



## Matching markets in housing and housing assistance

From the AHURI Inquiry  
Potential of new technologies to disrupt housing policy

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# Contents

<b>List of tables</b>	<b>vi</b>
<b>List of figures</b>	<b>vii</b>
<b>Acronyms and abbreviations used in this report</b>	<b>viii</b>
<b>Glossary</b>	<b>ix</b>
<b>Executive summary</b>	<b>1</b>
Key points	1
Key findings	1
Policy development options	4
The study	5
<b>1 Introduction</b>	<b>6</b>
1.1 Why this research was conducted	8
1.2 Policy context	10
1.3 Existing research	12
1.4 Research methods	13
<b>2 What is market design?</b>	<b>14</b>
2.1 Primary attributes of market design	14
2.1.1 The absence of a price mechanism	14
2.1.2 Private information that affects market performance	15
2.1.3 Variation in the characteristics of market participants	15
2.2 A market designer lense	15
2.3 A roadmap for upcoming analysis	17
<b>3 Social housing: ‘chain letting’ to enable swaps and transfers</b>	<b>18</b>
3.1 Current market design	20
3.2 What are the constraints on the existing market design?	21
3.3 Outcomes of restricted swaps/transfers	21
3.4 Market designer lenses: social housing	21
3.5 New market design proposal: social housing	23
3.5.1 Objective	23
3.5.2 Proposal: online exchange platform	23
3.5.3 Constraints	29
<b>4 An accessible housing market for people living with disability</b>	<b>31</b>
4.1 Is there an existing public policy objective for accessible housing?	32
4.1.1 People living with disability	32

4.1.2	Accessibility standards	33
4.1.3	Modified housing	34
4.1.4	NDIS	34
4.1.5	Accessible housing registers	35
4.2	Current market design	36
4.3	What are the constraints on the existing market design?	37
4.3.1	Demand for Specialist Disability Accommodation (SDA)	37
4.4	Outcomes of an undeveloped market for accessible housing	37
4.5	Market designer lenses: accessible housing	37
4.6	New market design proposal: accessible housing	39
4.6.1	Objective	39
4.6.2	Proposal: online housing register ('Hub')	39
4.6.3	Constraints	41
4.7	Policy development implications	42
<b>5</b>	<b>The private rental sector: balancing supply through Brokerage Plus</b>	<b>44</b>
5.1	Is there an existing public policy objective for private rental housing?	45
5.2	Current market design	45
5.3	What are the constraints on the existing market design?	45
5.4	Outcomes of mismatch in the private rental market	45
5.5	Market designer lenses: PRS	47
5.6	New market design proposal: PRS	50
5.6.1	Objective	50
5.6.2	Proposal: Brokerage Plus quarantine mechanism	50
5.6.3	Constraints	52
5.7	Policy development implications	53
<b>6</b>	<b>Presale of new apartments for owner-occupation by low- and middle-income households</b>	<b>55</b>
6.1	Is there an existing public policy objective for new apartment supply?	56
6.2	Current market design	56
6.3	What are the constraints on the existing market design?	58
6.4	Outcomes of mismatch in new apartment presales	58
6.5	Market designer lenses: new apartments	58
6.6	New market design proposal: new apartments	60
6.6.1	Objective	60
6.6.2	Proposal: digital platform	60
6.6.3	Constraints	61

6.7	Policy development implications	61
<b>7</b>	<b>Urban land aggregation for precinct-level redevelopment and intensification</b>	<b>64</b>
7.1	Is there an existing public policy objective for precinct-level aggregation and intensification?	66
7.2	Current market design	66
7.3	What are the constraints on the existing design?	67
7.4	Outcomes of the constraints on greyfield redevelopment	67
7.5	Market designer lenses: greyfield redevelopment	67
7.6	New market design proposal: greyfield redevelopment platform	68
	7.6.1 Objective	68
	7.6.2 Proposal: a platform approach to aggregation	68
	7.6.3 Constraints	69
7.7	Policy development implications	70
<b>8</b>	<b>Policy development options</b>	<b>71</b>
8.1	The power of ideas	72
	<b>References</b>	<b>73</b>
	<b>Appendix 1: Participation information sheet and consent form</b>	<b>84</b>
	<b>Appendix 2: Private rental sector: availability of stock to each quintile</b>	<b>90</b>
	<b>Appendix 3: A model-based method for transdisciplinary research</b>	<b>91</b>

## List of tables

Table A1: Surplus and deficits of rental housing for each quintile (2011)	90
Table A2: Allocation of rental stock by household income quintiles (2011)	90
Table A3: Disciplines and expertise of transdisciplinary research team	92

## List of figures

Figure 1: Australian housing by tenure and dwelling type in 2016: points of stress	10
Figure 2: Tenant nomination of preferred dwellings	24
Figure 3: Eliminating tenants who do not prefer any other dwelling to their current residence	25
Figure 4: The tenants (and residences) that remain after steps 1 and 2 of the algorithm	26
Figure 5: Discovery of a cycle (closed loop)	27
Figure 6: Household income quintiles and the housing affordability categories occupied by each	46
Figure 7: Brokerage Plus: targeted dwellings for head-lease program	51
Figure 8: Typical greyfield redevelopment of a single lot	65



## Acronyms and abbreviations used in this report

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Limited
AIHW	Australian Institute for Health and Welfare
ANUHD	Australian Network for Universal Housing Design
CBL	Choice-based letting
CHP	Community housing provider
CRA	Commonwealth Rent Assistance
DHHS	Department of Health and Human Services (Victoria)
DSS	Department of Social Services
FACS	Family and Community Services (NSW)
LHA	Livable Housing Australia
LVR	Loan-to-value ratio
NCC	National Construction Code
NDIA	National Disability Insurance Agency
NDIS	National Disability Insurance Scheme
NDUHD	National Dialogue on Universal Housing Design
NFP	Not-for-profit
NHL	Nightingale Housing Ltd
NRAS	National Rental Affordability Scheme
NSW	New South Wales
PRS	Private rental sector
RIA	Rights and Inclusion Australia
SDA	Specialist Disability Accommodation
SHO	Social housing organisation
TAC	Transport Accident Commission
TTC	Top trading cycle
UK	United Kingdom

## Glossary

A list of definitions for terms commonly used by AHURI is available on the AHURI website [www.ahuri.edu.au/research/glossary](http://www.ahuri.edu.au/research/glossary).

## Executive summary

### Key points

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This research proposes ways policy makers might consider the digital platform revolution in relation to housing markets. Platforms such as Airbnb and Uber replaced existing matching market managers. Their very substantial improvement in performance has been made possible by technology—more powerful computer chips; the Internet; the World Wide Web; broadband communication, and programming and operating systems that have dramatically reduced the search and transaction costs that previously meant many matching markets did not function well.

The housing system is comprised of numerous matching markets. This research identifies five sub optimal matching markets in housing, and proposes solutions:

- **swaps and transfers in public housing**—we outline how social housing tenant mobility and stock utilisation can be improved by the use of an algorithm to facilitate chain-letting.
  - **accessible housing**—a reiteration of the Victorian-based *Housing Hub* would improve the discoverability of accessible properties and matching to people living with disability.
  - **low-cost private rental housing**—some low-cost private rental housing, currently occupied by higher income households can be matched to lower-income households using a headlease program.
  - **apartment supply for low/mid income earners**—development of apartments can be de-risked by a focus on owner-occupiers, quality and design, which addresses settlement risk, reduces the profit margins required, thus improves affordability, and better matches supply and demand.
  - **precinct-level urban development**—coordination is a problem impeding the redevelopment of greyfield suburbs. A citywide platform is proposed, which can enrol landowners and others at any time, permitting them to indicate their interest in participating in potential redevelopment projects.
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### Key findings

Matching markets are markets in which agents seek to be paired with someone or something, with the criteria for matching often highly specific and requiring reciprocity (Abdulkadiroglu 2013; Abdulkadiroglu and Sönmez 2013; Agarwal 2017). Matching markets differ from commodity markets, in which price connects buyers and sellers. Successful pairing in matching markets is often difficult and costly, so matching making intermediaries have evolved to facilitate pairing. Governments and relevant market authorities have, in some special markets, led the creation of new mechanisms to facilitate better performance—for example in the markets of: kidney donation, medical intern programs, university college accommodation, radio spectrum auctions,

airline landing slots and vegetation offsets (for an overview see Sönmez and Ünver (2011)). New computing power and algorithms have been central to these efforts. In many industries, technology is allowing old matchmaking structures to be being swept aside by entrepreneurial market actors, who establish themselves as the new, more efficient and effective matching market manager (Evans and Schmalensee 2016). These intermediaries are known as platforms.

Parker, Van Alstyne et al. (2016) describe a digital platform as:

*a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform's overarching purpose: to consummate matches among user and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants.*

In this definition, which we adopt, intermediation involves *pulling* producers and consumers to the platform, *facilitating* interactions between them and *matching* producers and consumers 'using information about each to connect them in ways they will find mutually rewarding' (Parker, Van Alstyne et al. 2016: 44). The value created need not be financial. Parker, Van Alstyne et al. (2016) describe the impact on markets as a 'platform revolution'.

This research proposes ways policy makers might consider the platform revolution in relation to improving housing markets by examining five suboptimal matching markets in housing. Our objective is a conceptual exploration to seed ideas rather than provide detailed implementation principles or feasibility analysis.

- Firstly, we examine swaps and transfers within social housing, with the objective of providing greater choice to social housing tenants and better stock utilisation.
- Secondly, we consider accessible housing for sale or market rental and the role a new platform could play in providing the means by which people living with disability could discover accessible market housing and ensuring there is a national inventory of accessible housing.
- Thirdly, we examine the occupation of low-cost private rental housing by higher-income groups and assess whether some of this housing could be reallocated to lower-income households.
- The fourth investigation relates to the lack of supply of new apartments for owner-occupation by low- to middle-income households: we evaluate how search and transaction costs inhibit this market.
- The fifth case we consider is the role a new platform could play in aiding reaggregation of land for precinct-level urban redevelopment and the renewal of 'greyfield' suburbs.

### **Swaps and transfers within social housing**

*Swaps* (or mutual exchanges) are when social housing tenants are able to swap houses with other social housing tenants (traditionally, these transactions are bilateral). *Transfers* occur when a tenant leaves a property and is rehoused in a vacant property. Bilateral swaps involve finding or matching to another tenant who wishes to swap their dwelling for yours and is thus difficult and uncommon. In Australia, social housing tenants have little effective choice over their housing. Tenants on the waitlist are matched to housing according to administrative criteria rather than the preferences of the tenant. Lack of choice extends to post-allocation of initial housing, with policy generally unsupportive of swaps, despite tenants often desiring to move. The resulting lack of choice and mobility has been criticised by the Productivity Commission (2015). In the United Kingdom (UK), the cost to government of poor tenant mobility has been estimated at £542 million per annum (Gulliver 2010). Right to Move provisions were introduced

by the UK government in 2011 to address problems of employment access and poor stock utilisation.

Social housing landlords in the UK have established house exchange platforms to facilitate transfers and mutual swaps. These house exchange platforms are one-sided matching markets and they address the barrier to mobility caused when exchanges are bilateral through 'chain letting'. Chain letting is when multiple properties are swapped as part of a sequence, enabling a larger number of swaps to occur, and is an example of a mechanism design known as a top trading cycle (TTC). The TTC mechanism is well-understood and provides for stable matching, meaning the swapping tenants always obtain a dwelling that is preferable to the one they previously occupied. House exchange programs are more complex than other matching market programs, such as the National Residency Matching Program (NRMP) in the US, but as with the NRMP problems with the UK platforms have been addressed over time.

### **Accessible housing for sale or market rental**

Home ownership and private rental housing are major tenure types providing housing for people living with disability in Australia; however, little private housing is appropriate for people with a physical disability (Beer and Faulkner 2009; Bridge 2005; Bridge, Kendig et al. 2002; Casas 2007; Clarke and George 2005; Harrison 2004; Heywood 2005; Imrie 2004; Imrie 2005; Wiesel and Habibi 2015; Wiesel, Legacy et al. 2015). Finding accessible housing is difficult as there is no inventory or register of accessible stock (Bridge 2005). This discoverability problem reduces the opportunity for matches.

Modifications are typically not advertised, reflecting the adverse impact of such modifications on property value (Imrie 2005), again making accessible housing for market rental or purchase difficult to discover. Furthermore, the lower value of accessible housing often means modified stock is converted to mainstream housing and lost. Some proportion of vendors are, however, likely to prefer to sell to a person living with disability. In addition, a proportion of accessible market housing is occupied by people who are not living with disability, rendering it undiscoverable and unavailable to people living with disability.

### **Low-cost private rental housing**

Many households in the lowest two income quintiles attempt to match to private rental housing that is affordable to them, only to find that it is unavailable as a result of occupancy by higher-income groups (Hulse, Reynolds et al. 2015). This mismatch between affordable stock and low-income households results in housing stress and increased homelessness. Sometimes matching fails because of issues such as discrimination. Facilitating matches of affordable stock to corresponding income groups would be an inexpensive public policy intervention. The National Rental Affordability Scheme (NRAS) and Commonwealth Rent Assistance (CRA) are examples of existing policy interventions aimed at aiding matching in the private rental sector (PRS).

### **The supply of new apartments for owner-occupation by low- to middle-income households**

Developers of new apartments often have difficulty finding matches (i.e. presales). Investors are relatively easier to find than aspiring owner-occupiers and are less concerned with amenity, resulting in apartment product that is orientated to investors rather than owner-occupiers. Aspiring owner-occupiers with low to middle incomes therefore find it very difficult to match to apartment product that is both affordable and of decent quality and design.

Investors are inclined to renege on presale contracts if property prices decline between precontracting and settlement, and developers are able to void contracts or change designs (Sharam, Bryant et al. 2015a). Investor matches are therefore unstable in that they are inclined

to un-match or 'unravel'. The inability of developers to address this 'settlement risk' means their profit margins must be significantly higher than otherwise. This has implications both for cost and supply of new apartments.

Growth of the owner-occupier market segment would provide new supply of relatively affordable and well-located stock. Growth requires buyers who are 'sticky', that is, matches that are stable, in order to minimise settlement risk and competition that would facilitate resulting savings being passed through.

### **Precinct-level urban redevelopment**

Australia's low-density 'greyfield' suburbs, built between the 1950s and 1980s, are now the focus for provision of a new supply of well-located, sustainable housing (Newton, Murray et al. 2011). Greyfield redevelopment presupposes that many existing landowners would retain property ownership, although the redeveloped property would be different from their original holding. Reaggregation of currently fragmented land parcels to enable precinct-level redevelopment would deliver environmental, social and economic benefits. However, aggregation of lots is challenging because of the complexity of coordinating multiple landowners. The high transaction costs involved deter private developers and reduce the return when public agencies undertake renewal projects. The coordination role to be filled by a new platform can be conceived as facilitating matches between landowners and future opportunities.

## **Policy development options**

### **Swaps and transfers within social housing**

Governments could embrace the aspirations of many social tenants who wish to move, and facilitate mobility amongst tenants more generally, as a means of enhancing opportunities for employment and education, to promote better stock utilisation, and promote better connection with services and their families. The cost savings would likely be significant. A social housing exchange platform would facilitate swaps and transfers using a computer program that identifies chains of moves, which provides for more opportunities for swaps than traditional bilateral swaps.

### **Accessible housing for sale or market rental**

Government could promote the discoverability of accessible housing through mandating reporting of accessible properties. This would be a vital step in the creation of a national inventory of accessible housing, which in turn, is necessary for understanding how much accessible housing there is and the effectiveness of measures to increase the stock. The inventory could form the basis for a new reiteration of the Victorian-based *Housing Hub*, a service that matches accessible properties and people living with disability.

### **Low-cost private rental housing**

Governments could support a program, such as a brokerage service, to head lease low-cost private rental housing, effectively quarantining some of this stock for the exclusive use of low-income households. The degree of government subsidy would be minimal, covering administration only: households are simply reallocated from a higher-cost market rent to a lower-cost rent. These households would receive no additional subsidies. Any subsidy is essentially that of management costs of the program. The brokerage could operate as a platform with tenants as members and community services and real estate agents providing property services.

## **The supply of new apartments for owner-occupation by low- to middle-income households**

Government could support the establishment of a matching market platform that matches aspiring owner-occupiers with developers who are willing to share the financial benefits of improved matching with buyers. This support could take the form of financial guarantees and giving preferential access to surplus government-owned land to deliberative development syndicates.

### **Precinct-level urban redevelopment**

A citywide matching market platform could be established by a government agency as a permanent intermediary, providing the opportunity to match people, land and opportunities. Such a platform would provide a cost-effective mechanism for managing engagement with stakeholders over a long period.

A citywide platform would require a different administrative framework than for a single, limited redevelopment site. Data analytics platforms such as Envision Scenario Planner tool (Trubka, Glackin et al. 2016) and AURIN (Delaney and Pettit 2014) provide powerful knowledge about our urban environments, including redevelopment potential, and it would make sense to link such capacity with any platform established to engage with landowners.

## **The study**

This research is part of a wider Australian Housing and Research Institute (AHURI) Inquiry into the *Potential of new technologies to disrupt housing policy*. The study is unusual for AHURI in that it is concerned with new knowledge derived from applying conceptual understandings of market design to housing markets and housing assistance, rather than being an empirical investigation. The intention is exploratory, with the outputs a series of propositions. The purpose of the propositions is not to provide proof of concept but to be a stimulus for reflection and debate. Further research is necessary to test the potential policy and practice applications.

A transdisciplinary research team of academics, policy experts and practitioners explored housing and housing assistance provision through two reiterative workshops aimed at answering the following question and sub-questions:

- How could technology-enabled market ‘redesign’ drive innovation in housing policy and housing assistance to deliver efficiency gains and improve social and economic outcomes?
  - How could social and economic outcomes for tenants and landlords in the PRS be improved by redesigning the market, and how could housing assistance be used to drive such innovation?
  - Could social housing allocations be improved by new mechanism design(s), and what are the opportunities and barriers to realising successful implementation?
  - What potential is there for market design to contribute to improved housing affordability?

# 1 Introduction

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This research responds to digital and disruptive technologies and the way they are reshaping markets, consumer opportunities and service provision and the implications for housing.

Responding to long-standing criticism of the ability of classical economic theory to elucidate the behaviour of housing markets (Clark 2011; D'arcy 2006; Gibb 2009; Marsh and Gibb 2011b; Mclennan 1982; Smith, Munro et al. 2006; Smith 2011a; Smith 2011b), we argue that housing is a 'matching market' (Abdulkadiroglu and Sönmez 2013; Roth 2015). Matching markets are markets, in which agents seek to be paired with someone or something, with the criteria for matching often highly specific and requiring reciprocity (Abdulkadiroglu 2013; Agarwal 2017). They differ from commodity markets, in which price connects buyers and sellers. Matching markets are closely associated with the field of market design, which is concerned with creating rules and guiding market behaviour to create better market outcomes. The housing system is comprised of numerous matching markets.

In many matching markets, finding a match can be very difficult and/or prohibitively expensive. For these reasons, many matching markets, including the housing market, do not function well. The Internet, however, is changing this. The Internet and associated technologies reduce search and transaction costs, effectively 'turbo-charging' matching markets (Evans and Schmalensee 2016). As a result, matching markets have been heralded as the new economics behind digital disruption and the basis for a platform revolution (Parker, Van Alstyne et al. 2016).

This transdisciplinary conceptual exploration considers a number of housing policy challenges, including: declining home ownership, social housing mobility, affordable private rental, accessible housing and urban renewal.

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In his 1982 book *Housing Economics: An Applied Approach*, Duncan Maclennan suggested housing is a special economic case. The lack of explanatory power of conventional economic theory to elucidate the behaviour of housing markets is an ongoing theme within housing studies (see for example Clark 2011; D'arcy 2006; Gibb 2009; Marsh and Gibb 2011b; Smith, Munro et al. 2006; Smith 2011a; Smith 2011b). Although as Mclennan (2010) notes, housing has traditionally been a neglected area of macro-economic thinking. This changed somewhat with the global financial crisis of 2007–08; nevertheless, Marsh and Gibb (2011a) still question whether 'existing explanations of [housing] market behaviours and market movements are fit for purpose'.

The notion that housing is 'different' is fuelled by the failure of housing to conform to the ideal market posited by classical economic theory. This ideal assumes a commodity market in which price plays the role of connecting buyers and sellers. However, not all markets are commodity markets: at the other end of the spectrum are matching markets. Matching markets are markets in which agents (such as aspiring marriage partners) seek to be paired with someone or something, with the criteria for matching often highly specific and requiring reciprocity (Abdulkadiroglu 2013; Agarwal 2017). Within the field of matching markets housing is considered to be a matching market. The concept emerged in the early 1960s, with Gale and



Shapley (1962) work on the matching of marriage partners, which resulted in their deferred acceptance algorithm proposition. Abdulkadiroglu and Sönmez (2013), Roth and Sotomayor (1990) and Sönmez and Ünver (2011) provide surveys of the field. Sönmez and Ünver (2011) locate matching markets within 'matching theory'.

*Matching theory, a name referring to several loosely related research areas concerning matching, allocation, and exchange of indivisible resources, such as jobs, school seats, houses, etc., lies at the intersection of game theory, social choice theory, and mechanism design. Matching can involve the allocation or exchange of indivisible objects, such as dormitory rooms, transplant organs, courses, summer houses, etc. Or matching can involve two-sided matching, in markets with two sides, such as firms and workers, students and schools, or men and women, that need to be matched with each other. Auctions can be seen as special cases of matching models, in which there is a single seller. Recently, matching theory and its application to market design have emerged as one of the success stories of economic theory and applied mechanism design [emphasis in original].*

Application of matching markets theory has been applied to housing in relation to, for example, college dormitory accommodation and the simultaneous auctioning of condominiums (Goeree, Wooders et al. 2004). However, knowledge of these applications and understanding of housing as a matching market has not yet penetrated the housing studies field (or the social sciences more generally)—although Michael Ball speculated that game theory could provide scope for innovation in the property field (Ball 1998). Game theory has been a key influence on the field of market design and hence matching markets. The theory of matching markets can be seen as adding significant depth to Ball's earlier contention that in order to understand the 'structures of housing provision' it is necessary to comprehend exchange equally with production, consumption and management (Ball 1986).

In many matching markets, finding a match can be very difficult and/or prohibitively expensive, with high search and transaction costs. For these reasons, many matching markets do not function well. The buying and selling of housing is a case in point (Roth 2015). The development of commodity markets was a solution to the difficulties in finding matches in some markets (Roth 2015).

The field of matching markets is closely associated with the economic discipline known as 'market design', which is concerned with creating rules and guiding market behaviour to create better market outcomes. Market designers often have the task of fixing poorly performing markets or creating new ones (Roth 2007; Roth 2015). They are often asked by governments or relevant authorities to create mechanisms to facilitate improvements in matching markets. Examples of applications include kidney donation, medical intern residency programs, university college accommodation allocation, radio spectrum auctions, airline landing slots and vegetation offsets, to name but a few. Some degree of trial and error has accompanied these initiatives, with mechanisms subject to revision over time.

A market designer in such a context usually works within a discreet 'market' that provides a controllable environment. The housing system is a series of interrelated, non-discreet markets; but discreet markets, such as social housing, do exist within the housing system. In actual fact, matching markets do not have to be discreet and private entrepreneurial actors increasingly operate within such environments (Uber is a notable example). The consequences are often felt in related markets, raising issues for policy makers as to how, if at all, such businesses should be regulated. These private actors have entered these markets because the Internet and associated technologies are reducing the search and transaction costs that are characteristic of matching markets, in effect 'turbo-charging' those markets (Evans and Schmalensee 2016). For this reason, matching markets have been heralded as the new economics behind digital disruption and the basis for a platform revolution (Parker, Van Alstyne et al. 2016).

Airbnb is the most high-profile example in relation to housing, but it is far from being the only housing matching market. Many new and/or redesigned matching markets in market and non-market housing have been established. Some are succeeding, some have failed and others are yet to prove themselves. These initiatives are occurring specifically because of technological change. Indeed, as eminent market designer Alvin Roth has observed, digitisation requires coding, which in turn requires rules that are explicit. This has the effect of focussing attention on the rules of markets and how markets work within rules; that is, on their 'design' (Roth 2017). This suggests digital disruption inherently involves market (re)design.

The objective of this study was to think about housing and housing assistance in terms of matching markets. Our conceptual exploration examined various parts of the housing system to identify any suboptimal areas in terms of matching. Choosing five 'markets'—swaps and transfers within social housing; accessible housing for sale or market rental; low-cost private rental housing; the supply of new apartments for owner-occupation by low- to middle-income households; and precinct-level urban redevelopment—we asked if these markets could be improved through better matching. Could lessons learnt from Internet platforms—such as improved discoverability or the ways membership can create change—be applied in some way? The results are speculative and further research is necessary to test the potential policy and practical applications.

