

Consolidating the Australian Dream: Reconfiguring the Multi-Unit Housing Network

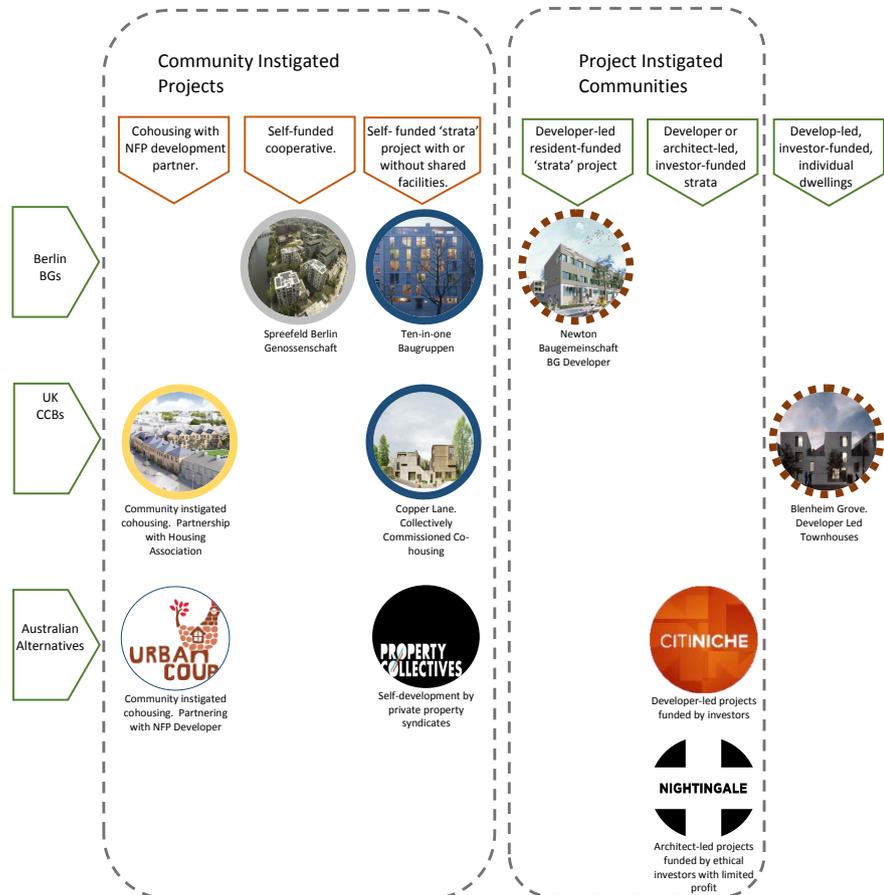
SUMMARY OF THESIS SUBMITTED FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

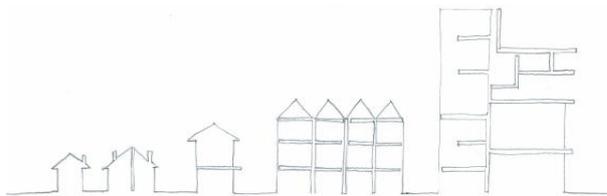
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multi-unit housing and the Australian dream

The free-standing single-family home continues to embody the Great Australian Dream to the majority of the population, despite multi-unit housing representing the majority of new dwelling construction in major cities in recent years. Many Australians view multi-unit housing as a temporary housing arrangement on the path toward achieving the Great Australian Dream, as a bespoke home for the urban elite, or as a housing option of last choice (Randolph & Tice 2013). As Australian strategic urban plans promote more multi-unit housing development in the interests of renewal, intensification, and sustainability, can the Great Australian Dream be consolidated?

Australian homeowners have a tendency to personalise their domestic environments through the contracting of original constructions and later renovation, remodelling, and extension. This familiar system

...reflects Australia's distinctive form of ownership as it carries individualism to greater lengths than in other ownership societies. Every Australian purchaser of a new detached dwelling has the ability to mould it to their individual needs and tastes in a way that only the very affluent can do in other societies. (Burke & Hulse 2010, p. 828)

In contrast, multi-unit provision is supply-led and, employing more industrialised construction and development systems (Burke & Hulse 2010; Turner 1976), seldom offers opportunity for individualisation. As speculative developers carry all financial risk, they hold substantial decision-making capacity. However, their short-term interest in the buildings produced mean decision-making is informed by priorities and objectives misaligned from those of potential owner-occupiers; generating “split incentives” on matters of use value, sustainability, and maintenance (Easthope & Randolph 2016).

Pursuing infill development, Australia's strategic urban plans indirectly ask households to forego the privilege of housing personalisation so entrenched in the Australian psyche. They entrust the implementation of infill housing to the speculative market, with its history of delivering commodified housing product attractive to private property investors. This raises concerns regarding building quality and long-term built and social legacies (Altmann 2015; City of Melbourne 2013) as market value is prioritised over use value, community, and liveability.

Strategic urban plans provide visions of “dynamic communities where people will want to live and work... each [with] a unique character... a sense of belonging and connectedness, which will make them a drawcard” (Government of South Australia 2010, p. 71). However, if speculative supply-led provision persists, it is more likely consolidation areas will lack diversity of housing type, be comprised of buildings designed and built to minimum standards, and be home to a high proportion of rental households with high mobility rates. To deliver the strategic visions greater consideration of future occupants’ preferences is necessary.

		Detached House	Multi-Unit Dwelling
Dwelling Stock	Existing	Buy an Existing Detached House ✓	Buy an Existing Multi-Unit Dwelling ✓
	New	Initiate Design and/or Construction of New Detached house ✓	Initiate design and/or construction of new Multi-Unit dwelling ✗

*Home Purchase Options in existing Australian Provision.
based on Dolin et al. 1992.*

Housing preference studies undertaken in Adelaide (Fischer & Ayturk 2011), Perth (State of Western Australia 2013), Melbourne, and Sydney (Kelly et. al. 2011) identified mismatches between household preferences and the housing delivered via speculative provision. They concluded an owner-occupier market exists for quality multi-unit development, but also show speculative multi-unit development falls short of meeting this demand due to a lack of diversity and owner-occupant appeal. To consolidate the Australian Dream, it is necessary to bridge the design and amenity gap between demand-led, free-standing dwellings and supply-led multi-unit housing. One way of achieving this is to relocate multi-unit design decision-making responsibilities to future residents. Enabling households to initiate the design and/or construction of new multi-unit dwellings empowers them to construct, for themselves, the new urban communities strategic planners envisage.

The Research Question

In the interests of supporting households to initiate the design and/or construction of new multi-unit dwellings, this research asks the primary research question:

What are the impediments to collective self-organised housing provision in Australian urban consolidation?

The Thesis:

- Describes the existing system of multi-unit housing provision in Australia, focusing particularly on design briefing and the determinants of dwelling function.
- Investigates current examples of Australian multi-unit urban infill projects which seek an alternative to existing provision systems.
- Observes international housing sub-markets which enable user participation in the provision of multi-unit urban infill housing.
- Draws together information from both the international and Australian examples to identify opportunities for reconfiguring the existing multi-unit housing provision system in Australia; redefining the role of occupants/owners in the housing provision and urban consolidation processes.

