

Density *my* way: Community attitudes to neighbourhood densification scenarios

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ABSTRACT

Transit Oriented Development (TOD) within existing urban areas often confronts entrenched community resistance. This paper documents the results of an Australian survey systematically evaluating the level of community support of densification strategies around a central train station in a greyfield suburban setting – based on theories in planning such as TOD (Pedestrian Pockets and Transit Boulevards), Greenspace-Oriented Development (GOD) and ‘hidden density’ approaches. This paper’s original contribution stems from using a hypothetical site which obviates localised issues and interests and allows for a comparatively neutral assessment of different densification approaches. The results are instructive and unanticipated. Support was highest for precinct-scale approaches to densification (TOD and GOD), while antipathy remains towards ‘hidden density,’ dispersed, single-storey background infill. The results also reveal significant and essential differences in support for densification models based on gender, with females more supportive of GOD approaches than conventional TOD. The paper highlights the need for revised policies to deliver alternative urban densification approaches, such as GOD, ensure the liveability of densification along Transit Boulevards, and impede deeply unpopular ‘hidden density’ or background infill.

1. Introduction

Australian cities are also sprawling rapidly (Australian Bureau of Statistics, 2021) and are an extreme case of a global tendency for urban sprawl (Angel, 2012). If detached housing in greenfield development remains the predominant means of housing surging populations (Australian Bureau of Statistics, 2021), Australian cities will balloon into what commentators characterise as an unhealthy (Ewing et al., 2014), stratified, environmentally destructive (Ritchie et al., 2021), inefficient, and unproductive form (Kelly & Donegan, 2015). While the need for urban densification is evident, research indicates that resistance to urban infill in suburban neighbourhoods is often endemic, hampering the delivery of infill agendas (Einstein et al., 2019; Goodman, 2017; Kelly & Donegan, 2015; Kwok et al., 2018; Maginn & Foley, 2017; Murphy, 2012; Pegler et al., 2020). In the face of this reportedly dogged resistance, policymakers need an accurate and up-to-date understanding of urban densification models with broad community support.

1.1. Theoretical framework

Policymakers advocate the application of TOD strategies in cities worldwide (Calthorpe, 1993). Indeed, as Ian Carlton (2009, p. 23) tells us, ‘now almost every metropolitan region with major public transport infrastructure has adopted some form of high-density TOD scenario’. Australia’s major cities are no exception and have policy frameworks aiming to deliver urban density around mass transit, reflecting the broad-scale adoption of TOD thinking (Department of Planning Transport and Infrastructure, 2017; Department of Planning, and Western Australian Planning Commission, 2015; Victorian State Government, 2017). This aspirational policy agenda is in stark contrast to the morphology of Australian cities that are some of the lowest density on the planet (Hurley et al., 2017) and comprise vast swathes of low-density, suburban development (Dodson, 2010) (Fig. 1). Reflecting this, the 2021 Census of Population and Housing found that only 16 % of private dwellings in Australia were apartments, with the bulk continuing to comprise detached houses (70 %) (Australian Bureau of Statistics, 2017; The Australian Bureau of Statistics, 2022).

Despite its manifest popularity with policymakers, TOD has faced

many impediments to implementation within existing suburban areas, including fierce community resistance (Bolleter et al., 2020; Newton, 2010; Newton & Glackin, 2014; Bolleter et al., 2022). According to commentators, there is an entrenched 'public sullenness' towards urban densification in suburban neighbourhoods (Kelly & Donegan, 2015, p. 129). This situation is partly explained by current communities' perception of density increases as an affront to suburban lifestyles (Dovey & Woodcock, 2014; Sarkissian, 2013). This reputed hostility is long-standing, with localised Australian community resistance to urban infill development being a significant impediment since the late 1980s (Davis & Harford-Mills, 2016). Such resistance stems from concerns about traffic congestion and parking hassles (McNee & Pojani, 2021) and already overcrowded public transport (Rice, 2016, p. 180). Aggravating this is apprehensions about diminishing privacy and amenity, the destruction of urban forests (Haaland & van den Bosch, 2015), the demolition of heritage buildings and the degradation of neighbourhood character (Rice, 2016). Further compounding resistance is cynicism that TOD represents an unholy alliance of state government planning agencies and private developers (Kwok et al., 2018) who are 'lining their own pockets' at the expense of the existing community (Rice, 2016). Resistance to urban densification can also be driven by an unacknowledged societal dimension, including attempts to preserve class status, exclude lower-income households, and protect home values, among other things (Talen, 2012; Wassmer & Wahid, 2019). Moreover, where infill developments include affordable housing, especially rental housing, those resisting density sometimes 'frame prospective tenants as freeloaders, anti-social, and even potentially criminal' (McNee & Pojani, 2021).

Community concerns relating to densification have arisen despite extensive theorising about factoring community opinion on planning issues under the encompassing framework of collaborative planning theory (Hall, 2014). The collaborative model emphasises the planner's role in mediating among 'stakeholders' within the planning situation (Fainstein, 2000, p. 452). Furthermore, the theory emphasises that it is not enough for policies to be designed solely by 'experts' (Healey, 2001)

and that urban visions must be grounded in understanding residents' preferences (Willing & Pojani, 2017). Irvin and Stansbury (2004) observed that it is widely argued that increased community participation in government decision-making produces many vital benefits and 'better acceptance' (Konsti-Laakso & Rantala, 2018). Indeed, a better understanding of community preferences for TOD should help with future design and communication about and, ultimately, acceptance of TODs in suburban areas.

Despite widespread support for and reliance on 'extensive public consultation processes' (Murphy, 2012, p. 177), collaborative planning praxis can tend towards superficiality when deployed in support of TOD projects. Kelly and Donegan explain, 'Too often in Australia, governments consult residents to provide a veneer of respectability to a pre-determined outcome rather than genuinely responding to residents' priorities' (2015, p. 156). Indeed, government-led community engagement exercises can be perfunctory, 'dull, jargon-laden or so vague and insipid' (Kelly & Donegan, 2015, p. 154). Moreover, while some local governments have moved to emphasise public participation at the policy-setting stage as opposed to when an individual development application is submitted (McNee & Pojani, 2021), most residents only engage in the planning process in response to particular development proposals (Kelly, Breadon, & Reichl, 2011). Furthermore, traditional 'town hall' style engagement also often fails to engage the 'silent majority' with an unrepresentative group disproportionately participating in, and dominating, public meetings concerning infill development (Einstein et al., 2019; Kelly & Donegan, 2015). Indeed, traditional community consultation can fail to engage many people, especially those with children, demanding jobs, or both (Kelly & Donegan, 2015, p. 159).

As a result of the above factors, there is a gap in the literature about community sentiment towards varying conceptual TOD models of neighbourhood densification. Indeed, research-led surveys have typically focused on what respondents would trade off regarding dwelling density and location (Curtin University and Sharley, 2013; Kelly, Weldmann, & Walsh, 2011) instead of a broader assessment of



Fig. 1. The low-density expanse of Perth's middle ring suburbs.

conceptual models of neighbourhood densification. To address this situation, the central research question guiding this enquiry is:

With local factors obviated, what TOD-related urban densification models do communities support, and how does this vary concerning different demographic groups?

2. Materials and methods

2.1. The density my way survey

The survey was developed using the online tool [SurveyMonkey® \(2021\)](#) to identify and unpack community preferences for neighbourhood-scale urban densification scenarios. The survey comprised two sections. The first introductory section concerned respondents' general attitudes to urban densification in their city and neighbourhood. Participants were asked:

Do you think population growth should be accommodated through 1) New suburban development on city edges or 2) Urban densification in existing neighbourhoods?

