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Age-Unfriendly by Design: Built Environment and Social Infrastructure Deficits in Greater Melbourne

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Abstract

Problem, Research Strategy, and Findings: The world's population is aging at a rapid rate, yet many local built and social environments are not well suited to support older adults. Australia exemplifies the demographic-environmental disconnect as it is one of the world's most suburban nations and has one of the proportionally largest baby boom generations. This research examines the relationship between built and social environments with respect to older adult vulnerability in Greater Melbourne, Australia. We found that neighborhoods with lower levels of built environment support also had lower levels of social infrastructure. The spatial imbalance across the region was most pronounced when considering the spatial distribution of older adults aged 85 years and above. Our analysis of policymaker interviews revealed a marked disconnect between the scale and scope of the challenges of suburban aging and the state and local government response. Limitations of the study include the operationalization of built environment and social infrastructure variables.

Takeaway for Practice: Age-friendly planning and design cannot be limited to the "easier stuff" such as communication and information, social participation, and respect and inclusion. Suburban built environments require more effort and investment in transportation, housing, and outdoor spaces and buildings in order to support the physical and mental wellbeing of older adults aging-in-place. Walkable suburban neighborhoods with high levels of accessible social infrastructure will help build community connections and encourage older adult physical activity and social engagement.

Keywords: aging; age-friendly cities; suburbanization; social infrastructure; Australia

Introduction

The planning, design, and management of cities play a critical role in shaping the lived experiences and wellbeing of older adults. The ability to age well is fundamentally shaped by the reciprocal connections between older persons and the environment in which they live (Menec et al., 2011). As people age, their physical and cognitive world becomes smaller and as a result the built and social fabric of their immediate neighborhood becomes increasingly important (Ghani et al., 2018; Kerr et al., 2012; Rosso et al., 2011). Walkable, mixed-use neighborhoods with high levels of accessible social infrastructure help build community connections and encourage older adult physical activity and social engagement (Hirsch et al., 2017; Levasseur et al., 2015; Leyden, 2003). But what if the local environment does not facilitate connections and is unsuitable for the needs of an older population? What if the social and physical infrastructure impede older adults' ability to age well?

Australia sits at the precipice of a considerable disconnect between demographic aging and supportive environments. Australia's baby boom generation (those born between 1946 and 1964) is, proportionally, one of the largest in the world and has expressed a desire to age-in-place (Kendig et al., 2017; Salt, 2004). However, Australia is also one of the world's most suburban nations – with approximately two-thirds of the population living in suburban areas (Gordon et al., 2015). Without convenient access to services, amenities, family and friends, older adults in suburban neighborhoods may face loneliness, depression, and other health risks (Kerr et al., 2012).

Our study examines the case of Greater Melbourne, Australia from an ecological perspective (Menec et al., 2011) to unpack the relationship between built and social environments with respect to older adult vulnerability and to capture policymaker perspectives on the challenges of aging in unsupportive environments. Specifically, we use spatial and statistical analysis of

secondary data and open and axial coding of key informant interviews to (1) determine whether neighborhoods with less supportive built environments have lower levels of social infrastructure, (2) determine the scale, scope, and spatial distribution of older adult vulnerability with respect to the built and social environment, and (3) analyze practitioner perceptions of and responses to suburban older adult vulnerability. Our findings demonstrate significant spatial divergence in built environment and social infrastructure support, producing distinct geographies of aging across Greater Melbourne. We also find a marked disconnect between the scale and scope of the challenges of suburban aging and the state and local government response. The case study provides a clarion call for planners and policymakers to reconsider suburban age-friendly planning to help build a more supportive, connected, and older future. The paper begins with a review of the aging and social infrastructure literature, followed by an overview of the case study area, description of the study methods, presentation of the spatial and statistical analysis and policymaker perceptions of suburban aging, and lastly the conclusion and implications for practice.

Background

According to Lawton and Nahemow's (1973) press-competence model, aging is a function of the interplay between physical and social environmental barriers (the press) and individual capacity to manage a demanding environment (competence). Congruence between environmental presses and personal needs nurtures cognitive and physical wellbeing, whereas discrepancies elicit adverse health outcomes (Kahana et al., 2003). As older adults age they are increasingly likely to experience some kind of impairment and therefore more likely to be negatively affected by their environment (Ghani et al., 2018; Lawton, 1982). As a result, older adults are more likely to spend time in their immediate neighborhoods than any other age group (Kerr et al., 2012). Their life

spaces effectively shrink (Rosso et al., 2011). The neighborhood environment becomes increasingly critical for older adult health (Hartt et al., 2021; Yen et al., 2009). Planning, building, and maintaining supportive social and built age-friendly environments are key to preserving and improving the quality of life of older adults (Buffel & Phillipson, 2016; Plouffe & Kalache, 2010; Scharlach & Lehning, 2013).

A principal component of an age-friendly supportive built environment is its walkability (Vine et al., 2012). Being able to drive in a car-dependent neighborhood can increase feelings of independence in older adults, but it begs the question of what happens when individuals can no longer drive (Zeitler & Buys, 2015). An older adult without a driver's license in a walkable community can continue everyday activities with little environmental press. In a poorly connected community where nothing is within walking distance and public transport access is poor, the environmental press is much stronger and can severely limit the ability to engage in everyday activities (Hartt & Biglieri, 2018). Car-dependent neighborhoods inhibit activity and community participation for those unable to drive (Lord et al., 2011).

In addition to being safer for older adult pedestrians (Dumbaugh & Zhang, 2013), walkable neighborhoods are associated with older adult food security (Chung et al., 2011) and increased older adult physical activity and active transport (Cerin et al., 2017). In a systematic review of built environment correlates of older adults' physical activity, Barnett et al. (2017) found that walkability was the single most important built environment feature for enhancing older adult health. Their finding is especially impactful considering that physical activity is important for maintaining cognitive ability (Stubbs et al., 2017) and a key protective factor against developing Alzheimer's and Parkinson's disease (Paillard et al., 2015). A walkable built environment is also integral to the health of people with Alzheimer's disease and related dementias (Biglieri, 2018).