Thesis Abstract

In promoting urban consolidation, Australia's strategic urban plans have the unintended consequence of reducing, if not eliminating, an individual household's capacity to directly engage with new dwelling production. Contrasts exist between the production processes of a free-standing home, typically constructed to contract, and that of a multi-unit building, typically speculatively designed and sold off-the-plan; with the latter removing the capacity for future occupants to directly influence dwelling function or design.

Hence, in providing a vision of higher-density urban communities, Australia's strategic urban plans arguably contribute to a disjunction between the function of higher-density dwellings and the individual households who seek to call them home. In response, a small number of Australian households and industry professionals have proposed alternative production processes to realise multi-unit housing suited to future occupants' collective needs.

This thesis examines the relational network of social and technical actors in existing multi-unit housing development. Structures of housing provision are visualised through an actor-network lens, and network relations are analysed to identify which (or what) network actors (or actants) influence design decisions, particularly regarding dwelling function and cost. The existing actor-network is compared with those of four alternative Australian cases. Employing both network analysis and primary interview data, impediments to collective self-organised housing in Australia are identified. Comparison of the actor-networks of the alternative cases recognises different types of network change in each case, reflecting participants' motivations and resources, with associated variation in outcomes. Means of addressing the impediments identified in the Australian cases are drawn from two international cases, building groups in Berlin, Germany and collective custom build in the United Kingdom.

The thesis argues successful consolidation of the Australian Dream advocated by contemporary urban planning policies requires that future residents be provided with greater capacity to influence design decision-making within the multi-unit structure of housing provision. Drawing lessons from the alternative cases, it proposes reconfiguring the actor-network of multi-unit housing to enable this to occur. The comparison of Australian and international case studies builds knowledge applicable to the development of policies and programs promoting collective self-organised housing in Australia, with relevance also to other dwelling densities.

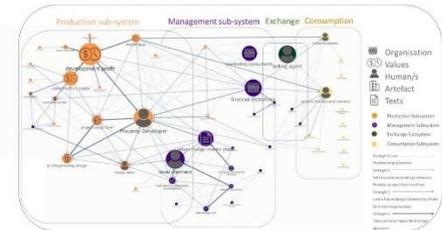
Thesis Outline

The Thesis comprises four Parts, each consisting of two or more chapters.

Part One sets the research *Context* (Ch1), introduces the theoretical frameworks engaged in the research (Ch2), and details research methods (Ch3).



Part Two: The Existing presents existing Australian multi-unit provision over three chapters divided into a review of secondary data (Ch4), the introduction of primary data (Ch5), and subsequent analysis (Ch6). Part Two concludes having provided a unique view of the existing multi-unit housing network and identifying key design decision-making influences.



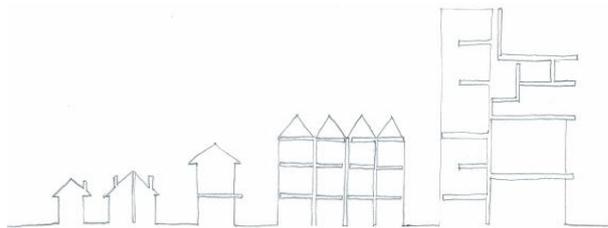
Part Three: The Australian Multi-Unit Innovators comprises three chapters. Chapter 7 introduces the Australian Multi-Unit Innovators, Chapter 8 presents the experiences of stakeholders to date, and Chapter 9 compares the individual projects, observing differences in their capacity to reconfigure the black-box via network analysis. Part Three concludes by identifying impediments to alternative multi-unit housing provision.



Part Four: International Multi-Unit Innovators comprises two chapters. Chapter 10 introduces the international cases, detailing their selection and relevant locational features. It also identifies variables amongst international self-organised housing sectors which facilitate initial comparisons between the two cases. Chapter 11 then draws lessons from the international cases in response to the impediments identified in Part Three.



The Thesis then concludes with response to the initial aims and research questions.



Developing without Developers – Collective Self-Organisation

The dominance of speculative multi-unit housing provision is not unique to Australia, with the vast majority of privately owned multi-unit dwellings in developed nations realised speculatively. However, around the globe, a long history of demand-led multi-unit innovations exists as a minority contribution to housing supply and has been the subject of renewed interest from both housing researchers and practitioners over recent years. Past examples include collectively owned and managed housing in Mumbai, India, the Turkish Republic, Hong Kong, Israel, and Argentina. Each emerged in the context of housing shortages resulting from conflict, rapid urban growth, or social inequality, and a dominant housing system failing to meet the needs of a segment of the population.

System failures continue today, with dwelling shortages in many urban locations, declining affordability, and an ongoing prioritisation of housing's role as investment and commodity. In this context, self-organisation of multi-unit housing is increasing in many western locations, either through the collective action of households, civil society groups, or policy change.

Reviewing literature on alternative multi-unit housing provision across the globe, the thesis navigates an array of terminology which is often inconsistent (Tummers 2011), with terms frequently misappropriated across language divides. *Collective Self-Organised (CSO) Housing* is used in the thesis to mean housing in which a “collective of individuals organize, finance, plan, and commission their own project” (Brunoro 2013 p1). Discussing CSO housing in Germany, Junge (2006) describes it as “*developing without developers.*”

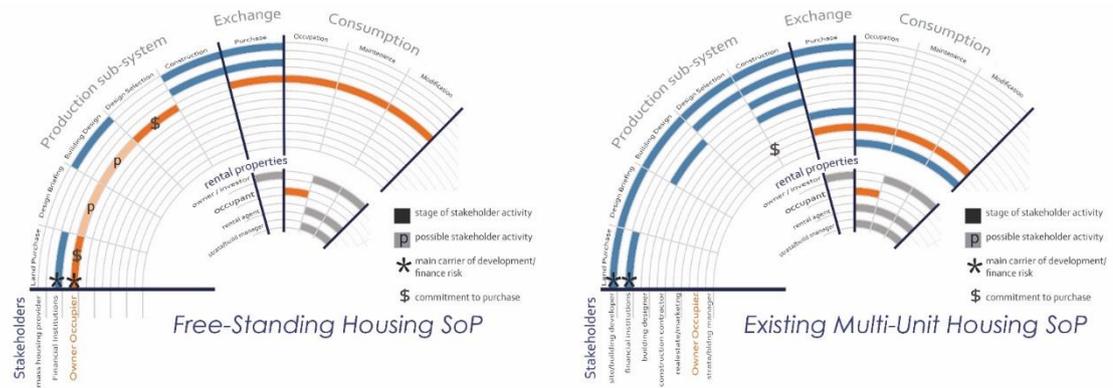


Self-organisation of housing, particularly multi-unit housing in which households benefit from the power of collective action and capital, contributes to diversity and affordability, can support community development and environmental investment, and can facilitate urban regeneration. It enables citizen participation in development, facilitating “an alternative outcome that would not otherwise have existed” (Jarvis 2015, p. 205) and realising a “flexible pathway towards diverse futures” (Ache & Fedrowitz 2012, p. 410).

