RECONCILING AMENITY AND INTENSIFICATION IN NEW ZEALAND'S COASTAL SUBURBS

AN ISLAND BAY CASE STUDY

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ABSTRACT

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With the global and national populations predicted to increase, the location of new residences provides a planning challenge. Intensification of existing areas has been identified as an alternative to urban sprawl (constant development at the edges of cities), but it has been suggested that opposition to intensification is greatest in desirable locations. As a result, this thesis examines how the tension between amenity and intensification can be overcome to allow for future growth in New Zealand's coastal suburbs. A review of the existing research indicates a gap exists in the literature regarding the suburban coast, so a study of national and international coastal suburbs was conducted in order to develop an understanding of patterns and relationships within these areas. A survey of international suburbs examines the relationships between housing types and density, in order to identify the potential that different housing types offer to an intensification project. A design case study located in Wellington's Island Bay applies and tests the findings of the previous chapters. The research finds that rather than an inherent tension existing between amenity and intensification, intensification has significant potential to increase amenity when planned at an urban scale, and that this may be best applied around a public waterfront. While the research presents a set of design guidelines to assist in the reconciliation of amenity and intensification, further research needs to be conducted into the mechanics of implementing such a scheme, especially with regard to its economic and community acceptance aspects.

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DEDICATION

In memory of Eileen Raynes

1921-2010

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‘THERE IS HUGE RESISTANCE TO INTENSIFICATION IN ALL THE PLACES WHERE PEOPLE MOST WANT TO LIVE’

NICHOLAS FALK

FROM ‘SMARTER GROWTH AND SUSTAINABLE SUBURBS’,
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CHAPTER ONE: INTRODUCTION

THE NEED FOR SUBURBAN INTENSIFICATION:

With the advent of the rail system during the industrial revolution land previously too far away from the central city to be of residential use became readily accessible. Combined with a desire to escape the pollution caused by the inner city factories the middle classes began to shift to the urban periphery, establishing the first modern suburbs. Attracted by the prospect of more space, increasing numbers of people moved to the suburbs as transport became cheaper and more efficient. As private car ownership became widespread suburbs developed at locations increasingly further away from the central city. Suburban development became focussed on the car, and rapid car oriented development gave rise to the concept of urban sprawl. The problems associated with suburban sprawl are well documented; traffic congestion, socioeconomic polarisation, lack of open space, and the resulting negative environmental effects.

While the figures vary, the majority of people living within cities choose to reside in the suburbs, a strong indicator of their desirability. With a predicated increase in both the national and global populations, growth management is a key issue in current

urban planning. To continue suburban development as currently practiced will only serve to exacerbate the negative effects associated with sprawl. There is, however, an alternative.

By focussing development in already established suburbs, an increase in population can be accommodated without the need for extensive greenfield development. Modern suburbs are characterised by low density developments on larger plots of land than their older inner-city counterparts. Increasing the density of these modern outer suburbs while addressing issues related to transport, services, open space and social diversity has the potential create well functioning, dynamic and resilient communities to support the future development of the city as a whole.

City and District Councils throughout New Zealand have planned for growth in different ways. In order to minimise greenfield development around the edge of the city (sprawl) Wellington City Council examined possible areas for intensification, identifying the costal suburb of Lyall Bay as a potential 'area of change.' A strong negative reaction from the public resulted in this idea being rejected, suggesting a tension between the goals of intensified suburban development and the desire to protect the high amenity of coastal areas. In response, this thesis asks:

How can the tension between amenity and intensification in costal suburbs be reconciled to allow for future growth?

To answer this question a design case study will be conducted in order to examine whether, and how, amenity and intensification can be reconciled. As New Zealand is younger and less populous than many other countries it may show different development patterns, and solutions proposed internationally may not be applicable locally. Therefore it is worth developing a response targeted at New Zealand, which can respond to national issues, attitudes, and development patterns in order to successfully plan for the future. To examine this, Island Bay in Wellington will be used as a case study.

DEFINITIONS:

AMENITY

This paper follows the Oxford Dictionary definition of amenity as ‘the pleasantness or attractiveness of a place’ (Oxford University Press, 2010). More specifically, research for the New Zealand Ministry for the Environment identified the following ten key amenity factors (Hill & Spargo, 1998):

- Safety
- Heritage
- Open Space
- Neighbour Issues
- Mobility and Accessibility
- Healthy Urban Environment
- Healthy Communities
- Economy
- Aesthetics
- Infrastructure

INTENSIFICATION:

Intensification will be considered as a significant increase in the physical density of the area, in both dwellings and people per hectare.

TENSION:

A number of submissions to Wellington City Council (Wellington City Council, 2007c; 2008), as well as general public reaction to the suggested intensification of Lyall Bay, indicate that intensification is perceived as reducing amenity (The Dominion Post, 2008; Johnsonville Progressive Association, 2009). As such, it may face significant opposition, especially in desirable locations, as indicated by Nicholas Falk’s statement: ‘there is huge resistance to intensification in all the places where people most want to live’ (2006b)

METROPOLITAN COASTAL SUBURB:

Suburbs from the Auckland, Wellington and Christchurch metropolitan areas are the subjects of this research.

ACADEMIC CONTEXT:

This research contributes to a larger field of scholarship which addresses sustainable suburban development. In the past urban design authors were concerned with the redevelopment of urban centres, the decay of which was seen as the result of suburbanisation. This, as well as the resulting problems suburban

expansion caused, resulted in suburbs being viewed negatively. More recently however, scholars and practitioners have begun to look at the suburb in a more positive light, examining its importance and how it, the original source of sprawl, can be used as a solution to continuing greenfield development. Current leading theories include Transit Oriented Development and Neotraditional Development, both of which are considered under the umbrella of New Urbanism, as well as Smart Growth, a form of the Compact Cities concept.

The literature on these concepts is expansive, with support and criticism readily available. By examining the criticism of each concept it is possible to identify the strongest parts of each, with the potential of combining them with findings from other literature and practice to create a strong solution for a new suburban design approach.

As the results of this thesis are designed to be applied in a New Zealand context, planning documents and policies are also texts that need to be studied. These will help set up the parameters in which the project can reasonably expect to operate. While changes to planning will likely be required for successful intensification, actions significantly outside the scope of current planning and expectations will need to be well justified, or they may inhibit success through public and bureaucratic resistance.

CHAPTER OUTLINE:

Having established the background and need for the research, the thesis progresses as follows:

Chapter Two contains a review of the key texts, criticism, and associated literature pertaining to coastal and sub/urban development. The aim of this chapter is to identify important considerations for coastal suburban design, which can be further examined and tested through the case study. The relevance of texts to a New Zealand context is particularly important.

Chapter Three examines a sample of coastal suburbs from each city in order to develop an understanding of coastal suburban patterns. This chapter ends with the presentation of a typology designed to classify and help organise examination of coastal suburbs.

Chapter Four examines a range of international suburbs with regards to their housing type. This chapter aims to establish ways in which different housing types affect density, and how they may interact with each other.

Chapter Five tests the findings of the previous three chapters through a design case study focussing on the waterfront area of Island Bay. A staged development scheme is presented, comprising of a series of planning maps, supplementary images, and rationale. This is followed by a discussion of the schemes weaknesses and identifies areas for further examination. This chapter concludes

with a set of general planning conditions to provide a base on which coastal suburban intensification may take place.

Chapter Six concludes the work by presenting the findings of the research, the major findings of each of the chapters, suggesting potential wider applications of the work, and identifying areas for future research.

CHAPTER TWO: LITERATURE REVIEW:

There is a great deal written on the topics of high-quality urbanism, coastal issues, and suburban design. However there appears to be a gap in the literature concerning suburban coastal design. This chapter aims to review salient features of the above areas and examine their implications for designing coastal suburbs.

URBAN DEVELOPMENT CONCEPTS

Currently, Smart Growth and New Urbanism are two leading formalised urban design and planning movements. As such, they offer a significant degree of both theoretical and practical guidance, with a strong focus on current urban design and sustainability issues such as urban sprawl (Dieleman & Wegener, 2004). The majority of the guiding principles of both concepts are shared to the extent that they are, at times, considered one and the same (Duany, Sorlien, & Wright, 2009; Litman, 2009). However, newurbanism.org (n.d) and smartgrowth.org (n.d) provide a set of principles for their respective disciplines. The shared principles are as follows:

- Walkable communities
- Higher densities
- Housing mix
- Quality urban environments
- A range of transport options
- Multifunctional, diverse environments

Some principals overlap, or are implied but not identified as guiding principles. These include:

- Connectivity is a New Urbanist principle not mentioned in Smart Growth, but is closely related to walkability and transport choice.
- Unlike New Urbanism, Smart Growth does not identify sustainability as a principle, but a number of its principles have outcomes contributing to sustainability. Research by Williams (2000) has indicated that increasing density improves urban sustainability in some aspects, while proving ineffective in others.
- Quality of Life is explicitly identified as a New Urbanist principle, but is considered a result of Smart Growth outcomes.
- Encouraging collaboration between designers and the community is identified as a Smart Growth principle only. However this is also considered important by New Urbanists (Ellis 2002; Duany, Sorlien, & Wright, 2009)

There are two key principles that set New Urbanism and Smart Growth apart as distinct planning methods. These are Smart Growth's focus on directing development to existing areas, and New Urbanism's focus on using traditional neighbourhood form.

Smart Growth aims to prevent urban sprawl and cater for future growth by increasing density and accessibility, often containing

development within an urban boundary (Bolick, 2000). A popular example is Portland, Oregon, in the USA.

Bolick strongly criticises Smart Growth as interfering and unconstitutional, which has been supported by several findings of the U.S. Supreme Court. However Litman (2009) addresses a number of criticisms of Smart Growth, finding many of them to be unjustified. He also provides a list of ten areas where Smart Growth needs improvement.

Key sub-concepts within New Urbanism are Neotraditional Development (NTD) and Transit Oriented Development (TOD). Where NTD uses traditional town planning as a guide, TODs use a development system based around a transport hierarchy. Despite the differences in their focus, they share many of the same basic principles (Calthorpe 1993, Quinn 2006).

Quinn (2006) identifies the shortcomings of TOD, while Ellis (2002) conducts an extensive review of criticism of New Urbanism, concluding that much of it is unfounded. Ellis also identifies areas where New Urbanism can be improved and more research is needed.

In order to simplify the implementation of New Urbanism and Smart Growth, Duany, Plater-Zyberk & Company developed a 'Smartcode' (Duany, Sorlien, & Wright, 2009) which can be added to a District Plan to instantly provide all the rules and guidelines required for New Urbanism and Smart Growth. The Smartcode

considers TOD, NTD and Smart Growth as 'Smart Growth', using the term Regional Centre Development (RCD) to represent Smart Growth as previously defined. A particularly notable feature of RCD is that it does not permit the existence of a suburban zone. While it is logical to treat the proposed intensification site as a suburban centre, and thus more urban in character than the remainder of the area, it is not the goal of this research to remove the suburb altogether. In this case, RCD is of limited value.

Increasing density is considered by many authors to be an important factor in creating more sustainable and pleasant suburbs (newurbanism.org 2010, smartgrowth.org 2010, Calthorpe 1993,) and has been identified by the Wellington City Council as the preferred method for responding to future growth (WCC 2007b). Cohen and Gutman (2007) identify a range of densities, such as time, information, language etc, providing a range of criteria on which to establish density. For the purposes of this research only physical (population and dwelling) density will be considered.

Yigitcanlar et al (2008) and Frey et al (2006) provide useful definitions for establishing levels of density. Yigitcanlar et al identify densities in relation to population where:

Very Low	= 0-10 people per hectare
Low	= 10-25 p/h
Medium	= 25-50 p/h
High	= 50-100 p/h
Very High	= 100+ p/h

Frey et al (2006) directly relate population and dwelling densities, describing 120-140 people per hectare as 60-80 residences. This equates to between 1.75 and 2 people per residence.

Combining these results in the following densities¹, providing a standard for use throughout the research:

Very Low	= 0-6 dwellings per hectare
Low	= 6-15 d/h
Medium	=15-29 d/h
High	=29-58 d/h
Very High	=58+ d/h

Given the relatively low density of modern suburbs, attempting to achieve a Very High density is unrealistic, as these densities tend to occur within central areas. However to house the greatest number of people in a suburban context, it is worth investigating the potential for suburban areas to cater for High densities.

DEVELOPMENT CONCERNS

Submissions to the Wellington City Council suggest that there is significant public concern in relation to the effects of increasing density. Notable concerns include crowding, decreased privacy, shading, loss of views, reduction in land value and the effect on suburban character (WCC 2007c). Loss of views is especially

significant in coastal areas as they are one of the unique features of these locations.

Development's effects on the environment are threefold. There are the established negative effects of development such as loss of habitat and increased pollution (McElfish 2007); effects from specific coastal features such as sea walls, breakwaters, and artificial beaches (Jacobsen, 2004; Pilkey, Pilkey, Pilkey, & Neal, 1983); as well as perceptual effects i.e. that the private realm is infringing on public space (Collins and Kearns 2008). Collins and Kearns suggest that while coastal development is often perceived to be decreasing public access, it can increase access through the creation of new roads and open space.

Ensuring public access to New Zealand's coastline has been identified as a matter of national importance (DOC 1994). Currently 69% of the 19,883km coastline is owned by the national or local governments (Collins & Kearns 2008, Te Ara 2009). It is an area which can be used and developed in a number of ways, from family holidays at a remote beach, to international trade through highly developed ports. It has also become an increasingly popular place to reside, as evidenced through increased subdivision and land values (Collins and Kearns 2008). However, with the continual increase in coastal property prices those on lower incomes may find themselves unable to enter – or forced out of – coastal

suburbs, increasing socioeconomic polarisation and reducing diversity and vibrancy.

The loss of community in the modern suburb, and the potential for alternative development patterns to counteract this trend is a major theme in New Urbanist literature and critique. Newurbanism.org (n.d) identifies a stronger sense of community as one of the benefits of New Urbanism. Ellis (2002) notes that while spatial planning will not create community in itself; it contributes by providing an environment conducive to forming social bonds. The effectiveness of this is discussed by Nasar (2003), however the major community challenge for any modern suburb, and especially affluent coastal suburbs, is diversity.

A number of authors discuss the socio economic and ethnic polarisation that occurs between city and suburb (Priemus et. al. 2004, Priemus & Hall 2004, Pulido 2000), a proposed solution to which is the development of more affordable housing. Due to the high land values associated with coastal property, the main challenge regarding diversity will be providing a variety of housing at an affordable rate. This can be addressed through the careful selection of location and dwelling type, taking into consideration factors such as proximity to amenities, construction methods, and land cost to dwelling ratio.

An additional concern which has been identified is that the proportion of people over 40 living alone is predicted to increase

(Calthorpe 1993, Gwilliam 2006). As modern suburbia has been identified as lacking housing variety, New Urbanists propose creating a range of housing types and increasing affordability in order to create a more diverse community, which could assist in reducing the current polarization (Potts, Falk, Kochan 2007). Burton (2000) has found that compactness can facilitate some facets of equality, while impeding others.

BUILT FORM

Restricted infill development of sites, as identified by WCC 2007a, has significant potential for coastal suburbs as they increase density while minimising loss of views. While ensuring character compatibility in terms of height, bulk, and site coverage, providing the required street connections may be difficult. Unless alternative parking arrangements are developed, vehicle accessways will feature prominently on infill sites, reducing green space and visual amenity. Infill is also reliant on a supply of adequately sized lots with owners willing to develop them. Given that 'lifestyle' is a major pull factor for coastal suburbs, finding residents willing to alter their lifestyle may be difficult.

Including terrace housing as an intensification strategy is useful as it can be configured to cater for a number of different user types. Configurations targeted to those desiring low maintenance properties could be set behind bands of shared space, while those desiring private space could have private frontages instead. In

coastal terms these are beneficial as the higher number of units per lot reduces costs, increasing their affordability.

Semi detached housing configurations, including duplex and triplex developments, offer a compromise between single unit dwellings on (comparatively) large lots, and terrace housing. The ability to contain multiple dwellings within a building of a similar visual nature to typical suburban housing is useful as it is less likely to conflict with surrounding character. It also has the benefits of reducing the land cost per dwelling, increasing affordability or allowing higher quality, and maintaining a lower population density, lessening the perception of crowding.

Depending on configuration, building vertically has the benefit of housing a larger number of people on a site, making it more efficient than terrace housing. However tall buildings have the potential to shade and overlook neighbouring sites, as well as block views. Research by Kearney (2006) suggests that careful placement can reduce these effects. She suggests that providing visual access to natural views and minimising views of constructed space lessens the perception of density and crowding.