After providing background and policy context, the report proceeds by examining each of these five markets in turn. In each case we then employ the conceptual lenses used by market designers to elucidate the problems in that market, and then propose an alternate, new market design.

## **1.1 Why this research was conducted**

This research responds to current and emerging digital and disruptive technologies, and the way they are reshaping markets, consumer opportunities and service provision. 'Disruptive technologies' are defined by Christensen (1997) as innovations that disrupt or redefine performance trajectories and consistently result in the failure of the industry's leading firms. Christensen's terminology has been influential, even if his thesis has been disputed, and is now used more generally to refer to situations where technology disrupts existing practises, whether that of an industry or of a market (e.g. the labour market). 'Digital disruption' refers to the combined impact of: more powerful computer chips; the Internet; the World Wide Web; broadband communications; programming and operating systems; and the cloud (Evans and Schmalensee 2016). Enabled by these technologies, further transformation is being wrought by artificial intelligence (AI) (machine learning or cognitive computing) which is replacing traditional data mining (Helbing 2015).

In its early days, the Internet was viewed by many as permitting 'disintermediation'; that is, reducing the role of actors or structures (such as a library or shopping mall) in providing 'platforms' for accessing goods or services (Gellman 1996). Whether purchasing information or white goods, consumers were perceived to be acquiring more market power as they could now avoid 'middlemen'. The Internet (and associated technologies) has been a boon for platforms whose function is to match agents with each other. As the Productivity Commission (2017) notes, information asymmetries and transaction costs have been reduced; and almost boundless data collection and processing enabled. So, while disintermediation has become a feature of the Internet, digital intermediaries or Internet platforms have become ubiquitous and are closely associated with the most transformative digital innovations. But what is a platform? Gillespie (2010) argues this is subject to extensive debate. The least contested definition is computational, being the technical infrastructure. A matching market platform is defined by Parker, Van Alstyne et al. (2016) as:

*a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform's overarching purpose: to consummate matches among users and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants (Parker, Van Alstyne et al. 2016: 5).*

In this definition, which we adopt, intermediation via a platform involves *pulling* producers and consumers to the platform, *facilitating* interactions between them and *matching* producers and consumers 'using information about each to connect them in ways they will find mutually rewarding' (Parker, Van Alstyne et al. 2016: 44). Such matching markets fundamentally differ from traditional business models, which are 'pipeline' businesses in that the supply model is linear, hence the term *supply chain* (Parker, Van Alstyne et al. 2016: 6).

In a traditional supply chain model, each transaction along the chain represents incremental value creation. This value (the *value chain*) is disrupted as supply chains disintegrate in the face of technological change. Using the shopping centre analogy, a producer makes the good and sells to a wholesaler, who sells to a retailer who is located in a shopping centre. This chain itself is not intermediated. The shopping centre is the intermediary (platform) between retailers and shoppers. It attracts shoppers by not charging them for the service it provides. Retail tenants are willing to pay fees (rent) for the service because shoppers are attracted to the centre. Platforms providing online shopping are *new* intermediaries who permit producers, wholesalers, retailers and shoppers to interact with each other independently of the position they used to occupy in the supply chain. This intermediation works for all but the owner of the shopping centre because of the greater value each participant is able to realise (Parker, Van Alstyne et al. 2016).

In the economics literature, the act of locating or finding a match—the pulling—is referred to as 'the search'. In the computer and technology disciplines, searching for a match is referred to as 'discoverability' (Erl 2016). Technology has enabled dramatic improvements to search capacity. However, platforms restructure the market in another important way: they aggregate their users via membership. Membership registers interest and provides for ongoing communication with consumers. In this sense, membership produces a 'bounded' market in that buyers and suppliers are known and reachable. Membership is also a means by which consumers are induced to reveal an extraordinary level of detail regarding their preferences. By aggregating users into pools, the task of discovering a match is narrowed considerably. Algorithms sort preferences and identify matches. Increasingly, new technologies, such as AI, improve this process.

The result of these changes should be 'higher productivity growth and improvements in living standards', although such change also poses the risk 'of higher inequality and dislocation of labour and capital' (Productivity Commission 2016 1). Accordingly, how best to manage technological disruption is now on the policy agenda at all levels of government (e.g. Productivity Commission (2016); City of Sydney (2015)).

To date, there has been little research evidence available to help policy makers, housing providers and housing consumers understand how digital disruption may affect the Australian housing system. Likewise, there is little guidance available to housing policy makers on how technology-enabled change could be harnessed to produce more equitable, effective and efficient outcomes in housing provision and assistance. This project is one of three supporting projects for the AHURI *Inquiry into the Potential of new technologies to disrupt housing policy*. The first project maps the 'disruption ecosystem' to provide a conceptual framework for understanding how new digital technologies might reshape housing provision and assistance (Pettit, Liu et al. 2018). The second (Crommelin, Troy et al. 2018) examines matching market platform Airbnb, which has dramatically reconfigured the short-let housing market.

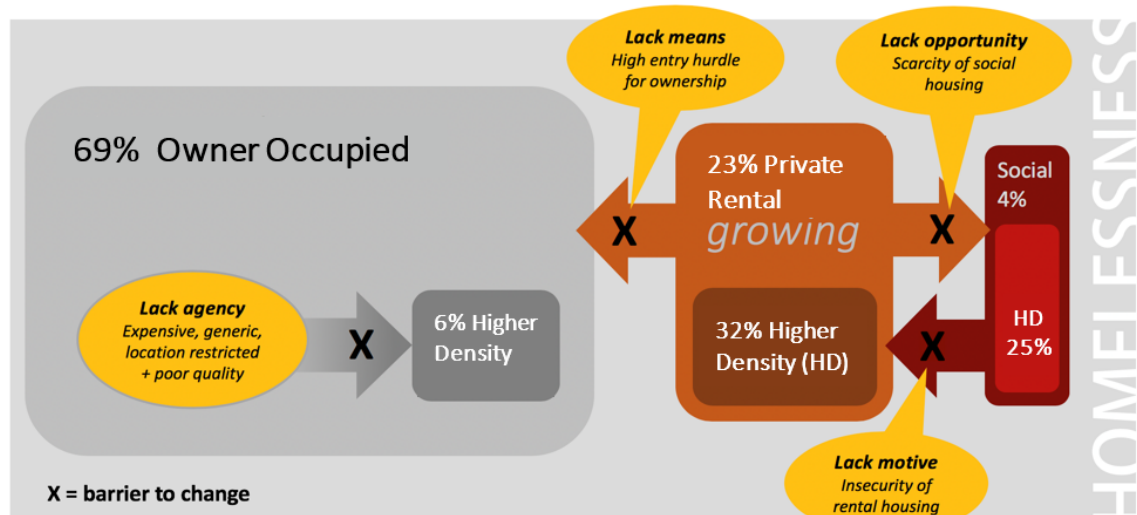
In many countries Airbnb has also impacted the supply of long-let or permanent housing, fuelling significant public interest in how disruptive technologies are reshaping housing opportunities for private market participants (e.g. Said (2015); Coldwell (2016); Ting (2016)). Airbnb is only one of many disruptions occurring within the private property sector. Residential real estate sales platforms have proliferated online, many of which aim for disintermediation, allowing buyers and sellers to transact without a real estate sales agent. Alternatively, buyers can find a real estate agent for a flat fee rather than for a commission (e.g. Purple Bricks). The reduction in search and transaction costs has given rise to new matching markets focussed on fractional investment in housing (e.g. BrickX and DomaCom), shared ownership (e.g. KoHab) and shared rental (e.g. Flatmates.com.au). The Internet has provided new tools for property management, resulting in new economies of scale in property management and industry restructuring (Hulse, Martin et al. 2018). Much of this change reflects improvements to matching. Fully digital land titles have been embraced in many jurisdictions (e.g. PEXA), reducing transaction costs in the house sales market, another matching market.

This project, the third in the Inquiry, focusses on the economics behind the platform revolution and the potential for digital technologies to be harnessed by policy makers to improve matching in a range of housing markets.

## 1.2 Policy context

The Australian housing system is changing. The idea that housing tenure changes in accordance with life stage is being challenged by a decline in home ownership, and the growth of insecure private rental as a long-term tenure of necessity rather than choice. Social housing is highly residualised but despite its problems provides security of tenure for residents. Figure 1 shows the potential links between tenures and highlights that some households lack the financial means to change their housing position, others lack opportunity, while others have no motive to change tenure, which reinforces the increasing siloed nature of tenure in Australia.

**Figure 1: Australian housing by tenure and dwelling type in 2016: points of stress**



Source: Tom Alves and Andrea Sharam. Data derived from ABS 2016 Census of Population and Housing, TableBuilder selected dwelling characteristics (separate house; semi-detached house; apartment or flat); and landlord type (real estate agent; person not in the same household; social landlord).

Private home ownership remains the norm in Australia, with 69 per cent of households purchasing or owning their housing outright, but the rate of home ownership has declined in recent years. The decline is primarily associated with newly forming households, which tend to

be younger households (Daley, Coates et al. 2017; Stone, Burke et al. 2013). Increasingly, blocked aspirations for home ownership—resulting from high entry costs associated with home purchase—mean more households live in private rental housing and for longer periods, with a third of renters now considered 'long-term' renters (i.e. for more than 10 years) (Stone, Burke et al. 2013).

The achievement of home ownership is affected by housing price inflation, which requires a larger deposit and greater proportion of household income to service mortgage repayments (CoreLogic 2016). Many low- to moderate-income households now lack the means to enter into home ownership but also face increased competition within the private rental sector (PRS) from higher-income households who may opt to not purchase housing, or who spend longer periods in private rental than in previous eras in order to save a deposit for home purchase. The result is that the overall availability of affordable rental stock for low- to moderate-income households living in private rental is affected not only by *absolute supply shortages*, but also by *availability shortages*, whereby lower-income households are displaced by higher-income households (Hulse, Reynolds et al. 2015). A consequence is that many lower-income households in the PRS are in 'housing stress'.<sup>1</sup>

Those households in the lower two quintiles of income distribution, faced with the precariousness that is a characteristic of private rental in Australia (Hulse and Saugeres 2008), lack the opportunity to enter into social housing because of the dwindling number of social housing units available and tight rationing of the stock to those with high/multiple needs (Groenhart and Burke 2014). As Figure 1 indicates, social housing makes up less than 5 per cent of housing nationally. Conversely, those living in social housing lack the motive to transition into private rental because of the lack of security of tenure (Wiesel, Pawson et al. 2014). While there are many causes of homelessness, poverty and lack of affordable housing are implicated as important factors contributing to the estimated 116,000 people who are homeless on any given night in Australia (ABS 2018).

The type of housing Australians are living in is also changing. In 2016, one in five households lived in an apartment; compared with one in seven in 1991 (ABS 2017). Living in an apartment is closely associated with private rental tenure, with a third of private rental households living in higher-density housing (see Figure 1). A quarter of social housing tenants live in higher-density housing, although in major cities a significantly larger proportion (40%) live in higher-density housing. Home owners, however, have not embraced apartment living, with only 6 per cent of owner-occupied housing higher-density. New apartment product, overwhelmingly created for investors, is highly generic and much of it is of poor quality and design (Government of Victoria 2015). In short, most apartments are not a good value proposition for an owner-occupier, despite the cheaper purchase price relative to detached houses. Investors, on the other hand, accrue rental income and can take advantage of attractive tax benefits. In addition, the inability of an individual owner-occupier to instigate the construction of an apartment, as is possible with house building, has meant reliance on speculatively developed apartment product. The lack of willingness of households to enter into owner-occupation of such product has implications for community support of urban consolidation policy.

While the suburban backyard is highly valued at a cultural level in greyfield suburbs, it is rapidly disappearing. Greyfield suburbs are defined as 'those *ageing but occupied* tracts of inner and middle ring suburbia that are physically, technologically and environmentally failing and which represent under-capitalised real estate assets' (Murray, Bertam et al. 2015: 9). The renewal of the greyfields presents the opportunity for sustainable residential intensification. Currently,

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<sup>1</sup> Housing stress is when a household in the bottom two income quintiles spends more than one-third of its gross income on housing.

these areas are undergoing significant intensification, despite planning regulations intended to prevent 'over-development' and often the developments are not adequately linked to good planning principles of service access, building community and retention of private and public open space.

Shifting focus from tenure to demand, the National Disability Insurance Scheme (NDIS) estimates there is unmet need for affordable housing for 80,000–120,000 NDIS participants. Indeed, with almost one in five people in Australia affected by disability (ABS 2015), there is evidently sizeable demand for accessible housing. As ageing is a key driver of disability, the ageing of the population increases the need for new supply of accessible housing and for modifications to existing housing.

Understanding demand for accessible housing is complex, and one of the functions of the National Disability Insurance Agency (NDIA) is to provide relevant data. On the supply side, it remains impossible to estimate the number of homes with accessibility features due to the lack of centralised data collection and repository; a problem first identified by Bridge (2005). The need to have an inventory of accessible housing is all the more important because people with disability are among the poorest in the community as they are less likely than those without a disability to participate in the paid labour force (53.4% compared with 83.2%) (ABS 2016), which exacerbates the housing affordability pressures they experience. The lack of affordable and appropriate housing means people with disability are over-represented among the homeless (Beer and Faulkner 2009).

Finally, some things remain constant over time. For those who are able to enter into social housing, the extent to which they have a choice over the housing allocated to them is limited. The price of obtaining social housing and thus housing security is being bound to a specific house and location, with little prospect of being able to move. The Productivity Commission (2017) has recommended the introduction of choice-based letting (CBL) as a means of providing greater choice to tenants, which would then facilitate better stock utilisation. The residualisation of social housing and rent-setting formulas insensitive to the attributes of individual dwellings have been identified as barriers to CBL by Hulse and Burke (2005) and Pawson and Hulse (2011). Alternative solutions must be found for increasing choice within such a constrained system.

These housing issues—of declining home ownership, longer (if not permanent) tenure in private rental housing, the residualisation of the social housing system, the invisibility of private accessible housing, sustainable urban renewal, and private owner-occupation of new apartments—seem a long way from the world of digital disruption. For social housing, the lack of digital disruption is the outcome of non-market provision and being quarantined from the competition that has fuelled change in markets. Prior to the 'turbocharging' of matching markets thanks to digital technology (Evans and Schmalensee 2016), interest in matching markets largely concerned markets (such as kidney exchange) that did not involve price as the clearing mechanism. This suggests that non-market provision of housing and housing assistance should be candidates for digital disruption.

### **1.3 Existing research**

The economic field of matching markets is well established and the literature extensive (see Abdulkadiroglu and Sönmez (2013), Roth and Sotomayor (1990), and Sönmez and Ünver (2011) for surveys). Discussion of matching markets is also to be found within the mathematics, management and computing disciplines, although to a far lesser extent. Parker, Van Alstyne et al. (2016) and Evans and Schmalensee (2016) are examples from the business literature, and both aim to introduce matching markets to a popular audience. Matching markets and market design as a theoretical approach have only just started to transcend this discipline barrier; this is

surprising given matching markets are often concerned with goods and services in which price plays no role in exchange. Such goods and services are typically publicly provided or are heavily regulated and are thus of interest to policy makers and hence to other disciplines. In the field of housing, Sharam, Bryant et al. (2015c) and Sharam and Bryant (2017) argue market design can elucidate problems within the apartment supply process, and suggest that a new matching approach would provide the ability for the orderly supply of apartments, thereby reducing risk and cost.

## 1.4 Research methods

This study is unusual for AHURI in that it is concerned with new knowledge derived from applying conceptual understandings of market design (an economics discipline) to housing markets and housing assistance, rather than being an empirical investigation. The intention is exploratory, with the outputs a series of propositions. The purpose of the propositions is not to provide proof of concept but to be a stimulus for reflection and debate. Further research is necessary to test the potential policy and practice applications.

A transdisciplinary research method was adopted. Polk (2015) describes transdisciplinary research methods as being a response to the multi-dimensionality of serious social and environmental challenges, the solutions to which require the involvement of 'actors from different organizations, interests and spheres of activity' with a number of approaches to knowledge production focussing on 'more integrative and participatory approaches to harnessing scientific knowledge for contributing to societal change' (Polk 2015: 110). In particular, 'Transdisciplinary orientations [sic] in research...try to overcome the mismatch between knowledge production in academia, on the one hand, and knowledge requests for solving societal problems, on the other' (Hoffmann-Riem, Biber-Klemm et al. 2008: 4). Transdisciplinary research synthesises the knowledge of academics from at least two discipline areas and that of the participating stakeholders. This study brought together a team of academics from various disciplines, industry/economics policy makers, and housing and housing assistance practitioners (as outlined in Appendix 3).

Adopting the approach of Defila and Di Giulio (2015), our participant policy makers and practitioners are not simply stakeholders who provide information and/or feedback but rather they take a more active role in the analysis. They are also 'future users' who could 'use the produced result in their professional or everyday life regardless of whether or not they are affected by the investigated problem and/or are stakeholders in the field of the investigated issue' (Defila and Di Giulio 2015: 125). A model-based method was adopted (the detail of which is included in Appendix 3).

The following overarching research question and sub-questions set the agenda for the team.

- How could technology-enabled market 'redesign' drive innovation in housing policy and housing assistance to deliver efficiency gains, and improve social and economic outcomes?
  - How could social and economic outcomes for tenants and landlords in the PRS be improved by redesigning the market, and how could housing assistance be used to drive such innovation?
  - Could social housing allocations be improved by new mechanism design(s), and what are the opportunities and barriers to realising successful implementation?
  - What potential is there for market design to contribute to improved housing affordability?

## 2 What is market design?

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Market design is a field of economics that studies the design of the institutions and arrangements that govern exchanges in a market. The central objective of market design is to improve overall market performance. It can be effectively applied in markets when:

- the market cannot utilise price signals to facilitate transactions
- market participants hold private (i.e. hidden) information that impacts on market performance
- buyers and sellers care about the identity/characteristics of their trading partners.

Market design highlights a number of dimensions of market performance that are often overlooked in applied settings. These include the need to elicit truthful revelation of private information, and the stability of the outcomes produced.

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In economics, a *market* refers to the institutions and arrangements by which the exchange (or assignment) of a particular good or service takes place. This broad definition encompasses a wide array of societal interactions; from highly structured and regulated markets such as the stock market, to decentralised markets such as the labour market. Indeed, within the economics literature the term ‘market’ extends to the matching of relationships, such as students to universities, and the social interactions by which couples meet and enter into life partnerships.

In some markets there exists an individual or body that has the authority to dictate the institutions and arrangements that govern transactions. This authority may derive from legislation, or from ownership of the market in question. In such cases we regard this individual or body as the *designer*. The choices made by the designer can materially affect the outcomes produced by a market—sometimes referred to as the *market performance*.

The field of *market design* studies how a designer can structure market interactions such that they implement the outcomes that best achieve the designer’s objectives. The designer is, in effect, choosing the rules by which the market will operate. In turn, the rules dictate the mechanism by which the market operates. For this reason, the term *mechanism design* is used somewhat interchangeably with market design in the economics literature.

It should be noted that market design is, in general, agnostic with regards to the objectives of the designer. The designer’s objectives may range from profit maximisation to economic efficiency, to specific social outcomes, depending on the context. The designer’s objectives are taken as given in the market design problem, with market performance measured by the extent to which the design achieves these objectives.

### 2.1 Primary attributes of market design

#### 2.1.1 The absence of a price mechanism

In many markets, prices function as an effective mechanism for aligning the behaviours of buyers and sellers. The price equates the quantity demanded by buyers with the quantity supplied by sellers, and also serves to match buyers to sellers. However, there exists a range of markets in which the price mechanism does not (or cannot) produce a socially beneficial market



outcome. In such markets, a designer may be able to improve the operation of the market. The leading example for the absence of a price mechanism is provided by those markets in which prices are prohibited by law from playing a role. An important case in point is kidney exchanges (see for example Roth, Sönmez et al. 2004; Roth, Sönmez et al. 2005; Roth, Sönmez et al. 2007). Individuals in need of a kidney transplant are sometimes fortunate enough to have a friend or relative willing to donate a kidney. Unfortunately, the prospective donor is often incompatible with the intended recipient. Using the principles of market design, economists have had substantial success facilitating kidney exchanges, in which a donation into the exchange is either immediately reciprocated by another compatible donor or grants the donor's friend a priority position on the deceased donor waitlist.

### **2.1.2 Private information that affects market performance**

The problem facing a designer is further compounded when the individuals within a market possess **private information**—information known only to themselves and which cannot be verified by a third party—that impacts on market performance and the objective of the designer. One example is the problem of fragmented property ownership and market price signals. A developer of a potential site only knows the attributes of the property being sold, even though other owners in the street may be interested in selling but not at the same time as the one being sold (they may be waiting to see the outcome of the sale or they may have other issues which only they know). If there was some mechanism to draw out this private information, there may be opportunities for more effective site assembly and better design and community outcomes.

### **2.1.3 Variation in the characteristics of market participants**

In market design, matching has been an important field of concentration. Broadly speaking, matching markets can be classified by roles played by strategic individuals within the market. Accordingly, there are many types of matching markets, and it is important to understand these within applied settings. For our purposes here, however, it is not necessary to go into that level of detail.

## **2.2 A market designer lense**

Market designers use a range of 'conceptual lenses' to assist in understanding the nature of the problems within a given market. In each of the five case studies examined (see chapters 3-7), the following concepts are used to provide an understanding of the nature of the problems and how market design processes could help mitigate them.

### **Product definition**

A product is any combination of services, technology or platforms that provides value to buyers so that they are willing to pay for it. In defining the product (or products) exchanged in a market, it is necessary to consider dimensions such as quality, location, size, and the like.

### **Market thickness**

Market thickness refers to the number of active participants on a given side of a market. Market thickness plays an important role in determining a participant's probability of finding a suitable match. Following McLaren (2003: 14), there are different ways that an increase in market thickness can occur.

- A rise in the number of market participants: If a bilateral exchange between participants is considered, then this implies an increase in the number of participants on both sides of the market (i.e. buyers and sellers).

- An increased versatility of participants: In this case, while the number of participants is constant, thickness can rise due to an increase in the scope of buyers that sellers can serve, or an increase in the scope of products that sellers can offer to buyers.
- Improvements in search efficiency: Any improvement that makes search more efficient. A prominent example of such an improvement is the use of the Internet, which made searching for products more efficient.

### **Information disclosure (safety and incentives)**

In any market design problem when agents have private information that is not readily available to the designer of the mechanism, 'truthful revelation' can only be ensured when the market design (or mechanism) produces the correct incentives.<sup>2</sup> Ideally, in a 'safe' mechanism, truthful reporting of private information will not harm market participants and will produce a better outcome than any possible misrepresentation.

### **Simplicity**

A mechanism consists of rules and procedures. The simpler these rules and procedures are, the more preferable the mechanism is, given that simplicity makes the mechanism operational and easy to implement. Put another way, in a 'simple' mechanism, the participants should understand the range of choices available to them and the consequences of their choices.

### **Congestion**

Thick markets may suffer from congestion. When too many participants try to exchange goods, there may not be enough time to evaluate all possible transactions. One example is online job application platforms. With the advent of the Internet, it is much easier for firms to advertise and for jobseekers to apply for various jobs. The sharp rise in the number of participants on each side (i.e. increased thickness) means it is not always possible to properly evaluate all candidates for a position. In this case, we can say the market is congested.

### **Messages**

This is related to the implementation of the mechanism. In particular, messages represent the means by which participants communicate their choices to each other. This communication can be either direct (where participants directly state what their preferences are) or indirect (where the choices they make reveal their preferences). These options can be designed within a platform (such as an online website with questionnaire).

### **Search**

For transactions to occur, market participants must find each other—that is, those who want to sell must match with those who want to buy. In other words, participants must search for each other. With search, an individual develops an optimal strategy for choosing among potential trade opportunities, accounting for the fact that delay is costly. Choosing the best possible option requires the participant to weigh up the marginal cost of delay against the marginal value of the option in trying one more time.

### **Linkages among markets**

Many markets are interconnected. For example, what happens in the private rental market can affect social housing. Due to this connection between markets, there are externalities between markets. In other words, what happens in one market affects outcomes in others. When

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<sup>2</sup> The revelation principle is a fundamental principle in mechanism design and concerns incentive compatibility

individuals are making optimal choices, they do not always account for the effect of their choices on others. Therefore, under certain conditions, a central authority or regulator is needed to account for this externality.

### **Exploding offers**

These are offers that expire if they are not accepted within a given time frame. Restricting the time available can prevent evaluation of alternative offers, limiting the choice. The concept of exploding offers is very much related to congestion as limiting the time available to accept offers is a response to competition.

