Curtin University of Technology

Department of Urban and Regional Planning

Community Attitudes towards Transit-Oriented Activity Corridor Redevelopment along Arterial Roads

A case study of South Street, between Fremantle and Murdoch, Perth, Western Australia

Presented to partially fulfil the requirements of:

Bachelor of Arts (Urban and Regional Planning)

URDE 4007 Planning Honours Dissertation

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2nd June 2016

School of Built Environment

Declaration

I, Sam McLeod, declare that this dissertation represents my own research and does not use the work of others except where cited within the text. The ideas, views and opinions expressed are mine personally and do not represent those of my employer or Curtin University of Technology.

Signed: 

Date: 2/6/16

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Acknowledgements

First and foremost, I would like to thank Mum and Dad for being encouraging, supportive, tolerant, occasionally hilarious, and always generous. I could not have achieved this dissertation without your help, support, love, and your significant long-term charitable contributions to my housing, educational and nutritional needs.

I am most appreciative to Prof. Carey Curtis for supervising this dissertation. Thank you for always being so ambitious, always setting me challenging goals, and being so supportive academically and professionally. Thanks also to Jake Schapper for always being available and willing to share his immense and seemingly limitless scope of knowledge, and providing us all with an undergraduate education like no other. Standing on the shoulders of giants, indeed.

Thanks to Vikky, Kaysanne, Emma, Brodie, Leon & Troy for many fun evenings, vegetarian restaurant choices and takeaway dinners. I am very grateful to Angela Zhang and Vikky Brown for kindly proofreading this manuscript. I feel lucky to have such well-treasured friends. I am grateful to all the anonymous strangers that completed my survey, and to the interview respondents who tolerated my provocative questions. Lastly, I'd like to thank Cr. Reece Harley, future Lord Mayor of the City of Perth, for helping me to drag this project out for another six months!

May 2016

Abstract

Activity Corridors have emerged as a popular redevelopment form for accommodating growth in dispersed, car-centric cities. However, public discourse suggests in-fill density is highly contentious, while international research presents a diversity of explanations for public perceptions of the suburban built environment. Concurrently, much planning theory, particularly that of new urbanist and communicative advocates, presents several arguments for improving public interaction in the process of facilitating suburban transformation.

A broadly distributed resident survey was conducted, along a case study arterial road transect, to ascertain a snapshot of public perceptions towards housing types, density and transport alternatives, and urban issues. Comparisons were made between demographic groups and along an urban form transect to identify any correlations. The survey findings then informed interviews with professional stakeholders and planners with experience operating in the built environment.

Broadly, respondents did have reservations towards increased housing density, but only where they felt it may adversely impact on their local amenity. Only a minor percentage of respondents oppose taller buildings generally. Data collected suggests that residents strongly desire improved public transport access, reduced urban sprawl, and local street improvements. Respondents exhibited nuanced opinions and conceptions of their urban environment, and were more favourable to increased density when improved public transport or local improvements were proposed. Interviews with planning professionals then grounded the results in experiences from practice, highlighting several practical and institutional impediments to effective built density outcomes. These findings suggest that human-scale, Activity Corridors construction would be publically supported with the consultation and support of the community, and with more effective roadway planning governance.

Chapter 1: Introduction

1.1 Background

Activity Corridors are one potential means of increasing residential densities, limiting suburban sprawl, and promoting a more polycentric, transit-oriented urban form in presently car-oriented cities (Curtis and Tiwari 2008). Many cities that were reorganised around the motor car in the post war modernist period have several hundred kilometres of arterial roads, with typically wide multi-lane carriageways, often with expansive reserves of land for future “upgrades” or road expansions (Duckworth-Smith 2013). Perth is classically representative of such a sprawling “modern” city and will be the focus of this research.

Arterial roads tend to be surrounded by low density residential housing, termed by some as “greyfields”(Newton et al. 2011). Greyfields tends to exhibit large yards around private homes, generously engineered suburban streets, and generally excessive provision of parking. A typical detached suburban residential dwelling might have two garage spaces, considerable driveway space, and verge and roadway space that can all be utilised for parking. Internationally, large expanses of surface parking around suburban shopping centres, business parks and employment institutions (typically provided to meet peak demand on the busiest days of the year, which are otherwise mostly empty) have also become the favourite target of new urbanist “retrofits” (Dunham-Jones and Williamson 2012).

Public debate about transformative change in existing suburbs often includes resistance, reluctance, or hesitance by residents, businesses, and other stakeholders in the built environment (Nematollahi, Tiwari and Hedgcock 2015; Weller and Bolleter 2013, 139). Even prominent “urbanists” have raised concerns about increased land use intensity in existing urban areas (Lutton 2013), while limited empirical evidence on actual public opinion exists to inform the dialogue.

1.2 Research Aim and Question

Several articles in the public literature allude to the potential for further research into resident perceptions of change of the built environment, including travel infrastructure. Whilst substantial datasets exist for public preferences in housing typology (Audirac 1999; Department of Housing Strategy and Policy Division 2013) and transport policy (Institute of Transport and Logistics Studies (ITLS) 2015), there is a lack of research that explores the interplay between these factors, and how these preferences are influenced by both housing, transport, and urban design characteristics. Therefore, the research question proposed to bridge this current gap in knowledge is:

> "What perceptions and attitudes exist towards implementing transit-oriented urbanism along existing greyfields arterial road infrastructure?"

1.3 Research Objectives

The following three objectives have been devised to meet the research question, and enable the process of research.

1. **Identify arterial road urban environments/transect zones by analysing historical development, urban design, regulatory issues and governance characteristics relating to main roads and development along them.**

This objective will ground this research in context, by providing meaning and explaining the history, function, and use values of main roads. This objective will also provide an opportunity to respond to planning theory around this research. Understanding the 'place values' residents feel towards their residential areas adjacent to existing arterial roads will inform the analysis of data subsequently collected. A transect of different types of built environments found along an arterial road – conceptualised along a transect - will allow deeper analysis of alternative implementation of Activity Corridor concepts. The findings of this section will inform interviews with industry practitioners and experts during the process of attempting to achieve the third objective.

2. **Explore resident and stakeholder attitudes and values of density, transport and built form, along a potential activity corridor. Identify whether a particular sub-group of people are associated with a particular attitude towards density.**

This objective seeks to collect a core set of data relating to resident perceptions. This data will provide insight into the current state of public preference towards housing and transport investment and location planning choices, and the role of arterial roads within metropolitan areas, allowing for analysis and synthesis.

Demographic and travel behaviour information will be collected from participants, allowing for comparisons between groups within the survey sample.

3. **Detail and categorise specific examples of issues, from practicing planners, local government and other professional stakeholders that have arisen when attempting to "retrofit" density or enact significant change in existing suburban greyfields, particularly those that are political in nature.**

This objective seeks to contextualise the findings of the previous objectives, and explore how planning practice today may respond (or may fail to respond) to public perceptions and attitudes. The purpose of this objective is to explore how current intuitional and governance arrangements influences the form and function of main roads and the developments immediately adjacent to them. Conducting interviews with prominent stakeholders will provide an excellent opportunity to explore the underlying experiences and perceptions evident in the public survey data, and chart potential future trajectories for change in the urban and suburban environments along arterial roads.

1.4 Dissertation Structure

After a comprehensive literature review, which seeks to identify the current state of knowledge and the gaps within the literature, thus informing the formulation of a specific research question. This dissertation then describes the research methods employed to answer the research question and meet the research objectives.

This dissertation explains the case study investigated, develops a research methodology, explores the survey and interview data collected, and synthesises reflections for planning policy and practice.

A comprehensive set of Appendices then follows.

Chapter 2: Urban Development and Roadway Planning History

The purpose of this chapter is to explore the history of planning theory and practice which has led to the broad construction of suburbia and the arterial roads which service them. Understanding the history and context of main roads is significant to answering the research question by layering an understanding of how and why arterial roads and their suburban surrounds exist in their current form, and exploring the management structures responsible for their ongoing management. This history is also of importance in understanding how residents along arterial roads may think about their residential environment.

Prior to the 1950s, Perth was a modest city (Figure 1), largely centred on the banks of the Swan River, and along passenger rail and tramway lines (Campbell 1999; Gregory 2003). Between the gazettal of the *Town Planning and Development Act* of 1928 and the Stephenson Hepburn Plan of 1955 – and the statutory 1963 Region Scheme which followed it – formal planning controls were coordinated by highly local authorities (Department of Planning 2014, 35; Yiftachel and Hedgcock 1992). Since the interwar period, however, Perth has undergone radial outward expansion, sustained by the repeated construction of freeway-dependant suburbs, and the decentralisation of industrial and commercial land uses (Yiftachel and Hedgcock 1992, 134).

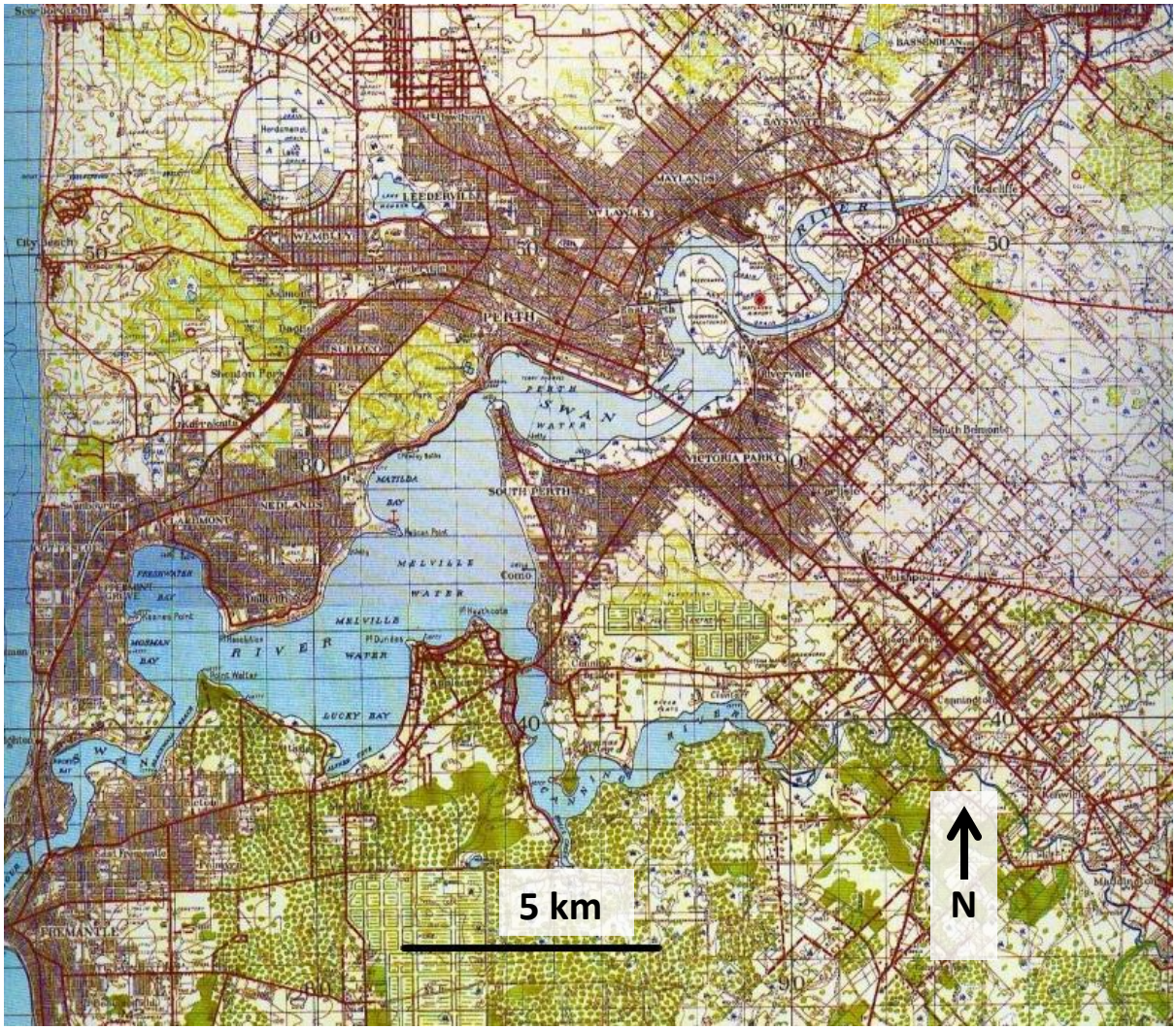


Figure 1: Metropolitan Perth, circa 1940s. (Henstridge 2003) Dark red/grey areas show the limited extent and concentrated distribution of Perth's urban areas prior to the widespread popularity of the private car.

'Suburbanisation' describes the rigid separation and isolation of land uses by Euclidian zoning (Taylor 1998, 100). This land use model was heavily supported and popularised by the new technology of the private motor car (Falcocchio and Levinson 2015, 15). Following prevailing international trends, particularly the Modernist movement, metropolitan planning in Perth during the post-war era became increasingly centralised, with control increasingly assumed by State Government agencies (Maccallum and Hopkins 2011). This centralisation has enabled significant integration of land use policy, road infrastructure construction, and universal provision of vehicle parking (Curtis and Tiwari 2008, 108; Mees 2000, 47), practically achieving the ambitions of car-centric urban development ideology.

The resulting metropolitan form, shown in Figure 2, is significantly more dispersed than the Perth that existed prior to the second half of the twentieth century.

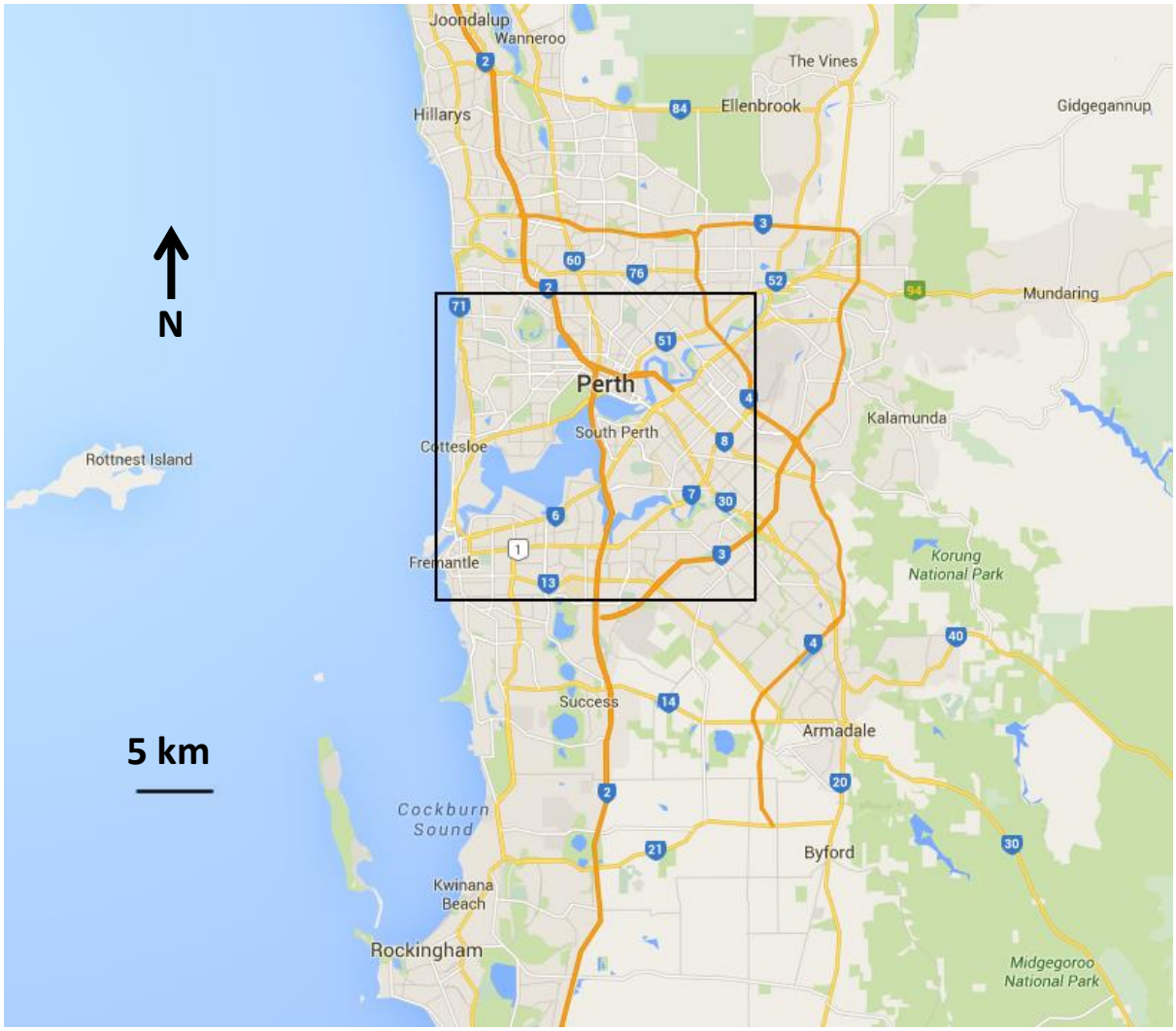


Figure 2 Metropolitan Perth, 2016. Box indicates bounds of 1940s map, Figure 1. (Google Maps 2015)

2.1 The Ideology of Suburbia

Suburbia was built and marketed with the promise of privatism (Davison 2006), freedom, and as a geographic expression of 'The Australian Dream.' Hedgcock (1994) describes the 'pioneer mentality' of first home owners living in newly constructed housing on the urban fringe. Beauregard (1989) describes the idealism of Modernists, who aspired to cities that could be designed and built to achieve social goals, in the public 'interest,' with land use controls implemented to tame conflicts between industrial capitalism and the residents of the public that the planners sought to serve. The Stephenson and Hepburn Plan for Perth (1955) is littered with notes of these aspirations (Maccallum and Hopkins 2011, 495), and proposes a city form based on supporting commercial efficiency and residential amenity.

The role of the development industry, as well as the planning policy makers, must be appreciated (Hedgcock 1994, 129). A cynical Marxist interpretation of the suburban development model may be that it is an endeavour of the market to sell more land, enabled by technological progress, which might inevitably land at a crisis of capitalism:

> "Capital by its nature drives beyond every spatial barrier. Thus the creation of the physical conditions of exchange -- of the means of communication and transport -- the annihilation of space by time -- becomes an extraordinary necessity for it."
>
> (Marx 1939, 459).

The recurring outward sale of low-density suburban land in Perth – the annihilation of space – has depended on the corresponding annihilation of travel time, which has been largely enabled by new arterial road networks.

2.2 The Requirements for Roads

The establishment of arterial road systems, highways and surface parking expanses was a crucial aspect of rationalist dream of modern comprehensive planning (Curtis and Tiwari 2008, 108; Hamilton-Baillie 2008). Broad swathes of low-density land use distribute trips across a great area, necessitating road infrastructure investments to meet the increased demand for private car trips (Falcocchio and Levinson 2015, 361). Engineering urban roads since the 1930s has largely concerned attempts to improve carrying capacity and safety through mode segregation and road engineering (Curtis 2005, 432; Hamilton-Baillie 2008).

Segregation of vehicular traffic and pedestrians can be traced back to 'Radburn' planning in the United States in the 1920s (Gehl 2011, 110), based on utopian, Garden City-influenced visions and prevailing anti-urbanist thought (Taylor 1998, 28). The increased speeds of motorised traffic gave rise to the emergence of the traffic engineering professions, and wider, network-oriented transport authorities.

2.2.1 The Power and Process of Road Interests

As the ubiquity of the private car and traffic congestion increased, the road lobby emerged as a powerful influence on planning policy and infrastructure investment. Metrics like 'Level of Service' – the average delay experienced by a car traversing a section of road – were created and applied by traffic engineers to quantify and justify road development (Henderson 2011). The highly influential work of Patrick Buchanan, entitled *Traffic in Towns* (1963), proposed the construction of hierarchical urban road networks, with a high degree of segregation between modes (Hamilton-Baillie 2008, 165; Taylor 1998, 29). This morphology was widely implemented in new subdivisions in Perth between the 1960s and the 2000s (Curtis 2005), and can be read in the suburban landscape today.

Figure 3: Segregation as advocated in the 1963 Buchanan Report, "Traffic in Towns."(Buchanan et al. 1963, 176). Caption reads: “Impressions of a pedestrian underpass showing the great care which is devoted to the details and landscaping.”

Figure 4: Pedestrian underpass, South Street near Murdoch University, Perth. (McLeod 2015)

The engineering-based design ideal rigidly classified and built roads according to 'functional classification,' with roadway width and design standard determined by anticipated vehicle demand (Dover and Massengale 2013, 28).

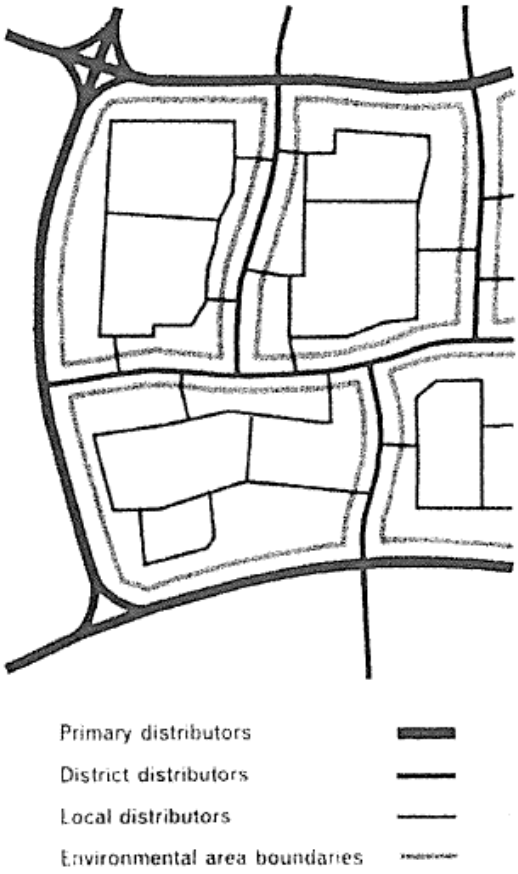


Figure 2.3 Planning for motor traffic and the environment at the same time: Buchanan's proposals for a hierarchy of roads and environmental areas
Source: From Buchanan *et al.*, 1963, Figure 13

Figure 5: Buchanan's Distributor Road Concept (British Context). (Taylor 1998, 32)

Notably, this road morphology limits access between adjacent suburbs, and concentrates vehicular congestion on arterials, as all inter-suburban traffic must pass through large distributor roads, even for very short trips (Duany 2008). The reasons for this unintended arterial road congestion are explored further in Chapter 3.

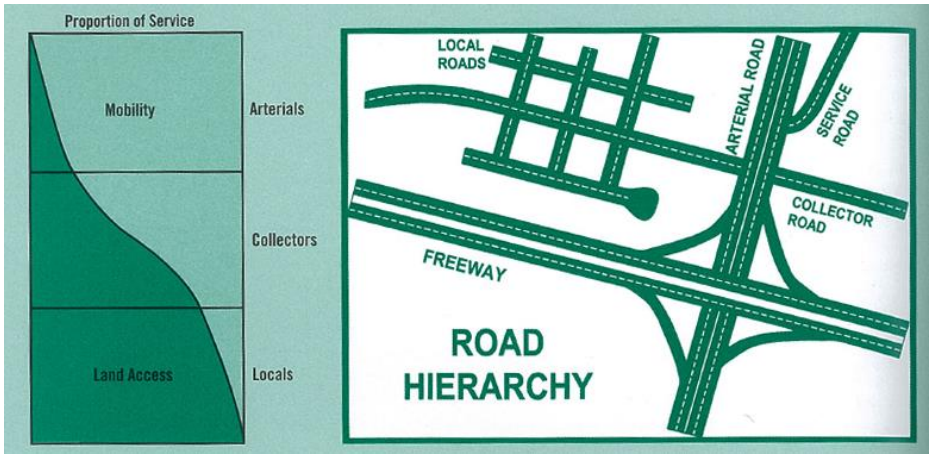


Figure 6: Functional Classification Roadway Engineering Principles (American Context).(Dover and Massengale 2013, 28).

As the road industry flourished, public transport began to languish. Road lobby groups were indicted in conspiracies to purchase and dismantle public transport infrastructure, as an anti-competitive means of driving car demand (Mees 2000, 43). The systematic disempowerment of transit agencies in Australia has progressed over several decades (Low, Gleeson and Rush 2005). Inner-urban streets were reconfigured to accommodate as much car carrying capacity as possible. Influenced by international planning, Perth removed the inner-urban tram systems in 1958, while tearing down ornate verandas over busy footpaths, freeing up additional space for automobiles (Gregory 2003, 52). The concept of J-walking was invented, and written into law (Norton 2007). A culture of indemnifying drivers over the deaths of pedestrians emerged (Faber 1978), prompting a resistance to car-centric city planning in northern Europe. Locally, the destruction of notable urban fabric catalysed the genesis of anti-modern activism (Gregory 2011). The immense modernist planning projects, which sought to revolutionise cities, provided opportunities for highly influential unelected technocrats to exert influences on city form through the provision of new highway infrastructure. The highly influential works of Jane Jacobs could be attributed, in part, to the antagonistic ambitions of Robert Moses, a New York City bureaucrat, who aspired to construct a comprehensive network of grade-separated expressways across New York's urban core (Caro 1974).

In Perth, the Main Roads Department (now Main Roads Western Australia) was highly active and influential in securing road reserves for planned highways, particularly in undeveloped land proposed for later development (Edmonds 1997, 137). Stephenson and Hepburn's

1955 Plan set out a large network of radial and orbital routes that have been largely constructed, often at much higher capacity than Stephenson and Hepburn had anticipated (Alexander and McManus 1992, 7). It is a mischaracterisation of the Stephenson and Hepburn Plan (Newman n.d.) to state that it was solely a car-centric plan. While it did propose orbital arterial roads, the plan also proposed new railways. One branch line was proposed from Daglish to Whitfords via Scarborough – a very early precursor to the Joondalup line, albeit on a widely different alignment, and another line from Bayswater, through 'Morley Park' to the eastern wide of 'Wanneru' (Stephenson and Hepburn 1955, 132). In contrast to the proposed road projects, neither of these links eventuated.

Road planning in Australia had a severe parasitic effect on public transport services in the decades after the 1940s (Mees 2000, 52). Today, road infrastructure agencies in Australia still retain a high degree of planning power, with the road lobby exerting considerable political influence (Low, Gleeson and Rush 2005). In view of recent history, it could be hypothesised that the allocation of power has been more influential in infrastructure provision than strategic metropolitan planning.

2.2.2 What is an Arterial Road?

For the purpose of this study, an arterial road is any road designed to provide medium and long distance through-access, not just access to local properties. Arterial roads may or may not have direct access or egress to properties. They are typically not grade separated, and are engineered to a less generous standard than entirely controlled-access freeways (Engineers 2009).

Typologies of urban landscapes along Arterial roads are identified in Chapter 6.

2.3 Chapter Summary and Relevance

The historical development and power structures that have led to the widespread development of arterial roads is significant in understanding the potential future roles of arterial roads, and potential governance conflicts that might impede or regulate change. The rationale for planning suburbia may contribute to public attitudes towards their local street,

and their perceptions of the role of the roadways that service them. Understanding Perth's pre-modern urban form provides an insight for future models of less car-dependant residential environments.

Chapter 3: Critiques of Suburbia and Main Road Environments

Planning theory has shifted significantly since the era of rapid modernist suburbanisation. Suburbia has been reviled by many urban commentators, especially in recent decades. This chapter critically reflects upon the history of arterial road and suburban development by exploring contemporary critiques and planning theory regarding these environments. Doing so will enable reflective analysis of the planning policies which govern today's arterial road environments. Understanding planning theory is important for the rigorous exploration and evaluation of planning policy (Forester 1993, 2). This chapter therefore contributes to a response to the research question by delving to academic criticisms of suburbia and arterial roads. The later sections of this chapter explain the rationale for post-car centric planning, and the principles that have informed recent multimodal roadway design.

3.1 Suburban Sprawl and New Urbanism

The accumulated landscapes of suburbs created by sprawling city form have been criticised for their low environmental and social quality (Kunstler 1994; Fishman 2008). As well as threatening the local ecology of the greenfields it sprawls into, suburbia may threaten the global ecology, through the impacts of climate change (Grimm et al. 2008). Etiological research suggests suburbia encourages unhealthy lifestyles (Frank et al. 2005; Pikora et al. 2003), contributing to the sedentary disease burden faced by societies living in postindustrial cities. The suburban model of human settlement is, and has long been, heavily subsidised by governments, and the high economic costs of building and servicing suburbia are well documented (Ellis 2002; Newman, Trubka and Bilsborough 2009). Distal, sprawling land use patterns are also associated with higher individual household economic vulnerability among residents (Dodson and Sipe 2008). Housing affordability, particularly for Generation Y, has also emerged as one of Australia's most pressing urban issues (Beer, Kearins and Pieters 2007).

Modernist planners had 'good' - though often elitist - intentions to achieve social aims through the application of planning and architecture (Birmingham 1999, 295). However, modernists assumed capacity to understand and plan for a singular prevailing public

interest, “assuming consensus over the aims of planning” (Taylor 1998, 23). Critics of modernism and suburbanism frequently challenge the singular, normative consequences of the Euclidean city (Ellis 2002), designed to separate land uses and support capitalism through economically-oriented infrastructure. It is tempting to characterise main roads and the homogenous suburbia they enforce as being planned within a modernist single “public interest,” while a multiplicity of diverse public interests actually exists (Beauregard 1989; Iveson 2007). One diverse public subset, for example, are people who cannot drive, or those with incomes insufficient to afford a bungalow on a well-located large urban lot.

During the closing decades of the twentieth century, a prominent reaction to the suburbanisation of cities - particularly in America - emerged from journalists, architects and other ‘neotraditionalists,’ who challenged the normative nature of suburbia (Ellis 2002; Fainstein 2000, 461). Fundamentally, they also challenge the rigid, suburban-oriented land use controls that were implemented to create it (Duany and Talen 2002; Talen 1999). The movement - termed ‘The New Urbanism’ - has emerged as a design-oriented philosophy. New Urbanism seeks to create neotraditional neighbourhoods and city form, by the placement and orientation of buildings towards the public realm, an emphasis on walking and transit, and provision of high-quality public space (Duany and Talen 2002; Katz 1994). James Howard Kunstler (1994, 2007) suggests that suburbia is a ‘cartoon’ of an idealised rural landscape, invalidated and made hellish by poor architectural design and modern urban engineering practices.

