Department of Urban and Regional Planning

Redevelopment on the periphery: An examination of the changing status of Armadale within successive strategic plans for Perth and corresponding revisions to local planning schemes

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This thesis is presented for the degree of Doctor of Philosophy of Curtin University 2015.

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

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Abstract

Armadale is a peri-urban centre located in Perth, Western Australia which has featured at various levels of prominence within metropolitan strategic plans since the *Stephenson and Hepburn Report* of 1955. Notwithstanding that the location has been the subject of some grand ideas within these documents, Armadale has struggled to change its status and rise to various visions set for it.

Armadale was originally established as a centre to service the surrounding rural hinterland. While other designated regional centres have developed to fulfil various higher order functions over time, it is contended that Armadale has struggled to reach this status. Armadale has been somewhat stigmatised as a relatively low socio-economic area suffering locational and social disadvantage with comparatively low regional significance. This situation however, is beginning to change.

This study is divided into two major areas of focus, strategic planning and statutory planning. It looks longitudinally at the various regional strategic plans developed over time from 1955 to the present for Perth, with a focus on Armadale, and seeks to determine the roles identified for it and the factors that may have inhibited or promoted its progress. It outlines the development of Armadale in response to various strategies in a bid to understand why the extent to which visions set for Armadale may or may not have been achieved.

This study provides an opportunity to understand how various theoretical and practical approaches including sustainability and urban consolidation can influence the planning of a peripheral or peri-urban centre over time. This analysis provides the backdrop to understand the recent challenges facing Armadale. In recent years, the development of Armadale has been influenced by planning approaches related to New Urbanism and urban consolidation. As such, since November 2005 the City has adopted a 'blanket recoding' approach which has sought to uniformly increase residential densities throughout the suburbs of Armadale, Kelmscott and Camillo under *Town Planning Scheme No. 4*. The impact of this significant statutory planning instrument is a central focus of this study.

Central Place theory ranks places in order of importance and sets out a retail hierarchy that has been applied to the study area. There currently exists a gap in the planning literature regarding the relationship between Central Place Theory and patterns of residential infill redevelopment in peri-urban areas, which this study has sought to address.

Empirical evidence suggests a relatively low uptake of redevelopment opportunities when offered to residents in an existing peri-urban area in the first few years of introduction. It is contended that this is due to a range of factors including a desire for private open space, a preference for larger dwellings and comparatively low land values which have not provided the necessary redevelopment 'trigger' to date. This study concludes by proposing a conceptual peri-urban redevelopment model that takes into account the relationship of redevelopment to central places and demonstrates relatively early attraction to such centres.

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Chapter 1: Introduction to the Enquiry of Strategic Planning in Perth

1.1.   Concepts of peripheral settlements

Peripheral settlements, also referred to as *peri-urban areas*, *the rural-urban fringe, in-between areas, peripheral growth centres, outer metropolitan growth councils, the built-up area outside the corporate limits of the city* and *outlying adjacent zones* are a distinct form of urban settlement that have traditionally functioned as a transitional zone between urban and rural land. Such areas often possess a metropolitan area on their inner boundary and a rural area on their outer local authority boundary (Buxton and Choy 2007; Gallent et al 2006; Iaquinta and Drescher 2000). Various definitions of peri-urban settlements convey to various extents, the interface nature of these areas as neither exclusively urban nor rural. Land use development patterns in such areas are typically characterised by the large-scale rezoning of vacant rural land.

German geographer H. Louis (1936) is recognised as one of the first scholars to focus on the concept of the urban fringe when he contributed to the research of Berlin's urban structure. He termed the fringe area as *stadtranzonen*, an area subject to the pressures of continual urban expansion (Feng 2004). Prior (1968) extended this idea by characterising the rural-urban fringe as a complex transition zone on the periphery of expanding urban areas, evident in most Western countries. According to Prior, a rural-urban fringe can only exist between a growing urban centre and its rural hinterland, so the concept can be considered as a residual zone between two more readily defined poles (1968). The rural-urban fringe represents the zone of transition in land use, lying between the continuously built-up urban and suburban areas of the central city and the rural hinterland.

Heimlich and Anderson (2001) have cited the failure of local authorities in the U.S. to effectively channel urban expansion to the most appropriate areas on the urban fringe. This ill-controlled growth is the result of demand for urban land which commenced in the early 1970s. Problems associated with development on the fringe include: loss of productive agricultural cropland, automobile dependence, cost of providing infrastructure (roads, pipes and wires) and the resulting uncontrolled fragmentation of the rural landscape as a result of unplanned rezoning proposals.

Gallent et al (2006) characterise peri-urban settlements in the U.K. as poorly planned, derelict and degraded, frequently ignored spaces. They represent highly pressured landscapes which must manage the continual threat of urban encroachment. Undesirable land uses are often drawn to the urban fringe including: waste disposal, car wrecking, sewerage treatment facilities, catteries, kennels and caravan parks. Employment land is also a common feature of the fringe including manufacturing, warehouses and distribution (light industrial uses). Peri-urban areas are often held in low regard and considered the antithesis of a quality landscape, requiring more effective spatial planning according to Gallent et al (2006). Fringe areas suffer from negative perceptions and negative representation as *non-places* taking on 'the appearance of a landscape littered with an assortment of disconnected uses, thrown onto the landscape with little forethought' (ibid 2006, 18).

Drivers for the expansion of urban fringe or peri-urban areas include population growth and residents' desire for open space. Such areas reflect cheaper land costs and are described by Heimlich and Anderson as 'a lifestyle much sought after by the American people' (2001, 3). This includes young couples in the early years of married life establishing their first home. Access to employment, schools, and the central city are all important considerations for a large proportion such households (Prior 1968). Perceived benefits of urban fringe areas include open space amenities, lower crime rates, lower housing costs, better air quality, more flexible transportation by automobile and the separation of residences from commercial and industrial activities, according to Heimlich and Anderson (2001).

Anderson (2008) disagrees that peri-urban settlements possess the above attributes and contends that they are often socially and economically marginalised, suffering from traffic congestion, poor quality open space, air pollution, and racial and economic disadvantage. Peri-urban areas 'teach us about the early processes of sprawl, such as the leapfrog development of affordable housing to the urban fringe and the largely unregulated sale of peripherally located land. They also reveal one of sprawl's understudied consequences: the construction of poor communities without the prior establishment of services necessary for health, safety, and property appreciation' (Anderson 2008, 19).

Iaquinta and Drescher consider that peri-urban environments reflect dynamic social change and mediate between the 'truly rural' and the 'truly urban' (2000, 2). The spectrum of change from rural to urban is discontinuous and multidimensional, and arises from underlying processes that increase economic inequality. As such, peri-urban settlements often attract migrants and the poor. Douglas (2006) similarly considers that such areas can be regarded as transition or interaction zones where urban and rural activities are juxtaposed. Valuable environmental areas on the periphery are often threatened by development including forested hills, woodlands, prime agricultural lands and significant wetlands. As such peri-urban areas are more unstable and vulnerable than either solely urban or rural settings.

Other scholars such as Davis (2004) regard peri-urban areas as a new kind of rural-urban hybrid landscape. Spatial definitions range from a 10 km zone beyond the city proper to a 100 to 300 km zone, as is the case in parts of East Asia and China (Webster and Muller 2000). As such, the peri-urban zone is not defined by a singular spatial measure. If this was the case, all of Europe and many other regions of the world could be considered peri-urban (Douglas 2006). McGregor disagrees with this view and considers that '30 – 50 km beyond the urban edge is a reasonable generalisation for large cities' throughout the world (2006, 11), a definition that can be applied to Armadale, which is located approximately 25km – 35km from Perth's centre. Peri-urban areas should be considered as a component of the wider city, rather than a separate entity as the city's economic and demographic processes function as a unified whole.

1.2   International perspectives of peri-urban regions

In various countries throughout the world, peri-urban areas are subject to changing international divisions of labour reflecting rapid industrialisation and economic development. In his study within the Pacific-Asian Region, which includes Sri Lanka and India, McGregor (2006) found that such centres accommodate the manufacturing and processing of high tech goods for global markets. Peri-urban development in Nepal has led to the transformation of formerly small villages into towns 'with 60 shops and 5 banks' (2006, 6). In African nations such as Ethiopia and Zimbabwe, peri-urban areas are often economically marginalised, and development processes

drive agricultural workers from their lands, further marginalising poor farmers, leading to loss of livelihoods. Likewise in Nigeria, freeway projects have led to competition for land leading to various local economic crises, further disadvantaging the poor (McGregor 2006).

Douglass (2010) considers that a major influence for the redevelopment of peri-urban zones in South-East Asia was the opening of banking and financial institutions to foreign investment. This permitted enormous injections of capital into the region that led to various large-scale urban land development projects, ranging from skyscrapers and world business districts to innumerable housing estates and new airports. Such rapid development placed enormous pressure on peri-urban areas. This investment resulted in the advent of a 'new age' of urban mega-projects focused on the expanding edges of the metropolitan region.

In a Tanzanian study, Kombe (2005) found that unregulated peri-urban development had given rise to city areas expanding in a disorganised, sprawling manner. Patterns of development had ignored planning norms and standards underpinning urban land use such as zoning, density distribution and principles such as the equitable provision of basic services and complementarity of land uses. Negative consequences of such growth were found to be exacerbated by poor national economic performance and looming poverty on the periphery. Webster and Muller (2000) found that unregulated peri-urbanisation resulting from manufacturing had led to rapid environmental degradation within China, Thailand and the Philippines.

In a more localised context, peri-urban areas have experienced significant population growth in the last three decades in most Australian cities. This is due to the comparative housing affordability and large open spaces they offer (Butt et al 2009). Jain (2008) considers that peripheral growth centres in Australia have been largely neglected from serious study, suffering from *ad hoc* planning, academic neglect and an incoherence of policy. This is due to their positioning outside of simple and fashionable policy options. Challenges for such areas include: poorly serviced social facilities, long commuting times, higher levels of car ownership, traffic congestion, noise hazards, waste disposal issues and a shortage of local employment.

Peri-urban settlements are often geographically, economically and politically disadvantaged with higher levels of unemployment, 'housing people in low socioeconomic groups who are reliant on non-professional jobs or are recently-arrived migrant groups with little skills to negotiate the complexities of urban dwelling' (Jain 2008, 127). Such areas often suffer from vague attention in regional planning and experience problems related to land speculation and leapfrogged development (Buxton and Choy 2007).

Within her study, Jain found that peripheral centres have been classified as 'working class battler disadvantaged, mortgage stress disadvantaged, old economy extremely disadvantaged or peri-urban disadvantaged' (2008, 129). According to Jain, such centres are characterised by a significantly lower proportion of the population with higher education and a higher proportion of those possessing no qualifications and with vocational (especially TAFE) qualifications compared to Australian averages. Jain also found significantly lower incomes among peripheral settlements than national averages, a high degree of welfare dependency and a relatively high presence of public or social housing (2008).

The VAMPIRE index developed by Dodson and Sipe (Vulnerability Assessment for Mortgage, Petroleum, and Inflation Risks and Expenditure) outlines the relationship between fuel prices and home mortgage interest rates. The index shows that households that move to outer suburban areas for home ownership reasons experience greater car dependence and more vulnerability to oil price inflation as a result of their shift. This is supported by the following mapping which generally shows 'high vulnerability' and 'very high vulnerability' for the south-east sub-region study area compared with 'minimal vulnerability' and 'moderate vulnerability' for the inner metropolitan sub-region (Dodson and Sipe 2008, 22). In the author's view, such problems are exacerbated by current strategic plans that promote car-based suburbanisation despite rhetorical commitments to reduce car reliance and promote travel by alternative modes (refer to Figure 1).
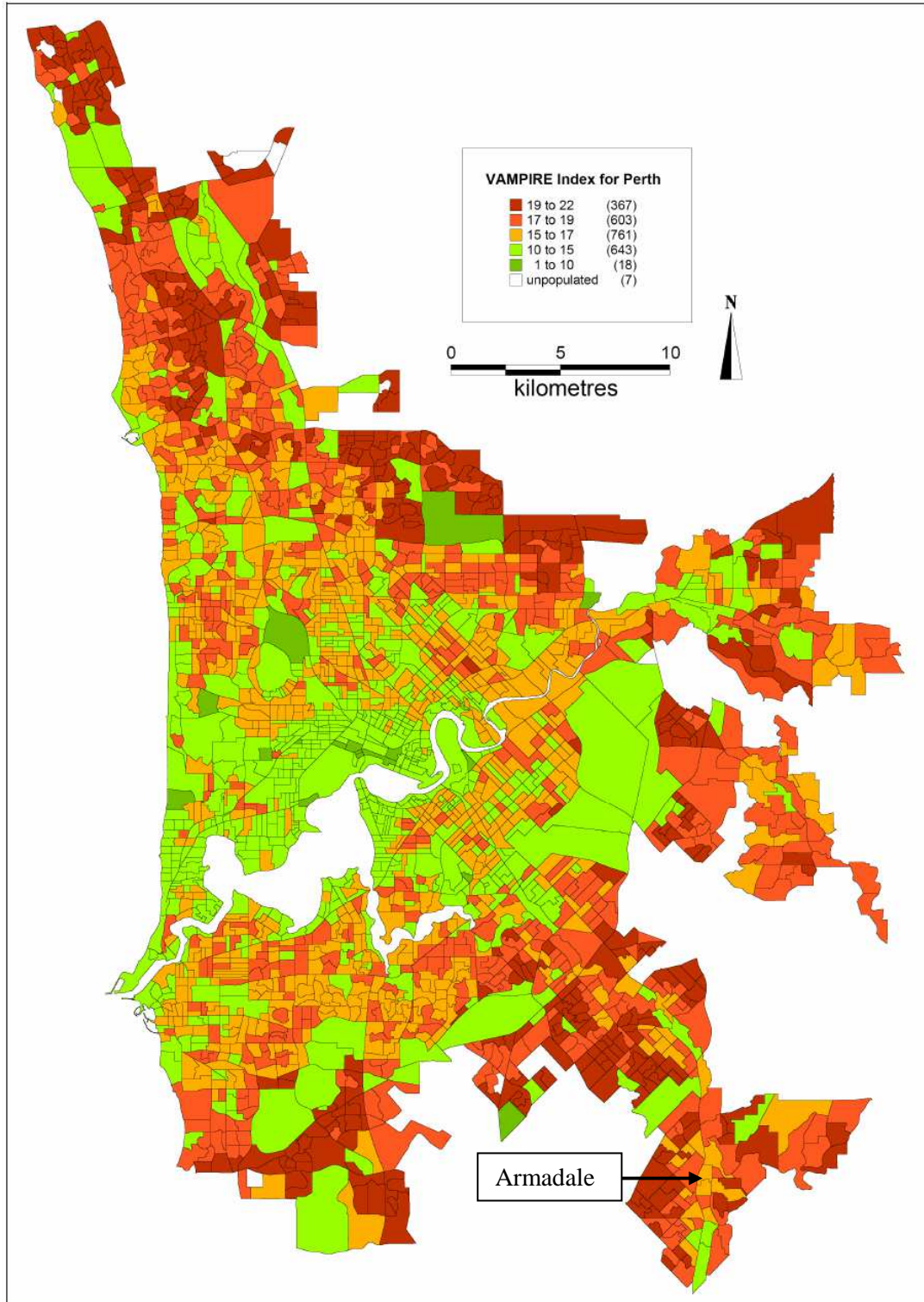
Figure 1: Mortgage and oil vulnerability in Perth. Generally, overall vulnerability is shown greatest on the periphery, away from public transport routes (Dodson and Sipe 2008).

1.3   Research Problem

Strategic plans cover large geographical areas and as such reflect overarching and broad principles. Within Perth's more recent plans, concepts such as 'accessibility', 'sustainability', 'liveability' and 'connectivity' are promoted (WAPC 2010). Past plans for Perth have typically adopted a universal, general or 'one size fits all' approach to the city's development. Several plans, including the *Corridor Plan* and *Metroplan* in particular, have neglected an in-depth analysis of various sub-regions, excluding a study of Perth's peri-urban settlements. Such plans seem to implicitly assume that a planning approach appropriate for one area will operate similarly well for all regions.

Such thinking assumes that built form, transportation and economic conditions are indistinguishable between various sub-regions when reality indicates that such elements vary substantially. This is evident within the above VAMPIRE index mapping which reflects vastly different transport vulnerability throughout Perth (refer to Figure 1). A planning approach that may prove effective for Fremantle, a centre with major historical significance to Western Australia, may not be applicable to Joondalup, for example, which was established only several decades ago. It is therefore contended that the 'one size fits all' approach evident within several of Perth's strategic plans since 1955 has not served Armadale well.

One 'gap' or research problem in this regard is that visions anticipated within strategic plans which may prove effective within inner city areas, do not always equate to delivery of high quality built form outcomes within peri-urban settlements. This is partly due to their overall neglect within overarching plans, a situation that has led to such centres struggling to a greater degree than other areas (Jain 2008). Peri-urban centres play an important and complementary role in supporting the metropolitan region's growth, and possess a unique set of challenges that require a more specific or tailored planning approach than that provided in past strategic plans for Perth.

1.4   Research questions

Planning practice in Western Australia is divided into two main areas of focus, statutory and strategic planning. The following research questions to be addressed throughout this study include a focus on both in relatively equal measure:

1. To what extent do peri-urban settlements develop over time in accordance with visioning set out for them in planning strategies? This question, which has a focus on overarching plans, seeks to ascertain how the strategic planning process can hinder or promote the reshaping of communities. It also seeks to ascertain how effectively planning strategies are implemented.

2. To what extent do peri-urban settlements respond to redevelopment opportunities provided by local planning schemes? This question, which has a statutory focus, seeks to ascertain the relationship between the rezoning of existing urban areas and the ways in which the local community responds by utilising Central Place Theory as a lens to examine the study area.

3. How do planning strategies inform the preparation, review and assessment of local planning schemes and local planning strategies? This question seeks to identify links between overarching higher order plans and more detailed, fine grained plans by identifying any connections between statutory and strategic plans.

1.5   The study area

This study is carried out on the south-eastern peri-urban area of the Perth metropolitan city to determine development patterns from both strategic and statutory planning perspectives. The former includes an analysis of past overarching plans for Perth and their vision for the study area since the mid-1950s. The latter includes statutory planning: day to day planning decisions undertaken by State and local authorities, which include rezoning (scheme amendment) proposals, subdivisions and development applications.

This study will focus on the current planning scheme for the City of Armadale, *Town Planning Scheme No. 4*, introduced in November 2005, to examine its influence within the local planning and redevelopment process. A local or town planning scheme is a legal document that applies to a defined area and confers rights on land by specifying how this land may be used and developed. Town planning schemes outline the processes to be followed before development can occur and provide a local authority with the ability to enforce the provisions of the scheme to ensure orderly and proper planning (City of Nedlands 2013).
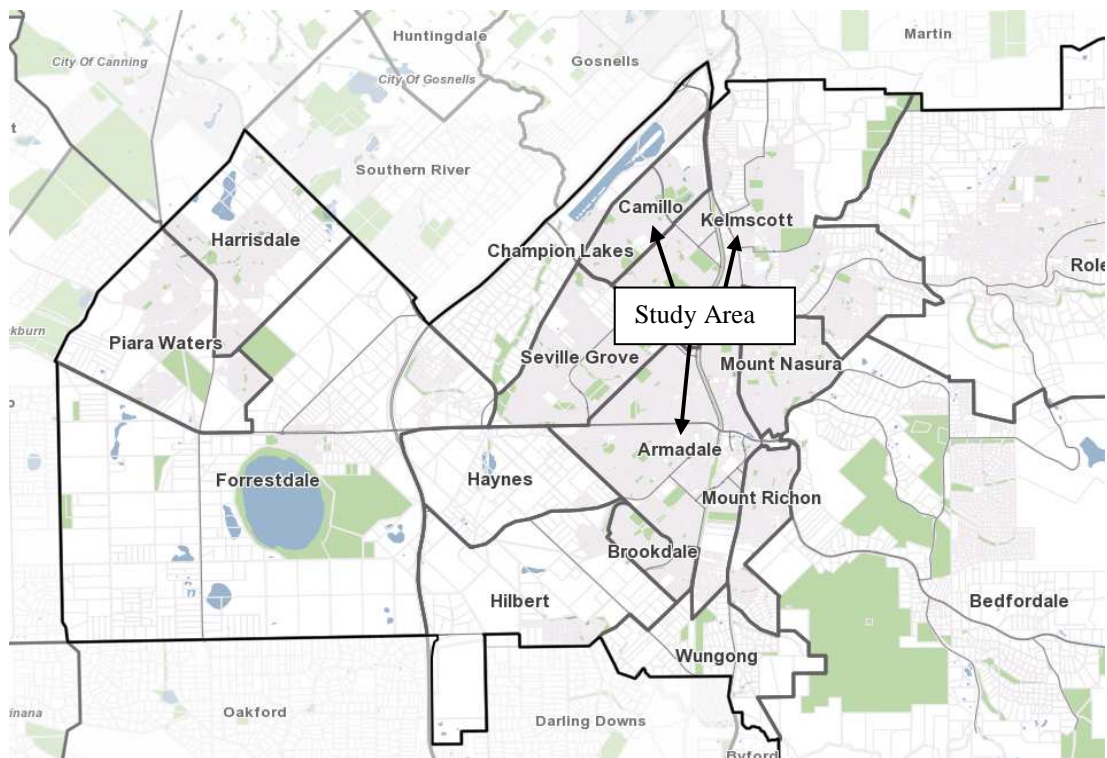
Figure 2: The study area includes Camillo, Kelmscott and Armadale (City of Armadale 2014).

The City of Armadale occupies a total area of 560km^2 (ABS 2014), however this study seeks to narrow the geographical focus to three suburbs, Armadale, Camillo and Kelmscott. These suburbs accommodate a high proportion of original 1960s and 1970s dwelling stock on relatively spacious lots of approximately 700m^2 to 1500m^2 in area (City of Armadale 2014). For the purpose of this study, the term *flatland suburbs* has been applied to the study area, located on the lower-lying flatter portion within the City of Armadale (refer to Figure 2).

This area is distinct to those suburbs located within the hills district such as Mount Nasura, Roleystone and Bedfordale, located to the east of Albany Highway, a primary regional road and freight route. The study area has traditionally accommodated relatively affordable dwellings with a high proportion of rental and State housing stock.

The *City of Armadale Local Planning Strategy* (2005) describes the study area as 'characterised predominantly by low density single storey housing constructed since the 1960s. Although an established suburban area, there are substantial pockets of vacant land suitable for infill residential development. Scope exists for revitalising old housing stock and infill development on vacant land and medium density housing up to R40 within 400m of existing commercial centres and railway stations' (2005, 17). Under the previous local planning scheme, redevelopment of lots within the study area was restricted via low density 'Residential R15' zonings (666m^2 average lot size). Existing housing stock within the study area could be described as being in 'average' condition with many examples observed in relatively 'poor' condition, including many ageing brick and tile and weatherboard dwellings (refer to Figure 3).

Figure 3: Existing housing stock on large lots in Kelmscott subject to higher dual codings under Town Planning Scheme No. 4. This land is contained within the study area (Author 2014).

The area selected as a focus for this study contains similarities to many well-established Australian suburbs of a comparable age: it is well-serviced with recreational areas such as parks and pedestrian walkways and contains services such as district centres, corner shops, schools, medical services and petrol stations. The study area is located 30 minutes by vehicle or passenger rail, (approximately 25km – 35km) from Perth's central business district. Thus according to current planning approaches which promote higher residential densities close to rail transport and commercial infrastructure, the area is suitable for urban intensification (refer to Figure 4).
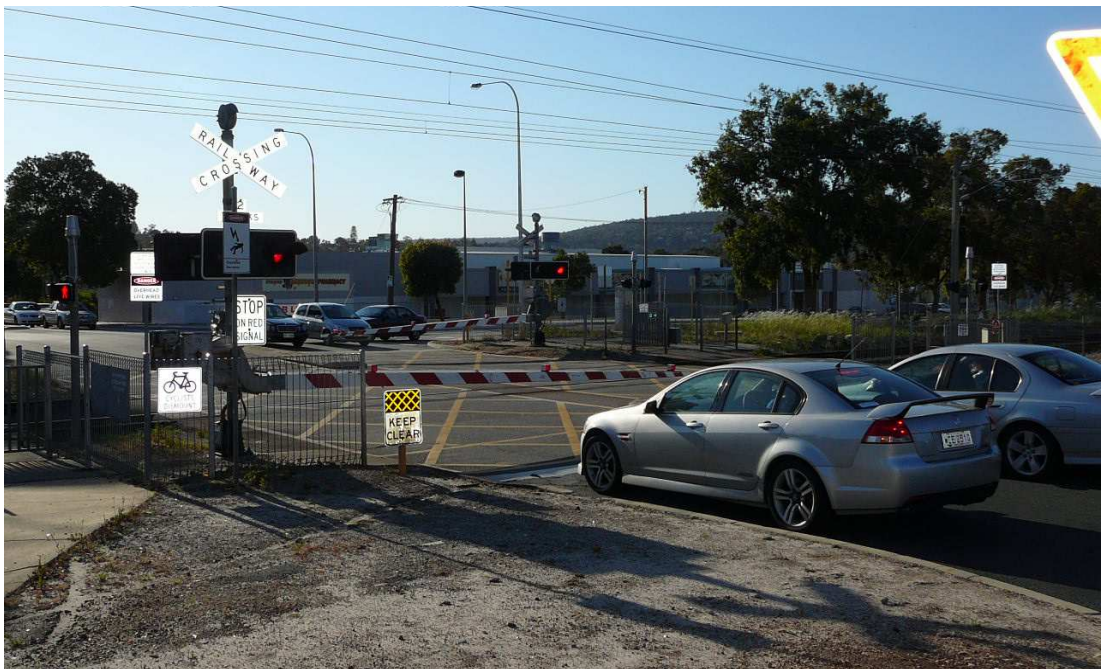
Figure 4: The City of Armadale is bisected by an established passenger rail network (Author 2014)**.**

Such attributes have enabled justification for higher residential codings, however implementing the local planning scheme since 2005 has not proven a straightforward process for the local authority. This is due to a number of factors, including the relatively poor condition of many existing dwellings within the study area, located on land which was never intended for redevelopment. Another factor has been the lack of development guidance and planning controls provided by the local planning scheme, which has led to poorer than anticipated redevelopment outcomes (City of Armadale 2007).

The challenge for the local authority in this regard is not only enhancing the quality of the City's existing housing stock, but also ensuring that high quality redevelopment renews poor amenity streetscapes. To address this issue, all redevelopment proposed at a higher coding must demonstrate compliance with *Residential Density Policy PLN 3.1* (City of Armadale 2007). Redevelopment approval is dependent upon meeting certain criteria with associated conditions intended to provide benefits to the locality. These address matters of an environmental, social and economic nature, such as the provision of high quality common areas, retention of significant vegetation and providing a financial contribution for footpaths adjacent to development sites.

Since 2005 the City has aimed to regenerate the study area via a blanket recoding process (City of Armadale 2005). Blanket recoding or upcoding is a planning mechanism which seeks to uniformly increase densities throughout entire suburban areas (refer to Figure 5). It can be considered distinct to targeted rezoning, where suitably identified areas are recoded close to activity centres and provide a gradation in zones throughout a local area.
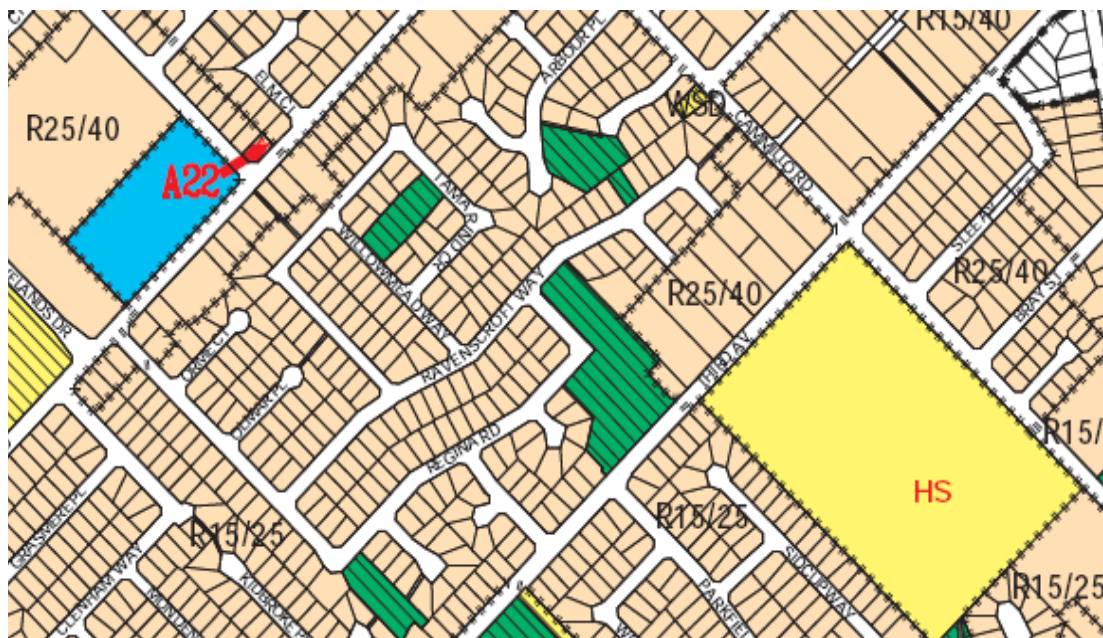
Figure 5: An example of the 'blanket rezoning' approach introduced in study area suburbs Kelmscott, Camillo and Armadale under Town Planning Scheme No. 4 (WAPC 2013).

'Split' zoning exists where a land parcel accommodates two separate codings: the lower code or base code allows development as a permitted 'right' with the higher, second coding permissible when certain redevelopment conditions are met. This mechanism was introduced within the City of Armadale at the behest of the then Planning Minister Alannah MacTiernan, who oversaw a number of large scale projects including the Champion Lakes Development, managed by the Metropolitan Redevelopment Authority and LandCorp (MRA 2014).

The City of Armadale currently accommodates an estimated 75,725 residents (City of Armadale 2015). Strong, continued population growth is anticipated for the city to 2031 which will see the local population almost double in size (refer to Figure 6).
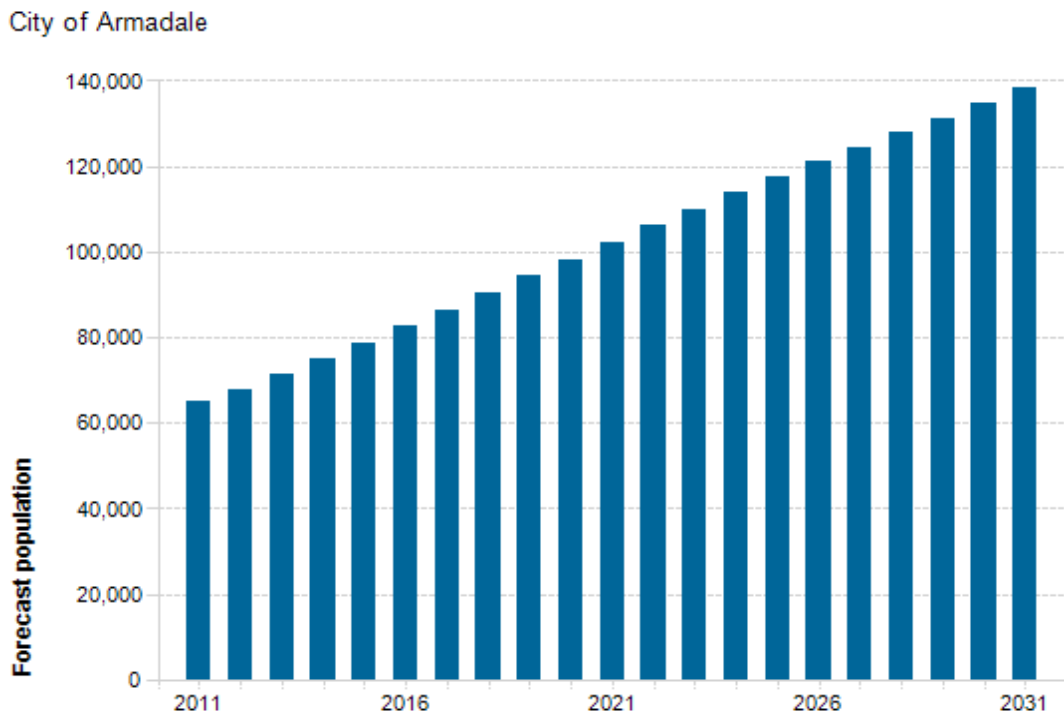
Figure 6: Population forecasts for the City of Armadale show consistent population growth to 2031 (ABS 2014).

1.6   Shift in focus of Perth's strategic plans over time

An examination of planning instruments for Perth over the last six decades reveals a continual evolution and shift of ideas, trends and approaches. Planning approaches current at a given time influence the content of plans as some ideas are promoted, while others are marginalised or excluded. It is a largely neglected, but worthwhile exercise to examine past and current plans for local areas. The value lays in the recognition of the basis of past decisions which can be clearly understood to identify approaches which have shaped the city both positively and negatively over time. This evolution in ideas can be clearly seen throughout strategic plans for Perth since 1955, and is also reflected within local planning schemes, local planning strategies and local planning policies.

At a strategic level, Perth's growth was first influenced by the development of the 1955 *Stephenson and Hepburn Report* and the subsequent *Metropolitan Region Scheme* (1963), which established a regional planning framework for the Perth metropolitan area. Following this, the *Corridor Plan* (1970), *Metroplan* (1990) and more recently *Network City* (2004) and *Directions 2031 and Beyond* (2010) have served as overarching strategies to guide metropolitan Perth and Peel's development. Under the current iteration of the *Metropolitan Region Scheme*, land identified for urban development equates to more than 140 km from north to south, a situation which shows no signs of being curtailed given Perth's appetite for large dwellings on spacious lots.

Adding to the challenge, with some notable exceptions such as the Perth to Mandurah rail link and plans for light rail transit services, Perth's urban framework assumes a high level of private motorised mobility amongst the public and is internationally recognised as low density sprawling city (Falconer 2008; Newman and Kenworthy 1999). Since 1955 Perth has grown far beyond the metropolitan boundaries that successive plans have drawn (refer to Figure 7). Its voracious appetite for growth has caused it to consume two and a half times the land that Perth's first comprehensive metropolitan region plan allocated to accommodate its population (Alexander, Greive and Hedgcock 2011).

Figure 7: Mapping from Directions 2031 and Beyond showing Perth and Armadale's urban expansion since 1925 (WAPC 2010).

Perth has historically accommodated two eastern, non-coastal peri-urban sub-centres, Midland and Armadale. Both have featured in each of Perth's strategic plans to varying degrees with a particular focus, form of development and function assigned. Armadale was first represented within the *Stephenson and Hepburn Report* (1955) as an agricultural settlement bisecting the extent of the metropolitan area. Accessible firstly by road and rail as an isolated settlement, then forming the extent of a corridor to an emerging sub-region, as a centre of major commercial and urban expansion and most recently as a centre for higher density infill redevelopment, Armadale's development has been strongly shaped by the strategic planning process.

The statutory planning process has been equally important, as day-to-day decisions made by local authorities reflect higher-order frameworks and longer-term visions provided for within strategic plans. More recent strategies have seen Armadale form a significant component of Perth's land supply due to population and housing affordability pressures. As Perth's low density suburbs have continued to spread outward, many young families have been increasingly attracted to Armadale, the focal point of the south-east sub-region (WAPC 2010). It was perhaps inevitable that the low density expansion of urban growth that has been characteristic of Perth's development since 1955 would over time spread contiguously in an easterly direction to Midland and Armadale. A major reason for this has been the favourable conditions offered by Perth's peri-urban settlements with respect to land affordability and an abundance of open space, considered by many new residents to provide ideal conditions for raising families.

Early strategies for Perth were prepared in the context of accommodating population growth and associated suburban expansion, however since the early 1990s an emphasis on urban consolidation has been reflected. Elements now considered central to modern strategies such as: bushland and groundwater protection, buffer zones, the need to protect culturally significant areas, encouraging high density development, transit oriented development, mixed-use development and similar aspects were largely absent from plans prepared prior to *Metroplan* (1990). *Metroplan* represented a symbolic turning point for planning in Perth, during which time newly emerging social and environmental aspects were introduced.

Overarching objectives characteristic of more recent planning strategies include: reducing travel distances to shopping precincts, services and employment, encouraging greater use of public transport, constructing pedestrian friendly streets, enabling greater levels of community interaction, preserving urban amenity and establishing a more functional public realm. Such objectives are reflected within State planning policies such as *Liveable Neighbourhoods* (WAPC 2007) and the *Residential Design Codes* (WAPC 2002; 2008; 2013) as well as within local planning schemes and local planning strategies, instruments utilised by local authorities to guide decision making.

These objectives aim to reduce the cost of infrastructure at the urban fringe and seek to promote a more equitable, vibrant, and safer city. In more recent times, urban infill has been strongly promoted as using less urban land to house a given population is associated with reduced road construction, travel demand, carbon emissions and other environmental impacts and more efficient use of public transport, utilities and community infrastructure (WAPC 2010).

Prior to 2005, the City of Armadale prepared a draft local planning scheme which provided no significant revisions to existing residential densities in the flatland study area, which meant the primarily R15 ($666m^2$ average lot size) or 'low density single dwelling per lot' model would remain in place for the foreseeable future. The then current political mood favouring sustainable development meant that this 'business as usual' approach was deemed inappropriate by the Labor State government of the day, who sought to promote urban consolidation principles and the draft local planning scheme was not endorsed.

The scheme was subsequently revised by the local authority to include higher density 'split codings' of R15/25, R15/30, R25/40 and R15/40 within the study area. Significantly the driver for higher densities emerged from State Government, rather than from a local government level. This demonstrates the manner in which prevalent planning approaches in vogue at a given time (such as urban consolidation, sustainable development and New Urbanism) can shape and influence local planning schemes and strategies beyond local government areas.

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1.7   Research aims

The study area has been impacted over time both by various strategic visions as well as revision to residential codings within statutory planning instruments, which most recently has led to the redevelopment of existing lots. As such, this study aims to identify and clarify the unique challenges and issues that settlements on the periphery face. It sets out to conduct a comprehensive evaluation of three established suburbs within the City of Armadale as a case study to evaluate the impact of various planning and infrastructure decisions which have contributed to its development over the last six decades. It will analyse Armadale's progression in the context of past planning strategies for Perth as from the time of the earliest strategies prepared, Armadale has featured as an important focal point of the south-east sub-region.

All of Perth's planning strategies since 1955 have reflected various theoretical considerations in vogue at the time of their preparation and release. These include Central Place Theory advanced by Christaller (1933) and later adapted by Berry and Garrison (1958) concerned with the way that settlements agglomerate and function. Central Place Theory is considered by a number of scholars including Beavon (1977) and Trubka (2011) to be in a declining stage of influence. As a commercially oriented model however, it ranks communities according to the assortment of goods available in each that explains the size, number, and spacing of distribution centres to serve a dispersed population and as such is considered useful as a tool or 'lens' in the context of this study.

This study will also undertake an analysis of the most significant planning approaches since 1955 that have influenced the development of Perth and the study area. Theories and approaches significant to the preparation of planning strategies will be explored throughout this study. Such approaches have been examined due to their inclusion within various strategies and can be considered as possessing a high level of currency during the preparation and release of various plans. In addition the impact of infrastructure decision making including the development of highway corridors and passenger rail services will be explored as well as the role of significant individuals in shaping the development, promotion and advancement of Armadale.

This study will identify rates of redevelopment undertaken when planning instruments such as local planning schemes are revised, permitting redevelopment of recoded lots. Such mechanisms have the potential to impact greatly upon residential amenity, affordability and liveability in peri-urban areas. Redevelopment of original lots permissible under the 2005 local planning scheme challenge the model of large front and rear private open spaces and represent a departure to traditional Australian suburbia. In this context, the following objectives have been set for this study:

1.8   Objectives of the study

1)   To examine longitudinally the various planning strategies which have impacted Armadale since 1955 when the first strategic plan for the Perth region was introduced;

2)   To identify the extent to which Armadale has achieved various targets / visions of these strategic plans against what the plan forecasted for the area;

3)   To determine the nature and theoretical underpinnings of redevelopment in Armadale with specific focus on residential infill subdivision; and

4)   To determine how to best plan (both strategically and statutorily) for sub-regional centres on the periphery.

1.9   Rationale

This study seeks to contribute to an increasingly important debate regarding the development of settlements over time, particularly how cities manage population growth due to or despite strategic planning. Strategic planning will remain critical into the future as cities attempt to manage population growth within existing urban areas. The research is relevant to the concerns of demographers, the development industry and local planners in the work in which they engage. This empirical work seeks to set the foundation for a greater narrative of interest to those responsible for the future planning of our cities, particularly within those areas requiring revitalisation, where retrofitting sustainable principles within existing residential areas poses significant challenges.

This thesis addresses universal principles that if applied, could enable cities to fundamentally work better as they can apply to the redevelopment of low density peri-urban centres located throughout many parts of the world, particularly U.S.A., New Zealand and Australia. The data employed in the analyses of this work are based on an Australian city seeking to transition from lower density towards medium density redevelopment with a primary focus on a growing peri-urban sub-region. Many cities are currently seeking to address issues related to urban form and addressing the key question of whether to build out or build up (Weller 2009). Armadale has traditionally chosen the somewhat easier 'build out' option, however through urban densification, this emphasis is slowly beginning to shift.

Historically, the City of Armadale has experienced relatively low densities similar to other areas in Perth. An abundance of land has enabled its housing stock to conform to the Australian standard of a detached, single-family home on an individual, relatively large lot, which the literature widely confirms as Australian preference (Hussey 2002; Kotkin 2006; Vallance et al, 2004; Weller 2009). As with similar areas facing growth pressure and sustainability concerns, the City has increasingly sought to encourage a more intensified urban form as a sustainable alternative with new solutions being sought to accommodate growth within existing city boundaries. In this regard, a major challenge identified by Searle (2007) and Weller and Bolleter (2013) is the reluctance of many residents to accept higher density housing. Often referred to as 'not in my backyard' or NIMBYism, it can be considered a major challenge to redevelopment in established urban areas, potentially preventing the implementation of urban consolidation.

An analysis of past development within the study area reflects dominant planning concepts considered important at the time. For those areas that have not seen successful implementation, decisions should be understood in relation to metropolitan strategic plans. A review of the planning literature reveals a lack of studies that evaluate the actual performance or effectiveness of various policies that are adopted, reflecting the thinking among planners at the time. As new theories gain currency, new plans are made, often without a thorough evaluation of previous plans (Middle 2010). This study seeks to address this gap in the current planning literature.

1.10   Theoretical framework

This empirical study focuses on procedural planning theory and hence looks more into aspects of 'theories in planning' (substantive) rather than 'theories of planning' (procedural) (Faludi 1973, 7). In other words, while the study will inevitably deal with the substance of planning, it will essentially explore the prescriptive aspects of procedural planning, i.e. how planning is carried out. This study will analyse procedural planning from visionary strategic concepts to implementation and assess the findings in relation to the objects or substance of planning and whether the adoption of procedure eventually justifies the need to plan.

It takes a retrospective view of the extent to which the assigned role for a particular locality, accompanied by supportive polices at various levels, is able to be played out. Since the object of planning strategies is the highest use of land and optimal land use allocation, the rate of successful implementation can be verified over time by studying the built environment. This study seeks to test the relevance of these types of theories by monitoring the impact of planning policies informed by such planning concepts on the resultant built environment and urban form over several decades. In broader terms it seeks to test the relevance of theories and their implementation to the overall benefits for the community that planning seeks to deliver.

This study will look into the effectiveness of planning and plans at different levels, mainly the broader strategic level and the local development control level. It uses a case study approach to highlight procedural issues and limitations of plans that could be attributed to either the shortcoming of theories in failing to explain various phenomena, a theory-practice gap, or miscalculations by planners, among other things. In so doing, it serves to evaluate the relevance of planning theory to regional development and urban form outcomes.

This study can also serve as a step towards informing planning practice by separating sound and relevant theory from some which is less valuable in terms of delivering built form outcomes. Planning agencies control land use and thereby seek to shape the development of the built environment at a local level. Planning is carried out at various levels of application, primarily through State and local authorities.

The scale of decision areas determines the level of detail considered in planning and decision-making and the nature of planning tools utilised. The relationship between direction setting through broader regional strategic planning and its implementation and manifestation in physical urban form by means of local development controls is supposed to be complementary in theory. However, the connection between the two may not always be as clear as envisaged by planners and policy makers.

This study presents Armadale as a peripheral sub-regional centre that has featured in the regional strategic considerations of the Perth metropolitan region from the time when the first strategic plan was prepared. It sets out to analyse Armadale's status as a regional entity as well as describe it in terms of its relationship to the central city as a peri-urban sub-regional centre. The various roles assigned to Armadale within Perth's overall development over the past six or so decades will be identified and the strengths and weaknesses of each strategy evaluated in relation to those. The visioning of Armadale at various periods will also be investigated to explain the locality's changing status within these successive strategic metropolitan plans.

To gain insight into the approach of planners regarding Armadale, contemporary dominant planning theories, particularly those influential at the time of each strategy's preparation, concerned with the way that settlements evolve, will be discussed. It is contended that Armadale's location has been the major determinant of its current status and it has also been impacted by the policies formulated for its development over time. In order to better understand the values and principles that the earlier planning strategies were based on, the planning theories in vogue at the time are used to describe and assess implementation on the ground.

The effect of the location of Armadale in relation to Perth, therefore will be explored according to Central Place Theory developed by Christaller (1933) and the core-periphery model developed by Friedmann (1966). Central Place Theory (CPT) was developed by Walter Christaller in the 1930s who postulated the existence of a settlement hierarchy in his book *Die zentralen Orte in Suddeutschland* (Central Places in Southern Germany, 1933).

Christaller postulated a 'stepped hierarchy' view that affords a meaningful approach to the analysis of systems of central places, particularly for small and medium sized areas 'and is attested by a considerable body of literature contributed from different parts of the world' (Dick 1973, 75). Successive discontinuities separate lower from higher order centres enabling identification of the hierarchical status of various centres.

The theory is commercially oriented and ranks communities according to the availability of goods and services available. At the bottom of the hierarchy (lower order) are centres that offer provide basic daily necessities. Larger central places carry basic as well as more specialised goods (higher order). Within any given market, there exists a larger number of purveyors of 'lower order' (lower threshold and range) goods and fewer sellers of 'higher order (higher threshold and range) goods (Beavon, 1977).

It is therefore considered that Central Place Theory provides an appropriate lens or tool with which to examine recent redevelopment trends within the study area. A gap currently exists between Central Place Theory and the nature and agglomeration of redevelopment, which this study aims to address (refer to Figure 8).

Conceptual framework of the study
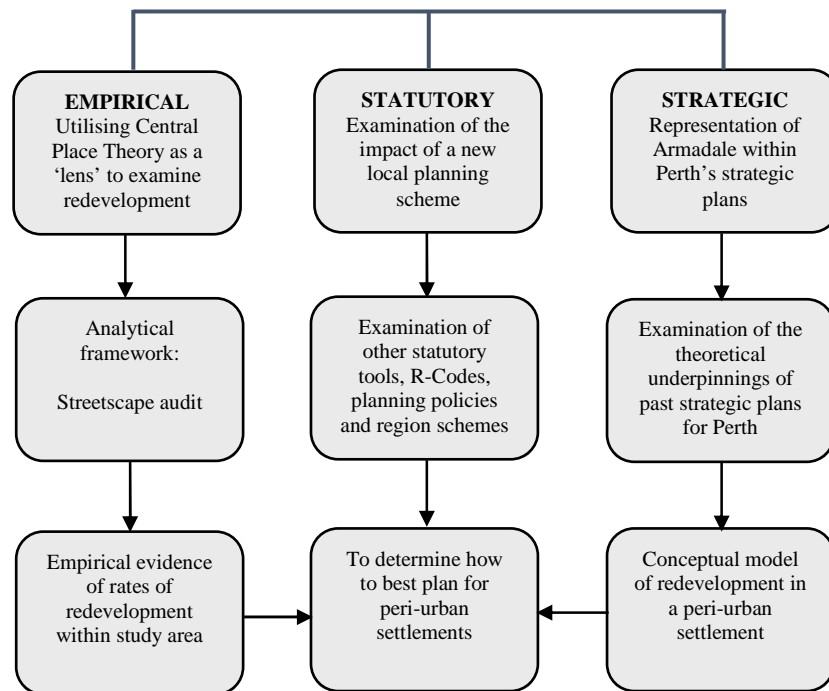
Figure 8: Structure of study: Changing status of Armadale within successive strategic plans for Perth and corresponding revisions to residential codings under local planning schemes.

1.11   Evolution of metropolitan planning in Perth

Perth's development has been characterised by cyclic periods of economic boom and decline, by an unabated process of population growth and urban expansion and by a dominant ethos of frontier development according to Yiftachel and Hedgcock (2007). They identify four main historical stages in the development of Western Australia, broadly corresponding to the preparation of strategic plans: professional pioneering (1892-1951), professional strength and public consensus (1951-68), professional strength without public consensus (1969-82); and challenges to planning (1983-92).

Six main features are considered characteristic of the development of planning in the State: pioneering heroism, professionalisation, economic facilitation, politicisation, fragmentation, responsiveness and decline, summarised as follows:

Stages	Years	Elements	Result
1.*Pioneering heroism*	1910 – 1960's	Commitment and vision of three local planning 'legends': William Bold, Harold Boas and Gordon Stephenson.	Important visionaries paved the way for the development of the planning profession as it is known today.
2.*Professional-isation*	Planning's 'golden age' 1950s to late 1960s	Mandatory introduction of planning in all local authorities and the initiation of planning education.	Establishment of the institutional and professional foundations on which planning rests today.
3.*Economic facilitation*	Most notably since the 1970s	Planning was mainly about facilitating, promoting or initiating development and growth.	Most major plans and strategies have attempted to create economically efficient conditions at the expense of urban reform and social justice goals.
4.*Politicisation*	1980s	Direct government involvement in what was previously considered the domain of 'independent' planning advice.	An inevitable politicisation of the profession occurred, most notably since the 1970s.
5.*Fragmentation*	1980s	Tensions started to appear within the planning profession along locational, affiliation or ideological lines.	A natural consequence of the politicisation of planning, diversity of ideas in planning emerged.
6.*Responsiveness*	1990s to the present	Local engagement and community consultation increasingly part of the established character of West Australian planning.	Planners became more attuned to the needs of their constituencies and subject to greater demands for accountability.
7.*Decline:*	2000s to the present	Emergence of other, often more powerful agencies and methods of land use control and a greater reliance on 'the market'.	Loss of influence in recent years and circumventing of the planning system by development-seeking governments. A rise in influence of environmental and heritage bodies.

Table 1: Stages of planning in WA, adapted from Hedgcock and Yiftachel (2007).

Strategic planning in Western Australia has a relatively short history. 'Although the planning of the State's urban and rural settlements began 165 years ago, the activity as it is known today (that is, the control of land-use and development) started to strike popular roots in the State only a century ago' (Hedgcock and Yiftachel 2007, 297). The organisation of planning in Western Australia was not complete until the mid-1960s, when metropolitan and local planning in the Perth region became mandatory, rural towns began to prepare planning schemes, and the first planning education course was introduced at the Perth Technical College. Since that time, planning has extended beyond the traditional realms of development control into new areas, such as the preparation of environmental and social impact assessments, the initiation of regional and rural development policies and the introduction of the *State Planning Strategy* (ibid 2007).
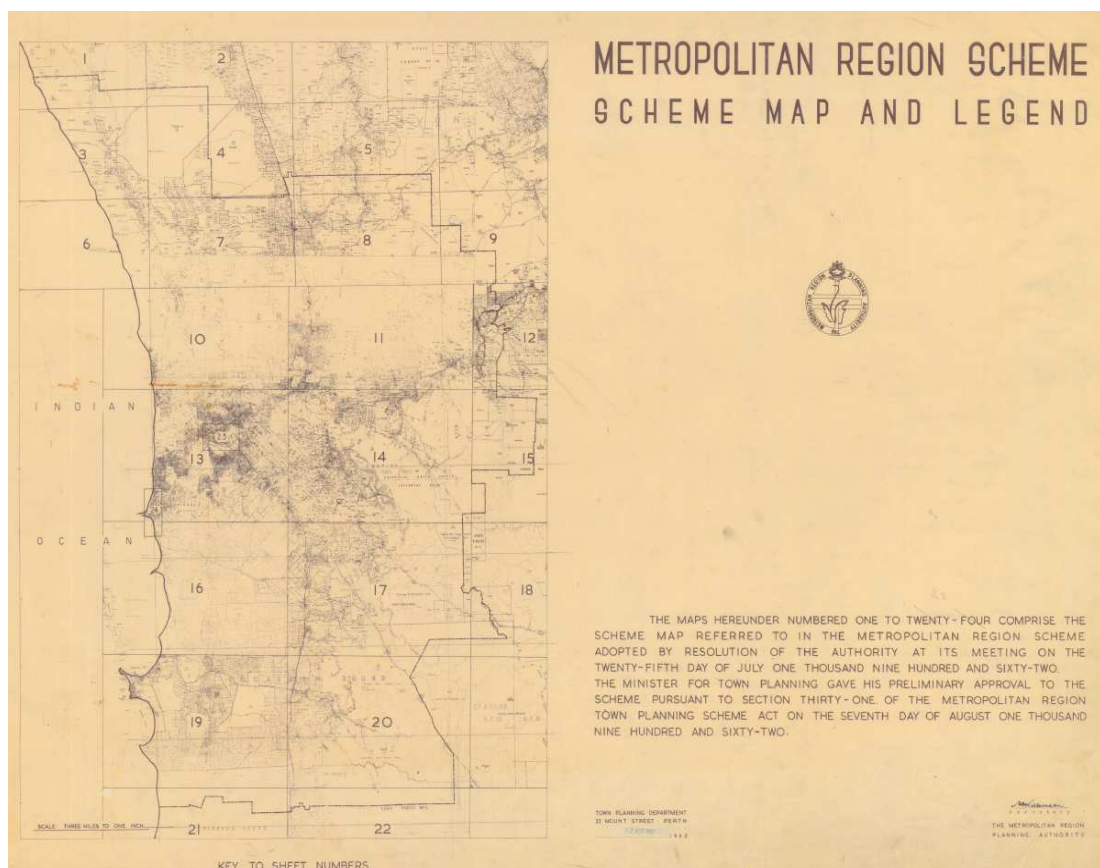
Figure 9: Earliest index of the Metropolitan Region Scheme which included 24 detailed maps (WAPC 1963).

1.12   Activity prior to the Stephenson and Hepburn Report

The *Town Planning and Development Act* (1928) and the *Metropolitan Town Planning Commission Act* (1927) emerged as Perth's earliest planning instruments. The 1928 Act, drafted by William Bold was a comprehensive and powerful piece of legislation which created the institutional pillars of West Australian planning — the *Town Planning Board* (to approve subdivision and advise the Planning Minister on local planning) and the *Town Planning Department* (to advise the Board). It provided for specific control over planning at a metropolitan and local level, as well as establishing more general control over the subdivision of land throughout the State (Hedgcock and Yiftachel 1992). Following the release of the *Stephenson and Hepburn Report*, the *Metropolitan Region Scheme* was released in 1963. Since this time, this large scale 'broad brush' planning instrument has provided an overarching framework for the subsequent expansion of Perth (refer to Figures 9, 10, 13, 14).

Following the release of the *Metropolitan Region Scheme* in 1963, various strategic plans were released for Perth. These included the *Corridor Plan* (1970), *Metroplan* (1990), *Network City* (2004) and *Directions 2031 and Beyond* (2010). These strategic plans have provided Perth with the framework to enable subsequent planning decisions by State and local authorities. The relationship between strategic and statutory planning in Western Australia can therefore be considered a close one. At a finer grained level, the local planning system sets out an established set of zones reflecting a formal structure that permits decision making at all levels of the planning process. Planning instruments utilised within the statutory planning process include various local planning schemes as well as the *Residential Design Codes* (WAPC 2013) and *Liveable Neighbourhoods* (WAPC 2007).
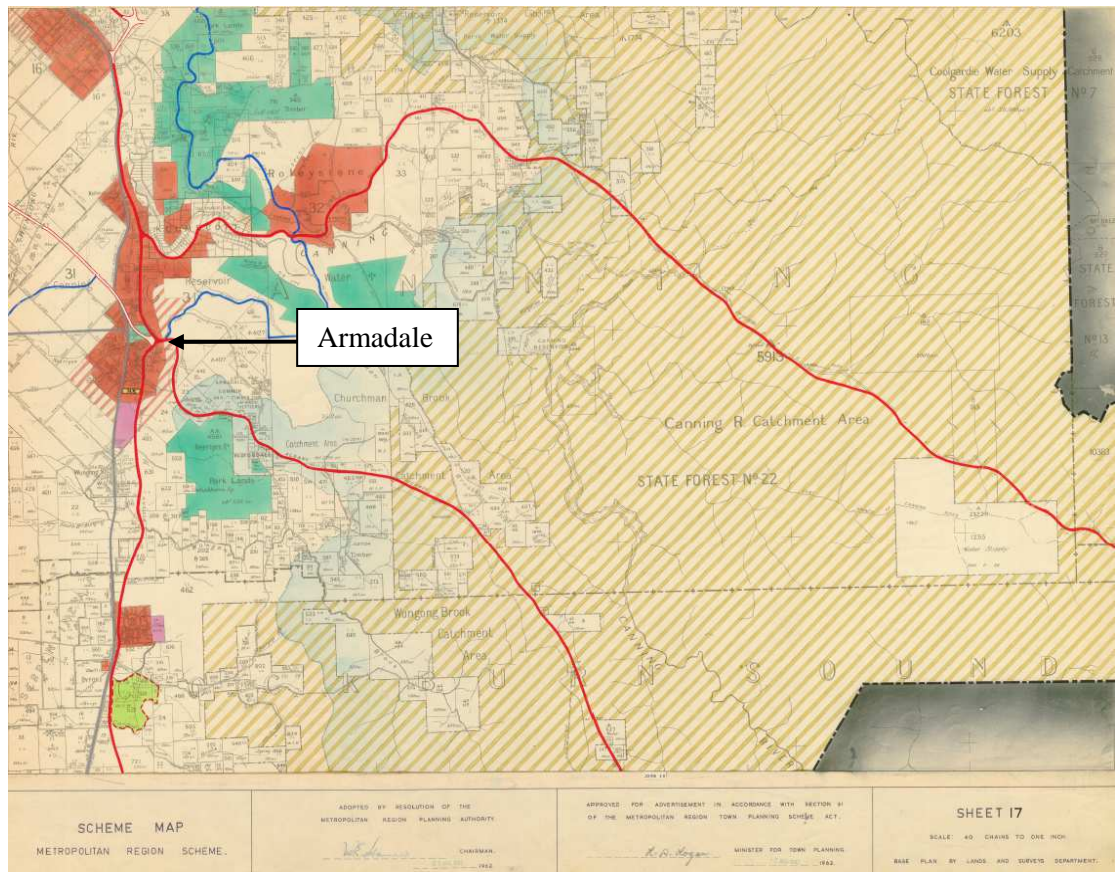
Figure 10: Sheet 17 of the 1963 Metropolitan Region Scheme representing the Armadale district (WAPC, 1963).

1.13   Organisation of the thesis

Chapter 1: Introduces the context and major issues and provides a brief summary of the structure of the report. It also outlines the research aims, rationale and theoretical framework. Chapter 1 also provides some background to the planning of Perth and Armadale, and outlines planning activity prior to the introduction of the *Stephenson and Hepburn Report* (1955).

Chapter 2: Introduces the methodology utilised including the research approach, outlines the geographical scope of the study and addresses issues such as familiarity with resource persons, employment and the potential for conflicts of interest. Following this, Chapter 2 outlines the intent of the streetscape review, including the methodology utilised and the key assumptions of the study.

Metropolitan planning in Perth 1955 - 2010

Stephenson-Hepburn Plan   The Corridor Plan   Metroplan   Directions 2031 and beyond

1955   1970   1990   2010

Figure 11: The above timeline excludes Network City (2004) due to its short 7 year lifespan (WAPC 2010).

Chapter 3 – 6: Analyses each plan in relation to Perth and Armadale commencing with the *Stephenson & Hepburn Report* (Chapter 3), the *Corridor Plan* (Chapter 4), *Metroplan* (Chapter 5) *Network City* and *Directions 2031 and Beyond* (Chapter 6). Due to its 'draft' status and brief 7 year lifespan, the discussion of *Network City* has been undertaken in conjunction with the Chapter dedicated to *Directions 2031 and Beyond* (refer to Figure 11).

Chapters 3 - 6 also include a discussion of each plan, identifying their strengths and weaknesses, outlining various visions for Armadale and evaluating their legacy. These Chapters also provide a discussion of the various theoretical perspectives relevant at the time each state plan was prepared including: the rational planning model, postmodernism, feminist theory, sustainability and New Urbanism.

Chapter 7: Outlines the impact of urban consolidation through *Town Planning Scheme No. 4* for Armadale as well as presenting the debate for and against higher density development within existing areas, commonly referred to as urban infill. Other statutory planning instruments are discussed including *Residential Design Code* (WAPC 2013) distributions in Western Australia and this section also examines Sydney and Melbourne's experiences with urban consolidation.

Chapter 8: Summarises the findings of empirical research, including semi-structured interviews and draws the findings together. The results of streetscape audit and findings are also presented, analysed and discussed. A conceptual framework is introduced based on findings of the case study research. This section also applies Central Place Theory to the study area.

Chapter 9: Concludes the study, reflects on the impacts of each strategic plan for Perth, outlines policy implications and contributions of the study and provides recommendations for further research and analysis.
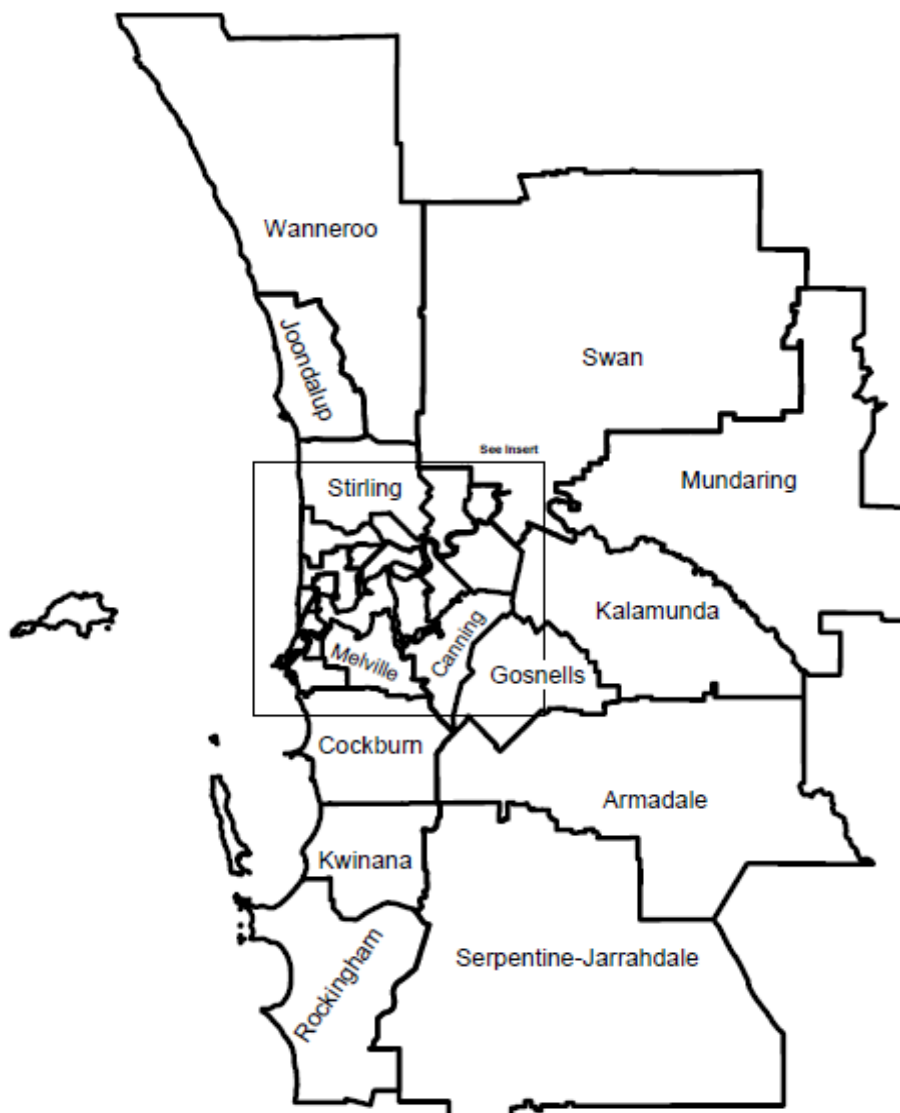
Figure 12: The City of Armadale, located south-east of Perth, is a relatively large peri-urban local government area which accommodates a diversity of land uses including: light industrial, commercial, urban and rural land (WAPC 2013).
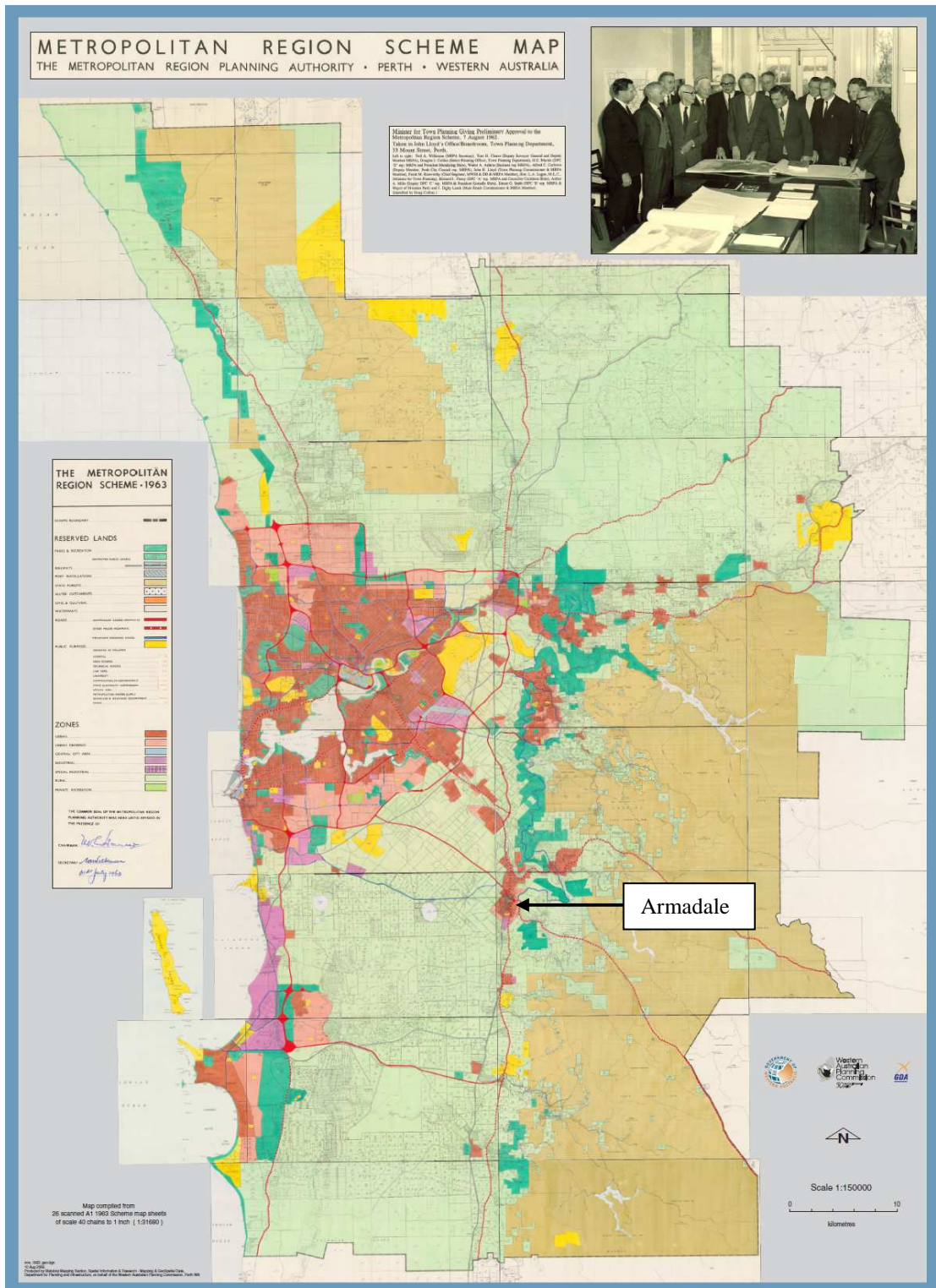
Figure 13: First gazetted Metropolitan Region Scheme, 1963. Note Armadale's relative isolation from Perth, separated by rural zoned land (WAPC 2014).
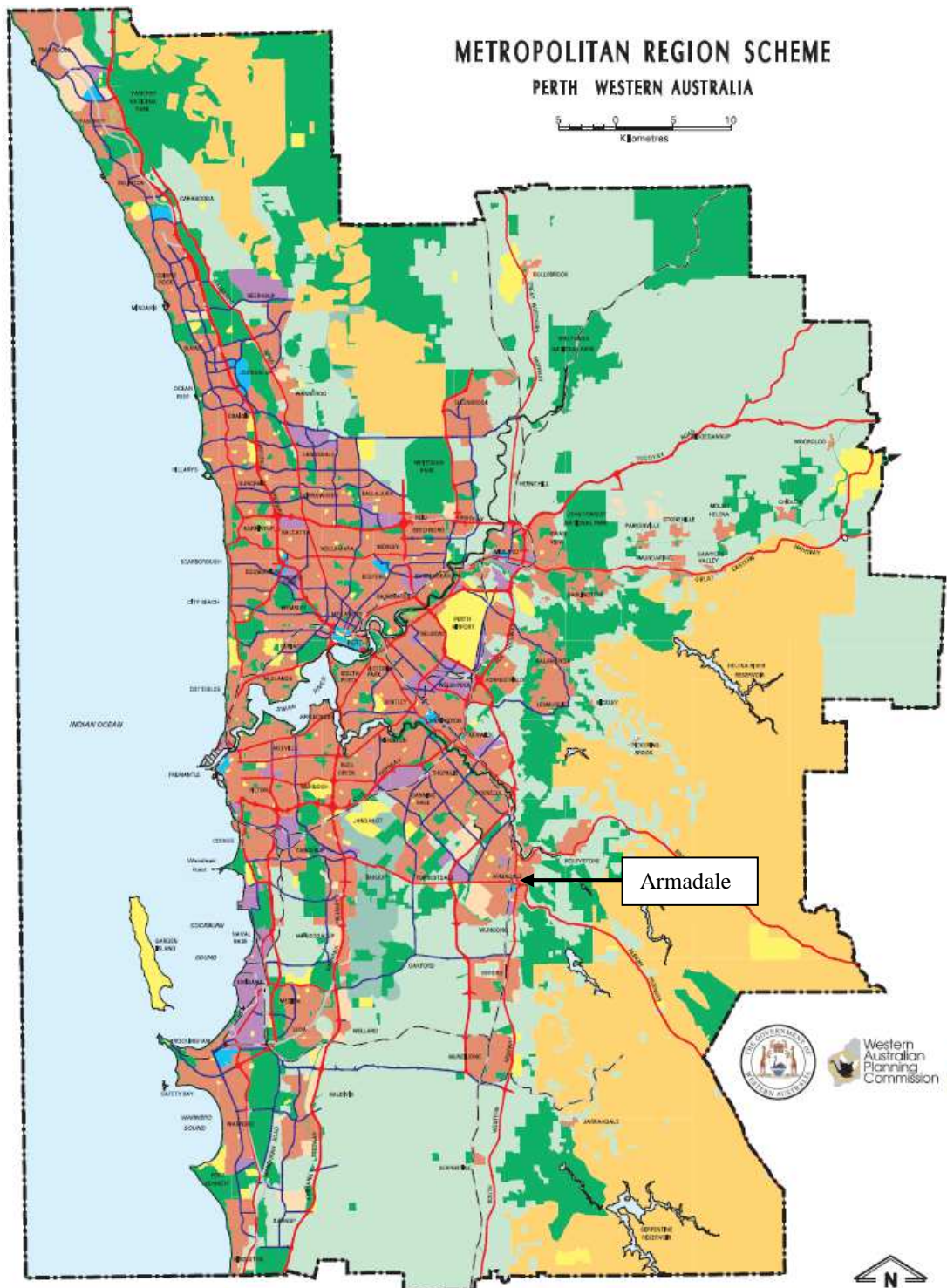
Figure 14: Evolution of the Metropolitan Region Scheme, from north to south approximately 140km. Note contiguous urban development from Perth's centre to Armadale and beyond to Mundijong (WAPC 2014).

Chapter 2: Methodology - Components of the empirical work

2.1   Introduction

This section will provide the following points of discussion: an outline of the research approach undertaken, including policy analysis and the case study approach, an explanation of the types of data analysed, a summary of the author's familiarity with the setting and an outline of the streetscape audit. These elements will be discussed in detail within the following sections. The methodology adopted in this research requires the collection of data from a range of sources and various methods and will result in research outputs as summarised below.

Objectives	Methods of investigation	Expected outputs
To examine longitudinally the various state planning strategies that have impacted Armadale since 1955 when the first strategic plan for the Perth region was introduced.	A critical review of past and present planning strategies and development control mechanisms affecting the case study area.	An assessment of the role and representation of a peri-urban settlement over time.
To identify the extent to which Armadale has achieved various targets / visions of past strategic plans against what the plan/s forecasted for the area.	In-depth semi-structured interviews with resource persons. These include State and local government officers, particularly those who have influenced Armadale's development.	To generate a profile of the case study area with respect to achievement of current planning goals including redevelopment, urban renewal and contributions to housing diversity.
To determine the nature and theoretical underpinnings of redevelopment in Armadale with specific focus on residential infill subdivision.	A streetscape audit analysis assessing changes of land use and the rate of redevelopment within the case study area since November 2005.	To determine an analytical framework to assess rates of redevelopment within the study area.
To determine how to best plan (both strategically and statutorily) for sub-regional centres on the periphery.	A literature review, semi-structured interviews and streetscape audit analysis.	To generate a conceptual model predicting patterns of redevelopment when peri-urban areas are recoded under local planning schemes.

Table 2: Summary of objectives, methods and expected outputs of study.

2.2. Research philosophy

The theoretical framework, otherwise referred to as the *paradigm* influences the way knowledge is studied and interpreted. The choice of paradigm sets out the intent, motivation and expectations for the research (Mackenzie and Knipe 2006). The term *paradigm* may be defined as a loose collection of logically related assumptions, concepts or propositions that orient thinking and are often not revealed in research, according to and Slife and Williams (1995). Researchers make claims about what is knowledge (ontology), how it can be known (epistemology), what values feed into it (axiology), how researchers write about it (rhetoric) and the processes used for studying it (methodology). Such aspects should be clearly identified within research.

Creswell (2003) identifies four categories of *knowledge claims* or *theoretical paradigms* and divides these into the following areas:

Post-positivism	Constructivism	Advocacy Participatory	Pragmatism
Determination	Understanding	Political	Consequences of actions
Reductionism	Multiple participant meanings	Empowerment and issue-oriented	Problem centred
Empirical observation	Social and historical construction	Collaborative	Pluralistic
Theory verification	Theory generation	Change-oriented	Real-world practice oriented

Table 3: Categories of theoretical paradigms, adapted from Creswell (2003).

The post-positivist approach, also known as the *scientific method* or *quantitative research* seeks to challenge absolute ways of knowing and recognise that researchers cannot ever be 'positive' about the claims of knowledge when studying phenomena. As such evidence established throughout the course of research is always imperfect and fallible. Research involves a process of making claims and refining these, while abandoning others for other claims more strongly warranted (Creswell 2003). Such practice can be considered as 'reductionistic' as the intent is to reduce ideas into a smaller, more discrete set of ideas to test. Generated knowledge is based on careful observation of objective reality and a deterministic philosophy in which causes determine outcomes. Research should therefore aim to develop relevant true statements that can serve to explain the situation that is of concern or that describes the causal relationships of interest.

Constructivism is an approach in which individuals seek understanding of the world and develop subjective meanings of their experiences. Generation of meaning arises in and out of interaction with a human community. Constructivists do not generally begin with a theory (as with post-positivists) rather they seek to 'generate or inductively develop a theory or pattern of meanings' (Creswell 2003, 9) throughout the research process. Meanings are often multiple and varied leading researchers to look for a complexity of views rather than narrowing meanings into simplistic ideas. The goal within research is to rely on the participants' view of situations being studied. Constructivist researchers address the processes of interaction among individuals and focus on a specific context (Grubla and Fisk 2013).

The third paradigm identified by Creswell (2003) is termed the advocacy / participatory / transformative approach that arose throughout the 1980s to address issues of social justice to represent the marginalised and disenfranchised. Research should include an action agenda for reform while addressing inequality and the oppression of marginalised groups. It resulted from dissatisfaction with dominant research practices and the realisation that much sociological and psychological theory that lay behind the dominant paradigms had been developed from the white, able-bodied male perspective (Mertens 2005, 17). Such researchers consider that the constructivist approach to research does not address issues of social justice and does not adequately represent the marginalised (Creswell 2003, 9).

The fourth paradigm identified by Creswell (2003) is the pragmatic approach where knowledge claims arise out of actions, situations and consequences. Researchers choose various methods, techniques and procedures that best fit their purposes. Truth is all important and the approach is uncommitted to any one system of philosophy or reality. Such researchers focus on the 'what' and 'how' of the research problem (Creswell 2003, 11). Pragmatists reject 'the scientific notion that social inquiry is able to access the 'truth' about the real world solely by virtue of a single scientific method' (Mertens 2005, 26). Pragmatism provides the underlying philosophical framework for mixed-methods research and places the research problem as central by applying all approaches to understanding the problem (Creswell 2003, 11). Data collection and analysis methods are chosen as those most likely to provide insights into the research question.

This research is based on resource persons' realities in the understanding of a peri-urban settlement over time and as such a constructivist approach is considered appropriate as a basis for this study. Such an approach is considered useful in examining the subjectivity of realities and actions of resource persons. It relies on methods identified by data collection tools such as interviews, observations, document reviews and visual data analysis (streetscape audit) and is a useful approach for theory generation (Mackenzie and Knipe 2006). A section of this study will analyse past strategic plans for Perth utilising a feminist approach, considered a marginalised or excluded voice (Watkins 2000), so it can also be considered as partially utilising the advocacy / participatory paradigm.