Walkable neighborhoods can foster independence and dignity thanks to better access to services and amenities (Levasseur et al., 2015). The accessible proximity to amenities, services, and community supports in walkable communities also bolsters opportunities for social interaction and connection (Ferreira et al., 2016). Residents in walkable, urban neighborhoods have been shown to have greater levels of social interaction than their suburban counterparts (Richard et al., 2009). The presence of spaces of social interaction that are not home or work, which Oldenburg (1999) refers to as "third spaces", have been identified as important to the health and wellbeing of older adults (Campbell, 2015). In their study of the Gold Coast, Australia, Alidoust et al. (2019) found that third places were more likely to be located in walkable than car-dependent neighborhoods. Furthermore, the study found that older adults perceived third places to be more accessible when located in walkable environments.

Third spaces are one example of social infrastructure – resources that physically structure social engagement. It is important to distinguish social infrastructure from social capital. The latter is commonly used as a measurement of personal relationships and networks, whereas the former refers to the physical arenas that allow social capital to develop. Social infrastructure are physical places, spaces, institutions, organizations, and groups that shape everyday interactions and create social connection (Latham & Layton, 2019). According to Klinenberg (2018, p. 5), "when social infrastructure is robust, it fosters contact, mutual support, and collaboration among friends and neighbors; when degraded, it inhibits social activity, leaving families and individuals to fend for themselves." Social infrastructure runs the gamut of public, non-profit, and private institutions, including libraries, community centers, parks, and places of worship (DeVerteuil et al., 2020; Latham & Layton, 2019), many of which are commonly found across the denser and older parts of cities. The distribution of social infrastructure in newer, less dense automobile-oriented suburbs

and exurbs is potentially more scarce and perhaps quite localized, and the subject of relatively little research to date (DeVerteuil et al., 2021).

Older adults in low-density, car-dependent neighborhoods may face the interrelated challenges of inadequate built environment and social infrastructure. Our study examines the relationship and geography of built environment and social infrastructure support and older adults in Greater Melbourne, Australia. Recognizing the diverse nature of suburban environments (Forsyth, 2012; Keil, 2017), we use a typology to capture the built environment of neighborhoods across the metropolitan region (Gordon & Janzen, 2013) rather than delineating an urban-suburban dividing line. This approach allows us to identify the built environment diversity within Greater Melbourne, critically examine centralist bias of urban practice, and uncover the inequitable distribution of supportive built environments and social infrastructure and the potential vulnerability of older adults.

Case study: Greater Melbourne

The Greater Melbourne region (Figure 1) has a population of 5,159,211 and consists of an amalgam of 31 local government areas in an area just shy of 10,000 km^2 (Australian Bureau of Statistics, 2021; Saberi et al., 2017). Like many Australian metropolitan regions, Greater Melbourne is characterized by a compact urban center surrounded by low-density suburban sprawl (Henderson, 2019; Rahnam et al., 2015). Melbourne's sprawling suburban development is reflective of historically cheap land surrounding the city, state-funded heavy and light rail radiating out from the inner urban core, policies designed to facilitate detached house ownership, and a consistently high rate of population growth (O'Connor & Healy, 2004). The region has a history of centralist planning and development where government responses and public-private

partnerships have tended to look inwardly upon the metropolitan area and neglect infrastructure deficits in outer Melbourne (Henderson, 2019). The automobile reliance of suburban Melbourne has been linked to the social exclusion of non-driving older adults (Liu & Engels, 2012).

