The lists of actions created during the two STICK workshops are not easily categorised according to the focus of the research question for each workshop. While the first workshop focused on construction, planning, and finance, and the second workshop focused on community integration, there were clear overlaps in the actions arising from both workshops.

This prompted a further methodological step: the research team integrated the 37 actions from the two workshops into a single list, removing those were repeated or could be readily combined. This resulted in a list of 21 actions. We then undertook a further stage of evaluation to select which of these actions should be prioritised according to feasibility and impact. Here, “impact” was considered in relation to how participants perceived an action’s effect on bringing about change to the housing supply system. “Feasibility” related to how participants understood the ease with which such an action could be implemented, given perceptions of cost, effort, and the will of those who enable those actions.

Normally, STICKE workshop participants would make this decision by consensus. However, this process of consensus decision-making was not possible due to the time constraints imposed by translating the STICKE process to the online environment during COVID-19 restrictions. While some participants submitted action evaluations via email after the workshops, these tended to vary greatly between participants, because they were not developed via consensus. Thus, the researchers used participant data to inform an evaluation via consensus between members of the research team. This final stage of evaluation identified 12 actions that were seen to offer higher levels of feasibility and impact.

The section below provides a full list of the combined 21 actions suggested by participants from both workshops (see Table 4.16). We then outline the final 12 priority actions and how they were identified.
<table>
<thead>
<tr>
<th>Actions</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Total</th>
<th>Prioritise?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield study to give developers information on benefits of building this form of housing on greenfield sites.</td>
<td>3</td>
<td>9.5</td>
<td>12.5</td>
<td>N</td>
</tr>
<tr>
<td>Clear translation of housing priorities from State to local.</td>
<td>9</td>
<td>4</td>
<td>13</td>
<td>Y</td>
</tr>
<tr>
<td>Educate LGAs to reduce planning application resistance and stigma of compact homes.</td>
<td>8</td>
<td>6</td>
<td>14</td>
<td>Y</td>
</tr>
<tr>
<td>Councils fast-track knockdown rebuilds for small homes (for ageing in place, realise value/income of second home).</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Changing the prescriptive nature of some of the planning requirements (e.g., parking, garden area, setback).</td>
<td>8.5</td>
<td>5</td>
<td>13.5</td>
<td>Y</td>
</tr>
<tr>
<td>Remove third party appeal rights when building regulations are met.</td>
<td>8.5</td>
<td>1</td>
<td>9.5</td>
<td>N</td>
</tr>
<tr>
<td>Explore and overcome rural land restrictions to allow further subdivision.</td>
<td>6.5</td>
<td>6</td>
<td>12.5</td>
<td>N</td>
</tr>
<tr>
<td>Financial incentives for people to consider buying into or moving into smaller homes.</td>
<td>10</td>
<td>5</td>
<td>15</td>
<td>Y</td>
</tr>
<tr>
<td>Educate stakeholders via writing, events, online campaigns, advocacy, and lobbying: promote small-home living; explore models; demonstrate benefits, need, and demand</td>
<td>6.5</td>
<td>8.5</td>
<td>15</td>
<td>Y</td>
</tr>
<tr>
<td>Review and highlight examples (within Australia and overseas) where the concept has worked.</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>N</td>
</tr>
<tr>
<td>Small homes government grant (give people opportunity to repurpose own land and free up equity for retirement).</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Financial incentives for building and renting smaller homes.</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>N</td>
</tr>
<tr>
<td>Exemplar project on urban site to sell and evaluate idea (and to take advantage of private sector’s willingness).</td>
<td>7</td>
<td>9.5</td>
<td>16.5</td>
<td>Y</td>
</tr>
<tr>
<td>Ensure new urban renewal masterplans have inclusionary rezoning development contribution: keep space for THCs.</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>N</td>
</tr>
<tr>
<td>Planning regulation change to create typology of small homes and enable building them as affordable housing.</td>
<td>10</td>
<td>4</td>
<td>14</td>
<td>Y</td>
</tr>
<tr>
<td>Engagement with mortgage suppliers to address financing reluctance (by establishing an investment model).</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>N</td>
</tr>
<tr>
<td>Determine the demand for small homes.</td>
<td>7</td>
<td>8</td>
<td>15</td>
<td>Y</td>
</tr>
<tr>
<td>Determine government’s willingness to support the concept.</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Design work: cluster models (safety, ownership, shared facilities, sustainability, diverse forms for diverse residents).</td>
<td>7</td>
<td>9.5</td>
<td>16.5</td>
<td>Y</td>
</tr>
<tr>
<td>Investigate non-village models: compact homes inserted into other fabrics.</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>Y</td>
</tr>
<tr>
<td>Co-design with potential residents and neighbouring communities.</td>
<td>7.5</td>
<td>8.5</td>
<td>16</td>
<td>Y</td>
</tr>
<tr>
<td>Enable government rental support to finance purchase.</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>N</td>
</tr>
<tr>
<td>Publish the economic benefits of compact homes.</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>Y</td>
</tr>
<tr>
<td>Regulatory reform: change Victoria’s laws to allow a secondary dwelling as of right on an existing block.</td>
<td>8.5</td>
<td>4</td>
<td>12.5</td>
<td>N</td>
</tr>
<tr>
<td>NDIA independent living options: mix of community/informal support to reduce required funding. Trial with NDIA.</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>N</td>
</tr>
<tr>
<td>Source crowdfunding and work with governments to create/develop the concept.</td>
<td>3.5</td>
<td>3.5</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Develop/provide microfinance options.</td>
<td>5.5</td>
<td>5.5</td>
<td>11</td>
<td>N</td>
</tr>
<tr>
<td>Persuade an LGA to provide land; if one local government develops a successful model, others may follow.</td>
<td>6.5</td>
<td>7.5</td>
<td>14</td>
<td>Y</td>
</tr>
</tbody>
</table>

Table 4.16: Evaluation of 21 Actions from Both STICKE Workshops (A and B)
4.3.4 Systems Thinking Analysis of Priority Actions

From Step 3 of the STICKE process, participants across the two workshops generated 37 actions that could be undertaken to improve the supply of compact housing in Geelong. These 37 actions were consolidated to form a list of 21. From this list, 12 actions were identified as “priority actions” via ranking by researchers and participants according to their perceived impact and feasibility. These 12 priority actions were then taken by the research team and further analysed according to systems thinking principles.

Here, Meadows’ (1999) framework of leverage points in systems analysis was used to evaluate the priority actions from least effective (a 12-point value) to most effective (a 1-point value). As detailed in Part 3 of this report, leverage points denote places within a complex system where interventions can be staged. Meadows (1999, p. 1) termed these places “points of power”. Each priority action was allocated a value between 12 and 1, ranging from tinkering to paradigm shifting. Table 4.17 (below) shows the results of this analysis.
## 12 Priority Actions

<table>
<thead>
<tr>
<th>Description</th>
<th>Impact (1–10)</th>
<th>Feasibility (1–10)</th>
<th>Area</th>
<th>L-point (1–12)</th>
<th>Leverage Point Description (Meadows, 1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-design exemplar projects with potential residents and neighbouring communities; to sell and evaluate idea (taking advantage of private sector’s willingness).</td>
<td>7.5</td>
<td>8.5</td>
<td>Building and Design Community Integration</td>
<td>2</td>
<td>Mindset or paradigm from which the system – its goals, structure, rules, delays, parameters – arises.</td>
</tr>
<tr>
<td>Educate stakeholders (via writing, events, online campaigns, advocacy, lobbying: promote small-home living, explore models, demonstrate benefits, need, and demand).</td>
<td>6.5</td>
<td>8.5</td>
<td>Building and Design Community Integration</td>
<td>4</td>
<td>Power to add, change, evolve or self-organise system structure.</td>
</tr>
<tr>
<td>Clearly translate housing priorities from State to local</td>
<td>9</td>
<td>4</td>
<td>Planning Controls</td>
<td>6</td>
<td>Structure of information flows (who can/cannot access information).</td>
</tr>
<tr>
<td>Change prescriptive nature of some planning requirements (parking, garden area, setback).</td>
<td>8.5</td>
<td>5</td>
<td>Planning Controls</td>
<td>5</td>
<td>Rules of system (such as incentives, punishments, constraints).</td>
</tr>
<tr>
<td>Change planning regulations to create typology of small homes and enable building them as affordable housing.</td>
<td>10</td>
<td>4</td>
<td>Planning Controls</td>
<td>5</td>
<td>Rules of system (such as incentives, punishments, constraints).</td>
</tr>
<tr>
<td>Financial incentives for people to consider buying into or moving into smaller homes.</td>
<td>10</td>
<td>5</td>
<td>Financial/Legal</td>
<td>5</td>
<td>Structure of information flows (who can/cannot access information).</td>
</tr>
<tr>
<td>Determine demand for small homes to stimulate supply.</td>
<td>7</td>
<td>8</td>
<td>Building and Design Community Integration</td>
<td>6</td>
<td>Structure of information flows (who can/cannot access information).</td>
</tr>
<tr>
<td>Educate LGAs to reduce planning application resistance and stigma of compact homes.</td>
<td>8</td>
<td>6</td>
<td>Planning Controls Community Integration</td>
<td>7</td>
<td>Gains around driving positive feedback loops.</td>
</tr>
<tr>
<td>Persuade an LGA to provide land; if one local government develops a model and proves its success, others may follow.</td>
<td>6.5</td>
<td>7.5</td>
<td>Planning Controls</td>
<td>10</td>
<td>Structure of material stocks and flows (e.g., transport networks, population age structures).</td>
</tr>
<tr>
<td>Design work on cluster models (safety, ownership, shared facilities, sustainability credentials, diverse built forms for resident diversity – ages, stages, abilities, cultural).</td>
<td>7</td>
<td>9.5</td>
<td>Building and Design Community Integration</td>
<td>12</td>
<td>Constants, parameters, numbers (e.g., subsidies, taxes, standards).</td>
</tr>
<tr>
<td>Investigate non-village models: compact homes inserted into other fabrics.</td>
<td>4</td>
<td>9</td>
<td>Building and Design Community Integration</td>
<td>12</td>
<td>Constants, parameters, numbers (e.g., subsidies, taxes, standards).</td>
</tr>
<tr>
<td>Publish economic benefits of compact homes.</td>
<td>5</td>
<td>10</td>
<td>Financial/Legal</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.17: Priority Actions and Leverage Points (STICKE Workshops)
It is evident that some actions were perceived differently by community informants and the research team: some actions rated as having high impact were deemed to have lower leverage values. Similarly, for some actions of high importance our informants, there was lower capacity to bring about wider structural change when the action was viewed in isolation. For these sorts of actions, the impact will not necessarily be distributed more widely across the system.

Cross-System and Community Integration Actions and Leverage Points

Central to both systems maps were attitudes towards living in, living near, and owning compact homes in Australia; these attitudes also informed the attitudes of builders, planners, financers, and the existing communities that single or clustered compact homes might be located within. These attitudes are informed by the general perception that small homes are inferior to the larger homes that dominate the Australian housing market. Stakeholders saw these attitudes as informing the misconception that compact homes are a new idea; combined with the aspirational norm that identifies status with large and valuable homes, this marginalises the idea of downsizing or living within a smaller footprint, in turn reinforcing community resistance to clusters of compact homes.

To disrupt these negative feedback loops within the system, this factor must be changed. One action emerged as being a key leverage point to address this. The action that seeks to address negative public perceptions of compact homes targets the idea that compact homes are of poor design quality, which feeds into attitudes of NIMBYism; and active community resistance to compact home development, which limits the acceptance of, demand for, and hence production of compact homes.

**ACTION: Co-design exemplar projects with potential residents and neighbouring communities.**

This would allow advocates to sell and evaluate the idea (and to take advantage of the willingness of the private sector):

- **Impact:** 7.5/10
- **Feasibility:** 8.5/10
- **Leverage point:** 2

The research team deemed this action as high priority due to its potential level of impact to effect change to a range of other factors in the system. Actively involving all stakeholders in the design process will help ensure the resulting microvillage is useable, high quality, meets the needs of diverse residents, and is well-integrated with existing communities, services, and infrastructure. Co-creating exemplars with communities can break down negative perceptions of compact homes, and thus community resistance. As per Meadows’ (1999) framework, tackling this action in isolation will address the mindset or paradigm from which the system – its goals, structure, rules, delays, parameters – arises. In addition, an exemplar project that breaks the mould, such as the Nightingale model, not only disrupts the system but also creates a new flow of information, where people might see how complex financing and construction arrangements can be simplified.

While the above action targeting public attitudes will make a significant change to the system, it is likely to have multi-actor involvement and to require continual effort to maintain its positive effects. Implementing this action will unlock new opportunities to engage the community, while also reducing delays in incorporating new rules or operating parameters around the building and design of compact homes. However, the traction of the action is impeded by constraining factors within the system, which
reduces its impact. This action is likely to become more impactful if the following symbiotic action is implemented concurrently or before it:

**ACTION: Educate stakeholders** via writing, events, online campaigns, advocacy, and lobbying:
- promote small-home living; explore models; and demonstrate benefits, need, and demand.

**Impact:** 6.5/10  
**Feasibility:** 8.5/10  
**Leverage point:** 4

The research team deemed this action high priority due to the level of impact it will have across the system. Intervention at this level will effect change on a range of other factors in the system. Addressing this action in isolation will create power to add, change, evolve, or self-organise the housing supply system structure, because it will sow the seeds of a revolution in the system. The action will not, however, compel the acceptance of value systems. Here, stakeholder education is about giving the right people power to change the system – that is, community members, rather than already-wealthy people. A renewed focus on engagement, awareness, and representation to promote living in and owning compact homes can target the public perception that smaller homes are substandard or inferior to larger homes, grow advocates’ capacity to enact further change, and stimulate demand for and thus supply of smaller homes.

**System-Specific Actions and Leverage Points**

**Building and Design-Based Actions**

For the above two actions to become more impactful, we recommend implementing the following interrelated action (Table 4.18) – determine the demand for compact homes – concurrently or before:

<table>
<thead>
<tr>
<th>Action</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Leverage Point</th>
<th>Leverage Point Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine demand for small homes to stimulate supply.</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>Structure of information flows (who can/cannot access information).</td>
</tr>
</tbody>
</table>

Table 4.18: Building and Design-Based Actions to Change Structure of Information Flow

As noted, this action relates to the structure of information flows (who does and does not have access to information). If this is addressed, the information can unlock leverage points of higher value. Specifically, demonstrating a high demand for compact homes – as a *choice*, rather than as a *need* imposed entirely by lack of wealth/income – is key to improving attitudes towards compact homes amongst builders, financiers, and people who make planning rules and decisions. Our community informants felt that demand for living within a smaller footprint is hidden, perhaps even suppressed by the cultural norm of aspiration towards owning a large house; they also felt that research into this issue could reveal a growing desire for living in less environmentally impactful ways, linked to far greater acceptance of the reality of anthropogenic climate change.

Unlocking such demand will allow the construction sector to benefit from economies of scale and efficiency in design; in turn, this can improve the quality of homes and/or drive down construction costs, change the public perception that smaller homes are substandard, increase affordability, and thus
reduce homeowners’ debt as a proportion of total development cost; in turn, this will make lenders less resistant to financing the construction of compact homes. Of course, the efficacy of this action for stimulating supply relies on evidence of high demand, when this may not be the reality. For the above action to become feasible, we recommend the following two interrelated actions (Table 4.19, below):

<table>
<thead>
<tr>
<th>Action</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Leverage Point</th>
<th>Leverage Point Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design work on cluster models (around safety, ownership, shared facilities, sustainability credentials, diverse built forms for resident diversity: ages, stages, abilities, cultural).</td>
<td>7</td>
<td>9.5</td>
<td>12</td>
<td>Constants, parameters, numbers (such as subsidies, taxes, standards).</td>
</tr>
<tr>
<td>Investigate non-village models: compact homes inserted into other fabrics.</td>
<td>4</td>
<td>9</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.19: Building and Design-Based Actions to Change Constants, Parameters, and Numbers

The two actions listed above relate to changes in constants, parameters, and numbers in a system structure. If addressed, these actions will unlock leverage points of higher value. Specifically, design work by experts on different models of compact homes, inserted into other urban contexts such as tight city sites (as is common in Japan), can demonstrate the ability of these homes to meet diverse wants and needs (including cultural diversity, accessibility, affordability, numbers of residents, and so on). Designing for diversity can demonstrate suitability for ageing in place, while also changing perceptions that compact homes are not meant for younger demographics and/or city dwellers. However, in both STICKE workshops, participants recognised that planning controls are greatest obstacle for such design work to occur. To overcome this limitation, the following five planning-related actions were prioritised. (A further three planning-related actions were not prioritised, as they were deemed relatively unfeasible, despite being impactful if they were achieved.)

Planning Control Actions

The planning control system was seen as the key constraint in the system of supply for compact homes, impacting community integration, building, design innovation, and financing. Two of our five planning-related actions (see Table 4.20, below) were seen as having low feasibility, but high impact, as they could lubricate other leverage points by clarifying and thus potentially changing the rules of the system.

<table>
<thead>
<tr>
<th>Action</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Leverage Point</th>
<th>Leverage Point Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change prescriptive nature of some planning requirements (e.g., parking, garden area, setback).</td>
<td>8.5</td>
<td>5</td>
<td>5</td>
<td>Rules of system (such as incentives, punishments, constraints).</td>
</tr>
<tr>
<td>Change planning regulations to create typology of small homes and enable building them as affordable housing.</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.20: Planning-Based Actions to Change Rules of System

In combination, the above actions target a range of incentives and disincentives for building compact homes that arise from the need to comply with planning controls. The first action directly addresses
constraints that limit the number of compacts homes constructed per square metre in a cluster; the second related action aims to distinguish compact homes from larger homes, so that the same planning constraints are not applied to both typologies. If addressed, these actions will unlock leverage points of higher value. For the above actions to become more feasible and impactful, we recommend the following interrelated action (see Table 4.21, below):

<table>
<thead>
<tr>
<th>Action</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Leverage Point</th>
<th>Leverage Point Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearly translate housing priorities from State to local.</td>
<td>9</td>
<td>4</td>
<td>6</td>
<td>Structure of information flows.</td>
</tr>
</tbody>
</table>

Table 4.21: Planning-Based Actions to Change Structure of Information Flows

Addressing this action in isolation from the rest of the system’s factors will change the structure of information flows. However, translating these goals is likely to have a delayed effect. Currently the policy and regulatory environment around housing construction is geared heavily toward conventional dwellings, restricts the construction of compact homes on small parcels of land, and in turn disincentivises banks from financing the construction of compact homes. An action that redefines the goals of State and local government to make new housing affordable and environmentally sustainable – accompanied by a clear roadmap of how to achieve this, with clear remits for local governments – would have a higher leverage value (3), because the system would necessarily conform to that goal. However, such an action is currently unfeasible.

This action will likely be more impactful and successful if the following related action (Table 4.22) is implemented concurrently or prior:

<table>
<thead>
<tr>
<th>Action</th>
<th>Impact</th>
<th>Feasibility</th>
<th>Leverage Point</th>
<th>Leverage Point Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate LGAs to reduce planning application resistance and stigma of compact homes.</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>Gain around driving positive feedback loops</td>
</tr>
</tbody>
</table>

Table 4.22: Planning-Based Actions to Change Gains Around Driving Positive Feedback Loops

This action relates to the power to increase gains around driving positive feedback loops in the system structure. This action is self-reinforcing, for as Meadows (1999, p. 11) explains, “the more it works, the more it gains power to work some more.” Specifically, the action seeks to overcome the fear of backlash against any regulatory reform that could upset the dominance of the conventional housing sector; this fear reduces the effectiveness of lobbying for improvements to make the policy environment more favourable. If addressed, this action will unlock leverage points of higher value.