New Urbanism thus seeks to re-assert the distinction between rural-ness and urbanity by the application of design languages of pre-automotive cities and towns. This marks a return to a nostalgic era of ‘fine-grain’ development (Jacobs 1993) undertaken before the rapid suburbanisation of the post-war era. New Urbanism seeks to mix land uses, increase social ties with residents, and build towns with a civic quality (Katz 1994; Talen 1999). New Urbanism, when employed as an idyllic city form, in conjunction with social goals for equity, economic development and socially conscious development, forms a strategy to achieve the ‘Just City’ (Larsen 2005, 800).

3.1.1 Physical Determinism

While New Urbanism could be considered a theory, writers such as Fainstein (2000) have characterised New Urbanism as an ideology, marketed by advocates with a deterministic attitude (Harvey 1997), not unlike modernists, whose ideas that New Urbanists so fervently reject. Physical determinism is a 'discredited fallacy' (Bohl 2000, 777; Harvey 1997, 2), which asserts that the built form determines the behaviour of the persons who occupy it (Lloyd Lawhon 2009, 123). Social and cultural factors are hugely influential to a person's habit, aside from aspects of the built environment (Taylor 1998, 41). The substantive ideology of New Urbanism has led some scholars to go so far as to place New Urbanism "on the ideological continuum of Modernism" (Vanderbeek and Irazabal 2007, 41). Beauregard (2002) also described New Urbanism as remaining heavily influenced by modernism, while incorporating some aspects of postmodernism. Whilst the theoretical debates about determinism and the ideology of planners continue, it is important to note that evidence does seem to suggest that residents who live in neighbourhoods designed to facilitate walking do generally walk more than those who do not (Cervero and Kockelman 1997; Frank et al. 2005; Handy et al. 2002), affirming the concept behind the view of New Urbanists.

3.2 Main Roads to Main Streets?

Perth has several hundred kilometres of metropolitan arterial roads to support several thousand hectares of sparse suburban fabric (Duckworth-Smith 2013). The quality of high-capacity road spaces for pedestrians is almost universally regarded as poor (Ellis 2002, 265). Main roads have been engineered for the benefit of cars, and seem to have little value as places. The corridors created for the car have been criticized as exclusionary (Kitchin 1998), and threatening for pedestrians (Gehl 2011; Jacobs 1961). Arterial road landscapes lack amenity, and pose ricks to human health (Ellis 2002, 265; Rollo and Barker 2013). Aside from the obvious risks of traffic accident trauma, high traffic volumes have been associated with increased incidences of respiratory illness and disease for residents living nearby (McConnell et al. 2006).

In addition, the setbacks and physical separation of buildings away from the road, and each other, has reduced the social value of the street space (Alexander, Ishikawa and Silverstein

1977, 593; Gehl 2011). Kevin Lynch's seminal work, *The Image of the City*, describes the sensory experience of a place, and the meaning and sense of place created through them (Lynch 1960). Lynch suggested the 'imageability' of a place defines its quality. For pedestrians, the image and sensory experience of a loud, threatening and polluted arterial road streetscape is poor (Figures 7 and 8), while drivers are protected from the sensory assault by a cocoon of metal, typically passing through too quickly to dwell on the poor quality of the space.

Figure 7: Desolate, visually simple pedestrian environment on South Street near Kwinana Fwy.(McLeod 2015)

Large parking spaces also exert a detrimental impact on the quality of places, especially for pedestrians (Alexander, Ishikawa and Silverstein 1977; Babb 2010; Shoup 2005). Parking also encourages and perpetuates the use of the private car for trips, even where satisfactory public transport exists (Weinberger 2012). The omnipresence of parking, in itself, represents a massive consequence of historical planning fashions, manifest in today's built environment.

Figure 8: Poor quality urban environment dominated by car parking, South Street, Kardinya (McLeod 2015)

3.3 Carrying Capacity and Supply-Demand Dynamics

Several mechanisms have emerged in the literature illustrating the futility of car-centric transport planning. Urban road congestion in cities tends to revert towards a typical average rate of delay (Downs 1962). Ironically, increasing supply of capacity on main roads results in little, if any, improvement to congestion. Providing additional capacity, in the form of lanes or higher road standard, encourages drivers to make more trips, leading to the realisation of 'induced demand,' resulting in a return to the earlier level of congestion (Cervero 2001; Duranton and Turner 2011; Mees 2000, 27; Mogridge 1990; Standing Advisory Committee on Trunk Road Assessment (SACTRA) 1994). Paradoxically, the weight of evidence suggests that increasing road capacity can even worsen traffic congestion, as the additional demand driven by the improvement exceeds the additional capacity of that improvement (Mogridge 1997).

3.3.1 Downs-Thompson Paradox

Distilled simply, the Downs-Thompson paradox asserts that the average time of door-to-door trips in urban areas by private vehicle is determined by the duration of the same door-

to-door trip by public transport (Mogridge et al. 1987). This is because road congestion encourages public transport use, just as poor public transport journey times motivates car use, increasing road congestion (Mogridge 1997). Thus, both modes will tend to meet a kind of equilibrium. The counter-intuitive consequence, therefore, is that improving public transport system speeds is a means to improve road congestion. Litman (2015, 6) conjectures, based on international planning examples, that some travel demand phenomena also occur in reverse, such that a reduction in road space may trigger less travel by car. However, very broad assumptions are fraught, as elasticities, habits and choices can be highly variable, difficult to measure, and not-necessarily bi-directional (Cervero and Kockelman 1997).

3.3.2 The Risk Compensation Effect

The consistently engineered standards and resulting predictable, abstract environment of urban arterial roads is also likely to increase the perceptions of safety among drivers, resulting in what Adams (1995, 141) describes as the "risk compensation effect." This theory hypotheses that human motorists will adapt their behaviour relative to their perception of risk and danger, so roads perceived as safer by drivers will result in increased speeding and recklessness (Adams 1995). This theory is congruent by evidence put forth by Ewing and Dumbaugh (2009), who found that "edge friction" – objects close to the roadway - along urban arterials corresponds with greater driver caution and lower speeds. Reflecting this theory, New Urbanists encourage the design of intersections which seem dangerous, to reduce driver speed and encourage negotiation between modes (Duany, Speck and Lydon 2009, 8.3).

3.4 Desegregation and Multimodal Street Planning

Reflecting these phenomena, urban designers in recent decades have begun to reverse the process of segregating traffic (Hamilton-Baillie 2008), in a paradigm shift back towards streets which mix various modes on the same street. Hans Monderman, an innovative Dutch transport engineer, radically engineered safer streets by *increasing* perceptions of danger, by removing overt signage, removing barriers to hazards, and undifferentiating the pedestrian realm and carriageway (Project for Public Spaces 2008).

Central to the success of such "shared spaces" and intersections is the risk compensation theory in reverse, with drivers taking a more cautious driving approach and sharing the road with pedestrians with a greater degree of equity (Hamilton-Baillie 2008). Pedestrians almost always prefer to cross roads at grade (Bentley et al. 1985, 71), and desegregating traffic is crucial to re-establishing the street as a place. Diversifying the mode share of streets and roads is also important for improving the access of marginalised, disabled or other groups who have poorer access to places by car (Lucas 2006).

The removal of lanes, termed a "Road Diet" - or, among New Urbanists, "Complete Streets" - has emerged as a means by which streets can be retrofitted (Duany, Speck and Lydon 2009, 8.1) Famously, this practice has underpinned several projects in New York (New York State Department of Transportation 2013), to much recognition and acclaim (Smart Growth America 2015). The potential for conversion may not be a universal panacea, however, especially on busy road or freight routes. In a landmark study, Appleyard and Lintell (1972) found that social connections along a street were inversely correlated by the daily vehicle traffic volumes and speed on that street (Figure 9).

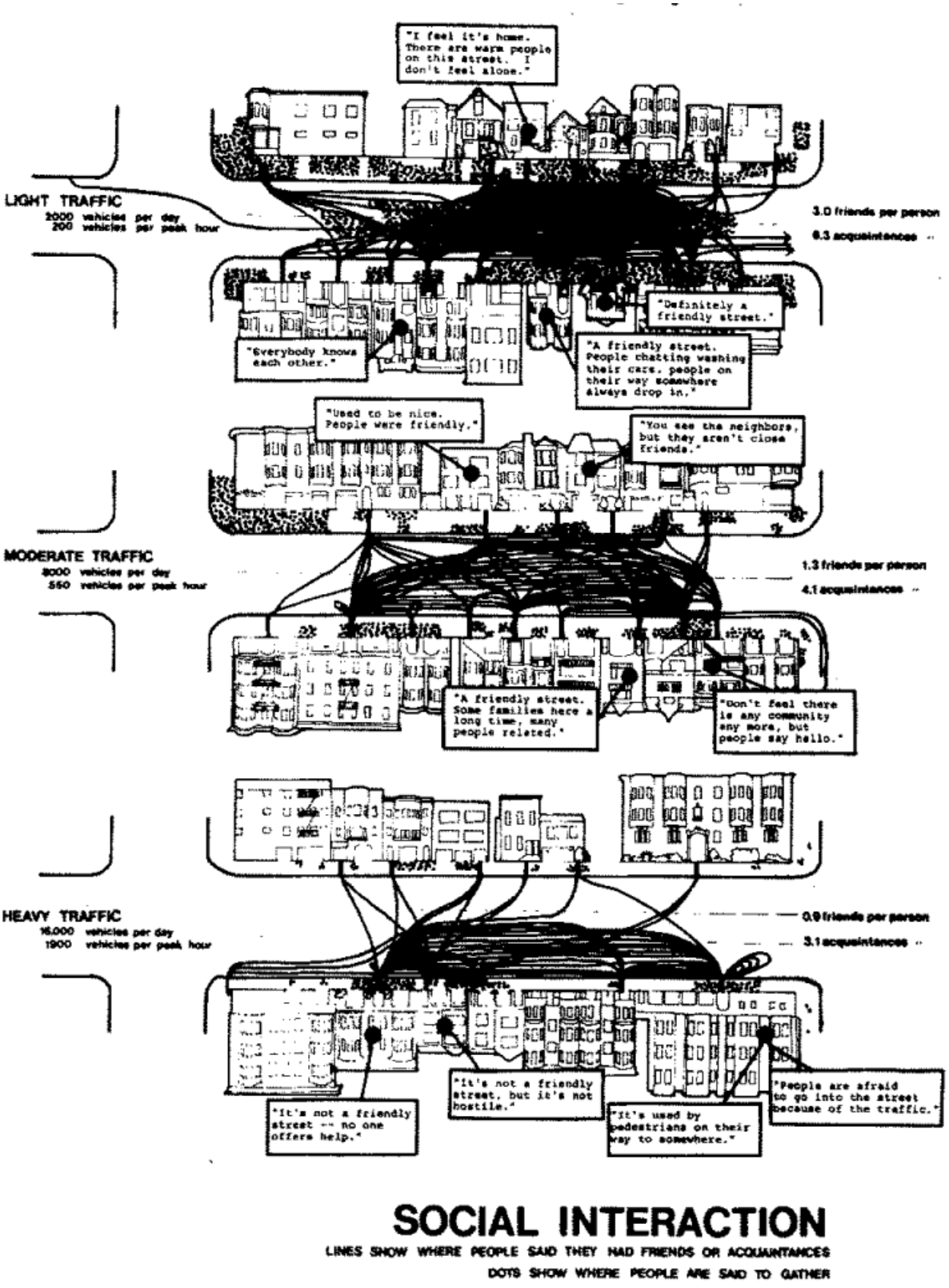


Figure 9 Social Interaction on Streets. (Appleyard and Lintell 1972, 88)

New measures of street capacity have emerged, which challenge traditional road evaluation methods by encompassing values other than gross vehicle capacity. In the United States, "Multimodal Level of Service" assessment tools have been devised to factor in transit, cycling and pedestrian access, and have been utilized to advocate for balanced roadway planning (Currie, Sarvi and Young 2006; Dowling et al. 2008; Henderson 2011).

3.4.1 Self-Selection and Housing

Beyond physical determinism and the general concept of Transit Oriented Development (TOD), evidence suggests that residential self-selection occurs (Cao, Mokhtarian and Handy 2009). That is, people are likely to make housing choices with regard to their transport options, and people likely to utilise transit are likely to select a more transit-accessible dwelling, provided the opportunity. Marchetti (1994) observed that the time commuters are willing to spend commuting each day is globally quite constant, and has been for several decades, despite changes in transport technology, at around an hour per day. Furthermore, evidence suggests that daily time spent commuting is inversely related to measures of happiness and wellbeing (Office for National Statistics (United Kingdom) 2014; Stutzer and Frey 2008). Ergo, reductions in road access may prompt residents and firms to make spatial adjustments, offsetting the time impacts of congestion.

It is pertinent to note that many authors of planning literature commenting on urban form in Perth since the 1950s have observed that the quality of medium and higher density housing constructed in the post-war period have been poor, failing to respond to urban context, constructed cheaply, thereby normalising a suburban housing archetype (Yiftachel and Hedgcock 1992, 141; Weller and Bolleter 2013). Experiences of such low quality dwellings are likely to have significantly influenced residents' perceptions of denser housing typologies (Property Council of Australia, The Greens and Australian Urban Design Research Centre 2013, 16), especially where those residents have lived in segregated residential houses for the majority of their own lives. Identifying perceptions along sample groups living in alternative housing types is thus a key component of this study.

3.4.3 Peak Car and Transit-Oriented (Re)development Potential

The dominance and popularity of the motor vehicle generally seems to be at a crossroads. Many jurisdictions seem to have reached 'peak car,' with overall per-capita vehicle kilometres travelled per capita generally decreasing over time (Goodwin 2013). In recent years, younger people in Australia have been obtaining driver's licenses at rates much lower that the historical average (Delbosc and Currie 2013). Urban highway removal and public transport projects are being utilised in urban renaissances worldwide (Suzuki, Robert Cervero and Iuchi 2013).

Mode shift, and the accompanying change in urban form, presents a new frontier of redevelopment. Chester, Horvath, and Madanat (2010) estimate that car-centric cities might have a parking stock of anywhere between three to eight parking spaces for each individual car. The retrofitting of "greyfields" suburbia, and the utilisation of this inactive space, constitutes a significant opportunity to drastically improve the sustainability of existing city districts (Bohl 2000, Larsen 2005, Newton 2010).

Internationally, the "retrofitting" of car-centric suburban shopping centres and low-density precincts has become a project model by new urbanists (Dunham-Jones and Williamson 2012). One such example is shown in Figure 10. This provides a good conceptual model of what "Activity Corridors" might conceivably look like in Western Australia.

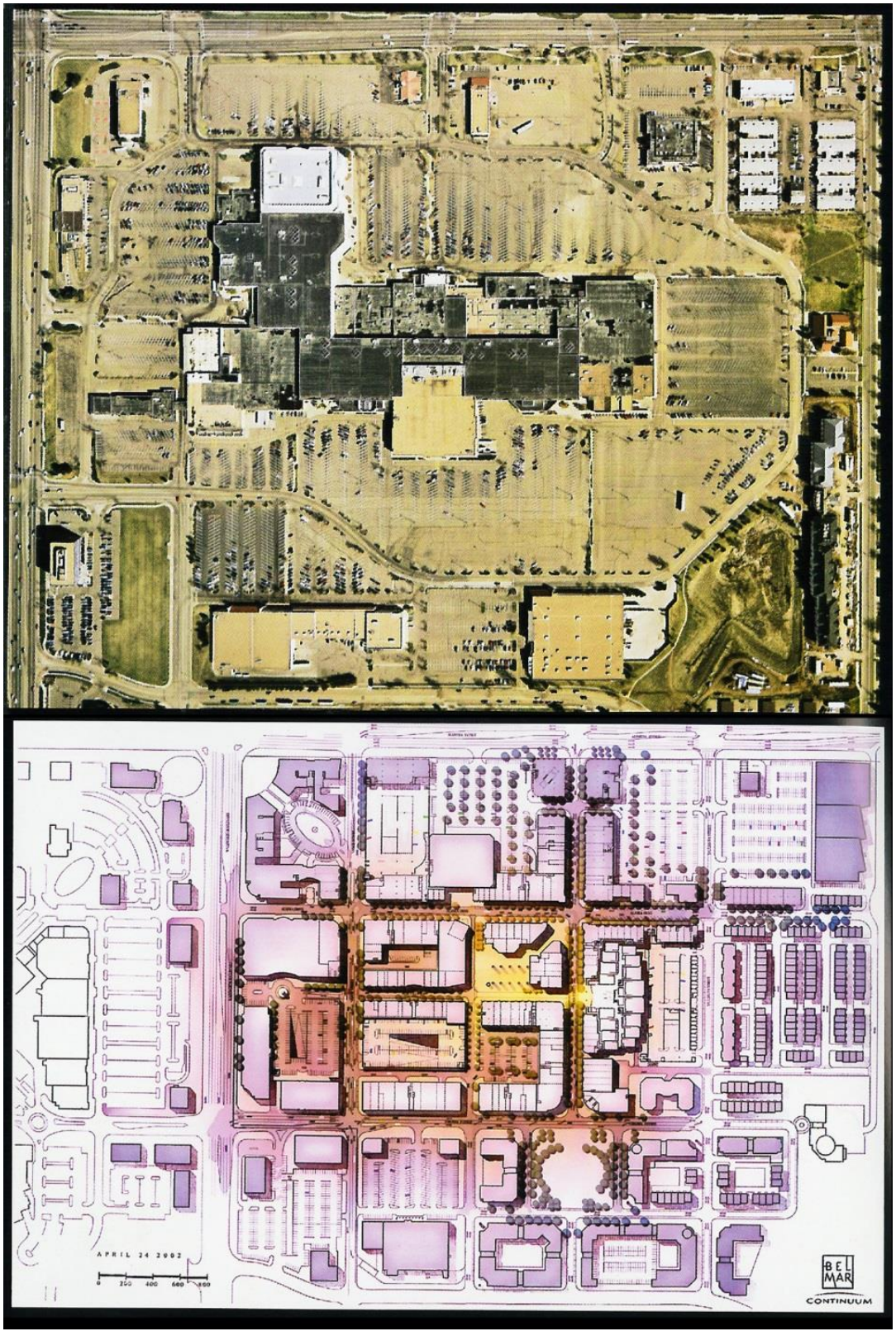


Figure 10: Belmar Mall redevelopment, Lakewood Colorado. (Dunham-Jones and Williamson 2012, 80-81). This redevelopment is highly representative of a classic New Urbanist greyfields adaption project, and will be later utilised as a model for discussion and evaluation.

3.5 Inclusive and Deliberative Planning Theory

Just as substantive theories have evolved substantially since the apex of modernism, theories about the process of planning have shifted considerably. These shifts are highly significant when contemplating the potential transition of road space, which was mostly developed with a pre-modern, top-down view. Procedural theory is particularly important when discussing potential change in the built form which is contentious, or which substantially affects local communities.

Planning in the postmodern era can be intimately concerned with public participation and the communicative process of reaching consensus in planning (Healy 1997). Cities can be created by a diverse range of stakeholders, in collaborative processes that yield fairer and more just outcomes (Fainstein 2000). Some theorists, such as Bruggman, have gone so far as to assert that great contemporary cities have forged urbanism through grassroots, bottom-up community planning (Hazel-Streeter 2011, 1). Such a shift reflects the change of thinking on the role of the planner through the existence of the profession. Monumentally, Davidoff (1965, 283) wrote:

> "The advocate planner would be more than just a provider of information, an analysis of current trends, a simulator of future conditions, and a detailer of means. In addition to carrying out these necessary parts of planning, he[/she] would be a proponent of specific substantive design solutions."

The communicative values of New Urbanism have been questioned by scholars (Fainstein 2000; Harvey 1997; Krieger 1998). New Urbanism remains a design-centric ideal, which incorporates public participation in the design process, primarily in the form of charrettes (Dover 2001; Duany and Talen 2002; Ellis 2002). Locally, charrettes have been put forth as the means by which community consultation for light rail corridors might be undertaken in Perth (Jones 2011, 13). Controversially, the degree of participation afforded to the community during a charrette is often manipulated by the designer to achieve predetermined outcomes (Dover 2001, 7). Charrettes can be educational, broadening community thinking about planning and development, but in practice, they can lack the long-term participatory engagement that should accompany continual urban redevelopment and change (Bond and Thompson-Fawcett 2007, 469). Bohl (2000, 790)

details a broader range of public participation processes, though they are still intertwined with the intrinsic design process.

Fainstein's (2000) critique of the substantive, "neo-modern" attitude of New Urbanists is reflected in the seemingly secondary-importance assigned to the *process* of achieving communicative, collaborative and participatory outcomes. Hence, while the ideology of New Urbanists are influenced by notions of sustainability and a broader goal of improving the built environment, it is pertinent to remember that the failed ideas of substantive modernist planning were largely conceived in much the same ideal.

Figure 11: Substantive Theorists: Andres Duany and Le Corbusier. (Mark Hood 2010)

3.6 Chapter Summary and Relevance

This chapter has described the anti-suburban and counter-road thinking that has begun to manifest in contemporary planning practice. This chapter has identified the rationale of anti-suburban land use and urban design ideologies. Furthermore, by elucidating the complex phenomena that cause, limit and adjust to road congestion and driving behaviour, the means by which travel demand can be addressed by strategies other than additional car-centric planning have been established. These phenomena (and the level of awareness of them among the community and planning stakeholders) form much of the underlying rationale and potential of the Activity Corridor concept.

Chapter 4: Activity Corridors and the Politics of Implementation

This chapter describes, in specific detail, the activity corridor concept, and the potential for implementation. Subsequently, experiences and research in the politics of environments will define an appropriate and novel scope for the research component of this dissertation.

4.1 Planning Context

During the emergence of the postmodernist movement, New Urbanist thought has begun to influence urban design, in principle and in practice (Curtis and Punter 2004; Fainstein 2000; Falconer, Newman and Giles-Corti 2010). In Australia, State Governments have begun to embrace the infill and density implications of sustainability and New Urbanist theory as a planning imperative. At a Western Australian level, metropolitan planners have embraced the "Activity Corridor" principle, identifying many existing arterial roadways for redevelopment at much higher residential densities (Western Australian Planning Commission 2015d). This is particularly the case in inner and middle suburbs, where the land value of the location is high, while zoned residential densities have, since initial construction, remained very low (Hopkins 2010, 63). Adams (2009) has suggested that distributing more intense development in this fashion is likely to encounter less resistance, as it preserves the majority of existing suburbs.

An Activity Corridor is a linear stretch of mixed-use development along a transit line (Curtis 2006), typically along road-based public transport, such as Bus Rapid Transit (BRT) or Light Rail. Activity Corridors can be retro-fitted along arterial roads, particularly in low-density car reliant cities. It is pertinent to note, however, that the concept of linear development is not new. Early inner-urban commercial and housing development in Perth spanned radically along transit lines (Campbell 1999), and earlier theoretical concepts for planned linear development spanning back to at least as early as 1882 (see Figure 12) (Curtis and Tiwari 2008, 107; Priemus and Zonneveld 2003, 198).

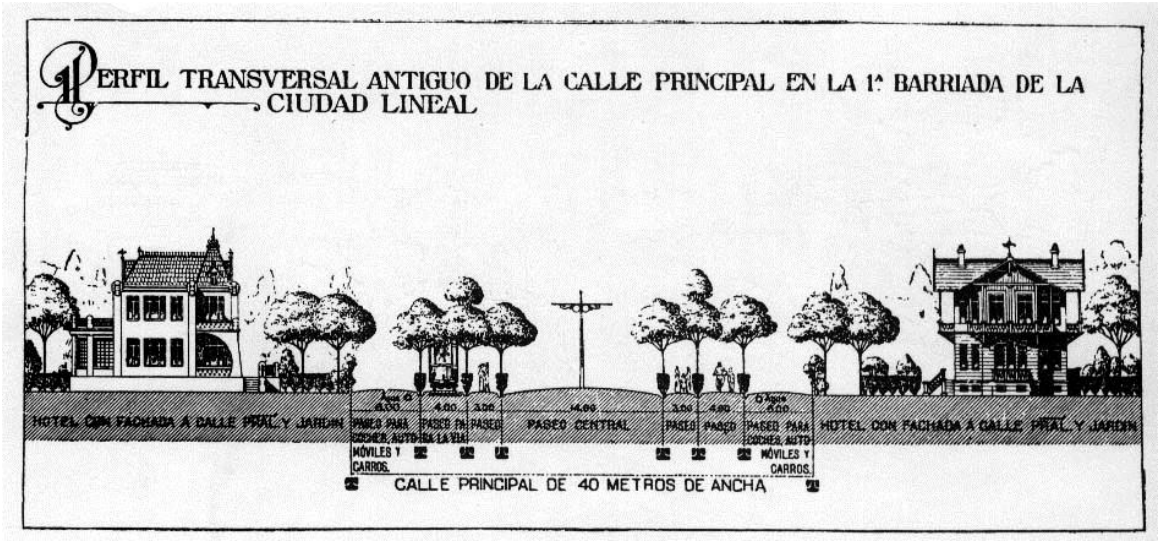


Figure 12: Ciudad Lineal, The Linear City. (Urban Cidades 2008)

Activity Corridors have successfully been developed interstate and overseas, particularly around new Bus Rapid Transit investments, such as in Bogatá, Columbia, and Curitiba, Brazil (Cervero and Dai 2014). Intense development along rail corridors - often by railway companies themselves – has been a consistent urban development strategy in Tokyo, Japan (Chorus and Bertolini 2016). While Perth does have a recent history of some streetscape improvements along main roads, there has been no comprehensive and coordinated construction of Activity Corridors. To date, there have been local proposals (Property Council of Australia, The Greens and Australian Urban Design Research Centre 2013), academic literature (Curtis and Tiwari 2008) and strategic studies (Department of Planning 2012, 2013b), with little implementation. Coordinated efforts to implement urban design, land use intensity, roadway design, parking reorientation, improved public transport provision, green infrastructure and other pedestrian amenities have failed to materialise.

The most recent high level strategic plan for Perth, *Perth and Peel @ 3.5 Million*, liberally apply “Activity Corridors” to several main roads, particularly within the Central Sub-Region Structure Plan (Western Australian Planning Commission 2015a). Such liberal development of Activity Corridors in a city where they are largely absent will arouse the interest of a large cohort of stakeholders.

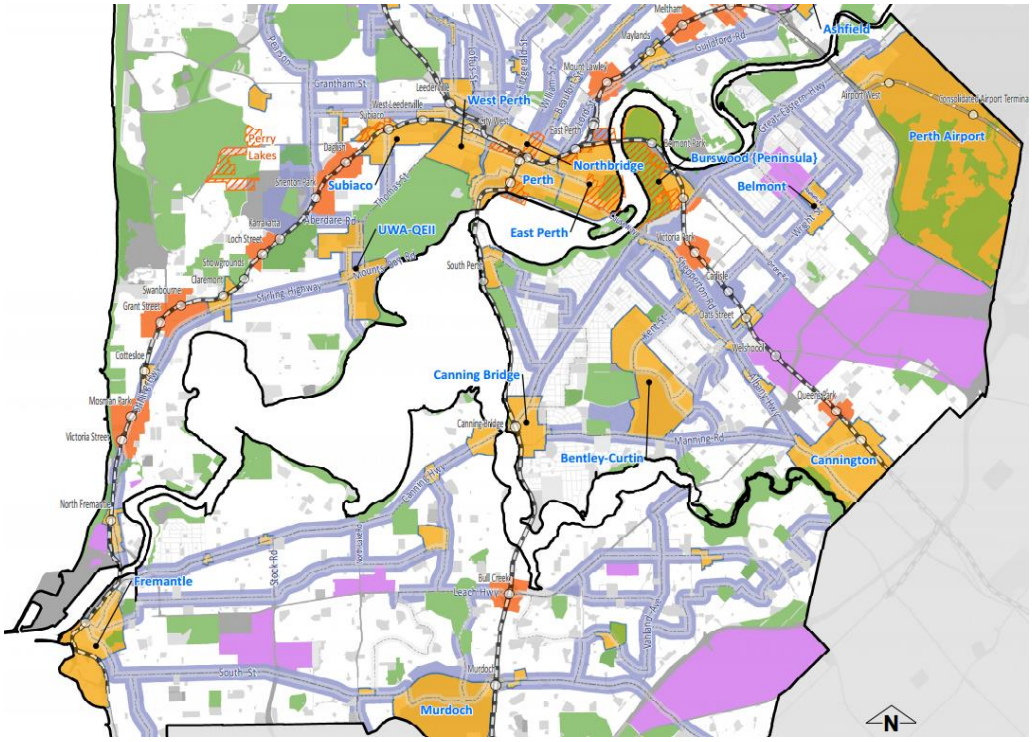


Figure 13: "Draft Central Sub-Region Structure Plan", in Perth and Peel @ 3.5 Million. Proposed Activity Corridors shown in purple.

Source: (Western Australian Planning Commission 2015a)

Many theorists have asserted the axiom that higher land use density promotes increased use of public transport (Cervero and Kockelman 1997; Currie and Delbosc 2011; Falcocchio and Levinson 2015; Newman and Kenworthy 1999, 756). However, Mees (2000, 150) contends that effective network design and efficient distribution of services can feasibly support suburban trips, even where density is moderate or low. Regardless of the density argument, there is consensus that public transport and land use patterns must be considered in an integrated manner to achieve a more sustainable, transit-oriented built form outcome (Curtis 2008; Grosvenor and O'Neill 2014). Recent evidence from the Gold Coast suggests that installing light rail through high density corridors results in considerable mode shift (Stay and Griffin 2015).

Responding mainly to the land use component of sprawl, planning agencies operating in Perth have increased residential densities to constrain outward urban growth. During the first decade of this century, a broad, deliberative planning process, *Dialogue with the City*, led to the formulation of a metropolitan masterplan oriented towards a compact,

networked Perth (Curtis 2006; Hartz-Karp 2005; Maginn 2007). Participants in public engagement workshops embraced infill (Wood-Gush 2006), and survey results indicated that people broadly prefer a more compact Perth, that is well serviced by public transport (Department of Planning and Infrastructure 2003). In recent years, however, increasing resistance to increased housing density has emerged in the public debate (Lutton 2013; Moodie and Trigger 2015; Nematollahi, Tiwari and Hedgcock 2015; Weller and Bolleter 2013). Activity Corridors, implemented to their full, integrated form, would present drastic changes to the form and characteristics of main roads, and the adjacent land along them (Duckworth-Smith 2013).