### **Unravelling**

Unravelling occurs when offers are made in the absence of key information that can only be subsequently revealed. In the housing context, buying an apartment off the plan is an example: since the presale contract permits modifications to the apartment plan, certain aspects of the offer are not revealed to the buyer until after the purchase has occurred.

## **2.3 A roadmap for upcoming analysis**

In this chapter, we have defined market design and highlighted its link to matching markets through examples. We have listed the major attributes of market design, and defined and identified the fundamental conceptual lenses that are employed by market designers. In the analysis that follows, we look at housing markets and housing assistance through these lenses.

### 3 Social housing: ‘chain letting’ to enable swaps and transfers

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*Swaps* (or mutual exchanges) are when social housing tenants are able to swap houses with other social housing tenants (traditionally through bilateral transactions), subject to certain conditions being met. *Transfers* occur when a tenant leaves a property and is rehoused in a vacant property.

The cost to society of poor tenant mobility in the UK (estimated at £542 million per annum) has resulted in the establishment of house swap platforms. Such platforms enable better stock utilisation, increased opportunity for employment and education, improved health outcomes for both tenants and their extended families, and a reduction in crime and antisocial behaviour. In Australia, swaps and transfers are a neglected area of policy-making, with tenant mobility typically restricted.

Transfers and mutual swaps are facilitated in the UK via *chain letting*. Chain letting is when multiple properties are swapped as part of a sequence, enabling a larger number of swaps to occur. Third-party house swap platforms (which are often owned by social housing landlord consortiums) use chain letting as a key means of enabling tenant mobility.

Market design and matching markets provide the theoretical and conceptual basis for ‘chains’. This report outlines the theory behind chain letting in social housing for the first time.

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Social housing allocations are a form of exchange conducted through bureaucratic administration. The allocation system is largely designed as a two-stage process: the first to determine eligibility for social housing, the second to allocate a dwelling to an eligible household. Swaps or mutual exchanges are where two households are permitted to swap their dwellings with each other, subject to certain conditions being met. Swaps do not involve the filling of a vacancy. In Australia, swaps and mutual exchanges have never been a central element of the allocation process as they are seen as more of a side issue to the core business of first-time allocation.

Most jurisdictions are welcoming of swaps, even though in practice the conditions under which they are allowed might change from one state to another. For example, in Victoria mutual swaps are allowed when both tenants agree to a swap and meet current social housing eligibility criteria, and their households meet the housing size guidelines (DHHS 2017). The Queensland Government, however, requires tenants show why their current housing does not meet their needs, and there is a limited set of permissible reasons for seeking a swap (Department of Employment Economic Development and Innovation 2010).

Transfers occur when a tenant chooses to leave a property and is rehoused in a vacant property. A transfer involves filling a vacancy but also results in a vacancy. As with swaps, there are differences among the states in the way transfers are implemented. In South Australia, the transfer system incorporates two lists: one for high-priority tenants at risk and another for those who just want to move. The high-priority transfers are generally catered for. In New South Wales (NSW), tenants who have a change in their circumstances that affects their housing needs can request a transfer. The reasons justifying transfers are limited and require a high level of documentation, though urgency of cases is considered. Tenants in under-occupied

dwelling may seek a transfer to a smaller property. Transfers simply on the grounds of a preference for different housing or location are not considered (FACS 2016). Community housing providers (CHPs) are more flexible in their approach to transfers (Wiesel, Easthope et al. 2012).

In the UK, barriers to mobility—and hence mutual exchanges and transfers—have faced increased scrutiny (Chartered Institute for Housing 2014; Family Mosaic 2017; Jones and Sinclair 2002; Wilson 2014). Measures aimed at improving the mobility of social housing tenants were included in the Localism Act 2011, and strengthened Right to Move provisions were announced as part of the Autumn Statement 2013 (Department for Communities & Local Government 2015). A primary purpose for the Right to Move provisions was to ‘ensure that tenants are not prevented from taking up an employment opportunity because they cannot find a suitable place to live’ (Department for Communities & Local Government 2015). However, government policy insisted that transfers must reflect tenant *need* rather than ‘wishes’.

Concern that tenants commonly want to move for non-essential reasons is dispelled by Gulliver (2010), who found that health, education and safety were the over-whelming motivations for wanting to move (with the cost of poor mobility an estimated £542 million per annum). The most significant cost saving (£305 million) Gulliver found would be achieved by enabling tenants to care for relatives, and a further £81 million saved by addressing the physical and health consequences of inappropriate housing. He estimated £48 million in costs annually arise from tenants being unable to move into employment, and £18 million arise from tenants wanting to move to take up better work but being unable to. Much larger savings would be available through addressing overcrowding (£58m in relation to the costs to the criminal justice system relating to delinquency, antisocial behaviour and crime), and £32m for educational under-attainment. In 2013 the UK Government imposed an ‘under-occupancy penalty’<sup>3</sup> requiring affected Housing Benefit claimants to pay on average an additional £14 a week (Department for Work and Pensions 2013). This measure resulted in increased demand for smaller properties, although many social landlords were not in a position to provide such properties. In other research Family Mosaic (2017) found a third of their tenants wished to move for reasons including overcrowding, location, suitability of dwelling, and financial and health issues. Mutual exchanges are advocated as a solution (Chartered Institute of Housing 2012).

A number of house swap platforms operate in the UK, with House Exchange the largest. House Exchange was established by housing association Circle Anglia Group, one of the largest housing associations in the UK, as a not-for-profit (NFP) service in 2004. The aim of House Exchange is to have all social landlords join, ‘to help many more people move easy’ (Circle Anglia Group 2012: 12). In the language of market designers, House Exchange is seeking to increase the thickness of the market, which would then increase the opportunity for matches. Increasing the opportunity for matches in this case involves chain letting—that is, when multiple properties are swapped as part of a sequence (Gulliver 2010). Chain letting has historically been difficult to obtain because of lack of vacancies and new supply, lack of provision for downsizing, the priority given to new allocations, and lack of priority for relocations (Thornhill 2010: 34). Family Mosaic (2017: 25) argues that creating ‘chains of housing mobility’, in which voids are first offered to existing tenants wishing to downsize (rather than to applicants on the waiting list), with the downsizer’s dwelling then offered to a family on the waiting list, would result in substantially more people being housed than is possible under the existing policy. This draws attention to both market design and mechanism design.

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<sup>3</sup> The British Welfare Reform Act 2012 introduced a penalty for social housing tenants who were deemed to be under-occupying their property. This measure is also known as the ‘spare room subsidy’ or ‘bedroom tax’.

In the UK, the decline in new supply and the imposition of the 'under-occupancy penalty'<sup>4</sup> has generated increased interest in under- and over-occupancy of existing stock, and hence in swaps and transfers. A new market design is evolving to improve occupancy and provide for greater tenant choice and mobility. Administrative barriers to creating chains are being tackled. Is there an existing public policy objective for swaps and transfers in Australia?

While social housing organisations (SHOs) publish criteria for approving a transfer or swap, articulated policy rationale for swaps and transfers appears to be absent. This is most likely the result of policy-making focussed on the primary rationing process, without allocations at a more systemic level being considered.

A potential rationale is fairness, because the primary allocation process of putting an applicant into a dwelling involves no price signal or other choice mechanisms. In the Australian context, a household will be allocated the dwelling that first becomes available. It is luck of the draw to a large extent as to what dwelling a household gets: Household A may get a brand-new town house in a prime location, while Household B gets a substandard property in a poor location. Should the latter be destined to live there forever, or should processes be created to enable movement after a certain time?

Reviews of CBL suggest increased tenant choice reduces vacancy rates and maintenance requirements (Hulse and Burke 2005). As transfers and swaps enhance choice, they should, in theory, deliver benefits to tenants and housing authorities. Tenants may want to access education opportunities for themselves or their families; to be closer to services, family and friends; to move away from unresolved disputes with neighbours; or they might simply prefer another location or dwelling type.

Transfers and swaps may enable better utilisation of stock and improved cash flow (such as when a single-person tenant relinquishes a three-bedroom dwelling), or permit dwelling renovation or site redevelopment. Needless to say, both swaps and transfers involve additional administration.

### **3.1 Current market design**

In order for a swap to occur, tenants must register their interest in swapping. Current registers held by SHOs in Australia are often rudimentary computer databases of tenants seeking to swap. In Victoria, swaps are arranged through local offices that keep a register of tenants wanting to swap. An officer, at the request of a tenant, undertakes basic searches of the database. The tenant is then able to contact any of the tenants who have put themselves on the list, usually via telephone or email. Family and Community Services (FACS) in NSW provide a computer matching service to facilitate mutual exchanges (FACS 2014).

Tenants in some jurisdictions have established Facebook groups or blogs as communications platforms to find a match (see for example [www.facebook.com/ministryswap/](http://www.facebook.com/ministryswap/)). However, SHOs urge caution in using such sites due to the predatory behaviour of some users.

The alternative to finding a swap is to seek a transfer. However, transfer applications are treated by SHOs as new applications and consequently are entered into the same waiting list as new applications (Wiesel, Easthope et al. 2011). Urgent cases will go onto the priority waiting list.

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<sup>4</sup> The British Reform Act 2012 introduced a provision whereby the Housing Benefit paid to social housing tenants was reduced if they were deemed to be under-occupying their dwelling. This meant tenants were required to fund the gap between their Housing Benefit and their rent if they had a 'spare' room. As a consequence, it is also referred to as the 'bedroom tax'.

### **3.2 What are the constraints on the existing market design?**

The current design for swaps and transfers is not intended to facilitate relocations. Other policy objectives, however, aim to improve occupancy utilisation (i.e. having an appropriate number of people for the residence size). Maximising occupancy utilisation is constrained by the existing profile of social housing stock: a lack of single-person dwellings, for example, decreases the prospect that single tenants living in larger homes will move.

More broadly, policy seeks to improve the employment participation of social housing tenants (see for example (Productivity Commission 2015). While obtaining a job offer provides proper grounds for a transfer, the reverse, namely the possibility that swaps and transfers could contribute to improved job participation, has not been considered. Lack of housing security is likely to deter jobseekers from looking for employment beyond easy reach of their current residence. Alternatively, impeding transfer of a tenant who has found work distant from their current residence may be a means of encouraging their exit from social housing.

Facebook groups and blogs reveal a widespread view that tenants seeking swaps or transfers to more desirable locations (such as coastal areas) are somehow 'ripping off' the system. This reflects a general perception of social housing as a form of charity. This is not an accurate view, given the potential improvements that swaps and transfers can provide. For example, swaps and transfers facilitating the relocation of non-working households (i.e. not jobseeking) to areas with lower employment opportunities increases the opportunity for tenants seeking work, as it provides access to social housing in higher employment regions. At the same time, in light of rising private house prices and the need to stimulate employment in regional areas (as a way of attracting households away from metropolitan areas), the relocation of tenants with healthcare needs to regional areas would provide an economic stimulus in these areas.

### **3.3 Outcomes of restricted swaps/transfers**

The number of Facebook groups and blogs that facilitate swaps for social housing tenants and ex-tenants reflects the role of the Internet in improving discoverability that enables matches—even if only a proportion of those interested in swapping advertise via these means. The uptake of Internet communication channels also underscores the physical barrier to discoverability that occurs when tenants are required to visit an SHO office in order to conduct a search.

These online locations also function as forums for discussing tenant frustration with transfer and swaps criteria, as well as the amount time required to obtain a transfer. These sites therefore represent pent-up demand for relocation. Underlying demand for relocation is unknown.

The policy question is: What is gained by restricting relocation (be that through policy or by not having enabling systems), and what is being lost by not facilitating greater choice? As mentioned previously, CBL provides some insight into the benefits of increased choice. However, the potential gains for asset management, programming of maintenance, property utilisation, and the impact on cash flow are unknown. Modelling would conceivably provide answers.

### **3.4 Market designer lenses: social housing**

Market designers use a number of conceptual lenses to analyse existing markets and guide the design of new markets. Here we apply those lenses to the Australian social housing market.

#### **Product definition**

Social housing per se is, at a policy level, bedevilled by a lack of coherent market design objectives. Importantly, social housing is a package of services that includes:

- security of tenure
- housing affordability
- non-discriminatory access.

Housing by virtue of being located in space provides access to services, employment and amenity associated with specific locations. Social housing tenants typically have little choice over location. Further, income-based rents create a disconnect between many of the attributes of the housing (including quality and location) and the value a tenant puts on a specific type of housing or locality. That is, the lack of price signal results in tenants being unable to adequately rank or trade-off attributes as they would be able to do in the private market (see Burke, Neske et al. (2004) for discussion of tenant willingness to pay additional rent for specific housing attributes). In other words, tenants are constrained to the extent they are able to define the product for themselves.

Product definition is central to the debate on housing assistance, the purpose of which is alleviation of poverty, and hence to discussions of housing affordability. The Productivity Commission (2017), for example, proposes equalising the subsidisation provided to public and private tenants; although this in itself does not deal with the issue of the level of assistance required to address housing affordability. Financial equalisation, moreover, does not address other issues, such as the lack of tenure security in the PRS or housing standards.

### **Market thickness**

Data on the number of swaps and transfers sought and obtained by tenants in social housing is not publicly available, so determining the thickness of this market would require an examination of applications for and actual swaps and transfers granted. Any assessment would need to also consider pent-up demand or unrevealed demand. The Sydney Morning Herald reported that 7,535 households in NSW were waiting for a transfer in 2015 and 380 households swapped (Gooch 2015), but did not provide a figure for transfers. Market thickness is impacted by the amount of social housing in an area sought by a tenant, the number of vacancies and the number of households willing to swap. Between 2010–11 and 2015–16, 12 per cent of Victorian public tenants were seeking a transfer; 15–22 per cent of those were transferred in each year and only 87 mutual swaps were processed over the five years (Victorian Auditor-General's Office 2017 22).

### **Information disclosure (safety and incentives)**

Prospective tenants are provided with limited opportunity to state their locational preferences when first applying for social housing. Within that framework, their need to secure housing means they have a significant incentive to choose areas that increase their chance of being housed (e.g. where there are concentration of social housing), rather than selecting areas that would for other reasons be more suitable (e.g. closer to work opportunities). That is, they have significant incentive to not reveal their true preferences, as the mechanism is not 'safe'.

### **Simplicity**

Most jurisdictions have restrictive criteria for swaps and transfers in social housing, and require extensive documentation. The process for a swap is particularly complex, involving verifications and approvals, and physical inspection of properties. The process is handled manually.

### **Congestion**

The number of swaps occurring in social housing is small, suggesting a lack of congestion.



## Messages and search

The official 'marketplace' for social housing swaps is managed by SHOs, but is done so very inadequately, resulting in tenants establishing their own marketplaces (of which there are many). The plethora of competing platforms, while overcoming the problem of poor access to the marketplace, ironically increases the searching required. Unofficial online marketplaces are not supported by SHOs because they are considered not safe for tenants due to the predatory behaviour of some users.

## Linkages among markets

Applicants on the social housing waiting list, especially those on the priority list, take precedence for vacancies, which affects transfers (Wiesel, Easthope et al. 2011). If swaps and transfers were facilitated to a greater degree, new applicants would be more likely to accept offers made since they would know they could later transfer or swap.

## Exploding offers

None are identified for the social housing market.

## Unravelling

New social housing tenants do not know everything about the residence they are being offered. If they did, would they make a different choice? Consider a case where a tenant moves next door to a to someone who has a history of making violent threats against neighbours? If the tenant cannot move, his/her well-being is affected. The tenant may even choose to move out of social housing and cycle through the homelessness system until they are able to access social housing again. Another example of unravelling is when a tenant does not accept employment because they cannot relocate (i.e. they trade off increased income against security of tenure).

## 3.5 New market design proposal: social housing

### 3.5.1 Objective

To create a house swaps platform (or exchange platform) that enables chains of exchanges (chain letting), with the aim to facilitate the maximum degree of tenant mobility, while ensuring that every tenant who participates in the platform is better off (as defined by the tenant). The features required of the platform are as follows.

- No tenant would be forced into a swap against their will.
- Tenants should be able to do no better than by reporting their preferences for properties truthfully.
- The interface should be sufficiently simple as to enable the inclusion of tenants with disability or impairment, limited education, language barriers, and the like.
- The exchange platform should be able to implement the objectives of the SHO as they relate to the relocation of existing residents and housing of waitlisted tenants. (Ideally, the platform should be flexible enough to adapt to, and implement, the SHO's objectives as they evolve over time.)

### 3.5.2 Proposal: online exchange platform

The proposal is for an exchange platform that is comprised of an easy-to-use web (or app) portal as the interface and a *matching algorithm* that operates at the back end. Our focus here is in describing the operation of the matching algorithm: that is, the mechanism (or rules) by which the platform determines the chains of exchanges to be implemented. The algorithm is

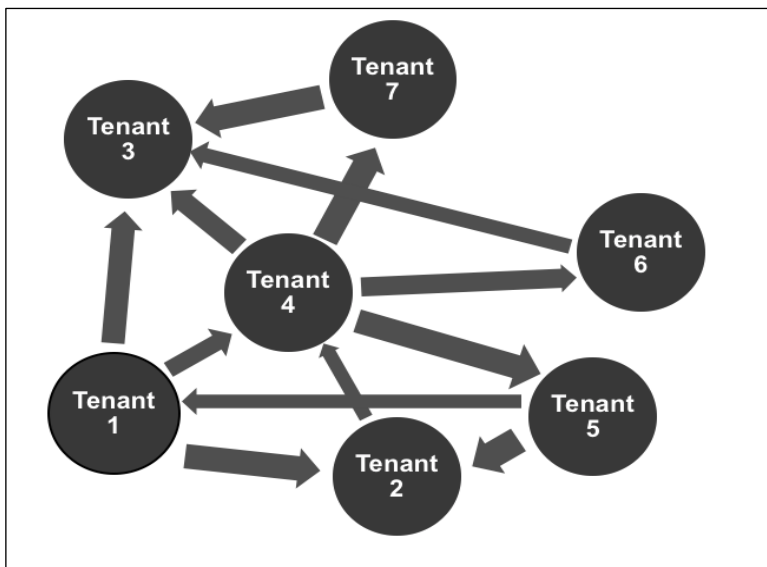
described here in plain language, but the rules are such that the required process can be readily handled by computer.

The matching algorithm that is central to this proposal has a long history in the market design literature. It is a version of the top trading cycle (TTC) algorithm (see for example Shapley and Scarf (1974); Roth and Postlewaite (1977); Roth (1982) Ma (1994)). To begin with, we describe the simplest case, in which all participants on the platform currently reside in a property managed by the SHO.

From the perspective of a tenant the exchange platform would operate as follows.

- 1 Periodically, existing tenants interested in moving are invited to opt into a 'round'. By opting in, the tenant has the opportunity to state a desire to move and simultaneously includes their current dwelling in the pool of potential swaps. Consequently, the number of tenants and dwellings in a given round are the same.
- 2 A description of all dwellings available in a round (characteristics, location, etc.) are provided for participating tenants to see. (Later, we incorporate the possibility that vacant properties are also to be allocated through the swap mechanism—in this case an equal number of waitlisted tenants would also be included.)
- 3 From the list of available dwellings, participating tenants nominate all those that they would prefer over their current residence. An example of the resulting system of nominations is illustrated in Figure 2. In Figure 2, Tenant 1 has nominated the dwellings of Tenants 2, 3 and 4 as being preferable to Tenant 1's current residence. Tenant 2 has nominated the dwelling of Tenant 4 only, and so on. In the event that none of the listed dwellings are preferable to their current home, a tenant always retains the option of not nominating any dwelling (Tenant 3 has exercised this option in Figure 2.)

**Figure 2: Tenant nomination of preferred dwellings**



Source: Authors.

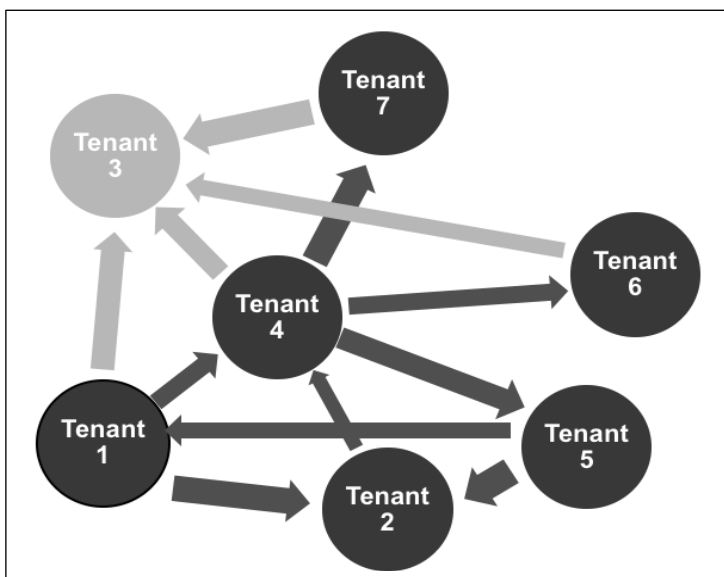
- 4 Each tenant orders the dwellings that they nominated in step 3 (if any) from most preferred to least preferred.
- 5 The algorithm assigns a dwelling to each participating tenant according to the preference listings, having determined the maximum number of mutually beneficial matches that can be made. Swaps then take place.

We believe that steps 1 to 4 could be facilitated, in a straightforward manner, using existing technology.

We now describe the operation of the matching algorithm used to assign dwellings in step 5, as it applies to a case in which no vacant properties and no waitlisted tenants are present in a round.

- 6 The algorithm identifies all tenants who have not nominated a property as being preferable to their current residence.
- 7 The algorithm removes all tenants identified in step 1, as well as their current dwelling, from the round. The removal of such a tenant is illustrated in Figure 3: as Tenant 3 is not willing to move to any other property in the current round, both Tenant 3 and Tenant 3's dwelling are removed.

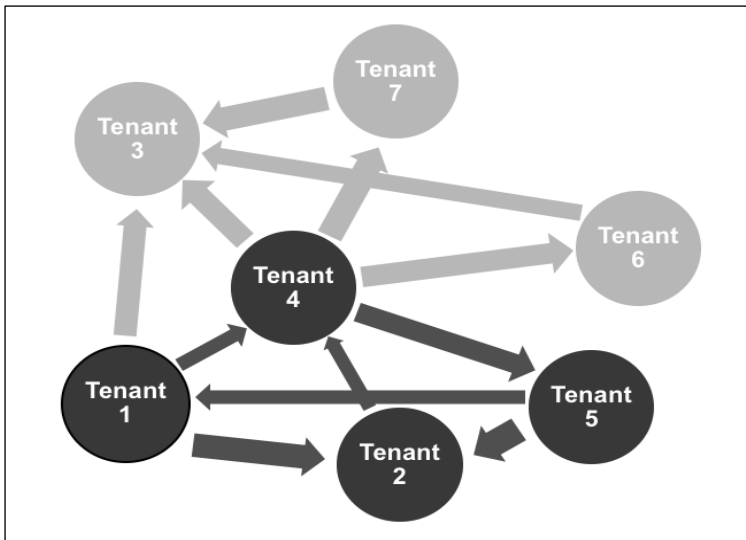
**Figure 3: Eliminating tenants who do not prefer any other dwelling to their current residence**



Source: Authors.

Steps 1 and 2 should be repeated until all tenants remaining in the round have at least one of their nominated properties remaining in the round. To illustrate this iterative process, notice in Figure 3 that with Tenant 3 gone, Tenants 6 and 7 do not prefer any of the remaining properties. Thus, the algorithm requires Tenants 6 and 7 to be removed from the round along with their residences. The results are illustrated in Figure 4. Notice that at this point, every remaining tenant has nominated at least one of the remaining residences.

**Figure 4: The tenants (and residences) that remain after steps 1 and 2 of the algorithm**

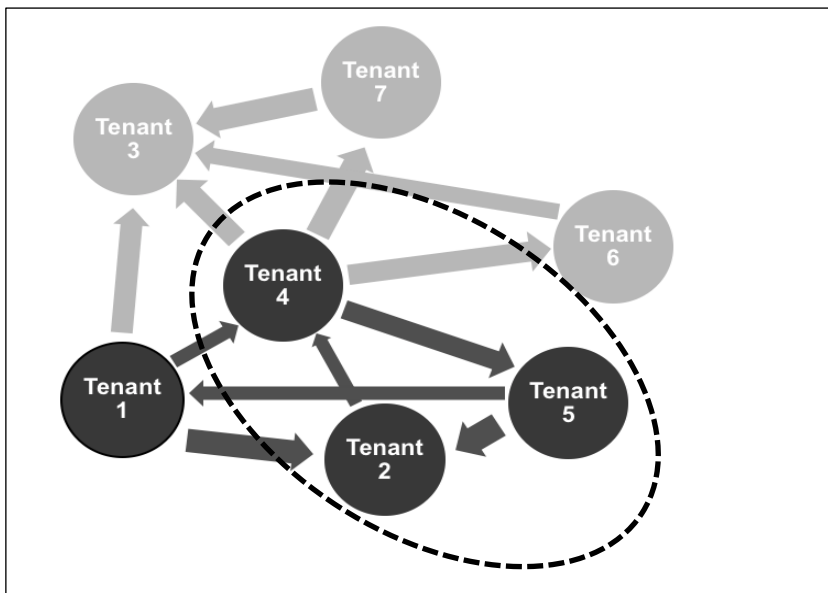


Source: Authors.