To make the above action more feasible, we recommend the following interrelated action (Table 4.23, below) also be undertaken:
Table 4.23: Planning-Based Actions to Change the Structure of Material Stocks and Flows

The above action relates to changing the structure of material stocks and flows in the system structure. Specifically, the paucity of affordable land options for compact homes in urban and suburban contexts limits opportunities for design innovation and experimentation that might lead to proof of concept for clusters of these homes. If addressed by an LGA, this action will unlock leverage points of higher value. Unless there is government intervention to increase the supply of cheap land that is well connected to facilities and transport, the final priority actions around financing compact homes (see below) become more important.

**Finance-Based Actions**

Financial constraints in the system were raised often across both STICKE workshops. Participants recognised that banks see compact homes as unusual and are thus reluctant to lend against their construction. This reluctance helps preserve the dominance of conventional housing over time. To address this obstacle, the action following action was seen as highly impactful:

**ACTION: Financial incentives for people to consider buying or moving into smaller homes.**

- **Impact:** 10/10
- **Feasibility:** 5/10
- **Leverage point:** 5

The research team cautiously deems this action as high priority, due to the level of impact it will have across the system; however, it was recognised as having only medium to low feasibility. While this action will make a significant change to the system, it is likely to have multi-actor involvement, and its efficacy is impeded by other constraining factors within the system. Its feasibility is also reduced by the types of incentives currently possible, which give little hope of such an incentive being created. For the action to become more feasible, we recommend the following interrelated action (Table 4.24, below):

Table 4.24: Finance-Based Actions to Change Constants, Parameters, and Numbers

This action relates to changes in constants, parameters, and numbers in the system structure. If addressed, it will unlock leverage points of higher value, especially if rolled into other actions to compound the benefits. If the evidence was compelling, and was provided to stakeholders able to make best use of it, this action may be able to change the structure of information flows (Leverage Point 6).
PART FIVE | DISCUSSION AND CONCLUSION

5.1 Recap

The Microvillage Geelong Project used an inclusive research approach to gather a broad range of opinions, viewpoints, and ideas about alternative housing choices. The HOME research team began by conducting a detailed evidence review, distilling prior research on the Tiny House Movement (THM), along with the relevant design, construction, financial, and community integration contexts of compact homes and microvillages. We reviewed a broad range of evidence, reflecting a growing global interest in building tiny and compact homes, but little of this prior research has been empirical. In other words, very few studies have directly analysed the viability of tiny and compact homes to provide an affordable housing option that can minimise consumption of building materials, land, and energy, and which integrates and links with the community in meaningful ways.

In Part 2 of the study, we analysed the geographical context for this research. We found that housing affordability is a significant problem in Geelong, where 10 percent of households who rent and 6 percent of households with mortgages are experiencing housing stress. The problem is most acute in Corio–Norlane, where 17 percent of households are under housing stress. COVID-19 has exacerbated the issue, with 36 percent of renting households experiencing reduced working hours during the pandemic. While this impact was softened by JobKeeper payments and the JobSeeker subsidy, this dampening effect ended on 31 March 2021, when both schemes were discontinued. Importantly, as home ownership is key in protecting older people on Age Pensions from crossing the poverty line, elderly Australians unable to buy a home decades ago when they were more affordable are now experiencing historically high levels of housing stress.

To address the paucity of primary research data on the viability of building and living in compact homes, in Part 3 we undertook a multifaceted community engagement process. The research team recruited a diverse range of stakeholders to participate in focus groups, interviews, and systems thinking (STICKE) workshops. Our focus groups engaged the following community stakeholders:

- Financial and legal sector stakeholders – to identify the financial, legal, and risk implications associated with establishing a microvillage of compact homes
- Experts in the construction, planning, financial, and legal aspects of housing – to analyse viable design/construction options and determine feasibility, given goals around affordability, sustainability, accessibility, and liveability, and
- Potential residents – to explore their perspectives on issues of community integration, both within the microvillage, and between residents and the existing community.

Data from the focus groups were analysed to identify the barriers, opportunities, and enablers to building clusters of compact homes in relation to financial, legal, construction, design, planning and community integration issues. The data made it clear that current barriers, especially in relation to financing compact homes and overcoming planning controls, far outweigh the opportunities.

Parallel with the focus groups, we conducted interviews to investigate the possibilities for ageing in place in a potential microvillage for older women on low incomes – a cohort at increasingly high risk of
housing stress and homelessness. In line with the focus group findings, despite a clear desire amongst this vulnerable cohort for affordable downscaling, our interviews revealed a growing frustration with the many obstacles they face in realising this housing goal.

The focus groups and interviews revealed two preferred models for a cluster of small homes (microvillage). For both models, the notion of “tiny” homes was rejected as a long-term living option in favour of “compact”, permanent homes on foundations of 40sqm–48sqm; there was also a preference for microvillages of 8–30 homes that foster community integration via careful consideration for people, place (including communal spaces for activities and shared resources), and processes. The preferred models for a potential microvillage are as follows:

- Co-ownership with a community housing provider (CHP) was the clearly preferred option, as it removes some of the financial and managerial burdens of individual ownership. The chief issue with this model is finding a CHP willing and able to co-fund a small development, especially in light of the issues our study identified around the model’s financial feasibility.
- A residential park “ownership” model was the second preference. Under this model, residents do not own the land. This model requires either a change in state law similar to that operating in Queensland, or a local government willing to provide land with a 99-year lease.

Finally, we ran two systems thinking (STICKE) workshops to identify actions to overcome some of the identified barriers. Each workshop had a different focus: one addressed construction, design, planning and financial barriers, the other explored how to overcome community resistance to clusters of compact homes. Despite this, the actions identified in both workshops spanned all four areas (design, construction, planning, and financial). It became clear that in Australia’s current housing supply system – which is dominated by larger stand-alone homes, and medium- or high-density apartments – it is impossible to untangle NIMBYism from design, construction, planning, and financial barriers.

From the STICKE workshops, 12 priority actions were identified as having the potential to effect systemic change in the supply of compact homes, improve the current system of housing supply, or address system factors and relationships to improve smaller components.

In Part 4, the final stage of analysis, the research team used “leverage point allocation” (Meadows, 1999) to determine the level of effectiveness of these 12 priority actions. We found that increasing Geelong’s supply of compact, affordable, high-quality compact homes that are well connected to communities and facilities requires intervention at multiple levels, including paradigmatic change. While the workshops identified actions that are highly feasible to carry out, their implementation would not necessarily bring beneficial change to all factors involved in that system, or enact changes that will match the system’s aspirational goals.

Below, we synthesise the findings from our primary research data and evidence reviews to formulate a set of five Recommendations. These Recommendations build on and/or qualify the priority actions identified by the community stakeholders who participated in this research.
5.2 Synthesis of Findings: Contextualising and Qualifying Priority Actions

Here we bring together all findings from Part 1, Part 2, and Part 4 of this study. While our discussion centres on the 12 priority actions formulated and evaluated with the stakeholder community, these actions are qualified in light of the wider research evidence to inform a more nuanced understanding of their contexts, potentials, and limitations. We discuss these actions in relation to the four principal areas of enquiry addressed in this study: building and design, planning, finance, and community integration. In the discussion below, some actions recur across different areas of enquiry, because they have impact on (or are impacted by) other areas. Indeed, as we discuss in Part 5.2, most of these actions impact on (or are impacted by) the other actions. For example, few of the proposed design innovations can occur without changes to the current planning context; nor will the suggested financial incentives be effective unless both planning controls and attitudes to compact homes are changed.

5.2.1 Building and Design Actions

First we qualify the building and design priority actions put forward by participants in our two systems thinking (STICKE) workshops (see Table 5.1, below) in relation to findings from our evidence review, focus groups, and interviews.

<table>
<thead>
<tr>
<th>Action</th>
<th>Leverage Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-design exemplar projects with potential residents and neighbouring communities.</td>
<td>2</td>
</tr>
<tr>
<td>Determine the demand for small homes to stimulate supply.</td>
<td>6</td>
</tr>
<tr>
<td>Design work on cluster models (safety, ownership, shared facilities, sustainability credentials, diverse built forms for resident diversity – ages, stages, abilities, cultural).</td>
<td>12</td>
</tr>
<tr>
<td>Investigate other models than a village - compact homes inserted into other fabrics</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 5.1: Building and Design Actions

In our evidence review, we note Penfold et al.’s (2018) suggestion that media representations tend to frame tiny homes as providing economic freedom and an alternative lifestyle in line with a growing social movement against the dominant influences of capitalism and over-consumption (see also Evans, 2019). Thus, advocates for tiny house living “tap into narratives of ‘less is more’ and ‘debt free living’ that trouble dominant Australian housing social norms” (Penfold et al., 2018, p. 164).

STICKE workshop participants expressed similar ideas, both in positive terms (the potential for small homes to disrupt market norms equating size with quality) and negative terms (possible resistance to such disruption by the construction and housing finance sectors). The popular perception of tiny homes as amateur self-build projects also tends to reinforce the association between “tiny” and “low quality”. In Focus Group 1, financial sector professionals noted some barriers that might be addressed by shifting the common perception that compact homes are of lower quality than larger homes:

- Lenders are hamstrung by the naturally conservative approach of regulators, which maintains the market norm and stifles both design innovation and financial innovation.
- The social and environmental value of compact homes has little value for lenders, who are risk adverse, concerned with reputational damage of foreclosing on vulnerable households.
Lack of exemplars means financers are inexperienced, and thus wary of taking risks on housing models that deviate from the norm.

Participants from the financial sector also identified significant real or apparent cost barriers that design would need to address by:

- Minimising the high cost of building and maintaining shared facilities, which increase risk and reduce the possibility of financing
- Combating perceptions that compact homes are of inferior quality
- Demonstrating that there is demand for compact homes that support a stable resale market for security properties, and
- Reducing the costs of building compact homes while maintaining and publicising their quality.

The above issues might be partly addressed by attracting alternative home lenders/investors. These could include social or community housing providers that prioritise quality, sustainable design and other social and environment benefits that align with the Tiny House Movement’s focus on reduced consumption and community-based living.

In Focus Group 2, members of the Microvillage Geelong Taskforce evaluated a series of construction, legal, and financial models. The favoured model was co-ownership of compact homes (not tiny homes) with a community housing provider (CHP), which would remove some of the financial and managerial burdens of ownership for the residents. The key obstacle was finding a CHP that is willing and able to co-fund a small development of up to a dozen units, especially in light of the issues we identified around this model’s financial feasibility. Participants suggested that design that enabled resident diversity could help attract such investors. Under a proposed co-ownership model, a CHP would own two to four of the total 12 units, with the remainder owned by residents, or private investors renting to residents.

Our primary research data identified a clear need to change widely held perceptions and attitudes around tiny and compact homes. These dwelling are often seen as expensive to build well, having generally poor design and construction quality, and depreciating in value like a caravan, and thus presenting a high financial risk. There is a clear need for exemplar projects to dispel these perceptions. The research literature highlights further gaps in knowledge around the house supply sector’s perception of tiny and compact houses. There is a need to:

- Understand the “underlying tension between a desire to be free from government regulations and obligations and a reliance on public infrastructure (Shearer & Burton, 2021b)
- Know the actual demand for tiny houses and other compact home models. In other words, determine whether demand represents “a small, specialized housing niche or a significant ‘movement’” (Shearer & Burton, 2021b)
- Explore the development of broader tiny/compact home communities “that are not subject to the regulatory constraints and negative social perceptions associated with caravan or mobile home parks…less ons might be learned from retirement living developments” (Shearer & Burton, 2021b)
- Determine how the market can be supported to provide much more diverse housing in terms of size (Shearer & Burton, 2021a), and
• Investigate “the epistemological power of media discourses in shaping tiny house dwellers’ understandings and experiences of the tiny house” (Penfold et al., 2018).

The STICKE workshops also identified aligned activities that could help change attitudes to small-home living. Both the research literature and our participants identified a need for further research and design work to explore the possibilities for single and clusters of compact homes in different settings.

Several design preferences were identified in focus groups with potential microvillage residents, and interviews with low-income women about ageing in place. All participants aspired to live in a setting that fostered a sense of community. This finding aligns with previous research findings that most people who are attracted to small-home living want to live in a community of other tiny house dwellers (Shearer & Burton, 2021b), with shared values around living more sustainable lives. Participants suggested several design characteristics that could help achieve sense of community in a microvillage.

Some suggestions were about fostering internal community integration (between residents):

• Resident diversity in terms of age (including children), cultural background, and physical abilities
• Space for shared resources such as tools, vacuum cleaners, kitchen equipment, and books
• A mix of intimate private outdoor space and high-quality communal outdoor spaces for gardening and socialising
• Indoor shared spaces for meals and laundry facilities, including space for visitors to stay overnight and share family meals, and
• The right number balance – enough residents to create community and fund shared facilities, but not so many that residents do not know their neighbours.

Other suggestions were about local integration (between residents and the neighbouring community):

• A location, whether urban or suburban, that is within walkable distance of amenities such as public transport, shops, medical services, and green space
• Interaction with the local community by enabling locals to access communal space, for example to run workshops, a Men’s Shed, or a small business providing services for the neighbourhood
• A layout that strikes a good balance between privacy, safety, and integration with neighbouring communities, and
• Creating an exemplar of good design, informed by best-practice global precedents, to showcase a more sustainable, ecofriendly, community-focused way of living.

Participants also made suggestions about individual needs:

• Long-term security of tenure in homes that meet the changing needs associated with ageing. That is, dwellings that are accessible and based on universal design principles, or at least readily adaptable to meet these needs
• Diverse options for resident car parking (shared or individually owned cars), either close enough to units for safety and easy grocery carrying, or away from units for those who prefer vehicles to be separated from the dwellings
• Able to meet a variety of needs, such as pet ownership, and
• Co-design processes, so that resident input and choices shape the end product.
While tiny/compact houses challenge definitional norms of what a home is, they have potential to offer both an affordable alternative to traditional dwellings and flexibility in construction (Butt & Stephenson, 2019; de Chastel, 2018; Shearer et al., 2019). Despite the lack of clear definitions of what constitutes a tiny home (Evans, 2019; Gabbe, 2015; Iglesias, 2014; Infranca, 2016; McAllister, 2017; Penfold et al., 2018; Shearer & Burton, 2018; Turner, 2016), and their fluid legal status, which varies across jurisdictions (Anson, 2018), our evidence review highlighted their potential to meet the needs of the aspiring residents who contributed to this research. These include economic needs (Clinton, 2018; Ford & Gomez-Lanier, 2017; Harris, 2018; Mangold & Zschau, 2019; Shearer, 2015; Shearer & Burton, 2021b), security of tenure (Shearer & Burton, 2021b), sustainable community (Boeckermann et al., 2019; Carlin, 2014; Ford & Gomez-Lanier, 2017; Harris, 2018; Mangold & Zschau, 2019; Penfold et al., 2018; Shearer & Burton, 2021b), and freedom (Clinton, 2018; Ford & Gomez-Lanier, 2017; Harris, 2018; Mangold & Zschau, 2019; Penfold et al., 2018; Shearer, 2015; Shearer & Burton, 2021b).

To support the full scope of social and environmental benefits Tiny Home Communities (THMs) can offer, there is a need for innovative approaches that challenge current land-use and zoning practices (Alexander, 2017; de Chastel, 2018). Such changes, coupled with user-led design (co-design), could enable infill development of tiny/compact homes, which could potentially foster “economically diverse communities” (Evans, 2018a, 2019; Iglesias, 2014; Infranca, 2014, 2016; Withers, 2012). Philosophically, the tiny house model presents an opportunity to shift away from economic assumptions of continual growth, towards an alternative value system (Anson, 2018).

Gaining local resident support is key to both establishing THMs in existing neighbourhoods and combating strongly held negative perceptions of tiny homes (Bozorg & Miller, 2014; Evans, 2018b; Infranca, 2014, 2016; Withers, 2012). Tiny homes have the capacity to reframe conventional notions of home and place by reflecting aspirational notions of home, rather than forming undesirable housing clusters (Evans, 2018a). They also have a role in building diverse communities and fostering urban density (de Chastel, 2018; Gabbe, 2015). The tiny house model is limited by the current regulatory environment, and this curbs the potential to realise truly radical alternatives to the traditional housing market (Anson, 2018) (see the sub-section on planning controls below).

In relation to the building regulatory context, there is scant academic literature on the characteristics and performance of tiny homes. Conspicuous evidence gaps identified in the research literature include:

- Rigorous empirical assessment of the environmental footprint of tiny and compact houses, including their construction and running costs (Shearer & Burton, 2021b), and “the materiality of tiny-house production” (Penfold et al., 2018)
- Explore construction innovations to reduce minimum ceiling heights in bathrooms, kitchens, and lofts/attics; withstand minimum bushfire attack level; perform to higher energy efficiency levels responsive to climate zone (Strachan, 2019); and reduce costs and improve performance via prefabrication and mass production techniques, as a professionally built THOW can currently cost three times more per square metre than a standard house (Shearer & Burton, 2021a)
- Detail options and impacts of submitting changes to the Building Code of Australia (BCA), and explore how to provide a potential path to permanent occupancy of tiny and compact houses in all Australian states and territories (Wenban, 2019), and
• Determine whether small homes can meet the housing needs of specific groups, such as single older people who want to live near each other but not necessarily under the same roof (Shearer & Burton, 2021a), students, or “in-law” units for ageing in place (Ford & Gomez-Lanier, 2017).

Further empirical research is clearly needed. Building the evidence base is a crucial step towards reforming building and planning regulatory restrictions on compact homes, and helping housing financers see the benefits of developing new financial and ownership models.

5.2.2 Planning Actions

We now qualify the five priority planning actions in relation to relevant findings from our evidence review and Focus Group 2 (see Table 5.2, below).

<table>
<thead>
<tr>
<th>Action</th>
<th>Leverage Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change prescriptive nature of planning controls limiting space efficiencies (e.g., parking, garden area, setback).</td>
<td>5</td>
</tr>
<tr>
<td>Change planning regulations to create a typology of compact homes and encourage building them as affordable housing.</td>
<td></td>
</tr>
<tr>
<td>Clearly translate housing priorities from State to local towards affordability and sustainability.</td>
<td>6</td>
</tr>
<tr>
<td>Educate LGAs to reduce planning application resistance and stigma of compact homes.</td>
<td>7</td>
</tr>
<tr>
<td>Persuade an LGA to provide land; if one local council develops model and proves its success, others may follow.</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 5.2: Planning Actions

Our evidence review of planning schemes confirms there is little commonality across Australia in relation to allowing or restricting a microvillage, and most regulations do not specifically address either single or clustered compact homes. Several prior studies found that land zoning regulations, building codes, and government housing strategies lack a clear definition of what constitutes a tiny home, which creates an uneven and opaque policy environment (Evans 2018b; Withers 2012).