2.3. Research approach

In general, three types of designs are applied in most research projects: qualitative, quantitative and a mixture of these two methods (Creswell 2003). The strategic and statutory planning instruments that have impacted Armadale over the last few decades can be assessed by means of a mixture of quantitative and qualitative measures. Bell (1987) recommends the inclusion of a wide range of methods during the early stages of research and argues that while qualitative and quantitative research methods have different emphases, they are not necessarily mutually exclusive. Quantitative researchers collect facts and study the relationship of one set of facts to another (ibid 1987) with often generalisable conclusions. Quantitative research is usually structured, logical, measured and wide while qualitative research is more intuitive, subjective and deep.

Patton (2002) identifies three kinds of qualitative data. The first, interviews, involves open-ended questions yielding in-depth responses about a subject's experiences, perceptions, opinions, feelings and knowledge. The second, observations, comprises fieldwork descriptions of activities, behaviours, actions, conversations, interpersonal interactions and any other aspect of observable human experience. The third, document analysis, includes evaluating written materials and other documents from organisational sources. For the purpose of this study, all three qualitative data investigation types are utilised in relatively equal measure.

In respect to surveys and interviews, Patton recommends *purposeful sampling* where resource persons are selected because they are information rich and illuminative, that is, they offer useful manifestations of the phenomenon of interest. Accordingly, the interview group within this study has been selected due to their broad experience within WA's planning system over many years. Three types of interview identified by Patton include: the informal conversational, the general interview guide approach and the standardised open-ended interview.

The main type utilised within this study is the general interview guide approach where questions are listed providing opportunities for the interviewer to explore topics, probe when necessary and ask further questions that will illuminate the subject under discussion (refer to the Information Sheet at Appendix C for the list of questions utilised). The interaction is kept focused while allowing individual perspectives and experiences to emerge in a semi-structured manner (Patton 2002). The interviewer remains free to build a conversation within a particular subject area, to pose questions spontaneously and to establish a conversation style with a predetermined focus on a particular subject.

2.4. Policy analysis

In this context policy analysis seeks to identify linkages between policy decisions made and later planning outcomes. This study will provide an analysis of past and current local and State Government planning policies to evaluate their performance over time. Such analysis allows a clear picture to emerge of how various planning approaches in vogue at a given time motivate various actors from government to formulate and accept a particular policy position (Nagel 1999).

Assessment of current and past planning policies should focus upon the following questions (adapted from Weimar and Vining 1991):

- How was the policy designed?
- How was the policy implemented?
- What were its impacts? (This includes immediate results, medium-term effects and longer-term impacts).
- What were the inputs and resources allocated to its preparation and implementation?

Lichfield et al (1998) suggest that planning strategies exist to enhance the inherent potential of land but have traditionally suffered from evaluation almost exclusively in economic terms. Ecological and social considerations should also be included in order to enhance breadth and objectivity, beyond considerations related solely to land values. An economic perspective alone is inadequate as important elements such as social and ecological dimensions related to future generations' needs have become more central to planning strategies in recent decades.

The policy analysis component undertaken in this study relates to the first and second objectives of this study: 'To examine longitudinally the various planning strategies which have impacted Armadale since 1955 when the first strategic plan for the Perth region was introduced' and: 'To identify the extent to which Armadale has achieved various targets / visions of these strategic plans against what the plan/s forecasted for the area'. Reflections on these policies were determined by identifying theories in vogue at the time of each strategy's release as well as a textual review of ideas consistent with various theoretical positions.

2.5.   The case study approach

Case studies are useful where the cumulative impacts of a range of factors needs to be clearly understood. The approach is most useful in studying phenomena for which established theories are not yet available. The process pays close attention to a small pool of participants, drawing conclusions within a specific context. Researchers do not seek to focus on the discovery of a single universal truth but emphasis within the process is focussed upon exploration and description. Case study research is inherently qualitative (although quantitative tools can be used).

Baxter and Jack (2008) consider that the focus of a study should be narrowed down and the researcher should not attempt to pose questions which are too broad. This is possible by placing boundaries on a case study, binding it by time, activity, definition and context which ensures the study will remain reasonable in scope. These recommendations have been utilised within this study.

Baxter and Jack contend that the case study method affords 'researchers opportunities to explore or describe a phenomenon in context using a variety of data sources' (ibid 2008, 544) which can lead to the development of new theoretical frameworks. This recommendation will be applied in this study in order to postulate a new planning conceptual model applicable to peri-urban settlements.

Multiple data sources should be utilised to enhance data credibility including: 'documentation, archival records, interviews, physical artefacts, direct observations and participant observation' (ibid 2008, 554). These multiple sources should logically converge during the analytical process: 'Each data source is one piece of the puzzle with each piece contributing to the researchers understanding of the whole phenomenon. This convergence adds strength to the findings as the various strands of data are braided together to promote a greater understanding of the case' (ibid 2008, 554). The researcher should avoid collecting overwhelming amounts of data which may require onerous management and analysis. Superfluous data should be discarded and researchers should avoid focusing on issues tangential to the central research questions.

Cassell and Symon (2004) note that a high quality case study is characterised by rigorous preparation, appropriate presentations of evidence to reach appropriate conclusions and careful consideration of alternative explanations of the evidence. They consider that the aim of a case study is to provide an analysis of the context and processes which illuminate the theoretical issues being studied. Such an approach is particularly suited to research questions which require a detailed understanding of social and organisational processes due to the rich data which can be collected on site in context. The case study lends itself to a study of individual issues within a context (such as within a peri-urban settlement) and can focus on the formulation of strategies, and is considered ideally suited to this study.

Cassell and Symon (2004) consider that case study methodology is analogous to that of a detective who sifts evidence, considering some relevant and some not, to build inferences as to what has happened, why, and in what circumstances. The case study also draws out analysis which may be applicable on a wider basis.

This study is what Baxter and Jack (2008) would refer to as an instrumental case study that seeks to inquire into a social issue or to refine a theory and adopts a naturalistic approach that takes place in real-world settings where the researcher does not attempt to manipulate the phenomenon of interest.

2.6.   Types of data utilised

This study utilises both primary and secondary data. Primary data was gathered through surveys and semi-structured interviews carried out with planning staff at State and local agencies and others involved in various stages of Armadale's evolution and development. Secondary data comprises a content analysis of regional planning strategies, published reports, relevant agency files, Council meeting agenda items and other relevant state planning documents. All secondary data accessed is available within the public realm, as part of State and local government websites.
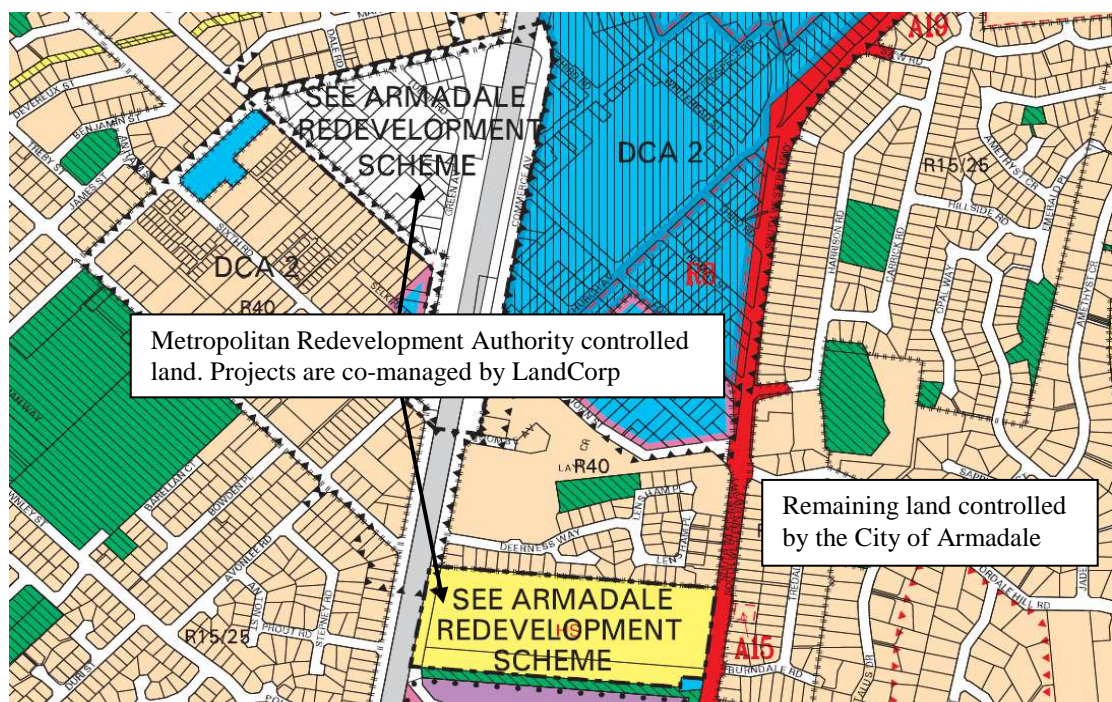
Figure 15: Armadale accommodates local authority and Metropolitan Redevelopment Authority managed land (WAPC 2014).

This study focusses on the work of four government agencies with varying levels of influence and jurisdiction over the locality — the City of Armadale, Department of Planning (including the Western Australian Planning Commission or WAPC), LandCorp and the Metropolitan Redevelopment Authority (formerly the Armadale Redevelopment Authority) (refer to Figure 15). The two former agencies have a long history of shaping planning processes in Western Australia. An analysis of their approach and policies enables an understanding of the broader policy context from which to draw meaningful broader implications and generalisations for the study area in a valid manner. The latter two agencies have proven influential in more recent years working together in providing urban land to the market.

Interviews with the key policy makers and stakeholders were a primary source of data for both stages this study. 30 urban planners were interviewed from State Government, private consultancy, academia and local government. These resource persons have been identified as P1 – P30 and during the course of the study a number of individuals changed employment and position title. The interviews gathered comprise a significant part of the study's primary data and were developed and undertaken in the later stages of this project.

Questions posed to resource persons covered the following topics:

- Armadale's progression and development over time;
- Theoretical approaches in vogue during the time of each planning strategy for Perth;
- Identifying various historical land-use roles envisaged for Armadale;
- Armadale's movement towards urban consolidation and blanket upcoding of residential lots since 2005;
- Achievement or otherwise of housing diversity goals within Armadale;
- Likely uptake of redevelopment opportunities by Armadale residents and;
- Identifying ways in which the locality can improve its performance.

The selection of resource persons was what Babbie (2001) calls purposive, in that they were chosen because of their relevance to the research topic, useful for situations where there is a need to reach a targeted sample quickly and where sampling for proportionality is not a main concern. The resource persons were chosen on the basis of their expertise, experience, knowledge and insight regarding the subject matter.

Following the interview process, draft transcripts were sent to the interviewees for verification. Once any requested changes were made, transcripts were prepared, the responses were categorised and major themes identified, reproduced in Appendix F to illustrate the most significant and insightful points made by resource persons. Follow up phone calls were also undertaken to check certain factual information and several follow up emails were provided by respondents in order to expand upon certain points which were made. This provided additional qualitative information that complemented information obtained from the longer interviews, included within the transcript section of this study.

2.7.   Personal familiarity with the setting

The author was employed throughout this study by the Western Australian State Government in a planning management capacity. There remained adequate separation between the strategic and statutory teams where the resource persons for this study were drawn from and any involvement in managing various projects. As such any potential conflicts were avoided as the author's work was sufficiently separate from those involved with preparing state strategies, such as the strategic team which prepared and manages *Directions 2031 and Beyond* (2010). Ensuring the author's personal neutrality needed careful attention from the outset and this was maintained throughout the course of this study.

Having worked within local planning in WA for more than a decade raised additional potential for bias, as the author may have already formed a view about certain planning ideas, strategies and plan making approaches. Sadler (2002) identifies three types of biases: ethical compromises, value inertia, and cognitive limitations.

Ethical compromises relate to inherent subjectivity described as a conflict of interest between researcher and the agency that is the subject of the study, a personal relationship between the provider of information and the researcher, and 'sloppiness' where, for example, an argument is made that is not substantiated by the data but based on personal views.

Creswell (2003) contends that objectivity is an essential aspect of competent inquiry and for this reason, researchers should examine methods and conclusions for bias. Biases were handled in two ways: firstly the author was not in a position of direct power (e.g. line manager) with resource persons, so unequal power relationships were avoided. Secondly, resource persons were located within independent teams, distinct and separate from the author's daily planning work. There was also some potential for bias in relation to the local authority, as the author had been previously employed at the City of Armadale shortly following introduction of the new local planning scheme which forms a major focus of this study. This bias was addressed somewhat because there were several years between concluding employment and the commencement of this study. In addressing these issues the author was able to ensure the appropriate distance from resource persons interviewed.

Sloppiness was avoided through a rigorous transcribing process and through consciously verifying arguments and conclusions with peers. Any view presented by resource persons was critically assessed regardless of whether or not it conformed to the author's personal views. Patton (2002) describes as 'empathic neutrality' the ideal cognitive and emotional stance that a researcher needs to adopt so as to not become too involved with the subjects and, therefore, lose the ability to judge clearly the information gathered. Patton also recommends 'a middle ground between becoming too involved, which can cloud judgement and becoming too distant, which can reduce understanding' (ibid 2002:50).

The personal familiarity between the author of this study and the resource persons had the potential to undermine this neutrality somewhat, but also had a number of advantages, particularly in gaining access. Fontana and Frey (2000) identify seven key elements of the interview process: The first is the setting, which deals with the familiarity of the surrounds for those being interviewed. The second attribute

involves understanding the language and culture of the respondents. This had already been established in most cases because the author had a working relationship with many of those interviewed as colleagues within the WA planning system.

The ways in which strategic plans were received when introduced and how they are now viewed was considered as important to this study. Individuals who had primary responsibility for preparing local and State planning instruments were particularly sought out in order to gain an understanding of current and past strategic thinking. Long-term employees of State and local government were found to be able to offer a unique perspective across several strategies and offer perspectives on the legacy of each plan.

For example, one resource person (referred to as P3 in this study) was considered a particularly valuable source of knowledge having joined the Department of Planning in 1988. He had worked under several strategic plans for Perth, possessing a high degree of familiarity with *The Corridor Plan* (1970), *Metroplan* (1990), *Network City* (2004) and *Directions 2031 and Beyond* (2010). Prior to this, 'P3' was employed at the City of Armadale as an urban planner in the mid-1980s. A number of respondents had a similar breadth of experience and length of service, reflecting a comprehensive level of knowledge of the issues under discussion which justified their inclusion within this study. The use of experts in this way is considered valid because it can be used to elicit perceptions or judgements in a specialised area. Interviews with the key planning staff and decision makers revealed some useful information about the nature of their agency's current plan-making approaches.

2.8. The streetscape audit (overview)

The second part of this study comprises a streetscape audit which was carried out in order to ascertain rates of residential redevelopment in the study area approximately 7 years after the introduction of a new local planning scheme. This audit was conducted in mid-2013 and included streets within the suburbs of Camillo (formerly Westfield), Kelmscott and Armadale.

A streetscape audit was undertaken to assess the medium-term impacts of a new statutory planning framework and evaluate the relationship between planning and later built form outcomes within existing suburban areas. This was supplemented by ground-truthing which was undertaken via driving through the area to measure changes in housing stock since 2005.

Early on in the process the streetscape audit was attempted by bicycle, however it was found that the distances to be covered were too great for such a method and driving through the area became necessary. The raw data gathered involved graphic analysis using maps and aerial photos which were verified online. The streetscape audit relates to objective 3 and 4 of this study: 'To determine the nature and theoretical underpinnings of redevelopment in Armadale with specific focus on residential infill subdivision'; and 'To determine how to best plan (both strategically and statutorily) for sub-regional centres on the periphery'. Where redeveloped lots were encountered, year of construction was cross checked to ensure redevelopment was as a result of *Town Planning Scheme No. 4*, post-November 2005.

Figures 16 and 17: The above images demonstrate the discrepancy between cadastral mapping and the City's aerial photography. A desktop survey alone was deemed insufficient in gathering accurate data and a streetscape audit was undertaken (City of Armadale 2013).

The study was conducted only within those City of Armadale streets which had undergone zoning changes under the 2005 local planning scheme and excluded those areas which had not undergone such a revision. It was anticipated that the recoding of lots in Armadale would result in the following redevelopment scenarios:

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- Demolition of a single dwelling and the construction of 2 new dwellings (one at front, one at rear);
- Retention of an original dwelling and new dwelling constructed at the rear of the lot (battleaxe retention scenario); or
- Subdivision down the middle of the original 20m wide lot providing both lots with a narrower 10m wide road frontage.

Prior to undertaking the streetscape audit, an examination of local authority mapping revealed several discrepancies between development on the ground and that reflected in cadastral mapping. Some examples of higher density redevelopment were found to not have been recorded on the City's website. For example 30 Inverness Circle Camillo (refer to Figure 16, central dwellings with red roofs) shows 2 grouped dwellings, constructed prior to 2005, occupying $959m^2$ however the City's cadastral data shows this as a single lot (refer to Figure 17). Council's data was found in some instances to be up to 18 months old, hence ground-truthing via a streetscape audit became necessary during the early stages of investigation and analysis.

The study area is defined by the following streets (Refer to Figure 18 and list of streets in study area, Appendix B):

Armadale = 269 streets in total
Camillo/Westfield = 94 streets in total
Kelmscott = 227 streets in total

Total streets in study area = 590 Streets

Although there are 590 streets contained within the study area, many were found to be located outside of urban areas. For example, several were contained within industrial zones, within the Kelmscott hills district, under control of the Metropolitan Redevelopment Authority or operating as control of access highways with no direct lot access permitted. These roads, approximately 193 in total, were excluded from this study. Therefore, for the purposes of this study, approximately 397 streets remain. (Refer to Table 12 for methodology utilised to exclude roads from the study).

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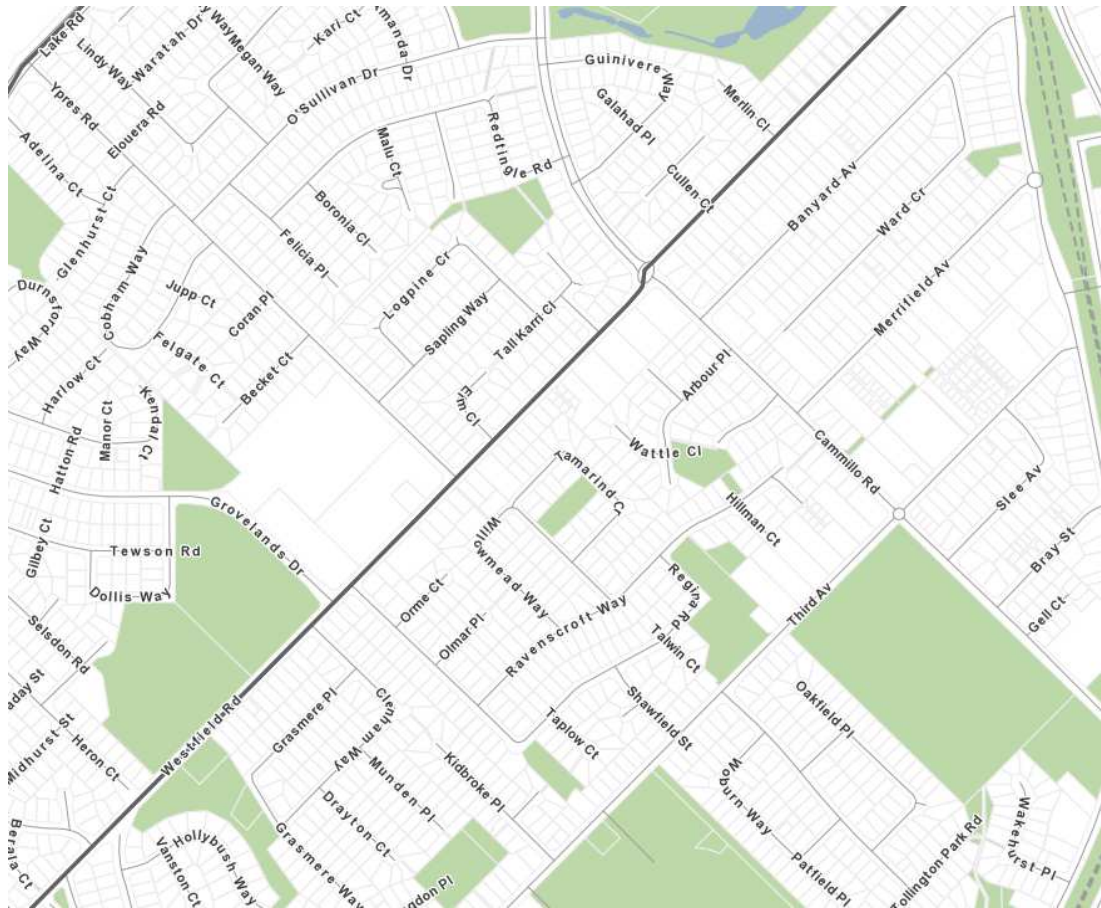
Figure 18: Camillo / Kelmscott: 144 streets were surveyed during the streetscape audit. These include: Ypres Road, Lindy Way, Cobham Way, Ravenscroft Way, Adelina Court, Galahad Place, Merrifield Avenue, Woburn Way, Cammillo Road and Fancote Street to name a few (City of Armadale 2014).

2.9.   Validity and reliability of data

Bell (1987) considers a case study valid if it is carried out systematically and critically, if it is relatable, and if by publication of the findings it extends the boundaries of current knowledge. This study has attempted to follow this approach: 'The great strength of the case study method is it allows the researcher to concentrate on a specific instance or situation and to identify, or attempt to identify, the various interactive processes at work. These processes may remain hidden in a large-scale survey but may be crucial to the success or failure of systems or organisations' (Bell 1987, 31).

All good research projects must be valid and reliable. Reliability means that significant results should be inherently repeatable and researchers should be able to perform the same experiment under the same conditions and generate the same results. Validity concerns the soundness, legitimacy and relevance of a research theory and its investigation. For an idea or theory to become an accepted proposition, its theoretical and practical aspects must be sufficiently robust (Kitchin and Tate 2013). Validity establishes whether research results meet all of the requirements of the scientific research method. Internal validity refers to the structure of an experimental design, which should be consistent. External validity is the process of examining results and identifying any causal relationships.

Creswell (2003) considers that researchers should 'triangulate' data sources and attempt to identify their own biases. This was undertaken through the use of several sources of information including existing planning literature, use of resource persons and State and local planning strategies and schemes which enhanced the study's validity. The 'triangulation' process undertaken by combining multiple data collection methods provides stronger substantiation of constructs and hypotheses. Combining quantitative (numbers) and qualitative (words) data types is also favoured and can also prove synergistic, according to Dooley (2002). Reliability of data was enhanced through checking transcripts to remove any inconsistencies and conducting regular meetings with research supervisors to discuss findings and analysis while cross-checking with related planning studies for comparative analysis.

2.10.   Ethical issues and data storage

Ethics approval for this study was formally granted on 24 April 2013 by the Research Support Branch, School of Built Environment at Curtin University. All raw data in electronic form collected during the research has been backed up and will be kept in a safe and secure place within the School of Built Environment, Building 201, Bentley Campus, Curtin Univeristy for a period of at least 5 years in accordance with Ethics guidelines. (Refer to Appendix C, Participation Consent Form).

The Human Research Ethics Committee (HREC) of Curtin University sets out a number of requirements including maintaining confidentiality, protecting anonymity of participants, providing informed consent and ensuring adequacy of method. This research conforms to guidelines for 'Research with Low Risk'. Participants were invited to participate on a voluntary basis and the research did not require identification of participants at any stage.

The data collection process did not disrupt daily work tasks or create any conflicts of interest. Questionnaires and research methods were pre-tested via a Pilot Study before actual field work took place (Refer to Appendix D for a transcript of the Pilot Study). Participants were advised of the subject matter and intent of the study to analyse Perth's strategic plans from 1955 to the present for Perth, with a focus on Armadale. Resource persons were advised that they were selected for the study due to their professional involvment with planning and their views on various plans would form a major component of the study (Refer to Appendix C, Participation Consent Form).

Issues covered in the questionnaire did not include any personal, offensive or highly controversial matters. Responses from the interviews were collected on a confidential basis without personal identification. (Refer to Appendix E, Resource persons' non-identifiable details).

Chapter 3: The Stephenson and Hepburn (1955) Report for Perth and Fremantle

3.1   Introduction

The following sections provide a detailed background of Armadale's representation in past and present strategic plans for Perth. They trace the locality within successive planning strategies to show its changing role over time. For example, when the first strategic plan for Perth was released in 1955, Armadale functioned as a peri-urban rural town site servicing the surrounding hinterland. In more recent times, areas within Armadale have been set aside for light industrial and commercial land uses. Most recently, Armadale has functioned to meet demand for relatively affordable urban land on Perth's periphery as young families are drawn to the region.

The following Chapters 3 to 6 seek to illuminate the treatment of Armadale within Perth's planning strategies since 1955 and will provide a basis for the subsequent sections of this study. These Chapters are structured in a similar manner and deal with Perth's plans in chronological order.

3.2   Background to the Stephenson and Hepburn Report

The *Stephenson and Hepburn Report*, comprising over 300 pages of text and mapping was comprehensively detailed by later plan's standards, containing chapters entitled: 'People', 'Work', 'The land and its use' and 'Standards of development'. It was released during a period when manufacturing industries were integral to Perth's economy (approximately 26% of the total workforce), where large lots encouraged the provision of relatively low cost detached housing and where private automobile ownership was rapidly increasing to approximately 80,000 vehicles. The 1950s represents the era of the 'baby boomers' and the Report noted that 100,000 children had been born in the years between 1947 and 1955 (Stephenson and Hepburn 1955, 32).

By 1955 large scale heavy industrial development in Kwinana was operational and a road hierarchy had been established comprising regional controlled access highways and lower order roads. The inadequacy of Perth's road network to accommodate further increases in traffic was noted as a concern within the Report and a recommendation for a second airport near Gnangara was proposed in order to decentralise Perth's rapidly expanding air services. Challenges associated with servicing new urban areas, particularly within Perth's foothills and among areas containing high water tables deemed much of Perth's land unsuitable for urban development. The Report strongly critiqued inefficient low density forms of subdivision which had occurred in the past, considered wasteful of land and services. Many of the challenges identified under the 1955 Report remain to the present and issues relating to traffic management, urban density, population growth and the development of marginal land represent key planning challenges facing Perth (Weller and Bolleter 2013).

The Report sought to build community spirit, with diversity and the creation of unique identity necessary in order to create successful places. The single dwelling on 'one fifth acre and one-quarter acre single dwelling sites' (Stephenson and Hepburn 1955, 151) equating to large lot sizes between 800m^2 and 1000m^2 was considered most suitable for the majority of families in Perth. Other models of housing such as flats and attached houses were also promoted, despite the recommendation that such higher density forms comprise only 10% of a given area due to potential for social disadvantage. The Report acknowledged the engrained Australian preference for detached housing and correctly predicted that this trend would continue, that family expectations would centre around a single house with its own garden.

Hedgcock and Yiftachel consider that the idea of community planning and the development of balanced communities was presented as an achievable and realistic goal strongly promoted and 'rigorously detailed in a social planning agenda far wider than earlier planning initiatives' (1992, 71). In accordance with modernist thinking of the time, community interests were placed above individual rights and 'the ability to locate, set aside and cede land for a wide range of public facilities gave planners the necessary power to genuinely conceive the full dimensions of new and expanded communities' (ibid 1992, 71).

An unsuccessful attempt to amend the *Town Planning and Development Act* in 1951 led to the decision to bring in an overseas expert to prepare a plan for the metropolitan area (Michael 2012). Professor Gordon Stephenson, Lever Professor of Civic Design at the University of Liverpool, arrived in Perth in 1953 to work with Alastair Hepburn, the Town Planning Commissioner for Perth. Stephenson had earlier prepared the *Greater London Plan* and later advised governments, designed projects and held university posts in several countries. Perth was undergoing a period of rapid population growth coupled with an economic boom and associated post-war reconstruction and a new plan for Perth would assist in the management of this expansion (refer to Figure 19).
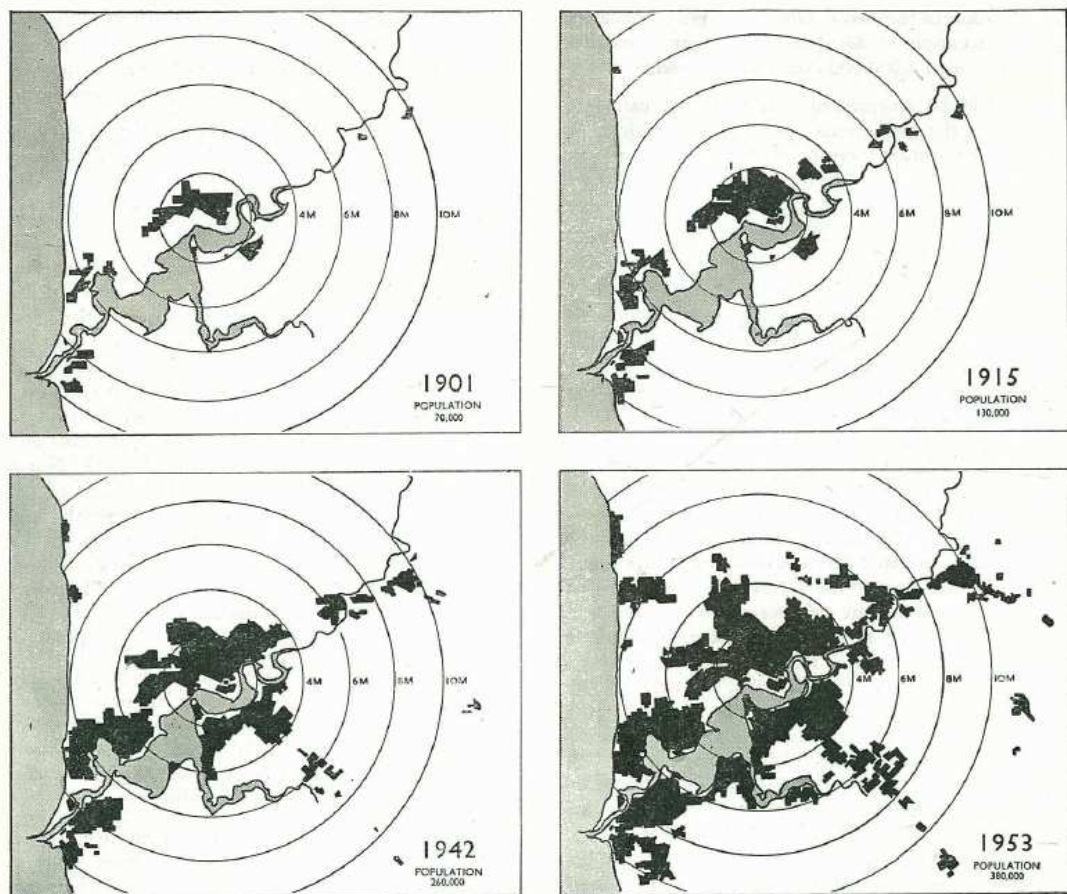
Figure 19: The 1955 Report emerged in the context of rapid population growth in Perth. By 1942 urban development surrounding Armadale was beginning to noticeably expand (Stephenson and Hepburn 1955, 42).

Gregory (2009) considers that Stephenson enjoyed widespread stakeholder support during preparation of the plan. Governments and councils, heads of government departments and developers were all 'in the mood to make far reaching plans', as were 'those citizens able to look beyond the day after tomorrow' (2009, 8). Stephenson and Hepburn consulted extensively with influential figures and cultivated positive relations with the local media, reaping the rewards of such an approach. Despite this, there was no attempt at community consultation in the 1950s and community opposition was not effectively managed nor addressed by government. The complete Report was sent to government in 1955, was endorsed, released and later provided the basis for the *Metropolitan Region Town Planning Scheme Act* (1963).

It is considered by a number of scholars that the *Stephenson and Hepburn Report* was a thoroughly competent and professional plan, assisting in establishing planning as a professional and bureaucratic activity which led to new planning legislation being expediently passed through parliament (Gregory 2009). Michael (2012) considers that the Report possessed great foresight, particularly in respect to the expansion of key transport routes such as the Kwinana and Mitchell Freeways and Tonkin, Roe and Reid Highways and as such is 'still relevant today because of its sound planning principles overall' (2012, 23). Michael notes that 'the Report's target population of 1,400,000 at the end of the century was a figure very close to the actual population at the time' (2012, 24) and also considers that Perth was very well served by the Report. Dr Carmen Lawrence, Western Australian Premier from 1990 – 1993 in a speech to launch *Metroplan*, described the 1955 Report as 'remarkable', enabling Perth to be comprehensively planned, rather than developing in an unguided, *ad hoc* manner (1990, 1).

The Report stood the test of the immediate post-war years, 'however cracks began to show as the 1960s emerged and a new mood began to prevail' (Hedgcock and Yiftachel 2007, 6). Two main factors conspired to undermine the status of the *Stephenson and Hepburn Report*. First, the growth in car ownership far outstripped earlier forecasts and put enormous pressure on existing infrastructure. Secondly rapid population growth due to the emergence of large scale mining in the State's north-

west and increasing international migration meant demand for residential land unexpectedly outstripped supply (ibid 2007).

In the decades following 1955, the number of vehicles on Perth's roads, which had already doubled in the decade to 1970, continued to increase, reaching 552,325 in 1980 (Newman and Kenworthy 1999, 244). As a number of scholars have argued, Australia's metropolitan areas were in the grip of 'automania' during the 1950s and 1960s. Little or no thought was given to the environmental footprint of the new freeway engineering projects for Perth, which are not considered to tread lightly on people or on the earth. Moreover, the car and the road systems on which they depend, especially freeways, have many negative impacts, including restricting communication and human contact, as scholars including Newman and Kenworthy (1999), Vallance et al (2004) and Weller (2009) have noted.

Strong population growth continued in Perth following the release of the 1955 Report and low density suburbia flourished as a result of ideal conditions. Hedgcock and Yiftachel consider that for migrants arriving in Australia, 'Perth's suburban environments offered much of what they hoped for in their new lives. Cheap, well-serviced land, with easy access to jobs, shops and schools, was consistently designed and developed to form the evolving structure of a rapidly growing metropolis' (1992, 72). The Report sought to develop a compact city, focusing on a single large central business district and a secondary centre in Fremantle. Strong rail and bus services to these centres were planned and a new network of metropolitan highways would be built, linking urban centres and decentralised industrial estates to residential suburbs.

3.3   Armadale in the context of the Stephenson and Hepburn Report

There had been no previous comprehensive strategic plan for the metropolitan area, so Stephenson and Hepburn were free to set basic parameters. The Report sought to create 'centres of growth' for areas comprising the outskirts of the metropolitan area, which included Armadale. Both Albany Highway and South-Western Highway served as primary access to Armadale in addition to a train line running parallel to Albany Highway, and this road and rail infrastructure supported the early expansion of Armadale as a regional centre. Despite this well-established rail network, it is

considered that Main Roads' influence is 'pronounced' in the *Stephenson and Hepburn Report* which 'had the virtues and defects of the planning ideology of the day, which was to give primacy to the private automobile' (Gregory 2009, 187).
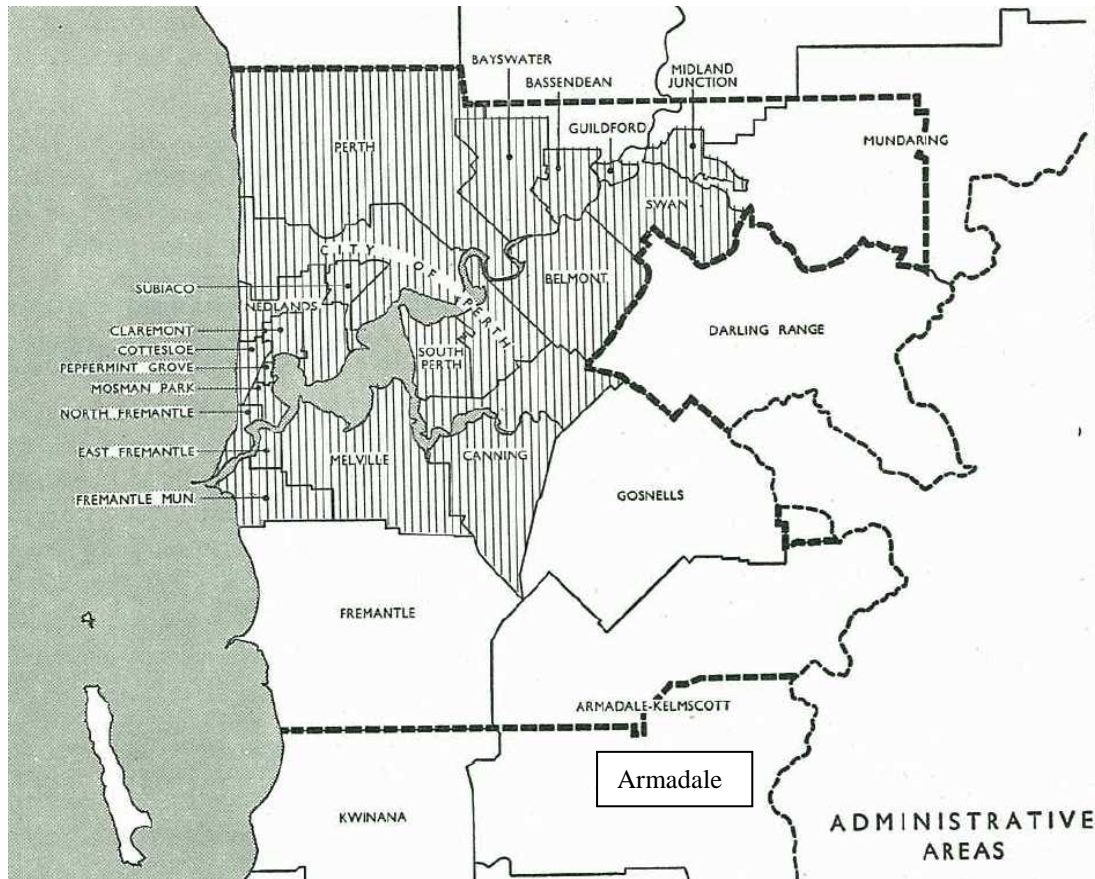
Figure 20: In 1955 Armadale represented the extent of the Metropolitan area which bisected the Shire. The northern portion of the Shire was included within the metropolitan area and the southern portion was excluded (Stephenson and Hepburn 1955, 29).

Armadale was identified as a major centre of strategic importance which 'could be expanded with advantage to the region' (Stephenson and Hepburn 1955, 237). In 1955 the entire Perth region covered 2000 square miles' or 3200 km^2 (compared with over 6000 km^2 today) and comprised 29 local authorities. Armadale's population comprised 7440 residents, compared with over 75,000 in 2015 (City of Armadale 2015). The district's gross residential density was comparatively lower than areas located closer to Perth's centre, comprising 9 persons per acre (compared with 12 in the Belmont, Midland and Canning / Gosnells Road Districts, 18 in the Subiaco, Claremont and Nedlands Districts and 57 persons per acre in the City of Perth).

During the 1950s, Armadale was bisected by the extent of the metropolitan area 'as prescribed in the regulations of the Traffic Act' (refer to Figure 20). Since this time, continual amendments under the *Metropolitan Region Scheme* have meant that Armadale is now located more than 40km north of the current southern scheme boundary, indicating strong and unabated growth of the metropolitan area since 1955 (WAPC 2013).

The 1955 Report proposed to expand Armadale's existing agricultural function which included a thriving market gardening industry. Armadale was identified as possessing some capacity for urban expansion, however this was considered secondary to its primacy as an employment centre, considered ideal for those who wished to take advantage of various employment opportunities. Armadale was also acknowledged as an abundant milk producer, reflecting its farming origins. The Report cited the problem of high water tables as potentially insurmountable obstacles, incorrectly considering that clay soils from Cannington to Kenwick, containing poor drainage characteristics, would severely limit future potential for residential development and considered that 'only limited expansion is to be expected beyond Cannington' (Stephenson and Hepburn 1955, 237).

Land surrounding Armadale was considered to possess well-draining soils where the 'clay characteristics of the other areas are not apparent' (ibid 1955, 237). Ideal soil conditions contributed to the early development of land surrounding Armadale due to the presence of relatively easily serviceable and developable land. As such the sub-region was considered appropriate for further population growth: 'Kelmscott and Armadale have already reached the proportions of small towns and conditions have been shown to be such to encourage rapid expansion' (ibid 1955, 237).

Appendix (iv) of the Report entitled '*Special Study: District Centres'* (1955, 299) contains several observations and recommendations for peri-urban settlements including Midland and Armadale. Stephenson and Hepburn considered that growth in such areas was occurring in an '*ad-hoc* and haphazard manner, without regard to ultimate requirements' (ibid 1955, 299) and without consideration to the ultimate function of such centres which would likely cause problems in future.

The Report considered that greater regard would be required to address issues relating to facilities and infrastructure to service the growing population. Large distinct centres such as Armadale would be best served by separate and distinct plans, which should be undertaken within the local planning process, by local planning staff in order to address local issues.
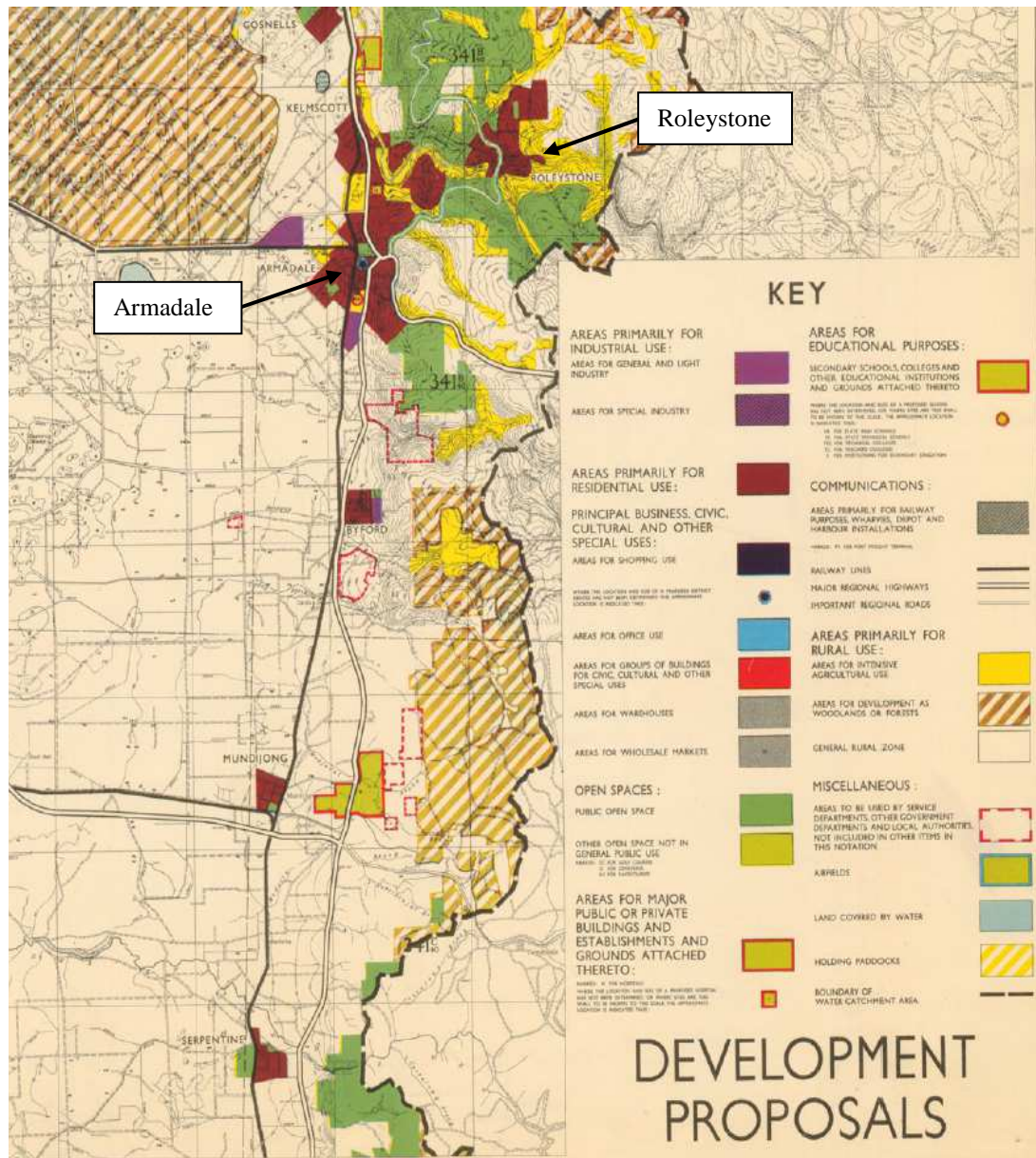
Figure 21: 'Plate 9' mapping showing areas set aside for urban, public open space and industrial land uses (Stephenson and Hepburn 1955). Also note the early development of Roleystone, which was occurring at a rate comparable with the study area.

A recommendation for Perth's peri-urban settlements, which also included Kwinana, Rockingham and Kalamunda (and later undermined under the subsequent *Corridor Plan* in 1970) was for the creation of relatively compact communities 'which are generally self-dependent although forming part of the Metropolitan Region' (ibid 1955, 299). In respect to the rural areas of Roleystone and Bedfordale, the Report considered that 'the remainder of the rural area is poor land, and largely unsuitable for close settlement (refer to Figure 21). It is proposed, therefore, that the general minimum subdivision of rural land should be 5 acres' (2 ha), a recommendation which remains to the present, including under *Town Planning Scheme No. 4* (City of Armadale 2005) (refer to Figure 22).
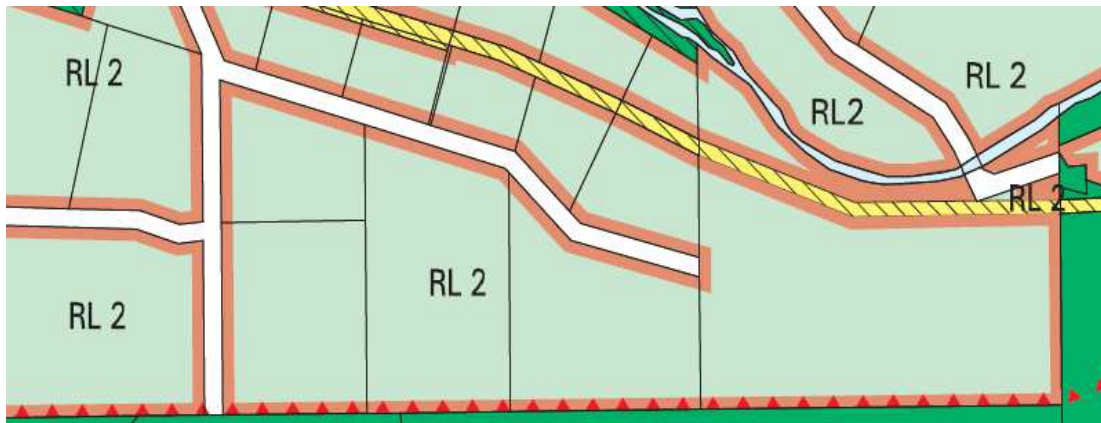
Figure 22: Many of the 1955 Report's recommendations have remained to the present. 5 acre (2.0ha) lots remain in Bedfordale, represented as 'Rural Living 2' under Town Planning Scheme No. 4 (City of Armadale 2013).

3.4   Peri-urban settlements under the Stephenson and Hepburn Report

The Report emphasised the ongoing primacy of central Perth, which contained the greatest number of regional attractors including retail uses and office buildings and also attracted the highest traffic volumes in the region. Issues relating to traffic congestion and office space were described as 'acute' after an inventory of office floor space and monitoring of peak period traffic was undertaken. An analysis of the interrelationship between Perth and peri-urban settlements was undertaken via an analysis of public transport, with frequent service passenger rail recommended for commuters working in central Perth (another element later undermined under the subsequent 1970 *Corridor Plan*).

The importance of expanding Perth's centre including extending commuter parking options, expansion of the bridge and freeway network and constructing a central terminus for buses was recommended within the Report. The function of Perth as a commercial shopping district was further encouraged and it was considered that office growth should be constructed parallel to the Swan River to take advantage of amenity and views. In a departure from the low density housing model recommended for outer areas, high density 'flats' including apartments or multiple dwellings were recommended for Perth's centre, particularly on those sites with higher amenity and proximity to services, for example on land overlooking the Swan River. Thus the concept of 'highest and best use' of land and the importance of utilising land more efficiently was a strong theme throughout the 1955 Report for central Perth. This thinking however, did not extend to the development of peri-urban settlements such as Midland and Armadale, which were still developmentally embryonic in comparison.

Within the 1955 Report, Midland was included within 'Districts 20 and 21' which included: Guildford, Midland Junction, Middle Swan, Greenmount and Swan View. Midland's accessibility to a well-established rail network was noted and it was incorrectly considered that clay soils in the vicinity would preclude residential development for several surrounding areas. The State Housing Commission had started constructing low density public or social housing and possessed a noticeable presence in Midland and neighbouring Midvale by 1955.

State housing had previously been constructed in moderate numbers within Swan View, but expanding this was not recommended due to the need for intensive agricultural land in the vicinity (later protected under the *Swan Valley Planning Act* 1995). Midland was at this time larger than Armadale, accommodating almost twice the number of residents, at that time 12,500 persons, projected to accommodate 44,500 residents due to its proximity to Perth's centre. Great Eastern Highway formed the main transport route by road from Perth and heavy vehicles had begun to cause traffic congestion in the locality, a cause of concern to Stephenson and Hepburn. As a result a Midland bypass was recommended and later constructed.

While Armadale was to accommodate a variety of land uses, Midland was envisioned as a light industrial centre which then included railway engineering works and abattoirs and the Report recommended that scattered housing in the vicinity should be replaced by more economically viable industrial uses. The Midland Junction commercial centre served a wide area, a technical school was recommended for construction and a hospital, which was partly constructed, was recommended for completion. In a similar manner to Armadale, Midland was considered as lacking public open space reserves and the report recommended sites in Guildford and east of the Midland Railway near Blackadder Creek be acquired for this purpose. The number of rail level crossings in the town centre were considered excessive, with '6 crossings in 1.5 miles' and it was recommended that these be consolidated.

3.5.   Impact of the Stephenson and Hepburn Report on Armadale

The *Stephenson and Hepburn Report* sought to expand upon the south-east sub-region's economic and employment diversity, with various areas identified for commercial, industrial, agricultural and to a lesser extent, residential growth. Armadale was envisioned as a significant regional centre which would service the surrounding hinterland, known as 'District 39'. This comprised Armadale, Kelmscott, Byford, Mundijong and Serpentine, with Armadale as most significant in the hierarchy due to its strategic location between Albany and South Western Highways, proximity to a major shopping and business precinct and proximity to passenger and freight rail infrastructure (refer to Figure 23). Under the district's summary, Armadale promised to be 'a regional centre of some importance', known for its state brickworks and commercial orchards in the valleys.

The 1955 Report provided a high level of specificity regarding Armadale's natural attractions, far beyond that which successive planning strategies have provided, with local features such as Neerigen Brook, Serpentine River and the Darling Escarpment discussed in detail in addition to then undeveloped future suburbs such as north Westfield, now known as Camillo. The natural beauty of various sites surrounding Armadale was noted and it was considered that such areas would 'be visited by many tourists' (Stephenson and Hepburn 1955, 237).

Armadale would continue to serve as an employment and tourism centre with a resort and commercial orchards in the hills, State brickworks and extensive agricultural and pastoral industries. The Report also considered that Armadale's industrial sector should be expanded to include manufacturing industries which should be encouraged to settle within the locality.
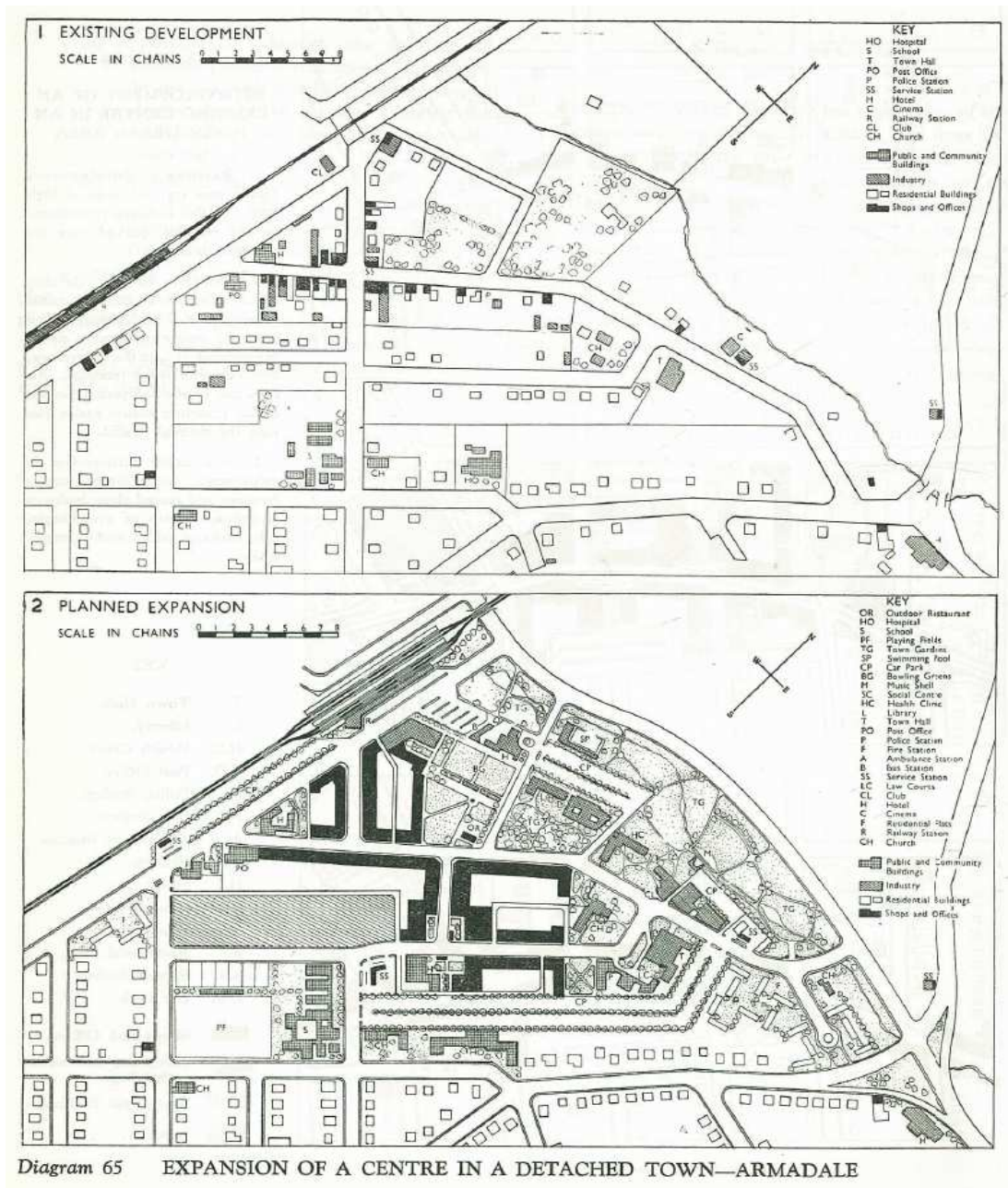
Figure 23: The first detailed plan for Armadale's centre which sought to expand shopping and office land uses (Stephenson and Hepburn 1955, 304).

Rapid population growth during the 1950s meant that the shopping and business districts in central Armadale had already begun to outgrow their respective areas and a hospital, although acknowledged as necessary to service the locality, had not yet been constructed. Large areas of public open space, now characteristic of the region, were at early acquisition stages (as many were held in private ownership) with intent to create an open space chain running along the Darling Escarpment. The high school site south of Armadale along South Western Highway had been identified at the time of the Report's preparation as had suggested areas for industrial development, which remain operational to the present, zoned under *Town Planning Scheme No. 4* (City of Armadale 2005).

In terms of future urban growth, the Report correctly predicted 'considerable expansion of the residential area, partly on the western flat lands and partly on the more difficult hill country' (Stephenson and Hepburn 1955, 237) including the area now known as Kelmscott Hills and Clifton Hills. Mapping entitled 'Proposed Density of Development' shows the entire district as 'more than 5, less than 10 persons per acre', which today would be considered a relatively low target, equating to approximately R15 ($666m^2$ average lot sizes), a standard of land use density which remained throughout the study area suburbs of Armadale, Kelmscott and Camillo until dual coding was introduced under *Town Planning Scheme No. 4* in 2005.

3.6. Strengths and weaknesses of the Stephenson and Hepburn Report

The *Stephenson and Hepburn Report* contained a number of weaknesses and inaccurate forecasts which would later become evident, particularly in respect to Armadale. While it acknowledged the rapid population growth within the area, correctly predicting this would continue, it greatly underestimated the proportion of urban development which would eventually settle in Armadale, relative to other land uses. Various areas within the City which have subsequently become major urban areas such as Brookdale, Seville Grove and North Forrestdale are absent from growth forecasts within the Report. Within the following five decades, the entire district would undergo major urban expansion as demand for residential land outstripped competing land uses.

An overestimation on the region's manufacturing and tourism role meant that both would see a drastic reduction in significance over time (refer to Figure 24). However much of this shift is as a result of economic factors outside of planning's control and the shift of global economic markets and capital leading to a reduction in manufacturing in Perth would have been difficult for Stephenson and Hepburn to foresee in 1955.
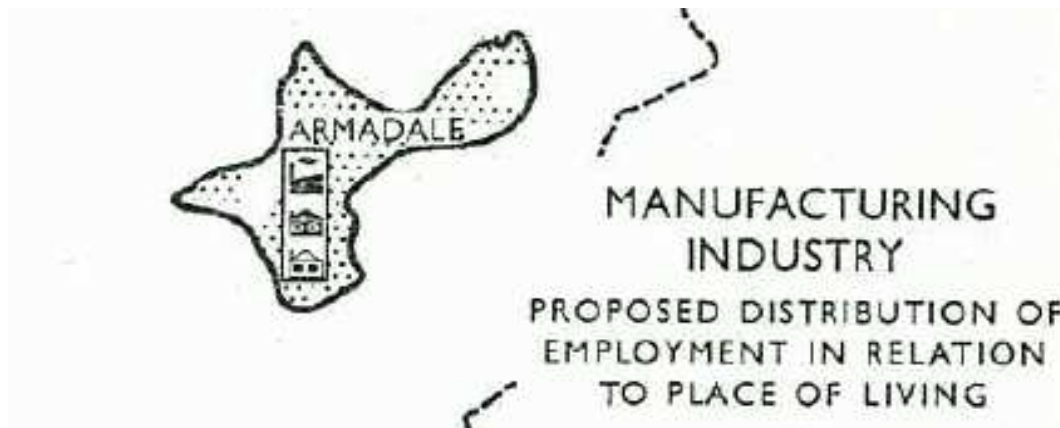
Figure 24: Under the Stephenson and Hepburn Report, Armadale was envisioned as a manufacturing centre, a role that significantly declined in importance over subsequent decades (1955, 67).

A number of scholars including Gregory (2009) have noted the Report's emphasis upon private, rather than public modes of transport and the subsequent expansion of Perth's network of major roads and highways. This view is supported by a 2009 Council agenda item prepared by the City of Vincent which reveals the manner in which the Report has been perceived over time. The local authority considers that the *Stephenson and Hepburn Report* has 'contributed to a number of emerging problems including domination by single occupant cars, resulting in parts of the road system being congested at peak travel periods, increasing atmospheric emissions, increasing costs of providing and maintaining roads and subsidising public transport and the limited development of transport alternatives' (City of Vincent 2009, 1). This emphasis on private transport is 'unsustainable at social, economic and environmental levels without a committed integrated plan to develop a more balanced transport system' (ibid 2009, 1).
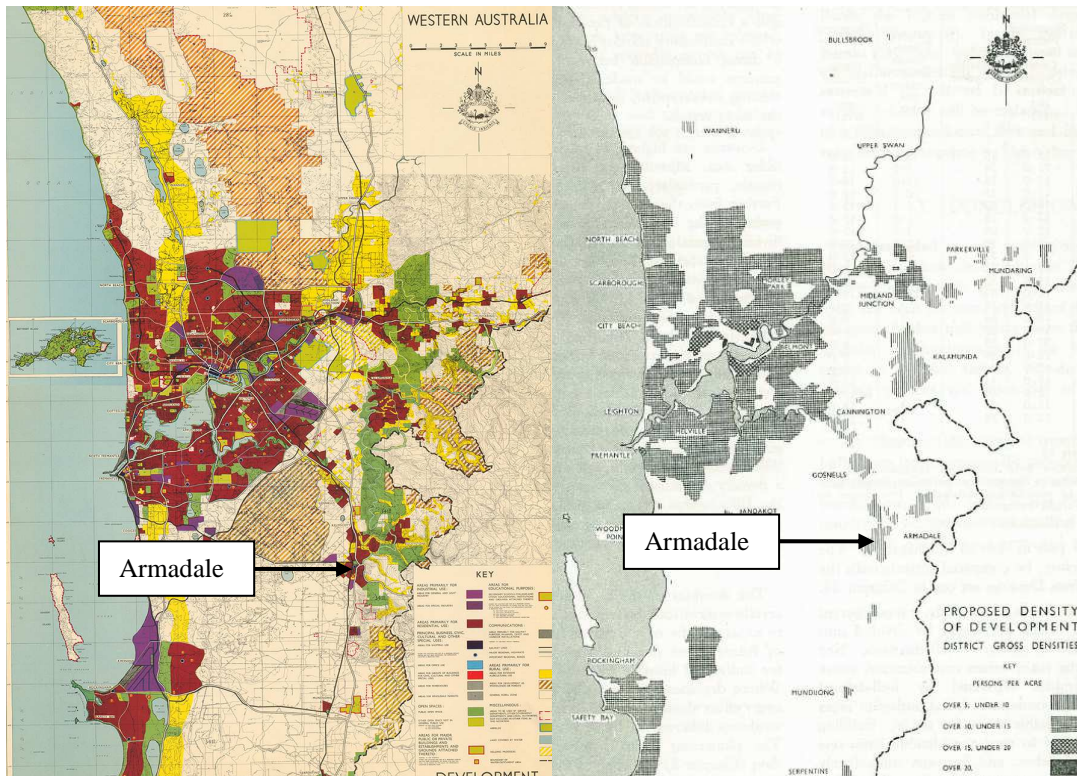
Figures 25 and 26: In comparison with later strategies for Perth, the Stephenson & Hepburn Report leant on a compact settlement model (Stephenson and Hepburn 1955, Appendices, 85).

The Report incorrectly predicted that contiguous urban expansion from Perth's centre towards Armadale would be limited to Cannington due to poor drainage characteristics of soil in this area (refer to Figures 25 and 26). Issues relating to clay soils and low water tables would mean that urban development would be prohibitive. The Report did not address ways to overcome such constraints such as the use of clean fill to raise building envelopes and it was considered that such conditions would prevent urban development towards Armadale.

Population projections would outgrow the Report's predictions within a short period, eventually undermining its relevance and status. The resident population in 1955 in District 39 was 7440 and ultimate population to accommodate 39,000, however the City of Armadale's population alone exceeded 75,000 in 2015 (City of Armadale 2015). The *Economic and Employment Lands Strategy for Perth and Peel* in an analysis including the cities of Armadale, Gosnells and the Shire of Serpentine-Jarrahdale, forecasts that the sub-region will accommodate 228,000 residents by 2031 (WAPC 2012).

As such, forecasts in the 1955 Report greatly underestimated future population figures and the associated requirement and demand for serviced urban land in the locality. *Directions 2031 and Beyond* seeks to achieve an increase in dwellings from 65,000 in 2008 to 100,000 dwellings by 2031 within the sub-region (WAPC 2010) and demand for medium density urban land at the expense of other land uses remains high.

The Report's discussion of housing density omitted issues related to heritage or sustainable development and was shaped only by the need for privacy, sunlight and daylight. Higher density housing was discouraged within the Report as it could lead to congested development and future 'slums'. Such a view promoted the expansion of low density housing, which over time became characteristic of Armadale's housing stock. The discussion of higher dwelling types was limited, focusing mainly upon 'flats', a housing type which often attracted social problems and should be limited to no more than 10% of the total of dwelling types in a given area.

Proposed density controls of 15 persons per acre combined with market preferences for large lots led to an absence of townhouses or terraced housing, although both urban forms were included in the Report's appendix as potential housing forms for consideration. Proposed densities of urban development (over 5 under 10 persons per acre or one fifth of an acre) equate to approximately R12.5 – R15 by today's standards leading to the widespread construction of detached low density housing in the City (refer to Figures 27 and 28). Such an approach would later prove difficult for the City of Armadale to later manage as it sought to encourage more compact forms of housing under *Town Planning Scheme No. 4*.
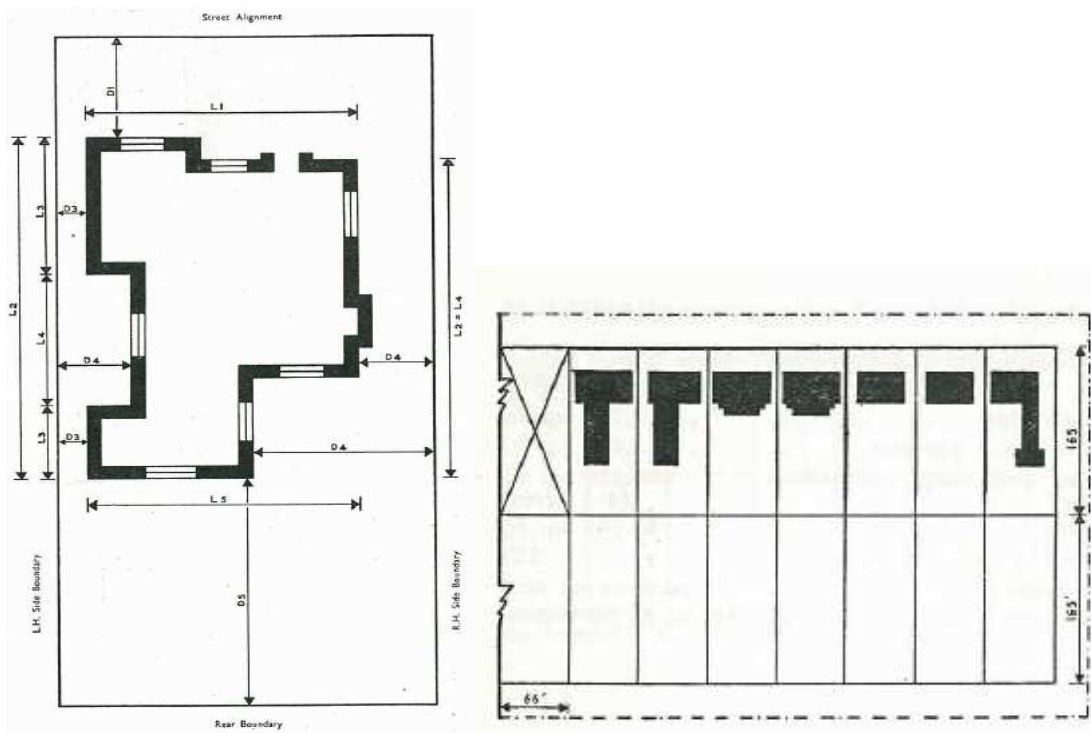
Figures 27 and 28: The 1955 Report encouraged relatively small dwellings with large rear areas of private open space (Stephenson and Hepburn 1955, 267, 274).

A brief discussion of urban redevelopment was outlined in the Report and it was considered that areas containing older properties may be rebuilt in the following years. These were situated close to the main city centres and because of their age, possessed densities higher than average. It was suggested that such areas could be redeveloped: 'Such developments would be constructed a higher density than those within new development areas and an average *Net Residential Density* of 27.7 persons per acre would be appropriate' (1955, 149).

What was considered medium-density in 1955 equates to a low density coding in today's terms, and Stephenson and Hepburn's recommendation equates to a density of approximately 7 persons per 1000m^2. If approximately 3.5 persons are assumed per family, then this equates to a residential coding of approximately R20 (500m^2 average lot size). Such locations would be coded far beyond R20 under more recent planning schemes to allow the provision of high density dwellings close to activity centres and transport and it is contended that the Report lacked overall vision in administering higher residential densities in appropriate locations, close to services and transport.

It can therefore be argued that the Report failed to lead in terms of housing density and merely followed the easier option of low density housing in greenfield areas which was predicted to continue. Contrary to more recent practice under *Town Planning Scheme No. 4* (City of Armadale 2005) the Report considered that piecemeal redevelopment of small lots was undesirable and 'architectural grouping' over several lots or a larger land area would result in superior design outcomes.

Gregory (2009) considers that the ultimate failure of the 1955 Report was due to urban developers having exceeded agreed urban boundaries due to lot sizes which were too large and the focus upon the desirability of large gardens. Such gardens are now considered an inefficient use of land and would not only place growth pressure upon Perth, but would require significant resources to maintain. In the light of more recent concepts regarding sustainability, knowledge of biodiversity and water restrictions, Grose suggests that recommendations within the *Stephenson and Hepburn Report* were inappropriate for the Australian climate, having been based on an overseas standard of limited sunshine and plentiful rain. The 1955 Report was implemented within Perth's Mediterranean climate, with an outdoors lifestyle, with unique recreational requirements where suburban development did and continues to move into globally important bushland.

Ecological knowledge was poor in 1955 and the exceptional biodiversity of the south-west of Western Australia unknown. Further, improved knowledge now exists regarding elements such as Aboriginal heritage (Grose 2009). Land was viewed as developable whatever the type of suburban landscape being developed, without regard to the quality of the bushland in-situ, and regardless of the historical value of the land (refer to Figure 29). The Report also overemphasised the need for public open space, much of which is underutilised in Armadale, costly to maintain and accommodates various parcels regularly sold by the local authority (City of Armadale 2014). Average lot sizes have reduced in recent years, rendering the configuration of a residential dwelling with associated gardens as proposed by Stephenson and Hepburn largely obsolete, particularly in new residential areas.
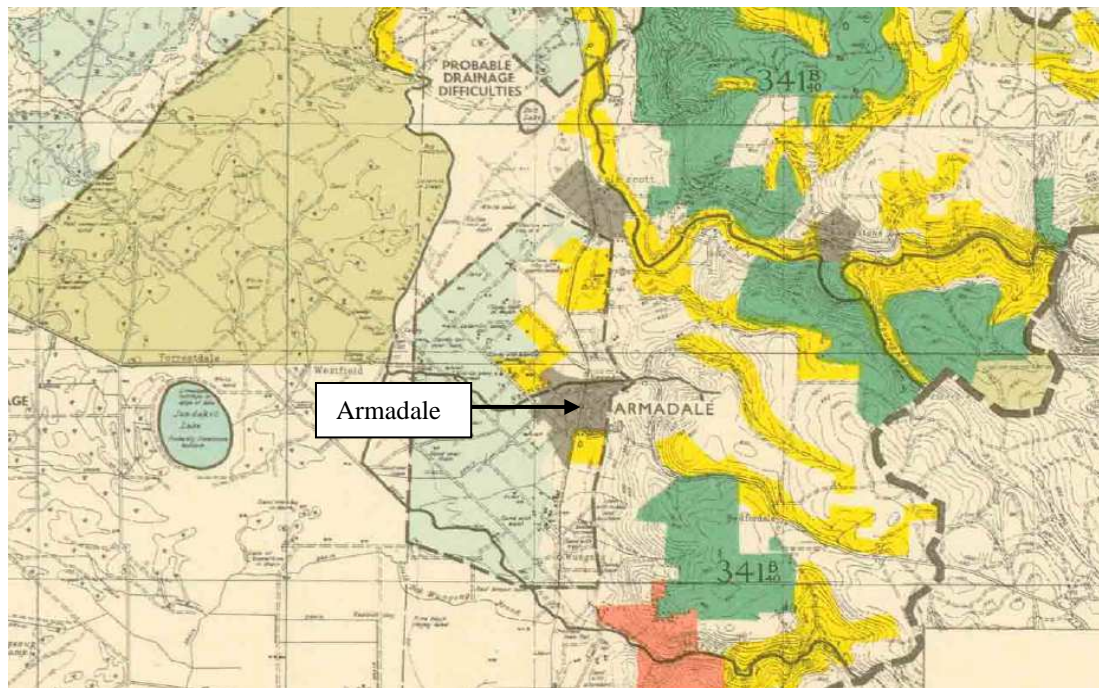
Figure 29: 'Plate 7' mapping entitled 'Land Availability' within the 1955 Report showing proposed land uses. Extensive areas surrounding Armadale are shown as 'land covered by water' and 'probable drainage difficulties' to the north between Kenwick and Armadale (Stephenson and Hepburn 1955).

Similarly to subsequent plans for Perth such as *Directions 2031 and Beyond*, the 1955 Report considered that living close to employment and general accessibility was important for residents. In 2011, employment self-sufficiency in the south-east sub-region was lower than the metropolitan average at 42%, meaning a high proportion of residents must travel outside of the locality to work. *Directions 2031 and Beyond* seeks an employment self-sufficiency target of 55% and an additional 32,000 to 48,000 jobs in the sub-region by 2031 (WAPC 2010).

Workers involved in manufacturing, retail, health care and social work are among those who must travel out of the sub-region most (WAPC 2012). Thus it could be argued that Armadale's role as an employment centre as envisioned under the *Stephenson and Hepburn Report* did not fully come to fruition as the proportion of local employment available to residents has declined since the mid-1950s. This indicates that over time Armadale has increasingly become a place to live, rather than a place to work.

3.7.   Theoretical approaches reflected in the Stephenson and Hepburn Report

The purpose of this section of the study is to elaborate upon the various theoretical ideas, movements and approaches to planning which shaped and influenced the preparation and implementation of the *Stephenson and Hepburn Report.* Such theoretical orientations have various levels (some strong, others weak) of relevance in terms of explaining, predicting and understanding how the development of peri-urban sub-regional centres such as Armadale take place.

3.7.1.   Rational Planning: historical background and main features

Planning practice during the era of the *Stephenson and Hepburn Report* can be seen as maintaining the integrity of the modernist project. This early approach to plan-making involves bringing reason and democracy to bear on capitalist urbanisation and guiding decision making on the basis of technical rationality in order to produce a coordinated and functional urban form and using economic growth to create a middle-class society (Mandelbaum et al 1996). This period was characterised by the release of master planning schemes which would 'arrange land-using activities in ways that achieved functional and aesthetic objectives' (Beauregard, in Campbell and Fainstein 1997, 215).

The modernist approach seeks to focus on the city as a whole, involves a commitment to reform which focuses upon hierarchies, order and centralised control (Irvine 2013). The comprehensive, rational model of problem solving and decision making would seem to have been highly influential in guiding State planning for several decades in Western Australia. Both the *Stephenson and Hepburn Report* (1955) and the subsequent *Corridor Plan* (1970) could be considered as strongly conforming to the rational approach in design, intent and implementation.

The rational planning model is considered as comprising the following five steps: definition of problems, design of courses of action, evaluation of consequences, choice among alternatives and implementation of a chosen alternative (Taylor 2004, 68, Stiftel 2000, 5).

The following table applies the above steps to Perth's first strategic plan:

5 step model	Stephenson and Hepburn Report (1955)
Definition of problems	Perth had no comprehensive strategic planning framework
Design of courses of action	Professor Stephenson and Alistair Hepburn were contracted by the State Government of the day to prepare a strategic plan
Evaluation of consequences	The plan should be subject to review every 5 years to identify changes needed and to monitor planning consequences
Choice among alternatives	Flats vs single dwellings vs terraced housing were considered as potential housing types, for example
Implementation of a chosen alternative	The report was prepared and released based on a compact city paradigm

Table 4: The 5 step rational planning model applied to the Stephenson and Hepburn Report

3.7.2. Rational Planning, treatment of peri-urban regions

The *Stephenson and Hepburn Report* implicitly assumed that most of Perth's vast expanses of vacant land were largely free of development constraints. As such, land could be developed relatively easily compared with more recent development which is subject to greater environmental and planning controls. Prosperity through development and liberation from scarcity were implicit within the plans and concepts of poverty, marginalised voices and an underclass were largely unstated. An exception to this is the occasional references to State housing which was beginning to be constructed in increasing numbers within Perth's peri-urban suburbs, surrounding Kwinana, Armadale and Midland predominantly (refer to Figure 30).

Figure 30: Workmen engaged on the State Housing Commission project at Medina on the periphery, the first neighbourhood of the Kwinana New Town (Stephenson and Hepburn 1955, 24).

Peri-urban areas such as Armadale were described by Stephenson and Hepburn as 'embryo centres in detached townships' (1955, 300). Such areas were viewed by government as large potential sources of affordable land but according to Stephenson and Hepburn had suffered from an absence of regional planning which had resulted in disorderly, misdirected growth which 'can only give rise to a legacy of confusion impossible to resolve in the longer term' (1955, 299).

A correction to this was attempted through recommendations contained within the 1955 Report which sought to organise land uses by grouping shopping facilities together with other commercial uses such as banks and professional offices. Vast areas of land on Perth's periphery including 'Kwinana New Town', 'Gosnells Road District', 'Rockingham Road District' and 'Wanneru Road District' (1955, 212) were considered to be readily available to accommodate affordable urban development with significant constraints largely unaddressed (refer to Figure 31). Consideration of wetlands and aboriginal heritage for example, was largely lacking in Perth's earliest plans (Gregory 2009).

Figure 31: Weatherboard housing on the periphery, Kwinana New Town (Stephenson and Hepburn 1955, 65).

It can be considered that the *Stephenson and Hepburn Report* centred around a 'master narrative' for Perth, synthesising development processes and the built environment towards a culturally homogenous, middle-class society encouraging low density housing where Perth was a 'singular form, invariant over time' (Klosterman 1996, 219). The spatial paradigm reflected in these early plans for Perth focussed not only upon urban land uses but also upon the production of standard commodities for large markets including the BP refinery in Kwinana and Fremantle Port facilities.

The importance of transportation infrastructure for the circulation of commodities is pronounced in the *Stephenson and Hepburn Report* and highways and other control-of-access roads such as the 'Fremantle-Midland Junction Highway', 'Yanchep Highway' and the 'Perth-Kwinana Highway' (1955, 116) were planned for during this time. The location of investment in proximity to labour, seeking to locate residential development adjacent to industrial development in Kwinana, combined with what Taylor (2004) terms an 'embourgeousement' of the working class fostered a sense in which wealth was intended to be relatively evenly spread.