The next steps in the algorithm establish the ‘chain’ of exchanges to take place. Notice that the example illustrated in Figure 4 has two chains that would be mutually beneficial to the participants. The first candidate chain has Tenant 1 moving into Tenant 4’s residence, Tenant 4 moving into Tenant 5’s residence, and Tenant 5 closing the loop by moving into Tenant 1’s residence (Tenant 2 does not swap). The second, alternative, chain involves Tenants 2, 4 and 5 moving in the same way (Tenant 1 does not swap). (In Figure 4 we can see that each candidate chain corresponds to a closed loop of arrows.) The algorithm now identifies the chain that best respects the stated preferences of the tenants. The following example illustrates the process by which the algorithm computes the best matches.

- 8** Select one of the remaining tenants in Figure 4 (it doesn’t matter which one, as the outcome of the algorithm is the same regardless of where you start).
- 9** Construct a chain by following the arrow to the selected tenant’s most preferred (highest ranked) property, and proceed in this manner until a closed loop is found. In Figure 4 there are two tenants who have nominated multiple remaining properties (Tenants 1 and 5). For the purposes of our example, suppose that Tenant 1 prefers Tenant 4’s property over Tenant 2’s, and that Tenant 5’s highest preference is the dwelling of Tenant 2. The chain would thus start with Tenant 1, next in the chain is Tenant 4, then Tenant 5, Tenant 2 and finally back to Tenant 4. In this instance the closed loop (or cycle) that the algorithm finds includes Tenants 2, 4 and 5 (see Figure 5). This closed loop of tenants is called a top trading cycle (TTC). Every tenant in the TTC should now be allocated his or her most preferred remaining property.
- 10** At this stage, remove all tenants and properties in the TTC start the algorithm again at step 1 with any remaining tenants. The process stops once all tenants have either been removed or included in a TTC.

**Figure 5: Discovery of a cycle (closed loop)**



Source: Authors.

The presence of a vacant property in the round complicates matters. One way to deal with a vacant property is to allocate it directly to a waitlisted tenant and then allow the tenant to opt into the round as an existing tenant. Alternatively, vacant properties (and an equal number of waitlisted tenants) can be incorporated into a round.

The modification of the TTC algorithm that permits the inclusion of vacant properties into a round is Abdulkadiroglu and Sönmez (1999) 'you request my house—I get your turn' algorithm. The algorithm follows the same process outlined above. However, in this case at step 5, *either* the final tenant's most preferred remaining property in the chain is currently occupied by a tenant who is already in the chain, and thus a TTC exists, or the final tenant in the chain prefers a vacant property. If there is a TTC, it is resolved as described in steps 4 and 5. If the final tenant in the chain prefers the vacant property, every tenant in the chain is allocated their most preferred remaining property. In this case, the first tenant's original residence (if any) is now vacant for the next iteration of the algorithm.

This TTC algorithm and its variations have been described here in very simple terms. Alternatives are possible, depending on the objectives of the SHO. For any set of objectives, a scoring measure can be constructed. If the algorithm is run for every possible ordering of tenants at step 1, with each of the outcomes scored, then the outcome that best achieves the objectives of the SHO can be selected.

### **Summary of the proposed exchange platform**

The process of swaps is conducted in rounds (frequency determined by the SHO). Tenants are invited to participate. The objective is to maximise the number of households willing to participate, so a tenant should not be taking a risk by opting into the system and should be able to do no better than by honestly reporting their preferences. This means the tenant needs to know as much as possible about the property. An interface similar to realestate.com.au could provide location and photographs. Trip Advisor-style review systems or resident surveys could provide a method of properties being scored by existing tenants and neighbours, with results being made available to participants. Properties where there is a known risk from a neighbour are not listed at all, or filters are applied to ensure no inappropriate matches occur. (For example, properties within a specified distance of a convicted paedophile would not be visible to families.)

By opting into a round the household is effectively listing their current residence. Each participating tenant is sent a list of all the properties listed in the round, either via a web interface or an app. The household selects all the properties they would prefer to their current residence. Tenants who choose no properties are taken out of the round (and hence their property is also removed). Properties that are not chosen are also removed, which means those tenants must exit the round. Remaining tenants are provided with a reduced list of properties, which they number from most to least favoured. The process is repeated until everybody who remains in the round has at least one preferred property in the round. The algorithm identifies the system of exchanges that best matches the stated preferences of participating tenants.

When a vacant property is introduced into a round, participating tenants are invited to choose that property; if preferred by at least one tenant, the process results in a new vacancy. This property is then offered to someone on the waiting list and the new tenant can later swap in order to gain a different property.

Introducing a vacant property into a round permits an SHO to prioritise tenants, permitting the highest ranked tenant to choose first.

### ***Implementing the objectives of SHOs***

In our proposed exchange platform, the SHO is the market designer, controlling the allocations and dictating the terms. The SHO, for example, will determine which people qualify for which properties. Under certain circumstances, 'trade-offs' may need to be made. For example, the SHO may not want a couple moving into a four-bedroom house and so can apply a filter so that there are no four-bedroom properties visible to the couple. However, moving that couple into a four-bedroom house may be necessary in order to facilitate a long chain or large loop—a 'trade' which realises substantial benefits. Permitting one couple to up-size may, in fact, facilitate the downsizing of six others. On the other hand, considered in a dynamic sense, it may be better to have that four-bedroom property available at a later time.

All tenants must feel absolutely confident that their participation in the exchange program is voluntary and that there is no coercion. However, a SHO in pursuit of its aims may want to induce demand through incentivising certain tenants to move. In order to achieve better occupancy utilisation, for example, single people in larger dwellings may be offered something over and above a smaller dwelling in order to persuade them to move. Administratively, the simplest inducement would be a rent-free period, but it could also include free removalists or an appliance upgrade in the new property.

### ***Incorporating CHPs***

Incorporating CHPs into the exchange program creates more opportunities for swaps (i.e. it thickens the market). CHPs, like SHOs, would be able to set filters. In the UK, associated administrative hurdles have been an issue for multi-provider exchanges.<sup>5</sup> A second issue that has emerged in the UK is that CHPs find themselves taking problematic tenants they would have preferred to have rejected. A CHP wanting such a tenant to move on has no incentive to reveal what they know about the tenant. An option is to have a means by which a tenant's reputation (poor arrears, property damage or problematic antisocial behaviour) is automatically attached to the tenant when he/she participates in an exchange round (perhaps in the form of star ratings). CHPs could then set a filter that prospective tenants must have at least a three-star rating for the previous 12 months in order to be eligible for a property. Conceivably there may be hard-to-let properties where a CHP or SHO would accept a tenant with a lower rating. CHPs in the UK are considering how the increased opportunity for mobility can become a carrot

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<sup>5</sup> According to Oona Goldsworthy, Chief Executive of United Communities, Bristol, in a personal verbal communication to Andrea Sharam, 21st November, 2017.

used to gain better tenant behaviour. For example, the prospect of being able to move should be an incentive to care for a property, as other tenants are more likely to want to move to a property if it is in good condition.

### ***Logistical challenges***

While the algorithm can identify chains, some of which, at a theoretical level, could be long (meaning involving many households), at a practical level achieving the simultaneous move of many households could be difficult. The matching process means every household in that cycle or loop must move at the same time. Moving house involves the SHO and the households being prepared. The tenant may need to arrange for children to attend new schools, household effects need to be packed and removalists booked, utilities need to be disconnected and reconnected. Houses need to be cleaned and potentially maintenance may need to be undertaken. Administrative systems can be developed to facilitate the moves but it is likely that there would be a limit to how many moves could feasibly occur at once. This limit would need to be considered in determining the length of the chains and the frequency of rounds.

### ***Rental income implications***

SHOs base rents on household income rather than the attributes of the property. Household size therefore affects the rent paid. Allocation policy currently matches households to the size of property they require (with restrictions in place to prevent overcrowding and under-occupancy of bedrooms). Assuming the SHO's objective is improved occupancy rates, the downsizing of lone-person households into smaller properties, opening the way for larger households to occupy larger properties, should have a positive rental receipt impact. Some leakage would occur if occasionally smaller households were to upsize in order to facilitate a longer trade. As rents are income-based, a lone-person household who is working will pay more rent than one on a statutory income. In a one-sided market, this has no impact if the properties are of equal size.

Such a matching market does not address the income-based rent-setting model and the problems that are derived from that. However, if rent-setting were to reflect the type of property (over and above the number of bedrooms—i.e. location, condition etc.) as rents do in the PRS, the matching market platform is the vehicle by which SHO allocative preferences can be blended with tenant preferences, including their willingness to pay.

### **3.5.3 Constraints**

A number of practical constraints exist that may impact on the feasibility of our proposal.

The first constraint is technical. The matching algorithm must be computationally tractable, and it must be possible to design and implement a user-friendly 'front end' readily accessible to tenants of an SHO. At a minimum, tenants should be able to effectively navigate the interface with the assistance of their caseworkers. Fortunately, the algorithm we propose is well within the computational power of modern computers, and current web and app technology should be more than sufficient for the requirements of a front end.

The second constraint is financial. Can our proposed solution be implemented in a cost-effective manner and deliver overall benefits (acknowledging that there are additional administrative costs associated with managing additional tenant moves)? We do not offer an answer to this question. Rather, we acknowledge it as a factor that may impact on the feasibility of our proposal.

The final constraint is logistical. The system of swaps generated by the algorithm must be logistically tractable for the SHOs. The experience in the UK suggests that managing tenant moves is complex, particularly when there are multiple social housing providers involved. We do

not offer an answer to this question, but note that much of this complexity flows from the problems associated with product definition.



## 4 An accessible housing market for people living with disability

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Australian private sector housing fails to provide appropriate housing for people with a physical disability, with a lack of accessible stock compounded by numerous barriers to discoverability.

Lack of accessible stock is exacerbated by the difficulties of identifying appropriate dwellings, as there is no inventory or register of accessible stock (Bridge 2005). Lack of discoverability undermines the contribution of voluntary accessible housing standards in increasing stock.

Modifications that make housing accessible are not typically advertised, reflecting the adverse impact of such modifications on property value (Imrie 2005). This reduces the likelihood of discoverability. Furthermore, the lower value of accessible housing means modified stock is often converted to mainstream housing and lost. Some proportion of vendors are, however, likely to prefer to sell to a person living with disability.

Some proportion of accessible market housing is occupied by people without a disability.

The loss of accessible housing and lack of availability of existing stock undermines new, voluntary supply of accessible housing.

Discoverability can be promoted through the establishment of a register of accessible stock and matching market platform. The *Housing Hub* in Victoria is a nascent matching market which could be expanded to provide this role. Owners looking to sell or rent out their accessible properties would be able to find buyers/renters living with disability, forestalling the loss of accessible properties.

Overseas experience suggests the success of matching markets for accessible housing is dependent on mandatory disclosure of accessible properties by property owners (Scotts, Saville-Smith et al. 2007; Stack 2014).

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Home ownership and private rental housing are major tenure types providing housing for people living with disability. The Australian private sector housing, like much of the Western world, has, in the absence of universal accessibility standards, failed to provide appropriate housing for people with physical disability (Beer and Faulkner 2009; Bridge 2005; Bridge, Kendig et al. 2002; Casas 2007; Clarke and George 2005; Harrison 2004; Heywood 2005; Imrie 2004; Imrie 2005; Wiesel and Habibis 2015; Wiesel, Legacy et al. 2015).

The market for accessible housing is unusual. Unlike typical markets, vital information (i.e. the accessibility of the housing) is often withheld and thus the discoverability of accessible housing is difficult. This lack of transparency arises because some modifications are believed to detract from the value of the dwelling (Imrie 2005). One consequence of lower property value is the removal of accessible features prior to sale. To complicate matters further, accessible housing can be a substitute for non-disability housing and hence some accessible housing is occupied by households that do not include a person living with disability (Scotts, Saville-Smith

et al. 2007). Income-related affordability constraints experienced by most people living with disability affect the price these housing consumers can afford to pay for housing and thus prevents a market premium for accessible housing emerging. A price premium would aid discoverability. The lack of discoverability of accessible properties has its counterpart in the difficulty experienced by sellers of finding a buyer specifically seeking an accessible dwelling. It can be assumed that some vendors and landlords of accessible housing are likely to be sympathetic to purchasers/tenants living with disability (assuming they or a member of their family required modified housing at some point).

## **4.1 Is there an existing public policy objective for accessible housing?**

### **4.1.1 People living with disability**

A disability can range from some limitation in activity to the complete loss of ability to complete an activity. Thus, a disability restricts a person's activities and is particularly significant where it impacts on core activities such as looking after oneself (for example washing, cooking, eating), mobility and communication with other people. It can also impact on a person's social and economic participation in society. The extent to which participation in these everyday activities is affected depends upon their environment and its design, on community attitudes and discrimination, and on the assistance available to people living with disability.

A disability can be the consequence of environmental factors, a genetic disorder, an accident, illness, ageing or some combination of these factors. A person can live with disability from birth or can become disabled through accident or illness at any stage of their lives. According to the 2015 Survey of Disability, Ageing and Carers (ABS 2015), 18.3 per cent of Australians live with disability and the prevalence of disability increases with age—ranging from 3.4 per cent of people aged 0–4 years to 85.4 per cent of people aged 90 years and over—and rises more rapidly for people over 55 years.

Disabilities can be categorised by type or by the extent to which they limit the person. The Australian Bureau of Statistics (ABS 2015) classify five levels of limitation:

- profound core activity limitation
- severe core activity limitation
- moderate core activity limitation
- mild core activity limitation
- schooling or employment restriction.

Alternatively, disabilities can be categorised according to type. (House with No Steps 2015) defines four broad categories:

- intellectual disability: with the person having difficulty communicating, learning and retaining information
- physical disability: when their physical capacity and/or mobility is limited
- mental illness: when mental illness affects a person's thinking, emotional state and behaviours
- sensory disability: which affects one or more senses—sight, hearing, smell, touch, taste or spatial awareness.

Living with disability affects people differently. The above categories give some indication of the range of accessible housing required to meet the varying needs of people living with disability.

Accessibility standards set out minimal requirements for all new dwellings so that they can be more easily modified to meet the changing needs of a household as well as the needs of a range of people living with disability.

#### **4.1.2 Accessibility standards**

The National Construction Code (NCC) sets the minimum requirements for the design, construction and performance of buildings throughout Australia. New buildings must comply with the NCC and the Disability (Access to Premises – Buildings) Standards. Older buildings must comply with these standards when the owner, person or business using the building carries out major renovations or changes. In relation to private housing, the relevant NCC classes are 1a (detached, semi-detached, row, terrace, villa units, townhouses) and 2 (a building containing two or more sole occupancy units). An increase in stock of accessible housing (that meets the accessibility standards as set out in the NCC) is thus only achieved when new housing is built or major renovations of existing housing are undertaken.

The National Dialogue on Universal Housing Design (NDUHD)—a partnership between community, consumer groups, government and industry—first convened in 2009. It advocated a voluntary approach to standards for livable housing design. Members developed the Livable Housing Design Guidelines, which define a ‘livable home’ as one ‘designed and built to meet the changing needs of occupants across their lifetime’, with features that make it ‘easier and safer to use for all occupants including: people with disability, ageing Australians, people with temporary injuries, and families with young children’ (Livable Housing Australia 2017: 8).

The NDUHD set aspirational targets for the voluntary uptake of the guidelines: 25 per cent of all new residential housing to meet the lowest acceptable level by 2013; 50 per cent to meet this standard by 2015; 75 per cent by 2018; and 100 per cent by 2020 (NDUHD 2010).

Livable Housing Australia (LHA) was funded by the Australian Government to progress the target set by the NDUHD. LHA has developed a set of guidelines (now in its fourth edition) for the residential building industry which describes 15 livable design elements across three standards: silver, gold and platinum. It has also developed a certification process whereby qualified industry professionals assess, accredit and certify whether dwellings have achieved LHA silver, gold or platinum standard.

Many of the livable design elements do not dramatically change the appearance of new dwellings and some elements, such as reinforced walls, are not visible on inspection. For example, at the silver level, the seven core design features are:

- 1** a safe continuous and step-free path of travel from the street entrance and/or parking area to a dwelling entrance that is level
- 2** internal doors and corridors that facilitate comfortable and unimpeded movement between spaces
- 3** a toilet on the ground (or entry) level that provides easy access
- 4** a bathroom that contains a hobless shower recess
- 5** reinforced walls around the toilet, shower and bath to support the safe installation of grabrails at a later date
- 6** stairways designed to reduce the likelihood of injury and also enable future adaptation
- 7** at least one level (step-free) entrance into the dwelling (Livable Housing Australia 2017: 13).

Even the design elements at gold and platinum levels do not dramatically change the appearance of new dwelling.

The voluntary approach to accessible housing has been criticised by the Australian Network for Universal Housing Design (ANUHD) and Rights and Inclusion Australia (RI Australia) for failing to generate a systemic transformation (ANUHDRIA 2015; Ward and Jacobs 2017). Critics also argue that the most exacting of the standards, platinum, fails to address common accessibility issues (Nix 2016). Initially, a review of the target was envisaged every two to three years, with the first due (but failing) to occur in 2013. Government funding of LHA ceased in 2014, with the organisation ceasing employment of staff, which suggests there will be no reviews (Ward and Jacobs 2017). Ward and Jacobs (2017: 88) argue 'if the LHA continues with its current approach, a generous estimation is that 5% of the National Dialogue's 2020 target will be reached.' In April 2018, the Building Ministers' Forum agreed with the scope of the Australian Building Codes Board's (ABCB) national Regulatory Impact Assessment, which proposed inclusion of minimum accessibility standards for housing in the NCC (Department of Industry Innovation and Science 2018).

According to ANUHD and RIA, the voluntary nature of the standards has meant there is considerable deviation from the standards. ANUHD and RIA believe approximately 9,300 projects were planned or built with 'something like LHA silver level or above' (ANUHDRIA 2015 8). Of these, 4,000 were social housing units. Further, as some of the key financial supporters of LHA are providers of retirement villages, much of this new stock is not going into the general private housing pool. ANUHD and RIA's criticism of voluntary standards and the lack of monitoring of the inventory of accessible housing echoes Bridge (2005), who found that the quantum of Australia's accessible housing stock is, problematically, unknown and difficult to determine.

The third Building Ministers' Forum announced in October 2017 that it would, in consultation with state and territory disability ministers, undertake a national Regulatory Impact Assessment regarding accessible housing for private residences. The assessment process will examine LHA's silver and gold performance levels as options for a minimum accessible standard (BMF 2017).

#### **4.1.3 Modified housing**

Some proportion of existing housing complies with something like LHA silver level or above, having been built by developers cognizant of the need for accessible housing and/or of the current and future needs of an ageing population, or because some accessible housing was required to obtain a planning permit. In Canberra and Sydney, for example, tens of thousands of apartments have been required to achieve an accessible standard; however, no register of these apartments has been kept by the relevant planning authorities. Such housing typically would not have been marketed as accessible.

Some of this housing that meets accessible standards would subsequently have been modified to meet the particular needs of a householder living with disability. Some of these modifications, such as grab rails, would be minor; others, such as a wheelchair accessible kitchen, would be major. Some dwellings that were not constructed to accessible housing standards would also have been subsequently modified. The quality of these modifications varies, with some just 'making-do' or providing an 'institutional' feel (for example, in the use of non-slip flooring), while others are of high quality with aesthetic appeal.

Some specialised accessible housing is specifically built to meet the needs of particular people living a disability and already has modifications incorporated into its design, for example Specialist Disability Accommodation (SDA).

#### **4.1.4 NDIS**

The NDIS is premised on individualised assistance driven by consumer-choice in the market. The scheme is intended to fund eligible participants for the cost of housing, leaving the decision

as to the type of accommodation to the individual. This funding addresses income-related housing affordability constraints. As yet, the annual funds that will be available to each individual to spend on housing have not been determined. There remains a question of whether these funds should be attached to the housing or the individual, as housing providers are reluctant to make long-term investments in highly specialised housing when it may not be easy to sell the property or fill rental vacancies. This funding is, in any event, currently restricted to a small number of people with very high care needs. A key issue in developing this market is provision of information. The National Disability Insurance Agency (NDIA) is expected to release data on participant's housing needs and preferences to deliver a market signal to housing providers, but this has not yet occurred.

#### **4.1.5 Accessible housing registers**

Bridge (2005) found that the quantum of Australia's accessible housing stock was unknown and difficult to determine. As the NDUHD/LHA did not establish an inventory to track accessible housing supply, this is very problematically still the case.

While the NCC does not require accessibility, accessible housing supply is being facilitated to some extent by planning authorities. The Australian Capital Territory (ACT) for example (Ward and Jacobs 2017) and some NSW local governments require a certain percentage of new apartments to achieve an accessible level (Elenor 2006; Scotts, Saville-Smith et al. 2007; Ward and Jacobs 2017). Councils without such powers are sometimes able to negotiate on a case-by-case basis for the inclusion of accessible housing in new builds. In neither scenario are the accessible dwellings recorded in any inventory of accessible housing. Nor is it likely that developers would market these properties as accessible. An unknown proportion of new housing supply, therefore, complies with something like LHA silver level or above. In addition, an unknown portion of existing housing has been modified to enable people with disability to remain in their existing home and community.

While there is no national inventory of accessible housing, the Summer Foundation in Victoria, an advocacy organisation for people with disability, have established the *Housing Hub* website—a register that lists rental vacancy listings for accessible housing (predominately housing held by social landlords) and accessible properties for sale. The platform supports the development of a market for SDA by encouraging people with disability to register their specific housing needs, in order to establish there is demand for specialist accommodation, which in turn will provide the certainty required by housing developers that enables them to obtain financing. The creation of the *Housing Hub* was influenced by Sharam, Bryant et al. (2015c), who proposed matching markets as a better way of aligning supply and demand in the housing market in order to obtain greater affordability and quality of homes.

Internationally, there are now many examples of accessible housing registers, but surprisingly little current knowledge. Scotts, Saville-Smith et al. (2007) referred to some studies conducted in the early 2000s which examined registers that had been operating for a few years: we were unable to find these studies. However, two later reviews, by Evans (2013) and Stack (2014), support the findings of Scotts, Saville-Smith et al. (2007), so it is safe to assume those early studies align with the findings of later research. The oldest accessible housing register is MassAccess in Massachusetts, which started in 1995.

The success of existing registers is variable, with the Massachusetts registry regarded as the most comprehensive and successful, as dwelling owners are required by law to make information about their accessible properties public (Scotts, Saville-Smith et al. 2007). Other registers struggle to discover accessible properties, and thus, the market tends to be too thin. Registers also find it difficult to maintain up-to-date information on properties.

These are problems typical of those faced in matching markets. Market design can therefore explain the problems and point to solutions. It is worth mentioning that accessible housing

registers also operate in the social housing sector, an example being the London Accessible Housing Register (LAHR). The LAHR has encountered many of the same problems as the private market housing registers (Pawson, Sosenko et al. 2011). The primary difference being that social housing registers (and indeed social housing swaps) are one-sided matching markets, rather than two-sided matching markets (as is the case with the private housing registers). One-sided means that all the participants are on the same side of the market. Put crudely, for the sake of the non-economists, one-sided matching markets, such as apply in social housing are relatively simple and are stable in their outcomes. Two-sided matching markets require special attention to their design, which includes at times the need to compel market participants to do certain things (like be truthful about requirements or asset characteristics). This is one of the reasons why MassAccess has been more successful than other accessible market housing registers.

## **4.2 Current market design**

New supply into the market is voluntary and a lack of mandatory standards means the loss of existing stock cannot be prevented. Obtrusive modifications, such as larger bathrooms and toilet, detract from the property value as these features often involve sacrificing internal space typically given over to other uses. If the vendor does not remove the accessible features, the housing price will be discounted. This puts vendors of accessible, and particularly fully accessible properties, in a quandary. It is likely they paid for the modifications, but may need to remove the modifications in order to realise the highest possible price for the dwelling at sale. In economic terms, there is sometimes a deadweight loss involved. The vendor, moreover, having had difficulty obtaining appropriate housing themselves, will be only too aware that someone else is likely to need such housing.