Tall buildings create a planning conflict however. While their ability to house a number of people near the seafront is desirable due to increased accessibility, they are the development form most likely to block views, overlook, and shade, while being the least likely to suffer from these. Locating these farther back from the shoreline

reduces the blocking of views, but also reduces accessibility. Pilkey et al. (1983) note that multi-storey buildings are difficult to relocate in response to erosion, thus requiring careful consideration of the risks and benefits of their location.

Regardless of how it is achieved, Kearney (2006) believes that negative feelings about high densities are not necessarily a given, a view supported by the high desirability of the Glasgow West End as identified by Frey et al (2006). However quality has been identified as a key concern through submissions to Wellington City Council regarding intensification (Wellington City Council, 2007c; Wellington City Council, 2008). Poor quality development is believed to reduce nearby land value as well as decrease visual amenity and local character.

COASTAL ISSUES

The New Zealand Coastal Policy Statement 1994 is the document developed to guide local authorities in managing coastal issues (DOC 1994). Preservation of natural character, management of development, and Maori issues are identified as areas of particular importance. It was reviewed in 2004 (Rosier 2004) and a proposed Coastal Policy Statement developed as a result (DOC 2008). This has yet to become operative. Olsen (2003) identifies Integrated Coastal Management strategies as a useful guide for coastal development. The Foreshore and Seabed Act (2004) is significant as it currently identifies the Crown as having ownership of the

foreshore and seabed, and ensures public access (Hickford, 2009). The current Government intends to replace this act, but this change is unlikely to have a significant effect on the research as public access to the shoreline is unlikely to be restricted.

The coastal environment provides a set of natural hazards which must be considered during development. The corrosive effects of sea spray are one such example, which is acknowledged through the identification of coastal zones in New Zealand building literature. A practical effect of this is preventing the use of unsuitable materials within these areas (Consumers' Institute & DBH 2004). Erosion is identified as a major issue, and while Jacobsen (2004) views the benefits of sea walls as questionable, Pilkey et al. (1983) disapprove of their use outright. This poses difficulties as sea levels are predicted to rise up to 88 cm within the next 90 years (MFE, 2001).

It has been suggested that coastal settlements have difficulty developing economically, especially when near more developed centres (O'Conner 2004). O'Conner suggests that this is a result of residents fulfilling their needs for services in a nearby metropolitan centre, preventing all but the most basic services from developing locally. This is partially attributed to factors that make the coast desirable for residing, such as sea views, generally having little appeal to businesses. He also identifies coastal developments as having higher proportions of welfare dependence and

unemployment than other areas, despite having high property prices.

It is important to note that while this specifically refers to settlements existing outside, rather than part of, cities, the concerns are still applicable to a lesser extent. Suburbs have traditionally been populated by the affluent, whereas up until the boom in coastal popularity, small coastal settlements often had lower property values, supporting a lower income population (Gurran, Squires, & Blakely, 2005). Also, unlike isolated settlements, metropolitan areas provide a wide range of both jobs and employees to fulfil a suburb's needs (Bogart, 2006). Due to the size of this larger network, transport becomes an important feature, requiring consideration within the suburb itself, and between the suburb and the rest of the metropolitan area.

TRANSPORT

A number of negative outcomes associated with transport have been identified (Yigitcanlar, et al. 2008, McElfish 2007). Measuring transport sustainability is discussed by Akerman & Hojer (2006), who conclude that technological development alone appears insufficient for achieving sustainability. Greater use of public transport is a proposed solution.

Hensher (2007) discusses the benefits of buses, while Quinn (2006) identifies factors impeding their use. Goldman & Gorham (2006) suggest methods of overcoming these. The benefits of trains are

listed by Litman (2007), and trams by (Falk 2006b). Yigitcanlar et al. (2008) discuss the potential for automated 'smart transport'. While these forms of transport can effectively service the commercial, retail and residential needs of a coastal suburb, their ability to service recreational needs is limited, as discussed below. Location of transit routes and stops in coastal suburbs is explored in Chapter Three.

Due to their size, common pieces of recreational equipment such as surfboards, umbrellas, deckchairs and the like are difficult to carry on buses, if permitted at all. In addition, other factors such as the smells associated with fish and bait are likely to be unwelcome, as is sand and the family dog. These limitations are even more pronounced with taxis.

To transport the average New Zealand household of three (Statistics New Zealand, 2007) by bus, one kilometre to the coastal edge would cost approximately \$10.20 return (Auckland Regional Transport Authority, 2010; Greater Wellington Regional Council, 2010a; Greater Wellington Regional Council, 2010b; Environment Canterbury, 2010). However the same journey by private vehicle costs around 28 cents (New Zealand Transport Authority, 2009; New Zealand Transport Authority, 2010)², making it a more attractive option for those who own cars. Charging for parking is an effective method of increasing the costs of using a private vehicle, but unfairly impacts those with little disposable income. It is also

undesirable as there is currently no effective alternative to transporting the desired equipment.

Provision for private vehicles, stated as important in the Charter for the New Urbanism (Congress for the New Urbanism, 1996), is discussed by both Yigitcanlar et al (2008) and Falk (2006b). Salingaros (2005) suggests that pedestrian space must be protected from traffic and Crankshaw (2009) suggests that on street parking forms a protective barrier which should be taken full advantage of while disrupting street continuity as little as possible. Plan Change 56 (WCC 2007a) implements this by reducing the permitted width of vehicle accessways to sites, which the Smartcode (Duany, Sorlien, & Wright, 2009) requires be accessed by rear lanes. The Smartcode also requires that open parking areas are screened from view and is very specific about the location of parking areas on lots. In addition it limits the width of parking area accessways, and requires bicycle racks to be provided alongside parking.

Two design approaches for addressing the above problems are:

- Locating as many people as possible within walking distance of coastal recreational areas will minimise the need for vehicular transport, however this raises a number of other issues.
- The coastal recreational area will need to provide parking spaces for those who live outside a walkable distance. This distance may be shorter than what is usually considered walkable, to take into account the added weight of recreational equipment.

Walkable streets offer an alternative to using private vehicles for transport, among other benefits, increasing accessibility for those unable to access a car, be it due to age, financial situation or other factors (newurbanism.org n.d, McElfish 2007). They are also identified as key to developing social relationships and maintaining a lively community (Gehl, 1971). The Smartcode defines a walkable distance as a quarter of a mile (approx 400m/5 min walk) as standard, or half a mile from a transport hub (Duany, Sorlien, & Wright, 2009).

The literature identifies the benefits of walkability (newurbanism.org 2010, Potts, Falk and Kochan 2007), and provides guidance on how to develop it (Potts, Falk and Kochan 2007, newurbanism.org n.d.). As with transport in a coastal environment, the literature is applicable to most of the settlement, however special consideration is required for the coastal edge.

Two key concerns pertaining to walkability in a coastal environment are security and exposure. If a public space is present between the coastal edge and residences, there will be a lack of passive surveillance along the coastal edge, especially at night. In addition, the coastal edge offers little in terms of protection from wind or high seas, causing it to be unpleasant and potentially dangerous in windy or wet conditions.

Crime prevention through environmental design (CPTED) offers design guidance for increasing safety (Auckland City Council, 2010).

Developing areas near the coast which are active into the evening, such as restaurants, could provide passive surveillance while careful planting can contribute to reducing exposure. However care must be taken to not block lines of sight (ACC, 2010). Sand dunes further complicate matters, as their recommended treatment (Pilkey et al, 1983) may block sight lines towards a beach, relying on taller buildings to provide passive surveillance. However it has been suggested that residents of buildings over four storeys lose contact with activity at ground level (Alexander et al., 1977), which may diminish the effectiveness of passive surveillance.

DESIGN GUIDANCE

The literature provides multiple examples of how density can be achieved. Calthorpe (1993) and Fillion (2001) provide and examine recent examples of higher density areas. Frey et al (2006) examine historic high density suburbs in Glasgow, while planning documents from the Wellington City Council (2007a, 2007b, 2007c 2008) provide an example of how future planning for higher densities may occur. Jenks (2000) identifies New Development, Redevelopment, Conversion and Extension as four different intensification strategies. The appropriateness of any given strategy would be dependent on both site context and the scope of the intensification plan.

A number of authors provide design guidance. Wellington City Council has a comprehensive Residential Design Guide (2009a) and

Proposed Plan Change 72 (2009b) introduces a Coastal Edge Design Guide. However, this is limited to ribbon development directly adjacent to the coast. Crankshaw (2009 p. 168) provides lists of design considerations and the New Urbanist Smartcode (Duany, Sorlien, & Wright, 2009) provides an authoritative description of the sizing and layout of specific features for each of its identified zones, making it a useful design tool even if not fully implemented. Pilkey et al. (1983) provide in depth examination and guidance on coastal development issues, as does the New South Wales Coastal Design Guide (Coastal Council of New South Wales, 2003).

Despite lacking specific acknowledgement of the suburban coast, Smart Growth and New Urbanism are useful concepts as they codify a number of techniques for successful urban development. These can be critiqued and modified for application in coastal suburban environments.

CONCLUSION

While coastal suburbs face many of the same challenges as any other suburb, their location on a coastal edge introduces a number of unique features and circumstances that warrant a specific approach. As there is currently a gap in literature concerning this point, research conducted in other areas has been examined in order to anticipate some of the challenges and opportunities provided in such a situation. Significant findings pertaining to coastal suburbs are noted below:

- Due to its position as a current popular theory of good urban design, New Urbanism provides a comprehensive base on which to apply the above findings with the intent of developing a set of responses to coastal suburban intensification.
- While sharing many similarities with New Urbanism, Smart Growth, represented in the Smartcode by Regional Centre Development, is less desirable due to its rejection of the suburban zone.
- The New Urbanist principles relate well to the amenity factors presented by Hill and Spargo (1998), many of which could be considered specific facets of the more general NU principles. As such, the principles New Urbanism presented at the beginning of this chapter will be the criteria on which amenity is judged throughout the research.
- A target density level of 29-58 dwellings per hectare has been established, in order to find an upper level as to what may be appropriate.
- Access to, and blocking of, views are major concerns regarding development, as is maintaining character.
- The high land values of coastal properties have been identified as posing challenges to diversity and housing affordability. Combining different forms of development with a range of locations enables a variety of housing options to be created, with the potential to increase dwelling affordability and range.

- Coastal issues pertaining to development can be examined by asking the following three questions:
 - What will the effects of the development be on the coastal environment?
 - What will the effects of the coastal environment be on the development?
 - What will the perceived effects of the coastal and developed environment be?
- Public transport is limited in its ability to service the recreational needs of a coastal suburb, requiring a coastal zone which can accommodate private vehicles, without detracting from a pedestrian environment.
- Establishing public pedestrian space will require addressing conflicts between safety through visibility and safety through protective barriers, security and aesthetic appeal, and vehicles and pedestrians.

The findings of this chapter alone are insufficient to develop a design response. The following two chapters provide case studies examining coastal suburbs and housing types. By combining the findings of the case studies with those of this literature review, a design experiment can be conducted to see if it is possible to develop a set of techniques for the reconciliation of amenity and intensification.

NOTES

¹The value of 1.75 residents per household has been used to reflect the trend towards smaller households and growth in the single 40+ age group. Results are rounded up. It would also be possible to use household sizes from census data for the conversion of dwelling numbers into population, however this does not take into account future trends.

²In the last census, the average New Zealand household size was 2.7 people (Statistics New Zealand, 2007), which for this case will be taken to represent two adults and a child. One kilometre has been used as the distance travelled, and when fare zones are applicable this is assumed to be one zone. Bus fares from the three main centres have been averaged. The average adult fare is \$2 and the child's fare is \$1.13.

The private vehicle example is based on a 2001 Toyota Corolla which travels 14,000 km per year, the New Zealand average, on 91 octane petrol. Annual fuel costs were calculated to be \$1450, which included an increased fuel use of 20% due to a roof rack (for the surfboard), cooling via open windows, and a 'brisk' driver (New Zealand Transport Authority, 2010). A conservative \$500 per year was also included to represent vehicle licensing (registration) and Warrant of Fitness costs. The cost of travelling one kilometre was \$0.139, resulting in a round trip total of 28 cents

CHAPTER THREE: COASTAL PRECEDENT REVIEW

INTRODUCTION

For coastal suburban planning to be successful it is important to identify and understand the underlying features and patterns of these suburbs and the relationships between them. This chapter examines a number of coastal suburbs, beginning with international examples, before examining New Zealand suburbs from each of the major metropolitan regions.

Key features considered include:

- Built form
- Topography (New Zealand suburbs only)
- Public green space
- Transport links and public transport routes/stops
- Location of civic buildings and business zones

Along with the physical data, graphs will present social data relating to the suburb. Data will fall into the following categories:

- Age
- Household Size
- Ethnicity
- Income

Income figures will be reported in the currency of the country concerned.

Following this analysis a typology is presented. The typology is the result of the suburban analysis as well as a survey of the metropolitan area coastlines, and is based on the common patterns revealed. The relationships between features within the typology, the preferential combinations thereof, and their position with regards to New Urbanism are discussed in the conclusion.

INTERNATIONAL PRECEDENTS AND NEW ZEALAND CASE STUDIES

The following case studies take the form of a 1:10,000 figure ground diagram of the suburb, a short description of notable features, and four smaller diagrams. The smaller diagrams represent:

- The suburb's location for international precedents, or the suburb's topography in the New Zealand case studies
- Public green or open space
- Transport features
- Civic structures and designated business zones.

The following conventions have been used:

When reading the statistical data, the numbers on the graphs represent the median age, median income, and mean household size in the statistical area in which the suburb is located. The small upper graph represents the statistics for the suburb's city/district, while the lower graph represents those for the region.

SEASIDE – FLORIDA - USA

While not strictly a suburb, Seaside is of a similar scale to a number of the other suburbs examined, and provides an example of New Urbanist coastal planning. As an oft-cited example of such planning, Seaside combines a geometric, formal centre with both loose grids and freeform streets on the periphery. The clearly defined centre creates a focal point for the area, while the extension of the business centre to the seafront forms an active edge. Also notable is that the beach is accessed via walkways that run over the top of the sand dunes, rather than between them.

(US Census Bureau, n.d. a; b; c; d; e; f; g; h; i; Seaside, FL, 2010; Google, 2010a)

AGE

- Under 15
- 15-64
- 65 and over

ETHNICITY

- US European
- African/Indian American
- Other

INCOME

- Less than 25k
- 25k – 49.9k
- 50k +

FAMILY

- No Children
- Children
- Solo Parent

LIVERMEAD – TORBAY - ENGLAND

Livermead has the most freeform road pattern of the suburbs examined. There appears to be no reason for its layout, which leads to cul de sacs in unusual places, reducing connectivity and serving to make wayfinding difficult. While a major road keeps much of the coastal zone public in nature, properties on the promontory extend right up to the cliff edge, privatising the area.

(Office for National Statistics, n.d., 2004a; b; 2008; 2009; 2010; Torbay Council, 2008; 2010a; b; c; Google, 2010b)

Ethnicity data for Livermead, as well as median household size and income bracket data for Torbay District and Southwest Region was not available.

SURFERS' PARADISE – GOLD COAST - AUSTRALIA

Despite its coarse grain and relatively few buildings, Surfers' Paradise has the greatest potential density of all the examined suburbs. However, as a tourist destination the total population at any one time will fluctuate. While the hotels have comparatively large open spaces around them, residential dwellings are densely packed on small lots. Tourism explains the large business area dedicated to entertainment and accommodation. A coastal walkway creates a buffer between city and sea, creating not only a public edge, but providing an alternate pedestrian only route along the suburb.

(Australian Bureau of Statistics, 2008a; b; c; Gold Coast City Council, 2010a; b; Google, 2010c)

BROWN'S BAY – NORTH SHORE – AUCKLAND

Brown's Bay is one of only two suburbs examined to have a business area directly adjacent the waterfront. The business centre is unusual as it forms a hook shape, spreading retail along a path, rather than in a block. The central area also appears to hold a larger number of multi unit residences than any of the other suburbs. Open space runs throughout the central area, as well as adjacent to the beach. The relationship between the northern coastal housing and the beach is much more intimate in comparison to the rest of the coast.

(Statistics New Zealand, 2007a; b; 2008a; Google, 2010d; Auckland Regional Council, n.d.; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

- Under 15
- 15-64
- 65 and over

ETHNICITY

- European
- Maori
- Other

INCOME

- 20k or less
- >20k & ≤ 50k
- Over 50k

FAMILY

- No Children
- Children
- Solo Parent

WOOD BAY – WAITAKERE - AUCKLAND

Wood Bay displays the lowest density of all the suburbs reviewed. It is zoned 'bush living' as nearly all the space not used by roads or dwellings is heavily vegetated. Despite having a band of public bush along the waterfront, which density and topography render difficult to use, the edge condition appears private rather than public. From the sea, the heavy planting conceals many of the houses, significantly reducing the perception of development. This helps create a natural, (relatively) untouched appearance.