While such dwellings were not explicitly prohibited in Residential Zones, for example, they were not specifically permitted either. This led to a cautious approach, with planning officers unwilling to approve these developments or even hostile towards them, fearing a negative community response or creating a “ghetto”. For Shearer and Burton (2021b), local government planning and building restrictions were the biggest obstacles faced by actual or aspiring tiny house dwellers; land use regulation under local government planning schemes and bylaws was complex, and varied across different states and LGAs.

However, while the planning system exhibits little consistency, occasional prohibitions, and scant explicit promotion of compact dwellings, across Australia there is a general commitment to foster housing diversity, raise densities, and improve affordability and sustainability. These factors auger well for the future positive reception of a microvillage. In some situations, infill developments of tiny homes have offered opportunities for local governments and communities to meet other objectives for higher-density, more sustainable, affordable, and accessible urban environments – if they were willing to consider land use and zoning reforms (Evans 2018a, 2018b; Iglesia 2014; Infranca 2014, 2016).
How to change the planning system to better accommodate this form of housing? For Butt and Stephenson (2019), this involves establishing more formalised planning definitions and practices around smaller dwellings to increase their legitimacy and acceptability. Our research participants confirmed this. However, planners have been advised to wary of a possible gradual erosion of amenity standards in “the pursuit of questionable affordability gains when considering the relaxation of planning regulation to promote the development of small or “compact” dwelling types” (Clinton, 2018, p. 196).

The literature noted concerns around car parking requirements (which not all microvillage residents may need), as well as open space (which in a microvillage context could be delivered via communal rather than personal space). Some jurisdictions also allow permanent occupancy of caravan park cabins or semi-moveable dwellings; in Queensland, this form of housing is available to people on low incomes who want to live at a smaller scale, in a more collective way.

In addition to the evidence review, the research team also examined Victoria’s regulatory regime and the Geelong Planning Scheme. In Victoria, a “dwelling” or self-contained residence was not defined by size, but rather by the existence of certain facilities – a kitchen, food preparation area, bath or shower, closet pan, and wash basin; other requirement include access to key infrastructure, compatibility with neighbourhood character, and adherence to overlays. In short, Victoria’s planning framework does not distinguish between different types of dwellings. In the Geelong context, there are requirements for car parking, open space, and third party appeals, but again no definition of dwelling types.

The Geelong Planning Scheme does include the category of “Residential Park”, which requires a planning permit and therefore must conform with other requirements for parking, open space, and so on. Focus Group 2 favoured this model, along with a model based on co-ownership with a community housing provider (CHP). This latter option is very feasible under Geelong’s Social Housing Policy, with the City of Greater Geelong (CoGG) looking to expand the role of community housing providers in the region. This would enable access to funding via the Victorian Government’s Big Housing Build initiative, which aims to increase the supply of social and affordable housing. The 2017 amendment of Victoria’s Planning and Environment Act 1987 also encourages an increase in affordable housing via local councils seeking a voluntary affordable housing contribution as part of the planning process; this occurs through the mechanism of Section 173 Agreements. CoGG also has surplus land that is available for such an initiative; in terms of affordability, this is also consistent with its Social Housing Policy.

A priority action arising from the STICKE workshops – to translate State-level commitments to affordable housing to the local level –is thus already occurring in Geelong. An offer of city-owned land for a pilot microvillage is also within the realms of possibility. The larger agenda of changing the planning regime – adding a typology of compact homes, easing car parking and open space requirements, and limiting third party appeal rights – is harder to achieve in Geelong. However, if a microvillage proposal was approved, with specific exemptions for parking and open space, the city’s planning system would reveal itself as open to the innovative model favoured by our research participants. This model could be emulated elsewhere, potentially prefiguring wider attitudinal change, along with local planning system changes. The research team thus affirms the proposed planning-based actions as Recommendations, with one caveat: planners should be wary of potential negative impacts when considering regulatory reforms to enable single or clustered compact dwellings.
5.2.3 Financing Actions

Here we qualify the three priority financing actions in relation to relevant findings from our evidence review, and Focus Groups 1 and 2.

<table>
<thead>
<tr>
<th>Action</th>
<th>Leverage Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial incentives for buying or moving into smaller homes</td>
<td>5</td>
</tr>
<tr>
<td>Determine the demand for compact homes</td>
<td>6</td>
</tr>
<tr>
<td>Publish the economic benefits of compact homes</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 5.3: Financing Actions

As we have noted, on the face of it, microvillages seem to represent a viable dwelling option for people on lower incomes due to their compact size and perceived affordability. The individual dwellings are small, and so theoretically cheaper to construct, with a smaller footprint than traditional houses. However, costs and barriers to entry can be higher than they first appear: the cost of land, construction, site remediation, common services, and infrastructure must all be funded. Current low demand for prefabricated volume construction of compact homes makes these dwellings more expensive per square metre than traditional homes available via volume builders; this reduces the appeal of smaller dwellings and puts them out of reach for many low-income households. Meeting the needs of an ageing cohort by building to universal design principles and high energy standards further raises costs and reduces the perceived benefit.

Shared facilities bring economies of scale and may reduce overall space requirements, allowing for more homes to be located on the same site. However, these facilities add costs and the burden of maintenance over time, and are much less economically feasible in smaller developments, where the additional costs are shared across a reduced number of residents. Microvillage developments are also more likely to require governance structures (for example, strata), which impose further costs. The non-standard nature of the dwellings also raises serious challenges for financing, particularly where residents are older people and/or people on low incomes.

The financing solutions identified as applicable to the microvillage model rely mostly on private sector solutions that require no to little government incentives, such as using social impact developers and relaxing planning restrictions. However, many of these options may not be viable in the proposed context – that is, low-density microvillages for older residents on low incomes – without additional government or philanthropic support.

Findings from our evidence review and Focus Groups 1 and 2 highlight the need to publish, promote, and advocate for the benefits of compact homes – particularly their economic benefits, but also, we suggest, their wider social and environmental benefits. There is also a need to assess the demand for this type of dwelling, and to make that demand more visible. This is an important step to encourage governments, planners, developers, and financiers to find solutions to meet this perhaps latent but nonetheless growing need. It is also important to promote models of living that challenge the existing consumer paradigm of “more is more”, the cultural norm of aspiring to own large homes, and the idea that residential property is primarily an investment vehicle for accruing wealth, rather than a utility that...
promotes household and community wellbeing. In furthering these aims, the proposed actions may foster incentives for building, buying, or moving into well-designed, high-quality smaller homes that meet individual needs for privacy while also providing opportunities for social connection.

### 5.2.4 Community Integration Actions

Here we qualify the four community integration priority actions in relation to relevant findings from the evidence review, Focus Groups 3 and 4, and the interviews we conducted on ageing in place.

<table>
<thead>
<tr>
<th>Action</th>
<th>Leverage Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-design exemplar projects with potential residents and neighbouring communities.</td>
<td>2</td>
</tr>
<tr>
<td>Educate stakeholders.</td>
<td>4</td>
</tr>
<tr>
<td>Determine the national demand for single compact homes and microvillages.</td>
<td>6</td>
</tr>
<tr>
<td>Educate LGAs to reduce planning application resistance and stigma of compact homes.</td>
<td>7</td>
</tr>
</tbody>
</table>

**Table 5.4: Community Integration Actions**

The need to co-design exemplar projects with potential residents and neighbouring communities was strongly supported by the evidence review, focus groups, and interviews. This approach was seen to foster community integration. Twelve papers from the evidence review suggest participation in the design process by potential residents encourages the formation of new social connections and a sense of shared ownership of resources (Devlin et al. 2015; Glass 2009, 2012, 2013; Fromm 2012; Korpela 2012; Sanguinetti 2014; Pedersen 2015; Ruiu 2015, 2016b; Jolanki and Vilkko, 2015; Lies et al. 2017).

Potential residents’ capacity to identify the design features needed to enhance community integration was also evident across findings from all three sources. The number of dwellings, layout of the development, and the design/mix of private and communal spaces were all highlighted as important considerations. Our evidence review findings supported a design in which small private residences are located around a large, shared open space (Jarvis 2011, Sargisson 2012, Pedersen 2015, Sullivan 2016), with focus group participants suggesting either a semicircular or star-shaped configuration.

The need to co-design exemplar projects with potential residents is entirely in line with the strong call for such pilot projects by de Chastel (2018), Ford and Gomez-Lanier (2017), and authors of the Q Shelter and ESC Consulting report *Tiny House Deep Dive Workshop*, which explores the potential of tiny houses with the private, government, community, and academic sectors (Q Shelter & ESC Consulting, 2018).

Turning to integration with existing communities, our evidence review suggests that considering neighbourhood dynamics when planning new cohousing communities could promote bridging and linking social capital via integration with the local environment and wider settings (Droste 2015, Ruiu 2016b). Furthermore, focus group participants expressed a desire to respect the existing neighbourhood in overall design, and to include neighbours during planning phases. They also supported the idea of fostering connections with the wider community by sharing communal spaces (Droste 2015, Ruiu 2015), such as including a community hall within the microvillage.
The findings also emphasise the need for stakeholder-wide education to support community integration. For example, in the Australian context, de Chastel calls for public dissemination of information about the possibilities tiny houses offer (de Chastel, 2018). Jarvis (2011) argues that explaining cohousing models in a format that is understandable for a broad audience can help avoid political refusal, stigmatisation, and stereotyping of current and future cohousing initiatives. Our evidence review found cohousing remains poorly understood in Australia (Riedy et al. 2019). Given this, it is notable that our focus groups and interview participants suggested a microvillage in Geelong could “showcase” an alternative, simpler, and more affordable way of living and ageing in place to the broader community.

Recent studies support the need for further research into the demand for: (1) building single compact homes as secondary dwellings, and (2) living in community-focused clusters of compact homes (microvillage), particularly for older women on lower incomes (Shearer & Burton, 2021a, 2021b). Our own interview data strongly support this. Focus group data also suggests there is a wider group of potential residents – including retired men, younger single people, and one-parent families – who are interested in microvillages as a housing option.

Finally, our evidence review supports the need to education local governments to reduce resistance in planning applications, alleviate the stigma of compact homes, and support community integration. While municipalities often vary in their responses to cohousing communities (Pedersen, 2015; Riedy et al. 2019), Fromm (2012) argues that cohousing projects need to engage with key stakeholders at the municipal level to facilitate the development process.

While there was congruence between our findings from the STICKE workshops, evidence review, focus groups, and interviews, some aspects relating to community integration are not captured in the above action areas. One notable gap was the personal attributes identified as fostering community integration, including shared values, a strong desire for connectedness, and reciprocity among residents. Potential residents also highlighted the importance of sound internal processes for building community integration, including selecting diverse residents; negotiating decision-making and governance; sharing practical items and activities; and maintaining a balance between community and privacy.

Finally, our evidence review, focus groups, and interviews highlighted the potential health-promoting aspects of an affordable, well-designed microvillage. This was particularly evident amongst research participants who are not well supported by existing housing models, and who find themselves vulnerable to homelessness and unable to safely age in place.
5.3 Recommendations (Full Version)

The findings from our evidence reviews, focus groups, and interviews were used to qualify and refine the priority actions from the STICKE workshops. This validation process resulted in the generation of five Recommendations. These Recommendations are set out in detail below, and presented in summary form in the early sections of this report (see pages viii–x).

**Recommendation 1: Co-Design Exemplar Projects with Potential Residents and Neighbouring Communities**

Actively involve all stakeholders to co-design exemplar projects featuring clusters of tiny homes. Prioritise high-quality design outcomes that are affordable, exemplify sustainable universal design principles, and thus meet the varying and long-term needs of a diversity of residents. These exemplar projects should be informed by the best global precedents to demonstrate a more affordable, sustainable, ecofriendly, safe, and community-focused way of living. Clusters of between 8–30 homes will need to be designed to demonstrate scalability and integration with existing communities, services, and infrastructure. They should include:

- **Flexible, robust but low-cost communal internal space for:**
  - Shared resources (laundry facilities, tools, vacuum cleaners, kitchen equipment, books)
  - Meals and cooking
  - Visitors to stay overnight
  - Classes, workshops, or a small business providing services for the local neighbourhood.

- **A mix of private and shared outdoor spaces:**
  - Intimate and private for individual dwellings
  - Communal for gardening and socialising, and
  - Parking choices and locations for both shared and individually owned cars.

- **A balance between privacy, safety, and neighbourhood integration.**

Research for these exemplar projects will also need to explore ownership and design models that enable resident diversity in terms of ages and stages, abilities, cultural backgrounds, and finances. Design research will be required to develop construction innovations that achieve both high-level energy performance and cost reductions via prefabrication and mass production techniques.

The projects will also need to be empirically evaluated to determine their environmental performance, including construction and running costs, and to assess their social performance in terms of improving social connectedness, both between residents and with neighbouring communities. Results of this evaluation can be used to inform proposed changes to the Building Code of Australia (BCA).

**Recommendation 2: Educate Stakeholders to Change Negative Perceptions of Compact Homes**

Stigma, stereotypes, and negative public attitudes present a significant barrier to wider acceptance of compact homes and microvillages as viable affordable housing options. This barrier should be addressed via education strategies to promote the environmental, financial, and community benefits of living in compact homes, with a view to increasing both acceptance and demand. Education should target a
range of stakeholders including builders, financers, regulators, and the wider community. Activities could include public writings, events, online campaigns, advocacy, and lobbying. This education strategy should seek to:

- Showcase global exemplars of different models in different contexts, including:
  - Variously sized clusters in both urban or peri-urban contexts, and
  - Single homes inserted into urban contexts (e.g., city sites where conventionally sized homes cannot be built, or secondary dwellings to primary residences).
- Publicise well-designed compact homes that meet diverse needs (cultural, accessibility, and affordability), and are suitable for all stages of life
- Demonstrate demand for compact homes as a choice, rather than a need imposed by financial constraints – especially to social equity investors and social/community housing providers.
- Disrupt the cultural norm of aspiring to own a large house, and
- Catalyse demand, thus providing impetus to develop innovative production technologies (e.g., modular, prefabricated) to reduce costs and improve environmental performance.

Recommendation 3: Planning Reform

In view of the often-negative local responses to proposals for Tiny Home Communities (THCs), and the current lack of definitions around dwelling types, there is a need to reform planning frameworks. Planning nomenclature should be amended to included definitions of “tiny”, “small”, or “compact homes”, and “microvillages” or “THCs” made up of such homes. There is also a need to ease the prescriptive requirements around car parking, setbacks, and open space, and reconsider the scope of third party appeals.

Popular acceptance could be increased if one locality – such as the City of Greater Geelong, as part of its Social Housing Policy – made land available for the construction of an exemplar microvillage that could be used as a model for other local government areas (LGAs) in Victoria. To make compact homes a viable affordable housing option, planning reform is required at both nationwide and local level.

Recommendation 3.1 Nationwide Reform

- Across Australia, all state and territory planning systems should be revised to explicitly define and permit the construction of smaller homes (down to 40sqm) and microvillages within designated Residential Zones.
- Local governments should be educated about the many benefits of compact homes to alleviate stigma and reduce resistance in planning applications.

Recommendation 3.2 Local Reform

To facilitate compact home developments, pilot projects and viable models are required. By supporting the approval and construction of a microvillage, one local government area (LGA) could provide a model for enacting planning scheme changes and evaluating their impact. City of Greater Geelong (CoGG) is well placed to become such a model, due to several factors: CoGG’s new Social Housing Plan; the recent identification and documentation of surplus land within the municipality; the presence of a local resident group eager to build a microvillage; and an encouraging State
Government, which recently made a substantial financial commitment to increasing the supply of affordable housing in Victoria. The following local actions are recommended:

- That the City of Greater Geelong amend its existing Planning Scheme to include definitions of a range of acceptable dwellings in Residential Zones, including small homes (down to 40sqm).
- That the City of Greater Geelong amend its existing Planning Scheme to allow the waiver or modification of prescriptive car parking, setback, and open space requirements where these can be met in alternative ways.
- That the City of Greater Geelong (CoGG) work with applicants to approve construction of a microvillage on well-located surplus land within the existing Planning Scheme. This work should be undertaken in the context of CoGG’s Social Housing Policy and the Victorian State Government’s commitment to expand the supply of affordable housing.

**Recommendation 4: Conduct Research to Assess Demand for Tiny and Compact Homes in Geelong and Australia**

At present, we have no clear picture of demand for small homes in Australia. To date, there has been no empirical research examining the demand for different compact housing models in this country. Niche demand is sufficient to stimulate a small number of exemplar projects (see Recommendation 1). However, demand does not appear to be at the level necessary to simultaneously stimulate supply and design innovation, improve quality, and drive down costs. There is a pressing need to build an evidence base for future action, and addressing this knowledge gap is a crucial step. Without this empirical evidence, the impetus and justification for planning reform (Recommendation 3) is weakened, and the data for stakeholder education (Recommendation 2) is incomplete. The need is particularly pressing as governments begin to prioritise affordable housing, and Australians revaluate the suitability of our housing in the face of the climate change crisis and the COVID-19 pandemic.

**Recommendation 5: Promote Benefits, Reduce Costs, Remove Financial Barriers, and Increase Access to Compact Homes for People on Low Incomes**

For many Australians on low incomes, financial barriers place smaller homes out of reach. To make compact homes a viable affordable housing option, there is a need to remove financial barriers and reduce costs. Demonstrating the benefits of well-designed compact homes also presents an opportunity to stimulate demand, which may contribute to cost reductions. To address these factors, the following actions are recommended:

**Recommendation 5.1:** Promote the social, environmental, and economic benefits of smaller homes. Increasing awareness and demand by promoting the benefits of well-designed, prefabricated dwellings could reduce their cost and make compact housing options more affordable and feasible (materials and construction costs are relatively expensive in Australia). In addition, demonstrating demand for this type of housing and developing a track record for resales will make lenders more likely to accept it as collateral and security for standard mortgage loans.

**Recommendation 5.2:** Provide financial incentives and/or remove existing financial disincentives to developing, building, and owning well-designed, energy-efficient compact homes. Possible mechanisms include planning regulations and personal taxation. For example,
explore targeted support to help lower-income households enter or re-enter the housing market – perhaps by offering larger targeted home-owner grants to specific groups (e.g., single women in their 50s following relationship breakdown). We also note that Victoria’s Big Housing Build initiative requires new homes to achieve a minimum 7-Star NatHERS rating.

**Recommendation 5.3:** Increase the supply of high-quality social housing and intentional communities designed for ageing in place, with a focus on housing single-person households on very low incomes. Home ownership will likely remain unattainable for this group, and they are increasingly locked out of the private rental market. Options include well-designed, prefabricated, detached dwellings in appropriate settings (e.g., regional and lower density areas). This could help underpin demand, enable innovation, and drive down costs. Consider supporting the development of such projects via Victoria’s Big Housing Build initiative, under which 25 percent of total investment is allocated to homes for rural and regional communities.

**Recommendation 5.4:** Assess the feasibility of a government loan or guarantee scheme for aspiring owners of compact homes. Such a scheme could reduce barriers, mitigate lender aversion to borrower characteristics and security property, and contribute to an evidence base and track record. Assisting more lower-income households into home ownership may also help alleviate rental stress and pressure on social housing waiting lists.

**Recommendation 5.5:** Continue pursuing further tenancy reforms to strengthen tenant rights and improve security of tenure. This issue came up repeatedly during our study, with participants equating security of tenure solely with home ownership, not renting.