Unobtrusive accessibility design measures (such as those reflected in the LHA silver standard) may not present a disadvantage in terms of property value. It remains to be seen whether such properties will be marketed as accessible (if they have not been developed specifically for a market segment such as retirees), and whether subsequent sale/rental advertising will mention accessibility. As housing attractive to people without a disability, it is equally likely to be occupied by the non-disabled (Scotts, Saville-Smith et al. 2007). In the absence of mandatory standards, discoverability of accessible housing is as important as new supply.

Many people living with disability have low incomes as a result of incapacity to work or being unable to secure employment; thus, the affordability of private market housing is a major challenge for them (Bridge 2005; Imrie 2005; Saugeres 2010; Wiesel and Habibis 2015). The low income of those on the demand-side inhibits a price signal that would promote discoverability, and a strong preference by those without a disability to not purchase or rent housing that has obvious accessibility modifications incentivises their removal. Theoretically, if more people living with disability had higher incomes, accessible housing could attract a premium. Being able to obtain a price premium would result in vendors advertising the accessibility features, thus improving its discoverability. While accessibility modifications continue to detract from the property value, advertising will not include reference to accessibility or modifications. This means the discoverability of appropriate properties is extremely difficult. Market designers often confront the problem of individuals within a market possessing private information (information known only to themselves and which cannot be verified by a third party) that impacts on market performance and the objective of the designer. In redesigning the private market for accessible housing, a key objective would be providing incentives for owners of accessible housing to reveal the information they hold about their properties.

### **4.3 What are the constraints on the existing market design?**

Constraints on the private market for accessible housing are threefold. Firstly, there is a supply issue. A limited supply of dwellings meets the silver, gold and platinum standards for accessible housing. An even more limited supply has been modified, and this stock is subject to attrition as the supply of modified housing is offset by the removal of accessible housing features. Secondly, there is an availability issue: people without a disability occupy some of the accessible housing (Scotts, Saville-Smith et al. 2007). Thirdly, accessible private market housing is not easily discoverable.

#### **4.3.1 Demand for Specialist Disability Accommodation (SDA)**

NDIA anticipates releasing data on the number of people living with disability and their needs (including location), to enable housing suppliers (particularly for SDA) to plan for new supply. However, this has not yet occurred and housing providers are reluctant to proceed with development as they do not know what the demand actually is.

### **4.4 Outcomes of an undeveloped market for accessible housing**

A small proportion of people living with disability live in housing that is both appropriate and affordable. People with disabilities are frequently discriminated against in the private rental market: this contributes to homelessness and overcrowding. The inability of people living with disability to access appropriate independent housing frequently places an enormous burden of care on ageing parents.

### **4.5 Market designer lenses: accessible housing**

Market designers use a number of conceptual lenses to analyse existing markets and guide the design of new markets. Here we apply those lenses to the Australian accessible housing market.

#### **Product definition**

The heterogeneous nature of disability is a considerable hurdle for the creation of standards, and the difficulties of defining accessibility features and translating these into enforceable standards is a long-standing issue (Helle, Brandt et al. 2011; Imrie 2005). From a market design perspective, standards provide the product definition. When standards are translated into labels (in this case silver, gold and platinum ratings) the barrier to consumers presented by complex information can be greatly reduced. The very heterogeneity of disability, however, will mean trade-offs between simplicity and requisite knowledge are necessary; standards, therefore, are to some extent a guide rather than definitive.

Consumers of accessible housing, in most cases, need to go to considerable lengths to ascertain the information they require about a house for sale or rent (Imrie 2005). Accessibility is not typically an advertised feature of housing and there is no requirement for housing in Australia to be rated for its accessibility. Labelling as a form of information disclosure is intended to make searching for a good or service easier and cheaper, thus improving economic efficiency. Labelling promotes product differentiation, which permits a shift in consumer sentiment away from one good or service in favour of a competing good or service, that is able to charge more for a superior product.

Certification is an important adjunct to standards, as it protects producers as well as consumers. Voluntary standards are often adopted by an industry when higher-cost products face competition from lower-cost products that claim to be the same but are not. An example of the

positive impact of voluntary standards on a market is organic produce. Appliance star labels are an example of mandatory information disclosure; the policy rationale is that consumer sentiment will shift away from the least efficient appliances when it is understood that lower upfront costs are offset by higher running costs. Labelling in this case reduces overall energy consumption and greenhouse gases.

The value provided by certification is that it promotes stability of the product definition. The problem with voluntary standards is that rivals can use similar definitions, thus differentiation is difficult. Whitegoods, being commodities, are traded often and consumers learn rapidly enough that competition can eliminate the poorest performing products. Housing is a matching market rather than a commodity market and is traded too infrequently for bad product to be eliminated from the market. This suggests mandatory standards would be preferable over voluntary standards or mandatory information disclosure.

### **Market thickness**

The high underlying demand for accessible housing—although highly differentiated, reflecting the variation in need—is affected by limitations on capacity to pay arising from the low incomes of most people with living with disability. The supply of accessible housing is limited and vendors of accessible housing are incentivised to sell into the broader market.

### **Information disclosure (safety and incentives)**

While property owners are concerned to achieve the maximum price at sale or maximum rent possible, on the other side of the market people with disability also have an incentive to avoid revealing information on their disability status. Illegal discrimination against people living with disability is common in the rental housing market. Tenants living with disability may therefore wish not to disclose that they have a disability. However, the ability to avoid disclosure is difficult, as landlords and real estate agents can request proof of income, including an income statement from Australia's social security agency, Centrelink. These documents will reveal the disability and carer status of members of the household. In any market design problem, when agents have information that is not readily available to the designer, truthful revelation can only be ensured when the market design (or mechanism) produces correct incentives.

Ideally, in a 'safe' mechanism, truthful reporting of private information will not harm market participants and will produce a better outcome than any possible misrepresentation. The experience of registries suggests that owners of accessible properties will not reveal the information they hold unless compelled to do so. The Massachusetts registry, MassAccess, is regarded as being the most comprehensive and successful registry for this reason (Scotts, Saville-Smith et al. 2007). Massachusetts legislation requires accessible properties are made available exclusively to people with disability seeking housing for a short period before being made more broadly available. We are unaware of any assessment of the impact on property owners and the degree to which such a design may be considered 'safe'.

### **Simplicity**

The challenges around establishing standardised product definitions, as discussed, highlight the complexity of providing information in the accessible housing market. Without standards and certification, technical knowledge is a barrier to transactions. A real estate agent, for example, even with the best intentions, may provide incorrect information to a potential buyer/renter living with disability, for whom there are additional difficulties and costs associated with attending property inspections.



## Congestion

The lack of thickness in the accessible housing market suggests congestion is not an issue.

## Messages and search

Vendors and landlords typically do not advertise properties as having any form of accessibility modification. Such information may not be available even on request. The vendor or landlord may not want to disclose such information or may not understand the request. Tenants may face discrimination if they reveal their disability status. Gumtree ([www.gumtree.com.au](http://www.gumtree.com.au)) provides a platform for sales and rentals of accessible housing, but there is very little advertising and what there is appears to reflect regional markets where it may be difficult to sell property. Tenants may advertise that they are seeking an accessible property (again mostly regional) but these advertisements are like personal appeals, suggesting a lack of market power.

## Linkages among markets

Accessible housing is a housing submarket, and accessible housing can easily substitute non-disability housing. People without disability therefore compete with those living with disability for accessible housing.

Credit markets, both for development and mortgages, are an important element for the supply of accessible housing. The cost to construct highly specialised accessible housing may result in a high loan-to-value ratio (LVR) making it difficult to secure debt financing. Buyers of accessible housing may be willing to pay over the market price in order to secure the housing but mortgage lenders may be unwilling to issue loans if the LVR is too high.

## Exploding offers

Presale contracts for off-the-plan apartment purchases do not guarantee delivery of the initially proposed product. Any changes made by a developer may mean the apartment is no longer appropriate for a buyer living with disability.

## Unravelling

Construction of housing intended for people living with disability, which is then occupied by those without a disability, denotes unravelling. In addition, voluntary standards that give rise to a plethora of competing standards also suggest unravelling.

## 4.6 New market design proposal: accessible housing

### 4.6.1 Objective

To increase the opportunity for people living with disability to buy or rent existing accessible housing by improving the discoverability of accessible and modified housing.

### 4.6.2 Proposal: online housing register ('Hub')

The *Housing Hub* ([www.thehousinghub.org.au](http://www.thehousinghub.org.au)) is an embryonic matching market. 'The Hub' is a digital platform that seeks to match people living with disability with specialised accessible housing. A Victorian service, The Hub is a pilot project run by the Summer Foundation with funding from the Australian Department of Social Services (DSS). The aim is to demonstrate to housing suppliers that there is fully funded demand for rental accommodation now that the NDIA has been established. Currently, the focus is on SDA. SDA housing is shared housing funded by government, and managed by government or a community organisation.

The Hub permits housing suppliers to advertise vacancies and people living with disability are able to register their needs to prompt development. Ward and Jacobs (2017) suggest the lack of

success of voluntary accessibility measures stems in part from concern about the validity of expressed 'need'. A housing hub such as this is a register of actual demand and supply. Further, as Sharam, Bryant et al. (2015a) and Sharam and Bryant (2017) argue, new matching markets that aggregate demand for developers can ensure the orderly production of housing—a phenomenon facilitated by the Internet reducing search costs.

A future reiteration of the *Housing Hub* could become a permanent register of all discoverable standard and non-standard accessible and modified properties, including a profile of each property. The new Hub would list and track accessible properties (Stack 2014). The register would provide the status of properties: current tenure (if known) and whether or not it is on the market. People living with disability would become members of the scheme and provide information on their needs and housing preferences. Strict privacy provisions would apply. As with Facebook, members could activate their status (e.g. currently seeking, interested in potential opportunities), ensuring members only receive advertising they are interested in.

The discoverability of people living with disability is important for housing developers wanting to ensure they have buyers for property sales, or alternatively tenants for rental accommodation, as delays in finding buyers or tenants has a negative cashflow impact. Anecdotally, the experience in the CHPs suggests the lack of a specialised marketplace has meant finding tenants living with disability has been difficult.

Our proposed register would be created through:

- mandatory listing of existing accessible properties by property owners.
- local government listing planning permits, building permits and modifications made by government programs (such as the Commonwealth Home Support Programme and the Home Care Packages Program) and by transport accident agencies in each state/territory
- web scraping<sup>6</sup> to capture data on properties
- crowd-sourced data (e.g. a visitor to a house could write a Trip Advisor-style review)
- algorithms that suggest matches of properties to those seeking housing.

The short-let market provides lessons for the design process.

Accomable was a specialist short-term holiday letting start-up platform providing accessible accommodation to people living with disability. The business was recently sold to Airbnb. Airbnb attracted criticism because the only accessibility standard searchable on their website was 'wheelchair accessible' and being unverified did not necessarily mean a property was accessible by wheelchair. Airbnb says it is working on new accessibility checklists for hosts. Accomable permitted searches of:

- step-free access to property
- step-free access to a bedroom
- step-free access to a bathroom
- roll-in (hobless) shower
- grab rails in the bathroom

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<sup>6</sup> *Web scraping, web harvesting, or web data extraction* is data scraping used for extracting data from websites (see Boeing, G. and Waddell, P. (2016) 'New Insights into Rental Housing Markets across the United States: Web Scraping and Analyzing Craigslist Rental Listings', *Journal of Planning Education and Research*, vol. 37, no. 4, 457-476. DOI 10.1177/0739456x16664789).

- facilities for individuals with a visual impairment
- facilities for individuals with a hearing impairment.

Photo and video technology provided customers with further information (Gazda 2017). Information from such sources cannot, however, always capture a complete picture. A property may have a grab rail, for example, but it may not be installed properly or it may be in the wrong place. For this reason, Accomable attempted to verify accessibility through inspections of properties by staff or local disability community organisations.

With a platform such as Accomable—and indeed at the heart of accessible housing standards—there is a tension between the need for simplicity and the need for highly detailed information that is highly variable. That is, user interfaces need to be relatively simple to navigate, but the search variables need to reflect the nature of the disability and housing, both of which are highly heterogeneous and the fine detail vitally important. This tension creates market friction.

The problem can be overcome by obtaining a specialist assessment of each property. However, such assessments are a significant expense for a person living with disability. A possible solution in the future could be the use of three-dimensional house plans, derived from video or photographs, to permit accurate computer-based assessments. The broad variables could then be used to narrow the field of possibilities.

In market design terms, it is likely Accomable was unable to convince financiers that a thick market could be established, because while demand was claimed to be high, supply was a problem. The sale of Accomable to Airbnb raises another issue: that of short-term letting reducing the supply of long-term lets and owner-occupied housing. This wider issue is addressed in another report in this series (Crommelin, Troy et al. 2018).

#### **4.6.3 Constraints**

The accessible housing market may never be especially thick, which also means it would be difficult to financialise the platform. This has implications for recurrent funding of any future platform operations.

Evans (2013) and Stack (2014) suggest housing registers struggle to ensure information is accurate, of sufficient scope and remains fresh, with the resources required to maintain up-to-date information a significant burden. Some registers, accordingly, place automatic expiry dates on rental and sale listings to ensure those searching for properties are not unnecessarily inconvenienced. Properties listed, however, remain registered with the service. The issue of out-of-date information needs to be considered in the context of otherwise very poor discoverability. Increasingly, technology, especially AI, should be able to track and analyse changes. For example, AI could potentially track external accessibility of properties using Google Street View, automatically 'read' planning permit applications that are accessible online, etc.

Consideration needs to be given to encouraging an existing real estate platform, such as realestate.com.au, Domain or rent.com.au, to include the accessibility features of properties as filter categories in order to improve discoverability. As large existing platforms, they have the expertise required to deliver the functionality required. The potential is for a much deeper, richer platform than a stand-alone single-purpose platform. Despite the resources of the large commercial platforms, they remain advertisers in the tradition of newspapers. As such, purchasers/renters can use filters to aid their searching but have little opportunity to provide their information to the market. That is, the purchaser/renter finds their own match; the platform does not find their match for them as it does not know who they are or what they want. Furthermore, it may be difficult to build trust in a commercial entity.

If a new Australian register of accessible housing was created, a key concern would be who would own it and how privacy would be protected, given it would hold the addresses of very vulnerable people. Matching markets have high information exchange needs and trust is critical to participation in the market. Certain types of properties being advertised, for example those with platinum standard (denoting a resident with very high care needs and hence especially vulnerable), could only be viewed by designated authorised persons, such as caseworkers. The trade-offs are that not all people living with disability have a caseworker, and reducing discoverability reduces the thickness of the market.

## 4.7 Policy development implications

Current policy settings are aimed at increasing the supply of accessible housing. To some extent, however, accessible and modified housing is being lost (i.e. converted to non-disability housing) or rendered unavailable (i.e. through occupation by people without a disability), partially negating the impact of new supply. Conversion of accessible housing sometimes represents a deadweight loss to the economy. This situation serves to emphasise the need for universal accessibility.

A policy consideration is that some proportion of modifications to private housing (both owner-occupied and rental) is publicly funded, with the Commonwealth Home Support Programme and the Home Care Packages Program funding modifications for elderly people to enable them to remain in their homes. State-based schemes, such as the Transport Accident Commission (TAC) in Victoria, at times make modifications to a private rental property, and subsequently remove those modifications from a property when a TAC claimant moves out of it.

The absence of universal accessibility means there is a need to account for the stock of accessible housing and also to consider its availability to those living with disability. A register of accessible housing is a vital planning tool.

In addition to supporting the establishment of an expanded *Housing Hub* and mandating disclosure of accessible properties by landlords and vendors, government could:

- fund the gap between the modified value of a property and the market value (both rental and sale) if owners agreed to not remove modifications—the purchasers could repay this funding after an agreed period using the uplift in property value
- soften the impacts associated with mandatory reporting of accessible properties, such as the possible delay in lettings or sales, by providing support to cover such costs
- in the absence of mandatory reporting, incentivise owners of accessible properties by providing small grants to vendors and landlords to advertise on a registry.

SHOs house a high proportion of people with disabilities. As large rental housing providers, they have asset management systems, but the discoverability of properties with modest modifications (such as ramps and rails) is difficult as these alterations are not necessarily recorded. Use of a recording and classification process that enables coding (an inherent requirement to aid digital discoverability) indicates a direction that could be taken by social housing property management/information management systems.

One option is to establish an online platform, functioning as a clearinghouse, that could service a broader market. The *Housing Hub* is a nascent matching market but it could take on a larger role. Nightingale Housing Ltd (NHL), for example, currently operates another nascent matching market, but it could be incorporated into an expanded *Housing Hub* rather than developing its own infrastructure. NHL develops apartments, including silver standard accessible properties, for owner-occupation. Aspiring buyers register with NHL and when development sites are purchased they are invited to express their interest in the project, and later to enter into a ballot

for the housing if demand exceeds the anticipated supply of dwellings. NHL requests information on accessibility needs and places people living with disability on a segmented list. Other providers of 'quality' housing product (e.g. Residential Independence Pty Ltd, the accommodation program of the Victorian TAC) could also join The Hub, thus increasing the quantity and range of offers available to all (TAC 2017).

If NHL (for example) were to be integrated into the *Housing Hub*, The Hub platform would gain another housing supplier of accessible housing, but also gain the people on the NHL register, most of whom do not have a disability. By broadening the marketplace in this way, perhaps the degree of vulnerability involved in revealing accessible properties is reduced.

Potentially, a SHO or specialist disability housing provider could use the platform when seeking to purchase additional properties if they find that they are short in an area. They could use the register to identify existing properties with appropriate attributes and could then approach the owners about either head leasing or outright purchase.

## 5 The private rental sector: balancing supply through Brokerage Plus

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Many households in the lowest two income quintiles attempt to match to private rental housing that is affordable to them, only to find that it is unavailable as a result of occupancy by higher-income groups (Hulse, Reynolds et al. 2015). This mismatch between affordable stock and low-income households results in housing stress and increased homelessness.

This issue can be addressed by quarantining a proportion of the affordable stock and making it available to households in the lowest two income quintiles. This could occur through:

- a proportion of the affordable stock being head leased by an intermediary/platform such as a brokerage program
- landlords being incentivised to enter into head-leasing agreements by a cash-flow guarantee and other inducements.

Control of some of the supply of affordable stock by an intermediary would provide the opportunity for a new approach to the management of private tenants. For example:

- tenants become members of the scheme by paying a refundable fee (on an instalment basis) rather than a bond
- no minimum lease period and maximum periods reflecting the head lease.

Such a program would involve only a very shallow government subsidy. Tenants would receive no direct subsidy other than what they may already be getting (e.g. CRA). The tenants pay full market rent but benefit by being able to access more affordable stock. Any subsidy is essentially that of management costs of the program.

Here we propose a strategy to quarantine some of the low cost private rental housing through a head-leasing program: Brokerage Plus.

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The PRS is a matching market, with landlords and tenants entering into a mutual agreement. Demand for private rental housing today is significant and growing, driven by blocked ability to achieve home ownership, rationing of a declining number of social housing dwellings, and the large number of international students attending Australian universities. Close to one quarter of Australian households call the PRS home. This growing reliance on the PRS necessarily draws attention to the operation and performance of the sector (Hulse, Martin et al. 2018).

As an increasing number of tenants experience housing stress, the mismatch between low-income households and low-cost stock suggests there is a need for policy makers to focus on mechanisms that match specific stock to specific tenants. CRA, for example, is a mechanism intended to enable tenants to match to housing that would otherwise would be too expensive for them. The increased rental payment contributes to ensuring there is a supply of rental

housing—that is, it allows landlords to match to tenants who would otherwise, because of lack of income, be unable to enter into a mutual agreement with them.

### **5.1 Is there an existing public policy objective for private rental housing?**

Public policy in relation to private rental housing reflects the shift from the direct provision of social housing to assistance with the cost of private rental housing. As of June 2016, around 1.35 million tenants received CRA payments totalling \$4.4 billion (AIHW 2017). CRA payments are capped and adjusted by the Consumer Price Index (CPI) rather than rental increases. Rental assistance provided for private housing is of significantly lower value than that provided for social housing (Productivity Commission 2017).

### **5.2 Current market design**

The Australian Government provides a concession in relation to the taxation of capital gains on investment properties, and negative gearing provisions allow landlords to offset costs relating to their investment against other income. Generous by international standards, these taxation policies, together with a long period of low interest rates, have fuelled property speculation and housing price inflation, suppressing rental yields. Lower rental returns in turn increases reliance on capital appreciation. These taxation policies are attractive to individuals but not to institutional investors, who are interested in yield, with the result that supply is highly reliant on small-scale individual investment locked into relatively illiquid assets.

Residential tenancy law is a state responsibility, with legislators under pressure from tenants in regard to security of tenure and rent setting—and as private rental increasingly becomes a life tenure, in regard to issues such as pet ownership and the ability to make minor alterations. State and territory governments also provide private rental assistance, which supports tenants to access and maintain tenancies.

The NRAS is an example of an existing policy measure aimed at matching eligible households to the supply of new private rental housing. CRA is another, with the mechanism being a payment that allows eligibility-restricted tenants entry into a market segment that they would not otherwise be able to access. This additional capacity to pay supports supply.

### **5.3 What are the constraints on the existing market design?**

The existing design reflects the unintended side effects of housing assistance and taxation policy reforms. It was not the intention of these policies to undermine home purchase or see major growth in private rental, particularly at the higher cost end (see Section 5.4). Decades on, this has been the outcome, but policy reform is difficult given the stakeholder interests that have built up around the current policy instruments.

### **5.4 Outcomes of mismatch in the private rental market**

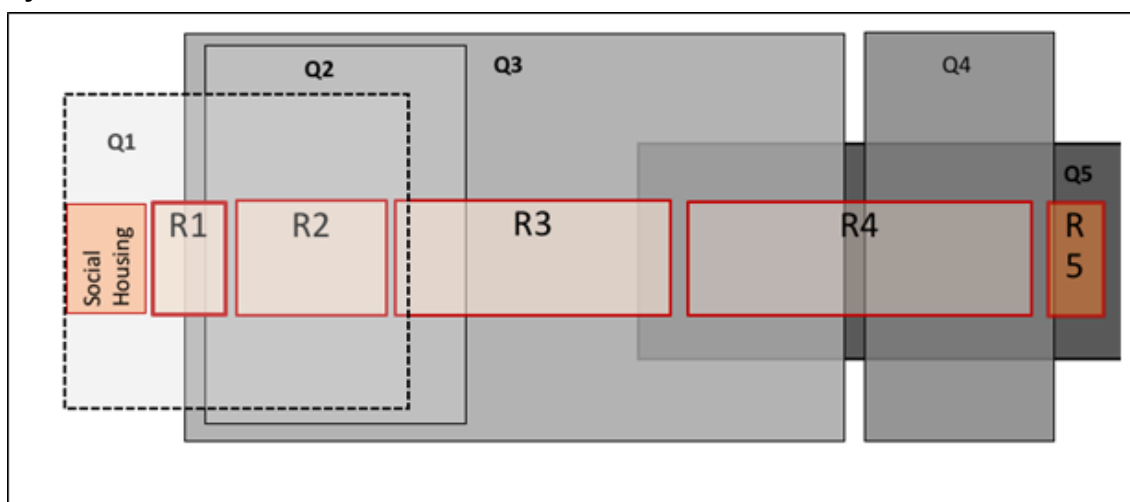
Demand for rental properties has resulted in very low vacancy rates and high rents in major cities, particularly in inner-city areas. There is broad experience of housing stress, which is acute for the lowest income households. Housing precariousness is the norm, with rental increases and evictions the cause of unwanted mobility.

Hulse, Reynolds et al. (2015) analysed private rental supply and affordability according to household income ('affordable' defined as paying less than 30 per cent of household income on

rent). Their research revealed an absolute shortage of stock affordable to households in the lowest income quintile (Q1 <\$30,500), which was exacerbated by a lack of availability (reflecting occupation by higher income quintiles).

Figure 6 represents, in a highly simplified form, each income quintile's (Q1 to Q5) occupation of the corresponding housing affordable to each quintile (R1 to R5). Q1 households (dotted line) occupy R1, R2 and R3 housing.<sup>7</sup> Hulse, Reynolds et al. found that while Q1 households make up 20 per cent of households, only 9 per cent of stock is affordable to them. The deficit of affordable housing for Q1 in the PRS is 187,000. In contrast, Q2 (\$30,501–\$56,000) households represent 22 per cent of households but 43 per cent of the stock is affordable to them. There is little 'top-end' rental housing, so Q4 and Q5 households by necessity must often seek cheaper housing. It would be safe to assume, however, that many seek cheaper housing by choice, as doing so would permit them to save for house purchase.

**Figure 6: Household income quintiles and the housing affordability categories occupied by each**



Source: Andrea Sharam, based on Hulse, Reynolds et al. (2015).

Hulse, Reynolds et al. found two modal points for rents: \$300 and \$500 per week, which accords with lower-income households clustering into R2 housing and higher-income households clustering into R3.

