REAL MATERIAL ETHEREAL

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Shared space in contemporary housing: design research experiments towards a more resilient Melbourne

Abstract:

The need for a greater diversity of housing options in Australia continues to escalate, as our major cities simultaneously contend with unprecedented rates of growth, changed modes of living and a fledgling mainstream housing market. Shared space is emerging as a lynchpin for delivering dwelling alternatives to the unsustainable, inflexible, and cost-prohibitive development models that dominate Melbourne's housing supply. For example, shared amenity and services in higher density housing can increase the quality of urban redevelopment outcomes and decrease the ongoing cost of living for residents. Yet many of the benefits achieved through the design of shared domestic spaces are not permissible under current planning regulations. Similarly, service efficiencies delivered at a collective-level are not easily achieved in a mainstream housing market geared towards individual ownership. New possibilities for sharing personal assets have come about with the advent of the global Sharing Economy. However these digital infrastructures are having unintended social and physical impacts for urban housing. The success of home-sharing platforms like Airbnb, for example, is diminishing the locational and financial choices available to Melbourne's long-term renters.

This paper brings together a range of design research that explores the design opportunities and challenges of shared domestic space undertaken by academics at Monash University. Operating across the scales of room, building, neighbourhood and metropolis, the authors demonstrate how speculative design and spatial analysis inflect on the social, financial and policy frameworks that underpin residential development outcomes in Melbourne. The body of work spans doctoral research, commissioned research, competitive grants and built projects. Together, the projects suggest how digital infrastructures could be instrumentalised through spatial design to positive effect, supporting a greater diversity of dwellings, new kinds of shared interactions and potential policy-formation to steward Melbourne's growth towards 9 million people.

Introduction

The rapid intensification of the city demands that a greater number and diversity of people can access existing urban spaces for changing needs. Accommodating these needs extends beyond public space provisions, which have already been stretched to keep up with population growth. As such, shared amenities and services are increasingly provided within private realms. For example, we are not only seeing the re-emergence of shared laundries in multi-residential complexes (typical of inter- and post-war flats), but shared private transport, shared work spaces and shared utilities are also becoming more frequent. Well-designed common spaces enable residents (and visitors) to borrow from collective assets and resources, as well as create new capital together. Community capital offers ways of reducing individual living costs and enables residents to accrue wealth from their spatial assets. As our cities continue to grow at unprecedented rates, shared spaces may prove a necessary strategy for updating or augmenting over-burdened public services, such as sustainable energy production or early childhood learning.

Between the two poles of private domestic space and the public realm are a spectrum of shared and common spaces that are becoming increasingly necessary for achieving resilient urban environments. However, common space is not 'saleable floor area' in market terms and is typically stripped-down by developers, often eliminating its productive potential for residents. Furthermore, the act of sharing – sharing space, resources or collectively contributing to urban and social improvements – is not an obligation, and so, the design and delivery of shared spaces are not facilitated by formal planning policies or design standards. To this end, the authors present a sample of design research projects that discuss the imperatives of sharing in contemporary dwelling contexts and offer replicable strategies for responding to Melbourne's growing housing challenges.

Beginning with the scale of a room, the paper explores the digital and spatial levers for achieving a diversity of high quality, shared living arrangements within urban dwelling types. Shifting the scale of spatial inquiry to suburban precincts, the paper examines the collective impact of lot-by-lot redevelopment and considers how repeated and residual spaces produced through small scale infill activity could be reconfigured for collective benefits. Finally, the inputs and barriers for delivering shared spaces and resources are discussed through spatial analysis of larger urban networks and metropolitan patterns. The sample of work was generated in both practice and academia. A secondary aim of the paper is to consider the relationships between applied and speculative designs for responding to the economic, social and environmental uncertainties of future cities.

Rooms and building parts

Concepts of collective living have radically shifted in the last decade since the arrival of the Sharing Economy.[1] This disruptive technology has wrought significant changes to urban environments and living arrangements through the optimisation of latent resources, including housing. By 'incrementalizing' rent – both physically and temporally – the Sharing Economy has facilitated more flexible access to domestic space. For example, where residential tenancy models are typically governed by titles, the minimum increment of lettable space that can be listed and rented via platforms like Airbnb has been reduced to the scale of the room. Likewise, rental periods have also shrunk, with spaces now available to lease by the hour, day and month.[2] These major shifts have enabled widespread participation by suppliers and consumers, opening up a distributed global network of on-demand rooms.

House sharing platforms present a powerful tool for addressing the current underutilisation of existing housing stock.[3] However, in addition to optimising the occupation rate of pre-existing residences, the Sharing Economy is also driving new and peculiar kinds of developments to meet the demand for interim housing unfulfilled by current market offers.[4] The price premiums that individual rooms attract have led to supersized homes being purpose-built for the Sharing Economy. One example is an 18-bedroom, 18-bathroom 'monster house' on an average-sized allotment in inner Melbourne (fig 1). With each room listed separately on Airbnb, the house is capable of generating around $8,800 p/w in rent, or 14 times the average income for a rental property in the area.[5] The cellular arrangement of rooms are contained within a built volume that meets current envelope controls. The project is officially registered as a rooming house – despite its nightly rates which remain double that of an average rooming house – raising questions about whether the property is fulfilling its assumed function as a provider of accessible and affordable housing.[6] However, a room in the monster house is still less expensive than a budget hotel, and its on-demand availability via Airbnb means that it can operate more like a home-hotel hybrid.

Further research suggests this is not an isolated case, with at least eight of twenty registered rooming houses in the same suburb listing rooms on Airbnb, in similar, purpose-built properties.[7] While it could be argued that this model addresses the need for more flexible rental arrangements in step with the increasing mobility and transience of contemporary life, the property remains concerning from both an architectural and social perspective. For example, if we accept the 'board 'n breakfast' listing as lodgings in a conventional dwelling, then, per capita, living space and outdoor amenity is only 15% of that for an average household size, and so design quality is significantly compromised. Moreover, there is a risk that candidates

seeking genuine rooming house accommodation will be subject to displacement, and that the shrinking pool of affordable options will not be reflected in the official register.

Figure 1. 18-bedroom 18-bathroom supersized house in inner suburban Melbourne, with each room listed separately on Airbnb.

Emergent home-hotel hybrids such as these are a testament to the ways in which the Sharing Economy can and is shaping cities without input from designers, and in many cases, without oversight by planning authorities. While social and economic disruptions continue to confound our regulatory frameworks, can designers play a role in stewarding better physical outcomes that work with, rather than resist, the transience of contemporary living patterns? Reciprocally, can the tools that have afforded new types of economic exchange underpin contemporaneous design practices? The *Pavilion House* design research project explores these questions (fig 2).[8] By harnessing the logic of digital platforms, this speculative investigation carves out new terrain for future design experiments. The instrumentation of the rentable room as both a fluid commodity and a design device opens up new possibilities for designing and delivering positive spatial outcomes in contemporary cities.

Figure 2. *Pavilion House,* Jacqui Alexander. Floor plan demonstrates the home reconceptualised as a series of atomised rooms. Interior sectional perspective renders show furniture elements that mediate the relationship between household occupants, enabling more or less space to be rented out on-demand.

Pavilion House reconceptualises the home as a series of atomised, flexible rooms, arranged around a courtyard. Designed for a site in Melbourne's inner West, the project reimagines the single dwelling typology for compact on-demand living. This dispersal of rooms and two points of access produce a non-hierarchical spatial condition that affords more or less space to be leased on-demand, enabling a range of household configurations including a small family, adults with dependent or Airbnb host and guest. A series of operable furniture elements mediate access to rooms, facilitating shared experiences while also preserving a level of autonomy. Conceptualised as both a spatial and economic model which can be expanded, *Pavilion House's* parti establishes a formal logic for incremental development on the site that could potentially be funded by the income accrued from the dwelling asset over time.[9] The scalability of the model suggests how sharing platforms might be leveraged to sustain self-funding infill activity that simultaneously diversifies housing options in Melbourne's inner suburbs over time.