4.2 Housing Markets and Economic Constraints

While working with regard to planning principles is important, planners must also work within the constraints of the economic systems of the societies in which they practice. Many theorists regard planning as a force to correct for failures of the free market (Beer, Kearins and Pieters 2007, 18; Campbell and Fainstein 2003, 7). Sternberg (2000) argues that producing good urban design relies on planners intervening in *laissez faire* capitalism (Ellis 2002, 296). Levine (1999) argues that regulators can encounter great difficulty in *requiring* density in suburban areas, especially when there is a strong market preference for larger dwellings. State governments in Australia are heavily involved in the built environment, as the largest (crown) landholder, primary planning regulator, and the main provider of land improvement infrastructure. Curtis and Punter (2004, 34) write “the State exerts a major influence over an oligopolistic land market.” The economics of land are central to issues of urban development. Famously, Winston Churchill (1909, 84) wrote:

> Land monopoly is not the only monopoly, but it is by far the greatest of monopolies - it is a perpetual monopoly, and it is the mother of all other forms of monopoly.

Suburban development has denied consumers a diverse range housing choices (Audirac and Shermyen 1994, 56). Low-density suburban detached housing is by far the prevailing form of housing in Perth (Weller and Bolleter 2013, 91). Understanding the microeconomic choices of land consumers might explain both the feasibility of, and community views towards,

Activity Corridors, especially since the housing they would provide offers an alternative in an existing housing market.

Dilapidated, low-quality dwellings, commonly found along main roads (Duckworth-Smith 2013), might be far more likely to be owned by investors, leased as rental properties. One of the primary rebuttals to the Activity Corridor concept is that this housing provides a bank of affordable rentals for low-income earners. However, the demography of the residents along main roads is unclear, and is a potential area for research. Jacobs (1961), Zulkin (1982), Bentley et al. (1985, 57), Atkinson (2003), and many other urban theorists stress the role of affordable properties in enabling both cultural regeneration, and supporting new enterprise. Those with a cautious view of denser, New Urbanist neighbourhoods have suggested that redeveloped housing ought to incorporate areas for “dirty” cottage industries (Pyatok 2000), such as found in the back shed of the average suburban dwelling, ensuring developments are adaptable and, as defined by Bentley et al. (1985, 56), “robust.”

Housing affordability in Australian cities remains an ongoing issue, with younger people increasingly delaying moving into their own housing (Beer, Kearins and Pieters 2007, 11). One factor likely to incite reluctance to adopt a lifestyle reliant on public transport may be the increasing casualization and flexibility in employment in Australian cities (Curtis and Punter 2004, 32; Forster 2006, 175; Morris, Wang and Berry 2002). Younger workers might be more reliant on motor cars as their employer or location of employment may be more likely to change. Employment centres also tend to be dispersed, with workers making trips between a variety of dispersed locations (Forster 2006, 174).

At a local level, (Holling and Haslam-McKenzie 2010, 283) found that there exists some market demand for transit-oriented housing in Perth, particularly for younger and wealthier people. Their research concerned choices, and not the placement or location of typologies of housing in a particular location. Interestingly, Audirac (1999), in testing the marketability of New Urbanist living, found that many survey participants stated they would be willing to live on a smaller lot if more amenities were nearby. She found that younger people were most willing to make the trade-off (Audirac 1999, 60). Other research, such as that by Brueckner, Thisse, and Zenou (1999) suggests that the spatial distribution of high amenity

land uses, relative to a plot of land, determines the value of that land. Davies and Atkinson (2012) suggest there is a latent demand for higher-density housing in high amenity areas in Perth. Thus, New Urbanist Activity Corridors with a high degree of nearby amenities and desirable land uses may be highly valued by the market.

4.3 The Politics of Change, NIMBYism, and Built Environment Preferences

Suburban lifestyles have become deeply entrenched in Australian culture. Davison (2006, 204) describes the widespread acceptance of suburbia for the "private comfort and benign order" it provided in the post-war period. Beauregard (1989, 383) described the modernist project as aiming towards the 'embourgeoisement' of the working class, and suburbia has long been marketed as an environment of a superior lifestyle. Culturally, suburbia is associated with the consumerism and privatism that underpins unsustainable lifestyle habits (Curtis and Punter 2004, 34). In-fill development in Perth, even if modest, often attracts resident opposition (Weller and Bolleter 2013, 97.)

4.3.1 So Why Do Suburbanites Oppose Density?

Community Opposition to change in the suburban environment has been well documented (Devine-Wright 2009; Hazel-Streeter 2011; Lewis 1999). The term NIMBYism (Not-In-My-Backyard) has been used to describe the attitudes of residents who oppose change, but the term is simplistic and fails to account for the diversity of views and reasons for opposition (Ruming, Houston and Amati 2012, 434). More cynically, Hubbard (2005) theorized that privilege and exclusion might underpin resistance to the introduction of new or different persons within the community, especially if those people are perceived to have a different identity to existing residents. This is consistent with the view, put forth by Beauregard (1999, 397) and others, that segregation remains a major force within suburbia. The attitudes of "suburbanites," while often hypothesised (Ellis 2002, 271; Kunstler 1994), are not often empirically investigated, nor is NIMBYism well understood.

Woodcock, Dovey, and Wollan (2009) found that residents of inner-urban Brunswick, Melbourne, opposed high-rise development because they were defending the "broad sense of place and community" and the identity of the locality, rather than specifically opposing

the proposed built form. They also found that existing residents fear that the new residents of denser housing will drive in and out of the locality without interacting with the established community. Opposition to change is heavily rooted in place identity, involving meanings, sense of place, psychological attachment, and personal attachment (Devine-Wright 2009). In examining resident perceptions around transit-oriented developments in Perth, Nematollahi, Tiwari, and Hedgcock (2015) found that respondents had reservations to both physical building and street characteristics, as well as attitudes based on social perceptions or fears.

It has been suggested that land fronting major roads is likely to be less contested than the suburban "hinterland," which sits behind it (Adams 2009; Duckworth-Smith 2013, 4). Baum (1999) suggests that residents tend to view their locality with a nostalgic, idealistic view, which leads to an inherent conservative reaction towards any proposed change. He argues that residents only become motivated to embrace change once they understand an urban issue, and contemplate their own locality within the frame of potential future scenarios. In this way, residents may devise and take ownership of a solution, embracing change with an optimism of future improvement.

In using photo-simulation survey techniques, Braughton et al. (2011, 16) found that participants generally did not consider the connection between urban density and level of transit service, resulting in a conservative response to their preferred height of greyfields redevelopment. The participants of their research, in Stockton, California, generally felt that 3-4 floor development was the tallest acceptable building form along a transit corridor.

4.3.2 Collective Opposition

Since the 1960s, community groups in Perth have become highly proficient in protesting and lobbying against large redevelopment projects (Gregory 2011). Some community groups in Fremantle, notably the Fremantle Society, have developed a tradition of heritage activism and have emerged as a strong lobby for the preservation of suburbia (Davidson and Davidson 2010). Far from being politically or architecturally illiterate, community groups become highly proficient in understanding the planning system, and can articulate sophisticated views on proposals (Hazel-Streeter 2011; Lewis 1999). The potential force of a

well-organised community opposition group may be highly effective in scuttling proposals perceived as large or radical, and the threat of such a campaign may influence the decisions of policy makers. The role of community lobby groups in influencing the planning density agenda will be a key focal point of the interview stage of this research.

4.4 Chapter Summary and Research Niche

Just as an understanding of planning is incomplete without understanding the politics surrounding it (Davidoff 1965, 331), an understanding of community resistance to intense development is limited without an appreciation of public preferences of land use distribution. As the other major component of the transport and land use policy system, the community's attitude towards parking for high-density and transit-oriented housing will be explored, providing further insight into the desirability of denser, transit-oriented housing. Of particular interest to this research is whether the community is likely to support taller built form in exchange for improved public transport infrastructure, as has been tested internationally by Braughton et al. (2011).

Understanding these prevailing community attitudes will be of key interest for practicing planners and policy makers, and may help to provide empirical evidence to inform the public discourse. This research may also shed light on community preferences for or against New-Urbanist style mixed-use development.

Chapter 5: Methodology

This Chapter describes the research design and process undertaken to achieve the research objectives. This thesis seeks to achieve the research goals in three parts, using a mixed-methods, case study approach.

5.1 Epistemology and Ontology

This research is fundamentally concerned with the social and political dynamics of urban space, and their influence on the practice of planning. Planning is largely a political endeavour (Forester 1980), concerned with social goals and managing conflict. Much of the conflict involved in planning space relates to the perceptions and connections stakeholders feel towards that land (Baum 1999). “Sense of Place” describes the constructed understandings, attitudes and meanings people hold towards their particular environment or place (Jorgensen and Stedman 2001; Stedman 2003). Many urban theorists describe the role of public space, and, therefore, streets, as places of rich interaction and communication between people (Gehl 2011; Jacobs 1961; Mehta 2013; Whyte 1980). Social constructionism, the theory that knowledge is constructed through communication and interpersonal interaction and experience (Burr 2015; Stedman 2003), thus forms an epistemological basis for this research.

5.2 Methodology

A case study has been selected as the methodological basis for this study. The case study approach can allow for relatively deep exploration and analysis of a topic in a relatively short period of time (Bell 1993, 12). Case studies are best conducted when various individual methods are applied, triangulating data to produce a holistic understanding of the case, which can be related to theory (Yin 2003). Triangulation is important in ensuring research draws upon multiple data or methods to yield deeper understandings (Berg 2001, 6). Hence, a mixed-methods approach will be employed, utilising qualitative and quantitative methods of data collection. Whilst some academics warn against extrapolating too broadly, Flyvbjerg (2006) contends that, particularly in the social sciences, case studies are a means to arrive at deep and nuanced understandings of a case, which, when

considered in broader theories and experiences, continues the formulation of knowledge and expertise. Case studies can be an excellent means by which to test and evaluate theory (Flyvbjerg 2006, 10). Therefore, it is anticipated that the findings of the case study might be informative when considering Activity Corridors and higher housing density more broadly.

5.2.1 Case Study Location

The case study will be conducted on South Street, an arterial road between the sub-centres of Fremantle and Murdoch, in Perth, Western Australia (Figure 14). The study area is 10km long, and has a very high degree of built form diversity along the route, owing to the different stages of urban development that have occurred over more than 150 years. It thus forms a kind of transect – a successive range of different built environments, along a cross-section of a metropolitan region. The characterisation of specific built environment transect 'zones' allows for comparisons between different urban forms which might be commonly found along an arterial road route. Analysing specific types of environments found along arterial roads might allow later research to extrapolate or compare findings to other, similar urban environments. The case study area is described more deeply in Chapter 6.

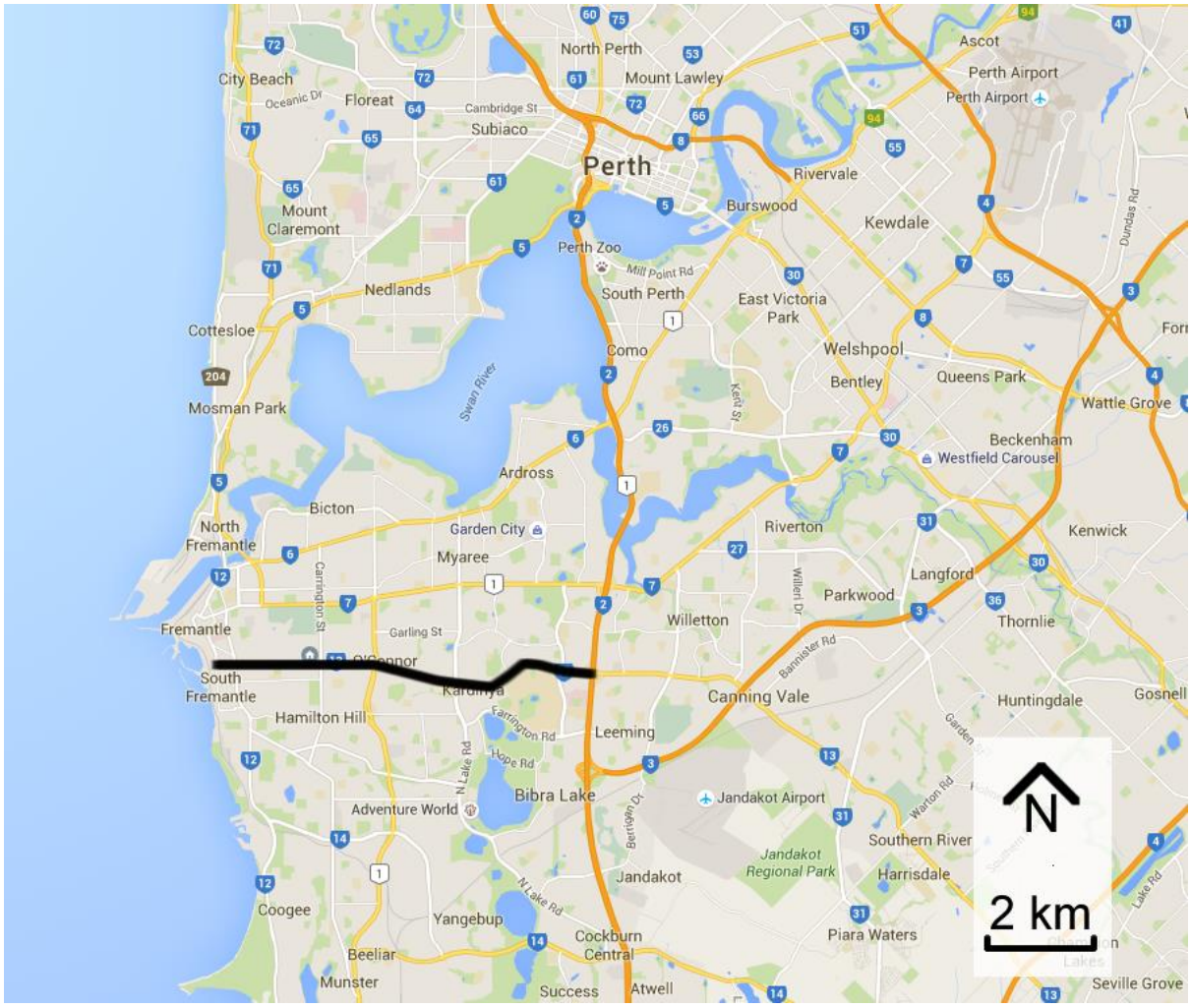


Figure 14: South Street in metropolitan Perth context. (Google Maps 2016)

5.3 The Transect in Research

Transects are a useful research tool, employed in various academic disciples. Urban transects have been used previously in a diverse range of urban geographical studies (Clay 1994; Duany and Talen 2002, 253; Luck and Wu 2002). As early as 1915, Patrick Geddes theorised a “Valley Section” of environments, placed on a geographical scale and assessed in relation to their value for human exploitation (Duany and Talen 2002, 273).

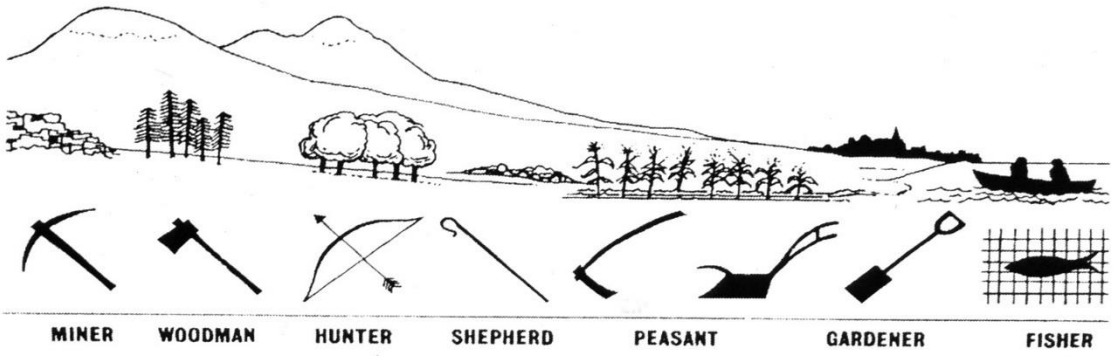


Figure 15: Patrick Geddes' Valley Section. (Centre for Applied Transect Studies n. d.)

Prominent new urbanist, Andres Duany, has advocated for a transect-based means of categorising and planning environments on a rural to urban continuum (Duany and Talen 2002). Internationally, this concept has been applied through form-based statutory planning codes and schemes (Talen 2009).

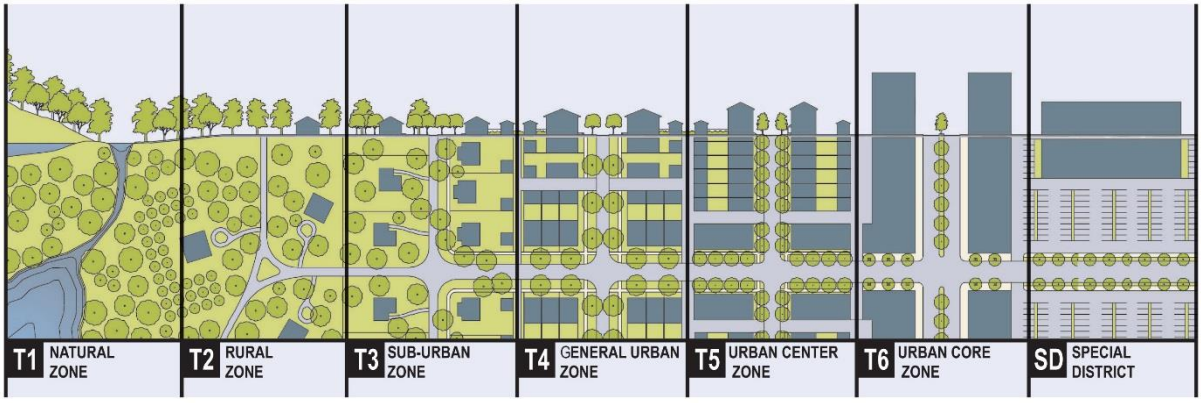


Figure 16: New Urbanist Transect, as detailed by Duany and Talen (2002).

Source: Centre for Applied Transect Studies n. d.

Importantly, New Urbanists see the transect as a guide to urban change. In much the same way as ecological environments undergo succession, New Urbanists argue environments should ideally undergo succession along the transect. Such change is driven by the changing housing requirements of aging communities, the demands generated by typical population

growth, the conception of new businesses, and the changing nature of local economies (Duany 2008). Other urban writers have utilised the transect as a literal tool for cross-sectional urban analysis, to interpret and narrate the city:

> "Kevin Lynch's "Walk Around the Block," was an impressive eye-opener, and a predecessor to his memorable work, *The Image of the City*. An evening walk with the incomparable observer Jane Jacobs down Pittsburgh's lively Fifth Avenue, in the early stages of our work on *The Exploding Metropolis*, further opened my mind to the rigorous pursuit of generalizations along a linear path."
>
> - (Clay 1994, x. [preface])

"Transect Walks" have become popular across several disciplines as an observational research method, well-suited to participatory research practice (Catalytic Communities 2013). Prominent urbanists, particularly Jane Jacobs (1961), Jan Gehl (2011) and Jeff Speck (2012), have described the significance of experiencing and interpreting a place as a pedestrian moving through. Payton and Hawkes (2013) have described scenarios for retrofitting transit-oriented development along a transect of urban environments.
The transect research tool therefore supports the use of a long, linear case study area.

Urban form typologies along the case study route will be categorised into transect zones as part of the field observations method. These environments may be representative of many other arterial environments, allowing for some extrapolation of theory.

5.4 Objectives, Methods and Process

The structure of the research undertaken for this dissertation is detailed in Table 1 below.

Table 1: Research Goals

Objective	Methods	Output
1. Identify arterial road urban environments/transect zones by analysing historical development, urban design, regulatory issues and governance characteristics relating to main roads and development along them.	• Case Study Research • Literature Review • Field Observations	• Chapter 2-4, 6 • Transect Zones (Chapter 6.5) • Urban Design Observations Appendix • Photographs

2. Explore resident and stakeholder attitudes and values of density, transport and built form, along a potential activity corridor. Identify whether a particular sub-group of people are associated with a particular attitude towards density.	• Community Survey • Literature Review	• Survey data for interview discussion • Quantitative representation of views • Chapter 7 (broad findings) • Chapter 8 (sub-group findings)
3. Detail and categorise specific examples of issues, from practicing planners, local government and other professional stakeholders that have arisen when attempting to "retrofit" density or enact significant change in existing suburban greyfields, particularly those that are political in nature.	• Expert and Professional Stakeholder Interview	• Interview quotes • Qualitative explorations • Chapter 9

5.5 Literature Review and Desktop Study

A literature review, forming Chapters 2 – 4, was undertaken prior to research design, to identify the current knowledge, thinking and theory relating to the topic. A gap in the literature triggered the formulation of a specific research question, explored by the subsequent application of research methods.

A desktop study and field observation study were undertaken to explore the history and resulting existing conditions of a case study area. Yin (2003, 12) identifies the role archival records and other existing documents can play in assisting the triangulation of data relating to the case studied. The desktop study and fieldwork were undertaken concurrently, enabling further investigation of any observations. The desktop study has defined much of the discussion of the subsequent chapters. Specific observational outputs are included as Appendix A.

5.6 Questionnaire Survey

Administering a survey produced a significant set of quantitative and qualitative data to meet Objective 2, and informed the process of achieving Objective 3. A postal survey (with data mostly collected through an online interface) was conducted over July and August 2015.

5.6.1 Surveying Theory

Oppenheim (1992, 43) argues that the accuracy of responses gained from a sample is of greater significance than the numerical size of the sample itself. Sampling is also not truly random, as only those who are able and elect to respond will provide data (Creswell 2003, 160), introducing selection bias. Participation is entirely voluntary and consent is implied when the respondent agrees to the first question of the survey (Berg 2001, 57). Distribution of the survey invitations provided the opportunity to make significant fieldwork observations. An online surveying service, *SurveyMonkey*, was utilised as online surveys tend to attract responses very shortly after the respondent receives the request (Denscombe 2010, 14). Respondents also had the option to complete a survey by phone or by mail to ensure participation was as accessible as possible.

5.6.1.1 Attitudinal Research and Likert Scales

As this research was fundamentally concerned with measuring preferences for different choices, Likert Scales were selected for most attitudinal questions. Likert scales are relatively easy to understand, and enable the rapid answering of questions (Oppenheim 1992). However, data collected through Likert scales is ordinal – a scale of categories. The difference or interval between different categories cannot be assumed (Jamieson 2004, 1217). Therefore, traditional statistical measures such as the mean and standard deviation can not be calculated. Data analysis will therefore be undertaken by comparing the percentage of respondents who identified in categories for different statements.

Open-ended questions were also included to allow for the collection of unique responses, personal observations and comments.

The specific Survey questions, with details for the rationale underlying each question, are included as an Appendix B.

5.6.1.2 Demographics and Preservation of Anonymity

Demographic data was collected to enable comparisons between groups, and comparison of the sample group to census data. Demographic data was self-reported. No identifiable information was collected.

5.6.2 Recruitment and Ethical Considerations

The survey design posed minimal ethical issues, as it was anonymous, the surveying method generally did not involve interpersonal contact, and the questions were not of a provocative nature. Ethics approval (#RDHU-101-15) for the human research component of this research was received in June 2015, and is included as Appendix C. Local newspaper coverage to encourage responses was sought, but did not eventuate.

5.7 Interview Sampling and Ethical Considerations

Interviews with practitioners and regulators working in the planning system were undertaken after public surveys, to gain reflections and explore the meaning of results. Reflection and deliberative analysis of the results with professional planners and stakeholders aims to yield holistic knowledge of the issue, as per the mixed-methods, case-study research approach.

Interview respondents were recruited by purposive sampling (Teddlie and Yu 2007). Respondents are considered one of a broader group to whom they belong, and not necessarily representative of that group. Thus, a small sample size is acceptable as the individual data produced will be closely scrutinised, again within the wider format of the case study approach. Mason (2010) suggested that 10 respondents for qualitative interviews may be a "saturation point," beyond which further interviews may be of limited use. Eight respondents were selected for an interview, of which 5 agreed to participate. Local planners who represented government, intuitional and non-profit organisations were identified for the individual attitudes towards Activity Corridor development. An executive member of a residents' association was approached to represent the interests of an influential and active suburban lobby group.

Interviews were recorded with the permission of participants, producing exact verbatim data (Denscombe 2010, 188). Subjects are not identified by name, and were provided with the opportunity to select the title by which they are described. This was especially the case for respondents whose usual title or occupation would enable easy identification.

Chapter 6: Case Study Profile

This chapter provides context and meaning to the survey and interview results by exploring the form and history of local development of South Street, the case study area.

6.1 Context and Location

South Street is a significant arterial road transecting the southern suburbs of Perth. Designated State Route 13, it extends from South Fremantle, through Murdoch, to Canning Vale, where it becomes Ranford Road. Ranford Road itself eventually leads to Armadale, the near south-east extent of the metropolitan area. Fremantle and Armadale are gazetted Strategic Metropolitan Centres under *State Planning Policy 4.2: Activity Centres for Perth and Peel* (Western Australian Planning Commission 2010) and are therefore targets for further growth. Under the same policy, Murdoch is a "Specialist Centre," reflecting the unique concentration of health and educational land uses of the precinct. South Street itself is designated as a "District Distributor A," (Main Roads Western Australia 2016b), and runs mostly within a reserve under state control under the Metropolitan Region Scheme (Western Australian Planning Commission 2015c). Main Roads Western Australia (MRWA), the statutory body tasked with managing WA's arterial road network, classifies 'District Distributor A' roads for "high capacity traffic movements between industrial, commercial and residential areas," that provide access between multiple other high-capacity roads within the network (Main Roads Western Australia n. d., 1). Typically, they have limited access to adjacent properties, service road entrances to commercial and industrial uses, specific signal-controlled pedestrian crossings, and no on-road parking (Main Roads Western Australia n. d.)

The case study is highly representative of many other major urban roads in Western Australia, and the same policy and governance generally applies. It is also the length of a conceivable radial light rail or bus rapid transit project, with BRT proposed for the route by 2031 (Department of Transport 2011).

The western portion of South Street, between Marine Terrace, Fremantle, and Kwinana Freeway, Murdoch, has been selected as the case study area, owing to current land use patterns, built form diversity, existing public transport accessibility, streetscape design differences, and broad residential catchment. Each of these variables may impact on residents' travel behaviours and development preferences. During survey distribution, 2487 residential properties were identified along the case study area, with 341 of those having an address on South Street. The distribution of all survey flyers is detailed in Appendix D.

Ideally, assuming there is one household currently occupying each property, 333 responses would be needed to attain a confidence level of 95% and a 5% confidence interval (Creative Research Systems 2012). 142 responses would return a confidence level of 95% and a confidence interval of 8% (Creative Research Systems 2012).

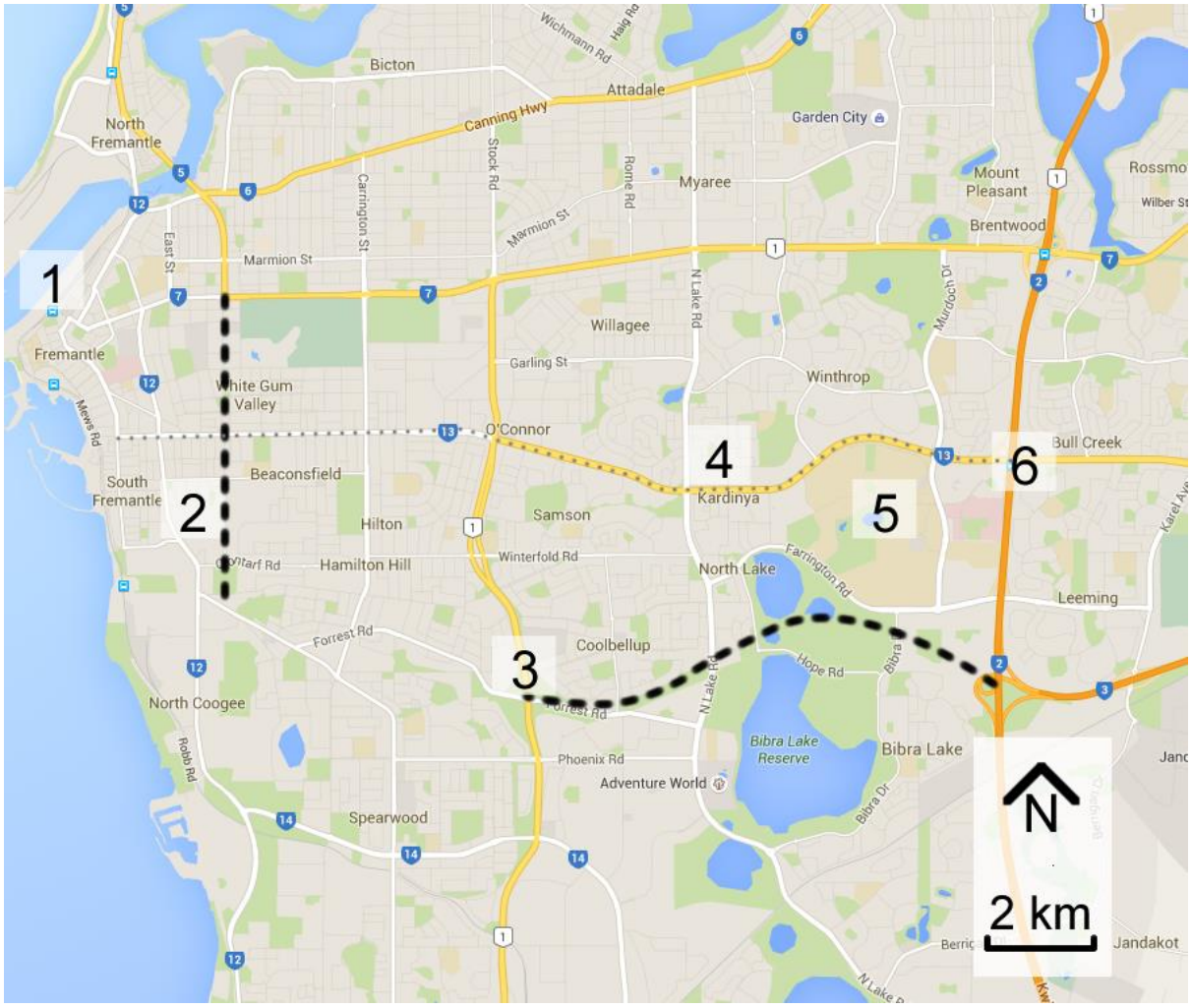


Figure 17: Annotated Map of South Street case study area

Key:

1. Fremantle city and Fremantle Port
2. Former Fremantle Eastern Bypass route
3. Current proposed Roe 8 project route
4. Kardinya Shopping Centre (corner South Street and North Lake Road)
5. Murdoch University
6. Fiona Stanley Hospital and Murdoch Station

The case study route is indicated by the dotted line.