Previous survey research has shown that some residents resist urban infill development, despite feeling urban densification is necessary at the metropolitan scale ([McNee & Pojani, 2021](#)). Therefore, to explore whether general attitudes to densification at the metropolitan scale were consistent with those at the neighbourhood scale, we asked respondents: *Do you support urban densification in your neighbourhood?*

To further elucidate the factors underlying respondent sentiment, we asked them to rank why they did or did not support densification in their neighbourhood. The reasons presented were drawn from the relevant

literature ([Dovey & Woodcock, 2014](#); [Haaland & van den Bosch, 2015](#); [Kwok et al., 2018](#); [Rice, 2016](#); [Sarkissian, 2013](#)). We then asked respondents who did not support densification in their neighbourhood to rank factors that could reduce their concerns.

The subsequent main section of the survey explored respondents' attitudes to four different urban densification scenarios that accommodated an additional 2000 dwellings in a hypothetical/typical 1 km² Australian greyfield neighbourhood ([Newton, 2010](#)) with a train station. We based the normative scenarios ([Goodspeed, 2020](#)) on various established urban densification strategies related to 'theories in planning' ([Olesen, 2018, p. 26](#)) ([Fig. 2](#)). These include:

1. TOD Pedestrian Pockets ([Calthorpe & Fulton, 2001](#)). This scenario draws on planning theory which proposes clustering a mixture of land uses and housing (at higher densities) around high-frequency rail nodes configured as the heart of the enlarged community ([Newton, 2010, p. 93](#)). Proponents propose that TOD, in this form, will increase public transport use and provide residents with convenient access to the train station and local amenities ([Calthorpe & Fulton, 2001](#); [Newman, 2007](#)).
2. TOD Transit Boulevards ([Calthorpe & Fulton, 2001](#)). This scenario builds on planning theory that proposes multi-functional arterial roads supporting higher-density, mixed-use developments with regular bus services connecting to nodes in the rail network ([Adams, 2016](#); [Calthorpe, 2002](#)). Proponents suggest that such scenarios will increase public transport use and provide residents convenient access to bus services and local amenities ([Calthorpe, 2002](#)).
3. Greenspace-Oriented Development (GOD) ([Bolleter & Ramalho, 2014](#)). This scenario stems from theory that proposes urban densification is grafted onto upgraded parks that are comparatively well-



Fig. 2. A comparative image of the urban densification strategies: 1. TOD Pedestrian Pockets: Urban densification around a train station, 2. TOD Transit Boulevards: Urban densification along a major road, 3. Greenspace-Oriented Development (GOD): Urban densification around parks, and 4. Hidden density: Urban densification in backyards.



Fig. 3. The hypothetical greyfields suburban neighbourhood.

served by public transport. Proponents venture that GOD will provide residents with various health and well-being benefits through convenient access to green space (Bolleter & Ramalho, 2019).

4. 'Hidden density' (Matsumoto et al., 2012, p. 133) referred to as background infill (Bolleter, 2016). This scenario relates to planning theory that proposes that urban densification should be a 'gentle, hidden, invisible form of density' (Matsumoto et al., 2012, p. 133). In the Australian context, this constitutes 'background' infill, which comprises small-scale, single-storey, semi-detached survey strata, and typically two to seven group dwellings organised around a shared driveway (Kelly & Donegan, 2015; Newton et al., 2011). Proponents presume that background infill will provide residents with a suburban lifestyle, albeit on much smaller lots, and will mitigate community resistance through, to some degree, 'hiding' the new dwellings when viewed from the street (Newton, 2010, p. 93).

The four urban densification scenarios were intentionally simplified to elucidate respondents' preferred scenarios and allow exploration of the basis of those preferences without getting bogged down in detail. Inspired by serious games and co-design methods (Bolleter, Vokes et al., 2021), the survey employed a baseboard (Fig. 3) upon which the authors designed and deployed various densification scenarios within an 800 m walk of transit. The benefits of basing the scenarios on a generic, hypothetical 'site' (or gameboard) instead of a 'real' site are vital. First, it obviates specific site issues which could confuse assessment (e.g., a prominent topographic feature) or vested interests that go with land ownership (Einstein et al., 2019). Indeed, a survey based on a 'real' site immediately becomes enmeshed in vested interests because most planning for urban densification in existing neighbourhoods takes place on

land that is privately owned but publicly managed (Stein, 2019).

Moreover, geographic (spatial) discounting influences attitudes to urban densification, wherein the distance from the domicile may contribute to local opposition or support (Brown et al., 2014). By obviating issues relating to proximity to urban densification, respondents can assess the normative scenarios unencumbered by such factors. Moreover, the neutral base allows for consistent assessment of the different scenarios. Finally, the modularity of the base gives a user-friendly game-like quality to respondents unfamiliar with assessing urban design/planning scenarios. Nonetheless, we note the simplifications. For example, we represented the surrounding suburbs in an unsubdivided form to allow clarity of assessment of urban densification scenarios. We also represented the rail line as sunken to create a unified base on which to represent the scenarios.

The survey first presented respondents with a visual of the hypothetical suburban neighbourhood typical of Australian greyfield (middle-ring) suburbs in cities such as Perth, Melbourne, Adelaide and Brisbane (Newton, 2010; Newton et al., 2011). This suburb contained single-storey, detached suburban houses, a suburban train station, sports ovals and parks (reflecting the mid-twentieth century recreation movement) (Byrne et al., 2010), small district shopping centres, major and minor roads, and a fringing light industrial area. The scenarios were sited in a greyfields setting because 'greyfield precinct redevelopment (and densification) constitutes one of the principal challenges for twenty-first-century urban planning' (Newton, 2010, p. 100). Participants were then instructed on the scenario choices and sequentially presented with the four different TOD scenarios for delivering the additional dwellings.

These normative scenarios were prefaced with the following

statement:

Presume you live in a suburban house in this neighbourhood, and a target has just been set for an additional 2000 dwellings to be developed. What follows are different scenarios to accommodate those 2000 dwellings according to various approaches for you to evaluate. We want to know what you would prefer and why.

The scenarios were as follows.

2.2. Scenario #1 urban densification around a train station

This scenario:

- Adds 2000 new dwellings to the neighbourhood (in a mix of low, medium and high-rise apartment buildings)
- Concentrates high-rise apartment buildings with shops, restaurants, and entertainment venues around the existing train station
- Introduces new trees, paving and street furniture in the train station plaza

- Introduces mid-rise and low-rise apartments within a 5-minute walk of the train station
- Replaces the surface level car parks near the train station with a multi-storey car park (Fig. 4)

2.3. Scenario #2 urban densification along a major road

This scenario:

- Adds 2000 new dwellings to the neighbourhood (in a mix of low, medium and high-rise apartment buildings)
- Concentrates high-rise apartment buildings with shops, restaurants, and entertainment venues along the main road
- Introduces new trees, paving and street furniture along the main road
- Introduces mid-rise and low-rise apartments within a short walk of the main road
- Replaces the surface level car parking near the train station with a multi-storey car park (Fig. 5)