(Statistics New Zealand, 2007a; c; 2008b; Google, 2010e; Auckland Regional Council, n.d.; Yellow Pages Group, 2009; Wisers, 2010; ZoomIn, 2010)

AGE

ETHNICITY

INCOME

FAMILY

ORAKEI – AUCKLAND CITY - AUCKLAND

One feature of Orakei that stands out is the large roundabout in the centre of the featured part of the suburb. While aerial photos only show a grassy surface, photos from street level suggest the presence of a cricket wicket. As it is relatively undeveloped it is readily adaptable and can be used as a multifunctional space. Due to its central location it provides an ideal setting for small events.

(Statistics New Zealand, 2007a; d; 2008c; Google, 2010f; Auckland Regional Council, n.d.; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

CONIFER GROVE – PAPA KURA - AUCKLAND

Two features within Conifer Grove stand out from the other suburbs examined. Where cul de sacs are present in other suburbs, they are generally fully surfaced. In Conifer Grove however, the majority of cul de sacs have grassy roundabouts in the middle, creating a space which is claimed by residents. Also notable is that Conifer Grove has a network of interior green spaces providing pedestrian paths that are distinct from the road network.

(Statistics New Zealand, 2007a; e; 2008d; Google, 2010g; Auckland Regional Council, n.d.; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

- Under 15
- 15-64
- 65 and over

ETHNICITY

- European
- Maori
- Other

INCOME

- 20k or less
- >20k & ≤ 50k
- Over 50k

FAMILY

- No Children
- Children
- Solo Parent

ROSENEATH – WELLINGTON

As Roseneath is located on a steep hill, the coastal road has little effect on the suburb as few residences are connected to it. Coastal accessibility is limited as the coastal road only connects to the rest of Roseneath at two points. This lack of connection to the actual coastline can be used to challenge Roseneath's identity as a coastal suburb. However, its adjacency to the coast, as well as its exposure to coastal conditions and provision of coastal views, warrants its inclusion in this study.

(Statistics New Zealand, 2007f; g; 2008e; Google, 2010h; Wellington City Council, n.d.a; Wellington City Council, 2009; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

ETHNICITY

INCOME

FAMILY

LYALL BAY - WELLINGTON

An interesting feature of Lyall Bay is that the main street is not adjacent to the retail area. This may be due to the retail zones peripheral location, where land would have been available for the development of large format stores. While a major road runs along the coast, the main road runs inland, as this is the shortest route to the city.

(Statistics New Zealand, 2007f; g; 2008f; Google, 2010i; Wellington City Council, 2010a; n.d.b; 2009; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

ETHNICITY

INCOME

FAMILY

SEATOUN - WELLINGTON

Seatoun is unusual as it has located both of its schools adjacent to the coast, and as such is the only suburb examined to have playing fields by the sea. While other suburbs have public green space on the waterfront, in all cases formal playing fields are set further into the suburb. Also of note are its lack of a coastal road, and the positioning of the grid at an angle to the main beachfront area. These factors combine to create a pedestrian waterfront accessed via several points, rather than continuous access via a coastal road.

(Statistics New Zealand, 2007f; g; 2008g; Google, 2010j; Wellington City Council, 2010b; n.d.b; 2009; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

ETHNICITY

INCOME

FAMILY

BREAKER BAY - WELLINGTON

Breaker Bay is an example of ribbon development, which the Wellington City Council seeks to avoid. While it is well connected to public transport due to the number of bus stops, its reliance on a single road places it at risk of being cut off in a storm. Further development is limited to building on the hillside. This is expensive due to the need for earthworks and strengthening.

(Statistics New Zealand, 2007f; g; 2008g; Google, 2010k; Wellington City Council, 2010b; n.d.b; Wellington City Council, 2009; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

Statistical data is the same as Seatoun, due to Breaker Bay's inclusion in the Seatoun area during the Census.

NEW BRIGHTON - CHRISTCHURCH

New Brighton is a good example of a business zone oriented toward a single inland road. This is beneficial as it makes the business zone more accessible for those who live deeper in the suburb. The pier is also a distinctive feature of New Brighton, extending pedestrian space into the ocean and creating a unique environment for its users.

(Statistics New Zealand, 2007h; i; 2008h; Google, 2010l; Christchurch City Council, 2009a; Environment Canterbury, 2010; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

Data not available

AGE

- Under 15
- 15-64
- 65 and over

ETHNICITY

- European
- Maori
- Other

INCOME

- 20k or less
- >20k & ≤ 50k
- Over 50k

FAMILY

- No Children
- Children
- Solo Parent

SOUTHSHORE - CHRISTCHURCH

Roading has been kept to a minimum in Southshore. Rather than having many cul de sacs, houses are served by a number of long driveways, often running three or four houses deep. This has the effect of separating houses from the street, which is beneficial for privacy, but results in poor connectivity. Southshore has both public and private edges; on the upper western side dwellings front onto the coast, whereas public space is adjacent to the coast on the eastern and southern sides.

(Statistics New Zealand, 2007h; i; 2008i; Google, 2010m; Christchurch City Council, 2009b; c; Environment Canterbury, 2010; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

Data not available

AGE

ETHNICITY

INCOME

FAMILY

SUMNER - CHRISTCHURCH

Unlike a number of the other suburbs, the road along Sumner's waterfront is the lowest in the street hierarchy, with the main street running a block behind it. Its placement in the hierarchy is due to its function as an elongated parking lot to service the public waterfront space. The road narrows at intersections in this area, which are accentuated by the use of bricks. This serves to slow traffic and make pedestrians more visible, improving safety.

(Statistics New Zealand, 2007h; i; 2008j; Google, 2010n; Christchurch City Council, 2009d; Environment Canterbury, 2010; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

Data not available

AGE

ETHNICITY

INCOME

FAMILY

LYTTELTON - CHRISTCHURCH

Data not available

Lyttelton is set apart from other suburbs as its waterfront is occupied by a port, preventing a public relationship with the coastline at the front of the suburban centre. It is also the only New Zealand suburb examined which is serviced by a rail link. While it can be accessed from both sides by coastal roads, its primary connection with central Christchurch is through a tunnel on State Highway 74.

(Statistics New Zealand, 2007h; i; 2008k; Google, 2010o; Banks Peninsula District Council, 2006; Environment Canterbury, 2010; Yellow Pages Group, 2009; Wises, 2010; ZoomIn, 2010)

AGE

ETHNICITY

INCOME

FAMILY

COASTAL SUBURBS: A TYPOLOGY

Within each of the following five categories are the features which have been identified as key aspects of coastal suburbs:

1) VERTICAL TOPOGRAPHY

The majority of the suburb is situated on a hill or on flat land.

2) HORIZONTAL TOPOGRAPHY

The suburb is located on a promontory, bay, or sits on a section of (relatively) straight coast.

3) STREET PATTERN

The street network is laid out in a grid, an alternative formal layout, responds to topography, or is freeform.

4) PUBLIC/PRIVATE EDGE

The suburb actively encourages public access to the coastline by allocating usable public space or a road adjacent to it. Coastal areas with dwellings as the nearest human intervention to the coast will

be deemed private however this does not require actual ownership of the coastal land.

5) MAIN STREET DIRECTION

Main streets either follow the coast, or run inland.

EXAMPLES

TORBAY

ORAKEI

ROSENEATH

CONCLUSION

The studies of coastal suburbs within this chapter have led to the identification of a number of underlying patterns which have allowed for the development of a typology. They have also allowed for the identification of relationships between coastal features, and how they might relate to New Urbanism. As the typology focuses on the physical structure of the suburbs, it is difficult to relate the results to the more 'functional' principles of New Urbanism. However other New Urbanist principles such as walkability, pedestrian orientation, and connectivity are able to be considered. Findings are as follows:

- While any street pattern can be applied to flat land, it is most common for streets in hilly areas to have a topographical layout. However, if parts of the hill are flat enough, both grid and freeform patterns can be applied, as seen in Brown's Bay and Orakei. While in most cases a topographical layout is necessary, it risks reducing connectivity due to its reliance on the terrain. Pedestrian routes similar to those seen in Lyttelton can be created between roads to improve this, but if they are too long or too steep they may not be conducive to walkability.
- Steep hills can create ambiguous edge conditions. Many of the suburbs examined have a clearly public coastal edge. However Wood Bay is a good example of how public space

which is difficult to use due to gradient, and in this case dense planting, creates an essentially private edge. This has the potential to provide private outlook housing, and thus contribute to housing mix, while ensuring the coast does not become legally privatised.

- It is quite common for a mix of street patterns to be present in a suburb, the most common mix being a coastal road (topographical) combined with either a grid or a freeform layout. The combination of a grid and a freeform layout is rare, hinted at only in Seaside. It is interesting to note the lack of a coastal road in Seatoun. This limits vehicle access to the waterfront area, and when combined with the angled grid, allows for the creation of 'entry points' to the beach. This is both conducive to walkability and connectivity, as it places a pedestrian focus on the waterfront, while the regularity of the grid provides a number of access points. Coastal streets are valuable from an edge perspective as they ensure the coast has a public character. This effect is removed if the street is set behind housing as in Conifer Grove, but can be restored by other means.
- The main roads and public transport links in the majority of the New Zealand suburbs considered run inland, rather than along the coast. This suggests that city centres are inland

from the examined suburbs, and reduces the risk of isolation if roads are damaged. The location of suburban centres varies a lot between the suburbs, which is likely to be a result of the wider context in which they are situated. Setting back suburban centres increases accessibility for residents deeper in the suburb, but draws shoppers and workers away from the coast. Locating centres near the coast has the potential to increase vibrancy in the area, so warrants further investigation. Where business areas are located near the coast, but arranged along an inland route, locating some retail and services along the waterfront in a similar fashion to Seaside or Brown's Bay may help to activate the coastal area. Including civic functions on the waterfront, such as in New Brighton, also creates additional pull factors.

By considering the findings of Chapters Two and Three together it is possible to draw conclusions as to what features make a suburb suitable for intensification:

- Flat suburbs are likely to be more conducive to intensification for several reasons. Firstly, significantly less earthwork is required than building on hills, thereby reducing costs. Secondly, formal or grid street patterns can be applied to flat land, which contribute more to

connectivity and wayfinding than topographical or freeform types. Thirdly, walkability can be significantly reduced by hills if the gradient becomes too steep. Despite this, hilly areas do have advantages. Greater access to natural views from hills may reduce perceptions of density, and the slope reduces the chance of buildings blocking each other's access to light and views.

- While any of the horizontal topography types are suitable for intensification, Bays have a slight advantage as they naturally focus in towards a coastal centre, rather than radiate from an inland focal point as seen in Orakei. Bays may also be less prone to damage from waves and storms, due to their natural breakwaters.
- The grid street type is preferential as it provides an easily understandable layout with many connections and street edges, making moving through the suburb easier be it by foot or vehicle. The formal type is also conducive to intensification for the above reasons; however the street pattern may not be as easily understood as a grid. Topographical street patterns can be conducive to intensification when limited to a coastal road, but when applied in full are likely to risk poor connectivity as their path is dictated by land form rather than efficiency and ease of use. Freeform street patterns should be avoided as they

contribute little to connectivity and wayfinding, reducing walkability and making them inefficient.

- Public edges are more conducive to intensification as they provide a link between the built form and the coast. They increase access, and provide more space for users to enjoy while helping to mitigate the effects of increased density. Active edges can provide services to the public edge, enhancing its amenity value and providing a greater range of activities. Private edges inhibit a dialogue between built form and coastal space, preventing the full public value of the coastal area being realised.
- Inland main streets are preferential as they provide a strong link to the coast for residents of the inland areas of a suburb. Inland streets may also contribute to a pedestrian friendly waterfront, by focussing traffic inland rather than along the waterfront as would be the case with a coastal main street. Inland streets are also much less likely to suffer wave damage during storms, reducing the risk of a compromised main street.

Following this, the suburbs examined which are best suited to intensification are:

- Brown's Bay
- Lyall Bay
- Seatoun
- New Brighton
- Sumer

Conifer Grove and Orakei are also sites where intensification could occur, but are less suitable than the previous suburbs.

Island Bay, which will be examined fully in Chapter Five, shares many similarities with the sites best suited to intensification. Built around a bay flanked by hills, and with a gridded street network, Island Bay is similar to Brown's Bay. However the central flat area is much less dense, with a built fabric more in scale with Lyall Bay or Sumner. Like Lyall Bay, Island Bay's coastal road is considered a main road, and in conjunction with open space near the waterfront, provides Island Bay with a public edge. Like the majority of the suitable suburbs, Island Bay's main street runs inland, and in this case is offset to one side. It is notable however that the main street bypasses the main beach area, removing a clear connection between main street and beach.

It is important to note that the case studies reveal that despite having a number of features in common, each of the cases is unique; serving as a reminder that context will be of the utmost importance during the selection and development of any intensification strategy. Despite this the findings are valuable as they provide a framework which can serve as a starting point in coastal suburban design, as well as some insights into common responses and how they may function.

CHAPTER FOUR: DENSITY REVIEW

INTRODUCTION

In order to plan for intensification it is important to understand the forms and patterns which underlie different densities. This chapter investigates this through considering areas of towns and cities which are comprised predominantly of one of four types of housing construction. The four housing types reviewed are:

- Detached Dwellings
- Semi Detached Dwellings (2-4 dwellings per building)
- Terrace/Row Housing (>4 dwellings per building)
- Apartments

The purpose of this chapter is threefold:

The first aim is to reveal forms and patterns that underlie or develop as a result of the presence of a particular housing type. Secondly, it aims to identify opportunities and challenges related to each building type. Finally, it aims to draw conclusions regarding how the different forms may interact when combined.

CASE STUDIES

Due to New Zealand's identification with western culture, this chapter examines density patterns in a number of settlements located mainly in Europe and North America. Unlike those in the

previous chapter, these diagrams focus on built form and only include extra information when it is particularly useful in understanding the area. Locations have been specifically chosen to demonstrate some of the variety of ways each housing type can be used.

The following case studies will take the form of a 1:10,000 figure ground diagram of the area, a short description of notable features, and supporting sketches. An approximate dwelling density is also reported.

Plans and figure ground diagrams were based on aerial photographs from Google Maps, while Google Streetview was used for the development of building elevations and perspective views. Where Streetview was not available, user uploaded photos from Google Maps were used as the base for the supplementary sketches.

Dwelling densities in each example were identified by taking the mean of three sample blocks, each measuring one hectare. Blocks were chosen which best represented the dwelling type or types within each suburb. Densities marked with an asterisk are from third party sources, which are identified by an asterisk at the bottom of the page. Each unit in a terrace was assumed to hold 1.7 dwellings¹.

LAGUNA NIGUEL – CALIFORNIA – USA

15d/h

Comprised of single dwellings arranged around a freeform road pattern, and connected to a major road, Laguna Niguel is representative of a typical modern car suburb. What makes it significant however, are the strips of public space located at the rear of a number of buildings. This has both benefits and disadvantages. It provides recreational space for exercise, children's play and socialising, as well as a view of nature. However, exposing the rear of houses to the public raises security concerns if passive surveillance is reduced as a result of the primary orientation being toward the street.

(Google, 2010p;q;r;s)

28138 Rubicon Ct

24390 Nugget Falls Ln

28000 Gunnison Ct

Public space at rear of lots

Housing mix within the area is extremely limited, while the combination of a large number of cul de sacs and few intersections suggests poor connectivity. Some public facilities are present, but the area is generally a single use residential suburb. Poor connectivity reduces the walkability of the area, but is mitigated by the inclusion of the tracts of open space. While this green space will contribute to the environmental quality of the area, the data is insufficient to draw overall conclusions as to environmental quality and quality of life.

NORTH CHERRY HILLS VILLAGE - DENVER CO - USA

3 d/h

The most interesting feature of Northern Cherry Hills is the reduction in density through the suburb. The layout of the upper area is an example of a fairly typical suburban density, which can be seen across all the detached housing examples. However three notable other density patterns are present: High site coverage levels can be seen in the semi detached homes in the centre left, while the centre right and lower right represent large homes on larger sections than is usual. Extremely low densities are evident in the lower centre and left where housing is situated on very large lots.

(Google, 2010t;u;v;w)

2180 East Eastman Ave

3464 Columbine Cir

3 Cherry Hills Dr

1 hectare, 3 Cherry Hills Dr

While still primarily single dwellings, Denver presents a wider range of dwelling sizes, contributing towards housing mix. The gridded street pattern to the North is better connected than the more freeform patterns below it, and is more conducive to walkability. The area appears to be single use residential, with the exception of commercial temporary accommodation to the west. Most significant areas of open space are privately owned, leaving little open space for public use.

