IMBY CREATING A MODEL FOR DENSITY THAT MAINTAINS SUBURBAN VALUES.

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ABSTRACT

With Greenfield approaches becoming less popular among city councils, forms of densification are being sought out, the most common yet unprecedented form being infill housing. On grounds of this, other methods including apartments are being considered the best solution. For suburban cities, this runs the risk of ignoring fundamental suburban qualities that have been highly desired in New Zealand since settlement, such as open space, autonomous land ownership, and control over one's own property. Considering 'the state house' as a foundational suburban housing model for New Zealand, the Hutt Valley becomes the focus of study for this thesis.

This thesis proposes using infill as a viable solution and means of exploring suburban living to produce a model of densification that offers both continuity with and transformation of cultural and architectural traits of suburban living. It argues for more compact and affordable models that are easily applicable to current New Zealand suburbia and are more responsive to current households. By exploring suburbia at different scales and exploring the current housing layout, new forms of suburban density are formed, where flexibility and neighbourliness are prioritized. The resulting dwelling is arranged based on the varying social needs of humans, allowing inhabitants to define private, shared and public areas both internally and externally.

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1.1

INTRODUCTION

Figure 3.1: Figure ground of Hutt Valley.

In New Zealand, greenfield development is typically implemented to provide dwellings for population growth. With the encroachment of greenfield onto important farmland along with the large rates of population increase, councils are starting to explore other means of housing provision (HCC). Solutions to the problem come in the form of densification of existing neighbourhoods, typically infill. Lower Hutt has a history of poor quality infill housing and the Council proposes that apartments near commercial areas are a preferred solution (O'Neil) (Fig 2.1). For decades suburbia has provided a highly desirable lifestyle for New Zealanders that offers valuable qualities: open space, autonomous land ownership, control over one's own property, neighbourliness and other aspects associated with the quarter acre dream. When density is added, often these qualities are compromised.

Figure 3.2: Current development occurring within Lower Hutt

1.1

INTRODUCTION

Question

How can increased density be achieved within the suburbs in ways that maintain the valued aspects of the suburban lifestyle?

This thesis aims to analyse and critique suburban living in the Hutt Valley. A model will be developed for further higher density development that offers both continuity with and transformation of cultural and architectural traits of suburban living.

The principal objective of this design-led research investigation is to develop a model of increased density housing which:

- Reviews and critiques the historic development and culture of suburbia
- Is easily applicable to New Zealand suburbia
- Develops a detached house typology that is:
 - More responsive to current households
 - Affordable
 - Fits within the context of the Hutt Valley
 - Establishes neighbourliness.

Using Lower Hutt as a case study this thesis explores how density can be achieved within the suburbs whilst maintaining valued aspects of the suburban lifestyle. It also revisits infill housing as a viable alternative, applicable to all areas of existing suburban settlement.

1.1

INTRODUCTION

Method & Scope

The research provides studies in two key areas, social implications of infill housing and providing a new housing model. Two principle theorists have provided key input in developing this thesis.

Nigel Bertram is director of the Melbourne based practice NMBW Studio and a professor at Monash University. Bertram has produced a wide range of texts based on his own design works and explorations of the existing urban environment. His texts provide a key methodology of thinking “simultaneously at different scales” whilst also considering different “types of relationships between individuals and groups”(Bertram). With infill as the proposed design outcome, these methodologies question current approaches to dwelling design thus revealing the importance of smaller scaled design.

Robin Evans was both an architect and teacher, dividing his time between Harvard University and the University of Westminster from 1986 until he died in 1993 (Heron). Having also produced a wide variety of texts, his works explore the architectural history of building types, a key text being *Translations from Building to Drawings*, where he explores dwelling layout. This text provides key insight into the logic of current dwelling layout and its relation to social behaviour within the home.

Case studies are all individually distinctive and vary from classical to contemporary but most could be categorised as villas. This allows exploration into how designs are responsive to their intended household providing insight to define the household of today.

The focus of the thesis is design led research using photographs, maps, diagrams, drawings and design work, with annotations to guide the process. Emphasis is placed on the final design, with previous iterations used to illustrate key decisions in the design process.

The author has created all images unless otherwise specified.

Design Scope

This thesis explores the use of single detached infill dwellings to increase density of suburban developments.

Changes to current housing expectations are required such as the limit of one car per section. This adjustment is offset by the creation of more affordable housing. Along with this comes the assumption that current owners of these dwellings would be interested in investing their land into infill housing.

Another key aspect is structure and affordability. For these houses to be a viable option cost has been considered. Although detailed costing and structural specifics are beyond the scope of this work.

Figure 3.3: Methodology diagram showing process of thesis

1.1

INTRODUCTION

Structure

INTRODUCTION

Provides an overview of the thesis.

CONTEXT

Explores suburbia at four different scales: Global, New Zealand, Lower Hutt and Chosen Sites.

Context also looks at current forms of densification, discussing infill as a valid means of achieving higher densities whilst also identifying important suburban characteristics.

SITE OBSERVATIONS AND DESIGN INTENTS

Broken down into four design areas: Boundary, Landscape, Layout and Articulation. This section identifies key design intents applied to the final design proposal.

FINAL DESIGN

Also broken down into the previous four categories, this section applies the design intents to generate the final design.

EXEGESIS

A summary of how the work responds to the thesis questions and implication on the practice/discipline in New Zealand

Works can be categorized under one of the following five categories:

SITE OBSERVATIONS

Looks at the current and historical aspects located within suburbia.

CASE STUDIES

Projects which have influenced the design.

IN DISCOURSE

Reviews of relevant texts, relating the design to the current architectural discipline.

DESIGN EXPLORATIONS

Iterations and diagrams that provided key insights in creating the final design, presented throughout the document in a dashed box.

DESIGN INTENTS

Summary of desired methods to achieve density whilst maintaining suburban qualities. These intents are apparent in the final design.

2.CONTEXT

2.1

GLOBAL SUBURBIA

Introduction

Figure 2.1: Ebenezer Howard's Garden City Scheme consisting of smaller communities linked, with a larger central city.

The 'American Dream', 'Kiwi Dream', 'Australian Dream' or the 'Quarter Acre Dream', are all expressions used to describe the ownership of a suburban home. A single detached dwelling on its own plot of land located away from the city centre.

'Sub' meaning close and 'urbs' meaning city, 'the suburbs', literally referred to villages that were located outside of city walls "occupying the band between city and country" (Girling & Helphand 7). Despite the inferiority of these villages, initially, owning a dwelling in green areas outside the city was considered a luxurious retreat. These large country villas, from 1st Century Rome were called 'suburbani' (Infoplease).

VILLA: Originally a large country estate, now considered a house with a yard/garden space.

Suburbia offered an alternative to the poverty associated with high population densities within cities. Ebenezer Howard, the 'father of suburbia', provided the solution in *Garden Cities of Tomorrow* with the idea of integrating the rural and urban, producing detached houses on a single plots of land with green space (Bruegmann 170). The conclusion of the World War increased the need for mass housing, and the accessibility of the car and train combined to make suburbia a viable and popular option.

2.1

GLOBAL SUBURBIA

USA

Britain

Australia

New Zealand

Figure 2.2:Forms of suburbia located around the world. Despite many similarities, each region has design qualities that differentiate one from the other.

Despite its idealistic portrayal, 'monotonous' is often used to describe suburbia. Critics argue that the uniformity of the mass-produced lots and their detached houses lead to conformity and lack of social excitement (Barker 23, Archer 214). Suburbia as a merger of country and city also gained critique, claiming it provided none of the benefits of the country and its distance from the city created more disdain due to the commute (Greene, Castle 3).

Yet suburbs in most regions now host the majority of the population (Fishman xii, Barker 14). "Suburbs do not merely survive: they flourish" (Barker 14). In reality many inhabitants have responded contentedly to surveys year after year (Bruegmann 164).

Suburbia has been called "the greatest misallocation of resources in the history of the world", due to its sprawling nature and reliance on automobiles (Greene). Yet the focus on sprawl is only 20 years old, whilst suburbia exceeds this by centuries (Bruegmann 7). Many texts often use the word suburb to replace sprawl.

SPRAWL

Using undeveloped land near the perimeter of current infrastructure to create new urban development.

SUBURB

A district, away from the city centre, typically a residential one.

Although, suburbs are the result of sprawl, they are not the same. Critics of sprawl, accompanied by critiques about monotony denounce suburbia, yet primarily focus their argument on the large scale captured by the aerial view.

The word 'suburbia' addresses the plural of 'suburb', yet includes both the dwellings **and its inhabitants**. With suburbs in many areas around the world holding the majority of the population, the small-scale relationship between the built and living provides key insight into the culture of suburbia. Chris Healy makes clear this important distinction by comparing the term 'suburbia' with the idea of 'culture'

"Culture can refer to all manners of things: it can denote specific social practices or a way of life; it can evoke the mundane or the quintessence of the human spirit. In Australia the word suburbia is similar"

(Healy xiii)

SUBURBIA

The collective view of the suburbs and its inhabitant's ideals, customs and social behaviours.