### 5.4 Study Challenges and Limitations

The research team notes the following challenges and limitations associated with this study.

#### 5.4.1 Data Collection Under COVID-19

Between April 2020 and March 2021, this research project faced considerable delays due to COVID-19 restrictions. At that stage, the collection of primary data via face-to-face focus groups, interviews, and STICKE workshops was underway, but not yet complete. Most of the focus group sessions had been completed by then, but ongoing COVID-related disruptions meant the two STICKE workshops were delayed by nine months. Over that period the research team also faced changes in membership, with colleagues lost due to major workplace change imposed by the pandemic. These delays and changes in personnel slowed project momentum considerably.

The primary challenge we faced was redesigning the STICKE workshops for online delivery. Up until that point, STICKE workshops had been conducted at Deakin University many times, across numerous studies. However, the workshops had always been held face-to-face, due to the consensus-building benefits of participants being in the same room. To re-establish project momentum, the STICKE format was re-designed for online delivery. The translation to online was largely successful, enabling a wide range of stakeholder to gather without all being present in one physical space. However, the need to restrict workshop duration so participants did not become fatigued by lengthy screen-time meant completing all stages was challenging. In particular, the consensus evaluation of actions was not finalised. This meant the actions had to be evaluated by individual participants after the workshops via...
completion of an emailed pro-forma. As a result, there was high degree of variability in participant evaluations. To even out this variability and finalise which actions would be prioritised, an additional evaluative process was completed by researchers with systems thinking expertise.

### 5.4.2 Financial Modelling

The scenarios we used to calculate the cost comparisons are all artificially constructed and are not based on a specific “real-world” project. Thus, the scenarios are based heavily on assumptions and averages that may not apply to an actual site-specific development opportunity. For example, we have assumed the cost of land to be $789 per sqm, based on the average price in North Geelong. We have assumed an average cost per dwelling of $50K for civil and infrastructure works; again, these costs can be highly site specific. We have made assumptions about the land allocation per dwelling, but in reality, the available land sites may be larger or smaller, which will influence the overall cost outcomes.

In terms of financing, we assumed that resident purchasers have a 20 percent deposit, in order to avoid the need to buy lenders’ mortgage insurance, and that they qualify for a 30-year principal and interest amortising mortgage loan (or in the case of the THOW scenarios, a seven-year principal and interest amortising loan). We assumed that CHP purchasers will have access to financing at low interest rates through NHFIC. In both cases, we assumed the interest rate on the loan will remain constant throughout the term. In reality, resident purchasers may be able to fix the interest rate on their loan for up to five years, while CHPs can fix the rate on NHFIC borrowings for up to 15 years. At the time of writing, interest rates are at historic lows; as such, over the 20-year term, they will likely increase at some point, which will impact financing costs.

We also made assumptions about incomes, revenue, various ongoing costs, and the relative rate at which these items will inflate over the 20-year period. We assumed that costs escalate at a higher rate than incomes grow, based on current trends – for example, noting the significant year-on-year increases in insurance premiums. We assumed annual maintenance costs – and in the case of CHPs, long-term capital management costs – are straight-lined (averaged) throughout the 20-year period. In reality, maintenance costs are likely to be lower in the early years of a new build and will increase as the dwelling ages. Meanwhile, capital management costs (such as replacement of kitchens, bathrooms, water, and heating systems) are typically “lumpy”.

We also made assumptions about land and dwelling values, appreciating land value over time, and depreciating value of the constructed dwelling over time. To compare like for like, we used a discount factor of 0.25 percent to bring these 20-year cost comparisons back to a current value. It should also be noted that the annual cash flows (and for CHPs, annual profit and loss statements) will also be important for potential purchasers to assess in terms of feasibility. For example, while THOWs are a cheaper option overall, the loan must be repaid over seven years rather than 30, which increases the annual cost substantially over those initial seven years.

Consequently, the outputs of the scenarios serve to compare different options on a relative basis – with the strong caveat that each actual development will need to be assessed on its own merits, and that cost and financing arrangements will be specific to the lender, property, and borrower.
The parameters of each scenario, and the assumptions we applied to those scenarios to provide cost comparisons, are contained in the Excel workbook that accompanies this report (see Appendix F).

5.5 Long-Term Evaluation

We suggest that long-term evaluation plan that captures key outcome indicators for residents should be developed and embedded into the preferred models.

In line with our research approach, which combines co-creation and participatory design processes, Taskforce members have provided us with regular input and feedback on our research over the course of the project. Our preliminary findings on potential microvillage models were also tested with a wider group, including Taskforce members, in Focus Group 2.

If some of our key Recommendations are implemented – for example, if a pilot microvillage is constructed – then a longer-term evaluation will need to be conducted. This evaluation should assess whether the development meets the residents’ expectations around affordability, security, accessibility, sustainability, design, social connection, and wellbeing. The evaluation will need begin prior to residents moving into the microvillage, in the early stages, and as the resident group evolves. We propose that this evaluation will involve assessment of the following KPIs:

- **Affordability**: homes can be occupied (rented or owned) by residents expending less than 30 percent of their income on rent/mortgage payments.
- **Security**: the microvillage provides security of tenure to support ageing in place, and a sense of home and community.
- **Accessibility**: homes are built to universal design standards, and services are readily accessible (shops, public transport, open space, medical facilities, schools etc.), using the principles of the “20-minute Neighbourhood” as a guide.
- **Sustainability**: homes perform to at least NatHERS 6-Star rating to ensure energy efficiency and keep running costs down.
- **Design**: the microvillage is designed in such a way that it respects existing neighbourhood character at an appropriate scale. Homes are physically secure, safe, and conform to universal design standards to allow for ageing in place.
- **Social connection**: there is an appropriate mix of private and communal space, well-managed and inclusive decision-making processes, openness to a diversity of residents, and connections to the existing surrounding community.
- **Wellbeing**: the microvillage supports overall resident wellbeing. Residents report high levels of social connectedness and satisfaction with the community.

5.6 Conclusion

This research project investigates the viability of increasing the supply of affordable housing for people with limited funds who want to live in modest-sized, sustainable, lower-consumption homes that connect with the community in meaningful ways. The context for the study is the increasing marketing, availability, and media promotion of tiny homes that positions them as a possible affordable housing solution for those with limited income and wealth.
The project investigated the viability of tiny-house alternatives in relation to four key issues: building and design (including universal design (for ageing in place) and environmental performance), regulatory planning barriers, finance, and community integration. We conducted an evidence review to inform the possible development of compact, affordable housing models. We also collected primary data through a series of focus groups, interviews, and systems thinking workshops with a diverse range of community stakeholders and experts. The findings are timely, with both local governments and Victoria’s State Government exploring innovative models for increasing the supply of affordable housing, and with passionate stakeholders eager to build a cluster of 6–12 compact homes in Geelong.

Tiny and compact homes are not currently a viable affordable housing option for people who want to live in homes that minimise consumption of building materials, land, and energy, and which integrate and link with the community in meaningful ways. This is due to a range of barriers related to design, construction, planning, financing, and community integration. Regulatory barriers are the chief deterrent. While much of this is as might have been expected, our research participants have helped frame Recommendations to overcome these barriers.

The HOME research team makes five Recommendations. In brief, they are: co-design exemplar pilot projects with potential residents and neighbouring communities; educate stakeholders to change negative attitudes to compact homes amongst builders, financers, regulators, and the wider community; reform planning regulations to permit tiny and compact homes to occupy space on appropriate properties; conduct research to determine actual demand for tiny and compact homes in Australia and Geelong; and promote the benefits of compact homes, with a view to reducing costs, removing financial barriers, and increasing access for people on low incomes.

However, to be effective, these Recommendations should not be approached in isolation. If the goal is to create real, long-lasting change, the Recommendations should be implemented in a systemic and holistic way, at different leverage points across the system, and across different practice domains.

With Australia facing the dual crises of climate change and housing affordability, a radical shift is clearly needed if the housing sector is to provide an expanded choice of affordable, high-quality compact homes suitable for residents across their lifespans. This study seeks to contribute to that shift by providing an evidence base to inform the development of compact, affordable housing models.
References: Part One


Wenban, C. (2019). The US tiny house on wheels movement with respect to a building code and relevance to Australia. *Australian Planner, 1*-5.


**References: Part Two**


**References: Part Three**


Patterson, K., Proft, K., & Maxwell, J. (2019). Older women’s risk of homelessness: Background paper.

References: Part Four


References: Part Five


APPENDICES

Contents

APPENDIX A: Building Regulations Analysis ................................................................. 163
APPENDIX B: Prefab 21: Winning Student Design Project ........................................ 170
APPENDIX C: Case Studies ......................................................................................... 180
APPENDIX D: Cohousing as a Model for Social Health: A Scoping Review .............. 189
APPENDIX E: Leverage Points Analysis .................................................................... 202
APPENDIX F: Excel Workbook Calculator – Cost Comparison Scenarios for Financing Models ................................. 205
APPENDIX A: Building Regulations Analysis

Regulation of Tiny Homes: Design, Construction, and Movement

This Appendix explores the building principles, guidelines, and regulations that impact the design, construction, and movement of tiny homes. We outline the relevant regulations, and also highlight some key points that should be considered in designing and building both THOFs and THOWs.

Given the absence of housing regulations specifically tailored to tiny home construction, we focus on the current Australian regulations that have the greatest influence on tiny houses. These include the Building Code of Australia: National Construction Code (NCC) (2019, Vol 2 for Class 1 Buildings (Housing); Australian Design Rules (ADR) and Vehicle Standards Bulletin (VSB); and planning schemes (Evans, 2018b; Shearer et al., 2019; Strachan, 2019; Weetman, 2019; Wenban, 2019). The impact and implications of these regulations are discussed below.

We begin with an analysis of the National Construction Code (NCC). Section 2 of the National Construction Code (NCC) (2019, p. 43) establishes performance requirements for buildings that address the following factors:

- Structural adequacy
- Services and equipment (damp and waterproofing)
- Fire resistance
- Provisions for the health and amenity of occupants
- Safe movement and access
- Energy efficiency and sustainability.

Section 3 of the NCC reflects acceptable forms of construction, based on the performance requirements for complying with the Housing Provisions. In this regard, housing (a building or structure) is required to:

- Safeguard people from injury caused by structural failure
- Safeguard people from loss of amenity caused by structural behaviour
- Protect other property from physical damage caused by structural failure
- Safeguard people from injury that may be caused by failure of, or impact with, glazing.

Providing a detailed description of every NCC subcategory (structural provisions 3.1–3.12) is beyond the scope of this report. Below we outline and discuss the NCC categories that directly impact the construction of tiny houses. We first address the regulations governing the construction of THOFs, then turn to the regulations governing the construction of THOWs.

Regulations Governing the Construction of THOFs

The National Construction Code (NCC) classifies a building according to the purpose for which it is designed, constructed, or adapted to be used. Currently, the regulations governing the construction of THOFs are exactly the same as those governing other forms of housing, because THOFs are classified as “class 1a buildings”, regardless of their size (National Construction Code (NCC), 2019, p. 28). These NCC regulations are outlined below. We have highlighted key considerations for the construction of THOFs.
Part 3.2 (NCC), Footings and Slabs: Compliance with performance requirements Part 2.1.1 and Part 2.2.3 requires footings and slabs to be installed in accordance with one of the following: a) The footing or slab is constructed in accordance with AS 2870; b) Piled footings are designed in accordance with AS 2159. Part 3.2.2.2 of the NCC explains the standards for filling under concrete slabs, and Part 3.2.2.3 does likewise for footing and slab foundations. Section 3.2.3 provides the requirements for concrete in relation to AS 3600, and for steel reinforcement in compliance with AS 2870.

Part 3.4 (NCC), Framing: Just like mainstream housing, tiny homes are required to remain structurally secured. As a result, the NCC’s framing regulations have considerable impacts on their construction. Roof, floor, and framing systems for THOFs are usually built from both steel and timber. Part 3.4.1 presents the need for subfloor cross ventilation with openings in external and internal subfloor walls. On the construction of framing, timber members should adhere to the AS 1720.1, AS 1720.5, AS 1684.2, and AS 1684.4, and steel members need to comply with either AS/NZS 4600 (Cold-formed steel structures), AS 4100 (Steel structures), or NASH Standard (Residential and Low-Rise Steel Framing, Part 1 Design Criteria). Most of the structural frames in Australia are made from timber, but replacing them with steel members decreases the weight of construction (Strachan, 2019).

Notably, the NCC has not provided information about the application of Light Gauge Steel (LGS) framed structures, which have recently been widely employed in many Australian projects as a “smart building solution” and are readily applicable to tiny home construction. LGS structures are designed using the FRAMECAD system and manufactured by rolling or pressing steel into semi-finished or finished goods at an ambient temperature. This technology speeds the construction process by using prefabricated structural elements.

Part 3.5 (NCC), Roof and Wall Cladding: Both metal roofing and plastic sheet roofing are used for tiny homes. The installation of plastic sheet roofing for a THOF must comply with AS/NZS 1562.3, and metal roofing must adhere to:

- Part 3.5.1.3 to ensure the minimum roof slope and pitch drainage capacity
- Part 3.5.1.5–7 to ensure the waterproofing of the house through fastenings and flashing detail for roof windows, for instance.

For THOFs, tile and shingle roofing, two options commonly used for tiny homes, need to comply with AS 2050 for tiling, and AS 4597 for terracotta, fibre-cement, and timber slates and shingles. Part 3.5.2.4–5 of the NCC also determines details for gutters and downpipes.

Wall cladding for a THOF must be watertight and fixed between structural frames based on:

- Part 3.5.4.2 for timber cladding, including weatherboards, and profiled boards
- Part 3.5.4.3 for fibre-cement and hardboard wall cladding boards
- Part 3.5.4.4 for fibre-cement, hardboard, and plywood sheet wall cladding
- Part 3.5.4.5 where an eave is installed.

Part 3.6 (NCC), Glazing: For THOFs, as with all other residential construction, glazing presents the biggest challenge in thermal envelope performance, which is the basis of energy efficiency assessment (O’Leary et al., 2018). Glazed windows with frames, window walls with one-piece framing, and adjustable louvres positioned in an external wall all need to adhere to AS 2047 to ensure user safety and insulation efficiency (both waterproofing and thermal transitions). Second-hand glazed units, fixed louvres, roof lights, and skylights should comply with AS 1288. Part 3.6.4.5 of the NCC provides
regulations for bathroom, ensuite, and spa room glazing, and Part 3.6.4.6 presents the visibility regulations for glazing. Details on double glazed windows for energy proficiency are provided in NCC Part 3.12.2.1.

**Part 3.7 (NCC), Fire Safety:** Fire safety regulations specify the distance separating external walls between habitable buildings, seek to decrease the chance of fire spread through appropriate design and materials, and mandate the inclusion of fire notification tools and evacuation provisions. For THOFs built as independent and detached accommodations meeting the mandated 900mm distance between dwellings requirement, a Fire Resistance Level (FRL) of 60/60/60 is not necessary (Part 3.7.2).

Due to the compact nature of THOFs, it is vital to select acceptable non-combustible materials to slow the spread of fire. Part 3.7.1.1 of the NCC provides a list of materials that can be used wherever a non-combustible material is required in the Housing Provisions. These are: a) plasterboard; b) perforated gypsum lath with a normal paper finish; c) fibrous-plaster sheet; d) fibre-reinforced cement sheeting; e) pre-finished metal sheeting with combustible surface finish not exceeding 1mm thick, and where the product’s spread-of-flame index is not greater than 0; f) sarking-type materials that do not exceed 1mm in thickness and have a flammability index not greater than five.

**Part 3.8 (NCC), Health and Amenity:** This section of the NCC aims to enhance the safety and movements of occupants and contains several practical guidelines for the construction of all homes. The first section, Part 3.8.1, specifies requirements for the waterproofing of external walls and wet areas such as bathrooms, toilets, showers, and laundries. It also depicts the characteristics of typical water-resistant junctions and joints to ensure building elements meet the requirements in wet areas. This section is followed by regulations for the minimum room height in habitable areas. The standard height for living rooms and sleeping areas is recommended to be 2.4m, and for kitchens and bathrooms it should be 2.1m. For attics, at least two-thirds of the total floor area must have a room height of more than 2.2m.

Part 3.8.3 of the NCC describes equipment and amenities compliance, including the kitchen sink, facilities for food preparation, washing machine facilities, closet pan, toilet, bath or shower, washbasin, and space for a washing machine. Of course, including this range of facilities is a challenge for tiny homes due to their compact nature.

Part 3.8.4 of the NCC assigns at least 10 percent of the floor area of each room as required window area, excluding roof lights. Artificial lighting must comply with AS/NZS 1680.0. Part 3.8.5 requires appropriate ventilation for habitable areas, via openable windows and exhaust fans, to be not less than five percent of the room area.

The final section, Part 3.8.6, describes the specifications of separating walls for sound isolation. For a THOF, adequate sound isolation is required for bathrooms. THOWs also benefit from this consideration. Given the importance of space, designing an internal wall that provides the necessary sound isolation with the least possible thickness is a performance challenge.

**Part 3.9 (NCC), Safe Movement and Access:** This section of the NCC provides requirements for the design and construction of staircases, ramps, barriers, handrails, and swimming pools to ensure the safe movement and access of occupants. The design of a stairway to take loading forces must comply with AS/NZS 1170.1 and Table 3.9.1.1. Evidently, the required area for the given dimensions is not achievable for tiny homes, and requires a performance solution for safe access (Strachan, 2019). Part 3.9.1.3
describes the required specifications for an external ramp, which must have a gradient not steeper than 1:8 and must provide landings complying with 3.9.1.5 at the top and bottom of the ramp. This section is of utmost importance for a THOF aiming to be accessible for its occupants over its long lifespan.

Part 3.9.2 of the NCC explains the need for barriers in situations where there is more than 1m height from the level of the trafficable surface to ensure safe movement from staircases and openings. Continuous handrails must be designed at a minimum height of 865mm above the nosings of the stair treads, and the floor of a ramp.

**Part 3.12 (NCC), Energy Efficiency:** This part of the NCC has key implications for design and construction of THOFs. It contains energy efficiency measures and examines the building fabric and sealing, external glazing, air movement, and services. To comply with the energy efficiency Deemed-to-Satisfy (DTS) Provisions, there are two principal strategies: a) the thermal simulation of a building must be assessed using NatHERS schemes; b) the elements of the building must adhere to prescriptive Deemed to Satisfy (DTS) provisions specified in the ABCB Standard for NatHERS Heating and Cooling Load Limits. O’Leary et al. (2018) argue the need to phase out the DTS elemental pathway in favour of thermal simulation of buildings because design factors, under the first strategy noted above, are assessed more holistically (Daniel et al., 2017).

As indicated in Part 3.12.0 of the NCC (2019, p. 362), thermal performance must comply with Part 3.12.1 for the building fabric; Part 3.12.2 for the external glazing and shading; Part 3.12.3 for building sealing; Part 3.12.4 for air movement; and Part 3.12.5 for services. Part 3.12.0.1 requires “an energy rating, including the separate heating and cooling load limits of greater than or equal to 6-star of NatHERS (2020) rating”. Notably, the current NatHERS is not capable of calculating and modelling “the small footprint and larger wall surface area” of tiny homes, and also overlooks the multi-functionality of THOFs (Strachan, 2019).