Shared spaces not only offer financial benefits to owners and increased housing accessibility and flexibility for prospective tenants. In higher density development, common areas can be an effective way of 'giving back' to the urban realm, which is necessarily cannibalised through a project's realisation.[10] The reciprocity between public and private spaces is often fostered through street beautification and activation, with most planning policies prescribing gardens, dwelling entries and/or commercial premises form the property frontage. Conversely, the 'unattractive' areas that service residential activities, such as parking, bin stores and the like, are hidden behind the street interface, or buried underground.

The Kerr Street Apartments (by NMBW Architecture Studio) subvert this relationship. Here, the ground floor garage is 'spec'd-up' and designed as an extension of the public realm. In spite of its inner-city location in Fitzroy, Melbourne, regulations required that each apartment provide two parking bays. Pre-empting that the garage would be underutilized as parking alone, Kerr Street attempts to optimise this space by reimagining it as a semi-public arcade, enabling both vehicular and pedestrian access through the site between the street and rear lane. Glazed garage doors allow each 'car-room' to be potentially used for other things, including workshops, play spaces or even small shops (figs 3 & 4) allowing for adaptation and hybridity.

Cars and people are not separated; they share the same space. This recalls the mid-block shopping arcades or laneways, where through-circulation is shared intimately with display and access to shops / dwellings above.

Figure 3. Plan of potential uses in the 'arcade'

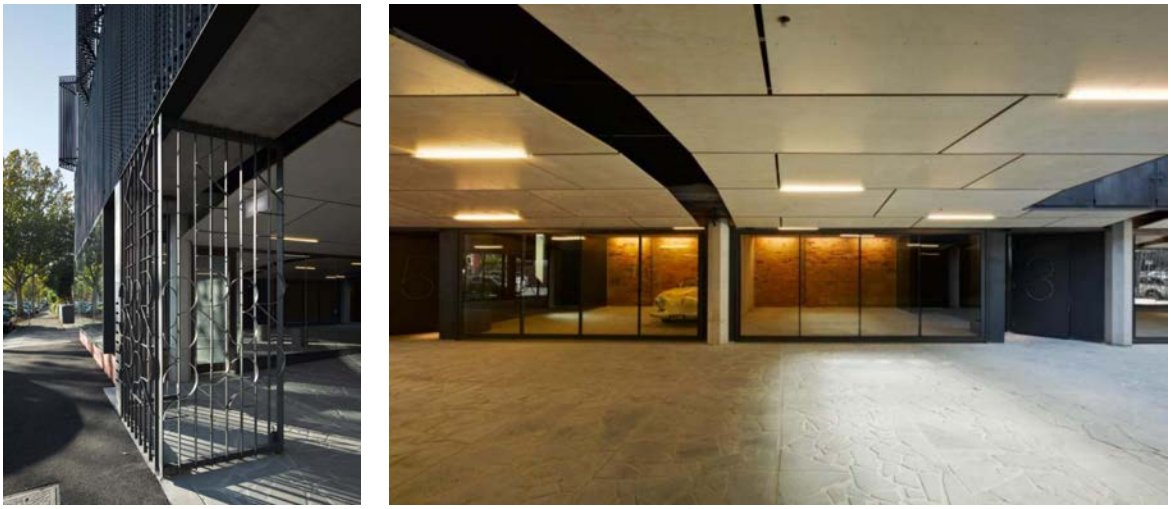


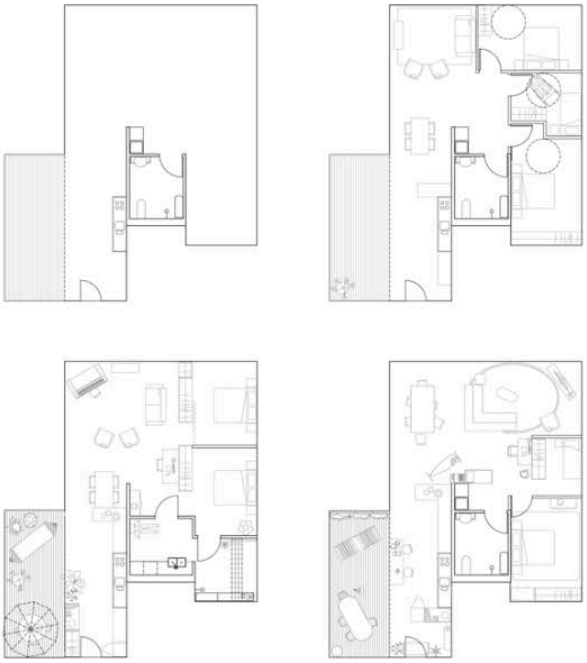
Figure 4. Photos of Kerr Street arcade, as built.

However, today, the concept of the arcade has not been fully realised by residents, who have been reluctant to open up the entry gates on the street frontage to visitors – pointing to difficulties in shifting established attitudes towards privacy and security. Nonetheless, given the popularity of car-sharing schemes and the imminent introduction of autonomous vehicles in Australia, the project raises important questions about the afterlife of parking spaces in inner Melbourne, where as much as 40% of apartment parking goes unused every day.[11]

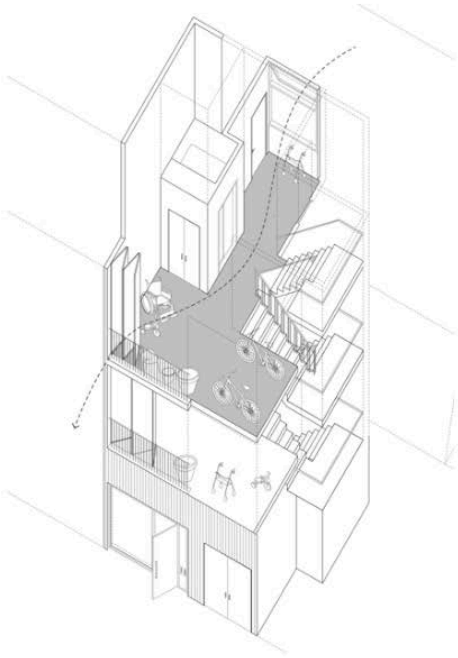
Circulation, sites and precincts

Stakeholder appetite for improving the urban realm through the design of shared spaces, and the barriers to delivering such outcomes in practice, can be traced through the research and implementation phases of a multi-residential project for Housing Choices Australia (HCA). Unlike Kerr Street, where the end-users were not involved in the design process, HCA contributed to the conceptual development of housing design strategies as a research partner on *The Space of Ageing*, and acted as both client and developer during the built realisation of those strategies on a site in St Albans.[12] The project reconsiders the six-pack apartment model for ageing social housing tenants. In addition to the flexible fitout of apartment shells (see *Pavilion House* above), the mobility, autonomy and caring needs of both the tenants and carers were addressed through siting and circulation approaches.[13]

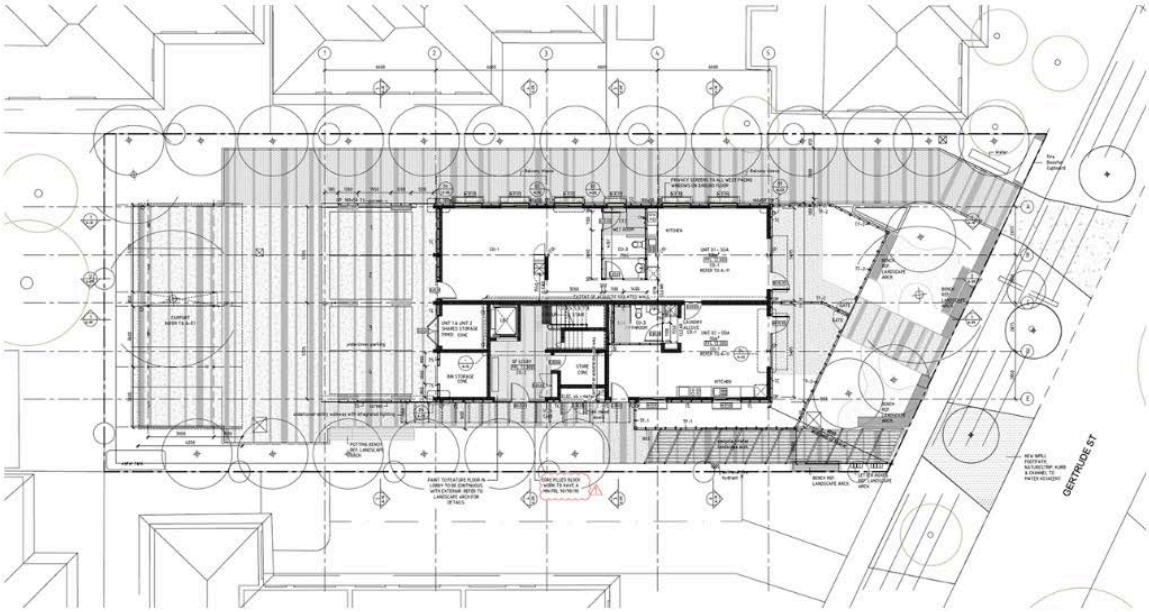
Oversized landings for each level of the lift core provide a type of spill out space for tenants, where they can personalise their entries and find moments of easy interaction with their neighbour (fig 5). Compared with the 'monster' house discussed above or typical apartment developments, which strip-down the 'non-saleable' circulation spaces in a building, this not-for-profit development invests in high quality and occupiable common spaces as integral components of delivering secure, sociable and affordable living options for tenants in the long-term.[14]