Importantly, self-organisation offers a useful tool in the implementation of urban consolidation policies; one which can respond to specific household aspirations, and avoid the lack of innovation typical of speculative development. Since the emergence of the urban consolidation agenda, the discussion has continued as to *who* will inhabit the new dwellings proposed, *what* will that dwelling form be, and *where* is it to be located? These questions are not easily answered in a private, speculative housing market. They are more directly addressed when the prospective inhabitants themselves are free to speculate on their own behalf and “build for their own use” (Millington 2000, p. 27). This thesis aims to assist Australian households to do just that.

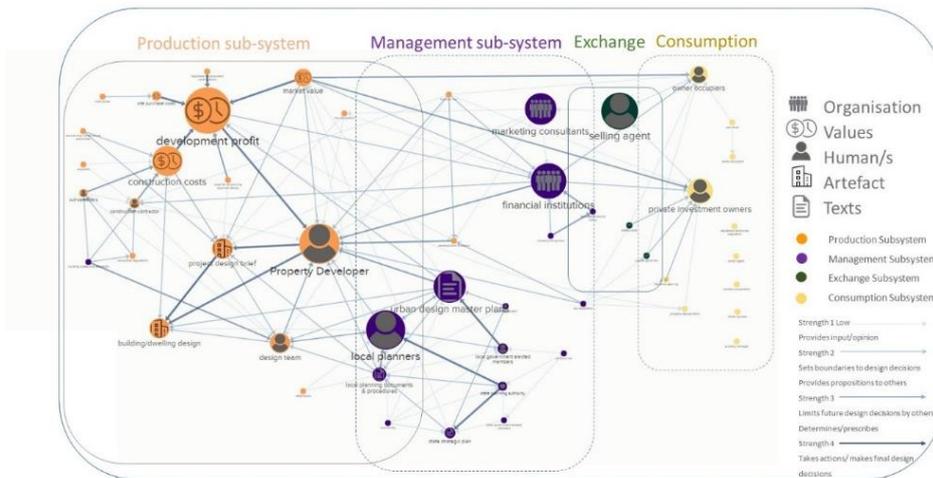
Understanding, Conceptualising & Visualising Housing

Transcending disciplinary boundaries, housing eludes the application of a singular theoretical framework. This research integrates knowledge sets, concepts, methods and analysis techniques across disciplinary boundaries to generate a distinctive view of housing systems, their effectiveness, and their limitations. Initially, multi-unit housing provision is conceptualised following Ball's *Structures of Housing Provision Thesis* (1986), in which all individual and institutional stakeholders are recognised as actants. This holistic approach to viewing housing provision facilitates effective comparison of alternative housing provision systems within and across locations. Additionally, it enables identification of structural and relational attributes transparent to disciplinarily-compartmentalised or problem-specific research.



Secondly, concepts drawn from *Actor-Network Theory* are introduced, including understandings of network stabilisation and the creation of black-boxes, processes of network translation, and recognition of human and non-human agency. Both Actor-Network Theory and Ball's Provision Thesis view agency and power as relationally generated, acknowledging relations of domination and subordination cannot be assumed but become known only following analysis of network relations. Flows of design information into and through the housing provision networks are observed to identify key actants in design decision-making and identify opportunities for network reassembly.

Thirdly, understanding and comparison of the socio-technical networks of housing provision is enabled by visualisation and quantification using *Social Network Analysis* software. Together, these frameworks provide a layered theoretical lens to examine multi-unit housing provision, comparing alternatives and allowing previously silenced actors to emerge.

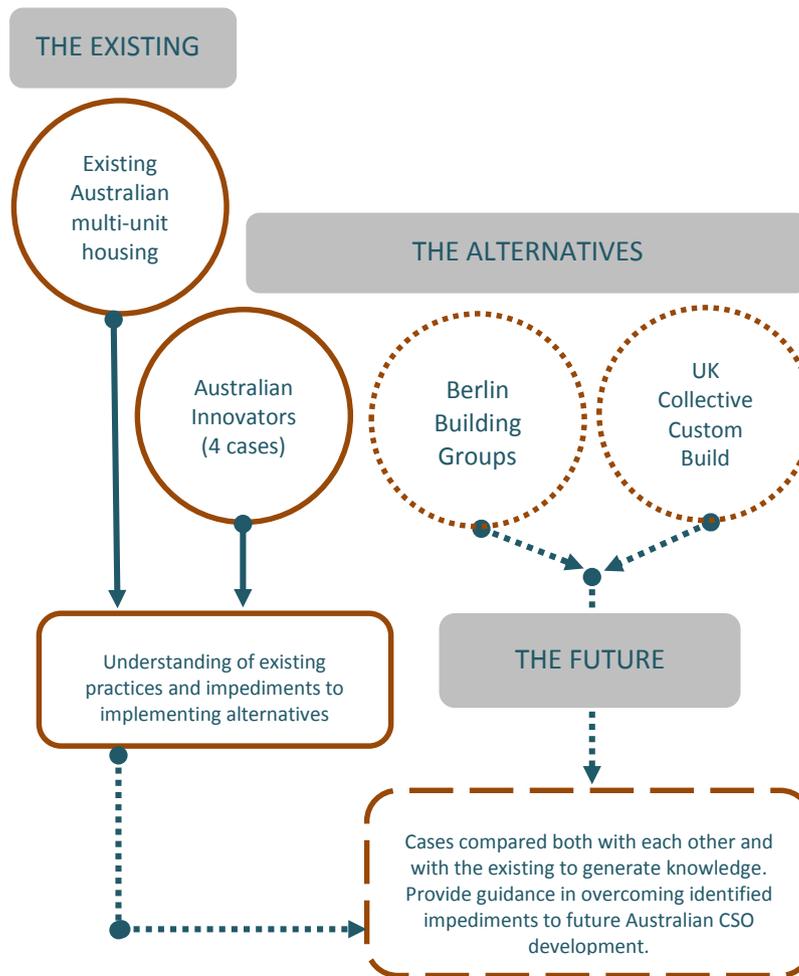


Example of the network mapping used to visualise relations between stakeholders and determine key design decision-makers. Shown here is existing multi-unit provision with stakeholders sized by the network analysis measure of network centrality (betweenness).

The actor-network visualisations developed to represent the structures of housing provision under examination in this thesis provide unique insights in these cases and, with further development, may prove equally useful to other research examining the complex web of social and technical actors in housing systems.

Research Design & Methods

The research employs a system-embedded case study design following Thomas (2011), including the use of key, nested, and outlier cases to abductively build knowledge. Thomas' case study approach is shown to converge appropriately with Actor-Network Theory in comparative housing research pursuing transferability.



Data Collection & Analysis Methods utilised:

- Literature review
- Document analysis
- Semi-structured in-depth interviews
- Deliberative & snowball sampling
- Ego-network mapping
- Comparative analysis of ego-centric diagrams
- Data triangulation through correlation
- Transcription & analysis of interview dialogue
- Thematic analysis
- Network mapping
- Network analysis
- Actor-network theory

Two distinct stages of analysis are undertaken. The analysis of primary and secondary data collected generates network representations. These are analysed and compared with both visual observation and the use of Social Network Analysis software. Data is analysed both qualitatively and quantitatively.