A summary of the findings of this section are compared against transect zones in Table 4.

6.2 History and Form

A 1844 plan for Fremantle, marked out 15 years after colonial British arrival, shows South Street as the southern boundary of the town (State Records Office 2015b), presumably from which the road derives its name. The first suburban subdivisions along the western end of South Street were planned around 1851 (State Records Office 2015a). The fine grain of early, pre-automobile housing development is still evident today, with very narrow side streets (yield streets with kerb-to-kerb widths of 6 m) and modest housing clustered around the first kilometre of the route. This section of South Street is slow, with a posted speed limit of 50 km/h, with on-street parking, and a pedestrian environment enclosed by trees and protected from passing traffic by parked cars on the roadway. Dwellings typically have major openings on the street frontage, allowing occupants of front rooms to easily glance over the street. The South Street kerb-to-kerb width is approximately 12 m wide, with parking on both sides. The distance between front doors of opposite properties along the street is approximately 25 metres. Numerous heritage-listed properties line the street (Heritage Council of Western Australia 2016).

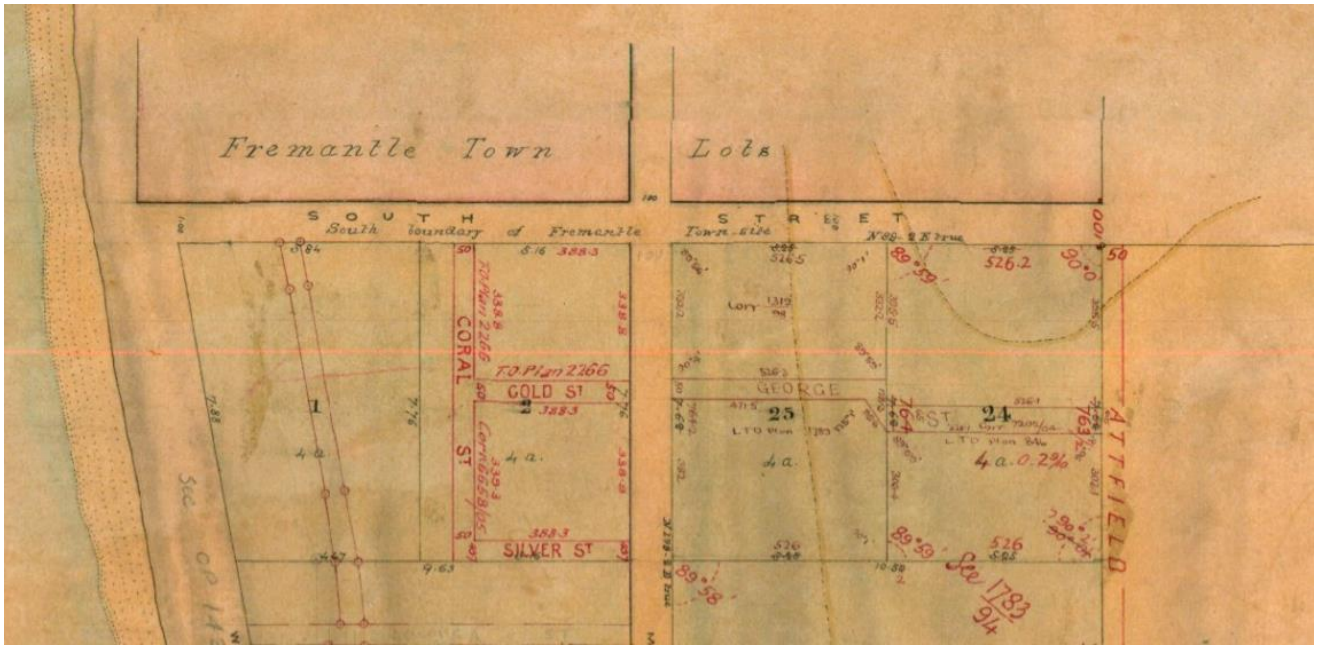


Figure 18: 1851 Map of Subdivisions, South Fremantle. (State Records Office 2015b)

Figure 19: Heritage housing, South Street, Fremantle (McLeod 2016)

During the early twentieth century, tram services ran along South Street. Initially, the line ran to Central Avenue, Beaconsfield, and later to the intersection of South Street and Carrington Street, Hilton (Chalmers 2001, 18; Perth Electrical Tramway Society 2013). Consistent with other early commercial centre development in Perth, there are small street-oriented neighbourhood shopping centres at the former termini of the route. The line was removed in 1948, with the broader Fremantle Municipal Tramways system closing in 1952 (Chalmers 2001, 59).

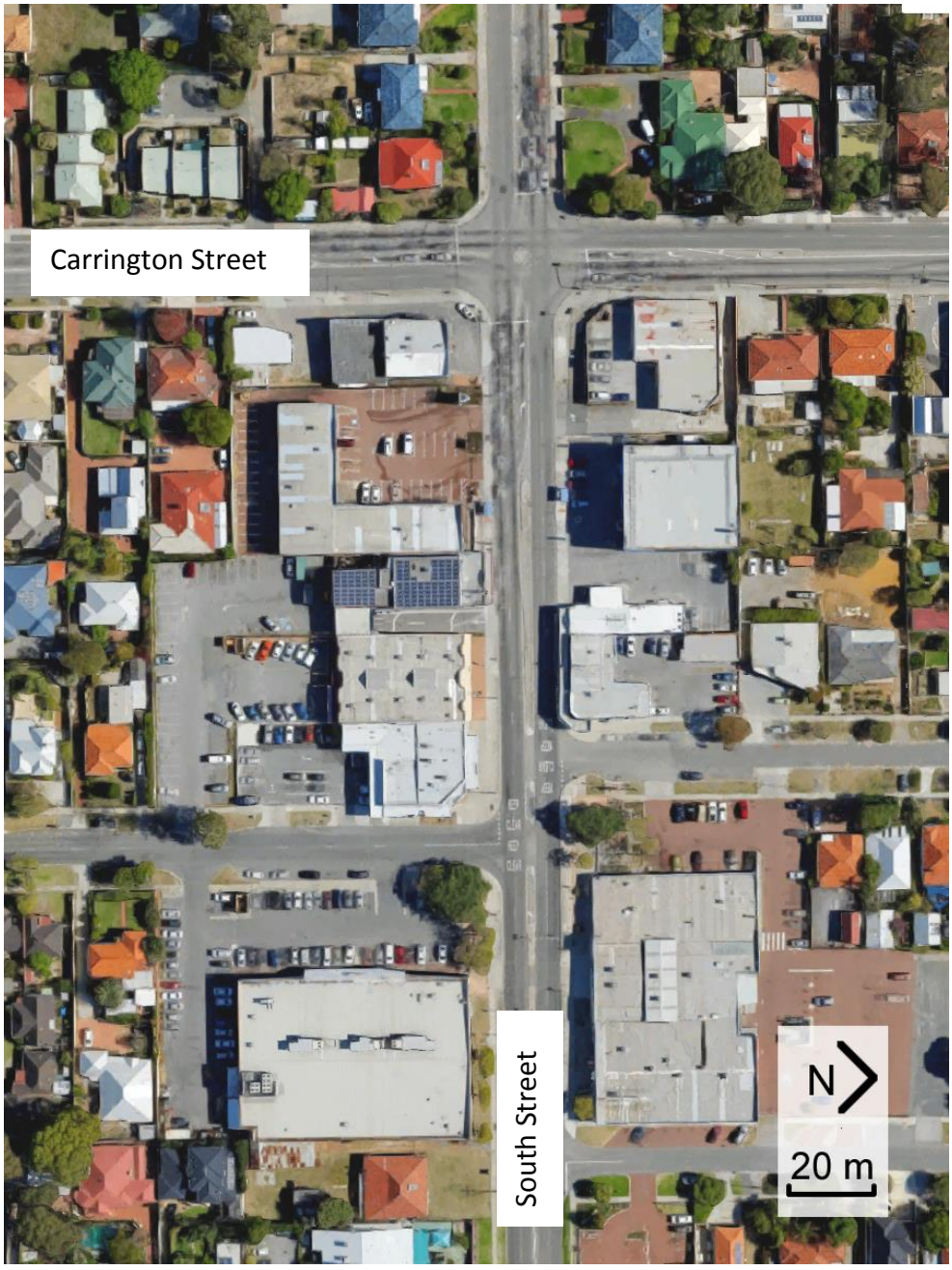


Figure 20: Hilton Local Centre, corner South and Carrington Streets, Hilton. Terminus of former tram route, representative of many similar precincts in Perth. (Google Maps 2016).

East of South Fremantle and Beaconsfield, the post-war suburbia becomes far less dense, with wider verges, and site planning designed for private parking and vehicular access. The kerb-to-kerb width remains about 12m, with approximately 35-45 m between opposing front doors. The Primary Regional Road Reserve for South Street extends into private residential properties, particularly in White Gum Valley, Beaconsfield and Hilton (Western

Australian Planning Commission 2015c). Local newspapers have claimed that Main Roads aspires to widen the carriageway to fulfil this reserve in future (Grant 2015a).

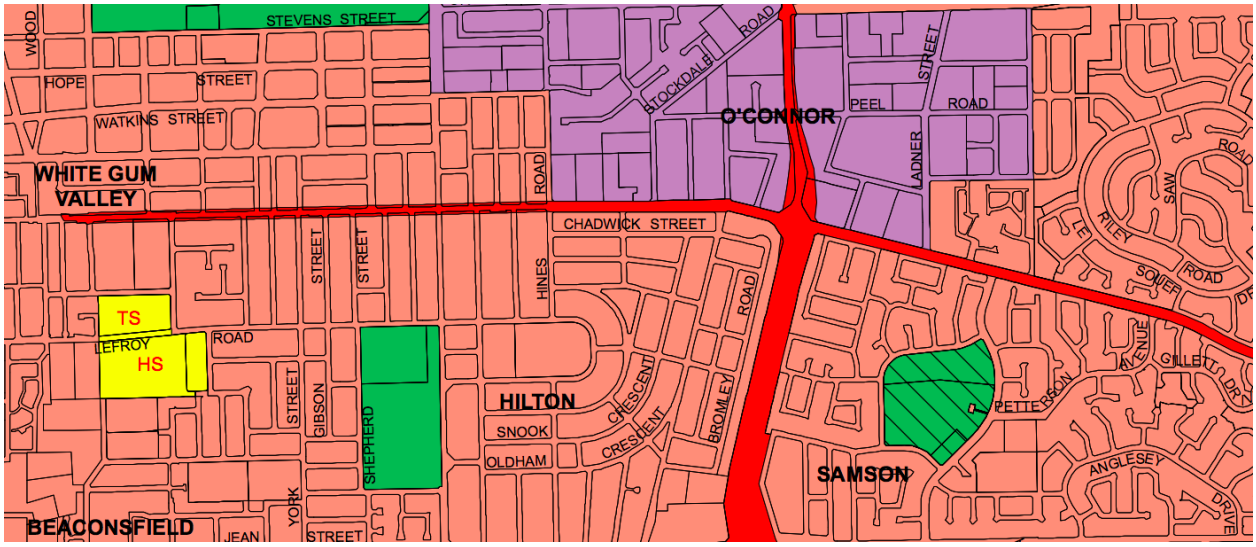


Figure 21: South Street Road Reserve, showing intrusion into properties in White Gum Valley and Hilton. Note Grid to Curvilinear street form transition (Western Australian Planning Commission 2015c).

Main Roads have opposed redevelopment or improvement of residential properties at the eastern end of this road reserve in White Gum Valley, where the reserve does intrude approximately 10m into the front of private properties (City of Fremantle 2015, 12). In a draft scheme amendment seeking to improve urban design and street management along South Street, particularly around the Hilton precinct, the City noted that the Department of Planning declined to meet to discuss a potential multi-agency governance approach (City of Fremantle 2015, 12).

Much later (1970s – 1990s) suburbs east of Stock Road have a road network of hierarchical and curvilinear design, with, generally, no direct lot access to South Street. The road carriageway becomes much wider (30 m), with a 70km/h posted speed, and nature strips on both sides available for future widening. This suburbia is highly representative of the suburban development model based on car-based access with a functional classification hierarchy of streets and arterial roads.

Figure 22: Kardinya and Pine Plantation (depicted in green) Note eastern terminus of South Street and absence of Stock Road. (Universal Business Directories 1964)

The original Metropolitan Region Scheme of 1963 included an orbital freeway around Perth, cutting around the West End of Fremantle adjacent to the freight railway lines (Western Australian Planning Commission 2011). The primary road reserve was later revised to connect future stages of Roe Highway with the southern terminus of Stirling Highway at High Street. This reserve ran through Beaconsfield and White Gum Valley, intersecting South Street near Wood Street. The "Fremantle Eastern Bypass," as it was known, became a contentious political issue, with the Court Liberal State Government planning to construct the route in the 1990s (Lewis 1995; *Metropolitan Region Scheme (Fremantle) Act 1994*).

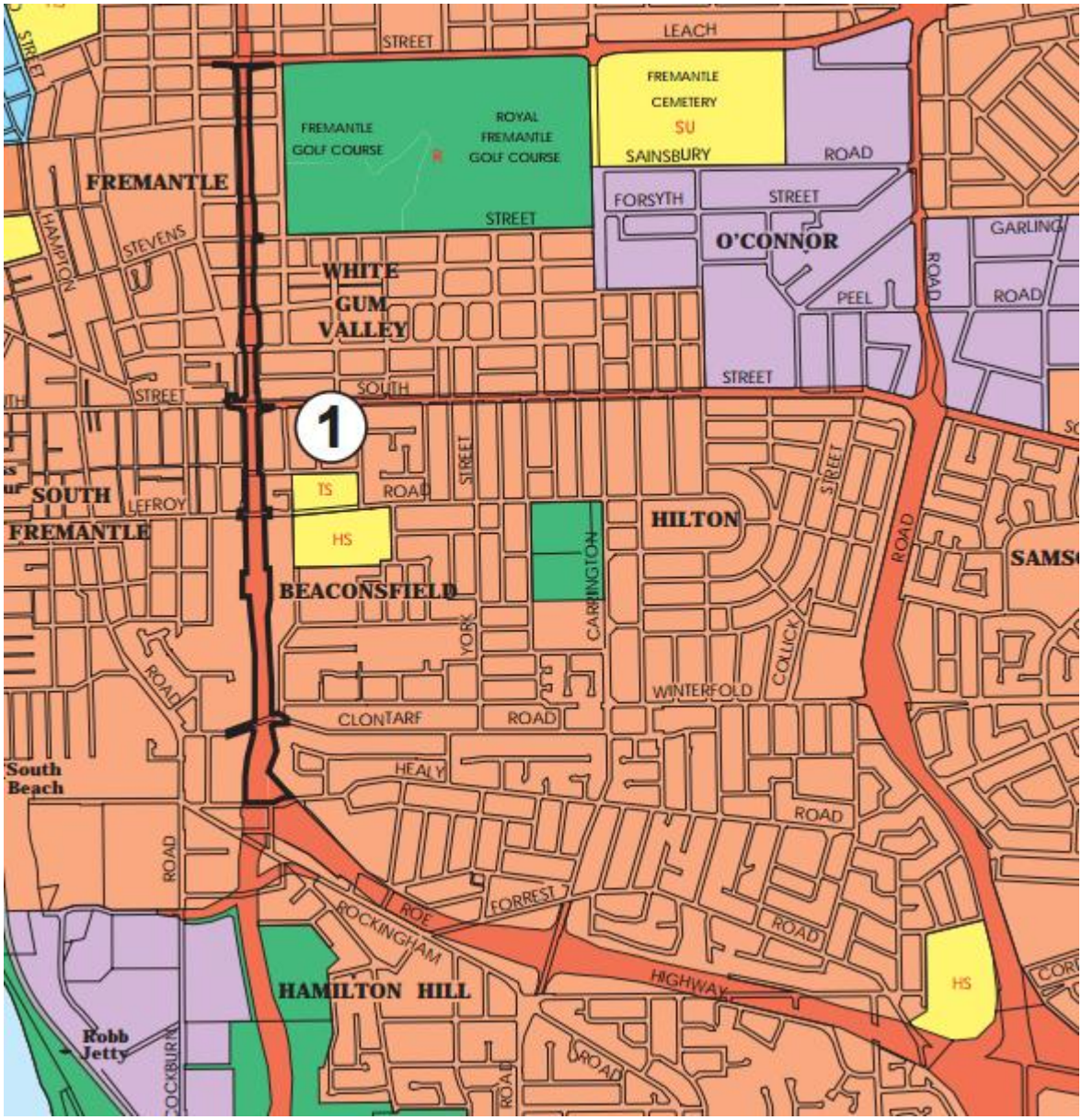


Figure 23: Fremantle Eastern Bypass Reserve, outlined section deleted. (Western Australian Planning Commission 2003a)

The project was divisive, with residents of (predominantly Liberal-voting) Melville and suburbs surrounding Leach Highway supporting the project, and the progressive Fremantle suburbs through which the road would cut vehemently opposing it (Parliament of Western Australia 2002, 1638; Western Australian Planning Commission 2003b). Subsequent to the 2001 state election, the new Gallop Labour Government consulted with the WAPC about the reserve, which it decided to delete, based on rail freight planning, and eventual southward relocation of the port (Western Australian Planning Commission 2003a). The

commission then alienated much of the vacant crown land for private residential development.

South Street was connected to Kwinana Freeway with the completion of the Mount Henry Bridge and associated freeway section in 1982 (Main Roads Western Australia 2013). The Perth-to-Mandurah Railway line, planned by the Gallop Labour Government, runs down the Kwinana Freeway Median. Opened in December 2007 (Public Transport Authority 2015), the line has a station at South Street, *Murdoch Station*, which has dramatically restructured public transport patronage of residents living in suburbs along South Street (Scheurer and Curtis 2008), and commercial property investment along the corridor (Curtis and Mellor 2011). Murdoch station is currently the busiest suburban station on Perth's train network, with 59% of interchange passengers arriving on feeder buses (Mees and Dodson 2011, 17). Since 1999, South Street has been serviced by the 'Circle Route' (Government of Western Australia 1999), a relatively high-frequency (every 15 minutes during daytime hours) orbital bus route circumnavigating Perth's middle suburbs.

Figure 24: Government Advertising Signage at future "South Street" Train Station, now Murdoch Station. (Stevenson 2005)

6.2.1 Roe 8, Roe 9 and The Perth Freight Link

The recent revival of the orbital freeway connection between Roe Highway and Fremantle Port, in the form of the Perth Freight Link, was announced in the May 2014 Abbott Government Federal Budget (Main Roads Western Australia 2016a). This project has reignited significant debate within the community. If constructed, the Perth Freight Link may intersect South Street at Stock Road, or tunnel under Hilton and White Gum Valley between Stock Road and Fremantle Port (Grant 2015b; Main Roads Western Australia 2016a).

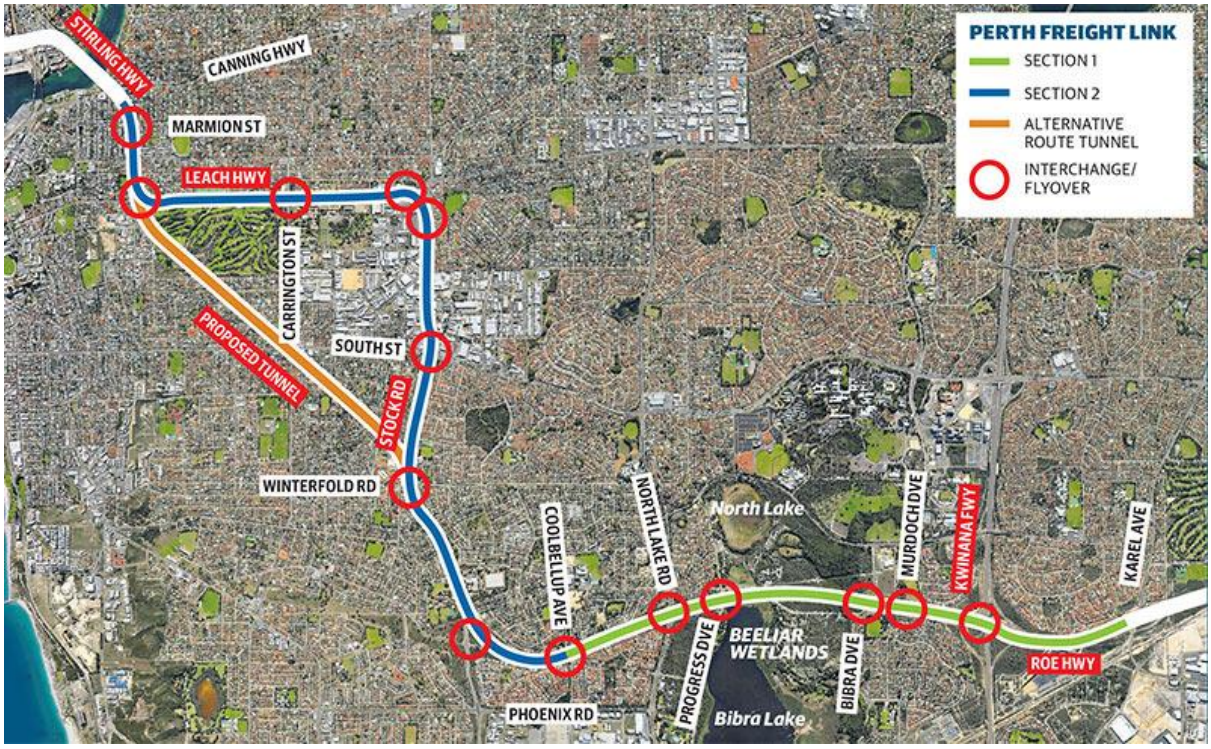


Figure 25: Perth Freight Link Proposals (Wright 2015)

A number of community and lobby groups have mobilised to oppose the project (Australian Institute of Landscape Architects (WA Chapter) 2015; Rethink the Link 2016), with many properties along the route displaying "Rethink the Link" campaign signage (Figure 26). The City of Fremantle also opposes the project (City of Fremantle 2014, 50). Once again, the proposal divides across major party lines, with the Federal and State Liberal governments undertaking the project, with opposition mounting from the Labor Party and The Greens (O'Connor 2015). The project has also been criticised as being at odds with the long term state planning policy of relocating Perth's main port southward to Kwinana (Newman and Hendrigan 2015; Western Australian Planning Commission 2015b, 35).

Public surveying for this dissertation was undertaken three months prior to the Supreme Court's December 2015 judgement that the environmental approvals for the Roe 8 project were invalid, and that the Environmental Protection Authority must comply with internal policy when conducting environmental assessments (Supreme Court of Western Australia 2015). Interviews were held subsequently, in February and March 2016.

Figure 26: "Rethink the Link" campaign signage, South Street, Fremantle (McLeod 2016)

In December 2015, Main Roads commenced upgrades to the intersection of South Street and North Lake road, next to Kardinya Shopping Centre. This project involves minor carriageway widening, lengthening of turning lanes, and installation of additional signalised pedestrian crossings (Main Roads Western Australia 2016c).

6.3 Land Use Survey

Today, the land along South Street itself exhibits a broad range of land uses, including Murdoch University (the largest campus, by area, in Australia) and Fiona Stanley, a major tertiary hospital. Residential built form remains generally low-rise, with the walkable catchment of South Street remaining largely devoid of any tall residential buildings. Field

observations reveal Fiona Stanley Hospital and Murdoch University as being the only properties with structures taller than 3 storeys along the route. The residential density of suburbs along the case study area, at the 2011 census, were:

Table 2: Land Use Density along the Case Study Area

Suburb	**Area (sq Kms)**	**Total Dwellings**	**Dwelling Density (Dwellings per sq km)**	**Persons in Occupied Dwellings**	**Persons Per Occupied Dwelling**	**Population Density (People per sq Km)**
Fremantle	5.5	4 008	728	6 626	1.92	1 204
South Fremantle	1.5	1 408	938	2 723	2.18	1 815
Beaconsfield	2.7	2 095	775	4 356	2.31	1 613
White Gum Valley	1.2	1 257	1047	2 551	2.27	2 125
Hilton	1.7	1 574	925	3 254	2.31	1 914
Samson	1.1	767	697	1 857	2.56	1 688
O'Connor	1.9	157	82	308	2.09	162[a]
Kardinya	4.4	3 442	782	8 406	2.62	1 910
Murdoch	4.3	1 225	284	3 097	2.70	720[b]
Bateman	2.0	1 315	657	3 518	2.82	1 759
					Average density (excluding outliers)[c]:	**1753.5**

Source: (Australian Bureau of Statistics 2015)

[a] Statistical area contains the O'Connor Industrial Area.

[b] Statistical Area contains Murdoch University, which includes extensive veterinary fields and bushland.

[c] Excludes Murdoch and O'Connor as outlies (statistical area not representative of suburban bounds).

Parkland, reserves, non-residential and vacant land are included in census land area totals, making comparison of individual suburbs difficult. However, it is intriguing that the newer, curvilinear suburbs have generally more occupants per household, and thus comparable

population density, despite the more spacious suburban dwellings and urban form. The sample of suburbs may not be representative of other suburbia, however, as dwellings proximate to Murdoch University may be more likely to contain more shared accommodation. 62% of households in Murdoch are non-family households, compared to 31% in Kardinya (Australian Bureau of Statistics 2015a).

6.3.1 Employment Distribution

At 2007 (the most recent year for which figures are available), the majority of employment in the case study area is in Fremantle, a traditional city centre, and Kardinya, where there is a suburban-style shopping centre. The O'Connor light industrial area is located along South Street resulting in a degree of truck traffic, especially around Stock Road, though employment density is low.

Table 3: 2007 Land Use and Employment Survey Data for Suburbs along the Case Study Route

Locality	Floorspace (m^2)	Full time employees	Part time employees	Full time offsite	Part time offsite	Job Density (total jobs per 1000 m^2 of floorspace)
Fremantle	655 789	7 034	6 323	292	264	21.21
O'Connor	471 174	3 354	959	166	140	9.80
Kardinya	50 193	575	698	16	2	25.72
Murdoch	125 599	519	107	15	3	5.12
Totals	1 302 755	11 482	8 087	489	409	(Aggregated): 15.71

Source: (Department of Planning 2015). *Note: This survey was conducted prior to the completion of both the Mandurah Railway line, and Fiona Stanley Hospital.*

While this data does not reflect telecommuters or people running businesses from home, it is consistent with literature about population-driven dispersion of employment (Watkins 2014, 1050). Watkins (2014) suggests that professional, administrative and creative industries tend to centralise to the inner-city, while industrial, construction, education, health, retail trade and community services have diffused into middle and outer suburbia. This is consistent with South Street, where some employment remains in central Fremantle,

with the remainder largely concentrated around hospital and university campuses, shopping centres, and industrial areas.

Figure 27: Aerial photo of O'Connor. (Jones 2015). South Street runs from left edge to central upper edge of frame.

6.4 Parallel Past Research Findings

As part of the *Dialogue with the City* project (which involved employing communicative planning methods to inform strategic metropolitan master planning in Perth in the early 2000s (Curtis 2006; Hartz-Karp 2005; Maginn 2007)), a survey of 8000 households (of which there were 1711 responces) was undertaken to identify broad community views around key planning issues (Department of Planning and Infrastructure 2003). 74% of respondents preferred improving public transport over building roads, 66% of respondents favoured concentrating redevelopment over fringe development, and 90% of those surveyed had preference for building polycentric activity areas in addition to the central city district (Department of Planning and Infrastructure 2003, 34). A key conclusion of the report was that public preference was to maintain and improve the efficiency of existing roads rather

than constructing new ones, and a strong preference towards reducing car reliance (Department of Planning and Infrastructure 2003, 9). Interestingly, the corridor urban morphology, with activity centred along transit routes proved popular, with strong support among respondents (Department of Planning and Infrastructure 2003, 49).

6.5 Transect Urban Form Typologies

Over the course of the field observations and desktop study, three arterial road urban environments have been identified along the South Street Transect. From West (oldest) to East (most recent):

1.
2.

Figure 29: South Street Transect Areas

Source: Google Maps 2016.