To achieve the 6-star NatHERS rating, building fabric thermal insulation must conform to AS/NZS 4859.1; roof design must comply with the total R-value (thermal resistance rating) specified in NCC Tables 3.12.1.1a to 3.12.1.1g; the R-value of external walls and roofs must adhere to Parts 3.12.1.4 and 3.12.1.5 of the NCC respectively; external glazing size/type and location must conform to Part 3.12.2.1 (based on specified climate zones, to balance potential solar gains and heat loss via conduction through glazing); building sealing must be fixed, based on requirements outlined in Part 3.12.3, particularly for roof lights, external windows and doors; air movement (both natural and mechanical) must be provided to habitable rooms in accordance with Part 3.12.4; and ductwork for artificial lighting and building services must comply with Part 3.12.5 for their insulation, heating, and cooling.

In sum, conformation to a performance-based code measured via NatHERS is a challenging issue for tiny house designers. There is a need to revise current modelling. de Chastel (2019) argues that accepted building standards, which have been established over decades, do not consider the suitability of tiny houses. She believes that state governments in Australia need to consider building norms that specifically address requirements for tiny homes.

**Regulations Governing the Construction of THOWs**

Currently, the NCC Class 1a of buildings includes detached houses or a group of two or more attached dwellings, each of which is a building, separated by a fire-resisting wall. This category includes a row house, terrace house, town house, or villa unit. None of the building classes (1a, 1b, and 2–10) makes
any reference to demountable homes, or whether a building sits on foundations or otherwise. By this
definition, the very nature of a THOW excludes it from classification as housing, and thus from the
construction regulations that pertain to residential buildings. Thus, while this section follows the NCC
Vol. 2 structure, this is merely in order to identify the construction issues that THOW builders face.

**Part 3.4 (NCC), Framing:** In building a THOW, construction requires structure for the subfloor, walls,
and roof; this is usually timber, but can be metal. Builders need also to be aware of the interconnections
between roofing, flooring, and walling systems, as well as the connection between the subfloor and
steel trailer. These connection points should be designed by a structural engineer to ensure a THOW
can be transported safely.

The mobile nature of THOWs makes wind classification for their structure a challenging issue. It is
important to calculate the lateral wind load caused during relocation, and to consider this in structural
simulation (Strachan, 2019).

**Part 3.5 (NCC), Roof and Wall Cladding:** Given the mobile nature of THOWs, metal roofing or a pliable
membrane are commonly used, and these would benefit from compliance with AS 1562.1. Where
different metals are used in a roofing system, including flashings, fasteners, guttering, and downpipes,
these should be compatible with each other, as described in Tables 3.5.1.2a to 3.5.1.2d, in line with the
regulations that govern THOFs. For wall cladding, it is vital to select materials and construction methods
that are watertight and can endure high wind loads during relocation. This choice can be informed by
guidelines in:

- Part 3.5.4.2 for timber cladding
- Part 3.5.4.3 for fibre-cement and hardboard wall cladding boards
- Part 3.5.4.4 for fibre-cement, hardboard, and plywood sheet wall cladding
- Part 3.5.4.5 where an eave is installed.

Section 3.5.5 also explains requirements for the construction of metal wall cladding in accordance with
AS 1562.1. In some cases, metal wall cladding is used in THOWs.

**Part 3.6 (NCC), Glazing:** As for THOFs, the glazed windows and doors in a THOW’s external walls should
adhere to AS 2047 to ensure the safety of users and insulation efficiency (both waterproofing and
thermal transitions). It is crucial that the external glazed units be attached to the main frame to increase
stability against extra wind load during relocation.

**Part 3.7 (NCC), Fire Safety:** Part 3.7 of the NCC sets out ancillary provisions about fire safety and the
construction of dwellings in bushfire and alpine areas. In alpine areas, doors need to open inward,
which is not currently the case for most THOWs. To decrease the threat of bushfires, homes need to be
constructed to a minimum Bushfire Attack Level (BAL). This standard poses a challenge for constructing
THOWs, as they could be relocated to a place with a different BAL. However, Strachan (2019) suggests
that THOWs can be built to a minimum BAL of 19 with minimal extra materials cost.

**Part 3.8 (NCC), Health and Amenity:** Part 1.3.2.1.6 of the NCC requires a minimum height of 2.4m for
living and sleeping areas. However, THOW designers can explore novel performance solutions for these
regulations, as they do not apply to moveable homes. The minimum required facilities for a home are a
kitchen sink, food preparation facilities, closet pan, toilet, bath or shower, washbasin, and space for a
washing machine. Given space constraints, a compact THOW may not be able to include them all.
Part 3.9 (NCC), Safe Movement and Access: Required areas for the design and construction of staircases and ramps are challenging for THOWs, but these could be negotiated through the Deemed to Satisfy Solution in the NCC. There is a need for unique performance solutions that address these challenges (Strachan, 2019).

Part 3.12 (NCC), Energy Efficiency: This section sets out requirements for a 6-star NatHERS rating in terms of building fabric, external glazing, building sealing, and air movement. But it would be challenging for THOWs to conform to these standards. For example, it would not be viable for THOWs to comply with the same NatHERS rating when relocating between different climate zones (Strachan, 2019).

The Australian Design Rules and Vehicle Standards Bulletin

Whenever a THOW is on the road, it must be compliant with regulations in the Australian Design Rules (ADR) and the Vehicle Standards Bulletin (VSB). Established by the Australian Government, the ADR sets national standards about vehicle safety, theft deterrence, and emissions. The VSB complements the ADR, and provides detailed information on the design, manufacture, sale, modification, maintenance, import, and repair of road vehicles.

The very nature of movable tiny homes raises additional considerations for the Australian Design Rules on THOW dimensions. Here, length is not usually as challenging as weight and height restrictions (see Table A1, below).

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.1.1 “Total Length”, including any “Equipment”</strong></td>
<td></td>
</tr>
<tr>
<td>• “Total Length” of a motor vehicle, other than an “Articulated Omnibus”, must not exceed 12.5m</td>
<td></td>
</tr>
<tr>
<td>• “Total Length” of an “Articulated Omnibus” must not exceed 18m</td>
<td></td>
</tr>
<tr>
<td>**6.1.2 “Rear Overhang”, including any ‘Equipment’”</td>
<td></td>
</tr>
<tr>
<td>• The ‘Rear Overhang’ of any motor vehicle must not exceed 60 percent of the “Wheelbase”, or 3.7m, whichever is the lesser</td>
<td></td>
</tr>
<tr>
<td><strong>6.1.3 Height, including any “Equipment”</strong></td>
<td></td>
</tr>
<tr>
<td>• The height of any motor vehicle must not exceed 4.3m</td>
<td></td>
</tr>
<tr>
<td><strong>6.1.4 Overall Width”, including any ‘Equipment’</strong></td>
<td></td>
</tr>
<tr>
<td>• “Overall Width” of any motor vehicle (other than an L-Group vehicle) must not exceed 2,500mm</td>
<td></td>
</tr>
</tbody>
</table>

Table A1: Australian Design Rules (Australian Government Dept of Infrastructure, 2018; Wenban, 2019)
According to Wenban (2019), Table A2 (below) indicates the relevant sections of ADR and VSB for the design and construction of THOWs.

<table>
<thead>
<tr>
<th><strong>22 General Caravan Requirements</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>22.1 Doors</strong>: Every motorhome or caravan equipped with cooking facilities, or living or sleeping accommodation, shall have only outward-opening or sliding doors, with at least one located on the left-hand side or at the rear</td>
</tr>
<tr>
<td><strong>22.2 LPG Installation</strong>: LPG installations in motorhomes and caravans shall comply with the requirements of the relevant code</td>
</tr>
<tr>
<td><strong>22.3 Fire Extinguisher</strong>: Motorhomes and caravans must be provided with a fire extinguisher in accordance with the relevant Australian Standard</td>
</tr>
</tbody>
</table>

**Enclosed Trailer**: If intended for use as a mobile home or living quarters when parked. Camper trailers, workers amenity trailers, mobile kitchens or mobile offices are also regarded as caravans. A THOW would typically come under provisions for a light trailer (<3.5 tonnes) or medium trailer (3.5–10 tonnes) and should also comply with the following VSB1 sections, under the trailer construction and caravan requirements:

- Lighting
- Electrical Wiring
- Braking
- Drawbars, Safety Chains, Safety Chain Attachments, and Couplings
- Wheel Guards (Mudguards)
- Visibility of Tray
- Axles and Suspensions
- Wheels and Tyres

**Table A2: Vehicle Standards Bulletin (VSB1) (Australian Government Dept of Infrastructure, 2009; Wenban, 2019)**

**Universal Design Guidelines: Livable Housing Australia**

In the final section of this Appendix, we describe the Livable Housing Design (LHD) Guidelines (2012) that were developed by the National Dialogue on Universal Design in a consensus agreement by industry, community, and human rights organisations. Livable Housing Australia (LHA) (2012) proposed four key easy living features for the design of Australian homes: homes should be easy to enter; easy to move in and around; capable of easy and cost-effective adaptation; and designed to anticipate and respond to the changing needs of home occupants. The Guidelines support three levels of accreditation: Platinum, Gold, and Silver.

Livable Housing Australia (LHA) (2012) presents 16 livable design elements, each of which is expected to achieve either Silver, Gold, or Platinum accreditation for new detached and semi-detached houses, terraces, and townhouses. LHA acknowledges that the core design elements in the Silver level (the first seven elements outlined in Table A3, below) provides the most widespread benefit in most circumstances. In accordance with the main aim of this study, the requirements for Platinum level (including the seven main elements, and additional elements for kitchens and bathrooms) are outlined.
Table A3: Standards for Gold-Level Livable Housing Design Accreditation

1. Flooring. All floor coverings should:
   - Provide a minimum clear width of 1000mm.
   - Be straight in design.
   - Be firm and even, and
   - Be slip-resistant flooring.

2. Windowsills and window control positions.
   - Windowsills on the ground (or entry) level in living areas and bedroom spaces should be positioned no higher than 1000mm above the finished floor level to enable enjoyment of the outlook.
   - Window controls should be easy to operate with one hand and located within easy reach from both a seated and standing position.

3. Family/living room space that enables ease of movement.
   - A continuous handrail on one side of any stairway where there is a rise of more than 1m. This handrail must:
     - Be positioned adjoining a load-bearing wall.
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level
     - Feature a level transition between abutting surfaces (a maximum vertical tolerance of 5mm between abutting surfaces is allowable provided the lip is rounded or bevelled).
   - One bathroom should feature a slip-resistant, step-free (hobless) shower recess. Shower screens are permitted, provided they can be easily removed at a later date.
   - A minimum 1200mm clear circulation space forward of the toilet pan, exclusive of the swing of the door.
   - A minimum 1200mm clear circulation space forward of the shower recess entry.
   - If the entrance to the dwelling is at a level (step-free) entrance door.
   - If the entrance to the dwelling has a clear opening width of 900mm.
   - Minimum dimensions of at least 3800mm (width) x 6000mm (length).
   - Minimum dimensions of at least 3800mm (width) x 6000mm (length) forward of the shower recess entry.
   - A bathroom that contains a hobless (step-free) shower recess.
   - A covered parking space to ensure protection from the weather.
   - A vertical clearance over the parking space of 2500mm.
   - A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).
   - Where the entrance threshold exceeds 5mm and is less than 56mm, a ramped threshold may be provided.

4. Door and tap hardware selected and installed to meet specifications.
   - Door hardware should be installed 900mm–1100mm above the finished floor.
   - Light switches should be positioned in a consistent location:
     - horizontally aligned with the door handle at the entrance to a room.

5. Ground (or entry level) bedroom space. The dwelling should feature a space (or room) on the ground (or entry) level that:
   - Provides for a minimum path of travel of 1000mm on at least one side of the bed.
   - Provides for a minimum path of travel of 1000mm on the remaining side of the bed.
   - Is of at least 10m², with one wall a minimum length of 3m.

6. Laundry space with slip-resistant flooring and specified clearances.
   - At least 1550mm clearance should be provided in front of fixed benches and appliances.
   - Basins, sinks, and tubs should feature lever or capstan-style tap hardware, with a central spout.
   - Internal doors and corridors that facilitate comfortable and unimpeded movement between spaces.
   - In at least one level (step-free) entrance into the dwelling.
   - A continuous handrail on one side of any stairway where there is a rise of more than 1m. This handrail must:
     - Be positioned adjoining a load-bearing wall.
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level
     - Feature a level transition between abutting surfaces (a maximum vertical tolerance of 5mm between abutting surfaces is allowable provided the lip is rounded or bevelled).
   - The family/living room should accommodate a free space, 2250mm in diameter, to enable ease of movement clear of furniture.
   - The walls around the toilet, shower, and bath to support the safe installation of grabrails at a later date:
     - Solid masonry or concrete, the walls around the shower, bath (if provided), and toilet should be reinforced to provide a fixing surface for grabrails combined must be able to withstand 1100N of force applied in any position and in any direction.
   - The walls around the toilet are to be reinforced by installing:
     - at least 25mm, or
     - at least 12mm.
   - The walls around the shower, bath (if provided), and toilet should be reinforced to provide a fixing surface for grabrails combined must be able to withstand 1100N of force applied in any position and in any direction.
   - The walls around the bath are to be reinforced by installing:
     - at least 25mm, or
     - at least 12mm.
   - The walls around the hobless (step-free) shower recess are to be reinforced by installing:
     - at least 25mm, or
     - at least 12mm.

7. A safe, continuous, and step-free path of travel from the street entrance and/or parking area to a dwelling entrance that is level.
   - A minimum clear width of 1200mm.
   - A maximum pathway slope of 1:14, with landings provided at no greater than 9m for a 1:14 ramp, and no greater than 15m for ramps steeper than 1:20. Landings should:
     - Have a minimum clear width of 1000mm.
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level
     - Feature a level transition between abutting surfaces (a maximum vertical tolerance of 5mm between abutting surfaces is allowable provided the lip is rounded or bevelled).
     - Provide dimensions of 1160mm (width) x 1100mm (length)
     - Be located in a bathroom on the ground (or entry) level
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level
     - Be straight in design.
     - Be located in a bathroom on the ground (or entry) level

8. A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).
   - A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).
   - A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).
   - A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).
   - A level surface (1:40 maximum gradient, or 1:33 maximum gradient for bitumen).

9. The entrance must have a minimum clear opening width of 900mm.
   - The entrance must have a minimum clear opening width of 900mm.
   - The entrance must have a minimum clear opening width of 900mm.
   - The entrance must have a minimum clear opening width of 900mm.
   - The entrance must have a minimum clear opening width of 900mm.

10. A safe, continuous, and step-free path of travel from the street entrance and/or parking area to a dwelling entrance that is level.
APPENDIX B: Prefab 21 (Winning Student Design Project)

Prefab 21

A project by

Deakin Architecture and Formflow in partnership with Samaritan House

Prefab 21 students and advisors

List of students:

List of Advisors:

Ms Dang Hoang Uyen Do (Evelyn)  Mr Andrew James Galea
Ms Kate Soyoung Gwag  Mr Daniel Johnson
Mrs Marisa Claudia Martinez  Mr Trung Kien Nguyen (Kean)
Ms Priyanka Novel Pereira  Ms Maitri Yogeshbhai Shah  Ms Ying Xin Tan (Fishy)
Mr Athan Vadiakas  Ms Ankita Ashok Vernekar

James Doerfler  Deakin Architecture  Matt Dingle  FormFlow
Bernard Brussow  FormFlow  Brian Sherwell  Samaritan House  Stewart Seaton  Deakin Architecture  Lana van Galen  Deakin Architecture
The Prefab 21 Project has been designed by Deakin Architecture Students and made by FormFlow to provide a prototype residential unit for the Samaritan House homeless shelter.
Each unit of Prefab 21 consists of 4 modules constructed offsite together in one and day.
Deakin architectural students and the FormFlow team have worked together in a collective effort to produce details that are architecturally pleasing and both practical and harmonious with the architectural vision of Prefab21.
Sense of community locations of modular units enhance the open spaces as places where people enjoy. Community gardens will improve social connection as well as help develop a sense of community.

Master Plan

The Site Masterplan uses Sustainable principles and Passive Siting strategies to reduce negative impacts on the environment, to reduce consumption of non-renewable resources, to minimize waste and to create healthy, productive environments.

Sustainability

The proposed units achieve solar passive orientation, utilizing solar energy and water tanks. Material selection was considered for minimal maintenance and sustainability. In the common area, the lawn is provided for site permeability. Due to the existing flooding overlay, we propose concrete as path paving material.

Native Landscaping

Native landscaping can make a big impact on water consumption; by using trees, plants, and grasses that are native to the area, we can greatly reduce irrigation needs. Landscaping can also be used as part of a passive energy strategy; by planting trees that shade the roof and solar heat gain inside the building.

Environmentally Friendly

Recycled plastic is proposed for outdoor furniture, signs and bollards, helping to minimize cost and to promote a sustainable community. Community gardens are proposed with raised garden beds, next to the storage shed, to encourage social interaction and to provide inexpensive local grown vegetables.

Services

Services are located to the south-side, along the property boundary: an area close to the unit’s power, water and sewer connection points and with restricted traffic. The community area was positioned considering the continuity of the social aspect and relationship with the existing two Samaritan housing in the front. Community gardens are proposed with raised garden beds, next to the storage shed, to encourage social interaction and to provide inexpensive local grown vegetables.
Sustainability

Rainwater Collection = 22 m³/year (1.4 - 2.2 m³/month)

The harvesting of rainwater not only creates economical savings, but also helps reduce the strain imposed on the public water systems; reducing latent energy required to process clean water. System classified as a grey-water only system: where harvested rainwater is used primarily for non-potable applications such as: the flushing of toilets, supplementing the typical water unit.

Off-site construction is often referred to as 'prefabrication', 'off-site manufacture' or 'modern methods of construction', and it involves modular planning, design, fabrication, and assembly of efficient construction of a permanent structure.

Heating system consumption, one person unit might consume around 21 kWh per day and night. Energy consumption by rooms and main functions are summarized in the pie chart; heating system consumed over 70%, followed by KITCHEN at 18.5%, BATHROOM at 4.9% and BEDROOM at 3.3%.
Sustainability

Natural Light / Internal lighting and heat gain. It is able to get directed light with the open glass at North and East elevation, in order to reduce the amount of electricity using by heating system. Meanwhile,ing the overhanging roof protects the inner space from direct sunlight while glazing introduces the indirect one; reducing the chances of overheating during summer. Moreover, the west side of Prefab21 are covered with the double insulated wall to avoid the adverse direct low angled light in the afternoon, especially to reduce the inner heat gain during summer. The combination between Double glazing and Double Low-e material are used for the glass door and window for more sustainability.

Natural Ventilation

Cross ventilation within Prefab21 is facilitated by especially suitable during Spring and Autumn, drawing air/wind from both ends of Prefab21. However, in the Grand Winter where air conditioning is preferred, natural ventilation can be partially achieved within the living room / kitchen area by leaving the front door and windows open; albeit localised within the kitchen. Furthermore, with the high ceiling height, allows for higher levels of comfort by means of natural convection (hot air rises, cool air sinks) ; resulting in more comfortable felt temperatures.
Materials are crucial in building parts in which materials we use in our project is necessary. This poster will compare benefits between some outstanding materials in two of the most important kinds of materials in a building: Steel Frame and Insulation material.