BRIDGEMEAD – PORT ELIZABETH – SOUTH AFRICA

Bridgemean is notable as an example of a dormitory suburb with poor exterior connection. Located on the outskirts of Port Elizabeth, surrounded by open space and connected to the main road by one sealed and one unsealed feeder road, Bridgemean is heavily dependent on private vehicles. However, the interior connectivity is enhanced by a series of pedestrian walkways. These walkways provide a direct route through the suburb, facilitating access to the central public space. There do not appear to be any public facilities, short of open fields for sporting activities, or shops. This is likely due to the development's proximity to a large mall.

(Google, 2010x;y;z;aa)

Avontuur Rd/Glenconner Ave

6 Hermitage Ave

12 Coega Cres

Park, 1 hectare

Despite differences in external appearance and building orientation, practically all the houses in the main section of the suburb are the same type, size and on sections of very similar size. Dwellings on the fringes of the suburb are of a different style, but are still single dwellings and appear to have less variety than those within the central area. The suburb is well supplied with public open space, providing some public amenity, however as it is relatively undeveloped it may in fact be reserved for future construction.

CENTRAL AREA - LAGUNA WEST CA - USA

27d/h

Planned by Peter Calthorpe, Laguna West was designed as a Transit Oriented Development; however Quinn (2006) and Demographia (2000) question its effectiveness. Notable features include the geometric street layout, the islands (with a private edge), large amounts of open space in the centre, and a core of larger, but not obtrusively so, multi unit buildings. Unfortunately significant portions of the central area (top centre) remain undeveloped, resulting in a distinct lack of the greater sense of urbanity expected in a suburban centre.

(Google, 2010ab;ac;ad;ae)

9276 Bay Head Ct

3228 Grimshaw Way

2914 E Laguna Way

Laguna West achieves its higher density through the inclusion of multi unit dwellings in the Northern section. The density of single dwellings is similar to those within Laguna Niguel, however the formalised layout of Laguna West ensures a greater degree of connectivity. As blocks are shorter and more potential walking routes are available, the area appears more pedestrian friendly than the other examples examined so far. Civic functions are located along the central spine of the area, making them easier to access and creating a focal point for the community.

SOUTH SHORE – BLACKPOOL – ENGLAND

South Shore provides an example of semi detached dwellings in grid form. While the majority of buildings comprise of two dwellings, there are a significant number of larger semi detached arrangements and some terraces. Towards the left there appears to be a trend towards locating larger arrangements on the short edges of blocks. This allows for higher densities in parts of the block, without disrupting the character of the long sides (two dwellings per building). Dwellings are typically two storied with a paved setback incorporating some planting. Garaging is located at the rear of lots, and in terraced areas is accessible via a rear lane.

(Google, 2010af;ag;ah)

12 Sandgate

Houses on Sandgate

24 Sandgate

South Shore has a significantly higher density than the previous examples, due to the predominance of semi detached dwellings. The gridded street network contributes to connectivity while diversions from the grid add variety. While the dwellings are similar in size and shape, section sizes vary throughout the area, providing a degree of choice when choosing a home.

SOUTHERN AREA - CAERNARFON – WALES

69d/h

When compared with Laguna Niguel, Caernarfon illustrates how semi detached neighbourhoods have the potential to support a higher population while allowing more open space, even in a less efficient freeform layout. The major contributor to this is a substantially smaller dwelling size. The above left images represent four hectare blocks of the highest density semi detached and single dwelling areas of Caernarfon and Laguna Niguel respectively. Garages are either in line with the dwellings or set behind them, and are single garages only. In contrast, garages in Laguna Niguel are often in front of the dwelling, and designed for multiple vehicles.

(Google, 2010p;r;ai;aj)

Caernarfon ≈ 160 dwellings

Laguna Niguel ≈ 75 dwellings

19 Bryn Hyfryd, Caernarfon

*24390 Nugget Falls Ln,
Laguna Niguel*

While the irregular block sizes in Caernarfon's freeform street pattern provide variety, they lack connectivity in some places, significantly increasing the distance required to move between certain points. It is interesting to note Caernarfon's higher density when compared to South Shore, which is due to an abundance of four unit semi detached dwellings, as well very dense housing in the northwest. Caernarfon's rural setting could assist in reducing perceptions of crowding, but is likely to have undesirable effects as well.

BALLINFOYLE – GALWAY – IRELAND

38d/h

The Tirellan Heights section (curving part) of Ballinfoyle appears very similar to modern suburbia. Key features include a freeform layout, peripheral location and the presence of enlarged cul de sacs. Surprisingly, despite the appearance of more open space when compared with Bridgmead, another peripheral development, Tirellan Heights has the higher density. This highlights the potential of different combinations of dwelling type and layout for increasing actual density while creating a range of perceived densities. This is most applicable to semi detached dwellings as when compared to other dwelling types their smaller size allows for more flexibility in layout.

(Google, 2010x;z;ak; lukzar, 2010)

Tirellan Heights ≈ 120 dwellings

Bridgmead ≈ 45 dwellings

Home in Tirellan Heights

6 Hermitage Ave, Bridgmead

Ballinfoyle does not appear particularly conducive to walking. The freeform section in Tirellan heights has few connections to the surrounding streets, and while the gridded areas are better connected and on smaller blocks, it is a long walk along a main road to leave the suburb. There is little housing mix in this area, and private sections are of a similar size, resulting in a lack of variety. Functional separation is evident through the clear boundary between the suburb itself and the retail area to the southeast.

MASTRICK – ABERDEEN - SCOTLAND

30d/h

Mastrick is interesting as it is comprised mainly of semi detached buildings containing three or more dwellings, as well as its irregular block shapes. Its proximity to the suburban centre also sets it apart. The spaces between buildings create a sense of permeability by providing visual access through blocks, significantly reducing the perception of density. Houses are typically two storied, with setbacks providing space for parking, garden, or both.

(Google, 2010a;am)

Non alignment with street

Polygonal terrace housing

8 Ross Cres

While the irregular street network in Mastrick is well connected, its complexity is likely to make wayfinding a challenge. While this would reduce walkability, the interest value and sheer number of different routes are mitigating factors. A wide variety of semi detached dwelling configurations provides visual diversity, and demonstrates the versatility of this housing type. Due to its proximity to the suburban centre, housing is interspersed with commercial and civic structures, making it more of a multifunctional area than previous examples.

DENNISTOUN – GLASGOW – SCOTLAND

77d/h

Dennistoun is interesting as the definition of blocks by terrace housing is highly variable. In some cases blocks are completely enclosed, while others are only closed on one, two, or three sides. Non rectangular blocks are also notable, a feature not seen in any of the other terrace housing examples. Dwellings are typically four storeys high with small planted setbacks and entrances raised off the street. In most cases the land enclosed by the terraces is divided into lots, with one accessible from each dwelling. Where this space is accessible by vehicle, it is common for a portion of this space to be used as parking.

(Google, 2010a;ao;ap) *(Frey, et al., 2006)

Access to courtyard

74 Meadowpark St

Corner of Garthland Dr and Meadowpark St

Dennistoun's gridded street structure provides a high degree of connectivity within the area contained by the rail line, but relatively few paths across it. Streets are clear, and are generally well defined by built form on the eastern side of the suburb. Blocks are less distinguishable on the western side in plan, but should still be clear to pedestrians. Despite the possibility of introducing more transport options, the rail line is likely to have some negative effects on the environmental quality of the surrounding dwellings.

GETAFE – MADRID - SPAIN

55 d/h

Getafe is notable as its terraces tend to form strips rather than blocks. With a trend towards long terraces, some in excess of 20 dwellings, the short terraces in the lower area seem out of place. However they provide a more intimate setting by decreasing the number of houses on the street, offering more choice in neighbourhood character. Dwellings are generally two stories and show three setback patterns. Dwellings either have no setback at all, have the garage aligned to the streets and the rest of the dwelling set back, or the entire structure is set back. In the last two cases setbacks are still relatively small.

(Google, 2010aq;ar;as;at)

Calle Puerta de Toledo

8 Calle Puerta Cerrada

*Calle de la Isla de Bohol/
Calle Puerta del Sol*

4 hectare detail, Getafe

The street network within Getafe is confusing and poorly connected, making both walking and driving within the area difficult. Several major roads also divide the suburb, further impeding pedestrian movement. While several house designs are present within Getafe, each terrace is comprised of a single design, significantly reducing variation within blocks. While this provides a more cohesive facade, it risks becoming monotonous.

ALAMO SQUARE – SAN FRANCISCO - USA

42 d/h

This area is mainly comprised of terrace houses and fully detached dwellings in close enough proximity to each other to create terrace like character. This character leads to clear definition of city blocks, but the small gaps in-between the detached buildings leads to increased visual permeability. Building footprint varies both across the area and within each block. Dwellings are typically three to four stories tall and either front directly onto the pavement or are set back. Setbacks are often occupied by steps leading to entrances above ground level. Studies by Moudon (1983) suggest that the number of households residing in a building can vary significantly, even amongst buildings of similar size and form.

(Google, 2010au;av;aw;ax)

1058 Fell St

1238 Grove St

716 Steiner St

Rear lot structure

While predominantly residential, a number of commercial and civic functions are present within Alamo Square's built fabric, showing a degree of mixed use. Moudon's findings regarding dwelling numbers within each building suggest variety in dwelling size. This not only increases amenity through providing choice, but as the buildings are of similar size and scale, it allows this choice while maintaining a consistent building character. Walkability is increased through the small block sizes, regular nature of the grid, and a large number of connections.

OUTER SUNSET – SAN FRANCISCO - USA

45 d/h

Outer Sunset differs from the previous example as it hosts a much more consistent pattern in terms of buildings size, form and block formation. Essentially all the buildings are terraced, resulting in less permeable blocks than Alamo Square. A notable pattern in this area is the way gaps are created at the ends of the blocks. This is due to the rear yard of the side lots preventing the terraces at the top and bottom connecting with the side terraces. Dwellings in this area are typically two stories with a setback serving as driveway and parking space. Garages are much more prominent than in the previous example.

(Google, 2010ay;az;ba;bb)

3528 Ortega St

1870 Great Hwy

Ortega St

Rear lot structure

Dwellings within Outer Sunset vary significantly, despite their terraced arrangement. This provides visual diversity as well as a high degree of choice, due to the range of designs. Unlike Alamo Square however, Outer Sunset shows little degree of mixed use, as the only identifiable non residential functions are a day-care centre, high school, and baseball field. Accessibility to the beach is compromised as three lanes of highway traffic separate it from the rest of the suburb.

CBD – CALGARY – CANADA

79d/h

This study works off the assumption that the central city hosts a number of apartments as well as offices and retail stores. While it is difficult to identify any particular building as purely an apartment building, downtown areas are often characterised by mixed use developments. Benefits to residential occupants include the proximity to facilities and the use of under/above ground parking. A significant disadvantage is the lack of private or semi private open space. Roof gardens provide a potential solution, and could function as a shared space, or as allotments which can either be packaged with an apartment or purchased separately.

(Google, 2010p;ai;ay;bc) *(Sparrow, 2010; The City of Calgary, 2010)

*Building footprints in Calgary
over a 4 hectare area*

Outer Susnet

Caernarfon

Laguna Niguel

Due to its nature as a CBD, this area is naturally multifunctional and the presence of tall buildings provides a number of landmarks which can be used for wayfinding. Housing types would be limited to apartments, as high land values preclude anything else, limiting choice. The grid system provides a good degree of connectivity, but this could easily be inhibited by traffic congestion.

AREA AROUND RUE DE BELLEVILLE – PARIS – FRANCE

This area provides an example of apartments located within the inner zone of a city which follow an opportunistic development pattern. Public spaces are clearly defined by the buildings around them, and are much closer in proximity than any of the other examples of apartments. Much of the space around and enclosed by the apartments is planted. This will allow access to views of nature and may assist in reducing the perception of density and crowding (Kearney, 2006). Space enclosed by apartments is similar to that surrounded by terraced buildings and could be treated in a similar way.

(Google, 2010bd;be;bf;bg;bh) *(Property Vision, 2007)

22 Rue des Bois

Rue de Belleville/Rue Haxo

Rue du Telegraphe

1 Place des Fetes

Streets with the area around Rue de Belleville are irregular but generally very clearly defined. While this may make wayfinding more difficult, the large number of routes provides a high degree of choice to pedestrians, increasing walkability within the area. Housing mix is mainly comprised of a combination of small and large apartment buildings, as well as a few small terraced buildings.

STUYVESANT TOWN (NYC) – NEW YORK - USA

A notable difference between the previous example and Stuyvesant Town is that Stuyvesant Town appears to be a development within a park, rather than apartments with nearby planting. Where the previous example appears more or less continuous, Stuyvesant Town is markedly different to its immediate surroundings in form, bulk and setting. Also of note is that the development contains a number of shops, as well as restaurants and recreational facilities. The park itself is extensively planted with a number of developed walkways, providing a pedestrian friendly, convenient living environment in an attractive setting.

(Google, 2010bi;bj;bk;bl) *(The New York Times, 2006)

Building footprints over 4 hectares

View along East 16th St

View along Avenue A

283 Avenue C Loop

Stuyvesant Town is a multifunctional area, incorporating a number of services into the residential towers. While the park like surroundings increase the environmental quality, the buildings themselves will have a significant shading effect on this area due to their size. The development is well connected by both streets and pedestrian paths, and walkability is further enhanced by the pleasant surroundings.

KSTOVO – NIZHNY NOVGOROD PROVINCE - RUSSIA

n/a

Rather than locate a single development within a park area as in the previous example, the majority of the settlement of Kstovo is set in park like surroundings. While trees occupy much of the green space, open spaces are strategically located throughout the area, maximising accessibility. Parking appears to be located at the foot of each apartment, which create courtyard spaces through their layout. Many of the apartments are five stories high, although taller buildings are present. Building density varies across blocks, despite the suggestion of an underlying layout pattern. This variation provides each block with different layouts, contributing towards the creation of unique identities.

(Google, 2010bm; Msokolov, 2010; Valb, 2010; Maschine, 2010; Tarantalkst, 2010)

Street view in Kstovo

Walkway in Kstovo

View down onto apartment block

Apartment Blocks, Kstovo

Housing mix in Kstovo is very limited, but some smaller dwellings are present. Green spaces appear to be designed to enhance pedestrian experience, with a number of walkways evident throughout the area. It is interesting to note that rather than green spaces being shaded by buildings, due to the number and size of the trees, buildings may in fact suffer extensive shading from the planting.

CONCLUSION

The location studies within this chapter have allowed for the identification of the underlying patterns, opportunities and challenges, and potential interactions between each of the building forms. Underlying patterns are as follows:

Fully detached dwellings are the most flexible of the dwelling types in terms of layout, having been used in grid, freeform, and formal patterns. There can be significant variation between size, configuration, and appearance within an area, which is especially pronounced in the Cherry Hills study. Despite this, there is a trend towards having large multi car garages at the front of the property, with the house located behind.

Semi Detached dwellings tend to have a closer relationship with the street than fully detached homes. Smaller setbacks are common and garages are typically in line with the building or at the rear of the property, providing more usable open space at the front of the property. Smaller semi detached dwellings share a similar flexibility in overall layout with detached buildings.

Terrace Housing often clearly defines the block in which it is located. This arrangement creates block scale courtyard spaces which are predominantly divided into private lots. Terraces are often laid out in rectangular blocks, but both angled blocks and linear layouts are present in the Dennistoun and Getafe examples

respectively. Terraces frequently have small setbacks, and the location of parking spaces is highly variable.

Apartments can either be highly varied or repetitious, depending on whether they are the result of opportunistic development or large scale planning. Large planned developments have a tendency towards significant amounts of open space, which is less likely to appear in inner city opportunistic development. In either case, apartments can effectively frame space, defining street fronts and creating semi private spaces for occupants.

These patterns offer both opportunities and challenges when being considered for application in urban design:

Fully detached dwellings have the greatest potential for offering variety within a street, and their layout flexibility makes them a versatile solution for a range of applications. However as the lowest density solution they are likely to have the highest associated land cost per unit, and the very versatility that makes them desirable may cause unease for neighbours with regards to local character.

Semi detached dwellings offer a similar flexibility to detached buildings, allowing a low density appearance while offering a higher number of dwellings. Challenges related to these dwellings include a reduction in variety due to repeated units, as well as privacy issues, particularly with regard to acoustics. These challenges may be minor, as repetition may be desirable for both economic and

aesthetic reasons, and privacy issues can be mitigated through effective insulation.