Dwelling plans showing flexible and accessible occupations. Rooms are provided 'without doors' unless specific tenant or carer needs require them.



Shared space for 'easy' interactions, and where neighbours can store every-day equipment, such as wheelchairs, and personalise with plants etc.



Building volume 'fixed in the middle of the site, with typical front garden setback and parking at rear. Separation of parking from street and additional driveway along the length of property limits the diversity of private and shared open spaces at ground level.

Figure 5. (top left) Dwelling plans showing flexible and accessible occupations. (top right) Axonometric of generous open-air core. (bottom) Site plan after planning amendments.

The investment in social spaces was followed through to a site level, with the initial building setback enabling a generous landscaped frontage to be 'given over' as part of the public street. Parking provisions, recreation facilities and outdoor furniture was proposed within this zone, encouraging different aged user-groups and facilitating encounters between tenants, visitors and community members. Despite the benefits of such a space for individual tenants and the

collective neighbourhood, planning approval was ultimately contingent on relocating parking to the rear of the property.[15] Incorporating a long driveway and vehicle turning at the back boundary resulted in spatial, cost and time imposts. While it is indeed possible to achieve good design outcomes under planning constraints, the blanket application of standardised controls significantly limits development diversity and the ability to make use of site-specific advantages (fig 6). The HCA apartments could be considered a lost opportunity, illustrating the need to tailor our strategic planning policies to specific contexts and contemporary resident-needs. In the experience of the authors, it is the lack of design 'evidence' and project exemplars that impedes alternative strategic decisions.

Figure 6. Street condition before (middle) and after (bottom) changes.

Developing spatial evidence to underpin strategic policy formation is a key aim of the practice-led research undertaken by the Monash Urban Lab. An example is the speculative

investigation of dispersed, but precinct-scaled, housing redevelopment in Melbourne's middle suburbs.[16] The design model harnesses the piecemeal pattern of infill housing that is rapidly replacing the original detached dwelling types in post WWII suburbs. Rather than develop dual and triple occupancy units on a lot-by-lot basis, which typically result in poor quality development outcomes (figs 7 & 8), the precinct design model coordinates development across clusters of disaggregated allotments. Dispersed precincts offer an alternative strategy for delivering higher density, better quality and more sustainable housing outcomes in well-located 'greyfield suburbs'. [17]

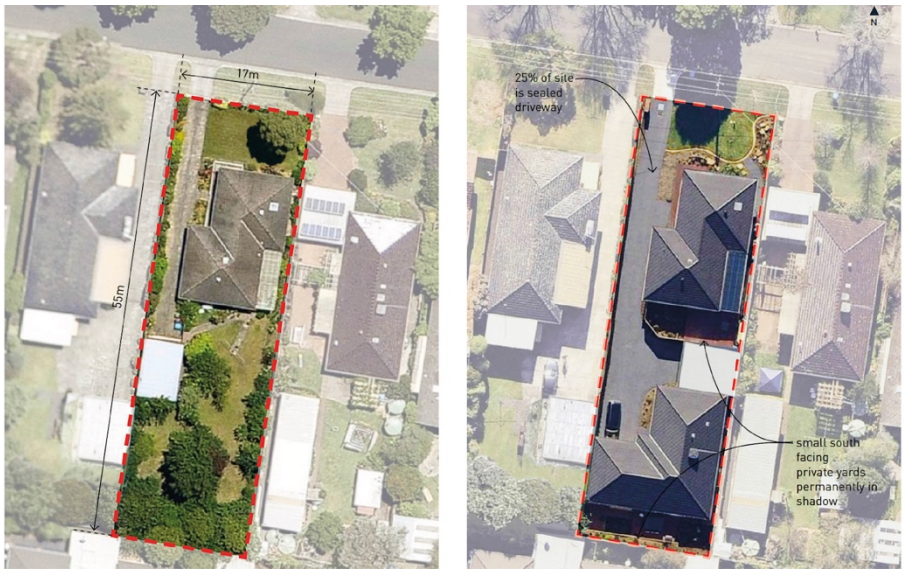
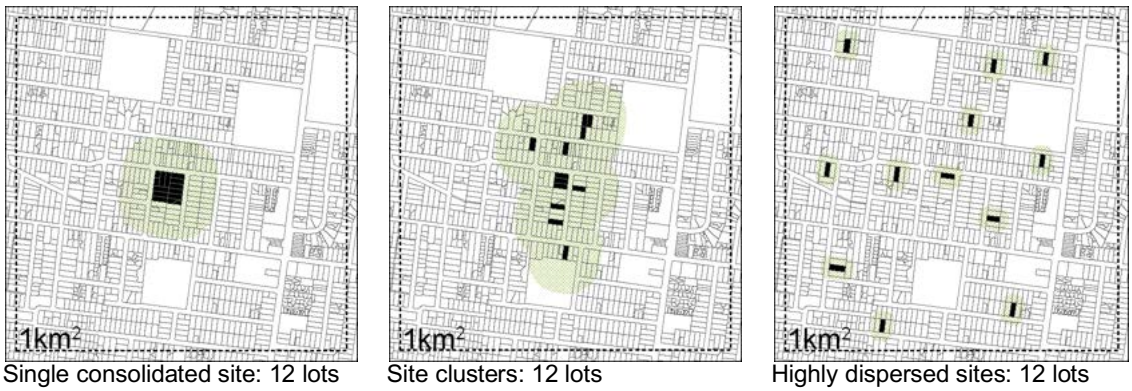


Figure 7. Typical market infill: (left) before - existing post-war dwelling; (right) after - overshadowed small open space and dominance of impermeable driveway surfaces

Figure 8. Aggregate impact of lot-by-lot development over time.

The research showed that redevelopment across a cluster of non-contiguous sites has a larger field of influence on suburban renewal, when compared to piecemeal lot-by-lot projects or larger consolidated developments, which commercial developers favour for ease of construction of repeatable and profitable building types (fig 9). Consolidated and lot-by-lot infill models provide a limited number of dwelling options for a rapidly growing and diversifying population, relying heavily on the existing infrastructure and attributes found in post-war suburbs, but giving little back to the collective built fabric or existing communities. In fact, status quo outcomes are eroding the 'leafy' qualities of post war suburbs that existing residents have nurtured and continue to value.[18]



Single consolidated site: 12 lots | Site clusters: 12 lots | Highly dispersed sites: 12 lots

Figure 9. Field of influence of coordinated development

Conversely, an integrative precinct approach that operates across several disaggregated sites has the potential to deliver a range of medium density housing types currently lacking in the housing market. This acupuncture-like approach enables a mix of garden apartments, courtyard dwellings and townhouses to be strategically distributed in response to the existing context, ameliorating the impacts of higher density development through design (fig 10).

Distribution of dwelling take advantage of site specific attributes, minimising impact on neighbours. New amenity and services strategically inserted to upgrade the quality and performance of the collective neighbourhood.