The *Stephenson and Hepburn Report* could thus be seen to implicitly convey the idea that prosperity would diffuse so lower classes could rise to affluence and adopt the values and behaviours of the middle class and the 'good life' would trickle down to be shared. This prosperity would be enhanced through population and economic growth with lucrative export industries 'based on the production of wool, wheat and gold' (1955, 8).

Within the modernist framework, Stephenson and Hepburn were able to assume an all-powerful and privileged insight into the public interest. Mandelbaum et al (1996) consider that such modernist planning is incompatible with a spatially problematic and flexible urban form, as it seeks unrealistic orderliness, functional integration and social, racial and cultural homogeneity. This is particularly evident in photos which accompany the Report (refer to Figure 32). This is also reflected in government policy of the time which intentionally favoured immigration to Australia from certain European countries, particularly the UK between 1901 and 1973 following the introduction of the *Immigration Restriction Act* (1901), often referred to as the 'White Australia Policy'.

Figure 32: Racial and cultural homogeneity reflected within the Stephenson and Hepburn Report (1955, 37).

Chapter 4: The Corridor Plan (1970)

4.1   Background

The *Corridor Plan* was released by the Metropolitan Region Planning Authority (MRPA) in November 1970 and represented a major departure from the previous strategy. At 73 pages in total, it provided less detail and site-specific information than previously in an era where Perth's urban footprint covered 140 square miles (or 223sq km). An ambitious and broad scale long-term strategy, the plan forecast to 1989 in order to guide Perth's future development. It reflected what could be termed a dispersed corridor approach and was justified by 'world-wide support by many city regions whose problems of urban growth are of far greater magnitude than our own' (MRPA 1970, 2).

Preparations for the *Corridor Plan* were undertaken at the Australian Planning Institute Congress of August 1968, during which possible scenarios for the future urban growth of Perth were among the main topics of discussion. Dr David Carr and Professor Gordon Stephenson outlined various scenarios for Perth's future suburbs comprising 'clusters' and 'corridors', a reflection of thinking influenced in part by the review of the *Metropolitan Region Scheme*. By February 1969 the MRPA had settled upon a corridor form of development and plans were prepared (MRPA 1970).

The need for a new strategy was driven by rapid growth in population leading to demand for housing. The plan noted that in 1955, Perth's population was 416,000 and rose to an estimated 650,000 in 1969, an increase of 50% in a time when WA's total population numbered 966,740. This growth created strong demand for housing which 'contributed to considerable land speculation with resultant high prices for lots beyond the reach of the average wage-earner' (MRPA 1970, 9). This situation was not due to a physical shortage of land, but as a result of speculation, driven by an unrestrained free market economy, which had created an artificial shortage of land. As a result of a dramatic spike in land prices, it became necessary for the MRPA to revise population targets within the south-east corridor from earlier projections of 54,000 to an 'ultimate' population of 111,000 by 1989. The role of the new strategy

would be to ease this pressure on urban land prices, considered to be growing unsustainably.

At the time of the *Corridor Plan*'s preparation, WA was continuing to benefit from sustained economic growth as part of the global 'long boom' between 1945 and 1970. This period saw expansion of the Pilbara region and south-west area of the State for agricultural settlement which attracted jobs, migration and urban growth. A development ethos was emerging in Perth and government intervention in private sector investment focused upon the sharing of profits, rather than upon guiding development (Hedgcock and Yiftachel 2007). This differed from earlier planning traditions when the planning system emphasised development controls and regulation.

Faced with the spatial constraints within the *Stephenson-Hepburn Report* of 1955 and the *Metropolitan Region Scheme* (MRS), Perth possessed an inadequate plan during a time of major population growth. Prior to the *Corridor Plan*'s release, urban development had exceeded the boundaries of the 1955 Report and had begun to effectively extend the metropolitan area in the 'north-west, east, south-east and south-west' directions (Adams 2007, 67). Armadale was included as part of a major 'Future Urban Expansion' area with almost contiguous development depicted from Perth's centre for the first time, differing markedly from the *Stephenson and Hepburn Report* which depicted vast areas of undeveloped rural land between Cannington and Armadale.

The *Corridor Plan* promoted the spread of urban land well beyond the metropolitan boundaries set by the *Stephenson and Hepburn Report*, which had relied on a compact city paradigm. The plan proposed the expansion of low density suburbs, serviced by a comprehensive road network which was recommended by the *Perth Region Transport Study* (PERTS) in 1970. Significantly for this study, the first corridor recommended for development under the plan was located between Cannington and Armadale. This area was previously considered too constrained to accommodate urban development due to poor drainage characteristics of the clay soil, but as a result of greater demand for urban land, this situation changed and the area became considered suitable for future development.

THE CORRIDOR PLAN FOR PERTH 1970

LEGEND

URBAN DEVELOPMENT 1970

FUTURE URBAN DEVELOPMENT

NON URBAN USES 1 - NATIONAL PARKS
AND MAJOR OPEN SPACES

NON URBAN USES 2 - LAND RESERVED BY GOVERNMENT
OR STATUTORY AUTHORITIES FOR SPECIFIC USES

NON URBAN USES 3 - 'V' VITICULTURE, 'O' ORCHARDING
'MG' MARKET GARDENING

NON URBAN USES 4 - AGRICULTURAL,
INSTITUTIONAL AND SPECIAL USES

BOUNDARIES OF URBAN CORRIDORS

MAJOR ROAD CONNECTIONS

RAILWAYS

SOURCE: THE CORRIDOR PLAN FOR PERTH 1970

Figure 33: By 1970 the metropolitan area had extended significantly compared with the previous plan where Armadale had represented the southern extent of the metropolitan area (MRPA 1970).

The *Corridor Plan* advocated large scale rezoning (from rural to urban) for considerable areas in Perth, including large areas along the coast. New settlements at the edge of all corridor arms, which included Armadale, would be developed as self-contained towns of up to 100,000 to 150,000 inhabitants, linked to the regional communication system (refer to Figure 33).

Hedgcock and Yiftachel note that the two leading concepts of the day were 'social equity' and 'economic efficiency'. History records that economic efficiency prevailed, emphasising the 'facilitation of economic growth' philosophy that has characterised Perth's planning since. Therefore, after a few short years, the *Corridor Plan* and the development ethos it represented, reasserted its dominance of the planning system in Western Australia. Nowhere was this victory more pronounced than in the planning of Perth's centre, where developers sought to promote property development, often at the expense of the city's residential community, retail activity and architectural heritage (2007). As during the era of the *Stephenson and Hepburn Report*, private vehicles were continuing to increase their dominance over Perth's transportation system and this led to the closure of the Perth-Fremantle rail service in the late 1970s.

Hedgcock and Yiftachel (2007) consider that for the remainder of the 1970s and the early 1980s, the State planning system was dominated by three countervailing forces. First, the *Corridor Plan* was significantly reinforced by a range of technical reports and structure plans that guided its implementation. Second, local authority planning began to increase in influence due to intensifying land use conflicts and development pressures in Perth's municipalities, and a growing number of locally produced planning graduates. Third, the environmental lobby started to grow in popular and political strength, spurred on by the publication of Seddon's work on the West Australian environment, and the preparation of the *System 6 Study* — the first comprehensive examination of natural reserves in and around the Perth region. These three forces set up two major confrontations that were to dominate planning in Western Australia for the next 20 years: local versus central control, and facilitation of development versus environmental protection.
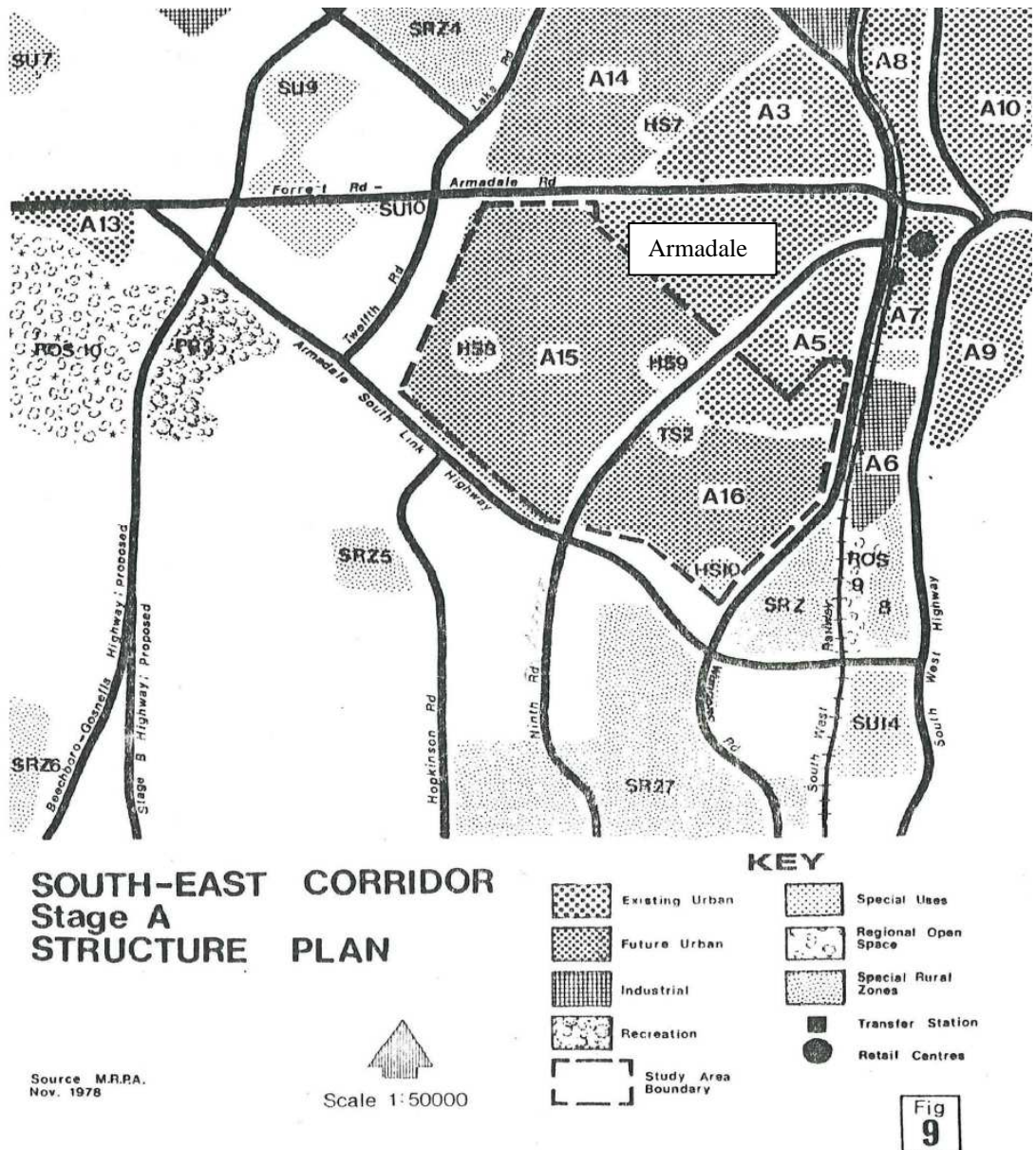
Figure 34: In 1978 the first structure planning undertaken for Armadale was introduced which extended 'the broad parameters for continued urban development within a framework of major roads' (MRPA 1978 in Taylor and Burrell 1980, 9).

A study commissioned by the State Housing Commission a decade after the release of the *Corridor Plan* reveals an increasing demand for urban land close to Armadale which occurred in conjunction with 'the declining viability of pure farming or rural pursuits' (Taylor and Burrell 1980, 7). At this time in the State's history, many large land parcels surrounding Armadale were held in State Government ownership and the first structure plan for the region had been recently released (refer to Figure 34).

Taylor and Burrell note that the State Housing Commission owned 34% of potentially usable undeveloped land immediately south of Armadale, which reflects the sub-region's historical role in accommodating a relatively high proportion of public housing. Other State government agencies including the Education Department and State Energy Commission also owned large portions of land. A detailed south-east corridor *Stage A Structure Plan* was introduced in 1978, the first such plan for Armadale which showed the expansion of urban land located within a framework of major roads including Armadale Road, Hopkinson Road, the proposed 'Armadale South Link Highway' and the 'Beechboro-Gosnells Highway' (Tonkin Highway) (1980, 9).

4.2.   Impact of the Corridor Plan on Armadale

During the mid-1960s the State Government, concerned with the growing demand for urban land and associated housing shortages had begun to identify potential opportunities for residential development throughout Perth. By 1967 the MRPA had begun planning the south-east corridor, with a focus on land located between Cannington and Armadale. Due to its strategic importance, Armadale had been identified as a sub-regional centre along with Midland, Fremantle and Rockingham as well as the then undeveloped area near Lake Joondalup. Armadale would become a self-sufficient satellite city, described as 'a local service centre' at the junction of the Bunbury and Albany Highways and would emerge as a significant sub-regional centre, employing workers who would otherwise travel to Perth for work.

The main issue impacting upon the development of the south-east corridor was overcoming various environmental constraints including the 'probable drainage difficulties' referenced in the *Stephenson and Hepburn Report* as a result of low lying land. Taylor and Burrell cite a number of difficulties during this time in bringing sufficient land to the market, not because of a shortage of land area, but due to 'extensive problems of servicing, particularly for sewerage and drainage which have caused severe restrictions on development, at least in the short term and will dictate staging of development in the long term' (1980, 57).

Such difficulties were to be addressed through development of an extensive drainage network and the use of clean fill to raise the effective height of various sites within various low lying areas which later enabled urban and commercial development to occur. Previously, such land was considered too marginal for such land uses. This shift is evident in the 1971 iteration of the Metropolitan Region Scheme which depicted urban zoned land from Cannington to Armadale (refer to Figure 35).

The protection of local environmental features was acknowledged as important in the 1970 plan, including the recreational foreshores in Canning and Southern Rivers and the Serpentine and Canning dams. Reticulated water and sewerage were in early stages of provision and the plan referred to a temporary sewer plant which would service Gosnells, Kelmscott and Armadale. Electricity and gas services were deemed as easily and readily available to service the district.

Figure 35: The 1971 iteration of the Metropolitan Region Scheme showing almost contiguous urban development from Perth's centre to Armadale (WAPC 2014).
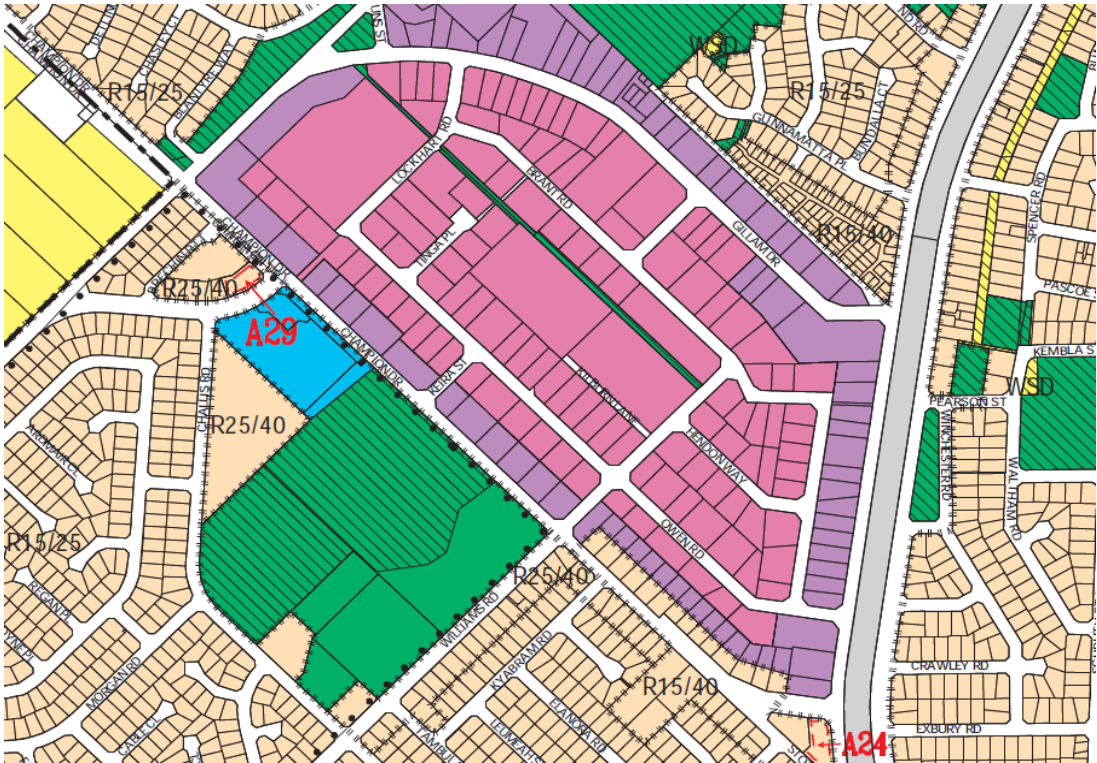
Figure 36: Current light industrial zoned land in Kelmscott, shown in purple. This land was first set aside under the Corridor Plan (City of Armadale 2014).

The plan sought to encourage and expand the fledgling industrial sector in Armadale, which was considered at that time to be not particularly strong. In 1968, 200 acres was set aside for industrial land, which remains to the present as light industrial land located in the vicinity of Owen Road and Gillam Drive Kelmscott (refer to Figure 36). This area was deemed suitable for industrial purposes as it was located close to rail and a readily available workforce, with suburban development intended to surround the precinct. As with the *Stephenson and Hepburn Report*, it was acknowledged that workers engaged in the manufacturing sector would travel to industrial areas outside of the region in many cases. The plan recommended light, heavy and general industrial land uses adjacent to urban zoned residential and commercial land. Agriculture and forestry were also identified as future growth industries in the south-eastern sub-region.

TABLE 3.2
WORKFORCE CATEGORY: METROPOLITAN REGION
1966 and 1989.

CATEGORY	1966	%	1989	%
Primary Production	7,000	3.2	11,500	2.0
Building & Construction	20,500	9.4	51,700	9.1
Manufacturing	50,100	23.0	126,300	22.2
Service	140,400	64.4	378,800	66.7
Total	218,000	100.0	568,300	100.0

Figure 37: Proportion of the workforce by category of industry. Note the declining role of primary production, building and construction and manufacturing and the growth of service industries from 1966 to 1989 within Perth (MRPA 1970, 27).

Manufacturing in the wider metropolitan region would include 'all forms of manufacturing activity from heavy industry to printing and packaging' and would comprise 22.2% of the total workforce by 1989, while service industries such as 'transport and storage, communications, commercial and office activities and personal service (1970, 26) would comprise 66.7% of the total workforce. Primary production comprising fishing, agriculture, forestry, mining and dredging would comprise 2.0% and building and construction would comprise 9.1% of the total workforce by 1989 (refer to Figure 37).

Under Section 4.6 of the *Corridor Plan* entitled 'South-East Sector', the sub-region was identified as possessing potential for the most clearly defined urban corridor within the metropolitan region, from Kenwick to Armadale which was the then current limit of the corridor. Further development was proposed adjacent to the railway along Albany Highway, providing a logical contiguous residential, communications and transport link. The plan also sought to create unique focal points where each corridor would acquire individual identity and enable the creation of a unique community atmosphere to engender a sense of belonging and wellbeing for residents. These independent centres would develop unique and complementary identities depending on their location, mix of residents and workforce base (MRPA 1970).

Taylor and Burrell's review of the greater Armadale area ten years after the release of the *Corridor Plan* makes a number of recommendations. Six new primary schools and three new secondary schools would be required to service the rapidly expanding population and 'although the *Stage A Structure Plan* shows the inclusion of a Technical School, later information from the Education Department indicates that such a site is not required' (1980, 45). Open space was intended to be set aside and vested in the local authority at the standard *10 per cent of net residential area* and large parcels were sought for acquisition by Council.

The State Housing Commission considered that Armadale would be a suitable locality for the provision of public housing, which experienced major growth during the time of the *Corridor Plan*, due to high rates of government land ownership surrounding the locality. Recommended lot sizes for State Housing Commission owned lots was 700m^2 as a minimum with 18m frontages, which is large compared with more recent standards. Duplex lots would be 1100m^2 in area with 10% of total lots to be 800m^2 as per recommendations within the *Stephenson and Hepburn Report*. Higher density housing, although not specified by lot size, was recommended to be located close to the district level shopping centre, recreational facilities and public transport (Taylor and Burrell 1980).

Passenger rail was considered as operating under capacity while Albany Highway was rapidly approaching peak capacity, indicating the public preference for private, rather than public transport during the era of the *Corridor Plan*. As a result of poor patronage the plan advocated that commuter rail services be gradually suspended. Busways would be built on the railway reserves and an express bus system introduced. Special car parks would be provided along the busway 'so that workers could change from car to bus' (MRPA 1970:48). The MRPAs overall vision for Perth was for a more equitable metropolitan structure by improving the accessibility of residents to locations of urban employment, services and recreation. It is evident however, that this was to be undertaken mainly through private, rather than public transport as depicted within a number of planning documents including the *South-East Corridor Stage A Structure Plan* which sought to expand the surrounding road network (MRPA 1978 in Taylor and Burrell 1980, 9).

4.3.   Strengths and weaknesses of the Corridor Plan

Explicitly, the *Corridor Plan* sought a balance between developing a compact city and providing sufficient opportunities for urban land as a result of increased population growth and sought to address what it termed 'the danger of sprawl' (MRPA 1970, 11). Despite this, the dispersed low density urban growth as proposed under the 1970 *Corridor Plan* is often pejoratively referred to as 'sprawl'. There are four widely accepted measures of sprawl, which together can be organised into an index (Ellis 2002). Such measures include low densities, segregated land uses, a lack of network permeability and an absence of urban vitality.

The *Corridor Plan* possessed all of these attributes to a greater or lesser degree. Despite advocating indefinite corridors, the *Corridor Plan* warned of problems associated with unchecked outward development by stating that 'the first task of planning is to prevent a vast sprawl. Such centre-less and sporadic suburban scatter is expensive to develop and wasteful in its requirements for public utility, transport and social services. It neither enhances the urban environment nor preserves the essential character of readily accessible non-urban areas' (MRPA 1970, 11).

The *Corridor Plan's* commitment to avoiding 'a vast sprawl' is questioned by a number of scholars including Adams (2007) and Grose (2009). Other scholars have critiqued the plan for its sprawling approach to growth and its emphasis on decentralised urban development requiring significant investment in road infrastructure (Lutton 2014). Hedgcock and Yiftchael (2007) consider that the *Corridor Plan* represented the indefinite outward expansion and creation of a multi-centred city which totally contradicted the vision advanced in the 1955 *Stephenson and Hepburn Report* of a relatively compact, single centre metropolis. Lutton considers that 'our government planners purposefully induced a sprawling car-dependent city' by devising the *Corridor Plan*, causing 'Perth to spread further than any other Australian city and endure traffic problems normally associated with far larger cities' (2014, 1).

Spatially the *Corridor Plan* differed markedly from the previous *Stephenson and Hepburn Report*. The previous plan had emphasised compactness (despite advocating relatively large lots) while what Grose (2009) has called the 'sprawling utopic vision' proposed under the *Corridor Plan* sought the creation of distinct and individual centres which would flourish with each retaining a unique and important identity. New corridors would possess benefits ranging from enhanced employment, recreation and housing opportunities to a more efficient transport highway system which would prove convenient to all. In the context of a sparsely populated city, it is considered that the plan failed to forecast for an appropriate timeframe (only 18 years) and it has been attributed to directly influencing Perth's status as one of the lowest density, sprawling cities in the world (Adams 2007; Falconer 2010; Newman and Kenworthy 1999).

Adams describes the strategic direction provided by the *Corridor Plan* as 'relatively impotent in determining the location and timing of urban expansion patterns' (2007, 61) and notes a significant disjuncture between the spatial plan and actual development outcomes which occurred under its guidance. Adams considers that its implementation has proven problematic and urban expansion patterns in Perth have not accorded to its prevailing spatial planning vision: 'By 1992 the urban zoned areas under the MRS had grown to a total of 670 km² with an additional 37 km² of urban deferred land zoned and there were substantial areas where 'urban breakout' had occurred', which can be defined as development at variance to that intended under a strategic plan. For the entire metropolitan region, a total of 83 km² of urban and urban deferred zoning break-out occurred within The *Corridor Plan* time frame which accounted for 52% of all urban and urban deferred rezoning through this period' (2007, 68). Adams notes that the south-east corridor possessed a significant 14.7km^2 total breakout or 61% of all developed land.

Douma and Kriz (2003) consider that corridor planning in general is fraught with potential challenges evident in five major areas: governance, economic impacts, financing design and citizen preferences. Problems with corridor development are 'always large' (2003, 2) and include issues such as: ensuring accessibility, provision of high quality transportation, developing liveable communities and encouraging economic development.

The scale of corridor planning often means that no single jurisdictional agent exerts total control over the corridor and competing interests can compromise the whole vision. The south-eastern corridor for example, comprises a number of local authorities with jurisdiction over various parts of the corridor including the cities of Canning, Gosnells and Armadale as well as the Town of Victoria Park.

Significant omissions within the *Corridor Plan* included: density targets, heritage considerations, the environmental impacts of the large-scale rezoning of greenfield land and employment self-sufficiency for workers. Despite the distances between centres and the lack of connectivity between Midland and Armadale for example, it was considered that access between centres would be easy and convenient. It was assumed that 'in the south-east, many of the workforce will continue to commute to the Perth centre' (a distance in excess of 25 - 35km) and populations would be attracted to and settle within corridors, close to major roads. Movement to the regional centre via high speed busways would run within the railway reserves from Armadale, Midland and Fremantle, north to Whitfords and south to Rockingham. This recommendation was never implemented and passenger rail continued to operate in Perth.

Grose considers that preparation of the 'corridor growth concept' sought to reflect the principles of the 'Garden City' and 'City Beautiful' movements, which sought the creation of large green belts which had gained popularity internationally, particularly in the UK (2009). As the *Stephenson and Hepburn Report* prior, Grose suggests such an approach may not have been appropriate for Perth's warm, dry Mediterranean climate.

Hedgcock and Yiftachel (2007) note that not only has the *Corridor Plan* been widely criticised for its sprawling and spread approach, soon after release found its accountability under scrutiny and it received scathing criticism from the Government's White Royal Commission appointed to investigate the formulation of the plan. The *Corridor Plan* also received major criticism from a well-publicised study undertaken by a prominent and controversial Perth planner, Paul Ritter.

Like the *Stephenson and Hepburn Report* prior, the *Corridor Plan* acknowledged that the mix of housing in Perth should increase beyond the predominant detached housing model. In a seemingly contradictory manner it acknowledged that there was much to recommend the existing low density way of life and it was expected that most people would seek to continue to live in such a manner. It was predicted that higher density accommodation including flats, home units, terrace housing and pedestrian deck housing would proportionally increase, mainly around the regional centre of Perth, adjoining the sub-regional centres and in other strategic locations such as near train stations.

The resulting urban form meant a large increase in flat construction, still evident in many inner areas of Perth, including Victoria Park and Maylands. In 1962/2 flats represented 15.4% of all dwellings built in Perth but by 1969/70 this had risen to 33.2% (MRPA 1970). This period represented the greatest proportion of medium to high density housing constructed in Perth. The higher density housing model however, did not penetrate Armadale to a significant degree, which continued to reflect a low density housing model on spacious lots (Taylor and Burrell 1980).

A formal review known as the *Preferred Strategy* (1987) considered that the *Corridor Plan* had been partially successful in its aims, tackling the problem of endless sprawl and congestion by defining corridors and emphasising the need for ease of movement along such routes. Lutton disagrees with this view and contends that the review 'warned that an unduly elongated city structure with one centralised primary employment centre would produce significant future problems. But like many bureaucratic decisions, expert warnings from those outside the system were rarely heeded' (2014, 1). Former Western Australian Premier Dr Carmen Lawrence, described the *Corridor Plan* as 'based on the concept of linear urban expansion along transport corridors' a concept which 'has been retained in *Metroplan*' (1990, 1) and considered that it had served Perth well during its 17 year lifespan.
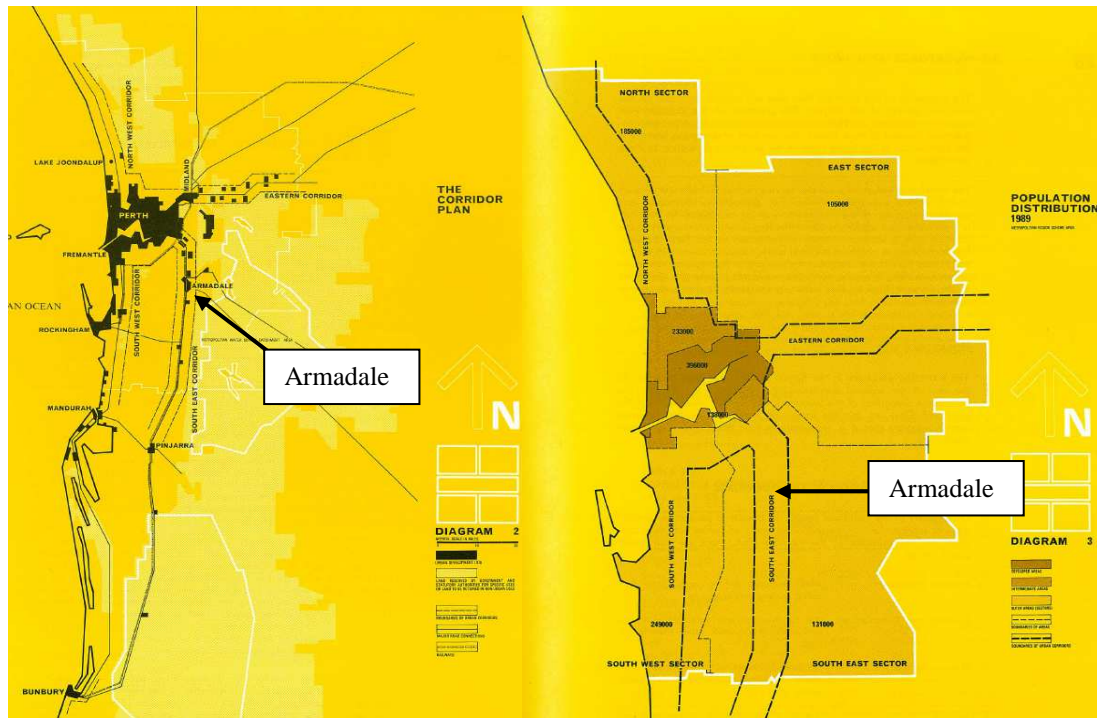
Figures 38 and 39: The Corridor Plan sought to expand Perth's population outside of established centres via a dispersed corridor approach (MRPA 1970).

Despite this apparent success, Dr Lawrence considered that the *Corridor Plan* had led to a number of undesirable transport impacts with linear urban expansion leading to 'many people in the outer suburbs having to travel long distances to work in central Perth, often in congested peak hour traffic conditions' (1990, 3) (refer to Figures 38 and 39). Lutton considers that the driver for the *Corridor Plan*'s spatial approach was that 'wealth generation for industry players lay in endlessly building roads and selling large detached houses on coastal land' (2014, 1).

The *Preferred Strategy* acknowledged that the *Corridor Plan* had markedly influenced the morphology of Perth. A review was considered necessary when it became evident that low density development would continue in many outer parts of Perth and several major commercial centres were not developing as successfully as expected (*Metroplan* 1990). The economic performance of peri-urban centres such as Armadale was considered poor due to lower than expected populations and a lack of private investment. The review recommended a greater emphasis on urban consolidation to reduce the demand for new urban land. It recognised that major commercial centres were required within inner suburban as well as outer suburban areas and sought to direct further growth away from coastal corridors. As a result of

this review process the *Preferred Strategy* was refined to produce 1990s *Metroplan*, the subsequent planning strategy for Perth.

Hedgcock and Yiftachel consider that the *Corridor Plan* largely failed to meet its objectives and argue that increasing doubts about its feasibility 'soon tempered the decentralisation zeal along with a new conviction among State government ranks on the merits of central growth' (1992, 97). The legacy left as a result of the 'wrongheaded' approach provided by the *Corridor Plan* in central Perth became 'the intensification and concentration of office development, a decline in retail activity, the virtual disappearance of permanent residents, the loss of architectural heritage, and the uneven nature of city centre development including the decline of warehousing and residential uses (Alexander 1985, cited in Hedgcock and Yiftachel 1992, 99). Ultimately the plan resulted in longer journeys to work for residents, increased congestion of the road network and resulted in the intrusion of commercial uses into residential areas, impacting upon amenity.

The *Corridor Plan* noted that peri-urban settlements including Armadale had failed to thrive and a suite of initiatives were proposed as a result. Stimulation of employment and economic activity was to be achieved via the expansion of the Armadale City Centre, the extension of Tonkin Highway south of Albany Highway and the introduction of new feeder bus services, which would be introduced from Byford and Mundijong to Armadale. Armadale's development during this time was considered as having been compromised by a number of factors outside of its peri-urban location including 'offensive trades, in particular poultry farms and kennels' (BSD Consultants 1995, 2) as well as by competing land uses such as basic raw materials and agriculture. The fragmented ownership of landholdings posing difficulties for land assembly was yet another challenge which saw Armadale's development stagnate throughout this period.

4.4.   Perth and peri-urban settlements under the Corridor Plan

The *Corridor Plan* sought a determined movement away from the primacy of the central business district in order to decentralise Perth's retail and employment centres. The movement of government agencies to peri-urban centres such as Armadale was encouraged as a first step which would enhance the growth of the underperforming outer sub-regional centres. The plan considered that after State Government agencies settled in such areas, favourable conditions would be created after which time the private sector would be attracted to the sub-regions providing further capital for growth. This became the direction of planning thought throughout many parts of the western world in the 1970s, which along with promoting decentralised centres also emphasised issues of social justice, public participation and economic forces.

Under section 5.2 of the *Corridor Plan* entitled 'Development of Sub-Regional Centres', Armadale was included as one of five major areas identified for significant growth along with Joondalup (then undeveloped), Midland, Fremantle and Rockingham. These centres were identified as operating at lower capacity than envisioned, and a more comprehensive role for each centre would be required. Bunbury was also considered for inclusion as a significant centre, however it was considered too isolated to function as part of this unit. These sub-regional centres would create foci within the Perth region and would be relatively self-sufficient as populations would look to locally satisfy their economic, community and employment needs.

Under section 4.2 entitled 'Transport Highways and Public Transit', a freight network was recommended from Perth's centre to Fremantle, Midland and Armadale. Transport between peri-urban centres was not highlighted as a major priority due to the emphasis on central Perth: 'Special bus lanes within railway reserves will connect the Perth central area to Fremantle, Midland and Armadale and within the north-south freeway complex. It is considered that a system of express buses on these routes would cater for about half of the central area workforce in 1989' (MRPA 1970, 39).

At this time Midland was envisioned as a major employment hub, where surrounding suburban and hills residents would work, saving them the longer commute to Perth. Like Armadale, Midland was considered regionally significant due to its location at the junction of a major transport network including Great Northern and Great Eastern Highways and well established passenger and freight rail infrastructure. Midland's importance as an industrial and commercial centre had increased considerably due to these attributes and 'extensive redevelopment of the core of Midland is expected in the next few years when a new shopping and office complex is to be built' (MRPA 1970, 45). Midland was considered suitable for an extension of industrial uses and 350 acres of land was set aside comprising railway engineering works and abattoirs. Housing, containing 'a mixture of old and new' (ibid 1970, 45) was anticipated to accommodate single family dwellings almost exclusively although some higher density housing was considered appropriate within and adjacent to the town centre.

Section 4.3 of the *Corridor Plan* entitled 'The Outer Areas (Sectors)' considered that sufficient urban zoned land surrounded Armadale and Midland and this could accommodate future population growth: 'There will be a need to rezone considerable areas of urban land in the north-west and south-west corridors. In the eastern (Midland) and south-eastern (Armadale) corridors, it is expected that the larger population could be housed mainly in areas already zoned for urban use' (MRPA 1970, 40). In addition to the development of land surrounding Midland and Armadale, the plan encouraged development of the northern and southern corridors through the rezoning process. As such, northern coastal development towards Joondalup and Wanneroo became a major component of the *Corridor Plan*. The 1966 Census reflected a population of 6000 residents in the north-west corridor, however the *Corridor Plan* forecasted a population of 185,000 by 1989.

As a result of rezoning proposals made possible under the *Corridor Plan*, it was considered that the *Metropolitan Region Scheme* contained an adequate supply of zoned urban land to accommodate population increases over the following two decades. While it can be considered that the State Government had successfully provided adequate serviced land to the market, addressing the political problem of spiralling land prices, such widespread rezoning of previously undeveloped land also

ensured the ongoing promotion of the low density housing model in Perth for the next several decades.

Taylor (2004) considers that plans prepared during this time reflected a 'top down' approach where opposition voices were silenced and ignored. Such an approach is reflected within the preparation phases of the *Corridor Plan*, which was prepared via a process lacking in community consultation. Taylor also considers that although preparation phases were typically comprehensive, the crucial question of how they were to be implemented was lacking: 'Most town planners received no training in and therefore lacked any practical skills for implementation. Consequently, the plan chests of many local planning authorities were stuffed with bottom drawer plans that had not been through the practical, messier business of implementation' (Taylor 2004, 111).

4.5.   Theoretical approaches reflected in the Corridor Plan

The rational planning model can be considered to be the basis of urban and transportation planning during the era of the *Corridor Plan*. Stiftel describes the rational planning model's steps as 'desires, design, deduction, decision and deeds' (2000, 6) and considers that although the model has suffered widespread criticism, for well over 20 years it remained the most widely subscribed planning theory and to this day its logic can be found within the justification of most recent plans.

For example, with respect to the *Corridor Plan*'s, preparation, an elaboration of the ends was identified as a result of population growth pressures in Perth (Step 1). The design of a course of action was considered at the Australian Planning Institute Congress of August 1968, during which time possible scenarios for the future urban growth of Perth were discussed (Step 2). Dr David Carr and Professor Gordon Stephenson (responsible for the previous plan) prepared an evaluation of consequences (Step 3) of various scenarios for Perth's future suburbs comprising 'clusters' and 'corridors', a choice among two opposing alternatives (Step 4) (MRPA 1970).

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By February 1969 the MRPA had settled upon a corridor form of development representing implementation of a chosen alternative (Step 5) and plans were prepared. This process seems to have been carried out in the absence of widespread community consultation, which compared with more recent planning practice, is considered inadequate. While the above 5 step model is also partly applicable to the *Stephenson and Hepburn Report*, steps 4 and 5 are more applicable to the *Corridor Plan* as the role of the 1955 Report was to set spatial parameters for Perth and as such it did not seek to formulate numerous land use alternatives such as 'clusters' and 'corridors', for example.

5 step model	Corridor Plan (1970)
Definition of problems	A new planning strategy was required for Perth due to land shortages and to address the spiralling costs of land.
Design of courses of action	Possible scenarios for the future urban growth of Perth were considered at the Australian Planning Institute Congress of August 1968.
Evaluation of consequences	Clusters vs corridors, compact development vs dispersed development and the potential consequences of each were evaluated.
Choice among alternatives	Corridor planning prevailed and opened up vast areas of undeveloped land. This was a politically favourable approach.
Implementation of a chosen alternative	Plans were prepared. The previous plan was rapidly forgotten and discarded and vast areas of undeveloped land were rezoned.

Table 5: The 5 step rational planning model applied to the 1970 Corridor Plan (adapted from Stiftel 2000).

Mandelbaum et al (1996) consider that the lens through which plans such as the *Corridor Plan* were prepared was via an 'objective logic' allowing planners to distance themselves from the biases of any particular group, avoid accusations of self-interest and identify actions in the public interest. This approach would benefit society as an organic whole, allowing a mediative role between capital and labour in accordance with modernist thought.

Beauregard (1991) considers that modernist planning focusses upon the production of commodities and transportation infrastructure, seeking to locate industry in close proximity to urban centres as occurred in Armadale, Midland and Kwinana during this period. This practice benefitted the emerging industries by ensuring an adequate local labour force in close proximity, which is reflected in the planning approaches during this time. Peri-urban sub-centres would fulfil various land-use roles related to agriculture, industry, tourism and transport with expanding residential settlements that would support Perth's economic and population growth.

Chapter 5: Metroplan (1990)

5.1. Background

The subsequent two planning strategies that followed the *1955 Stephenson and Hepburn Report* contained significantly less detailed information than the first strategic plan for Perth. *Metroplan*, although slightly lengthier than the *Corridor Plan* was in comparison to the 315 page 1955 Report, still a comparatively brief document. It introduced concepts of: urban renewal and consolidation, the protection of water mounds, preserving green regions, mixed use development, housing diversity and residential infill over a total of 90 pages. This represented the first time in which such ideas were incorporated in plans for Perth, reflecting the influence of the burgeoning global environmental movement.

Metroplan sought to encourage a number of diverse planning elements including: improving public transport, environmental protection, urban growth containment, encouraging employment opportunities, planning for cycling and walking, increasing areas set aside for regional open space and expanding areas set aside for architectural and Aboriginal heritage. It promoted such initiatives with the intent to provide flexibility which should be subject to regular review, responsive to changes in community needs and values (Lawrence 1990). *Metroplan* represented a departure from previous strategic plans, directing the future of Perth in largely non-prescriptive terms and was presented as a general framework for growth. *Metroplan* projected in a relatively far-sighted manner to 2021, a 31 year timeframe, almost double the 18 year timeframe provided by the *Corridor Plan*.

Metroplan emerged in a context of rapid population growth where 'in the last 30 years, Perth's population has doubled from 500,000 to 1,000,000' (DOPAUD 1990, 3) and was anticipated to grow to 2,000,000 residents by 2020. The America's Cup yacht race held in 1987 was considered to have contributed to the rejuvenation of Fremantle and areas such as Claremont and Subiaco were cited as high quality examples of urban design.

It was the first of Perth's planning strategies to fully embrace the redevelopment of existing suburban areas, the importance of more efficiently developing underutilised land and encouraging residential intensification around activity and transport nodes, thus representing a major turning point. Demographic trends towards smaller families and lone person households were beginning to influence an emphasis towards housing diversity and it was acknowledged that the existing paradigm of detached housing on a large lot 'will not suit everyone' (DOPAUD 1990, 7).

According to Hedgcock and Yiftachel (2007), the previous *Corridor Plan* was rapidly forgotten in the quest for a new style of government committed to an active development-led agenda. In the push for development, links between government and capital on a constant search for potential profits created the seeds for what became known as 'W.A. Inc.' This pejorative term described a range of failed joint public private development ventures involving a close and allegedly corrupt financial association between the State government and leading entrepreneurs.

The genesis of *Metroplan* began with 1987's *Preferred Strategy*, a formal review of the *Corridor Plan* considered necessary due to increasing urban homogeneity, the proliferation of low density housing and the failure of the outer sub-centres including Armadale to thrive (DOPAUD 1990). Many of the *Preferred Strategy's* recommendations were directly integrated within *Metroplan*. These included: a greater emphasis on urban consolidation, provision of commercial centres within inner suburban areas (not just outer areas) and for low density growth to be directed away from coastal corridors. Following a public consultation period and review of over 1200 submissions (representing a shift from the 'top down' modernist planning model), the *Preferred Strategy* was revised and refined to produce the new plan.

Metroplan promoted principles related to prosperity, sustainability, social justice, economic efficiency and health which it was hoped would provide positive lifestyle opportunities. In comparison to several other strategies for Perth, specific place-based discussion was relatively limited and various areas within Armadale were not discussed in detail as they had been within the *Stephenson and Hepburn Report*.

Other significant centres including Midland, Joondalup, Rockingham and Fremantle were not discussed in great detail. Rather, it was envisioned that various values and goals such as accessibility and urban consolidation would apply equally to all areas in Perth and would be successfully and appropriately implemented by State and local authorities. The City of Perth was acknowledged as the most significant 'central place' and perhaps as a reaction to the decentralisation ideology implicit within the *Corridor Plan*, its predominance in the region was emphasised several times within *Metroplan*. This was reflected in Premier Carmen Lawrence's speech to launch the strategy: 'All over the world, city centres are making a comeback and the Government is committed to working with Perth City Council to enhance Perth's role as the hub of the Perth Metropolitan Region' (Lawrence 1990, 3).

While *Metroplan* emphasised the primacy of Perth as the hub of the region, it somewhat undermined this objective by simultaneously advocating the decentralisation of employment recommending that 80% of service sector jobs should be created in the suburbs. As such, a cornerstone of the plan was the emphasis on the creation of strong suburban centres: 'as well as providing better opportunities for shopping, employment and services in the suburbs, the centres will encourage the formation of strong local communities' (DOPAUD 1990, 10). *Metroplan* also emphasised the need for improved urban design in new areas, the importance of retail growth and the provision of new office and commercial centres.

Midland was identified as part of a new growth area which also included the Swan Valley and the emerging area of Ellenbrook. The Swan Valley was recognised for its viticulture and table grape production and *Metroplan* sought to maintain the rural character of this area, formalising this through the introduction of the *Swan Valley Planning Act* in 1995. Despite the new approach, corridor thinking remained within *Metroplan* and various areas such as the new north-east corridor north of Midland were recommended for expansion. *Metroplan* advocated making use of existing public transport linkages, particularly for commuter access and central Perth would accommodate bus and train terminal expansions. To address increasing traffic volumes, road widening was proposed along major highways as well as the expansion of park and ride facilities and bus priority lanes.

During this period in Perth's development, peri-urban settlements had failed to attract substantial population and economic growth. North of Perth beyond Joondalup, Alan Bond's *Bond Corporation* had presented designs for 'Yanchep Sun City', a future satellite city for 200,000 residents which ultimately failed to be developed due to its location 60km north of Perth. As such 'for nearly 30 years (between 1970 and 2000) the region was lost, Atlantis Marine Park closed, tourism to the region collapsed and all development stagnated, with the two isolated seaside villages of Yanchep and Two Rocks lacking basic infrastructure facilities' (Sun City News 2013, 1).

Similarly, while *Metroplan* acknowledged that Fremantle and Midland had thrived, it was noted that the outer trio of Joondalup, Rockingham and Armadale had been hampered by their peripheral location and had not expanded and flourished to an anticipated degree. Perth did not yet possess the necessary threshold population and attractors to enable peri-urban areas to grow in a manner which had earlier been planned for through private investment and the strategic planning process.

Metroplan sought to establish five main sub-regional centres to be the principal foci of commercial development: Armadale, Fremantle, Midland, Joondalup and Rockingham. Building on the *Corridor Plan*, which proposed five sub-regions, *Metroplan* added a further eight: Stirling, Canning, Morley, Belmont, Claremont, Booragoon, Joondalup and Whitfords, all of which were identified due to proximity to major shopping centres, employment and public transport infrastructure (refer to Figure 40). During this time Perth was described as 'on the threshold of being a major world city' (DOPAUD 1990, 4) following the success of the America's Cup yacht race in 1987. Perth's new trading and cultural relationships with the rapidly evolving countries of the Asia-Pacific rim would contribute to its new status and would assert a higher degree of importance to the region.
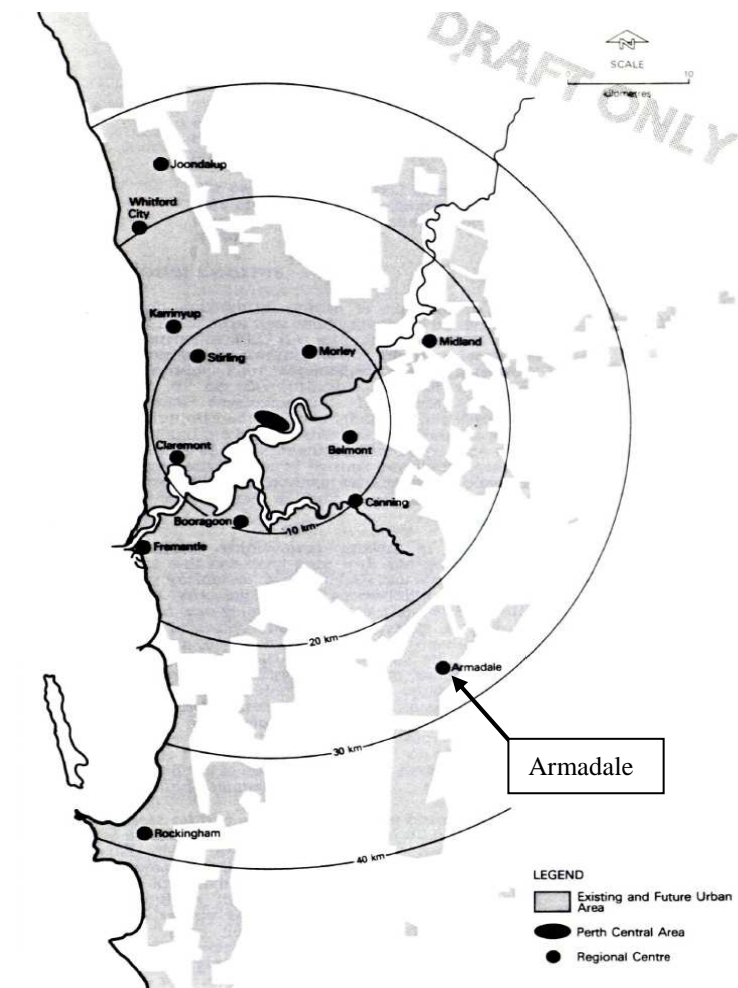
Figure 40: A key element of *Metroplan* was the expansion of inner and peri-urban sub-centres. Such places were located adjacent to major shopping precincts which guided their centrality (Garden City, Rockingham City, Belmont Forum, Carousel, Karrinyup, Midland Gate, Morley Galleria and Whitford City) (DOPAUD 1990).

Armadale's lagging performance was to be addressed via a new focus for the region, seen as the best way of attracting higher-order functions and economic diversity sought by the plan. It was to comprise one among several centres which 'will be targeted by Government to encourage early growth and development' (DOPAUD 1990, 21) with the intention to facilitate its transformation into a vibrant town centre with a distinctive character. It was also envisioned that Armadale should support a larger and more varied employment base, which would assist in reducing commuter flows to central Perth. Assembling land for large industrial estates and consolidating commercial development within Armadale's strategic regional centre was recommended to revitalise its poor commercial and retail performance.

LEGEND

■ Urban	▨ Rural/Non-Urban	●	Service/Commercial Centre
▨ Future Urban	▨ Groundwater Catchment	⊕	Airports
▨ Regional Open Space System	▨ Surface Water Catchment	⛵	Harbours
■ Major Industry	▨ Proposed Surface Water Catchment	—	Major Road Concept
▨ Escarpment Protection		⋯⋯	Railway Concept
		➤	Future Urban Growth Option
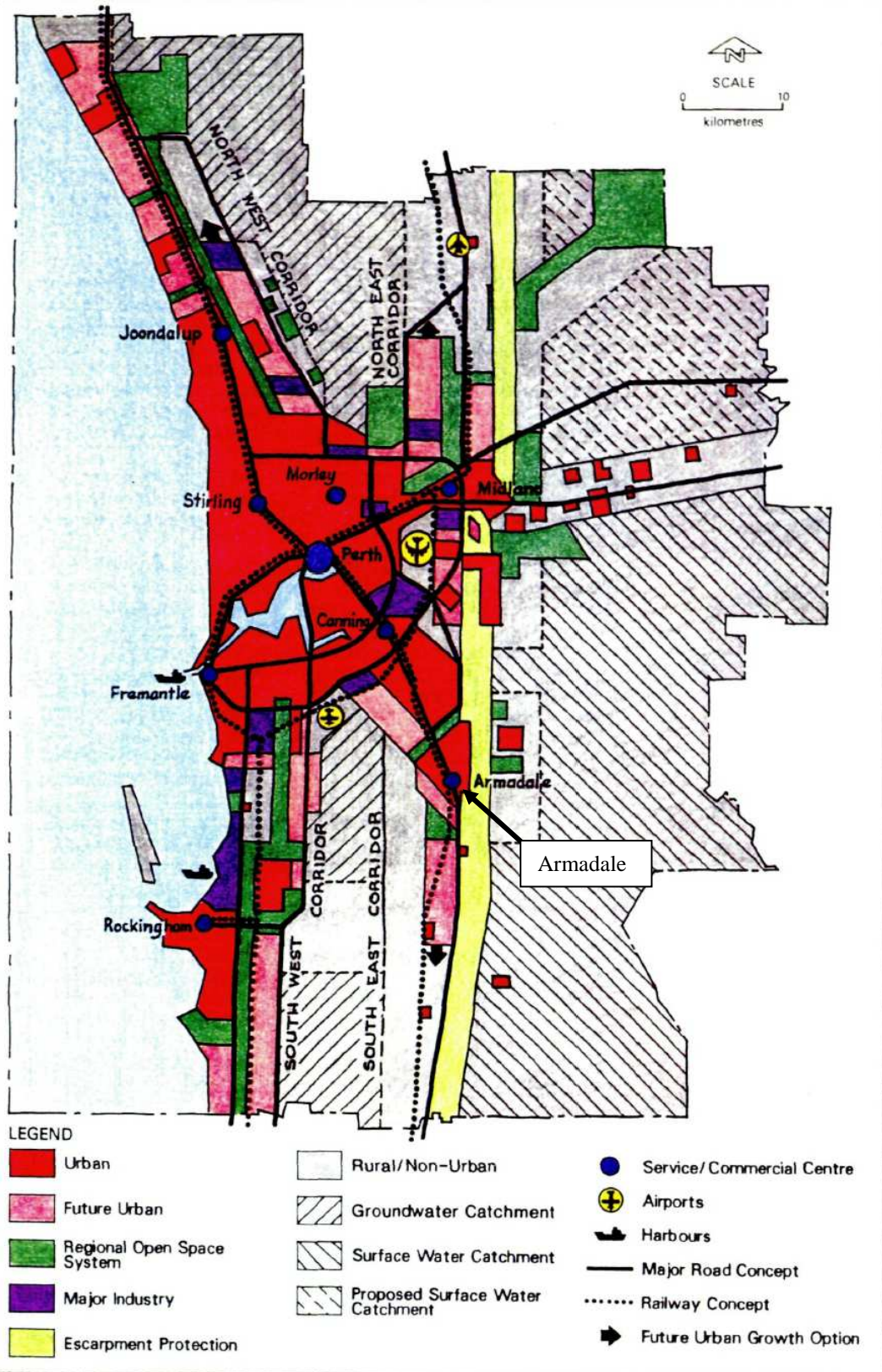
Figure 41: Areas surrounding Armadale were identified for urban expansion under Metroplan depicted as 'Future potential urban land use (to 2021).' Also evident is the residual reference to corridors, a legacy of the previous plan (DOPAUD 1990).

5.2.   Impact of Metroplan on Armadale

Approximately one decade after the release of *Metroplan*, the south-east sector was described as 'one of the slowest growing metropolitan sectors in terms of residential land supply and building activity' (WAPC 2001, 148). This sector, encompassing the City of Gosnells, City of Armadale and the Shire of Serpentine-Jarrahdale, represented only 9% of Perth's total residential lot creation. Initiatives proposed to address lagging performance included: the establishment of the Armadale Redevelopment Authority in 2001, the upgrading of the Tonkin and Albany Highways, provision of infill sewerage within Kelmscott and Byford and the upgrading of the Kelmscott – Armadale Hospital (ibid 2001, 152).

Similarly to the *Corridor Plan* previously, *Metroplan* designated various areas for future urban growth throughout Perth (refer to Figure 41). Adams (2007) considers that *Metroplan* substantially reduced the overall area earmarked for future urban development compared with the *Corridor Plan* previously as the concept of urban containment was promoted as a key policy measure. Future urban expansion for Perth was to be encouraged principally via a thickened north-west corridor to accommodate the rapidly developing satellite city of Joondalup, the expansion of a newly created north-eastern corridor (into the Swan Valley to incorporate Ellenbrook) and an emphasis on the growth potential of the south-west corridor.

Adams (2007) notes that *Metroplan* substantially decreased the growth potential of the south-eastern corridor, however this view is not supported by associated mapping entitled 'Urban Expansion Areas' which shows substantial land set aside as 'Future potential urban land use (to 2021)' surrounding Armadale to the north-west, west and south (DOPAUD 1990). Adams' view is also somewhat undermined by the expansion shown under subsequent plans such as the *South–East Corridor Structure Plan* where new large areas of future urban development (shown as 'Urban Deferred') were proposed in rural areas such as Wungong, Byford and Mundijong (refer to Figure 42, WAPC 2014).
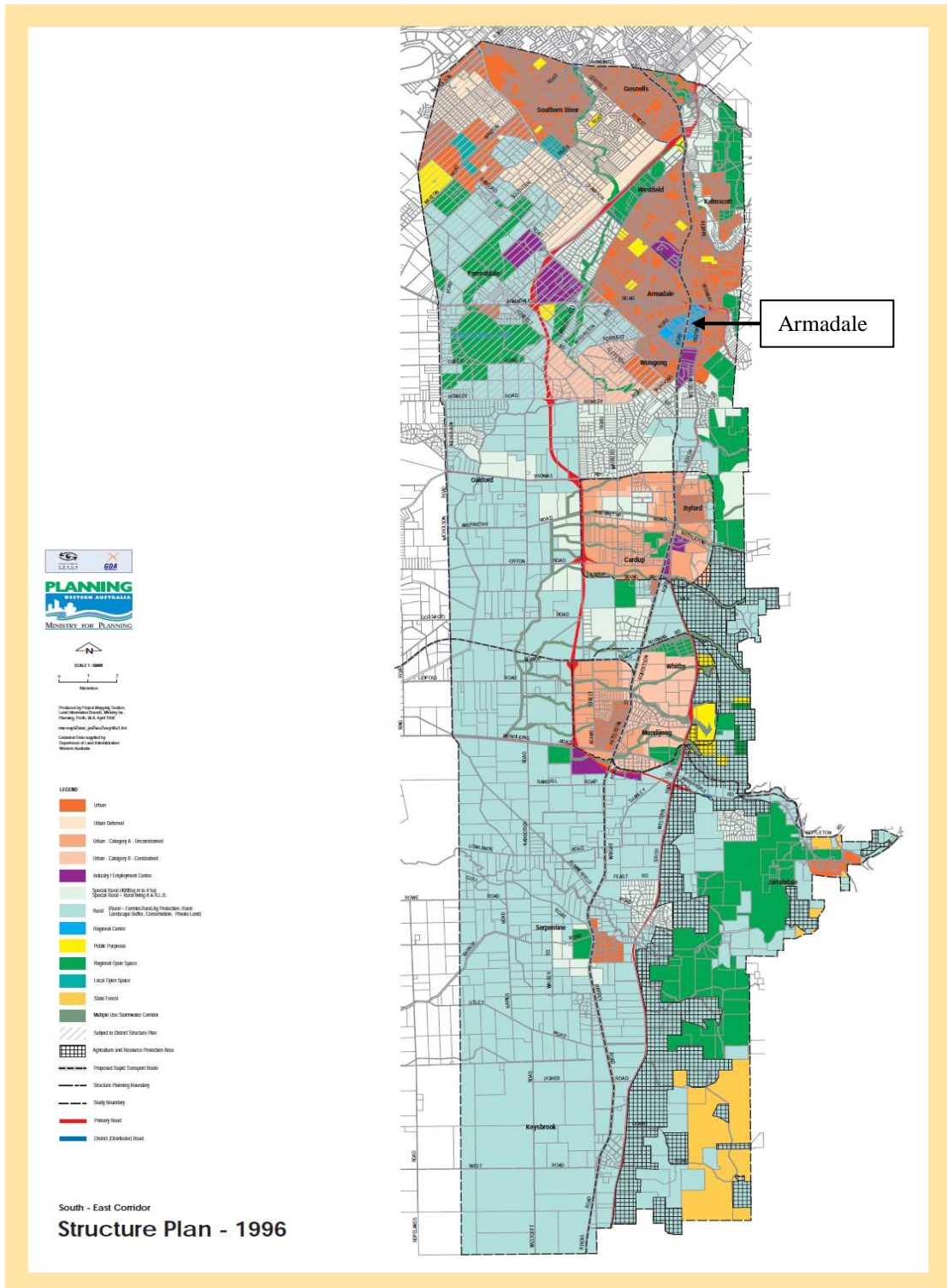
Figure 42: The South–East Corridor Structure Plan, released 6 years after Metroplan. Urban development was recommended south of Armadale for the Byford / Cardup and Mundijong areas. The above represents some of the first computer generated mapping produced by the then Ministry for Planning (WAPC 2014).

Metroplan acknowledged that central Perth should achieve regional predominance, however decentralisation from Perth's central business district was also a key focus as the majority of the workforce would be based in suburban areas. The suburbs' capability to become significant employment centres would improve over time as their population catchments developed. While central Perth would remain the most important commercial and civic centre, 'the hub of the region', a key element of the future development of Perth would be the establishment of robust suburban centres.

Increasing the resident population of East Perth was advocated under a major renewal project, and inner-city housing should be made more affordable. The plan considered that if such conditions could be successfully created, the result would bring life and vitality back to the city. *Metroplan* considered that young families would be attracted to peri-urban areas such as Midland and Armadale while older families and the elderly would remain in more established areas, closer to Perth. Suburban shopping centres were considered major attractors for development and viewed as the best manner in which to attract residents to peri-urban centres (DOPAUD 1990, 48).

The *South East Corridor Study Interim Report* commissioned by LandCorp and prepared by BSD Consultants (1995) reveals several development constraints surrounding Armadale. These included: the Jandakot Mound (precluding urban development), the presence of Cardup Shale surrounding Byford, the exclusion zone adjacent to the quarry north-east of Mundijong, titanium mineral extraction surrounding Mundijong, offensive trades (poultry farms, kennels and piggeries) and the Armadale tip site. Further constraints included groundwater contamination originating from a former landfill site in Gosnells (BSD 1995), high water tables corresponding with a lack of topographical variance (which would pose problems for drainage) and the Armadale sewerage treatment plant buffer zone. Other constraints included 'the fragmentation of land ownership and difficulty of land assembly in areas favourably designated, zoned and otherwise suitable for urban development' (BSD 1995, 15) as well as strong opposition from rural property owners to accept new development at variance with existing land uses.

In comparison with earlier strategies, *Metroplan* was innovative in a number of respects and presented several initiatives which remain central to more recent plans. For example, comprehensive detail was provided regarding the siting of higher density housing, which should be located close to shopping centres, public transport nodes, tertiary centres, employment centres and leisure facilities.

Contrary to the aims of the *Corridor Plan*, *Metroplan* explicitly advocated a more compact urban form, through consolidating corridor growth and facilitating urban development adjacent to existing urban areas rather than extending development on the periphery, reflecting the movement towards sustainability as a key policy position within planning. *Metroplan* considered that difficulties associated with assembling land held in fragmented land ownership was a primary planning issue for Perth. Such land fragmentation was considered a major roadblock, potentially preventing significant redevelopment within areas such as Armadale from taking place (DOPAUD 1990).

Similar to subsequent strategies, *Metroplan* emphasised accessibility, considering that employment should be localised and convenient to a resident workforce (in distinction to the *Corridor Plan*) by facilitating the development of large industrial estates near urban areas. Expansion of manufacturing land uses would be appropriate for Armadale with growth of the residential area to occur in conjunction with expansion of the hospital and government secondary school. Armadale was formally classified as a 'Strategic Regional Centre' and targeted for future growth and development with urban expansion past Armadale to Byford also encouraged. Urban growth was to be accommodated within all corridors including the south-east corridor and a wider range of house styles and dwelling types was recommended with an emphasis upon affordability made possible through developing land on the periphery (refer to Figure 43).
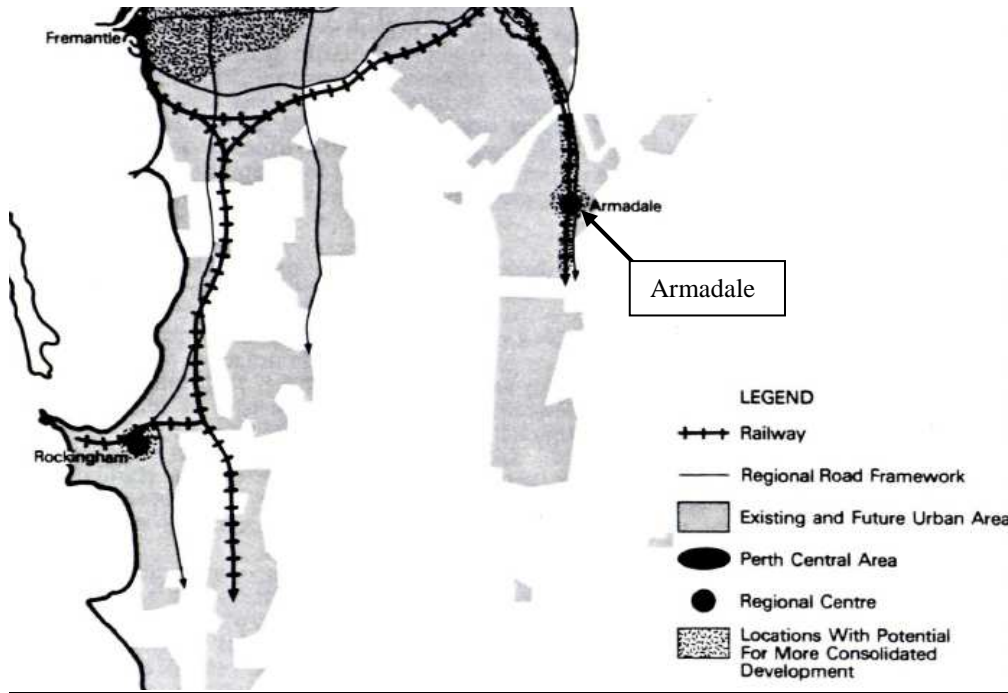
Figure 43: Land surrounding Armadale was identified for future urban expansion within Metroplan in addition to land located between Byford and Mundijong (DOPAUD 1990).

In an approach reflecting a shift towards postmodernity, *Metroplan* considered that the existing predominantly single detached housing model was not the most appropriate model for increasingly large groups such as the elderly, childless couples, single parent families and single-person households, all of whom were not served well by uniform single residences. Increased diversity of housing stock would be beneficial for Perth and would provide the impetus for suburban renewal reducing the need to urbanise new areas on the fringe of the built-up area. Residential infill (though the exact type or density was not specified) was advocated as the main vehicle to facilitate regeneration of suburbs and would also allow a wider range of households to live closer to established services and employment.

As per current planning practice, all urban land in Perth was zoned and coded under a local planning scheme. *Metroplan* considered that the residential R20 coding (approximately 500m^2 per lot) was considered appropriate for areas serviced with reticulated sewer, encouraging the development of 'uniform single residences' contradicting the stated aim of housing diversity. Low density codings such as R15 and R17.5 (666m^2 and 571m^2 lot sizes respectively) were characteristic of Perth's suburban development during this time.

Metroplan identified Kenwick, located approximately 17km from Perth's centre as the edge of the urban core with Armadale representing the limit of urban zoned land in the south-east sub-region. This spatial limit would not remain for long however, and areas surrounding Armadale were soon planned for urban expansion, particularly to the south.

5.3.   Strengths and weaknesses of Metroplan

While relatively accurate about population forecasts (approximately 2.0 million by 2021 in Perth and Peel and 320,000 homes in new areas required by 2021), many of the recommendations within *Metroplan* were not specific and the plan lacked detail in several key areas. While concepts such as housing affordability in inner city areas such as East Perth was encouraged, a lack of clear direction particularly in relation to density targets and associated mapping meant a lack of clarity for planners and stakeholders in respect to implementation.

Concepts such as infill, accessibility and housing affordability were promoted as central values without corresponding implementation plans to show how such ideas could be achieved. Statements such as 'maintaining the quality of neighbourhoods' (DOPAUD 1990, 5) and 'changing the mix of housing types to meet the changing demands of the population' lacked statutory guidance for planning decision makers. While *Metroplan* represented the beginning of a paradigm shift from outward expansion towards a more intensive use of existing land, the resulting strategy was somewhat vague and contradictory in intent.

As previously within the *Corridor Plan*, there appeared numerous contradictions in emphasis including advocating an increased diversity of housing types while promoting the benefits of a low density lifestyle and promoting a more compact urban form while advocating a low density target of 7 dwellings per ha to 9 dwellings per ha. This target is well below the current target of 15 dwellings per ha advocated by *Directions 2031 and Beyond* which corresponds to a generally accepted level of density where 'a good quality and cost-effective public transport service can be provided' (AMCORD 1995, 57).

Metroplan was driven by increasing widespread public criticism of the failures of the *Corridor Plan*, however Hedgcock and Yiftachel consider that *Metroplan* 'sat on the fence' in addressing Perth's major planning issues. '*Unlike the Stephenson-Hepburn Report* and the *Corridor Plan*, which presented bold visions of the future, the new plan concurrently promotes decentralisation *and* central growth, consolidation *and* peripheral development, continued large scale road building *and* support of public transport. In total, *Metroplan* truly reflects the indecision and confusion in which the planning profession is currently trapped and for which it is widely challenged' (313, 2007).

Premier Carmen Lawrence's speech for the launch of *Metroplan* reflected this somewhat contradictory intent: '*Metroplan* will contain urban sprawl by encouraging the development of more varied forms of housing in the built-up area, together with a wider range of housing densities in new growth areas. Very importantly, we need to promote a more sustainable pattern of development which will conserve our environment and natural resources. But the future population growth in Perth cannot all be accommodated in the existing built-up area. New urban areas will be needed. The north-west, south-west and south-east corridors will be enlarged, and a new corridor created north-east of the city' (Lawrence 1990, 2).

The plan advocated expansion of the north-west corridor to Joondalup, major expansion of the south-west corridor to Mandurah, limited expansion to the south-east towards Byford and new growth areas in the north-east corridor near Ellenbrook. Such areas, located on Perth's periphery, undermined the goal of a compact city and support Weller's view that 'cheap' and 'easy' greenfield land is usually first to be developed (2009). Armadale was well placed to accommodate this new growth: for policy makers and planners it provided vast reserves of relatively affordable, undeveloped land. By the time *Metroplan* was released, developers, including the State Government, had identified development opportunities surrounding Armadale. A planning and servicing study of the south-east corridor undertaken in 1995 by planning consultants BSD reveals that 'a substantial area located to the south of Armadale and designated as *Potential Future Urban* is relatively unconstrained, subject to considerable development interest and considered to be developable over the shorter term' (BSD Consultants 1995, 7).

Adams (2007) considers that both the *Corridor Plan* and *Metroplan* directly contributed to Perth's current status as a sprawling elongated city stretching virtually continuously from Two Rocks in the north to beyond Rockingham in the south. Both were prepared in a context of strong forecast demand for urban land and were predicated upon the vast majority of the future population conducting daily commuter patterns in private automobiles: 'These spatial plans shared a vision for future urban expansion to occur ostensibly through a decentralised road hierarchy based urban development model. Both plans therefore earmarked vast swaths of predominately rural land in various growth corridors for future urban expansion to occur' (Adams 2007, 71).

As with the *Corridor Plan* previously, Adams considers there were substantial departures from intended development outcomes envisaged by *Metroplan*. The power of the State Government's planning regulations to effect spatial visions for future urban expansion patterns, described by Adams as 'problematic' were no match for the powerful development industry: 'An institutionalist theoretical perspective on spatial planning suggests that the shared power world of policy implementation may be heavily influenced by actors outside of the centralised planning structure. Building on this perspective, growth coalitions theory then points towards actors from the land development and real estate industries potentially being the business elites influential in the spatial plan obfuscation – in the form of urban and urban deferred break-outs' (Adams 2007, 71).

Kennewell (2008) considers that the most significant contribution of *Metroplan* is that it finally 'challenged both the notion of an ever-expanding metropolitan area and the Perth vision of the detached home on a single block' (2008, 249). Although the single detached housing model may have been challenged, the model continued to flourish unabated during this period. Residential preferences continued to remain large dwellings on large lots, particularly in peri-urban areas such as Armadale where detached dwellings currently comprise over 90% of all dwellings (WAPC 2010).

Metroplan sought to promote new objectives such as: increasing densities within existing and new suburban areas, protecting the State's built and natural heritage (for which the *Heritage Act* was introduced in 1990), expanding the urban rail transit (which saw the Perth-to-Fremantle rail service reopened, the rail network electrified and a new north-western rail line being constructed in Perth), the revitalisation of Perth's centre, including the redevelopment of East Perth via a Development Corporation and the appointment of an Inner City Living Taskforce in 1991. At this time, planning in Perth reflected several new influences including: urban consolidation, heritage, inner city revival and ecological sustainability, although Hedgcock and Yiftachel (2007) consider that little solid professional consensus was galvanising behind any of these concepts.

Although *Metroplan* called for a shift towards infill redevelopment with an emphasis on units and townhouses, opposition to the rezoning process was emerging as a considerable force in Perth, particularly in semi-rural areas close to the encroaching urban front. The release of *Metroplan* was met by strong opposition to intensified development by those living in existing rural wedges that had been identified for potential future urban development. Such residents considered that the existing amenity and rural lifestyles would be threatened by proposals for new urban communities within the expanded corridors. These areas included 'rural areas in the foothills, East Wanneroo, West Swan, Canning Vale and Southern River that were the focus of visible and vocal campaigns opposed to urban development which commanded considerable public and media attention' (Hedgcock and Yiftachel 1992, 120).

It is significant to note that the majority of the above areas are now zoned 'Urban' and resident objections ultimately failed to halt Perth's demand for residential land. It should also be noted that the controversy arising from proposed rezoning of land from rural to urban within existing rural wedges in Perth had not yet reached undeveloped areas within the City of Armadale. The development of North Forrestdale, which occurred in the mid-2000s as an extension of the Canning Vale residential area remained rural zoned land located safely outside of any proposed urban encroachment (BSD Consultants 1995).

Although embedded as a central principle in *Metroplan*, urban consolidation was not easily implemented within Perth's established suburbs. Its overall ineffectiveness in this regard has been noted by Hedgcock and Yiftachel: 'While *Metroplan* has successfully captured much of the rhetoric concerning new planning imperatives, it remains largely ineffective at enacting any real changes in planning direction. Outer area development remains the one item which the plan continues to facilitate successfully' (Hedgcock and Yiftachel 1992, 134) and: *Metroplan* 'only proposes a mild increase in average densities from eight to nine dwellings per hectare. Although the strategy argues for urban containment, its commitment to the concept is questionable, principally due to: (a) *Metroplan*'s concomitant proposal for massive suburban expansion and (b) its reluctance to include an urban density policy as part of the metropolitan strategy (a draft density policy was released in 1989 but has not been adopted). This reluctance means that local authorities will continue to be solely responsible for determining the density of urban development, thus reducing the prospects of consolidation. Many of *Metroplan*'s statements on the prospects of consolidation can be dismissed as lip service and this is especially true when agencies such as LandCorp continue the tradition of large lot subdivisions' (ibid 1992, 140).

5.4.   Perth and peri-urban settlements under Metroplan

Metroplan echoed many of the main ideas contained within subsequent strategies and was visionary in a number of respects. Several innovations included: the acknowledged importance of a more compact urban form, the importance of accessibility, sustainability, the protection of water resources and promoting higher density redevelopment closer to activity centres. While somewhat constrained by the previous corridor approach *Metroplan* sought a major departure from many of the recommendations contained within the *Corridor Plan*. It also focused upon a number of new initiatives which would prove beneficial to the State. These included: extending the amount of industrial land in Perth, establishing an efficient freight network via Reid Highway to Midland and via Albany Highway to Armadale and planning for a new airport, which was never developed.

Metroplan also sought to protect water resources, particularly the Gnangara and Jandakot mounds, recommending that no industrial and urban land uses be supported in such areas. It also provided recommendations on new areas which contained basic raw materials including: sand, limestone and silica sand for glass and silicon chip manufacture. Landholdings containing such resources were recommended for protection and sourcing close to the urban area where they would be most needed.

Perth's status as the State's most significant central place was to be achieved through an expansion of commercial floor space, employment and infrastructure, including public transport: 'For this reason *Metroplan* supports priority being given to public transport for central area access and a limit on consumer car parks within Perth central area, consistent with the available road space for private vehicles on the approach roads' (DOPAUD 1990, 68). Implementation of *Metroplan*'s recommendations was to occur via planning controls within a number of planning instruments such as the *Metropolitan Region Scheme's* urban and urban deferred mechanisms, corridor structure plans, a metropolitan development program and regular monitoring and review 'to address specific aspects of *Metroplan* as necessary to ensure policies address the broader planning objectives of the region' (DOPAUD 1990, 90).