Terrace housing offers great potential in terms of height, comfortably spanning one to four stories or higher. Their linear nature is both useful in clearly defining streets and blocks, and in doing so they create semi private courtyards for their occupants. These spaces are incredibly flexible and could be divided into private lots, shared spaces, or combinations of each, while serving multiple purposes. However their volume effectively limits them to straight or angled compositions, as building curves would increase the cost. They also reduce visual permeability and physical accessibility through blocks, increasing the perception of density and thus potentially, crowding

Apartments present three significant opportunities. They have the ability to house the greatest number of people on the smallest amount of land, allowing more space to be kept open or developed in the future. Retrofitting apartments into existing buildings saves demolition costs, can preserve character, and allows more people to live in areas where new building space is rare. When located effectively apartments also ensure access to services for the greatest number of people for any dwelling type. Large multi apartment developments are at risk of being monotonous, and care must be taken to make open space attractive and useful. Shading, lack of privacy, and blocking of views are causes for

concern for neighbours, which must be addressed if local resistance is to be overcome.

Having considered the underlying patterns of each dwelling type as well as the opportunities and challenges they present, conclusions can be drawn as to how they may interact with each other for greatest benefit.

Single and semi detached dwellings can be used together for great effect. With regard to overall scale and lot coverage, smaller semi detached buildings can be effectively blended amongst single dwellings to enable a variety of living arrangements without compromising character. They can also be used in combination with larger semi detached arrangements (3-4 dwellings) to add variety to a streetscape, or fill unwanted gaps. Most surprisingly, detached dwellings can be used very effectively in combination with terraced housing, as demonstrated in the Alamo Square study. Placed in close proximity to each other, and near terraces, these dwellings can take on a terraced character, allowing increased permeability without detracting from the rhythm created by the terraces.

Semi detached dwellings interact seamlessly with terraces as they can form a volume gradient, acting as a visual introduction to the terraced areas. They can also maintain a terraced character in spaces where terraces may be difficult to construct, or visual permeability is desired, as in the Mastrick study.

As a result of their size, terraces have the greatest potential of the dwelling types for positive interactions with apartments. If located in close proximity and of similar size, apartments need not stand out from nearby terraces, reducing perceptions of them being out of place. The most powerful interaction between terraces and apartments is that by incorporating shared access to dwellings within a terrace, they essentially become apartments without a change in visual character. This is of great significance as it requires neighbours to respond to a proposed development on its own terms, rather than applying pre conceived ideas about apartments. Due to the great difference in size, there is little potential for successful interaction between detached dwellings and apartments. Larger semi detached arrangements can still provide a visual lead in to apartments if they share similar visual characteristics, otherwise this effect is limited.

From these findings a hierarchy can be established to assist in the selection of dwellings types:

- Apartments
- Terrace
- Semi Detached
- Fully Detached

With the exception of fully detached dwellings that are terrace like in character (hereafter referred to as the Terrace Like type), the findings suggest that each dwelling is best located next to a

dwelling of the same, or immediately adjacent, type. Terrace like dwellings have the same position on the hierarchy as terraces.

By comparing the dwelling density in each case with the minimum 'High' density threshold of 29 dwellings per hectare, it appears that all areas except the fully detached examples exceed this threshold. This suggests that significantly higher densities can be achieved by increasing the housing type one increment within the hierarchy. This has the benefit of achieving density while minimising character conflict, but by itself does little to increase amenity.

In relation to the studies conducted in Chapter Three, the vast majority of dwellings within the examined New Zealand suburbs appear to be fully detached dwellings. While apartments may be present in suburbs with higher density areas, such as Brown's Bay or New Brighton, terraced and semi detached arrangements are rare.

By understanding the characteristics of coastal suburbs and dwelling forms, it becomes possible to develop a set of design responses for the reconciliation of amenity and intensification in coastal suburbs.

NOTES

¹This number is based on Moudon's 1983 findings that what appeared as a single dwelling could be several. The multiplier was developed by assuming that in six terraced units, three would contain a single dwelling, two would contain two dwellings, and one would contain three.

CHAPTER FIVE: CASE STUDY

This chapter unites and applies the findings of the previous three chapters to the suburb of Island Bay in Wellington. The case study area is 500 by 800 metres (40 hectares).

Initially, a map and statistics for Island Bay will be presented, followed by an overview of the proposed design. Key features of the design will then be presented and discussed in detail. These include the streets, open space, and built form. It is the intention of this case study to find the upper limit for what may be appropriate in this context, in order to make recommendations as to what is suitable. A staged implementation plan is presented, followed by a discussion of the scheme's weaknesses and suggestions as to potential solutions. The chapter concludes by suggesting a set of planning guidelines, and a summary of major findings.

Supplementary images and perspective views are presented throughout the text to further illustrate and support the design. Depictions of facades and public spaces are illustrative only and are included for a sense of realism. While representing the functional intention of the spaces, these do not represent actual outcomes.

It is important to note that New Urbanism was used as a *starting point* in the design. As a result a number of features within this

scheme diverge from the requirements of the Smartcode (Duany, Sorlien, & Wright, 2009). Regardless, the major principles of New Urbanism (Newurbanism.org 2010) are maintained, and form the focal points for considering amenity.

ISLAND BAY – WELLINGTON

Location of site in Island Bay, Wellington, 1:100,000

Reef Street

Houses in Island Bay

The Esplanade - West

The Esplanade - East

Building Density $\approx$ 15 dwellings/hectare
Population Density $\approx$ 28 people/hectare
Population in 2006 $\approx$ 7000

(Statistics New Zealand, n.d.; 2007f; 2007g; 2008l; 2008m; Wellington City Council, 2008)

EXISTING BUILT FORM

Topography

Open space

Transport

Civic buildings

(Google, 2010bn; Wellington City Council, 2009; 2010a)

PROPOSED DEVELOPMENT SUMMARY

PROPOSED DEVELOPMENT

AMENITY:	ACHIEVED BY:
Walkable	Wider, higher quality, flexible use pavements, and smaller blocks provide more pedestrian choice while enhancing coastal access for a wide range of users.
Multifunctional and Diverse	Ground floor retail edges, office spaces, and dwellings in the same building create a multifunctional area widening the variety of activities performed throughout the day.
Housing Mix	A combination of detached, semi detached, terraced and apartment housing.
Quality Environment	A pedestrian oriented environment with flexible high quality public spaces and a range of activities occurring throughout the day and night.
Higher Density	Increase in building, population and activity density. Increase from 15 to 47 d/h.
Range of Transport Options	Bus route to the city and provision for taxis and private vehicles, set within a walkable community.
Connectivity	Smaller block sizes provide more connections and paths to follow.
Sustainability	Sprawl is prevented through intensification while pedestrian orientation encourages walking and the mixed use areas reduce potential need for travel.
Quality of Life	The opportunity to live in a dwelling best suited to personal lifestyle, in a desirable location, with high quality public spaces and a number of amenities nearby. While this is difficult to assess objectively, surveys are a potential method of conducting further research into this area.

Building Density ≈ 47 dwellings/hectare¹
 Population Density ≈ 85 people/hectare
 Population Increase ≈ 2500

STREET NETWORK

The design recognises that streets are the predominant form of public space, and that the opportunities provided by an intensification scheme offer a great deal of potential for improving their amenity value. The design realizes this through increasing the quality of the streetscape and introducing strong identities to each of the major streets. Key areas where the streetscape can contribute to increased amenity are in the areas of pedestrian orientation, connectivity, and creating high quality environments.

EXISTING

PROPOSED

Island Bay currently has roads that are excessively wide in relation to the amount of traffic they support. This increases their effect as a barrier to pedestrians and results in wide, uninteresting areas. This excess space has been reclaimed for pedestrian use, resulting in wider footpaths. The extra footpath width allows for the inclusion of more planting, street furniture, and spontaneous activity while still allowing plenty of space for pedestrian flow. On street parking allows parked vehicles serve as a protective barrier between traffic and pedestrians.

New streets are introduced to provide greater connectivity and reduce block size. This not only creates a more interesting pedestrian environment, but also assists in reducing the perception of bulk. The most significant road alteration is the re-routing of The Parade to connect to the main waterfront area. This was necessary to create a satisfying conclusion to The Parade and a sense of arrival at the waterfront, creating a direct link from the city to the sea. Also notable is the new street running parallel to The Parade. While performing the above mentioned functions, it also provides access to sea views for those residing deeper in the development.

Street hierarchy and character have been strengthened within the scheme in order to increase variety and assist in wayfinding. Providing each of the major streets with its own identity makes recognition easier, while the combination of pavement widths, traffic lanes, parking arrangements and nearby building functions provides a range of settings which are conducive to different activities. The relationship between street hierarchy and building

type also contributes to the legibility of the development, as the most important streets host the highest densities of dwellings, shops, and activities.

Currently, Island Bay's public transport requirements are served by a bus route along The Parade. It is assumed that this service would develop as the population grows larger. By reclaiming excess road width as pavement rather than buildings footprint, the scheme allows for the introduction of light rail services at a later point; however this will result in a reduction of pavement width.

STREET HIERARCHY AND CHARACTER

THE PARADE

THE ESPLANADE

SECONDARY STREETS

REEF STREET

Street	Road Width	Pavement Width	Direction	Parking	Speed
Parade	11m	5.5m	Two Way	Parallel	50kph
Esplanade	11m	Special	Two Way	Parallel	50kph
Secondary	11m	3m	Two Way	Parallel	50kph
Reef	8m	5.5m	One Way	Parallel	20kph

The Parade

The Esplanade

Secondary Streets

Reef Street

REEF STREET- A shared street with strong pedestrian orientation encourages flow between retail edge and park.

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OPEN SPACE

The scheme introduces a large amount of high quality public space in order to mitigate the effects of the intensification, increase amenity, and beautify the area. Open space is concentrated around the coastal edge, as this area is of the greatest value, and the largest open spaces are associated with the most intensive areas of the development. The built form contributes spatial definition, active edges, and maximises the amounts of seaside dwellings with a coastal outlook, while the large amounts of open space help to mitigate the undesirable effects of the large buildings. The major spaces are the waterfront promenade and the park.

The waterfront promenade provides a more pleasant environment and caters for a greater range of activities than the original pavement. The introduction of planting, greater detail, and high quality materials beautifies the area; while widening the promenade and providing a range of spaces allows for different uses. It is envisioned that the promenade can be used for weekend markets, as well as providing space for small performances through the provision of a stage and seating. The width of the central walkway allows bicycles, skateboards and pedestrians to coexist safely, while also comfortably accommodating wheelchairs and mobility scooters.

EXISTING

PROPOSED

The park serves multiple purposes in the development scheme. While its primary purpose is to provide high quality public space, it also acts in conjunction with the promenade to ensure the waterfront area is an unequivocally public space. In response to the Coastal Policy Statement (DOC 1994) the park also protects the waterfront promenade from a significant amount of shading, as the majority of the time shadows are cast over the park but do not reach the promenade or beach. While this does reduce the amenity value of the park, it ensures the character and amenity value of the most desirable spaces are preserved. Coastal character is further enhanced by the restoration of sand dunes across the full frontage of the park. While their separation from the sea due to the sea wall and road renders their functional use moot, they form an important aspect of coastal identity and their restoration acknowledges this.

Following the advice of Pilkey et al. (1983) the park also serves as a buffer against future sea level rise by ensuring buildings are located away from the areas at greatest risk of flooding and storm damage. While this also provides some protection against tsunami, it has not been specifically designed for this, and further research is warranted.

A number of Island Bay's significant historical features are located near the shoreline, so in order to recognise and respect Island Bay's history, and prevent their character value from being compromised

by new development; these features have been incorporated into the development's open spaces. The existing arched entrance and memorial rotunda in the park are retained, as are significant coastal buildings such as the surf club and the bait house. The sea wall is also preserved, and no interventions have been made into its structure.

When the park, beach, promenade, and surrounding buildings are considered together, they result in an extended waterfront zone. This zone allows for a wider range of activities to occur throughout the space, increasing the variety in, and thus amenity of, the area. Spaces this scheme provides include active edges, quiet edges, wide open spaces, intimate spaces, places to pause, places to play, places to be seen and heard, and places to withdraw.

While the variety of uses and types of space within the waterfront area all contribute to amenity, the edges which are activated by the buildings perform some especially important functions.

The introduction of retail edges to the ground floor of the built form creates additional reasons to visit the waterfront, attracting more people to the area and introducing more things to do while there. As restaurants and bars often operate well into the night, the timeframe within which the waterfront is occupied is extended, increasing the efficiency of the space, but most importantly responding to safety concerns by providing passive surveillance. The effectiveness of this is further increased as apartment

residents provide more eyes on the street, and the height of the apartments allows a clear view over obstacles such as sand dunes.

DUNE BOARDWALK- Boardwalks through the sand dunes provide a more intimate area of the park

THE WATERFRONT PROMENADE- A space for a range of recreational activities, the waterfront promenade can also host weekend markets and includes a small stage and seating for public performances.

THE EXTENDED WATERFRONT- Park, Promenade, Reef St, and retail edges combine to create a larger waterfront 'zone' encompassing a variety of activities, and usable well into the evening.

BUILT FORM

MAXIMUM HEIGHT LIMITS

The most important consideration when designing the conditions for the built form within the scheme was how to achieve much higher densities without conflicting with the surrounding context. Other significant considerations included maximizing choice through the provision of a variety of housing types, and creating a mixed use environment.

In order to blend the new development into the existing fabric, a gradual increase in building density and type has been applied. The aim of this was that no two adjacent sides of a street would be drastically different in scale or character. While this was simple to apply in one direction, Island Bay comprises of flat land between two hills, providing built fabric on three sides of the development. While successful at the northern and eastern edges of the development, because the main street is offset to the western side of the development, the location of the highest densities around The Parade resulted in the south western side of the development meeting the existing buildings at five stories to one (see weaknesses).

The development caters to a wide range of potential residents as it offers a wide range of housing and section types, as well as being located in a pedestrian friendly community with a strong public transport link to the city. It is especially important to note Moudon's 1983 findings which demonstrate that what appears to be a single dwelling can in fact be several. A range of housing values are present, affected by location, tenure, housing type, and the size of the associated section. The combination of these factors serves to encourage a vibrant, accessible and equitable place to live, increasing both density and amenity.

THE PARADE- A gradual Increase in height and building type prevents drastic differences in building form along the street.

Street planting and furniture have been removed for clarity

DWELLING TYPE

Semi Detached construction forms the primary interface with the existing fabric when entering Island Bay along The Parade. These function well in the transition to higher densities as two dwellings can be developed on a standard single lot while appearing only a little different to a single dwelling.

The 'Terrace Like' dwelling type is based on the study of Alamo Square and forms a smooth transition between semi detached dwellings and terraces. As they are separate buildings they are more easily constructed on the hill than true terraces, and the spaces in between them increase visual permeability, reducing the appearance of bulk on a prominent location. Most importantly, Moudon's findings show that they have significant potential in providing a variety of dwelling sizes.

While terraced buildings risk evoking images of endless repetition, the density study of Outer Sunset in San Francisco illustrates that this is not necessarily the case. While ultimately the developer's decision, it is envisaged that the terraced housing will vary, providing an interesting and unique streetscape while maintaining block definition and the higher density that terrace housing allows. Green spaces at the centre of the blocks are divided amongst individual dwellings for use as sections, and construction on these sites should be limited to garden sheds and similar small buildings.

LOT DIVISION

Apartment buildings provide the highest density housing within the scheme, and their bulky aspects serve as an interface for the introduction of the multi-use blocks. The apartments allow a great deal of flexibility in terms of unit size, price and location. Throughout the design the majority of the apartment buildings are two units deep, and the apartment units are based on a five metre by nine metre module. Three applications of this model have been investigated; a single unit studio apartment, a two storey double unit, and a single storey double wide unit. While the larger units work well, the requirements of Clause G7 of the building code (Department of Building and Housing, 1995) make the layout of the studio apartment difficult, as only five metres of frontage is available for daylight access. While a potential solution is provided, it may be worth increasing the width of the module.

In addition to the on-street parking provided throughout the scheme, concealed parking buildings provide off-street and residents' parking in the courtyard areas of the densest blocks. Accessed through a street frontage the parking structures are surrounded by built form, screening the vehicles from view and providing greater security and protection from the elements. It is intended that green roofs are built into the tops of the parking buildings, allowing them to be used as outdoor space by the surrounding apartments. This space is both larger and more flexible than balconies, and is aimed at attracting those who want an apartment lifestyle but also wish to have some garden space. As it is essentially a third floor roof, it is only subject to two storeys worth of shading, rather than the full five it would have been exposed to if kept as a ground level courtyard.

This presents a noticeable weakness concerning the quality of outlook for the apartments facing the sides of the parking buildings. While an air and light easement enforces a five metre space between apartment and parking building, and planting softens its facades, the quality of this space is highly questionable.

The development encourages the creation of a mixed use environment by providing retail friendly ground floor levels and large floor plates suitable for offices, in addition to apartments and civic space. In this scheme retail frontages are either on one or both sides of the street. It is envisaged that streets with two retail frontages will be primarily used for retail, while those with a single aspect are designed with the hospitality trade in mind.