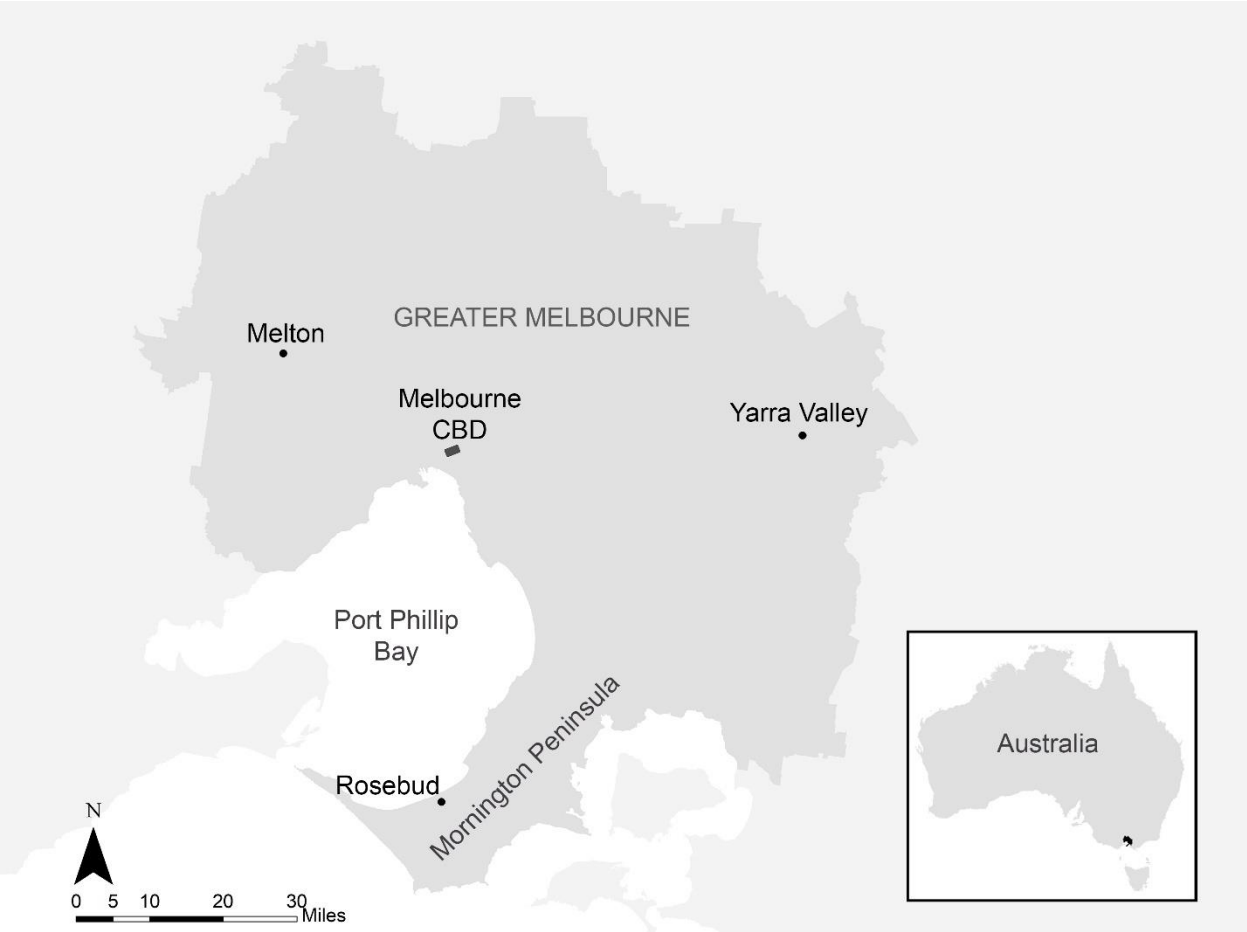

Figure 1: Map of Greater Melbourne.

Urban planning in Victoria, and subsequently Melbourne, is overseen by the Victorian Planning Authority (VPA), a statutory State Government authority, while issues of health and wellbeing (including aging) are the responsibility of the Department of Health and Human Services. These state government organizations work collaboratively with local planning authorities to develop strategies that support local actions focused on developing age-friendly

cities. The Victorian State Government and Greater Melbourne's municipalities have increasingly recognized the need to plan urban areas in a more age-friendly way, leading to the publication of numerous age-friendly and active aging policies since the 2000s (Kendig et al., 2014). Most recently, the Victorian State Government published a four-year strategic plan titled *Melbourne: A Great Place to Age 2020-2024* which presents 16 priorities in planning for an aging population (City of Melbourne, 2020c). This is the primary policy relating to planning and age-friendly cities in Greater Melbourne. It closely aligns with the World Health Organization's (WHO) Age-Friendly Cities Framework and emphasizes the use of social infrastructure to facilitate respect, safety, community connectivity, and support (City of Melbourne, 2020c). Accessibility of urban spaces and affordability of housing are highlighted as key action areas addressing safety of older adults, however most actions contained within the policy focus on inclusivity in planning processes, encouraging social participation, and provision of outreach services (City of Melbourne, 2020c). The *Melbourne Planning Scheme* (The Victorian Planning Authority, 2021) does not explicitly detail how these action areas will be addressed. The needs of older adults are only raised in the context of providing residential aged care facilities in its discussion of housing supply. Many of the priority areas for age-friendly cities identified by the WHO are addressed through non-age specific State and Local Government policies, such as *Plan Melbourne 2017-2050* (The State of Victoria Department of Environment, Land, 2017), *City of Melbourne Transport Strategy 2030* (City of Melbourne, 2020b), and the *City of Melbourne Affordable Housing Strategy* (City of Melbourne, 2020a).

Methods

The overarching objective of this research was to explore the relationship between the built and social environments with respect to older adult vulnerability. We employed a two-part approach to examine (1) the spatial relationship between social infrastructure and supportive built environments and older adults, and (2) policymaker perceptions of and responses to older adult vulnerability.

The first phase of the research combined spatial and statistical analysis to determine the spatial relationship between the level of built environment support and social infrastructure and potentially vulnerable older adults across Greater Melbourne. The empirical analysis was conducted at the smallest standardized spatial unit for which all data was available: statistical area 2 (SA2). The SA2 is an appropriate spatial delineation for our study as it captures a functional area from which people come to access services at a center (Australian Bureau of Statistics, 2016). SA2s contain between 3,000 and 25,000 residents and often represent distinct suburban areas (Australian Bureau of Statistics, 2016). A total of 257 SA2s in Greater Melbourne were included in the study.

Data on older adults was obtained from the 2016 Australian Census of Population and Housing. We collected data on two groups: older adults aged 65 years and above (referred to as "adults 65+" for the remainder of the paper), and older adults aged 85 years and above (referred to as "adults 85+" for the remainder of the paper). The distinction between adults 65+ and 85+ reflects the higher likelihood of frailty, vulnerability, and decreased activity and independence of the latter group (Behm et al., 2013; Fried et al., 2004). While this is not the case for every individual above the age of 85, adults 85+ generally experience heightened cognitive and physical issues (Levitin, 2020). Specifically, we collected data on the overall proportion of each group relative to

the population as well as the proportion of residents within each group living alone – another key indicator of older adult vulnerability (Channer et al., 2020; Holt-Lunstad et al., 2015).

In order to construct an inventory of social infrastructure across the Greater Melbourne metropolitan area, we focused on three types of social infrastructure: public, non-profit, and religious. Each of these types of institutions provide the key components of social infrastructure (DeVerteuil et al., 2020): a binding of the social and the spatial through a shared physical environment and high accessibility. Public social infrastructure includes hospitals, parks, libraries, community and learning centers, public pools, and transit nodes. Hospital data was retrieved from the Victoria State Government (2022) list of public hospitals. Park data from the City of Melbourne's (n.d.) list of parks and public spaces and a Google Maps search of Greater Melbourne. Library data was available from the *Public Libraries Victoria* website (n.d.). Public pool and community and learning center data was available from a private website on recreational facilities (Melbourne Playgrounds, n.d.). Transit node data was retrieved from the *Public Transport Victoria* website (Transport for Victoria, n.d.).

Non-profit social infrastructure includes men's sheds, neighborhood houses, Lions Clubs, and Country Women's Associations. Men's sheds and neighborhood houses are unique forms of social infrastructure that originated in Australia and are prevalent in communities across Victoria. Men's sheds are community groups that gather to "tinker, fix, repair, and make items", provide support, and promote health and wellbeing (Victorian Men's Shed Association, n.d.). Whereas men's sheds are traditionally reserved for men only, neighborhood houses aim to "bring people together to connect, learn, and contribute to their local community through social, educational, recreational, and support activities" (Neighbourhood Houses Victoria, n.d.). All non-profit social infrastructure data was accessed from organizational websites (Country Women's Association,

n.d.; Lions Clubs, n.d.; Neighbourhood Houses Victoria, n.d.; Victorian Men's Shed Association, n.d.). Religious social infrastructure focused on places of worship of the three largest denominations (Catholic, Anglican, and Muslim) and data was retrieved from online lists of places of worship (Allianz Assistance Health, 2020; Anglican Diocese of Melbourne, n.d.; Catholic Archdiocese of Melbourne, n.d.).