SURBURBAN

Pertaining to Suburbia

Culture becomes the crucial lens through which key aspects of suburbia can be derived and critiqued. By studying both people and their use of built form, the fundamental qualities of suburbia can be procured and through design research new housing typologies can be implemented.

2.1

GLOBAL SUBURBIA

Defining Characteristics

DEFINING CHARACTERISTICS

Regardless of whether they are myth or a reality, most suburbs promise the following key ideals or characteristics.

AFFORDABILITY

Typically dwellings located closer to city centres have a higher cost per square metre. In the suburbs households can gain more space and a bigger dwelling for a similar price to a smaller, central city apartment.

LAND OWNERSHIP

By having ownership over the property, homeowners have autonomy and the opportunity to 'do what they like' on their own property. Detached dwellings allow owners to renovate all aspects of the house/section.

GREEN SPACES

Access to green space in Suburbia is abundant. Residents have more opportunities to engage with nature.

PRIVACY

Open space and fencing surrounding a single detached dwelling provide privacy for residents to carry out a large variety of activities without concerns of interference from neighbours.

PRIVATE OPEN SPACE

A backyard provides dwellers the opportunity to engage in outdoor activities in private.

COMMUNITY/ NEIGHBOURLINESS

Suburbs are associated with strong aspects of community connection.

BETTER LOCAL AMENITIES

Many move to suburbia to make use of good community infrastructure such as schooling and clubs.

2.2

NEW ZEALAND

Suburban Context

This thesis deals specifically with the spatial and social characteristics of New Zealand (NZ) suburbia. Some of those are universal, others locally specific.

NZ is one of the most urbanized populations in the world with 86% of people living in city areas (Derby). The suburban context plays a large part in NZ history within its short period of settlement.

A crucial element of NZ suburban development is the state house. Since the 1920s, the government has provided housing developments where potential homeowners could choose to buy or rent off the Government (Derby). These state houses, all built during different eras, provide a key insight into housing development in NZ.

Figure 2.3: *State Houses in Lower Hutt, 1930s*

2.2

NEW ZEALAND
Housing Demographic

Figure 2.4: 81.1 percent of dwellings within NZ are detached houses on single lots (Statistics NZ).

Figure 2.5: Around 20,000 – 23,000 new dwellings are required per year. The number of dwellings built per year averages 15,000 (Statistics NZ).

Figure 2.6:Based on a housing price to average income ratio, NZ houses are “among the most overvalued in the world” (*The Economist*). Graph B shows the percentage that NZ housing is overpriced based on income, in comparison to the countries own long term average.

2.2

NEW ZEALAND

Forms of Development

Greenfield Development

- Around 10-20 dwellings per hectare
- Typically detached dwellings
- Single or double storey
- Minimum site size of 400m²
- Involves developing land at the fringes of urban areas

PROS

- Can achieve larger numbers of new dwellings at once
- Abundant yard space

CONS

- Dwindling supply of undeveloped land
- Large scale Investment
- Requires large land holdings

Medium Density - Low Rise

- Around 30-60 Dwellings per hectare
- Either semi-detached or attached dwellings
- 2 – 4 Storeys
- Minimum site size 300m²

PROS

- Can be joined to existing amenities
- Makes use of existing sites within the city
- Provide appropriate sizes for smaller households

CONS

- Limits outdoor space
- Large scale investment

High Density - High Rise

- Above 60 dwellings per hectare
- Apartment dwellings
- Over 4 Storeys
- Usually located around city centres

PROS

- Makes efficient use of small areas

CONS

- Rely on strong local amenities
- Typically more expensive
- Balcony as outdoor space
- Large scale investment

(Hutt City Council)

Figure 2.7: Greenfield Development

Figure 2.8: Medium Density

Figure 2.9: High Density

By giving preference to medium and high density models, current councils are jeopardising key characteristics and aspects of Suburbia. This thesis argues for designs that integrate increased density with suburban living.

INFILL

- Involves turning the backyard of an existing section into a new dwelling.
- Around 20-50 Dwellings per hectare
- Detached dwelling
- One or two storey

PROS

- Currently the most popular form of intensification in NZ.
- High accessibility and availability of the land
- Could occur in the majority of residential zones
- Geographically widely located
- Capacity to occur without land consolidation as it relies on a single lot
- Only modest financial risk associated with development for a owner subdividing off their backyard
- Can occur without large scale investment
- Incremental growth of housing stock
- Uses existing infrastructure

(Wright)

“Densification through such development will become increasingly important if we are to attempt to develop low-rise forms of density”.

-Louise Wright (58)

Better quality infill could provide new opportunities for housing as a viable alternative for greenfield development; one that makes use of existing infrastructure within middle suburban areas.

2.2

NEW ZEALAND
Precedence

Figure 2.10: Infill housing precedence mainly focuses on unused lots between buildings rather than supplementing existing lots.

Because infill development tends to be informal, there are few established design models for it (Newton et al. 2, Castle 3). The implications of its backyard location are not adequately addressed by spec houses.

“Architects have always designed for these issues, although typically their work is at the level of the individual; house for a specific brief”

— Louise Wright (61)

The lack of design precedence, infill as a housing option, provides a niche for the architectural profession to become involved in the suburban housing debate once again.

“Architects who look to the suburbs and engage themselves in the process of development have tremendous opportunities to challenge the status quo and radically reimagine the suburban landscape”

— Dunham Jones (14)

Figure 2.11: *Hobsonville Point Housing Plans, by Architecture Workshop and Isthmus. Although not infill, this specific precinct designed comprises of suburban typologies with compact floor areas.*

2.3

LOWER HUTT

Figure 2.12: Lower Hutt Site Map

2.3

LOWER HUTT

Introduction

Lower Hutt works as a commuter city for Wellington, roughly 17 kilometres away, based between two sets of hills known as the Hutt Valley.

The Hutt is well known for its variety of schooling, parks and green spaces. It also has good public transport infrastructure with a train system running up the valley and bus access elsewhere.

This thesis has chosen the Hutt Valley as the site for these explorations for three key reasons:

- The Hutt has been the place of suburban experimentation within NZ since its conception (Fig 2.13). With large pockets of development from a large variety of decades, characteristics of suburbia can be easily explored through the comparison of and changes to these designs.
- It is a growth area in NZ requiring an increase in housing supply.
- The flat topography of the Hutt is typical of preferred areas for suburban development and therefore designs from this study have greater relevance.

2.3

LOWER HUTT

History

Figure 2.13: Lower Hutt development over time

2.3

LOWER HUTT

History

Figure 2.14: From Left to Right: Early petone development; Naenae house 1945, Naenae development 1945.

The Hutt Valley was one of the first New Zealand settlements. Within months the Hutt River flooded the settlement resulting in movement to Thorndon, Wellington. In 1855 an earthquake lifted the land “draining a portion of the lower valley” allowing larger settlement in the Hutt to occur (HCC).

Throughout the years the Hutt has been the location for many extensive housing projects (Maclean). Large development occurred between the 1910s to 1950s. Many housing schemes were tested using the Hutt Valley including the 1920s housing scheme where high quality workers villas were built in areas along the river, in the central city, and Petone (McKay 22).

The most prominent development was 1000 state houses, located in the Naenae region in 1945 to provide families with accommodation after the war (Schrader 170).

Smaller pockets of development have occurred all over the Hutt Valley since the 1950s.

Although the current Lower Hutt population is of a similar size to that of the 1970s, housing demand is rising as a result of more small households. Council projects that around 170 new dwellings need to be provided annually to sustain demand (HCC). A new strategy is required for Hutt Valley housing provision: one that is affordable to encourage homeowners to move to Lower Hutt.

Figure 2.15: The average density in Lower Hutt is around 10 Dwellings per Hectare (HCC). To shift from low to medium density Lower Hutt needs to increase this to roughly over 30 dwellings per hectare (Turner).

2.3

LOWER HUTT *Density*

Figure 2.16: The Hutt City Council's Urban Growth Strategy proposal.

Figure 2.17: Studies of infill with light blue as potential sites for infill

Based on Hutt City Council restrictions of 400m² per lot, infill can only provide for around 1370 homes (HCC).

If the minimum site was reduced to 240m², corresponding to around 45% of properties on the valley floor can provide infill housing. Of the 15,000 current dwellings a further 6,900 can be developed.

Figure 2.18: Graphs based on site coverage and comparison of council and study.

2.5

CHOSEN SITES

Introduction

Figure 2.19: The sites chosen for exploration provide an array of historic typologies of mass housing in the Hutt Valley.

Figure 2.20: Table of comparison of Land Development of each chosen site.

2.5

CHOSEN SITES

Boulcott

1

Figure 2.21:Figure ground of Boulcott Site Today

The Boulcott site contains a large number of 1890-1920 workers cottages. The north-western side of the block running along the river creates problems for design studies. It is not a fair representation of middle suburbia as the side provides additional access and amenity.