Proposed access to parking, 1:500

Section through parking building, 1:500

Planting scheme to soften the edges of the parking structures

Studio apartment: 45m² (5x9) interior with 10m² balcony

Two storey apartment: 90m² interior with 10m² balcony

Double width apartment: 90m² (10x9m) interior with 20m² balcony

STAGED DEVELOPMENT

Due to the scale and scope of the intensification programme it is necessary to divide it into stages:

Stage One signals the beginning of the redevelopment through the upgrade of the park and waterfront, extension of The Parade, and the introduction of semi detached and terrace housing. The park and road upgrades improve the amenity for residents and visitors alike, while the new housing marks the beginning of intensification without diverging too far from the existing low density character of the area.

Stage Two increases the density and variety within the area through the development of new semi detached and terrace housing, as well as the first apartments. This stage serves to support the increase in population required to justify the third stage, as well as firmly identify Island Bay as a growing community. Retail and office space required to support the increased population is provided through the ground floor areas of the apartments.

Stage Three involves major earthworks in order to re-shape the hill on which it is located, and introduces a large number of new dwellings to the area. The earth and road works carried out at this stage also signal a commitment from the city to ensuring the future success of Island Bay. As in Stage Two, the ground floors of the apartment buildings can be used as retail and office space. Stage

Three also includes the construction of the major parking buildings. While not concealed at this stage, it is important that these are built before the surrounding buildings, to add parking spaces to the existing development and reduce the complexity of construction during Stage Four.

Stage Four concludes the development scheme through developing the largest buildings and providing the greatest amounts of residential, retail and office space. This stage also has a direct effect on the waterfront area, significantly increasing the variety and volume of amenities within the area.

It may appear desirable to implement Stage Four before Stage Three in order to provide the greater amount of amenity earlier in the process. This is not recommended as the scale of the work required to implement stage three would provide significant inconvenience to the (now greatly increased number of) residents in terms of noise, visual effects and traffic disruption. As a result it is most desirable for this inconvenience to affect the least number of people, thus the presented order.

PROPOSED BUILT FORM

Stage One

Stage Two

Stage Three

Stage Four

WEAKNESSES:

Part of the testing of the design involved a critical review of the scheme in order to identify areas of weakness and further research. These are discussed in the following section, where possible solutions are proposed, or the need for further research suggested.

As the purpose of this research is to test a method of accommodating growth in the best possible way from an urban form perspective, the mechanics of the scheme's implementation have not been examined in depth. The removal and demolition of the existing housing stock poses a significant challenge, particularly with regards to achieving public support. While it is likely that some residents will be willing to sell, it is inevitable that many will be reluctant to do so. Regarding public support in general, it may help to stress the scheme's focus on a high quality public realm (benefit for all), rather than purely on the new dwellings (benefit for the individual).

It has also been noted that the land values in peripheral suburbs may not be high enough to support development of this scale. As this project was carried out to examine the feasibility of an urban form, the full implementation, including economic feasibility and land amalgamation methods, is an area where further research is definitely needed.

It has been suggested that lots be clearly defined in all cases, rather than allow developers to purchase a desired amount of land from a pool. This should help to encourage continuity where continuity is desired, and contribute to variety when appropriate. This should also help to enforce a fine grained approach to development.

Highest densities are in the front row

The location of the tallest buildings along the front of the scheme is open to challenge, as many schemes step down towards the waterfront. In this case it was felt that in order to gain the greatest

levels of amenity from the extended waterfront, it was necessary to provide a dense edge. Specifically, this adds a lively retail edge, strong definition of the extended waterfront space, passive surveillance with a greater line of sight than smaller buildings, and a greater number of dwellings with waterfront views than previously.

It should be noted that the design was carried out with the intention of finding the upper limit for what would be appropriate within the given context. As a result the front row is taller than desirable. A more appropriate solution would be to limit this area to four storeys, with five available in exceptional circumstances. It is then possible to reduce the heights and densities of the remaining buildings which will likely result in a better interface with the surrounding context, while still retaining much of the schemes amenity value.

A particularly noticeable example of a poor interface is where the back of the five and six storey buildings located on the curve of The Parade meet the existing, one storey houses. While the scheme suggests enforcing setbacks to break up the street frontage, the height and bulk of these buildings is still extremely imposing. If the schemes tallest buildings were limited to four storeys, this would not only immediately lessen the negative effects, but the rear sections of the apartment buildings could be reduced to three

storeys without appearing compositionally odd. If combined with a series of courtyard setbacks this interface would meet its surrounding context much more favourably, as well as significantly reduce shading.

Five and six storeys meet one storey, a poor edge condition

A suggested alternative to a dense frontage is to locate the highest densities deeper in the suburb while reducing heights and densities toward the waterfront. In conjunction with this the waterfront

space would be extended inland. This has several benefits: less dense building types provide a greater degree of visual permeability, and a stepping down of heights would provide access to sea views for a greater proportion of the suburb. A less dense frontage will also improve the development's interfaces with the surrounding context, providing a more continuous skyline along the suburb's seaward aspect. While these factors make this desirable, separating the waterfront from the dense edges risks reducing the amenity that the density provides to the area. If the open space was extended inland, a dense edge around part of the space would provide the amenity to that area, but in doing so risks drawing focus away from what makes coastal suburbs unique - the waterfront.

The exclusion of fully detached dwellings as a building type within the scheme is open to challenge, given that they already form the majority of the surrounding context. Currently Plan Change 56 (Wellington City Council, 2007a) provides for these types of dwellings as a mode of intensification, but risks resulting in the ad hoc introduction of a number of small dwellings that do little to add amenity to the surrounding area and the greater public realm. An alternative that plays on the fully detached aesthetic is that of the American duplex/triplex type. In this type multiple dwellings are located in a large building that appears as a single dwelling, rather than the connected but visually defined housing associated with

the semi detached type. While these are likely to fit the surrounding context better than semi detached housing, they may lead to a coarser grained urban fabric which is less conducive to producing an urban feel than other housing types.

Setbacks break up the facade, but the edge condition is still poor

There is a weakness in the scheme regarding the configuration of the apartments. As the apartment buildings within the scheme are two units deep, the majority of apartments only have access to

light, air and views on one side. While this reduces their amenity value compared to apartments with twin aspects, in the block edge configuration it allows for significantly higher densities than buildings which are one unit deep. This is mitigated to some extent in the double wide and double floor apartment examples, which have double the area for daylight access and views, despite being single aspect. Loss of amenity due to the single outlook is further mitigated by the location of the apartments – their proximity to the waterfront places them in the most desirable location, they have the greatest access to other amenities within the development, and they also have off-street parking.

The parking buildings within the scheme are a failure. Originally designed to be above ground due to concerns about a rising water table, and concealed on the inside of blocks as a response to New Urbanist concerns, they significantly reduce the quality of the outlook for those whose apartments face towards them. Due to the single outlook nature of these apartments, this is unacceptable.

Removing the parking areas altogether is undesirable as earlier research has established the need for coastal suburbs to cater for private vehicles. Parking buildings not only supplement the scheme's on-street parking, but provide additional security and protection from the elements. Possible solutions include placing the parking areas below the buildings' footprints in a full or semi

basement configuration, or reducing the height of the central parking buildings and setting them into the ground.

Fully underground car parks under the buildings' footprints would work best for areas with retail frontages, while a semi basement arrangement provides residential frontages with a raised entrance for added privacy and variety. The extra load on pumping equipment caused by a rising water table (due to sea level rise), will need to be considered during their design. Reconfiguring the central parking structures so that they comprise of a semi basement level and a single storey above this may work, as the increased storey height of the ground floor retail areas would allow for two levels of parking to be kept below the first residential floor. This would provide all residential floors with a view over the structures' rooftop green spaces, while the low amenity ground level would act as service access for the retailers.

PLANNING GUIDELINES

As a culmination of the findings of the previous chapters, the following planning guidelines may assist in reconciling amenity and intensification while developing coastal suburbs:

STREETS:

- Purpose:
 - To create an environment that encourages walking and privileges pedestrian experience while still providing for the needs of vehicles.
- In General:
 - Excess road width should be reclaimed as pavement.
 - Pavements should incorporate planting directly into the ground.
 - Parallel on-street parking should be encouraged.
 - In important pedestrian areas, thin, pedestrian oriented streets allow for vehicle access while minimising interruption to the surrounding area.
- On Main Streets:
 - Paving should be used to differentiate the more active area of the main street.
 - Street furniture should be present, but space should be left for itinerant activities.

OPEN SPACE:

- Purpose:
 - To create a vibrant, unequivocally public waterfront to serve as a focal point for coastal suburban life while taking measures to protect the built form from erosion and sea level rise.
- In General:
 - Waterfronts should include a coastal promenade and a large public open space.
 - The depth of the open space should minimise shading of the waterfront promenade.
 - Open spaces should draw the benefits of a coastal location further into the site.
 - Both the open space and the promenade should be multipurpose.
 - The promenade must be wide enough to accommodate pedestrians, wheelchairs, cyclists and other recreational users.
 - The promenade should incorporate planting and street furniture, and be well lit.
 - Part of the open space should be adjacent to retail.
 - Total open space should be equal to or greater than the original area.

BUILT FORM:

- Purpose:
 - To cater for future growth through integrating higher densities and a wide range of housing choices into the suburban environment while minimising conflict with the surrounding urban fabric.
- In General:
 - Height is taken to mean number of storeys, the individual height of which should be based on the surrounding context.
 - The maximum height should be limited to four storeys.
 - In special circumstances, five storeys may be permitted.
 - A hierarchy of housing types is as follows:
 - Apartments
 - Terraces / Terrace Like
 - Semi Detached
 - Fully Detached
 - A combination of semi detached, terrace/like, and apartments is desirable.
 - Housing types should interface with the same type, or those that are immediately adjacent to them within the housing type hierarchy.
- Intermediate housing types should be present to support a successful transition between the existing context and the densest housing type introduced into the scheme.
- Terrace Like buildings can replace the requirement for semi detached dwellings if appropriate.
- On Main Streets:
 - Maximum height should be the same on opposite sides of the street.
 - Height changes should occur between blocks.
 - Retail frontages should be provided at ground level in business areas.
 - High density blocks should allocate some space for office use.
 - Buildings not within the main business area should be set back three metres.
 - Semi detached buildings interfacing with the existing buildings should be set back according to their context.
- On Minor Streets
 - Height changes should occur within the block, but not apply to buildings on block edges that face a main street.
 - Maximum height on the opposite side of the street should be the same or smaller if facing the less

dense direction, of the same or greater if facing the more dense direction.

CONCLUSION

Chapter Five represents the application of the findings of the previous chapters to a site in Island Bay, Wellington. Through conducting a case study as a design experiment and undergoing critical review, it is possible to draw a number of conclusions as to how a range of techniques may assist in the reconciliation of amenity and intensification.

Widening pavements by using excess road width allows for a more developed and more pleasant pedestrian environment. Extra width allows for the accommodation of larger planting, more space for sidewalk activities such as busking or al fresco dining, and provides more space for walking, helping to improve flow. It also serves a symbolic purpose, indicating a shift from a vehicle oriented environment to one that privileges the pedestrian. Creating new streets allows for an increase in the number of street frontages, as well as a reduction in block size. This improves connectivity by creating more paths for pedestrians and vehicles, encouraging a more walkable and interesting environment, while the increase in frontages allows a greater number of dwellings to have a relationship with the street.

The extended waterfront demonstrates how a number of factors can combine to produce a vibrant, multipurpose, and pleasant open space that creates a truly public waterfront. Retail edges on the park provide an extra reason to go there, while servicing park

users' requirements for refreshments and keeping the space active for longer periods of time. Reef Street's layout minimises traffic disruption between retail and park, allowing easy access between the two, while the park itself is multifunctional and contributes to character through the restoration of the dunes. The park also serves as a buffer, protecting the built environment from flooding due to sea level rise and minimising shading of the waterfront promenade. Finally, the waterfront promenade provides a high quality multi use space in the suburb's most valuable area.

The case study indicates that a gradual build up in both height and density of housing type reduces the degree of conflict when integrating the development with its surrounding context. It also demonstrates that five storeys is likely to be excessively high in a suburban New Zealand context, and that four storeys may be more appropriate. The case study also highlights the challenges of integrating a dense centre into a suburb when the main street is offset to one side. While there is plenty of space on one side to build up density toward the core, a shorter distance on the other side may lead to integration difficulties.

The critical review identified areas of weakness within the scheme. Of particular note is the failure of the courtyard parking buildings, which would be better incorporated as basement parking under the apartments. Areas for further research include investigating setting the core back and reducing density towards the waterfront,

and exploring how such a scheme would be implemented from economic and public acceptance points of view.

These findings allowed a set of planning guidelines to be developed which can be used as a starting point when considering intensification of coastal suburbs. While these require further development and testing to ensure they achieve the desired outcomes, they do provide a basic set of strategies which should greatly assist with the incorporation of amenity into an intensification process.

NOTES

¹Due to the range of building types within the area, calculating density via samples is unlikely to give a representative figure. As a result, the total number of dwellings within the study zone (500x800m) has been divided by the total area within the zone, less the area of the beach and sea.

CHAPTER SIX: CONCLUSION

Throughout the research it became apparent that rather than an inherent tension existing between amenity and intensification, intensification has significant potential to increase the amenity of the surrounding area. It also became apparent that this intensification needs to be both planned, and at an urban scale as a great deal of amenity relies on the relationships between a number of features.

In terms of New Zealand coastal suburbs, the research indicates that this amenity is best concentrated around the coastal edge, as this is the most desirable location, and there is a strong desire for this to be public. This not only allows a greater proportion of the population to live in a desirable environment, but contributes to sustainability through the reduction of urban sprawl and its negative effects.

In order to arrive at these findings, the research moved through four stages:

Chapter Two revealed that a significant gap exists in the current literature in relation to coastal suburbs in general, and specific studies of New Zealand's coastal suburbs are practically nonexistent. As a result, research from a number of areas was compiled and considered together, in order to draw conclusions as to what makes coastal suburbs unique. It became clear that the coastal environment introduces a number of extra considerations

and challenges to a suburban context. Perhaps the most important of these is that there is a strong desire - and expectation - that New Zealand's coastline is kept as public space for the enjoyment of all, rather than privatised for a privileged few.

The review of coastal suburbs in Chapter Three was conducted in order to gain an understanding of the range of coastal suburban forms, especially in New Zealand. While sites were limited to those within the major metropolitan centres, it is worth considering if these are fundamentally different from any other New Zealand coastal suburb, as future growth is unlikely to be limited to the largest cities.

Chapter Four examined a range of housing types with the aims of identifying their underlying patterns, challenges and opportunities, and suggested ways in which they may interact. It found that a gradual increase in the density of housing types could allow significant intensification within a development while respecting the surrounding character. The range of housing types required for this increase provides potential residents with more choice, and is designed to attract a wider range of people, potentially contributing to diversity and vibrancy within the suburb. In conjunction with the findings of Chapter Three, New Zealand's coastal suburbs were identified as having a very limited range of housing types, and would require this range to be extended in order to increase density without decreasing amenity.

Chapter Five united the findings of the previous chapters by applying these findings in a design experiment/case study set in Island Bay. The case study offered the opportunity to test the findings of the previous chapters in order to identify likely strengths and weaknesses. While the design demonstrates that intensification has the potential to provide a great deal of amenity to an area, it is not without faults, and these provide ample ground for further research.

The research process identified a number of areas where future research is required:

There is a clear lack of research into the coastal suburban environment. If coastal suburbs are to be seriously considered as sites for future intensification then research into this area needs to be conducted. While international research on this topic would provide a strong starting point for designers, it is important that research specific to New Zealand is conducted, in order to highlight and allow response to important local issues

While a typology was developed in Chapter Three, it was not fully utilised in the design, as Island Bay only represented some of the identified types. It has the potential to be a useful tool in organising thinking about coastal urban form, and could be used as the basis for a design 'toolkit'. In order for this to happen however, extensive research into coastal suburban form and further development of the typology would be necessary.

A number of areas for future research were identified within the case study, but two stand out as being of particular importance. As it is imperative that the intensification is planned at an urban scale, traditional market mechanisms are unlikely to be effective in its realisation. As a result, the mechanics of implementing such a scheme from an economic and community acceptance point of view is perhaps of the most pragmatic importance. In terms of future design research it would be especially interesting to examine the reconciliation of a coastal edge activated by high densities, and the desire to reduce density towards the coast in order to maximise views.

Fundamentally, the design case study focussed on the development of a high amenity public space as a focal point for an intensification project. While the particular application of this was in relation to the suburban coastline, similar thinking and techniques could be applied to any intensification project using public space as its focus. It would also be worth investigating the application of these techniques to provincial coastal suburbs.