Part Two: the Existing

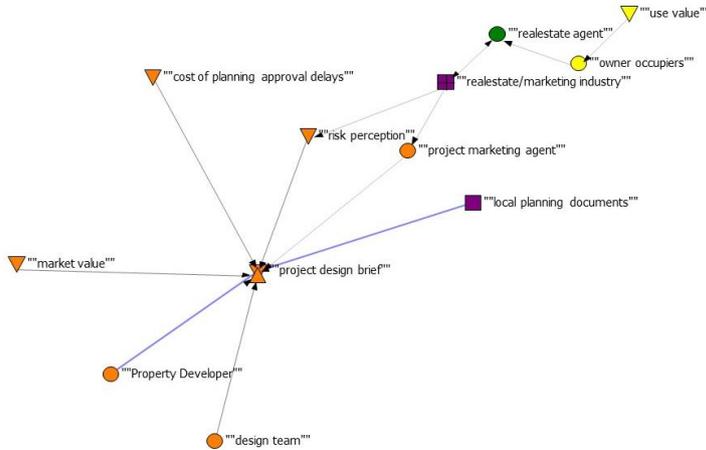
Strategic Urban Plans call for ‘medium-density housing’, ‘higher-density housing’, and ‘high-density housing’ to transform Australian cities in the coming decades. In doing so, they do not question the existing ‘black-box’ of speculative multi-unit provision and hence risk perpetuating historic mismatches between the multi-unit housing produced and that desired by households attracted to the ‘Consolidated Australian Dream.’

Prior to pursuing alternative structures of provision (SoPs), this part of the thesis looks inside the existing black-box. It asks *‘What influences the design and function of multi-unit infill housing currently being constructed in Australia?’* and *‘What are the impediments to deviation from the existing multi-unit infill housing supply system?’*

An abundance of past research has described and interrogated existing multi-unit housing in production, management, exchange, and/or consumption. Most research, however, addresses only one or two of these *sub-systems of provision* described by Burke and others (Burke & Hayward 2000, Burke and Hulse 2010, Burke 2012). Here, knowledge constructed by others (secondary data) is combined primary data from key stakeholder interviews to construct a systemic view of the multi-unit SoP. Importantly, both *humans* and *non-human* participants in production are recognised, with

- *texts* (e.g. strategic plans, building codes, planning documents, legislation),
- *values & perceptions* (e.g. market value, use value, risk perception, political risk),
- *artefacts* (e.g. project design brief, building/dwelling design), and
- *organisations* (as collections of humans – e.g. financial institutions, state planning authority)

conceived as capable of acting within the network and influencing resultant built outcomes.

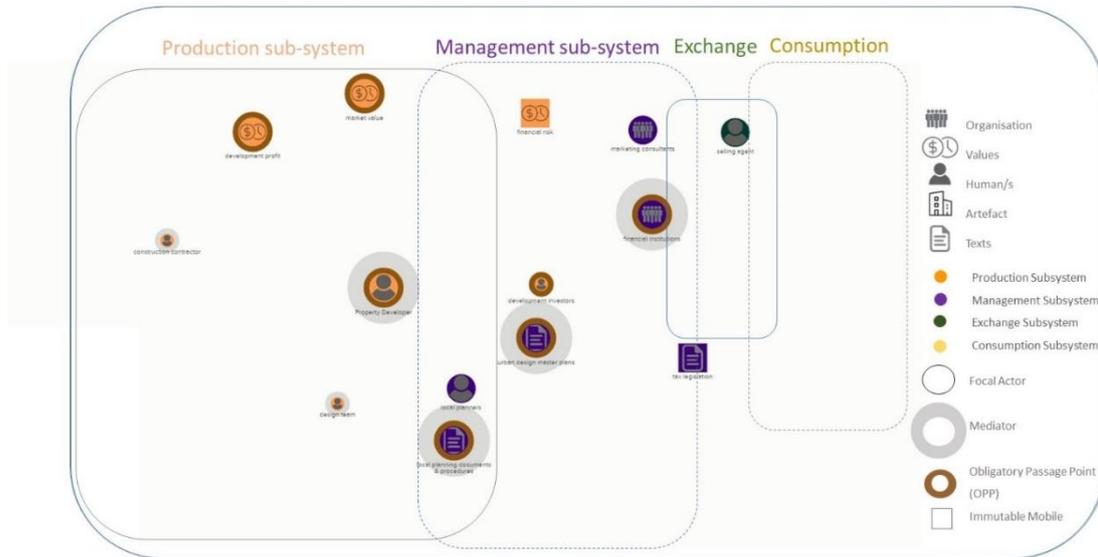


Mapping of flow paths of design information demonstrates distance between actants and barriers to information flow. This flow path shows the connection between Use Value and the Project Design Brief to be lengthy and indicates design input from potential owner-occupiers is mediated by realstate/marketing industry and external risks prior to informing the design brief.

Actor-network mapping

With the use of network-analysis software (UCInet), network attributes are used to identify focal actors, mediators and obligatory passage points (OPPs) in design decision-making.

Focal Actors	Those who acts to align the interests of others with their own
	property developer, development profit, market value, urban design master plan, local planner, selling agent, marketing consultant, financial institutions, risk perception, local planning documents, tax legislation.
Mediators	Those with capacity to transform, translate, distort, or modify design information to suit their interests
	urban design master plan, construction costs, property developer, design team, financial institution, marketing consultant, local planning documents.
OPPs	Those who define a situation which must be met; holds power of approval
	market value, development profit, financial institution, development investors, urban design master plan, local planning documents, property developer.



Simplified Mapping of existing multi-unit SoP showing only those actants identified with capacity to influence design outcomes using network metrics. Shows absence of design input from consumption sub-system and dominance of non-human actants.

Key Findings from Part One: the Existing

- Market value and development profit are the primary drivers of multi-unit dwelling provision, with these monetary measures carrying greater influence in the SoP than the use value of dwellings.
- A disconnection exists between the existing production and occupation subsystems, with limited opportunity for occupants to engage in, or directly inform, the housing production process.
- Potential multi-unit occupants not engaged with the available investment-purchaser driven product remain silent within the existing actor-network.
- Multi-unit owner-occupiers are not able to align the interests of others with their own, transform, translate, distort or modify design information to suit their interests, or hold power of approval.
- Key design decision-makers are concentrated in the production and management subsystems, only about half of whom are human actants capable of negotiation and possible innovation.

- Strategic urban plans are not focal actors in determining multi-unit design outcomes. In projects where one organisation or individual carries multiple key roles (eg a developer assuming roles as development investor, construction contractor, and design team leader) the influence of strategic urban plans is further diminished.
- Strategic-level and project-level actants have very different understandings of the location of risk within the network, of who in the network decides what types of dwellings to build, and the influence purchasers are able to exert on dwelling design. The interviews supported the previous premise that multi-unit housing remains a closed black-box to many strategic actants.
- The co-location of decision-making with financial risk in the existing SoP leaves those actants exposed to long-term risk (liveability, community, environmental) without influence and allows the motivations of actants seeking short-term financial profit to translate information flows and mediate design decisions on their behalf.

In answer to the research question, '*What influences the design and function of multi-unit infill housing currently being constructed in Australia?*', this case has shown the *key influencers* to be:

financial profit, financial risk, and financial systems, (incl. banking institutions and tax legislation)

Equally, it has revealed who or what has the least influence on design and function of multi-unit infill housing, that being the potential owners/occupants and use value. In particular, the SoP excludes potential multi-unit owners/occupants not represented by previous multi-unit purchasers.