Figure 2.22:Individual Site Figure-Ground

- Plot size 15m x 40m
- Detached Dwelling
- Small front yard
- Large Backyard

Figure 2.24: Blue Prints of initial 1920s Dwelling on Connolly Street. 1:200

- 2 Rooms wide, 3 rooms deep
- Central corridor
- Wet areas at the back of house
- Lounge orientated to street

Figure 2.23: Workers Cottages Today

- Single Storey
- Weatherboard Cladding
- Tiles or Corrugated Iron Roofing
- Hipped Roof with Gable
- Decorated front yard and façade for elegance

2.5

CHOSEN SITES

Epuni

2

Figure 2.25:Figure ground of Epuni Site

Developed during the 1945 housing development, now privately owned dwellings, many still in their original condition. With thousands of state houses located in the Hutt, this is the best area for design explorations of density and infill.

Figure 2.26:Development sketches and final photo showing mass scale of this development

- Use of cul-de-sacs
- Parks at the center of each block
- Same site layout as 1920s dwellings

Figure 2.27:1940s State housing plan. 1:200

- Sun orientation considered
- Similar proportions
- Central Hallway
- Services to the South

Figure 2.28:Street frontages of initial 1940s state housing

- Simple exterior
- Small balcony on front façade
- Weatherboards
- Tiled or Corrugated Iron Roofing
- Hipped Roof

2.5

CHOSEN SITES

Pomare

3

1: 5000

Figure 2.29: Pomare Development Plan 2014-2015.

- Smaller Plot Sizes
- Larger Dwellings
- Smaller front and back yard

Figure 2.30: Plans for a Pomare Development Dwelling. 1:200

- Garage
- Non-rectangular plan

Figure 2.31: Elevation of pomare development

- Mixture of cladding types
- Corrugated iron roofing
- Hipped roof

2.5

CHOSEN SITES

Design Characteristics

Each of these periods of development are analyzed according to this survey of key characteristics:

Figure 2.32: SUBDIVISION PATTERN

- Grid Pattern
- Cul-De-Sacs
- Blocks include parks and community spaces

Figure 2.33: BOUNDARY

- Detached Dwelling
- Within a Garden Setting
- Dwellings Closer to Street

Figure 2.34: LANDSCAPE

- Smaller Front yard
- Larger Private backyard
- Front presents house to street
- Back provides visual amenity from house

Figure 2.35: LAYOUT

- 2 rooms wide, 3 rooms deep
- 4:5 ratio proportion (almost square)
- Central corridor
- Service rooms at the back
- Entry includes verandah

Figure 2.36: ARTICULATION

- Hierarchy of elevations with primary facing the street
- Hipped roof
- Weatherboards, corrugated Iron

3. SITE OBSERVATIONS AND DESIGN INTENTS

3.0

SITE OBSERVATIONS AND DESIGN INTENTS

Summary

The chosen sites were analysed according to 5 categories: Subdivision, Boundary, Landscape, Layout and Articulation. However, since this thesis is focused on working **within existing lot types**, the subdivision pattern category becomes redundant.

SITE OBSERVATIONS AND DESIGN INTENTS

BOUNDARY

The implications of adding infill housing to single detached dwellings within their existing boundaries with regards to neighbourliness, privacy and access.

LANDSCAPE

Focuses on the front, back and side space around the dwelling. Looks at the purpose and qualities of this space and how infill effects its usability.

LAYOUT

Studies relevant housing plans, both historically and currently relevant to suburbia. Key components are isolated and developed to assess their importance in new infill housing.

ARTICULATION

Explores the visual and spacial expression of suburbia, from the building façades and interior details to the landscape and street-scape.

3.0

SITE OBSERVATIONS AND DESIGN INTENTS

Key

Throughout this thesis existing dwellings are bold whilst new dwellings consist of thinner lineweights.

EXISTING

NEW

3.1

BOUNDARY

Introduction

This section is labelled *Boundary* due to the importance of this edge condition within suburbia. Not only is it the boundary of legal ownership but a social boundary between two or more households. Additionally it is also the boundary between individual and communal life (or private and public).

Common critiques of suburbia suggests homogeneity. Yet, creating division through fencing and distance from boundary lines are used to ensure differentiation between units and between public and private.

PRIVATE

For the use of one particular person or group, free from interruptions of others.

PUBLIC

Open to or shared by everyone.

NEIGHBOURLINESS

Enhanced social interaction between neighbours.

Boundary can be divided into three sections:

Grain - How households are dispersed across a landscape in relation to boundaries and each other.

Access - How access to additional dwellings on infill sites can be achieved.

Interfaces - A smaller scale observations of what architectural devices can be used along edges.

“Architecture certainly creates separations. It is also thereby concerned with the act of division”.

-Nigel Bertram (14)

3.1

BOUNDARY
Grain

Figure 3.1: *Villa Rotunda - Andrea Palladio, Italy, 16 Century. 1:5000*

The Villa Rotunda, unlike many countryside buildings during the 16th Century, was built specifically as a palazzo rather than for agricultural work.

It was chosen as a case study of the archetypal villa; an isolated dwelling in a landscape setting, detached from the public to reflect the status of the individual (Archer, 46).

Figure 3.2: Sites are typically rectangular with dimensions of roughly 45m x 15m.

Figure 3.3: Earlier subdivisions contained cul-de sacs and large recreational areas.

Ben Schrader, in his book, *We Call It Home*, interviews many ex residents of state housing noting the increased social community due to these traits.

3.1

BOUNDARY
Grain

Figure 3.4: All three developments have similar grains in terms of width of blocks on street. The most recent development has an increased density as plot sizes have been reduced in area by 40%. Yet, the house size has increased as plot size is reduced.

Figure 3.5: Current approach to infill housing

Figure 3.6: Boundary rules in the Hutt Valley. The building must be setback from boundary.

3.1

BOUNDARY

Grain

Figure 3.7: Taking a section of Boulcott sites and dividing directly in half making sections 340m². However backyards of existing sections are eliminated.

Figure 3.8: Epuni Site with suggested infill exploration allowing space for backyards for each existing section.

It was discovered through explorations of many lots that for infill the best way to divide a section is based on the proportions of each site individually, ensuring that building still allows a minimum amount of open space for both the new and existing section.

Figure 3.9: Hobsonville - Architecture Workshop, Ithmus 2014 1:200

Approach at designing suburban houses on small properties.

- Single or double storey
- Small foot print
- Maximize land use
- Maximize use of sunlight

Figure 3.10: Building smaller two story dwellings at the back of each section allows larger amounts of open space to be achieved. Although smaller in plan, issues of shadowing and privacy arise (Appendix 1).

3.1

BOUNDARY
Grain

25 Connolly Street

Figure 3.12: When observing 1920s housing now, many have undergone a number of extensions.

Figure 3.11: This design iteration explores converting the existing house into two dwellings by extending the dwelling out the back and then splitting down the centre. See fig 3.23 for floor plan.

- Large hallways inefficient
- Large amount of interior renovation
- Consistent grain

Figure 3.13: *Moriyama House - Ryue Nishizawa, Japan 2005, 1:200*

A multi-unit dwelling up to 3 stories high, the Moriyama house provides a finer grain in response to the urban surroundings. One overall owner who rents out rooms they have no use for.

Figure 3.14: *House in Buzen - Suppose Design Office, Japan 2009, 1:200*

By noticing that the long and narrow paths between houses and edges were underutilised areas, these paths were incorporated into the interior, bringing key play areas indoors.

3.1

BOUNDARY

Grain

Figure 3.16: Figure Ground - Moriyama 1:2000

Figure 3.17: Figure Ground - House in Buzen, 1:2000

By using the building as the boundary the private open space of each dwelling has become integrated into the interior. Each room becomes an individual piece creating a finer grain.

Figure 3.15: Design Exploration: Using a finer grain with the existing. 1:1000

This creates a contrasting grain to suburbia as the scale of the new building footprint is much finer.

3.1

BOUNDARY

Grain

Figure 3.18: The use of building as boundary allows the building to be used as fencing and creates alcoves of open space within the building.

3.1

BOUNDARY
Grain

Building as boundary and detached dwellings both play key roles.

- The detached dwelling maintains a familiar grain to the existing. It also sustains the key idea in suburban living of individuality and privacy.
- On smaller sections, the boundary becomes vital to achieving a second dwelling. In certain cases the boundary walls help to create key private areas.
- Building as boundary also disrupts this view of houses as solely autonomous, instead posing an interrelationship. The suburbs become viewed as urban fabric.

“Seeing the systematic qualities of a larger landscape for dwelling makes possible the design of rooms, houses, streets and yards as integrated and equal parts of a fabric. This approach looks beyond the imagery of neighbourhood and the simple positioning of volumes of houses to see how environments are structured to support dwelling”

- Chow

3.1

BOUNDARY

Access

“Access, accessibility, and alternative opportunities are critical. Thus one must look at open space to see how and whether access is facilitated and encouraged to examine how open or exclusive, any place may be. Access is a social and pragmatic matter”

-Nigel Bertram

Figure 3.20:Current access to infill involves private fenced driveways. In some cases neighbouring infill developments have separate driveways.

Access provides the spatial connection of the dwelling to the street. Often fenced up and purely viewed as a means from a to b, these spaces are undervalued.