**Steel Frame**

Bluescope Truecore Steel

Accreditations & Certifications

- NATA
- ACRS

KINGFILED Hot-Dip Galvanizing

Accreditations & Certifications

- We’ve taken Victoria’s climate change pledge.
- Green star rated
- Platinum rated

**Insulation**

ARTHWOOL FloorShield R2.5

AUTEX Greenstuf Underfloor
APPENDIX C: Case Studies

International Case Studies

The first set of case studies below was completed by Deakin student Aremel Tibayan as part of his Bachelor of Design (Architecture)/Construction Management (Honours). The student’s role in this project was to research, document, and critically examine up to eight relevant international examples of clusters of small affordable homes in urban and/or regional environments. The results are presented in data templates to enable comparison. The data includes project description, context (place, site, relevant planning/building regulations), design response to need, whether the project was built/not built, drawings and plans (small homes and clusters).
Local and Australian Case Studies

Below we present a selection of case studies profiling comparable projects and housing models from Geelong and across Australia. The models encompass eco-villages, cohousing developments, a specialist aged care facility, and permanent tiny housing for people who have experienced homelessness.

Wintringham: Highton, Geelong

Wintringham is a not-for-profit registered Housing Association. It provides housing across the state to elderly women and men over 50 who are homeless or at risk of becoming homeless. Applications occur through the Victorian Housing Register and are prioritised on the basis of their support needs, age and degree of frailty. As well as single occupancy units there is also Housing and Support packages available. Rental fees are based on income and assets and residents pay not more than 30 percent of income.

This development is a specialist aged care facility, with 34 new one-bedroom units built at 3 Cranwell Court, Highton. It was officially opened on 13 July 2011. Each unit has been designed to optimise natural ventilation and light, providing a contemporary living space measuring approximately 50sqm. Universal accessibility ensures ongoing tenancies for older people who may have limited mobility. The site includes a community room and landscaped gardens.

From 2021 there will be an additional 22 new units added via a grant from the Victorian Property Fund and land as well as funds from the Alexander Miller Estate (Geelong, Highton | Wintringham).

Additional information on Wintringham here >

Baptcare: Norlane, Geelong

Up to eight tiny units for the Department of Health and Human Services (DHHS) are proposed for St Georges Road, Norlane. An aged care facility that offers care for low to high need elderly, as well as respite, specialist dementia and palliative care, it is a not-for-profit operation that caters for low income DHHS public, government supported and community housing clients. What is important for this project is the way in which the standard facilities of individual rooms and shared living, dining, garden and lounge spaces are co-designed and co-located with a café, community hub, men’s workshop and community gardens that are open to and used by the Norlane community. This has made the facility a welcome addition to this locality (https://www.baptcare.org.au/ Accessed 4.3.2021)

Illabunda Eco-Village, near Parramatta, New South Wales

The Illabunda Eco-Village is a five-acre property located in Winston Hills, near Parramatta, in New South Wales (NSW). The site currently hosts 15 families in their own freestanding, terrace, or semi-detached houses, with a further seven expected over the next two years.

The Illabunda development is located within walking distance of primary and secondary schools, shops, and the new bus transitway into Parramatta. By car it is only minutes from the SQM, M4, and M7 motorways, and from the Parramatta CBD. Half of the five-acre site comprises dedicated green community space. Features include:

- Intentional community focused design
- All dwellings centred around a village green
- Low energy use, passive solar designed homes amidst community spaces
- Community gardens for organic food production
- Regenerating native forest
- Onsite rainwater harvesting, and stormwater treatment and re-use
- Onsite energy production.

Additional information on Illabunda Eco-Village here >

**Christie Walk, Adelaide, South Australia**

Christie Walk is an ecological cohousing development on a 2000sqm (half-acre) site in central Adelaide. The development is a small community of homes and gardens that combines many ecologically sustainable and community enhancing features.

Initiated by Urban Ecology Australia in 1999 as a demonstration project, Christie Walk seeks to promote nature and people-friendly urban development by example. The goal was to create a liveable, affordable, and environmentally benign urban community that provides a practical prototype for the ecological development of cities. It was completed in December 2006.

The project consists of 27 dwellings, including four linked three-storey townhouses with full solar orientation; a three-storey block of six apartments with east-west orientation; four individual cottages; and a five-storey apartment block facing onto Sturt Street, with a communal kitchen/dining/meeting room/library, and toilets on the ground floor.

Around 40 people live at Christie Walk, ranging from young children to people aged over 80. There is a strong community ethos. The site features stormwater capture, solar electricity, and recycled and non-toxic building materials. It is designed to foster social interaction and a sense of community, with a traffic-free layout and convivial outdoor places where people can gather informally or sit quietly alone.

Developed using a cooperative approach, Christie Walk was financed by a combination of debt and personal capital. The development’s success relied heavily on the passion and commitment of the individuals involved. The involvement of several discrete entities was another key factor in the project’s successful delivery. In particular, the creation of two independent entities enabled clearly articulated roles and responsibilities.

- Wirranendi: A private not-for-profit housing cooperative, comprising resident and non-resident members, was the main group that delivered the development. The group owned the land during construction, with individual properties then sold on a community title.
- Ecocity Developments Pty Ltd: A not-for-profit ethical builder, set up to construct the project, using various subcontractors.
- Ecopolis Architects: A for-profit architectural firm, established by Paul Downton prior to the project’s conception.

Additional information on Christie Walk here >

**Pinakarri Community, near Fremantle, Western Australia**

Pinakarri is an intentional community and urban cohousing project located near Fremantle, in Western Australia (WA). The project was founded by a diverse group of people – primarily parents, and mostly female – who sought a more socially sustainable way to raise their children. They formed a community over an eight-year period before finding and purchasing a suitable piece of land. In 1991 building was
completed and the first tenants moved in. Pinakarri was the first cohousing cooperative in WA to feature a mix of public and private housing.

The development features 12 self-contained houses, along with a central “common house”, built on a 3000sqm site where four houses originally stood. The houses vary in size, and all feature passive solar design and an earthy colour scheme. Each house has a small north-facing private garden. Fences are low-profile and semi-permeable, to enable both separateness and engagement with the surrounding community. One unit is designed for a young woman who is severely disabled and would otherwise have faced institutionalisation. She has 24-hour care.

The community is made up of around 40 people, including residents and friends who live nearby. Common space includes shady lawns and trees irrigated by a greywater system; an organic vegetable garden and fruit trees; a community laundry (which supplies some of the greywater); the common house; and a firepit. Rainwater collected in winter is used to flush toilets. The common house includes a meeting room, office, and tiny guest room where visitors can stay. The central common house and firepit represent the metaphorical “heart” of the site.

Additional information on Pinakarri Community here >

Launch–Harris Transportable Housing Project, Maribyrnong, Melbourne

During 2016 and 2017, there was a sharp rise in visible homelessness in the Melbourne CBD. Rough sleepers were demonised in tabloid media commentary and by certain public figures. In early 2017, as international visitors began arriving for the Australian Open tennis tournament, authorities disbanded “homeless camps” in the city, sparking protests and heated public debate. These events coincided with the City of Melbourne proposing new regulations to criminalise rough sleeping (although ultimately, that proposal was not adopted) (Mundell, 2017a; 2017b).

The controversy prompted State Government efforts to explore options for creating new housing on “surplus land”, through a combination of philanthropic/private-sector funding, local government support, and community housing organisation oversight.

This eventuated in the Launch–Harris Transportable Housing Project, comprised of 57 small dwellings located on nine Vic Road-owned sites along Ballarat Road in Footscray and Maidstone, in Melbourne’s inner west. Managed by community housing organisation Launch Housing, the units provide permanent housing for people who have experienced homelessness.

State Planning Minister Richard Wynne, a former Housing Minister, backed the project and oversaw the approval process. The City of Maribyrnong also supported the initiative, while VicRoads contributed underutilised land in the Maribyrnong LGA. The first six units were constructed with support from the Victorian Property Fund. During the planning approval process Launch Housing contacted neighbours via letterbox drops, inviting them to have a one-on-one conversation with a project team member. Two public meetings were also held. The first three sites were developed and occupied with no objections, but some negative media coverage led to a “planning backlash” around the remaining six sites.

The prefabricated units were built in Horsham and transported to the sites. Schored Architecture designed the homes and Oscar Building constructed the initial units. Measuring 20sqm inside, the units are situated in clusters of six to 12. They are 6-star NatHERS rated, and include passive cooling, solar hot water, acoustic rating, shading, double glazing, and spilt-system heating/cooling. There are no dedicated
The project cost $9.6 million in total. A variation in costs per unit is reported as being between $80,000 to $130,000 per house when fully connected and installed (Yarra City Council, 2019).

The experience highlighted the need to carefully consider site selection, as this is critical for managing costs. Project costs can vary considerably, depending on the site’s location, accessibility, and attributes (including gradient, drainage, soil quality, and access to infrastructure/services). Ongoing maintenance and upkeep are another key cost to consider.

**Cohousing Models and Examples**

As a form of intentional community that shares characteristics with clusters of tiny homes, the cohousing model warrants consideration. To further support self-driven communal housing arrangements, peak body and advocacy group Cohousing Australia recommends providing incentives that would allow for pre-permit advice, an expedited permit process, and reduced permit fees.

Cohousing Australia has also identified some key considerations for state governments that would help enable cohousing-type developments:

- Mandatory inclusionary zoning requires developers (both private and government) to ensure a proportion of every residential development is reserved for affordable, community, or public housing. This measure promotes a mix of tenure types and increased density of residential dwellings on a site. Cash contributions from developers are often required to enable other actors, such as the state, to provide affordable or social housing in other areas of the neighbourhood. There are currently a number of inclusionary zoning trial sites across Victoria, but aside from affordable or social housing, none explicitly provide for alternative types of tenure or housing.

- On-site waste collection and parking requirements for alternative developments need to be relaxed to accommodate more environmentally aware projects.

- Developer contribution exemptions need to be applied to unorthodox developments that address key criteria around social and environmental justice benefits.

- If the development will serve the greater public good, third party appeal rights that enable neighbours, developers, and affected parties to raise objections should be suspended.

- Minimum dwelling sizes should be reduced to allow for tiny houses and micro-apartments.

Several other issues inhibit self-driven communal housing arrangements in Victoria. These include:

- A lack of definition for alternative housing and tenure arrangements in the Land Use Terms at State level
- Insufficient understanding of the benefits of cohousing models for the built environment, and for social and financial sustainability
- A need for partnership case studies between the state, private sector, and housing associations
- No funding or capital support at a Commonwealth or state level, such as low-interest bonds and provision of public land
• Prohibitive stamp duty and rates.

Examples of Cohousing Projects

A selection of 12 Victorian cohousing projects is listed below. More detail on each project is available at the links provided.

• Cape Paterson Eco-Village >
• Cohousing Banyule >
• The Commons Brunswick >
• Co-West Cohousing >
• The Digs >
• Murundaka Cohousing Community >
• Nightingale Ballarat >
• Nightingale Brunswick >
• Nightingale Fairfield >
• Older Women in Cohousing (WiNC) >
• Urban Coup >
• WestWyck >
APPENDIX D:
Cohousing as a Model for Social Health: A Scoping Review

CITIES & HEALTH
https://doi.org/10.1080/23748834.2020.1836275

ORIGINAL SCHOLARSHIP:

Cohousing as a model for social health: a scoping review
Elyse Warner, Emma Sutton and Fiona Andrews
School of Health and Social Development, Faculty of Health, Deakin University, Burwood, Australia

ABSTRACT
Social connections, and the social capital they foster, are important contributors to health, and often occur in the context of housing. Cohousing is one form of housing design often touted as fostering social capital. This scoping review aimed to draw on the social capital theory to examine how cohousing promotes the social health of residents and integrates with existing neighbours. Potential studies were identified from 28 academic databases across public health, architecture and humanities. The literature search was limited to peer-reviewed articles published in the last 10 years in developed countries. Of 59 potential studies reviewed against inclusion/exclusion criteria, 37 contributed to the findings. Thematic analysis identified the social structures inherent in, as well as the physical design, of cohousing models and their relationships with social health. There was evidence of the development of bonding and (to a lesser extent) bridging and linking social capital. However, the studies reviewed had a number of limitations: few included control, non-cohousing samples and tended to rely on case studies and cross-sectional study designs with small sample sizes. A key finding and recommendation from this review is therefore the need for more robust primary research of cohousing models to determine benefits for social health.

Introduction
Social connections are important contributors to positive physical and mental health (Holt-Lunstad et al. 2010, 2015). Having social health, defined in this context as the ability to develop and benefit from meaningful connections with others, as part of a social network can encourage conformity to social norms around health-promoting behaviours and offer resources that act to buffer the impact of stressors on health (Holt-Lunstad et al. 2010). Conversely, it has been argued that social isolation not only predicts poor mental health but is also a stronger risk factor for premature death than obesity or smoking (Holt-Lunstad et al. 2015). There is evidence that social isolation is increasing in cities in several Western countries. In the UK, a Minister for Loneliness has recently been appointed, while in Australia, several key health organisations have identified combating loneliness as a priority public health challenge (Tatz 2019, VicHealth 2019).

Housing is an important setting for addressing loneliness and social isolation. Franklin and Tranter (2011, p. 1) argue that ‘loneliness is endured, mostly in isolation, inside the four walls of a home’. More specifically loneliness is spatially concentrated, being located in some housing types and tenures more than others (Franklin and Tranter 2011). Conversely, healthy and affordable housing can improve social connectedness by addressing inequalities and encouraging people to establish ‘roots’ in a particular place (Hulse et al. 2011).

There are a burgeoning number of housing schemes in Western cities but, one particular model gaining popularity as a means of addressing social isolation within an urban housing context, and the subject of this review is cohousing.

Cohousing communities are purposefully designed to improve connections between neighbours; shared communal areas co-exist alongside private dwellings and residents collaborate in the establishment and ongoing management of the community (Glass 2009, Sargisson 2012, Sanguinetti 2012, Chiodelli and Baglione 2014, Droste 2015). Cohousing emerged in the 1960s and 1970s across Denmark, Sweden and the Netherlands in response to ‘disintegrating’ community values and social isolation (Sargisson 2012). This approach to housing later emerged in the northern United States in the 1970s, 1980s and 1990s, often described as the ‘second wave’. This version is somewhat distinct from European cohousing, in that communities are predominantly owner-occupied (rather than being all-rented or a combination of rented and privately owned) and never financed through the state as part of social housing (Sargisson 2012). Nevertheless, practitioners continue to see cohousing as a way to escape the alienated, isolated, and disconnected social life in modern society, whereby neighbours are ‘strangers’ treated with suspicion and
mistrust, civic responsibility is limited, and there is little belonging or 'community' (Sargisson 2012).

Residents move to cohousing communities for a number of reasons, including prior experience of community living; dissatisfaction with nuclear family living models; the desire for friendly supportive relationships with neighbours; values related to child-rearing and/or multigenerational living; and a preference towards ecologically sustainable living (Markle et al. 2015). Cohousing, according to Garcia (2011), offers many benefits for residents. They live in a local supportive community, with neighbourly connections encouraging the sharing of resources and time-consuming responsibilities and providing a greater sense of physical security. For the young, social networks for tutoring, education, and job training thrive, while a diverse group of adults provide positive role models (Garcia 2011). Being able to call on nearby neighbours for help and less reliant on driving makes cohousing an optimal choice for the elderly, while the pedestrian-friendly setup allows greater mobility and access to an environment full of natural activities and engaging opportunities for persons with disabilities (Garcia 2011). From a public health perspective, studies purport that cohousing has mental and physical health benefits, including avoiding or delaying the need for medical care through neighbour support, increasing mental stimulation through community involvement, and increasing feelings of efficacy and self-esteem that come with helping other community members (Lubik and Kosatsky 2019).

Given these advantages, cohousing is consistently linked to social capital. Social capital, according to the seminal works of Bourdieu (1986) and Coleman (1988), refers to the resources (either potential or realised) for individuals within their social networks as determined by social norms and obligations. Putnam (1995), in contrast, views social capital as a resource of groups or societies that benefits individuals. The main components, however, can be summarised as reciprocity, trust, social norms, shared ownership over resources, social agency and participation in social networks (Onyx and Bullen 2000). There are three types of social capital: bonding, or the internal relationships within a group of similar members; bridging, which refers to external ties; and linking, the extent to which individuals can develop relationships with institutions and individuals who have relative power over them (Szreter and Woolcock 2004). These components develop through the process of social connectedness, which encapsulates the various types of connections, interactions and processes between individuals that sustain social participation, as well as perceptions of available support (Denny et al. 2014, Kelly 2012). Social connections, and in turn social capital, provide a range of benefits, including access to information, social control, solidarity and mutual support, and engagement and civic sense (Bourdieu 1986, Coleman 1988, Putnam 1995). In doing so, both are closely linked to social health; connections and capital foster social health, while possession of social health, in turn, enables individuals and communities to develop greater connections and the reciprocity, trust, shared ownership, social agency and participation associated with social capital (Onyx and Bullen 2000) (refer Figure 1). These same advantages are often cited in relation to cohousing (Sargisson 2012, Fromm 2012, Ruis 2016b).

To our knowledge, no research to date has explicitly analysed the links between cohousing and social health. Therefore, the aim of this scoping review was to explore these potential links by drawing on the social capital framework to examine how cohousing promotes social capital and thus the social health and wellbeing of residents and integrates with existing neighbours. In order to achieve this aim, we focused on peer-reviewed papers reporting on cohousing, including both primary research and reviews. Given literature on cohousing is inter-disciplinary, and the aim was to explore the current evidence in order to inform the impending development of a cohousing community in Australia, the scoping review was an appropriate approach. Scoping reviews are one form of rapid evidence assessment that aim to answer a research question by focusing on the identification of key concepts, evidence, and gaps in research through the systematic search, selection and synthesis of existing evidence (Colquhoun et al. 2014). It is at times necessary to adopt rapid evidence assessments, particularly when there is a need to achieve scientific rigour in a timely manner (Tricco et al. 2015). Unlike systematic reviews, which often demand 6 to 24 months to examine the efficacy of clinical interventions using specific quantitative methods and undertake critical quality assessment of the evidence (Khangura et al. 2012), rapid evidence assessments require less time (3–6 months) and use more streamlined processes, such as searching fewer academic databases, using one rather than two researchers to collect data (Tricco et al. 2016), and/or excluding study quality assessment (Arksey and O’Malley 2005, Peters et al. 2015).

Methods

The review presented here followed the steps for scoping reviews, beginning with the development of the research questions, followed by the identification of potential studies, the review of papers against the inclusion/exclusion criteria, data charting, and the generation of findings/recommendations (e.g. Tricco et al. 2016). The review was guided by two research questions: What cohousing designs promote the social health and wellbeing of residents? What designs promote social integration with existing neighbours? Two authors developed the search
terms and the research inclusion/exclusion criteria. The search included English-language studies published between January 2009 and September 2019. Restricting articles to this date range ensured research was up-to-date and relevant to recent housing trends. The review was also limited to research carried out in developed countries to ensure evidence would be best-placed to inform the development of a cohousing community in the Australian context.