Impediments to deviation from the existing multi-unit SoPs identified include:

- reluctance on the part of key actants to compromise their current network position for fear of financial loss
- the resistance of existing network connections, in which those actants who may seek an alternative network solution (such as use value, future occupants, or architects/designers) are not located in a structural network position which enables them to modify the existing network.
- the stability of existing network connections, meaning that despite significant reconfigurations occurring between actants in the production subsystem, the network properties of actants in the management subsystem (policy, planning, financial, institutional and contractual systems of development) change very little in response.

Part Three: the Australian Multi-Unit Innovators

The stabilised multi-unit structure of provision (SoP) described in Part Two of the thesis has dominated infill housing for some time, limiting industry and community exposure to alternatives (Martel et al. 2013a). Individuals and groups seeking to navigate an alternative multi-unit outcome are pursuing a small number of innovative infill housing projects in Australia. In the spirit of Collective Self Organised (CSO) housing projects they seek to enable owner-occupier input into design to varying degrees. This part of the thesis examines four such innovative examples in the form of a nested, outlier case study (Thomas 2011a). At the time of data collection (Feb 2015) one case was occupied, one was in development, and two were yet to be realised. All innovative cases:

- seek an alternative to the developer-led, speculative SoP,
- comprise 4-25 dwellings in a single development of 3 or more storeys,
- are located in areas designated for consolidation in strategic urban plan, and
- were initiated by future residents or professionals seeking improved higher-density living outcomes.



The four cases each have distinct approaches to navigating or reconfiguring the existing multi-unit SoP. Publicly available information was collected for each case and interviews conducted with key stakeholders, including residents, future residents, architects, instigators, development partners, and government advisors. The interviews focused on three main inquiries:

- stakeholders' motivations to pursue an alternative housing SoP,
- barriers experiences, and
- resources necessary to succeed in delivering their housing ambitions.

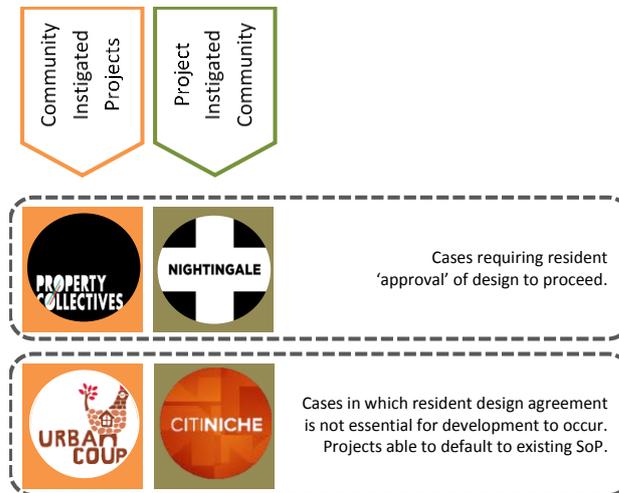
The actor-network mapping undertaken in Part Two: the Existing was also used to examine and compare the four cases.

Motivations

Stakeholders are motivated by a general dissatisfaction with the choices provided by the existing multi-unit SoP and the ongoing commodification of housing. Motivations are grouped into two main themes: financial and ideological. Financially, stakeholders seek to either deliver housing at a lower price point, or to achieve more desirable housing outcomes for equivalent cost. Ideological motivations include the pursuit of more environmentally aware ways of living, a desire for a greater sense of community, or frustration with the existing SoP in relation to realising ethical professional responsibilities. Ideological motivations inform expectations in relation to design participation.

Design Participation

All stakeholders seek SoPs which enable greater design participation by future residents, although expectations vary. Projects instigated by future residents seek the greatest degree of design involvement, commencing from design briefing and including site selection. Those instigated by design professionals offer less design input and do not engage with future residents until later in the development process. However, the ability for future residents to become focal actants in the new SoP networks is seen to vary not with the process of instigation, but with the location of risk and land ownership. It is concluded only future residents who collectively own the land to be developed are guaranteed the power to approve design decisions (become OPPs). No cases increase individualisation of dwellings beyond the existing multi-unit SoP.



Barriers Experienced

Previous research by others has investigated barriers to infill housing development in Australia. This research identifies barriers specific to implementing the innovative SoPs the cases propose. Barriers identified include:

Accessing knowledge: The bespoke nature of development means a process pioneered by one group to accommodate their unique personal and locational circumstances is seldom replicable. This leaves each group of innovators with the challenge of developing new processes and solutions (financial, legal, administrative) relative to their own unique circumstances. This challenge is accentuated by a lack of project documentation and information exchange across developments.

Time commitment: The uniqueness of the SoPs proposed can be exceptionally time-consuming and have involved the pursuit of numerous ‘dead ends.’ The resulting lengthy process becomes a hurdle to progress.

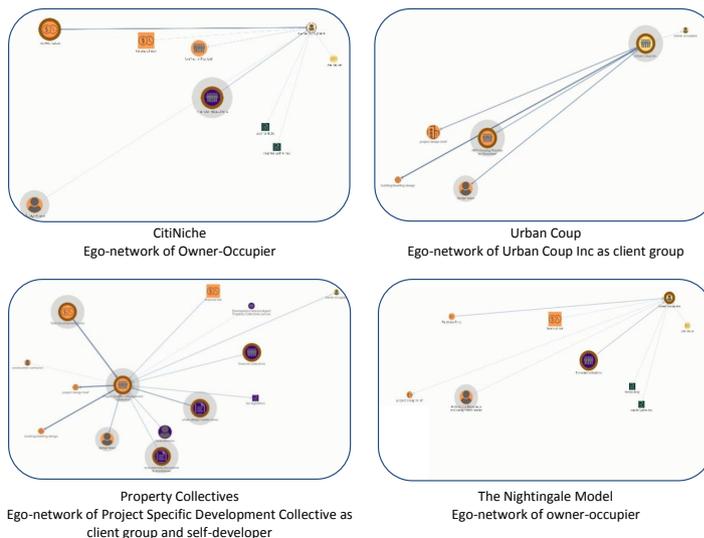
Accessing professionals with appropriate experience and common interests: The proposed SoPs, none of which include traditional developers, require a subtle reconfiguring of professional roles and boundaries. To date, few industry professionals have experience in effectively negotiating such changes and very few have experience in designing directly for (and with) a collective of multi-unit residents. Where professionals hold the knowledge required to fulfil these altered roles they begin a brokerage role, providing them significant power over design and livability outcomes.

Inflexibility of existing SoP: Each case has sought to reconfigure the existing, stabilised black-box of multi-unit provision, which one interviewee suggests results from the vested interests in the current system which “work against reforms”. Each case has experienced situations in which the existing SoP, and the processes it has brought into being, have resisted the alternatives they propose. In particular, these relate to accessing finances, accessing land, the existing relationships between risk, design and market values.

Many of these barriers are experienced differently by community instigated projects and project instigated communities.