1. Height to park edge, minimising overlooking.
2. Park edge landscaped + programmed
3. Pedestrian links to park + bike path
4. Existing sports club
5. District-wide water system maintains sports ovals
6. New childcare centre adjacent existing aged care
7. Basketball court on roof of consolidated carpark. Potential for future adaptation.
8. Potential pipeline of public housing assets to be redeveloped as future needs arise in the precinct

1. Landscaped connection to existing sports field
2. Connection through block
3. Potential for future development
4. New community building
5. Public open space
6. Ramp to semi-submerged parking
7. Building chamfered to prevent overshadowing
8. Assisted living and health centre
9. Potential pipeline of public housing assets to be redeveloped as future needs arise in the precinct

Figure 10. Precinct types: (left) Park edge; (right) Green streets.

Built form changes enacted across a larger field opens up opportunities for more effective sharing of amenity and services. For example, carparking can be consolidated and shared by multiple property owners within the precinct, eliminating the unnecessary duplication of vehicle crossovers and circulation spaces on individual properties and freeing up space for alternative uses (see Kerr Street above). Cross-programming and high-quality landscape design allows shared parking areas to double as additional outdoor amenity or new community facilities needed to support impending population increases. Similarly, different types and scales of open space can be threaded through a collective precinct in ways that are unachievable in piecemeal and consolidated developments (fig 11). Distributed open spaces that respond to the diversity of building typologies not only increase the quality and performance of development (e.g. mitigating urban heat sinks), but can be used to create new connections and augment the existing public realm network. In this sense, dispersed precincts have a higher surface area contact and thus have greater potential to regenerate more of the ageing post war fabric and implement positive changes for the whole community.

Figure 11. Identifying new strategic connections and potential upgrades to existing streets to increase walkability, improve access to amenity and support intensified uses.

Urban patterns, resources and services networks

The changed public realm networks in a dispersed precinct point to the types of spatial design knowledge that could be employed by policy makers to support the sustainable transformation of low-density suburbs into more resilient environments. However, the established residential fabric has historically received very little design attention when compared to inner city or fringe urban areas. It is argued here that the lack of design engagement has contributed to the current absence of strategic direction for these greyfield contexts, raising questions about the type and funding of housing and urban research. The social, economic and environmental imperatives of contemporary cities not only demands new and innovative development approaches, but a better spatial understanding of the existing suburban condition is also needed to inform those innovations.[19] In addition to the commissioned research undertaken by the Monash Urban Lab, which sought applied research outcomes for increasing the supply of sustainable and affordable dwellings within the existing housing market, detailed examinations of the intrinsic qualities within the residential fabric have been undertaken through independent doctoral research at Monash University.[20]

An evolving (sub)urbansism, for example, explored the transformative potential of the ambiguous thresholds in residential environments that are neither definitively public nor private: nature strips, front gardens, setback spaces, driveways and some carports and garages. [21] These inert gaps in the residential fabric mediate our collective occupation of the suburbs, but they themselves are not designed for inhabitation. Nevertheless, they are informally adapted in unconventional ways, often generating shared benefits, such as productive food-gardens on nature strips, or conversion of a garage into a general store. A closer reading of the informal appropriation of these ambiguous sites could reveal spatial armatures that enable residential suburbs to evolve.

By shifting the typical frame of design inquiry from the private dwelling, to focus on the spaces in between dwellings, the research demonstrated how the spectrum of shared, common, and semi-public spaces that already exist in the suburbs could potentially be extended and amplified for new collective occupations (fig 12). Reconfiguring these spaces as operative, productive resources could provide ways for residents to extract value from their properties while enhancing neighbourhood amenity and community capital. Some spaces perform best as small pockets between groups of neighbours, such as a shared garden shed or children's play equipment. Others can be used as spatial structuring devices within a block, such as the conjoining of driveways as through-lanes to create new frontages and valuable corner sites.

Others again work better at a block scale, such as on-site water treatment and energy production systems (figs 13 & 14).

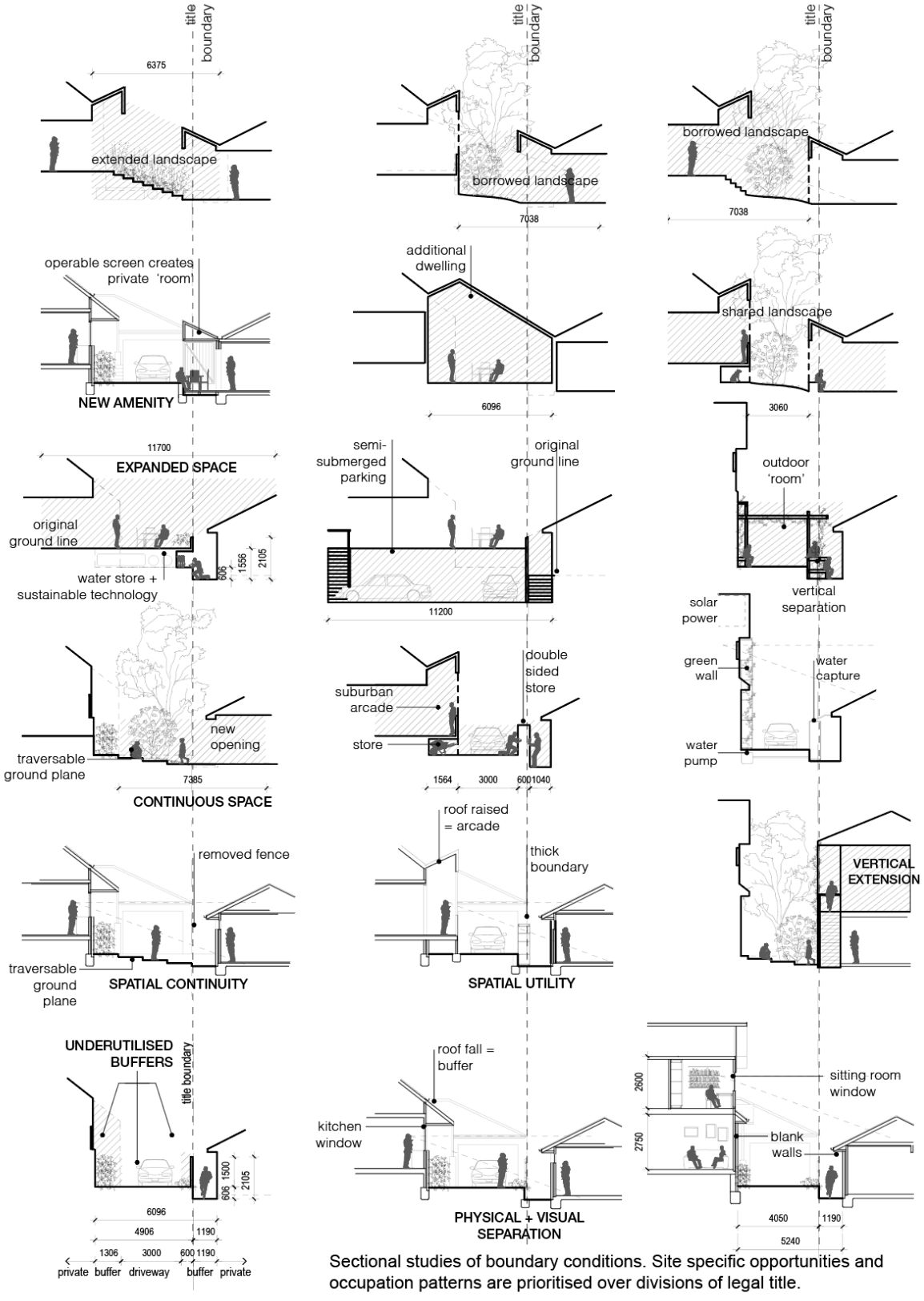


Figure 12. Building–to–building spaces.

Aggregate impact of small scale, resident-led changes begins to spatially restructure a suburban block. Existing dwelling fabric is incrementally renewed, and the quality and diversity of infrastructure, amenity & services collectively enhanced over time.

Figure 13. Residential bock – change over time.