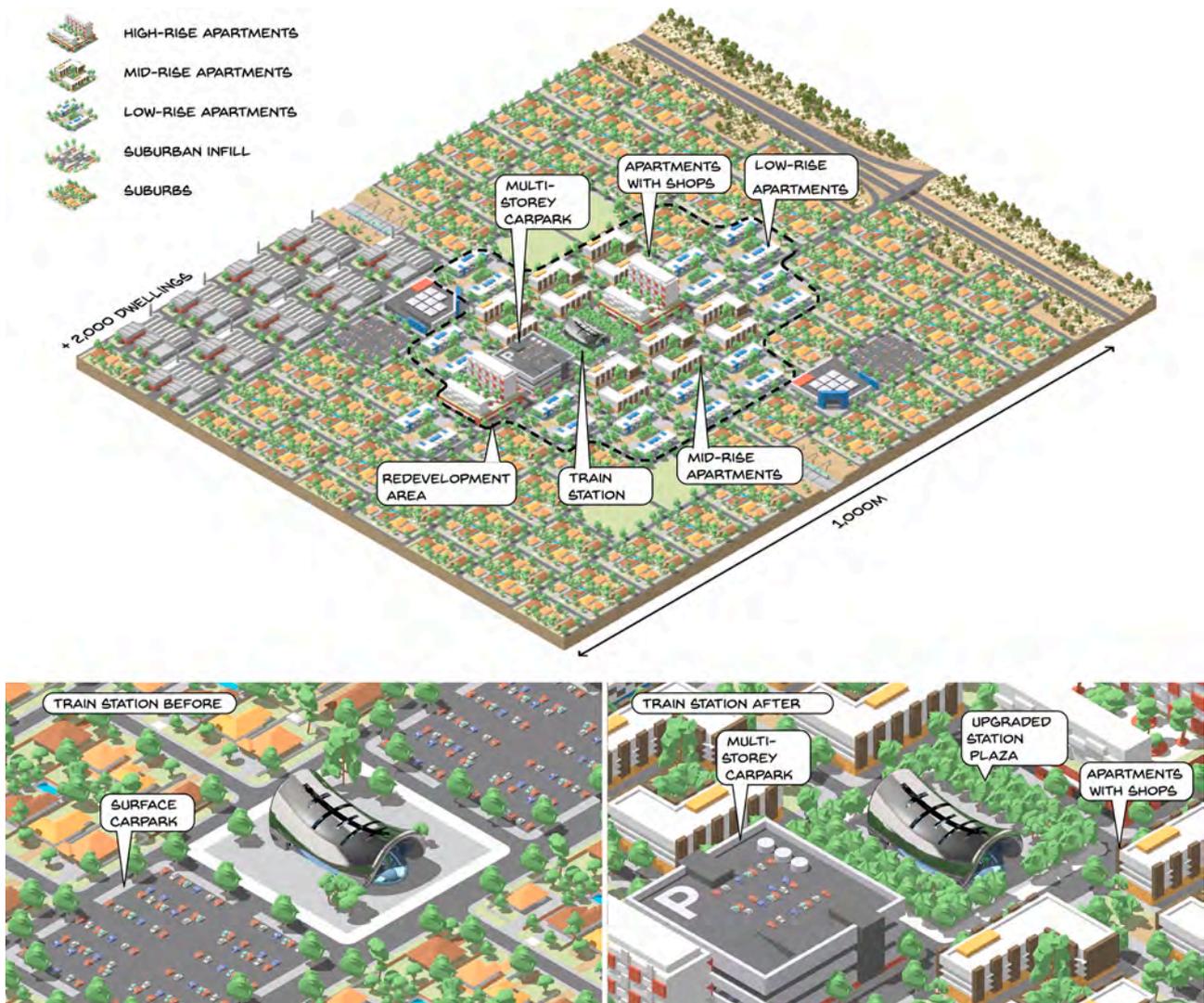


Fig. 4. Urban densification around a train station.

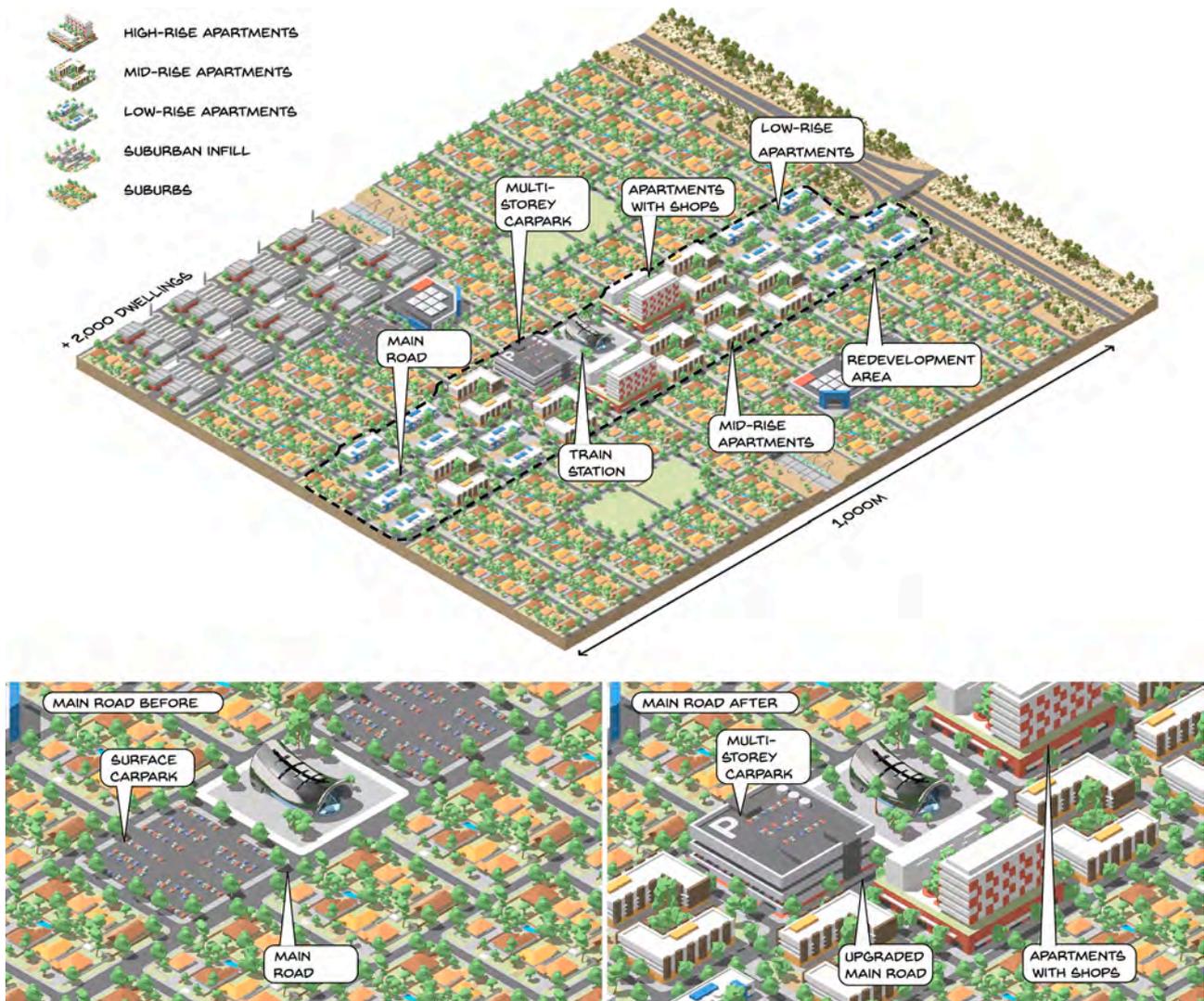


Fig. 5. Urban densification along a major road.