This outcome can be viewed as a market mismatch in which allocation is often awarded to higher-income households for reasons other than price and/or because of factors such as locality. Aggregated numbers do not accurately represent the situation in specific localities. Low-cost stock is often associated with areas of low economic opportunity and hence low housing demand. Conversely, the shortages of affordable stock are most acute in inner-urban areas where there are plenty of jobs. Lower-income households seeking work therefore need to pay higher housing costs or commute long distances in order to maintain employment participation. The mismatch could therefore also be presented as a mismatch between where housing exists and where people want to live. However, the rental price modal points indicate that in larger cities there would be zones in which the competition between Q2 and Q3, and between Q3 and Q4, households would be considerable.

<sup>7</sup> In fact, each quintile occupies all R affordability categories, but in order to reduce complexity we have simplified the diagram. The exact number is provided in Appendix 2. The deficit of affordable and available housing for each quintile is also included in Appendix 2.



## 5.5 Market designer lenses: PRS

Market designers use a number of conceptual lenses to analyse existing markets and guide the design of new markets. Here we apply those lenses to the private rental market.

### Product definition

Australia's tenancy laws, for better or worse attempt to reconcile competing product definitions. On the one hand, the housing is an investment, and on the other, it is someone's home. As the proportion of private rental housing has grown, and has more households spend longer living in private rental, the conflict between these definitions has increased. Tenants' objectives for security of tenure and control over standards has intensified as the product definition for investment has shifted from rental returns to capital appreciation. Policy settings have encouraged the latter, and unsurprisingly have found it difficult to simultaneously provide a stronger definition of rental housing as 'home'.

### Market thickness

At an aggregate level, the PRS can be considered to be very thick in that there are many houses available and many households seeking private rental. There is, however, a shortfall of rental housing available that is affordable to those on low incomes. This suggests there are submarkets in which supply is not thick. Subsidisation of low-income tenants provides access to the thicker market. As indicated in section 5.4, the thickness of the low-cost end of the market is modified by the fact that much of the stock is occupied by higher-income earners. This can occur because in the information disclosure process (see below) the attributes of higher-income households may be more attractive to a landlord. From a consumer perspective, higher-income households may be willing to sacrifice location, quality or size (which will cost more) in order to save for home purchase or other expenses.

### Information disclosure (safety and incentives)

Landlords seek information to determine the credit risk posed by a prospective tenant. There is risk of arrears or non-payment and of property damage. Accordingly, obtaining a tenancy requires a significant level of disclosure on the part of tenants. This includes providing evidence of income (which for Centrelink recipients means disclosing the number of dependents and any disability status), and character—the latter being evidenced by references from past landlords or real estate agents. Landlords and real estate agents are able to undertake credit reference checks and check specialist tenancy databases (commonly known as tenancy blacklists). Informally, they are able to contact a tenant's previous real estate agents. The information obtained shapes the tenant's likelihood of gaining a tenancy. The vacancy rate will also affect the extent to which a landlord may be willing to accept the losses arising from a void in order to obtain an acceptable tenant.

New fintech companies such as Trustbond and Snug offer intermediary services in which the tenant pays insurance in place of a bond (e.g. \$250 instead of \$2,000). The insurance cost is determined in relation to the tenant's online reputation (with the necessary data provided via the company's access to the tenant's social media account). The tenant is effectively credit scored on the basis of the disclosures they make on social media and will pay more or less depending on their apparent trustworthiness. The implication of this is that poorer tenants with a less-than-exemplary credit history and unable to raise the funds for a bond will pay an insurance fee that is less than the bond but still high and non-refundable. Such schemes may be a better alternative to payday lenders, or simply provide a way for such lenders to provide the same service while avoiding regulation of interest rates.

Low vacancy rates in major cities means market-power currency lies with landlords. Landlords or real estate agents can discriminate against prospective tenants for legitimate reasons such

as low income and perception of credit risk. Equal Opportunity laws oblige landlords and real estate agents not to discriminate for reasons such as race, ethnicity, parental status and disability. Tenants and their advocates argue that discrimination is common (Wiesel, Legacy et al. 2015) although it is often difficult to establish.

For tenants, security of tenure and future rental increases are primary concerns. Standard lease agreements provide for very short minimum lease periods (6 and 12 months being the norm) and a maximum lease period of five years. Rents can be increased every six months in line with the market. Landlords have the legal option to terminate tenancies early. Landlords are not required to indicate to prospective tenants if they have an intention to sell the property or reclaim the property for their own or family members' use (a legitimate reason to evict without notice), or whether they intend to increase the rent in the future.

Tenants are interested in whether or not they will have 'quiet enjoyment' of the property. While the law restricts the entry of landlords and agents, breaches are common. Some landlords prefer to self-manage properties and these landlords are often associated with poor property/tenancy management, including unauthorised entry of the property (Stone, Sharam et al. 2015).

Landlords need to provide very little information to tenants and no tenancy database exists for tenants to check a landlord's history or reputation. Trip Advisor-style review mechanisms on the Internet, such as Google reviews, provide the opportunity for tenants to rate real estate agents. However, doing so involves risk for the tenant, as their review could be seen negatively if it came to light as part of the referencing process undertaken by landlords and agents.

Tenants may believe it is in their interest to offer to pay more than the advertised price for a property or may be advised by the landlord or agent to offer more. Thus, informal rent 'auctions' are common.

### **Simplicity**

Advertising of properties has been greatly assisted by the Internet, increasing the capacity to reach audiences. Real estate platforms offer demand-side users many functions to aid their search for properties. Obtaining a tenancy is still not a simple process, although new software applications such as 1form (desktop and mobile-based) are reducing the work involved. 1form permits tenants to create a single application, which is made available to each real estate agency that subscribes to the service.

Tenants are required to book property inspections, submit applications (providing evidence of income and references) and present well. If successful, they must inspect the property in order to verify the property condition report. The tenant will need to provide one month's rent in advance and the equivalent as bond.

The process is not simple for landlords and agents either. The agent or landlord must vet the applications, make credit checks and contact referees. If an agent handles the property, they will need landlord approval of the tenant. A property condition report must be prepared and the tenant must check this and approve, with amendment if required.

### **Congestion**

As a tenant may not be successful in obtaining his/her first preference and may have time constraints for obtaining a tenancy, s/he will probably make multiple applications, all but one of which will be redundant. This involves work for the tenant, as well as for agents and landlords who must assess the applications regardless. A landlord may make an offer, only to be refused when the tenant takes a competing property. Low-income tenants, who are at a disadvantage when competing with higher-income households, will need to make more applications unless they move to less attractive areas or apply for less attractive properties.

## Messages

Real estate agents obtain landlords by two main methods. Firstly, they obtain property to manage as a result of being the agent who buys or sells the property; and secondly, through purchasing rent rolls. 'Rent rolls' are the properties under management of a particular agent. Rent rolls are sold typically through specialist brokers, with the process conducted on a highly secretive basis. The price paid is never publicly disclosed. Landlords are only made aware of any sale after the fact, when they are given the option to find an alternative agent. In effect, landlords often end up with agents they have not chosen.

Traditionally, property management is a low volume/high cost service that makes low returns for real estate agents. The agent's prime interest in maintaining a relationship with the landlord was generally the possibility that the landlord may use the agency to buy and sell property. As the sector has grown, economies of scale mean property management can be a profitable activity—and it is a stable income stream, unlike sales which tend to fluctuate from year to year. Low margins, however, require close attention to costs.

Management of both landlords and tenants is very relationship based. Landlords, in particular, are sensitive to the treatment they receive, and rent roll attrition is significant. In order to avoid client losses, real estate agents need to make their landlords and tenants feel as if they are getting the attention they require, whilst undertaking as little work as possible. New software applications and mobile telephony enable property managers to be available whether or not they are in the office. Back-office tasks are increasingly automated, while others, such as accountancy services, are being offshored. Online dashboards provide landlords and tenants with the opportunity to make requests at any time, knowing the requests will automatically be directed to the responsible person. Technology, therefore, is enabling a fundamental change in the property manager role, permitting the property manager to focus on matters that require actual personal communication.

## Search

Landlords and agents advertise for tenants when they have a vacancy, providing both the address of the property and rent sought. Messaging is aimed at prospective tenants, not sitting tenants. Tenants tend not to advertise that they are seeking a tenancy, although there is some advertising on Gumtree. Platforms such as Domain.com.au, for example, do not even provide this option. Tenants looking for a share house appear willing to advertise and there are specialist platforms, such as Flatmate.com.au, for this. Despite the Internet, there has been no fundamental change in the strategy for obtaining tenants. Communication with tenants ceases once they leave an agency/landlord. In contrast, Airbnb retains the guest on its books because the guest may become return business. As the guest is a member, advertising can be targeted directly at them in order to generate new business. By narrowing the search for its landlords, Airbnb grows its business. There are no signs of this lesson being translated into the long-let market.

## Linkages among markets

Housing is an investment, and flow of capital into the PRS will reflect the risk-adjusted return on investment compared with returns available from other investments, as well as the cost of capital. Favourable tax treatment ensures private rental will attract investment.

## Exploding offers

A prospective tenant might put in ten applications for properties and prefer one above all others, but feel compelled to accept the first offer made rather than risk not obtaining a tenancy at all.

## Unravelling

The limited time permitted to inspect a property, the lack of Trip Advisor-style review options and the pressure to accept any property (rather than a preferred property) means a tenant is unlikely to be fully informed about a property. In particular, issues with the performance of the property (e.g. ventilation, poor noise attenuation, difficult neighbours) may only become apparent after moving in. The tenant may feel the need to move as soon as the lease permits and if very dissatisfied may break the lease. Some tenants will feel they have little choice but to accept a property that has problems, and having moved in will seek to leave as soon as the opportunity presents itself. Both situations cost the tenant and the landlord.

## 5.6 New market design proposal: PRS

### 5.6.1 Objective

To allocate some of the existing private rental housing affordable for households in the lowest two income quintiles to these households.

### 5.6.2 Proposal: Brokerage Plus quarantine mechanism

The proposal seeks to address the availability of lower-cost housing stock, rather than the shortage of stock. Schemes such as the Low-Income Housing Tax Credit program in the US and the NRAS are analogous matching markets. In these cases, the programs match landlords with new housing stock to eligibility-restricted households. The effect is to quarantine new housing supply for the exclusive benefit of the target groups. With the exception of some small-scale community brokerage schemes, this lesson of ring-fencing affordable private rental stock has not been transferred to other housing assistance measures for low-income private rental in Australia and the failure to do so reduces the efficacy of the funds spent on CRA. Our proposal is to apply this lesson to existing low-cost private rental stock, with limited subsidy.

The benefits of such a scheme are obvious.

- By reducing a household's rental costs, financial stress is alleviated, along with some of the social issues flowing from such stress.
- It reduces the demand for social housing by virtue of giving more low-income households affordable options within the existing PRS.
- The degree of government subsidy is minimal, and is to cover administration only: households are just reallocated from a higher-cost market rent to a lower-cost rent. Households receive no additional subsidies.

As outlined above, an unreasonable number of low-income households are in housing stress as a result of being unable to secure affordable private rental tenancies because higher-income groups occupy the affordable housing. While some of these households exercise a preference to allocate a greater percentage of their household budget to housing, the financial situation of lower-income households would suggest that such an outcome is generally not a choice.

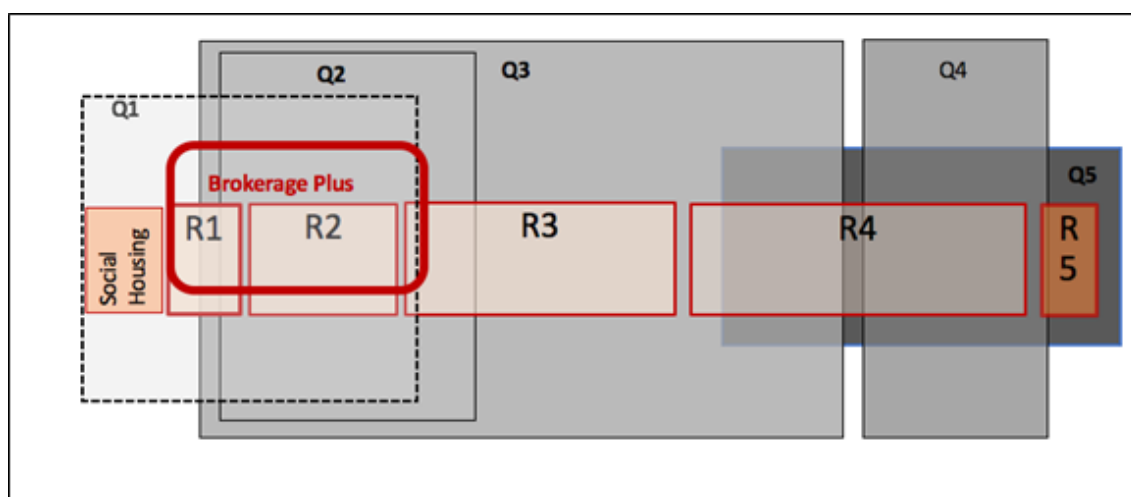
Quarantining some of the existing affordable housing so that it can be matched to lower-income households would be an effective housing assistance measure. Other measures, such as CRA, improve capacity to pay but do not address competition from higher-income groups. The quarantine mechanism proposed is a market rent head-lease scheme. Defence Housing Australia is analogous, as are social housing head-leasing programs, although the latter are subsidised. Quarantining through head leasing provides some of the attributes of current brokerage programs and would be a logical extension of brokerage, hence the description *Brokerage Plus* (see Figure 7).

The scheme would require identifying, for relevant household type, what represents a low-income household. Target groups could be further refined to exclude, for example, international students or all tertiary students, as these populations are temporary low-income renters whose economic situations are likely to improve once they graduate.

Brokerage Plus would apply to R1 and R2 stock and would prioritise Q1 and Q2 households. The scheme would function as follows.

- Brokerage Plus enters into a head-lease contract with private landlords for a set period, utilising commercial leasing arrangements that set out rental payments for the period, maintenance arrangements, grounds for breaking the contract, make-good provisions, and dispute resolution. The duration of the head lease could vary from a few years up to ten years.
- Brokerage Plus enters into a residential tenancy agreement with the tenant. The rent paid by the tenant reflects the rent paid by Brokerage Plus to the landlord.
- The landlord is incentivised to enter into a head-lease arrangement by being offered guaranteed cash flow. Additional incentives could include competitively priced landlord's insurance and property management.
- Philanthropic landlords could be matched with tenants they would like to support. The scheme would seek a tax ruling for 'deductible gift' for these landlords.

**Figure 7: Brokerage Plus: targeted dwellings for head-lease program**



Source: Andrea Sharam, based on, based on Hulse, Reynolds et al. (2015).

As with many new digital platforms, Brokerage Plus would operate as a membership scheme.

- Aspiring tenants become members and stay members until they choose to exit the scheme.
- Tenants provide data such as proof of identity and income when seeking membership. Increases in income do not affect rent paid.
- Properties are initially advertised to members, and if no tenant is found then more broadly.
- When a tenant/member is ready to search for a property they activate their status and provide details on what they are seeking. The algorithm will find possible matches and send the tenant/member and head-lease manager a message. A tenant/member can view all the advertised properties.
- A tenant/member applies for the property as if to a private real estate agency (there is no waiting list).

- A tenant has security of tenure for the period of the head-lease contract and knows at time of signing the tenancy agreement when the head lease will expire.
- There are no penalty provisions if the tenant/member wants to move and another property is available.
- Membership fees apply, becoming payable three months into the tenancy and ceasing once the equivalent of one month's rent is reached. The fee is repayable at exit from the scheme or when leaving a property managed by the scheme. The membership fee replaces the bond. As a membership scheme, it may be legally possible to charge a fee in lieu of a bond, enabling the scheme to retain the fee and use the interest earned to cover administration. Any surplus could be used to provide additional support.
- Payments are made by direct debit, with direct access to CRA payments.
- Education and support opportunities are available to the tenant/member via online learning and/or through caseworkers. The majority of tenants will not require any additional support, although a minority would require intense support.
- Tenants whose income increases during their tenancy may stay in the property on the rent determined in the lease agreement. This enables the household to save or use the extra funds for other essential purposes. If their economic situation has definitely improved they will not be eligible for a new lease once their existing lease expires. If the income increase is not reasonably assured over the longer term, the tenant remains eligible for Brokerage Plus properties. This ensures those who experience precarious employment can be protected, and those gain higher income do not continue to occupy the low-cost stock, preventing other lower-income households from accessing it.

The effect of this proposal is to create a matching market within a matching market: one that adopts a different allocation mechanism. Price is less important in our new market, but unlike social housing, eligibility is less restrictive. The mechanism may be CBL, a simple queuing system or a ballot system.

The platform could be community (i.e. NFP) owned, perhaps a social enterprise real estate agency. Operationally, much of the work could be undertaken by existing CHPs and/or homelessness agencies, with such organisations also being able to provide members with support should they require it. If government support was required to realise the proposal, there may be an issue of competitive neutrality.

Head leasing for social housing provision suggests there would be private landlords willing to enter into such leasehold arrangements. Housing New Zealand leases extensively, with associated property management fees enabling the scheme to operate profitably.<sup>8</sup>

### 5.6.3 Constraints

R1 and R2 properties not in the scheme will be subject to price increases, as more Q3+ households would compete for this stock. This may disadvantage Q1 and Q2 households who do not participate in the scheme (this needs to be considered in the context that currently a large number of these already pay R3+ rents). Lower-income Q3 households (on the margin of eligibility) will be adversely affected by these rising costs. CRA could be amended to provide compensation.

The focus here has been on affordability. Any head-lease scheme would need to undertake analysis on location as a price driver of rents and consider the quality/standard of the housing.

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<sup>8</sup> According to Callum Logan, former Regional Asset Manager of Housing New Zealand, in a personal communication to Andrea Sharam, 19th February 2018.

Some rental markets, such as in regional areas, are well supplied with private rental housing and low demand has meant these markets are broadly affordable.

Removal of R1 and R2 properties from the general market would have a considerable affordability impact on Q3 households in particular. As described in section 1.2, many Q3 households lack the means to enter into home ownership. A comprehensive policy response would create opportunities for such households, either for home ownership or build-to-rent schemes that can offer quality housing and security of tenure. (In chapter 6, new apartment supply is examined as such an option.) Many Q3 and Q4 households rent more affordable stock as a means to save. The proposal here is not to quarantine *all* of the R1 and R2 stock, just some of it. The choice of Q3 and Q4 to rent cheaper stock needs to be considered in the context of the large numbers of Q1 and Q2 households that are compelled to rent more expensive stock.

## 5.7 Policy development implications

The demand for rental assistance (CRA and PRA<sup>9</sup>) is growing as more households find themselves in the PRS, and for longer periods. Demand for housing assistance is most acute among lower-income households as CRA does not bridge the gap between income and rental costs. There is an overwhelming need for supply of affordable housing in the first instance, but in the second instance a need to ensure affordable housing is available to lower-income households. In terms of the latter, policy could shift so that affordable housing is specifically directed towards the households that most require it.

Brokerage Plus (like NRAS) is a program intended to target rental housing to specific income cohorts. Brokerage Plus targets Q1, Q2 and Q3 households and R1, R2 and R3 stock. The intent and impact are the same: to reallocate stock according to income.

Brokerage Plus targets Q1 and Q2 tenants in particular, many of whom would be on a social housing waiting list. The scheme, therefore, is a method of better managing the private rental system to enable lower-income households to access the most affordable rental properties. The additional benefit would be to reduce waitlist need.

Existing head leasing for social housing has revealed a class of landlord willing to participate in such programs. In some cases, the properties may be of poorer quality but in suitable locations. Where landlords are financially constrained in undertaking maintenance, the opportunity exists for Brokerage Plus to undertake repairs/upgrades in exchange for a reduced rent. That is, the scheme also has the potential to become a way of financing landlords to bring their properties up to the desired standard.

Schemes such as Brokerage Plus offer a new tenancy management approach. It is increasingly evident that residential tenancies legislation does not reflect the requirements of a contemporary PRS. There are other issues as well, such as the inadequate training and skills of real estate agents (Hulse, Martin et al. 2018). If the PRS is to be the 'last resort' housing option for low-income and vulnerable households, then some of the lessons of public tenant management need to be translated into private tenancy management. Many households in the PRS are new to renting and lack requisite knowledge and skills, resulting in the breakdown of tenancies and adverse credit histories (Stone, Sharam et al. 2015). Private rental managers are poorly equipped to address the needs of such tenants. Rent rolls are increasingly important to estate agency viability, providing a steady income to hedge against the ups and downs of the

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<sup>9</sup> Private rental assistance refers to financial assistance provided to tenants by state and territory governments

purchase market (Hulse, Martin et al. 2018). Most real estate agency training (limited as it is) is about the latter, with little attention to issues of tenancy management.

Digital disruption, in the form of fintech and data mining, is an emerging threat to tenants deemed a credit risk, resulting in them being excluded or paying more in order to access a tenancy (Hulse, Martin et al. 2018). Essential services markets have a long history of such 'redlining' practices (Sharam 2007). The solution in many jurisdictions is the use of 'providers of last resort' or safety net schemes. SHOs effectively operate as providers of last resort, but as social housing is further residualised there will be a need for a provider-of-last-resort scheme in the PRS as more and more tenants find themselves unable to secure a tenancy or find the terms and conditions of access prohibitive. Current brokerage programs are likely to evolve into providers of last resort. Brokerage Plus is such a provider-of-last-resort scheme.

Disruption by fintech companies, such as Trustbond, have financial implications for state and territory governments. Should the Trustbond model be successful in attracting wealthier households (who may prefer to pay a \$250 insurance fee rather than having \$2,000 in bond monies 'frozen' without interest being payable), bond monies held by government will be reduced and, thus, the interest that accrues on bonds will be correspondingly, lower. There is a possibility that in the future bonds will only be paid by poorer households. This should necessitate reconsideration of how the interest on bond monies is disbursed.

To establish the Brokerage Plus program a number of implementation processes would need to be addressed.

- 1** State governments would be the preferred implementation agency, given the scale and resourcing issues. The government would identify the number of properties to be quarantined (e.g. 20,000) and provide the financial incentives required to encourage this number of landlords to participate in the brokerage program. As there is no rent subsidy, the incentive payment would likely consist of guarantees on property damage, provision of or subsidised landlord's insurance and property management. If these averaged, for example, \$1,000 a year per property, this would only cost \$20 million annually (in addition to management and set-up costs). This is a fraction of the cost of other private rental intervention models.
- 2** A digital platform would need to be established to enable the lowest income quintile households to apply; this in turn would require eligibility criteria for income and assets. These criteria could be similar to those used for the NRAS, and development of the platform could be tendered out.
- 3** A number of Brokerage Plus agencies would need to be identified for administering the program. Again, this could be by tender and the role would preferably go to community sector agencies, some of which already have brokerage programs. There could be resistance from the real estate sector, which would see a loss on rent roll return. This could be addressed by having a proportion of the Brokerage Plus stock managed by estate agents through a similar tender process as used for the community sector. Clear guidelines would need to be created here, including evidence of quality tenancy management.



## 6 Presale of new apartments for owner-occupation by low- and middle-income households

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Developers of new apartments often have difficulty finding matches (i.e. presales). Investors are relatively easier to find than aspiring owner-occupiers and are less concerned with amenity, resulting in apartment product that is orientated to investors rather than owner-occupiers. Aspiring owner-occupiers with low to middle incomes therefore find it very difficult to match to apartment product that is both affordable and of decent quality and design.

Investors are inclined to renege on presale contracts if property prices decline between precontracting and settlement, and developers are able to void contracts or change designs (Sharam, Bryant et al. 2015a). Investor matches are therefore unstable in that they are inclined to un-match or ‘unravel’. The inability of developers to address this ‘settlement risk’ means their profit margins must be significantly higher than otherwise. This has implications both for cost and supply of new apartments.

- Growth of the owner-occupier market segment would provide new supply of relatively affordable and well-located stock.
- A matching market platform would reduce the search costs involved in connecting aspiring owner-occupiers with developers.
- Growth requires buyers who are ‘sticky’ in order to minimise settlement risk and competition that would facilitate resulting savings being passed through. Buyer input into design, materials and sustainability early in the process engenders buyer ‘stickiness’, mitigating settlement risk. Stickiness could be increased by sharing the savings in the form of price discounts. This is not likely to happen, however, unless there is more competition in the market.
- DIY development syndicates would provide the necessary competition and the platform would be able to connect households seeking to join a syndicate. Development syndicates offer affordability gains in the order of 25–30 per cent.
- Government could support the establishment of a platform by providing financial guarantees and giving preferential access to surplus government-owned land to syndicates.
- The platform could service other markets such as the build-to-rent, key worker and accessible housing sectors.