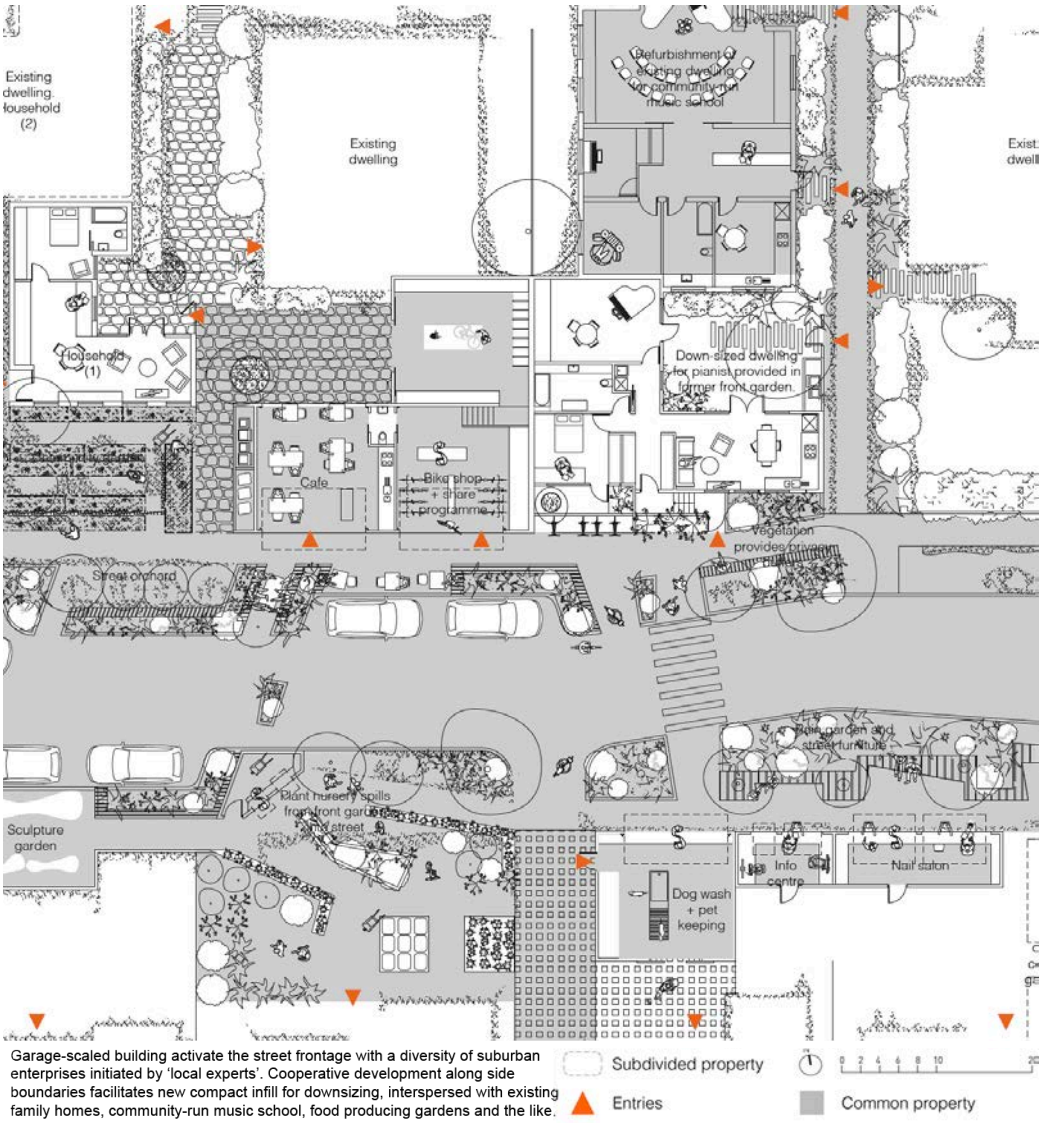


Figure 14. Re-occupation of common and semi-public spaces.

This multi-scalar investigation shows how the constructed whole can become larger than the sum of its parts in the long term, by integrating small-scale development opportunities with broader suburban ambitions. Working within the grain of small-scale infill activity could produce hybrid building types with the overall effect of increasing dwelling yield and diversity, as well as delivering new forms of community, education or health services to support intensification. When appropriate spatial armatures are embedded into the built fabric, the collective field can more readily adapt to changing resident-circumstances, enable the potential pooling of resources or capitalise on community assets and enterprises which can be upscaled over time.

As discussed above, achieving elasticity within the collective fabric is equally incumbent on the way the built environment is administered as it is on the way it is designed. In particular, contemporary ownership structures and governance processes need to be considered at the middle scales of blocks and neighbourhoods, not just the scale of building/site or region/jurisdiction. Mid-scale design and governance approaches will become increasingly important as sustainable infrastructure and technologies are delivered as district-wide, not metropolitan-wide, systems (fig 15 & 16).[22]