Figure 3.21: 25 Connolly Street - Boulcott Development

Figure 3.22: The typically flat sides of existing dwellings allows easy inclusion of driveways without disrupting this existing.

3.1

BOUNDARY

Access

Figure 3.23: Explored options of shared driveways on Boulcott site.

-Access through the back divided the backyard allowing access and play to overlap. When applied to curvy cul-de-sacs and subdivisions this could prove difficult. Driveways would become excessively long when extended beyond four dwellings.

-Shared access at the front resulted in car parking becoming the façade of the streets. Front parking on sites proves beneficial for front dwellings, yet unfavourable for rear dwellings.

Figure 3.24: Driveways built on one section

Using a driveway width of 2.5m on the Epuni sections, most spaces between dwellings can provide rear access.

Driveway study provides

- Access for two rear dwellings
- Backyard car access for existing dwellings

Assuming that infill is achieved gradually, having driveways on one section is the most logical solution. When adjacent properties desire to intensify, access can be granted.

3.1

BOUNDARY

Interface

“Urban architecture is the social arrangement of large and small parts of its environment”

-Nigel Bertram

Interface is divided into three sections.

- Private – Looks at how private open space is achieved currently and explores new methods.
- Shared – Explores how different areas could be designed between dwellings.
- Public – Explores how suburban dwellings can address public areas.

The nature of boundary is defined by smaller scale aspects such as:

- The type, height and porosity of fencing
- Distance between neighbouring activities
- Positioning of mailboxes and walkways in relation to their neighbours
- Planting
- Shared spaces

Dealing with these conditions at a local scale could potentially have a greater impact on neighbourliness and interaction.

Figure 3.26: Today, fences contribute immensely to the Lower Hutt suburban landscape.

Private open space is viewed as one of the most essential qualities of suburban living. Subsequently, the fence has therefore become a defining feature.

Figure 3.27: Yet around half a century ago the “open unfenced back yard was an intimate part of this heritage” (Grampp. 182).

If fences were in place, they were low and porous. Fences started to become popular following the closer proximities of houses and shift of the yard from a place of production to living (Grampp. 184).

3.1

BOUNDARY

Interface - Private

Figure 3.28: Fencing located between yards in the Boulcott Development

Figure 3.29: Today back yard fences are typically around 2 metres tall.

Often front yard fences are lower. As density becomes more prominent reliance on front yards as private open space results in front fences being raised.

Roland Barthes, a French philosopher, discusses Idiorrhythmy in his lecture series, *How to Live Together*. Idiorrhythmy, the idea of living collectively yet having no interference of individual space, relies heavily on the importance of private space. He views idiorrhythmy something that doesn't protect but defines boundary and therefore its occupants. This "implies an ethics of distance between cohabiting subjects" (Barthes 58).

When discussing the importance of the boundary, Richard Sennett suggests porosity. "When we imagine where the life of a community is to be found, we usually look for it in the centre" (Sennett 53). The result is planning practices, such as sealing the edges of communities by removing any porosity, reducing exchange between different racial, ethnic and class groups.

"The porous wall and the edge as border create essential physical elements for an open system"

-Sennett (53)

Figure 3.30: *Elwood House - NMBW Architecture Studio, Australia 2008*

With a small amount of yard space, the dwelling uses porous fencing to establish privacy whilst also provide connection to the public Elwood Canal.

3.1

BOUNDARY

Interface - Private

Figure 3.31: The fence varies in spacing, size and height to create exposure and privacy depending on usage of yards.

By establishing porosity, the fence becomes a tool to interact with neighbours whilst establishing privacy in other areas. The yard becomes a space with a large variance in qualities.

3.1

BOUNDARY

Interface - Shared

Figure 3.33:Current solutions to infill propose fenced driveways.

“Driveways are built for a singular function but gain secondary functions... as paved portions of front yard that act as personal plazas and courtyards”

-(Girling & Helphand, 32).

They become social spaces for interacting with neighbours and recreational activities for children. By fencing the driveway, opportunities are missed for the existing dwellings to interact with these spaces.

3.1

BOUNDARY

Interface - Shared

Figure 3.34: *Brunswick House - NMBW Architecture Studio, Australia*

Figure 3.35: *Planting in front of windows to either create distance between others and house or to block view from neighbouring windows*

Use both distance and height to establish privacy.

3.1

BOUNDARY

Interface - Public

Figure 3.37: Front yard as a buffer between public and private

Front yard currently:

- High fences used to make front yard private
- Or low fencing with little activity making a buffering space.

Figure 3.36: Current Frontyards from both Boulcott and Epuni Sites

Figure 3.38: *Heller Park Street Residence - Six Degree Architects, Australia, 2012*

Take ownership of public space

The location of the vestibule and building adjacent to the public park, defines the open space as a part of the Heller Street complex.

Vestibule: Referring to space in front of a main entranceway and includes elements such as “porch, verandah, undercroft, arcade, passage, lobby and alcove” (Bertram 87).

These spaces:

- Create porosity to the outside
- Bridge internal and external circulation
- Consist of overlapping functions
- Create engagement with the public.

3.1

BOUNDARY

Interface - Public

Figure 3.39: Design explorations into public areas

The use of a verandah allows each site to have access to their own clearly defined space in a public area.

Public spaces are typically perceived as neutral spaces. "It is specific groups, who frequent, and in fact appropriate, such individual urban spaces" that determine the success of these spaces (Bertram 67).

"So rather than neutral and even spaces for an idealised notion of the general public, it is perhaps spaces where specific groups of people actively become involved, appropriate or borrow urban space where we are able then to experience and take part in some sort of meaningful exchange, where there is actually something to exchange with."

-Nigel Bertram (67)

Dwellers take ownership of their land that interfaces with the public realm instead of strictly establishing privacy. This encourages interaction whilst providing the choice for privacy.

3.1

BOUNDARY

Interface

Figure 3.40: It is also important that with the new infill housing design window placement is carefully considered.

Although each interface condition discussed has provided a means of dealing with either aspects of public, private or shared, all techniques can be used and explored in all areas. These decisions should be informed by aspects of the current dwelling. In some situations trying to use more porous methods of privacy are unsatisfactory.

Design Intents Discovered

- Divide lots relative to existing dwelling size.
- Building on Boundary to make use of smaller sites.
- Maintain a similar grain to the existing through the use of detached dwelling.
- Accommodate driveway on one original section.
- Use Fencing to establish a variance between private and public aspects.
- Establish privacy between dwellings through the distance and height of planting.
- Allow a porous private area onto public space through the use of Vestibules.
- Provide opportunity for infill dwellings to face a communal area similar to a street.
- Apply privacy techniques in appropriation to openings between dwellings.

3.2

LANDSCAPE

Increased density often results in smaller private spaces and the erasure of rear and front yards. Studies revealed that some forms of private open space can be offset by public space. Complete removal of private open space for communal purposes would be strongly opposed (Gray i). Regardless, good design of outdoor areas is essential as it determines how users inhabit the space and relate to neighbours.

This chapter observes current use of outdoor space and uncovers key design techniques. There are many ways in which backyards are used; they are spaces where individuals partake in activities and express their own tastes. This chapter explores these yards general spatial arrangements rather than specifics based on individual preferences.

‘Landscape’ is divided into two sections as both the existing and infill sites deal with completely different issues:

Existing dwelling - how existing sections can be appropriated for infill.

Infill - how the yard should be designed for these dwellings?

Figure 3.41:Yard condition created by infill

3.2

LANDSCAPE
Existing

1:500

Figure 3.42: *From Left to Right: 1920s, 1950s and today developments.*

Figure 3.43: When exploring the 1920s dwellings many backyards contained a concrete path down the centre.

Figure 3.44: Photos confirm that the path was use as a means to access vegetable gardens. Over time the backyard has shifted to a place of socializing rather than one of production (Head 20).

3.2

LANDSCAPE

Existing

Explorations of Boulcott sites inhabited today:

- Division of areas through the use of foliage
- Services are located towards the back of the section and hidden (Leech 87).
- Formal display patios, gardens and play areas (Dovey 135).
- Now a series of outdoor rooms/spaces (Girling & Helphand 27).

Figure 3.45: Boulcott Landscape Plans

Explorations of Boulcott sites inhabited today:

- Backyard as an extension of the kitchen and family room (Girling & Helphand 28).
- The integration of inside and outside (Dovey 137).

- Decking close to house
- Planting against back fence
- Creates view out from dwelling

Figure 3.46: *Boulcott Landscape Plans*

Although large amounts of open space can provide room for activities these spaces are often underutilized. Previously yard sized was based on necessity for food production. Today this is not the case. The backyard no longer needs to be this large.

3.2

LANDSCAPE

Existing

Figure 3.47: *The side yard has always been a space of transition and buffering, often used as a service area and for circulation (Girling & Helphand 26).*

Figure 3.48: *Front yard as a family portrait*

Initially the front yard was a place of display, to show wealth through the use of garden and the ornate building frontage. Today the front yard is used to provide a visual barrier. Typically fenced and often uninhabited apart from cars and garages.