Comparing Innovators' Actor-Networks

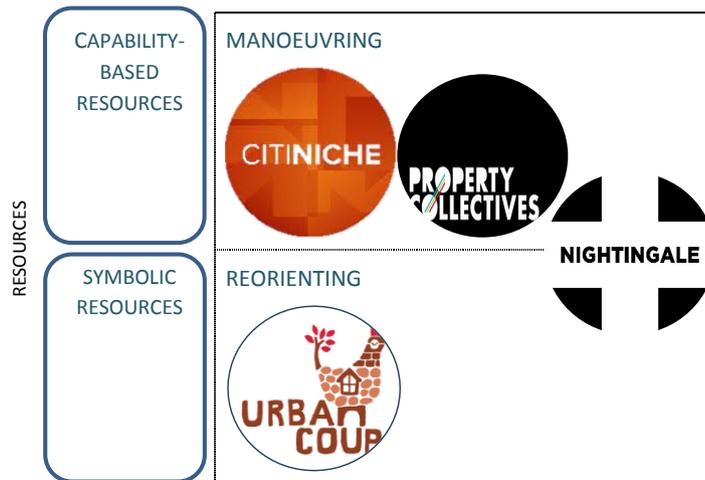
The thesis makes both visual and metric network observations, comparing the information flows between key actants in each innovative SoP to identify variations. The comparison shows that each produces distinct outcomes and opportunities for design. Most cases enable owner-occupiers to pass design information more directly across existing subsystem boundaries. Most redefine the roles of the developer, the design team, financial institutions, and future residents while engaging more human actants in the production subsystem.



All instigators are motivated to achieve improved multi-unit living environments for themselves or their clients, and each disrupts the existing SoP to varying degrees. Community instigated projects involving a client group of future residents in design are shown to facilitate more significant disruption than professionally-led projects. However, the future residents' capacity to collectively embrace and share financial risk is shown to have even greater influence on a projects capacity to achieve its original ambitions. Similarly, those SoPs which remove the developer (be they for-profit or not-for-profit) are more likely to achieve their desired housing outcomes. Those SoPs which remove the developer are also shown to increase the influence of Strategic Urban Plans, a desirable outcome of interrogating, rather than re-enrolling, the existing black-box.

Key Findings from Part Three: Innovative Cases & Constrained Agency

This part of the thesis argues the capacity for network actants to alter the actor-network varies with their motivations, their structural position in the existing actor-network, their ability to influence others, and their capacity to access knowledge and resources. In concluding this part, Gulati and Srivastava's (2014) framework of constrained agency and network action is employed to identify the different types of network action being undertaken by each of the innovative SoPs. Utilising this framework for comparison it is shown that innovative SoPs utilising a combination of capability-based resources (technical knowledge) and symbolic resources (cultural frames, world views and narratives) offer the greatest potential to successfully reconfigure the actor-network of provision.



The greatest success in delivering built projects to date occurs when extensive network disruption is proposed and additional actants become brokers of unique information essential to network operation. In the cases observed here, this involved the proposition of an alternative finance model, not solely the proposition of an alternative design solution.

Part Two previously concluded design outcomes of the existing multi-unit SoP are predominately influenced by property developers, development profit, financial institutions, market value and tax legislation. Part Three demonstrates that by reconfiguring the actor-network the influence of these actants can be reduced and that of previously uninfluential actants increased, including designers, owner-occupiers, and the project design brief. SoPs in which future residents act as a group or collective to define a project vision provide future occupants with the strongest capacity to influence design outcomes, although this varies with ability and willingness to accept risk.

The stabilised nature of the existing actor-network limits the capacity for actants to realise their ideal SoP and requires, sometimes undesirable, compromises. The thesis outlines challenges faced by the Australian innovators, including those pertinent at *project-level*:

- land,
- financing,
- professional services,
- realising financial savings,
- balancing individual and collective decision-making,
- time, and
- balance design input and individualisation with costs and risks,

and those relevant to the *strategic development* of a viable alternative multi-unit housing SoP over time:

- information dissemination, and
- role of government and policy.

Part Four: the International Multi-Unit Innovators

The Australian multi-unit innovators all sought to increase the influence of owner-occupiers in the multi-unit SoP. They demonstrated that reconfiguring the actor-network can improve owner-occupiers structural position in multi-unit provision, but also identified multiple challenges exist to realising the SoPs they propose.

This part of the thesis examines two international CSO housing sectors, one relatively mature, and the other in formation. It draws lessons from these international experiences, reflecting on how they have sought to overcome project-level and strategic-level challenges.

Berlin Building Groups (BG)

The contemporary forms of building groups (BG) in Berlin build upon a long history of self-help and community living, and now represent approximately ten per cent of all new housing construction, predominately in the form of infill housing. BGs can be professionally-led or community-led and ‘develop without developers’ to provide housing to future residents at cost.

UK Collective Custom Build (CCB)

Speculative housing development plays a more significant role in the UK than in Australia, with the vast majority of all dwellings constructed by for-profit developers at all densities. Custom Build (CB) and Collective Custom Build (CCB) housing is promoted by current UK planning and housing policies, with reference to examples from the European Continent, including German BGs. The experiences of policies aiming to support CCBs in the UK therefore offer this research an example of previous attempts to transfer lesson from BGs to another jurisdiction.

Data collection

In addition to literature review and document analysis, semi-structured interviews were conducted with key stakeholders in BGs and CCBs in Berlin and the UK in November 2014.

Drawing lessons from international cases

This part of the thesis aims to address the challenges faced by Australian Innovators at both project and strategic levels. It discusses past experiences in each of the international locations to draw lessons applicable to the Australian context, it is notable that greater interconnections between project-level and strategic-level actants exist among the Building Group (BG) and Collective Custom Build (CCB) stakeholders interviewed than in the Australian cases. In both international locations, multiple actors actively engage with sector advocacy in addition to direct participation in a particular project or projects. Stakeholders undertake strategic-level advocacy in both professional and non-professional capacities, with the majority of interviewees indicating a sense of social responsibility to assist in developing CSO housing beyond the projects that benefit them individually.

The thesis details how the *project-level challenges* have been experienced in each location and draws together learnings relevant to each. Here, the *strategic-level lessons* are summarised together with recommendations for policy intervention in the Australian context.

Strategic-Level Lessons

Intermediaries

Intermediary bodies have emerged in each location, however, their capacity to bring together top-down and bottom-up actants varies. Initial intermediaries are the professional consultants and industry actants who provide services and support to innovators. Berlin architects interviewed argue CSO housing sectors need to maintain such bottom-up roots, acknowledging that dissemination of information by authoritative agencies reduces insecurities about an innovative approach to housing, but suggesting “sharing a meal at a friend’s [building-group] residence builds more trust.”

In the UK case, the initial bottom-up intermediaries have partnered with top-down policy makers to act as a public access information repository and promote both CB and CCB. While this organisation has the capacity to influence top-down policy makers, they are charged with advocating on behalf of multiple housing types and tenures, not just urban infill CSOs. Housing types which experience fewer barriers to implementation have become prioritised.

Neither case provides Australia with a definitive solution to establishing an ideal network of intermediaries, but together they have provided some cautionary lessons and show:

- Intermediaries emerging from bottom-up network action are essential to CSO project development and remain so throughout the process of sector maturation.
- Early intermediaries established for sharing knowledge can become unnecessary during sector development and hence emerging SoPs should not be dependent upon their ongoing presence.
- The most desirable intermediaries are those which maintain an active connection with residents and communities and build trust.
- Top down intermediaries must engage with multiple and diverse solutions, not only those that are market dominant, preferred by industry stakeholders, or politically motivated.