As the global population is predicted to rise significantly in the foreseeable future, and sustainability and land use are becoming increasingly important, intensification provides a means by which a city can house a growing population within its existing footprint. The findings of this research indicate that the planned intensification of desirable areas such as the coast, allows a greater

number of people to reside in, and enjoy, a highly desirable area while contributing significantly to the amenity of the location. As a result, this thesis suggests that opposition to intensification *need not* be in the places where people most want to live.

BIBLIOGRAPHY

Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Angel, S. (1977). *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.

Ashton, P. (2008). Suburban Sydney. *Sydney Journal* , 1 (3), 36-50.

Auckland City Council. (2010). *Introduction to crime prevention through environmental design*. Retrieved June 2, 2010, from Auckland City Council:
www.aucklandcity.govt.nz/auckland/introduction/safer/cpted

Auckland Regional Transport Authority. (2010). *Bus Fares*. Retrieved May 31, 2010, from MAXX Auckland Regional Transport:
<http://www.maxx.co.nz/pricing-passes/bus-fares.html>

Australian Bureau of Statistics. (2008b, February 10). *2006 Census QuickStats : Gold Coast (Local Government Area)*. Retrieved June 21, 2010, from Australian Bureau of Statistics:
<http://www.censusdata.abs.gov.au/ABSNavigation/prenav/ProductSelect?newproducttype=QuickStats&btnSelectProduct=View+QuickStats+%3E&collection=Census&period=2006&areacode=LGA33460&geography=&method=&productlabel=&producttype=&topic=&navmapdisplayed=true&ja>

Australian Bureau of Statistics. (2008c, February 10). *2006 Census QuickStats : Queensland*. Retrieved June 21, 2010, from Australian Bureau of Statistics:

<http://www.censusdata.abs.gov.au/ABSNavigation/prenav/ProductSelect?newproducttype=QuickStats&btnSelectProduct=View+QuickStats+%3E&collection=Census&period=2006&areacode=3&geography=&method=&productlabel=&producttype=&topic=&navmapdisplayed=true&javascript>

Australian Bureau of Statistics. (2008a, February 10). *2006 Census QuickStats : Surfers Paradise*. Retrieved June 21, 2010, from Australian Bureau of Statistics:

<http://www.censusdata.abs.gov.au/ABSNavigation/prenav/ProductSelect?newproducttype=QuickStats&btnSelectProduct=View+QuickStats+%3E&collection=Census&period=2006&areacode=307103587&geography=&method=&productlabel=&producttype=&topic=&navmapdisplayed=true&j>

Bogart, W. T. (2006). *Don't Call it Sprawl*. Cambridge: Cambridge University Press.

Bolick, C. (2000). Subverting the American Dream: Government Dictated "Smart Growth" is Unwise and Unconstitutional. *University of Pennsylvania Law Review* , 148 (3), 859-872.

Breen, A., & Rigby, D. (1996). *The new waterfront : a worldwide urban success story*. New York: McGraw-Hill.

Coastal Council of New South Wales. (2003). *Coastal Design Guidelines for NSW*.

Cohen, M., & Gutman, M. (2007). Density: An Overview Essay. *Built Environment*, 33 (2), 141-144.

Coiacetto, E. (2007). The Role of the Development Industry in Shaping Urban Social Space: a Conceptual Model. *Geographical Research*, 45 (4), 340-347.

Congress for the New Urbanism. (1996). *Charter of the New Urbanism*. Retrieved May 30, 2010, from [cnu.org](http://www.cnu.org): www.cnu.org/charter

Cosgrove, D. (2006). Modernity, Community and the Landscape Idea. *Journal of Material Culture*, 11 (1/2), 49-66.

Demographia. (2000). *Neotraditional Community Review: Laguna West (Sacramento)*. Retrieved July 17, 2010, from [Demographia.com](http://www.demographia.com/db-nu-calgw.htm): <http://www.demographia.com/db-nu-calgw.htm>

Department of Building and Housing. (1995). *Compliance Document for New Zealand Building Code: Clause G7: Natural Light*. Retrieved October 11, 2010, from Department of Building and Housing: <http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/clause-G7.pdf>

Dieleman, F., & Wegener, M. (2004). Compact City and Urban Sprawl. *Built Environment*, 30 (4), 308-323.

Duany, A., Sorlien, S., & Wright, W. (2009). *SmartCode v9.2*. Retrieved April 21, 2010, from Smartcode Central: http://www.smartcodecentral.com/smartfilesv9_2.html

Environment Canterbury. (2010). *Metro - Fares*. Retrieved May 31, 2010, from Metro: <http://www.metroinfo.org.nz/fares.html>

Falk, N. (2006a). Towards Sustainable Suburbs. *Built Environment*, 32 (3), 225-234.

Falk, N. (2006b). Smarter Growth and Sustainable Suburbs. *Built Environment*, 32 (3), 328-341.

Filion, P. (2001). Suburban mixed-use centres and urban dispersion: what difference do they make? *Environment and Planning A*, 33 (1), 141-160.

Frey, H. W., Ferguson, N. S., Bagaeen, S. G., & Woods, L. (2006). Suburbs Reconsidered: Form, Mobility and Sustainability. *Built Environment*, 32 (3), 250-266.

Greater Wellington Regional Council. (2010a). *Adults*. Retrieved May 31, 2010, from Metlink: <http://www.metlink.org.nz/adults/>

Greater Wellington Regional Council. (2010b). *Metlink - Children/Concession*. Retrieved May 31, 2010, from Metlink: <http://www.metlink.org.nz/children-concession/>

Gurran, N., Squires, C., & Blakely, E. (2005). Planning for sea change in coastal Australia. *Australian Planner*, 42 (4), 10-11.

Gwilliam, M. (2006). Policies for the South East: Seizing the Potential. *Built Environment* , 32 (3), 323-327.

Hasse, J. E., & Lathrop, R. G. (2003). Land resource impact indicators of urban sprawl. *Applied Geography* , 23 (2/3), 159-175.

Heiman, R. (2007). The Last Days of Low-Density Living: Suburbs and the End of Oil. *Built Environment* , 33 (2), 213-226.

Hickford, M. (2009, March 2). *Law of the foreshore and seabed - The modern challenge*. Retrieved May 25, 2010, from Te Ara - The Encyclopedia of New Zealand: <http://www.teara.govt.nz/en/law-of-the-foreshore-and-seabed/4>

Hill, D., & Spargo, G. (1998). *Environmental Performance Indicators*. Wellington: Ministry for the Environment

Hite, D., Sohngen, B., & Templeton, J. (2003). Zoning, Development Timing, and Agricultural Land Use at the Suburban Fringe: A Competing Risks Approach. *Agricultural and Resource Economics Review* , 32 (1), 145-157.

Huppatz, T. (2005). Planning and coastal development in South Australia. *Australian Planner* , 42 (4), 12-13.

Johnsonville Progressive Association. (2009, November 9). *Say "No! To the Ghetto!" - Stop DPC 72 from Destroying the Johnsonville we love!* Retrieved November 29, 2010, from

Johnsonville Progressive Association Blog:
<http://johnsonvillepa.wordpress.com>

Kearney, A. R. (2006). Residential Development Patterns and Neighborhood Satisfaction. *Environment and Behavior* , 38 (1), 112-139.

Litman, T. A. (2009). *Evaluating Criticism of Smart Growth*. Victoria, British Columbia: Victoria Transport Policy Institute.

Lörzing, H. (2006). Reinventing Suburbia in The Netherlands. *Built Environment* , 32 (3), 298-310.

Marshall, S. (2006). The Emerging 'Silicon savanna': From Old Urbanism to New Suburbanism. *Built Environment* , 32 (3), 267-280.

McElfish., J. M. (2007). *Ten Things Wrong With Sprawl*. Washington D.C.: Environmental Law Institute.

MFE. (2001). *Climate change impacts on New Zealand*. Wellington: Ministry for the Environment

Moudon, A. V. (1983). *Built for Change: Neighborhood Architecture in San Francisco*. Cambridge, Mass.: MIT Press.

Nasar, J. L. (2003). Does neotraditional development Build Community. *Journal of Planning Education and Research* , 23 (1), 58-68.

New Zealand Department of Internal Affairs. (2010, January 14). *Sustainable Urban Development: Setting the Scene*. Retrieved June 1, 2010, from New Zealand Department of Internal Affairs: http://www.dia.govt.nz/diawebsite.nsf/wpg_URL/Resource-material-Sustainable-Urban-Development-Setting-the-Scene?OpenDocument

New Zealand Transport Authority. (2010, May 27). *fuel\$aver.govt.nz*. Retrieved May 27, 2010, from [fuel\\$aver.govt.nz](http://www.fuelsaver.govt.nz/fuel.html): <http://www.fuelsaver.govt.nz/fuel.html>

New Zealand Transport Authority. (2009). *rightcar.govt.nz*. Retrieved May 27, 2010, from [rightcar.govt.nz](http://www.rightcar.govt.nz/compare.html?cars=15311): <http://www.rightcar.govt.nz/compare.html?cars=15311>

newurbanism.org. (n.d.). *Urbanism Principles*. Retrieved 04 20, 2010, from [newurbanism.org](http://newurbanism.org/newurbanism/principles.html): <http://newurbanism.org/newurbanism/principles.html>

O'Conner, K. (2004). *Understanding and Managing Coastal Economic Development*. Melbourne: Department of Sustainability and Environment.

Office for National Statistics. (2004a, November 09). *Age Structure: Torbay*. Retrieved June 22, 2010, from Office for National Statistics: <http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=276838&c=torbay&d=13&e=15&g=402318&i=1001x1003x1004&m=0&r=1&s=1277116991034&enc=1&dsFamilyId=276>

Office for National Statistics. (2004b, November 09). *Age Structure: TQ2 6RQ within Torbay 009B*. Retrieved June 22, 2010, from Office for National Statistics:

<http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&c=TQ2+6RQ&e=15&g=402107&i=1001x1012x1013x1003x1004&j=299576&m=1&p=-1&q=1&r=0&s=1277117300700&enc=1&dsFamilyId=276>

Office for National Statistics. (2009, November 26). *Income: Model-Based Estimates: TQ2 6RQ within Torbay 009*. Retrieved June 22, 2010, from Office for National Statistics:

<http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&c=TQ2+6RQ&e=14&g=402107&i=1001x1012x1013x1003x1004&j=299576&m=1&p=-1&q=1&r=0&s=1277118708626&enc=1&dsFamilyId=266>

Office for National Statistics. (n.d.). *Neighbourhood Statistics: Torbay (2001 Census)*. Retrieved June 22, 2010, from Office for National Statistics:

<http://neighbourhood.statistics.gov.uk/dissemination/LeadDatasetList.do?a=7&b=276838&c=torbay&d=13&g=402318&i=1001x1003&m=0&r=1&s=1277045441968&enc=1&domainId=15>

Office for National Statistics. (2008). *Neighbourhood Summary TQ2 6RQ within neighbourhood Torbay 009B*. Retrieved June 22, 2010, from Office for National Statistics:

<http://neighbourhood.statistics.gov.uk/dissemination/Neighbourh>

oodSummary.do?width=1920&a=7&r=1&i=1001&m=0&s=1277045629609&enc=1&profileSearchText=TQ26RQ&searchProfiles=

Office for National Statistics. (2010, June 8). *South West - summary*. Retrieved June 22, 2010, from Office for National Statistics: <http://www.statistics.gov.uk/cci/nugget.asp?id=1134>

O'Hare, D. (2008). Missing the Gold Coast Train? The interaction between private development and three levels of government planning in attempting to co-locate a new railway station and a major new town centre. *Sustainable Development*, July, 367-377.

Olsen, S. B. (2003). Frameworks and indicators for assessing progress in integrated coastal management initiatives. *Ocean & Coastal Management*, 46 (3/4), 347-361.

Oxford University Press. (2010). *amenity*. Retrieved November 8, 2010, from Oxford Dictionaries Online: http://english.oxforddictionaries.com/view/entry/m_en_gb0023480#

Pilkey, O. H., Pilkey, W. D., Pilkey, O. H., & Neal, W. J. (1983). *Coastal Design: A Guide for Builders, Planners & Homeowners*. New York: Van Nostrand Reinhold.

Priemus, H., & Hall, P. (2004). Multifunctional Urban Planning of Mega-City Regions. *Built Environment*, 30 (4), 338-349.

Priemus, H., Rodenburg, C. A., & Nijkamp, P. (2004). Multifunctional Urban Land Use: A New Phenomenon? A New Planning Challenge? *Built Environment*, 30 (4), 269-273.

Property Vision. (2007). *PropertyVision 06/07*. Retrieved November 29, 2010, from Property Vision: www.propertyvision.com/project/uploaded-media/0-a-capital-city.pdf

Pulido, L. (2000). Rethinking Environmental Racism: White Privilege and Urban Development in Southern California. *Annals of the Association of American Geographers*, 90 (1), 12-40.

Quinn, B. (2006). Transit-Oriented Development: Lessons from California. *Built Environment*, 32 (3), 311-322.

Rudel, T. K. (2009). How Do People Transform Landscapes? A Sociological Perspective on Suburban Sprawl and Tropical Deforestation. *American Journal of Sociology*, 115 (1), 129-154.

Sparrow, J. (2010). *Real Estate in Downtown Calgary*. Retrieved November 29, 2010, from Jim Sparrow: www.jimsparrow.com/downtown-calgary.php

Statistics New Zealand. (n.d.). *Interactive Boundary Map*. Retrieved June 19, 2010, from Statistics New Zealand: <http://clientapps.nowwhere.com.au/statsnz/maps/default.aspx?id=3576002&parentID=&type=>

Statistics New Zealand. (2007, May). *Quickstats about New Zealand*. Retrieved May 25, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?type=region&tab=Households&id=9999999>

Statistics New Zealand. (2007a, September). *Quickstats about Auckland Region*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=1000002&type=region&ParentID=>

Statistics New Zealand. (2007b, September). *Quickstats about North Shore City*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000005&type=ta&ParentID=1000002>

Statistics New Zealand. (2007c, September). *Quickstats about Waitakere City*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000006&type=ta&ParentID=1000002>

Statistics New Zealand. (2007d, September). *Quickstats about Auckland City*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000007&type=ta&ParentID=1000002>

Statistics New Zealand. (2007e, September). *Quickstats about Papakura*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000009&type=ta&ParentID=1000002>

Statistics New Zealand. (2007f, September). *Quickstats about Wellington Region*. Retrieved April 23, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=1000009&type=region&ParentID=1000009>

Statistics New Zealand. (2007g, September). *Quickstats about Wellington City*. Retrieved April 23, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000047&type=ta&ParentID=1000009>

Statistics New Zealand. (2007h, September). *Quickstats about Canterbury Region*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=1000013&type=region&ParentID=1000013>

Statistics New Zealand. (2007i, September). *Quickstats about Christchurch City*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=2000060&type=ta&ParentID=1000013>

Statistics New Zealand. (2008a, June). *Quickstats about Browns Bay*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3507101&type=au&ParentID=1000002&expand=2000005&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008b, June). *Quickstats about Titirangi South*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3512000&type=au&ParentID=1000002&expand=2000006&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008c, June). *Quickstats about Orakei North*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3516400&type=au&ParentID=1000002&expand=2000007&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008d, June). *Quickstats about Takanini West*. Retrieved June 19, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3523920&type=au&ParentID=1000002&expand=2000009&scrollLeft=0&scrollTop=1828&ss=y>

Statistics New Zealand. (2008e, June). *Quickstats about Roseneath*. Retrieved April 23, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?pdf=1&id=3576700&type=au&ParentID=1000009&expand=2000047&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008f, June). *Quickstats about Lyall Bay*. Retrieved April 23, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3577000&type=au&ParentID=1000009&expand=2000047&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008g, June). *Quickstats about Seatoun*. Retrieved April 23, 2010, from Statistics New Zealand:

<http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?pdf=1&id=3577500&type=au&ParentID=1000009&expand=2000047&scrollLeft=0&scrollTop=0&ss=y>

Statistics New Zealand. (2008h, June). *Quickstats about New Brighton*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3595800&type=au&ParentID=1000013&expand=2000060&scrollLeft=0&scrollTop=258&ss=y>

Statistics New Zealand. (2008i, June). *Quickstats about South Brighton*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3595900&type=au&ParentID=1000013&expand=2000060&scrollLeft=0&scrollTop=258&ss=y>

Statistics New Zealand. (2008j, June). *Quickstats about Sumner*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3596200&type=au&ParentID=1000013&expand=2000060&scrollLeft=0&scrollTop=258&ss=y>

Statistics New Zealand. (2008k, June). *Quickstats about Lyttelton*. Retrieved June 19, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3596400&type=au&ParentID=1000013&expand=2000060&scrollLeft=0&scrollTop=258&ss=y>

Statistics New Zealand. (2008l). *Quickstats about Island Bay East*. Retrieved April 23, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?tab=AgeSex&id=3576002>

Statistics New Zealand. (2008m). *Quickstats about Island Bay West*. Retrieved April 23, 2010, from Statistics New Zealand: <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPlace/SnapShot.aspx?id=3576001&type=au&ParentID=1000009&expand=2000047&scrollLeft=0&scrollTop=0&ss=y>

The City of Calgary. (2010). *Calgary Snapshots 2010*. Calgary, Alberta: The City of Calgary.