Given the research questions covered a range of topics, databases related to a variety of fields, including health, architecture, ageing and social sciences, were used to conduct the search. EBSCOhost databases included Academic Search Complete; AgeLine; Art & Architecture Source; Avery Index to Architectural Periodicals; CINAHL Complete; Environment Complete; Global Health; GreenFILE; Health Business Elite; Health Policy Reference Center; Health Source – Consumer Edition; Health Source: Nursing/Academic Edition; Humanities Source; MEDLINE Complete; PsycINFO; Social Work Abstracts; SocINDEX with Full Text; and Urban Studies Abstracts. Additional Informit databases searched included ARCH – Australian Architecture Database; APAFT – Australian Public Affairs Full Text; APAIS-Health – Australian Public Affairs Information Service – Health; ATSIhealth Aboriginal and Torres Strait Islander Health Bibliography; FAMILY- Australian Family & Society Abstracts Database; Health & Society – Health & Society Database; Health Collection; Humanities & Social Sciences Collection; POLICY – Analysis and Policy Observatory; and RURAL – Rural and Remote Health Database.

Table 1 provides a summary of terms combined during the search process. Housing design terms were based on the researchers’ previous knowledge of the field; these were initially broad in nature to capture the various labels used to describe cohousing. Social health terms were based on definitions of social

<table>
<thead>
<tr>
<th>Housing design</th>
<th>Social health</th>
</tr>
</thead>
<tbody>
<tr>
<td>cohousing</td>
<td>social health</td>
</tr>
<tr>
<td>co-housing</td>
<td>community connect*</td>
</tr>
<tr>
<td>tiny home*</td>
<td>well-being</td>
</tr>
<tr>
<td>intentional community*</td>
<td>connection</td>
</tr>
<tr>
<td>micro village*</td>
<td>sense of community</td>
</tr>
<tr>
<td>cooperative house*</td>
<td>belonging</td>
</tr>
<tr>
<td>co-operative house*</td>
<td>social cohesion</td>
</tr>
<tr>
<td>community led house*</td>
<td>social support</td>
</tr>
<tr>
<td>community house*</td>
<td>psychosocial</td>
</tr>
<tr>
<td></td>
<td>social*</td>
</tr>
<tr>
<td></td>
<td>social isotat*</td>
</tr>
<tr>
<td></td>
<td>quality of life</td>
</tr>
<tr>
<td></td>
<td>inclusion</td>
</tr>
<tr>
<td></td>
<td>age in place</td>
</tr>
<tr>
<td></td>
<td>ageing in place</td>
</tr>
<tr>
<td></td>
<td>social interaction</td>
</tr>
<tr>
<td></td>
<td>socialisation</td>
</tr>
<tr>
<td></td>
<td>neighbour*</td>
</tr>
<tr>
<td></td>
<td>integral*</td>
</tr>
</tbody>
</table>
capital (Bourdieu 1986, Coleman 1988; Putnam 1995, Onyx and Bullen 2000). The EBSCOHost search involved undertaking two separate searches, one with each cluster of terms (e.g. Search 1 was housing designs, Search 2 was social health), and then combining the two using AND. The Informit search combined all variations of the housing design terms and social health terms inside separate parentheses (e.g. ((cohousing OR co-housing) OR ('tiny house') OR ('tiny home')) OR ('intentional community') OR ('intentional communities'))) and then combined the terms using AND.

Papers were excluded from this review if they focused on intentional communities that examined service provision (e.g. support for mental health issues, disabilities or substance use) for vulnerable groups within cohousing, as these models were recognised to have different contributors to, and outcomes for, social health. Research carried out in developing countries, which tended to focus on housing models in severely disadvantaged areas (e.g. slums), was also excluded to ensure outcomes would be more applicable in Australian socio-economic and housing contexts. Based on a review of the abstracts and countries of origin, included studies tended to originate in the United States and Europe.

After removing duplicates and refining the search, 2811 potential studies were identified using this search protocol (refer Figure 2). Two researchers first selected 20 titles at random and reviewed the abstracts against the eligibility criteria, reaching agreement on which titles to include and exclude. One researcher (A1) then reviewed titles of remaining articles; 237 were retained. Further revision was undertaken to filter out papers not specific to cohousing; this resulted in 59 papers. In line with recommendations (Arksey and O’Malley 2005), variables used for charting when reviewing full-text papers included authors/date/journal; location and type; theoretical framework; sample/methods; main findings, and gaps/recommendations.

![Figure 2. Search results.](image-url)
This chart has been condensed as a table in the supplementary materials.

Thematic analysis, based on the steps of Braun and Clarke (2006), was used to analyse the findings of the 28 primary research studies and nine reviews included. Findings from the articles were read by all three authors in order to be immersed in the data and enable the identification of potential patterns. Preliminary codes relevant to the research questions were devised, with findings from the articles assigned to codes as examples. Articles tended to explore more than one concept related to social capital and social health (refer Table 2). Codes were then drawn together repeatedly until key themes emerged from the data; these were subsequently reviewed and refined in order to arrive at the two main ideas — social structures inherent in co-housing models and the physical design of these communities — presented in the next section.

Results

Included studies

Of the 59 studies identified from the abstract review for full-text review, 23 were excluded based on the lack of explicit information regarding social health. The included studies (N = 37) were 28 primary research studies and nine review papers. Of the primary research studies, nine were based on case studies; seven were qualitative studies; six used mixed methods; three used cross-sectional surveys; and one was a case-control study. Reviews were mostly narrative reviews.

Elements of social health, and their relationship to bonding, bridging and linking social capital, is inherent in the literature concerning cohousing (refer Table 2). The reviewed studies, whether they were drawing on their own small-scale study of a cohousing community or reviewing the broader literature, emphasised two main avenues through which cohousing promotes the social connectedness, social capital, and thus social health, of residents: the social structure and the physical design.

Social structure

Establishing the cohousing community: shared goals and collaboration

The establishment of a cohousing community is a social process (Glass 2009), with many references in the literature to the role of participation and collaboration in determining not only the success of projects but also the formation of social capital (Fromm 2012, Sanguinetti 2014, Ruiu 2015, 2016b, Jolanki and Vilkkko 2015). Specifically, the process of establishing a cohousing community has the potential to foster bonding social capital among residents as well as bridging and linking capital with external ties. Cohousing communities typically begin with potential residents leading the formation of a group with similar interests and a shared goal (Sanguinetti 2014). Having a purpose is said to provide a common focus and encourage communal actions and shared emotional investment, thereby increasing trust and the sense of community from the initial phase of the housing project (Glass 2012). Group members then discuss the development and running of the community, learning facilitation and group management skills in the process. This begins to build 'team' cohesion by forming alliances among future residents, and between residents and local organisations and the municipality (Fromm 2012).

Twelve papers suggest participation in the design process empowers the creation of new social connections and a sense of shared ownership of resources (Devlin et al. 2015), and thus the opportunity for bonding social capital (Glass 2009, 2012, 2013, Fromm 2012, Korpela 2012, Sanguinetti 2014, Pedersen 2015, Ruiu 2015, 2016b, Jolanki and Vilkkko 2015, Lies et al. 2017). For example, those associated with the elder cohousing community in the United States studied by Glass (2009) began to involve potential residents in the design process through courses, retreats, informal meals and get-togethers, and formal planning sessions. Potential residents also had many individual choices in the construction details of their units (Glass 2009). These efforts supposedly created opportunities to begin to build a sense of community during the lengthy construction period. However, as is common with many studies of cohousing, the lack of control group or research into residents' experiences of 'sense of community' prior to the cohousing project means it is difficult to clearly measure whether these strategies affect social connections. Instead, evidence depends on residents' perceptions. For example, Ruiu (2016b), drawing on qualitative interviews, found that residents of Italian cohousing communities strongly believed their participation in the design process promoted more intimate relationships and increased their social capital in comparison with their previous situations. However, research also suggests that the organizational phase can be intense, and requires strong skills in conflict resolution to avoid disagreements that can negatively impact on social cohesion moving forward (Sargisson 2010, Jarvis 2015).

Residing in the cohousing community: community connections and support

Once established, connection to the community is fostered as residents share meals and activities (Choi and Paulsson 2011), and collectively own, manage and enjoy communal facilities and spaces (Sanguinetti 2014). Nine papers suggest the collaborative nature of cohousing communities creates an environment
Table 2. Reviewed literature in terms of mechanisms promoting social capital and social health.

<table>
<thead>
<tr>
<th>Study design</th>
<th>Physical design</th>
<th>Bonding social capital</th>
<th>Bridging social capital</th>
<th>Linking social capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeney (2012): United States, Germany</td>
<td>Design of community</td>
<td>Social contact</td>
<td>Collaboration, shared goals</td>
<td>Integration with neighbourhood</td>
</tr>
<tr>
<td>Glass (2013): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korpela (2012): Finland</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jarvis and Bennett (2011): Scandinavia</td>
<td>Design of community</td>
<td>Collaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom and United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itala (2015): United Kingdom</td>
<td>Design of community</td>
<td>Mutual support, social connectedness</td>
<td>Collaboration, shared goals, social connectedness</td>
<td>Integration with neighbourhood</td>
</tr>
<tr>
<td>Italy (2014): United Kingdom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass (2009): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Devlin et al. (2015): United Kingdom</td>
<td>Balance of public and private space</td>
<td>Collaboration, shared goals, social connectedness</td>
<td></td>
<td>Integration with wider neighbourhood</td>
</tr>
<tr>
<td>Wechuli (2017): Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualitative studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jarvis (2011): United Kingdom and United States</td>
<td>Design of community</td>
<td>Collaboration, social connectedness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kh advantages et al. (2012): United States</td>
<td>Design of community</td>
<td>Social connectedness</td>
<td>Collaboration, mutual support, social connectedness</td>
<td>Integration with wider neighbourhood</td>
</tr>
<tr>
<td>Jarvis (2011): Australia, United Kingdom and United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itala (2015): Italy and United Kingdom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ives et al. (2013): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puplampu (2019): Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedy et al. (2019): Australia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeks et al. (2019): Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed methods studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garcaiano (2011): United States</td>
<td>Design of community</td>
<td>Mutual support, social connectedness</td>
<td>Collaboration, mutual support, social connectedness</td>
<td>Integration with wider neighbourhood</td>
</tr>
<tr>
<td>Glass (2011): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass (2015): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jolanki and Vikiio (2015): Finland</td>
<td>Design of community</td>
<td>Mutual support, social connectedness</td>
<td>Collaboration, mutual support, social connectedness</td>
<td>Integration with wider neighbourhood</td>
</tr>
<tr>
<td>Markle et al. (2015): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedersen (2015): Denmark</td>
<td>Design of community</td>
<td>Mutual support, social connectedness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-sectional surveys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chei and Paulson (2011): Sweden</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soos and Tung (2014): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass (2016): United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case-control study</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kohl and Then (2013): Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anvers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chioldi and Bagliero (2016)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droste (2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Libertini (2016)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubin et al. (2019)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itala (2014)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sargison (2016)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sargison (2012)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turner et al. (2018)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vestbro and Horrelli (2012)</td>
<td>Design of community</td>
<td>Social connectedness</td>
<td></td>
<td>Integration with wider neighbourhood</td>
</tr>
</tbody>
</table>
| where residents support and offer practical help to one another (Glass 2009, 2013, 2016, garciano 2011, jarvis 2011, 2015, Jolanki and Vikko 2015, Markle et al. 2015, Wechuli 2017), which can prevent social isolation, foster bonding social capital and contribute to improved mental health (especially among older people) (Puplampu 2019). Indeed, one of the few studies to compare residents of cohousing with demographically similar residents found that those from cohousing communities give and receive significantly more socially supportive behaviours. However, interestingly, cohousing residents do not report they are exceptionally abundant in support on measures of perceived social support. This is because, according to Markle et al. (2015), they do not consider the giving and receiving of support extraordinary. Knowing
there are others around to assist in times of need also creates a sense of safety and security, and trust seems to develop, especially within elder cohousing projects (Glass 2013, Iolanski and Vilkkö 2015). These benefits in terms of bonding social capital, however, are somewhat expected, given these communities were designed to foster social connections. It is also common for participants to know each other prior to starting the establishment process, and residents often specifically choose to live in projects because they seek a greater sense of community.

Expectations of intentionality can, however, differ from the way shared values are actually acted on in practice (Jarvis 2015). For example, Fromm (2012) suggests that families may not have the hours free to commit to the added work expected of community members. Furthermore, where residents are elderly or of lower income, their priorities may focus on stability rather than the maintenance of the wider community. These differences can lead to conflict and situations where the group experiences a form of arrested development (Jarvis 2011), with examples of residents socially withdrawing and others leaving the community permanently. In this way, communities are continually evolving over time. Glass (2013), one of the few authors to explore residents' perceptions longitudinally, found that each time a resident left or joined the senior cohousing community, the system would adjust and become slightly different, reinforcing its dynamic nature.

It is therefore interesting, given so much emphasis on the importance of engagement for the social connectedness of cohousing residents, only three papers attempt to consider outcomes for residents who move into an established community, and are therefore not involved in decision-making processes from the outset. Findings are mixed, with two papers suggesting differences in feelings of belonging between founding members versus newcomers (Jarvis 2015, Ruiu 2016a). For example, Ruiu (2016a) found the addition of residents in a cohousing development in the United Kingdom specifically affected community life by creating two separate groups. The new residents, whose detached dwellings were added to one side of the site after the original development was completed, did not participate as readily in community life, used the common house less frequently and parked their cars near their homes rather than in the main parking area; this reduced their possibility to casually meet other residents. Consequently, the aim to establish a community characterized by sharing practices was only partially achieved within each single group rather than as a whole. While the lack of integration could be attributed to the altered physical layout of the community, it does suggest that problems can arise when not all residents participate in the phases of development (from the forming to the performing phase). In contrast, one study found positive integration overall between existing (or ‘old’) and new residents (Pedersen 2015). Apart from minor tensions, and one example of a major conflict over the rebuilding of part of the facility, new residents integrated well or very well. New and ‘old’ residents also showed little difference in their perceptions of the democracy, or the value they placed on their cohousing community (Pedersen 2015). While Pedersen (2015) therefore infers that he has answered the question of how new residents integrate into an existing resident group, it remains unclear why little differences in the views of the two groups exist. Findings were also based on surveys and interviews with senior cohousing communities, and therefore cannot be generalised beyond this context.

Integration with existing neighbours

With regard to social connections beyond the cohousing community, there is an underlying expectation that communities will interact positively with the broader neighbourhood (Tummers 2016). Primary research in England and Italy shows how cohousing residents' bonding social capital, which is established through participation in the development of the community, also represents the foundation for building external and institutional social ties (Ruiu 2016b). Cohousing is thus posited to promote bridging and linking social capital through integration with the neighbourhood and wider setting (Ruiu 2016b). This can occur from the outset, whereby the planning stage takes neighbourhood dynamics into consideration and consults with external groups (Droste 2015, Ruiu 2016b). Translating the cohousing process for the public can help to avoid political refusal, stigmatization, and/or stereotyping of present and future cohousing initiatives (Jarvis 2011).

Furthermore, once established, cohousing communities are said to foster bridging and linking social capital by inviting neighbours to organised activities (sport, entertainment, cultural, leisure, social events) (Ruiu 2015, 2016b) and opening up communal facilities, such as green spaces and common rooms, for others to use as parks, garden allotments and meeting rooms (Droste 2015, Ruiu 2015). These actions will ultimately contribute to the acceptance of cohousing and the recognition of communities for their hybridity, diversity and openness, and involvement in enhancing the wider neighbourhood 'social life' (Droste 2015, Ruiu 2016b).

Nevertheless, the conditions for cohousing to maintain such openness to the broader neighbourhood are relatively understudied (Tummers 2016).
Furthermore, there remains a concern that cohousing projects could potentially become disconnected from the broader neighbourhood (Ruiu 2015). Indeed, a survey of 741 Germans found those who lived in cohousing were significantly less active in the outside community than their control group counterparts, and residents' benefits occurred at the expense of returns for civil society (Kehl and Then 2013). The lack of integration with surrounding neighbours is one of two problems with cohousing identified in a review by Chioldelli and Baglione (2014), who argue that, because cohousing communities are often introverted from a physical perspective and self-sufficient in terms of function and relationships, they have the potential to segregate themselves (Chioldelli and Baglione 2014). This can cause barriers (Weeks et al. 2019), including scepticism from potential residents (Riedy et al. 2019); initial suspicion from neighbouring residents; and opposition from policy-makers and local authorities (Ruiu 2014, 2016b, Droste 2015, Pedersen 2015). For example, a study of 41 older Australians deemed potential future residents revealed cohousing was poorly understood, and there were concerns about how the sharing of space would work in practice (Riedy et al. 2019). Neighbours can also be hostile at the beginning, with English experiences suggesting they see cohousing communities as hippie groups or communes (Ruiu 2014).

Communities can also be perceived as elitist (Lietart 2010) or gentrifiers (Droste 2015), given the lack of diversity in terms of economics, social and cultural backgrounds (Chioldelli and Baglione 2014, Ruiu 2015, Pedersen 2015). The higher financial costs of sites and construction are typically borne solely by residents, thus excluding those who are more vulnerable (Ruiu 2015). The self-selection of residents who fit with the lifestyle and values of the community, albeit more of an abstract concept rather than a true recruitment system, is also associated with a lack of social heterogeneity and intensified segregation (Droste 2015, Ruiu 2015). Furthermore, because cohousing is typically privately owned, residents are permitted to govern using their own internal system of rules and can therefore decide who, from outside, can be allowed to enter into the community, including using communal spaces (Chioldelli and Baglione 2014). Municipalities thus vary in their responses, with Pedersen's work (2015) in Denmark finding some supported the development of senior cohousing facilities as subsidised dwellings, while others refused to be involved on the basis that establishing social housing for seniors in good health from privately owned homes was not a public endeavour. This is in contrast to Riedy et al. (2019), who found stakeholders were mostly positive about cohousing as a solution to elders' housing issues. While some literature suggests projects need to engage with key stakeholders to facilitate the development process (Fromm 2012), how projects do this differs across the literature, reflecting the variety of communities in terms of size, location, establishment processes and socio-political contexts. In this way, it could be argued that there is less certainty around the capacity for cohousing to facilitate bridging and linking forms of social capital compared to bonding social capital.

Physical design

The review found that the physical design of communities is integral to its success (Sargisson 2010, 2012), with specific elements proposed by Williams (2005) now widely accepted to foster bonding social capital and thus the social health of residents (Vestbro and Horelli 2012, Sanguinetti 2012, 2014, Glass 2012, 2013, Pedersen 2015, Sullivan 2016, Ruiu 2016b). Four articles outline the 'cluster design', which aims to provide a central location for social interaction by building small private residences around a large, shared open space (Jarvis 2011, Sargisson 2012, Pedersen 2015, Sullivan 2016). Residents report this as the ideal site plan; they can witness what is happening from their homes, join with other residents who are socialising, and incidentally meet with neighbours as they undertake everyday tasks and pass through the common areas to get to their front doors (Pedersen 2015). In contrast, earlier research suggests that residents who live in second storey dwellings facing away from common green spaces report a sense of disconnect and loss of opportunities for socialising (Glass 2013).