Under *Metroplan*, Armadale's recognition as an important urban centre was emerging and this is evident in detailed structure plans which were prepared during this time. This is also evident in development industry interest in the locality, responsible for undertaking preliminary studies regarding land capability and local development potential. The rural character of land surrounding Armadale was considered worthy of protection and urban development in non-designated areas would not be supported. Overall, the corridor was beginning to play a more important role in accommodating Perth's population growth, with 8000 dwellings 'expected to be provided in the south-east corridor over the next four years' (BSD Consultants 1995, 7) due to vast reserves of 'high capability land' to the south.
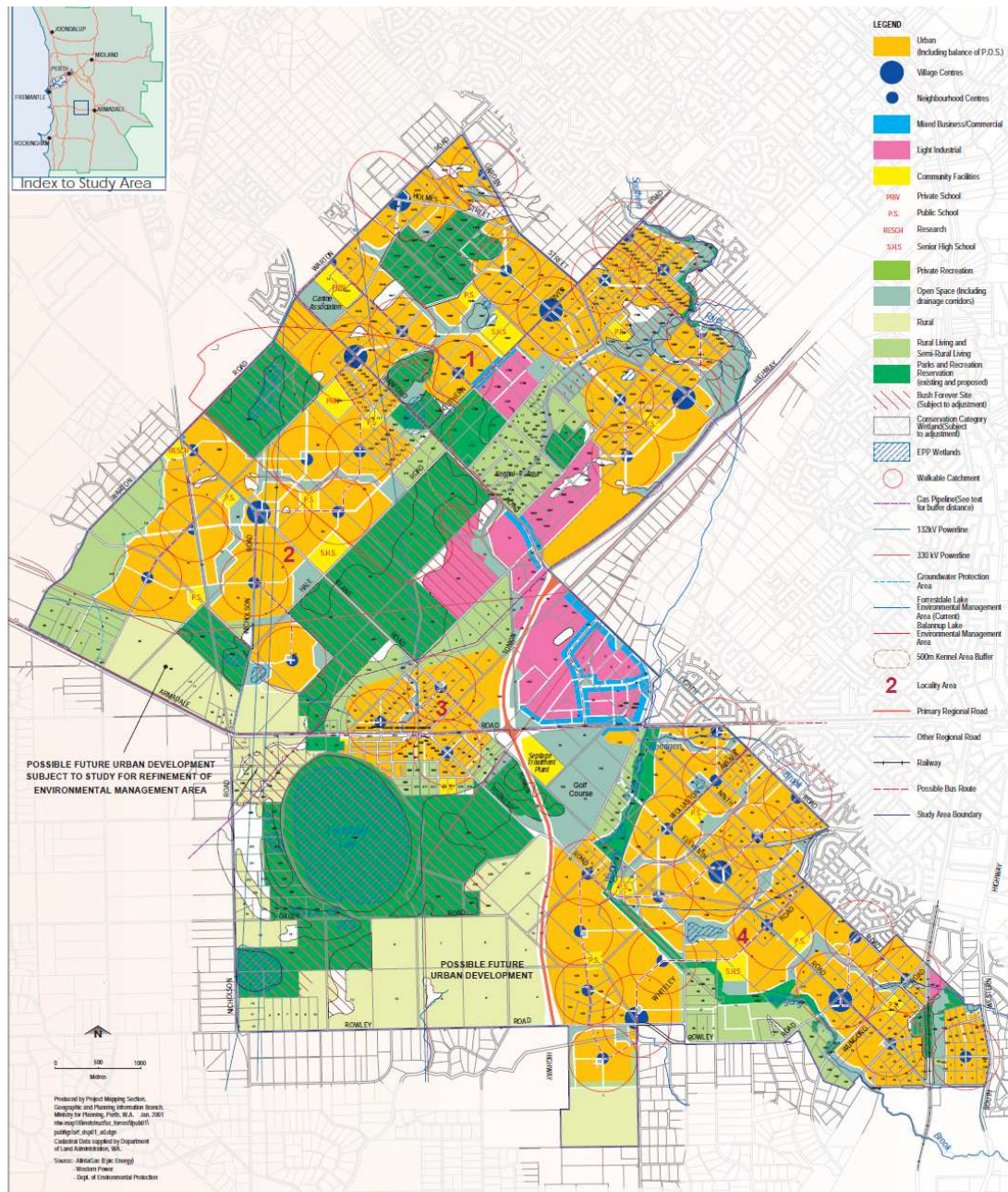
Figure 44: The 2001 Southern River/Forrestdale/Brookdale/Wungong District Structure Plan was released 11 years after the introduction of Metroplan and sought to expand the amount of urban land in the south-east corridor, reflecting its increasingly important role (WAPC 2014).

Large landholdings held by State Government agencies such as the State Housing Commission and LandCorp were set aside for the purposes of long term urban and commercial development surrounding Armadale. Overall it can be considered that Armadale's significance as an urban and employment settlement was becoming increasingly acknowledged by State Government and the development industry during this period (refer to Figure 44).

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5.5.   Theoretical approaches reflected in Metroplan

By the time *Metroplan* was being prepared in the late 1980s, the modernist influence was experiencing a decline (Irvine 2013) in part as a result of eclecticism, the reality of a post-fordist political economy and the emergence of postmodern cultural sensibilities. Another undermining factor of modernism proved to be economic restructuring with a shifting emphasis from manufacturing to service industries which had spatial implications for Perth. In addition, the associated fragmentation of labour and capital made it increasingly difficult to maintain the modernist commitment to centralised control and a conflict-free public interest.

5.5.1   Postmodernism: background

Hoffman (2013) considers that the modern era experienced a decline as early as the 1950s, however other scholars consider that this occurred in the late 1980s (Stiftel 2000; Watson and Gibson 1995). Following this period, postmodernism emerged as a key influence within western thinking, including within urban planning. Postmodernist includes a turn to historical allusion, spatial understandings, the abandonment of critical distance for ironic commentary, the embracing of multiple discourses and a rejection of totalising ones, a scepticism towards master narratives and a disinterest in conventional performance, all of which challenges modernist planning thought (Irvine 2013).

The early 1990s saw an increasing divergence of social influences borne from cultural diversity that meant planners needed to become more receptive to a changing community. This meant acknowledging and respecting diversity and difference and meaningfully involving communities at early planning stages. This is reflected in the extensive public participation phases of plans subsequent to *Metroplan* which sought to undertake comprehensive public consultation processes (Falconer 2008). Postmodern approaches have an emphasis upon 'grass roots' movements and communal organisations among marginalised and underrepresented groups.

'Postmodernists look to the past as well as the present and the future because they suspend the implicit belief in the inevitability of progress' (Welcomer 2001, 1177). Further, postmodernism views the meta-narratives of progress, science, industrial development and representative democracy with scepticism.

Elements of postmodernism identified by Beauregard (1991) include: more flexible procedures in the workplace, a defensive and weakened labour force, lessened trade union representation and decreased emphasis upon welfare programs. All of these trends have implications for those living on the periphery that may lead to greater vulnerability including economic marginalisation and reduced access to stable employment. Soja (in Watson and Gibson, 1995) conveys a disturbing picture of postmodern cities which can be applied to areas on the periphery: masses of homeless, rampant crime, a permanent urban underclass and 'enclaves of outrageous wealth and despair' (ibid 1995, 134).

Despite the above description, not all elements of a postmodern city are necessarily bleak. Urban transformation and restructuring is also characteristic of a postmodern city. This is evident in the altering of Armadale's urban fabric through densification under *Town Planning Scheme No. 4* (City of Armadale 2005). Another potentially positive characteristic of a postmodern city is the growth of high technology areas, office buildings and industrial parks, the planning for which has been undertaken under the *Economic and Employment Lands Strategy* which has set aside large areas of land for employment uses surrounding Armadale (WAPC 2012).

Other elements such as growth in new service based sectors such as the entertainment industry and the expansion of the finance, insurance and real estate sectors is characteristic of postmodern cities. Significantly, Armadale has undergone rezoning to higher densities prior to areas located closer to the city such as within the City of Gosnells. This has resulted in 'a breaking down of the neat, tent-like density gradients stretching outward from the central city to the suburbs' (Soja in Watson and Gibson 1995, 132).

5.5.2. Feminist Theory: main features

Feminist planning theory, comfortable operating within a postmodern context (Stiftel 2000), seeks equity in planning processes between genders and critiques planning instruments which ascribe negligible value to women's work such as home child care. It seeks to address structural discrimination against women in cities, to address antiquated modes of housing and to move beyond traditional suburban housing models based on nuclear family structures. Feminist planning theory rejects the rational model of planning in favour of a model that recognises diverse and marginalised voices. It seeks that 'process, flexibility, communication and negotiation take precedence over rigid planning principles and theory divorced from practice' (Campbell and Fainstein 1997, 443).

Feminist thought recognises implicit values and attitudes throughout planning instruments whereby women are ignored, exploited, oppressed or devalued. According to Watkins (2000), planning strategies should be constructed upon a more egalitarian basis, with emphasis upon expanding community interaction and communication. Such plans are responsive to social and environmental needs and express a concern for the public good, cultural diversity and urban vitality. Ritzdorf (1992) considers that planners assume a value set that is inherently and historically masculine, and overriding goals and objectives are more likely to be shaped by male than female decision makers. Planning theory is grounded in many of the principles that feminist theorists reject outright who do not regard rationality as the basis for most of human action.

The issues that feminist thinking seeks to address are of direct relevance to the urban environment and include: improving the economic status of women, identifying the location and movement of women in the built environment, identifying the connection of patriarchal relationships to capitalist relations and improving the relationship between public and private life (Rothschild 1999). Land use decisions in most cities are made in a semi-private process involving city bureaucrats, elected officials and capitalist developers. As a result the decisions made usually contribute to increasing gender inequalities (Young 1990).

Rothschild considers that women have traditionally been excluded as both designers and users of cities and have been marginalised within professions related to urban design, architecture and planning (1999). Young terms this exclusion the 'five faces of oppression' which include exploitation, marginalisation, powerlessness, cultural imperialism and violence (1990, 48).

5.5.3. Feminist theory: application to Perth's strategic plans

A study undertaken by Hillier (cited in Mandelbaum et al 1996) examines eight Western Australian plans from a feminist perspective. *Metroplan* is the only strategic plan for Perth included for analysis within Hillier's study. Other State planning documents examined include: *Bunbury Regional Plan (1986), Planning for the future of the Perth Metropolitan Region* (1987), *Perth Metropolitan Region Commercial Centres Policy* (1989), *Are you being served?* (1989), *Transporting Perth into the 21st Century* (1990) and *Policy Manual* (1990). Hillier found that 'women are virtually invisible in these plans and in the professional discursive forms that characterise them' (1996:289) and considers that such plans deny their male-centred biases. Women are represented only as a homogenous group defined in relation to men.

Hillier describes the form of existing and proposed buildings, streets, parks and transit lines contained within such plans as 'phallocentric'. Planners should be more focussed on 'those who take children to school – that is women and their convenience' (in Mandelbaum et al 1996, 290). Perth's strategic plans often hide gender, making women invisible within the public sphere. Such plans 'refuse to engage with women, to acknowledge women's stories and women's needs. Women thus remain disempowered by the modernist discourse of planning policies that are physically and economically driven' (ibid 1996, 293).

Hillier's view that women are largely 'invisible' is reflected within the strategic plans for Perth which are a focus of this study. Reference to feminist ideas or theory is infrequent and gender representation is noticeably absent, particularly within Perth's earliest strategies.

The *Stephenson and Hepburn Report* in its chapter on 'People' omits any discussion of women, instead concentrating on natural increases to population which is not gender specific. In a section entitled 'Work' the strategy notes that 'the proportion of female labour employed in manufacturing industry is much lower than the proportions in more highly industrialised regions' (Stephenson and Hepburn 1955, 9). Similarly the *Corridor Plan* contains chapters on 'Population' and 'Workforce and Work' but all discussion is versed in terms of 'persons per net residential acre' (homogenous groupings) rather than discussions about men and women. One exception to this is a brief reference to women within the *Corridor Plan* which refers to: 'the increasing number of working married women' (1970, 26) which were beginning to influence the composition of Perth's workforce.

Metroplan omits a discussion of gender altogether, instead seeking to maintain 'the quality of life of its citizens' (DOPAUD 1990, 17). This is also true of Perth's more recent strategies as discussion of gender roles or representation of the masculine and feminine is largely absent. *Network City* refers to 'the valuing of Indigenous heritage and respect for all cultures, in a city for our children' (WAPC 2004, 3) and the importance of creating people-oriented forms of development, also omitting a discussion of women. *Directions 2031 and Beyond* refers to a rapidly growing non-gendered population which avoids a discussion of women specifically.

5.5.4.   The representation of women in other Australian plans

The absence of the representation of women is reflected elsewhere during the time of Perth's earliest strategic plans. The *Sydney Region Outline Plan, A Strategy for Development* (SPANSW 1968, 27) omits a discussion of women and focusses upon managing Sydney's strong growth to '5.5 million in the year 2000 by which time the annual growth rate may be at a level not far short of 100,000 *people* per year' (1968, 18). The *Report on the Metropolitan Area of Adelaide* (1962) contains a section within Chapter 5 entitled 'Population' which states that 'as females live longer there are more females in the older age group than males' (1962, 49) but does not go beyond this and does not seek to address the role of women within the city.

Such description is not tied to any particular recommendations for the planning of Adelaide, but is included within more general demographic information such as: 'Percentage distribution of persons aged 65 years and over'.

The City of Melbourne Strategy Plan (Interplan 1974) similarly excludes discussions relating to gender. The plan does however, seek to introduce community consultation within the planning sphere and departs from Perth's earliest plans in this respect. It cites 'the contribution made by a wide range of residents, public authorities, business and professional groups and neighbouring municipalities. Community participation is a new concept in Australia and is necessary for planning at all levels, not only at the strategic level but also for local action planning' (1973, 275). Overall it can be considered that the absence of women within planning strategies for Perth was also being reflected throughout a number of Australian cities during this time.

5.5.5. Feminist Theory: treatment of peri-urban regions

Yiftachel et al (2001) consider that although peri-urban areas are locationally disadvantaged for all residents, they are most difficult places for women. Such places located 40 or 50km from the city centre 'have all of the concomitant problems of lack of facilities and isolation' (2001, 71). Such areas risk replacing 1960s public housing estates with new ghettos of low income owner occupier and rental housing in outer suburbia. 'Such locations are difficult places to live, especially for women' (2001:71).

Greed concurs that the periphery, considered a product of decentralised sprawl, poses challenges for women, many of whom do not have access to transport during the day: 'For women living out on the edges of cities without cars, and limited public transport, the question of whether their estate is a private development or a public council scheme is academic as the problem is similar in both types of development' (1994, 42). Iaquinta and Drescher (2000) consider that peri-urban regions primarily disadvantage women who often have less economic opportunity to move or migrate to areas closer to the central city.

5.5.6. Sustainable Development: historical background

Contemporary discussions about urban form and infill are increasingly linked within the framework of sustainability and Perth's strategic plans since *Metroplan* in 1990 have included this element as a major focus. The sustainability agenda arose out of a global awareness that the consumption of natural resources was occurring at a rate greater than the natural environment could support. The 1987 'Our Common Future / Brundtland Report' cautioned this destruction of resources. This warning gave rise to the concept of 'sustainable development', whereby economic growth, as a priority for human welfare, was balanced with concerns for social equity and environmental protection (Harger 1996; Pacione 2001).

The United Nations (U.N.) sets out a number of overarching goals in order to promote more sustainable patterns of production and consumption. Protecting and managing the earth's natural resource base is an essential requirement for sustainable development (2014). The U.N. is committed to working to promote sustainable and inclusive economic growth, social development and environmental protection and thereby to benefit future generations of the world without distinction of any kind such as: age, sex, disability, culture, race, ethnicity, origin, migratory status, religion, economic or other status. The global nature of climate change calls for the widest possible cooperation by all countries with a view to reducing global greenhouse gas emissions. Sustainable Development Goals are accompanied aspirational global targets, with each government guided by the global level of ambition while taking into account national circumstances.

Other approaches such as Herman Daly's *Steady State Economics* model seek to develop cities qualitatively through improvements in science, technology, and ethics without growing quantitatively in physical dimensions (sprawl). Such a model lives on a constant metabolic flow of resources from depletion to pollution. Entropic throughput should be maintained at a level that is both sufficient for the health of cities and within regenerative capacities of the containing ecosystem. Steady State Economics also aims to stabilise population, reregulate international commerce, introduce ecological tax reform and limit income inequalities (Daly 2013).

Perth's earliest plans excluded any specific discussion of sustainability compared with more recent planning instruments. The *Stephenson and Hepburn Report* focussed on Perth's natural features and the importance of their accessibility and preservation and the *Corridor Plan* omitted the inclusion of environmental issues, focussing only on tangentially related subjects such as Perth's 'Rural Base' and 'Climactic Base' (1970, 4). By 1990 however, environmental awareness was becoming more prominent within Perth's planning system. The 'Statements of Principle' within *Metroplan* include encouraging 'a green region in which planning is in harmony with the environment, natural features are protected and a comprehensive system of parks and conservation zones can be developed' (1990, 2). Overall *Metroplan* sought to encourage 'a sustainable region in which emphasis is placed on energy conservation and the protection of water supplies and other natural resources' (ibid 1990, 2).

5.5.7. Sustainable Development: treatment of peri-urban regions

In *Made in Australia, the future of Australian Cities*, Weller and Bolleter (2013) outline an alarming scenario, considering that 'Perth is Australia's if not the world's most sprawled city per capita with the highest ecological footprint of any Australian city' (2013, 91). Perth's economy lacks diversity, reflected in the homogeneity of its urban form and they consider that apart from coal, all resources upon which Perth's 'vast suburban sprawl' is reliant will be exhausted sometime this century.

The solution proposed by Weller and Bolleter is to rezone all of the rural land located within the *Metropolitan Region Scheme,* much of which is located on the periphery: 'We have 118,000ha of rural land in our metro boundary, which can house the extra millions' (2013, 91). This may prove an unrealistic solution as much of this land is zoned rural for logical reasons: it is comprised of marginal land, bushland and conservation category wetlands. Such constrained land does not easily allow urban development and is unlikely to receive support from environmental agencies if rezoning is ever proposed.

Newman and Kenworthy (1999) define sustainability as economic development which improves and avoids harming the environment. The city is a dynamic and complex ecosystem which is able to take advantage of various efficiencies of scale as it grows, however Perth is a poor performing car-dominated city. Newman and Kenworthy tie notions of sustainability primarily to transportation behaviour. Walking and cycling feature very low in the Australian psyche: 5.1% of Australians walk or ride to work, and in the US this is lower at 4.6%. Reducing auto usage and utilising light rail should be a higher priority for all cities. Development should be tightly regulated to ensure a more compact land use pattern, rather than encouraging outward development. According to Newman and Kenworthy the biggest threat to sustainability is continued automobile dependence (1999).

Other scholars have studied the 'food security' potential of peri-urban areas, exploring the connection between urban dwellers and a sustainable food supply. McKenzie et al (2014) discuss the utilisation of peri-urban land for vegetable tourism within the metropolitan area of Barcelona, Spain. Such 'agri-tourism' seeks to produce organically certified produce close to consumers, considered safer, fresher and tastier (local and green). The authors suggest that farming within protected peri-urban areas provides a number of advantages related to sustainability, including reduced transport costs. The area within the metropolitan region of Barcelona has been able to successfully resist urban encroachment since the 1990s via the planning system which has permanently zoned such land 'Agricultural Park', a land-use zone permitting farming. Such planning controls seek to manage conflict and competition between agricultural and residential land uses.

The City of Armadale *Town Planning Scheme No. 4* does not provide such controls and large-scale farming within the study area is almost non-existent. Since the 1970s the study area has experienced a decline in agricultural and farming uses as demand for more valuable urban, commercial and industrial land has increased (Stephenson and Hepburn 1955, Taylor and Burrell 1980, 7). As such the current state of the study area reflects an absence of medium and large scale agricultural uses.

Chapter 6: Network City (2004) and Directions 2031 and Beyond (2010)

6.1.   Background

In its short 7 year life *Network City* (2004) existed only in draft form and comprised a polycentric multi-centred strategy which identified 120 activity centres and activity corridors (central places) for redevelopment. It intended to integrate land use and transport networks within established suburban areas and planned for a 25 year timeframe to 2030. It was driven by the need to better manage Perth's urban growth with an emphasis upon environmental protection, particularly with respect to sensitive areas such as the Swan River, coastal areas, wetlands and bushland. It promoted the more efficient use of existing urban land and sought to improve the use of existing services and infrastructure in order to reduce Perth's reliance on private transport. *Network City* also outlined the merits of implementing an urban growth boundary to limit growth on the periphery. Although this was never implemented, it clearly leaned upon principles related to a more compact, higher density, interconnected city.

Network City was unique in that it represented the greatest emphasis upon urban consolidation and infill development within all of Perth's five strategies since 1955 with an ambitious target of 60% of all new housing development to occur in existing built up areas and the remaining 40% to occur in previously undeveloped greenfield areas (WAPC 2004). It remained as a 'draft' throughout its life, being superseded less than 2 years after the Liberal State Government won the state election under Premier Colin Barnett in September 2008.

Like *Metroplan* prior, specific locations such as Midland and Armadale were not analysed in detail and a discussion of sub-regions was largely lacking. Yet the timing of the release of the strategy upon various local authorities including the City of Armadale proved significant. Shortly following its release, the City implemented a new local planning scheme effectively doubling the allowable residential density within Armadale, Kelmscott and Camillo (the study area).

Network City was therefore highly influential in shaping those local planning schemes in Perth which were being prepared and released at that time. Like the *Corridor Plan* and *Metroplan* prior, the driving force for the new strategy was an attempt to manage population growth within a context of decreasing housing affordability. This became a political issue which it was hoped a move towards urban consolidation would address (Weller 2009).

Figure 45: The key themes of Network City (WAPC 2004).

Values of *Network City* included: sustainability, inclusiveness, innovation and creativity, equity and improved connectivity within a more efficient transport network. Key objectives included: accessibility, accommodating urban growth within existing city boundaries, extending public transport services, making fuller use of urban land, protecting environmentally sensitive areas and promoting affordable housing (WAPC 2004) (refer to Figures 45 and 46).

An urban growth boundary (UGB), acknowledged as a North American approach primarily used within a context of weak statutory controls, was proposed at the preparatory 'Dialogue with the City' events. It was considered that such an approach could have a number of advantages. These included: reducing the potential for leap-frogging of development to areas where land is cheaper and reducing the total amount of land needed to accommodate Perth's population while preserving agricultural lands and environmentally sensitive areas on the periphery. An urban growth boundary was never implemented within Perth and *Network City* did not provide location-specific data regarding the impact that such an initiative may have had in Armadale.

There was however, discussion on how this might likely impact peri-urban settlements. It was considered that such a mechanism would increase 'price pressure on land within the boundary, causing poorer households to be displaced and forcing them further out of the urban area (possibly leap-frogging the boundary), where affordable housing may or may not be available' (WAPC 2004, 113).

Engage with wider community		Reform/improve policy and processes	
Strategy 1-2:	Use land resources efficiently	Strategy 1-1:	Foster land use and transport integration
Strategy 2-7:	Work in partnership	Strategy 1-3:	Manage urban growth
Strategy 2-8:	Create shared responsibility	Strategy 2-2:	Integrate planning and infrastructure
Strategy 3-2:	Cultural planning	Strategy 2-10:	Reform governance
Strategy 3-3:	Providing places with qualities	Strategy 3-1:	Integrate cultural planning
Strategy 3-6:	Place management	Strategy 3-4:	Conserving cultural heritage
Strategy 3-8:	Housing affordability	Strategy 3-5:	Development in tune with its context
Strategy 3-9:	Housing diversity	Strategy 3-6:	Place management
Strategy 3-10:	Revitalise existing centres	Strategy 3-7:	Change development systems
Strategy 3-11:	Cultural use of unused government assets	Strategy 3-11:	Framework for place based revitalisation
Strategy 3-12:	Revitalisation projects	Strategy 3-13	Revitalisation contributing to places and infrastructure
Strategy 3-14:	Tap into creative industries	Strategy 3-15:	Considering community safety
Strategy 4-2:	Access the workforce	Strategy 3-16:	Promoting mixed use
Strategy 4-3:	New and revitalised employment centres	Strategy 3-17:	Enhance street connections for people
Strategy 4-5:	Provide employment land	Strategy 4-1:	Workability
Strategy 5-2:	Empower local communities to defend environment	Strategy 4-4:	Revise planning mechanisms for employment
Strategy 5-3:	Protect biodiversity	Strategy 5-1:	Refocus planning decision making so environment has equal weight with social & economic factors
Strategy 5-6:	Moore River to Busselton Greenway	Strategy 5-4:	Protect areas of environmental significance
Strategy 5-8:	Coastal Planning Strategy	Strategy 5-5:	Protect Indigenous heritage
Strategy 6-1:	Comprehensive transport strategy	Strategy 5-7:	Protect water resources
Strategy 6-5:	Expand public transport system	Strategy 5-9:	Reduce Perths eco-footprint
Strategy 6-6:	Balanced transport systems	Strategy 5-10:	Reduce energy use
Strategy 6-7:	Balanced ridership	Strategy 6-2:	Transport links activity centres
Strategy 6-8:	Protect aviation infrastructure	Strategy 6-3:	Enhance transport safety
Strategy 7-1:	Use infrastructure to influence growth	Strategy 6-4:	Enhance freight systems
Strategy 7-4:	Minimise infrastructure costs	Strategy 7-2:	Maximise service efficiency
		Strategy 7-3:	Use technology to improve services

Figure 46: The comprehensive strategic objectives accompanying Network City (WAPC 2004).

Support for an urban growth boundary was based upon the potential benefits that such a mechanism could provide by contributing to increasing density in centres and saving on infrastructure costs, thus reducing the total amount of urban land required. No new subdivisional proposals would be supported outside of the designated boundary area. *Network City* considered that potential for the boundary to be expanded over time would be frustrated by rural-residential development, particularly the subdivision of large single family hobby farms located outside of the designated urban area:

'These lots experience an increase in value because they provide the amenity of open space that has been created by means of the urban growth boundary. This in turn leads to political opposition by the owners of these properties who do not want to see the expansion of the urban growth boundary to allow higher densities and thereby threaten their open space amenities' (WAPC 2004, 114). Overall however, the concept of introducing an urban growth boundary within Perth was eventually abandoned. The WAPC considered that strong planning controls provided via local planning schemes meant that effective control on the rate and direction of urban growth could be achieved and as such the mechanism was considered 'somewhat superfluous' (ibid 2004, 114).

The 2002 iteration of the Residential Design Codes of Western Australia (WAPC 2002) current at the time of *Network City's* release, defined medium density development as R30 – R60 (approximately 150m^2 lots to 300m^2 lots) and high density development as R80 – R160 and greater (multiple dwellings up to 5 storeys in height). *Network City* considered that although low density housing and living within low density neighbourhoods would remain the most popular lifestyle options for Perth and Peel's residents, future densification would be necessary due to resident concerns relating to affordability and sustainability. Despite this, it was acknowledged that resistance to embrace higher density housing remained strong in the Australian psyche.

Falconer (2008) notes that the participatory process for *Network City* revealed that approximately one half of participants viewed living in *medium-density* areas as 'attractive' or 'reasonably attractive' but only 10% of participants considered that living in *high density* areas would be 'attractive' or 'reasonably attractive'. This finding was perhaps not surprising given Australia's historical tradition of low density suburbia with its perceived family and open space benefits and the reluctance of many residents to embrace a major shift in housing forms.
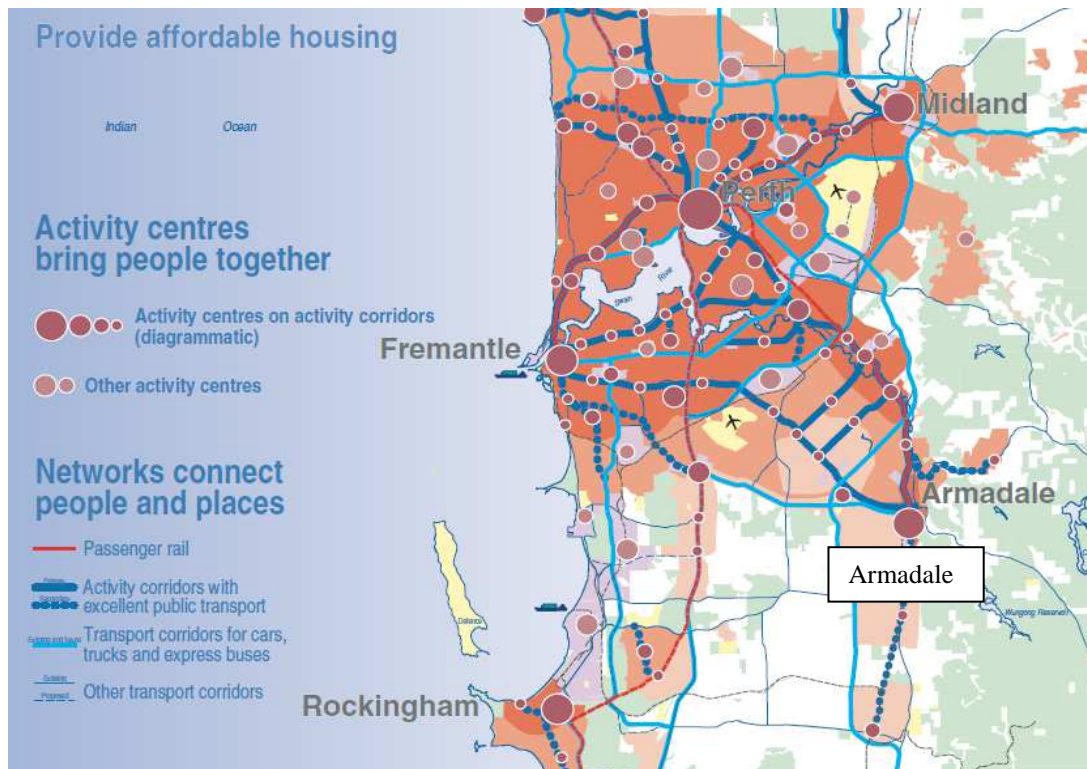
Figure 47: Network City emphasised connectivity to activity centres or central places (WAPC 2004).

6.2. Strengths and weaknesses of Network City

Weller's (2008) critique of *Network City* considers that it has failed on all levels to provide an alternative to piecemeal suburban sprawl. He identifies the following main flaws:

- Its 2030 timeframe is too short-sighted;
- Its land requirement calculations are inaccurate (23,000ha of land already committed for urbanisation supersedes the 60% - 40% target, enough land for 276,000 homes);
- Many of the 120 activity centres identified for increased density are unattractive for pedestrians. They have been designed for cars, not people and are located in areas which will require substantial redevelopment which will prove more costly than greenfield development (refer to Figure 47);

- The strategy comprises only 'words' with no plans or images demonstrating the types of urbanism it recommends: 'Because it has no imagery *Network City* has failed to gain traction in the public imagination and there is considerable confusion amongst both professionals and the general public as to how its words will be translated into forms' (Weller 2008, 7). In Weller's view, *Network City* is a poor example of a master plan and merely provides a set of ineffective principles intended to limit sprawl.

Network City recognised that its most controversial element was its urban infill target. It acknowledged that there were those who viewed the 60:40 target 'as too ambitious, while others see it as too easily achieved' (WAPC 2005, 17). The target was designed to be dynamic, for its performance to be constantly monitored and reviewed over time. Kennewell (2008) describes Network City's infill target of 60% as 'lofty' and considers that it set itself an insurmountable task, questioning whether the strategy could have realistically addressed population growth: 'The majority of projected population additions will still be found in seemingly ever-expanding suburbs, north and south of the city, *Network City* projects a Perth and Peel population of 2.22 million by 2030. This represents a 52% increase on the 2001 figure' (2008, 254).

Of further concern to other scholars was the continuation of the predominant detached housing model that resulted from *Network City's* implementation: 'Significantly, few new high density developments have achieved the 'New Urbanist' urban village model that inspired many of the core tenets of the plan' (Davies and Atkinson 2012, 3484). Kennewell (2008) considers that *Network City's* intention for a significant amount of growth to occur within existing areas of Perth was not successfully achieved and as with *Metroplan* and the *Corridor Plan* previously, outward urban growth continued relatively unabated under the plan.
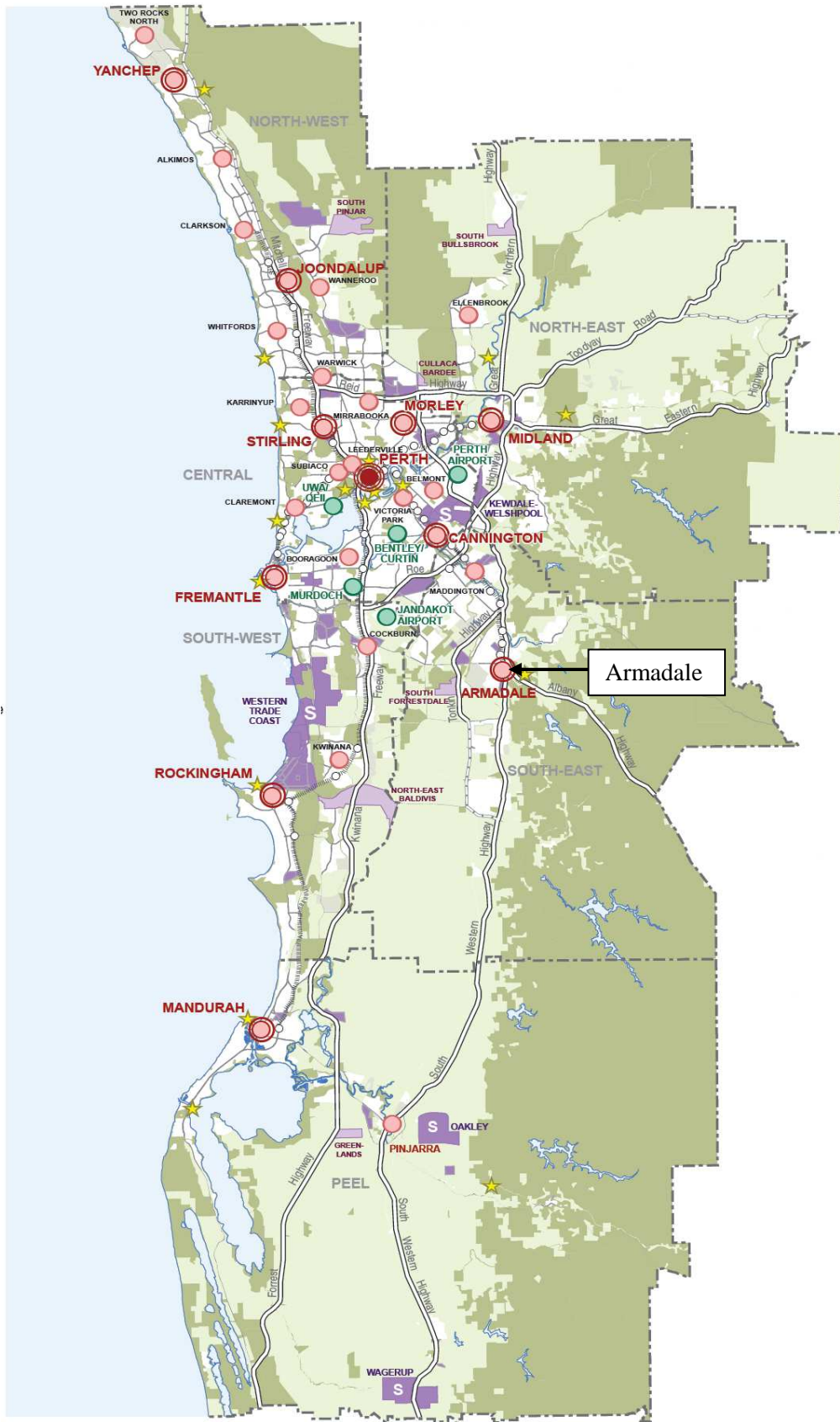
Figure 48: The area covered by Directions 2031 and Beyond is larger than that covered by Network City and is divided into 6 sectors (WAPC 2010).

6.3.   Directions 2031 and Beyond

Directions 2031 and Beyond was adopted and released by the Western Australian Planning Commission (WAPC) only seven years after the release of *Network City* in August 2010 (refer to Figure 48). As the current strategic plan for the Perth metropolitan and Peel regions it seeks to establish a vision for the future by providing a framework to guide the detailed planning and delivery of housing, infrastructure and services. Similarly to past plans, the driver for the *Directions 2031 and Beyond* strategy is population growth anticipated from 1.65 million in 2010 to 2.2 million by 2031. This will require an additional 328,000 dwellings and 353,000 jobs, with recent growth modelling projecting a city of 3.5 million people by this time. Under the strategy, Armadale is represented as a rapidly urbanising *Strategic Metropolitan Centre* with associated secondary and district centres accommodating a major transport / freight route with the South Western Highway, Tonkin Highway, Albany Highway and Brookton Highway (refer to Figure 49).

Strategic metropolitan centre	Secondary centre	District centre
Armadale	Maddington	Byford Forrest Lakes Gosnells Kelmscott Wungong* Mundijong Thornlie North Forrestdale (Newhaven)*

Figure 49: Hierarchy of activity centres within the south-east sub-region with Armadale as the most significant centre (WAPC 2010).

Directions 2031 and Beyond acknowledges that Perth is a sprawling city. It seeks to improve the relationship between where people live and work in order to reduce commuting time and cost and to improve the associated impacts on transport systems and the environment (WAPC 2010). One of the most significant elements of the plan is that the ambitious 60:40 infill target outlined under *Network City* has been revised under *Directions 2031 and Beyond*.

While aiming to increase densification by one-third, *Directions 2031 and Beyond* has revised the ambitious target of 60% to that under *Network City* to 47% or '154,000 of the required 328,000 dwellings as infill development' representing a more conservative approach to urban consolidation. Despite this variation in infill targets, both strategies share the common theme of seeking to encourage redevelopment within established suburban areas. *Directions 2031 and Beyond* seeks to foster a liveable, prosperous, accessible, sustainable and responsible city with intent to promote and increase housing diversity, adaptability, affordability and choice (WAPC 2010). Key intentions of *Directions 2031 and Beyond* include:

- a clean, green, productive and distinctive city;
- a city with good public transport, cycling and pedestrian systems;
- an equitable, inclusive, safe and prosperous city;
- a city which maintains high levels of employment;
- a tolerant city which embraces diversity;
- a city which gives people a sense of identity and belonging.

6.4.   Impact of Directions 2031 and Beyond on Armadale

Directions 2031 and Beyond's treatment of Armadale is outlined in detail within Volume 10 entitled *South-East Sub-Region*. The sub-region as defined by the strategy comprises the City of Gosnells, City of Armadale and the Shire of Serpentine-Jarrahdale. The City of Armadale is classified as a 'future growth area' which possesses 1500ha of undeveloped urban zoned land and an additional 300ha of land within several short term urban expansion areas. This represents a total of 1800ha of greenfield land for future urban development. In contrast, the neighbouring City of Gosnells possesses just 900ha of potential greenfield land (WAPC 2010). Under the preferred 'connected city medium density' scenario, Armadale is forecast to accommodate 32,800 dwellings to 2035 compared with 23,100 dwellings in the City of Gosnells and 30,800 dwellings within the Shire of Serpentine-Jarrahdale.

The sub-region will also accommodate several priority industrial sites to enhance local employment and meet the WAPCs employment self-sufficiency target of 55%. Light industrial sites include: Armadale, Kelmscott, Maddington-Kenwick, Forrestdale, West Mundijong and Brookdale. This represents a continuation of the south-east sub-region's historical role in accommodating light industrial development, first set aside under the 1970 *Corridor Plan*.

Directions 2031 and Beyond is far more prescriptive and detailed than *Network City*, *Metroplan* and the *Corridor Plan* prior and its associated volumes contain locality specific mapping with detailed population / dwelling projections (refer to Figure 50). Demographically the sub-region comprises a higher proportion of young families compared to the Perth metropolitan area as a whole. 91% of the current housing stock comprises single detached houses, which is higher than the metropolitan average of 77%. This supports Jain's study which found that residents seek larger dwellings in peri-urban areas (2008). Further, the preferred low density housing form grew by 2% from 1996 to 2006 corresponding with a decrease in townhouses and multiple dwellings (WAPC 2010).
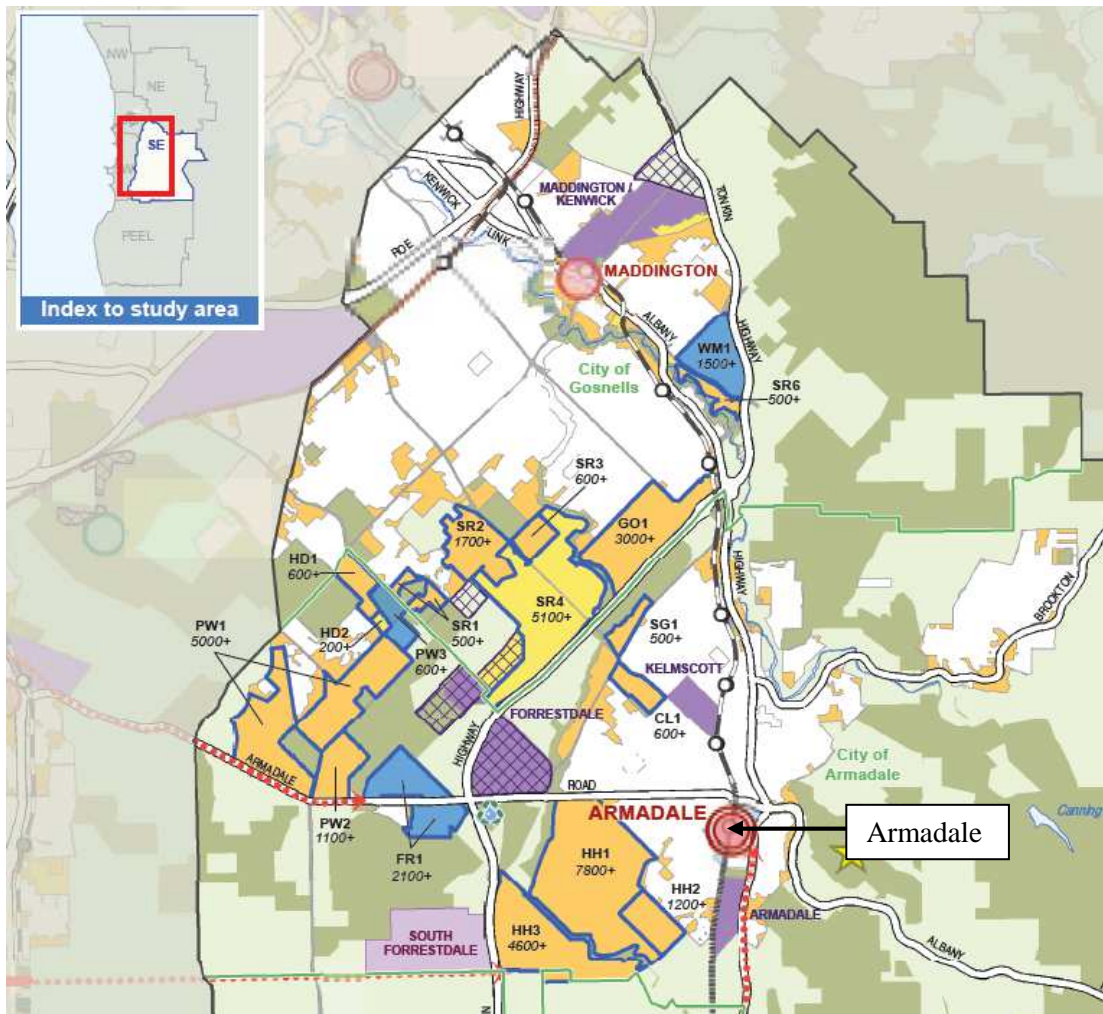
Figure 50: Directions 2031 and Beyond provides detailed population projections for the south-east sub-region (WAPC 2010).

To address future growth requirements, the strategy identifies a number of large landholdings which indicate the potential for future residential land uses. Much of this land is not currently zoned urban, being presently zoned rural. The strategy refers to these areas as greenfield 'urban growth areas' including Byford, Southern River/Forrestdale, Mundijong and includes areas managed by the Armadale Redevelopment Authority. Other areas such as West Martin, Piara Waters and Forrestdale East (a combined area of approximately 400 hectares) are indicated as urban expansion areas in the draft urban expansion plan. Future population growth within the south-east sub-region is primarily concerned with greenfield development, seeking to convert expanses of undeveloped, unserviced rural zoned land.

Areas upcoded from R15 to R15/25 under *Town Planning Scheme No. 4* have been excluded from population growth calculations within *Directions 2031 and Beyond*. As such the strategy focuses on greenfield development primarily within the sub-region and does not address the implementation of urban infill development to a significant degree. This is a significant omission in terms of infill calculations which have been provided.

Directions 2031 and Beyond notes that within the south-east sub-region the average household size decreased from 2.81 persons to 2.75 persons between 2001 and 2006 and by 2031 it is estimated that the average household size will comprise 2.21 persons. Factors identified for this demographic shift include the increasing number of people choosing to live alone, the declining fertility rate and an increase in single-parent families. Other factors contributing to these changes are an ageing population combined with the longer life expectancy of women over men. As a result of this recognition of shrinking household sizes, the strategy seeks the introduction of density targets, equating to a '50% increase in the current average residential density of 10 dwellings per gross urban hectare to a target of 15 dwellings per hectare in new development areas' (WAPC 2010, 4).

Current land use zonings within the south-east sub-region are varied with low density rural codings prevalent within the Shire of Serpentine-Jarrahdale ranging to higher density land concentrated towards the Byford centre. The City of Gosnells reflects the medium-density R17.5 coding under *Town Planning Scheme No. 6*, with R30 and R40 codings located closer to rail and other central places (WAPC 2013) (refer to Figure 51). The City of Armadale reflects R15/25 split codings throughout its existing suburbs, with R40 coded land located closer to activity centres and rail. Low density rural codings facilitating $2000m^2$ – 2.0 hectare lots are located within the hills precincts of Roleystone and Bedfordale. Rather than advocating the blanket recoding of entire suburbs, considered a poor planning outcome (WAPC 2010), *Directions 2031 and Beyond* emphasises higher density development along targeted urban corridors such as arterial and high volume roads and identifies vacant land parcels as areas suitable for densification.

The strategy notes that there is a need for more detailed planning for medium-rise higher density development along urban corridors. This will need to consider heritage and other local planning factors to clearly demonstrate how such development can be integrated effectively with the adjacent lower-density suburban fabric.
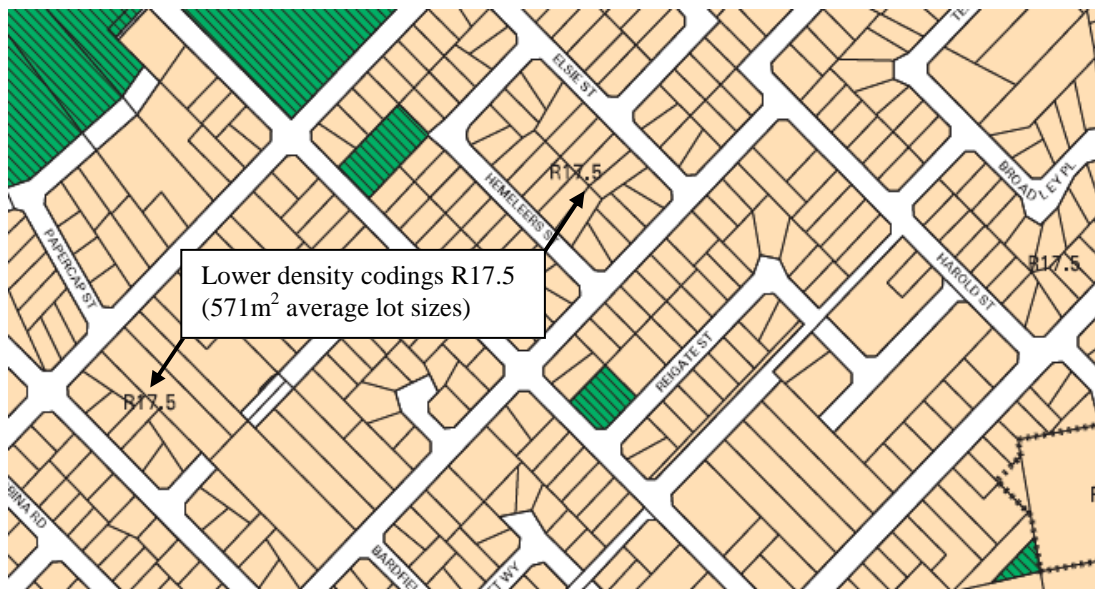
Figure 51: Lower-density codings within neighbouring City of Gosnells Town Planning Scheme No. 6 (WAPC 2013).

6.5.   Strengths and weaknesses of Directions 2031 and Beyond

Like previous strategies which have attracted similar criticism, *Directions 2031 and Beyond* is a document which appears to 'sit on the fence' or pull in opposing directions leaning both towards a pro-infill as well as pro-greenfield approach in a contradictory manner. For example, it seeks to reduce congestion while significantly increasing populations in peri-urban areas. To reduce congestion solutions such as: staggering work times, car-pooling, promoting mixed use activity centres and promoting opportunities to work from home are recommended, however there is no specific information provided that will enable an increase in cycling and walking to occur, nor are all of these options easily achievable.

Weller and Bolleter describe *Directions 2031 and Beyond* as 'particularly shortsighted' and imprecise: 'If ABS growth projections are proven correct, some 1,325,000 people will need to be housed in greenfield development. This equates to 576,000 freestanding homes across 48,000 ha of land. Where these extra people will work, how they will move around and what sense of place they will find in this vast tract of new suburbia is anyone's guess' (Weller and Bolleter 2013, 91). They also question the potential for widespread infill redevelopment in Perth considering that '1,175,000 people will need to be housed in infill development. Putting aside that the fact that transit corridors and piecemeal greyfield infill will absorb some development, to meet this number, Perth would need to build 618,421 apartments in its 104 designated activity centres in the next four decades. To date, even modest attempts at urban infill in Perth have met with strong community resistance and there is no site in Perth to our knowledge that could facilitate so many buildings unless its current urban fabric was razed to the ground as to begin anew' (ibid 2013, 91).

Other stakeholders consider that although *Directions 2031 and Beyond's* aspirations are appropriate, the 'theory behind its implementation is lacking' and a metropolitan authority with greater planning and development powers should be established as 'the sustainability of Perth depends on it' (SGS 2012, 1). An analysis undertaken by SGS consultants considers that employment centres often agglomerate far from proposed urban growth areas, as such, the plan's sustainability credentials are questioned: 'Left to market mechanisms alone, jobs are unlikely to be attracted to Perth's proposed activity centres at rates above those achieved in the inner-metropolitan area' (ibid 2012, 1). Referencing the 2008 *National Housing Supply Council State of Supply Report* the analysis states that 'high density dwellings of the type envisaged are up to twice as expensive per square metre to purchase as lower density units on the urban fringe. When faced with the choice between an expensive high density unit in a middle to outer metropolitan location and a cheaper, larger dwelling on the suburban fringe just a few kilometres away (perhaps with a garden and room for two cars and a boat), most households will opt for the latter. This will be the case even if (members of) the household has employment in a suburban activity centre' (ibid 2012, 1).

Michael (2012) considers that a longer term vision for *Directions 2031 and Beyond* is more appropriate than the vision which plans for a timeframe of just over two decades: 'I would take a leaf out of the *Stephenson and Hepburn Report* and reflect on 40 or 50 years as a longer term vision and then determine the short to medium term horizons. While the document does give such direction, reflecting in more detail, specifically on the longer period could well impact the staging and priorities chosen' (Michael 2012, 30). While Michael considers that *Directions 2031 and Beyond* represents a step forward for planning in Perth, its inadequate timeframe somewhat undermines its potential success.

Directions 2031 and Beyond notes that 57% of all trips in Perth are undertaken by motor vehicle and recommends an expansion of the current highway system via planned upgrades including six-lane freeways on Roe and Tonkin Highways interspersed with four-lane highways and traffic signalised intersections (WAPC 2010). Population forecasts to 3.5 million for Perth and Peel will result in further pressure on Perth's existing road system and it is unclear how the strategy will manage and reduce both car dependence and congestion. Without a detailed, traffic management assessment and without significant densification around existing rail corridors, this goal may prove difficult to achieve. *Directions 2031 and Beyond* emphasises the importance of reducing the 'development pressure on existing suburbs and the urban fringe' and considers that there should be a viable alternative to 'car-based suburban and urban fringe development' (WAPC 2010), which further demonstrates a somewhat contradictory approach.

The minimal residential coding changes proposed throughout many of Perth's existing suburbs within *Directions 2031 and Beyond* largely reflects a 'business as usual' approach. *Delivering Directions, the draft plan for urban consolidation for metropolitan Perth and Peel* (2014) prepared to provide guidance on achieving infill targets over the next 30 – 40 years, seeks to minimise the impact on Perth's existing suburbs while 'preserving residential character and more than 90% of the existing built up environment' (2014, 1).

Several stakeholders such as the Property Council of WA and the Urban Development Industry Association (UDIA) have been critical of the overly restrictive local planning controls that prevent innovative and affordable higher density dwellings (UDIA 2010) and *Directions 2031 and Beyond* has been critiqued on this basis. By failing to contain outward growth and increase density targets within existing residential areas, it risks contributing further to the 'spread city' which Alexander, Greive and Hedgcock (2011), Falconer (2008) and Newman and Kenworthy (1999) among other scholars, strongly warn against.

Not only does *Directions 2031 and Beyond* appear to pull in different directions internally, it also is at odds with other State planning instruments including the *Residential Design Codes of Western Australia* (2008). The '*R-Codes*' are regularly revised and amended based on stakeholder feedback, including community comments. In recent reviews such as that conducted in 2010, the *R-Codes* have aimed to facilitate smaller dwellings, acknowledging that the planning system in Western Australia has in the past discouraged medium and higher density housing. In a section entitled 'Single Bedroom Dwellings' (2011) the review states that such a type of dwelling will become increasingly necessary in order 'to accommodate the one or two-person households that now make up over half of all households in Western Australia'. Despite this perceived need, there is little scope for more compact dwelling types within *Directions 2031 and Beyond*, particularly in established areas where low density residential codings are predominant.

The *Directions 2031 and Beyond* Report Card, released in September 2011 and December 2013, reports on the mainly positive progress on the implementation of the strategy. It identifies district and local structure plans endorsed by the WAPC, which have met the greenfield target for density of 15 dwellings per hectare. These include: Wellard East, The Glades at Byford, Mundijong-Whitby, Kerosene Lane Baldivis, Alkimos-Eglinton, Yanchep/Two Rocks and Rivergums. With the exception of Rivergums, which is located in Burswood, these areas are located approximately 25 – 40kms from Perth's centre, and can be considered as places suffering from locational disadvantage.

Such a situation now equates to small cottage 250m^2 lots being created in Byford on the periphery and retention of large 1000m^2 lots 5km from the CBD in Nedlands, a situation scholars such as Jain (2008) would consider illogical as families are attracted to peri-urban areas for more spacious lots and a relaxed semi-rural lifestyle (refer to Figures 52 and 53).

Figures 52 and 53: Compact lots on the periphery contrasted with larger 1012m^2 lots located 6km from Perth's centre (WAPC 2013).

Directions 2031 and Beyond contains little emphasis on transforming existing areas, however the 2011 Report Card states that the WAPC is reviewing a number of local schemes and policies in order that this may happen in future. Within the inner metropolitan sub-region for example, local planning schemes within the City of Belmont and the Town of Victoria Park are undergoing assessment to ensure they reflect objectives within *Directions 2031 and Beyond.* The 2013 Report Card shows City of Armadale as possessing a net site density of 9.18 persons, compared with 155.9 for the City of Perth and 2.2 persons within the Shire of Serpentine-Jarrahdale (WAPC 2013, 51).

As per previous plans, key themes are elicited without a necessary comprehensive implementation strategy, so it is unclear how goals of 'liveability, prosperity, accessibility, sustainability and responsibility' (WAPC 2010, 2) will be implemented. Such has been the case with several of Perth's past strategies which offer broad direction, but lack detail necessary to facilitate change at a local level.

For example, the strategy includes statements such as 'all people should be able to easily meet their education, employment recreation, service and consumer needs within a reasonable distance of their home' (WAPC 2010, 23). Such statements are vague and somewhat unrealistic in a city which stretches more than 140km and where 'reasonable distance' is not prescribed. Such statements also conflict with the current planning practice of approving urban development in an increasingly outward manner. Yanchep is approximately 60km from Perth's centre for example, which would seem outside of a 'reasonable distance' for commuting to Perth's centre and recent structure planning approvals in Two Rocks further north challenge the ease in which commuters who live in such areas can access their workplaces, which may be located in the central business district of Perth or further south.
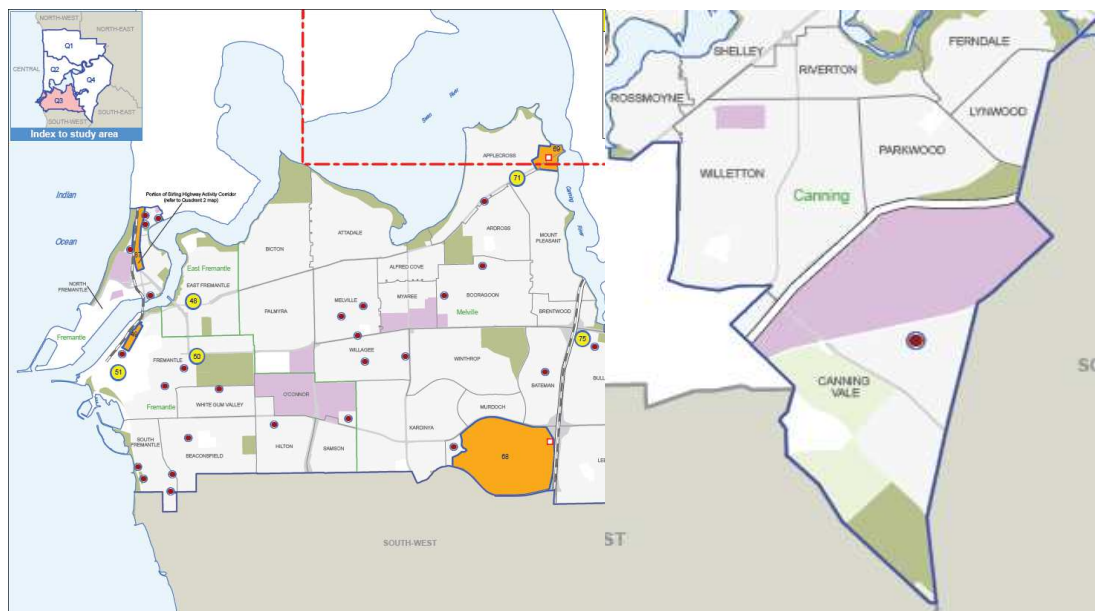
Figures 54 and 55: Mapping from Directions 2031 and Beyond showing little change in the densification of established Perth suburbs, reflecting a 'business as usual' approach (WAPC 2010).

Weller (2009) warns against a 'business as usual' approach, yet it is very difficult to see how *Directions 2031 and Beyond* promotes changes to current densities as the above mapping demonstrates, until further work in this regard is undertaken (refer to Figures 54 and 55). The residential density of large suburban areas will remain unchanged and will not be subject to significant urban infill. Suburbs such as Ferndale, Kardinya, Shelley, Winthrop, Leeming, Mount Pleasant, North Perth, Mirrabooka, Tuart Hill, Joondanna, Mount Hawthorn (to name a few) will not

undergo anything other than 'small scale incremental' densification within the next two decades.
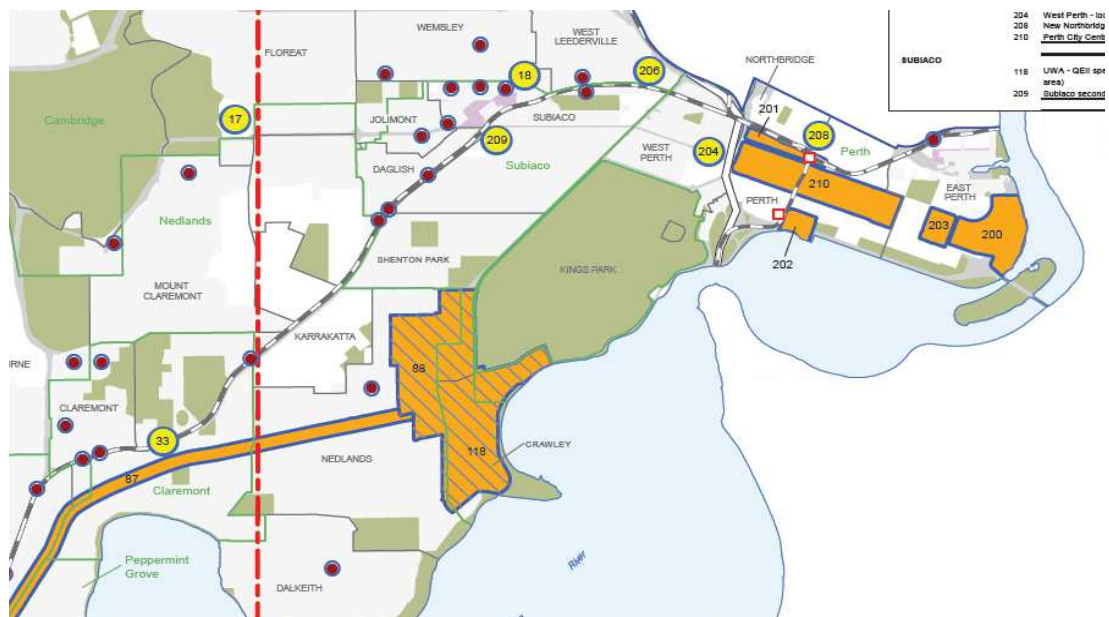
Figure 56: Higher codings shown in red along road and rail infrastructure under Directions 2031 and Beyond (WAPC 2010).

Mapping contained within the strategy also appears at odds with the aim of accommodating medium rise, higher density housing development throughout Perth (WAPC 2010) (refer to Figure 56). The strategy also omits lessons from the experience of South Australia and New South Wales, both of which have in the past permitted 'dual occupancy' provisions which allow the construction of two dwellings on a single lot without the need for planning approval (Craig 1989; Searle 2007).

Such a mechanism could be considered blanket recoding as all lots within a given location are able to redevelop, effectively allowing two dwellings on a single lot (R25 on 700m^2 = duplex development under current R-Code provisions). *Directions 2031 and Beyond* considers that the 'blanket' up-coding of large areas of the inner suburbs is not favoured, as it is unlikely to enhance the character of neighbourhoods (WAPC 2010, 77). This is also supported by the development industry, many of whom view such a mechanism as a 'one size fits all' planning approach which lacks variety and leads to poor built-form outcomes (refer to Figure 57).

Figure 57: An example of the development industry's reluctance to support 'blanket recoding' due to the potential for a built form 'monoculture' (Landcom 2011).

During the public advertising phase of draft *Directions 2031 and Beyond* a number of submissions were provided by key stakeholders (WAPC 2010). These identified a number of weaknesses and planning elements which had not been adequately addressed. A selection of these concerns outlined by the Urban Development Institute of Australia (UDIA 2010) included:

- The inability of infrastructure to cope with additional densification: The absence of detail in upcoding without the associated upgrading of infrastructure is an issue which could undermine the strategy's success. Stakeholders identified a number of constraints to achieving a 47% rate of residential infill including the capacity of infrastructure to support increased densities in established areas, specifically waste water treatment plants that are already operating at capacity;

- Local government and resident resistance to densification: a number of local government authorities in central and middle ring suburbs are currently reducing density codings which prevents higher rates of infill being achieved;

- A lack of provision for affordable housing. Affordable housing in infill areas will be difficult to achieve given relatively high land costs and high construction costs for development over three storeys. The market preference for detached housing prevails and is unlikely to undergo a wholesale change to a preference for multi-storey living particularly where prices are comparable to detached housing in a similar location;

- Inaccurate population projection forecasting: The population projections contained within *Directions 2031 and Beyond* are underestimated and consequently the number of projected dwelling units falls short of what will actually be required having implications for the amount of urban zoned required to accommodate future development;

- The report references higher density around train stations. The opportunity of high rise development on top of the train stations and adjoining parking areas, which might require special zoning is not addressed: 'In the context of a desire for higher infill development and Transit Oriented Development this seems a missed opportunity'.

6.6.   The future of Directions 2031 and Beyond

In 2013 the Department of Planning and WAPC commenced work on the next phase of the strategy entitled: *Delivering Directions 2031 and Beyond: Plan for urban consolidation in metropolitan Perth and Peel*. This program is one of a number of strategic and statutory instruments intended to work towards the goal of urban consolidation in Perth's existing low density suburbs. Initiatives include:

- Identifying targeted increases in mixed use and medium rise higher density housing and diversity while seeking to leave the majority of the urban fabric unchanged;
- Providing a hierarchy of places and locations for a range of economic activities and activities and employment and;
- Connecting communities with jobs and services.

It is unclear how *Directions 2031 and Beyond* will be perceived in the future, however responses to date from scholars such as Weller and Bolleter (2013) indicate negative responses, particularly towards the strategy's modest densification targets. The strategy will ultimately be measured by how well it meets its objectives which will become evident over time. At present, however it seeks at best to conservatively retrofit incremental infill within targeted existing areas along activity centres and does not represent a radical approach to densification, something it is contended that Perth requires.

The work of *Directions 2031 and Beyond* continues via the *Perth and Peel@3.5million* draft framework which seeks to manage projected population growth to 2050 (WAPC 2015). The framework, which updates mapping contained within the original strategy, shows additional road and rail infrastructure as well as urban and industrial land to accommodate this growth. Armadale is included within *South Metropolitan Peel*, a sub-region which 'will more than double by 2050 to 1.26 million people' (ibid 2015, 6).

Whether *Directions 2031 and Beyond* delivers on its aspirations or further pays 'lip service' to principles such as urban consolidation remains to be seen, however it is likely that the plan's legacy will centre around the maintenance of the low density model within existing suburban areas and the creation of more compact lots on the periphery to meet its target of '15 dwellings per gross urban zoned hectare of land in new development areas' (WAPC 2010, 4). Likely future impacts on Armadale include a continuation of the more compact dwelling approach first encouraged under *Town Planning Scheme No. 4* which is now widely reflected throughout many of Perth's new subdivisional areas.

Stephenson and Hepburn Report (1955)   Corridor Plan (1970)   Metroplan (1990)
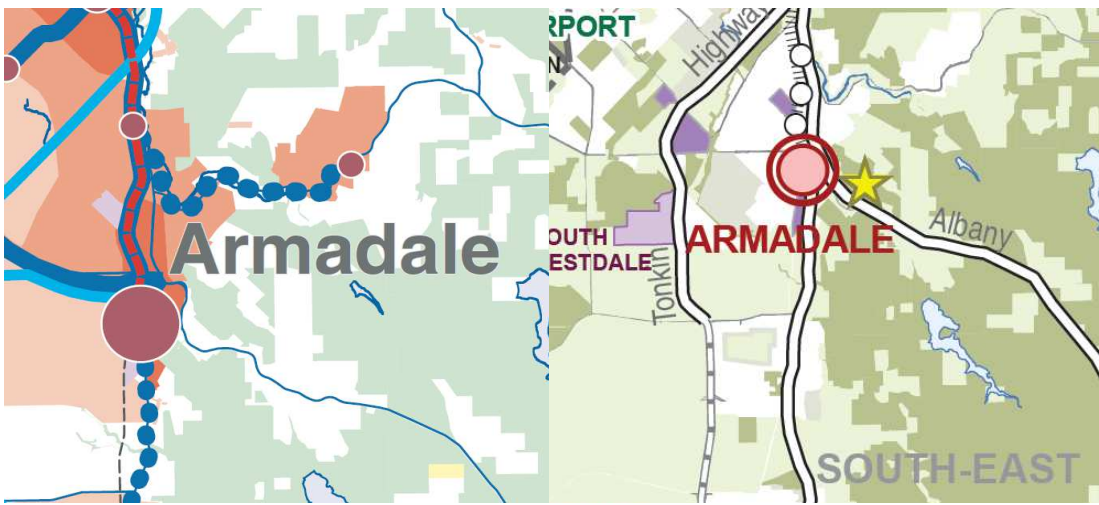
Network City (2005)   Directions 2031 and Beyond (2010)

Figures 58 - 62: Perth's Strategic Plans since 1955 and the representation of Armadale within associated mapping.
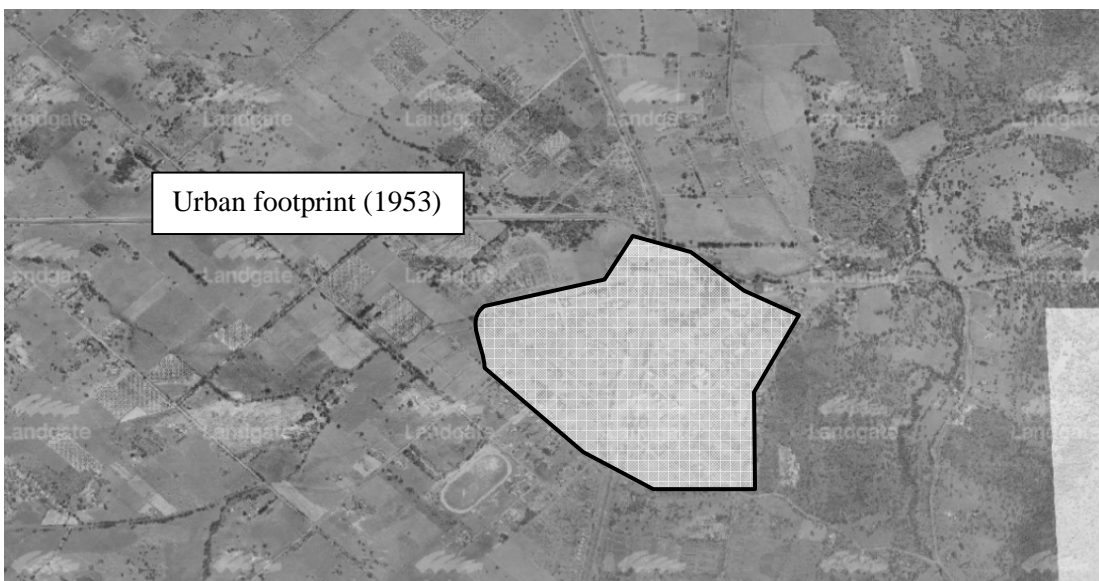
Figure 63: Armadale's spatial urban footprint, 1953 (Landgate 2015).
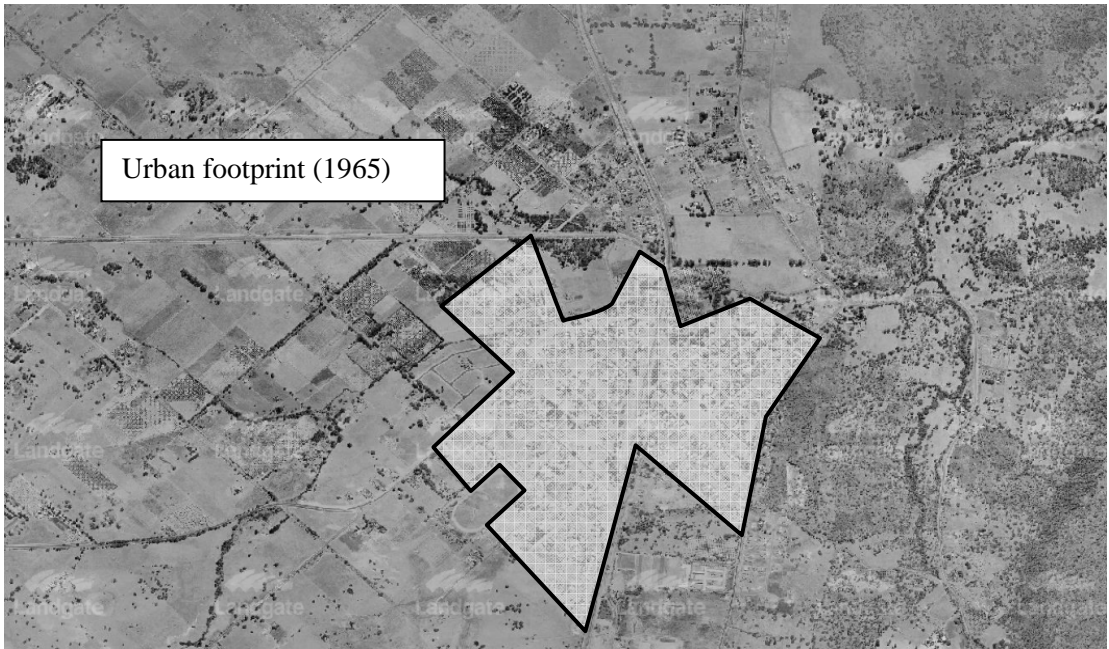
Figure 64: Armadale's spatial urban footprint, 1965 (Landgate 2015).
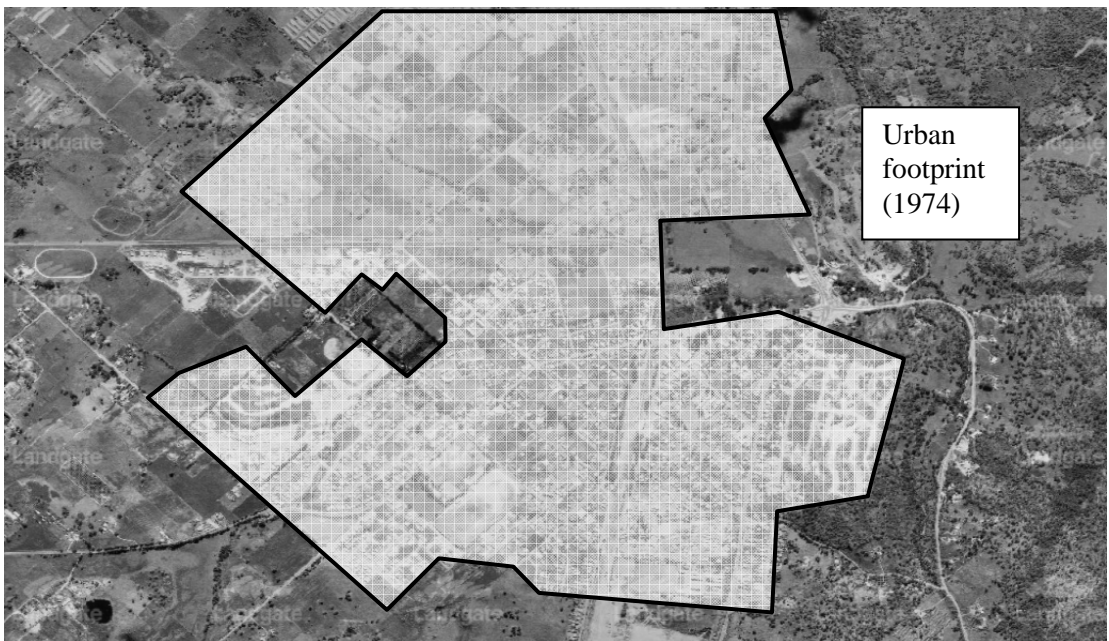
Figure 65: Armadale's spatial urban footprint, 1974 (Landgate 2015).
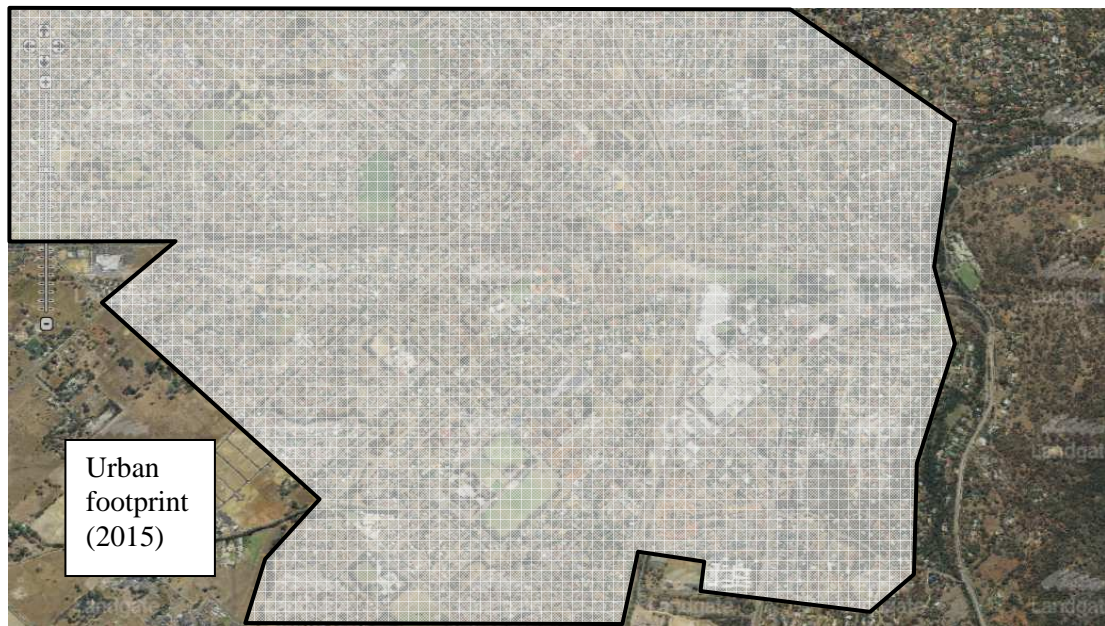
Figure 66: Armadale's spatial urban footprint, 2015 (Landgate 2015).

6.7. Treatment of Armadale within past strategic plans and Census data

Directions 2031 and Beyond identifies common themes among strategic plans for Perth since 1955 stating that 'although planning approaches for the region span fifty-five years, there are a number of consistent themes running through all: 1). Limiting Perth's urban expansion footprint; 2). Concern for the protection of green space; 3). The development of well-designed centres and movement corridors; 4). The need to plan for population and employment growth' (WAPC 2010, 26). Despite this, an overall analysis of Perth's strategic plans since 1955 shows that the goal of limiting urban expansion within existing urban boundaries has been largely unsuccessful as Adams (2007) and Weller (2009) have noted.

Armadale's role and representation within Perth's strategic plans has greatly shifted over time, perhaps more than any other centre in Perth (refer to Figures 58 – 66). Under the 1955 *Stephenson and Hepburn Report*, Armadale was represented as an isolated rural settlement with approximately half of the Shire area located outside of Perth's defined metropolitan area with a total population of less than 8000 residents. Despite its low population, it was experiencing strong growth and several shopping and business facilities had already outgrown their sites.

Armadale was acknowledged for its strategic importance, considered suitable for agricultural, commercial and industrial expansion. Its natural attributes were considered worthy of protection and ideal for growth with suitably draining soils, high quality environmental assets and access to vast reserves of undeveloped rural zoned land. The Report sought to address the haphazard, *ad hoc* patterns of development which was feared would prejudice the ultimate role of Armadale as a regional centre of major importance.

The 1970 *Corridor Plan* was released during an era of population growth pressures and associated demand for urban land during a time that agricultural viability of the Armadale district was declining. Armadale was identified as one of several sub-regional centres which also included Midland, Fremantle, Rockingham as well as the area now known as Joondalup. Armadale would become a self-sufficient satellite city, described as 'a local service centre' located at the junction of the highways to Bunbury and Albany, employing workers who otherwise travel to Perth for work. The plan also sought to encourage and expand the light industrial sector in the sub-region, which was in its early stages of development. The *Corridor Plan* considered that the Armadale sub-region possessed the highest potential for the most clearly defined urban corridor existing in the metropolitan region, from Kenwick to Armadale and as such it became the first corridor developed.

1990s *Metroplan* allocated substantial vacant land surrounding Armadale for urban development which extended to rural centres such as Byford and Mundijong. This era of Armadale's development could be considered one of attempting to address major impediments to urban development, including managing the impact of various high impact extractive land uses. In addition, the fragmentation of land ownership and difficulty of land assembly in areas favourably designated for urban development and strong opposition from rural property owners meant that urban growth in Armadale did not proceed smoothly during this period.

Network City outlined an ambitious 60:40 infill target which sought to reduce the reliance on peri-urban greenfield land. It was released during the preparation stages for *Town Planning Scheme No. 4* and strongly influenced the manner in which the City subsequently administered planning approvals.

The scheme introduced a split-coding model which permitted infill redevelopment in Armadale's suburbs for the first time. *Network City* intended to provide incentives for a significant amount of growth to occur within the already developed areas and it was anticipated that this would reduce sprawl by reducing the demand for new greenfield land.