Role of Government and Policy

The literature and interviews from both Berlin and the UK concur that government policy in this area has two main objectives:

- 1- to remove barriers to innovative self-formed, bottom-up groups building for themselves,
- 2- to promote and facilitate expansion of CSO housing as a trustworthy alternative to supply-led provision.

Experiences in Berlin also indicate it is critical to continue to support self-forming groups over time as ongoing innovators, ensuring opportunity for the resultant housing to continue to evolve with occupant needs and providing ongoing impetus for professional facilitators to continually seek improvement.

The current UK policy approach is one of top-down enablement of bottom-up development which will take time to filter through the national planning system before its impact is measurable. Whilst stakeholders support the policy intentions, they identified a disjunction between the stated intentions and the conservative programs implemented. Catalyst funding programs introduced to provide access to land and finance were viewed as overly bureaucratic, more suited to developers than community-based groups, and failing to address the barriers experienced by stakeholders. To date, UK policies rely on existing stakeholders' knowledge and capital without making changes to the existing SoP sufficient to build trust and social capital.

A substantial difference between the two cases is the time at which government intervention or assistance has occurred. The late-stage interventions in Berlin sought to support a CSO sector which had emerged and developed its own, revolutionary SoP. In contrast, no such SoP yet exists in the UK and government intervention there seeks to nurture one while avoiding risk exposure; an approach which reinforces the roles of current dominant actants in multi-unit provision and fails to support innovative alternatives.

Together the international cases provide some cautionary lessons and show:

- ideally, a combination of both hard and soft policy measures is required to address the range of barriers experienced by stakeholders, with different needs existent at project and strategic-levels;
- policy measures must recognise the interactions between barriers to CSO development, addressing these from an integrated, network wide perspective;
- it is essential to avoid reinforcing the dominance of existing actants and ensure future residents are key actants in new SoPs;
- government interventions must be more than modifications to the existing SoP, but avoid prescribing a fixed, ideal alternative;
- in encouraging alternative housing provision, policy should employ cautionary approaches to avoid unintentional constraints; ideally achieving policy neutrality over time;
- policies incentivising or encouraging CSO projects need to recognise the unique challenges faced in inner urban areas to realise the strategic aims of consolidation.

Key Findings from Part Four: International Innovators

The international CSO housing cases reinforce previous observations, identifying the need to reconfigure, not just alter, the existing black-box of speculative multi-unit provision to facilitate a viable CSO housing sector. The case studies provide insights to establishing a viable CSO housing sector where none currently exists.

Network Action Resources

In the three case study locations of Australia, Berlin, and the United Kingdom, CSO instigators identify a number of failures or controversies in the dominant multi-unit SoP. Failure to meet the living requirements of a portion of the market, failure to deliver quality multi-unit homes at affordable prices, and more. Such failures result in controversies between actants; between use value and market value, home and commodity, desire for the “new forms of housing” and “new urban form” promised by strategic urban plans and the desire for profit. Controversies have motivated actants in all locations to reopen the black-box; to alter the meaning of relations with and between other actants, reorienting the actor-network to a different world view.

In both locations, those seeking multi-unit innovation have been more likely to achieve their objectives when they possess (or are able to access) the capability-based resources to manoeuvre themselves into a network position which increases their capacity to act. From such a position they become focal actants, enrol others in their proposed alternative SoP, align interests, and enact translation (Callon 1986a).

Parallel SoPs

The relatively mature Berlin CSO housing sector demonstrates the capacity for multiple actor-networks of provision to co-exist. Berlin CSOs enrol professionals experienced in the existing SoP actor-network alongside new actants; engaging stakeholders previously unassociated with (possibly failed by) speculative multi-unit provision. As Hamiduddin & Gallent state: “[m]aximum benefit will be derived from this model if it is seen as one route to delivering the homes that communities need amongst a jigsaw of alternatives” (2015, pp. 17-18).

In contrast, most CSO housing actor-networks in the UK enrol existing actants such as for-profit developers and Housing Associations. Enrolled in both speculative and CSO housing actor-networks, these institutional actants struggle to move between the different action frames and world views of the two networks. As such, CSO housing groups find themselves competing with conflicting world views of powerful actants enrolled in their

own SoP. The Berlin CSOs have created a new actor-network of multi-unit provision which circumvents the need to engage housing institutions or profit-seeking actants from the existing black-box.

Risk Reluctance

UK CSO projects tend to enrol institutional actants due to an entrenched reluctance among existing stakeholders to deviate from known risk profiles. In both UK and Australian projects, CSO groups willing to assume development risk are often prevented from doing so by the constraints of the existing SoP. Sharam et al. (2015) show reluctance on the part of Australian financial institutions to fund alternative development due to associated business risk, with one lender stating:

If something goes wrong and it all gets totally stuffed up and we lose a million dollars we don't want to be on the front page of the [newspaper] suing couples because they've tried to do the right thing and we're the bad guys. (Sharam et al. 2015, p. 5)

The Berlin actants have succeeded in shifting both risk and risk perception. This reflects a revaluing of risk due to the absence of profit-seeking in the CSO housing SoP.

Intervention

It is advisable to exercise precautionary principles, to attempt to anticipate unintended consequences when implementing change in complex systems and actor-networks. However, in UK and Australian CSO housing excessive caution on the part of multiple actants is inhibiting progress. In both cases intervention from an influential actant is required to break the cycle of risk reluctance and demonstrate CSO infill housing viability.

However, interventions in early phases of sector maturation can unintentionally limit future options by defining parameters before alternative combinations of alternatives are explored. For example, the processes of group formation, constitution, decision-making, financing, and ownership structures have incrementally developed in Berlin over time as experience and knowledge have increased. The Berlin Building Groups are highly diverse, meeting the needs and ambitions of households, and continue to evolve. The actor-network(s) which enable their provision are sufficiently flexible to accommodate groups with differing objectives. The case studies emphasise that there is no single or ideal CSO housing SoP and any land or finance interventions by government should avoid prioritising one CSO solution over others. An SoP prioritised by legislation or eligibility restrictions risks becoming locked-in, resisting controversy from rivals and generating an additional multi-unit black-box.

Thesis Conclusion

Collective Self Organised (CSO) housing seeks to disrupt the existing Australian multi-unit housing Structure of Provision (SoP). For most participants, Australian and international, CSO housing seeks to address the mismatch between speculative multi-unit housing design and their households' needs or preferences. Instigators proposing alternative SoPs must problematise (make controversy around) the existing black-box of provision; modify existing actants or relations, recruit others to share their vision, and negotiate resistance from existing network actants and relations.

Examining the existing Australian multi-unit SoP in comparison with innovative alternatives in Australia, Berlin, and the UK, the thesis identifies multiple impediments to collective self-organised housing provision in Australian urban consolidation. Collating the findings of the preceding thesis parts through an Actor-network lens identifies five primary impediments:

- *Agencement and asymmetry*
- *Uncertainty*
- *(mis)Alignment of interests*
- *Mediation and participation*
- *Controversy and competition*

Current Australian housing policy is interested in liberal individualism and supporting capitalist development (Burke & Hulse 2010; Jacobs 2015). The majority of policies informing housing outcomes are managerial, targeted at ameliorating housing challenges both generated and problematised by existing, dominant housing SoPs. Policy typically reinforces existing structures of provision in support of existing influential actants economic interests through targeted subsidies and taxation interventions. The asymmetry of knowledge in the existing actor-network provides key actants with the power to override the interests of others, to problematise housing in line with their own interests, and offer certainty. In doing so they hold greater capacity to act, to influence policy to maintain existing black-boxes.