To capture variation in Greater Melbourne's built environment we relied upon the typology developed in Gordon's (n.d.) *Suburban Nation* project. The project developed and tested a range of models to capture the diverse and varied built environments of metropolitan regions across two largely suburban nations: Canada and Australia. In both contexts the study concluded that transportation behavior models were most effective in representing the urban and suburban landscape (Gordon & Janzen, 2013). The Australian portion of the study resulted in a built environment metropolitan typology consisting of active cores, transit suburbs, auto suburbs, exurbs, and other (Gordon et al., 2015). Active cores neighborhoods are defined as SA2s in which active transportation to work rates are at least 150% of the Greater Melbourne mean. Transit suburbs are SA2s in which public transportation to work rates are at least 150% of the metropolitan mean and active transportation rates are less than 150% of the metropolitan mean. Auto suburbs are SA2s in which both active transportation and public transportation rates are less than 150% of the Greater Melbourne mean. Exurbs are predominantly rural areas where population density is less than 150 per square kilometer (the OECD definition of a "rural community"). Finally, SA2s with no, or close to no, resident populations such as cemeteries and industrial areas were classified as "other". In total, Greater Melbourne contains 40 active core neighborhoods, 19 transit suburbs, 169 auto suburbs, and 29 exurbs.

The second phase of the study focused on policymaker perceptions of and responses to older adult vulnerability. As the State Government of Victoria is responsible for establishing policy directions for both planning and health matters, which local policies and plans must then align with, the study concentrated predominantly on policymakers at the state level. Fourteen key informant interviews with policymakers were conducted in January 2020. Interviewees included eight senior employees of the State Government of Victoria's Department of Health and Human Services, two executives from the Victoria branch of a large national aging not-for-profit, two policy advisors from the Municipal Association of Victoria (who oversee local planning authorities), and two senior members of the office of the Commissioner for Senior Victorians. Interviews were recorded, transcribed, and transcripts were analyzed using open and axial coding.

Intraregional analysis of social infrastructure and the built environment

The first objective of this study was to test whether there is a spatial association between social infrastructure and built environment support across Greater Melbourne. Figure 2 depicts the location of social infrastructure (public, non-profit, religious) over a map of Greater Melbourne's neighborhoods as defined by the built environment typology (active core, transit suburb, auto suburb, exurban, other). The map clearly demonstrates that public, non-profit, and religious social infrastructure are clustered in more supportive built environments. The spatial distribution demonstrates that the prevalence of social infrastructure diminishes along the urban-suburban-exurban hierarchy.

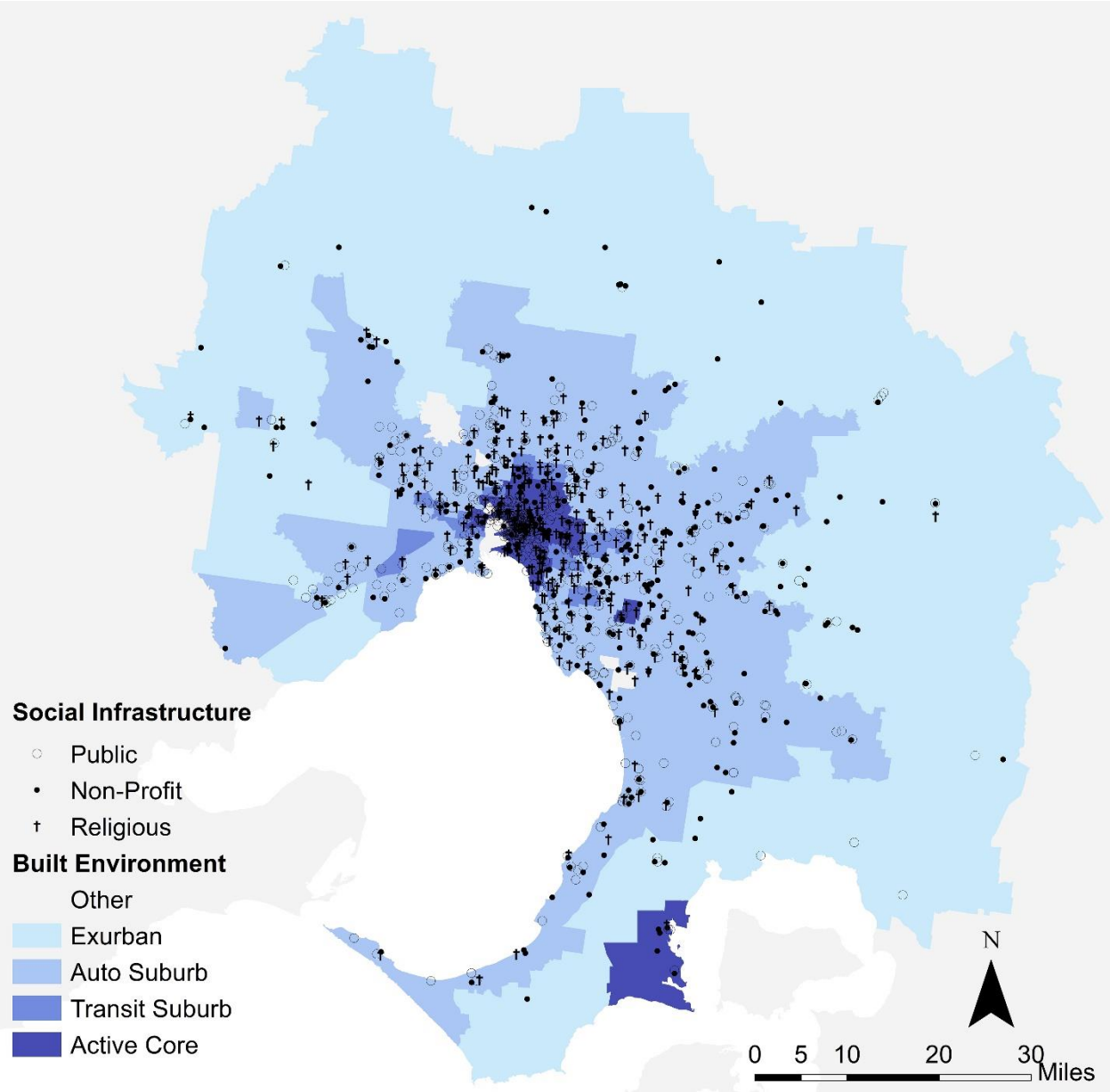

Figure 2: Map of social infrastructure and built environment in Greater Melbourne.