Under *Directions 2031 and Beyond*, Armadale is included with neighbouring local authority areas City of Gosnells and the Shire of Serpentine-Jarrahdale for ongoing urban expansion. The City includes land classified as a 'Future Growth Area' representing a total of 1800ha of greenfield land for urban development and remains the key strategic centre for the region. Under the favoured 'connected city medium density' scenario, the City is forecast to accommodate 32,800 new dwellings to 2035.

Overall, the role for Armadale since 1955 under various planning strategies for Perth can be summarised as follows:

- A continual decline of agricultural and tourism land uses;
- The relatively stable and modest growth of commercial land uses;
- An increasing role in transportation and freight movement via a network of major roads and highways such as Tonkin Highway, Armadale Road, Albany Highway and South-Western Highway;
- An increasingly important role in providing light and general industrial land for Perth; and
- The unabated growth of urban development, driven by strong demand for residential land.

A review of historical Census data supports the above summary of Armadale's development over the past 6 decades. The 1954 Census conducted one year prior to the release of the 1955 *Stephenson and Hepburn Report* reveals the Armadale - Kelmscott 'Road District', included within the Swan Statistical Division, accommodated 5753 persons. This was relatively evenly split between males and females at 2956 and 2797 respectively (Commonwealth Bureau of Census and Statistics 1954).

The area now referred to as the City of Armadale was excluded from the Perth metropolitan area, reflecting its rural settlement origins. Major employment land uses within the district included primary production / agriculture (496 persons employed) and manufacturing (80 persons employed). This comprised: mixed farming grazing, dairying, mining, forestry, engineering, food production and textile production. All of these local industries were contributing positively to the State's economy (1954, 82).

The 1971 Census, conducted during the era of the *Corridor Plan* (1970), included Armadale – Kelmscott as a 'Local Government Area' as part of the Perth metropolitan area for the first time which had grown to 15,644 persons (Commonwealth Bureau of Census and Statistics 1971). The total labour force of 5869 persons included those employed in the following sectors: wholesale and retail (1166 persons employed), manufacturing (1086 persons employed), community services (599 persons employed) and agriculture (471 persons employed), reflecting a relative decline in primary production, farming and agriculture within the locality.

The 1991 Census, conducted during the era of *Metroplan* (1990) showed major growth with a total population of 46,868 within the City of Armadale, which had gained inclusion within the 'South East Metropolitan Statistical Subdivision'. The City accommodated a total of 15,037 dwellings with 821 of these registered as unoccupied (ABS 1991). By 2001, Armadale's working population of 9780 persons revealed a declining level of workers employed in agriculture, forestry and fishing (258 persons) and a low representation of workers employed in mining (48). Major growth areas included land uses associated with urban development: construction (738), property and business services (717) and retail trade (2312) (ABS 2001).

The 2006 Census, conducted during the era of *Network City* (2005) revealed a total working population of 10,936 within the locality. Major employment sectors included: retail trade (1799), health care / social assistance (1961), education / training (1511) and construction (888). Other land uses including: agriculture, forestry and fishing (267) and mining (39) continued to decline relative to population growth (ABS 2006). Major employment growth areas continued to include land uses associated with urban development.

The 2011 Census, conducted during the era of *Directions 2031 and Beyond* (2010) revealed a total working population of 29,746 within the locality. Perhaps responding to redevelopment opportunities provided by the City of Armadale *Town Planning Scheme No. 4* (2005), the construction sector had increased to 3237 working persons, while wholesale trade had grown to 1482 persons employed (ABS 2011). This shift towards what would ultimately become the primary role of Armadale in accommodating an expanding urban and working population was largely unforseen by Perth's earliest strategic plans (Refer to Table 6).

Year	City of Armadale, total population	Total working population	Workers employed in agriculture, mixed farming	Workers employed in construction
1953	5753	1179	20	Not included
1971	15,644	5869	500	Not included
1991	46,868	Not included	Not included	Not included
2001	49,893	9780	234	739
2006	50,535	10,936	267	888
2011	62,296	29,746	259	1150

Table 6: Summary of Census data for the City of Armadale, 1953 – 2011.

6.8.   Theoretical approaches reflected in Network City and Directions 2031 and Beyond

6.8.1. New Urbanism: historical background

A discussion of New Urbanism has been undertaken in this section due to its influence within more recent strategic plans. Earlier plans for Perth emphasised managing growth, rather than contraction or consolidation, which is evident in the difference in the spatial footprint reflected within the 1955 *Stephenson and Hepburn Report* and the 1970 *Corridor Plan*. The fifteen years between these strategies saw unprecedented expansion in Perth, particularly along the north and south coastal corridors. In contrast to this dispersed expansion, New Urbanism promotes a set of principles which are more closely linked to the key objectives within more recent planning strategies including *Network City* and *Directions 2031 and Beyond*.

Network City for example, considers that public transport-friendly layouts for new suburban development can be considered as reflecting elements of New Urbanism (WAPC 2004, 105). The local planning scheme introduced in Armadale in 2005 also reflects elements which could be considered as closely reflecting New Urbanist principles. Within the Perth and Peel regions, Armadale has been one of the first districts to realise the impact of such an approach through blanket recoding of the suburbs of Camillo, Kelmscott and Armadale, despite its peri-urban location.

New Urbanism emerged in the 1980s as a reaction to earlier planning approaches which had tended to segregate land uses (Kelbaugh 2002). For example, both the *Stephenson and Hepburn Report* and the *Corridor Plan* recommended that various educational, industrial and commercial land uses should be separated from residential land uses. The earliest plans prepared for Armadale including a plan entitled *Expansion of a centre in a detached town – Armadale* showed industrial and commercial land in a dedicated zone, located away from residential development (Stephenson and Hepburn 1955, 304).

In a contrary manner, New Urbanism seeks to locate community facilities within walking distance of shopping, jobs and transit and also seeks community consensus for all plans (Duany et al 2010). Major characteristics of New Urbanist (NU) developments include walkability, permeability, local character and compactness, which aim to provide residents with a highly liveable community which promotes public transport (Breheny 1992). New Urbanist developments seek to facilitate social interaction through the increased rates of walking to contribute to enhanced social capital and are often designed around 'pedsheds' where the focal point is a neighbourhood centre (WAPC 2007). Such an approach has particular applicability to Armadale which was originally developed along a passenger rail network.

6.8.2. New Urbanism: application to peri-urban regions

Several New Urbanist principles are embedded within *City of Armadale Town Planning Scheme No. 4*. These include:

1). Promoting and increasing housing diversity, choice, adaptability and affordability through the urban redevelopment process;

2). Emphasising higher density development in urban cores while preserving rural and environmentally sensitive areas such as Bedfordale and Roleystone;

3). Integrating new development within the existing urban system through recoding existing suburban areas;

4). Emphasising safety and security, encouraging open fencing and passive surveillance as a condition of development approval;

5). Protecting public open space reserves and investing in public spaces;

6). Reducing car dependence through encouraging higher density and mixed use development near rail corridors;

7). Locating garages discreetly and avoiding auto-dominated landscapes;

8). Encouraging Transit Oriented Development;

9). Encouraging walking, for example requiring the provision of footpaths as a condition of development approval (City of Armadale 2005; Ellis 2002).

New Urbanism seeks to encourage a range of improvements to existing areas including: enhancing liveability, improving pedestrian access, reducing traffic, sharing transport modes, lowering living costs and improving accessibility to public open space (Duany et al 2010). The majority of these elements are reflected within *Town Planning Scheme No. 4* and *Network City*.

Ellis (2002) contends that New Urbanism is preferable to the *business as usual* low density model prevalent in western nations and argues that the current default setting for urban development is auto-dependent sprawl, residential pods strictly sorted by income, shopping malls and big-box stores surrounded by seas of asphalt, strip commercial zones, fortress-like office parks. He considers that this is 'a model which has never proven to be an optimal urban form. Conventional builders are certainly not putting their projects on hold until sufficient research evidence arrives. They are

building as fast as they can, wherever they can. Consequently as a society we are building ourselves deeper and deeper into a vast landscape of mandatory auto ownership and mandatory maximum auto usage, with all the consequences thereof' (Ellis 2002, 283).

6.8.3. Sustainable development and Network City and Directions 2031 and Beyond

Sustainable development can be described as 'attempting to reduce resource depletion and the environmental impacts of development activity. It has also taken on meanings that refer to economic vitality and quality of life. These three objectives may not always be compatible even though policy statements attempt to accommodate them all' (Austroads 2009, 10). Grubler and Fisk (2013) consider that modern cities have become inherently unsustainable as they generate large volumes of waste and greenhouse gas emissions.

To address the poor environmental performance of Perth, *Network City* includes sustainability as a key value along with inclusiveness, innovation, creativity and equity. The strategy recommends that future planning decisions should be made upon such principles: 'The fundamental concepts of sustainability – the precautionary principle, intergenerational equity and biodiversity protection - are widely accepted as a rational and equitable basis for planning decisions that protect all interests, both present and future' (WAPC 2004, 57).

The optimal city would comprise higher density housing, 'providing some local retail and commercial space with local interaction, itself reducing the need for automobile travel' (Grubler and Fisk 2013, 111). Within *Directions 2031 and Beyond*, sustainability is closely linked to higher residential densities which 'increase the cost effectiveness of essential service infrastructure provision and improve the efficiency of the public transport system' (WAPC 2010, 47). This thinking has led to more recent planning direction in Perth which encourages smaller lot sizes and dwellings which are considered more sustainable.

6.8.4. <u>Core-Periphery Theory: main features and stages of development</u>

Core-Periphery Theory was developed by Friedmann (1966) who studied developing regions within Venezuela. The theory outlines the stages which peripheral centres move through over time and the relationship with core areas, known as the 'core-periphery relationship'. Friedmann considers that as the core develops it becomes more prosperous, while the periphery suffers due to its role in subsidising the core (Nieuwkoop 2012). Economic activity often concentrates in a core region, leaving more basic agricultural activity in the periphery. The centre is characterised by rapid, intensive development and the periphery is characterised by a poor performing economy, often in a stage of decline.

The core often possesses a higher concentration of people and wealth than the periphery, which often suffers from poor infrastructure as a result of regional disparities within its schools, hospitals, shopping centres, housing and transport. Friedmann identifies five planning regions: the core, upward transitional areas, resource frontier regions, downward transitional areas, special problem regions and programming regions. In order to address regional disparities, Friedmann suggests (1) concentrating public investment in the core (2) a breakdown of the centre-periphery structure by (3) outward migration to downward-transitional areas and (4) a reduction in the rate of urbanisation.

Friedmann (1966) considers that peripheral centres through four major stages, occurring in parallel with the development of urban transport systems. Within Stage 1 (pre-industrial) the centre operates as an isolated agricultural society. The area is characterised by localised economics and settlements consisting of small units 'whose economic subjects (population and merchandise) have low mobility' (Raagmaa 2003, 3). Within Stage 2 (transitional) development expands as a result of capital accumulation, industrial growth and a dominant centre emerges. Concentration of the economy occurs from the periphery to the core and the inter-regional mobility of labour and intensity of trade rises. The periphery remains totally subordinated to the centre of political and economic dominance within Stage 2.

Within Stage 3 (industrial) the centre experiences further industrial and economic growth which leads to the emergence of neighbouring centres, linked with increasing interactions between elements in the urban system and the construction of transport infrastructure. Economic growth spreads outward to the periphery and decentralisation occurs as a result of higher prices in the core area. As such 'the intensity of people's daily mobility and distances between workplace and home increases' (Raagma 2003, 4).

Increased commuting costs result from the city's expansion however 'commuting costs discourage a city to expand unboundedly' (Abdel-Rahman and Wang, 1996, 467). Within Stage 4 (post-industrial) the urban system has become fully integrated. Spatial inequalities are reduced and land values rise due to the distribution of economic activities which creates specialisation.

Friedmann believed that the allocation of economic activities within the core and the periphery should attain optimal balance and stability: 'An integrated model foresees a cyclical movement of the population caused mostly by age: the youth study in big cities, families settle in suburbs, elderly people look for a cheap and peaceful rural environment' (Raagma 2003, 5).

Friedmann found that the growth of the centre is subsidised by the periphery and as such their relationship is a colonial one, with the periphery being economically exploited by the core. Productivities are usually higher in the centre which has better linkages with national and overseas markets, encouraging further advantage. Abdel-Rahman and Wang (1996) found that higher wages and prices are found in the core. They also found that fewer employment opportunities in peri-urban areas reduce wages leading to more subdued development. Wage inequality between the core and the periphery is clearly defined as a result of a spatial dichotomy between skilled workers who reside close to the single metropolis and unskilled workers who reside on the periphery. Since World War 2 this income disparity has widened between core and peri-urban regions (Abdel-Rahman and Wang 1996).

6.8.5. <u>Core-periphery theory: treatment of peri-urban regions</u>

Friedmann's (1966) findings can be applied to peri-urban settlements such as Armadale since 1955 which has experienced: the decline of traditional agriculture, a maturing of the industrial economy, the rise of new metropolitan centres via population growth and urban revitalisation as a result of various plans. Armadale has moved through each of Friedmann's four stages in its early agricultural and pastoral functions (pre-1950s, Stage 1), followed by its centre development planned under the *Stephenson and Hepburn Report* entitled *Expansion of a centre in a detached town – Armadale* (Stage 2) (1955, 304). This was followed by the development of industrial estates in the 1950s – 1970s, the expansion of industrial uses in the 1970s and 1980s (Stage 3) to its current role accommodating a number of urban centres reflecting higher development standards (Stage 4) including North Forrestdale.

This area comprises four major residential estates established since 2005: Arion, Vertu, Heron Park and Newhaven: 'attractive, thoughtfully designed and family oriented places to live, offering improved access to amenities such as shopping centres, public transport routes, schools, ovals and parks' (City of Armadale 2012). As Friedmann (1966) points out, improvements to peri-urban centres occur in parallel with enhancements to the regional transport system. Armadale has experienced continual improvements in transport infrastructure including intersection treatment and road upgrades from dual carriageways to four lane divided regional roads on a number of roads including Ranford Road (Main Roads WA 2014).

The extension of Tonkin Highway to a freeway standard, six lane control of access highway with grade separated interchanges was extended past the City of Armadale's western boundary in 2005. Albany Highway, a 6 lane undivided carriageway which connects the district to Perth, accommodates approximately 28,000 vehicles per day. Armadale Road, which provides the main route from Armadale to the Kwinana Freeway has also been upgraded in recent years to a 4 lane standard and accommodates approximately 16,450 vehicles per day (Main Roads WA 2014).
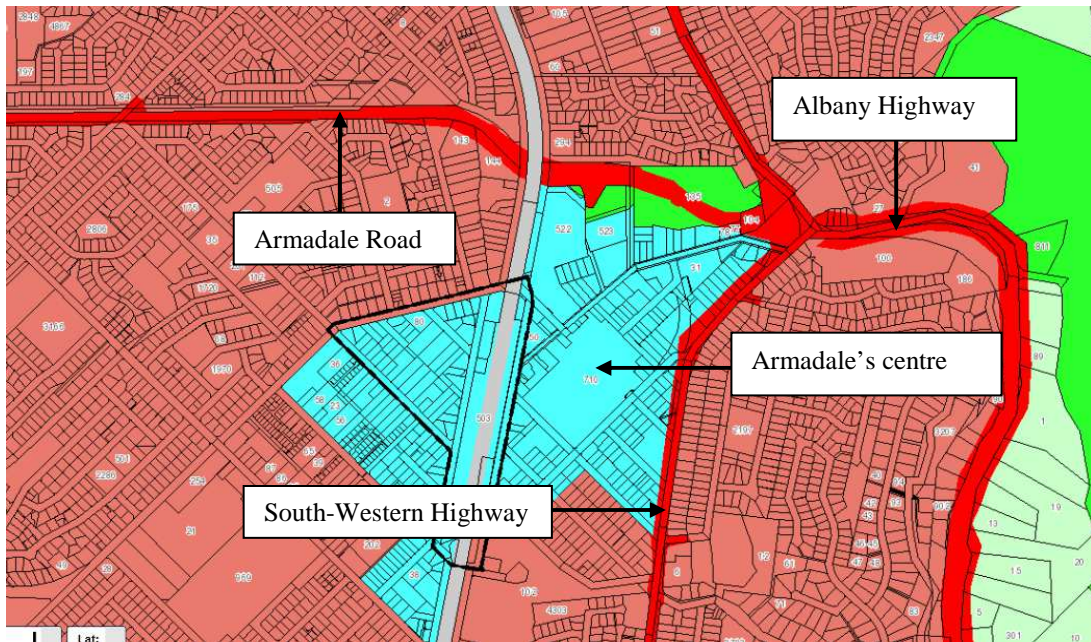
Figure 67: Primary Regional Roads (shown in red) controlled by Main Roads WA within the study area. These include Armadale Road, South-Western Highway and Albany Highway (WAPC 2014).

The City of Armadale accommodates several high order transport routes including Albany Highway, South Western Highway and Armadale Road, all of which are classified as Primary Regional Roads in the *Metropolitan Region Scheme*, under the control of Main Roads WA (refer to Figure 67).

6.8.6.   Summary of theoretical approaches reflected in Perth's strategic plans

The earliest strategic plans prepared for Perth, within which Armadale has featured at various levels of prominence, could be considered modernist in orientation. Planning practice at this time in Western Australia largely ignored the need for community consultation and environmental constraints, instead seeking to meet housing demand on plentifully available land. It has been noted by scholars such as Hillier (1996) that this early period in Perth's planning history excluded women from significant representation within planning schemes and strategies. This is reflected in both the *Stephenson and Hepburn Report* and the *Corridor Plan* (cited in Mandelbaum et al 1996) and it can be argued that this situation has continued.

By the 1980s, various societal influences led to modernism experiencing a decline and a greater number of voices were brought to bear within planning. It was not until *Network City* (2004) and *Town Planning Scheme No. 4* (2005) that community consultation was undertaken in a comprehensive manner, reflecting the influence of postmodernism, which encouraged a greater diversity of participation (Irvine 2013).

Perth's earliest strategies sought to segregate land uses within central Armadale, separating commercial and residential uses as per Diagram 65: *Expansion of a centre in a detached town, Armadale* (Stephenson and Hepburn 1955, 304). This segregation was later challenged under New Urbanism in the 1980s, which seeks greater walkability and connectivity within cities. New Urbanism, reflected within various provisions of *Town Planning Scheme No. 4*, and its associated local planning policy *PLN 3.1*, seeks smaller more compact lot sizes and greater reliance on public transport through higher codings near activity centres and transport nodes (City of Armadale 2005).

Residential infill is a key element of New Urbanism, which seeks to improve the existing suburban fabric (Steuteville and Langdon 2003). As such New Urbanism complements Armadale's movement towards sustainability which includes: 'reduced auto emissions, energy use and stormwater runoff. Smaller lots cover less land and a mix of uses and well-designed streets off the opportunity to walk, which can result in less driving, petroleum use and smog' (ibid 2003, 202). Shrinking lot sizes and decreased reliance on private transport and a greater reliance on walking and bicycles are also considered more sustainable by a number of scholars including Gehl (2005), Newman and Kenworthy (1999) and Weller (2009).

Armadale has historically operated as a peri-urban settlement servicing the surrounding hinterland with relationship to the core of Perth. Like other core-periphery relationships it has been subordinated to the centre of political and economic dominance, reflecting lower wages, lower land values and fewer employment opportunities for professionals (ABS 2014). This income disparity between the core and the periphery has increased over the last 50 years (Abdel-Rahman and Wang 1996).

Within Armadale the four tier retail hierarchy comprising: street corner convenience cluster, neighbourhood shopping centre, community shopping centre and regional shopping centre is identifiable in accordance with Central Place Theory.

The following table provides a brief summary of various theoretical approaches evident within strategic plans for Perth since 1955. Such approaches can be considered current 'theories in vogue' during each plan's preparation. Within each strategy, it is clear that both major and minor approaches have been reflected. For example, *Network City* reflects an approach conforming to elements of New Urbanism, both textually and within its spatial component. Other approaches such as sustainability are briefly mentioned and as such, can be considered a minor theoretical approach within the strategy. Overall however, the impact of each plan has been a shift towards more compact lot sizes over time (refer to far right column in Table 7).

It can be concluded that various economic and social conditions in Armadale remain unique to the locality. Armadale remains an area historically stigmatised by locational disadvantage, possessing a low socioeconomic profile and suffering from a comparatively weak regional focus. Its current status has generally not been acknowledged and accounted for within various metropolitan strategies for Perth.

Urban consolidation, the current planning approach reflected within many of Perth's local planning schemes, has been widely promoted at a State level in recent years (WAPC 2004, 2010). There are problems with applying this approach uniformly throughout Perth, however. A unique social and built form context in Armadale, an absence of land market pressures and the desire for open spaces mean that many residents continue to enjoy the lifestyle offered by open spaces and large lots.

Overarching Planning Strategy	Major Theoretical Approach	Minor Theoretical Approaches	Impact on Armadale	Urban densities encouraged within each plan
Stephenson and Hepburn Report (1955)	Modernism	Rational Planning Core-Periphery Theory	Much land surrounding Armadale was constrained, undeveloped vacant land.	800 - 1012m^2 (one-fifth and one-quarter acre) lots intended to prevent overcrowding evident in the U.K.
Corridor Plan (1970)	Modernism	Rational Planning Central Place Theory	Introduction of manufacturing, industry and urban development.	Gross density of 7 dwellings per hectare = 700m^2 - 1000m^2 (single dwellings on separate lots).
Metroplan (1990)	Postmodernism	Sustainability New Urbanism	Urban land development flourished at the expense of other uses.	Gross density of 9 dwellings per hectare = 700m^2 – 900m^2 (single dwellings on separate lots).
Network City (2004)	New Urbanism (harder approach, 60% of redevelopment within existing areas).	Sustainability Central Place Theory	Urban consolidation encouraged and housing constructed accordingly. Widespread redevelopment potential for existing lots.	Parent lots: 700m^2 – 800m^2 with potential for subdivision to create 350m^2 – 400m^2 lots.
Directions 2031 and Beyond (2010)	New Urbanism (softer approach, 47% of redevelopment within existing areas).	Sustainability Urban Consolidation	Further redevelopment occurring, creation of smaller lots.	Parent lots: 700m^2 – 800m^2 with potential for subdivision to create 200m^2 - 350m^2 lots.

Table 7: Theoretical approaches reflected within Perth's strategic plans and their impact on residential lot sizes.

Recent redevelopment in Armadale has been characterised by poor quality opportunistic battleaxe redevelopment, resulting in what Vallance et al term *rental property* (2004). This model has not proven beneficial to the area and does not reflect the intent of the local authority (City of Armadale 2007). The question for Armadale remains: 'Where to from here?' It is contended that a new approach is required to provide overall improvements to the locality. In order to undertake this, the following section will outline the strengths and weaknesses of urban consolidation to lay the foundation for Chapter 8. Chapter 8 will apply Central Place Theory to develop a model of how redevelopment has operated with respect to the distribution of services in the locality in an attempt to find solutions to the various planning challenges facing Armadale.

Chapter 7: The impact of urban consolidation on Armadale

7.1.   The debate regarding urban consolidation and higher density redevelopment

To this point, the study has focussed primarily on strategic planning. The following section will focus on statutory planning and more specifically outline the arguments for and against redevelopment within existing suburban areas. This section also includes a locational analysis of the study area within the City of Armadale. The debate regarding urban consolidation is an important one in the context of this study. The concept is becoming more central to the redevelopment of existing cities and forms the foundation of much of *Town Planning Scheme No. 4* (City of Armadale 2005) and *Directions 2031 and Beyond* (WAPC 2010). Urban consolidation remains a controversial issue and not all scholars share the view that more compact dwellings necessarily provide the most appropriate, most liveable or most sustainable proposition.

The vast majority of scholars promote the benefits of urban consolidation which has become the overwhelming position advocated within planning discourse. This is reflected within many planning strategies and schemes and is endorsed widely within the literature (Alves 2006; Ellis 2002; Falconer 2008; Gehl 2011; Loh 2007; Newman and Kenworthy 1992; Searle 2007; Vallance et al 2004; Weller, 2009; Wheeler 1998). However not all scholars support trends towards urban consolidation, infill and higher density redevelopment.

Opposition to higher density redevelopment often concerns arguments around preferences for the type of spaces in which people prefer to live, considered most functional, most pleasant, most traditional and most practical in terms of family sizes, reflected within existing low density suburbia. As Searle (2007) and Vallance et al (2004) have noted, proposals for higher density redevelopment are often met with resident opposition and negativity, particularly in well-established or 'well-heeled' (wealthier) areas. Weller (2009) argues that if not effectively dealt with, such opposition threatens to prevent such redevelopment as resident opposition is an increasingly powerful local influence which politicians are sensitive to.

Low density suburbia has long been associated with hope and well-being for citizens (Kotkin 2010) and many residents have increasingly sought to defend it. This has created substantial problems for both State and local governments in managing the process of urban redevelopment which in turn has made development outcomes unpredictable, adding further costs and delays to what is an already a notoriously risk-prone industry (Alves 2006).

Arguments for the maintenance of low density suburbia include the positive lifestyle opportunities afforded, the ability to inspire identity formation and even the ability to inspire creativity (Bruegmann 2005; Gleeson 2006 cited in Falconer 2008). Kotkin (2010) argues that most people do not seek to live in higher density housing forms promoted by urban planners and while suburbia is far from perfect, it serves people well by reflecting the desires of those within countries such as the U.S., Canada and Australia. Infill redevelopment often requires expensive and impractical upgrading of services, particularly reticulated sewer and water. Servicing costs are reduced through greenfield development as building on a vacant land parcel is more cost effective than retrofitting development within an existing area. Weller considers that sprawl is 'cheap to build' (2009), enabling young families to enter the housing market in a relatively affordable manner. Greenfield development is also argued to provide higher levels of safety, considered as one of the most suitable contexts in which to raise children, with nearby parks and large backyards.

O'Toole (2007) considers that modern planning seeks to promote high density housing at the expense of development beyond the urban fringe and questions many of the assumptions presented within modern strategies and schemes. Poorly implemented urban consolidation is argued to increase hard stand areas, reducing permeability and intensifying the impact of storm and flood events. Converting undeveloped sites to residential land uses reduces the safety valve of open space and increases the concentration of buildings, making populations more vulnerable. Further, crowding people into smaller spaces around constrained road capacity is dangerous as it reduces the prospect of rapid evacuation from the city into safer areas.

The prevailing planning view that urban sprawl has spread land uses out, forcing people to travel more than they would have to in a pedestrian or transit oriented city is false, according to O'Toole. Access to private vehicles has produced great benefits, and low density urban development simply enables people to take advantage of these including: higher incomes, access to consumer goods, social and recreational opportunities, freedom of movement as well as health and safety advantages (O'Toole 2007, 209).

The overwhelming preference for housing in countries such as Australia remains low density detached dwellings as attested by numerous studies (Bishop and Syme 1995; Stretton 1996; Vallance et al 2004; Weller 2009). Weller (2009) considers that high rise or higher density housing is not common in Perth and is generally unfavoured throughout Australia. Many Australians could not conceive people living under or above them and most retain a desire for large homes and gardens. Bishop and Syme (1995) cite several attitudinal surveys which reinforce a similar preference for low density living. Urban consolidation and medium density housing are demonstrated to be moderately to highly negative in the Australian culture with high-rise the least preferred housing type.

In 'Boomtown 2050' Weller (2009) cites Brownlie Towers in Bentley, Western Australia as a notoriously poorly executed example of high density development which he terms 'vertical sprawl' located within an area of low amenity. Other scholars refer to the cultural bias against high density housing, which is often associated with overcrowding and crime. This is often blamed on the cultural attitude of the early migrants from the United Kingdom who preferred single detached houses as a solution to the overcrowding and pollution in British industrial cities. Such residents moved to the suburbs in search of 'privacy, a relaxed lifestyle, sunlight and fresh air' (WAPC 2003, 10).

Gordon and Richardson (1997) consider that low density settlement is the overwhelming choice for residential living in many western countries. Suburbanisation has led to lower congestion through shifting road and highway demand to less congested routes.

Their study found that the Los Angeles suburban resident had a 20 minute shorter trip time than the New York City centre resident with average travel times in high density neighbourhoods greater due to traffic congestion. A study by Ladd (cited in Gordon and Richardson 1992) found that costs of managing traffic, waste collection and policing increase with higher densities and no available research has given convincing support to the fears of sprawl presented by planning authorities.

Ladd considers that the term 'urban sprawl' is pejorative and associated with unaesthetic, lazy and undisciplined urban expression, a term which has come to mean almost any kind of low density suburban development. That suburbanisation should be under attack is unwarranted given the preferences of the majority of Americans for a suburban lifestyle.

Vallance et al (2004) in a study conducted within New Zealand, found that urban infill is rarely well received by local residents and its implementation remains a contentious issue. Though some market support for higher density housing exists, demand remains greater for dwellings on larger lots particularly in peri-urban areas and objections to infill housing have become a common feature of the local media with opposition vociferous and widespread.

Residents' views of infill housing were not based solely on the features of a shrinking built form, perceptions of poor social behaviour and increased social disconnectedness were also a clear basis for opposition. Typical responses by surveyed residents included:

- Infill brings the concrete jungle;
- Infill becomes rental property (rather than owner-occupied);
- Infill should only be kept to specific areas;
- Infill contributes to the rise of individualism and social disconnectedness;
- Infill has high turnover of occupants;
- Infill brings social problems.

Stretton (1996) argues that residents' values are inconsistent with reduced private spaces and increased densities. Preferences reflect low density suburban living while high density housing is viewed as impacting upon urban quality (Troy 1996; Williams 2001; Williams 2004 cited in Falconer 2008). Other studies have revealed residents' desire to escape the pollution and overall offence to the senses that can be associated with inner city living (Bentley 1999; McIndoe et al 2005; Schoon, 2001, cited in Falconer 2008). Troy (1992 cited in Falconer 2008) has argued against urban consolidation in favour of providing sufficient open space to enable garden planting and opportunities for recreation, critical in making a city liveable. Should residential infill be widely adopted, privacy will be diminished causing residents to withdraw into their shrinking personal domains.

O'Toole (2007) cites the historic animosity of planners towards low density suburbia and private forms of transport. He describes planning for mixed-use neighbourhoods so that housing, employment and daily needs are all within walking distance as 'authoritarian'. O'Toole considers that highly prescriptive New Urbanist planning codes are unworkable as they imagine that the automobile is not the preferred and dominant mode of travel.

Planning is currently a negative regulatory machine, designed to stifle all initiative and creativity. Planners advocate a 'one size fits all' approach and eliminate the need for creative thinking. The prescription for smart-growth is similar: increased densities, mixed-use developments, promoting walking, cycling and public transit and discouraging driving by limiting parking and street flow capacities. Such planning ideas are doomed according to O'Toole (2007). Planners should look at the experience of models and precedents that have worked well, rather than concentrate upon fashionable planning ideas and theories.

7.2.   Summary of arguments against urban consolidation

In studies undertaken over the last several decades, landowners in countries such as Australia, New Zealand and the U.S.A. have consistently provided responses reflecting overwhelming negativity towards higher residential densities, including urban infill and multiple dwellings. According to the literature there is no evidence to suggest this will change in the short to medium term. Vallance et al's study (2004) clearly reveals that the majority of respondents would prefer to move to larger lots on the periphery of cities as opposed to seeking to live within inner-city apartments as larger living spaces, privacy and backyards are highly valued. Lewis (2000) acknowledges the preference for larger lots, however argues that a shift towards higher densities is inevitable as cities grow. In respect to the implementation of urban consolidation, Lewis considers that the collective appraisal of new planning ideas is often so wrong that planners should back their own judgment despite widespread disapproval (2000).

Hedgcock and Yiftachel consider that the fault lies in the upcoding mechanism itself: 'Both strategic and statutory planning in Perth at a local and State government level is currently oriented around manipulating zonings and density codings, which are constantly producing mediocre environments. Too little consideration and commitment is given to developing an overall vision of what the city should look like and how it will function into the future' (1992, 141).

Hedgcock and Yiftachel also consider that there are no easy answers about how to implement more intensive redevelopment. Local government and community opposition to higher densities, developer conservatism towards new urban concepts, the present structure of the real estate market, developers lack of experience with higher density environments and vested interests all lean towards the low density model: 'The magnitude of problems facing cities particularly issues related to oil and greenhouse warming will not be successfully tackled through incremental change alone, unlikely to alter the basic structure of the city and certainly not in a reasonable time frame and a more substantial vision of alternative living environment is needed' (Hedgcock and Yiftachel 1992, 97).

Figure 68: Nollamara in Perth's north showing the impact of revisions to a local planning scheme and the resulting uniformity of redevelopment. Armadale has permitted a similar form of redevelopment through Town Planning Scheme No. 4 (Google Maps 2013).

7.3.   Summary of arguments for urban consolidation

More recent planning thought leans strongly in favour of a 'compact city', 'urban consolidation' or 'New Urbanist' paradigm, influenced by an increased awareness of environmental issues and a shift towards sustainable development. Newman and Kenworthy (1999) argue that population growth is accommodated better by denser developments and infill, rather than by the manner of incremental redevelopment that has been encouraged in recent decades in most Australian cities (refer to Figure 68).

Bishop and Syme (1995) argue that traffic congestion and rising energy costs have begun to influence residents away from large dwellings on the periphery towards infill housing closer to city centres. Although land per square metre is more expensive within inner areas, convenience, lower costs of transportation and reduced energy bills provide offsets to this initial outlay, with time saved avoiding traffic congestion moderating stress and enhancing productivity.

Other scholars such as Kunstler are more strident in their critique, describing low density suburbia as possessing 'no future', and 'the slums of tomorrow' (2011, 2). Kunstler notes that variations of defence of suburbia 'range from the idea that it is the highest expression of free markets, to the notion that it is the natural outcome of our democracy, to the belief that God has ordained it' (ibid 2011, 2). He suggests that the suburban project cannot continue indefinitely due to western culture entering a long-term global energy crisis that will eventually end this 'drive-in utopia'.

What defenders of existing suburbia overlook Kunstler argues (2011), is that American style suburbia was made possible only by generous supplies of cheap fossil fuels, and once those conditions no longer prevail, not only will there be no further expansion of sprawl, but all of the existing infrastructure built according to that pattern – which comprises more than eighty per cent of built form in America – will drastically lose its market value:

> 'No combination of alternative fuels or new systems will allow us to run America the way we currently run it, or even a substantial fraction of it. We are not going to run Wal-Mart, Walt Disney World, and the interstate highway system on hydrogen, coal synfuels, tar sand or oil shale distillates, bio-diesel, ethanol, recycled french-fry oil, solar electricity, wind power, or nuclear fission.

> The stark truth of the situation is that we are simply going to have to make other arrangements – and I'm sorry to have to repeat that this will be the case whether we like it or not. Suburbia will be coming off the menu. We will no longer be able to resort to the stupid argument that it is okay because we chose it. Sprawl is, and always has been, to put it as plainly as possible, a living arrangement with no future – and to regard it as anything else is a disservice to our fate' (2011, 2).

Anderson et al (1996) argue that sprawling nature of many large cities adversely impacts upon the ability to move beyond the private car in meeting transport needs. Higher density cities have lower energy requirements than those of a more dispersed city and sprawl has a negative impact upon sustainability, recreational activities and biodiversity. Sprawl is defined as possessing the following characteristics: an increasing expansion of the metropolitan boundary that separates urban from rural land uses, a general reduction of intensity of all land uses, as measured by population and employment densities, transport networks that provided high connectivity, even in peri-urban parts of the city and the separation of residential uses from other land uses. Sprawl is evident in all affluent countries and very difficult to reverse, having been built firmly within the hardware of cities.

Wheeler (1998) argues that urban infill redevelopment contributes to sustainability objectives, potentially improving the long-term social, economic and ecological health of cities. Characteristics of a sustainable city include: compact, efficient land uses, reduced car usage, better access to services, more efficient use of resources, reduced pollution, the restoration of natural systems, enhanced living environments, a healthy social ecology, a sustainable economy, enhanced community participation and involvement and the preservation of local culture and wisdom, all of which lean towards urban consolidation.

Conte (2000) considers that the defence of low density development has been promoted by a group of 'free-market' analysts working for conservative think tanks, along with a number of academics within universities. Conte argues that the existing 'laissez faire' ideology is unable to provide an adequate foundation for planning, which is inherently public and integrative. Similarly Ellis (2002) considers that too many individuals have an excessive faith in the markets without a corresponding sense of their limits. Weller (2009) considers that the case for sprawl is politically supported by economic liberalism and a suspicion of any regulatory planning that inhibits individual rights vested in land.

WAPC's *Economic and Employment Lands Strategy: non-heavy industrial, Perth metropolitan and Peel regions* (2012) utilises employment self-sufficiency as a key sustainability indicator within the six sub-regions of Perth and Peel. The strategy outlines that the north-west sub-region, comprised of the cities of Joondalup and Wanneroo, has the lowest employment self-sufficiency level in the state at 41%: 'Many of the working residents of the north-west sub-region must travel to the CBD of the central sub-region for work, resulting in peak hour congestion on the road system and negative externalities such as pollution, lost productivity and increased travelling costs for the commuting worker' (WAPC 2012, 52).

Such data demonstrates that those living within peri-urban areas are most disadvantaged by lengthy commuting times. This is contrasted with the central metropolitan area which has an employment self-sufficiency level of 121%. This enables reduced transit times and lower associated energy costs, supporting the WAPC's position that infill redevelopment and mixed use development contributes to reducing the number of and duration of private car journeys.

Weller (2009) considers that 'the case against sprawl is that it is flab to what should otherwise be a taut body. Sprawl is wasteful because it is destructive of agricultural land and precious habitat. Its non-porous surfaces increase run-off that damages waterways, and its free-standing homes are inefficient with regard to energy and infrastructural costs. Sprawl is car-dependent with increasingly long commutes that, in turn add to the problem of global warming. Sprawl leads to social problems because it isolates people in a landscape of homogeneity. Sprawl is thought to lack culture and community because it lacks density and a sense of place. And finally, sprawl is ugly and people buy into it because they have no other choice' (2009, 37). Weller further argues that the argument for higher population densities within the inner city and along established transport spines 'makes a lot of sense'. High costs associated with building new infrastructure, including roads and rail for regions on the city fringe are prohibitive and as such governments across all levels have generally been unable to deliver such infrastructure in a timely manner.

7.4.   How other Australian cities have managed urban consolidation

In a Sydney based study, Searle (2007) outlines that proposals for higher density redevelopment were locally unpopular when first proposed in the 1980s. Searle describes the manner in which planning power, political influence and market forces successfully converged to allow the implementation of urban consolidation in the face of community opposition. Sydney's experience demonstrated that higher density housing provides a number of benefits which governments realised over time: cheaper infrastructure (shorter lengths of pipes, wires and roads), reduced dwelling costs, greater affordability and meeting changing demographic requirements - the needs of increasing one and two person households who were viewed as accelerating urban sprawl by 'unnecessarily' residing in traditional low density dwellings.

Public transport uptake became greater and external pressures such as various oil crises meant there were recognised benefits of locating workers closer to employment and services. Sydney's local authorities were required to approve development applications for two dwellings on a single block of land within residential zones, under certain conditions. An additional provision intended to manage sprawl included a maximum 450m^2 size for newly created lots.

Searle considers that resistance to urban densification in the 1980's and 1990's was primarily from higher socio-economic and older existing low density suburban communities concerned by negative impacts including: loss of the green environment, additional traffic, reduced privacy and loss of streetscape amenity. Poor examples of unit design were frequently proposed including multi-storey flats which ignored prevailing architectural forms. The lack of design controls including 'overbuilding', destruction of trees and the emergence of unattractive streetscapes meant local protests became stronger and residents objected to what they considered to be an overabundance of medium density housing. At the peak of the 1980's housing boom, 34% of all planning approvals for housing were multiple dwellings. By 1995 this had increased to 60% (Searle 2007).

The basis for opposition to urban consolidation included perceptions of: spoiled views, traffic snarls, environmental concerns, unwelcome newcomers, ugly apartment blocks, privacy concerns and ruined tranquil peninsulas. Searle (2007) cites examples of groups of irate residents cheering when a multi-unit or townhouse development was refused at crowded and highly emotionally charged local government meetings. When extensive community consultation occurred, redevelopment of large sites in sensitive precincts became more acceptable to residents, however most opposition remained confined to higher income suburbs.

The State government responded by implementing a series of measures to improve residential unit design to complement existing areas, imposed new rules such as the requirement to engage architects throughout the development process and established design review panels to assess proposals. Despite vociferous opposition, by the early 2000s it became clear that higher density redevelopment had been operating at a significant level for approximately one decade and that as a planning approach, urban consolidation had succeeded. Searle considers that the main opposition to densification has been from higher income, staunchly non-Labor, wealthier areas. Though it has been forced to adapt where necessary from political and public pressure, it has triumphed and survived largely intact. In Searle's view, this success is likely to continue into the future and can be applied to the growth of all Australian cities (2007).

Alves (2006) attributes urban consolidation within Melbourne to increasing the fragmented, private ownership of land, encouraging piecemeal and sporadic redevelopment which placed local governments in the role of umpire for hundreds of individual planning contests. While urban consolidation has been partly successful, the success of Melbourne's consolidation policy is more accidental than planned. Alves considers that urban consolidation in Melbourne has not contributed towards overall housing affordability. The increasing social inequality that has become wedded to the economics of multi-unit housing construction means that benefits accruing from the more intensive use of existing public infrastructure are mostly enjoyed by those who have already benefited from shifts in the affordability of the housing market (ibid, 2006).

Such a finding has applicability to Armadale, as the benefits of higher density development are intended to serve the community rather than serving the needs of developers who may enjoy the profits of redevelopment while contributing little to streetscapes and the community. Such was Council's early experience with higher codings provided for under *Town Planning Scheme No. 4* which saw a relatively high level of exploitation via poor quality, small-scale, piecemeal redevelopment (City of Armadale 2007).

7.5.   Targeted vs blanket rezoning

Falconer (2008) argues in favour of targeted rather than a blanket recoding approach and *Directions 2031 and Beyond* concurs, considering that targeted consolidation should not be confused with a uniform policy of densification (WAPC 2010). Transit Oriented Development (TOD) can be considered a targeted approach which focuses upon density gradients that are higher close to public transport and commercial anchor points. Areas located further away from anchor points or activity centres (central places) are considered less suitable for high densities and are consequently built to comparatively lower densities.

Figure 69: Limited density gradients showing R25/40 codings located closer to shopping and transport in the study area and lower R15/25 codings located further from such services (WAPC 2013).

In Armadale, limited density gradients have been introduced with R40 codings located within 400m - 800m of rail infrastructure and shopping facilities and R15/25 codings located elsewhere, further from services. It should however be considered that *Town Planning Scheme No. 4*'s approach is one of primarily blanket recoding as 90% of the land identified within Camillo, Armadale and Kelmscott is uniformly zoned R15/25 (refer to Figure 69).

7.6.   Residential Design Code distributions in Perth

Armadale's flatland suburbs (the study area) were originally established with large lots which according to urban scholars such as Falconer (2008) and Weller (2009) remain the preference for most families in Perth. While revisions to local planning schemes have influenced the growing trend towards more compact lot sizes, the dominant housing model in Perth remains single detached dwellings on relatively spacious lots. The distribution of coded land reflects this, with R20 reflecting almost half of all coded lots, followed by R17.5 ($571m^2$ average lot size). The R20 coding allows the creation of a $450m^2$ to $500m^2$ lot (or greater) which has potential to accommodate a large 3 - 5 bedroom dwelling with between 2 and 3 car garage and 2 – 3 bathrooms (refer to Figure 70).
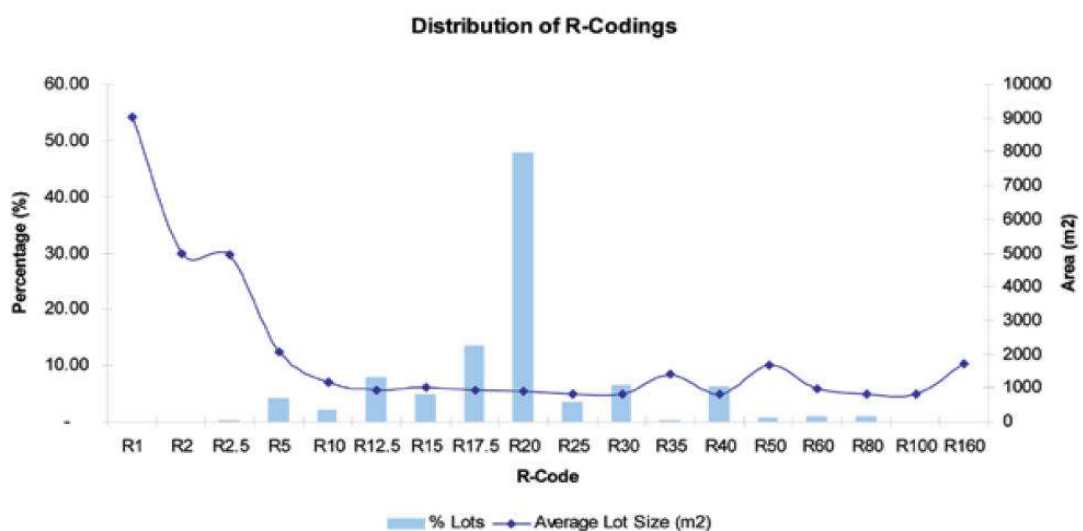
Figure 70: Graph demonstrating the manner in which the low density housing model continues to dominate Perth's urban form. The graph also shows the relationship between coded land and actual lot sizes (WAPC 2010).

Directions 2031 and Beyond states that home builders in Australia and the USA currently build large homes, with average floor space now in excess of 200 square metres. WA's new single detached houses are on average 244m^2 while other nations reflect smaller dwelling sizes: UK = 76m^2, Sweden 82m^2, Ireland 88m^2, Spain 97m^2, France 113m^2, Belgium 119m^2, New Zealand 196m^2 and USA 202m^2 (WAPC 2010). The trend towards large homes in Australia is being challenged by local planning schemes that recode land within existing areas at higher densities, enabling more compact dwellings through the creation of smaller lot sizes.

7.7.   Residential infill and housing affordability

The relationship between infill redevelopment and housing affordability is not a clear one. A number of scholars highlight the affordability advantages which urban infill can provide and point to its inevitability over time for this reason: 'From an affordability perspective, densification makes a lot of sense. Across capital cities, based on median prices, buying a unit is about $65,000 more affordable than buying a house. In Sydney, where the unit market is much more mature, the price difference is a much larger at $110,000' (RP Data 2011). Also arguing that smaller dwellings are more affordable, Weller acknowledges that while Australians are passionate about their backyards, affordability pressures and greater congestion mean that more residents will consider a higher density housing option over time (2009).

Steinacker's (2003) study found that infill development, defined as 'residential development occurring within the city limits of major cities', offers few affordability benefits due to difficulties associated within the redevelopment process including: 'diseconomies of scale, small, irregularly shaped parcels for redevelopment, parcels not zoned for intended use, complicated and time consuming rezoning processes and a lack of a critical land mass to offset negative features of the surrounding neighbourhood' (ibid 2003, 495). Steinacker examined 50 local authorities in the USA from 1996 – 2000 and found financial, environmental and economic considerations often result in a higher per unit cost for city infill units than for suburban greenfield units making them less affordable.

While observing some benefits such as an increased tax base, revived neighbourhoods and slowed outward growth there was 'also one potentially serious cost – increased housing costs' (ibid 2003, 505) and relative affordability suffered: 'There is some evidence that infill development will not ameliorate the affordability pressures in many cities that is detrimental for low or moderate-income households that need more inexpensive housing' (ibid 2003, 505).

In response to increasing housing affordability issues, the former Western Australian Housing Minister Troy Buswell launched the State's *Affordable Housing Strategy 2010-2020: Opening Doors to Affordable Housing* in 2010. The strategy aims to address the lack of affordable housing throughout WA by delivering at least 20,000 affordable homes by 2020, with a target to deliver 3500 additional social housing dwellings, as well as 5500 subsidised private rentals and for 32,000 affordable housing lots to be released by 2020 (Western Australian Government 2010).

The strategy seeks to pursue key planning reforms, optimising the use of ancillary dwellings (granny flats) and introduces planning codes that facilitate medium density mixed use or multi-unit developments. It considers that the current planning system does not promote sufficient housing diversity and seeks the production of smaller lots in peri-urban areas such as Henley Brook, Hammond Park and Golden Bay. Within the last 30 years Perth has seen a decline in housing affordability, and cheaper housing options have now been removed from the market.

The strategy notes that 'in May 2000 a family in Perth on the median income of $40,700pa could buy a home for 3.9 times their annual income, whereas in September 2010 the same family on the median income of $73,300 pa needed at least 6.5 times their annual income to purchase a similar property' (Western Australian Government 2010, 1). The strategy does not promote the redevelopment of existing urban land or infill, apart from the 'granny flats' (ancillary accommodation) housing option, which cannot be considered true infill.

Rather than advocating redevelopment within existing urban areas, the strategy recommends a range of initiatives including:

- Exploring alternative tenure arrangements – land rent programs;
- Expanding options such as affordable lifestyle villages;
- Expanding initiatives such as community land trusts;
- Using public / private partnerships;
- Investigation of shared equity or 'Keystart' loans;
- Relying on the relaxation of existing planning mechanisms.

7.8.   The role of the redevelopment authority in Armadale

Approximately half of the land located within the City of Armadale is controlled by the Metropolitan Redevelopment Authority (MRA). The MRA was established as a result of the *Metropolitan Redevelopment Authority Act* in 2011 and undertakes various redevelopment projects within the Perth metropolitan area. Its work was previously undertaken by the East Perth, Subiaco, Midland and Armadale Redevelopment Authorities.

The MRA seeks to develop communities where people live, work and recreate. The *Metropolitan Redevelopment Authority Act* (2011) provides 'for the planning and redevelopment of, and the control of development in certain land in the metropolitan region; and to establish a State agency with planning, development control, land acquisition, disposal and other functions in respect of that land' (MRA 2013, 1). The MRA enjoys wide development powers, including the power to resume land, self-determine applications, undertake environmental rehabilitation and implement and coordinate urban regeneration projects.

The MRA seeks to undertake the following (ibid, 2013, 1):

- To build a sense of place in redevelopment areas by supporting unique and high quality design, heritage protection, public art and cultural activities that respond to Perth's environment, climate and lifestyle;

- To promote economic wellbeing by supporting development that facilitates investment and provides opportunity for local businesses and emerging industries to satisfy market demand;

- To promote urban efficiency through infrastructure and buildings, the mix of land use and facilitating a critical mass of population and employment;

- To enhance connectivity and reduce the need to travel by supporting development aimed at well-designed places that support walking, cycling, and public transit;

- To promote social inclusion by encouraging, where appropriate, a diverse range of housing and by supporting community infrastructure, activities and opportunities for visitors and residents to socialise; and

- To enhance environmental integrity by encouraging ecologically sustainable design, resource efficiency, recycling, renewable energy and protection of the local ecology.

Figure 71: Townhouse development in Champion Lakes, Armadale, a built form outcome possible through the work of the Redevelopment Authority (MRA 2013).

Rather than the conventional model of land use zones utilised within the City of Armadale, the MRA utilises a place making approach, which involves planning, architecture, environmental science and engineering to produce master plan documents, intended to form the foundation of new communities. 'Place development involves active consultation with local authorities, government agencies and the community to deliver new infrastructure, clean up the surrounding environment and identify and restore heritage buildings. Place management strategies support each project vision and sustainable community development through asset management and investment attraction, land sales, development control and community and economic development initiatives' (ibid 2013, 1).

Such an approach provides a number of advantages in comparison with redevelopment administered by a local authority. Firstly, the MRA is involved with primarily greenfield development or a 'blank canvas' approach to redevelopment, which provides advantages to that offered within the local authority area. There are for example, no considerations of retention and upgrading of ageing dwellings (refer to Figures 71 and 72). The redevelopment process undertaken by the MRA often involves large areas of land, as opposed to 'piecemeal' redevelopment of individual lots.

Thirdly, the powers available to the MRA mean that development is undertaken via a self-approval process with no requirement for approval from the local authority, allowing greater autonomy in delivering large scale projects. Within the City of Armadale, the MRA exercises planning control over a number of precincts including: Armadale Central, part of Kelmscott, Champion Lakes, Champion Drive, part of Forrestdale and Wungong, including the suburbs of Hilbert and Haynes (City of Armadale 2014).

Figure 72: Typical 'battleaxe' redevelopment observed within the study area (Author 2014).

7.9. City of Armadale Town Planning Scheme No. 4

The City of Armadale *Town Planning Scheme No. 4* reflects a shift towards urban consolidation and urban infill within its existing low density 'flatland' suburbs. This has resulted in smaller, more compact dwellings, challenging the area's historical low density urban housing stock. Although the majority of original or parent lots surveyed within the study area comprise approximately $700m^2$ of land (City of Armadale 2014) and can be redeveloped at the R25 density coding ($350m^2$ required for an average single lot), several larger lots located within walking distance of train stations and shopping precincts (central places) have been split-coded R15/40 or R25/R40 ($220m^2$ required average lot size, or greater under multiple dwelling provisions of the Residential Design Codes (WAPC 2013).

Some of these larger lots, up to $3000m^2$ provide greater scope for redevelopment as major grouped / clustered dwelling sites suggested by some scholars as providing a superior design outcome than the common battleaxe strata arrangement. Battleaxe rear strata redevelopment has been widely criticised as offering an overall poor design outcome due to lack of amenity for the rear dwelling, which is often surrounded by fences on all sides, allowing poor streetscape views and access (Alves 2006; Hussey 2002; Weller 2009).
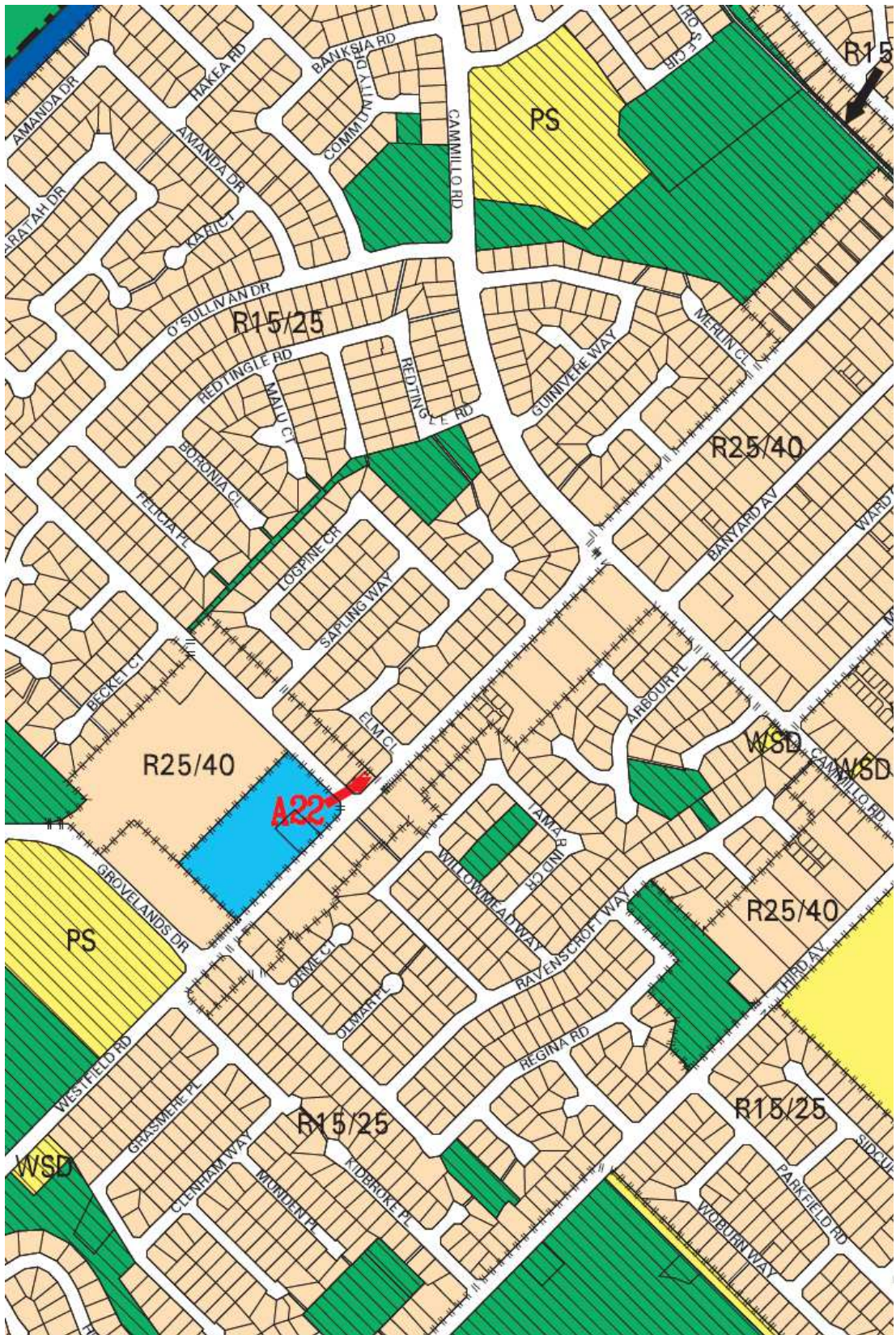
Figure 73: City of Armadale local planning scheme mapping showing blanket, split codings: R15/25 and R25/40. The lower number refers to single dwellings, the higher number refers to group dwelling redevelopment (WAPC 2013).

7.10. Planning instrument permitting higher density redevelopment

Town Planning Schemes are administered in Western Australia under Part 5 (s 68) of the *Planning and Development Act* (2005). The following provisions are contained within *Town Planning Scheme No. 4* and permit higher density redevelopment (City of Armadale 2005):

- Clause 5.2.4: 'the City may permit increases in residential density subject to compliance with the City's Residential Density Design Policy where land is identified on the Scheme map as R10/25, R12.5/25, R15/25 and R17.5/25, development at the higher density is limited to group dwellings up to a density of R25': and
- Clause 5.2.5: that 'Development is to be limited to the lower code, except the City may permit development up to a density of R40 where certain conditions are met'.

Since 2005, under *Town Planning Scheme No. 4*, the potential for urban concentration has increased for the study area suburbs of Camillo, Kelmscott and Armadale. Each original lot, formerly zoned R15 (666m^2 average lot size) is dual coded to R15/25 under *Town Planning Scheme No. 4* with a 'density bonus' to R30 if the lot possesses two street frontages, such as a corner lot arrangement or if located adjacent to public open space.

These changes have meant the creation of more concentrated urban forms including 'battleaxe' survey-strata lots in former backyards, altering the nature and fabric of the City in those lots possessing an effective rear area of between 300m^2 and 350m^2 (refer to Figures 73 and 74).
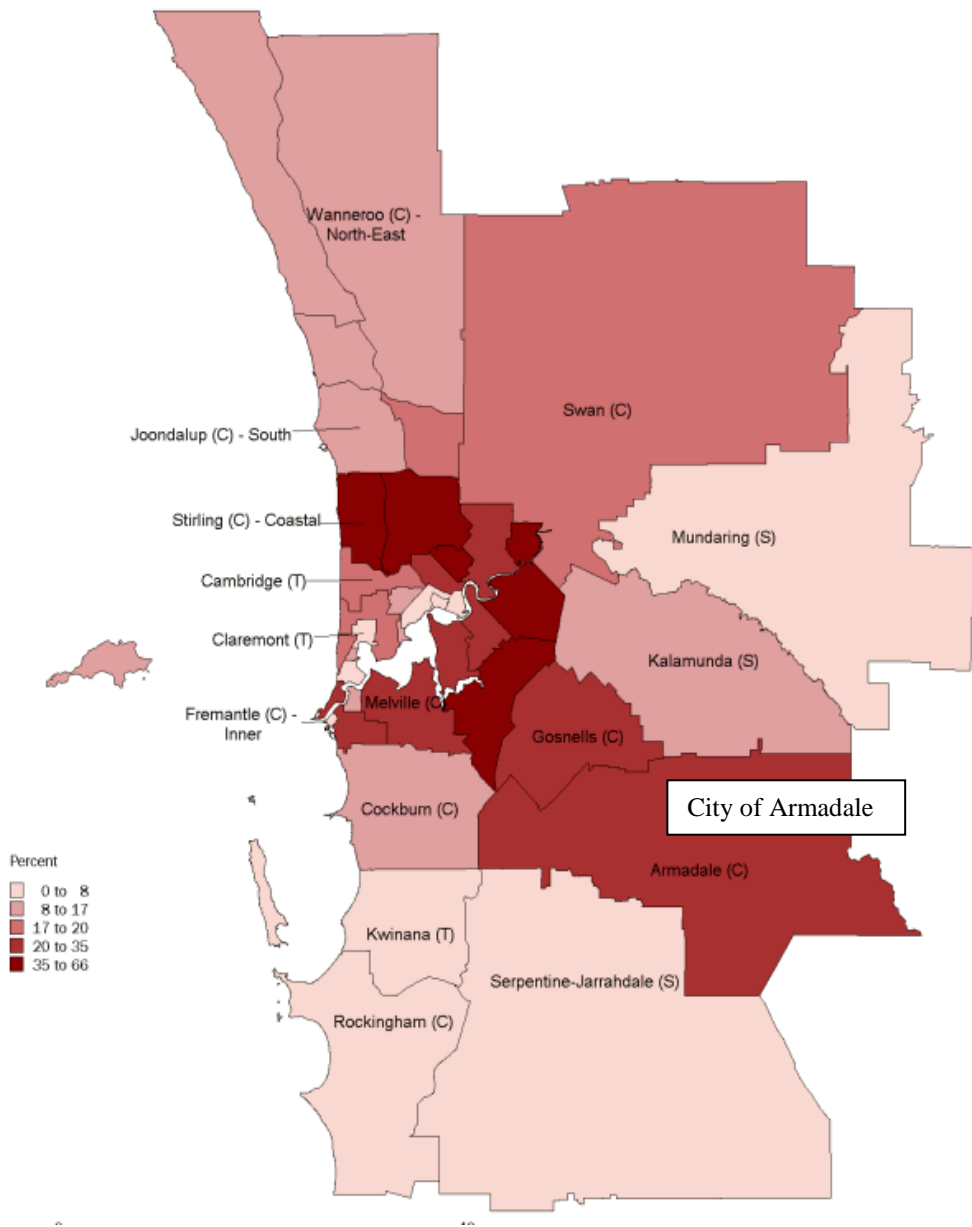
Figure 74: As a result of redevelopment opportunities provided under Town Planning Scheme No. 4, Armadale is strongly represented within the proportion of grouped dwelling approvals in relation to other local authority areas (WAPC 2010).

The following section of this study will identify the nature of Armadale's redevelopment over time and its relationship to central places in order to address the following: What is the relationship between central places and urban redevelopment within the study area? This key question ties into all four objectives of this study, namely:

1)   To examine longitudinally the various state planning strategies which have impacted Armadale (the study area) since 1955 when the first strategic plan for the Perth region was introduced;

2)   To identify the extent to which Armadale has achieved various targets / visions of these strategic plans against what the plan/s forecasted for the area;

3)   To determine the nature and theoretical underpinnings of redevelopment in Armadale with specific focus on residential infill subdivision; and

4)   To determine how to best plan (both strategically and statutorily) for sub-regional centres on the periphery.

Chapter 8: Findings and Analysis

8.1.   Applying Central Place Theory to Armadale – retail hierarchy

A number of spatial models of urban land use seek to explain the growth of cities. Some of the classic models include: Burgess' *Concentric Zone Model* (1925), Hoyt's *Sector Model* (1939) and Harris and Ullman's *Multiple Nuclei Model* (1945) among others (refer to Figure 75). These three models imply that wealthier social groups live further from the core of cities, classified as 'high rent residential', 'high class residential' or 'zone of better residences', areas where land becomes more valuable and houses become newer with increasing distance from the central business district. This could be translated as meaning that land is less affordable in peri-urban areas such as Armadale. (Pacione 2009, LHS 2015) (Refer to Figure 75).
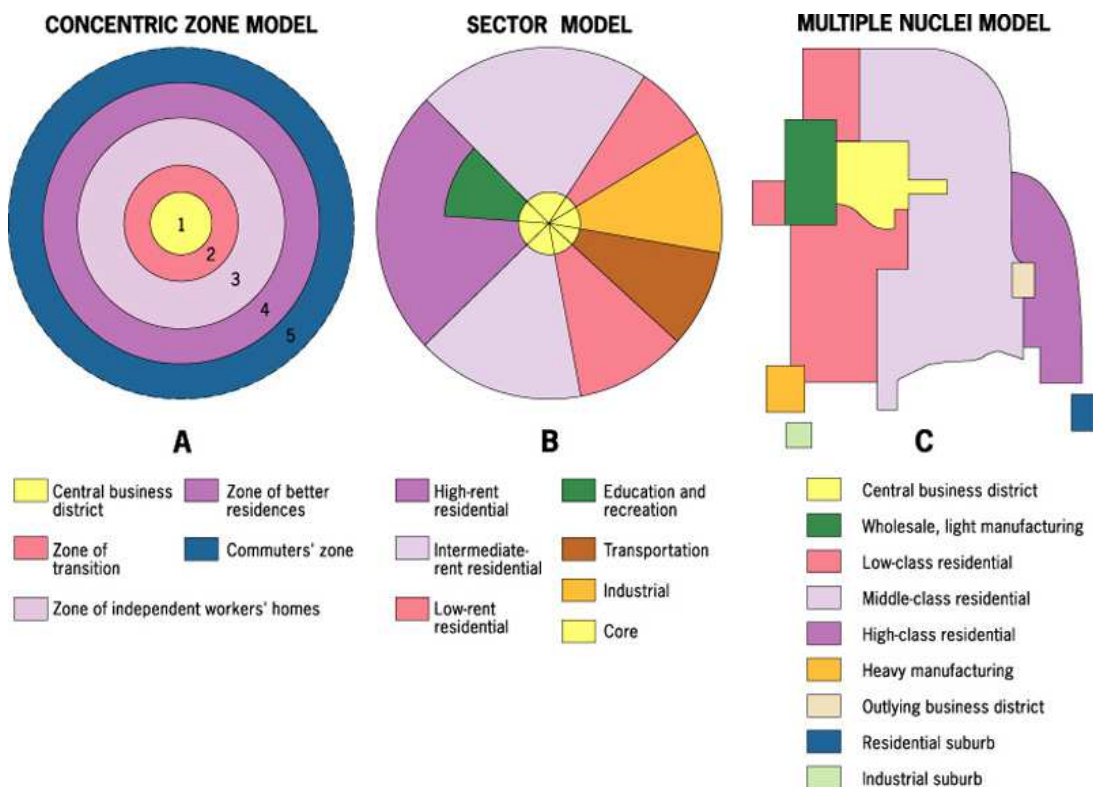
Figure 75: Structural models for explaining the growth of cities (LHS 2015).

Patterns of development where wealthier residents reside on the periphery of cities has not been reflected within the progression of the Armadale corridor since 1955 and it is considered that the opposite has historically been the case. In addition, Loh et al (2007) found that peri-urban regions in Australia are often arranged without apparent order, 'contradicting the model of orderly, concentric zones to cities' (2007, 16).

Within the multiple-nuclei model developed by Harris and Ullman, the central business district is given reduced importance within the city and 'low-class residential' zones are located proximate to the CBD (LHS 2015), another description which is not applicable to Perth's development. This approach is partially applicable to direction provided within the 1970 *Corridor Plan*, where outer areas were planned as higher order central places intended to attract residents and investment. It should be pointed out however, that by 1990, central Perth had re-established predominance in the Perth region as the most important central place (Lawrence 1990). It is beyond the scope of this study to examine each of these approaches in depth. Although some elements of the above models' graphic depictions may apply to Armadale reflecting Perth's radial growth, they do not explain its progression since 1955.

The following section of the study will build upon previous discussions of Central Place Theory (CPT) and apply it to the present day study area within the City of Armadale. Central Place Theory posits a retail hierarchy defined by the provision of lower and higher-order goods within settlements. It is contended that Armadale possesses a clearly defined retail hierarchy and therefore Central Place Theory remains useful as a tool or lens in studying the locality. This study however, seeks to add a further element to the discussion to demonstrate how urban redevelopment is attracted to central places, particularly higher order centres. Therefore the following discussion will focus on the concentration and dispersal of redevelopment in Armadale since 2005 in relationship to its retail centres.

8.1.1. Central Place Theory: historical background

Central Place Theory (CPT) relates to the regularity in size, composition and distribution of urban centres. It seeks to account for the spatial arrangement and number of settlements in a micro-economic world of identical, equally affluent, uniformly distributed and fully informed consumers. The theory was developed by German geographer Walter Christaller who studied settlement patterns in southern Germany in *Die zentralen Orte in Suddeutschland* (Central Places in Southern Germany, 1933), considered a precursor to all subsequent attempts to understand the nature of central place systems. Within the landscape of southern Germany, Christaller observed that towns of a certain size were roughly equidistant. When he examined the functions of the settlements he found it possible to model the pattern of settlement locations using geometric, primarily hexagonal shapes (Beavon, 1977).

The theory is commercially oriented and ranks settlements according to an assortment of goods and services available in each to serve a dispersed population. At the bottom of the hierarchy are the smallest central places (centres of commerce) which provide the most basic consumer needs. Moving up the hierarchy, larger central places offer more specialised goods and services that are less necessary to daily life (less frequent purchases). Basic places (e.g. grocery stores) can be classified as low order while more specialised places (e.g. universities) can be classified as higher order. High order settlements carry low order goods and services but not vice versa. Settlements which provide low order services are said to be 'low order settlements'. Within any given market, there exists a larger number of purveyors of 'low order' (low threshold and range) goods and fewer sellers of 'high order' (high threshold and range) goods (Beavon 1977).

Central Place Theory has been described in positive terms, including as a successful attempt to construct a fully realised theory of spatial structure as well as geography's finest product (Bunge 1962, cited in Beavon 1977). Central Place Theory has also been described as 'too implausible to serve as a basis for empirical work' (Marshall 1978, 125) and more recently deeply unfashionable and in the decline stage of its theoretical cycle (Berry 1992) but remaining worthy of retention as a valuable element within urban planning (Rodrigue 1975).

Central to the theory is the concept of the 'threshold' which is the minimum population that is required to support the provision of certain goods or services and the 'range' of goods or services, which is the maximum distance consumers will travel to purchase these. Demand for any particular good declines in relation to the distance, and beyond a certain point demand drops to zero. By utilising 'threshold' and 'range', the lower and upper limits of goods or services can be found. It is therefore possible to see how central places can be logically arranged in an imaginary area. As settlements increase in size, they increase their number of functions and share of higher order services (refer to Figures 76 and 77).
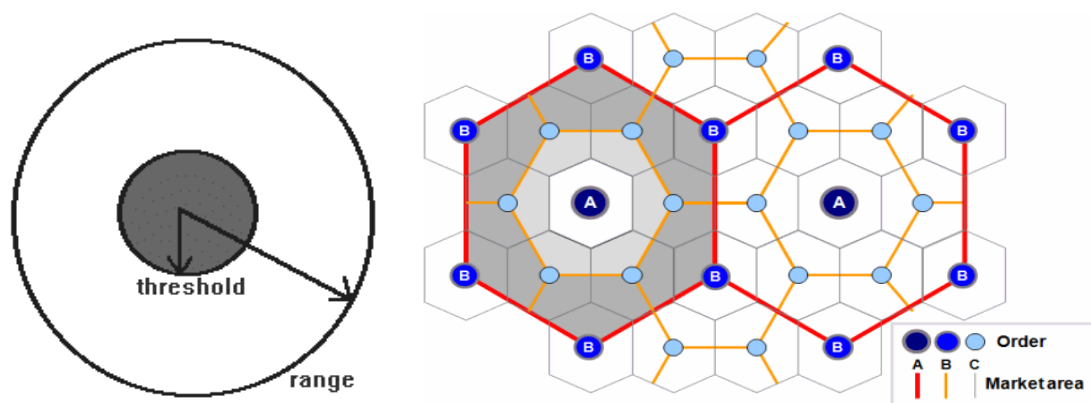
Figures 76 and 77: Graphical representation of CPT's sphere of influence and representation as a 'lattice' structure (Beavon 1977; McLaughlin 2009).

The 'sphere of influence' refers to the surrounding area under influence of the central place, while 'threshold population' refers to the number of people required to sustainably maintain a given good or service. If the threshold population falls or technological advancements are introduced, the economic viability of a central place declines. There is a clear relationship between the selection of goods and services available within each area and the surrounding population catchment. Businesses selling high order items cannot survive in sparsely populated areas and as a result they often locate in large population centres (Beavon 1977).

8.1.2. Perspectives on Central Place Theory

Several scholars have provided perspectives on Central Place Theory, positing variations and applying the theory to more recent conditions. Between 1957 and 1966 Berry and Garrison attempted to empirically verify the theory leading to the more general theory of tertiary activity. Berry and Garrison consider that Central Place Theory is more applicable to intra-urban (i.e. comparing Armadale to Midland) than to inter-urban central place systems (i.e. retail hierarchy within the City of Armadale) and that each order or class of town possesses discrete central activities, characterised by a specific population size (Beavon 1977). Towns with more complex sets of activities will possess all the central activities of lower orders plus a group of central activities that will distinguish them from lower order places (Berry and Garrison 1958, cited in Beavon 1977). It therefore follows from the theory that the periphery is less well serviced than the core region.

Berry (1992) differentiated a set of central places into hierarchical orders on the basis of either the number of central activities or people in each town. In a study of Snohomish County, Washington, he ranked thirty three central places into 52 categories of central activity with respect to population size and number of activities. Berry also suggests that the four tier hierarchy of rural central places: village, town, city and regional capital is paralleled by a four level hierarchy comprising street corner convenience cluster, neighbourhood shopping centre, community shopping centre and regional shopping centre.

(Highest)	Central Business District	Eighth
	Large Regional Centre	Seventh
	Medium Regional Centre	Sixth
	Small Regional Centre	Fifth
	Large Neighbourhood Centre	Fourth
	Medium Neighbourhood Centre	Third
	Small Neighbourhood Centre	Second
(Lowest)	Corner Retail	First

Table 8: Berry's retail hierarchy, broadly applicable to the study area (McLaughlin 2009).

Berry classified retail centres into the above eight hierarchical classifications from central business district to corner retail and used Reilly's law of retail gravitation to explain the breaking points of intra-urban market areas (refer to Table 8). The model explains the effect of greater distance on the 'pull' of a central place, or its ability to attract demand for a good at that particular location as well as defining the distance from a central place to the 'break point' (McLaughlin 2009). In the following section, this study will examine how this 'pull' impacts not only consumers within a retail context, but how higher density redevelopment is attracted to higher order central places. Trubka (2011) supports this idea, considering that Central Place Theory can explain how retail centres shape the agglomeration or attraction of settlements close to such centres.

8.1.3. Central Place Theory: application to Perth and Armadale

Strategies for Perth and Peel have referenced Central Place Theory since the *Stephenson and Hepburn Report* (1955). The *Corridor Plan* (1970) explicitly sought the creation of efficient central places. *Network City* (2004) sought higher density development around 120 activity centres linked by activity corridors which could be regarded as fulfilling the role of central places. Generally State and local planning lexicon no longer refers to 'central places', but rather 'activity centres', which fits comfortably within the traditional definition of central places, defined as: 'locations where a range of activities are encouraged: employment, retail, living, entertainment, higher education, high level or specialised medical services and just a few such activities' (WAPC 2004, 14).

WAPC State Planning Policy 4.2 Activity Centres for Perth and Peel (2010), defines activity centres as community focal points, 'which include activities such as commercial, retail, higher density housing, entertainment, tourism, civic, community, higher education and medical services. Activity centres vary in size and should be well serviced by public transport' (WAPC 2010, 4139). Armadale is classified as a 'Strategic Metropolitan Centre' (major central place) under the WAPC *Activity Centres* policy and Kelmscott is classified as a 'District Centre', reflecting less centrality than Armadale.

Within Armadale the four-tier retail hierarchy comprising *street corner convenience cluster*, *neighbourhood shopping centre*, *community shopping centre* and *regional shopping centre* is identifiable and Armadale includes a significant central business district within the Jull Street precinct, originally planned for under the 1955 *Stephenson and Hepburn Report*.

McLaughlin's Cincinnati based study (2009) found that Central Place Theory could not perfectly explain the arrangement of retail centres for three main reasons. Firstly, the metropolitan area is not a homogenous theoretical region and as such, centres are spread unevenly.

Secondly, the existence of 'big box' shopping facilities drastically changes the nature, scale and locality of other centres and thirdly, accessibility is not uniformly easy in all directions, instead being affected by natural features and access to major highways. Despite this, McLaughlin found that some uneven hexagonal grouping was observable and Central Place Theory was still partially valid in an urban setting. However the complete and seamless arrangement of equal area hexagons as outlined by Christaller and tested by McLaughlin is not evident within the study area.