Several studies suggest the use of pedestrianised areas (Sargisson 2012, Devlin et al. 2015) and locating car parking at the periphery of the community (Garciano 2011, Ruiu 2016b) encourages residents to meet each other as they walk past neighbours' houses to reach their vehicles (Sargisson 2012). However, whilst designs that enable all residents to enter and exit the community through the same common routes are in theory beneficial for social interaction and thus bonding social capital, there appear to be some exceptions (Glass 2012, 2013). For instance, the distances from units to the car parks can be challenging for the elderly, with ageing residents suggesting that the risk of falls during adverse weather actually confined them to their units and contributed to social isolation. This then becomes counterintuitive, especially when cohousing is proposed to be an attractive option for seniors to age in their own homes amongst a socially connected community (Glass 2009, 2012, 2013, 2016, Fromm 2012, Kang et al. 2012, Glass and Vander Plaats 2013, Devlin et al. 2015, Jolanki and Vilikko 2015, Pedersen 2015, Lies et al. 2017).

In terms of the buildings, cohousing developments aim for physical designs that encourage social connections and interaction, but still ensure individual space for
privacy and solitude (Garcia 2011, Jarvis 2011). Much of the literature, therefore, focuses on the development of bonding social capital, despite suggestions that common areas might be made available for others beyond the cohousing residents (Droste 2015, Ruiu 2015) in order to foster bridging and linking social capital. For example, the common house is widely recognised as a fundamental feature of cohousing design, providing a designated area for communal activities and socialising among residents, including eating meals together (Jarvis 2011, Pedersen 2015, Sullivan 2016). Most common houses include a kitchen, combined living and dining area, and a guest room, though some will also incorporate a shared laundry, mail room, games area, office, workshop, or storage room (Glass 2009, Pedersen 2015, Sullivan 2016, Lies et al. 2017). Common houses should not be excessively large, with Pedersen’s (2015) review of 26 cohousing communities suggesting that 150 square metres offers an ideal balance between public and private space.

Access to these common facilities means private dwellings are typically smaller, albeit with most of the features of conventional homes (Garcia 2011, Sargisson 2012). Units can be designed for specific needs, including ageing in place (Glass 2012, 2013, Glass and Vander Plaats 2013), with the possibility of installing handrails and stair lifts (or ensuring no steps at all) a bedroom and bathroom on the first floor; and doorways and bathrooms that allow wheelchair access (Glass 2012). Individual dwellings are typically private, though having one’s own front porch supposedly encourages spontaneous interaction and may therefore foster bonding social capital. Ten residents from a senior cohousing community in the United States took photographs of their front porches and suggested it allowed them to sit outside and interact with neighbours who ‘perch’ on their railings as they pass by (Lies et al. 2017). However, four studies have found residents still desire private outdoor areas, with grass, where possible (Glass 2012, 2013, Devlin et al. 2015, Sullivan 2016). Glass (2012, 2013) analysed data from a mixed-methods case study with three elder cohousing communities in the United States. Although no data was collected from those who participated in the planning and development but chose not to move into the community, or residents who moved away, residents in both studies expressed disappointment about not having a private yard (Glass 2012, 2013). One community addressed residents’ desire for private yards by reserving some external spaces for the use of individual units only.

This review suggests that the number of units and residents in a cohousing community also appears to be important when aiming to foster frequent communication and social connection. Two studies, for example, suggest that cohousing models with between 20 and 30 units can enhance social cohesion of the group while still respecting privacy (Glass 2012, Pedersen 2015). This is in line with much of the research on physical design of cohousing communities, which focuses on features that promote social interactions among residents, and thus bonding social capital, rather than between residents and the wider neighbourhood in terms of bridging and linking capital.

Discussion

The aim of this scoping review was to draw on social capital theory to examine how cohousing promotes the social health and wellbeing of residents and integration with existing neighbours. Overall, the literature repeatedly claims that cohousing promotes social connections and social capital, established through social structures and the physical design (Fromm 2012, Ruiu 2016b). Cohousing communities guarantee bonding social capital through connections, internal cohesion, trust among members, shared goals and internal rules, which (as depicted in Figure 1) in turn has the potential to foster the social health of residents. Communities can also develop bridging and linking social capital by being open to the outside, establishing friendly relationships with the broader neighbourhood and creating partnerships with external actors (Ruiu 2016b).

These claims regarding the impacts of cohousing on social capital and social health outcomes should, however, be met with caution, particularly in light of the somewhat limited quality of evidence. For example, literature reviews do not describe their methodologies in sufficient detail and are often ‘hybrid’ publications, merging evidence from literature searches (albeit with limited detail on methodology) with observations from their own work in cohousing communities (Sargisson 2012, Vestbro and Morelli 2012, Ruiu 2016b). Surveys are often cross-sectional, meaning they cannot definitively prove that participation in cohousing increases levels of connectedness (or vice versa) (Sanguinetti 2014). Ten authors presented case studies (Glass 2009, 2012, 2013, Fromm 2012, Korpela 2012, Jarvis and Bonnett 2013, Devlin et al. 2015, Ruiu 2015, 2016a, Wechuli 2017); results obtained using this methodology are not always generalisable to other contexts, but this was further challenged by a general lack of detail on the samples and whether these captured all residents’ perspectives. Nine studies were qualitative in nature and utilised small samples, meaning results cannot necessarily be generalised to other cohousing communities beyond their immediate contexts. Furthermore, the samples in the studies were mostly homogenous. Although the reliance on highly educated, higher-income, mostly Caucasian women reflects the general demographics of cohousing as a whole, several studies
discussed this as a weakness (Glass and Vander Plaats 2013, Glass 2016, Sullivan 2016). In addition, only 11 of the studies appeared to include mixed-age cohousing communities.

Studies typically interview existing residents within their cohousing communities, without consideration of their previous experiences. None appear to take measurements of social connections, or social capital, before moving into the community, meaning it is difficult to prove if, and by how much, social capital changes (Ruiu 2016b). Glass and Vander Plaats (2013) themselves acknowledge that the benefits they delineate came from previous literature and anecdotal evidence, and therefore that more formal measures of social connections (and isolation) are needed in future surveys. Furthermore, few studies collected data over multiple time points, meaning it remains relatively unclear how social capital changes over time. The use of longitudinal data (Markle et al. 2015, Wechuli 2017, Weeks et al. 2019) is therefore recommended.

Only two studies (Kehl and Then 2013, Markle et al. 2015) included a non-cohousing comparison group. While there was the possibility that they may be predisposed to dissatisfaction with their current living situation, and as such did not represent the average non-cohousing population (Markle et al. 2015), including a comparative group still allowed for impacts of cohousing to be measured. Future studies should endeavour to include a comparative group when exploring the experiences of cohousing residents to see if social capital increases (and more quickly) in these communities.

The majority of studies rely on self-report data to measure behaviours and practices among cohousing residents. Therefore, studies may be affected by social desirability bias or inaccurate recall by participants (Althubaiti 2016). For example, residents will obviously be aware of the researchers’ interests in cohousing and therefore potentially overstate its benefits, including the formation of positive social connections. In addition, cohousing residents have made the intentional choice to live in a community that places emphasis on social interaction, with several studies suggesting this is a primary reason for moving there (Glass 2009, Kang et al. 2012, Markle et al. 2015). In this way, most residents self-select to be involved in cohousing, whether through the establishment of the project or by moving into an existing community, based on their fit with its aim and the values of the group (Puplampu 2019). Given the intention of most cohousing projects is to create a ‘friendly neighbourhood’ and ‘community life’ (Sargisson 2010), these residents are already potentially drawn to collaboration, and may therefore be more favourable towards contributing to the community and becoming involved in the larger neighbourhood compared to the general population (Fromm 2012). Therefore, further research is needed which compares the experiences of cohousing residents with the general population to determine the true effects on social connections and social capital.

**Study strengths and limitations**

The main strength of this scoping review was its attempt to integrate literature concerning social health and housing. Research constantly promotes cohousing as a specific model designed to facilitate greater social connections. Our integration of findings with social capital theory suggests there are apparent links, but that more research measuring the development of social capital over time is required.

Scoping reviews, however, are not without limitations. The aim to summarise evidence within a specific timeframe meant we decided to focus only on peer-reviewed papers. This is possibly problematic given the nature of cohousing communities, which are often reported on by cohousing associations and profiled as ‘case studies’ in other forms of grey literature. While this may have excluded potentially valuable lessons, we believe the terms used to search 28 academic databases offered comprehensive results. We also consider this to reinforce our recommendation that more rigorous studies into the successes (and potential failures) of cohousing communities in facilitating social health need to be undertaken and subsequently published in the peer-reviewed literature.

Another limitation of this review was the decision to focus on papers from locations with similar contexts to Australia. While results still included evidence from a range of countries where cohousing is more common, including Denmark, Germany, the United Kingdom and the United States, there is the potential that relevant evidence from dissimilar countries was excluded. Including evidence from other contexts, including developing countries, may have offered alternative useful insights.

A further limitation of this review was the decision to exclude published studies that focused on service provision. Although such models are typically designed to support vulnerable groups, and are therefore likely to have different contributors to, and outcomes for, social health, there is still the possibility that these studies included relevant information about design features.

**Conclusion**

While the potential for cohousing to contribute positively to social capital, and therefore the social health and wellbeing of residents, was evident across the literature discussed in this scoping review, the exact impact continues to remain unclear. This is because, at least in part, the existing evidence draws predominantly on short-term explorations of perspectives of small groups of cohousing residents. Further research...
should therefore move beyond self-report and involve longitudinal data collection and observations of interactions within cohousing communities across different stages of the process and with different residents (old versus new, renters versus owners), in order to capture changing social experiences. Evaluating cohousing outcomes more rigorously could establish stronger links between cohousing and social health, thereby encouraging public and private investors, policymakers and administrators, as well as potentially interested residents, to consider this model as a means of preventing social isolation.

Disclosure statement
The authors declare that they have no conflict of interest.

Funding
This work was supported by the Geelong Community Foundation, Geelong, Australia.

Notes on contributors
Elyse Warner, PhD, is a Lecturer in the School of Health and Social Development at Deakin University. Her research interests include the relationship between families and health, with a particular focus on the influence of housing and community. She has published on the wellbeing of young adults and parents who return to co-residence, as well as the health and wellbeing implications for families raising children in high-rise apartments and on the suburban fringe. She lectures in human development and family health and well-being.

Emma Sabin recently completed a Master of Health Promotion at Deakin University. She has a broad range of research interests, including the ways in which neighbourhood and housing design impact social health. She has worked in the disability sector for a number of years and is interested in promoting social health among people with disabilities, especially those with a limited informal support network. In addition, she is interested in improving food access and urban design in disadvantaged communities to increase health outcomes.

Fiona Andrews, PhD, is a Senior Lecturer at Deakin University, School of Health and Social Development, Co-Leader of the Deakin Research Hub HOME, and member of the Centre for Health through Action on Social Exclusion (CHASE). She has research interests and has published on the relationship between neighbourhoods, health and families, with a particular focus on parents of preschool-aged children. She lectures in healthy cities; family health and well-being; health, place and planning.

References


Hulse, K., et al., 2011. At home and in place? The role of housing in social inclusion, AHURI final report no. 177. Melbourne: Australian Housing and Urban Research Institute.


APPENDIX E: Leverage Points Analysis

Using a generalised example action to increase the supply of affordable housing, here we discuss how these 12 leverage points were used to evaluate the 12 priority actions formulated from the systems thinking (STICKE) workshops. Affordable housing supply is an issue identified in all stages of this research and underpins basic elements of all systems relating to access and inclusion. The ubiquity of affordable housing supply as an everyday stressor for marginalised communities, as a human rights issues, and as a fundamental factor underpinning the state of social and economic systems makes it a useful example to emphasise.

12. Constants, parameters and numbers determine how fast a change in one of the flows might be according to the level of discrepancy. For instance, a large discrepancy in the supply of appropriate housing might provoke the introduction of government subsidies for private builders. This is an intervention at the parameter level, which seems intuitively correct but rarely changes the behaviour of a system. The number of appropriate houses in the system might increase but, due to a range of other constants that remain the same, few meaningful effects would ever eventuate. Meadows (1999 p. 6) likened this level of intervention to ‘arranging the deck chairs on the Titanic’ – parameter changes must be at saturation levels (in the critical parameter range) and involve massive amounts of effort in order to reap any discernible benefit. Parameter-level changes can be powerful leverage points, but only if their impact is large enough to catalyse impacts upon other items further down the list.

11. The sizes of buffers and other stabilising stocks, relative to their flows describes the relationship between how big a stock is and the rate of flow that affects its increase or decrease. Big stocks stabilise systems and, if their flow rates are low relative to their size, this makes them harder to change. An example of this is when a large amount of housing stock already exists; this can lead to stability because there’s a lot of housing available, but the problem is that when such a large stock exists, it’s hard to change/update (e.g., to make it more accessible). These stocks are usually physical and the smaller the stock relative to flow, the more nimble but unstable the system becomes. Small stocks with high rates of flow can be powerful leverage points, but the cost and effort involved are usually immense.

10. The structure of material stocks and flows relates to how the system is plumbed and networked. This can relate to the geography of the system, for instance, where current affordable housing stock is in relation to the rest of the housing stock and how the position of this stock interacts with flows (e.g., provisioning services – builders, funders, administrators etc.). This can produce delays in the system, and they are usually low-value leverage points given that the layouts of large stocks and flows are sometimes ‘plain unchangeable’ (Meadows 1999, p. 8).

9. The lengths of delays, relative to the rate of system change is the impact that delays between adjustments to flows and stocks will have on how information feeds into the next actions. For instance, in implementing policies or programs that affect the rate of flow (in or out of particular stocks) in the supply of affordable housing, a delay in effect may lead to the premature cancellation of those policies or programs. It may take time for the system to provide feedback on how it has changed in relation to inflows and outflows, so we must therefore be cognisant of over- or under-shooting. Changing the lengths of delays in the feedback of information can be a very powerful leverage point but is often hard to change. Slowing the rate of growth in unaffordable housing is a higher leverage point than trying to
catch up with providing more stock of affordable housing. Changing delay lengths must be attuned to the impacts of making changes in a particular direction – growth changes exacerbate issues, while slowing rates of unwanted change is often more effective.

8. The strength of negative feedback loops, relative to the impacts they are trying to correct against denotes particular cause and effect relationships where changes are made to keep the system operating within safe, manageable or equitable parameters. There are numerous negative feedback loops in a system, and they can be thought of as thermostat systems that self-regulate constants. The goal might be to make sure land supply does not increase at a rate that outstrips the capacity to service it; this is the setting of the thermostat. This goal must be monitored by mechanisms that accurately report whether the state of the system is within range of the goal; this is the detector in the thermostat. Finally, there must be a response capacity of the system where changes are made to ensure that discrepancies in what is being detected/monitored are kept within range of the goal, such as ramping up the rollout of services to new residential areas or curtailing the release of new land. The strength of this negative feedback loop must match the impact that it is trying to affect. In other words, if the impact is higher rates of homelessness, the strength of corrective measures must be robust in order to maintain the goals of the system. Preventive and protective measures are examples of ways to strengthen a negative feedback loop.

7. The gain around driving positive feedback loops is self-reinforcing. As Meadows (1999, p. 11) stated, ‘The more it works, the more it gains power to work some more.’ This relates to the growth rate of assembled systems as a result of feedback loops that create scenarios which ultimately re-create themselves – if left unchecked, unmitigated growth will occur and the system will eventually collapse. This can be demonstrated in the current state of the ‘housing crisis’, where the system is promoting the growth of practices and flows which diminish the capacity to provide affordable housing – such as investors leveraging their investments so as to accumulate more investments. Weakening positive feedback loops of negative behaviour can create powerful leverage points in the system.

6. The structure of information flows can be thought of as who does and does not have access to information. In any system, there are actors that are positioned in ways which can affect the system in changing its behaviour. Actions that occur on this level create new conditions that bring new or existing actors into the flow of information. When new information is made more, or less, available and if this is distributed unevenly among actors, the system will produce a number of unequal actions: It is now a new loop, delivering information to a place where it wasn’t going before and therefore causing people to behave differently. People who have secure housing know how to obtain it. For people who have a manifest need for affordable housing, new information as to how to obtain it will impact upon how they behave. When system information is missing to those who need it most, the system invariably malfunctions – targeting the creation of new information loops is an effective leverage point. However, if information is not restored in the right place, there is little positive effect – missing feedback loops create unaccountability.

5. The rules of the system such as incentives, punishments, and constraints impact upon the system in very significant ways and are high leverage points that can yield enormous outcomes. Laws, policies and contracts are examples of mechanisms that maintain sets of rules about how the system operates and under what parameters. Which entities have power over the rules and how they use them are
fundamental to understanding how the behaviours of particular actors are determined by the parameters set out for them. In addressing the supply of affordable housing, one example of changing the rules would be to legislate mandatory inclusionary zoning practices for new residential developments. These new rules would not change the system but, rather, change how the system operates within its parameters. When coupled with the creation of new loops and the constraint of positive feedback loops, action at this level can be powerful.

4. **The power to add, change, evolve or self-organise system structure** is akin to providing the conditions for a revolution in/of the system. It is about giving power to change the system to the right people, that is, people with lived experience and community members, rather than the already-wealthy. Self-organisation involves: changing any aspect of the system that can be found lower on this list; adding new physical structures (leverage points 12–9) such as housing typologies; adding new negative or positive feedback loops; and making new rules. The system is at its most resilient when its ability to self-organise is at optimum – when the rules facilitate the system to operate at this level. The key to this leverage point is ensuring that there is enough variation in the stock – diversity of configurations – to allow the system to self-evolve into patterns that suit its goals.

3. **The goal(s) of the system** contorts or controls every leverage point lower down this list. The system itself is neither good nor bad; it is the goals of the system that determine what end the system is working towards and who it is serving. The amount of housing in the overall market is neither a good nor bad thing, but it matters whether that amount services the populations that need it. At present, the housing market does not entirely perform the role of appropriate and affordable shelter but is being leveraged as a site of economic growth. If the goal were to make housing stock affordable, the system would necessarily conform to that goal. This is a matter of political, moral and social will, more than anything else.

2. **The mindset or paradigm from which the system — its goals, structure, rules, delays, parameters — arises** is based upon the collective agreement or acceptance of value systems. In our example of affordable housing, this would hold that some houses are more valuable than others and that the distribution of that value system is agreed upon as fair. These are big unstated assumptions – that certain housing types in certain geographies make a house more or less affordable – and there are a range of social issues that govern these assumptions. We might call this an apparatus of thought that is shared in a given society; in this sense, they are paradigms. Meadows (1999, p. 18) stated that ‘You could say that paradigms are harder to change than anything else about a system, and therefore this item should be lowest on the list, not second-to-highest. But there’s nothing necessarily physical or expensive or even slow in the process of paradigm change.’ In order to target change in the mindset or paradigm of the system: anomalies and failures in the old system must be acknowledged continuously and loudly; advocates of the new paradigm should be given visibility and power; and these advocates must work with active change agents and open-minded people.

1. **The power to transcend paradigms** is the flexibility to move between old and new paradigms, to accept changes, to remain unattached to one over the other (even if it conforms more to our own worldview) and to acknowledge that no single paradigm functions as an optimal system in the service of all. It is, in a sense, a paradigm of ever-changing paradigms.
APPENDIX F: Excel Workbook Calculator – Cost Comparison Scenarios for Financing Models

(Download Excel workbook)
Visit: Deakin HOME Research Hub >