2.4. Scenario #3 urban densification around parks

This scenario:

- Adds 2000 new dwellings to the neighbourhood (in a mix of low, medium and high-rise apartment buildings)
- Concentrates high-rise apartment buildings with shops, restaurants, and entertainment venues around two major parks
- Introduces new trees, planting, paving and street furniture in two major parks
- Introduces mid-rise and low-rise apartments within a short walk of the two major parks (Fig. 6)

2.5. Scenario #4 urban densification in backyards

This scenario:

- Adds 2000 new dwellings to the neighbourhood (in a mix of low and mid-rise buildings)
- Delivers new duplex and triplex dwellings primarily through the subdivision and redevelopment of suburban backyards
- Delivers occasional mid-rise apartments dispersed throughout the neighbourhood

- Delivers a predominately residential neighbourhood (Fig. 7)

Participants were asked to rank the scenarios for neighbourhood change in their order of preference (1 = most preferred, 4 = least preferred), and a comments box was provided so they could indicate their reasons for supporting (or not supporting) options.

2.6. Recruitment

The survey was developed to be distributed nationwide. However, recruitment efforts were the strongest in Western Australia (WA). The survey was promoted through (a) the Australian Urban Design Research Centre (AUDRC) and University of Western Australia (UWA) social media networks (LinkedIn, Facebook) and via industry partner membership lists, and (b) appearances on ABC radio in Western Australia. Recruitment was conducted over four months between February and May 2022, and data were collected via the completion of the survey via a Survey Monkey weblink (SurveyMonkey, 2021).

2.7. Analyses

Data were analysed using SPSS version 28. Cross-tabulation and chi-square analyses were conducted for categorical variables ($p < 0.05$). In

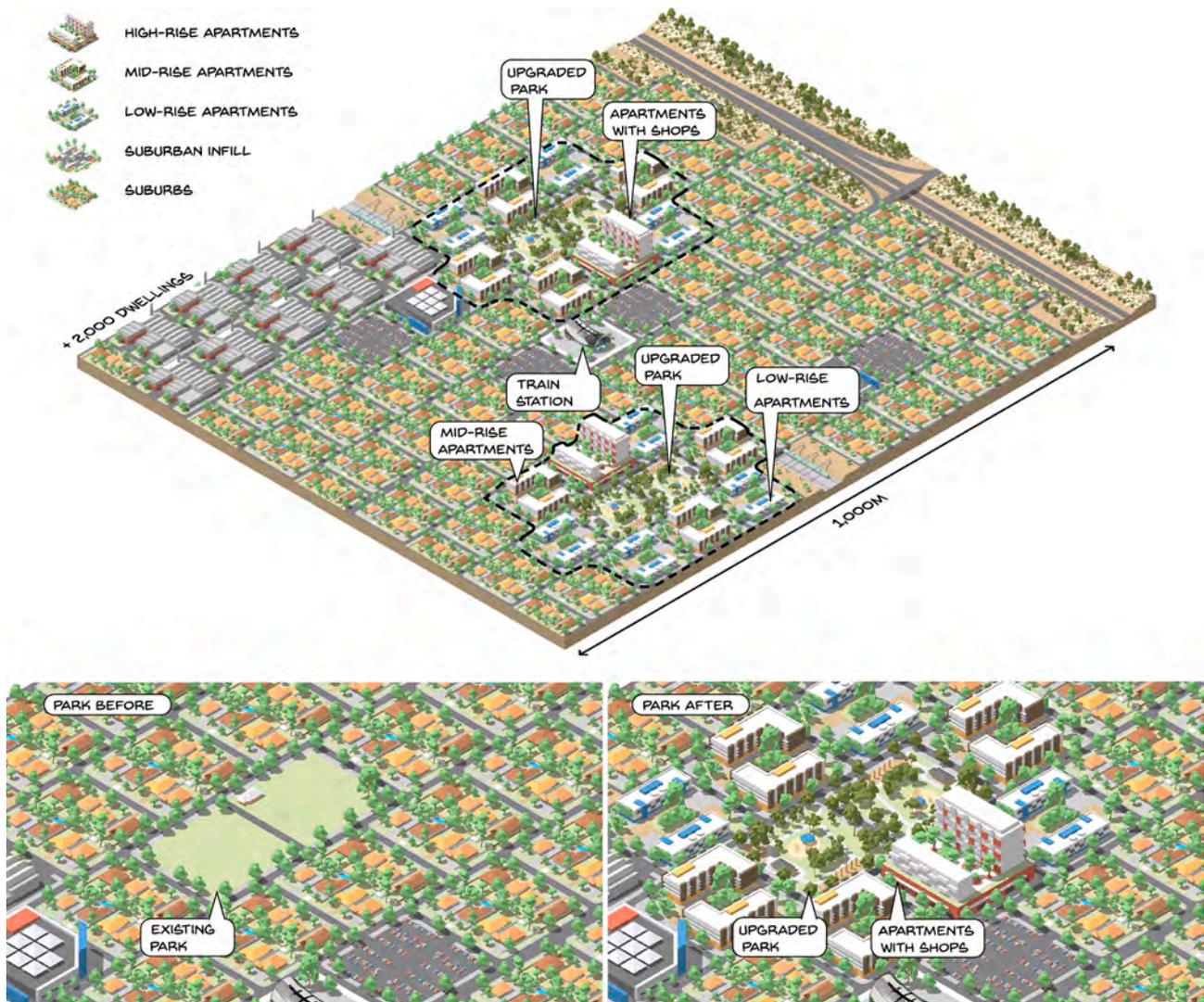


Fig. 6. Urban densification around parks.

addition, binary logistic regression analyses were used to examine associations between demographic variables (age, gender, birthplace, residential dwelling type) and the dependent variables, i.e., support for urban densification and reconsideration for support after options were viewed in the survey. During regression analyses, ‘undecided’ responses were excluded, leaving the outcome variable in two categories: support (yes) or support (no).

Ranked data were examined to test the hypothesis of equal mean ranks across the factors presented in the following questions (a) Reasons for support of urban densification in your neighbourhood; (b) Reasons for NO support of urban densification in your neighbourhood; (c) Factors which could reduce concerns about urban densification.

Kendall’s coefficient of concordance (W) (Schmidt, 1997), a measure of agreement between survey respondents, where 0 indicates no overall trend in agreement, and 1 indicates unanimous agreement, was used to measure agreement at the 5 % significance level. Interpretation of Kendall’s Concordance Coefficient W relied on agreement level ratings as suggested by Landis and Koch (1977): 0–0.2 = poor agreement; 0.21–0.40 = fair agreement; 0.41–0.60 = moderate/acceptable agreement; 0.61–0.80 = substantial agreement; 0.81–1.0 = near perfect, to perfect agreement.

Gender was examined as four categories (male, female, prefer to self-

describe and prefer not to say) during univariate analyses and reduced to two categories (male, female) for regression analyses. As such, total sample numbers are provided in all results tables, and missing data are not reported. Finally, we reviewed the qualitative commentary and manually coded it into positive, negative and undecided categories.

Logistic regression analyses were used to determine odds ratios (OR) with 95 % confidence intervals (CI) that present the strength of association between independent variables (i.e., gender and birthplace) and the densification scenario preferences. Briefly, the OR predicts the odds that the outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure. A $p < 0.05$ was used to assess the statistical significance of all analyses.