Key:

3. Early inner-urban
4. Grid-based middle suburbs
5. Curvilinear automobile suburbia

Table 4: Arterial Road Transect Environments identified by Desktop Study and Field Observations

Transect Zone	Era	Example suburbs along transect study area	Urban Form Observations			Typical Residential and Job Density	Road Engineering Characteristics			
			Architectural form (Private Realm)	South Street Widths:	Non-Residential Land Uses		Street Form Observations (Public realm)	Functional classif.	Posted Speed Limit	Arterial Road Access
Early Inner-Urban	Pre 1930s	Fremantle, South Fremantle	Fine-grained. Attached dwellings. Heritage, federation properties. Some small properties lack private parking. Small front yards and porches effectively define public-private realm interface. Rectangular lots.	**Kerb-to-kerb:** 12m **Front door to front door:** 25m **Road reserve:** 20m **Typical public verge (inc. footpath):** 3 - 4 m	Very small local shops, service station, corner-building offices. Minimal on-lot parking. Heritage industrial buildings exhibit adaptive residential re-use.	**Zoned:** R30 – R35 City of Fremantle **Actual dwelling density (census):** ~800 dw. per km^2 **Actual population density (census):** 1200 – 1800 people per km^2 **Jobs (LUES Survey):** ~20 jobs per 1000 m^2	Varied rectangular street geometry, short kerb radii. Some laneways and shared spaces. No bike lanes, cyclists negotiate around parked cars and in traffic lane On-street parking ubiquitous. Footpaths on all sides of all streets.	Local road (2 lanes)	50 km/h	Universal

Transect Zone	Era	Example suburbs along transect study area	Urban Form Observations			Typical Residential and Job Density	Road Engineering Characteristics			
			Architectural form (Private Realm)	South Street Widths:	Non-Residential Land Uses		Street Form Observations (Public realm)	Functional classif.	Posted Speed Limit	Arterial Road Access
Grid-Based Middle Suburbs	1930s to 1960s	Beaconsfield, White Gum Valley, Hilton	Mostly spacious, single detached dwellings, some battle-axe succession. Some post-war flats. Denser near former tram stops/shops. Every property has on-lot parking and/or plentiful verge space. Consistently defined front boundaries. Large front yards occasionally dilute street relationship. Rectangular lots.	**Kerb-to-kerb:** 12 m **Front door to front door:** 35 – 45m **Road reserve:** 25 – 30 m **Typical public verge (inc. footpath):** 6 m	Small local shopping centres surrounding roadway. Modest parking lots. Post-war industrial area set well back from carriageway, but frontages address the street.	**Zoned:** R20 – R25 City of Fremantle **Actual dwelling density (census):** 700 – 900 dw. per km^2 **Actual population density (census):** 1600 – 2100 people per km^2 **Jobs (LUES Survey):** No large empl. centres. No data.	Longer rectangular superblocks. Moderate curb radii. Dedicated cycle lane either side of South Street Consistent footpaths. Bus stops well connected with footpath networks. Minority on-street parking; either informal verge parking or driveway/garage.	District Distributor A (2 – 4 lanes)	60 km/h – 70km/h	Near universal

Transect Zone	Era	Example suburbs along transect study area	Urban Form Observations			Typical Residential and Job Density	Road Engineering Characteristics			
			Architectural form (Private Realm)	South Street Widths:	Non-Residential Land Uses		Street Form Observations (Public realm)	Functional classif.	Posted Speed Limit	Arterial Road Access
Curvilinear Automotive Suburbs	1970s to 2000s	Samson, Kardinya, Murdoch, Winthrop, Bateman	Large single dwelling housing. Some "McMansion" style very large 2-storey suburban homes Garages integrated into almost every dwelling. Frequent lack of private-public space distinction. Highly variable street relationships, depending on site design. Curvilinear geometry creates strange lot shapes.	**Kerb-to-kerb:** Dual carriage, 30 m each, 5m central median) **Front door to front door:** No residential properties directly fronting/ opposite each other. **Road reserve:** 40 m **Typical public verge (inc. footpath):** 6m + local access roads and surplus road reserve land	Large shopping centres with expansive car parks. "Campus" style employment centres – Murdoch Universities and hospitals, disparate from South Street.	**Zoned:** R20 – R25 City of Melville **Actual dwelling density (census):** 500 – 700 dw. per km^2 **Actual population density (census):** 1000 – 1900 people per km^2 **Jobs (LUES Survey):** 5-25 jobs per 1000 m^2	Curvilinear cul-de-sec landscapes. Large, wide, sweeping streets with massive curb radii. Engineered to very very high standards. Segregated bicycle paths of varying quality, extremely dangerous to cycle on road Pedestrian underpasses. Little on-street parking. Lack of footpaths, even for obviously well trafficked routes near bus stops and Murdoch University. Disability access would be very poor - see Kitchin (1998) Parking controls around Murdoch. Otherwise plentiful parking everywhere.	District Distributor A (6 lanes)	70 km/h	Limited direct access to properties, suburb "entrances" intersecting with South Street

Detailed urban design observations and photographs for each typology are detailed in Appendix A. Satellite photographs of each transect zone at the same scale follow.

6.5.1 Early Inner-Urban Transect Typology

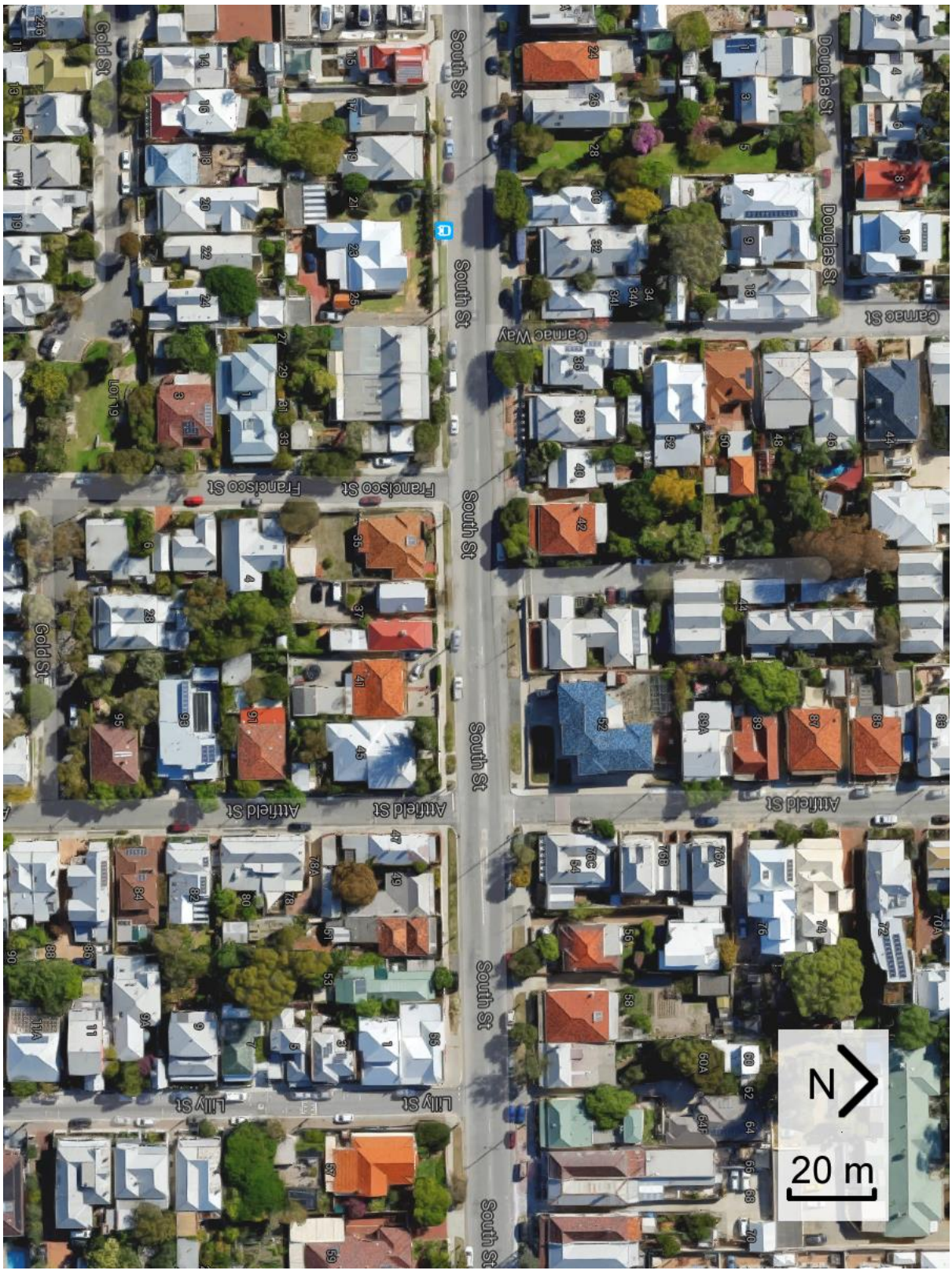


Figure 30: South Street between South Terrace and Hampton Road, South Fremantle.(Google Maps 2016)

6.5.2 Grid Based Middle Suburbia

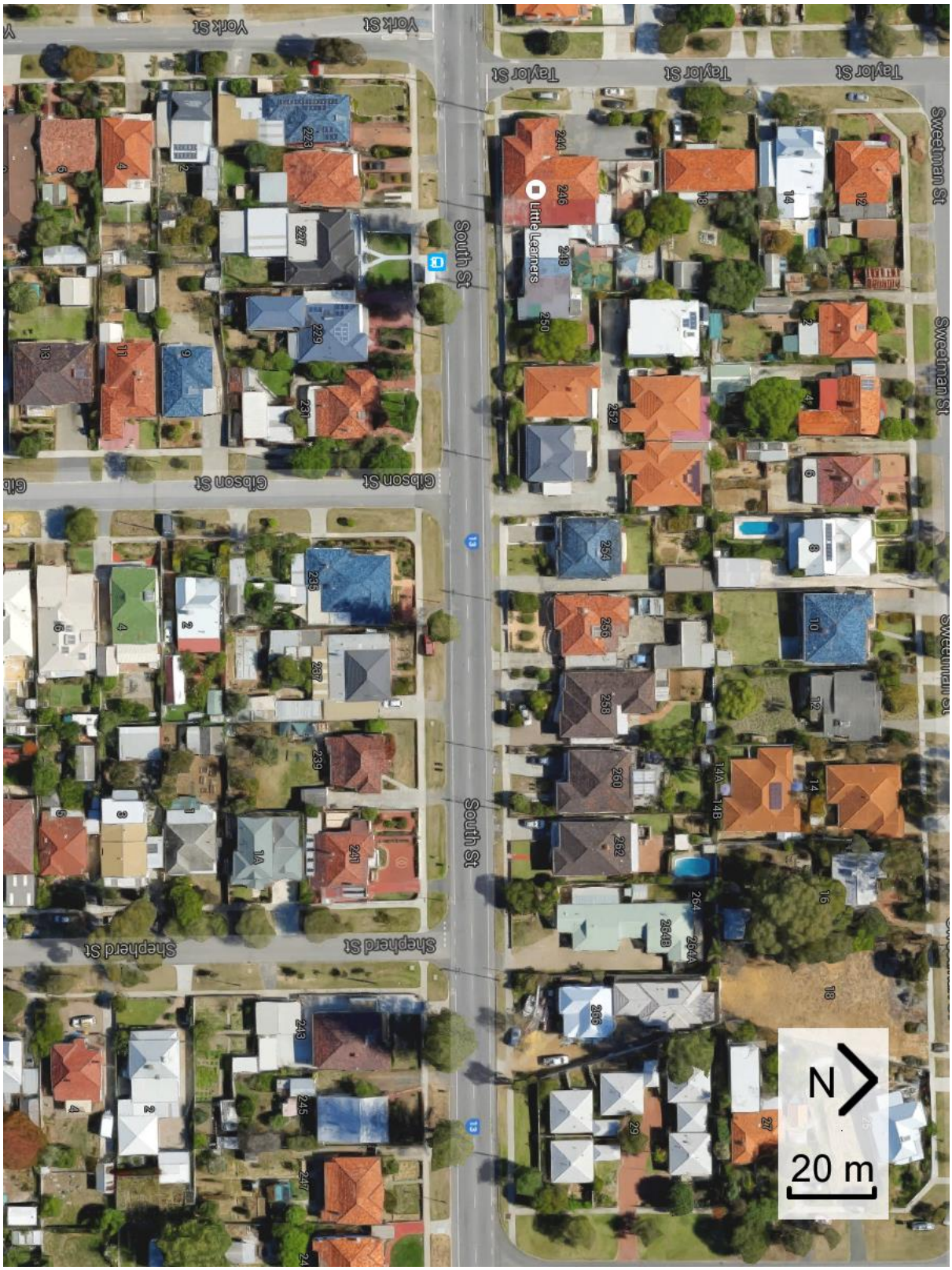


Figure 31: South Street near Carrington Street, White Gum Valley and Beaconsfield.(Google Maps 2016)

6.5.3 Curvilinear Automobile Suburbia

Figure 32: South Street near North Lake Road, Kardinya. (Google Maps 2016)

Chapter 7: Survey Results and Findings

Overall, 145 survey responses were collected. Of the 140, 136 responses were collected online. Three responses were received by post, as the survey flyer included an option to request a paper survey pack, delivered and retrieved via Australia Post. This option was included to ensure respondents who lacked internet access or ability were not entirely excluded. One survey was conducted by telephone by the request of the respondent. Five incomplete responses were received, which were discarded. Hence, 140 responses have been considered for data analysis. The specific survey questions, with notes for the rationale behind selected questions, is included as Appendix B.

7.1 Sampling and Recruitment Results

Recruitment took the form of a formal letter, on university letterhead, inviting residents to complete the survey online, or request a paper survey pack. A graphical flyer with the same details was on the reverse. 2,487 letters were hand-delivered through August 2015. With 140 results returned, the overall response rate for all properties selected was 5.62%. At a confidence interval of 95%, at a percentage of 50%, the Confidence Interval (margin of error) is 8.05% (Creative Research Systems 2012). This degree of accuracy is acceptable, as this is only an indicative survey, forming only part of the mixed-methods research process. The population of the sample size is also technically unknown, as properties – not individuals – were counted. Responses were sought from individuals, collecting individual attitude data, with some questions asking them to provide demographic data for their household.

Properties situated directly along South Street were all included, of which there were only 341 properties identified. Properties along intersecting roads or immediately adjacent to South Street were manually selected by estimating pedestrian access to South Street (walking for approximately 2 minutes down one side of the street), whilst on-site delivering letters. 2,146 such properties were identified. Properties that had a residential building that was evidently vacant were still selected, though vacant land was not. Mailboxes at Murdoch University Student Village and the St Ives Retirement Village were inaccessible, so no letters

could be delivered. This is regrettable, as students and retirees are likely to have some exposure to public transport, and represent unique perspectives within the community. A full itinerary of letters distributed by street is included in Appendix B.

Table 5: Responses from each Suburb along the Case Study Area

Suburb	**Number of Properties**	**Number of Responses**	**Response Rate**
Fremantle	296	13	4.39%
South Fremantle	138	13	9.42%
Beaconsfield	425	27	6.35%
White Gum Valley	254	21	8.27%
Hilton	159	10	6.29%
Samson	97	5	5.15%
O'Connor	98	2	2.04%
Kardinya	739	29	3.92%
Murdoch	166	4	2.41%
Bateman	115	12	10.43%
Others/prefer not to say/skipped	-	6	-
Total	2487	140	5.62%

Regrettably, the address for the online survey inadvertently featured capitalisation in the form of "surveymonkey.com/s/**S**outh**S**treet". Several respondents contacted the researcher to report difficulties accessing the online survey at the URL provided. Unfortunately, the issue was realised after the distribution of flyers. This may partially account for the low response rate. The response rate achieved by this research method should not be regarded as typical or indicative for this reason.

7.2 Data Bias and Limitations

The data has an inherent self-selection bias, as only those who actively respond are considered (Hudson et al. 2004). However, if it is assumed that residents who would be vocal and active in the planning process are more likely to assert their views at a survey opportunity, and those who are apathetic about the built environment will ignore a survey, the selection bias in this instance may be of limited significance.

Owners of properties who do not reside at the address could not feasibly be surveyed, although they could potentially be highly influential stakeholders in the local planning process. This “noncoverage error” (Dillman 1991) could be addressed in a more broad survey in future research. Moreover, it is important to consider that survey questions are about abstract ideas, and responses may not necessarily reflect how residents may react to specific development proposals within their locality.

7.2.1 Demographic Representativeness

Survey respondents were generally older than the combined population of all the suburbs abutting the case study area. Juvenile age groups were not targeted, and are not represented in the data.

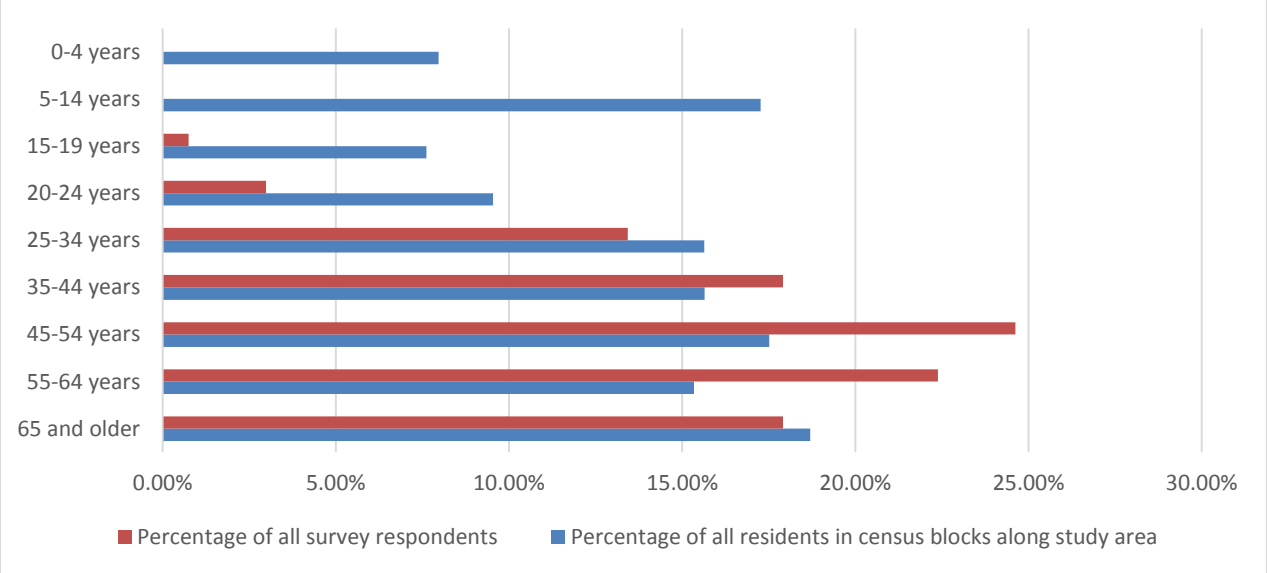


Figure 33: Study Area Population and Respondent Age Groups

While only 48.87% of the population in the study area are male, they were over-represented in the survey results, at 59.5%.

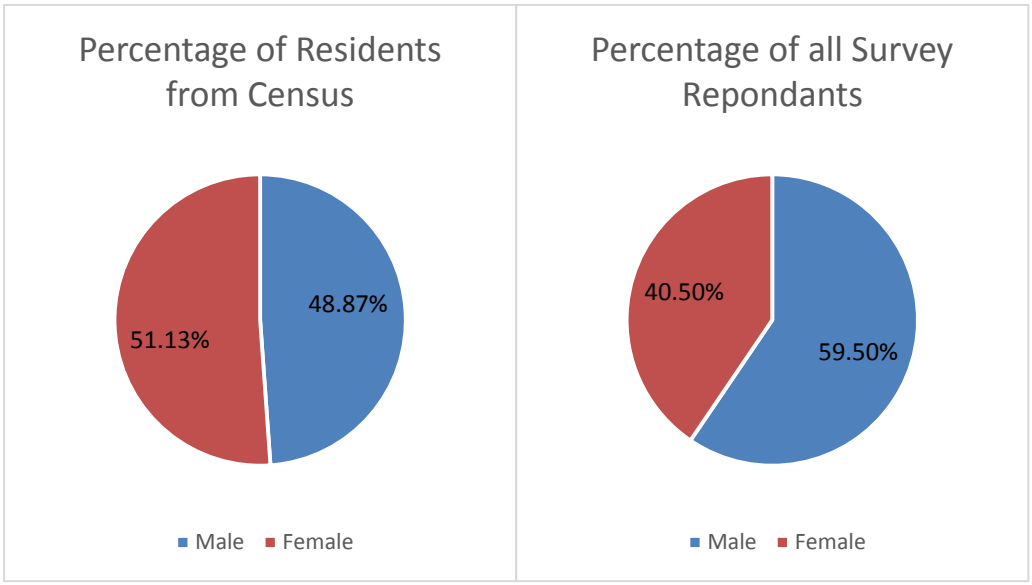


Figure 34: Study Area Population and Respondent Gender Ratios

Household income brackets stated by survey respondents were generally higher than that stated in the 2011 Census for the suburbs along the case study route. Whether this is attributable to more educated, higher income people being more interested in a research survey, or people over-stating their income, is indeterminable.

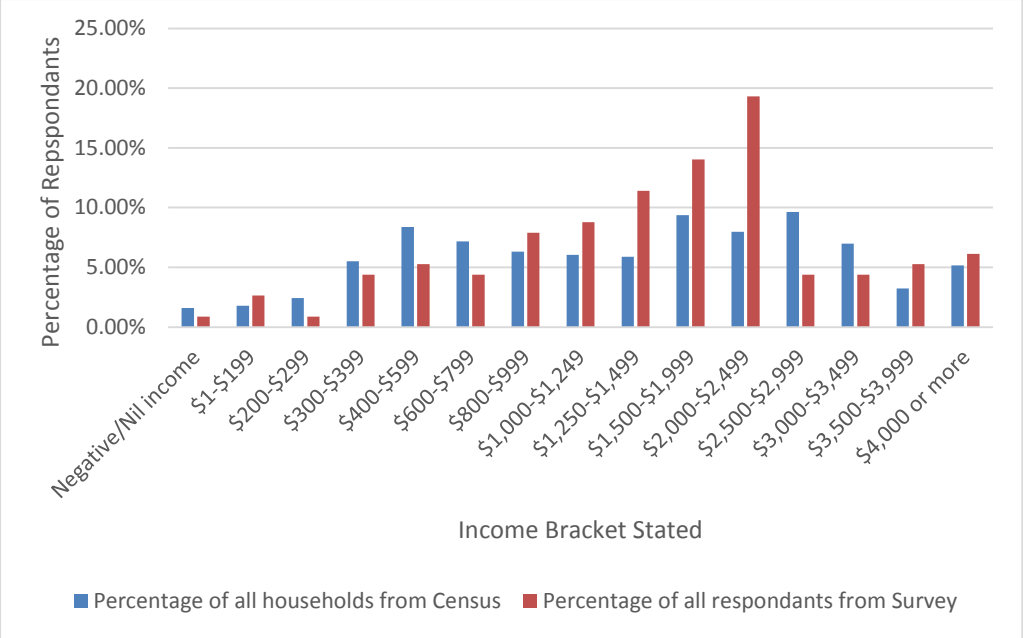


Figure 35: Study Area Population and Respondent Income Bracket Groups

As this research is based on a case study methodology, the findings may not necessarily extrapolated to society more broadly, though a deep understanding of a case through a mixed-methods approach can contribute to broader knowledge (Yin 2003). The limitations of this data need to be considered, with meaning and conclusions made considered with reference to other research findings. The overrepresentation of men, higher income earners and people of an older age should be contemplated, but does not preclude the analysis of data though a mixed-methods case study approach.

7.3 General Findings – Entire Survey Group

This chapter describes findings made for the entire survey group. Findings between different demographic groups, and identification of relationships will be discussed in Chapter 8.

7.3.1 Built Form

The share of dwelling type stated by respondents was very similar to the metropolitan average. Eighty percent (80%) of responses were from separate houses, which reflects the built form evident along the case study route.

Table 6: Survey Results – Q.2 - Which of the following best describes the home you live in?

Answer Options	**Response Count**	**Response Percent**	**Greater Perth Dwelling Type Percentage - 2011 Census (ABS 2015)***
Separate house	112	80.0%	78.61%
Semi-detached, row or terrace house, townhouse, etc	15	10.7%	11.88%
Flat, unit or apartment	13	9.3%	9.05%
Other	0	0.0%	0.0041%
answered question:	140		
skipped question:	0		

*Percentage share of all *occupied* dwellings on census night

7.3.2 Current and Potential Travel Habits

On the day of the 2011 Census, 48,098 people in Perth - or 5.60% of all employed people over 15 years of age - caught a bus at some point of their journey to work (ABS 2015). Although the survey question was structured differently to the census, 20.7% of respondents in the South Street survey reported “usually” travelling on the bus to their usual occupation or activity. The public transport access available to residents along South Street is above average for suburban Perth (Curtis and Scheurer 2016), owing to the high frequency *CircleRoute* bus service, the Murdoch and Fremantle train connections, and the proximity to the Perth CBD.

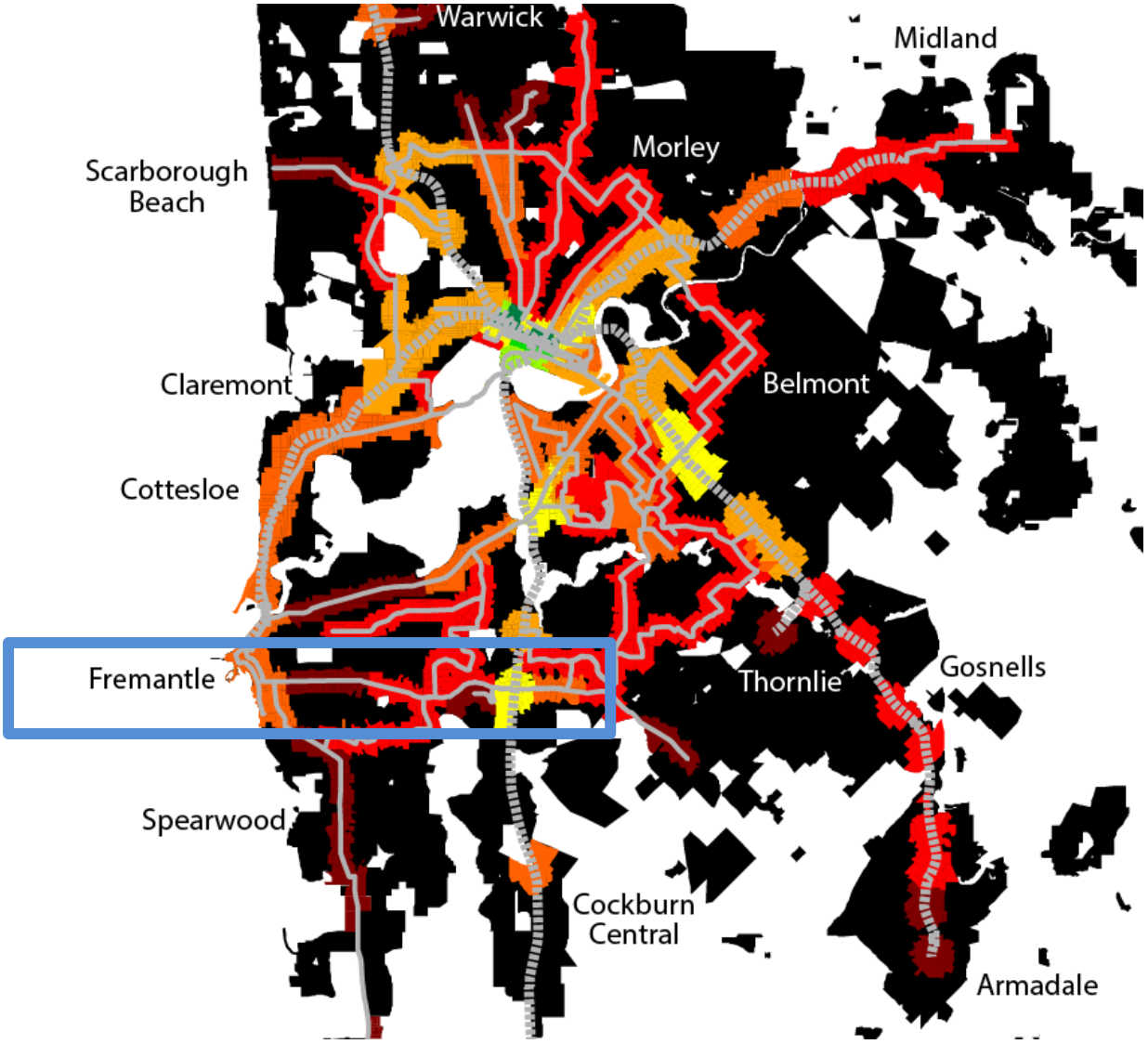


Figure 36: Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) Perth 2011 Map. (Curtis and Scheurer 2016).Case study route shown in blue frame.

Regular participation in cycling was also overrepresented among the survey cohort at 10.7% of respondents cycling to work or place of activity, well above the 1-2% typically reported in Perth (Loader 2014). Differences in the question wording compared to that in the census (the survey for this research inclusion of non-employment related trips) is likely to account for much of this increased reported mode share. When asked about their use of South Street, 89.9% of respondents reported living around South Street, 12.1% of respondents worked along it, 38.8% reported shopping nearby, and 12.2% percent used other services along it. 42.4% of respondents caught public transport along it. Among public transport trips, Perth city was the predominant reported destination (Figure 37).

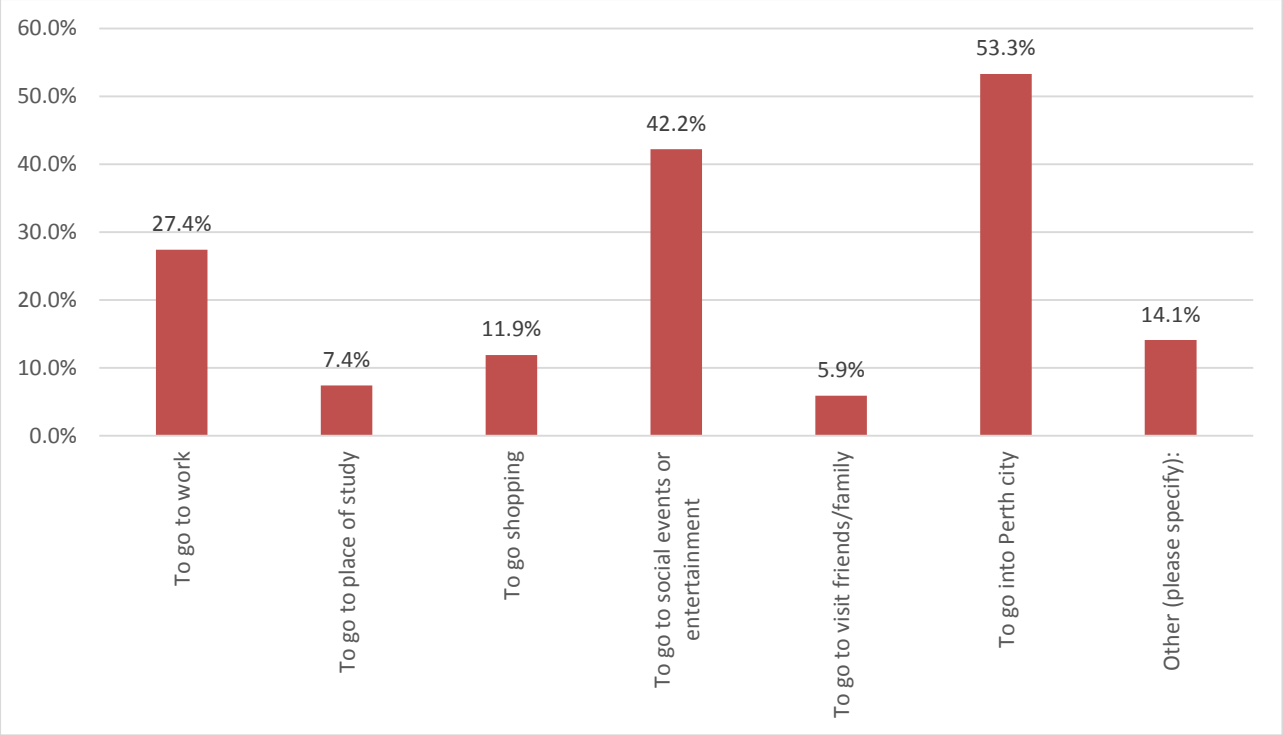


Figure 37: Survey Responses – Q.4 - "What do you mostly use public transport for?" (Select all/any)

7.3.3 Oil Price Fluctuation Responses

Respondents were asked to consider a scenario in which petrol suddenly increased in price from around $1.40 to $5 per litre. The purpose of this question was to encourage future-oriented thought to frame thinking about planning issues (Baum 1999), and identify the potential usage increased for each non-car travel mode or alternative.