Figure 3.49: *Infill requires the redefinition of the front, back and side yard of the existing site.*

This section explores ways to do this and assumes only minor adjustment to the existing building.

Side-yard

By removing fences, driveways can now become a place of interaction. Certain areas can integrate with nearby open spaces or to create play areas. The driveways then become a multi-functional space.

3.2

LANDSCAPE

Existing

Backyard

This sections explores how other architects have designed for smaller yard space.
Key qualities are extracted and then applied to design explorations.

Figure 3.51:Victoria Road House - Fiona Winzer Architects, Australia, 1:200

The design of this extension leaves only a small amount of backyard space. To combat this, the line between indoor and outdoor is blurred through the use of large windows creating connection to the outside. Using the same flooring for the kitchen and the decking helps create this offset. The indoors then becomes an integral part of the outdoor space.

A variety of surfaces are used to imply a series of connecting smaller spaces. This is reinforced by the use of split levels.

Figure 3.52: *Blending of interior and exterior*

Figure 3.53: *Use of surface to differentiate parts of the yard.*

Figure 3.54: *Use of height to differentiate parts of the yard*

3.2

LANDSCAPE

Existing

Front-yard

With the back of existing properties being used for infill, dependence on the front yard is increased.

Figure 3.55:Habitat 21 - Monash University, Australia 1:200

Figure 3.56:Bisley Pace - James Russell Architects Australia 1:200

Garages and accompanying driveways become the bridge from the dwelling to the street and garden.

HABITAT 21

- Garage as a multi-purpose space
- Garage creates connection between front and backyard

BISLEY PLACE

- Facade consists of 4 garage doors.
- Open landscaping shares everyday living with the street.

The 1950s state houses have large front yard spaces. By treating the garage as a multi-purpose space, a new architectural element can redefine the yard from a buffer space to one that brings the living from the dwelling out into the street.

3.2

LANDSCAPE

Infill

Figure 3.58: *Back Infill*

The use of spec plans which assume a street frontage are not appropriate to this siting of the infill dwelling to rear of existing one.

Figure 3.59: *Moriyama House - Ryue Nishizawa, Japan 2005, 1:200*

By separating the dwelling into smaller blocks, the landscape can run through the house. The Moriyama house separates the dwelling in a way where many different niches are formed allowing a **large variety of outdoor spaces**.

1:500

Figure 3.60: *Moriyama house design exploration*

The Moriヤマ House is multi residential with one owner who rents the extra spaces. Because of this the space between buildings creates necessary distance as well as usable space. In the case of this design exploration the house has lost legibility as the dwelling is blended with its surroundings. This contradicts the idea of the detached family home as identifiable.

3.2

LANDSCAPE

Infill

Figure 3.61: *House in Buzen - Suppose Design Office, Japan 2009, 1:100*

With a focus on narrow spaces the House in Buzen is designed with rooms as separate buildings with long spaces in between. The house acknowledged the importance of **providing a large variety of spaces for different purposes.**

Figure 3.62: Design exploration based on House in Buzen

This design intervention uses these pathways as a means to provide proximity. The dwellings have their own identity whilst still allowing interaction with neighbours.

3.2

LANDSCAPE

Infill

Figure 3.63: La Villa Rotunda by Andrea Palladio, 1:1000

The Villa Rotunda, has a high ratio of garden to building. It has four frontages in all four orthogonal directions. This provides key views from the dwelling of the surrounding landscape. The building becomes a place where one contemplates their surroundings (Berzal).

Although distinct views are limited on the flats of the Hutt Valley, the thesis proposes each house can have four aspects and a variety of open spaces. This allows activities to occur around the whole site.

3.2

LANDSCAPE

Infill

This approach provides a variety of outdoor spaces and allows inhabitants to determine the extent to which these spaces interact with neighbours. Different scale of privacy and public life can be determined.

Design Intents Discovered

- Reduce the size of backyards.
- Use a variety of ground surfaces and heights to create areas in the backyard.
- Provide opportunity for private backyards to open up onto communal areas.
- Blend the interior and exterior space to create appeared extension of outdoor space.
- Use the Garage as a multi-purpose space to create efficient use of the front yard.
- Create street connection through existing dwellings by taking ownership of their front yard
- Allow driveway to become used as multi-purpose space.
- Allow Landscape to run through building.
- View Surrounding space as a series of yards.
- Provide a mixture of public and private spaces.

Often suburbia is recognised for both its grain and the design articulation of its front facade. Critique of suburbia mostly looks at the external shell. Less attention is given to room layout and composition, most likely because it cannot be viewed from the street nor satellite map, making it the most personal aspect of the home. It dictates how family members relate to one another and to the outside.

Layout is defined as “the way in which parts of something are arranged” (Oxford). By looking at each room as a part, how they relate to one another and the outside can be established.

This chapter can be divided into 3 sections:

History

Flexibility: This discusses the literal changing of the building hardware such as extensions and renovations.

Adaptability: Discusses how the usage of the building can change within the confines of the existing layout.

Roland Barthes discusses rooms as being symbolic of autonomy, allowing individuals to explore their own identity. Associated with this is also social aspects, how people interact within the home. Discussion of human behaviour in relation to spaces will be addressed throughout.

3.3

LAYOUT

History

1:500

Figure 3.67: Plans and renovations to 1920s villas in the Boulcott site were studied. Almost 100 years old, these sites have undergone a large number of renovations reflecting changes in suburban lifestyles.

Figure 3.68: Dwelling layout from each historic site

Changes discovered from plan studies

- Dwellings initially planned according to hierarchy and grandeur with the living space facing the street. After 1940s solar orientation became a key determinant of layout.
- Living areas typically at the front were moved to connect to backyard.
- Houses opened up to backyard
- Kitchen typically located at the back of the house and hidden, now an integrated part of the open plan living space.
- Dwelling size larger as is has become more common for everyone to have own space.
- Master bedroom increased in size and separated from other bedrooms.
- Switch from separate spaces to one large open plan.

3.3

LAYOUT

History

Figure 3.69: Housing changes over time, based on *Dreams on Display* by Kim Dovey.

- - - Kitchen now a family area
- - - The separation of the parental area and addition of the ensuite
- - - Living, dining and entry combined. Formal areas more symbolic and less functional
- - - Multifunctional space larger. Living area increase from 20m² to 50m²

Figure 3.70: Dwelling type and corresponding family type

Suburban housing, is typically designed for the nuclear family. The 1920s dwellings were aimed at families starting life in New Zealand. 1945 state housing was proposed for families after the war. Today, defining the family is difficult. Suburban homes are “less supportive for other groups and serve an increasingly narrow segment of the population” (Girling & Helphand 1). Yet large developments still appear to target nuclear families over smaller minorities.

Even if varying the number of rooms per dwelling fulfils market demand, it is a short-term solution, as current dwellings resist change and growth (Chow 31). This results in families having to ‘trade up’ when the house no longer proves adequate.

There are surprisingly few alternatives proposed for this kind of housing (Chow, 82). Suburbia needs a proposition for a singular design that accommodates a large variety households.

3.3

LAYOUT

Flexibility

The desire for features, such as open plan, requires reconfiguration of existing dwellings. With an ornate facade and little space down the sides of each dwelling, changes typically come in the form of an extension out onto the backyard.

Figure 3.71: Possibilities of extension

When looking at the dwellings from the three explored sites, the 1950s dwelling also allows users to extend out the front. This is due to the houses' large setback and very plain façade. Ideally dwellings should be easily extendible from all sides.

Figure 3.72:Proportions of the front façade present issues as it is designed to specifically facilitate a hallway and two rooms.

Extensions are the primary means of changing a dwelling. But they increase the site area built on and therefore compromise the opportunity for densification via infill. Buildings need to be able to be easily reconfigured within. To explore this, iterations of internal retrofits were explored. Ideas such as open plan were incorporated due to their popularity today.

Creating a choice of entranceways allows users to change the overall arrangement of the house. Due to the hierarchy of the front, back, and sides, along with the narrow spaces between the sides, this proves difficult. Undefined sides of the building would help facilitate flexibility.

Figure 3.73:Creating choice of entranceway in building is limited

“A house with many external doors offers multiple ways of entering and leaving and hence different understandings of where the ‘front’ and ‘back’ might be. Ambiguous, non-prescriptive spaces are more flexible than specific single-use spaces, as yet unimagined activities can more easily be accommodated.”

Nigel Bertram

3.3

LAYOUT

Flexibility

Figure 3.74: Retrofits 1:200

The aim of these design retrofits:

- Three bedrooms
- Uphold modern day qualities
- Adaptability of rooms

Figure 3.75: Retrofit with internal Courtyard. 1:200

By opening onto the courtyard this exploration allows adjacent rooms to become either communal or individual spaces. The rear dining and kitchen can be easily separated from the living areas meaning separate functions can occur at once. It can be observed from this design that **open plan is not flexible**. Creating a series of spaces that can be connected and disconnected provides the adaptability needed to accommodate many different households.