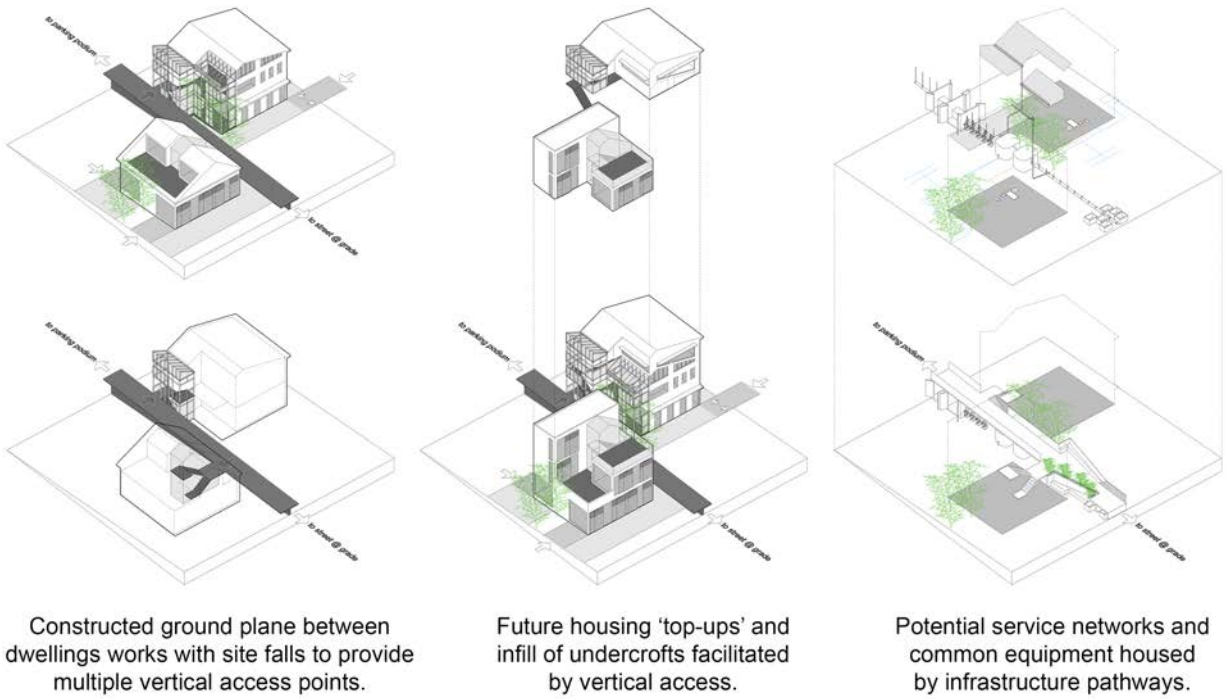


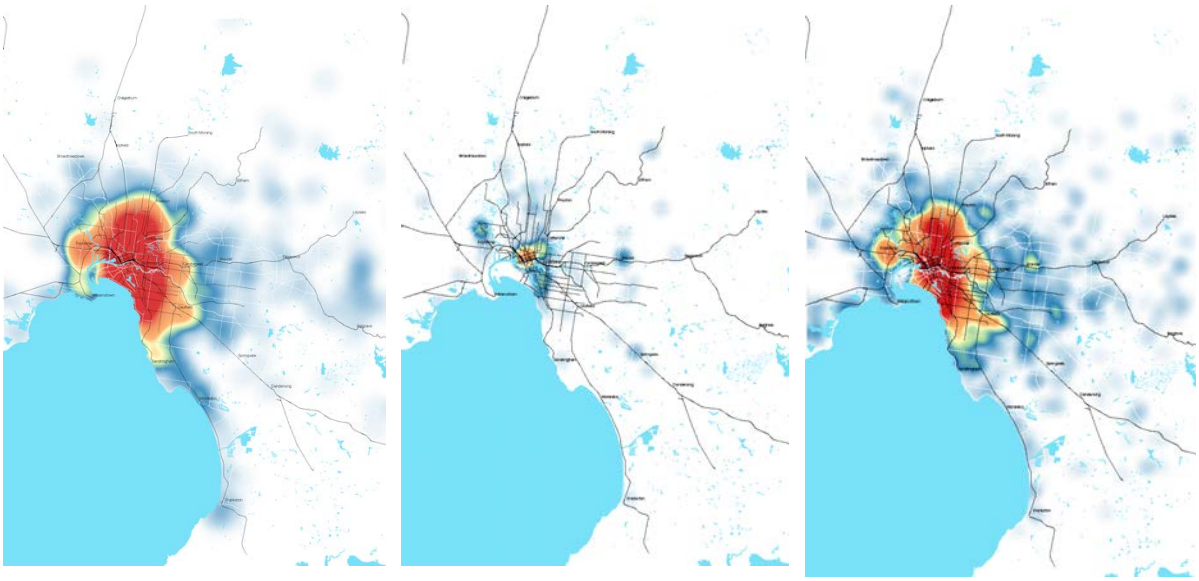
Figure 15. Operative and productive infrastructure.

Figure 16. Future residential quadrant.

The decentralisation of resources and services is also mirrored in the Sharing Economy model, which in theory, operates at the urban scale as a series of distributed assets or services that harness digital infrastructure to form larger global networks. However, in practice, data suggests that the distribution of shared resources and on-demand services are not always so diffuse. Home-sharing platforms like Airbnb tend to manifest in high concentrations of listings in inner urban areas – a pattern visible in first world global cities like Amsterdam, Paris, Barcelona, London and also Australian cities like Sydney and Melbourne. This is likely to stem from a range of factors including density of housing in central areas and proportion of high-

return investment properties, the demand for listings close to cultural infrastructure and public transport, and competitive rates relative to centrally located hotels. The popularity of centralised listings in many of these cities has had the unfortunate effect of displacing urban renters who are now competing with global tourism markets for access to housing that is close in employment centres, popular amenities and public transport. As a result, Amsterdam, London, Paris, Barcelona and now Sydney have all taken steps to avoid exploitative practices either through licensing agreements, or capping the number of days a property can be listed.

In Melbourne, where the housing market is cooling down following a sustained building boom, Airbnb remains unregulated. Unsurprisingly, Entire Home and Shared Room listings are similarly concentrated in the city and inner-city (fig 17). These areas have recently undergone significant high-rise, high-density redevelopment, resulting in an oversupply of homogenous, poorly-designed apartments that predate the implementation of minimum design standards.[23] Many lack basic amenities such as natural light to bedrooms, cross-ventilation and private outdoor space. New research indicates that recent urban development in Melbourne has failed to cater to large sections of the population, with 25-34 year olds dominating the centre – including new migrants and international students (fig 18).[24] While considered unliveable by many locals, these apartment complexes are finding new markets on Airbnb, with particular towers playing host to high concentrations of 'Entire Home' and 'Shared Room' listings, many of which are available year-round.[25]



Entire Home Listings | Shared Room Listings | Private Room Listings

Figure 17. Airbnb distribution in Metropolitan Melbourne. Data sourced from Inside Airbnb. Maps developed by Jacqui Alexander and Tom Morgan 2016

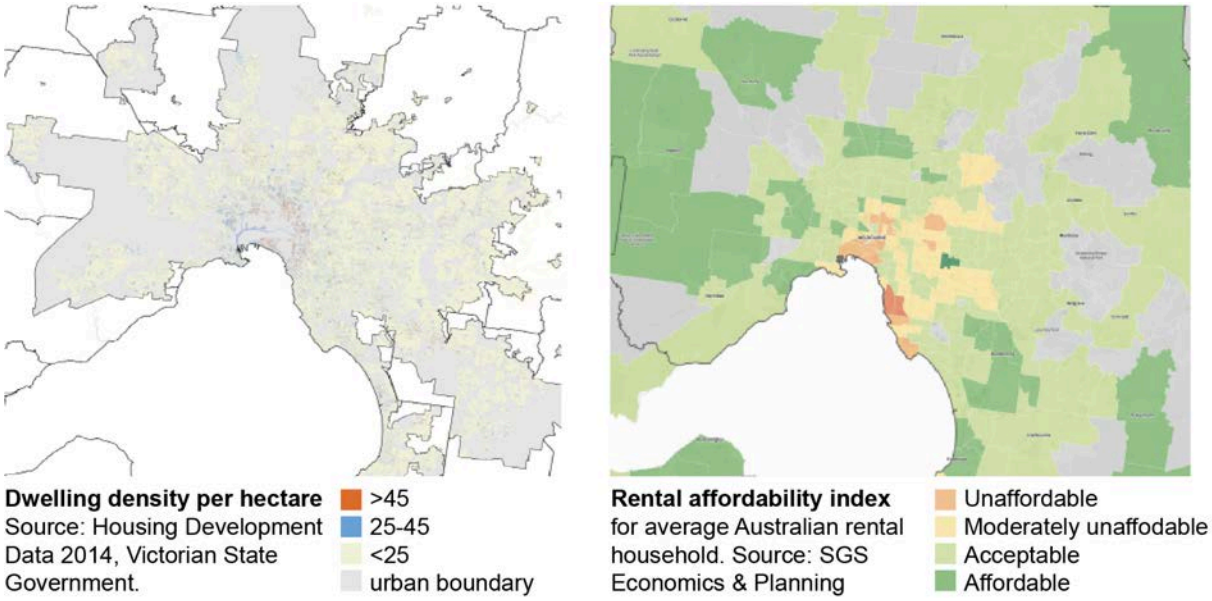


Figure 18. Distribution of housing density and affordability in Melbourne

Conclusion – future design research

The design of shared spaces, integrated with new modes of sharing (both physical and digital), presents a range of opportunities as Melbourne's population races towards 8 million. This paper demonstrates how the design of (time-share) rooms, common property, flexible thresholds and new types of productive networks can create a more responsive urban fabric capable of adapting to swift social, economic and environmental changes that now define urban life. However, the work also highlights the ambiguous and unregulated nature of shared spaces (again both physical and digital). More research is required to understand how these spaces are structured and used across multiple scales. Flexible and replicable spatial strategies are also required to enable multiple actors to effectively access and adapt shared spaces to their specific needs and contexts.

In this regard, platform-based systems could extend beyond a market interface and help coordinate creative engagements between disciplines and sectors, as well as potentially change the way we undertake design. *Supershared*, a purpose-built loft space designed for the *Occupied* exhibition[26] (fig 19), reveals how digital platforms developed for the Sharing Economy might be adapted as architectural tools to rethink program and foster genuine collaboration, imagination and hybridity in private and semi-private spaces across the city.

In *Supershared*, guests were invited to book time in the loft via platforms like Couchsurfer, Gumtree, Creative Spaces and Spacemarket, all of which privilege a different mode of occupation.[27] Drawing on Tschumi's theory of "superposition" [28], the project experimented with the intensification of space through digital cross-programming to generate unpredictable

outcomes in an otherwise heavily curated environment. Reservations were available in increments of one hour up to one month, depending on which platform was used in the booking process. Simultaneous bookings by different parties were coordinated behind the scenes, generating surprise interactions, productive overlaps, and hybrid activities. While the project remains a small test-case, it suggests that there is scope to incorporate platform logic as an operative tool in design practice, "anticipating and mitigating unintended consequences"[29] and recalibrating patterns of occupation and intensification to positive effect.