The relationship between social infrastructure and the built environment is tested statistically using a series of ANOVA tests (Table 1). The statistical analysis confirms the overall trend depicted in Figure 2. Active core neighborhoods have the highest levels of social infrastructure, followed by transit suburbs, auto suburbs, and lastly, exurban areas – logical as population density generally diminishes along the urban-suburban hierarchy. To determine if

social infrastructure is disproportionately located in more urban areas, we ran a second series of ANOVA tests accounting for population density. In addition to considering social infrastructure per capita (measured per 1000 residents), we also examined the spatial distribution of social infrastructure with respect to older adults. Specifically, we examined social infrastructure density in five ways: per 1000 residents, per 1000 adults 65+, per 1000 adults 65+ living alone, per 1000 adults 85+, and per 1000 adults 85+ living alone.

Table 1: ANOVA tests comparing mean levels of social infrastructure (SI) per neighborhood (SA2) across built environment types.

	Active Core	Transit Suburb	Auto Suburb	Exurban	P-value
SI Total	8.93	3.79	3.33	2.78	<0.001
Public	1.33	0.84	1.06	0.62	0.071
Non-profit	5.50	1.21	0.92	0.21	<0.001
Religious	2.1	1.21	0.92	0.21	<0.001
SI per 1000 pop	0.65	0.28	0.22	0.26	<0.001
SI per 1000 pop 65+	7.18	2.26	1.48	1.83	<0.001
SI per 1000 pop 65+ alone	29.87	8.82	7.72	10.80	<0.001
SI per 1000 pop 85+	78.90	14.38	13.00	23.83	<0.001
SI per 1000 pop 85+ alone	246.23	53.40	43.47	81.34	<0.001

Table 1 demonstrates that active core neighborhoods have a statistically significant disproportionate amount of social infrastructure, even after accounting for population density. The amount of social infrastructure per capita falls along the urban-suburban hierarchy until reaching exurban areas which in all instances have higher levels than auto suburbs. The trend is even more pronounced when concentrating on older adults. On average, active core neighborhoods have more than three times the social infrastructure per adults 65+ than auto suburb neighborhoods. For every 1000 adults 65+ living alone, a group shown to need more community support (Holt-Lunstad et al., 2015), active core neighborhoods have almost 30 sites of social infrastructure whereas auto

suburbs only have 10. The spatial imbalance is even more severe for adults 85+. On average, active core neighborhoods have over six times the social infrastructure per 1000 adults 85+ than auto suburb neighborhoods.

Intraregional analysis of older adult vulnerability

The second objective of the study was to determine the scale and scope of older adult vulnerability with respect to the built and social environment. To do so, we examined the proportion of four categories of older adults living in disparate built and social environments. In addition to the older adult categories (65+, 65+ alone, 85+, 85+ alone) and built environment typology (active core, transit suburb, auto suburb, exurban), we used location quotients to categorize the level of social infrastructure in each neighborhood (SA2). Neighborhoods with less social infrastructure per capita than the metropolitan average were categorized as “low” and those with above average social infrastructure per capita were categorized as “high”. A summary of the population distribution by neighborhood type is presented in Table 2.

Table 2: Absolute and proportional distribution of older adult populations in active core, transit suburb, auto suburb, and exurban neighborhoods by level of social infrastructure.

	Population 65+		Population 65+ Alone		Population 85+		Population 85+ Alone	
	n	%	n	%	n	%	n	%
Active Core	69,223	12	18,879	15	10,028	12	3,030	12
Transit Suburb	35,948	6	9,424	8	6,575	8	2,153	9
Auto Suburb	412,884	73	85,863	70	59,536	74	18,295	74
Exurban	44,802	8	8,013	7	4,350	5	1,131	5
Total	562,857	100	122,179	100	80,489	100	24,609	100
Active Core low SI	15,252	5	4,681	7	2,096	5	747	6
Transit Suburb low SI	16,903	5	4,735	7	2,884	7	1,026	8
Auto Suburb low SI	261,878	81	51,487	79	35,581	83	10,621	81
Exurban low SI	27,957	9	4,664	7	2,521	6	644	5
Total low SI	321,990	100	65,567	100	43,082	100	13,038	100

Note: Low social infrastructure (SI) refers to neighborhoods with less social infrastructure per capita than the metropolitan average.

We found that over 70% of older adults in all four categories reside in auto suburbs and over half of all older adults live in neighborhoods with low social infrastructure. Furthermore, almost half of all four groups live in auto suburbs with low social infrastructure. Less than 10% of older adults in all four groups live in transit suburbs. While over half of those in transit suburbs do have high levels of social infrastructure, older transit suburb residents were not as supported as those in active core neighborhoods where older adults benefit from a more supportive built environment and high levels of social infrastructure. Transit suburbs west of the CBD have particularly low levels of social infrastructure (Figure 2). The same neighborhoods are also characterized by low income and high immigration populations (Figure 3). The uneven distribution of public, non-profit, and religious social infrastructure within transit suburb neighborhoods highlights a centralist bias and the relative lack of support for potentially vulnerable groups.

Supportive built and social environments are important for all Melburnians, and certainly all older Melburnians. However, supportive built and social environments are most critical for

older adults living alone. Without a supportive built environment to facilitate mobility, access, and connections and/or supportive social infrastructure to cultivate and maintain social networks and activities, older adults may find themselves increasingly isolated. To get a sense of the spatial distribution of those most vulnerable to social isolation, Figure 3 highlights neighborhoods with higher than metropolitan average levels of three characteristics (65+ and 85+ living alone, low income, immigrant population) as well as metropolitan transit networks (bus, tram, rail).