The Dominion Post. (2008, September 9). *Infill housing plans cut back*. Retrieved November 29, 2010, from The Dominion Post: www.stuff.co.nz/dominion-post/624024

The New York Times. (2006, October 17). *110 Building Sites in N.Y. Sold to Speyer for \$5.4 Billion*. Retrieved November 29, 2010, from The New York Times: www.nytimes.com/2006/10/17/nyregion/18stuycond.html?ex=1181793600&en=66672abd7678de61&ei=5070

Unsworth, R., & Nathan, M. (2006). Beyond City Living: Remaking the Inner Suburbs. *Built Environment*, 32 (3), 235-249.

US Census Bureau. (n.d.c). *32459 - Fact Sheet*. Retrieved June 22, 2010, from US Census Bureau: http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=32459&_cityTown=3245

9&_state=&_zip=32459&_lang=en&_sse=on&pctxt=fph&pgsl=010
&show_2003_tab=&redirect=Y

US Census Bureau. (n.d.a). *Profile of General Demographic Characteristics: 2000: 32459*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=86000US32459&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=DEC_2000_SF1_U&-_lang=en&-redoLog=false&-_sse=on

US Census Bureau. (n.d.g). *Profile of General Demographic Characteristics: 2000: Florida*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&q_r_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=04000US12

US Census Bureau. (n.d.d). *Profile of General Demographic Characteristics: 2000: Walton County*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&q_r_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=05000US12131

US Census Bureau. (n.d.b). *Profile of Selected Economic Characteristics: 2000: 32459 (Zip Code)*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=86000US32459&-qr_name=DEC_2000_SF3_U_DP3&-ds_name=DEC_2000_SF3_U&-_lang=en&-_sse=on

http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&q_r_name=DEC_2000_SF3_U_DP3&ds_name=DEC_2000_SF3_U&geo_id=04000US12

US Census Bureau. (n.d.h). *Profile of Selected Economic Characteristics: 2000: Florida*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&q_r_name=DEC_2000_SF3_U_DP3&ds_name=DEC_2000_SF3_U&geo_id=04000US12

US Census Bureau. (n.d.e). *Profile of Selected Economic Characteristics: 2000: Walton County*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/QTTable?_bm=y&-qr_name=DEC_2000_SF3_U_DP3&-ds_name=DEC_2000_SF3_U&-_lang=en&-_sse=on&-geo_id=05000US12131

US Census Bureau. (n.d.i). *State and County Quickfacts: Florida*. Retrieved June 22, 2010, from US Census Bureau:
<http://quickfacts.census.gov/qfd/states/12000.html>

US Census Bureau. (n.d.f). *Walton County, Florida - Fact Sheet*. Retrieved June 22, 2010, from US Census Bureau:

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=ChangeGeoContext&geo_id=05000US12131&_geoContext=&_street=&_county=Walton+County&_cityTown=&_state=&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&pgsl=010&_submenuId=factsheet_1&ds_name=ACS

- Vaughan, L. (2006). Making Connections: The Case of Borehamwood. *Built Environment* , 32 (3), 281-297.
- Wellington City Council. (2008). *Infill Housing Review - Discussion Paper*. Wellington: Wellington City Council.
- Wellington City Council. (2007a). Proposed District Plan Change 56. Wellington.
- Wellington City Council. (2007b). Section 32 Report: Proposed District Plan Change 56. Wellington.
- Wellington City Council. (2008). Summary of Consultation and Feedback on Discussion Paper. Wellington.
- Wellington City Council. (2007c). Summary of Submissions: Proposed District Plan Change 56. Wellington.
- Wu, B., & Cai, L. A. (2006). Spatial Modelling: Suburban Leisure in Shanghai. *Annals of Tourism Research* , 33 (1), 179-198.
- Yigitcanlar, T., Fabian, L., & Coiacetto, E. (2008). Challenges to Urban Sustainability and Smart Transport in a Tourist City: The Gold Coast, Australia. *The Open Transportation Journal* , 2, 29-46.

SOURCE IMAGE REFERENCES

- Auckland City Council. (2007, February 27). *Sheet C12 Planning Map 1*. Retrieved June 04, 2010, from Auckland City Council: <http://www.aucklandcity.govt.nz/council/documents/district/maps/c121.asp>
- Auckland Regional Council. (n.d.). *Auckland Regional Viewer*. Retrieved June 18, 2010, from Auckland Regional Council: <http://maps.auckland.govt.nz/AucklandRegionViewer/>
- Banks Peninsula District Council. (2006, March). *Proposed District Plan*. Retrieved April 29, 2010, from Christchurch City Council: <http://resources.ccc.govt.nz/files/SettlementMapsS0toS29-bpdplstofpdfs.pdf>
- Christchurch City Council. (2009a). *City Planning Map 34a*. Retrieved April 29, 2010, from Christchurch City Council: [http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist\\$xhitlist_x=Advanced\\$xhitlist_vpc=first\\$xhitlist_xsl=objectlink.xml\\$xhitlist_sel=title;path;content-type;home-title\\$xhitlist_d={CCCPLAN}\\$xhitlist_q=\[field%20folio-object-name:%2734aScreen%27\]\\$xhitl](http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist$xhitlist_x=Advanced$xhitlist_vpc=first$xhitlist_xsl=objectlink.xml$xhitlist_sel=title;path;content-type;home-title$xhitlist_d={CCCPLAN}$xhitlist_q=[field%20folio-object-name:%2734aScreen%27]$xhitl)
- Christchurch City Council. (2009b). *City Planning Map 48a*. Retrieved April 29, 2010, from Christchurch City Council: [http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist\\$xhitlist_x=Advanced\\$xhitlist_vpc=first\\$xhitlist_xsl=objectlink.xml\\$xhitlist_s](http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist$xhitlist_x=Advanced$xhitlist_vpc=first$xhitlist_xsl=objectlink.xml$xhitlist_s)

el=title;path;content-type;home-
title\$хhitlist_d={CCCPLAN}\$хhitlist_q=[field%20folio-object-
name:%2748aScreen%27]\$хhitl

Christchurch City Council. (2009c). *City Planning Map 49a*.
Retrieved April 29, 2010, from Christchurch City Council:
[http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist\\$хhitlist_x=Advanced\\$хhitlist_vpc=first\\$хhitlist_xsl=objectlink.xml\\$хhitlist_sel=title;path;content-type;home-title\\$хhitlist_d={CCCPLAN}\\$хhitlist_q=\[field%20folio-object-name:%2749aScreen%27\]\\$хhitl](http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist$хhitlist_x=Advanced$хhitlist_vpc=first$хhitlist_xsl=objectlink.xml$хhitlist_sel=title;path;content-type;home-title$хhitlist_d={CCCPLAN}$хhitlist_q=[field%20folio-object-name:%2749aScreen%27]$хhitl)

Christchurch City Council. (2009d). *City Planning Map 56a*.
Retrieved April 29, 2010, from Christchurch City Council:
[http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist\\$хhitlist_x=Advanced\\$хhitlist_vpc=first\\$хhitlist_xsl=objectlink.xml\\$хhitlist_sel=title;path;content-type;home-title\\$хhitlist_d={CCCPLAN}\\$хhitlist_q=\[field%20folio-object-name:%2756aScreen%27\]\\$хhitl](http://www.cityplan.ccc.govt.nz/NXT/gateway.dll?f=xhitlist$хhitlist_x=Advanced$хhitlist_vpc=first$хhitlist_xsl=objectlink.xml$хhitlist_sel=title;path;content-type;home-title$хhitlist_d={CCCPLAN}$хhitlist_q=[field%20folio-object-name:%2756aScreen%27]$хhitl)

Environment Canterbury. (2010). *Route Map - Christchurch*.
Retrieved June 3, 2010, from Metro:
<http://www.metroinfo.co.nz/docs/route-map-christchurch-021109.pdf>

Gold Coast City Council. (2010a, January). *Gold Coast Planning Scheme Part 6 Local Area Plans*. Retrieved June 19, 2010, from Gold Coast City Council:

http://www.goldcoast.qld.gov.au/gcplanningscheme_0110/attachments/planning_scheme_documents/part6_local_area_plans/div2_laps/chapter_25_surfers_paradise.pdf

Gold Coast City Council. (2010b, January). *Surfers Paradise Local Area Plan - LAP Map 25.2 - Precincts*. Retrieved June 19, 2010, from Gold Coast City Council:
http://www.goldcoast.qld.gov.au/gcplanningscheme_0110/attachments/planning_scheme_maps/local_area_plans_maps/SURFERS_PARADISE/LAP25_2.pdf

Google. (2010a). *Google Maps: Seaside, FL*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010b). *Google Maps: Livermead, Torbay*. Retrieved May 3, 2010, from Google Maps: <http://maps.google.com>

Google. (2010c). *Google Maps: Surfers Paradise*. Retrieved May 3, 2010, from Google Maps: <http://maps.google.com>

Google. (2010d). *Google Maps: Browns Bay*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010e). *Google Maps: Wood Bay*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010f). *Google Maps: Orakei*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010g). *Google Maps: Conifer Grove*. Retrieved April 28, 2010, from Google Maps: <http://maps.google.com>

Google. (2010h). *Google Maps: Roseneath*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010i). *Google Maps: Lyall Bay*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010j). *Google Maps: Seatoun*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010k). *Google Maps: Breaker Bay*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010l). *Google Maps: New Brighton*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010m). *Google Maps: Southshore*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010n). *Google Maps: Sumner*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010o). *Google Maps: Lyttelton*. Retrieved April 29, 2010, from Google Maps: <http://maps.google.com>

Google. (2010p). *Laguna Niguel, California*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010q). *28138 Rubicon Ct, Laguna Niguel*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010r). *24390 Nugget Falls Ln, Laguna Niguel*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010s). *28000 Gunnison Ct, Laguna Niguel*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010t). *North Cherry Hills Village, Colorado*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010u). *2180 E Eastman Ave, Englewood*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010v). *3464 Columbine Cir, Englewood*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010w). *3 Cherry Hills Dr, Englewood*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010x). *Bridgmead, Port Elizabeth*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010y). *Corner of Avontuur Rd and Glenconner Ave, Port Elizabeth*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010z). *6 Hermitage Ave, Port Elizabeth*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010aa). *12 Coega Cres, Port Elizabeth*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ab). *Laguna West, California*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010ac). *9276 Bay Head Ct, Laguna West*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ad). *3228 Grimshaw Way, Laguna West*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ae). *9214 E Laguna Way, Laguna West*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010af). *Southshore, Blackpool*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010ag). *12 Sandgate, South Shore*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ah). *24 Sandgate, South Shore*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ai). *Southern Area, Caernarfon*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010aj). *19 Bryn Hyfryd, Caernarfon*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ak). *Ballinfoyle, Galway*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010al). *Mastrick, Aberdeen*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010am). *8 Ross Cres, Aberdeen*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010an). *Dennistoun, Glasgow*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010ao). *74 Meadowpark St, Glasgow*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ap). *Corner of Garthland Dr and Meadowpark St, Glasgow*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010aq). *Getafe, Madrid*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010ar). *Calle Puerta de Toledo, Getafe*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010as). *8 Calle Puerta Cerrada, Getafe*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010at). *Intersection of Calle de la Isla de Bohol and Calle Puerta del Sol, Getafe*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010au). *Alamo Square, San Francisco*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010av). *1058 Fell St, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010aw). *1238 Grove St, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ax). *716 Steiner St, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ay). *Outer Sunset, San Francisco*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010az). *3528 Ortega St, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010ba). *1870 Great Hwy, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bb). *3912 Ortega St, San Francisco*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bc). *CBD, Calgary*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010bd). *Area around Rue de Belleville, Paris*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010be). *22 Rue des Bois, Paris*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bf). *Corner of Rue de Belleville and Rue Haxo, Paris*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bg). *36 Rue du Telegraph, Paris*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bh). *1 Place des Fetes, Paris*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bi). *Stuyvesant Town, New York*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010bj). *720 E 16th St, New York*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bk). *206 Avenue A, New York*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bl). *283 Avenue C Loop, New York*. Retrieved July 27, 2010, from Google Streetview: <http://maps.google.co.nz/>

Google. (2010bm). *Kstovo, Nizhny Novgorod Province*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Google. (2010bn). *Google Maps: Island Bay*. Retrieved September 9, 2010, from Google Maps: <http://maps.google.co.nz>

Iukzar. (2010). *Tirellan Heihgts (sic)*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Maschine. (2010). *Kstovo*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Msokolov. (2010). *Kstovo*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

North Shore City Council. (2009, June). *Distict Plan Map: Zone 14*. Retrieved June 04, 2010, from North Shore City Council: <http://www.northshorecity.govt.nz/YourCouncil/PublicDocuments/DistrictPlan/Documents/District-Plan-Maps/zone-14.pdf>

Papakura District Council. (2010, May 11). *Map E -1*. Retrieved June 04, 2010, from Papakura District Council: http://www.pdc.govt.nz/Documents/PrintFiles/DP/A3_5/a3_e1.pdf

Seaside, FL. (2010). *Shop and Dine*. Retrieved June 7, 2010, from Seaside, FL: <http://www.seasidefl.com/ShopAndDineMap.asp>

Tarantalkst. (2010). *Kstovo*. Retrieved July 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Torbay Council. (2010a). *Local Plan*. Retrieved June 19, 2010, from Torbay Council: <http://www.torbay.gov.uk/index/environment-planning/strategicplanning/localplan.htm>

Torbay Council. (2010b). *Map 16*. Retrieved June 19, 2010, from Torbay Council: <http://plans.torbay.gov.uk/pdfs/maps/16.pdf>

Torbay Council. (2008). *Torbay Council Interactive Mapping for Geographical Information*. Retrieved June 19, 2010, from Torbay Council: <http://www.torbay.gov.uk/torbaygis/%28S%28nlr2o1ixarwvd2j01o4oik55%29%29/TorbayInteractiveMap.aspx>

Valb. (2010). *Kstovo*. Retrieved Jult 27, 2010, from Google Maps: <http://maps.google.co.nz/>

Waitakere City Council. (2010a). *Human Environment Map G10*. Retrieved June 04, 2010, from Waitakere City Council: <http://www.waitakere.govt.nz/AbtCnl/pp/districtplan/pdf/hemaps/heG10.pdf>

Waitakere City Council. (2010b). *Human Environment Map H10*. Retrieved June 04, 2010, from Waitakere City Council: <http://www.waitakere.govt.nz/AbtCnl/pp/districtplan/pdf/hemaps/heH10.pdf>

Waitakere City Council. (2010c). *Human Environments Legend*. Retrieved June 04, 2010, from Waiakere City Council: <http://www.waitakere.govt.nz/AbtCnl/pp/districtplan/pdf/hemaps/humenvtslegend.pdf>

Wellington City Council. (2009, March). *5m Contours*. Wellington: Wellington City Council.

Wellington City Council. (n.d.a). *Wellington City Council District Plan Map 12*. Retrieved April 27, 2010, from Wellington City Council:
<http://www.wellington.govt.nz/plans/district/volume3/pdfs/v3map12.pdf>

Wellington City Council. (2010a). *Wellington City Council District Plan Map 4*. Retrieved April 27, 2010, from Wellington City Council:
<http://www.wellington.govt.nz/plans/district/volume3/pdfs/v3map04.pdf>

Wellington City Council. (n.d.b). *Wellington City Council District Plan Map 5*. Retrieved April 27, 2010, from Wellington City Council:
<http://www.wellington.govt.nz/plans/district/volume3/pdfs/v3map05.pdf>

Wellington City Council. (2010b). *Wellington City Council District Plan Map 7*. Retrieved April 27, 2010, from Wellington City Council:
<http://www.wellington.govt.nz/plans/district/volume3/pdfs/v3map07.pdf>

Wellington City Council. (2008). *Wellington City Suburbs*. Retrieved November 11, 2010, from Wellington City Council:
<http://www.wellington.govt.nz/maps/pdfs/suburbs/suburbs.pdf>

Wises. (2010). *Wises Maps*. Retrieved April-June 2010, from Wises.co.nz: www.wises.co.nz

Yellow Pages Group. (2009). *Yellow Maps*. Retrieved April-June 2010, from Yellow Maps: maps.yellow.co.nz

ZoomIn. (2010). *ZoomIn*. Retrieved April-June 2010, from Zoomin.co.nz: www.zoomin.co.nz

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