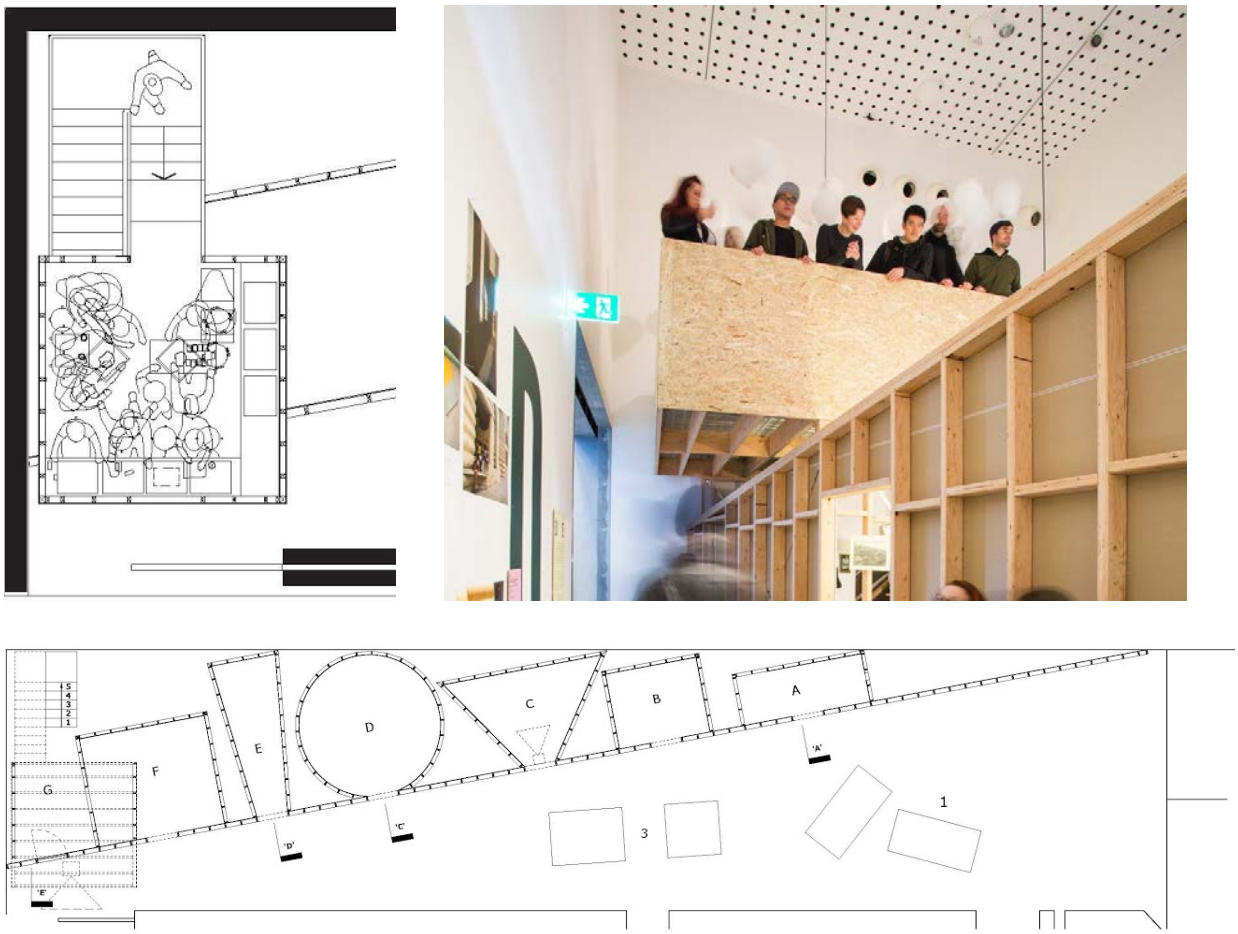


Figure 19. *Supershared*, mixed media installation by Jacqui Alexander and SIBLING Architecture for *Occupied*, 2016. Photography by Tobias Titz

For example, home-sharing platforms like Airbnb, could help increase the density of people within large homes throughout established and greyfield suburbs of Melbourne, intensifying neighbourhoods and dispersing the economic benefits of the Sharing Economy. Coupled with planned infrastructure upgrades, like the Airport Rail link and the Melbourne Metro Tunnel, on-demand infill approaches could be choreographed to take more advantage of time-contingent opportunities, amplifying the benefits of public expenditure. West Footscray (fig 20) is an example of a suburb which is conveniently located between the Airport and city-centre and earmarked for rejuvenation. In addition to supporting existing activity nodes, new and strategic

infill approaches here could bolster future tourism and reciprocally leverage the emerging industry to finance ongoing urban upgrades through commons-oriented platforms like *Fairbnb*, which redirects 50 per cent of all profits into local community development projects. [30]

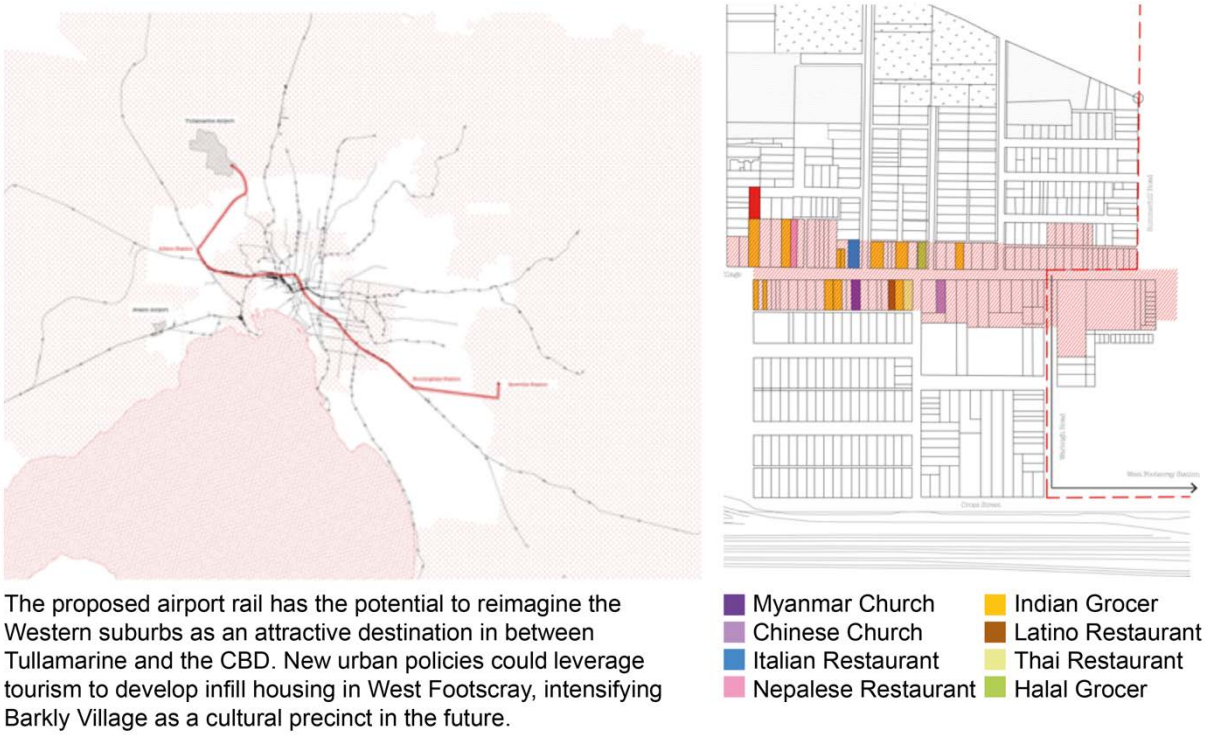


Figure 20. (left) The Airport Rail link.
(right) Example of integrative spatial, economic and social policy tools.

The design research presented here spans speculative investigations in doctoral theses, proof of concepts in commissioned research and applied learnings from architectural practice. These are just some of a number of scenarios in which architects and planners can critically and creatively work with spatial data produced by the Sharing Economy to recalibrate patterns of collective living and raise the quality of housing design outcomes.[31] Through a continuing process of experimentation, demonstration and reflection, the design community has the capacity to build sufficient 'evidence' about shared space to support the necessary shifts towards more equitable and resilient housing futures in Melbourne.

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1 The Sharing Economy refers to peer-to-peer networks of resources and services which can be accessed (typically for a fee) via digital platforms. Examples include home-sharing platforms like Airbnb, ride-sharing platforms like Uber, office-share platforms like Rubberdesk and WeWork.