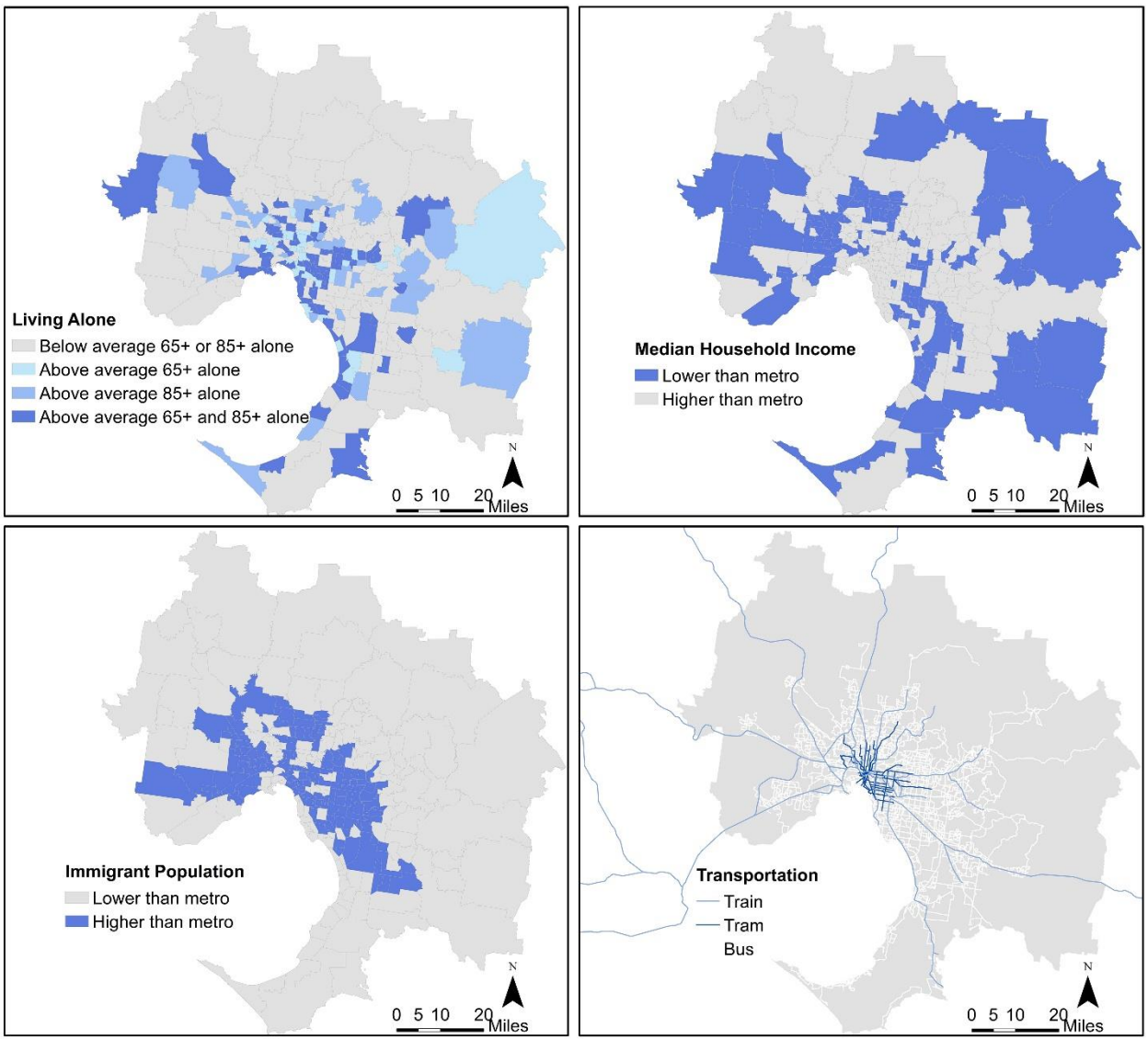

Figure 3: Maps of neighborhoods with (1) above average levels of adults 65+ and 85+ living alone, (2) median household income below the metropolitan average, (3) proportional immigrant populations above the metropolitan average, and (4) train, tram, and bus transit networks.

Neighborhoods with higher-than-average levels of older adults living alone are generally located in the southern half of the metro with distinct clustering around the CBD, in the suburban areas east of the CBD, and along Port Phillip Bay. Although there is overlap between neighborhoods with higher-than-average levels of adults 65+ and 85+ living alone, Figure 3 depicts distinct intragenerational geographies with the latter group more dispersed. The

concentration around the CBD reflects the large number of downtown high-rise apartments and retirement/active over 50s housing developments. The clustering along the coastline of Port Philip Bay and the Mornington Peninsula reflects the popularity of such locations with sea-change retirees seeking a less urban lifestyle, while remaining connected to downtown Melbourne by public transit (Mckenzie, 2020). Although it is important to note that the transportation connectivity along the Mornington Peninsula drops considerably as you move away from the CBD. It is also interesting to note that older adults living alone in immigrant neighborhoods are generally well supported by the built environment, transportation, and social infrastructure. The pockets of older adults living alone in the eastern, western, and southern fringes of the metro coincide with low built environment support (auto suburb and exurban areas), low social infrastructure, low income, and poor transportation connectivity. The confluence of vulnerability factors in the low-income exurban and auto suburbs of Melton, Yarra Valley, and Rosebud (Figure 1) is particularly concerning as there are virtually no sites of social infrastructure and no public transportation.

The lack of readily accessible social infrastructure in outer suburbs speaks to a larger issue around the emerging idea of "post-suburbia" which contends that suburbs should be seen as increasingly diverse, dense, and "urbane" (Phelps, 2015). Rather, the results bolster DeVerteuil et al.'s (2021) findings of a persistent deficit of social infrastructure in the far-flung Australian suburbs. As in Sydney (DeVerteuil et al., 2021), social infrastructure in Greater Melbourne continue to cluster in the active core.

Policymaker perceptions of and responses to suburban aging

In order to gauge policymaker perceptions of and responses to older adult vulnerability in Greater Melbourne, fourteen key informant interviews were conducted with state level practitioners. Three

distinct themes emerged from the analysis of the interview transcripts: (1) awareness of challenges, (2) reluctance to tackle built environment challenges, and (3) downloading of responsibility.