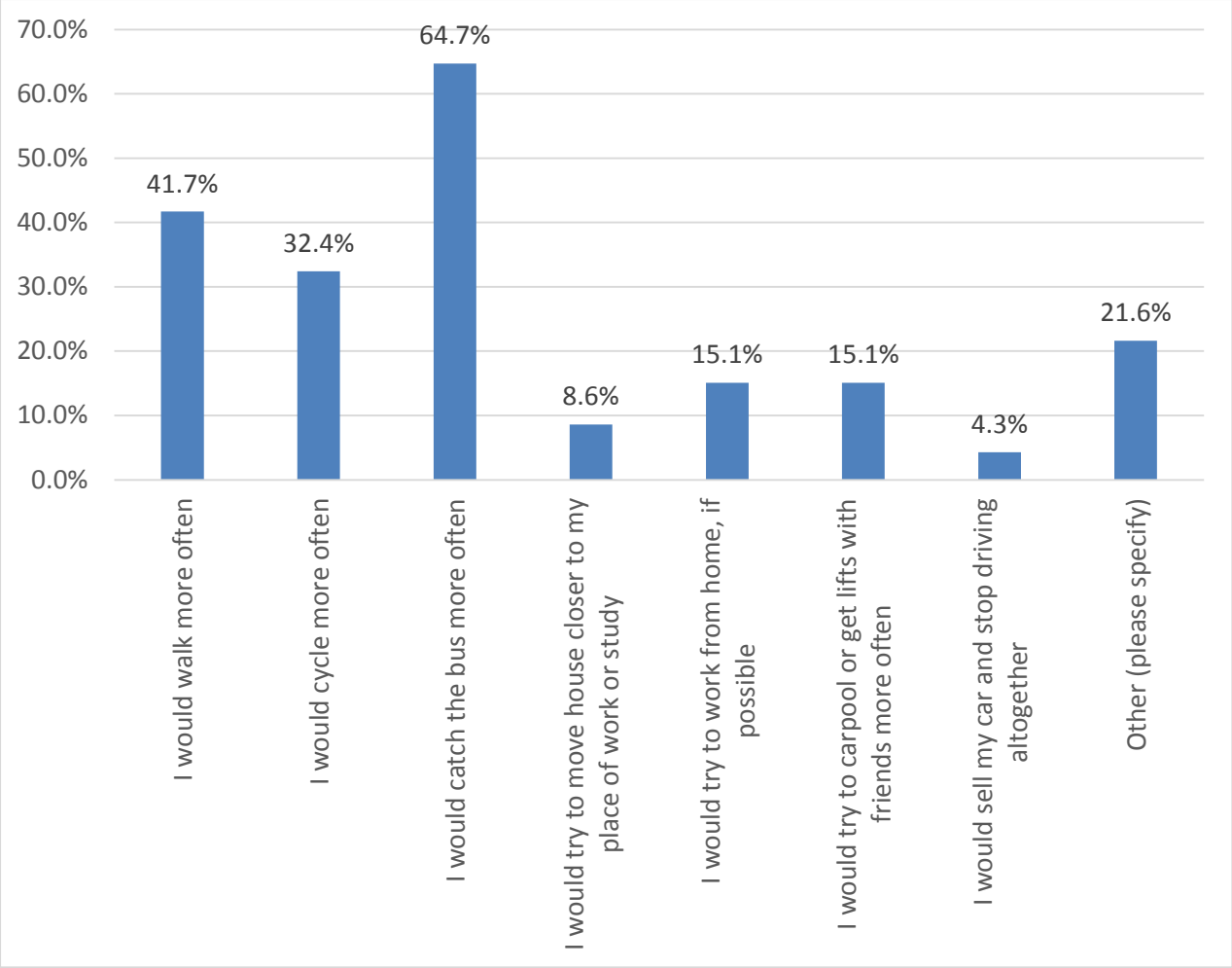


Figure 38: Survey Responses – Q.8 - "If petrol were to become $5 per litre tomorrow, which of the following would you be likely to do?" (Select all/any)

The results displayed in Figure 38 suggest that buses may accommodate about twice as much additional mode share than cycling, and 1.5 times that of walking. Among the "other" responses, most were indicating a preference to continue driving, or that specific occasional travel needs could not be met by any other mode. Given the dispersed nature of Perth, it is unsurprising that motorised travel is still preferred, given the potential that desired trips would exceed the typical range of active travel modes. One inference of this data is that the public would make walking and cycling trips for local shopping, and use buses for longer commuter trips. Interestingly, most of the "Other (please specify)" responses related to continual (albeit reduced) use of the car irrespective of the increased cost:

> "I only use my car out of absolute necessity so I would continue to drive; e.g. to visit family"
>
> - Respondent #58

These inflexible driving trips may be least cost sensitive, and potentially filled by on-demand transport, such as *Uber* or taxicabs. All responses are included in Appendix E, Question 8.

7.3.4 Broad Political Outlook

Respondents were asked to evaluate the following issues to provide context for travel and development preferences. Interestingly, the problem of global warming was, by far, the most strongly affirmed statement of the entire survey. This is consistent with recent national polling (Oliver 2015, 13).

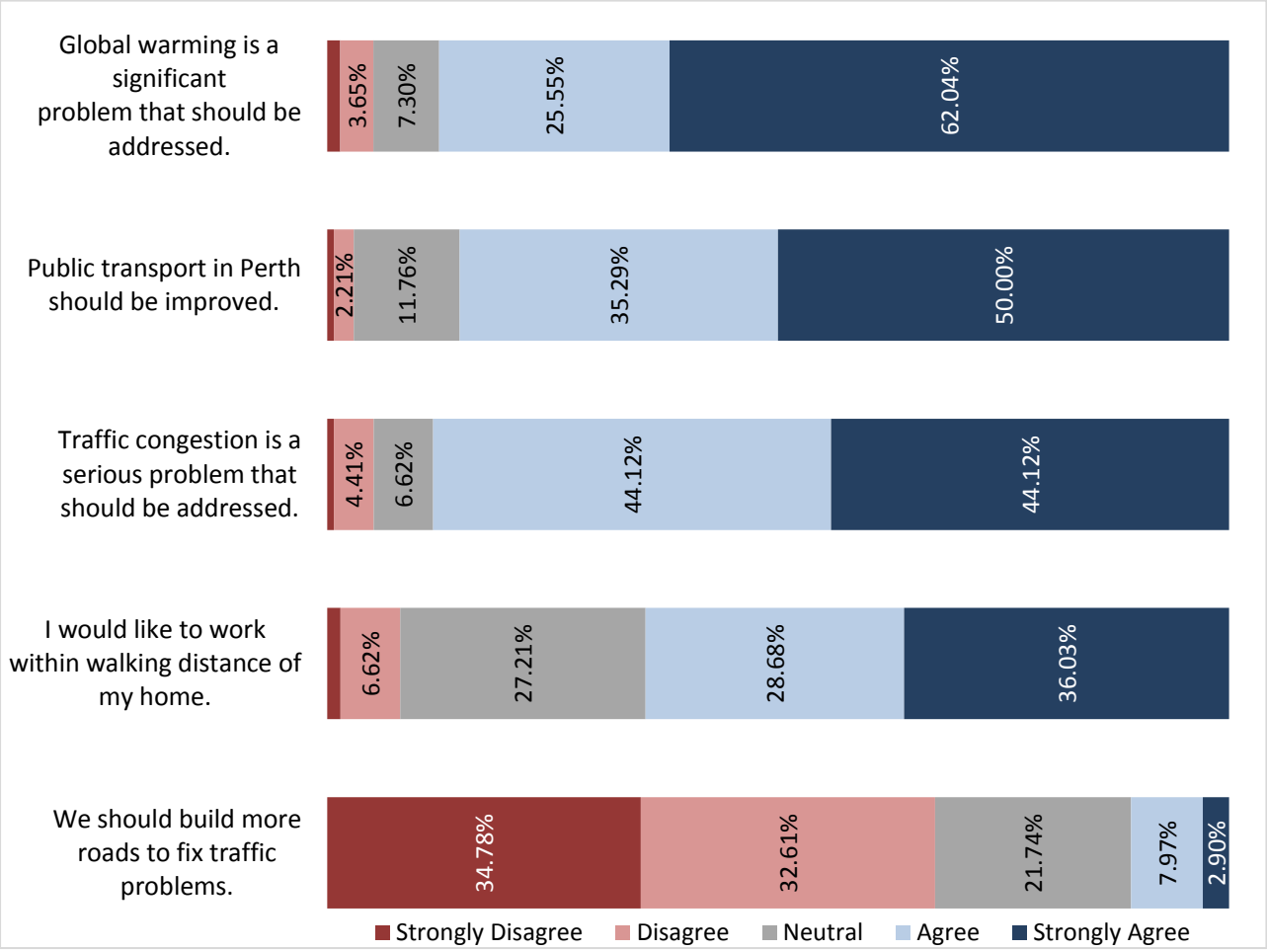


Figure 39: Survey Results – Q.9 - Broad Views

Most strongly, respondents opposed new road building, while favouring improvements to public transport. This mirrors with the findings of 2003 Department of Planning Survey, and results of the University of Sydney's biannual Transport Opinion Survey between 2010 and

September 2015 (Hensher and Daniels 2011, 5; Institute of Transport and Logistics Studies 2015) (Figure 40).

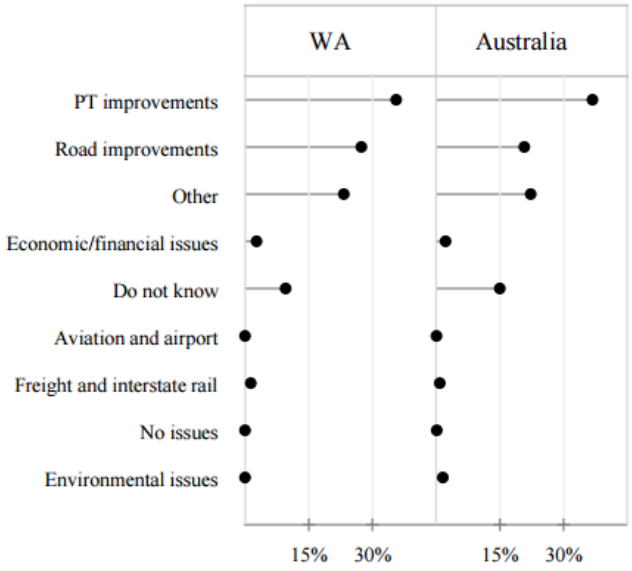


Figure 40: ITLS Survey Results - "Where you would spend $100bn over the next 5 years on transport improvement."

Source: (Institute of Transport and Logistics Studies (ITLS) 2015, 10)

There is now consistent empirical evidence that the broader Australian public overwhelmingly supports improved public transport over investment in roads. This case study survey has found similar results within a specific local context, albeit amongst a sample who use public transport in greater numbers than the wider metropolitan population.

7.3.5 City Form Preference

Respondents were asked about future city form to provide context and framing for attitudes towards density.

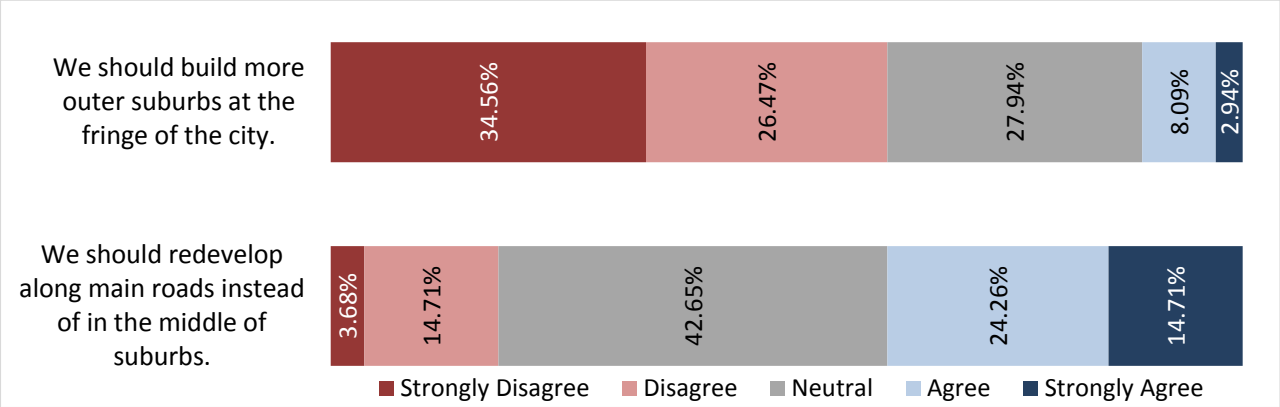


Figure 41: Survey Results – Q.9 - City Form Preference

Again, these survey findings are highly congruent 2003 Department of Planning survey, with most respondents widely opposing outward suburban expansion. This should be of key interest to planners, as the prevailing preference among at least 60% of the sample does seem to be for a compact city form. Results may differ for those at the urban fringe, presenting an interesting opportunity for further research. The question, at least among the sample population surveyed in this research, seems not to be whether to have more intense urban land use, but *how* that intensity is physically implemented within the existing urban boundary.

Adams' (2009) assertion that development should be concentrated along road corridors "leaving the surrounding suburban hinterland intact" was met with a mixed response among the sample group (who themselves live along a potential development route). Further surveying of residents who do not live along Activity Corridors would be needed to provide a comparative and more definitive evaluation of this assertion.

7.3.6 Activity Node Development Preference

The purpose of these questions is to establish the most preferable Transit Oriented Development (TOD) location, and the preferred form of those TODs.

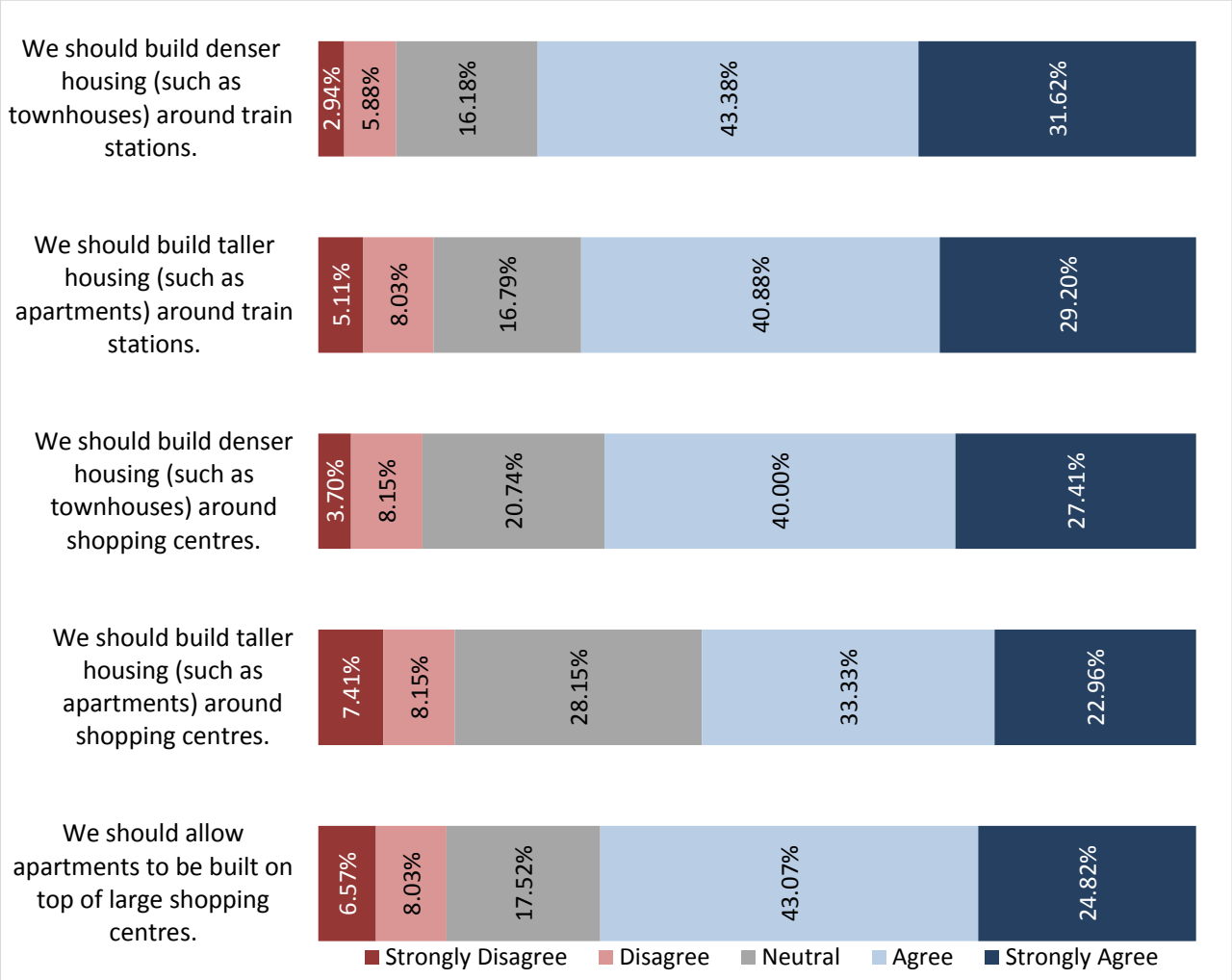


Figure 42: Survey Results – Q.9 - Housing Density and Height Preferences around Shopping Centres and Train Stations

In this instance, the sample population favoured taller and denser residential land use adjacent to train stations. More than half of the respondents also supported more intense residential development around shopping centres, and 67% of respondents supported building apartments on top of large shopping centres, with a further 17% neutral towards the idea.

This challenges the traditional built form outcome of a mono-use “big box” shopping centre, situated along an arterial access road, detached and separated from surrounding housing.

This dataset supports the notion that integrated, mixed use activity centres, are a publically acceptable means of achieving higher urban density along Activity Corridors in Perth. This suggests a public appetite for New Urbanist activity centre design, which has considerable implications for the future spatial distribution of both housing and employment.

Figure 43: Abandoned "big-box" shop, surrounded by expanses of vacant parking, Kardinya Shopping Centre. (McLeod 2015). This particular building is situated about 120m from the South street carriageway.

When asked how many stories of apartments should be allowed to be constructed atop shopping centres, of those who supported the idea (*n*=79), the mean response was 5.038 stories, with a standard deviation of 2.799 (see Figure 48). Maximum heights are further explored in section 7.3.9.

7.3.7 Utilisation of Parking for Development

The antithetical relationship between provision of parking and pedestrian-friendly urban form is well documented (Babb 2010). As early as the 1963 Buchanan report, parking was identified as a means to regulate car travel demand (Still and Simmonds 2000, 293). The

response to whether or not to develop underutilized car parking spaces, as is classic in New Urbanist "retrofits" (Dunham-Jones and Williamson 2012), was very evenly split:

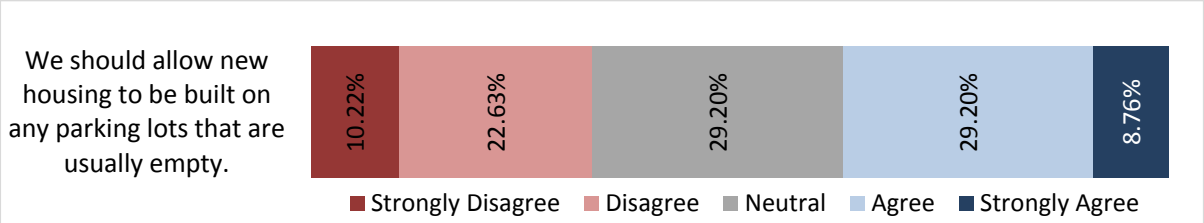


Figure 44: Survey Results – Q.9 - Redevelopment of Parking Lots

However, respondents generally do support parking mandates for residential developments:

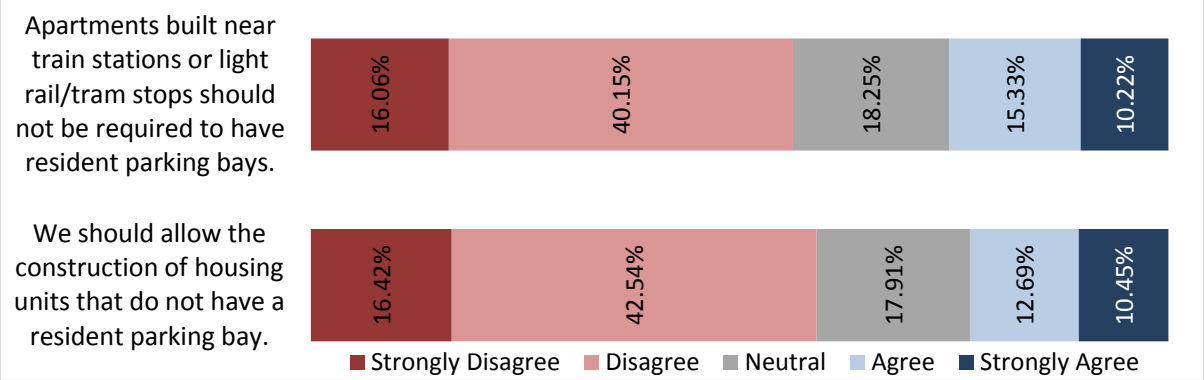


Figure 45: Survey Results – Q.9 - Provision of Dwellings without Parking

This finding is consistent with responses that emphasised residents' desire to retain at least one car. State Planning Policy 3.1: Residential Design Codes of Western Australia prohibit the provision of housing without parking bays, even for transit-oriented development (Department of Planning 2013a, 27), limiting the potential for respondents to become familiar with or aware of car-free dwelling types. Further research could identify willingness to pay for residential parking, to allow for planning and feasibility studies. The need for parking was also a recurring theme in the open-ended question responses, and consistent with previous TOD thesis research by Barlow (2010) and (Griffiths 2015).

For context, the cost of providing a parking bay in Perth is estimated to be, in 2013 dollars:

- $4000 - $8000 for a surface bay,
- $25 000 - $50 000 for a sub-surface or multi-storey bay (Brown 2013).

It may well be that the willingness to pay for parking may exceed the cost of provision. Planners must navigate the ongoing tensions associated with parking, and remain mindful of the role it may play in the politics of redevelopment.

7.3.8 Density and Public Transport Infrastructure Provision

Comparing attitudes towards density for different transport scenarios is integral to answering the research question of this thesis, as it indicates whether perceptions change substantially when improved infrastructure is offered.

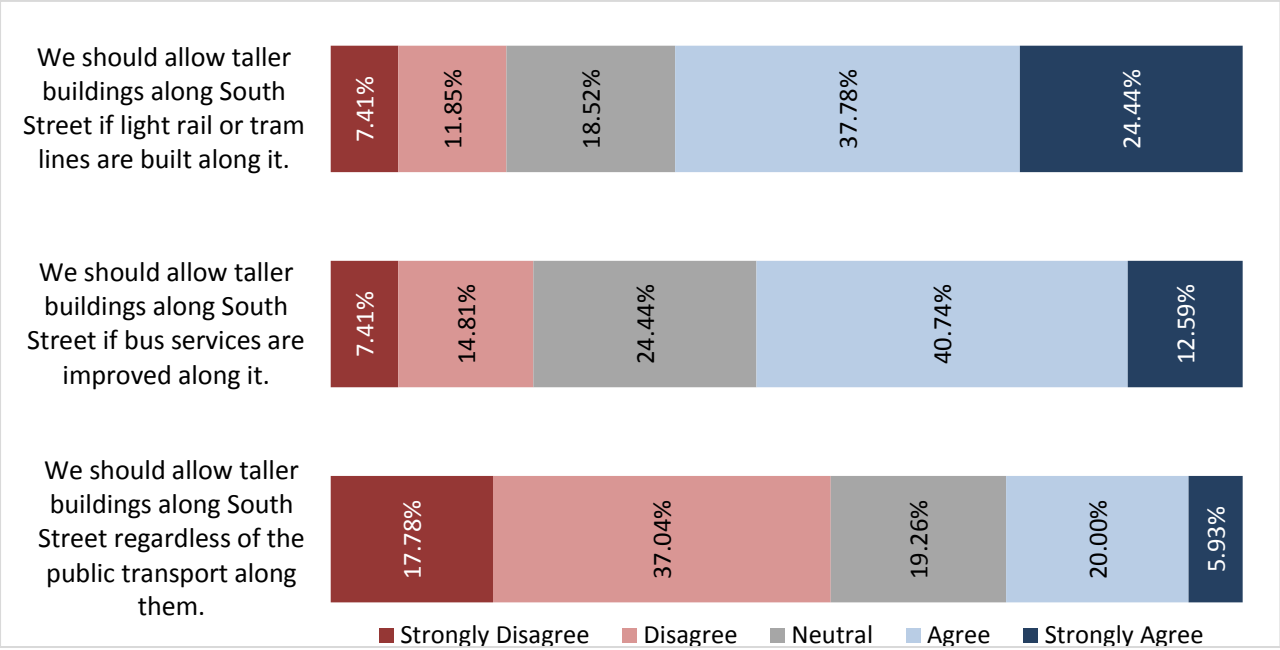


Figure 46: Survey Results – Q. 11 - Public Transport Infrastructure and Increased Building Height

These results show support for taller residential buildings is strongest where improved public transport infrastructure is offered. This finding suggests that, broadly, the general public may be receptive to making a trade-off for higher local housing density in exchange for public transport provision.

Given the cost magnitude of light rail compared to bus rapid transit (BRT), however, the impact on community building height preference for the increased cost is not proportional. (In a broad meta-analysis, Zhang (2009) calculated the capital and operating costs of Light Rail to be 2.58 times that of Bus Rapid Transit.) This survey suggests that only around 8%

more people support or strongly support taller buildings in exchange for light rail compared to BRT, although that support is slightly less strong.

7.3.9 Overall Opposition to Building Height

The “average” perceptions of the community to building height are difficult to capture. Previously, some have generalised that residents in Perth widely oppose higher housing.

Figure 47: Survey Results – Q. 11 - Opposition to Building Heights

A large proportion of the sample do not oppose taller housing (Figure 47). A consistent finding of all of the above questions is approximately 20% of respondents are against taller buildings regardless of any other factor. For questions that asked the tallest building the respondent would support in different contexts, there was a consistent 30% of respondents who supported only three stories or lower (Figure 48). This suggests, at least among the case study sample, the majority of people do not generally oppose taller building types, though support deceases rapidly as height climbs above five stories (Figure 48):

Figure 48: Survey Results – Q.10, Q.12 -Maximum Preferred Building Heights

These results are consistent with Californian research, which found most respondents supported up to 3-4 stories regardless of transit or amenity (street tress, etc.) provision (Braughton et al. 2011, 15). Interestingly, a small minority favour 10 or more stories regardless of situation. This group was represented in a small number of open-ended comments, where an exasperated "just build it" attitude emerged:

> "get on with it, increase density, begin with [vacant site]…"
>
> \- Respondent 12

7.3.10 Speed Limits

While several respondents complained of the noise externalities of the roadway, there was little support for reducing speed limits. Such a step would be crucial in implementing pedestrian-oriented urban design along the route (Hamilton-Baillie 2008, 168), with medium and long-distance through traffic ideally redistributed to other major roads in the network (Curtis and Tiwari 2008, 107).

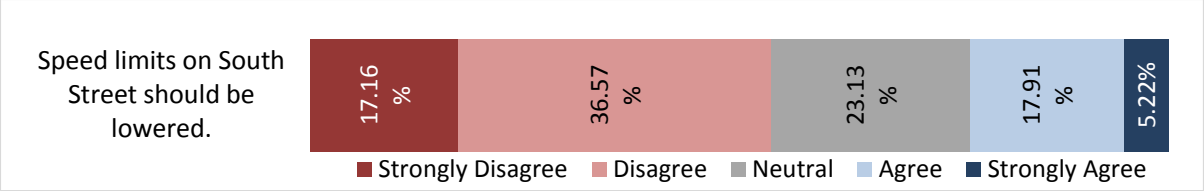


Figure 49: Survey Results – Q.11 - Speed Limit Reductions

7.4 Open Ended Responses

Generally, responses were quite progressive, and tended to reflect the findings of Likert questions. There was overwhelming support for public transport (PT), and opposition to road projects was prevalent. In terms of individual issues, participants mentioned issues of personal safety and reliability of PT, the problem of traffic noise, the need for street trees, the need for improved pedestrian infrastructure, the need for orbital/circumferential PT routes, a desire for sensitive in-fill, and improved transport governance. All open-ended responses are included in Appendix E of this volume

As anticipated, many respondents mentioned strong attitudes towards the Perth Freight Link, with the vast majority in opposition to the project.

Chapter 8: Differing Preferences among Respondent Groups in Survey Results

While different reasons for resistance to change have emerged in the literature, there is little evidence for difference in perception among different demographic groups. The purpose of this chapter is to contribute to addressing Objective 2 by identifying whether there is a specific population of respondents who are generally most resistant to density or less willing to accept taller built form in exchange for improved public transport. Of particular interest in undertaking this research was identifying any correlations between factors such as income, age, housing occupancy status, dwelling type and transect zone, and resident attitudes and preferences.

The data collected by this survey cannot be analysed with traditional quantitative statistical analysis tools, as there is not a clear mathematical difference between the Likert answer categories (Jamieson 2004). As such, comparisons will be made by simply comparing the percentages of respondents in each category, to distil broad, qualitative findings. As per a mixed-methods case study approach, data will be contextualised and analysed against the findings of the other methods used in this study (Yin 2003).