2 Jack Self, Shumi Bose, and Finn Williams, *Home Economics* (London: The Spaces, 2016), Chap. 1.

3 Jacqui Alexander, "The Architectural and Urban Implications of the Sharing Economy" (Doctorial Thesis, Monash University, Forthcoming).

4 Jacqui Alexander, "Domesticity On-Demand: The Architectural and Urban Implications of Airbnb in Melbourne, Australia" *Journal of Urban Science* No. 02. 88 (2018): 1-10.

5 Alexander, "Domesticity On-Demand," 1-10.

[6] Alexander, “Domesticity On-Demand,” 1-10.

[7] Alexander, “The Architectural and Urban Implications,” (forthcoming)

[8] Jacqui Alexander, “The Architectural and Urban Implications of the Sharing Economy” (Doctorial Thesis, Monash University, Forthcoming).

[9] Jacqui Alexander, “Disruptive Domesticity: Housing Futures and the Sharing Economy,” *Architecture Australia* May/June Issue: Housing Diversity (2018): 108.

[10] Intensification will inevitably consume urban space and resources, such as increasing demand on services, utilizing airspace or often impacting vegetation and solar access. If higher density developments can also deliver other public realm improvements, those contributions can in turn support high quality urban transformations being achieved ongoing.

[11] Elizabeth Taylor. *Transport Strategy Refresh: Background paper - Car Parking*. Melbourne: City of Melbourne, 2018. https://apo.org.au/sites/default/files/resource-files/2018/06/apo-nid179486-1145491.pdf. Accessed 15 July 2019.

[12] Housing Choices Australia was a Partner Investigator for the Australian Research Council Linkage Grant, *The Space of Ageing* (LP140100616). Chief Investigators: Prof Nigel Bertram; Prof Shane Murray and Prof Leon van Schaik.

[13] The building is as much designed for ageing tenant-needs, who may have encumbered mobility and limited social-networks, as it is for carer-needs. Carers can live-in or have a more transient presence. Dwellings are fully accessible and the apartment shells can be equipped with hoists and other devices as needed. Bathrooms are designed to be pleasant places to occupy, as some of the older residents are likely to spend many hours per day bathing and toileting, often with assistance and with one or more carers. Nigel Bertram and Catherine Murphy. ‘The Space of Ageing.’ *Architecture Australia*, May 2018.

[14] Investment in design quality, in turn serves, the long-term interests of the not-for-profit developer. Lee-Anne Khor. ‘Affordable and Accessible Housing.’ *Architecture Australia*, January (2017): 51-57.

[15] A standard requirement for some, but not all, local authorities in suburban contexts. Such controls are rigidly applied to eliminate the poorest development outcomes, but have the simultaneous effect of eliminating less conventional, high quality design approaches.

[16] Examined in collaboration with academic and government partners, including Swinburne University, the Office of the Victorian Government Architect, various State and Local Government planning authorities and the Department of Housing and Human Services. See Shane Murray, Nigel Bertram, Lee-Anne Khor et al. ‘Processes for Developing Affordable and Sustainable Medium-Density Housing Models for Greyfield Precincts’. *AHURI Final Report* 236 (2015).

[17] For detailed definition and discussion of “greyfields” see: Peter Newton, et al. “Towards a New Development Model for Housing Regeneration in Greyfield Residential Precincts.” *AHURI Final Report 236*, (Melbourne: Australian Housing and Urban Research Institute, 2011).

[18] Geoffrey London, Nigel Bertram, and Lee-Anne Khor. ‘Infill Housing Strategies to Transform Low-Density Suburbs .’ *In Sustainable Housing* – Proceedings of the International Conference on Sustainable Housing Planning, Management and Usability, edited by Rogerio Ameoeda and Cristina Pinheiro, 75–85. Porto, Portugal: Green Lines Institute for Sustainable Development, 2016.

[19] The singular reference to redevelopment of established residential suburbs in Melbourne’s metropolitan plan recognises the absence of any strategic direction for the greyfields: “Up until now, the redevelopment of greyfield areas has been generally uncoordinated and unplanned. That must change. ... Methods of identifying and planning for greyfield areas need to be developed.” Dept. of Environment, Land, Water and Planning. *Plan Melbourne*, 51.

[20] Spatial concepts and methods that may not be immediately implementable by the market or adopted by policy, thus having fewer avenues for funding, have initially been tested through the design-led thesis programme at Monash University. In this paper, Jacqui Alexander examines the potential of the sharing economy and Lee-Anne Khor explores the changed spatial and social qualities of the suburban fabric. Related thesis projects at Monash include: Diego Ramirez-Lovering. “The space of dwelling: an investigation into the potential for spatial flexibility to improve volume housing in Australia” (2013); Alysia Bennett. “Stealth Urbanism: The Covert Advance of Suburban Density and Diversity” (2016); Damien Madigan. “Alternative Infill” (2016); Gyongyver

Englomer. “Catchment Thinking as a New Approach to Rethink Urban Densification Strategies” (in progress); and Delia Teschendorff. “Edge Condition” (in progress).

[21] Lee-Anne Khor. “An evolving (sub)urbanism – uncovering spatial potentials in Melbourne’s residential fabric for future development.” PhD by project (Monash University, 2018).

[22] Baugruppen is an example of an integrated design and governance model that fosters community led development of shared physical and social resources. The benefits of such a deliberative design approach has recently been demonstrated at White Gum Valley in Western Australia. Jennie Officer & Geoffrey London. ‘Australia’s First Baugruppe’. *Architecture Australia* 107, no. 3 (2019): 84–87. Also see: Neeraj Bhatia and Steinmuller Antje. ‘Spatial Models for the Domestic Commons Communes , Co-Living And’. *Architectural Design* 88, no. 4 (2018): 120–27.

[23] Alexander, “Domesticity On-Demand,” 1-10.

[24] Seetu Bajracharya, Dorina Pojani and Neil Sipe, “Youth in, families out: six charts on the inner cities of Brisbane, Sydney and Melbourne” *The Conversation,* July 3, 2019

[25] Alexander, “Domesticity On-Demand,” 1-10.

[26] *Occupied* was exhibited at RMIT Design Hub in 2016. The exhibition was curated by Grace Mortlock, David Neustein, Fleur Watson. Exhibition design by Otherothers. Graphic design by Sean Hogan, Trampoline.

[27] *Supershared* was listed simultaneously on Couchsurfer, Gumtree, Creative Spaces and Spacemarket, all which privilege a different mode of occupation. For example, couchsurfer facilitates the sharing of spare beds or couches to backpackers free of charge, Gumtree facilitates the exchange of new and used goods, Creative Spaces lists spaces that are suitable for a variety of cultural activites including exhibition and performance space, workshops and makerspace, and Spacemarket facilitates more conventional deskshare co-working arrangements.

[28] According to Tschumi, productive relations of conflict can be orchestrated through spatial superposition. In this case, the project uses digital superposition used to program space creating occupational overlaps and adjacencies. Bernard Tschumi, *“Disjunctions,” Perspecta*, Vol. 23 (1987): 108-119

[29] Shenja van der Graaf, Pieter Ballon, “Navigating Platform Urbanism”, *in Technological Forecasting and Social Change 142,* (2019): 364-372

[30] Similarly, new policy levers are needed to incentivise a diversity of loose-fit dwelling types aimed at supporting home-sharing in the broadest sense, such as *Pavilion House* or the *HCA apartments,* while also enhancing the liveability for tenants and local alike. These could be immediately implemented through existing social housing delivery models, or in cooperation with locally operated home-sharing sites like *HANZA*, and *Herestay*, which facilitate the rental of spare rooms in exchange for companionship, low rent or practical assistance around the home. See: “Fairbnb,” https://fairbnb.coop/. Other examples include, “HomeShare Australia,” http://aus.homeshare.org.au/; “Herestay” https://www.swinburne.edu.au/current-students/student-services-support/accommodation/off-campus/herestay/. Accessed May 3, 2019.

[31] For example, market data from the Sharing Economy could be used unlock cooperative development opportunities, provide longitudinal post occupancy data or stimulate better quality design outcomes through the embedded rating and review systems.