3.3

LAYOUT

Adaptability

Figure 3.77: *Moriyama House - Ryue Nishizawa, Japan 2005, 1:200*

Figure 3.76: *House in Buzen - Suppose Design Office, Japan 2009, 1:200*

In both these Japanese case studies, the plan becomes adaptable by opening itself onto the landscape.

1:500

Figure 3.79: Using the landscape/circulation as a communal area.

Figure 3.78: Turning these spaces into hallways to connect the dwelling.

Case studies provide precedence for a variety of different shaped spaces. This concept aligns with early century housing where rooms would be unlabelled on plans (Archer, 122). Apart from wet areas, each room was open to individual interpretation. The labelling of rooms for specific functions came alongside philosophies of individuality that were popularised during the 17th Century (Archer).

3.3

LAYOUT

Adaptability

Robin Evans looks at the architectural plan as a means to determine human relationships since elements such as walls, doors and windows are employed to divide and re-unite space. He reveals the layout of housing today has made a large transition from a community built design to a secluded one.

Buildings like the Palazzo appear to have multiple doors per room. Prior to the Eighteenth Century this was common. Italian theorists “thought that more doors in a room were preferable to fewer” (Evans 63). It meant that there was a door wherever there was an adjoining room, making the house a matrix of interconnected chambers (Evans 64).

Everyone was:

“obliged to pass through a matrix of connecting rooms where the day-to-day business of life was carried out. It was inevitable that paths would intersect during the course of a day, and that every activity was liable to intercession unless very definite measures were taken to avoid it”

- Robin Evans (65)

Figure 3.80: Palazzo by Andrea Palladio 1:500

During the Eighteenth Century concerns over “intimacy, modesty and privacy” made many question these open-plan layouts (Archer 108).

As the philosophy of self and individualism became popular, the corridor, or hallway, became vital. The corridor provided greater privacy by “allowing people to bypass...rooms on their way to another” (Archer 108). This meant only purposeful communication occurred and incidental communication was reduced (Evans 79).

By the Nineteenth Century the principles of the corridor were firmly established in all planning (Evans 78). The Villa itself progressively became smaller and sized for the suburban family.

Evans identifies that since the introduction of the corridor “there have been no great changes in domestic planning – only accentuations, modifications and restatements” (79).

“The cumulative effect of architecture during the last two centuries has been like that of a general lobotomy performed on society at large, obliterating vast areas of social experience.”

“There is surely another kind of architecture that would seek to give full play to the things that have been so carefully masked... architecture arising out of the deep fascination that draws people towards others”

- Robin Evans (89-90)

3.3

LAYOUT

Adaptability

Figure 3.81:Country Villa - Kerstin Thompson Architects, Australia 2007, 1:200

Figure 3.82:Dowse and Toonhey Residence - Baracco and Wright, Unbuilt, 1:200

Both buildings consist of four rooms occupying each corner of the square. The interstitial spaces are in the form of a cross that can be divided through the use of bi-fold doors.

Figure 3.83: Iterations showing process of dissecting house, 1:200

Considering both privacy and social connection, using the cross enables the corridor to become the means of communal space.

The design exploration provides:

- Four rooms
- A variety of room sizes and proportions
- Each prong of the hallway consists of different dimensions
- Bi-fold doors can create additional rooms within the hallway by sectioning off areas.
- Room functions are undetermined
- Large number of entrance ways

Design Intents Discovered

- Accommodate a large variety of households.
- Allow the dwelling to be extendible from all sides.
- Provide a variety of entrance ways.
- Create no defined, front back and sides.
- Provide a large variety of spaces through connecting and separating rooms.
- Allow rooms both adjacent to and within hallway to be either communal or private.
- Provide a variety of spaces through an array of sizes.
- Overlap circulation and function to enable efficient use of space.

3.4

ARTICULATION

Introduction

This section addresses the stylistic and formal aspects of the design; materials, details, lighting and construction.

It is hard to determine what is 'kiwi' about NZ suburban housing. Discussing the 1920s villa, Bill Toomath stated "they're handsome little houses in themselves...but they're not New Zealand houses" (Schrader 96).

The style of these dwellings is often derived as a hybrid from overseas ones. The 1920s villa was discussed as being an English villa combined with either a cottage or the English bungalow (Mckay 24). The 1950s state house was a simplified form of this villa. Bill Mckay in *Beyond the State* discusses integration as being a key aspect of NZ style, suggesting that the combining of housing types and transfiguring foreign styles for local materials reflects the 'kiwi ingenuity', which is evident in the designs of these dwellings (105).

These initial dwellings aimed to portray ideas of stability and wealth. Their means of doing so was to replicate cultures and heritage from places of migration, specifically Britain.

Figure 3.84:*1920s Facade*

Figure 3.85:*1950s Facade*

Figure 3.86:*Today's Facade*

Figure 3.87:*Images of 15 Connolly street today illustrating typical stylistic and formal characteristics of State Housing.*

3.4

ARTICULATION

Exterior

Figure 3.88: Images of 42 Connolly street today including extensions illustrating typical stylistic and formal characteristics of State Housing.

3.4

ARTICULATION

Exterior

GARAGE AS FACADE

SECOND FLOOR ADDITION

SMALL FRONT ADDITION

FACADE REPLACEMENT

Figure 3.89: Studies of current dwellings in the Hutt with new additions.

Majority of renovations consisted of cubic lean-to structures. The low eaves and the sharp angle of the roof pitch make it hard to easily extend the dwelling from both a construction and aesthetic point of view (Mckay 105). A similar issue occurs with the addition of a second story. Integration with the initial dwelling is difficult, as the aesthetics of the roofline are a defining architectural feature.

Others have completely replaced the frontage of the building, which completely redefines the building.

Figure 3.90: Design explorations of roof form revealed that when divided, the internal layout of the dwelling became more flexible and easily renovated. Blocks could be removed from the cross shaped design and traded depending on the household. However the finer grain of the roof did not meet the desired aims to have same formal continuity with existing roofs.

3.4

ARTICULATION

Exterior

The roof pitch iterations provided intrigue but contradicts the house reading as one detached entity. Another issue is the complexity and continuity of this.

It is more important to note that dwellings are mostly experienced at the scale of the person from ground level.

LOOKING FOR THE LOCAL WORKSHOP

A study of multi-unit dwellings in Kelburn and Oriental Bay explored how entrance ways to each dwelling didn't necessarily coincide with the main façade of the building asking 'how should one identify dwelling at street level/scale?' This question informed subsequent design explorations.

Figure 3.91: Kelburn Dwelling

Figure 3.92: Kelburn Access

- One main façade
- Other entrances to building located along back and side

The original build, when divided into a multi unit development provides the address of some dwellings to be the plain back and others to the side.

Figure 3.93: *Oriental Dwelling*

Figure 3.94: *Oriental Access*

- Multiple façades
- Hard to identify what façade belongs with what dwelling.

These studies provide key insight into how the facade and articulation of the infill façade should be approached. At the back of the site clarity of entrance along with choice through visual articulation of façade is important.

- Facade Facing
- Entrance 1
- Entrance 2
- Entrance 3
- Entrance 4
- Entrance 5

3.4

ARTICULATION

Interior

When one thinks of a suburban house, one pictures the exterior, however much of suburbia is lived within. As many of the previous sections have revealed, it is by exploring possible interactions between people and their environments that reveals what design moves should be made.

Figure 3.95: *Santa Monica House - Frank Gehry*

The Santa Monica house consists of a new dwelling built around the old. In the process Gehry strips down the dwelling, exposing its structure.

3.4

ARTICULATION

Figure 3.96: *Internal structure of New Zealand Dwelling*

To ensure these dwellings can appeal to a majority of New Zealanders, building costs need to be reasonable. Gehry's design provides a key technique in using traditional building methods as a means of articulation within the home. Conventional building methods are derived from the mass production. By using these methods the common aesthetics are incorporated into the design.

3.4

ARTICULATION

Interior

THE CEILING

Figure 3.98: In section the ceiling is not expressive of the roof form. There is no variation in the height of the rooms.

Figure 3.97: By changing the heights of spaces in relation to openings different light qualities and proportions can be established.

Ceiling heights, along with different room sizes creates a variety of indoor spacial qualities. Dwellers can then choose to inhabit spaces based on these qualities, rather than based on a predetermined floor plan.

“Architecture is the making of a room, an assembly of rooms. The light is the light of that room. Thoughts exchanged by one another are not the same in one room as in another”

- Louis Kahn

Removing the ceiling space allows the roof structure and form to become exposed. This device creates significant variation between the various rooms in the house. A hierarchy and distinction of spaces can be established using different perforations of lighting.

Figure 3.99:Exploded Axonometric of Roof

3.4

ARTICULATION

Interior

Figure 3.100: The above lighting studies reveal that having smaller perforations in the roof creates engaging streaks of light whilst larger areas of glazing provide high levels of natural light.

Figure 3.101: Wall framing with typical 400mm spacings between studs.

Windows based on the dimensions of stud spacings means window replacement or movement is simple as window can be incorporated into existing structure.

Figure 3.102: Section through Bathroom

Windows are set at three heights creating different lighting opportunities and an easy means to incorporate additional windows into the existing structure.