A small number of respondents ($n = 43$) provided a postcode outside of Western Australia, and a further 240 respondents did not provide a residential postcode. These respondents were kept in the dataset for all analyses.

3. Results

A total of 799 respondents completed the survey. Demographic data and environmental characteristics of respondents are presented in Table 1. Gender was evenly represented, as were age generations other

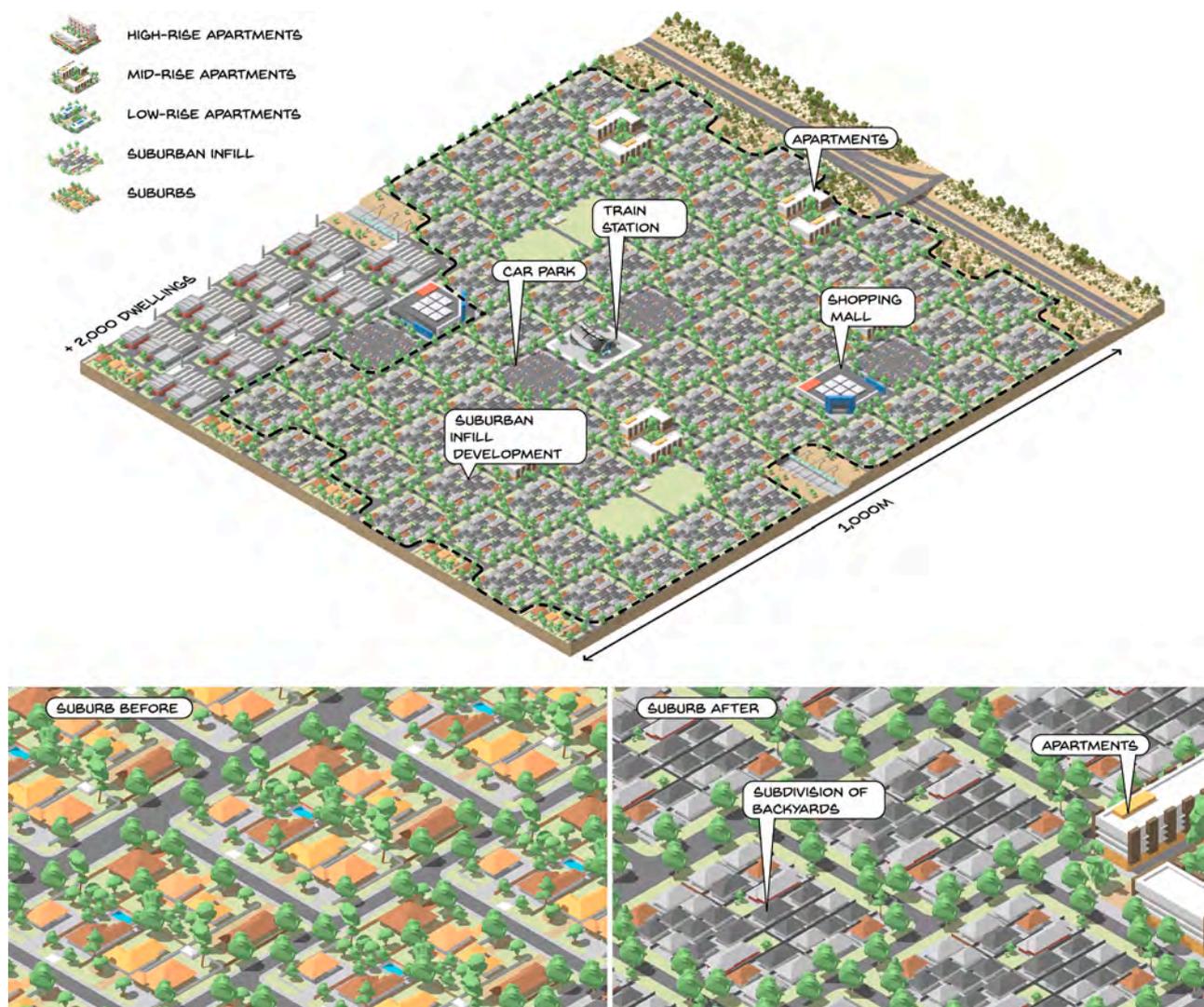


Fig. 7. Urban densification in backyards.

than the Silent Generation, which comprised just 1.99 % of the sample. Most participants (71.6) were born in Australia and lived in detached suburban dwellings (73.3 %). Most respondents (516) lived in Western Australia. However, 43 lived in other Australian states, and 240 did not provide a residential postcode.

Two-thirds of respondents supported urban infill densification approaches for accommodating population growth (66.45 %) in preference to greenfield suburban expansion (16.52 %), with 17.03 % undecided. When respondents were asked whether they supported densification in *their neighbourhood*, two-thirds (66.6 %) responded positively, while a quarter (23.5 %) reported they did not support urban densification. The remainder was undecided (9.9 %).

Univariate analyses in Table 2 revealed that age, sex, birthplace and dwelling type of residence were significantly associated with support for urban densification in the respondents' neighbourhood.

Table 3 presents the mean rank order values for reasons for supporting urban densification in their neighbourhood. Factors ranking highest were preventing urban sprawl, delivering urban vibrancy and street life and boosting urban amenities (Table 3). However, results indicate high variability in the rankings among respondents for each of the reasons presented in the survey, with Kendall's W value (0.161) indicating very little agreement among respondents regarding why they supported urban densification in the neighbourhood.

Factors ranking highest as reasons for not supporting urban densification in their neighbourhood were excessive building heights and density, traffic and parking hassles, urban forest degradation and reduced forest cover (Table 4). However, the Kendall's W value (0.235) also indicated very little agreement among respondents on why they did not support urban densification in the neighbourhood.

Respondents who did not support densification in their neighbourhood selected some factors that may reduce their concerns, although Kendall's W (0.256) indicated little agreement among respondents. Nonetheless, these factors included improved streetscapes and parks and increased urban vibrancy, amenities and social services (Table 5).

3.1. Urban densification scenario preferences

Table 6 presents the mean rank order scores for the respondent's overall ranking of preferred urban densification scenarios. Urban Densification Around a Train Station (mean rank score = 1.54) was the most popular, with Urban Densification Along a Major Road (score = 2.46) and Urban Densification Around Parks (score = 2.47) effectively tied for second. The least preferred scenario was the Urban Densification in Backyards (score = 3.54). There was a 'fair' level of consensus among respondents for each densification option presented.

A more detailed examination of preferences for densification around

Table 1
Demographic characteristics of survey respondents.

Demographic characteristic (n = 799) ^a	n (%)
Gender	
Male (including transgender men)	274 (45.51)
Female (including transgender women)	307 (51.00)
Prefer to self-describe as non-binary, gender-fluid, agender	2 (0.33)
Prefer not to say	19 (3.16)
Birthplace	
Australia	431 (71.59)
Other	171 (28.41)
Generation	
Silent Generation (1928–1945)	12 (1.99)
Baby Boomer (1945–1965)	172 (28.57)
Gen X (1965–1979)	167 (27.74)
Gen Y/Millennials (1980–1994)	165 (27.41)
Gen Z (1995–2015)	86 (14.29)
Dwelling	N
A stand-alone dwelling	441 (73.26)
Semi-detached, row or terrace, townhouse, villa, duplex, triplex (or similar) dwelling	91 (15.12)
Flat or Apartment	60 (9.97)
Other	10 (1.66)
Current state of residence	
Western Australia	516 (64.58)
Other states	43 (5.38)

^a Missing data not reported.