Awareness of challenges

Policymakers were aware of the distinct challenges facing older Melburnians in different areas of the region and acknowledged the additional disadvantage faced by older adults living in suburban neighborhoods. Interviewees consistently highlighted the importance of, and connection between, the built and social environments, explaining how inadequate suburban housing and public transportation contributed to older adult social isolation and loneliness.

A policy officer in Prevention and Population Health in the Department of Health and Human Services explained that some suburban areas in Greater Melbourne "are neighborhoods which are about as inhospitable as you could possibly imagine – like artificially contrived retirement communities, but there are no facilities within walking distance other than like a community meeting base. There are no shops; public transport access is extremely poor." The lack of social infrastructure, and especially walkable and accessible social infrastructure, and its contribution to social isolation and loneliness was noted by several interviewees. Inadequate suburban public transportation was seen to amplify these issues. A senior advisor in Seniors Programs and Participation in the Department of Health and Human Services acknowledged that "We have issues with transport, older people with transport. The data is showing that [issues with transport] contributes a lot to social isolation, and then all of the other issues stem from that." The lack of adequate public transportation is especially problematic as suburban residents "assumed that they would be able to continue to drive for the rest of their lives… the concept of catching

public transport is just a non-compute" (senior employee, Wellbeing and Community Support, Department of Health and Human Services).

In addition to transportation, housing was seen to be a major challenge for suburban aging. A policy advisor from the Municipal Association of Victoria explained that many "older people want to downsize but there isn't appropriate housing in their community." Appropriate is the operative word as interviewees outlined challenges with both single detached and apartment suburban living. Most interviewees concentrated on the former as single detached housing developments make up a large proportion of Greater Melbourne's suburban neighborhoods and are most closely associated with popular conceptions of suburban living. Issues of maintenance and inaccessible design were raised by many interviewees, but the most persistent theme was that of social isolation and loneliness. Rather than the home itself, the most significant challenge of single detached housing was the disconnected nature of its surrounding built environment. The reliance on automobiles, lack of social infrastructure and amenities, detached and divided nature of the neighborhood, and sheer distance separating households and their community all were seen to contribute to poor physical and mental health.

A policy officer in Prevention and Population Health in the Department of Health and Human Services felt that planning, and more specifically developers, were aggravating an already difficult situation, stating that there is a

> "need for older people to have the right kind of housing as they age. The ability to be able to change suburban houses to smaller, more suitable, universally designed accommodation. But the planning of our cities and the planning of our suburbs doesn't encourage the building of those kind of alternative housing styles.

> Particularly for renters. The opportunities to move are very, very limited. How do you get developers to look at the social aspects of what they're doing? Because the apartments that are being built are two-bedroom dog boxes, basically. And one-bedroom dog boxes."

Their comments were echoed by an executive from a not-for-profit, "the diversity of housing that's being created by developers is just not there. Their goal is really very singular. Maximize the number of properties." An employee in Ageing and Aged Care in the Department of Health and Human Services added that even "things that seem like really good planning, like getting more people living close to public transport, have resulted in older people being completely displaced from their housing because it becomes too desirable... planning has replaced a whole lot of older people that used to live in [older suburb] neighborhoods". Some local government authorities in Greater Melbourne, such as Port Phillip, have sought to address this through the provision of special free community bus services targeted at better connecting older adults to key facilities in their community (e.g. supermarkets) on weekdays (Wositzky, 2020). However, this does not address the issue of gentrification suggested by the interviewee above, which reflects a need to include and protect access to affordable housing in proximity to transit networks in land use planning policies.

Addressing the "easier stuff"

Interviewees explicitly highlighted the built environment and social infrastructure as determinants of social isolation and loneliness. However, the State of Victoria and the local councils in Greater Melbourne are overwhelmingly focused on mitigating the latter rather than addressing the

underlying structural issues. Despite the acknowledgment of housing and transportation as fundamental challenges of suburban aging, policymakers have been reluctant to devote resources to ameliorating the built environment. A policy advisor from the Municipal Association of Victoria summarized local council age-friendly priorities and action:

> "Housing, transportation, and outdoor spaces and buildings are the three domains that have got the least amount of work... But they've done heaps of work in social participation, respect and inclusion, communication and information, and community supports and health services… They've really addressed the easier stuff than the harder areas that are more demanding on the dollars."

The remaining "harder areas" consists of addressing factors in the physical urban form (distribution and diversity of land uses, and housing particularly), which may increase social isolation and inhibit older adults' mobility, sociability, and access to community facilities. Warner and Zhang (2019) argue that such changes to the physical fabric of cities are challenging because they require a fundamental shift in planning modalities and are difficult principles to implement in the short term to areas that were historically developed based on segregation of land uses. Making the physical environment more age-friendly and ensuring a diversity of age-appropriate housing options, Warner and Zhang (2019) argue, requires longer term coordination of land uses with transportation, a shift towards more mixed-use development, and encouraging diverse land uses in existing suburban areas through updated planning policies, zoning, and building codes. Moreover, while the "easier stuff" may be less costly, policymakers and planners continue to face significant challenges in the provision of social infrastructure and issues of social isolation and

loneliness in older age groups. The uneven distribution of social infrastructure highlights how the built environment can impede progress on the social, support, and communication domains of age-friendliness.

Another policy advisor from the Municipal Association of Victoria echoed the sentiment and further emphasized "the worst of all is housing. Housing for older people remains a really big issue for councils. They're not in that space generally and they're really not doing much." The very challenges that have been caused by poor planning and reinforced by downtown and inner suburb gentrification have been knowingly neglected due to their difficulty and expense. Housing affordability is a particular challenge for older adults, with approximately 30% of older adults in the Greater Melbourne reliant on a limited aged pension allowance, and almost 40% of those aged over 60 living in a rental property (City of Melbourne, 2020c). The lack of affordable housing in Greater Melbourne reflects numerous concurrent factors, including insufficient construction of new dwellings, constrained development opportunities because of Greater Melbourne's Urban Growth Boundary, and limited numbers of older people downsizing from larger properties (Birrell & Healy, 2018). This suggests a need for planners to facilitate the development of new housing stock, potentially through increased density of brownfield sites within the Urban Growth Boundary, to ensure older Melbournians have access to affordable and appropriately sized housing.