3.4

ARTICULATION
Interior

Figure 3.103: *Wall between kitchen and dining only clad above and below to create opening.*

This approach to structure and cladding provides variety and responsiveness to function.

Wall structure becomes viewed as a flexible system

Design Intents Discovered

The way that the dwelling is articulated can contribute to its flexibility, affordability and experience as a series of distinct spaces:

- Expose the roof structure in areas of the dwelling.
- Change heights of spaces to create different spatial qualities.
- Create Distinct spaces through the use of different perforations of natural lighting.
- Using a flexible window and wall structure
- Establishing key view points

Because of this the:

- Exterior expresses the interior design.

4. FINAL DESIGN

Lessons learned through site observations and design intents are now applied and assessed through the final design and earlier design explorations.

4.1

BOUNDARY

- Building on Boundary to make use of smaller sites.

Figure 4.2: When sites become smaller using the boundary for building becomes necessary. Two dwellings on a boundary provides an opportunity for close families or communities to share both dwellings

Figure 4.3: The building is still detached from other dwellings but on the boundary.

4.1

BOUNDARY

- Infill dwelling maintains a similar grain to the existing

Figure 4.4: When looking at the infill dwellings from a large-scale perspective they appear to look similar to the existing.

4.1

BOUNDARY

- Accommodate driveway on one original section

Figure 4.5: One driveway from the existing dwelling can service two infill dwellings.

4.1

BOUNDARY

- Use Fencing to establish a variance between private and public aspects

Figure 4.6: Mixture of both fencing and planting to create porosity and privacy as required.

Figure 4.7: Fencing takes into account height, spacing and size simultaneously.

4.1

BOUNDARY

- Establish privacy between dwellings through the distance and height of planting

Figure 4.8:Section between two dwellings. Shows distance and height of planting

Figure 4.9:Corresponding Plan

4.1

BOUNDARY

- Allow a porous private area onto public space through the use of Vestibules

Figure 4.10: Vestibule creates a threshold between the private interior of the dwelling and the adjacent public common space.

Figure 4.11: Perspective from Vestibule

4.1

BOUNDARY

- Provide opportunity for Infill dwellings to face a communal area similar to a street

Figure 4.12: Smaller community area located between the new dwellings.

4.1

BOUNDARY

- Arrange privacy techniques relative to openings between dwellings

Figure 4.13: Use of previously discussed techniques in relation to dwelling windows.

Figure 4.14: Position of infill windows in relation to existing housing. By ensuring windows do not align with other dwelling openings, privacy within the dwelling is established without fencing.

4.2

LANDSCAPE

- Reduce the size of backyards

Pomare Development Backyard

Figure 4.15: Private backyard size of existing dwellings size is similar to backyard size of recent developments. This does not include front yard or shared spaces, making open space of these proposed infill developments more abundant than more recent developments.

4.2

LANDSCAPE

- Use a variety of ground surfaces and heights to create areas in the backyard

Figure 4.16: Section showing slight change in ground height

Figure 4.17: Perspectives revealing different areas established through levels and material change.

4.2

LANDSCAPE

- Provide opportunity for private backyards to open up onto communal areas

Figure 4.18: Dwelling has chosen to open deck onto large space adjoining shared driveway space. Although boundary belongs to neighbour, negotiations to make better use of space become a key possibility.

Figure 4.19: Even the decision to hang washings, or place bins in driveway area increases neighbourly interaction. Complete removal of these aspects provides a single function or zero function space.

4.2

LANDSCAPE

- Blend the interior and exterior space to create appeared extension of outdoor space

Figure 4.20: Plan where existing dwellings allow decking to carry on into the interior

Figure 4.21: Continuation of decking extends the smaller backyard indoors.

4.2

LANDSCAPE

- Use the Garage as a multi-purpose space

Figure 4.22: Garages are placed between the dwelling and the street. This allows the front yard to be broken up into a more private and public area. By creating many access ways into the garage the space can be given another function. This also provides a new space for the existing dwelling that interacts with surrounding open space.

- Create street connection through existing dwellings by taking ownership of the front yard

Figure 4.23: Better use of front yard achieved through scale of public to private spaces. Garage location and multi-purpose use of land can contribute to this.

4.2

LANDSCAPE

Figure 4.24: *This allows dwellers to take ownership of their front yards, creating a vital street.*

4.2

LANDSCAPE

4.2

LANDSCAPE

- Allow driveway to become used as multi-purpose space

1:200

Figure 4.25: Plan of driveway reveals larger areas of paving creating areas where other function may occur on the driveway.

Figure 4.26: *Corresponding perspectives*

4.2

LANDSCAPE

- Allow Landscape to run through building
- View Surrounding space as a series of yards

1:100

Figure 4.27: Landscape through the building provides a larger number of smaller outdoor spaces. This means areas can be designed for an individual function such as services, social living, peaceful contemplation and play. Smaller areas can also be combined into larger ones.

4.2

LANDSCAPE

- Provide a mixture of public and private spaces

Figure 4.28: Private backyards with shared driveways and a public street area. Inhabitants can determine in which spaces they seek to interact with neighbours

4.3

LAYOUT

- Accommodate a large variety of households

Couple

Couple with 1 Child

Bedroom Addition

Figure 4.29: Different layouts of the same dwelling

4.3

LAYOUT

- Accommodate a large variety of households

2 Children + Playroom

2 Children in separate rooms

3 Children

4.3

LAYOUT

- Accommodate a large variety of households

Retired with space for visitors/family

Garage alternative

This layout also allows people to 'age in place' since it can adapt to respond to their different lifestyle stages.

4.3

LAYOUT

- Allow the dwelling to be extendible from all sides

Figure 4.30: Larger variety of possible extension options. Each individual room can be extended meaning complete reconfiguration of the home is never required.

4.3

LAYOUT

- Provide a variety of entrance ways

Figure 4.31: No defined front allows dwelling to have the choice of 4 entranceways.

4.3

LAYOUT

- Allow rooms both adjacent to and within hallway to be either communal or private

Figure 4.32: Corridor can be completely sectioned off into 4 spaces or opened up completely

4.3

LAYOUT

- Provide a large variety of spaces through connecting and separating rooms.

Figure 4.33: Plan showing large range of room configurations. The hallway can be divide up into smaller spaces, whilst rooms can be opened up onto it.

4.3

LAYOUT

- Overlap circulation and function to enable efficient use of space

Figure 4.34: Possible movement through dwelling. Reveals centre as a place of high circulation and therefore most social activities should be placed here.

4.3

LAYOUT

- Provide a variety of spaces through an array of sizes

Figure 4.35: Plan with measurements showing different dimension of each block. This dwelling is the largest of the explored dwellings.

This also provides a more compact solution, producing dwellings smaller than of 1970s dwellings (121m²) instead of the larger dwellings today (Marriage).

4.4

ARTICULATION

- Change heights of spaces to create different spatial qualities

Figure 4.36: *Hallway with higher roof to signify its importance within the dwelling as a primary space. Lower ceilings for the adjoining rooms.*

4.4

ARTICULATION

- Expose the roof structure in areas of the dwelling

Figure 4.37:Utilizing roof structure to create spatial delight within dwelling

4.4

ARTICULATION

- Create Distinct spaces through the use of different perforations of natural lighting

Figure 4.38: Lighting Quality A

Figure 4.39: Lighting Quality B

4.4

ARTICULATION

- Flexible wall structure

Figure 4.40: Kitchen showing use of applied panelling.

4.4

ARTICULATION - Flexible window structure

Figure 4.41: *Overlay of wall structure on lounge walls revealing possibilities of window placement.*

4.4

ARTICULATION

- Establish key view points

Figure 4.42: *Perspectives of views from dwelling*

4.4

ARTICULATION

- Exterior expressed as a result of interior

Figure 4.43: Renders showing outdoor aspects

4.4

ARTICULATION

- Create four potential front facades

North Elevation

East Elevation

South Elevation

West Elevation

Figure 4.44: *There is no facade hierarchy. All elevations could be identified as frontage*

Figure 4.46: Renders showing outdoor aspects

Figure 4.47: Overall Plan of Development 1:200

Figure 4.48: Overall Plan of Development 1:200

Figure 4.49:Section CC showing space to building ratio. 1:200

Figure 4.50: Overall Plan of Development 1:100

D-D

Figure 4.52: Overall Plan of Development 1:100

Figure 4.53:Section DD - Interior section of dwelling.

5. COMPARISONS

CASE STUDY

1920s Workers Dwelling

GRAIN

BOUNDARY

Small Building, large open space.

LANDSCAPE

Large backyard as place of production

1950s State House

Similar sized sections with cul de sac and larger recreational areas

Similar but typically no fencing at front of property

Larger front yard due to sun orientation

Housing Today

Larger sized housing on much smaller sites.

Large building on small site relies heavily on fencing

Front and backyard. Small in comparison to earlier housing developments.

LAYOUT

Living areas orientated to street, services at the back.

Sunlight key driver for room functions with living at the back. Layout very determined.

Open plan living with bedrooms down the side.