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The supply of new apartments is a matching market characterised by high search costs, heavy transactions costs and instability of matches. The risk of presale contracts not settling, known as ‘settlement risk’, denotes private information which is strategically withheld. Settlement failures are, in effect, instances of matches that subsequently un-match or ‘unravel’. While pre-contracting (presales) of apartments is a measure imposed by financiers, the purpose of which is to confirm demand for the proposed product and ensure sufficient revenue at settlement to

retire debt, and loan covenants can reduce riskier sales, buyers determined to renege on contracts have little in the way of deterrent.

There are many impacts of this suboptimal matching process. It focusses developer attention on those buyer segments most easy to identify: investors in rental housing and buyers of luxury product. The product, accordingly, reflects the demand of these two quite distinct markets. Luxury apartments are unaffordable for low- to middle-income households. While in theory the rental product can be purchased for owner-occupation and is more affordable than detached housing, in reality it offers poor amenity, poor design and quality—thus, less wealthy aspiring home owners find little new apartment product they actually want to match with. This has implications for policy aimed at sustainable urban consolidation.

Working within the existing institutional constraints, the market has evolved to address the risks that emerge from these matching problems. How the industry addresses the risks flowing from unstable matching has implications for supply, measures aimed at improving housing affordability and broader economic stability. Of importance here is the role of financiers and the oligopolistic structure of the development industry (Coiacetto 2009; Dong, Sing et al. 2006; Ong, Jam et al. 2003). Financiers determine who is financed to build apartments, when development will be financed and the minimum profit margin required. The requirement to borrow large amounts of capital and the expertise needed to undertake larger developments constitutes a market barrier that restricts the number of players in the industry and thus competition is limited. Improved matching can reduce costs and risk, but the question remains of how such a shift can be translated into affordability gains given the oligopolistic structure of the development industry. For this we return to the theme of intermediation and the role of platforms in pooling demand.

## **6.1 Is there an existing public policy objective for new apartment supply?**

Urban consolidation policies encourage intensification of housing, and planning schemes facilitate densification in specific localities. Concessions on land transfer duties (stamp duty) for off-the-plan purchases by both owner-occupiers and investors—policy intended to facilitate apartment development—has existed for many years in some jurisdictions. While encouraging new apartments, this concession predates urban consolidation policies. Notably, Victoria and NSW removed the concession for investors as of 1 July 2017 to advantage owner-occupiers over investors (presumably on the assumption that investors bid up the prices or crowd out owner-occupiers). South Australia, on the other hand, provided a concession as part of its 2012–13 Budget to apartments purchased off-the-plan within a defined part of the central city area. The concession was extended in 2016 and now applies to all of the state. The effectiveness of concessions in promoting home ownership is questionable, with benefits of this type typically eroded by the resulting price inflation. However, the concession is of benefit to investors as it improves the return on investment.

## **6.2 Current market design**

Developers of apartments engage in costly presale campaigns (generally around 10% of project cost) to find buyers and the process can take years (Sharam, Bryant et al. 2015a). Campaigns include extensive advertising, engagement of sales agents, construction of display units and in some cases international promotional tours. The discoverability of investors is aided by the payment of commissions of as much as 8 per cent to financial advisors who promote developments to their client lists (Hughes 2018). Investors are also induced by generous taxation incentives not available to owner-occupiers and in some states and territories at some

points in time concessions on land transfer duties (stamp duty), which increases the opportunity for capital gains. Foreign buyers are a highly significant part of the demand for apartments, with many buying real estate in Australia in order to shift capital out of their home country. The City of Melbourne, for example, estimates as much as 85 per cent of new apartment stock in central Melbourne is sold to investors (City of Melbourne 2013). This discoverability problem reflects a lack of thickness in the market.

Developers and their financiers rely on a number of proxies to forecast the strength of future housing demand, including population growth, employment participation, wage growth, credit conditions, migration, housing supply, patterns of household formation and historical sales (Sharam and Bryant 2017). Lenders, however, require that project developers obtain a specific percentage of presales before they will commit funds for construction. This demand needs to be converted into sales within the shortest possible timeline, because the time value of money<sup>10</sup> means that cashflow on housing development projects is negative until settlement (which is when the project is completed). For these reasons, search strategies concentrate on the buyer cohorts that are easiest to find and most likely to purchase: in Australia this is investors.

Presale contracts, in principle, ensure sufficient revenue at completion of building to retire debt. However, presale contracts do not guarantee settlement of the contracts. Market conditions may fluctuate in the time (often years) between presale contracting and project completion (Bryant 2012). Property values may fall, interest rates and input costs may rise, increased competition may result in oversupply, or credit conditions may tighten (Sharam, Bryant et al. 2015a). Buyers in certain circumstances have a strong incentive to avoid settlement if the value of the apartment has declined in the time between contracting and settlement (Bleby 2016; Derrick and Barker 2012).

Settlement is the point at which the developer has expended all funds, thus at this stage the developer and financier are highly exposed. While legal remedy is available to the developer, the cost and reputational risk of undertaking legal action undermine this option. Foreign buyers may simply not be locatable. Financiers address settlement risk by imposing restrictions on foreign sales, or by limiting the number of foreign sales and the number of sales per buyer, and by requiring due diligence on buyers to ensure capacity to purchase. Settlement risk is increased when selling to investors because of their sensitivity to property value. Mortgage lenders are also sensitive to price trends and may withdraw their offer of finance. They may mitigate their risk through lower LVRs, although this is a barrier for purchasers.

In a rising market, presales lock in the price for the purchaser, which could mean a considerable saving for the buyer if settlement occurs some years later. However, Australian Consumer Law permits the developer to amend plans, leaving presale buyers with no recourse if they are dissatisfied, or to void the contract if the development has not commenced after a certain period (Bleby 2016; Derrick and Barker 2012). The NSW Government has clamped down on the latter practice and the Victorian Government is considering how it can respond to this problem. Having established that developer pursuit of investors reduces the thickness of the market and reinforces reliance on investors, we turn to how this then affects supply.

The apartment development industry is an oligopoly, with significant barriers to new entrants (Coiacetto 2009; Dong, Sing et al. 2006; Ong, Jam et al. 2003). As a capital-intensive activity dependent on debt financing, development proposals are subject to rigorous credit assessment of the proponent's character, capital, capacity, collateral and conditions (Bryant 2012), which restricts the number of firms in the industry. The oligopolistic nature of the industry indicates a lack of thickness on the supply side of the market. Each project is scrutinised by lenders and

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<sup>10</sup> The 'time value of money' is the concept that interest can be earned on money. The longer a development takes the lower the return on investment.

demand itself is a key determinate of whether a project will be able to proceed; inadequate demand or looming oversupply will result in financiers refusing to lend or exercising their right to refuse to release funds for construction. Oversupply, therefore, is subject to correction, although there is a time lag. Thus, the norm is chronic undersupply (which upholds the market price and hence project viability), with a short period of oversupply resulting in firms exiting the market, either voluntarily or as a result of bankruptcy. Some degree of price discounting occurs at this point as an attempt to cut losses (see for example Bleby 2018; Hughes 2018; Schlesinger 2017). This is followed by a longer period of inactivity, reflecting lack of demand. The policy implication is that housing affordability cannot be improved by increasing supply. The industry needs demand to outstrip supply in order to de-risk projects and to maintain project viability. Project viability is determined by the profit margin required to compensate for the difficulties in finding matches and the instability of matches.

Investors are less concerned with amenity issues than owner-occupiers, so a result of the focus on investors is that apartment stock is highly generic, typically of poor design and low quality, particularly in Victoria (Government of Victoria 2015). This reinforces the lack of appeal of apartments to owner-occupiers. Investors' lack of concern with amenity provides developers with the scope to increase dwelling yield, which is a major factor in achieving project viability. Financiers typically impose a minimum profit-on-cost target, currently 20 per cent (Sharam, Bryant et al. 2015b; Sharam, Bryant et al. 2015c). Projects, accordingly, need the gap between expenditure and revenue to deliver a 20 per cent margin. Projects unable to convincingly forecast this minimum margin are not viable and would not normally be funded.

This 'structure of housing provision' (Ball 1986) reflects the pricing of risk, with risk being the problems with matching. A key public policy problem stemming from this is that apartments should be a source of relatively affordable owner-occupied housing in localities that are employment and service rich, but they are not.

### **6.3 What are the constraints on the existing market design?**

The existing design is, in effect, a rental investor model. Projects intended for owner-occupiers are aimed at the luxury end of the market where the margins enable larger dwelling size and better quality. There is no model of provision aimed at providing value-for-money affordable owner-occupied apartments. The issue, then, is not redesigning the current market but designing an alternate market specifically for affordable, quality home ownership.

### **6.4 Outcomes of mismatch in new apartment presales**

There is currently no market for quality affordable apartments aimed at owner-occupiers. Existing apartment product is highly generic, poorly designed, of poor quality and have low sustainability standards. This poor quality of building increases future liabilities, reducing any purported affordability gains.

### **6.5 Market designer lenses: new apartments**

Market designers use a number of conceptual lenses to analyse existing markets and guide the design of new markets. Here we apply those lenses to the Australian new apartments market.

#### **Product definition**

Unlike the market for new detached housing, where it is impossible to distinguish housing that will be owner-occupied and that which will be tenanted, most apartments are developed reflecting the interests of investors. The product, therefore, is a rental investment. Apartments

can be purchased by an owner-occupier, but the assumption at the outset of the development process is that the property will be tenanted.

### **Market thickness**

Market thickness is a critical issue in the new apartments market. The thickest segment of demand is investors. In contrast, owner-occupiers are currently relatively few. The more projects are orientated towards investors, the less attractive they are to potential owner-occupiers; thus, the two demand pools are discreet. The supply side of the market is also thin, with the development industry an oligopoly.

### **Information disclosure (safety and incentives)**

Both buyers and developers have an interest in strategically withholding information, which increases the risk for both parties.

### **Simplicity**

The process of purchasing off the plan is not a simple one. Developers are required by financiers to undertake due diligence on presale contracts and buyers are well advised to seek legal advice before signing a contract.

### **Congestion**

The lack of thickness in the new apartments market indicates an absence of congestion.

### **Messages**

Currently, consumers have little opportunity to reveal their preferences. Decisions about design, choice of materials and sustainability measures are made before the developer seeks financing and confirmed once statutory approvals are granted. Presales only commence once the approvals are gained.

### **Search**

Developers undertake often lengthy and expensive presale campaigns in order to find buyers. This search has a material impact on project profitability, and delays in securing buyers can result in projects being shelved. Buyers rely on advertising and visits to display units. Prospective buyers must wait for a project to be advertised, as few developers are branded to the extent that buyers would think to seek out a proponent. Actual apartments in previously completed developments are typically not available to inspect, given that these will have been sold—besides which, many developers would want to expose buyers to a real finished product.

### **Linkages among markets**

Credit markets are critical in the apartment development process, both in terms of development financing and mortgage financing. The need to obtain financing means supply is affected by capital markets, exposing linkages between markets.

Land is a critical input but supply is fixed and scarcity results in higher land prices, which affects project viability.

### **Exploding offers**

Exploding offers are not present in this matching market.

### **Unravelling**

Settlement risk reflects the strategic use of information that is privately held—that is, a lack of truthful revelation on the part of buyers. A buyer, for example, who is willing to forfeit their

deposit if there is fall in house prices, may know they will do this at the time they sign the presale contract. Buyers also face the risk that eventual design, quality and size of the apartment may be different from what was specified in the presale contract. The legal framework for contracting is unable to overcome both these risks.

## **6.6 New market design proposal: new apartments**

### **6.6.1 Objective**

The objective is the delivery of quality, well-designed apartments for low- to middle-income owner-occupiers.

### **6.6.2 Proposal: digital platform**

The proposal is for a new digital platform, whose purpose is to create stable matches. The key to stable matching is increasing the 'stickiness' or commitment to purchase of the buyer. New matching market platforms attract and hold their demand-side participants, which in this context would eliminate the need for individual development companies to engage in their own presale campaigns. The Internet is a key means by which the cost of obtaining members can be reduced.

Using membership as a means of aggregating or pooling demand narrows the search for buyers. The developer, as a supply-side member of the platform, is able to communicate with this pool of potential of buyers and elicit interest at the earliest stages of project planning. Incorporation of expressed design, material and sustainability preferences means the buyer can match to the housing they want, which increases the stickiness of the buyer. With settlement risk mitigated by the increased stickiness, the profit margin can be smaller. The savings created by reduced search costs and lower profit margin can be shared with the buyer, further increasing stickiness. This binding of the buyer to the project has, in the example of Nightingale Housing, resulted in more advantageous financing (Sharam and Bryant 2017; Sharam, Moran et al. 2018) (Sharam, Moran et al. 2018). NHL is an NFP model delivering market housing in Australia and New Zealand and has a list of over 5,000 registrants. NHL is not the developer of the housing, rather it operates as an intermediary, matching NHL licenced developers and aspiring apartment owners. Each Nightingale project has its own development company, and an NHL licence provides access to the registration list. Registrants are able to indicate interest in specific projects once land is secured and are then surveyed and interviewed concerning their preferences. The purchase price is the cost price of developing the apartment. Purchasers are engaged in decisions about design and the trade-offs necessary to deliver the product within the target price range. Once planning consent is gained, registrants who are still interested go into a ballot and if successful sign presale contracts.

NHL offers proof that improved matching reduces development risk, which can in turn improve housing affordability. A digital platform with greater focus on membership, servicing a broader range of developers, could change how the industry is organised and facilitate market performance improvements, resulting in significant affordability gains and improvements to the built environment. The idea was pursued by platform Citiniche in Melbourne, but this attempt was not successful (Citiniche recently filed for voluntary deregistration as a company<sup>11</sup>).

While savings can be made through improved matching, mainstream developers facing little competitive pressure are unlikely to pass through savings to buyers. One way this could be addressed is through the proposed platform being multisided in order to facilitate 'deliberative

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<sup>11</sup> No public explanation has been provided by the operator. Observation of the platform over the period of its operation indicated very little developer interest.

development'. Deliberative development is when groups of consumers form syndicates to undertake a development, supplanting the speculative developer (Sharam, Bryant et al. 2015b). This form of development occurs in a number of European countries and is particularly well established in Germany where it is known as *baugruppen*. In some German states, up to 20 per cent of new housing is delivered by *baugruppen*. *Baugruppen* has consistently delivered savings of 25–30 percent in Germany (Ring 2013), with an early Australian example delivering similar savings (Dolin, London et al. 1992). The role of our proposed platform would be to connect individuals seeking to join with others to form a syndicate. This was the purpose of German platform Group Estate.<sup>12</sup> In Melbourne, Property Collectives is a firm that provides this service on a small scale for people seeking to develop townhouses. Our platform could also have landowners as members, who could connect with syndicates.

While *baugruppen* delivers more affordable housing that is also of a much higher standard, the equity requirements to obtain debt financing are high. As a result, this form of housing production has largely been limited to wealthier households, which has led to criticism that the model fosters gentrification (Droste 2015; Hamiduddin and Gallent 2015). In Melbourne, *UrBau* an offshoot of NHL, has launched projects that require only 10 per cent equity from syndicate members, which addresses the equity hurdle (McGregor 2018). This has been made possible through the support of social impact investors who recognise that improved matching significantly reduces risk (Sharam, Moran et al. 2018).

Our proposed platform could do more than connect apartment buyers to developers. The *Housing Hub* (see Chapter 6) is an existing matching market platform in Victoria, specifically targeting the construction of SDA. People with disabilities register and provide details of their housing needs. Housing suppliers are encouraged to respond to this demand. The potential exists for the *Housing Hub* and NHL to evolve together into a more general housing platform. Such a platform could also match tenants to institutional build-to-rent housing (thus reducing the risks and costs of this type of housing, improving its viability), or match key workers to community housing. For example, a provider of key worker housing would be able to 'discover' how much demand exists for their proposed product and location by putting out an expression of interest to members of the platform. Stickiness of interested members could be increased by bringing these renters into the design phase. Increasing the tenant's stake in the development would be likely to reduce future damage to the property. Household members of the platform would be able to change their status depending on their circumstances.

### 6.6.3 Constraints

Many new matching market platforms are able to substantially reduce transaction times and costs. However, property development is a process that takes years and, even taking in account the role of an intermediary in making the matches, there would still be numerous transaction costs and complexities.

## 6.7 Policy development implications

Government has a long-standing objective for urban consolidation and an interest in the supply of housing. Increasing policy emphasis is being placed on the sustainability and quality of apartments, with limited success. Housing affordability is a concern, although the relative affordability of apartments compared to detached housing means there is little focus on apartments. Affordability and sustainability are objectives that are often perceived to be competing, with affordability often traded off against sustainability, for example. Speculative

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<sup>12</sup> GroupEstate has ceased operations in 2017.

developers, for their part, argue for deregulation of planning and reduction in taxes as an affordability measure, although any savings accrue to them as windfall savings. The issue for government is to consider how it can contribute to cost reductions that flow through to buyers as affordability gains, whilst ensuring quality and sustainability are obtained.

Government could do this by supporting the establishment of a platform that aggregates demand and matches individual housing consumers, at least initially, to deliberative development syndicates, NFP developers and housing providers, and institutional build-to-rent schemes.

Further, government could facilitate deliberative development by implementing the following actions.

- Providing credit enhancement (such as a guarantee for loans) that would enable a debt-to-equity ratio of 90:10, thus permitting more low-income households access to this form of housing provision.
- Offering surplus government land to deliberative/NFP developers before putting land onto the open market.
- Reforming stamp duty to ensure duty is payable only once and on the unimproved value of the land only (currently stamp duty is paid twice as the land is transferred twice). There are similar issues with Goods and Services Tax (GST) on transfers between entities, which could be amended to improve affordability.
- Supporting the creation of a service system for deliberative developers. There is a nascent market (see for example Property Collectives and CoDev in Melbourne, and GreenFabric in Western Australia). The groups themselves need education and processes to ensure capacity and to reduce costs. Consultancies such as project managers, architects, lawyers and planners will respond and specialise in servicing the deliberative development sector but some initial state support would assist this—for example, through developing model rules, template agreements and dispute resolution processes.

CHPs are an ideal partner for deliberative developers. In addition to their design and development experience, CHPs' tenancy management and place making skills could form the basis for supporting the groups. The provision of services to deliberative developers would be a source of revenue for CHPs.

Thus far discussion has focussed on the benefits to housing consumers who participate in a deliberative development. However, there are broader implications for deliberative development, such as being able to address settlement risk and lower search costs. Speculative developers could use the same platform to find buyers and design buildings in accordance with the preferences of the buyers. This would enable a shift from a speculative/high-risk/high-reward model to a deliberative/low-risk/fee-for-service model, providing housing at cost plus a low margin rather than at market price. The multi-unit residential development sector could build to actual articulated demand rather than hypothesised demand; that is, it would be less speculative. The owner-occupation sector would become a growth sector and, being less speculative, would be less prone to boom and bust cycles. This would have a positive impact on the economy. A more 'steady-state' construction industry would permit investment in technology and skills.

Other policy to facilitate institutional investment in rental housing would permit separation of owner-occupier multi-residential housing construction from investor housing, further reducing speculation and associated economic fluctuations.

CHPs and government could consider how matching demand to supply in the build-to-rent market could mitigate risk for investors in this product. One of the concerns for the development of this market is occupancy risk. Build-to-rent as long-term rental housing provides an improved



degree of security of tenure, but building for a known tenant should increase the propensity for the tenant to remain. The savings generated through stability of tenancies and lower property maintenance would enable a proportion of tenants to be housed on lower rents.

## 7 Urban land aggregation for precinct-level redevelopment and intensification

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Australia's low-density 'greyfield' suburbs, built between the 1950s and 1980s, are now the focus for provision of a new supply of well-located, sustainable housing. Precinct-level redevelopment would deliver environmental, social and economic benefits, but is challenged by the requirement to coordinate owners of fragmented lots and because existing landowners cannot be compelled to move, come to an agreement or sell their property. High transaction costs deter developers who otherwise have access to capital and expertise to undertake such redevelopment.

Precinct redevelopment presupposes that many existing landowners would retain property ownership, although the redeveloped property would be different from their original holding. A citywide matching market platform would provide the opportunity to enrol landowners as members of the platform. Such a platform would:

- permit discovery of interested landowners and their preferences
- permit clusters of landowners to be identified, enabling identification of localities that are 'ready-to-go'
- allow sequencing of projects and infrastructure planning
- allow planners to identify uncommitted landowners who could be targeted for recruitment into schemes
- provide a means by which residential landowners can discover other contiguous landowners in order to initiate their own redevelopment
- provide a means by which aspiring purchasers and renters can register interest in location and dwelling type
- provide a cost-effective mechanism for managing engagement over a long period.

A citywide platform would require a different administrative framework than for a single, limited redevelopment site. Data analytics platforms such as Envision and AURIN provide powerful knowledge about our urban environments and it would make sense to link such capacity to any platform established to engage with landowners.

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The old Australian model of suburban sprawl began to unwind in the late 1980s, with a recognition of the need to increasingly accommodate new development in the existing urban area. Much of the initial wave of redevelopment within the existing urban fabric was undertaken

at 'brownfield' sites<sup>13</sup> in and around the central business districts. However, as these sites have been exhausted, Australia's low-density 'greyfield' suburbs<sup>14</sup>, built between the 1950s and 1980s, have come to attention as the major source of land that could provide a new supply of well-located, sustainable housing.

While a succession of planning reforms over the last two decades has seen a substantial increase in redevelopment of such areas, the outcome in most cases is not particularly satisfactory. For largely political reasons, governments have been reluctant to be too prescriptive as to where redevelopment should occur and in what form. The broad planning framework—intended to protect suburbs from over-development (viewed primarily as problems with height), but also responding to significant population growth—permits subdivision of existing single-house lots. The effect of such planning provisions is that larger developers, capable of precinct-level redevelopment, are deterred, while creating ideal conditions for tens of thousands of small-scale developers. These small-scale builders compete fiercely, ensuring profit is constrained and resulting in highly generic, low-quality product such as that shown in Figure 8. The result, as Newton, Murray et al. (2011) have shown, is that despite the planning intentions ostensibly aimed at urban consolidation, a large proportion of greyfield redevelopment locates new dwellings well away from activity centres or transport access.

**Figure 8: Typical greyfield redevelopment of a single lot**



Source: Andrea Sharam 2018.

The single allotment development process precludes the provision of larger-scale development (including at precinct level), which could yield greater density and better use of open space, greater pedestrianisation and better water run-off (for example), without height becoming problematic.

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<sup>13</sup> Brownfield land is previously developed land that is not currently in use.

<sup>14</sup> Greyfield land is economically obsolescent or underused land.

Aggregation of existing housing land parcels would enable new housing typologies, which would add to housing supply while offering better environmental and social outcomes. Even if the market 'rules' encouraged site aggregation, fragmented property ownership in greyfield suburbs presents a significant barrier to redevelopment. Precinct-level redevelopment of existing occupied private housing to facilitate intensification poses many challenges, the most significant being that existing landowners cannot be compelled to move, come to an agreement or sell their property: they must be persuaded there is a benefit to them. The greatest benefits are likely to accrue from landowners acting in concert with each other, whether or not redevelopment is orchestrated by a developer. Coordination, however, necessitates information, and the market lacks the most critical information required: the intention of the landowner, which is of course shaped by the intentions of other landowners.

So, for example, a developer who has purchased some land may advance a different development strategy if s/he was aware of what other adjoining landowners were willing to do. This may involve making an offer based on the increased value of each individual lot if the lot were to be amalgamated with others to form a larger redevelopment site. Alternatively, the landowners' decisions may be the outcome of their influence on the redevelopment and the option to purchase a dwelling of choice in the redevelopment. Similarly, if local governments knew land owners' intentions or desires they too may be better able to identify likely or best positioned areas for redevelopment and build that into their planning schemes.

Currently, incorporation of residential lots into a larger redevelopment occasionally occurs. This is generally in activity centres and with larger developers.<sup>15</sup> Private developers often spend considerable resources attempting to recruit adjoining landowners. While there is no research on what factors most influence landowners, anecdotal examples suggest that adjoining residential landowners who do sell to developers are typically catalysed by the impending change in scale of buildings on the neighbouring property.

## **7.1 Is there an existing public policy objective for precinct-level aggregation and intensification?**

State planning policies support urban consolidation and the production of new supply of 'land' via subdivision of airspace, although significant intensification is typically limited to public transport corridors. Low-density suburbs are often protected by planning provisions limiting height and density of new housing. However, intensification in the form of further subdivision of land (rather than airspace) is permitted.

## **7.2 Current market design**

Current planning objectives for low-density older suburbs typically inhibit new urban and housing typologies that can provide additional housing while also improving sustainability performance and preserving amenity. At the same time, these planning rules encourage further subdivision of the land, reducing the opportunity for future sustainable transformation of the greyfields via precinct-level redevelopment.