Table 2
Associations between demographic factors and neighbourhood densification support.

Demographic variable	N	YES	NO	UNDECIDED	p
Generation	602				
Silent Generation	12	7 (58.3)	4 (33.3)	1 (8.3)	
Baby Boomer	172	94 (54.7)	59 (34.3)	19 (11.0)	
Gen X	167	124 (74.3)	24 (14.4)	19 (11.4)	
Gen Y/Millennials	165	129 (78.2)	24 (14.5)	12 (7.3)	
Gen Z	86	55 (64.0)	22 (25.6)	9 (10.5)	<0.0001
Gender ^a	602				
Male	274	198 (72.3)	57 (20.8)	19 (6.9)	
Female	307	205 (66.8)	66 (21.5)	36 (11.7)	
Self-describe	2	2 (100.0)	0	0	
Prefer not to say	19	4 (21.1)	10 (52.6)	5 (26.3)	<0.0001
Birthplace	602				
Australia	431	307 (71.2)	85 (19.7)	39 (9.0)	
Other	171	48 (59.6)	21 (28.1)	21 (12.3)	0.023
Current Housing					
Stand-alone	441	284 (64.4)	107 (24.3)	50 (11.3)	
Semi-detached, row, villa, townhouse etc.	91	73 (80.2)	12 (13.2)	6 (6.6)	
Flat or Apartment	60	44 (73.3)	14 (23.3)	2 (3.3)	
Other	10	8	0	2	0.018

^a Missing data not reported in the table.

Table 3
Reasons for support of urban densification in rank order.

Reasons for support of urban densification	Mean rank	Kendall's W	p
	n = 495		
To prevent urban sprawl	3.71		
Increased urban vibrancy and street life	3.8		
More urban amenities, e.g., cafes and restaurants	4.11		
Improved public transport services	4.4		
Improved streetscapes and parks	5.05		
Improved social services, e.g., public libraries and daycare centres	5.18		
Greater housing diversity	5.62		
Greater demographic diversity	6.37		
Greater local employment opportunities	6.77	0.161	<0.001

Table 4
Reasons for no support of urban densification in rank order.

Reasons for NO support of urban densification	Mean rank	Kendall's W	p
	n = 229		
Increased building height and overshadowing and overlooking issues	3.77		
Increased traffic congestion and car parking hassles	4.05		
Reduced urban forest cover	4.79		
Impact on neighbourhood character	5.28		
Threats to existing community	5.49		
Reduced private garden space	5.51		
Crowded parks and streets	5.95		
Distrust of developers	6.66		
Crowded public transport	8.07		
Reduced house prices	8.14		
Distrust of government	8.30	0.235	<0.001

Table 5
Factors which could reduce concerns about urban densification.

Factors which could reduce concerns about urban densification	Mean rank	Kendall's W	p
	n = 229		
Improved streetscapes and parks	2.66		
Increased urban vibrancy and street life	3.59		
More urban amenities, e.g., cafes and restaurants	3.69		
Improved social services, e.g., public libraries and daycare centres	4.05		
Improved public transport services	4.36		
Greater housing diversity	5.79		
Greater demographic diversity	5.87		
Greater local employment opportunities	5.97	0.256	<0.001

Table 6
Preferred urban densification scenarios in rank order.

Preferred densification options	Mean rank	Kendall's W	p
	n = 564		
Urban Densification Around a Train Station	1.54		
Urban Densification Along a Major Road	2.46		
Urban Densification Around Parks	2.47		
Urban Densification in Backyards	3.54	0.401	<0.001

the train station revealed significant associations with gender and birthplace. Females were approximately 30 % less likely than males to vote for the Densification Around the Train Station scenario first (OR 0.684; CI95% 0.483–0.968) $p = 0.032$. Moreover, when we analysed respondents, who voted for Densification Around Parks first, we found

that females were 1.6 times more likely than males to have voted for this option first (OR 1.62; CI 95 % 1.054–2.505).

Respondents provided extensive written responses across the four scenarios. Qualitative commentary from respondents, presented below, recognised various factors related to each scenario's pros and cons.

3.1.1. Urban densification around a train station scenario commentary

Respondents ranked urban densification around a train station as the preferable scenario. Some respondents considered this approach the 'logical answer to adding density.' Others considered it 'a great move for improving accessibility of services/shops without the need for cars and creating a vibrant community hub with a stronger identity.' Respondents generally felt that the Density Around a Train Station scenario could boost public transport use, walking/cycling and green space use. As one respondent affirmed, 'I always feel safer walking/riding when there is greater urban density provided as there are cafes/other reasons for people to be out and about around the train station.' Others echoed this sentiment:

The major drawback is the vibrancy of the new neighbourhood, a destination you would ride to and hang out or meet friends because something is happening.'

Despite its overall popularity, some respondents critiqued the scenario. Indeed, according to one respondent, 'instead of being vibrant and diverse, such developments tend to be noisy with mostly young people and tense-feeling.' The result is that such 'densified areas mainly comprise investment properties where the turnover of tenants is high, and therefore the sense of community is low.' Indeed, some respondents believed such scenarios would deliver the 'slums of the future' due to a concentration of higher-density building forms, which could precipitate social problems. Moreover, a lack of 'additional open space provided for higher density living' reinforced such concerns.

Others questioned the presumptions of TOD which underpin the scenario:

One furphy is that people will be willing to give up their cars. Where is the evidence to support that proposition?

Further respondents were concerned that the preference for 'park n ride' would mean 'there is never enough parking around train stations.'

3.1.2. Urban densification along a major road scenario commentary

This second-placed scenario (effectively tied with Urban Densification Around Parks) received positive and negative commentary. Positive responses identified that density along bus routes would provide 'improved public transport options' and connectivity. Moreover, urban densification along such corridors would catalyse 'activation, social vibrancy and economic stimulus', yield a 'better street vibe', and encourage significant pedestrian activity. Finally, some respondents predicted that 'density along main roads will also provide acoustic barriers for rear dwellings' and the surrounding lower-density suburb.

However, concerns about the Urban Densification Along a Major Road scenario were widespread. Several respondents worried about the liveability of the apartments: 'The air quality and noise are horrible. People in apartments must be able to access clean and fresh air and open space – not pollution, noise and fumes.' Others noted the road environment was 'hostile,' due to 'large volumes of traffic' and would make it 'unsafe for pedestrians, especially children.' Furthermore, others felt that density along car-dominated main roads is a recipe for spatial inequality, with 'low-income apartment dwellers ending up next to loud roads.' As one respondent pithily surmised, 'No one should have to live in that hellscape.' Rather than yielding 'demographic and housing diversity,' such approaches would result in the 'stratification of the suburb, where property values in the intact [suburban] areas continue to rise as these areas are desirable, and the lower amenity areas along arterials stagnate.'

Respondents also queried whether road authorities were willing 'to

create urban streets.' Fuelling such uncertainties around urban high streets was that 'retail is dying' due to the lingering effects of the pandemic. Some fretted that if the 'retail fails, the precinct will end up as a ghetto.' Conversely, if an 'urban street' materialised, it would 'clog transit arteries' and cause parking issues.