FLEXIBILITY

Building only extended out back

Building can be extended at the front or the back.

Back space could be extended but housing is already large in comparison to property size.

ARTICULATION

Hierarchy of front, side and rear. Hipped roof. Weatherboards, corrugated iron

CASE STUDY

Moriyama House

GRAIN

Very fine grain in dense urban context

BOUNDARY

Building on property edge to define boundary

LANDSCAPE

Yard runs through the dwelling. Allows all internal programmes to have a relationship to outside.

House in Buzen

Very fine grain in suburban context

Building slightly away from property edge with inward focus

Backyard runs through and around the home.

LAYOUT

Each space of the house a potential dwelling.

Each space of the house a potential dwelling.

Public hall with private spaces in corner areas.

FLEXIBILITY

Could be extended in all directions. Multiple story sections make this difficult.

Small amounts of extension available due to small distance between the boundary and each module.

Building could extend in any direction, although relies on symmetry formally.

ARTICULATION

Cube like form. No hierarchy of sides.

Cube form contrasts with surrounding suburban dwellings. Maintains hierarchy of front side and rear.

Strong ornate facade. Same on all faces of building.

CASE STUDY

Country Villa

GRAIN

Building in space through rural subdivision

BOUNDARY

Building far removed from boundary.

LANDSCAPE

Large amounts of landscape in all directions. No specific backyard/front yard.

Dowse + Toonhey Residence

Rural subdivision

Placed on the edge of irregular site

Dwelling in corner removes idea of back and front yard.

Santa Monica House
186

Regular grid street pattern

Semi outdoor area attached to boundary

Corner section exposes front and backyard

LAYOUT

Wet areas defined. Otherwise flexible.

Wet areas defined. Otherwise flexible.

Open plan living areas.

FLEXIBILITY

Could be extended in any direction and any size. Flexibility is provided in building layout.

Could be extended in any direction and any size. Flexibility is provided in building layout.

Extension could occur similar to typical suburban dwelling i.e. to front side and rear.

ARTICULATION

Simple form with all faces similar. Tall thin aspect alludes to building entrance.

Cubic form above the landscape.

Using the existing structure of the dwelling as decoration.

Proposed Design

Infill resembling suburban grain in terms of width and building footprint but not interms of site length as it divides the long site into two square sites.

Similar to suburban examples. Staggering of elements creates relationships to the boundary.

Yard space in all directions. Yard could also run though the dwelling space.

LAYOUT

Wet areas only ones defined. Everything else ambiguous/ flexible.

FLEXIBILITY

Each room can be individually extended. Enough space for whole rooms to be added. Rooms can temporarily or permanently be connected to the hallway

ARTICULATION

Similar to suburban dwelling with emphasis on hallway. More emphasis on spaces/areas than overall building articulation.

SUBDIVISION

STREET LAYOUT

DETACHED DWELLING IN GARDEN SETTING

HIGH FENCES

Land ownership: Both still maintain individual dwelling on its own section

Better Local Amenity: Driveways provide shared space. Could be considered an addition to local amenity.

Green Space: Both appear as buildings in landscape. Dwellings are surrounded by yard.

Privacy: Placement of windows and fencing now establishes privacy.
Neighbourliness: Changing the porosity and height of the fence allows a variety of different spaces to be established in relation to surrounding households.

BACKYARD

Private Open Space: Is decreased due to new dwelling. Backyard space becomes smaller.

Neighbourliness: Spaces between dwellings can be shared.

FRONT YARD

Private Open Space: Smaller backyard creates reliance on front yard and encourages better design and use of this.

FRONT PROVIDES VIEW TO HOUSE

Neighbourliness: Front dwellings make more use of front yard socializing the street.

BACK PROVIDES VIEW FROM HOUSE

Land ownership: No longer front and backyard but a series of yards creating a large variety of yard spaces.

4:5 RATIO PORPORTION

2 - ROOMS WIDE, 3 DEEP

CENTRAL CORRIDOR

LARGE COMMUNAL AREA, SMALLER BEDROOMS

Land ownership: Design proportions based on site rather than predetermined plans to maximize space. Also ability to allow extension in all directions.

Land ownership: Varies depending on side. Provides a variety of spaces rather than keeping the exterior to a strict box form.

Land ownership/ Affordability: Circulation space as inhabitable space which can be divided. Community/ Neighbourliness: Overlapping circulation and function interaction within the home increases. Privacy: Dwellers can decide to open or close off spaces onto hall.

Land ownership: Room spaces undefined and can be joined if open plan is desired.

MAIN ELEVATION TO ST

HIPPED ROOF

INTERIOR

STRUCTURE

Land ownership: Choice of entranceways

Affordability: Uses structure from NZS 3604 in inventive ways, to create spectacle without incurring high costs

Affordability: Making use of existing structure as something that can be easily changed.

6. CONCLUSION

5.0

CONCLUSION

This thesis began as a proposal to increase density within the suburbs whilst maintaining core characteristics of suburbia. Initially this was explored through the study of historic suburban development, both local and international. The Hutt Valley, specifically the state house became the main focus. The study of these dwellings, along with broader explorations of development types lead to compact infill as the preferred solution. The resulting design objective became to develop a new typology of the Villa that makes good use of the smaller site associated with a subdivided lot. A further objective became to find balance between the continuity with, and the transformation of, current suburban lifestyles and suburban housing typologies.

A new villa typology is proposed with the most radical change being the reconfiguration of the internal layout. Fundamental to this change was an alternative arrangement of circulation and room. Robin Evan's *Translations from Drawings to Buildings* proved particularly useful in challenging the use of the corridor over other devices relating one room to the next. The new proposed Villa integrates the hallway with multi-purpose space. Further in place of a single central corridor a cross-shaped hallway, each prong of a different dimension is used to link various rooms.

The key consequences are as follows:

- A compact and affordable model that due to its internal flexibility offers more uses within a compact floor area (around 120m²) significantly less than the current average size dwelling of 219m² (Marriage).
- The dwelling is adaptable and flexible allowing it to accommodate a variety of household demographics and the changes over its life-cycle.
- An extended interface between the rooms and the hallways to allow for greater choice and opportunity to vary the amount of overlap between more private and public areas.
- In combination, the cross formation of the hallway and arrangement of rooms produces a multi-directional plan with corresponding garden to all sides.

At both a micro and macro scale this project offers an alternative model of neighbourliness within the home where interface between public and private space can be overlapped. Similarly, the dwellings relationship to its neighbours, along with multi directional access, offers an alternative vision to suburban living that balances privacy with connectivity. It challenges the more traditional arrangement of front and back yard with a variety of perimeter landscapes to accommodate a variety of uses and manage the preferred threshold between neighbours whilst defining private, common and public space.

'IMBY' offers a critique of suburban living today. It provides a case study design, which tackles the need for dwellings to consider a large variety of demographics, neighbourliness and open space in their design.

Limitations and Deficiencies

This model could be applied to new and denser Greenfield development. A key limitation of this model is that it limits the increase of density to 40 dwellings per hectare as it can only double existing yield. Further, for desired amenity to be achieved especially in terms of solar optimisation and privacy, it relies on being a single story building envelop. The dwelling is also based on a suburban area that is typically one level. Two levels were explored but disrupted the key ideas of the hallway.

There is the bigger question of the market acceptance of this type of model given that it is smaller, and as a consequence does not have marketable extras such as ensuites, extra bathrooms and double garages. In this proposal the garage is treated as one of the typically four rooms of the dwelling and as a multipurpose space rather than a dedicated car space. It challenges the number of cars per household and this may be seen as a disincentive for this kind of approach. Similarly a separate shed has not been allowed for, however this villa typology does not preclude additional rooms being added to it.

The model also challenges the conventional relationship between neighbours. While it still gives people their own land and clear title, the proposed treatments of site boundaries may be a challenge. It has sought to diminish a reliance on fencing and to maximize opportunities of more shared amenity between dwellings. Only members of suburbia looking to invest at a small scale would receive this housing proposal willingly. It is likely that its modesty and therefore affordability may make this model more acceptable and desirable.

The articulation in this iteration exposes structure in the

roof and walls for increased transparency. This raises some technical complexities of lack of thermal gain and bracing which require further development. The new window technique would also require new forms of construction detailing that have not been explored in this thesis. More broadly in further developments it would be good to tackle the question of build ability for affordability of this model. There is also a large amount of glazing, which would provide a much higher cost of production.

The Future

The proposed parti of hallway and rooms could be incorporated into many different building types: offices, schools, and apartments. By allowing the hall to become an open and flexible space, buildings can benefit from having maximum usage of all floor areas.

It would be of interest to see how these concepts could be incorporated into denser forms of living. How can a multilevelled apartment gain the benefits of suburbia? How does the cross shaped hallway with different shaped rooms play out in the average area of an apartment?

When observing the articulation sections this design could also be incorporated into an existing dwelling as a retrofit. Dwellers could open up ceiling spaces and incorporate hallways into adjacent rooms.

APPENDICES

Figure 14.3:Appendix 1: Corresponding floor plan for fig:3.10

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