McLaughlin found that 'big box' large shopping malls act as high order central places due to the variety of services offered in one centre. The effect of such 'mega centres' is that consumers can visit one location for all of the goods they require and smaller centres are overlooked and may fail due to the enormous thresholds possessed. Accessibility near major highways contributes to the success of centres and remoteness from major transport routes hampers success (McLaughlin 2009). This finding is applicable to Armadale as all major centres classified as (1) or (2) in this study are located adjacent to Albany Highway and South-Western Highway which are classified as 'State Roads' or Primary Regional Roads (PRR) in the Main Roads WA hierarchy. The lowest order centre surveyed, Townley Street Mini Mart (4), is located on a low volume local access street and easily passed over by residents (refer to Figure 78).
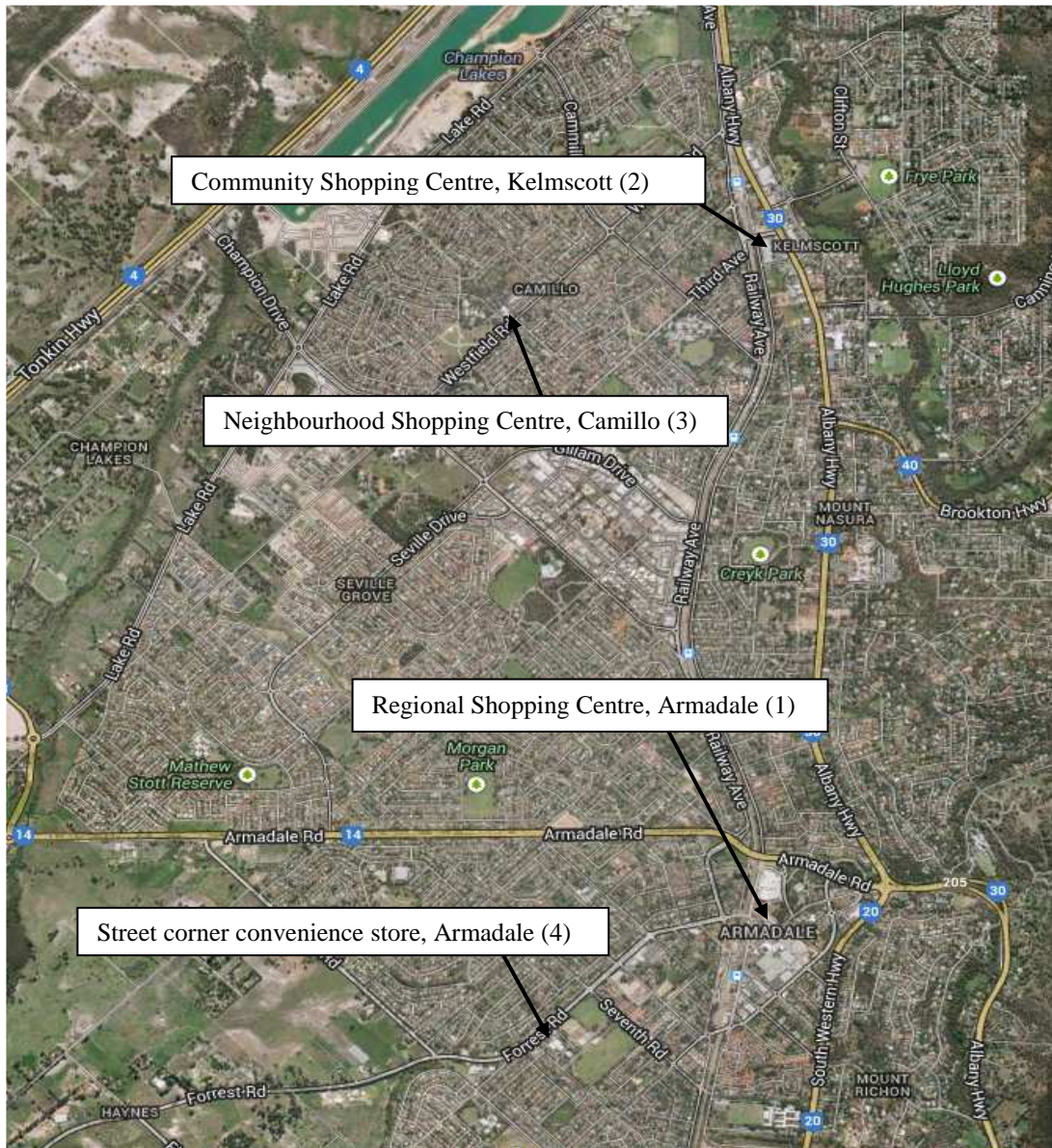
Figure 78: Although retail centres are arranged hierarchically in Armadale, their spatial arrangement is irregular and cannot be considered to conform to the classical 'lattice' structure (Google Maps 2014).

McLaughlin's findings (2009) revealed that Central Place Theory is more valid in rural areas and has declined in explanatory power in recent years due to a combination of transit speeds and technology. Central Place Theory remains a useful explanatory tool to some extent, but requires numerous qualifications and is not considered sufficient in isolation in accounting for the agglomeration of settlements and central places in a changing, modern world. The emergence of newer and larger forms of retail including the form and functional composition of metropolitan shopping centres challenges the traditional theory.

Many modern cities contain substantive, essentially non-hierarchical commercial concentrations including automobile sales rows, inner city arterial retail, bright lights areas, furniture retailing districts, ethnically oriented areas and ribbon developments (Beavon 1977). A number of these retail concentrations are evident within the study area, particularly the concentration of commercial ribbon development along Railway Avenue in Armadale which has tended to follow the rail alignment. Despite a number of exceptions, it can be considered that Armadale's retail facilities are arranged in a clear hierarchy and there are clearly defined areas offering goods of higher and lower scales of specialisation arranged by differences of size and scale.

Central Place Theory considers that areas with substantial scale economies (e.g. stock exchanges or symphony orchestras) will only be found in a few places, while areas with low scale economies (e.g. petrol stations or convenience stores) will be found in many places. Moreover, large cities tend to have a wide range of goods, while small cities only provide goods with low scale economies (Hsu 2008). This has broad applicability to Armadale with lower order goods and services predominant and located conveniently within the suburbs. While Armadale has at present no university campus or symphony orchestra (higher order), it contains many lower order fast food outlets including: Domino's Pizza, Red Rooster, Hungry Jacks, McDonalds, KFC, Subway, Chicken Treat and Donut King (True Local 2014). Armadale also possesses a lesser number of specialist gift stores, music shops and bicycle shops (higher order).

8.1.4. Critique of Central Place Theory

As a model of regional spatial structure, Central Place Theory has been the subject of numerous criticisms due to real world variations of urban morphology, contrasting modes of available transport and inequities in household income, ethnicity, and socio-economic status. Several scholars have contradicted the theory's basic hierarchical rules, partly because the theory relates only to the service sector and partly because settlements may develop due to other factors (Rodrigue 1975; Smith 1977). Christaller's model holds these factors as constant, assuming an even plain and a uniform distribution of natural resources.

Central Place Theory posits a flat countryside so no barriers impede consumer movements. In contrast, Armadale is located adjacent to a hills district which has hampered accessibility and prevented urban development, for example. Central Place Theory has also been critiqued on the basis of its 'inherent lack of dynamism and inability to accommodate the dramatic structural and organisational changes that have characterised modern retailing' (Brown 1995, 71).

Several scholars consider that Central Place Theory cannot provide an all-inclusive general theory and there remains a need to introduce further theories to explain the attraction of people and agglomerations of settlements (McLaughlin 2009; Trubka, 2011). A uniform distribution of population rarely occurs in practice since factors such as soil fertility and climate vary between places. Domination of large centres may create a shadow effect discouraging the growth of smaller centres, a phenomenon observed throughout the study area.

Central Place Theory is considered by Berry (1992) to be a purely deductive theory of a highly simplified and abstract nature developed on the basis of idealised assumptions. It relates only to the service element of regional structure, failing to explain distortions in the hierarchy caused by the location of primary and manufacturing industry, which tends to group into cluster or agglomerations due to location of transportation and resources. The theory is essentially static, explaining the existence of a regional spatial structure but fails to explain how that structure has evolved and it might change in the future. It assumes that consumers possess equal purchasing power, only one type of transport exists (with equivalent transport costs) and the model is equally applicable within sparsely and densely populated areas.

Trubka (2011) considers that Central Place Theory serves more as a description rather than an explanation of an efficient spatial economic structure. Rose (1968, cited in Dick 1973) has challenged a number of widely held tenets of Central Place Theory including the concepts of size regularity, the ordered dependence of both rural and central place residents upon successively higher order centres and the geometrically regular patterns of location of central places of different status in relation to the spheres of influence.

8.1.5. Consumer behaviour and Central Place Theory

Christaller believed consumers would always purchase goods from the closest place that offered that good and if demand was to drop, so too would its availability. Berry (1992) saw such ideas as highly simplistic without empirical observation, which would not apply to real world settlements. Christaller's positivist view that consumers are rational, utility maximising decision makers and that economic activity takes place in a freely competitive equilibrium seeking context was also questioned by Berry (1992). Christaller assumed travel to be uniformly priced and equally possible in all directions (not the case with Armadale's physical barriers), consumers patronised the nearest centre that purveyed the goods and services required and a separate, single shopping trip was made for each individual item.

Rodrigue (1975) considers that the layout of centres never conforms exactly to the theory's predictions. Numerous factors affect the spacing and functions of centres such as age, purchasing power, and urban density affect the spacing of centres and their hierarchical arrangements. Sufficient densities will allow, for example, 'a grocery store, a lower order function, to survive in an isolated location' (1975, 1). Consumers of higher economic status tend to be more mobile and have potential to bypass centres providing only lower order goods according to Rodrigue (1975).

Despite any perceived shortfalls, most urban scholars consider that Central Place Theory has served a useful role in identifying important concepts such as the interdependence of a city and region, the basic hierarchy of functions and centres, and market range and threshold populations (Beavon 1977; Brown 1995). It also successfully explains the spatial pattern of urbanisation positing a systematic arrangement of the classes of an object (economic centres, large and small) and adequately explains the location of various industries, of trade and of service activity.

Brown (1995) considers that the theory has been critiqued on the basis that it has been unable to accommodate the processes of commercial change and is based on assumptions rather than empirical observation. Central Place Theory 'describes a spatial pattern of retail activity that ought to occur, given the underlying assumptions, not one that necessarily does. That said, the model is by no means divorced from reality, on the contrary, it has spawned innumerable empirical

investigations, the results of which were mixed but – depending on which commentator one consults – broadly supportive of the hypothesised patterns of activity' (Brown 1995, 69).
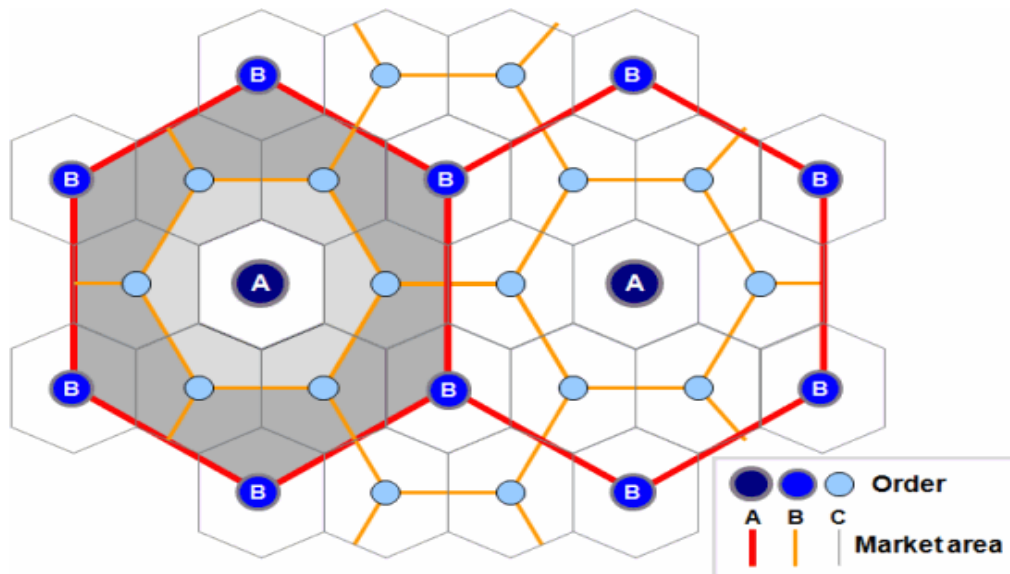
Figure 79: Central Place Theory (McLaughlin 2009)

Christaller's original formula for the importance of a given central place is as follows: $CP = D [(2a) + 1-(1/2b)+(1c)+(1/2d)]$

Where: D = the population density and a,b,c, and d are the areas of each ring and the numbers for the amount of goods consumed per capita in each ring respectively. By utilising this methodology, each central place can be ranked in order of significance (refer to Figure 79).

Christaller classified centres by using the number of telephones in an area as the determining factor of centrality however McLaughlin (2009) argues that any number of criteria can be used, such as the number of specialist stores, traffic volumes or the floor area of centres. The first step towards a diagnosis of the hierarchy of retail centres is to select the criteria that reflect variations in the centrality of places as accurately as possible (Dick 1973).

McLaughlin (2009) suggests that modern criteria for determining centrality can include: square metres of commercial floor space, number of employees, number of jobs per centre or number of individual retailers. Retail trade can be organised in a hierarchy using these threshold sizes and then finding the lowest common service to define the level or hierarchy. Clark (2013) sets out a retail hierarchy that classifies and ranks precincts based on the carrying capacity of stores.

Variables identified by Dick (1973) for the purpose of comparing the relative centrality of places include the following:

- Traffic volume to the central place;
- Number of key transport routes which radiate from the central place;
- Population size around each centre;
- Size of the workforce employed within the central place;
- The strength of interurban bonds of service dependence;
- Telephone (internet) traffic or availability;
- Presence or absence of ranked facilities (post office, courtroom, higher and lower status retailers).

The above methodology can be applied to Armadale to identify the following: complete shopping tier, partial shopping market tier, full convenience tier and minimum convenience tier.

Within this study, *order of goods available* by centre and *size of land parcels* have been utilised to provide a determining point of differentiation (refer to Figures 80 – 83 below, all images by Author, 2014):

Regional Shopping Centre, Armadale

Community Shopping Centre, Kelmscott Plaza

Neighbourhood Shopping Centre, Camillo

Street corner convenience store, Armadale

1) <u>Regional Shopping Centre</u> (Coles, Woolworths, Hoyts Cinemas, EB Games, library, pet store, Big W, K-Mart, Dick Smith, surf shop, jewellers, bank).
2) <u>Community Shopping Centre</u> (Coles, Woolworths, music shop, gift shop).
3) <u>Neighbourhood Shopping Centre</u> (IGA, hairdresser, newsagent, fish and chips).
4) <u>Street corner convenience store</u> (delicatessen, daily needs).

While Armadale's retail services can be ranked any number of the above methods, for the purposes of this study, total land area (gross retail floor area, plus car parking areas and landscaping) provides the strongest indicator of centrality. Specialisation of retail facilities also reflects this hierarchical arrangement as shown below:

Ranking	Name	Lot size	Retail facilities
Tier 1 Major Regional Attractor	Armadale Shopping City	3.49 hectares of land area or 34,988m^2	Coles, Woolworths, Progressive IGA, numerous jewelry stores, surf shop, post office, Dick Smith, Coles, EB games store, beauty salon, hair salon, travel agent, candle shop, K-Mart, numerous cafes, several menswear stores, several mobile phone outlets, Target Department Store and a pharmacy (Higher order goods).
Tier 2 Community Shopping Centre	Stargate Kelmscott	1.74 hectares or 17,443m^2	Woolworths supermarket, pharmacy, butcher, cafe and several fast food outlets e.g. Subway.
Tier 3 Neighbour-hood Shopping Centre	IGA Westfield	1.95 hectares of land or 19,551m^2	Newsagent, fish and chip shop, hairdresser, bakery and second hand clothing charity outlet store.
Tier 4 Street corner convenience store	Townley Street Mini Mart, Armadale	1120m^2	Daily needs: milk, bread, soft drinks, confectionary, ice creams and toiletries in a single, relatively compact retail centre. (Lower order goods).

Table 9: Hierarchy of retail central places observed within the study area

8.2. Results of semi-structured interviews

The following section presents the results of semi-structured interviews with resource persons selected for the purposes of this study. It seeks to determine the state of planning in terms of practice, rather than relying on theoretical approaches exclusively. It includes those responsible for preparing and implementing State planning documents, those working within statutory planning and those employed within the land development industry. Interviews were undertaken and as discussions ensued, respondents were free to raise ideas related to planning in Perth and Armadale.

The structure of the questions followed a thematic sequence commencing with Armadale's role within successive planning strategies and followed with a diversity of topics such as: density controls, infill targets, urban design, public transport, the standard of higher density development in Perth and similar key issues broadly related to the topic.

In total 30 urban planners were interviewed from State government, private practice, academia and local government. Resource persons have been identified as P1 – P30 to maintain anonymity and during the course of the study a number of individuals changed employment and position title. The interviews gathered comprise a significant part of the study's primary data and were developed and undertaken in the later stages of this project. Interviews were conducted throughout 2014 and an informal *pilot study* was undertaken prior to the recorded interviews being conducted in order to ensure that questions were delivered appropriately and would elicit the necessary depth of responses (refer to Pilot Study transcript at Appendix D).

Quotes have been included where a particular view aptly summed up the majority of responses on a given issue, contributed to the debate, pushed it in a new direction or demonstrated an interesting or relevant point. Resource persons generally supported urban densification and mixed-use development, in accordance with sustainable development and New Urbanism. Although several respondents extolled 'business as usual', arguing the merits of low density suburbia, extending the views of scholars such as Kotkin (2006) and O'Toole (2007), this view was outweighed considerably by the greater number of respondents who held the opposing view. Justification provided by respondents to higher density redevelopment echoed modern planning strategies and included the need to manage elements such as: commuter transit times, the impact of climate change, housing affordability, traffic congestion and the high cost of infrastructure provision in greenfield areas.

Interviews commenced with a description of the purpose of the study, which was described in relation to Armadale. Background was provided regarding the introduction of *Town Planning Scheme No. 4*.

Several planners provided a surprisingly detailed knowledge of Armadale, with some having worked at the City in a planning capacity. Others had experience in managing projects within the City as a State government planner or indirectly, for example as a consultant seeking planning approvals. The following section describes and summarises responses by resource persons to the following questions. Refer to Appendix C: Information Sheet for further information.

1.   How would you describe Armadale's progression and development since 1955 to the present, economically, socially and environmentally? How would you compare this with other centres such as Midland?

Despite its progress over time, Armadale was generally characterised as a locality suffering social disadvantage with the majority of resource persons describing it in terms such as 'despised', 'maligned', 'possessing the branding of a poorer socio-economic area', 'having regressed' and 'socially disadvantaged'. This was in part attributed to the historical role of the State Housing Authority in contributing to social disadvantage, a view supported by Alexander, Greive and Hedgcock (2011).

P2 characterised Armadale as a former agricultural community which had worsened over time. The State Housing Commission, now Department of Housing (which has historically provided housing assistance to those on low incomes in W.A.) accommodated residents with no history or connection to the area who did not share the same values as the existing residents.

These people 'became stuck out in the middle of nowhere with nothing to do, and there consequently remains a high level of substance dependency in Armadale'. P2 also considered that local business owners are reluctant to open their shops on Sundays 'due to the risk of robberies that many of them have experienced'. This view was generally supported by other resource persons who characterised Armadale an impoverished, undesirable locality with social issues relating to domestic abuse and community violence.

P21 considered that Armadale has struggled to move beyond its rural identity: 'Other centres like Midland and Joondalup have become more urbanised and have grown economically with hospitals, offices, major shopping centres and have also become more gentrified'. P25 cited the police academy, university and major hospital in Joondalup as major regional facilities which Armadale has failed to attract. P26 considered that Armadale remains an area possessing high bushfire risk, accommodating residents with fewer qualifications and lesser discretionary spending power. P30 considered that Armadale was divided into undesirable residential precincts including 'the weatherboard precinct, the State Housing precinct and the crime precinct'.

According to several resource persons, the future success of Armadale is dependent on how well it is able to reinvent itself (P2, P3, P15, P24, P25, P29). *Town Planning Scheme 4* is considered one component in a multi-purpose initiative to improve the social issues which remain within the City as it is designed to facilitate the replacement of poor quality housing stock. P2 further considered that 'the Council is on the right track in this regard' but stated that redevelopment in peri-urban areas like Armadale and Midland is often poorly executed, comprising 'villas', single storey, cheaply constructed housing undertaken principally for short-term profit.

2.   To what extent do you agree with the author's summary of the emphasis of each plan? What theories in your view have influenced these strategies and what legacy has been left by each plan?

The discussion then progressed towards Perth's overarching strategic plans regarding their impact and legacy over time. A summary was provided of each and plans were presented: The *Stephenson and Hepburn Report* advocated a compact city model, The *Corridor Plan* a dispersed approach along transport lines, *Metroplan* represented a turning point: the first of Perth's strategies advocating urban infill and redevelopment, *Network City* provided a 'harder' infill approach and *Directions 2031 and Beyond* a reduced or 'softer' infill approach.

Resource persons were asked to indicate if they agreed with the summary of each overarching plan and comment on the impacts or legacy left by each. P22 stated that 'each summary seems to sum up each plan correctly' and this view was typical of responses. Overall the *Corridor Plan* was the most maligned plan, promoting sprawling development and representing the greatest failing in all of Perth's strategic plans. This view is supported within the planning literature, most notably by Hedgcock and Yiftachel (1992).

One resource person (P3) considered that the failure of the *Corridor Plan* was due to the corridors being planned to connect to new centres 'but the centres didn't grow, so the whole plan fell over'. In P3's view, peri-urban centres should have developed first 'around a resource or need' which would have allowed centres such as Armadale to flourish.

The 1970 plan was considered to have underestimated the scale of distances in WA as the 'transport arteries don't actually go anywhere' (P3). A reason provided by P4 for the failure of the *Corridor Plan* was that it facilitated lot sizes which were too large: 'although touted as providing self-contained communities, the reality is that it continued to feed the population's desire for the low density, detached model offered by the great Australian dream, and did so for the next two decades'. P27 considered that the removal of trams in 1958 in Perth was a poor planning outcome, leading to car dependency, which the *Corridor Plan* further encouraged. P30 cited the *Corridor Plan's* 'poor execution and implementation'.

The current strategic plan for Perth, *Directions 2031 and Beyond* was also considered by resource persons. The strategy was frequently criticised, with P3 referring to it as a 'nothing document' with no forward plan to implement its recommendations: 'All we are doing is rolling out the green carpet to developers 40km and 50km from the central business district. Infill targets are far too low, far too conservative and quite pathetic in fact. If we do not meet the 50% infill target we are going to be in trouble'.

Directions 2031 and Beyond was generally seen as contributing to sprawl, adding to congestion and infrastructure costs, particularly with respect to roads. It was also considered that planning decision makers often 'do not realise the various costs of sprawl and there is a cost to the community' (P3) which is often not taken into account when overarching strategic plans are prepared.

Newly created communities guided by the 2010 strategy were described by P9 as 'deserted and lifeless', lacking community vibrancy. *Directions 2031 and Beyond* was considered 'an utter and serious failure', with too few growth areas and those identified located too far away from transport nodes including train stations. Cockburn Central was cited in this regard: 'The higher density development is a failure, you cannot walk to the train station or the Gateway Shopping Centre from there. You should not locate higher density development in areas where there is no amenity' (P9).

P19 considered that *Directions 2031 and Beyond* is likely to placate residents and avoid community opposition as its proposed changes do not represent a radical departure from the 'business as usual' low density housing model. It was considered that *Directions 2031 and Beyond* reflects a fear of community opposition and implies the need for the planning system to better manage concerns by engaging with the community early for input.

The existing low density model was not considered the best housing model into the future by over 75% of resource persons and requires innovation, revision and rethinking as Perth's existing suburbs remain highly car dependent: 'Without higher density development, sustainability goals will not be realised and business as usual will be the result' (P19). According to P13 and P14, *Directions 2031 and Beyond* reflects a fear of change and is entirely unsuitable for Perth for the next 20 years. P14 considered that with a change in political leadership, a new strategy would be 'rolled out', and considered that densification should be 'ramped up' in subsequent state strategies, rather than adhering to the current incremental approach to densification.

Other resource persons considered that *Directions 2031 and Beyond* represents a 'lost opportunity', totally lacking in vision. One respondent pointing to the large amount of vacant apartments in Perth responded that 'if this was Europe, they would all be full of residents', with the qualifying statement that the European and English housing models work more successfully as they emphasise inner-city high density living, considered a more sustainable model (P8).

In respect to the theoretical component of Question 2, resource persons did not provide a great deal of feedback regarding various approaches and preferred to elaborate on more 'concrete' topics. One resource person was unaware of the differences between modernity and postmodernism, however once this was expanded upon, expressed the view that modernity provides significant societal benefits such as avoiding extreme wealth inequity and benefits communities by 'spreading the wealth around' (P7). P7 also saw the benefit of a single unitary master plan, expressing the view that plans are best administered by a central authority in order to provide much needed leadership within the planning system, an approach reflecting a modernist approach.

3.   In your view, what has been the role envisaged for Armadale within each successive plan?

It was considered that Armadale functioned primarily as an agricultural centre (including 'staging post') prior to 1955, and its urban function expanded over time, reflected within various plans (P6, P13, P17, P21, P30). Armadale historically accommodated large reserves of affordable land, possessing a high presence of public housing as well as accommodating other lower socio-economic groups.

It was also acknowledged by resource persons that Armadale's role has shifted over time, that its manufacturing role has diminished and higher quality residential estates and new areas of light industrial land have provided an overall improvement to the locality. New State and local planning initiatives such as the *Economic and Employment Lands Strategy* (2012) and *Town Planning Scheme No. 4* (2005) were cited as contributing to this improvement.

Armadale's status as a peri-urban settlement was challenged by two resource persons (P1, P19) throughout the interview process, supporting the view that its function has changed over time. An analysis of various iterations of the *Metropolitan Region Scheme* shows the southern boundary moving increasingly south of Armadale over the last five decades which supports this view (WAPC 2014). Armadale was viewed as no longer a 'fringe' area due to suburbia having crept beyond it and generally other areas such as Byford and Mundijong were now considered true fringe or peri-urban areas.

One resource person saw Armadale's poor reputation as unjustified and recent improvements 'not acknowledged by many people' (P12). P12 considered that traditional development has shifted and higher socio-economic groups have sought to reside in newer areas such as Harrisdale, or have 'leapfrogged to the newer estates of Serpentine-Jarrahdale'. In P12's view, *Town Planning Scheme No. 4's* attempts to renew existing areas is therefore unlikely to be successful as there is now an abundance of new estates surrounding Armadale and little demand for a retro-fitted suburbia: 'There is too much new housing in the area to bother with living behind a house in Armadale in the decaying areas. The City has raised the density code and people aren't buying because they prefer the more exclusive areas around the fringe'.

P1 observed that traditionally, the further from Perth's centre, the cheaper the land, and as such lower socio-economic groups would amass. As each successive region would grow, the previous 'fringe' area would appear to improve 'as it was no longer fringe, and wasn't as far out or disadvantaged as the new areas'. New high quality master planned estates being market-driven, provide quality public open space and minimum standards of development which attract a more affluent buyer. Byford was cited as part of this new type of managed growth, with higher costs and estate covenants, however it was considered that Armadale has not been able to successfully move beyond its disadvantaged tag: 'That stigma will last, rather than evolving over time like it would have traditionally. Armadale is historically disadvantaged and will always remain so' (P1).

P22 considered that Armadale has always been seen as 'a bit of a back corner that has been left alone' or ignored within past strategic plans for Perth, while P25 considered that attempts to create Armadale as a major regional centre have not succeeded due to an absence of 'anchor businesses' and lack of attention from successive State governments.

It was considered difficult for stigmatised areas to be successfully renewed as a result of the redevelopment process, particularly if ageing dwellings are retained according to P1 and P12. Despite planning's best attempts, there are limitations to the extent to which disadvantaged areas such as Armadale can be transformed via the planning process. P29 agreed with this view stating that following World War 2, Armadale offered heavily discounted land in order to attract residents. Despite such historical attempts however, it 'will never rise above its current stigma as a low socio-economic area reflecting poor urban design outcomes'. Overall Armadale was described as 'a major centre', 'a suburban town centre', 'the focal point of the south-east sub-region' and 'gateway to the south-west, greater southern and lower foothills' by several resource persons (P2, P7, P11, P30).

4.   To what extent has Armadale achieved various targets / visions of these strategic and statutory plans against what was forecasted for the area?

The recent performance of *Town Planning Scheme No. 4* was succinctly summarised by P16 who considered that poor 'battleaxe' retention scenarios represented only a small proportion of redevelopment in the locality. The local authority 'only receives about 50 battleaxe rear strata subdivision proposals per year now and most proposed development is now higher quality new units, because developers realise they can get an extra unit if they demolish the existing house due to the density bonus'.

P16 considered greater development guidance and zoning information on the City's website since 2005 has led to developers finally coming to terms with requirements and meeting Council's aim of improved streetscapes in return for a density bonus:

'We struggled in the first few years of implementing the new planning scheme. We are now seeing a lot more new dwellings addressing the street, people building double garages and overall development outcomes are better. During the global financial crisis we were very quiet here with few proposals, but development applications are picking up now because the market seems to be improving'.

While *Town Planning Scheme No. 4* had enabled the City to meet various State density targets, much of the land surrounding new growth areas in Armadale is severely constrained 'and I do not think this is fully appreciated by most people' (P16). This view is supported by Taylor and Burrell's 1980 study which identified several major development constraints surrounding Armadale. At this time major developers including various State government agencies were beginning to identify areas for future development.

The view that *Town Planning Scheme No. 4* had succeeded in its aim of replenishing its housing stock was refuted by several resource persons. P15 considered that the general concept of single storey dwellings at R30 and R40 (on lots of approximately $220m^2 – 300m^2$ lots) was very poor: 'The overall outside appearance of these homes in Armadale might look appealing, but when you look at the internal floor plan there are still corners cut. Nice render doesn't translate to liveability with second and third bedrooms not much bigger than a storeroom and shower doors that can't open properly because the toilet is in the way. It reflects poor design'.

Housing design was an element considered as critically important with other resource persons considering that strict controls such as those favoured by various local authorities in Perth result in a higher quality of development. According to several resource persons, there remains an absence of strong design controls at both a State and local government level which need to be addressed in order to improve local planning outcomes. Historically Armadale has accommodated a poor standard of housing and unless design controls are improved, the locality will continue to perpetuate poor redevelopment outcomes.

P12 cited the locational disadvantage experienced by commuters who live in areas such as Armadale, stating that 'these far flung peri-urban areas remain horrible places to live and if fuel rises to $3.00 per litre then the poor first homebuyers who live there are stuck and will suffer most'. This view is supported by the VAMPIRE index, developed by Dodson and Sipe (Vulnerability Assessment for Mortgage, Petroleum, and Inflation Risks and Expenditure 2008). P12 considered that the planning system should address 'some of the nastier elements of sprawl in Perth because the development industry will keep lodging structure plans for land east of Byford, east of Mundijong, east of wherever'.

It is the predominance of low coded lots throughout Perth and Peel which strategies such as *Directions 2031 and Beyond* should address, according to P12. The media was also considered complicit, regularly running stories about densification which are unjustifiably negative: 'Denser living can be good in some ways. With people residing at closer quarters comes a vibrancy that can create an interesting place to be, and in some ways, a level of safety not offered in the suburbs. If there are always people walking about on the streets, even late at night, there is often a feeling of safety in numbers. Businesses can be also quick to respond to opportunities, opening new shops, eateries and services' (P12).

5.   What is your view of the blanket and targeted upcoding of existing greyfield areas that forms a major component of recent strategies in relation to Armadale and Perth generally?

P18 expressed the view that the benefits of selective or targeted upcoding are relatively 'undemocratic', with fewer benefiting compared with a blanket recoding exercise, in which all landowners are provided with equal opportunity to redevelop in a similar manner to that permitted under *Town Planning Scheme No. 4*. P20 critiqued all of Perth's strategic plans, including *Directions 2031 and Beyond* for a lack of prescriptive detail, particularly in terms of density codings allocated to land. Urban infill targets by councils were considered too easily met and therefore unambitious.

Responses from those working on the implementation of the strategy revealed that meetings had been undertaken with metropolitan councils to meet various densification targets and significant changes reflecting a higher density model could be best implemented by State government. According to this view councils such as the City of Armadale are reluctant to recode land beyond R25, however higher codings may be more appropriate, particularly close to services and infrastructure.

A number of resource persons including P6, P13, P14 and P25 considered that minor increases in densification from R15 to R25 are too conservative. Incremental densification allows the 'wrong kind of density' and often comprises a maligned battleaxe single storey grouped strata arrangement. It was considered that an improved scenario would be the introduction of higher residential codings such as R100 with 3 or 4 contiguous lots amalgamated to facilitate a large development comprising townhouses and/or multiple dwellings. Overall this was considered a superior approach compared with incremental piecemeal densification, which was seen as generally maintaining the low density business-as-usual housing model resulting in marginal and undesirable densification.

Mixed-use development was advocated by over half of resource persons as promoted within *Directions 2031 and Beyond*. P6 expressed the view that local authorities should support a degree of upcoding: '20% of any area close to services could comprise density higher than R40 then another 10% can be R80 and a higher proportion of R25 and R30 development could lead to genuine housing diversity and mixed use development, largely absent in Perth'. P11 advocated for higher densities around transport nodes and lower densities away from such services. A weakness identified with blanket recoding was the associated isolation from transport and services as 'people stuck out in the middle of nowhere can be subdividing. Maybe we should be keeping those lots large' (P11).

Overall it was considered that there is a lack of consistency in the manner in which density increases are undertaken by local governments and the process appears to be *ad hoc*. For example, Armadale has recently experienced higher density codings while several areas closer to Perth's centre have not yet undergone such revisions. Other resource persons described infill as potentially beneficial if considered with provision of public transport and mixed use development.

6.   Do you consider that development controls provided by planning instruments such as local planning schemes and the Residential Design Codes (2013) are sufficient in leading to positive planning outcomes or is greater control necessary?

Observation conducted prior to this study revealed many poor redevelopment examples within the subject area. These were attributed to an absence of local planning controls and developer reluctance to improve housing stock through various means including brick paved driveways, new fencing and landscaping. Development controls provided by the *Residential Design Codes* or *R-Codes* alone were identified as 'weak' by most respondents (including P4, P5, P15, P16, P17, P20, P21).

This was not the only view represented however, and one resource person considered that the R-Codes alone 'provide the nuts and bolts for redevelopment, all that is needed is a few washers via local planning policies' (P29). According to the majority however, unfettered market forces do not provide positive planning outcomes in isolation. The *R-Codes* were critiqued by P17 for providing insufficient development controls which would lead to areas such as Armadale being more likely to retain their stigma and perpetuate social disadvantage. Overall the greater the development controls at the local government level, the higher quality the resulting urban renewal would be. This would then encourage home ownership, and therefore a better socioeconomic mix. P17 summarised the predominant view reflected by resource persons: 'I say it all the time – if you leave things up to the private industry, you are going to have problems'.

It was considered by two resource persons that urban infill redevelopment in its current form fails physically, technologically and environmentally, leading to a degraded urban and social landscape. Design controls administered by local authorities were an element considered as critically important in this regard (P3, P17). According to this view there remains a serious absence of strong housing design controls at both a State and local government level which should be addressed. Blanket recoding should not be undertaken by local authorities until design controls have been decided upon and related issues resolved to avoid poor 'battleaxe' redevelopment configurations.

P1 stated that the *R-Codes* and various WAPC publications do not advocate battleaxe subdivisions, and therefore the 'split down the middle approach is becoming the new approach'. P1 considered that a double garage cannot be constructed on a 10m wide lot 'without it dominating the streetscape'. In order to prevent such domination by garages and the associated 'tokenistic rooms which waste valuable space in tiny lots' local authorities are seeking to encourage single garages where possible: 'They can't make it carte blanche, though, so they are targeting areas near public transport. But I absolutely guarantee that people will only use this as a last resort, because resale value is the prime concern of every single client I've met, and they all want double garages'.

Another respondent, P8, provided the following comments in respect to 2013 changes to the *Residential Design Codes*, suggesting that all modifications reflect current thinking within planning towards more compact dwelling forms: 'I don't think the new *R-Codes* are focussing on Armadale and other peri-urban areas, the second half of the document concerns multiple dwellings in presumably inner areas or close to transport. If I was to sum up the new *R-Codes*, the overall emphasis is on creating a New Urbanist European type city. Every possible low density business-as-usual element has been tightened'. Another resource person stated that many plans have failed to follow requirements outlined within *Liveable Neighbourhoods,* resulting in negative planning outcomes.

7.   Do you think successive strategies' aims since 1955 of providing diversity within housing in Perth has been achieved?

The majority of resource persons did not directly address each strategy's role in providing housing diversity in Perth, however several assumed they contributed to the current low density housing form. P8 considered that very little is being done to address the bias towards low density dwellings encouraged by past strategies. Multiple units are not being constructed in large numbers in Perth: 'Perhaps 5% of all new construction, which represents a very low uptake by the industry. The diversity being touted since 1955 hasn't really occurred. The WAPC says detached dwellings in Perth amounts to 77% of all development, but within the south-east sub-region it is 91%. You may think that the days of the 4 x 2 (large dwellings) are over but I don't believe it'.

P23 was typical of responses when he stated that housing diversity has not been adequately achieved in Perth. He then extolled the benefits of apartment living: less housing maintenance, closer to services, no garden maintenance, stating that living in higher density environments is 'great' and something generally untried by most people. P30 stated that housing diversity has not been achieved in Perth and split codings in Armadale have produced 'identical little single-storey boxes, smaller lots with no trees and no shade, producing heat sinks and a monotonous sea of roofs'.

P 14 stated that the R25 coding is now the standard not only under *Town Planning Scheme No. 4* but also for most new subdivisions in greenfield areas throughout Perth. Developers and local planning authorities, as well as targets set under *Directions 2031 and Beyond* have encouraged the provision of smaller lots and this is evident within the City of Armadale as well as other local government areas. A number of other resource persons considered that the R25 coding offers only incremental densification which lacks appropriate impact, rather than 'transformative densification beyond R40' which would truly benefit communities through contributing to a diversity of housing stock.

Weller (2009) considers that when developers identify areas for high density living in Perth it is best to focus on areas that have high landscape and cultural amenity and which would, by becoming denser, augment and enhance that existing amenity. This view was broadly supported by several resource persons who viewed densification as a planning principle more suited to activity centres and activity corridors (central places), rather than to be applied in a blanket fashion.

Despite the inclusion of principles related to urban consolidation within many planning strategies, the trend towards owning large dwellings in outer suburbs remains strong in the Australian psyche (Weller, 2009). In respect to the low uptake of redevelopment in Armadale as a result of *Town Planning Scheme No. 4*, P19 considered that insufficient density was being proposed and meeting development criteria is difficult: 'At the end of the day, there are limited opportunities because R25 is just too low. If you went from an R10 to R20, then it allows one extra house. If you recode land from R15 to R160 then someone could buy 3 or 4 contiguous lots and put something really good in, resulting in desirable housing diversity'.

This view was supported by P25 who stated that incremental recoding 'will result in cheap, disadvantaged housing as R25 is not a high enough coding to make a sufficient impact on the locality'. Current patterns of land ownership and fragmentation prevent higher density redevelopment, however such an approach was considered superior in terms of potential development outcomes. P14 agreed that Perth requires significant increases in density: 'We have enough land that is developed, we have enough greenfield land. We should retain the areas which have character in Perth: e.g. Cottesloe, although they can become enclaves for the rich, whether we like it or not'.

P14 also considered that areas such as Melville, East Fremantle and Kalamunda have a particular character 'but then there are entire suburbs where housing stock is old and reaching its replacement date. So if we are going to knock down houses in inner suburbs we shouldn't be replacing with a single house. If we are going to do high density is it needs to be high-value density. Low value higher density can bring in undesirable elements. We need to consider design to encourage a form of density that

can be achieved while minimising overlooking and that retains social characteristics, to move away from community concerns'.

P14 also cited the demographic needs for smaller dwellings, 'in the same suburb but in areas with higher residential density. We should try to encourage people to have a range of housing choices in their neighbourhood, to stay there and migrate within the neighbourhood as their lifestyle changes'.

P13 considered that peri-urban areas should accommodate relatively affordable housing as 'nobody wants a $750,000 two-bedroom apartment in Armadale. It is great from a planning perspective, but rubbish from a housing one'. P19 considered that 'low density does work well, but obviously it does not work everywhere. Other forms of housing are just as acceptable, but willy-nilly high density within established areas is not appropriate'. P19 considered that the main challenge is convincing people that it is a better option – the planning system needs to attract people by providing higher quality examples: 'High density is unfortunately associated with bad neighbours, low cost, low amenity and high crime rates. At the end of the day it is all about sales pitch. We need to pick the best spots for high density. We need to provide high density that is high-value and high-amenity'.

8.   What are the likely rates of redevelopment when recoding occurs in peri-urban areas over time? What factors would influence these?

This question sought to identify what level of resident and developer activity would occur if low density peri-urban areas were re-coded in areas such as Armadale. Such thinking is at variance with historical planning within the locality that from the time of earliest plans prepared, encouraged large lots. Most resource persons considered that rates of redevelopment would be low for the first few years after the release of *Town Planning Scheme No.4*. Several factors such as distance from the centre of Perth, reluctance to embrace change as well as the rural history of the area would account for this.

P30 made an important distinction between owner-occupiers and investors in Armadale, stating that investors (considered to be 'tradesmen and farmers') would be most likely to redevelop land due to the desire for higher profitability and yields. In P30's opinion, owner-occupiers would be mostly content to live on larger original lots. P28 stated that most residents would not possess the capital to redevelop and would be content to live in their current dwelling. One resource person (P23) argued that community and resident ignorance of prevailing planning rules would prevent redevelopment from occurring.

The City has traditionally sought to promote a balance between urban and rural living and prides itself on 'city living, country feel' (a prominent sign located at the entrance to the City for many years) with large areas of natural bushland present which may also influence the trend away from densification. Despite this, the low uptake of redevelopment was considered an interim situation only with housing shortages inevitable when increased population occurs, which will provide a trigger for more widespread redevelopment in future, according to most resource persons.

Lower median land values within the City in comparison with suburbs located closer to Perth were cited as influencing outcomes as potential profits may not justify widespread redevelopment. P11 stated that there are inherent difficulties in applying findings from an outer sub-region and attempting to make recommendations for an inner area, as both are subject to unique economic drivers, including differing land values. It was suggested by several resource persons that landowners may also be unaware of redevelopment opportunities within the study area or unwilling to live within a 'battleaxe' arrangement, considered a poor design outcome.

P1 considered that the low level of redevelopment reflected within the study area is due to poor soil types and resulting prohibitive site costs: 'In general site costs are too high. Developers can't absorb the cost and make a profit. Banks agree and won't lend money for the project. It's about the market. Regardless of what density code the local authority slaps on an area, if there's no market for the resulting built form, developers won't build'.

Overall the Western Australian planning system was considered as suffering from a lack of vision and was described as 'risk averse' (P4). Approximately 75% of respondents supported large-scale change to Perth's low density suburban model with some noted exceptions where low density dwellings form an important part of the urban character and should be protected. Several resource persons cited NIMBYism ('Not in my backyard') as a barrier to redevelopment and disagreed with the associated resistance to higher density development which is dominant in Perth. Others argued that current practice related to public consultation is flawed, that the public should not prevent higher density development, that densification is important for the 'greater good', positive for affordability, rather than building '4 x 2 (dwellings) in places like Byford', seen as inappropriate for first home buyers and a poor outcome in respect to transit times and a lack of accessible public transport.

Resource persons generally argued that higher density developments could be constructed in more locations within the study area, rather than the business as usual model which seeks creation of single residential lots. This view is supported by Ellis (2002) who estimates that approximately 25% - 40% of market demand could be accommodated by higher density development which is a market sector currently not being met in Perth. Like Weller (2009), he cites NIMBYism, investment in freeways, obstructive zoning controls, the conservatism of financial institutions and developer reluctance as roadblocks to achieving this. Ellis believes that it is inevitable over time that these obstructions will be rolled back and urban infill's true potential will be revealed and more widely embraced by the market.

One resource person stated that redevelopment rates in peri-urban areas would be 'extremely fast' due to demand for housing and lack of affordable housing options (P18) however this view was not supported by the streetscape audit. P26 stated that redevelopment rates 'would be generally very high due to the excellent investment opportunities and increasing land values' within the locality, also unsupported by the streetscape audit. P25 stated that fear of change and 'upheaval' would mean that most residents would not redevelop and suggested that when the current landowner passes away, 'the children will take advantage of the potential for redevelopment'.

9.   What are your overall recommendations for Armadale for the future to improve its status and performance?

Overall recommendations for Armadale provided by resource persons are summarised below. If implemented these suggestions could contribute towards improving redevelopment standards in the City. It is considered that they are closely aligned to New Urbanist principles:

1. Remove all blanket densities in favour of a split-density system with more rigid requirements for gaining higher densities. This will remove the automatic 'development potential' component being added into the land price;
2. Include tighter policy requirements that make two-storey development mandatory with decreasing lot sizes;
3. Reduce verge areas in lieu of street parking bays, and increase median strips in the road reserves (traffic calming);
4. Utilise redevelopment authorities, such as the Metropolitan Redevelopment Authority and reduce piecemeal redevelopment;
5. Promote mixed use development which encourages greater use of public transport, provides a better social mix and regenerates inner urban areas through purposive planning.

These responses were compiled and later emailed to resource persons who were asked what they considered as the single most important consideration in improving Armadale's redevelopment standards. Overwhelmingly, introducing more rigid development requirements was considered most important, followed by utilising redevelopment authorities within the development process.

| What is the most important consideration in improving development standards within the City of Armadale? (study area) |
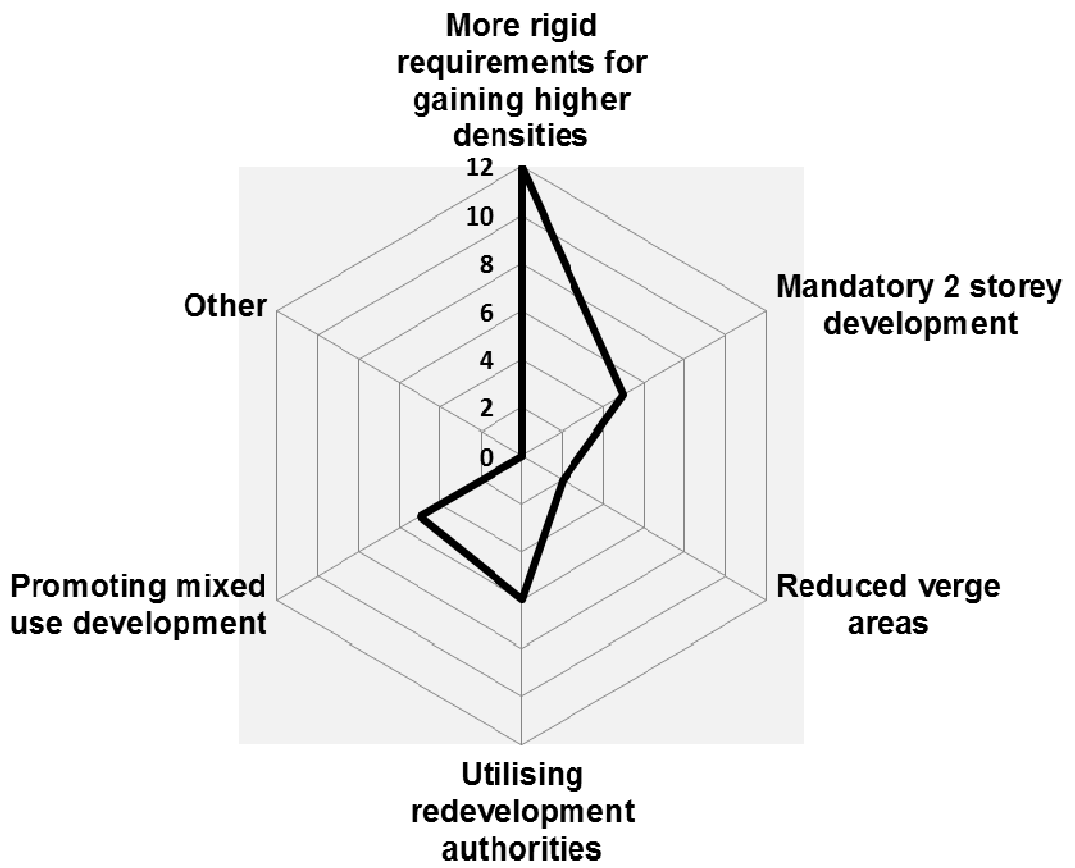
Table 10: Results of above interview question

8.3. Challenges raised and solutions suggested by resource persons

Table 11: Adapted from semi-structured interviews, summarised responses:

Planning challenges	Proposed solutions suggested during the interview process

Metropolitan Strategies

Directions 2031 and Beyond is a 'nothing document' and seeks to placate the development industry, targets are too easily met. Growth areas are too few.	A more radical approach to densification is required along activity corridors and within existing low density suburban areas.
The *Corridor Plan* was a failure and planned backwards, transport arteries went nowhere, with no related communities to connect to.	Subsequent plans for Perth will need to address connectivity and should encourage more compact lots for reasons of efficiency.
A number of local plans do not adequately adhere to strategic objectives set out in documents such as *Liveable Neighbourhoods* (WAPC 2007).	Planners should have due regard to all State policies and strategies to avoid negative planning outcomes.
Armadale has always represented the 'back corner' of Perth strategic plans and a locality that planners have consistently ignored.	Increased demand for residential land in Perth has meant Armadale has become more central to recent strategic plans.

Armadale's location and status

Armadale is isolated, socially disadvantaged and a crime hotspot.	Armadale requires renewal. Replacing ageing housing stock is one component of this. It is very difficult to shake off Armadale's historical stigma, but is being attempted through redevelopment.
Armadale is no longer at the fringe of the metropolitan area and can no longer be considered a peri-urban settlement.	Urban development has now extended beyond Armadale to the south albeit in a non-contiguous and leapfrogged fashion.
Armadale's overall land values will not increase unless it is master planned and reflects high quality design.	Successfully managing the infill process through design controls is vital to Armadale's regeneration.
Perth has experienced unabated population growth since 1955.	Population growth has traditionally been managed by rezoning urban land on the fringe however this is an unsustainable model which cannot continue indefinitely.
We need to plan for people not cars. Perth is too car dependent.	Public transport requires expansion throughout Perth, however Armadale is well served by public transport.

Residential density

Higher density housing should be more affordable and tailored to the community.	Areas such as Armadale should greatly increase the provision of more compact dwellings for first homebuyers.
Higher density development should be located around transport nodes.	The highest residential codings in Armadale currently occur near transport nodes (R40).
There needs to be a greater distinction made between high density and high value density.	Design is key in this regard and local authorities should enforce greater design controls.
Across Perth, there should be significant increases in density needed without creating enclaves for the rich.	Higher codings are required throughout Perth in appropriately located areas.
R25 provides the wrong kind of density, it is too incremental. As a result redevelopment in Armadale fails physically, technologically and environmentally, leading a degraded physical, social and economic landscape.	Higher codings beyond R25 will encourage a move away from single storey, medium density redevelopment.
NIMBYism threatens redevelopment from being undertaken.	Local opposition to increase densities has largely been avoided in Armadale via a comprehensive consultation process, particularly during the preparation phase of *Town Planning Scheme No. 4*.
The WA planning system suffers from a lack of vision and is 'risk averse'.	The City of Armadale has been one of the first local governments to implement higher densities and despite being located on the periphery is a leader in this regard.
Constraints such as clay soils lead to unsustainably high site costs, preventing redevelopment.	Development costs are directly passed onto purchasers. Affected lots may remain undeveloped.

Housing trends

First homebuyers have unrealistic expectations for large, unaffordable dwellings.	Dwellings should be more compact and affordable through higher density codings. First homebuyers should revise expectations.
Armadale's infill 'villas' are the predominant housing model within the study area. They provide an unimaginative and poor redevelopment outcome.	Higher codings in appropriate locations and the requirement to develop contiguous lots will support the provision of multiple dwellings.
Retaining ageing dwellings is a very poor outcome, particularly within battleaxe scenarios.	Such arrangements have reduced in number as a result of the local development industry seeking to provide higher quality outcomes.
Large gardens are wasteful, we need to rethink their role.	The creation of smaller lots means that the size of gardens has decreased in recent years.

Distance from the centre of Perth as well as the rural history of the area explains the relatively low uptake of redevelopment in Armadale (approximately 1% per year).	The redevelopment process often takes many years to take effect and uptake of redevelopment opportunities will increase in future.
In a capitalist society, growth is essential. It keeps nations running and keeps businesses running. The entire share market system demands growth, not 'production as usual'.	Recoding residential lots in Armadale has resulted in construction activity and stimulation to the local economy.
Perth's rental situation is dire and currently very little is being done to address this.	Urban consolidation means the more efficient use of residential land and over time can contribute to increased housing stock.
Landowners may be unaware of redevelopment opportunities or unwilling to live within a battleaxe arrangement, a poor design outcome.	All landowners received written correspondence during the preparation for *Town Planning Scheme No. 4*, community events and newspaper advertising also occurred.
The WA State Government seeks the rapid construction of homes for economic gains. Sustainability is somewhat 'tokenistic'.	The planning system must maintain a balance between ensuring high quality housing and encouraging development to occur.

Statutory controls

The *Residential Design Codes* provide weak planning controls and are insufficient in isolation.	Greater regulations are required through instruments such as local planning policies.
Greater distinction should be made between high density and high value density.	Design is key in this regard and local authorities should enforce higher design controls.
Residents should be able to 'age in place' within the suburbs which they live.	A greater diversity of housing is required throughout Perth. This can be encouraged within local planning schemes through zoning mechanisms.
Predominant codings throughout Armadale discourage multiple dwellings.	Local authorities can encourage such housing forms by precinct planning and local design controls.
Redevelopment authorities provide superior outcomes than piecemeal infill approach permitted under the City of Armadale *Town Planning Scheme 4*.	Higher quality of redevelopment can be provided as design controls are tightened.
'Backwards planning' within Perth means large lots in Nedlands and small cottage lots on the periphery.	Higher densities should be encouraged in areas well-serviced by public transport and infrastructure throughout Perth.

A number of lots within the study area were found to be just under the area required to subdivide easily. '700m² is required, and nearly every lot is 692-695m²'.	The WAPC can address this via the discretionary approval process or increasing codings from R25 to R30 where lot sizes are found to be marginally below R25 subdivision requirements.
The City has traditionally sought to promote a balance between urban and rural living and prides itself on 'city living, country feel'.	The urban consolidation process does not undermine the rural amenity of Armadale as the rural hills districts remain unaffected by upcoding proposals.
Two-storey development as required under various local government medium density redevelopment policies would not be possible in Armadale as that there is no market for 2 storey development in Armadale. Land values are at present too low.	The 16 August 2010 Council agenda item entitled '*The Design of Medium Density Development – Policy Finalisation'* states that as a result of existing poor design outcomes, new 'amendments would require medium density grouped dwelling developments to include a portion of two storey or smaller ground floor units and achieve a higher standard of landscaping' (City of Armadale 2010, 65).
Design is critically important and strict controls such as those favoured by other local authorities result in a higher quality of redevelopment.	The introduction of higher residential codings in appropriate locations such as R100 with 3 or 4 contiguous lots amalgamated to facilitate a major development site would address such concerns.

8.4.   Results of streetscape audit

This section will demonstrate the relationship between the hierarchy of retail centres outlined within Central Place Theory and urban redevelopment trends since 2005 when *Town Planning Scheme No. 4* was introduced via a streetscape audit. During selected dates from May to August 2013, an analysis of 144 streets in Camillo, Kelmscott and Armadale was undertaken to identify the extent to which new dwellings have been constructed at a higher density since November 2005, when the new local planning scheme was introduced. This analysis was undertaken via driving through the area and verified by various means online (Google Maps, RP Data and City of Armadale mapping). The following images of development, redevelopment and existing housing stock in the study area were observed during the course of the streetscape audit (Figures 84 - 95, Author 2014):

Battleaxe rear strata redevelopment

Other redeveloped sites

Group housing / redeveloped sites

The streetscape audit which comprised the second part of this study, sought to ascertain rates of residential redevelopment approximately seven years and six months after a new local planning scheme was introduced within the study area. Data included within ABS *Moving House Social Trends* show that the majority of Australians aged 25 – 29, 35-39 and 40 – 44 would move house at least once within this 7 year time frame, with older Australians 75 – 79 less likely to relocate. Main reasons provided for moving house include 'a desire for a bigger or better home', due to 'having purchased their own dwelling' and due to 'the breakdown of a marriage or relationship' (ABS 2010, 2). The streetscape audit sought to identify relationships between central places (Armadale's significant retail centres) and rates of urban redevelopment when local planning instruments are released. The study sought to ascertain the extent to which Central Place Theory can be applied to predict where local authorities can encourage urban consolidation where there will likely be the greatest uptake of redevelopment opportunities. There exists a gap in this knowledge within current planning literature.

Figure 96: Sample of streets audited in study area, Kelmscott and Camillo (City of Armadale 2014).

An analysis was undertaken by driving through and observing 144 streets generally from north to south (Camillo, Kelmscott and Armadale) to ascertain the extent to which new dwellings have been constructed at a higher density since November 2005, when the new scheme was introduced (refer to Figure 96). It was considered that 144 streets would provide a sufficient sample size according to criteria set out by Fox et al who refer to a study of this type as 'simple random sampling' (2009, 17).

In respect to the composition of streets within the study area, most contained fewer than 100 dwellings and only 10 streets audited contained more than 100 dwellings, which equates to approximately 7% of the total. In other words, less than 10% examined could be considered 'long streets'. 144 out of a total of 590 represent 24% of total streets in the study area, however a large number were excluded from the audit as outlined in the following table. When these are taken into account, a total of 36% streets in the study area were audited (refer to Table 12).

Reasons for excluding roads	No. of roads excluded from study	Examples of excluded roads
Highways and control of access roads with no urban lot frontages or other access limitations precluding redevelopment.	23	Jull Street, South Western Highway, Tonkin Highway, Armadale Road.
Roads contained within the Kelmscott Industrial Area.	13	Hendon Way, Lockhart Road.
Roads contained within the South Armadale Industrial Area.	12	Dickens Place, Browning Road, Burns Road.
Roads contained within the Kelmscott hills precinct (north of Albany Highway outside of the 'flatland' recoded study area).	102	Bernard Street, Steve Street, Peter Street, Alola Street, Anebo Place, Tranquil Road.
Roads excluded for other reasons: utility service roads, roads servicing commercial development only, rural roads, roads controlled by MRA in Kelmscott and Armadale and ungazetted roads.	43	Whitehead Street, Commerce Avenue, Tesla Way, Twelfth Road, Eleventh Road.
Former total: 590 roads	24%	144 out of 590 roads surveyed = 24%
Total Roads excluded from study	193 roads	397 roads remaining
New total: 397 roads	36.2%	**144 out of 397 roads surveyed = 36.2%**

Table 12: Rationale for roads excluded from this study.

Initial impressions gathered prior to formally undertaking the streetscape audit can be summarised thus: within peri-urban areas such as Armadale, there appears to be a relatively low uptake of redevelopment opportunities in the first several years after a local planning scheme is introduced. This initial finding has major implications for planners working in existing peri-urban areas seeking to upcode local areas via new planning schemes (refer to Figure 97).

It may be reasonably expected that this lack of resident interest in redeveloping land may alter if land values were higher and a greater period of time had elapsed (as was suggested by a number of resource persons) for example if the timeframe was extended to 15 or 20 years and much of the housing stock in the area was due for or required replacement due to age or condition.

Figure 97: The suburban areas in Armadale included as part of the streetscape audit (City of Armadale 2014).

Redevelopment triggers were not immediately apparent throughout the streetscape audit, but it is assumed that the need to replace an original dwelling would result in construction activity. In contrast, at least 10 examples were observed and recorded during the streetscape audit of new dwellings which occupied an entire parent lot of approximately 700m^2 where the potential for smaller dwellings by landowners was ignored. This was an unexpected finding as it was assumed that potential for profit would be a powerful motive for landowners. There are evidently other concerns outside of economic gains, which include a desire for large private spaces. This finding demonstrates that many prefer and seek larger lots and large dwellings within peri-urban areas (refer to Figure 98).

Figure 98: Several examples of recently constructed dwellings were observed throughout the streetscape audit which set aside redevelopment potential reflecting a preference for larger dwellings on spacious lots (Author 2014).

A total of 99 streets demonstrated zero redevelopment, reinforcing the planning literature's view that the preference for low density suburbia remains strong in the Australian psyche (Vallance et al 2004; Weller 2009). This also supports Jain's view that people seek to live in peri-urban areas for reasons related to family and space (2008). 17 Streets demonstrated a 1% - 5% redevelopment rate, while the remainder (28) demonstrated redevelopment rates from 5.1% - 100% (Total 144 streets). One street was found to possess 100% redevelopment which somewhat skewed the results as it comprised a single large multiple dwelling abutting Kelmscott Plaza. Overall however, approximately 80% of the subject study area reflected 5% or less redevelopment.

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The average redevelopment rate of all surveyed streets was finally calculated as approximately 3.7% (refer to raw data in Appendix A). Thus of all streets surveyed, only a total of 3.7% of landowners had redeveloped their land approximately 7 years and 6 months after the new town planning scheme had been introduced. This is less than a 1% redevelopment rate per year for the 'flatland' suburbs study area.

It is considered that this finding reflects a very low rate of redevelopment considering the 'democratic' opportunities made possible for all landowners within the subject area. This finding also challenges the views of several resource persons who suggested that redevelopment rates would be relatively high within a short period of time. It is assumed that this finding could be extended throughout the entire local authority area, with the exception of the rural hills districts and new subdivisional areas in Piara Waters and Seville Grove which were found to possess higher R25 and R30 codings as opposed to primarily R15/25 codings within the study area (City of Armadale 2005). The following mapping shows the least amount of redevelopment has occurred in Camillo, Kelmscott has reflected a moderate number of redeveloped lots and Armadale has reflected the highest rate of redeveloped lots within the study area (refer to Figures 99 – 101).

Figure 99: Camillo redevelopment (refer to green coloured lots) (WAPC 2014)
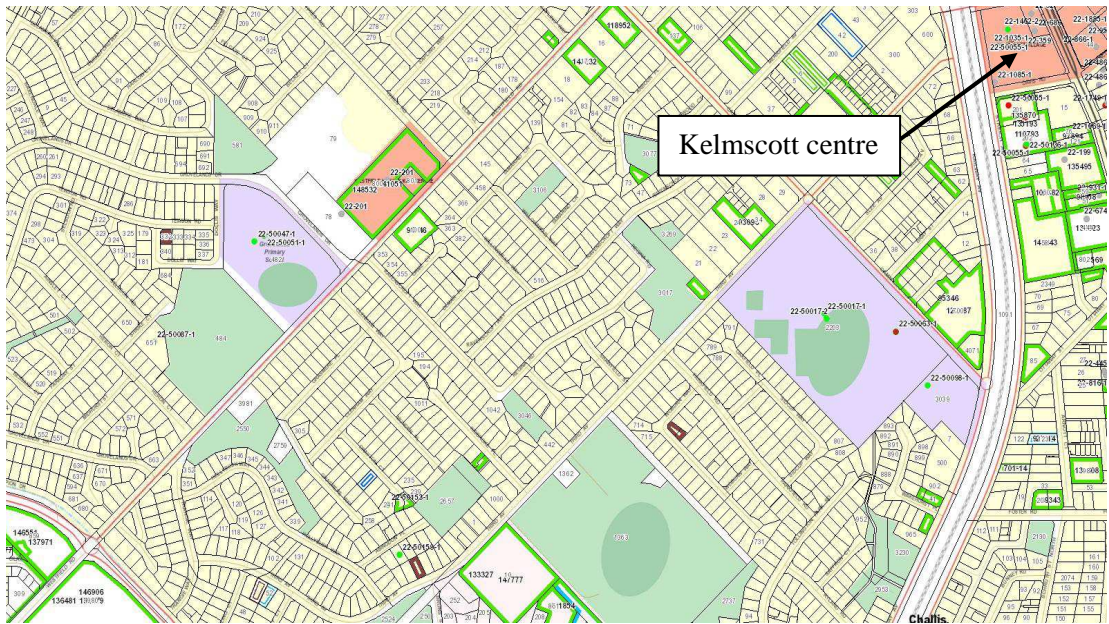
Figure 100: Kelmscott redevelopment (WAPC 2014)
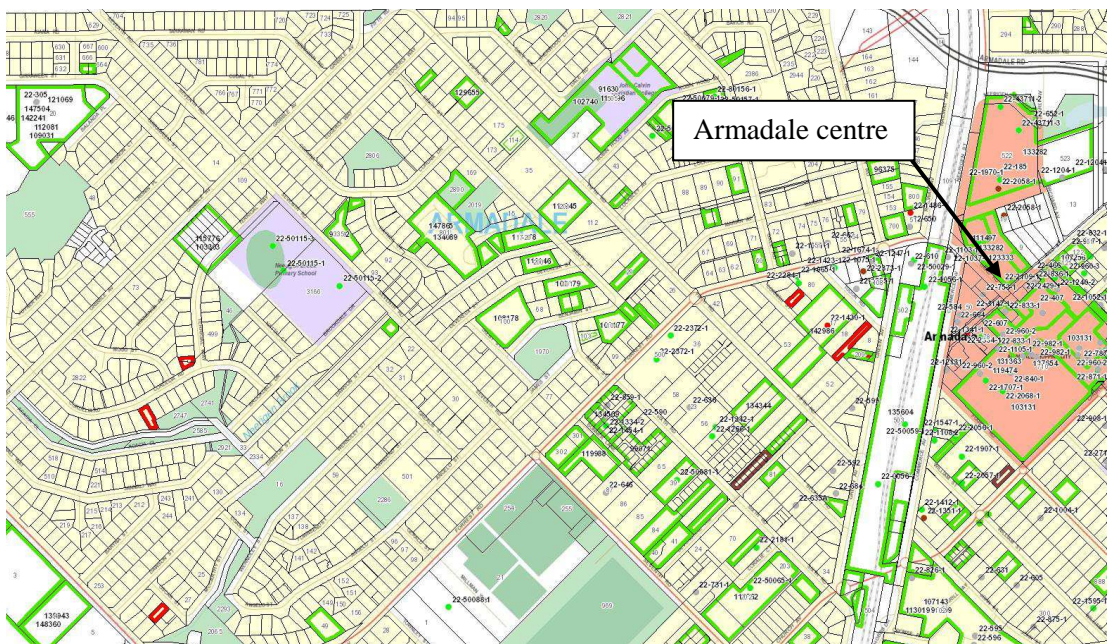
Figure 101: Armadale redevelopment and key (WAPC 2014)

■ Approved
■ Outstanding
■ Deferred
■ Refused
■ Cancelled
■ Unknown

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8.5. The streetscape audit and Central Place Theory

Midpoints of various streets surveyed were utilised as a reference point throughout this study as a small proportion were found to be very long. A given street may have been calculated to be 2km in length, abutting a central place at one end and 2km from that same central place at the other end. In such cases, a reference midpoint of 1km was utilised to calculate each street's average distance from the most proximate central place. The 144 streets surveyed were calculated to be on average, approximately 800 metres from their most proximate central place, which were overwhelmingly classified as regional shopping centre (Tier 1) or community shopping centre (Tier 2) (refer to Appendix A, Raw data, streetscape audit).

This finding reflects modern retail trends favouring large shopping centres, the predominance of large shopping precincts in Armadale as well as the 'overshadowing' phenomenon included as a tenet of Central Place Theory, otherwise known as the 'sphere of influence' (McLaughlin 2009) which disadvantages smaller scale retailers. As such the majority of streets surveyed were located within the generally established walkable catchment (800m) of such high attraction central places. As predicted by Christaller, the largest central places dwarf and overshadow small retail outlets, compromising the viability of more traditional corner store, low order retail such as Townley Street Mini Mart that struggle under the dominance of larger centres (Beavon 1977).

Further, the results of the survey revealed a positive relationship between redevelopment and proximity to central places. Out of the 30 surveyed streets located 400 metres or closer to their nearest central place, 12 had higher density redevelopment evident since 2005, presenting a stronger correlation of 40%, several times higher than the general findings of 3.7% for the overall study area. For the 17 streets located from 200 – 400 metres from their nearest central place, 8 of these reflected higher density redevelopment since 2005, a far greater percentage (47%) than that found within the overall study area. It can therefore be concluded that there is a strong correlation between rates of redevelopment and proximity to attractors or central places, particularly when larger centres are considered.

Of the total 144 streets surveyed, 13 streets were observed which either abutted or were located within 100 metres of their closest central place at the calculated midpoint. Of these, 4 streets reflected some level of higher density redevelopment, equating to 30% total redevelopment, considerably higher than the overall redevelopment rate reflected within the study area. The sole street which demonstrated a 100% rate of redevelopment, Davis Road in Kelmscott, was found to abut a Category 2 shopping centre (Kelmscott Plaza).

It can therefore be concluded that proximity to central places positively influences and attracts redevelopment. Redevelopment opportunities are more frequently taken advantage of within walking distance to such centres by the local development industry and landowners. Such lots are often located in more prominent locations with greater yields available and the results of this study reveal that greater rates of redevelopment is the result.

Figure 102: For those land parcels located far from large Tier 1 and 2 retail centres, lower rates of redevelopment were observed (WAPC 2014).

For those areas located further away from central places, a lack of redevelopment was typically observed (refer to Figure 102). One example was Third Avenue in Kelmscott, a locally prominent neighbourhood connector road approximately 2.5 km in length, on which Kelmscott High School is located. Third Avenue abuts Kelmscott Plaza to the north, categorised as a second tier '2' central place in the retail hierarchy as a significant attractor (Woolworths, butcher, chemist, fast food restaurants, numerous specialty stores and service station). The southern end of Third Avenue abuts Kelmscott industrial area, with few retail and community attractors present (some light industrial land uses, scattered workshops in poor condition, mechanics factory units, disused, oddly shaped and poorly maintained public open space).
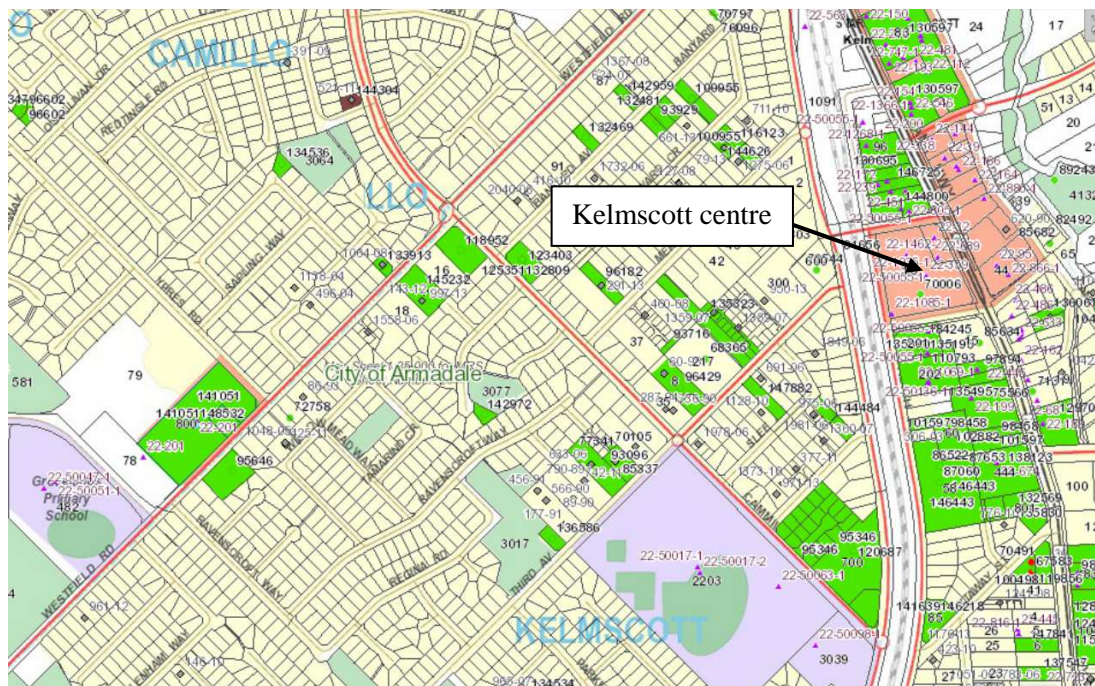
Figure 103: Refer to the land coloured orange to the north east (Kelmscott centre). Green coloured lots represent redeveloped lots. Major central places attract redevelopment whereas land located away from such centres generally does not (WAPC 2014).

Despite opportunities for redevelopment within the entire length of Third Avenue, all higher density redevelopment (11 sites out of 131 lots surveyed or 8.3%) was observed within 700m of Kelmscott Plaza and Kelmscott High School to the north while no redevelopment was observed at the southern end. Central Place Theory therefore has some explanatory power in showing how spheres of influence shape the ways in which settlements concentrate or fail to agglomerate (Trubka 2011) (refer to Figure 103).

This finding has applicability to local and State authorities in predicting locations of future redevelopment and identifying those areas which are more appropriately located to benefit from higher codings. Such a finding supports a 'targeted' recoding approach as densities can be supported closer to central places, while remote from such centres, outside of walkable catchments, redevelopment is less attractive among residents in favour of larger private spaces and backyards.

It was also observed that central places or activity centres reflect improved design outcomes with less 'battleaxe' arrangements evident near such activity centres. This suggests that larger scale developers are able to provide higher quality design and development outcomes, rather than the forms of redevelopment provided by single landowners, who were often responsible for less attractive development, such as 'retain front dwelling and build behind'. There is no zoning explanation for this observed trend, as developers are free to develop grouped dwellings or battleaxe retention scenarios equally under *Town Planning Scheme No. 4*. In this case, the market has chosen to offer an improved housing product in more prominent locations. Battleaxe retention scenarios (often accompanying a dwelling in poor condition) were mainly evident in less prominent areas and were observed within streets not immediately accessible or observable along major roads.

Along neighbourhood connectors and higher order, more prominent roads, a higher standard of redevelopment was typically observed, often involving more than 6 – 8 units. In such areas, battleaxe arrangements were less commonly observed and new dwellings had been constructed at a higher density. Battleaxe arrangements were found to be more prevalent in poorly maintained lower traffic volume access streets and present an inferior outcome according to design guidelines outlined by Hussey (2002).

Within the majority of very minor streets there was frequently no redevelopment sites observed, and generally the fewer dwellings in a given street, the less likely redevelopment had taken place. Along access streets containing larger, attractive dwellings, low redevelopment rates were observed.

Maintenance standards of existing dwellings were noticeably superior within several pockets in the study area. An example was observed within the Galliers Avenue precinct in Armadale where views of the surrounding landscape and evidence of renovation activity reflected a pride of ownership through manicured gardens, new fencing and sheds, extensions to dwellings, new roofing materials and other improvements. Such improvements were found to result in less local redevelopment. Such a scenario was not typical however but reflected the exception, and the majority of the housing stock observed within the study area lacked a high standard of maintenance (refer to Figures 104 and 105).

Figure 104 and 105: Many existing dwellings in the study area were observed in poor condition, reflecting a low maintenance standard, both pre- and post-redevelopment (Author 2014).

A potential explanation for the numerous examples of poor 'battleaxe retention' outcomes observed is that redevelopment controls provided for under City of Armadale *Residential Design Policy 3.1* require insufficient improvements to existing dwellings. Although the following upgrade measures are outlined in the City's local planning policy, these were found to be inadequately enforced during the streetscape audit. The policy states that: where an existing older dwelling is to be retained in a proposed grouped dwelling development, improvements to the existing building should include at least one of the following and the City may apply more than one more than one of the above criteria: (City of Armadale 2007).

- Restoration of the existing roof;
- Recladding or rendering of the walls;
- Repainting of the dwelling.

Where an existing older dwelling is to be retained in a proposed grouped dwelling development, improvements to the streetscape should include at least one of the following:

- New front open style fencing;
- Re-landscaping within the front setback;
- New paving and kerbing in the driveway and crossover.

8.6. Discussion of summarised findings in relation to City of Armadale

Finding No. 1: Central Place Theory has partial applicability to Armadale's recent redevelopment trends in accounting for the location of infill redevelopment:

A key finding of this study is that a higher proportion of redevelopment was observed closer to central places with a corresponding lower proportion of redevelopment observed far from such centres (refer to Figure 106). There is a current gap in the relationship between Central Place Theory and patterns of infill redevelopment, which this study has aimed to fill. Central Place theory outlines a clearly definable four-tier retail hierarchy comprising *street corner convenience cluster*, *neighbourhood shopping centre*, *community shopping centre* and *regional shopping centre*, all of which were identified during the streetscape audit. Therefore Central Place Theory can be considered useful in explaining Armadale's current retail service environment.

Despite this, Central Place Theory cannot be considered comprehensive in explaining recent redevelopment trends within Armadale for several reasons. Christaller's hierarchy of the assortment of goods and services is largely superseded by the predominance of large shopping centres and a corresponding lesser number of lower order retail outlets, revealed throughout the streetscape audit. For example, most streets in Armadale contain as their closest central place, a large retail centre, rather than a lower order outlet. Christaller considered that a larger number of such lower order retailers would exist, however this was not observed throughout the study area.

Recent expansion of the threshold population in Armadale has meant that large centres have become more viable, having undergone expansion in recent years with redevelopment managed by the Metropolitan Redevelopment Authority. Christaller considered that consumers would always purchase goods from the closest place that offered that good and if demand for goods was to drop, so too would the availability of that good, however the dominance of major centres in Armadale undermines this view. The findings of this study support Beavon's view that where retail attractors are high, people are willing to travel further as a greater variety of facilities justify this (Beavon 1977).
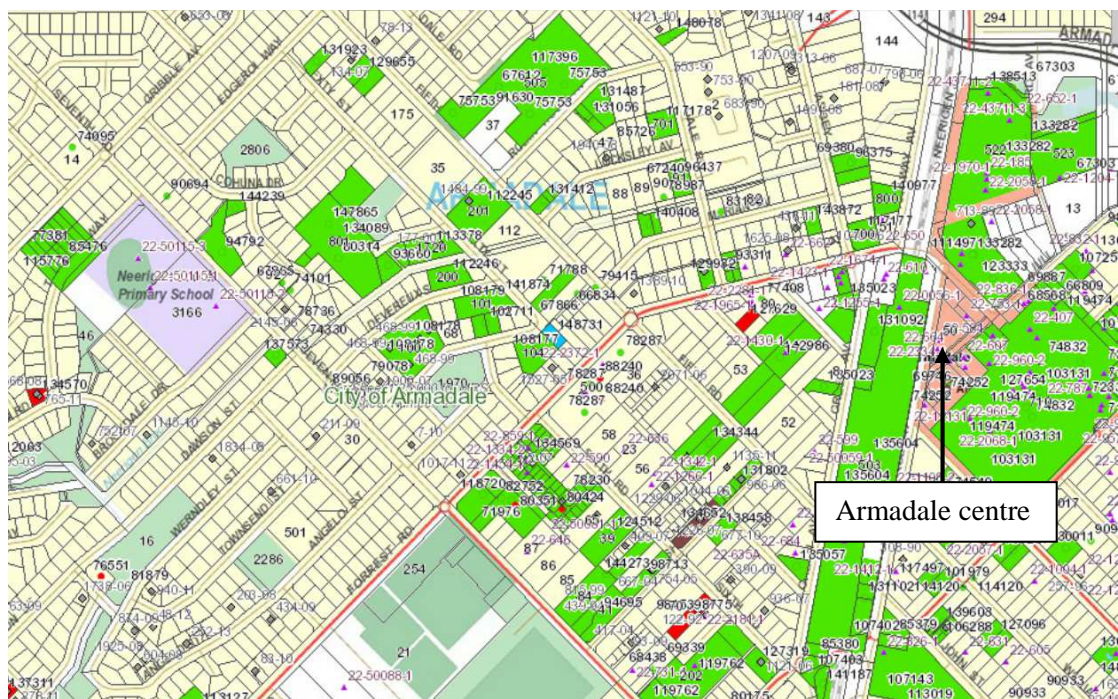
Figure 106: Refer to Armadale centre to the east (in orange). The majority of redeveloped sites were found in close proximity to high order central places (WAPC 2014).