Downloading of responsibility

Due to high costs and logistical difficulty, state and local governments have failed to address built environment impediments to aging well in the suburbs. Instead, policymakers have concentrated on the social and health domains of age-friendly cities. Setting aside the issues of this false and

precarious compartmentalization, the execution of the narrow purview of age-friendly initiatives in Greater Melbourne is considerably fragmented. All interviewees vocalized the importance of social infrastructure to the health and wellbeing of older adults and provided examples of government-funded initiatives to support local communities and combat loneliness. However, government-funded programming relies extensively on the self-selection, organization, and effort of individuals and community groups. According to a senior member of the office of the Commissioner for Senior Victorians, "we didn't have to put in new social infrastructure…it was really about thinking of the resources that we've got." State and local government downloading of responsibility to community groups and individuals was a consistent theme across the interviews.

Both the State Government and local councils provide funding to third spaces, such as men's sheds and neighborhood houses. The importance of men's sheds and neighborhood houses to older adult suburban aging was emphasized by all fourteen interviewees. However, relying on the self-selection and self-organization of community groups is problematic. Although they applauded the contribution of neighborhood houses, an executive from a not-for-profit also acknowledged that "neighborhood houses don't do everything for everybody. There'll be people in our community that are totally and utterly missed and are falling through the gaps."

In addition to the emphasis on community organizations, a senior member of the office of the Commissioner for Senior Victorians also regularly pointed to the responsibility and role of the individual and their immediate family in aging well, emphasizing the state's "very high level of interest in older people self-managing their health conditions as they age." Another member of the Commissioner's office also stressed the importance of "family networks to have as much proactive involvement in [older adult's] life journey" as "one of the best protective factors for an older person is to have the right trusted person that's there with them on their journey."

The devolution of the responsibility of aging well to individuals, families, and non-profit organizations can be viewed as a neoliberal cost-cutting strategy (Peck, 2012) that contains, localizes, and disconnects problems from wider structures of power (Jessop, 2009). This is consistent with previous research that has found state-level investment approaches in Greater Melbourne to be underfunded, opaque, narrow, and complex (Henderson, 2019). The State of Victoria is engaging in what Joy (2020) refers to as place-based policymaking to responsibilize "dutiful" families, "active" citizens, and "innovative" non-profit organizations and local governments. By downloading public responsibility, higher levels of government can co-opt the impactful and potentially expansive elements of localism without providing political tools or resource support.

The above also suggests that funding limitations may be driving a high degree of fragmentation and disconnection between planning and public health institutions working on the issue of making Greater Melbourne more age friendly. Reiterating the findings of Warner and Zhang (2021), this is likely to result in the number and quality of public services and thus social infrastructure planned for and offered in Greater Melbourne. It also suggests that there is a need for greater coordination and collaboration across institutions, rather than a reliance on individual organizations, particularly those in the non-profit sector, to address issues of older adult loneliness and social isolation.

Conclusion

Aging well requires a combination of individual and community-level factors to come together to support older adults in everyday activities (Hartt & Biglieri, 2018). Walkable neighborhoods with high levels of accessible social infrastructure help maintain and improve physical and mental

wellbeing later in life (Hirsch et al., 2017; Levasseur et al., 2015; Leyden, 2003). However, not all neighborhoods offer the same level of support. Our study of the rapidly aging (Salt, 2004) and overwhelmingly suburban (Gordon et al., 2015) metropolitan area of Greater Melbourne found that neighborhoods with lower levels of built environment support (i.e., auto-dependent suburban neighborhoods) also had lower levels of social infrastructure. This discrepancy has led to distinct geographies of aging and living alone. If older adults aspire to age-in-place, planners must play an important role in transforming auto-dependent neighborhoods with low levels of social infrastructure into age-friendly communities.

Unfortunately, there is a marked disconnect between the scale and scope of the challenges of suburban aging and the state and local government response. We found that policymakers have been reluctant to work on the most expensive, pressing challenges such as housing and transportation – which happen to be the very challenges caused and reinforced by suburbanization and neoliberal policies. While social elements of the age-friendly model may be "easier" and less costly, our analysis shows a distinct social infrastructure deficit in unsupportive built environments. The uneven geography of Greater Melbourne's built environment has led to a patchy landscape of social infrastructure. Neighborhoods with supportive built environments and good transportation connectivity are benefiting from the public focus on the "easier stuff" while disconnected, often lower-income, auto suburbs and exurban areas are overlooked. Targeted interventions to improve the built environment in such neighborhoods could address immediate concerns regarding housing and transportation and, as a result, provide an environment for social infrastructure to flourish.

Built environment interventions need to be coupled with the continuation and expansion of social programming. The current tendency to download the responsibility of aging well to

individuals and community members further disadvantages vulnerable and disconnected older adults. And while mutual aid and reciprocity can be of great benefit to local communities, they can also be co-opted by a devolving and shrinking welfare state as a way to fill the gaps. In turn, this enables governments to cast off needy communities by insisting that they are resilient. Initiatives to complement the extensive non-profit social infrastructure in Greater Melbourne, especially in the outer suburbs, could help broaden the accessibility of social infrastructure beyond the self-selection and organization of groups like men's sheds and the Country Women's Association.

Our findings further underline that the sparseness of social infrastructure in auto suburbs and exurbs is by design, not just a function of lower density or a random outcome of unintentional land-use policies. These places are purposefully left with deficits that are effectively built in through a restrictive planning model that produced a rigid material environment (in terms of housing, transportation, density), making them expensive to rectify later, leading policymakers to focus on procedure and recognition rather than redistribution. Planning and policy interventions must reflect the relationship between the built and social environments in order to avoid complicitly backing unsupportive neighborhoods and then failing to improve them to support an aging and potentially isolated, vulnerable population. Future research could build upon this regional study by narrowing the spatial scope of the analysis to incorporate perceptions of planners, policymakers, and residents at the local level, and expanding the analysis to include a wider range of neighborhood characteristics and indicators of social infrastructure.

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