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<sup>15</sup> A recent example is Bowen Street and Moriarty Road in Chatswood in Sydney, where the existing residential land owners sold their properties as a group to a developer in early 2018 in response to anticipated rezoning that would permit intensification. See Tan, S. (2018) '22 properties banded together for sale in one line in Chatswood', *Australian Financial Review*, accessed 22 April 2018, <http://www.afr.com/real-estate/22-properties-banded-together-for-sale-in-one-line-in-chatswood-20180314-h0xfyl>.

### **7.3 What are the constraints on the existing design?**

The major constraint on greater and more directed urban intensification/consolidation has been political will, related to a lack of support by many existing home owners for intensification. To some extent, this lack of support arises from a dearth of examples that demonstrate what can be gained through aggregation and how concerns can be mitigated. Another constraint on aggregation is the historical absence of a technological platform that enables the collection of landowner interests and timelines, and subsequent use of that knowledge to create better development outcomes. This constraint, in principle, no longer holds.

Clearly, aggregation presents a multitude of challenges requiring state leadership and multi-agency coordination. However, market design processes could assist in overcoming some of these challenges.

### **7.4 Outcomes of the constraints on greyfield redevelopment**

Existing small-scale developers are not well placed in terms of expertise, capabilities and financing to undertake precinct-level development. On the other hand, larger developers have avoided single-lot sites as the margins are lower. This outcome represents two different 'structures of housing provision' (Ball 1986), reflecting how the market is shaped by the risks associated with horizontal and vertical subdivision (Sharam, Bryant et al. 2015a). This suggests that greyfield redevelopment requires a shift in profitability in order to attract developers with the requisite skills and financial capacity. It also suggests the need for a different approach to value capture.

### **7.5 Market designer lenses: greyfield redevelopment**

Market designers use a number of conceptual lenses to analyse existing markets and guide the design of new markets. Here we apply those lenses to the Australian urban redevelopment market.

#### **Product definition**

The product is an urban precinct which is currently under-performing in terms of environmental sustainability, housing density and contribution to urban productivity.

#### **Market thickness**

Large parts of existing Australian cities are at the point of redevelopment, so the market could be described as thick. More specifically, thickness in this case pertains to contiguous lots. However, the number of lot owners open to changing the typology of their area may be much smaller, so the market can perhaps best be described as varying in thickness. Arguably, if areas are renewed to demonstrate high levels of amenity and performance, demand for aggregation will rise. The need for housing will also drive changing attitudes.

#### **Information disclosure (safety and incentives)**

Existing lot owners have little opportunity to reveal any interest they may have in being part of a precinct-level regeneration project.

#### **Simplicity**

Urban redevelopment involving existing residents is very complex and takes years.

## **Congestion**

Dealing with large numbers of potential lot owners would be a significant management task.

## **Messages**

Recruiting and communicating with numerous lot owners in a redevelopment project would be time consuming, costly and difficult. Property owners who are neighbours are able to readily communicate with each other but have limited means of engaging with others in their neighbourhood. Door knocking, letterboxing and town hall style meetings are traditional forms of approach, although some neighbourhoods have social media avenues. Outside agencies can use door knocking, letterboxing (or direct mailing), public meetings and general advertising. Websites are good for communicating once traffic is directed towards them.

## **Search**

Search for owners is relatively straightforward for government. However, recruitment and enrolment are expensive and time-consuming, relying on the strategies outlined above.

## **Linkages among markets**

Credit markets are critical in the development process, both in terms of development finance and mortgage finance.

## **Exploding offers**

Existing lot owners will be presented with time-restricted offers as property values are dynamic and development holding costs are significant.

## **Unravelling**

Participants in a redevelopment scheme whose property value subsequently drops in value (with the decline relating to the redevelopment rather than general market conditions), or who are in other significant ways dissatisfied, may result in too many lot owners seeking to sell their properties, which may adversely impact the value of all the property owners in the scheme.

Some redevelopments will depend on unanimous agreement by all owners or agreement by a specific owner. This puts some owners in a pivotal position and may result in deals falling through.

## **7.6 New market design proposal: greyfield redevelopment platform**

### **7.6.1 Objective**

The objective is broader-based, hopefully precinct-level redevelopment, which will in turn enable more sustainable and efficient utilisation of urban land, including modest intensification of housing delivered over a greater area to provide a substantial source of new housing in well-located areas.

### **7.6.2 Proposal: a platform approach to aggregation**

Precinct redevelopment of private landholdings requires not just knowledge of what land holdings are at the point of redevelopment (which data analytics tool Envision<sup>16</sup> provides), but whether landowners are interested in participating in redevelopment. The cost of recruiting

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<sup>16</sup> <https://aurin.org.au/projects/lens-sub-projects/envision/>

landowners is likely to be a significant cost barrier for regeneration. Redevelopment teams generally identify the site first and then, by means of advertising and direct approaches, enrol landowners. The platform approach turns this on its head by permitting landowners generally to indicate an interest in being involved in a precinct-level redevelopment, irrespective of where the land is. The platform could provide access to the type of market data that would be of interest to landowners, such as supply and demand of the asset class in question, the proposed routes for new public transport, planned new schools and such like.

In addition, landowners could be asked about their preferences. A general call for expressions of interest therefore, could provide the opportunity to uncover localities that are 'ready to go' from the perspective of participants. Redevelopment managers could identify clusters of agreeable landowners, permitting them to direct effort to adjoining landowners who have not registered. The early engagement of landowners may bring forward a precinct redevelopment plan or give priority to an area. Having many potential redevelopment sites may enable sequencing of projects and the rollout of related infrastructure (e.g. the extension of a tram route).

Once clusters of landowners are identified, preliminary work could provide some indicative designs to provide owners with a better sense of what could happen, and thus a second round of interest can be generated. Additional publicity would encourage more landowners to join the platform; the greater the participation the greater the options. As options become more real, individuals will determine whether they want to stay in the locality: either opting to put their property in the pool; or to not participate but stay and have a new neighbourhood emerge around them, or alternatively leave the precinct.

Accordingly, a digital platform is proposed that through membership enrolment would:

- permit landowners to register their interest in redevelopment
- permit government to identify precincts that are not only ready for redevelopment but have public support for redevelopment
- allow redevelopment managers to identify clusters of agreeable landowners, permitting them to direct effort to adjoining landowners who have not registered
- permit landowners to find neighbours, so that groups can organically form (to undertake deliberative development)
- provide government, developers and groups of landowners with a communications system for supporting communities of users (i.e. each precinct redevelopment)
- give non-residents the opportunity to reveal their interest in specific precincts, including their preference for home ownership or renting, and housing typology.

### **7.6.3 Constraints**

Aggregation presents a multitude of challenges requiring state leadership and multi-agency coordination. Development takes years and the ability to gain the commitment of a group of households is difficult. Some proposals will depend on unanimous agreement by all owners or agreement by a specific owner. This puts some owners in a 'hold up' or 'hold out' position. Holding out may increase costs overall or result in deals falling through. These problems are inherent in precinct-level redevelopment and do not concern the platform itself.

Privacy is an issue that has special relevance for the platform, as with all digital interfaces, and would need to be carefully managed.

## 7.7 Policy development implications

It is possible to conceive of urban redevelopment as being managed as a matching market with a marketplace/platform for an entire city. This would require a different administrative framework than for a single, limited redevelopment site. Data analytics platforms such as Envision provide powerful knowledge about our urban environments and it would make sense to link such capacity to any platform established to engage with landowners.

The outcomes of a citywide platform would also likely be different from those of a single, limited redevelopment site. Taking the lessons from Chapter 6 on apartments, redevelopment options would not be limited to what works for the speculative developer. As discussed, private residential development is unable to mitigate settlement risk efficiently: market prices for apartments need to be high enough to support the costs associated with this inefficiency. Further, in redevelopment projects, the cost of public infrastructure is part of a negotiation between public agencies and private developers. It is common for private developers to be provided with concessions on height and density controls in order to obtain public infrastructure. The cost of public infrastructure is then obscured by commercial confidentiality.

Deliberative development and fee-for-service apartment development make the costs of development explicit to the future owner-occupiers, and bring this knowledge into the public domain. Deliberative development is desirable because of the impact on affordability and sustainability but it will engender a level of transparency and debate on the costs of public infrastructure and who should shoulder those costs and how. This would be a positive step.



## 8 Policy development options

This research would and could not have been undertaken a decade or so ago. At that time, the role of digital technology was a specialist area of research and application and was remote from housing. Advances in technology and market applications (such as Airbnb) have created new ways of doing things, raising a number of housing policy implications including how best to use the technology for positive housing outcomes. To what degree can they be used to facilitate greater consumer choice, more effective service provision, and better housing market performance?

Building on five case studies, the research has highlighted areas where markets (or social housing provision) are not realising their full potential in terms of the above outcomes (i.e. they are suboptimal). Housing markets are complex, with innate market imperfections and constraints, many related to the inability to provide both producers and consumers with adequate and timely market information. Market design, through appropriate digital platforms, has the capacity to reduce these problems.

Despite being predominantly conceptual research, the report examines five areas where markets have been identified as operating sub optimally and looks at how these could potentially be improved by appropriate digital platforms and program interventions.

- **Swaps and transfers within social housing** To a large extent, the location, type and quality of housing obtained by a tenant is a case of pot luck at the time of the initial allocation. Swaps or exchanges have never been an imperative because of resourcing and management implications, particularly when a swap can create a chain of movements as households adjust their housing circumstances. Market design, with an appropriate digital platform, provides the potential to manage a chain of swaps, with the outcomes of greater tenant choice, more satisfied tenants and potentially lower property damage, and better stock utilisation.
- **Accessible housing for sale or market rental** A purpose-designed national disability housing hub would create a register of accessible properties to enable landlords/vendors to better find a tenant or buyer and provide buyers/tenants searching for a property with a means of more easily and quickly finding an accessible dwelling.
- **Low-cost private rental housing** As AHURI research has shown, much of the low-cost rent stock is occupied by higher-income earners. A rental brokerage scheme facilitated by an appropriate allocation platform could assist many low-income households to improve their access to affordable housing and reduce financial stress, with minimal subsidy.
- **The supply of new apartments for owner-occupation by low- to middle-income households** The high costs associated with discovering buyers (primarily investors) and settlement risk inhibits owner-occupiers from entering this market. By creating an appropriate digital platform, a new market for owner-occupiers could be created, enhancing supply and providing greater affordability.
- **Precinct-level urban redevelopment** Urban consolidation costs related to fragmented land ownership hinder development of greyfield areas. These costs could be reduced by creating a platform that enables landowners to communicate their interest in property sale to developers, and allows planning agencies to 'manage' site assembly in a way that best fits local planning objectives. This has the potential to lead to better affordability and higher quality urban design outcomes.

While the objective of each market design model outlined is different, information provision and market matching are the underlying rationales for them all. Each design model has the building of a digital platform or housing hub as a necessary condition, but also requires other structures

or processes to be set in place for policy implementation. What are the barriers to policy implementation?

- **The requirement of a lead agency**—In all cases, some agency or organisation has to undertake the development of the platform. There will be set-up costs and, in some instances, ‘freeloader’ implications (i.e. benefit will flow to those not carrying the original costs). This suggests a public agency would be most suited, whether an existing government department or a large but subsidised NFP organisation.
- **Organisational inertia**—For most organisations, to undertake building such a platform would take them out of their comfort zone. Developing digital platforms is not part and parcel of human service agencies and uncertainty about risk may limit enthusiasm for moving toward implementation.
- **Risk and uncertainty**—This has largely been a conceptual report and has not provided hard data, costs or potential take-up rates of the various platforms. This means uncertainty and associated risks in moving towards implementation. One way to proceed is through small-scale pilot schemes with appropriately monitored research.
- **Policy resistance**—In some cases (e.g. the urban renewal and rental brokerage models) an initiative by a public or NFP agency might be resisted by private sector interests who may see such a model as usurping their role or reducing their potential for profit. This would require consultation and/or consideration of how to actually use the private sector.

These implementation issues suggest the need for further research, with the best way to proceed probably via small scale pilots accompanied by appropriate monitoring of outcomes.

## 8.1 The power of ideas

This research is largely conceptual in nature. As the future-looking report in the suite of research for the AHURI Inquiry into the *Potential of new technologies to disrupt housing policy* this should not be surprising. Understanding technological change and attempting to predict its implications naturally involves grappling with new knowledge. Indeed, technological progress is often viewed as synonymous with pioneering knowledge. In investigating the economic change driven by digital technology and applying it to housing and housing assistance, this research is also at the frontier of knowledge.

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## Appendix 1: Participation information sheet and consent form



### Participant Information Sheet/Consent Form

<b>Title</b>	Could market design and technological disruption of housing and housing assistance improve social and economic outcomes?
<b>Chief Investigator</b>	Dr Andrea Sharam
<b>Co-Investigators</b>	Prof. Terry Burke Dr Martin Byford Dr Bilgehan Karabay Dr Sean McNelis
<b>Research Assistant</b>	Treshani Perera

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#### ***What does my participation involve?***

##### ***Introduction***

You are invited to take part in this research project, “**Could market design and technological disruption of housing and housing assistance improve social and economic outcomes?**”. You have been invited because of your expertise in Market Design or housing policy.

This Participant Information Sheet/Consent Form outlines the research project, and explains the processes involved with taking part.

Please read this information carefully. Please ask questions about anything that you don't understand or want to know more about.

Participation in this research is voluntary. If you don't wish to take part, you don't have to.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project

You will be given a copy of this Participant Information and Consent Form to keep.

### ***What is the purpose of this research?***

The purpose of the research is to determine whether a prima facie case exists for reform of various housing markets and housing assistance programs, when viewed through the prism of Market Design. The intention is to highlight possible positive social and economic gains.

Market Design can be defined as the process of designing the institutions and arrangements that govern the exchange of a particular good or service. The purpose of market design is to implement market outcomes that best achieve the designer's objectives, with the key being the designer's objectives which can range from profit maximisation, to economic efficiency, to social outcomes, depending on the context. Market Design has emerged as a means of fixing markets to promote competition or creating 'markets where there were none' (Roth 2007: 1).

Our particular interest is in a specific type of market: 'two-sided matching markets': A market is two-sided if there are two sets of agents, and if an agent from one side of the market can be matched only with an agent from the other side. (Erev et al. 2002, 360). Matching markets are pervasive but many, including the house sales market, do not function well (Roth 2015). New technology has created the potential to institute new/improved matching markets, including housing and thus overcome market inefficiencies (Sharam and Bryant 2017).

The theoretical foundations for Market Design were laid down by Gale and Shapely's (1962) work on algorithms to process preferences. The insights of that work were progressed by Roth who created a two-sided matching market for medical intern placements and another for kidney donation (earning him a Nobel Prize for Economics). These insights were rapidly applied to E-commerce (Kittsteiner and Ockenfels 2006).

With substantial public expenditure on housing assistance, declining housing affordability and supply shortages there is a significant public policy justification in seeking improvements to the housing system. The immediate focus of the research will be on the private rental sector, social housing allocations, and affordable apartment development.

### ***What does participation in this research involve?***

The research project will bring together senior government officials responsible for administering the two largest forms of housing assistance (social housing and rent assistance) with Market Design experts from central agency portfolios with housing and Market Design academics (the research team) in workshops to 're-design' aspects of housing provision and assistance.

Your participation would involve discussions in two reiterative workshops. Workshops are likely to be held in September 2017 and February 2018 and held at RMIT University, city campus. The duration of each workshop will last about 4 hours and will be audio-recorded.

As a prelude to the workshops an initial discussion paper will be prepared by the research team.

The first workshop will include:

- Introduction
- Presentations by research team members—
  - Presentation of overview of 'market design'/mechanism design
  - Presentation of overview of private rental sector
  - Presentation of overview of social housing allocations
  - Presentation of overview of apartment development
  - Presentation of overview of others as identified by the research team in preparing the Discussion paper

- Discussion on each of the above following a pre-determined discussion guide

The data from workshop 1 will then be synthesised into a second discussion paper in preparation for Workshop 2. Participants are encouraged to discuss the discussion papers with their own staff. Workshop 2 will re-examine the initial and any new propositions with learnings incorporated into a Final Report that will be peer-reviewed and published by AHURI.

***What are the possible benefits of taking part?***

Your participation will contribute to new insights into housing markets and assistance and will have potential to create positive social and economic outcomes.

This project is voluntary participation and does not provide any remuneration.

***What are the risks and disadvantages of taking part?***

We do not believe there are any foreseeable risks or disadvantages to you by taking part in this research. However, you will be required to contribute at least two days of your time.

***What if I withdraw from this research project?***

You may withdraw at any time. If you decide to withdraw from the project, please contact the Chief Investigator, Dr Sharam. You have the right to have any unprocessed data withdrawn and destroyed, providing it can be reliably identified.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with the researchers or with RMIT University.

***What happens when the research project ends?***

Once research is complete, the research findings are disseminated through a range of communication channels including the AHURI website, conferences and events, email newsletters, social media channels and the media. A web link to the published Final Report resulting from this research will be made available to you.

***How is the research project being conducted?***

***What will happen to information about me?***

Data provided by you will be synthesised into the second discussion paper and the Final Report. Your contributions in the workshops will not be individually attributed.

During the study: All data in digital format will be stored in a password protected folder and all the paper based data will be stored in lockable offices in RMIT and, Swinburne and UNSW.

Only the research team will have access to the research data and materials.

Following the completion of the study:

- All data will be stored securely in the RMIT archive for a period of 5 years after which it will be destroyed in accordance with privacy legislation.
- As a requirement of AHURI Funding, all the primary research data collected as a part of the project is anonymised and deposited in Australian Data Archive (ADA).

In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the Chief Investigator (details below).

Any information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) if specifically allowed by law, (3) you provide the researchers with written permission. Identifiable information obtained from you can only be accessed by the original research team.



### **Who is organising and funding the research?**

This research is being conducted by Dr Andrea Sharam (RMIT), Prof Terry Burke (Swinburne), Dr Martin Byford (RMIT), Dr Bilgehan Karabay (RMIT) and Dr Sean McNelis (Swinburne).

The research is funded by the Australian Housing and Urban Research Institute (AHURI). AHURI is a national independent research network with an expert not-for-profit research management company, AHURI Limited, at its centre. AHURI's mission is to deliver high quality research that influences policy development to improve the housing and urban environments of all Australians.

### **Who has reviewed the research project?**

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). This research project has been approved by the RMIT University HREC.

This project will be carried out according to the *National Statement on Ethical Conduct in Human Research* (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies.

### **Further information and who to contact**

If you want any further information concerning this project, you can contact the researcher

#### **Research contact person**

Name	Dr. Andrea Sharam
Position	Chief investigator
Telephone	99251439
Email	andrea.sharam@rmit.edu.au

#### **Complaints**

Reviewing HREC name	RMIT University
HREC Secretary	Peter Burke
Telephone	03 9925 2251
Email	<a href="mailto:human.ethics@rmit.edu.au">human.ethics@rmit.edu.au</a>
Mailing address	Research Ethics Co-ordinator Research Integrity Governance and Systems RMIT University GPO Box 2476 MELBOURNE VIC 3001

Should you have any concerns or questions about this research project, which you do not wish to discuss with the researchers listed in this document, then you may contact:

## Consent Form

**Title**                      Could market design and technological disruption of housing and housing assistance improve social and economic outcomes?

**Chief Investigator**    Dr Andrea Sharam

**Associate  
Investigators**            Professor Terry Burke  
                                      Dr Martin Byford  
                                      Dr Bilgehan Karabay  
                                      Dr Sean McNelis

**Research  
Assistant**                 Treshani Perera

### ***Acknowledgement by Participant***

I have read and understood the Participant Information Sheet.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the project without affecting my relationship with RMIT.

I agree to be interviewed and my voice will be audio recorded.

I understand that I will be given a signed copy of this document to keep.

I agree to being identified in the Final Report as a participant in this research

I do not agree to being identified in the Final Report as a participant in this research

Name of Participant _____	
Signature _____	Date _____

### ***Declaration by Researcher***

I have given a verbal explanation of the research project; its procedures and risks and I believe that the participant has understood that explanation.

Name of Researcher	_____
Signature	_____
	Date
	____

Note: All parties signing the consent section must date their own signature.

## Appendix 2: Private rental sector: availability of stock to each quintile

**Table A1: Surplus and deficits of rental housing for each quintile (2011)**

Quintile	Households %	Stock %	Surplus/deficit dwellings %	Surplus/deficit dwellings
1 (<\$30,500)	20	9	-11	-187,000
2 (\$30,501–\$56,000)	22	43	+21	+362,000
3 (\$56,001–\$91,000)	24	38	+14	+258,000
4 (\$91,001–\$142,000)	19	8	-11	-208,000
5 (>\$142,000)	15	2	-13	-224,000
Total	100	100		1,735,000

Source: Hulse, Reynolds et al. (2015).

Table A1, above, shows the number and percentage of dwellings in each affordability category. It reveals a substantial short fall in housing affordable to those on the lowest income. Table A2 shows how the housing is allocated across income quintiles. The absolute shortage of R1 housing (R1 reflecting stock affordable to Q1 households; R2 to Q2, and so on) means a high proportion of Q1 households must seek higher-cost housing, but there are 83,000 houses affordable to Q1 that are being occupied by higher-income groups. There is a large surplus of R2 housing (740,000 dwellings). This converts, however, to a deficit of 122,000 dwellings once occupancy is considered (43,000 being occupied by Q1 households, leaving 79,000 occupied by higher-income households). Similarly, there is a surplus of R3 housing but a deficit of 242,000 once occupancy is considered. Most of this is occupation by Q1 and Q2 households but 22,000 is by higher-income households. The housing stress of many of the Q1 and Q2 households is acute. Many Q3 households are also in housing stress.

**Table A2: Allocation of rental stock by household income quintiles (2011)**

Quintile	R1	R2	R3	R4	R5	Total
1	76,000	181,000	75,000	11,000	4,000	347,000
2	43,000	213,000	109,000	10,000	3,000	378,000
3	25,000	195,000	171,000	18,000	4,000	413,000
4	11,000	111,000	184,000	28,000	4,000	339,000
5	5,000	39,000	133,000	63,000	19,000	258,000
Total	159,000	740,000	671,000	131,000	33,000	1,735,000

Source: Hulse, Reynolds et al. (2015).

## Appendix 3: A model-based method for transdisciplinary research

A model-based method—that is, using a conceptual representation of a problem as the device (Bammer 2013)—was used to bring together the disciplinary and non-academic knowledge. The device was a matching market. The participants were initially provided with a short discussion paper, prepared by the academic research team, outlining the conceptual lenses used by market designers and some examples of how these lenses could apply to housing and housing assistance. They were also requested to read a key text, *Who Gets What and Why: The New Economics of Matchmaking and Market Design* by Alvin Roth. The first workshop applied these lenses to social housing, private rental housing, supply of new apartments, disability housing and other housing products such as shared equity and leaseholds. The results of this workshop were transcribed, with the transcription being provided to participants. The discussion informed the development of a second discussion paper, which outlined potential solutions to some of the problems raised in the first workshop. A second workshop then discussed these propositions. The results of the two workshops were synthesised, noting divergent opinions without making attributions. Not making attributions permitted the non-academic participants greater capacity to express their views. A draft of the final report was then circulated for comment. The discussion papers and the final report draw on a desktop review of secondary data.

**Table A3: Disciplines and expertise of transdisciplinary research team**

<b>Discipline/expertise</b>	<b>Organisation</b>	<b>Name/role</b>
Disability	Summer Foundation	Di Winkler, CEO
Community housing provider	Community Housing Ltd	Brett Wake, National Manager
Social policy	DSS	Sidesh Naikler, Branch Manager, Housing Policy Branch Welfare and Housing Policy Group
Housing and housing assistance policy	Housing SA	Geoff Slack, Director of Strategy and Reporting, Department of Communities and Social Inclusion
Housing and housing assistance policy	Housing SA	Michael Hicks, Market Analyst
Housing and housing assistance policy	DHHS Victoria	Dr Alex Dordevic, Chief Adviser Social Housing and NDIS Reform
Housing and housing assistance research	Centre for Urban Transitions, Swinburne University	Prof. Terry Burke
Housing and housing assistance research	Centre for Urban Transitions, Swinburne University	Dr Sean McNelis, Senior Research Fellow
Housing research	School of Property, Construction & Property Management, RMIT University	Dr Andrea Sharam, Senior Lecturer
Economic research—theoretical	Dept. Economics, Finance and Marketing, RMIT University	Assoc. Prof. Bilgehan Karabay
Economic research—applied	Dept. Economics, Finance and Marketing, RMIT University	Dr Martin Byford
One further government stakeholder agreed to participate on the condition of not being identified.		
In addition, expert workshop facilitation was provided by Assoc. Prof. Jonathan Boymal from Dept. Economics, Finance and Marketing, RMIT.		

## AHURI Research Centres

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