Another difficulty with applying Central Place Theory to Armadale is that Christaller's model was predicated on an isotropic all-flat surface which is at variance with Armadale's proximity to the Darling Scarp. Armadale can be described as possessing 'half a catchment' due to its close proximity to the Scarp, which provides a natural transport barrier, largely precluding urban development on the northern side of Albany Highway, particularly within the suburbs of Roleystone and Bedfordale. Natural features and topography of these suburbs have proven prohibitive in terms of servicing, particularly with respect to provision of reticulated sewer.

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Core assumptions within Central Place Theory that transport is equally easy in all directions are therefore not applicable to Armadale as Canning River provides a natural barrier from the study area to the hills area. Central Place Theory however, considers that relief barriers channel transport in certain directions (Beavon 1977) and Armadale's development has been influenced by its topography accordingly as Albany Highway and the passenger railway have followed a route traversing the flat area parallel to the hills precinct.

Finding No. 2: Local authority experience has highlighted that the absence of design controls can result in poor quality redevelopment outcomes

The City's experience with blanket recoding is evident in two Council meeting reports dated 17 March 2007 and 16 August 2010 entitled '*Amendments to Residential Density Development Policy'* and '*The Design of Medium Density Development – Policy Finalisation'* (City of Armadale 2007; 2010). As of March 2007, the local planning scheme had been gazetted for approximately 16 months. The report states that: 'Concerns have been expressed that development applications within the City's dual coded areas are not meeting the standards expected'. Since the introduction of density changes under *Town Planning Scheme No. 4,* 'there has been a major increase in grouped development proposals considered by the City in accordance with the Scheme provisions and the adopted Residential Density Development Policy' (City of Armadale 2007). Council's concerns relate primarily to a number of areas including:

- A lack of architectural innovation;
- Exploitation of zonings by developers who do not meaningfully contribute to the City's housing stock;
- Developers expectation of developing at higher codings;
- A lack of benefit to the community by providing low standards of dwellings with little improvement to the streetscape;
- A tendency towards uniform development, no eaves, no street surveillance, retained dwellings as part of a grouped housing development remaining in poor condition (a view strongly supported by resource persons).

These concerns were evident throughout the streetscape audit and support Hussey's study (2002) that suggests that the best housing design is that which contributes in a meaningful way to the streetscape, incorporating attributes such as accessibility, safety, liveability, sustainability and prosperity. Hussey contends that the best housing design is reflected in the following elements which largely preclude common battleaxe redevelopment observed in the study area:

- Front doors that offer street frontages,
- Garages that do not dominate the visual impact of dwellings,
- Broken building mass or repetition,
- A diversity of materials and features and
- Houses facing the street.

The March 2007 agenda item was not the only point in time that Council experienced challenges with poor redevelopment standards within the City under *Town Planning Scheme No. 4*. The 16 August 2010 meeting agenda item relating to infill dwellings on land coded R30 and above entitled '*The Design of Medium Density Development – Policy Finalisation*' reflects Council's concerns three years later. The report states that as a result of poor design outcomes the local authority: 'requires medium density grouped dwelling developments to include a portion of two-storey or smaller ground floor units and achieve a higher standard of landscaping. The quality of development being constructed at the higher density is continuing to result in low standards of amenity for future residents' (City of Armadale 2010, 65). Examples include: limited outdoor areas around dwellings and a lack of consideration given to the design and landscaping of common areas.

As a result, the City's Policy '*PLN 3.1 Residential Density Development*' was revised to incorporate provisions addressing issues relating to building design, open space and streetscape. Policy revisions included the following: Where over three units are proposed to a residential density in excess of R30 one of the following requirements shall be met: At least one third of the units within a development (to be rounded down in the event of an odd number) shall be comprised of two storey units (defined to include any development with at least one habitable room on the second

level); or at least 50% of the units within a development shall have a total floor area no greater than 110m² with an outdoor living area of at least 24m².

Local developer objections to Council's proposed revisions claimed they would not be reflective of current market demand and would in effect 'kill off' a large percentage of unit development in the area. Additional costs that apply to two-storey development would result in a reduced supply of dwelling units in the area and cause a detrimental impact on local businesses and house prices. The City acknowledged that two-storey development is more expensive to construct however provided the following trade-off: 'A further option for developers is to develop at R30 density or below. The offer of a development bonus in return for meeting various standards is a reasonable trade-off and is increasingly understood by the development industry. The underlying principle is that certain standards must be met or development should only occur at the lower density – where design issues are less critical' (City of Armadale 2010, 68).

A more recent Council agenda item dated 18 November 2014 sought to provide greater incentive to develop multiple dwellings 'in the hope that this would provide an alternative to the three or four bedroomed single house development being constructed' throughout the locality (City of Armadale 2014, 22). At this time, the City's scheme did not permit multiple dwelling developments in a number of coded areas and it was considered that such forms were not being encouraged to a sufficient degree. This was supported throughout the streetscape audit that found very few multiple dwellings have been constructed in the study area since 2005.

Council's 2007 and 2010 agenda items provide evidence that zoning controls and the *Residential Design Codes* do not produce desirable built form outcomes in isolation and result in lower than expected development outcomes in peri-urban areas such as Armadale. Such a view is supported by scholars such as Doppelt (2003) who consider that market forces in isolation do not ensure high standards of redevelopment. This view is also supported by: Hardi & Zhan (1997); Ling (2005); Mendoza (2003); and Pope (2004).

Council's experience has revealed that the *Residential Design Codes* do not always provide the best framework to ensure developments reflect high quality built form outcomes: 'while these documents provide some guidance, experience is demonstrating that greater guidance may be appropriate to ensure that improvements to the City's stock of housing occurs and opportunistic overdevelopment for speculative purposes is avoided' (City of Armadale 2007, 65).

Finding No. 3: Most planners and stakeholders oppose 'blanket recoding' and this is reflected in more recent planning instruments

Directions 2031 and Beyond states that: 'the blanket up-coding of large areas of the inner suburbs is not favoured, as it is unlikely to enhance the character of neighbourhoods' (WAPC 2010, 77). Blanket recoding is a central focus of this study, which has major implications for the next two decades for Perth's existing low density suburbs and future patterns of transportation. Mapping contained within *Directions 2031 and Beyond* shows that many of Perth and Peel's existing suburbs will undergo little or no significant transformation through increased blanket densification. Weller (2009) considers that community opposition and media coverage which frequently accompanies proposals for higher density development in existing areas threatens to prevent redevelopment.

The City of Stirling's experience was similar to that within the City of Armadale prior to additional planning controls being implemented in 2007. Community consultation revealed a lack of support for increased densities in a blanket fashion (City of Stirling 2009). Poor built form outcomes achieved through the blanket R40 zone within the City had shaped residents' views. Blanket rezoning across the local area has not resulted in desirable built form outcomes with poor housing diversity and lot sizes which were too small. The community went as far to suggest 'downcoding' or reducing residential codings within several areas in order to protect existing undeveloped lots from future poor quality infill unit development. The intensification of residential density surrounding existing local centres and community amenities was considered to be one of the most sustainable and efficient methods of encouraging growth and diversity, rather than blanket recoding (City of Stirling 2009).

This experience is also reflected elsewhere in Perth. The *City of Canning Local Housing Strategy (Draft)* describes the dual blanket density coding provisions in *Town Planning Scheme No. 40* permitting redevelopment as 'ineffective' and not serving a 'useful purpose in the planning framework' (City of Canning 2014, 31) due to poor redevelopment outcomes. Surveys undertaken with residents in Lynwood, Ferndale and Parkwood revealed that 'generally community members did not believe there should be an increase in residential densities' (ibid 2014, 15). Rental housing stemming from blanket recoding was identified as 'presenting property maintenance, overcrowding and car parking issues in Bentley, Wilson and St James. These properties were seen to diminish the visual amenity of the area' (ibid 2014, 15).

Finding No. 4: The Australian preference for low density living remains, despite the potential for redevelopment in peri-urban areas

Initial impressions from numerous visits to the study area revealed that relatively few landowners had chosen to redevelop their lots in the manner permitted by the 2005 scheme. Prior to undertaking a formal streetscape audit, it was estimated that that approximately 5% of residents had redeveloped their lots and this was found to be very close to the actual number of 3.7%. Therefore the impact of *Town Planning Scheme No. 4* appears to be not immediately striking and obvious 'on the ground'. Despite upcoding occurring more than 7.5 years previously, comparatively few landowners had taken the opportunity to redevelop their land in a manner permitted and it can be concluded that the City of Armadale has not become a transformed place as a result of *Town Planning Scheme No. 4*.

Change has been slower than anticipated and Council's desire to rejuvenate Armadale via an incremental blanket upcoding process has not occurred to the extent predicted for during preparation stages of the new scheme. This outcome supports the view in the literature that Australian preference is for low density suburbia, despite the potential for economic gain (Jain 2008). The results of the streetscape audit also revealed that blanket up-coding of well-located and serviced suburbs does not occur in manner which could be considered predictable, notwithstanding the finding that redevelopment is attracted to central places.

It is assumed that landowners would typically redevelop when their dwelling is due for replacement as a trigger, however it cannot be assumed that all seek more compact dwellings on smaller land parcels. Numerous examples of newly constructed dwellings were cited on original, recoded lots, a surprising finding, indicating that economic factors alone are not the sole determinants of redevelopment for residents in outer-lying metropolitan areas.

Interviews with resource persons revealed that landowner unawareness of development potential afforded to land may have contributed to the low levels of redevelopment. However it is doubtful that this is a factor: entire suburbs were recoded and landowners sent multiple letters (in addition to local newspaper advertising) during the consultation period for *Town Planning Scheme No. 4* which advised residents of proposed changes and requesting input. The public consultation phases for the 2005 scheme can therefore be considered comprehensive.

Finding No. 5: Independent redevelopment authorities often provide superior planning and design outcomes

Several resource persons discussed the stark contrast between piecemeal redevelopment (considered poor) and redevelopment provided by various Metropolitan Redevelopment Authority projects (formerly the Armadale Redevelopment Authority). Resource persons generally expressed the view that additional funding, planning powers and explicit design guidelines mean that overall development outcomes are improved, rather than expecting unguided market forces and upcoding to provide positive planning outcomes.

It was considered that 'shop front' development such as within Champion Lakes are very prominent types of development, and require powerful regimes or coalitions such as redevelopment authorities, and the result is high quality development, some of which has been positively recognised internationally. This was contrasted with what one resource person referred to as 'behind the curtain' forms of development, where single landowners operate resulting often in poor quality built form outcomes.

This view was supported throughout the streetscape audit which demonstrated that the more prominent a development, the more likely built form outcomes are improved. Where developments are located in less prominent locations, developed in isolation without regard to the wider precinct, development was found to be of a poorer quality.

8.7.   Proposed conceptual framework

This study has highlighted a theory – practice gap and a conflict between policies with respect to higher density redevelopment within a peri-urban settlement. The potential for a new conceptual approach has therefore arisen to address this gap for planners charged with implementing redevelopment within existing urban areas. For those areas on the periphery with relatively moderate land market values, a relatively low uptake of urban redevelopment was observed when permitted via the recoding process. In respect to land located closer to higher order central places, a higher proportion was found to have undergone redevelopment. Proximity to central places in peri-urban areas therefore influences both rates of and quality of redevelopment.

At present, statutory and strategic planning instruments rezone land parcels in a targeted or blanket fashion (or some combination of the two), and the revision of local planning instruments does not follow an established methodology. For example, the City of Armadale introduced a blanket recoding mechanism in 2005, but for other local authorities, this has not been the case. The City of Canning, for example, reflects higher R30 codings within residential pockets in Lynwood and Queens Park, but not within other suburbs such as Rossmoyne, Shelley and Ferndale (WAPC 2014).

The neighbouring City of Gosnells also reflects primarily low density codings, with higher density development located closer to passenger rail services. Overall the allocation of higher densities in local authority areas in Perth could be described as *ad hoc* (refer to Figure 107). This is at variance with various WAPC policies including *Liveable Neighbourhoods* which suggests that higher density land should be located close to neighbourhood centres, public transport and adjacent to high amenity areas such as public open space (WAPC 2007).
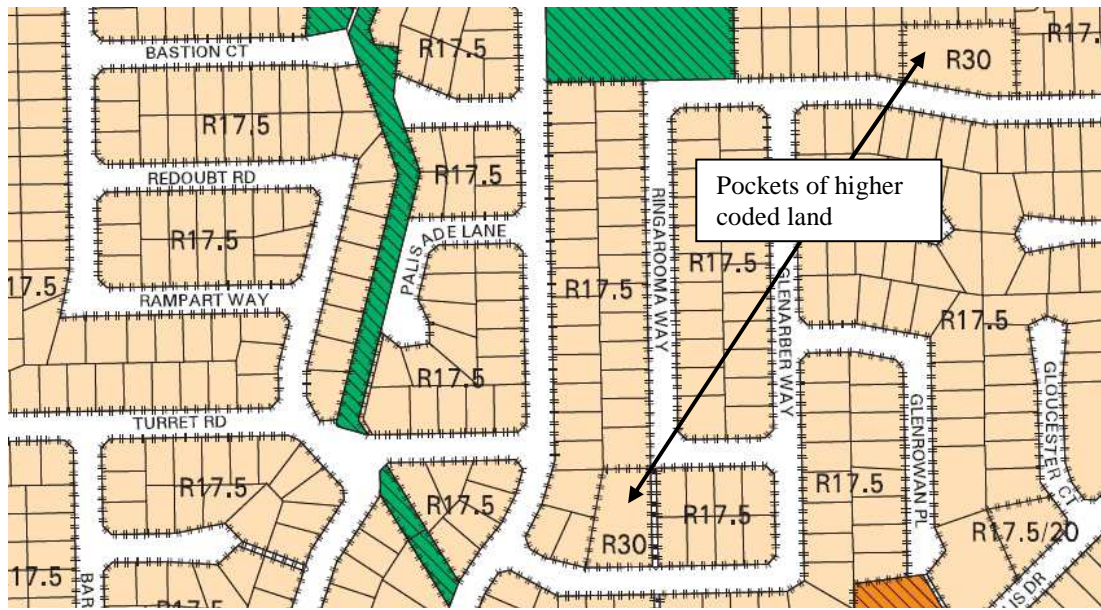
Figure 107: City of Canning Local Planning Scheme 40 showing '*ad hoc*' distribution of higher codings. Zonings reflect R30 pockets with little relationship to services and transport (WAPC 2014).

The emergent pattern of the uptake of redevelopment observed in this study can be seen as a valid contribution to a conceptual approach relating to urban consolidation in peri-urban settlements. Further justification for an emergent planning approach is that the conclusions drawn particularly from the streetscape study yielded such clear and conclusive results that the generation of a new conceptual framework is possible and can be undertaken. Such a model can assist in predicting which redevelopment opportunities are likely be taken up first as well as setting out the most appropriate housing types for various areas.

It borrows a number of elements from Central Place Theory, but is not intended to replicate it and excludes several of its key tenets. For example the emergent framework does not focus primarily on retail hierarchy, rather it is concerned with how residential redevelopments are attracted to certain areas, or their distribution pattern in relation to activity centres. The emergent conceptual framework which can be gleaned from this research has been termed the *Peri-urban Proximate Redevelopment Model (PPRM)*. Its usefulness lies in areas where planning instruments are outdated and require revision (currently every five years in Western Australia). The emergent model has the following core assumptions and elements and is based on empirical study within the study area.

Throughout the course of this study, the following tendencies were observed which point to the following principles: Within a redevelopment context, developers seek larger and more prominent land parcels and possess the means of capital to create superior design outcomes to those provided by single landowners or piecemeal redevelopers. The streetscape audit revealed that approximately 22% of all redevelopment in the city is undertaken by larger scale developers (above 6 units).

The closer a lot is located to an attractor, activity centre or central place, the more likely redevelopment will occur on that land (refer to inner, middle and outer zones, below). Lots located within 400m of central places, defined as 'ped-sheds' contained within a 5 minute walkable catchment outlined within *Liveable Neighbourhoods* (WAPC 2007) possess the greatest attraction for developers and will be redeveloped before other landholdings located further from central places.

Battleaxe configurations were found to reflect approximately 25% of total redevelopment in the study area. Such configurations frequently provide low quality outcomes, often accompanying the retention of existing dwellings that reflect a poor standard of maintenance. Such redevelopment occurs in isolation without regard to the wider precinct, far from attractors and central places in a manner that can be described as scattered or *ad hoc*. It can therefore be concluded that in a relatively unguided market, design standards tend to be superior closer to central places and weaker further from central places in established areas, particularly where lots are redeveloped in isolation (refer to Figure 108).
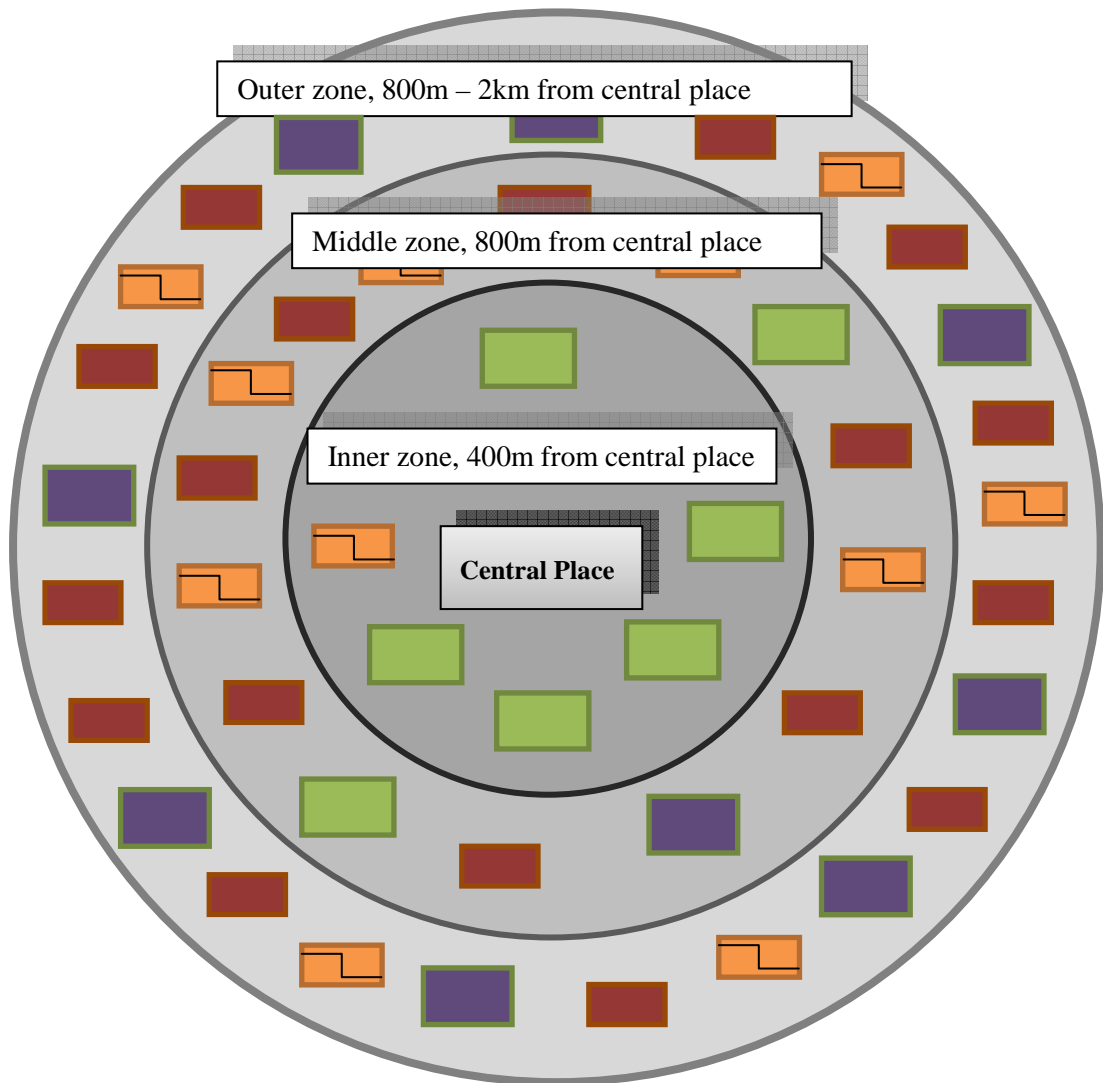
Figure 108: Conceptual construct of the Peri-urban Proximate Redevelopment Model, based on the streetscape audit within study area.

Central Place

| | Central Place, activity centre, community retail attractor: various tiers within hierarchy. |

Redeveloped large lots

| | A large lot located within the 'inner zone' redeveloped shortly after the introduction of a new local planning scheme. Previously considered unviable due to low density codings providing insufficient development yields. Potential for superior design outcomes (more prominent showcase development). |

Poor quality battleaxe redevelopment

A landholding subject of opportunistic redevelopment, comprising a battleaxe configuration providing a poor built form outcome. Retention of ageing original dwelling, in most cases. Redevelopment occurs for reasons of profit, rather than contributing to streetscape improvement. No relationship to central place. Strong redevelopment controls are recommended.

Large lots – not redeveloped

A large lot, located in the 'middle zone' or 'outer zone', greater than the 400m walkable catchment from the closest central place. Land which will not be redeveloped in the short to medium term due to a lack of locational proximity.

Small lots – not redeveloped

Traditional suburbia, an original, parent lot. Land valued for family and space reasons, mostly located in the 'middle zone' or 'outer zone' will not be redeveloped in large numbers (majority of recoded lots). Typically reflects a higher maintenance standard and pride of ownership.

The *Peri-urban Proximate Redevelopment Model* (PRRM) suggests that comparatively low land prices may not provide an immediate trigger for redevelopment in peri-urban areas. There is a tipping point at which land prices influence redevelopment, but until that point, landowners will value private open space above relatively marginal returns. This reflects the findings of the semi-structured interview process.

For example, median dwelling values for houses in Armadale, Camillo and Kelmscott in September 2014 were: $320,000, $315,000 and $370,000 respectively (Realestate.com.au 2014). Median dwelling values within central Perth during this same time period were $790,000 and median dwelling values in Bicton were $910,000 (ibid 2014). Median dwelling unit values in Armadale (peri-urban) were $275,000, however in Bicton (inner-city) were $490,000 (ibid 2014).

Developers can therefore realise higher yields in areas closer to and including inner city areas. Despite this, the rezoning process in peri-urban areas will result in a high degree of localised redevelopment and related activity including the buying and selling of properties as a result of increased land values, particularly for large, well located lots.

The *Peri-urban Proximate Redevelopment Model* (PRRM) explains patterns of redevelopment, identifying those land parcels which will likely be redeveloped (in what order) and how a land parcel's location determines what likely redevelopment standards will be reflected. The following section will apply the emergent conceptual framework to neighbouring areas in Maddington and within a currently undeveloped portion of Kelmscott. It is contended that these areas both contain past evidence of development processes in accordance with the *Peri-urban Proximate Redevelopment Model*. The following section will also apply the framework to a centre in Gosnells. It is contended that patterns of redevelopment in this area will conform to the tenets of the *Peri-urban Proximate Redevelopment Model* in future.

Centro Maddington Shopping Centre, a major regional attractor and Tier 1 shopping centre located approximately 17km from Perth reflects the following elements of the *Peri-urban Proximate Redevelopment Model* (PRRM). (Refer to Figures 109 and 110).

1.   To the north-west, higher density infill redevelopment is evident, reflecting the redevelopment of original lots (early redeveloper attraction to central place).

2.   To the south of the central place, new higher quality, prominent residential development has been constructed (early redeveloper attraction following revision to local planning scheme, adjacent to central place).

3. Within the middle and outer zones, very little redevelopment is evident and remains large lots valued for reasons related to family and space.

The following labels appear within the figure:

Central Place (Tier 1)

Land located further from central places will not be redeveloped in large numbers (majority of recoded lots to the east).

Higher quality density infill. Prominent redevelopment close to central place.
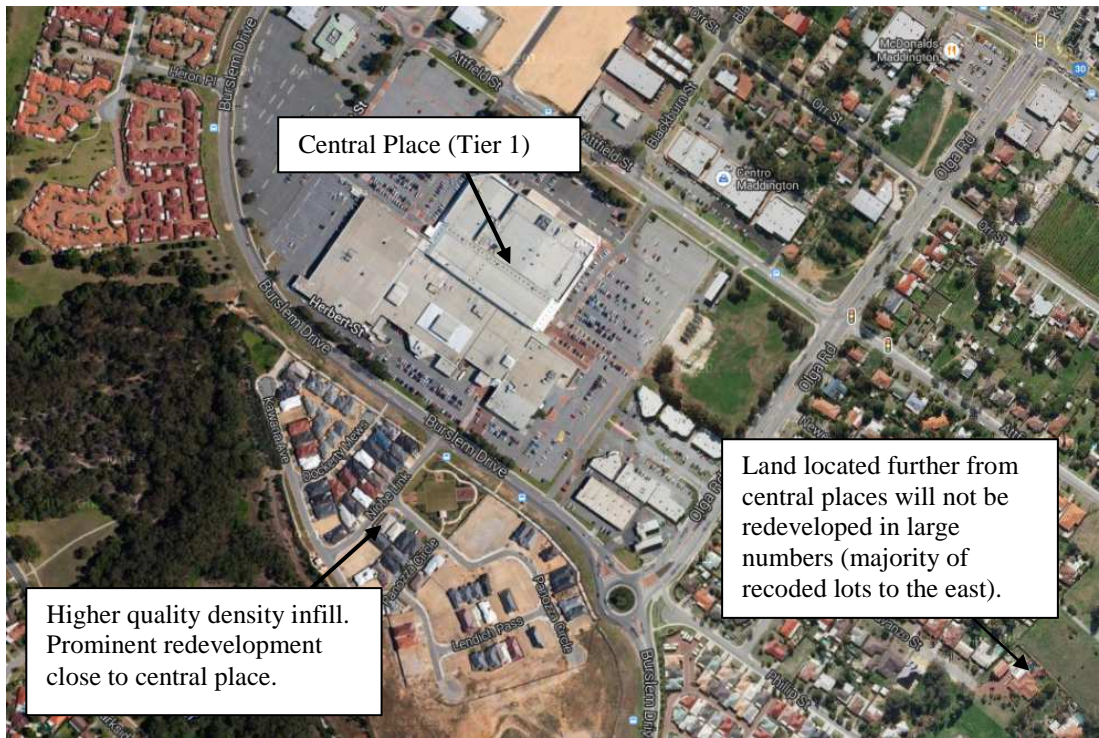
Figure 109: The Peri-urban Proximate Redevelopment Model applied to Maddington (Google Maps 2014).

The following labels appear within the figure:

Lower quality redevelopment (retained dwellings) on less prominent, local roads.

Higher quality redevelopment (new dwellings) on higher order road, abutting public open space.
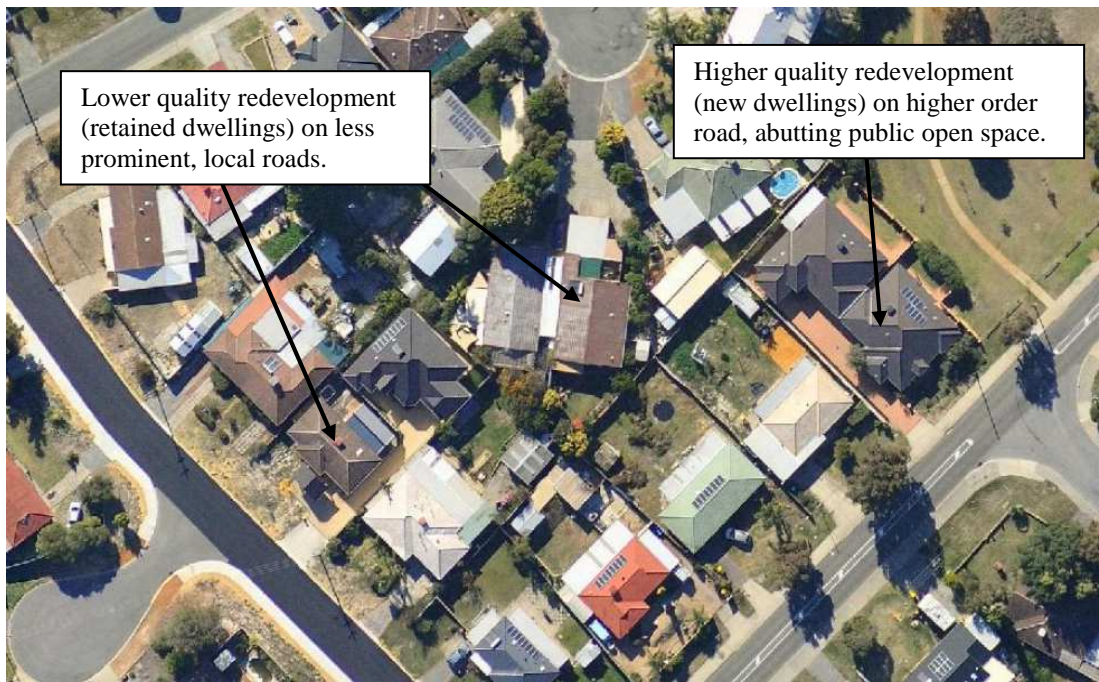
Figure 110: Evidence of the Peri-urban Proximate Redevelopment Model applied to Kelmscott (Google Maps 2014).

The above aerial photograph and following images of clustered two-lot battleaxe subdivision in Shawfield Street, Talwin Court and Third Avenue, Kelmscott are located approximately 1 km from the nearest Tier 2 central place (Kelmscott Plaza). Several elements of the *Peri-urban Proximate Redevelopment Model* are evident: redevelopment reflected along the more prominent local distributor road contains two new higher quality, large dwellings which addresses the abutting public open space in an aesthetically pleasing manner. Redevelopment reflected along the lower order access streets involves lower quality 'retain and build behind' battleaxe scenarios which do not address the streetscape or surrounding area (City of Armadale 2013) (refer to Figure 111 and 112).

Figure 111: New dwellings along prominent Third Avenue (Author 2014).

Figure 112: 'Retain and build behind', along lower order access street, Shawfield Street (Author 2014).

The following section will apply the *Peri-urban Proximate Redevelopment Model* to a currently undeveloped area in Gosnells in a predictive manner (refer to Figure 113). The subject land is located approximately 20km from central Perth. The aerial photograph below shows vacant land adjacent to a mid-tier central place (Neighbourhood Shopping Centre, appreciable attractor, Tier 3) currently zoned 'Development' requiring preparation of a structure plan prior to subdivision.

Following the rezoning process under a revised local scheme, the *Peri-urban Proximate Redevelopment Model* suggests that while currently unviable due to unsuitable residential codings, these large lots will be redeveloped first and will provide superior development outcomes. Those lots which are located far from the central place will not be redeveloped in large numbers, even if recoded favourably. Likely redevelopment outcomes for lots located in the middle and outer zones will comprise primarily *ad hoc*, poor quality opportunistic battleaxe redevelopment, often involving retention of an existing dwelling in poor condition.

Figure 113: Prediction of future redevelopment in accordance with the Peri-urban Proximate Redevelopment Model: Corfield Street Shopping Centre in neighbouring Gosnells (Google Maps 2014).

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The following cadastral map shows large lots observed close to a Tier 2 central place (Kelmscott Plaza), located approximately 29km from Perth (refer to Figure 114). The *Peri-urban Proximate Redevelopment Model* suggests that large land parcels located close to central places, will remain undeveloped until recoding occurs under a local planning scheme. Following this process, development yields will justify redevelopment, particularly if the site is environmentally sound (well draining soil, cleared, appropriate distance to water table, flat and level site). Future development will likely reflect higher built form standards than that which occurs far from central places, a finding reflected within the streetscape audit.
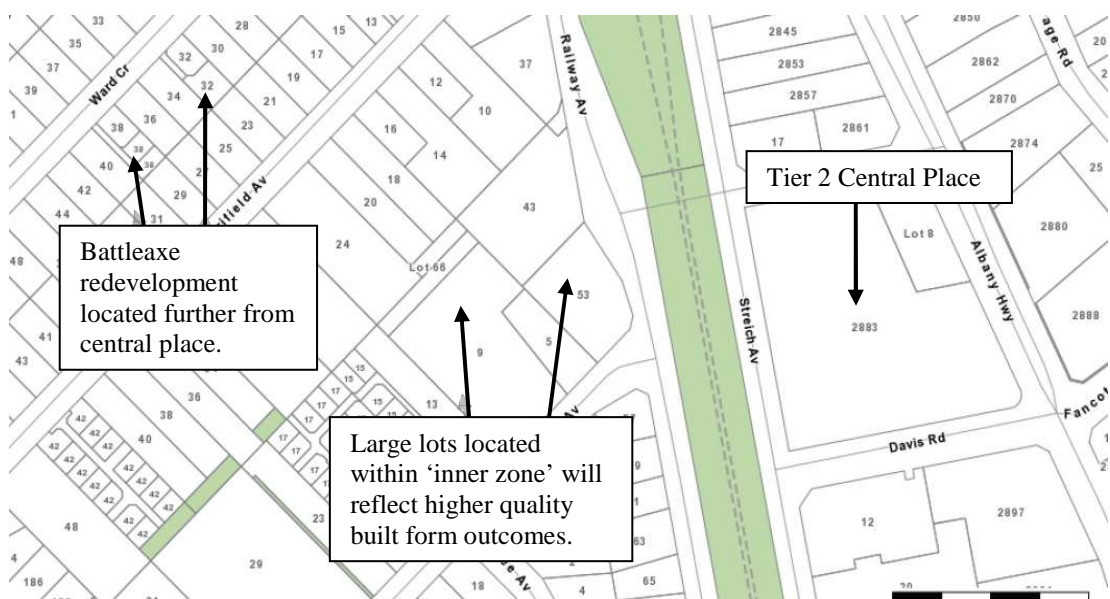
Figure 114: The Peri-urban Proximate Redevelopment Model applied to the study area (Kelmscott) (City of Armadale 2014).

The results of the semi-structured interview process reveal that if potential redevelopment sites are excessively constrained, remediation and servicing costs may prohibit redevelopment until such constraints are addressed. In a similar manner, the *Stephenson and Hepburn Report* (1955) considered that land located east of Cannington towards Armadale was unable to support urban development due to high water tables and poor drainage characteristics of the local soil. By the time of the release of the *Corridor Plan* in 1970 however, drainage infrastructure had improved, local development constraints were no longer considered insurmountable and urban development was proceeding in the area.

This section of the study will apply the *Peri-urban proximate redevelopment model* to other Australian cities (refer to Figures 115 – 118).

Battleaxe redevelopment located 800m from central place.

Higher quality redevelopment (new dwellings) abutting major road.

Larger landholding to be redeveloped shortly after the introduction of a new scheme. Current zoning provides insufficient potential yield.
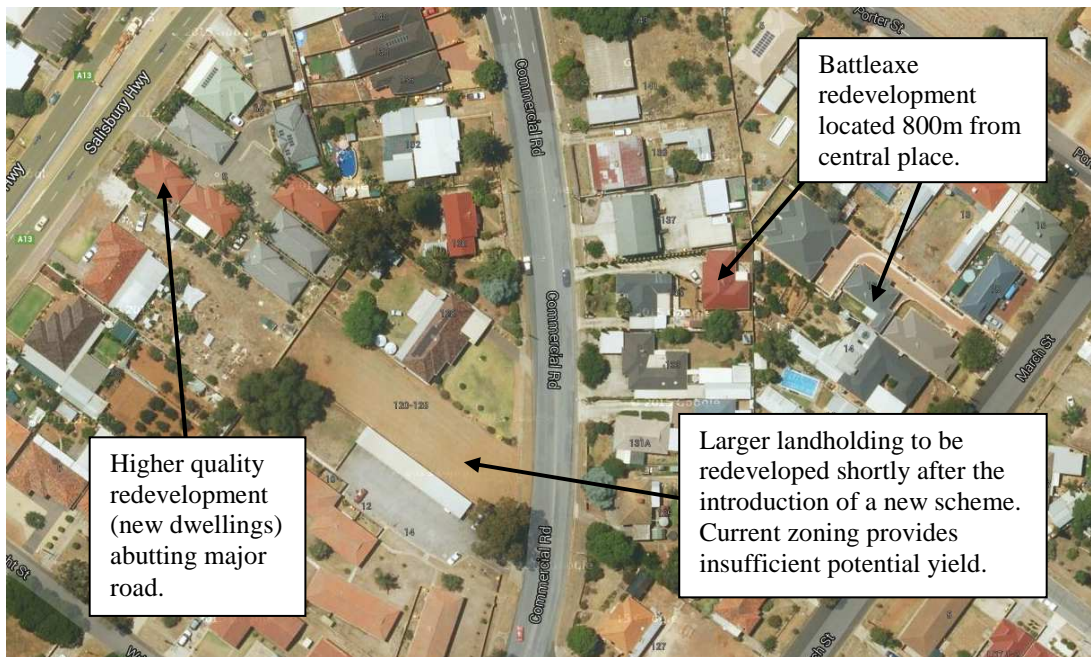
Figure 115: Battleaxe rear strata redevelopment located 800m from 'Parabanks Shopping Centre' (Google Maps 2015).

Battleaxe redevelopment located 1.7km from central place.
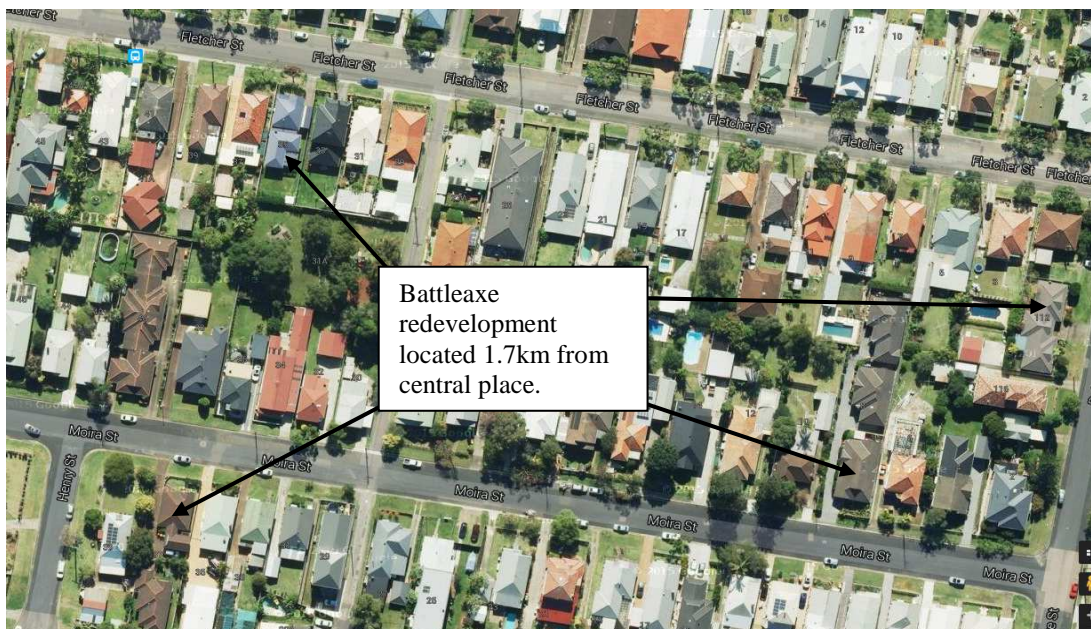
Figure 116: Battleaxe retention rear strata redevelopment located 1.7km from 'Westfield Kotara' (Google Maps 2015).
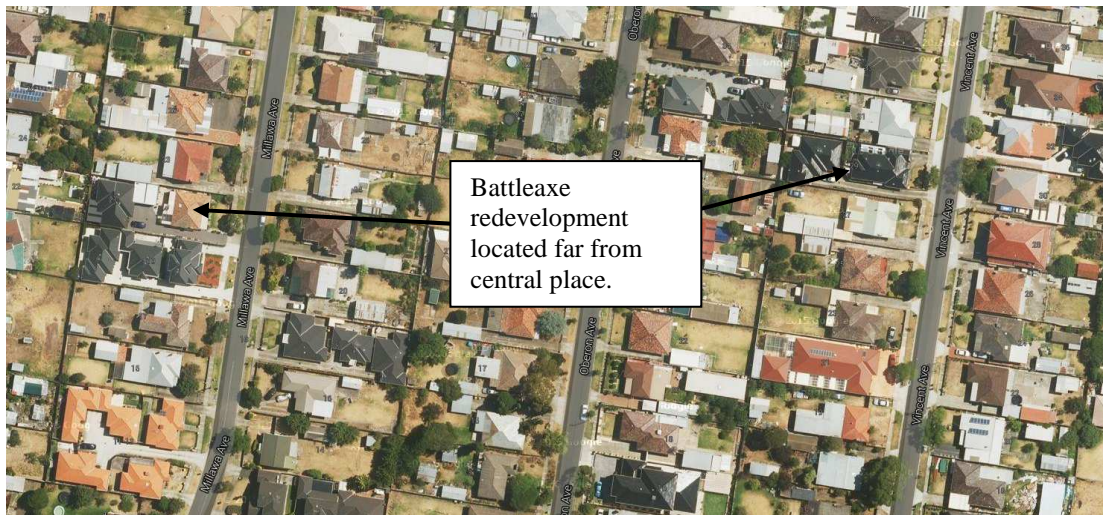
Figure 117: Grouped dwelling and battleaxe redevelopment located 1.5km from 'St Albans Supa IGA' (Google Maps 2015).

Figure 118: Rear strata battleaxe redevelopment located 1.2km from 'Woolworths Schofields' (Google Maps 2015).

Figure 115 shows a number of battleaxe redevelopment sites located approximately 800m from 'Parabanks Shopping Centre', a Tier 2 central place, 25km north of Adelaide, South Australia. Figure 116 shows numerous 'battleaxe retention' redevelopment sites located approximately 1.7km from a Tier 2 central place, 'Westfield Kotara', in Adamstown, a suburb of Newcastle. Figure 117 shows numerous grouped dwelling and retrofitted 'battleaxe retention' redevelopment sites located approximately 1.5km from a Tier 3 central place, 'St Albans Supa IGA' in Kealba, Melbourne, located approximately 16km north-west of the central business district.

Figure 118 shows numerous rear strata battleaxe redevelopment sites located approximately 1.2km from 'Woolworths Schofields' a Tier 2 central place in Marsden Park, approximately 49km north-west of the Sydney central business district.

Within the four examples provided above, several elements of the *Peri-urban Proximate Redevelopment Model* are evident: redevelopment reflected along lower order roads, far from central places includes lower quality retrofitted 'retain and build behind' battleaxe scenarios which do not address the streetscape or surrounding area. The more prominent Salisbury Highway shown in Figure 115 accommodates higher quality, new identical dwellings which avoids the retention of poor condition dwellings. All of the above examples demonstrate that the *Peri-urban proximate redevelopment model* can be applied beyond the study area (Refer to Figures 115 – 118).

Chapter 9: Conclusion

9.1   Conclusions and lessons of study

Several clear, unambiguous conclusions can be drawn from this study applicable to other low density cities in Australia and elsewhere. The first of these can be summarised thus: the role and representation of Armadale has vastly changed over time within the strategic planning process. Perth has experienced unabated population growth since the 1950s and as such the demand for residential land on the periphery has greatly increased. Since 1955 the overall vision for Armadale has shifted according to demand for various land uses to support the metropolitan centre, including: agricultural, manufacturing, tourism, light industrial, commercial, recreational and urban land. A number of these land uses remain significant to Armadale, including light industrial, commercial and urban land, while other land uses have declined in significance over time.

This study allows us to draw conclusions related to present day concerns about increasing densities in peri-urban settlements. Firstly, prominent vacant land parcels located near central places in such areas are those most often targeted for redevelopment. Such parcels comprise well located, larger, serviced lots often abutting higher order roads, which this study reveals will be among the land to be redeveloped shortly following the rezoning process. Secondly, this study concludes that within established peri-urban areas, recoding and amending local planning schemes does not result in immediate redevelopment by local residents, particularly if land values are relatively low. Redevelopment rates in low density suburban areas are therefore difficult to predict in advance by planners. Overall this study concludes that it should not be assumed that recoding suburban areas in a blanket fashion will result in immediate redevelopment activity.

The comparatively low levels of residential redevelopment observed throughout the study area since 2005 when *Town Planning Scheme No. 4* was introduced, supports the predominant view within the literature that large dwellings remain the preference within countries such as Australia and New Zealand (Jain 2008; Vallance et al 2004; Weller 2009).

Many dwellings observed within the study area were found to reflect improvements such as additions, patios and sheds with expanses of landscaped private open space. Australians living on the periphery clearly value space above other considerations and remain content with the current low density suburban model. Several resource persons interviewed considered that present land values have not proven a trigger for redevelopment. If land values were to increase, a definite 'tipping point' may be observed where economic gains outweigh the desire for larger dwellings and private open space. Perhaps such a scenario will arrive in Armadale in the future as land values rise, however at present urban redevelopment as permitted under *Town Planning Scheme No. 4* has not penetrated Armadale to a significant degree. This finding is supported by the overrepresentation of detached dwellings throughout the sub-region (91%) relative to the rest of Perth (77%) as noted within *Directions 2031 and Beyond* (WAPC 2010).

The streetscape audit revealed the presence of two distinct redevelopment processes within Armadale: *small-scale redevelopment* and *medium to larger-scale redevelopment*. The former typically constitutes a single land parcel with an associated dwelling undergoing redevelopment in isolation without regard to the wider precinct. The latter constitutes the work of developers or investors with the means to purchase larger lots and construct a greater number of dwellings while meeting Council requirements for communal open space, new fencing, landscaping and brick paved driveways.

In such cases, ageing dwellings are demolished to facilitate new single storey grouped dwellings or 'villas' at a density of R25, R30 or R40. Such an approach is intended to meet the City's aims of providing an improvement to streetscapes, however recent Council agenda items reveal that much redevelopment has not met anticipated standards (City of Armadale 2007, 2010). Overall however, redevelopment outcomes provided by medium-scale developers were observed to reflect higher standards than smaller-scale redevelopers, primarily as a result of the practice of removing and replacing poor quality housing stock.

A lesson to be derived from this study concerns the overall quality of built form as a result of the redevelopment process. This element is what the local authority refers to as 'improvement to streetscapes' (City of Armadale 2007). For larger prominent lots, located on higher order roads located close to shopping facilities, higher quality redevelopment was typically observed. Grouped dwellings located along higher order roads such as Railway Avenue in Armadale, sites located close to central Armadale and those observed along Third Avenue in Kelmscott adjacent to Kelmscott Plaza, were shown to reflect higher quality development outcomes than the more common 'battleaxe' dwelling configuration.

The poorest redevelopment examples were observed where an ageing dwelling had been retained and a new dwelling was constructed at the rear of the lot, far from central places with only a marginally improved streetscape or no discernible improvement. Therefore, the findings of this study supports the City's concerns regarding poor design standards and also supports Weller and Bolleter's contention that much infill redevelopment in Perth is undertaken primarily for opportunistic short term profit (2013).

It can therefore be concluded that piecemeal urban redevelopment in isolation, in the absence of appropriate guidance as observed, often does not yield positive design outcomes. Recent stages of *Directions 2031 and Beyond* have outlined that the State planning agency has attempted to address this by acting in concert with local authorities to ensure that development sites for infill are made available in accessible and environmentally sound locations.

A study of other local authority experiences with residential upcoding, such as that undertaken within the City of Stirling (2009) revealed that most resident objection concerns a fear of creating low quality or mediocre, poorly designed developments with a resulting loss of privacy and amenity. As a result resistance to higher densities (NIMBYism) remains a strong presence in Perth. This view was supported by several resource persons who raised concerns relating to inferior housing built form in Armadale, loss of space, reduced amenity and related social problems which can be associated with incremental blanket redevelopment.

The semi-structured interviews undertaken revealed that local authorities that have implemented higher codings with strong design controls have benefitted from higher quality development outcomes. The City of Belmont guidelines requiring two-storey development in return for a density bonus was cited as a positive example of this. Such design controls are accompanied by a suite of local planning policies.

Several resource persons suggested that providing a density bonus for higher quality developments is a superior planning approach which the City of Armadale could aspire to and implement. Developers would receive incentives for higher quality built form and the existing practice of 'building on the cheap' would prove less viable, with lower density 'penalties' applying. Although higher density redevelopment is permitted in such scenarios, it is strongly guided by the local authority and results in a higher quality built environment, according to resource persons.

After the first few months of the implementation of *Town Planning Scheme No. 4*, many development applications presented a lower standard of development than anticipated, which supports the view of resource persons that guidance provided by the *Residential Design Codes* alone does not provide sufficient redevelopment controls. The introduction and subsequent amendment of Local Planning Policy *PLN 3.1* in 2007 provided an attempt at greater regulation than that offered by *the Residential Design Codes* alone.

Despite this however, many poor examples of redevelopment undertaken since 2005 were observed throughout the streetscape audit. This is possibly as a result of Council's finite resources, including a lack of planning compliance undertaken and insufficient post-redevelopment inspections undertaken. The semi-structured interviews undertaken during the course of this study revealed the inadequacy of the 'business as usual' approach and revealed that market forces alone will not reshape communities such as Armadale in accordance with an overall vision of a more compact, self-sufficient, public transport oriented urban form where residents are provided with high quality, attractive alternatives to existing suburbia.

The streetscape audit undertaken revealed that poor redevelopment examples had failed to rejuvenate the City's dwelling stock and fulfil density bonus provisions set out within *Town Planning Scheme No. 4*. The City of Armadale has not yet introduced an holistic vision of an alternative living environment within its local planning scheme. Instead, the main planning approach within the study area has centred around manipulating density codings in an incremental manner and as such, the City has been forced to deal with the associated consequences of mediocre redevelopment. It is contended that a superior approach would be for the City to provide acceptable housing designs for each higher residential coding permitted and allow redevelopment subject to the removal of ageing, poor condition housing stock.

9.2   Reflection on Perth's strategic planning and legacy of each plan

Armadale has been included within all of Perth's successive overarching planning frameworks since 1955, particularly as its importance as a residential and commercial centre has increased. The two most recent planning strategies for Perth, *Network City* (2004), and *Directions 2031 and Beyond* (2010) have sought urban consolidation targets aimed at increasing the density of Perth's housing stock within existing suburban boundaries, despite the community's general reluctance to support higher density forms. Results of this study however, show that higher density housing has been embraced and implemented with minimal opposition within Armadale as it has been administered by the local authority in a consultative, gradual and transparent manner under *Town Planning Scheme No. 4*. The City of Armadale has much to teach other planning agencies in conducting the public consultation process when introducing new planning strategies, policies and schemes.

The introduction of the *Stephenson and Hepburn Report* in 1955 marked the first in a series of strategic plans that have shaped Armadale's development, reflecting the dominant planning moods, movements and ideology of the time. This was followed in 1970 by the *Corridor Plan*, shifting from a compact city paradigm to one which advocated urban dispersal and decentralisation along designated belts radiating from the CBD towards Armadale.

Of all of Perth's strategic plans, the *Corridor Plan* has been the most maligned, being widely blamed as a contributor to Perth's current car-dependent, low density physical form, contradicting the intent of the prior *Stephenson and Hepburn Report*. It could also be argued that the *Corridor Plan* failed to provide benefits to Armadale as during this era it remained hampered by its peripheral location and was failing to grow in an anticipated manner (DOPAUD 1990). Despite this, the corridor planning model remained the dominant planning model in Perth for over 20 years and strongly influenced 1990's *Metroplan*.

It can be argued that the spatial framework established during the 1970s remains to the present. The legacy of the *Corridor Plan* can be clearly seen within the *Metropolitan Region Scheme* with its clearly defined radiating 'belts' in a northerly, southerly, north-easterly and south-easterly direction to Armadale. It is contended that the corridor planning model has been the most successful planning approach for Perth since 1955, evident in urban zoned land now extending contiguously from Perth's centre to Armadale. The current planning strategy for Perth and Peel, *Directions 2031 and Beyond*, acknowledges the planning ideologies of the past and their relationship with Perth's current low density suburbs. It aims at finding a balance between managing outward growth and the more efficient, more intensive use of existing land in a similar manner to *Network City* previously. This approach strongly influenced the preparation of the City of Armadale *Town Planning Scheme No. 4* which since 2005 has sought urban consolidation within the study area.

All planning strategies for Perth and Peel since 1955 have contained strong features and elements in common. These include: encouraging diversity in housing types, promoting efficient transport networks, seeking the preservation of the region's natural features and acknowledging Perth residents' preference for low density suburbia. All have commented on themes such as: density, scale of buildings, the nature of work, accessibility, natural environmental features, people and all have identified various rural areas for urban expansion. Each plan has left a unique mark on Armadale's built form, serving as a long-standing reminder of the social, political, economic and environmental approaches in vogue at each point in time as well as the importance of robust, long-term strategic planning.

9.3   Overall recommendations

Overall recommendations of this study through data collection, the literature review and the semi-structured interviews undertaken are summarised as follows:

1.   Moving beyond piecemeal redevelopment of individual lots without regard to the wider precinct;
2.   Greater use of redevelopment design controls;
3.   Allowing more compact housing forms within existing areas and providing for a diversity of housing forms;
4.   Permitting a greater degree of mixed-use development;
5.   Expanding innovative housing, considering innovative options;
6.   Introducing dual occupancy provisions for large, single lots.

These recommendations are outlined in greater detail below.

1. *Moving beyond piecemeal redevelopment of individual lots without regard to the wider precinct*

The results of this study reveals that piecemeal redevelopment of individual lots does not produce quality built form outcomes and is often opportunistic in nature. Such redevelopment is of inadequate density and quality to contribute to the sustainable transformation of Armadale and may limit future opportunities for urban regeneration. Large and powerful organisations such as the Metropolitan Redevelopment Authority possess significant advantages in this regard, particularly with respect to land assembly and the funding of projects. These advantages are not available to small-scale redevelopers, who may also suffer from greater financial constraints. This was evident in the numerous examples of poor quality small-scale redevelopment observed throughout the streetscape audit.

It is recommended that the State planning agency work with local authorities to identify larger parcels of land for densification and upcoding near services, activity corridors and activity centres. Measures such as implementation plans could work to more closely guide the quality of development which occurs throughout Armadale and Perth. The current 'lip service' provided for in State planning strategies as evident through aspirational objectives such as 'sustainability', 'accessibility' and 'housing affordability' can often bear little relationship to specific built form outcomes and greater development specificity and imagery is required. The introduction of overarching planning documents in the absence of comprehensive strategies to implement initiatives such as infill development should be addressed by the planning system.

If informal redevelopment currently taking place in Armadale could be co-ordinated in an overall precinct approach, significant development advantages to the locality would ensue. This co-ordinated process would involve the amalgamation of several lots to create larger higher density redevelopment sites. This is seemingly prohibitive for individual landowners at present due to the fragmentation of land ownership. Co-ordination of landholdings depends on the agreement of multiple parties with respect to the timing of redevelopment, however such an approach would provide numerous benefits to the City.

2. *Greater use of redevelopment design controls*

It is recommended that higher coding provisions including density bonuses be permitted subject to stricter design criteria being met. Such an approach will contribute to improving streetscapes and shifts the focus to higher quality housing development to ensure that such standards are implemented 'on the ground'. The streetscape audit revealed that higher density development beyond the single storey model has not penetrated Armadale to a significant degree. It is recommended that Council extend provisions within Policy PLN 3.1 to enforce an emphasis on distinctive and high quality urban design elements. This will assist in the regeneration of the study area and meet Council's aims of streetscape enhancement.

It is also recommended that the local authority more closely regulate battleaxe redevelopment, part of the mediocre environments it is argued has been characteristic of infill redevelopment in Perth for the last several decades. Additional policy provisions to address battleaxe redevelopment are required and this significant aspect is largely unaddressed within Armadale's local planning instruments. The mechanism to allow higher density development in dual coded areas subject to strict criteria being met requires tightening in order to achieve improvements to local amenity and housing quality (City of Armadale 2007).

It is therefore recommended that Council continue to monitor, enforce and extend the level of development control which occurs in the City prior to issuing planning approvals and building permits. Site visits before and after development has been carried out for example, will ensure that improved development standards can be met, however the common scenario where an ageing poor condition dwelling is retained and a new dwelling constructed in a former backyard should no longer be permitted due to the potential for poor redevelopment outcomes.

3. *Allowing more compact housing forms in areas beyond Armadale and providing for a diversity of housing forms*

While Armadale has been one of the first local authorities to embrace higher density redevelopment, the detached low density housing model remains the preferred model throughout Perth. It is significant to note that the City of Armadale prepared the 2005 local planning scheme reflecting low density codings, however State government intervention obliged the City to provide higher density codings within the study area.

All planning strategies since 1955 have emphasised the importance of more compact dwellings, however over 90% of all dwellings in the study area remain single detached dwellings on original lots (WAPC 2010). This study contends that the planning system should encourage a greater proportion of more compact dwellings, including multiple dwellings. A larger proportion of housing stock could be accommodated by 1 and 2 bedroom dwellings, not currently accommodated within the current low density suburban model in Perth.

Shrinking household sizes, an increasing fragmentation of society, the changing nature of families and the tendency of more people to live alone (WAPC 2010) all reflect the need for planning instruments to more closely reflect community housing needs. As such, single unitary low density residential codings discouraging housing diversity may no longer be appropriate.

Further, the semi-structured interview process revealed that the R25 density code, predominant within the study area, does not always provide the best overall built form redevelopment outcomes. The local authority can address this by considering densification beyond R25 and R30 to facilitate high quality multiple dwellings throughout the City, in appropriate locations, near services and transport (central places).

4. *Permitting a greater degree of mixed-use development*

The benefits of mixed-use development are clearly articulated within the literature, were reflected throughout the semi-structured interview process and within *Directions 2031 and Beyond*, however such opportunities are also not being implemented to a significant degree within the study area. This is due to strict land use planning controls, administered by local and State governments which have tended to separate residential and commercial land uses, preventing the mixed-use model from reaching its potential. As such it is recommended that local authorities encourage a mix of residential and commercial land uses within suitable precincts.

For example the use class 'Shop' is an 'X' or prohibited use in residential zones within the city under *Town Planning Scheme No. 4*. This precludes mixed-use development, which includes shopping facilities on a ground floor and residential uses on upper floors in many areas. Although many local authorities favour a mix of residential and commercial land uses, some local authorities continue to prohibit such development outcomes. Throughout the streetscape audit, only one multiple, mixed-use dwelling was observed in Davis Road Kelmscott and it is contended that this model could be successfully expanded throughout the study area.

5. Expanding innovative housing, considering innovative options

In 2011 the City of Fremantle revised local planning regulations to permit small secondary dwellings otherwise known as 'granny flats' or ancillary accommodation within residential zones, where occupants are no longer required to be family members. This also became the case throughout W.A. under the *Residential Design Codes* in August 2013 (WAPC 2013).

Such an approach may encourage redevelopment and the more efficient use of land, particularly where demand for rental accommodation remains high. This can provide additional accommodation for family members or university students for example, close to services and infrastructure and increases potential rental yields. This approach is supported by numerous scholars, including Weller and Bolleter (2013) who consider that consideration of a broader range of household types is necessary in a pressured housing and rental market.

6. Introducing dual occupancy provisions for large, single lots

The results of this study revealed that land fragmentation is increasing within the study area due to survey-strata subdivision proposals which result from higher density redevelopment. For example, for a development proposing 10 units on a single lot, the land will typically be fragmented into 11 lots (10 lots as well as a common property access leg). This may compromise future urban renewal and redevelopment opportunities due to excessive land fragmentation.

Both Craig (1989) and Searle (2007) in a discussion of Adelaide and Sydney respectively, advocate dual occupancy for original 'parent' lots, where two dwellings exist on one residential allotment 'without a planning permit'. This is essentially the same configuration permitted under *Town Planning Scheme No. 4* without the need to further fragment land throughout the survey-strata subdivision process. Such an approach could be considered within other local authority areas throughout Perth to avoid unnecessary land fragmentation and the creation of multiple new Certificates of Title.

9.4   <u>Policy implications, theoretical contributions and future research</u>

The research questions investigated within this study have a number of policy implications for the planning of peri-urban areas in Perth and elsewhere. Overall there remains a lack of attention to peri-urban areas as a result of a 'one size fits all' approach undertaken by planning agencies which has failed to adequately address the nature and shape of development that occurs on the ground within such regions. This inadequacy is reflected in current practice where renumbering of density codes from R15 to R15/25 on various maps (and thereby allowing increased residential densities) represents the extent of planning controls provided.

This study has identified a number of significant gaps or deficiencies within State and local planning policies in Perth. This highlights the need for greater rigour with respect to achieving desirable built form redevelopment outcomes within peri-urban areas. There is a strong case to address these gaps that allow a wide range of dwelling outcomes, including 'battleaxe retention' and other grouped dwelling redevelopments that do not meet required or desired standards as outlined by the City and resource persons. To address gaps and weaknesses within the existing policy framework, it is suggested that planning policies incorporate new redevelopment provisions. These can be incorporated at all statutory and strategic levels: strategic plans, local schemes and the *Residential Design Codes* (WAPC 2013). Such policy provisions may include:

- No rear strata 'battleaxe' grouped dwelling configurations (above 2 dwellings) should be supported where the proposal includes retention of an existing dwelling;
- Duplex subdivision and redevelopment should be supported only for corner lots, side by side lot configurations and for land that possesses dual frontage to a dedicated road or right of way. In such cases all residential dwellings should front a gazetted road, laneway or street;
- Multiple dwellings should only be permitted when amalgamation of contiguous lots located within 800m of train stations and other central places occurs. Such redevelopment should attract a 'density bonus' of R80 (up to four storeys).

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This study has contributed to the understanding of peri-urban areas through the development of a conceptual framework showing patterns of redevelopment following the rezoning and recoding process. This model can be utilised to best predict areas for densification and has pointed out the complex interaction of local factors which often shape the intended renewal of existing settlements.

It is considered that the conceptual framework developed as a result of this study is applicable within cities where the following conditions prevail: the settlement is historically marginalised, stigmatised and reflects a history of undesirable land uses and relatively low land values with increasing outward pressure from the centre for urban expansion. This study has contributed to an understanding of how peri-urban areas are planned for and it is hoped that the model can be widely applied.

The following areas are suggested for future research related to this topic:

- Further examination of provisions within existing schemes, policies and other frameworks to emphasise quality of redevelopment, particularly within peri-urban centres;
- Greater research on the factors that promote successful implementation of densification within existing suburban areas including multiple dwelling redevelopment sites within peri-urban areas;
- Further research demonstrating, in dollar terms, the negative impacts of certain forms of redevelopment in peri-urban areas such as the retention of poorly maintained existing dwellings;
- Further case study investigations of centres undergoing transformation to examine the drivers of successful urban renewal. Determining the extent and nature of the role played by strategic planning, statutory planning and other forms of regulation;
- Further application and testing of the *Peri-Urban Proximate Redevelopment Model* outside of Western Australia.

9.5   Overall performance of the study area since 1955

So has Armadale achieved various visions set out for it since 1955? The results of this study reveal that Armadale has met high development standards in several significant precincts. New areas such as Piara Waters and North Forrestdale have provided high quality examples of urban development, with land values and resident attraction comparable to areas such as neighbouring Canning Vale attesting to this.

Figure 119: Significant retail investment has been attracted to the City of Armadale in recent years since the introduction of Town Planning Scheme No. 4 in 2005 (Author 2014).

The degree of investment and strong rates of population growth experienced within Armadale in recent years also attest to a flourishing and thriving sub-region, when compared with the era of the *Corridor Plan* which considered that the area had been hampered by its peripheral location. The hills areas of Bedfordale and Roleystone also accommodate peaceful attractive surrounds, reflecting a high quality built form.

Figure 120: New café located on Albany Highway in Kelmscott, provides a high quality attractor and meeting place for the local community, developed since the introduction of Town Planning Scheme No. 4 in 2005 (Author 2014).

Various areas controlled by the Metropolitan Redevelopment Authority have resulted in high quality redevelopment. For example Champion Lakes and the Central Armadale shopping precinct have greatly improved the facilities and built form examples which previously occupied the locality. Investment by major retailers have also contributed to retail options within the City, as has major growth areas of light industrial land included within the *Economic and Employment Land Strategy for Perth and Peel* (WAPC 2012).

Much redevelopment that has occurred as a result of *Town Planning Scheme No. 4* has contributed to revitalising the City as has the large-scale project work undertaken by LandCorp. Redevelopment that has occurred as a result of *Town Planning Scheme No. 4* since 2005 has permitted developers and retailers to occupy and develop parcels of formerly underutilised and inappropriately zoned land (refer to Figures 119 and 120).

Figure 121: Redevelopment should move away from poor 'retain and build behind' battleaxe scenarios which may compromise future redevelopment opportunities (Author 2014).

The main area where it is contended that Armadale continues to 'miss the mark' and fall short of high development standards is the numerous observed examples of battleaxe redevelopment in the locality. In such cases, a front dwelling in poor maintenance condition and with little heritage value is retained and a new (although often poor quality dwelling) is constructed at the rear of the lot (Refer to Figure 121). Such examples contribute to poor streetscapes and foster Armadale's reputation as a low socio economic area with a high prevalence of poor quality housing stock. Weak controls provided by planning instruments such as the *Residential Design Codes* and established implementation practices, which have focussed on 'pre' and not 'post' development outcomes have failed portions of Armadale in this respect.

Redevelopment shown below is one of many observed examples which has failed to renew the streetscape and also failed meet conditions of redevelopment (refer to Figure 122). These conditions typically include the following elements: upgrading of existing dwellings, submission of colour schedules to enhance visual amenity, submission of a comprehensive landscape plan (including the verge) that includes West Australian natives, high quality fencing demonstrating visual permeability, brick paved driveways and a contribution for kerbing and footpaths to be reinstated following the redevelopment process.

Figure 122: Poorly executed battleaxe redevelopment, Merrifield Avenue Kelmscott, located approximately 500m from the Kelmscott Train Station (Author 2014).

Such redevelopment offers little benefit to the community while increasing the legal fragmentation of land, limiting future redevelopment opportunities. Despite local planning policy guidance in respect to improving retained dwellings, such improvements have failed to be adequately implemented within the study area. Council's view is that many developers, who have gained an economic benefit through the urban consolidation process, have not been willing to contribute to improved housing stock and much remains in poor condition. This opportunistic redevelopment was observed frequently within the study area.

The results of this study demonstrate that redevelopment standards for grouped dwellings must greatly improve if Armadale is to rise above its disadvantaged and stigmatised past. This study recommends that the City no longer support the retention of ageing, poor condition dwellings within the study area. The removal and replacement of such housing stock will allow provisions contained within *Town Planning Scheme No. 4* to be implemented most successfully and will contribute to Council's main objective of enhancing and renewing poor existing streetscapes.

Appendices

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Appendix A: Raw data, streetscape audit

Street Name and Suburb	No of re-developed sites	No. of Dwellings surveyed in street	% of higher density redeveloped since 2005	Relationship to closest central place / distance and hierarchy
1.Herriard Rd Armadale	Nil	13	0%	2) Champion Dve Shopping Centre 1km
2.Crawley Rd Armadale	Nil	18	0%	2) Champion Dve Shopping Centre 1.1km
3.Exbury Rd Armadale	Nil	27	0%	2) Champion Dve Shopping Centre 1.3km
4.Galliers Rd Armadale	3 sites: one new, 2 b/a	61	4.9%	2) Champion Dve Shopping Centre 1.3km
5.Carringal Pl Armadale	Nil	14	0%	2) Champion Dve Shopping Centre 600m
6.Elanora Rd Armadale	Nil	36	0%	2) Champion Dve Shopping Centre 750m
7.Timbarra St Armadale	1 new site	21	4.7%	2) Champion Dve Shopping Centre 800m
8.Gaze St Armadale	Nil	28	0%	2) Champion Dve Shopping Centre 1km Existing Duplex predates TPS 4
9.Leumeah St Armadale	1 b/a	22	4.5%	2) Champion Dve Shopping Centre 750m
10.Tambulam Wy Armadale	Nil	33	0%	2) Champion Dve Shopping Centre 650m Existing Duplex predates TPS 4
11.Claunelle St Armadale	Nil	12	0%	2) Champion Dve Shopping Centre 750m
12.Phylma St Armadale	Nil	20	0%	2) Champion Dve Shopping Centre 750m
13.Warrina St Armadale	Nil	26	0%	2) Champion Dve Shopping Centre 1km
14.Wilcannia Wy Armadale	4 sites: 2 b/a, 2 new	53	7.5%	1) Armadale Shopping City 1.1km New redevelopment
15.Little John Rd Armadale	10 sites: 9 new, 1 b/a	72	13.8%	1) Armadale Shopping City 750m New redevelopment
16.Tuck St Armadale	4 sites: 3 new, 1 b/a,	22	18.1%	1) Armadale Shopping City 400m * @
17.Gladstone Rd Armadale	7 sites: 6 new, 1 b/a,	36	19.4%	1) Armadale Shopping City 700m
18.Lowanna Wy Armadale	4 new sites	101	3.9%	1) Armadale Shopping City 1km
19.Napean Pl Armadale	Nil	8	0%	2) Champion Dve Shopping Centre 1.5km
20.Cheritons Pl Armadale	Nil	14	0%	2) Champion Dve Shopping Centre 1.5km
21.Tait St Armadale	5 new sites	29	17.2%	1) Armadale Shopping City 1.5km

22.Wyloo Pl Armadale	Nil	9	0%	1) Armadale Shopping City 1.5km
23.Robe Pl Armadale	Nil	8	0%	1) Armadale Shopping City 1.2km
24.Challis Rd Armadale	12 new sites	137	8.7%	3) Champion Dve Shopping Centre 100m * #
25.Duri St Armadale	Nil	36	0%	1) Armadale Shopping City 1.0km
26.Mardi Ct Armadale	Nil	9	0%	1) Armadale Shopping City 1.0km
27.Cowra Ct Armadale	Nil	8	0%	1) Armadale Shopping City 1.2km
28.Pelham St Armadale	Nil	40	0%	1) Armadale Shopping City 1.4km
29.Piggott St Armadale	Nil	16	0%	1) Armadale Shopping City 1.4km
30.Rigden St Armadale	Nil	30	0%	1) Armadale Shopping City 1.2km
31.Selby St Armadale	Nil	17	0%	1) Armadale Shopping City 1.3km
32.Nielson Ave Armadale	Nil	24	0%	1) Armadale Shopping City 1.5km
33.Mornington St Armadale	Nil	31	0%	1) Armadale Shopping City 1.4km
34.Townley St Armadale	1 new site	93	1%	4) Townley St Deli 500m
35.Barge Ct Armadale	1 new site	11	9%	4) Townley St Deli 900m
36.Brixey Ct Armadale	1 b/a	16	6.2%	4) Townley St Deli 800m
37.Bell Ct Armadale	Nil	12	0%	4) Townley St Deli 800m
38.Mill Pl Armadale	3 sites: 1 new 2 b/a	4	75%	4) Townley St Deli 700m
39.Pollitt Cl Armadale	Nil	16	0%	4) Townley St Deli 700m
40.Forrest Rd (major) Armadale	4 sites: 2 new, 2 b/a	123	3.2%	Abuts Armadale Shopping City to 1.2km
41.Fountains Ct Armadale	1 b/a	23	4.3%	1) Armadale Shopping City 200m * @
42.Westminster Ct Armadale	Nil	15	0%	1) Armadale Shopping City 400m * @
43.Forde Pl Armadale	Nil	7	0%	1) Armadale Shopping City 400m * @
44.Owtram Rd (major road) Armadale	7 new sites	30	23.3%	1) Armadale Shopping City 600m
45.Frys Lane Armadale	Nil	18	0%	1) Armadale Shopping City 500m
46.Sherbourne Wy Armadale	Nil	23	0%	1) Armadale Shopping City 400m * @
47.Newton Ct Armadale	Nil	16	0%	1) Armadale Shopping City 300m * @
48.Blythe Pl Armadale	Nil	9	0%	1) Armadale Shopping City 500m
49.Glastonbury Rd Armadale	Nil	22	0%	1) Armadale Shopping City 100m * #

50.Orchard Av Armadale	Nil	Nil	0%	1) Armadale Shopping City 50m * #
Jull St Armadale	**Nil**	**Nil**	**0%**	**EXCLUDED 1) Armadale Shopping City 100m, no lot frontages**
Church Av Armadale	**Nil**	**Nil**	**0%**	**EXCLUDED 1) Armadale Shopping City 300m, no lot frontages**
Albany Hwy Armadale	**Nil**	**Nil**	**0%**	**EXCLUDED Control of access road, no redevelopment potential**
51.Tudor Rd Armadale	Nil	10	0%	1) Armadale Shopping City 100m * #
52.Marian Ave Armadale	2 new sites	37	5.4%	1) Armadale Shopping City 300m * @
53.Dale Rd Armadale	4 new sites	15	26.6%	1) Armadale Shopping City 500m
54.Sheriff Pl Armadale	Nil	4	0%	1) Armadale Shopping City 1km
Armadale Rd Armadale	**Nil**	**Nil**	**0%**	**EXCLUDED Control of Access road, no lot frontages**
55.Prospect Rd Armadale	Nil	26	0%	1) Armadale Shopping City 200m * @
56.Whitehead St Armadale	Nil	1	0%	1) Armadale Shopping City 50m * #
57.Third Rd Armadale	Nil	15	0%	1) Armadale Shopping City 50m * #
58.Thomas St Armadale	1 new site	22	4.5%	1) Armadale Shopping City 100m * #
59.Fourth Rd Armadale	Nil	31	0%	1) Armadale Shopping City 200m * @
60.William St Armadale	1 b/a	35	2.8%	1) Armadale Shopping City 250m * @
61.John St Armadale	5 new sites	41	12.1%	1) Armadale Shopping City 200m * @
Commerce Ave Armadale	**Nil**	**0**	**0%**	**EXCLUDED Non-residential road, no lot frontages**
62.Green Ave Armadale	Nil	0	0%	1) Armadale Shopping City 600m
63.Selkirk Rd Armadale	2 b/a	16	12.5%	1) Armadale Shopping City 300m * @
Tesla Way Armadale	**Nil**	**0**	**0%**	**EXCLUDED Non-residential road, no lot frontages**
Twelfth Rd Armadale	**Nil**	**171**	**0%**	**EXCLUDED Rural road, no lot frontages**
Tonkin Hwy Armadale	**Nil**	**0**	**0%**	**EXCLUDED Control of access highway, no lot frontages**
Eleventh Rd Armadale	**Nil**	**0**	**0%**	**EXCLUDED Rural road, no lot frontages**
64.Wungong Rd Armadale	Nil	162	0%	1) Armadale Shopping City 1km
65.Stepney Rd Armadale	Nil	22	0%	1) Armadale Shopping City 1km
66.Prout Rd Armadale	Nil	12	0%	1) Armadale Shopping City 1km
67.Anton Rd Armadale	Nil	0	0%	4) Townley St Deli 500m
68.Brookdale Dve Armadale	1 b/a	38	2.6%	4) Townley St Deli 500m

69.Ypres Rd Camillo	Nil	84	0%	2) Westfield Shopping Centre 500m
70.Adelina Ct Camillo	Nil	20	0%	2) Westfield Shopping Centre 1km
71.Glenhurst Ct Camillo	1 b/a	22	4.5%	2) Westfield Shopping Centre 750m
72.Elouera Rd Camillo	Nil	4	0%	2) Westfield Shopping Centre 850m
73.Lindy Wy Camillo	1 b/a	33	3%	2) Westfield Shopping Centre 800m
74.Waratah Dve Camillo	Nil	56	0%	2) Westfield Shopping Centre 750m
75.Sullivan Dve Camillo	Nil	57	0%	2) Westfield Shopping Centre 550m
76.Amanda Dve Camillo	Nil	81	0%	2) Westfield Shopping Centre 1km
77.Kari Ct Camillo	Nil	12	0%	2) Westfield Shopping Centre 650m
78.Cherry Wy Camillo	Nil	4	0%	2) Westfield Shopping Centre 900m
79.Hakea Rd Camillo	Nil	15	0%	2) Westfield Shopping Centre 800m
80.Guinivere Rd Camillo	Nil	45	0%	2) Westfield Shopping Centre 750m 2) Kelmscott Plaza 650m
81.Galahad Pl Camillo	Nil	7	0%	2) Westfield Shopping Centre 750m 2) Kelmscott Plaza 750m
82.Hemingway Dve Camillo	1 b/a	43	2.3%	2) Kelmscott Plaza 700m
83.Montrose Cir Camillo	Nil	33	0%	2) Kelmscott Plaza 600m
84.Ivanhoe Wy Camillo	Nil	12	0%	2) Kelmscott Plaza 450m
85.Camelot Pl Camillo	Nil	9	0%	2) Kelmscott Plaza 500m
86.Inverness Cir Camillo	Nil	102	0%	2) Kelmscott Plaza 900m
87.Dundee Wy Camillo	Nil	4	0%	2) Kelmscott Plaza 1km
88.Tweed Cl Camillo	Nil	22	0%	2) Kelmscott Plaza 1.2km
89.Kincraig Cl Camillo	Nil	8	0%	2) Kelmscott Plaza 1km
90.Kirk Cl Camillo	Nil	8	0%	2) Kelmscott Plaza 1.2km
91.Lake View Tce Champion Lakes	Nil	14	0%	2) Kelmscott Plaza 1.5km
92.Gertrude Av Camillo	Nil	24	0%	2) Kelmscott Plaza 1.5km
93.Zenobia Tce Camillo	Nil	22	0%	2) Kelmscott Plaza 1.3km
94.Clarence Wy Camillo	Nil	20	0%	2) Kelmscott Plaza 1.3km
95. Pendragon Ct Camillo	Nil	15	0%	2) Kelmscott Plaza 700m
96.Foster Rd Kelmscott	2 sites: 1 new site, 1 b/a	36	5.5%	1) Armadale Shopping City 1km