The interests of Australian CSO housing innovators differ from those of key actants in the existing SoP, prioritising housing and social benefits equally with economic benefits. Following K.Jacobs et al (2003), for CSO

advocates to progress their interests in alternative housing solutions it is necessary to construct a convincing problematisation, coalesce support, and advocate the implementation of institutional measures for change. However, while actants in all three case study locations would appreciate government assistance in negotiating barriers to change, most express some reluctance toward government/state intervention which may bring prescriptive solutions and compliance restrictions.

Strategic-level actants supporting alternative housing SoP are shown to have the dual roles of enabling innovation and normalising alternatives. Australian CSO housing innovators are currently constrained by existing actor-networks and the industry practices, policies, and legislation that have evolved to suit them. Ideally, a multi-unit infill CSO housing system would operate in Australia in parallel with the dominant speculative model, without preferential treatment provided by the state.

Initial encouragement is required to overcome existing impediments to CSO housing in Australia. At a minimum, this requires recognising the existence of a non-speculative multi-unit housing sector through appropriate legislation. Legislative definition would protect the emerging CSO housing sector from the unintended consequences of future policies or legislation introduced in response to problematisations in the speculative multi-unit SoP, and possibly exempt them from existing provisions which impede change. Recognition would also avoid speculative developers co-opting future interventions designed to encourage a CSO housing sector.

To enable ongoing innovation over time, SoPs should remain open and interactive, able to accommodate the multiple variables identified in CSO housing sectors. The legislative differentiation of multiple SoPs would enable implementation of targeted interventions, and concurs with a recent call for Australian “policy-makers to tailor policies to a more diverse audience, and in doing so, improve future adaptive capacity” (Shearer et al. 2016, p. 16).

By identifying and addressing impediments to groups of households building for their own use, the Great Australian Dream CAN be consolidated and the future visions of strategic plans achieved. However, a reconfiguration of the actor-network of provision is required which moves beyond existing stakeholders interests to both recognise future residents in provision and provide them with the capacity to act.

Contribution

This research contributes to the existing and ongoing multi-unit housing debate in Australia. It provides a unique representation of the existing SoP and peers into the currently locked-in black-box of multi-unit provision in Australia. Through comparison with actual and proposed alternatives it identifies opportunity for future change to diversify housing outcomes and increase housing choice.

More specifically, it:

- examines Australian alternatives to the existing multi-unit SoP(s) to explain why innovations sought by instigators are not always achieved and identify barriers to change,
- identifies a set of variables in international Collective Self Organised (CSO) housing which has the potential to inform project specific planning across multiple locations, and to provide a basis for further research or categorisation,
- draws lessons from international examples to provide project-level and strategic-level insights to encourage a collective self-organised multi-unit SoP in Australia, and
- experiments with a unique means of utilising Actor-Network Theory (ANT) in system-embedded comparative housing research, including the provision of seven factors to address in the design of ANT-informed housing research and eight factors to address in visualising actor-networks of housing provision with Social Network Analysis (SNA) software which can be adapted for use in other housing locations, types, or tenures.

Further Research

Self-organisation in the built environment is currently being researched internationally by scholars focusing on public space, housing, urban design, and planning. For housing, self-organisation by civil society “blur[s] traditional boundaries between housing production and consumption” (Stone 2015, p. 102).

Building specifically on the outcomes of this research project, further research is required to:

- Test the working hypothesis generated from the case studies that CSO participants’ agencement in design is directly linked to land ownership through the investigation of further international case studies.
- Investigate the role of new professionals (agents/CSO developers/brokers) emerging internationally to serve CSO housing groups, examining the diversity of services offered, location of risk, and perceived effectiveness. This would inform the future development of such roles in Australia. Investigate the professional roles of architects, project managers, and others in mature CSO housing sectors internationally to determine how they differ from existing professional roles and, hence, what additional professional skills are required to progress CSO housing in Australia.
- Undertake research into unsuccessful CSO housing groups in Australia who have abandoned their collective housing ambitions to determine if the reasons for their lack of success correspond with the challenges identified by current instigators.
- Re-examine these case studies, together with others as appropriate and over time, to determine which of the CSO housing variables identified here have the greatest potential to enable design disruption, providing target points for intervention in the actor-networks which leverage maximum gain.
- Continue to develop and test the ANT/SNA mapping methods introduced here to analyse other housing systems and other network intermediaries.

And, most important to the progress of collective self-organised multi-unit housing in Australia, commence investigations to inform a proposed legislative definition of this housing sector, realising differentiation and recognition.

ANT/SNA Mapping Contribution

In combination with concepts from SNA and network analysis, ANT has provided this research with a conceptualisation of housing as a heterogeneous socio-technical system. ANT's capacity to combine with, and advance, long-established theoretical constructs of housing is demonstrated. Ball observes "... contradictions between the spheres of consumption, exchange and production [are] important causes of change in structures of housing provision" (Ball 1986, p. 162). Viewed from an ANT perspective, such contradictions constitute controversies, triggering problematisation and translation by powerful (focal) actants. The understanding of change in actor-networks via translation provides a means of progressing Ball's Structures of Housing Provision beyond the static description of existing practices, or black-boxes, to the comparison of alternative futures.

Housing researchers have previously proposed the use of network analysis to identify key players in production (Nicol 2013) and consumption (Heitel et al. 2015) subsystems, and to compare typical and alternative cases (Nicol 2013). However, no completed precedent exists as guidance. The mapping provided the research with five unique observations:

- 1- it enabled the combination of an extensive literature on Australian multi-unit housing provision and design into a single, visual representation of design information flows.
- 2- using ego-networks, it highlighted the different views held by different actants and how these influence their capacity to act. In particular, the mismatch between ones sphere of concern and ones sphere of influence.
- 3- both visual and metric analysis identified key actants in the SoPs, with SNA literature providing an understanding of properties afforded to actants by their structural position.
- 4- mapping within the context of the Australian subsystems of housing provision, provided by Burke and colleagues, ensured the analysis remained focussed on the multiple subsystems of provision rather than focusing on the resultant architectural artefact, as is often the tendency in architectural research.
- 5- the mapping interacted successfully with primary data collection, both informing interview questions and providing structural network explanations of interviewees' observations.

In comparing alternative or proposed SoPs the ANT/SNA mapping provided analytical insights unavailable via other means. Mapping multiple alternative SoPs, the researcher can identify actants (and their relations) which remain unaltered, identifying the human and non-human actants which act to restrict network change. Using SNA metrics allows alternative networks to be compared, identifying network changes more likely to achieve desired outcomes or address identified challenges. The combination of actor-network mapping and SNA tools has identifying opportunities for network analysis and intervention which are of value not only to multi-unit housing provision, but also to any other design arena which requires the un-locking of a stabilised 'black-box'.

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