Groupings of respondents have been intentionally coarse, to reduce the effects of data noise and outliers. Any evidence of correlations is therefore indicative, and would require further research to definitively link and explain attitudinal relationships. Two Likert questions have been selected for comparative analysis:

- **Opposition to Density –**
  Question 11, Statement 4: We should not allow taller buildings along South Street
  This is a measure of overall resistance to building height and density.

- **Willingness for Transit-Oriented Taller Development –**
  Question 11, Statement 2: We should allow taller buildings along South Street if light rail or tram lines are built along it

This is a measure of the willingness to live in a higher-density neighbourhood in exchange for high-quality surface transit infrastructure.

Blank, “Prefer not to say” and “other” responses to demographic questions are excluded from the analysis of each question.

8.1 Comparison Findings

Most correlations between groups and attitudes were relatively modest. Most notably, people of higher income generally opposed taller buildings less, and were most willing to make the housing height/light rail trade-off. Unsurprisingly, people living in denser dwelling typologies are less resistant to taller development than those who live in detached housing. People who lived in flats, units, or apartments were also most inclined to accept taller housing in exchange for improved transit. When divided by urban area type, respondents who lived in the middle grid-based middle suburbs (the second typology identified on the transect) were most willing to live around taller housing if light rail was installed.

Just as the reasons that people select a transport mode or housing location can be diverse and different, the reasons for peoples’ responses to attitudinal questions are likely to be similarly variable. This trend emerged in the open-ended and “other” questions, where a diverse range of answers was received. With a limited sample size, the multi-factored complexity of individual’s housing and transport choices may significantly negate the effect of any broader trend or association. Moreover, these trends seem to be too weak to be extrapolated to broader planning practice – any simplistic conclusion currently lacks research evidence to be applicable to policy decision-making. Further understanding the pathology of attitudes should be done through more interactive, personal methods, which allow for the collection of more conversational data.

8.1.1 Income

112 respondents (81.15%) stated their weekly household income within the ranges used in the Australian Census, and answered the preference questions. While household income does not specifically indicate the wealth of the individual respondent, it is used as an imperfect measure of overall financial status.

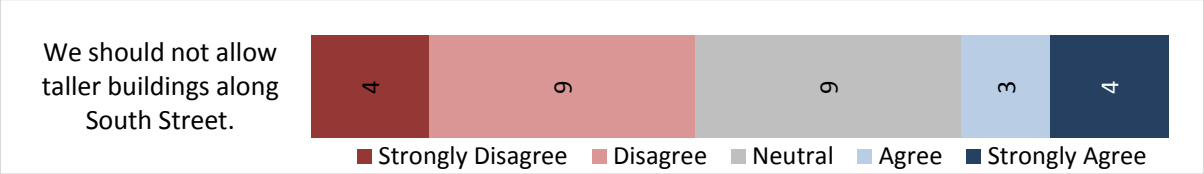
The sample group was divided into quartiles based on stated weekly household income:

- Lowest quartile: Nil/negative - $999 per week (n=29)
- Lower-middle quartile: $1000 - $1499 per week (n=23)
- Higher-middle quartile: $1500 - $2499 per week (n=38)
- Highest quartile:$2500 or more per week (n = 22)

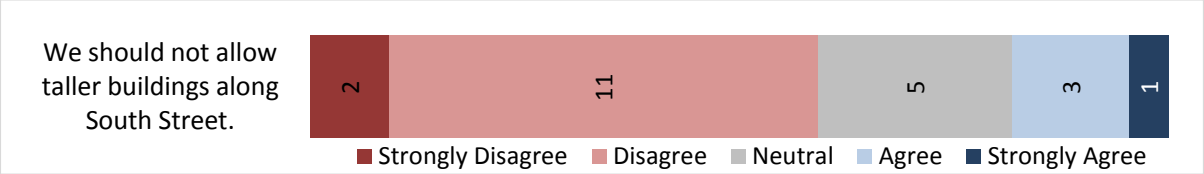
For context, mean Australian household disposable income for 2013-14, the latest figures available, was $998 per week (Australian Bureau of Statistics 2015b).

Opposition to Density

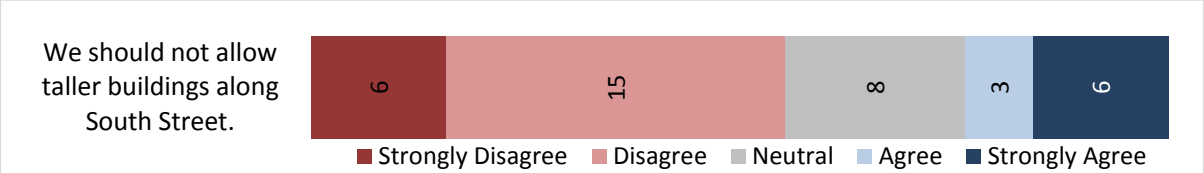
Lowest quartile:



Lower-middle quartile:



Higher-middle quartile:



Highest quartile:

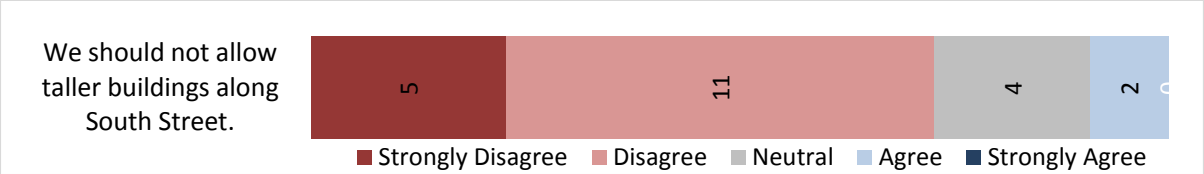
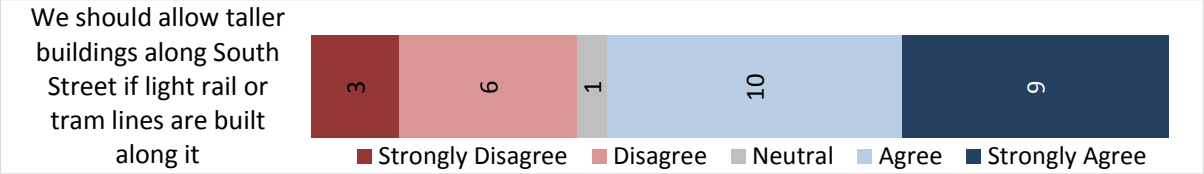


Figure 50: Comparison Survey Results - Income and Opposition to Density

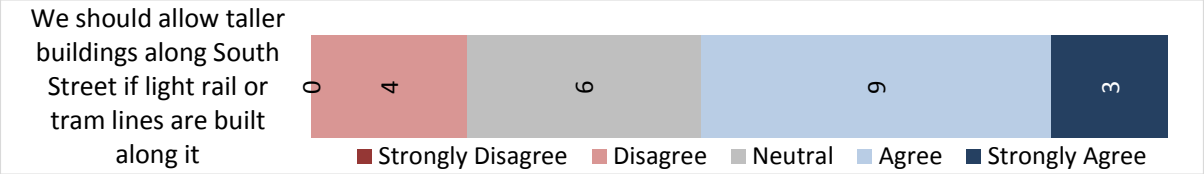
This suggests that, within the sample population, people living in households with higher incomes are slightly less resistant to taller housing, though the correlation appears modest.

Willingness for Taller Development

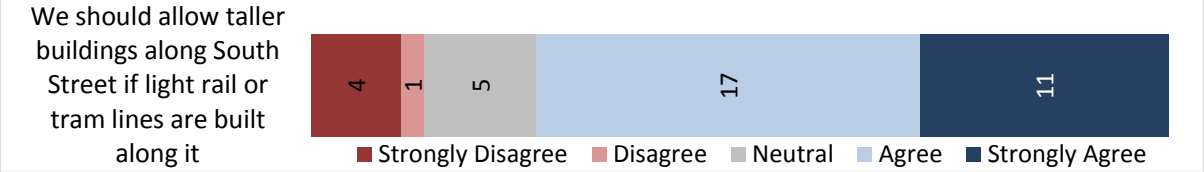
Lowest quartile:



Lower-middle quartile:



Higher-middle quartile:



Highest quartile:

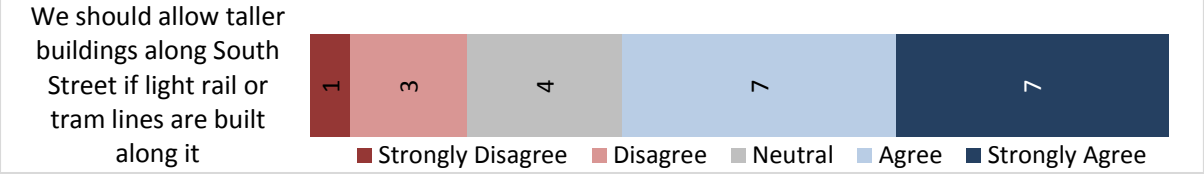


Figure 51: Comparison Survey Results - Income and Transit/Height Trade-Off

This data presents limited evidence of any correlation.

8.1.2 Housing Tenure Type

128 respondents (92.75%) stated their household tenure type and answered the preference questions. Housing tenure type groupings are as per the census:

- Owner occupied, without mortgage (n=55)
- Owner occupied, with mortgage (n=50)
- Rented from government/affordable housing scheme (n=1), data excluded as insufficiently sized sample
- Rented from private owner (n=22)

Opposition to Density

Owner occupied (without mortgage):

Owner occupied (with mortgage):

Rented from private owner:

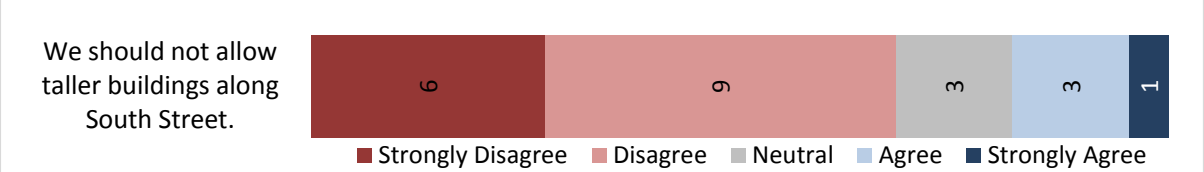
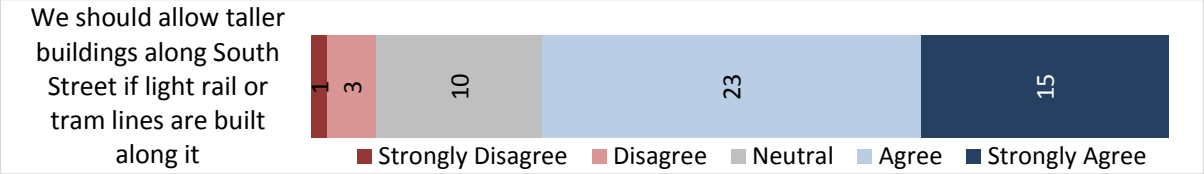


Figure 52: Comparison Survey Results – Housing Tenure Type and Opposition to Density

People who rent are much less resistant to taller buildings than those two own their dwelling. This is understandable, given their likely greater mobility and reduced investment in their dwelling.

Willingness for Taller Development

Owner occupied (without mortgage):



Owner occupied (with mortgage):

Rented from private owner:

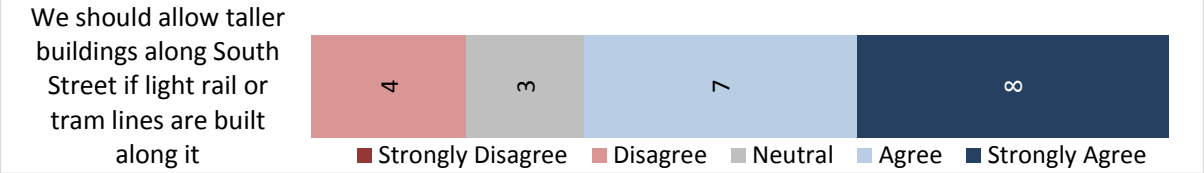


Figure 53: Comparison Survey Results – Housing Tenure Type and Transit/Height Trade-Off

People with a mortgage are the least open to transit-oriented redevelopment, perhaps because they may be most economically risk-adverse.

8.1.3 Dwelling Type

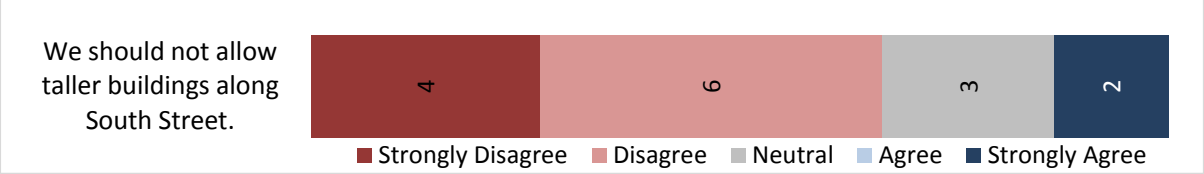
133 respondents (96.37%) stated their dwelling type and answered the preference questions. Dwelling types were collected as per the census:

- Separate house (n=107)
- Semi-detached, row or terrace house, townhouse, etc (n=15)
- Flat, unit or apartment (n=11)

Opposition to Density

Separate house:

Semi-detached, row or terrace house, townhouse, etc.:



Flat, unit or apartment:

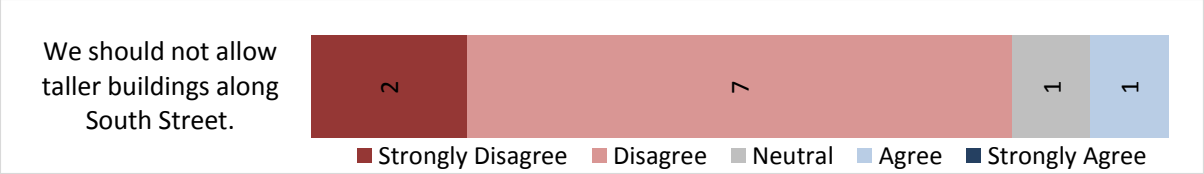
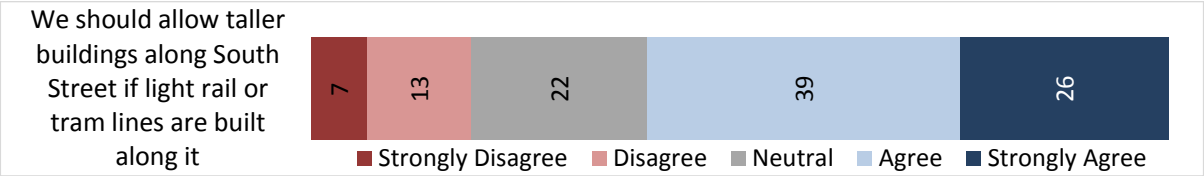


Figure 54: Comparison Survey Results – Dwelling Type and Opposition to Density

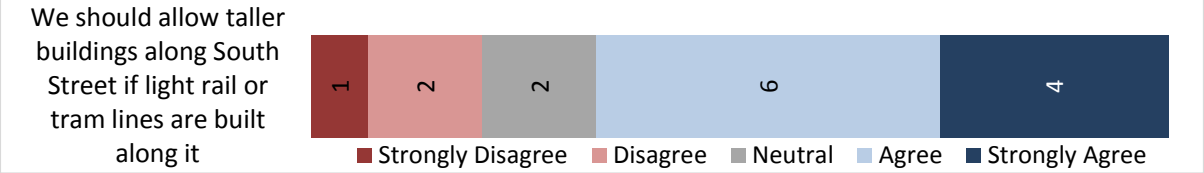
Although the sample size is limited, there seems to be an obvious and axiomatic correlation between dwelling type and favourability to taller housing.

Willingness for Taller Development

Separate house:



Semi-detached, row or terrace house, townhouse, etc.:



Flat, unit or apartment:

Figure 55: Comparison Survey Results – Dwelling Type and Transit/Height Trade-Off

This data suggests that people living in denser housing are more accepting of taller development, which would also seem axiomatic. Negative perceptions of dense housing was a key theme identified in the literature – it may be that people with more recent experience of denser living have more realistic or favourable experiences of taller building typologies.

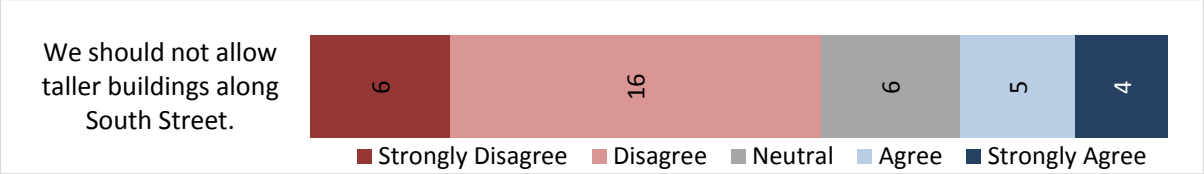
8.1.4 Age

130 respondents (94.20%) stated their dwelling type and answered the preference questions. Age brackets were collected in five yearly increments, as per the census. The youngest age bracket selected by a responded was 20 – 24 years. For simpler analysis, age brackets are grouped as following:

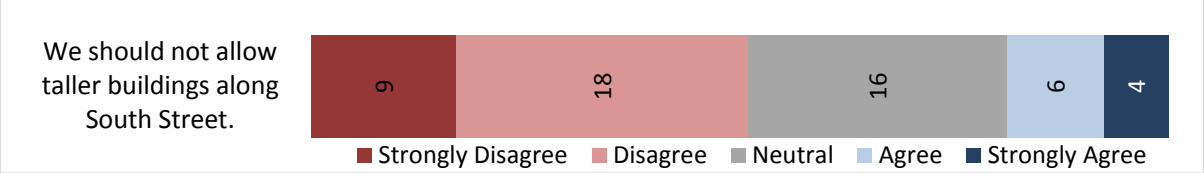
- Younger people – 20 to 39 years old (n=37)
- Middle aged people – 40 to 60 years old (n=53)
- Older people – 60 years and older (n=40)

Opposition to Density

Younger people:



Middle aged people:



Older people:

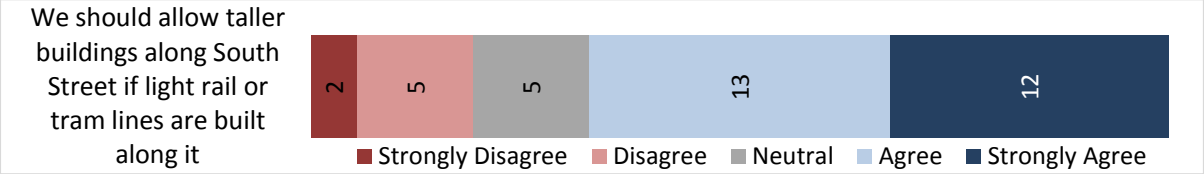
Figure 56: Comparison Survey Results – Age and Opposition to Density

Conclusion:

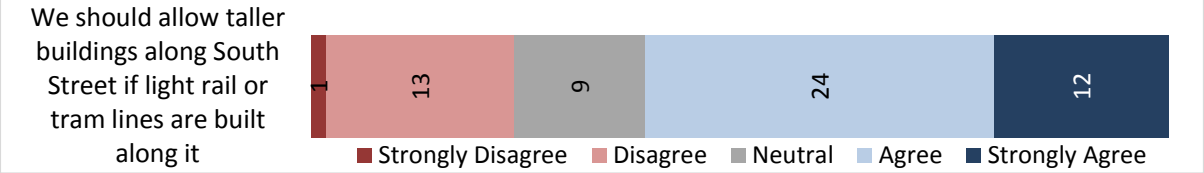
There appears to be no significant difference between age groups.

Willingness for Taller Development

Younger people:



Middle aged people:



Older people:

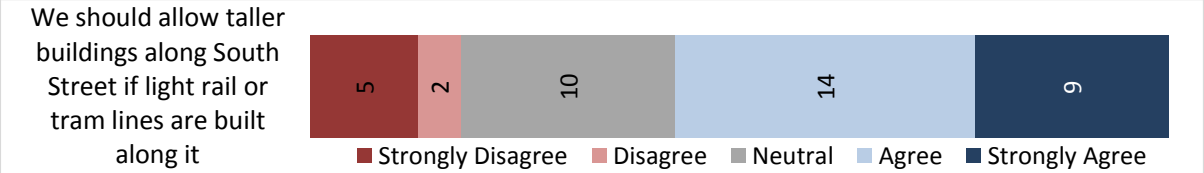


Figure 57: Comparison Survey Results – Age and Transit/Height Trade-Off

Once again, there was some variation in willingness to make the trade-off between age groups, though limited evidence of a relationship. If any, there is a slight increase in willingness to make the trade-off among the younger age group. This loosely matches Audirac's (1999) finding that younger people are most willing to accept the New Urbanist (smaller housing for more local amenities) trade-off.

8.1.5 Public Transport Usage

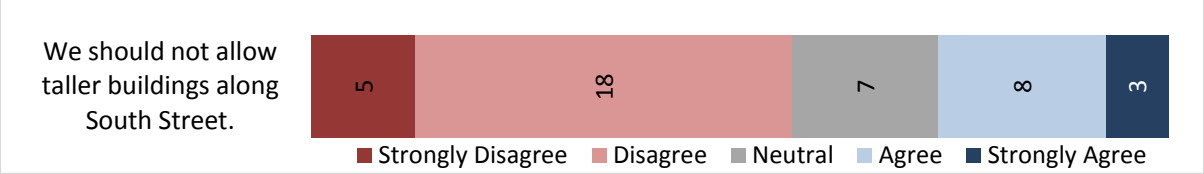
133 respondents (96.37%) stated their estimated average use of public transport and answered the preference questions. These responses have been broadly grouped into three groups:

- Frequently – Using public transport once per week or more (n=47),
- Occasionally – Using public transport at least once per month (n=41),
- Rarely – Using public transport less than once per month (n=45).

Opposition to Density

Frequently using public transport:

Occasionally using public transport:



Rarely using public transport:

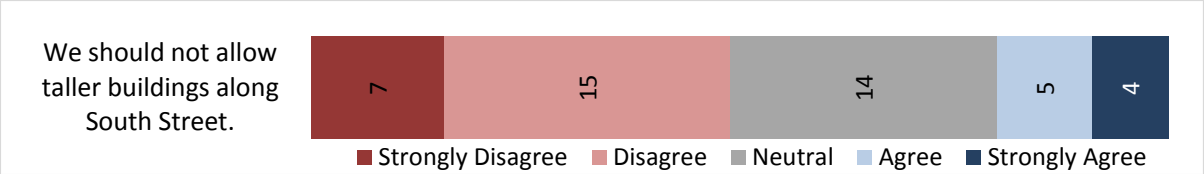


Figure 58: Comparison Survey Results – Public Transport Use and Opposition to Density

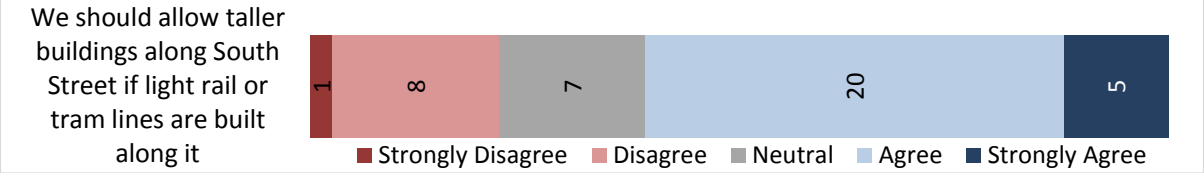
Conclusion:

The variation in these results seems to be of limited significance. This replicates Braughton's (2011) finding that the public think of transit and building form separately. Understanding this disconnect may be of value to planners.

Willingness for Taller Development

Frequently using public transport:

Occasionally using public transport:



Rarely using public transport:

Figure 59: Comparison Survey Results – Public Transport Use and Transit/Height Trade-Off

Conclusion:

Again, there seems to be no clear relationship in this instance.

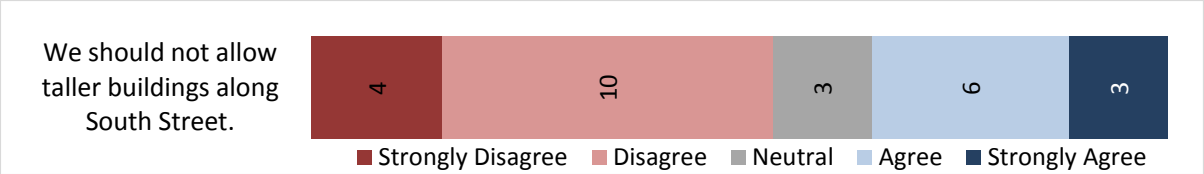
8.1.6 Urban Form/Transect Zone

137 respondents (99.27%) stated their suburb. Comparisons between environments will be made between Urban Form Transect Zones identified in during the transect analysis, by grouping responses from suburbs per the below:

- Inner-urban, pre-automobile settlement. The suburbs of Fremantle and South Fremantle (n=26),
- Grid-based middle suburbs. The suburbs of Beaconsfield, Hilton and White Gum Valley (n=58),
- Curvilinear, limited-access suburbs. The suburbs of Samson, Kardinya, Winthrop, Murdoch and Bateman (n=51).

Opposition to Density

Inner-urban, pre-automobile areas:



Grid-based middle suburbs:

Curvilinear, limited-access suburbs:

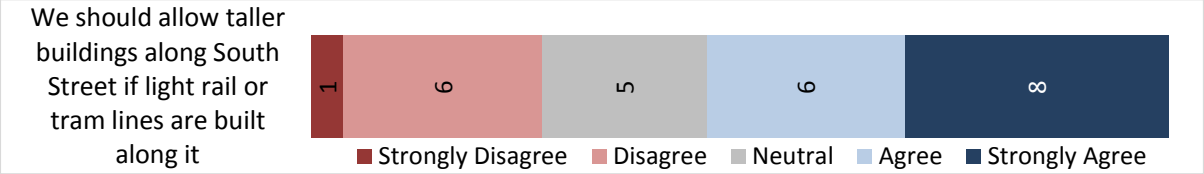
Figure 60: Comparison Survey Results – Transect Zone and Opposition to Density

Conclusion:

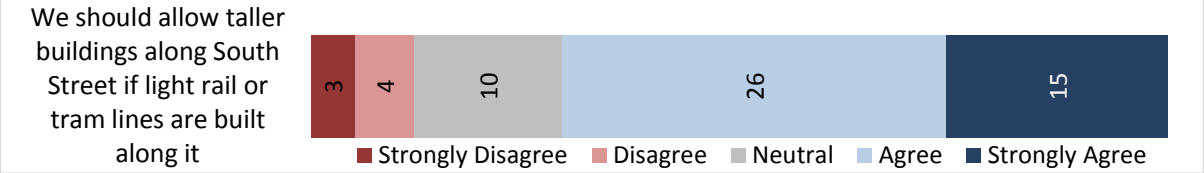
While the relationship seems weak, it is interesting to observe slightly more openness to taller development in curvilinear suburbs, which are traditionally very low-rise.

Willingness for Taller Development

Inner-urban, pre-automobile areas:



Grid-based middle suburb:



Curvilinear, limited-access suburbs:

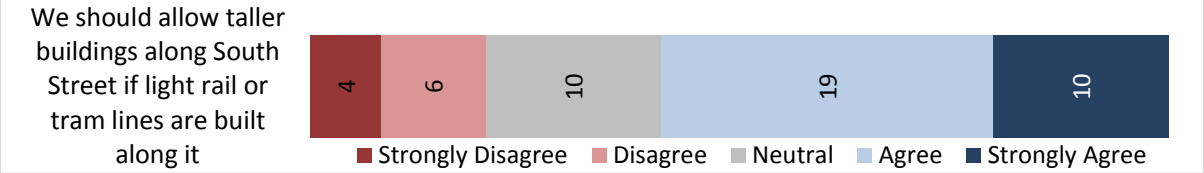


Figure 61: Comparison Survey Results – Transect Zone and Transit/Height Trade-Off

Increased resistance to the trade-off in inner-urban areas may reflect concerns about heritage, which were noted in both the literature, and in the qualitative survey results. It could be inferred that a similar reluctance for the trade-off is seen among residents of the curvilinear suburbs, who may be less interested in public transport, given the degree to which the street pattern inhibits walking to stops. Middle suburbs are less well served by transit than inner-urban ones, but the grid street form is legible, well-proportioned, and thus potentially facilitates walking (Gehl 2011, 137; Falconer, Newman and Giles-Corti 2010, 293; Forsyth et al. 2008, 1985). It therefore may be that middle suburb residents are most attracted to the notion of improved public transport, as they have the most to gain. Further research would be required for this correlation to be adequately explained.

8.2 Chapter Summary and Relevance

The purpose of this chapter was to establish whether a particular population characteristic or group is associated with a greater degree of opposition to taller buildings, thereby addressing the second component of Objective 2. By exploring correlations between demographic features and attitudes, this chapter sought to establish pilot evidence for who specifically might be most likely to oppose redevelopment or revert to "NIMBYism."

Just as the broader attitudinal survey evidence (and the open-ended qualitative responses) identified a broad diversity of views, mostly underpinned with logical personal reasoning, the lack of any strong correlation in this data suggests that resistance to taller building typologies is more likely to be a result of complex personal experiences and perceptions, rather than any demographic characteristic. The strongest correlation identified was that people living in denser housing are less opposed to additional denser housing, which is consistent with this 'personal experience' hypothesis. Importantly, the analysis of the sub-groups within the survey sample produced results largely consistent with the exploration of the sample group as a whole. Further research would be required to make any more definite conclusions.

Chapter 9: Industry and Professional Interview Findings

Interviews to discuss and reflect upon the survey results were held with planning practitioners and stakeholders in February and March 2016 (Table 7). All practitioners and stakeholders had a specific professional or personal interest in the South Street corridor. The purpose of the interviews was to interpret the survey results, and relate them to planning practice. Stakeholders who may be representative of a diverse range of actors in the built environment were interviewed for their specific perspective.