97.Schruth St Kelmscott	5 sites: 3 new sites 2 b/a	99	5%	2) Champion Dve Shopping Centre 1.4km
98.Pascoe St Kelmscott	1 b/a	12	8.3%	2) Champion Dve Shopping Centre 1.3km
99.Spencer Rd Kelmscott	4 new sites	41	9.7%	2) Champion Dve Shopping Centre 1.1km
100.Sonego Av Kelmscott	2 sites: 1 new, 1 b/a	30	6.6%	2) Champion Dve Shopping Centre 1.5km
101.Valentine St Kelmscott	2 sites: 1 new, 1 b/a	40	5%	2) Champion Dve Shopping Centre 1.5km
102.Lindley Av Kelmscott	Nil	11	0%	2) Champion Dve Shopping Centre 1.5km
103.Waltham Cl Kelmscott	Nil	50	0%	2) Champion Dve Shopping Centre 1km
104.Pearson St Kelmscott	Nil	6	0%	2) Champion Dve Shopping Centre 1km
105.Winchester Rd Kelmscott	Nil	49	0%	2) Champion Dve Shopping Centre 1.1km
106.Solent Rd Kelmscott	Nil	1	0%	2) Champion Dve Shopping Centre 1km
107.Banyard Av Kelmscott	6 new sites	67	8.9%	2) Kelmscott Plaza 400m * @
108.Merrifield Av Kelmscott	Nil	51	0%	2) Kelmscott Plaza 400m * @
109.Slee Av Kelmscott	2 sites: 1 new, 1 b/a	28	7.1%	2) Kelmscott Plaza 250m * @
110.Woburn Wy Kelmscott	Nil	33	0%	2) Kelmscott Plaza 1km
111.Patfield Pl Kelmscott	Nil	12	0%	2) Kelmscott Plaza 700m
112.Sidcup Wy Kelmscott	Nil	38	0%	2) Kelmscott Plaza 800m
113.Tollington Park Rd Kelmscott	2 new sites	71	2.8%	2) Kelmscott Plaza 1km
114.Bundalla Ct Kelmscott	Nil	17	0%	2) Kelmscott Plaza 1.2km
115.Shawfield Rd Kelmscott	1 b/a	11	9%	2) Kelmscott Plaza 1.2km Battleaxe arrangement, retain
116.Ibis Ct Kelmscott	Nil	5	0%	2) Kelmscott Plaza 1.2km
117.Talwin Ct Kelmscott	Nil	7	0%	2) Kelmscott Plaza 1km Existing Duplex predates TPS 4
118.Ravenscroft Wy Kelmscott	Nil	92	0%	2) Kelmscott Plaza 1.2km
119.Hillman Ct Kelmscott	Nil	6	0%	2) Kelmscott Plaza 750m
120.Adams Ct Kelmscott	1 new site	5	20%	2) Kelmscott Plaza 750m 8 unit site, new, larger lot
121.Regina Rd Kelmscott	Nil	48	0%	2) Kelmscott Plaza 1km
122.Ottaway St Kelmscott	2 new sites	26	7.6%	2) Kelmscott Plaza 500m All new dwellings
123.Erica St Kelmscott	Nil	9	0%	2) Kelmscott Plaza 400m * @

124.Kyabrab Wy Kelmscott	3 sites: 2 new, 1 b/a	31	9.6%	2) Champion Dve Shopping Centre 550m
125.Third Ave Kelmscott	11 new sites	131	8.3%	2) Kelmscott Plaza 1km
126.Westfield Rd Kelmscott	16 new sites	201	7.9%	2) Champion Dve Shopping Centre 1km
127.Centre Rd Kelmscott	Nil	1	0%	2) Kelmscott Plaza 1km School / Church Rd
128.Streich Av Kelmscott (major road)	10 sites: 7 new, 3 b/a	335	2.9%	2) Abuts Kelmscott Plaza 100m * #
129.Camillo Rd Kelmscott (major connector)	Nil	154	0%	2) Kelmscott Plaza 500m
130.Clarence Rd Kelmscott	Nil	18	0%	1) Armadale Shopping City 600m
131.Page Rd (north) Kelmscott	Nil	24	0%	2) Abuts Kelmscott Plaza 100m * # (Crime scene on day of survey, Police blocked road)
132.Fancote St Kelmscott	Nil	39	0%	2) Abuts Kelmscott Plaza 100m * #
133.River Rd Kelmscott	Nil	112	0%	2) Kelmscott Plaza 500m, 4) abuts local deli
134.Rundle St Kelmscott	Nil	14	0%	2) Kelmscott Plaza 800m
135.Ayton Rd Kelmscott	1 new site	14	7.1%	2) Kelmscott Plaza 800m
136.Stevington St Kelmscott	Nil	21	0%	2) Kelmscott Plaza 1.2km
Albany Hwy Kelmscott (major road)	**Nil**	**No. 2542 - 3226**	**0%**	**EXCLUDED Abuts Kelmscott Plaza, control of access highway**
137.Davis Rd Kelmscott	New multiple Dwelling	1	100%	2) Abuts Kelmscott Plaza 100m * #
138.Page Rd Kelmscott	Nil	12	0%	2) Abuts Stargate Kelmscott 100m * #
139.Fancote St Kelmscott	Nil	39	0%	2) Abuts Stargate Kelmscott 100m * #
140.Dean St Kelmscott	Nil	8	0%	2) Stargate Kelmscott 250m * @
141.Grovelands Way Kelmscott	Nil	15	0%	3) Westfield IGA 1km
142. Dyson Ct Kelmscott	Nil	7	0%	3) Westfield IGA 1.1km
143. Berala Ct Kelmscott	Nil	11	0%	3) Westfield IGA 1.2km
144. Frye Ct Kelmscott	Nil	8	0%	2) Champion Dve Shopping Centre 1.5km

Symbols representing distance from central place: 0 – 100m (#)   0 – 400m (*)   200 – 400m (@)

Appendix B: List of streets in study area - Armadale, 269 streets

Abbey Rd	Cowan St	Karoonda St	Robe Pl
Acacia Cl	Cowra Ct	Keates Rd	Robin Ct
Agnew Pl	Crawley Rd	Kembla St	Robin Hood Av
Albany Hwy	Cronin Pl	Kerun Ct	Rogers La
Allawah Ct	Cudal Pl	Kiama Rd	Rupert St
Amaroo Ct	Cull Ct	Kootingal Rd	Saw Rd
Angelo Pl	Dale Rd	Kyabram Rd	South Schruth St
Angelo St	Damerham Rd	Kyogle Pl	Scotia Pl
Angorra Rd	Damson Gr	Lathwell St	Selby St
Anham St	Dawson St	Law Cr	Selkirk Rd
Anton St	Deerness Wy	Lensham Pl	Serls St
Armadale Rd	Del St	Leumeah St	Seventh Rd
Ash Ct	Derry Av	Lewis Ct	Seville Dr
Avard Pl	Devereux St	Lilian Av	Sexty St
Avonlee Rd	Devonshire Tce	Lilika St	Shanks Ct
Baccello Wy	Dewar St	Little John Rd	Sheoak Pl
Badbury Rd	Dickens Pl	Locksley Av	Sherbourne Wy
Balanda Pl	Donald Ct	Lowanna Wy	Sheriff Pl
Ballina Wy	Doorigo Rd	Mallee Pl	Sherwood Ct
Barellan Ct	Dower Ct	Mardi Ct	Sinclair St
Barge Ct	Dryandra Wy	Marian Av	Sixth Rd
Baryna St	Dural Wy	Mason St	Smith Cl
Bavich Rd	Duri St	Masuli Wy	Solent Rd
Bedfordale Hill Rd	Edgeroi Wy	May Cl	South Western Hwy
Bell Ct	Egan St	Mccarthy St	Stepney Rd
Benjamin Rd	Eighth Rd	Mccormac St	Stone St
Bluegum Cl	Elanora Rd	Mckeown Ct	Stott Cl
Blythe Pl	Eliot Rd	Mignon Ct	Streich Av
Bonner La	Eneabba Pl	Mill Pl	Tait St
Bowden Pl	Exbury Rd	Millman Wy	Tambulam Wy
Brackley Rd	Fifth Rd	Mogo St	Tarrawan Rd
Braemore St	Forde Pl	Mornington St	Terrigal Wy
Brigalow Wy	Forest Ct	Morrell Wy	The Grove
Briggs Pl	Forrest Rd	Murray Ct	Third Rd
Brixey Ct	Fountains Ct	Namoi Pl	Thomas St
Brookdale Dr	Fourth Rd	Napean Pl	Tijuana Rd
Browning Rd	Friar Rd	Narooma St	Tillinga St
Brumby Pl	Frys La	Nattai Ct	Timbarra St
Burndale Rd	Galliers Av	Neerigen St	Tomah Rd
Burns Rd	Galong Pl	Neilson Av	Tomlinson Pl
Burran Ct	Gaze Ct	Nerang Ct	Toongabbie Wy
Burrowa St	Gerald St	Netley Pl	Toorak Rd
Byron Rd	Girraween St	Newton Ct	Townley St
Cabarita Rd	Gladstone Rd	Numulgi St	Townsend St
Cambell Rd	Glastonbury Rd	Nyran Pl	Treby St
Carawatha Av	Grealis St	Offord St	Tuck St
Caroline St	Green Av	Olbah Pl	Tudor Rd
Carradine Rd	Greengage Ct	Orchard Av	Umina Pl
Carringal Pl	Gribble Av	Oscar St	Urana Rd
Castle Pl	Gymea Ct	Owen Rd	Verrill Wy

Challis Rd
Chamberlain Wy
Champion Dr
Cheritons Pl
Church Av
Clarence Rd
Claunelle Rd
Clements Gr
Clybucca Pl
Cobar St
Cohuna Dr
Commerce Av
Coombe Av
Coonong Pl
Coralie Ct
Cordelia Rd
Cornish St

Hambledon Cr
Harber Dr
Haslemere Dr
Haynes Ct
Herriard Rd
Hickson Av
Hobbs Dr
Hughes Rd
Ikara Pl
Ironcap Pl
Ives Pl
James St
Janda Ct
Jannali Wy
John St
Joyner Wy
Jull St
Junee Pl

Owtram Rd
Peel Ct
Pelham St
Phylma St
Piggott St
Pinetree Cl
Pollitt Cl
Powell Cr
Prospect Rd
Prout Rd
Quandong Pl
Railway Av
Redross Ct
Rice Pl
Richard Pl
Rigden St
Ringwood Rd

Walcha Wy
Waltham Ct
Waltham Rd
Wangoola Tce
Warrina Pl
Werndley St
Westminster Ct
Whitehead St
Wilcannia Wy
William St
Williams Rd
Winchester Rd
Windarra Wy
Winnunga Pl
Wungong Rd
Wyee Pl
Wyloo Pl

List of streets in Kelmscott, 227 streets

Abingdon Pl
Adams Ct
Agostino Rd
Albany Hwy
Alola St
Anderson Pl
Anembo Pl
Arbour Pl
Arbuthnot St
Armitage Rd
Armstrong Rd
Arnel St
Arnott Ct
Ashley Dr
Ayton Rd
Balgor Ct
Banyard Av
Bega St
Belaire Tce
Bernard St
Biala St
Birdup Cl
Blackburne Dr
Blantyre Wy
Bolger Gdn
Boondi Pl
Braddock St
Brant Rd
Bray St
Bromfield Dr
Brook Pl
Brookside Av
Brookton Hwy

Davis Rd
Deakin Ct
Dean St
Denny Av
Detling Ct
Dixie Rd
Drayton Ct
Drummond Ct
Dyer St
Ecko Rd
Edmund Tce
Ensign Dle
Erica St
Excalibur Cir
Fancote St
Flinn Av
Foster Rd
Frye Ct
Gell Ct
Gemsarna Cr
George St
Gillam Dr
Gilwell Av
Grade Rd
Grasmere Pl
Grasmere Wy
Greendale Pl
Greener Wy
Greenwood Ct
Griffiths St
Grovelands Wy
Gunnamatta Pl
Haimlee St

Lang St
Lantern Ri
Lateritia Ct
Lefroy Rd
Lilian Av
Lindley Av
Lockhart Rd
Lori Rd
Lucich St
Mahara Rd
Marmion St
Martin St
Mckenzie Gr
Megisti Pl
Melanda St
Melody St
Merilee Tce
Merlin Cl
Merrifield Av
Messenger St
Meyer Cl
Mimosa Ct
Morrison Dr
Morundah Pl
Mount St
Mountain Vw
Mundanup Cl
Munden Pl
Mutton Pl
Narrik Ct
Nash St
Nimbus Ct
Nookawarra Pl

Railway Av
Ranford St
Ravenscroft Wy
Reeves Ct
Regina Rd
River Rd
Roberts Rd
Rock View Pl
Rowley St
Rundle St
Ryland Rd
Saddlers Rt
Saffron Ct
Savage Rd
North Schruth St
Scott Rd
Serene St
Shawfield St
Sidcup Wy
Slee Av
Sonego Av
Spencer Rd
Steve St
Stevington Rd
Stocker Rd
Streich Av
Sunset Tce
Talwin Ct
Tamarind Cr
Taplow Ct
Tara Wy
Taronga Dr
Teresa Ct

Bruns Rd	Hamersley St	Nowra St	Third Av
Buckingham Rd	Hendon Wy	Oakfield Pl	Tinga Pl
Bulida Ct	Hicks Rd	Olmar Pl	Tollington Park Rd
Bullockbush Rd	Hill St	Orlando St	Trangie Wy
Bundalla Ct	Hillman Ct	Orme Ct	Tranquil Rd
Bunney Rd	Hilltop Pl	Ottaway St	Travers Gdn
Butler Ps	Hollybush Wy	Owen Rd	Turner Pl
Camillo Rd	Horseshoe Ct	Page Rd	Turner Rd
Canning Mills Rd	Howard Pl	Panorama Dr	Ullyott St
Castlerose Ri	Ibis Ct	Parkfield Rd	Valentine Rd
Centre Rd	Incana Ct	Pascoe St	Vanston Ct
Champion Dr	Jason Ct	Paterson Rd	Vistula Tce
Charles St	Jet St	Patfield Pl	Wakehurst Pl
Chasley Ct	Katrina Tce	Pearson St	Waltham Rd
Church St	Keays Rd	Penjan Pl	Ward Cr
Ciro Rd	Keira St	Penny Pl	Wattle Cl
Clenham Wy	Kembla St	Peter St	Westfield Rd
Clifton St	Kevin Rd	Pindari Ct	Weston Tce
Cockram Rd	Kiandra Rd	Pine Ct	Williams Rd
Connell Av	Kidbroke Pl	Possum Pl	Willowmead Wy
Cope Pl	Kilburn La	Pries Pl	Winchester Rd
Cullen Ct	Kingsley Tce	Pries Park Rd	Woburn Wy
Curlew Ct	Kundyl Ct	Princeton St	Wright Pl
David St	Labyrinth Cl		Yurrah Pl

List of streets in Camillo, 94 streets

|			
Abdale Ct	Cullen Ct	Hemingway Dr	Montrose Cir
Adelina Ct	Delamere Wy	Heron Ct	Natasha Wy
Ainsley Ct	Dollis Wy	Huxley Ct	O'brien Pl
Amanda Dr	Dundee Wy	Inverness Cir	O'sullivan Dr
Argyll Cl	Durnsford Wy	Ivanhoe Wy	Pendragon Ct
Banksia Rd	Dyson Ct	Jarrah Cl	Railway Av
Baxendale Wy	Elm Cl	Jupp Ct	Redtingle Rd
Becket Ct	Elouera Rd	Kari Ct	Sapling Wy
Beechcroft Pl	Excalibur Cir	Kendal Ct	Selsdon Ct
Berala Ct	Exon Ct	Kincraig Cl	Selsdon Rd
Bessant Ct	Faraday St	Kirk Cl	Shetland Rd
Boronia Cl	Felgate Ct	Knott Ct	Shrike Ct
Camelot Pl	Felicia Pl	Kurrajong Wy	Silver Mallee Cl
Camillo Rd	Fir Ct	Lake Rd	Skye Cl
Centre Rd	Galahad Pl	Lake View Tce	Tall Pl
Champion Dr	Garrat Ct	Lancelot Cl	Tall Karri Cl
Cherry Wy	Gilbey Ct	Lantana Wy	Tewson Rd
Clarence Wy	Glenhurst Ct	Lindy Wy	Troon Pl
Clyde Pl	Grovelands Dr	Logpine Cr	Tweed Cl
Cobham Wy	Guinivere Wy	Malu Ct	Waratah Dr
Community Dr	Hakea Rd	Manor Ct	Westfield Rd
Coran Ct	Harlow Ct	Megan Wy	Ypres Rd
Cressida Wy	Hatton Rd	Merlin Cl	Zenobia Tce
Culford Ct		Midhurst St	

Following signing of the consent form, interviews will commence with a brief discussion of Perth's strategic plans to gauge respondents' opinions of their impact over time. Mapping will be provided with a short summary of the intent of each: The *Stephenson-Hepburn Plan* emphasised compactness, The *Corridor Plan* a dispersed approach along transport lines, *Metroplan* advocated urban infill and redevelopment, *Network City* presented a 'harder' infill approach and *Directions 2031 and Beyond* a 'softer' infill approach. Comments from respondents regarding each plan's legacy and effectiveness (if any) will be recorded.

1. How would you describe Armadale's progression and development since 1955 to the present, economically, socially and environmentally? How would you compare this with other centres such as Midland?

2. To what extent do you agree with the author's summary of the emphasis of each plan? What theories in your view have influenced these strategies and what legacy has been left by each plan?

3. To what extent has Armadale achieved various targets / visions of these strategic and statutory plans against what was forecasted for the area?

4. What is your view of the blanket and targeted upcoding of existing greyfield areas that forms a major component of recent strategies in relation to Armadale and Perth generally?

5. Do you consider that development controls provided by planning instruments such as local planning schemes and the Residential Design Codes (2013) are sufficient in leading to positive planning outcomes or is greater control necessary?

6. Do you think successive strategies' aims since 1955 of providing diversity within housing in Perth has been achieved?

7. What are the likely rates of redevelopment when recoding occurs in peri-urban areas over time? What factors would influence these?

8. What are your overall recommendations for Armadale for the future to improve its status and performance?
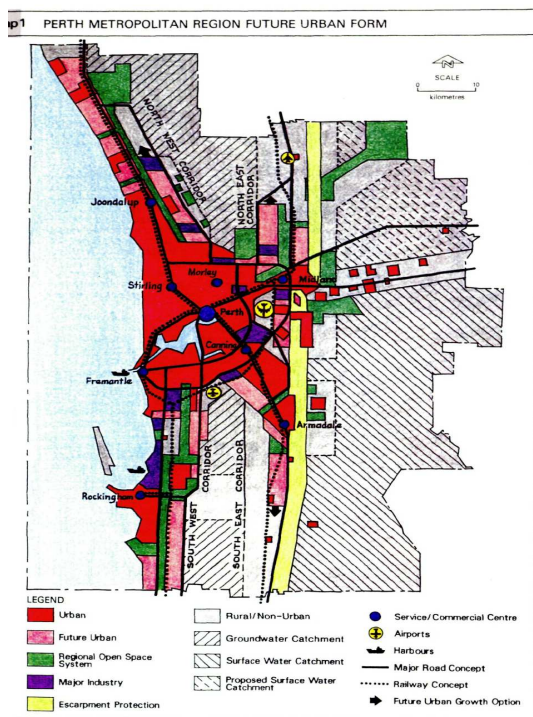
Appendix C: Attachments
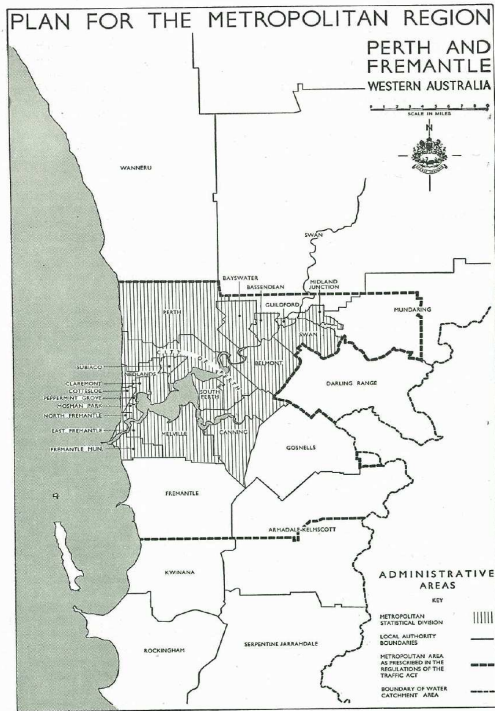
1955 Stephenson and Hepburn Report
(compact city).
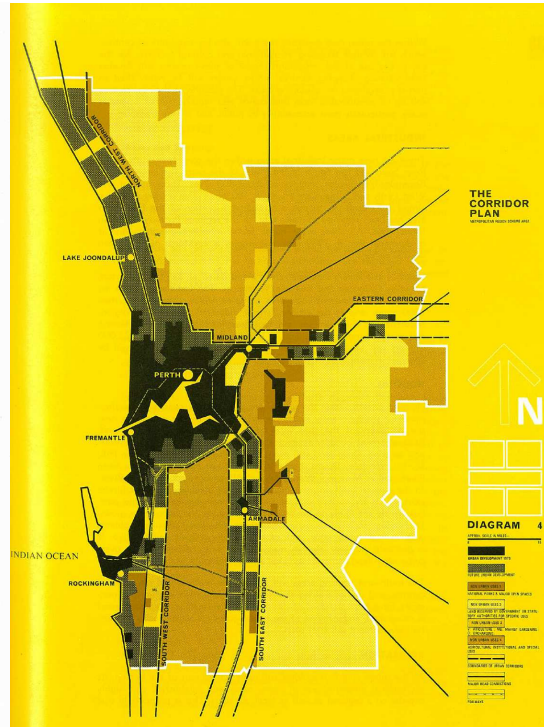
1970 Corridor Plan
(dispersed approach along transport lines).

1990 Metroplan
(infill, sustainability).
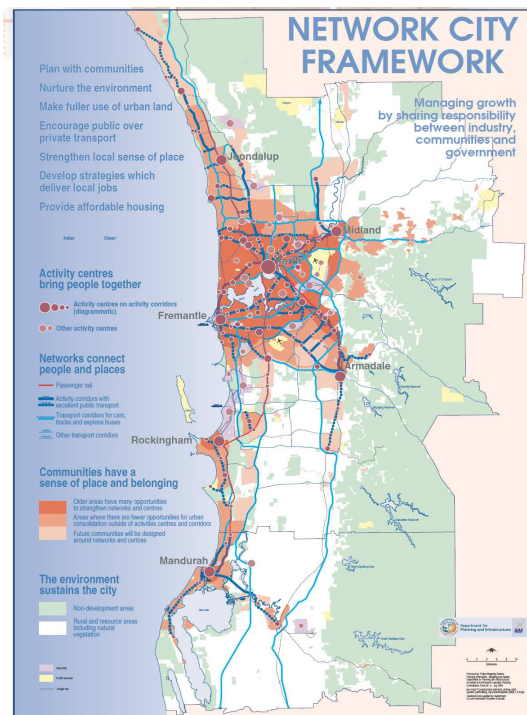
2004 Network City
(harder infill approach).

.
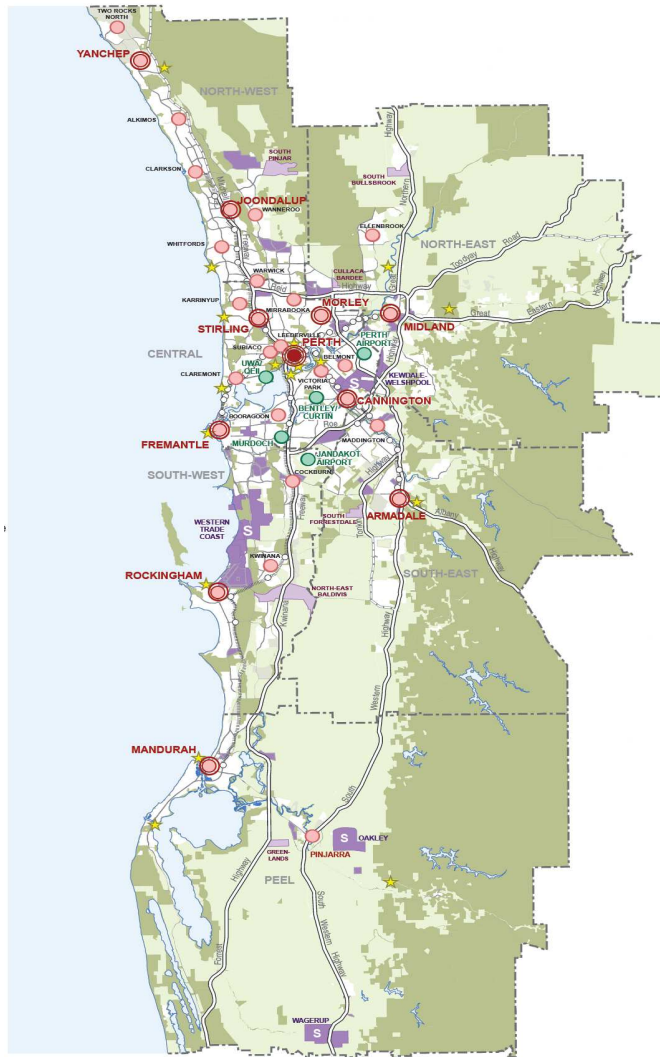
2010 Directions 2031 and Beyond
(reduced or softer infill approach).

Contact details

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Project Title: Redevelopment on the periphery: An examination of the current status of Armadale within successive strategic plans for Perth including revisions to residential codings under a local planning scheme.

Researcher: Simon Luscombe, PhD Candidate, *Student ID number 09859094.*

Supervisor: Assoc. Prof. Shahed Khan, *Head of Department, Urban & Regional Planning, Curtin University.*

Introduction: Thank you for agreeing to participate in this doctoral research. This research seeks to analyse the various regional strategic plans developed over time from 1955 to the present for Perth, with a focus on Armadale. It seeks to determine the roles identified for Armadale and the factors that may have inhibited or encouraged Armadale to successfully live up to those. This study will identify and analyse theories popular at the time of preparation of various strategies, such as Central Place theory, as well as the impact of more contemporary ideas related to urban consolidation and sustainability. It will seek to investigate and ascertain how the thinking of the time has influenced each strategic plan and how that has impacted upon the treatment and performance of Armadale. This thesis thus tests the potential of some universally accepted planning principles to deliver effective strategies to better accommodate and manage growth in regional or peripheral centres.

Your role: As a resource person and a professional involved with planning and/ or the land development industry, your views on planning policies dealing with Perth and Armadale and their adequacy will be sought through an in-depth, semi-structured interview.

The interview questions will focus on Armadale's role within successive planning strategies for Perth and other issues broadly related to the themes of this study such as regional transport services, emplement generation, population targets including density controls, infill targets and design issues.

The semi-structured nature of the interview has been adopted to ensure sufficient flexibility to encourage you to raise relevant ideas and/or refer to related issues not diretly covered by the interview questions.

Data Storage: All raw data in electronic form collected during the research will be backed up and kept in a safe and secure place within the School of Built Environment, Building 201, Bentley Campus, Curtin Univeristy for a period of at least 5 years.

Please sign below to indicate your consent to be interviewed for this doctoral study.

I, the undersigned, understand the following:

- I have been informed and understand the purposes of the study
- I have been given an opportunity to ask questions
- I understand I can withdraw from this study at any time without prejudice and without assigning any reason
- Any information which might potentially identify me will not be used in published material, unless I expressly allow it
- I agree to participate in the study as outlined to me
- I note that participation is voluntary

Name of Participant:

_____

Signature: _____   Date: _____

Contact details

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Personal History and background

My mother moved to Armadale in 1955, my mother moved in 1969 and I have lived in Armadale for 38 years. I seem to be the only person in my school and the only one of my friends still living in Armadale. We were taught to hate Armadale as a child and it has always been the butt of jokes. Even in my high school years I hated Armadale, it was only for travelling so long overseas that I ever wanted to return.

How would you describe Armadale's progression and development since 1955 to the present, economically, socially and environmentally? How would you compare this with other peri-urban centres in Perth?

Armadale is 80% of where a city should be. In the last 7 years it has seen a massive increase in the facilities available and over the next 5 years with the next influx of people it will have everything it needs. I still feel like it is missing something but I am not sure what that is. There is no disadvantage here anymore, it provides all of the facilities that anyone would need. It has a hospital, a law court and in theory you never have to leave. But the one thing I thing I think it misses is a vibrant culture, or maybe it is that the culture hasn't caught up with its facilities.

Armadale is still seen as 'bottom of the barrel' culture. But everything is nice here, it will just take time for the culture to shift. It is missing nice pubs, if we had a nice meeting place where you could take your children this would be better. We have the Elizabethan village but that is not in downtown Armadale. The Narrogin Inn is all bikies and bogans. But Armadale's culture is shifting. It has beautiful schools and beautiful shopping centres. In all honesty, if you walk in Fremantle you see more low class people there. For the most past it is just a nice place to live. Just like the song says: 'I don't think my postcode makes me a better person'.

What extent has Armadale achieved various targets / visions of these strategic plans against what was forecasted for the area?

People like Armadale because people like the rural and urban mix. The local authority is increasingly trying to make housing more compact, to make housing more dense, yet other areas of Armadale like Darling Downs still remain for those who like larger lots, and a short distance away they are still building on 700m^2 - 2000m^2 lots. It's not that I think its dense housing is bad. I can see the value in dense housing, not everybody wants to have a backyard or the old 'quarter-acre' block. People who migrate are very used to condensed living, so living in small spaces does not have a negative impact upon them, such as anyone moving from London or anyone moving from Asia.

What is your view of battleaxe redevelopment?

I love this sort of development. I think it is a great way to take advantage of all of the wasted area that we don't use. It's quiet at the back, it is off the street, it is very private and you don't have to deal with the neighbours if you don't want to. It's a great opportunity for people to make use of what they have, people who have probably had the land for 40 years. The design is important. But I have never met anyone in Armadale who has a battleaxe block. I like how Nedlands did it, they tried to make the houses look the same as the old one so it didn't look out of place, they made it the same feature windows rather than have this modern slap bang house.

I don't know one person who has split their block. I was once looking at buying a block which could be split which was in Brookdale Road in Armadale, I was going to buy it because I could split it and put a house at the back. Honestly the quality of the house that I was going to put in the back wasn't a concern because honestly the front house was so terrible, it was an old dodgy house that had extensions that weren't Council approved. It was old, built in the 1960s, it had a slap bang extension on the side of the house which was absolutely horrendous. It had a crazy tenant living in it and I thought she was mentally ill. There was a hole in the back fence and the garden had zero maintenance done. Instead I went onto buy a place in Byford with bigger land, but I never considered building a second house I thought if I wanted to I would

renovate it, but not in Byford. I was going to build a bigger house and not redevelop the land.

Has Armadale met visioning under successive strategic plans since 1955?

I think it has, it has a vibrant centre, it is the hub of the region, people come from Canning Vale to shop at Armadale, it is a massive appeal, it's easier to go to Armadale and a big drawcard is the movie theatres and the nearest ones are carousel or Southlands and these are more difficult places to navigate. You still have very bad areas like the TAB (betting agency) and Centrelink, they recently knocked down the TAB which used to attract many low socioeconomic people. Overall many people in Armadale feel that they have the right to be given everything by the Government.

Centrelink in Armadale is always full and has been since the 1990s. That part of Armadale used to be the centre. Pension day is not a day to be seen in Armadale, every second Thursday they all come down, there is shouting in the street, and it makes everyone feel uncomfortable and you are not sure if they are going to start fighting, you pay attention and move out of the way. Everyone thinks Dalkeith is so wonderful, they still have IGA and Coles they still have traffic congestion but it takes very little time to get around Armadale. There is also a lot of money and investment in Armadale.

What are the likely rates of redevelopment when recoding occurs in peri-urban areas over time? What factors would influence these?

I would redevelop if I could, I am young, I am educated and I see the value in property. The lower than anticipated uptake of redevelopment might be for the following reasons: a lack of resources, lack of education and lack of financial reward. In splitting your block (subdivision) the whole value might be $350,000. When you subdivide there are costs, the reward is not necessarily going to be there, people will lose their backyard, large open spaces and everyone wants space for their kids.

Appendix E: Resource persons' non-identifiable details

Pilot	CM	Accountant, long-term local resident, grew up in study area
P1	CA	Private consultancy planner, private surveying company
P2	PD	ex-State Government Planner, Director within local govt.
P3	CJ	State Government Planner, Director
P4	PJ	Planning graduate, works outside of planning
P5	RJ	Local Government Planner, statutory
P6	SD	State Government Planner, statutory
P7	SM	State Government transport planning
P8	BT	State Government Planner, statutory
P9	BG	State Government Planner, statutory
P10	HJ	State Government Planner, statutory
P11	ID	State Government Planner, statutory
P12	RP	Local Government Planner
P13	HJ	Private Consultant, director
P14	DJ	State Government transport engineer
P15	JP	State Government Planner, statutory
P16	SP	Local Government Director
P17	EJ	State Government Planner, part-time academic lecturer
P18	NC	State Government Planning, legal planning
P19	DA	State Government Planning / development officer
P20	MG	State Government Planner, statutory
P21	MN	State Government Planner, graduate
P22	KJ	State Government Planner, statutory
P23	WP	Local Government planning compliance, statutory
P24	DR	State Government planning, GIS
P25	KA	State Government Planner, statutory
P26	OT	State Government project manager
P27	SA	State Government project manager
P28	RA	State Government Planner, strategic
P29	BJ	State Government Planner, statutory
P30	BG	State Government Leasing / project manager

Appendix F: Semi-structured interview results – selected transcripts

Background of Armadale: In respect to Armadale's overall status and related social issues, one resource person provided the following background, highlighting the role of the State Housing Authority (as also outlined by Alexander and Greive, 2011) in contributing to social disadvantage, considering that Armadale remains a despised and maligned area:

Armadale was once an agricultural community or rural community, and it changed for the worse over time. The Armadale today that we know and despise came about as the Department of Housing or Homeswest brought in people with no history or connection to the area who did not share the same values as the existing residents.

These people became stuck out in the middle of nowhere with nothing to do, and there consequently remains a high level of substance dependency in Armadale. Friends of mine have told me that the local business owners are reluctant to open their shops on Sundays due to the risk of robberies that many of them have experienced.

Armadale really needs to reinvent itself. This I believe is the aim of the new local scheme (Town Planning Scheme 4). It is a good thing to replace the housing stock, but it needs to be seen that this is a multi-purpose initiative to improve the social issues which remain within the City of Armadale.

The Council is on the right track in this regard. In respect to housing diversity, we should have a lot more people living in Northbridge and central Perth, we should maximise the density in these places. I like East Perth, it is a classic example of a nice mix of density and if we did more of that style and standard of development then Perth would be much better off, rather than the poor quality 'villas' which exemplify redevelopment in outer areas like Armadale and Midland.

Background to Armadale and likely performance of the recoding mechanism within the study area was described as follows:

Armadale started life as a fringe suburb during the years when that meant land was affordable and there was a high presence of public housing with lower socio-economic groups. Now that fringe development has changed, higher socio-economic groups have been attracted to newer areas like Harrisdale, or leapfrogged to the newer estates of Serpentine-Jarrahdale. There is so much new estate development in the area, that there is no demand for a retro-fitted suburbia. That's what you have to buy if you want to live in certain areas, but there is too much new housing in the area to bother with living behind a house in Armadale in the decaying, 'inner' areas. The City has raised the density code and people aren't buying because they prefer the more 'exclusive' areas around the fringe.

Another resource person characterised the performance of Armadale as follows:

Armadale has its own unique character and sense of place and can be considered a rural locality rather than part of the urban Perth city framework. Armadale seems to suffer the legacy of a poorer socio-economic area, however its importance as an economic hub is increasing. Most localities have their own unique flavour but Armadale has less of a role in the function of the city then other major centres like Midland or Joondalup. Armadale has yet to lose its rural identity unlike Midland which is more urbanised. Midland and Joondalup have grown economically and now include: hospitals, offices, major shopping centres, universities and TAFEs. In a social context, gentrification seems to be happening in Midland, unlike Armadale.

Legacy of past strategic plans for Perth:

The discussion then progressed towards Perth's strategic plans regarding their impact and legacy over time. A summary was provided of each and plans were presented. Overall, the legacy left by the *Corridor Plan* was the most maligned, viewed as resulting in sprawling development and representing the greatest failing in all of Perth's strategic plans by all respondents (supported in the literature by Hedgcock

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and Yiftachel, 1992), attracting the greatest amount of criticism as the following statement, typical of responses, provides:

I still think it was planned backwards. It seems as though they planned the corridors, then planned the development along the corridors, and then planned the new cities at the end of the corridors, but the cities didn't grow, so the whole plan fell over. It seems to me if you are truly going to make self-sufficient centres, you build those first around a resource or need and then let the development fill the space between. And it seems as though they have still underestimated the scale of distances in Australia, WA in particular. What I see here is a terrific model of how a City should be connected with the wider State, but a terrible example of how to develop a City itself. Why we would develop along transport arteries alone is beyond me, when those transport arteries don't actually go anywhere. If they went to another City 20 miles away, fine. But when the next stop is Kalgoorlie, then why would you start moving towards it with development?

A further reason for the failure of the *Corridor Plan* was provided via follow-up email, which centred upon the corridor concept's inappropriateness for Perth's relatively low population:

I think a main reason for the failure of the Strategy is found in the Corridor Plan's Appendix in which the proposed model is compared with other similar corridor-based planning models from other cities around the world, such as Copenhagen and Washington DC. Washington's model is described as a 'radial corridor plan', and 'clearly articulates urban structure by creating separate but related communities'. One of these corridors ends at Baltimore and one at Annapolis – a distance by road of 63 kilometres and 51 kilometres respectively, only half the distance between Perth and Bunbury. At the time, however, Washington had a population of 756,500. In 1970, Baltimore rated seventh in a list of the 100 largest population centres in the United States with a resident population of over 900,000 people (US Census Bureau 1998).

Annapolis has a considerably smaller population of just over 30,000 people, but was experiencing rapid growth, having experienced a population boom of 30% above the previous decade's population which, in turn, had grown by over 130% from the decade before it. In this context, with such large related communities in such close proximity, a corridor-type plan appears to make perfect sense. In transplanting this model to the Perth context, however, it appears as though the authors of the Corridor Plan have completely underestimated the scale of distances in Australia, Perth's geographic isolation and relatively small population. In 1969, Perth's population was 635,500, not greatly less that Washington's 1970 figure of 756,500. The stark difference, however, is that the nearest city to Perth with a comparable size to Washington's neighbouring Baltimore was Adelaide with 808,600 people, some 2700 kilometres away.

Adding further contrast to the difference between the corridor-based plans for Washington and Perth lies in the population density for each city. In 1970 Washington's population density was 4757 people per square kilometre, and Baltimore's was 4466 people per square kilometre. In this situation, a corridor-based plan between two densely populated cities only 63 kilometres apart can be readily explained as allowing for a connected future growth between two major centres, and for the rapidly-expanding Annapolis nearby. At roughly the same time, in 1974, Perth's population density was approximately 1681 people per square kilometre, only 35% that of Washington DC. Clearly, a corridor-based plan was not required in such a sparsely populated city whose nearest comparably-sized neighbour was so far away. Although touted as providing 'self-contained communities', the reality of Perth's Corridor Plan is that it continued to feed the population's inexorable desire for the low density, detached model offered by the Great Australian Dream, and did so for the next two decades.

Perspectives on the 2010 strategic plan for Perth, *Directions 2031 and Beyond*: The renewal and revitalisation of existing greyfield areas under *Directions 2031 and Beyond* was also discussed, together with the emphasis of urban consolidation among previous state plans. The strategy was frequently criticised, the following statements representing typical views:

Directions 2031 and Beyond is a 'nothing document' with no forward plan to implement its recommendations. All we are doing is rolling out the green carpet to developers 40km and 50km from the central business district. Infill targets are far too low, far too conservative and quite pathetic in fact. If we do not meet the 50% infill target we are going to be in trouble. We need to make the most of existing infrastructure because sprawl creates further congestion. It is not just roads, it is also other infrastructure such as pipes and wires. Decision makers really need to realise the cost of sprawl, there is a cost to the community and I think we really need to educate decision makers in this sense. We have created our own little prisons with no corner shops, big box shopping centres, the mandatory use of the car all the time, street lighting based on what standard? Perhaps London blackout during World War 2! You could fire a gun up most suburban streets after 6.30pm without hitting a soul, it's deserted and lifeless. Sadly the suburban sprawl just doesn't do it for me.

Directions 2031 and Beyond is an utter and serious failure, its growth areas are too few and even those identified are located too far away from train stations. In relation to Cockburn Central, supposedly a transit oriented development, the higher density development is a failure, you cannot walk to the train station or the Gateway Shopping Centre from there. You do not put higher density development in areas where there is no amenity. We also need to make higher density affordable, like on Stirling Highway. In Nedlands and Claremont they are building 250m^2 apartments, which is ridiculous, we need to build 60m^2 apartments with a balcony to enable young people to get into the market. Young people want a 'lock and leave' lifestyle, especially those who work in the mining industry. All of the growth areas are located too far from the railway line and in Perth we suffer from a great fear of change.

Blanket recoding was a controversial topic explored within a number of interview discussions. Vallance et al (2004) notes that the blanket approach appears to be used as a solution to certain urban issues, without regard to associated social, economic or environmental costs. This view was reflected in several of the interviews undertaken with a roughly even number of planners supporting and critiquing it:

In respect to blanket recoding, my view is that they should allow this. 20% of any area close to services can comprise density higher than R40 then perhaps another 10% can be R80 and a higher proportion of R25 and R30 development so we can have genuine housing diversity and mixed use development, which we currently do not have in Perth and Peel.

I am not in favour of blanket recoding, although it is easy to do. We are better off to go for high densities around transport nodes. With blanket recoding, people still may be well away from services, but people stuck out in the middle of nowhere can be subdividing. Maybe we should be keeping those lots large. We need to think more seriously about how we do density increases. Part of it is marketing. We don't tell people why we need to increase density so NIMBYism remains strong. We have a development industry that is spending hundreds of millions every year telling people they need a 4 x 2 with a theatre room on 500m^2. All they are doing is reinforcing an existing value.

Now my parents and your parents in their 20's did not expect to own a home. That expectation has been built by the building industry, quick credit, driving the brand new car. I think we need to re-shape that expectation. Kids now think you can have your new house but now it should be a 4x2 with study. We need to make better use of the space you have, better living areas, open plan unit living. To me that is all about design. Then we have to market it and spend as much time telling people that this is a better lifestyle closer to the city than out in the sticks struggling with mortgage payments. You are not going to be stuck in traffic for 30 mins each way so you can have more time with your family. Kids used to be out and about. Now you don't dare to let the kids out, part of it now is to create safe areas. Kids should go out more.

Armadale as having now moved beyond the fringe: The idea that Armadale is a peripheral settlement was challenged throughout the interview process. This supports the view that various areas' functions change over time. It was also considered that it is difficult for previously stigmatised areas to successfully be renewed via the redevelopment process:

Armadale is no longer a 'fringe' area. Suburbia has spread well past this and this is key. What has happened over the years is that, traditionally, the further out you went the cheaper the land was, and hence the lower socio-economic groups would amass. What this means is that as each successive region would grow, the previous 'fringe' area would appear to be that little bit better (as it was no longer fringe, and wasn't as far out or disadvantaged as the new areas). But, as so many sources state – things have changed. Now once you travel even further, costs are going up.

Developers are only able to reclaim these costs by adding it to the land price. On top of this, they are having to master plan estates to a high quality and provide ample public open space. On top of this they are adding developer covenants to require a minimum standard of development, which ensures that they will only attract a more affluent buyer (to be able to afford to build to a minimum standard) and protect those buyers from other poor people moving into the area, meaning they are happy to pay higher prices. So this is what has changed: if the traditional growth had occurred – Armadale, which was once seen as disadvantaged fringe, would have seemed 'not so bad' once Byford grew. BUT – because Byford is part of this NEW type of managed growth, with higher costs and estate covenants, Armadale wasn't able to shake its 'disadvantaged' tag like every other previous 'fringe' area before it. I'll put it graphically for you:
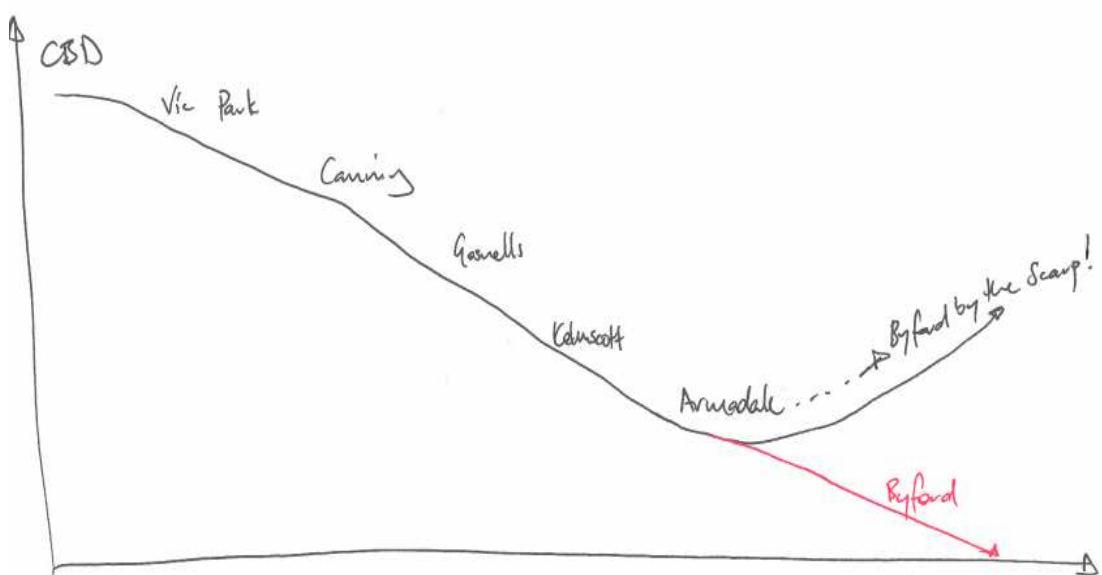
The red line shows 'traditional' fringe growth. After a while, Armadale would have only seemed to be 'half way down the slope', not 'at the bottom'. But now that the fringe suburbs are going up (new fringe growth – black line), Armadale has been caught in a rut that it can't get out of. It's a historical situation. Now there are better suburbs before it, and after it.

Kwinana is a great comparison – it was the dirty fringe once. Now we have Rockingham, Singleton, Baldivis: nice, new master planned estates. Now these areas are more expensive than Kwinana, and no-one wants to buy a subdivided block in smelly Kwinana if they can keep going and find something nicer. So Kwinana will be similar to Armadale in that it will always struggle. Armadale will have new estates too but these are new areas like Piara Waters. Kwinana proper will be a dump forever. It is in a rut as well. Here's a phrase for your study – Armadale's problem is a geohistorical one. Geo – where, Historical – when. Where and when. It was considered to be the fringe when the public perception of fringe growth changed. Therefore that stigma will last, rather than evolving over time like it would have traditionally. It is geohistorically disadvantaged and will always remain so.

Development controls provided by the Residential Design Codes or 'R-Codes' alone were identified as 'weak' by a number of respondents. According to such resource persons, unfettered market forces could not provide positive planning outcomes (a view widely supported by the literature) as the following interview excerpt illustrates:

While the R-Codes are sufficient to actually increase densities, they provide no quality control, and therefore stigmatised areas are more likely to retain their stigma and perpetuate their social disadvantage. The stronger the development control at the local government level, the higher quality the resulting renewal will be, and it will encourage more home ownership, and a better mix of socioeconomic groups. Armadale's medium level of control works for areas where the maximum density will allow only two grouped dwellings per lot. Stirling and Belmont's zonings both result in higher densities – generally three per (parent) lot, sometimes four, but the resulting built form is at opposite ends of the spectrum.

(The City of) Stirling's housing situation now is a result of leaving everything up to market forces (maximise profit by spending the absolute minimum in development), whereas (the City of) Belmont retains a form of government intervention, and therefore a higher standard of renewal is achieved, and a better socioeconomic mix can be expected. Infill in Nollamara / Balga / Westminster density = terrible. Infill in Serpentine-Jarrahdale and Alkimos 'cottage' lots = plain stupid. Infill in Claisebrook / Subiaco Centro = good in theory, but does not create diversity in social groups. It looks pretty, but falsely heralded as planning utopia when it has many shortfalls which are swept under the rug. Infill along Canning Hwy (between Canning Bridge and Berwick Street) = could be the greatest thing Perth has seen with regards to smart density. Those dwellings are mostly owned by Main Roads WA, and could be developed as a true transport corridor with ample connection to central Perth. I say it all the time – if you leave things up to the private industry, you are going to have problems.

Poor quality battleaxe redevelopment: Following the interview, a resource person emailed several images with the following comment regarding the low quality design outcomes which can accompany battleaxe subdivision, particularly where an existing dwelling is retained, either to lower costs or as a result of local authority heritage controls:

This is the problem I have with a lot of current infill. Look at that house on the front block – asbestos home, bottom weatherboards broken and falling off, sagging roof, no quality control at all. Yet there will be a brand new home stuck behind it. This is not revitalising suburbs.

Poor 'retain and build behind' scenario (Resource person via email).
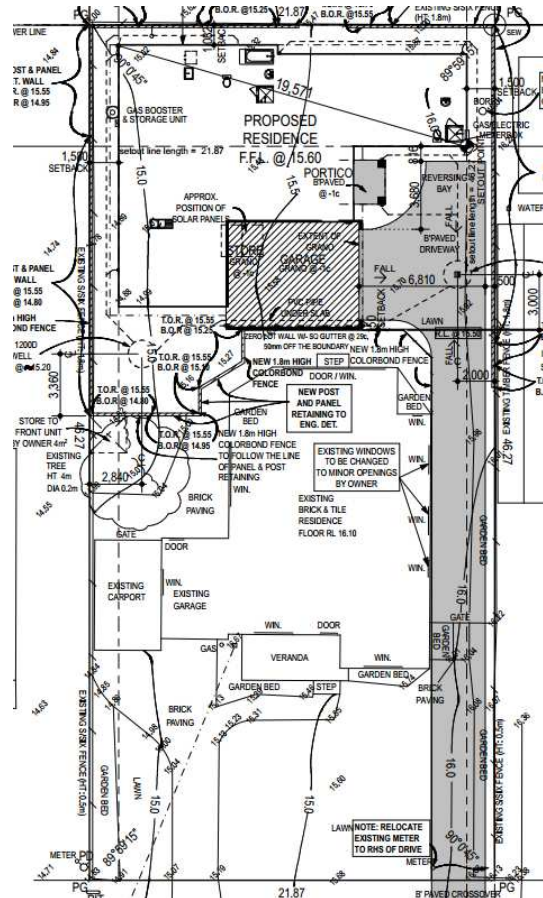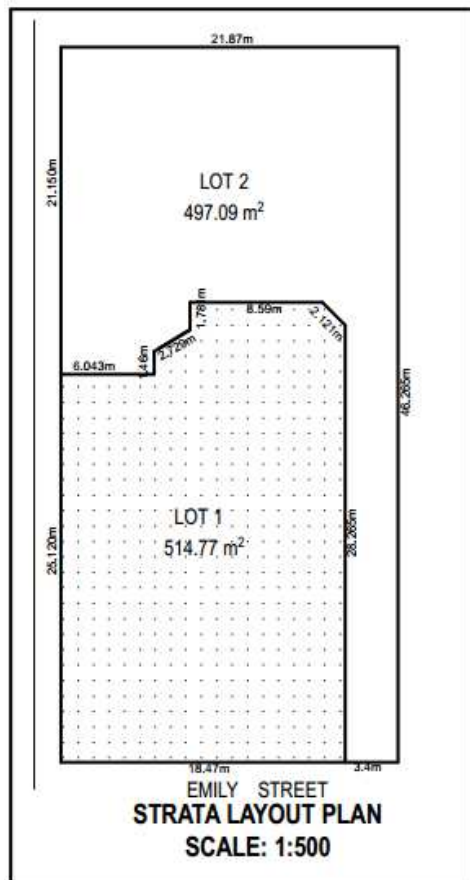
Irregular lot configurations as a result of retaining existing dwelling (Resource person via email).

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This is why I have a problem with fragmented strata ownership. Here's another example of a job we did. The lot for the rear house wraps around the back of the existing house. The front house was built in the 1950s – it will have to be demolished at some stage. But the house that will replace it has to be designed to fit within that ridiculous lot boundary, it is stupid. Plus, the eaves for the existing house run all the way into the access leg, all the way down.

Irregular lot configurations as a result of retaining existing dwelling (Resource person via email).

This is that other one in (name removed) that I always gripe about. Two new dwellings wrapped around two asbestos dwellings. I can't believe this was approved. It's just horrible. How are they going to build in that when the asbestos ones finally need to be demolished?

PROPOSED STRATA LAYOUT PLAN
SCALE: 1:500
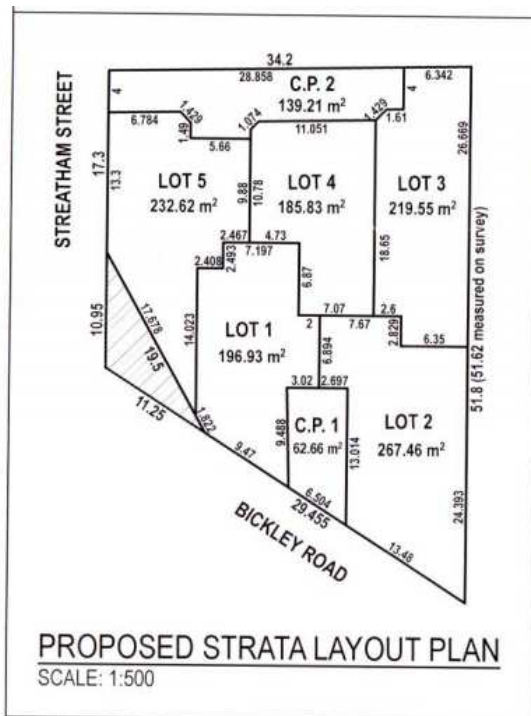
Lot configuration described as a 'mess' by a resource person (Resource person via email).

Here's a new winner, one that we had approved near your study area in Gosnells. Lots 1 & 2 are the original 60s dwellings. Dwellings 3-5 were designed to wrap around the back... Look at this mess... imagine trying to build something new on these in a decade or two.

The creation of increasingly peripheral areas in Perth: In respect to peripheral development and the homogeneity of housing in Perth, two resource persons conveyed the view that outer areas such as Armadale should not be developed in the first instance, instead that urban consolidation should be undertaken to a greater degree within inner areas, close to Perth:

Keralup will be an utter failure, because no-one wants to live 50kms out of town. We need to see that the days of 4 x 2 are over, we need to see 30 years in the future. Existing suburbs need to be recoded, particularly within inner areas. The fact that we are considering developments such as Keralup is absurd. We need to fit 3.5 million, which is the projection now, within existing areas, not new areas. This can be done if we are creative about densification.

I would argue that these far flung peri-urban areas remain horrible places to live and if fuel goes to $3.00 per litre then the poor first homebuyers who live there are stuck and will suffer most (by paying a higher proportion of their budget on fuel), not us planners. The thing is we will need to contain some of the nastier elements of sprawl in Perth because the development industry will keep lodging structure plans for land east of Byford, east of Mundijong, east of wherever. They do not care, there is no moral values built in. Putting oil aside, 2 hour commutes are unfair, not right at all.

I am just not in favour of places like Keralup and Ellenbrook, I think they are truly depressing places to live. You would be clinically depressed living there and not know why. So there are big problems with the business as usual creation of sprawl and suburbia. I have recently sat in the boardrooms of Perth's biggest home builders and heard the executives spout their point of view and they are seriously off track. They don't care whether land has been identified for other uses, they want residential development, anywhere they own land. Amenity, community services, roads are not an issue to them. If they could sell 4 x 2 houses anywhere, they would.

It is the predominance of low coded lots throughout Perth and Peel which strategies such as Directions 2031 and Beyond should address. The media is complicit in this, regularly running stories about densification which are mainly negative. Denser living can be good in some ways. With people residing at closer quarters comes a vibrancy that can create an interesting place to be, and in some ways, a level of safety not offered in the suburbs. If there are always people walking about on the streets, even late at night, there is (often) a feeling of safety in numbers. Businesses can be also quick to respond to opportunities, opening new shops, eateries and services.

Private enterprise can only go so far, and existing infrastructure – roads, schools and public transport – needs to be strong to cope with big numbers of people moving into a suburb because if services can't manage, instead of improving an area, large developments risk slowly choking suburbs to death. That's one of the ongoing problems with our urban expansion and consolidation. While we might be cramming more people in, governments still aren't doing enough to provide improvements to

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public transport (or other innovations such as safe bicycle lanes) to help people move in and out of an area without always relying on cars. Where we can rebuild areas of our suburbs then perhaps the best way to increase density and improve environmental performance is to invert the whole idea of freestanding homes surrounded by gardens.

Perth's need for higher value densification: one resource person elaborated on the infill vs sprawl debate and raised issues relating to retaining character and heritage within existing suburbs. It was considered that if vacant land is available in inner areas, this should be used more efficiently, rather than accommodating only a single dwelling:

Across Perth we need significant increases in density, not just in Armadale. My personal view is that we have enough land that is developed, we have enough greenfield land. We should retain the areas which have character in Perth: e.g. Cottesloe, although they can become enclaves for the rich (whether we like it or not). I think there are also some areas like Melville that have a particular character, East Fremantle and Kalamunda but then there are entire suburbs where housing stock is old and reaching its replacement date. So if we are going to knock down houses in inner suburbs we shouldn't be replacing with a single house.

If we are going to do high density is it needs to be 'high value density'. Low value higher density can bring in undesirable elements. We need to consider design to encourage a form of density that can be achieved while minimising overlooking / overshadowing and that retains social characteristics, to get away from the community concerns. So you and I when we are 65 can move into a smaller dwelling if we so desire, in the same suburb but in an area of higher density. So we should try to encourage people to have a range of housing choices in their neighbourhood, to stay there and migrate within the neighbourhood as their lifestyle changes. Also getting rid of stamp duty tax would facilitate people to move between dwellings (agents fees, capital gains tax) which work against this at present.

Regarding infill and affordability and housing typology, one resource person offered the following comment:

We use infill as a planning tool in order to achieve certain planning objectives. But when there is no holistic approach to that infill, the resulting issues become one of housing. It is also a good example of how the two often don't work together –the market requires that infill housing pushes prices up. Therefore what makes sense from a planning point of view is potentially damaging from a housing point of view.

I had this argument with a local authority planner the other day and they want us to put multi-storey units on a site – commercial below and apartments above. This is a planning approach to creating good infill. But the realities of the market and the owner means that this is simply not a viable option – they can't afford to do it, and there is no market for people to buy it. Simply changing from class 1 to class 2 buildings will push the prices up astronomically. Nobody wants a $750,000 two-bed apartment in Armadale. It is great from a planning perspective, but rubbish from a housing one. It points to there being two kinds of planning and development – prominent developments and what happens behind the scenes.

One resource person conveyed the view that a mechanism where a redevelopment authority presides over development means that the outcome is improved, rather than expecting 'market forces' and upcoding to provide positive planning outcomes.

All of the 'shop front' development (the East Perth's, Claisebrooks, Subiaco's, Champion Lakes) are very public types of development, and do require these regimes or coalitions, and the result is an excellent development, some of which have international recognition (such as Claisebrook). But then there's the 'behind the curtain' stuff. That's where our clients operate. Our clients just help make up the infill numbers, and seem to be generally left to just do their thing (and make money from it). These people have a huge impact on housing. The result is very poor, low quality development, without question.

The need for higher density, vs incremental densification: Despite the benefits of urban consolidation and its inclusion in many planning strategies, the trend towards owning large dwellings in outer suburbs remains strong in the Australian psyche (Vallance et al 2004, Weller 2009). In respect to the low uptake of redevelopment in Armadale as a result of *Town Planning Scheme No. 4*, one resource person conveyed the following view:

You are not offering sufficient density to attract any seriousness and the development criteria is hard. You are not offering any incentive, setbacks are too far and land increases are slight. There are at the end of the day, limited opportunities because R25 is just too low. Say you went from an R10 to R20, then it is one extra house. Say you have R15 to R160 then someone could buy 3 or 4 contiguous lots and put something really good in. Scarborough has done this, going into Doubleview. I admit it has its disadvantages. It has become noisier, you hear people having parties and you see people out and about more. Insulation is the key, hotels do this, double glazing, thicker insulation works really well. Perth has the lowest density, our metropolitan area could accommodate greater London, our city is considered one of the most sprawling, least sustainable cities in the world.

Low density does work well, but obviously it does not work everywhere. Other forms of housing are just as acceptable, but 'willy-nilly' high density within established areas is not appropriate. Over time higher density forms of housing will evolve. The main challenge for densification is convincing people that it is a better option – we need to attract people into higher quality examples. High density is unfortunately associated with bad neighbours, low cost, low amenity and high crime rates. At the end of the day it is all about sales pitch, it needs to be. We need to pick the best spots for high density. We need to have high density that is high-value and high-amenity.

Public Transport and Perth's ongoing car dependency: A number of respondents commented on Perth's automobile dependency including the view that many suburbs did not have sufficient densities to support transit servicing, or opportunities for residents to work or shop near their homes. Several resource persons offered the following view in respect to this auto-dependence:

We need to plan for people, not cars, which are just a tool, nothing more, just a form of transport. Because of the convenience of cars we have let ourselves be blinded that our lives revolve around them and we don't consider other options. We persist with cars even when other forms of transport are better or the benefits of car transport are marginal. We pay huge sums for that convenience. Simon, you said that you spend $2000 per year on bicycles. You could be spending that on trains with no health advantage. If you chose to drive you would spend $2000 on fuel and parking, but there are added costs, insurance, if married your wife needs a car – that is 2 insurance payments, 2 registrations, servicing, tyres, repairing damage and dings when they occur. Increased densification in places like Armadale will mean increased traffic. It should be noted that cars, bicycles and pedestrians don't mix. All of these travel at different speeds. Bicycle riders have no protection. We need dedicated cycle ways, and dedicated roads for cars. It's all lacking in recent planning strategies.

Public transport provision can't be seen as a private service that's run to make a profit. The PTA often use the low patronage to discontinue or not provide services, but the only way you will get people en masse to use public transport is to make it more convenient than the car. Transport, public and private is a self-fulfilling prophecy, if you build it they will come. Add a train line, people will use it. Add another freeway lane, more people drive. This means public transport has to be provided even if it's initially at a loss (on purely financial terms anyway). There are other benefits than just the financial one that need to be spruiked more along with providing better services – it's safer than driving a car (how many buses have accidents?), it is less stressful, you can read, listen to music and relax. These benefits aren't just personal, they're beneficial to society as well.

I'm a hypocrite of a planner and I hate catching public transport. I just want everybody else to use it. The politicians pushing for it still live on quarter-acre lots in Claremont, Nedlands, Dalkeith, not in Armadale. Smaller lots are for other people. They grew up with big backyards. Unit-style living is for other children growing up. The people they build their New Urbanist environments don't expect to use the train themselves, even though they may live directly above the train line and they have

reached a position in life where they can afford to move in to Subiaco – and that comes with a fancy car, and a job that provides a car bay.

The public transport is for other people. Nobody likes the tools of fighting congestion because the simple fact is that they are still not as efficient as the alternative. If I want to go to Ikea on the weekend, there is no alternative faster than driving. I would dread to think how many buses and trains I would have to connect to make a trip there. Even living close to work like I do – the bus is still not faster than driving, and it actually ends up costing more in bus tickets than it does in petrol. Plus, I don't have the convenience of being in a car with air-con and shelter from the rain. Therefore, if the tools we use to fight congestion are less efficient than the congestion itself, we are constantly fighting ourselves. Who wants to be forced to use a less efficient method?

NIMBYism (Not in my backyard opposition to higher density redevelopment): The discussion then moved to factors which were seen as preventing increased densities within established areas such as Armadale and Midland. The implementation of higher density housing frequently stirs up community outrage and remains a highly charged topic politically (Searle, 2007, Weller, 2009). Media reports often reflect the views of those against the redevelopment of existing areas. Throughout these media reports, it is clear that existing residents are reluctant to embrace intensification and do not feel comfortable with any change to the existing density within their neighbourhoods (Vallance et al 2004).

As a result, conventional housing remains unaffordable for those entering the market, requiring them to live on the periphery of the city in more affordable areas such as Armadale as low density development on the periphery is cheaper to build (Weller 2009). Community opposition which frequently meets such proposals risks derailing such plans for a greater diversity of housing stock.

One resource person offered the following view:

Directions 2031 and Beyond will placate residents and avoid community opposition as proposed changes involve expansion of Perth's highway system and are not a radical departure from business as usual. This conservatism, fear of community upset and political pressure implies the need for the planning system to better manage community concerns by engaging with the community early for input. The past urban low density model is not the best model into the future and requires innovation, revision and rethinking. Perth's existing suburbs remain highly car dependent and principles relating to sustainability are opposed to such a model. Without higher density development, sustainability goals will not be realised and business as usual will result.

Ellis (2002) estimates that approximately 25% - 40% of market demand could be accommodated by higher density development which is a market sector currently not being met in Perth. Like Weller (2009), he cites NIMBYism, investment in freeways and the motor car, obstructive zoning controls, the conservatism of financial institutions and developer reluctance as roadblocks to achieving this. Ellis believes that it is inevitable over time that these obstructions will be rolled back and urban infill's true potential will be revealed and more widely embraced by the market. In respect to this issue, one resource person offered the following view:

Planners should do something about community outrage. Expect it. Set up an office to deal with it. Be proactive. Planners think that such a process is too hard, that opposition will kill it. Don't let this happen. There is heaps of it in Perth, through Community Action groups, the top down vs bottom up balance needs be much better. The community should not prevent positive development. The Kensington Community Association is a huge problem for South Perth. You can talk to anyone from there. They stop everything from getting done. That Nedlands / Dalkeith groups are the same. It's gone beyond one or two people and into proper organised action groups with newsletters. Talk to people about the third party right of review as well – that's what holds up anyone doing anything. Anybody with an opinion can get something held up in the tribunal, rather than people who are directly affected. If we had that in WA, it would be a nightmare.

A number of resource persons referenced the 2013 changes to the *Residential Design Codes* which were released at the same time the interviews took place. Changes include:

- Ancillary accommodation 'granny flats' no longer require a family member to reside, maximum size is $70m^2$ and the need for an additional car bay has been relaxed if the property is close to rail or a high frequency bus route.
- A greater emphasis on 'deemed to comply' rather than highly prescriptive and a greater emphasis on neighbour consultation where proposals reflect non-compliance.
- Minimum site areas for newly created lots have been marginally reduced. R40 minimum was formerly $200m^2$, now $180m^2$, R25 formerly $270m^2$ min now $260m^2$.
- Site plans and supporting reports have to now contain greater detail including: traffic islands, location of services, trees, significant landscape features, location of nearest public transport, location of nearest retail and community facilities to name a few.

One resource person offered the following interpretation on drivers for the new R-Codes and reasons why the Government had undertaken to update these:

I have been asked by the Housing Industry Association (HIA) and the Minister for Local Government (LG) over the past month for examples of when LGs are using excessive planning controls, and the financial costs this is putting on home owners. It's about reducing the statutory controls that LGs have and the delays these cause. State Government and the lobby groups are going for the throat of LGs in this manner. They are being asked to justify why a compliant single dwelling needs to sit for months awaiting a DA just because the lot is small. I had one come through from (name removed) the other day that sat for 61 days before even being assigned to a planner for assessment. That application has now been lodged in planning for 120 days, and there is no sign we will get an approval any time soon. The push here by the State government (SG) here is not to create smaller lots, but to stop the massive delays caused by inefficient LGs.

You and I have talked numerous times about the backwards planning that we have – huge lots in Nedlands, tiny cottage lots out in Serpentine-Jarrahdale past Armadale. This is not about reduced car dependence, or sustainability. It is just a 'try anything' approach to reducing urban growth so LGs and SGs don't have to pay for extending services and maximising the total yield of homes. If a developer is prepared to open up new land, better he put in 1000 homes rather than 400. This makes the government look very proactive.

You have pointed out that the R-Codes and the WAPC do not advocate for battleaxe subdivisions, and therefore the 'split down the middle approach' is becoming the new approach. The problem is you can't put a double garage on a 10m wide lot without it dominating the streetscape. The traditional requirement for the garage to be 0.5m behind the front of the dwelling results in ridiculous and tokenistic development, as there is 6m of garage, 1m of hallway and 1m of setback, meaning you have a section of house that is 8m long but only two metres wide – this is absolutely useless, but people do it simply to have a portion of house forward of the garage. They call the ridiculous space a 'study nook' or some such garbage. In a bid to stop this blight in streetscapes from garages and these tokenistic rooms which waste valuable space in tiny lots, they are trying to encourage people to go back to single garages where possible. Resale value is the prime concern of every single client I've met, and they all want double garages.

Those speeches by (Ministers) MacTiernan and Day at the release of Metroplan and Network City respectively (sic) point out the bigger issue here. MacTiernan expected the help of LGs to meet their optimistic targets, but was essentially let down by each Council (your case with Armadale is a classic example). So Minister Day made the point in his speech he would help developers. The creation of Development Assessment Panels was the biggest slap in the face for obstructive councils: 'I think for the private sector to have confidence to invest in higher-density housing in appropriate locations, they need to know that good projects when they're put forward are not going to be rejected on the basis of some capricious or some flimsy reason'. The use of the word capricious says it all. Whimsical. Fickle.

I see one thing, and one thing only in these R-Codes changes – make it quicker for builders to be able to provide housing. Don't get tied up in Council over the width of garage doors, don't even bother with LGs unless the lots are tiny, get these things built, built, built. Keep the 'small and sustainable' model rolling along, but this is all tokenism, really. Otherwise, they would not approve 200m² lots in Serpentine-Jarrahdale or Clarkson or Pearsall or even Alkimos! But that's where we're building them. It's all about meeting targets, and LGs have proved for a decade now that they are usually the largest source of delay and frustration in providing housing.

You may like to believe that the powers that be are driving a movement towards sustainability through infill housing in places like Armadale, but I really, truly, honestly don't believe it. Housing is an important machine. Its importance in the wider economy is unprecedented. It's an empire which needs regular feeding, and both the government and the private industry do very, very well out of it. To me, the location of these tiny lots is the simplest proof positive that this move is not about a sustainable, walkable outcome, but just fitting all the people in. Look at the path of least resistance. The government knows that smaller lots are cheaper to buy. So it keeps home buyers happy. They also reduce suburban sprawl. So it keeps environmentally-minded people happy. They reduce the delays in requiring planning approvals. So homes are built faster and the public and building industry is happy. They allow more homes in existing areas. So Councils like Armadale who want to bring about urban regeneration are happy. The can fit more homes into new areas. So developers are happy. But you know what is also true? The ministers, and the people running the HIA, and the people running development companies aren't living on 200m² lots on the periphery, nor are these sustainable, and nor are they 'walkable' or serviced by public transport. There's only one reason why Minister Day gave Councils a kick in the teeth. They were stopping the machine. Everything is about the dollar, and it always has been.

Another respondent provided the following comments in respect to the 2013 changes to the *Residential Design Codes*, suggesting that all changes reflect current thinking within planning towards more compact dwelling forms:

What I clearly see is certain influences fading and certain influences being strengthened. The influences being strengthened are the dominant planning paradigm ones. I don't think the new R-Codes are focussing on Armadale and other peripheral areas, the second half of the document concerns multiple dwellings in presumably inner areas or close to the train. If I was to sum up the new R-Codes, the overall emphasis is on creating a New Urbanist European type city. Every possible low density 'business as usual' element has been tightened. To me the lagging behind of the building industry is the slow uptake of higher density forms of housing. Variation 1 of the Codes with the multiple dwelling emphasis occurred in 2008 and the Multi Unit Housing Code came out in 2009.

Perth's rental situation is dire and currently very little is being done. The 2002 Codes are widely critiqued for their 4 x 2 large housing bias. It seems to me the building industry is still 10 years or so behind. This is why the 2002 Codes were superseded. I notice few multiple dwellings around the place as I have known the rules since 2008. I don't live in The City of Vincent but they are definitely gaining traction there. I am genuinely amazed that there aren't more multiple units being done. I am puzzled why. Sure you do see them but maybe 5% of all new construction, which represents a very low uptake by the industry. The diversity being touted since 1955 hasn't occurred. The WAPC says that 77% of all housing is detached dwellings throughout Perth, but in the south-east sub-region it is 91%! I have heard the phrase 'the days of the 4 x 2 are over' at every Planning Industry Association conference for a long while but I really question this.

One resource person was provided with examples of higher density developments which have recently occurred in Armadale as a result of *Town Planning Scheme No. 4*. The following images of multiple dwellings (bottom, left) and grouped housing development (bottom, right) was used for the purposes of this discussion.

Newer housing forms located within the study area (REIWA 2014).

The one on the left – look how much land is required to build that, expensive land, with prime street exposure. It needs a large developer, or group of small developers. It needs the support of the relevant LG by rezoning land appropriately and lifting the building height limits. It needs the support of State government. It needs the support of the commercial industry to occupy the mixed uses at the bottom. This is the 'shop front' infill that works well within the growth machine model.

The one on the right – these fit on regular quarter acre blocks. These are 'mum and dad' investors, coming to companies like (name removed, building company). They use blanket density increases that are already provided, but they don't need the support of other developers or consultants. If they cut enough corners they can fund the venture on their own, but only by sticking to the single-storey quick-sell model. Also, it will be designed, approved and built within 12 months. The multi-residential one will take years. The reality is lots like the right one make up 99% of all Perth residential housing. As long as housing numbers are the prime concern, this low-brow approach will be the favoured model. Anything other than single dwellings are purely seen as wealth-creation tools, not an opportunity to provide ground-breaking design, or create urban paradises, or solve the socio-economic problems, or develop true sustainability.

Potential reasons why residents are not redeveloping their land in Armadale:

I think something is on the shonk here…I've been looking through this area of split density coding. Literally every lot in this area is just under the area required to subdivide. 700m² is required, and nearly every lot is 692-695m². The 5% variation to average site area can only be approved by the WAPC, not by Council (both Council and WAPC can vary minimum site area by 5%). That means that the owners cannot try for a built strata subdivision, where a second house is added and they reside in the original house, and subdivide quickly and cheaply at the end. By requiring it to go to the WAPC first, that means that the LG can require the condition that the existing home be demolished prior to issuing clearances and creating the new lots.

This is a con. This is the reason these areas aren't subdividing. People don't want to move out for 6-18 months while they demolish and wait for new titles, and then build. This effectively takes owner-occupiers completely out of the development market. The only people who can afford to subdivide are people who buy the property specifically as a project. I think this is Armadale's method of saying we'll increase our density to keep the WAPC happy, but we will make it as hard as possible for people to subdivide. It deliberately requires existing houses to be demolished, thereby avoiding the problem of old streetscapes with new homes hidden at the rear battleaxe lot. I clicked on a bunch of the lots on the Council's intramaps system, and they all show the lot area. There are some at a just over 700, but 99% were just short… That's in this area anyway.

Here's a villa in Sixth Rd, Armadale. See – it's actually simple to create something that looks nice. Window feature, scalloped gutter/fascia feature, simple landscaping… it's so simple.

Higher quality infill within the study area (Resource person via email).

The overall performance of *Town Planning Scheme No. 4*, including the presence of battleaxe redevelopment was summarised thus:

Council only receives about 50 battleaxe proposals per year now and most proposed development is now higher quality new units, because developers realise they can get an extra unit if they demolish the existing house due to the density bonus. People want to comply with Council's requirements, there is a lot more information on our website than when the Scheme was first introduced. Developers are finally coming to terms with the requirements, that Council wants improved streetscapes in return for a density bonus. We struggled in the first few years of implementing the new scheme. We are seeing a lot more new dwellings addressing the street, having double garages and the overall development outcomes are better.

During the global financial crisis we were very quiet here with few proposals, but development applications are picking up now because the market seems to be improving. Town Planning Scheme No. 4 has enabled us to easily meet the Department of Planning's density targets. The problem for us is meeting these density targets in new areas. Much of the land surrounding these growth areas is severely constrained and I do not think this is fully appreciated by most people.

The above view that *Town Planning Scheme No. 4* had succeeded in its aims, provided by an officer administering development approvals for the last 15 years, was strongly refuted by other resource persons, one of whom offered the following view:

I consider the general concept of single storey development at R40 as quite terrible. The overall outside appearance of these homes in Armadale might look appealing, but when you look at the internal floor plan there are still corners cut. Nice render doesn't translate to liveability with second and third bedrooms not much bigger than a storeroom and shower doors that can't open properly because the toilet is in the way. It reflects poor design. If you put lipstick on a pig, it's still a pig.

Site works for constrained sites meant that development was often prohibitive:

Site works for a recent job we did came in at just over $500,000. That's an additional $62,500 per grouped dwelling. The owners can't simply add this to the sale price, as buyers don't care what the developer had to do in order to build the home. Further, the banks won't give them the finance they need to do the development, as they realise they won't be able to cover this cost. The site has sat idle for years now. I spoke with the client most recently last week. The Council development application has lapsed and the WAPC approval expired in September 2014. I originally took the job in 2010. In other words, you may find that part of the reason that this particular area surrounding Kelmscott Plaza has traditionally low levels of infill is that the clay soil makes it prohibitively expensive to do so give the current BCA requirements and construction standards.

The developers will end up losing money. Older developments didn't perform site inspections, and homes built up on limestone (i.e. post-war era) aren't affected by soil types. If you look at the existing grouped dwelling sites on Third Avenue in Kelmscott, they're either 70's and 80's era, pre-dating the soil examination requirements, or larger sites of around 14 dwellings (therefore they are able to divide the site costs up between more dwellings, making it more affordable). I'm just saying, sometimes it boils down to pure economics.

Site costs are too high, especially for awkward shaped lots (as shown below). Developers can't absorb the cost and make a profit. Banks agree and won't lend money for the project. End of story. It's about the market. Regardless of what density code the local authority slaps on an area, if there's no market for the resulting built form, developers won't build.

Irregular shaped lot showing recent redevelopment (Resource person via email).

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Appendix G: McLaughlin's Ranking of Local Retail Services (2009)

Rank	Service	Threshold Population
8	Warehouse clubs and supercentres	10931
7	Household appliance stores	8344
7	Musical instrument and supply stores	7094
6	Home Centres	6657
6	Department stores	6208
6	Newsagents	6208
6	Optical goods stores	6208
5	Floor covering stores	5879
4	Clothing stores	5156
4	Baked goods stores	4662
4	Computer and software stores	4662
4	Jewellery store	4662
4	Office supplies and stationary stores	4182
4	Sporting goods store	4182
4	Shoe store	4076
3	Furniture store	3873
3	New car dealers	3617
3	Book stores	3605
3	Nursery, garden centre and farm supply store	2698
2	Hardware store	1202
2	Pharmacy	1202
2	Radio, television and electronics stores	1202
2	Supermarket and other grocery stores	1202
2	Used car dealers	1104
1	Automotive parts and accessory stores	223
1	Beer wine and liquor store	223
1	Convenience store	223
1	Petrol stations with convenience store	223