3.1.3. Urban densification around parks scenario commentary

This scenario received positive and negative commentary. Some respondents felt that an upgraded park would help new apartment dwellers to 'adjust to apartment living and trade-off not having a garden' by offering them 'easy access to open space' and 'nature.' Others predicted more 'residences adjacent to public spaces' would 'improve passive surveillance and thus create safer parks and neighbourhoods.' One participant extolled: 'This is a very common setup in Europe - the parks are always full of people and feel safe.' Accordingly, this would 'encourage more social interaction and a safer connected community environment.' Finally, comments indicated that respondents generally felt that the Density Around Parks scenario could boost walking to access and use greenspace.

Nonetheless, some respondents worried that 'too much density away from the train station would mean people may still rely on cars,' meaning 'more people parking on suburban streets.' Others were concerned that encircling the park with apartments could 'impact how suburban residents use these parks' as it could 'make it privatised' and 'exclusive' to apartment dwellers. One respondent regarded that such development destroys the idea of a park, 'to have a peaceful space away from buildings, bustle and people' and to 'be immersed in nature.' Moreover, some respondents were concerned that medium and high-rise apartments would 'block the sun, breezeways and views.' Finally, as with the TOD scenario, some respondents felt that increasing density could mean that the parks become 'hangouts or gang territories' with accompanying 'anti-social behaviour and increase in crime.'

3.1.4. Urban densification in backyards scenario commentary

This fourth-placed scenario generated little positive commentary. Nonetheless, endorsements of the scenario focussed on the absence of 'high rises which do not belong in suburbs.' Others highlighted the dispersion of 'density throughout a neighbourhood, rather than stratifying residents into those who can afford to live in single houses with backyards and those who cannot.' Regardless, the scenario received a barrage of negative commentary:

This option is terrible. It creates consistently boring suburbs. It achieves density with all the bad elements without promoting the good elements like vibrant main streets and diversity of housing stock.

Others noted that while the scenario 'can seem more acceptable as it progresses slowly, it results in governments doubling rates without the investment of any additional infrastructure to support the doubling population' and, as such, is 'driven by greed.' Respondents considered the problem to be, 'essentially you have people living in other people's backyards, which results in 'social unrest, noise, car parking issues, overuse of local facilities' without the 'transport and services that make it worth it.' As one concisely surmised, 'an utter disaster.'

Concerns mainly revolved around a loss of greenery, which a respondent described as 'important in providing tree canopy, cooling and attracting animal life.' A lack of backyards was a concern for some respondents. As one explained, 'with the reduction in backyard size, and there are limited options for people to be outside – which contributes negatively to mental health issues, social isolation issues, lack of community and increases social issues. Concerns around compounding extreme temperatures were also prevalent, and respondents warned the scenario would lead to a 'greater reliance on air conditioning and use of power to keep housing cool' and that a 'lack of tree canopy makes summer brutal.' Others worried about the lack of back gardens that would curtail children's play, saying the scenario 'strips residents of opportunities to grow their food' and denies opportunities for 'refuge for

wildlife and plant diversity.’ Some respondents considered the resulting ‘monoculture’ a massive loss of climate and community resilience.

Respondents were also cynical about Urban Densification in Backyards leading to positive shifts in active and public transport use, rating the scenario a ‘transport, public transit and walking disaster’ and a ‘nightmare to get around.’ As one implored, ‘it is not dense enough to warrant higher capacity or more frequent public transport, and there is often nothing worth walking to.’

4. Discussion

A gap exists in the literature about community sentiment towards varying models of urban densification around transit in existing neighbourhoods. This study is unique in its attempt to understand what transit-related urban densification models communities support and how this varies concerning different demographic groups.

The results of the introductory questions reveal considerable and unexpected support for urban densification. This support for infill development was much higher than in other surveys that recorded widespread hostility towards densification programs (Kelly, Breadon, & Reichl, 2011; Kelly, Weldmann, & Walsh, 2011; Sarkissian, 2013). Indeed, the reality may be more nuanced. According to our survey results, a community *minority* resists density in their neighbourhood. Nonetheless, the survey revealed that while resistance to density generally was in the minority, these feelings are firmly and deeply felt and relate to often valid concerns (Matsumoto et al., 2012). Regardless, the results raise the possibility that an unrepresentative ‘noisy’ minority may be drowning out the silent majority, as participatory planning amplifies some voices over others (Einstein et al., 2019). This conundrum highlights the importance of community engagement approaches that tap into the silent majority’s opinions. Indeed, traditional ‘town hall style’ community consultation can fail to engage a representative cohort of residents (Kelly & Donegan, 2015). Emerging technology, such as Public Participatory GIS (PPGIS) web-based mapping portals, allows commenting on design proposals online (Hooper et al., 2022) and offers just one example of such approaches that can canvas community attitudes outside conventional town-hall meetings.

4.1. Understanding urban densification scenario preferences

Despite general support for urban densification, it is evident that this support is contingent on its morphology. The survey found high levels of support for the Density Around a Train Station scenario, which affirms the TOD Pedestrian Pocket focus of the state government-authored metropolitan planning for Australia’s capital cities (Department of Planning Transport and Infrastructure, 2017; Department of Planning, and Western Australian Planning Commission, 2015; Victorian State Government, 2017). After decades of wrestling such precinct TOD planning into reality, communities appear to be generally supportive, a rare alignment of community sentiment and urban planning orthodoxy that partly contradict previous research (Davis & Harford-Mills, 2016).

Our findings also support alternative approaches to urban densification, such as Green-space Oriented Development (Density around parks) (Bolleter & Ramalho, 2019). However, the support for GOD is surprising as systematic GOD approaches do not feature in Australian metropolitan planning. Perhaps the increasing emphasis on access to nature prompted by the Covid-19 pandemic could partly explain the relatively high support for GOD (Bolleter, Edwards et al., 2021). Regardless, policymakers should enshrine GOD in metropolitan planning documents to complement TOD (For example, Department of Planning Transport and Infrastructure, 2017; Department of Planning, and Western Australian Planning Commission, 2015; Victorian State Government, 2017).

While GOD and corridor models (Density along a major road) recorded almost identical ratings regarding respondents’ preferences for neighbourhood change, the commentary revealed real concerns about

the ability of corridor densification to yield healthy and equitable living environments. Moreover, respondents were ambivalent about the ability of urban densification to transform arterial corridors into high streets. The community concerns concerning corridor development indicate that policymakers should be cautious about approaches which rely on it comprehensively (City of Melbourne, 2010; The Greens, Property Council of Australia, and The Australian Urban Design Research Centre, 2013).

Despite often unarticulated assumptions by the Local Government that residents prefer ‘hidden density’ or background infill (the Density in backyards scenario) due to its low-rise, dispersed, and incremental nature, the results indicate that background infill is deeply unpopular for the valid reasons cited. These concerns about piecemeal background infill and its negative consequences are also reflected in the literature (Bolleter, 2016; Newton & Glackin, 2014). Therefore, policymakers should seek to impede background infill through negative planning/minimum density approaches (Kupke et al., 2011; Matsumoto et al., 2012) to ensure they do not perpetrate such compromised models but also to build up impetus behind coordinated medium-density development such as TOD or GOD (Bolleter et al., 2020).

Analysis of demographic associations with scenario preferences was revealing. For example, females were less likely than males to vote for the Urban Densification around a Train Station scenario first, perhaps revealing less of a fixation with commuting to work in city centres. Moreover, perhaps associations of the CBD and the suburbs as separating commerce from domesticity and male from female gender linger (Farrelly, 2021). Moreover, females were much more likely than males to have voted for the Urban Densification Around Parks scenario first. Perhaps this reveals the importance of park access and nature experience for children and the fact that parks remain to some degree, a gendered space (Sandercock, 1998).