Table 7: Interview Participants

Reference Number	Respondent Identity	Experience	Transect Area(s)	Purpose
I1	Senior strategic planner, local govt. along South Street	Implementing density increases, local practice experience	3	Governance, community and development industry liaison, procedural considerations, feasibility and ideal outcomes
I2	Heritage advocate, former planner and city manager, former elected councillor	Lobbyist for conservation of heritage in Fremantle, experienced professional perceptive	1, 2	Perspective from a community group, insights into perceptions of amenity Explain etiology of concerns/resistance. Articulate preferences of those concerned for heritage and amenity
I3	Elected Mayor, LGA along South Street	Political, perspective of leadership, electability influence of urban issues.	1, 2	Seek high-level perspective in role of LGA in driving change. Comments on multi-agency issues.
I4	Resident's Association (RA) Representative	Advocating concerns of local residents, liaising with councils and authorities	3	Gain an appreciation of the role of suburban community group, and understand their interests, purpose, and views.
I5	Murdoch University Strategic Planner	Strategic master-planner, high-level strategic decision maker	3	Large land-owner, perspective from "campus" style institution typical of suburban areas. Exploring potential used of campus land, and potential use of private land adjacent to campuses.

9.1 General Views and Built Form Perceptions

Overall, interview respondents agreed or endorsed the attitudes expressed in the public survey. While several interview subjects found that the results were similar to their personal experience, a few were pleasantly surprised by the level of public awareness and urban progressiveness reflected in the survey.

Building on the survey findings, the interviews suggest that the majority of the public will accept reasonably tall (3-5) storey buildings along South Street, and that a pragmatic approach to ensuring that public fears about parking, traffic and amenity are satisfactorily heard and addressed is needed. If higher density is achieved together with *increases* to local amenity, such as streetscape upgrades and the introduction of desirable land uses, public fears could be allayed, potentially even mobilising support for additional good-quality in-fill once residents become acquainted with a positive outcome. When asked about what the community desires (or does not oppose), the representative of the heritage lobby suggested:

> "I think the proposals that [draw opposition] are above what is often referred to as 'human scale' - and I know that the definitions of human scale are as long as your arm - but one of my favourites is that human scale is where someone on a balcony on the top floor can communicate with someone on the footpath. And I quite like that one. But I'm not stuck on a particular height level, but I think that's not a bad definition myself."
>
> - I2 (Table 7)

The mayor echoed this sentiment:

> "There's interesting international evidence to suggest that is a real sweet spot. And you can get some really significant urban density by doing that well. I mean, I do think it's a little horses for courses, and I think there's places where - especially around city centres, to go above that. But I do think that in terms of bringing our community with us, and especially in terms of getting into more suburban developments, that having that as a predominant urban form isn't a bad thing, in terms of human scale. I don't want to be dogmatic and say that you can't go above 3-5 stories; that doesn't really help."
>
> - I3 (Table 7)

The planner from Murdoch University suggested that the prescriptive nature of the existing planning controls have limited diversity, and underpinned a lack of awareness about quality housing and taller development forms. She articulated a particular distain for current status-quo suburban in-fill:

> "I'm not a supporter of battleaxes ever, actually. I think they destroy the urban design amenity of streets, and I think they don't encourage a different kind of typology… So I'm looking for diversity. My answer to your question is that true diversity of typologies. We really need to start mixing it up and doing a much more sophisticated approach to subdivision design and any new compact development we do."
>
> - I5 (Table 7)

Figure 62: Large new house on battleaxe lot, Kardinya (McLeod 2016)

Negative experiences of poorly designed in-fill clearly have some influence in shaping perception. The Residents Association representative mentioned a historical case of lobbying against poor-quality high-density dwellings. Interestingly, though, she indicated that the findings of the survey are broadly consistent with the views of the association. When asked about what drives resident opposition to in-fill, she hinted at NIMBYism:

> "Obviously they don't want it in their own corner."
>
> -I4 (Table 7)

However, she went on to suggest that sensitive, low-rise high-density housing would be acceptable. When asked about the reasons for opposing housing taller than three storeys, she indicated that aesthetics and perceived potential traffic problems are the main provocations of opposition. Between the survey and interview results, there does seem to be some ambiguity as to whether some in the community consider increased road traffic as an inherent consequent of density, even where high quality public transport is provided.

9.2 Building Placement and Parking Provision

The main purpose of interviewing a representative of Murdoch University's strategic master-planning office was to ascertain an institutional perspective from a "campus" land landholder. This was especially relevant given the "campus" style land use identified in the curvilinear later suburbs arterial road transect. Interestingly, she indicated that current and future planning for the university was likely to concentrate active "urban" land uses within precincts central to the academic core of the campus, with little built form placed proximate to South Street. She viewed suburban nature of the campus frontage an asset to the university:

> "Part of the the masterplan is the landscape plan, and the landscape plan is likely to reinforce the verge buffer zone, which is quite a distinctive part of this university, and there's also a big change in topography in the west [of the campus], so actually getting close to South Street is probably impossible… So the topography is prohibitive, and I think getting close to South Street is not as important as creating a consolidated urban precinct."
>
> - I 5 (Table 7)

Figure 63: Current Murdoch University Streetscape, South Street (McLeod 2016)

Similar planning for Curtin University suggests that a preference exists for locating land use in the centre of the campus, internalising the townscape, illustrated in Figure 64:

Figure 64: Curtin Campus Master Plan (Curtin University 2014, 59)

This suggests a continuation with sub-urban aesthetic landscape planning ideas prevailing in practice. Through site observations, the curvilinear transect zone suburbs of Murdoch and Kardinya were identified as being highly suitable for redevelopment. Properties directly

adjacent to South Street, bordering Murdoch University, were observed to be particularly low density, often in poor repair. Census data suggests that a large proportion of these properties are used as 'share house' dwellings for multiple students, or homes with students lodging in a room. When asked about the university's preference for structure planning of suburbs directly adjacent to the campus, the interview respondent remarked:

> "I think the university would always love to be consulted, and I think the university would love to know what is happening at a district level planning, but I struggle to see how the university could – I mean, we are definitely looking at playing a role in the horizontal band that makes us part of the activity centre - but I think to jump South Street and move into suburbia is a long stretch."
>
> - I 5 (Table 7)

This contrasts with the "integrated" planning governance model suggested by the planner and elected mayor. The situation of urban land uses *near* or *along* arterials is clearly an ongoing debate within built environment professions and among the community. The local planner, the heritage advocate, and the elected mayor favoured bringing development close to the roadway, and undertaking commensurate multi-modality improvements of the roadway. The elected mayor stated:

> "My general view is you want to create urban streets, and activated urban streets. And I do think that when we have that kind of development set back away from them too much you have real loss of urban form. And I think that whilst busy streets require really clever designing around how you manage sound and those kinds of things, done well, they can work well, and you can also utilise those in terms of ground floor activation, commercial uses, and get a proper mixed-use outcome."
>
> - I2 (Table 7)

The local government planner was particularly supportive of placing apartments close to the roadway, with associated carriageway redesigns to pedestrianize the precinct:

> "I would prefer to actually push it up against the road myself. Two reasons, one, I'm not a great fan of big roads myself, full stop. I think having free-flowing traffic along South Street is not the ideal option. It's not a freeway, it is a district distributor, but you're going past a centre, and I think it should be interacting with the centre, slowing down. I think having a busier area is better, and I'd like to see it spread over both sides of the the road so it does work that way. In saying that, that's a pie-in-the-sky idea. In reality, I'd still like to see the shops pushed up against South Street to give that presence, it also protects the residential behind a lot more, and give the opportunity for Main Street development of the shopping centre, creating more of an activity centre."
>
> - I1 (Table 7)

Interview responses differed slightly in preference for specific location of apartments, but all broadly supported the concept of apartments around shopping centres. Interestingly, the resident association respondent indicated she would oppose apartment construction on a large car park adjacent to South Street at Kardinya Shopping Centre, but supported the same development concept on a nearby car park situated about 150 meters behind the road way. She perceived the parking close to the street as having much higher value than that accessible via a side street (see Figure 65).

Congruent with the survey results, parking recurred as an important consideration. The heritage advocate also expressed a need to be pragmatic in planning for accessibility:

> "I'm afraid I'm not one of those who believes that everyone is going to give up their cars. We might get steady reductions over the long term, and so, provision still must be made for parking. And I would prefer that parking was provided on site- with new developments, rather than ever-expanding on-street parking or parking lots. It's one of the things that is concerning me about new developments, I'm not sure that we are providing enough parking under them. We've got to take a sensible approach to this, or the community will jack-up and say "we don't want anymore."
>
> - I2 (Table 7)

The local planner mentioned the continuing market appetite for residential parking, filtering through to development applications. He foresaw the potential for improved management of spaces as a means to offset reductions in required parking provision. He suggested that strata law reform might enable the flexibility of such arrangements.

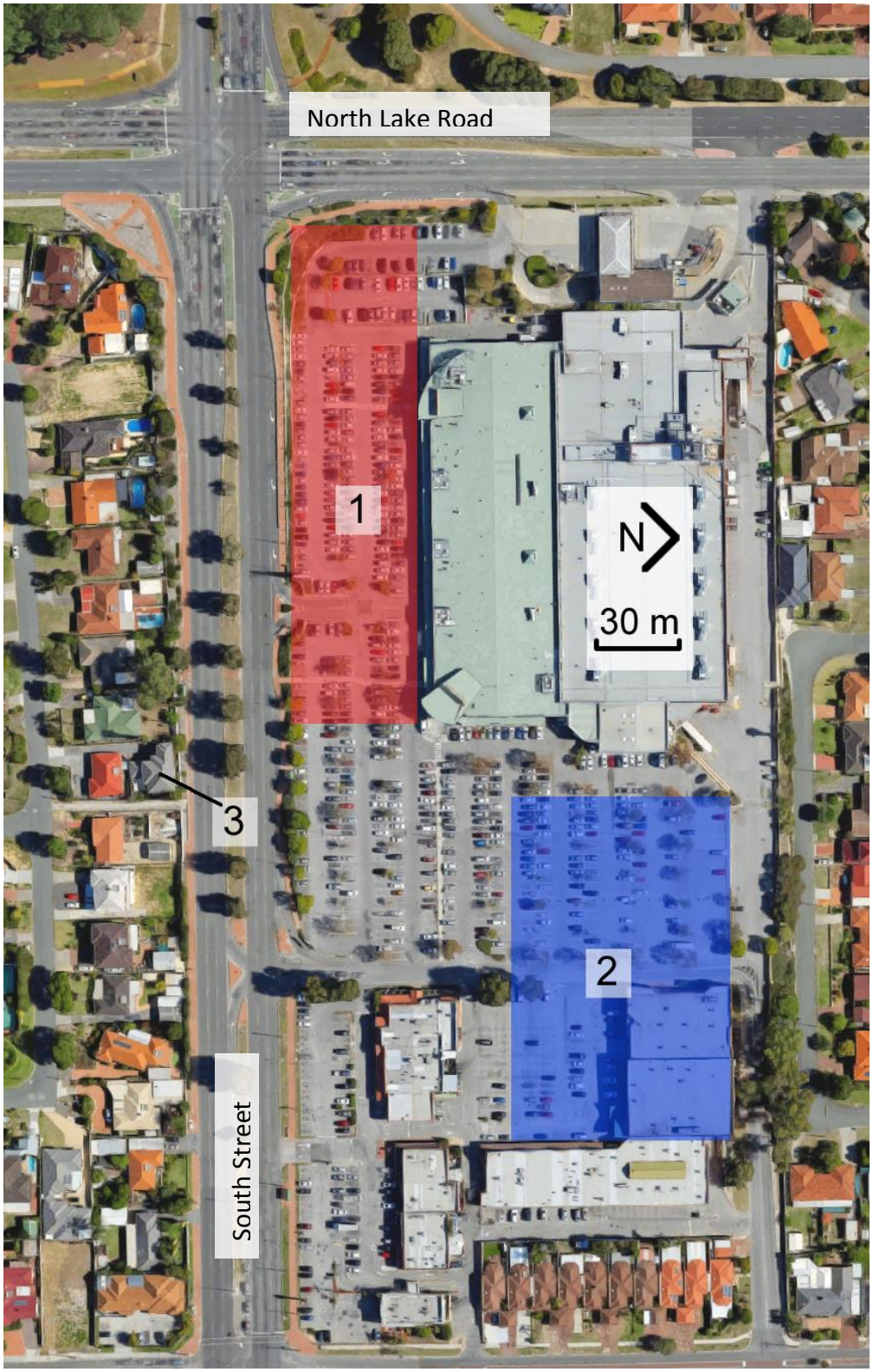


Figure 65: Kardinya Shopping Centre alternative development site. (McLeod 2016).

1. Development Site close to South Street, preferred by planner, opposed by resident
2. Development site set back 120m, preferred by resident
3. Traditional battle-axe subdivision typical of current practice.

9.3 Transport Inertia to Land Use Torpor

This research finds that people anticipate a continued reliance on cars, particularly in view of a lack of state government investments in the broader public transport network. Respondents were universally supportive of improved public transport infrastructure, but lacked optimism for foreseeable improvements in the short to medium term. One planner mused:

> "If we waited for the transport solutions first, we'd be waiting forever. So in the current political climate, I think it's incumbent on us to make state government feel uncomfortable, by increasing density, asking the questions. And it puts it back on them, then, to say we don't want to approve that density because we don't think the infrastructure can handle it, well let's get in on the discussion then about how we change the infrastructure. And I think we're learning to do that."
>
> - I1 (Table 7)

The mayor remarked that lack of investment in public transport other than buses had inhibited his LGA's efforts to undertake high-density, mixed-use structure planning:

> "At the very heart of this is a lack of links between transport planning and land use planning, and I think the failure to integrate those two has been at the heart of the problem…
>
> "We're really just not getting the benefits of getting your public transport in early and done right, and as a result, actually ending up with a really sub-optimal outcome, because of a lack of up-front investment- and Department of Planning's excuse was that we can't get the Department of Transport to commit to funding any of these projects, so they're not on the table, therefore we have to plan around roads and BRT, if that. Therefore, here's the urban form we get."
>
> - I3 (Table 7)

Clearly, lack of forward infrastructure provision stymies land use planning, because uncertainty of future infrastructure reduces land value and inhibits the economic feasibility of high-density projects. The interviews suggest that local governments may be well placed to advocate on behalf of developers, land owners, and the public. The heritage advocate remarked:

> "I think it is very much the City's role to advocate, given that it's the City's Town Planning Scheme which is the relevant document; the City definitely has a role to play."
>
> - I2 (Table 7)

He was particularly favourable to preserving the broad fabric of suburbs by concentrating development along transit routes:

> "You won't be able to get light rail servicing the middle of suburbs. It makes sense to increase densities within walking distance of transport."
>
> - I2 (Table 7)

The mayor suggested Rob Adam's Melbourne Activity Corridor concept, and reflected on the survey finding:

> "There's a lot of neutral people, this shows that people really don't know what it means. When you have 43 percent of people kind of going "well, maybe!" and you've got 40 percent say yes, and the usual 20 percent say no – but what I think this does show, is that we *need* to demonstrate. We need to work out how to demonstrate well, but also how to do it well. And how we interface between the density on the main roads, and good design and good amenity for the people who live there, but also making sure the suburbs that sit behind it don't have their amenity reduced, actually improved."
>
> - I3 (Table 7)

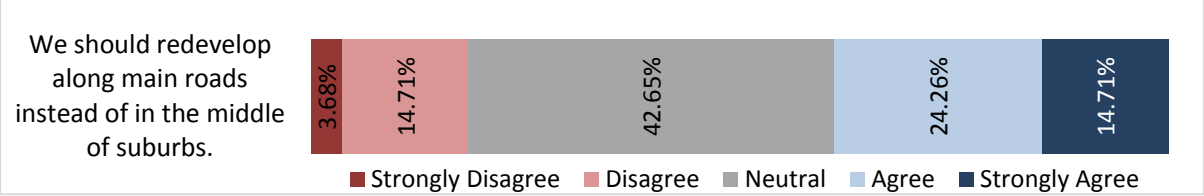


Figure 66: Survey Result – Q.9 - Testing Adams' (2009) Corridor Preference

The 20% of broadly anti-density survey respondents and minority view they represent was a recurring theme in the interviews. The mayor in particular commented on their influential role in the local planning process and political discourse:

> "I think you learn in politics that you're never going to bring everybody with you."

> "What would be interesting for us, is that while we do have large numbers of people speaking out against it, there's actually this very – what your survey would suggest – large silent majority that support it."
>
> - I3 (Table 7)

Further research may be useful in identifying the underlying motives of this group.

9.4 Planning Roadway Space and Main Roads Control

Aside from public preference factors, one of the most consistent and remarkable findings from the interviews were the congruent statements about the role and planning influence of Main Roads Western Australia (MRWA), the agency responsible for arterial roads and highways. MRWA is colloquially known as "Main Roads." Concerns ranged from minor individual cases:

> "[They were] not a huge lot of help… they eventually answer your letters. They definitely haven't been very helpful at all. They basically say 'my way or the highway; we don't want to know.' They have never been very collegial when they have done things. I think that if it is going to cut into their budget, they don't really want to know about it."
>
> - Residents Association Representative, I4 (Table 7)

… to major complaints about allegedly entrenched institutional practices:

> "They are extremely intransigent… you cannot, it's difficult, there is no negotiating with Main Roads. You will just do what Main Roads tells you to do, and there doesn't seem to be any recourse to come up with an alternative outcome.
>
> "They're not flexible, they are not interested in urban design, and they have no interest in design quality - they are a single service provider and they are driven by traffic analysis and numbers."
>
> - Murdoch University Representative, I5 (Table 7)

The elected mayor gave a local government perspective on the planning influence of MRWA:

> "I do think at the moment, it's unfortunate that Main Roads are driving strategic transport planning, and by default, land use, in a way that they shouldn't. Main Roads, in my view, should be a road building organisation, but the planning be integrated – land use and transport planning should be done external of Main Roads, and then their job is to implement those projects. But unfortunately we don't have that leadership sitting outside that, so Main Roads has started to fill that gap unfortunately, and I think in many ways, you've got the horse and the cart the wrong way around."
>
> - I3 (Table 7)

The institutional influence of MRWA is therefore a strong force counteracting the realisation of Activity Corridor style land use planning. This style of control is remarkably similar to international examples of bureaucracies other than land use planning authorities exerting massive anti-urbanist influence on the form and function of cities (Caro 1974). There is general agreement that lack of coherent public transport investment planning serves as an

inhibitive force to any effective non-suburban land use planning. Coupled with the statutory malfeasance of MRWA, the potential for high quality Activity Corridors is stifled not by the effective lobbying of NIMBYs, nor the resistance of a disinterested public, but the misallocation of actual planning power in the hands less capable of governing.

Clearly, the construction of high-density dwellings with associated improvements in local amenity may harness latent public support for activity corridor implementation. However, the mayor cautioned the current planning system may be inexperienced and ineffective at producing high quality dense urban environments, due to the recent historical tradition of suburbanism. He associated community opposition to density with perceived poor outcomes in recent non-suburban projects.

> "A fair bit of education both ways, I mean, we haven't got this perfect yet, and we need to learn around how we nuance this. The reality is that we don't yet have a… one of the interesting things we were debating last night is that we've got this push-back [to a scheme amendment], and then the community are saying "where are examples for where this works" - so it was easy for me to talk about Europe and Melbourne but there's nothing you can see - they want to drive their car and see "oh this is how it is."
>
> - Elected Mayor, I3 (Table 7)

Several of the open-ended responses collected from the survey mentioned international examples of high-amenity urban precincts. Evidently, the public are not monolithic in their view, and while the majority of the survey population were generally supportive of transit-oriented density, only successful pilot projects and a coherent, integrated planning narrative are likely to further increase support.

Chapter 10: Discussion and Conclusion

The purpose of this research was to identify community perceptions of Activity Corridor concepts, and explore how the current state of practice relates to or rejects prevailing public preferences. While Activity Corridors have been widely proposed as a strategy to better orient in-fill density, the literature lacks specific evidence relating to the specific attitudes and preferences of communities living along arterial roads. While some international literature has explored willingness to accept density where improved transit is proposed along greyfields corridors (Braughton et al. 2011), and extensive Activity Corridor design research has been undertaken in Perth (Duckworth-Smith 2013), little previous research has integrated an exploration of community perceptions, present planning practice and the current characteristics of the urban fabric around arterial roads. Additionally, the size and characteristics of the subset of the general population who most strongly oppose taller development are not well understood. The following research question was derived after a broad literature review:

> "What perceptions and attitudes exist towards implementing transit-oriented urbanism along existing greyfields arterial road infrastructure?"

A 10-kilometre segment of South Street, an arterial road in the southern suburbs of Perth was selected as a case study area. Desktop study and site observations were applied to identify three urban form transect typologies along the route for further comparative analysis. A widely distributed public survey of residents living around the case study area was undertaken to gather current transport behaviour trends, and attitudinal data towards built form and transportation infrastructure investments. Interviews with prominent stakeholders in the planning and local political spheres along the corridor were then undertaken to evaluate public preferences in relation to current practice, and to consider the root causes of recurring themes in public responses.

This study has found that existing public attitudes are broadly compatible with the implementation of Activity Corridors. Members of the public and the community have nuanced perceptions of their built environment - but only a small proportion are strongly

opposed to in-fill or denser development generally. The findings strongly reinforce the notion that the public think about urban issues with sophistication and capacity, which they are so often denied in simplistic or elitist discourse. The argument about density without consideration of multi-modal transport accessibility and changes to local 'amenity' is too simplistic to capture people's actual attitudes to development in their neighbourhood. A monocentric focus on density produces poor discourse, and may result in poorly designed development (Grosvenor and O'Neill 2014, 442).

Attitudinal survey respondents were compared by demographic groups to identify any potential correlations, and whether a particular demographic group constitutes the core opposition to denser development. Generally, respondents who reported higher incomes were slightly less opposed to taller development adjacent to their property, but were not significantly more inclined to accept taller housing where light rail was proposed. This contradicts with the findings of Nematollahi, Tiwari, and Hedgcock (2015), who associated higher incomes with more cautious views towards in-fill, perhaps due to reservations towards the potential new occupants of the neighbourhood. These survey results suggest that income itself is not indicative of perceptions, perhaps indicating that the personal experiences of each respondent to housing and neighbourhood forms more strongly influences the formation of attitudes towards proposed changes.

This notion is most strongly supported by other survey data. Within the survey sample, people living in denser or taller dwelling types were much less resistant to taller development, implying that familiarity or lived experience results in more favourable perceptions. This data further supports a hypotheses that perceptions of density are more likely to be the result of personal experiences, rather than a demographic characteristic. Survey respondents who lived in grid-based inner-middle suburbs (the middle typology identified on the transect) were most willing to live around taller housing if light rail was installed, suggesting this suburban form might be best suited for transit-oriented density intensification and investment.

Professional and political stakeholders in the local realm, including resident lobby groups, tend to concur with public perceptions gathered from those surveyed. They are broadly

open to change, so long as their concerns and aspirations regarding amenity, traffic and parking are addressed. While about one fifth of survey respondents held negative views about density, all the interviewed stakeholders expressed a pragmatic desire to address urban problems, so long as amenity is retained or improved. As such, amenity is central to any perceptions of the built environment (Brueckner, Thisse and Zenou 1999), and should be central to any planned intensification of land use in existing suburbs. Desire for streetscape improvements were recurrent suggestions in the survey data, though further research could be undertaken to better understand what the public perceive 'amenity' to be, particularly in the context of increasingly dense local built environments.

The findings of this research suggests that people find 'human scale' density broadly acceptable. Very tall apartment complexes, whether of the 1960s modernist style or the more recent tilt-up concrete tower typical of Perth's central city (or Queensland's Gold Coast) are deemed to not be acceptable in this context. Remarkably, Braughton et al.'s (2011) finding that 3-4 storey development along existing low-rise Greyfields is preferred by the public also holds true for the case study area.

The New Urbanist theory of urban succession - progressive up-zoning of an area through the range of urban forms along the transect zones on a gradual, community-driven basis (Duany 2008; Duany, Speck and Lydon 2009) - is highly compatible with the findings of this research. The transect model of contemplating environments provides a useful tool, which planners could utilise to make discussions of density more meaningful. While the existing Western Australian land use and density zoning system is effective at statutory *control*, both survey respondents and planning professionals discussed urban change through qualitative expressions of building form, and height, expressed in stories. This form of dialogue is evidently much more effective than technocratic "codes" in discussing urban change.

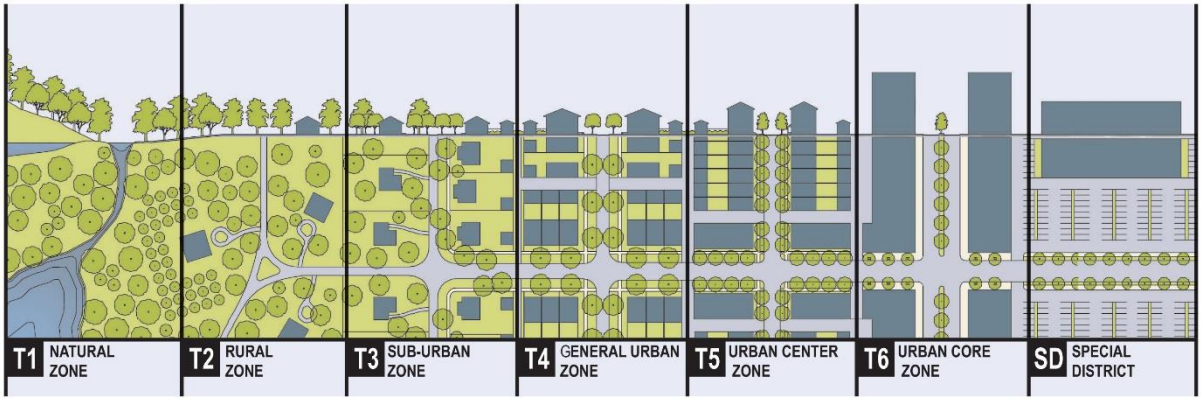


Figure 67: New Urbanist Transect, as detailed by Duany and Talen (2002).

Source: (Centre for Applied Transect Studies N.D.)

Incremental, successive development of Activity Corridors is also consistent with the idea of successively upgrading the mode of public transport along a route in line with development and population increases (Xu and Lin 2016). However, the interview respondents were strongly of the view that public transport infrastructure improvements needs to come first, to stimulate good land use planning and private property investment. There was concurrence among the small group of interview respondents that a reluctance to invest in public transport at State and Federal levels was impeding denser land use planning, and limiting the feasibility of more transit-oriented residential development projects. While alternative mechanisms and revenue streams for funding railway infrastructure have been suggested (Newman et al. 2016), the investor certainty that follows government commitments to fund urban rapid transit is ideal for enabling in-fill development projects (Property Council of Australia, The Greens and Australian Urban Design Research Centre 2013, 17)

Baum's (1999) theory of future-oriented public discourse, and participatory formulation of solutions to urban problems, is also supported by these findings. Mature, reasonable attitudes prevail, with evidence suggesting they have existed for at least the past decade (Department of Planning and Infrastructure 2003). (A collaborative process also enables residents to assess their attitudes with reference to their personal lived experiences, thereby potentially addressing their misconceptions or reservations.) However, cyclical changes in State Governments, resulting in recurring policy reversals, constrains the

potential to achieve the outcomes contained in policy (Jones 2014). The open-ended survey responses, and interviews with some stakeholders, found considerable malaise towards the existing system and resulting built form initiatives. It was identified that “flip-flopping” of the State Government transport planning agenda poorly serves the public, and engenders anger, distrust, cynicism and dissatisfaction. This research suggests that, further to impeding realisation of good infrastructure provision, this long-term uncertainty aggravates public annoyance, and does not respect long-standing prevailing public attitudes. Clearly, the public would prefer congruent transport and land use planning to simultaneously address the density, amenity, parking and traffic problems they perceive.

The solution to solving urban transportations is not just engineering, it is good planning (Mees 2000, 65). Despite the potential for Activity Corridors, the car remains central to urban planning in Perth. Clearly, the institutional power and process of MRWA is antithetical to the process of effective transit-oriented redevelopment along arterial roads. The multimodal urban form of Activity Corridors is incompatible with their stated goals of engineering vehicle traffic capacity. This issue is likely to constrain the provision of liveable, high-quality Activity Corridors as much as any local public resistance. Where urbanity in the built form is desired, an *urban* planning institution should coordinate a multi-agency approach, in conjunction with the community, and infrastructure providers. Interview respondents were generally positive about the current role of the Department of Planning, although some recognised that their primary focus on land use planning limited transit-oriented outcomes. Agencies such as MRWA should be infrastructure managers, subservient to the governments of land use, rather than an organisation of planning power and control. Furthermore, the self-fulfilling prophecy of car-oriented site and subdivision design has left an indelible requirement for parking provision. This remains a key “sticking point” in public perceptions of increasing density, and poorly planned developments threaten to give rise to additional public resistance. Both multimodal transport investments and innovative and efficient uses of parking may ameliorate the concerns of residents.

Clearly, improved, integrated and collaborative land use and transportation governance has the capacity to produce far more effective sustainability outcomes (Hrelja 2015). There is consistent and conclusive evidence that residents in Perth desire a modestly scaled city well

served by public transport (Department of Planning and Infrastructure 2003). There is, therefore, no excuse – nor any need – for current governance or practice to circumvent public discussion or ignore public attitudes and perceptions. In anything, the public view may be more progressive than planners perceive, but the failure to consult or communicate adequately results in ineffective and adversarial responses from members of the public. The evidence from the interviews and open-ended survey results suggests State Government institutions and decision-makers are often responsible for such failures in communication, particularly where the statutory control of multiple mono-focused agencies intersects. Clearly, an in-fill project with outcomes perceived as positive by the community will be effective not only in influencing perceptions, but proving that a model of transit-integrated urban arterial roads is an effective and high-amenity means of drastically improving car-reliant cities.

The sum of these findings suggest that there is an effective stalemate in delivering Activity Corridors in Perth, set by a combination of instructional power imbalances, path dependence, transit investment reluctance, residential developer uncertainty, and simplistic misrepresentations of public preferences. While innovative individual denser developments near arterial roads might be utilised to inform the public about the potential for desirable taller development, and individual public transport investments will be warmly welcomed by the public, there still lacks an effective marriage of implementation strategies in a coordinated approach to realise the full opportunity that Activity Corridors present. It is the planners – not the public – who are the problem.

Future Research

Some potential further research areas identified in this research project are:

- Willingness to pay values for parking, both residential and commercial,
- Willingness to pay for alternative modes of public transport,
- Evaluations of parking management strategies (Shoup 2005),
- Evaluations of alternative land use redevelopment incentives,
- Reasons for residential location choices and home selection,
- Idealistic desires for residential location (ie if money was no issue, where would you most like to live?),
- International trends in campus planning,
- Longitudinal changes in development preferences and
- Exploration of dynamics between engineering, planning and architectural professions.

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