4.1.1. The vital role of urban planning in influencing community attitudes to densification

The relative popularity of the TOD and GOD precinct approaches could stem from the proposed upgrading of the public realm to incentivise increasing densification. Indeed, our results show that segments of our communities are transactional and will consider trade-offs such as increasing urban density coupled with urban amenity. Indeed, popular reasons for supporting urban densification in the survey included increased urban vibrancy, more urban amenities, improved public transport and streetscapes and parks (ranked second to sixth, respectively). It is also important to note that the dominant reasons for not supporting urban densification were generally within the purview of urban planners, for example, increased building height and overshadowing, increased traffic congestion and car parking hassles, reduced urban forest cover and impacts on neighbourhood character (ranked first to fourth respectively). Conversely, societal factors such as an increasingly neoliberal planning and development system (Kwok et al., 2018) with less spatial urban planning or design dimension (e.g. distrust of developers, distrust of government and threats to the existing community) ranked comparatively lowly. This situation confirms spatial planning and design’s critical role in successfully integrating densification, and its attendant population, within existing suburban areas.

4.1.2. A lack of consensus challenging unified planning models

While ‘conflict is inevitable in cities and, up to a point, healthy’ (Farrelly, 2021), our results reveal little agreement among respondents regarding why they support/did not support urban densification. This situation tends to confirm those who critique the theoretical foundations of collaborative planning theory by asking whether consensus should be considered ‘possible or even desirable in a world of increasing difference’ (Tewdwr-Jones & Allmendinger, 1998, p. 1977). In praxis, this poses a challenge to reductionist ideas that if different groups ‘can be brought to the negotiating table, the resulting communication, if handled with contemporary consensus-resolution techniques, will

somehow prove beneficial in identifying the best possible solutions for all concerned' (Hall, 2014, p. 411). Such reductive thinking is contradicted by 'an infinitely messier' range of opinions 'than the theory would have liked' (Hall, 2014, p. 398).

4.2. Generalisability to other contexts

So how generalisable are these findings to other contexts? While the findings of this study are valuable in understanding community perceptions and attitudes towards urban densification in the Australian context, its unique attributes, such as economic, demographic, political, environmental, cultural and social conditions, mean that it is challenging to generalise these findings to other locations. Indeed, Australia has a long history of urban consolidation policy (Troy, 1996), a reasonably-sized middle class, relatively high levels of education (OECD, 2022), and high homeownership rates (Australian Institute of Health and Welfare, 2023), among other things, all of which are likely to affect perceptions of urban densification positively.

Moreover, most respondents resided in Western Australia's capital city of Perth. Several key TOD-related urban densification projects have also been undertaken with strong attention to urban design in Western Australia, which might also positively affect perceptions (Bolleter et al., 2022). Examples include Subi-Centro, successfully developed by the state land developer DevelopmentWA, on the Fremantle train line of Perth. Moreover, the current policy and implementation planning for 'Metronet', a potentially transformative rail and station precinct redevelopment project, also promotes TOD. Indeed, the Metronet project represents the most significant investment in public transport in Perth's history and has been accompanied by extensive community engagement and promotion (Metronet team, 2021). Hence there may be a level of trust and anticipation about the outcomes of such projects/approaches, which may not be evident in other countries with less favourable conditions (Grosvenor, 2019). Finally, Perth is one of the lowest-density cities on the planet (Hurley et al., 2017), so support for urban densification could be lower in other cities, nationally or overseas, which have already experienced significant urban consolidation and its attendant issues which can encompass traffic congestion, air pollution, housing affordability, urban heat islands, and loss of green spaces (OECD, 2012, p. 20).

Perhaps the generalisability of this work to other contexts should be seen in its *methodology*. In particular, the design of a non-site-specific representation of place that responds to the conditions listed previously to produce familiarity and legibility with the target audience while mitigating the impact of vested interests is essential. Nonetheless, graphic elements of the design, such as the choice of colours, composition, and fonts, as well as architectural choices, such as building typologies, urban morphology, landscape, street layouts, public open space, and vegetation, would need to be considered in the design of any future study in another context.

4.3. Limitations

We acknowledge the limitations of the paper. Firstly, our respondents were primarily from Perth, the capital city of Western Australia, so the findings most apply to this setting. We also acknowledge that a significant number of respondents did not provide a post-code. Future research could explore public sentiment towards urban densification in other Australian states or countries to enable cross-comparison.

Secondly, the survey explored existing communities' sentiments towards models of neighbourhood change concerning a hypothetical neighbourhood. How sentiment may change if the researchers applied these urban densification models to actual neighbourhoods remains untested. Moreover, the paper deliberately does not focus on resistance to urban densification that an urban development occurring next door to an existing resident may elicit. Nonetheless, this is worthy of future

research. Similarly, the paper does not focus on whether respondents want to live in the proposed apartment developments, as this has been explored elsewhere, albeit not recently (Curtin University and Sharley, 2013; Holling & Haslam McKenzie, 2010; Kelly, Weldmann, & Walsh, 2011).

5. Conclusion

If detached housing in greenfield suburban development remains the predominant means of housing growing populations (Australian Bureau of Statistics, 2021), Australian cities will continue to sprawl into what commentators characterise as an unhealthy (Ewing et al., 2014), divided, environmentally destructive (Ritchie et al., 2021), costly, and unproductive form (Kelly & Donegan, 2015).

In response, this study is the first to collate Australian community sentiment to evaluate models of urban densification, based on theories in planning, at the neighbourhood scale concerning a hypothetical base condition. To a large degree, this hypothetical site avoids a focus on local concerns, such as vested interests that go with land ownership (Einstein et al., 2019). Thus the findings arguably provide a more accurate assessment of collective attitude to urban densification than are garnered in conventional community engagement around specific urban densification projects.

The paper reveals general community support for precinct-scale approaches to densification and antipathy towards dispersed background infill, despite some Local Government assumptions to the contrary. Indeed, this finding has significant implications for urban densification policy. Policies enabling ad hoc background infill should be tightened to build impetus behind proactive, precinct-led urban densification strategies such as TOD and GOD. It is imperative that this happens soon as large TOD and GOD projects can take many years, even decades, from commencement to completion (Seamer, 2019).

The findings also provide some assurance of the community support for densification generally and established precinct TOD models specifically, representing a rare alignment between urban densification planning orthodoxy and community sentiment. The results thus lent support to precinct scale approaches being promoted in emerging urban densification policies such as Western Australia's new Precinct Design Guidelines (Department of Planning Lands and Heritage, 2019).

Moreover, the paper reveals that resistance to urban densification arises from an often-noisy minority while a majority are quietly supportive. This finding has implications for how planners engage with communities and reach beyond what has been pejoratively referred to as the 'squeaky wheels.'

Finally, despite a focus on a 'utopia of process' not a 'utopia of form' in the literature (for example, Harvey, 2005, p. 25). The paper's findings affirm the critical role spatial urban planning and design should play in successfully integrating densification, and its attendant population, within existing suburban areas.

CRediT authorship contribution statement

Julian Bolleter: Conceptualization, Funding acquisition, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Nicole Edwards:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – review & editing. **Robert Cameron:** Conceptualization, Methodology, Writing – review & editing, Visualization. **Paula Hooper:** Conceptualization, Funding acquisition, Investigation, Writing – review & editing.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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