

# “THE NEW EASTSIDE”

Re-populating East Christchurch Through Diverse,  
Contextualised, Medium Density Housing

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## THE NEW EASTSIDE

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A thesis submitted in partial fulfilment for the requirements of the degree  
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At the conclusion of the 2010 and 2011 Canterbury earthquakes more than 5100 homes had been deemed unsafe for habitation. The land and buildings of these were labelled “red zoned” and are too badly damaged for remediation. These homes have been demolished or are destined for demolition. To assist the red zone population to relocate, central government have offered to ‘buy out’ home owners at the Governmental Value (GV) that was last reviewed in 2007. While generous in the economic context at the time, the area affected was the lowest value land and housing in Christchurch and so there is a capital shortfall between the 2007 property value and the cost of relocating to more expensive properties. This shortfall is made worse by increasing present day values since the earthquakes. Red zone residents have had to relocate to the far North and Western extremities of Christchurch, and some chose to move even further to neighbouring towns or cities. The eastern areas and commercial centres close to the red zone are affected as well. They have lost critical mass which has negatively impacted businesses in the catchments of the Red Zone. This thesis aims to repopulate the suburbs most affected by the abandonment of the red zone houses.

Because of the relative scarcity of sound building sites in the East and to introduce affordability to these houses, an alternative method of development is required than the existing low density suburban model. Smart medium density design will be tested as an affordable and appropriate means of living. Existing knowledge in this field will be reviewed, an analysis of what East Christchurch’s key characteristics are will occur, and an examination of built works and site investigations will also be conducted.

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## ABSTRACT

The research finds that at housing densities of 40 units per hectare, the spatial, vehicle, aesthetic needs of East Christchurch can be accommodated. Centralising development is also found to offer better lifestyle choices than the isolated suburbs at the edges of Christchurch, to be more efficient using existing infrastructure, and to place less reliance on cars. Stronger communities are formed from the outset and for a full range of demographics.

Eastern affordable housing options are realised and Christchurch’s ever expanding suburban tendencies are addressed. East Christchurch presently displays a gaping scar of devastated houses that ‘The New Eastside’ provides a bandage and a cure for. Displaced and dispossessed Christchurch residents can be re-housed within a new heart for East Christchurch.



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CHAPTER ONE

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INTRODUCTION

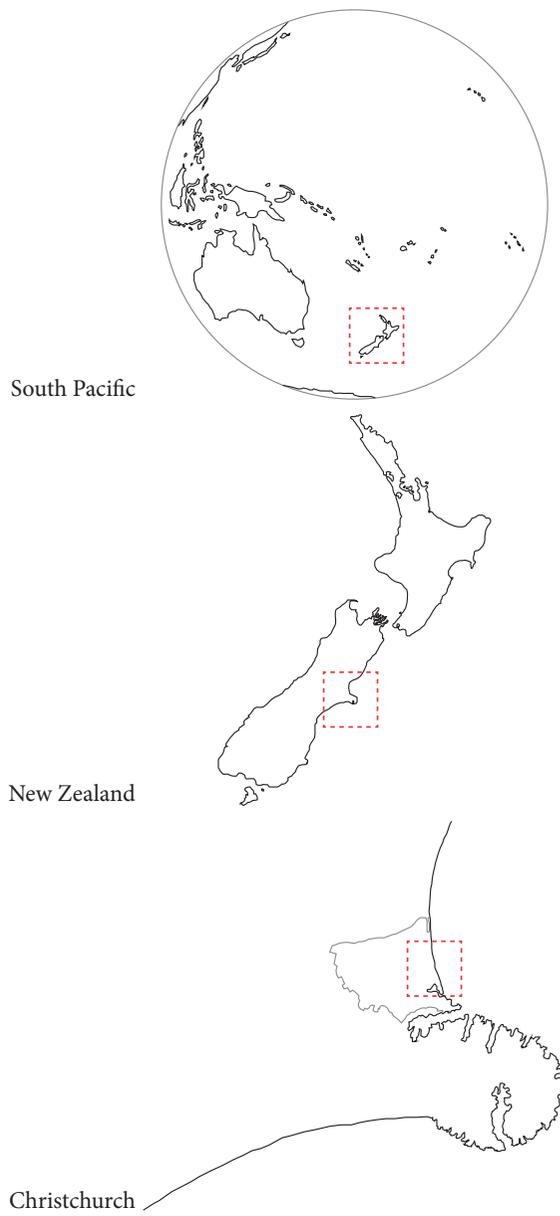


Figure 1.01: East Christchurch location map

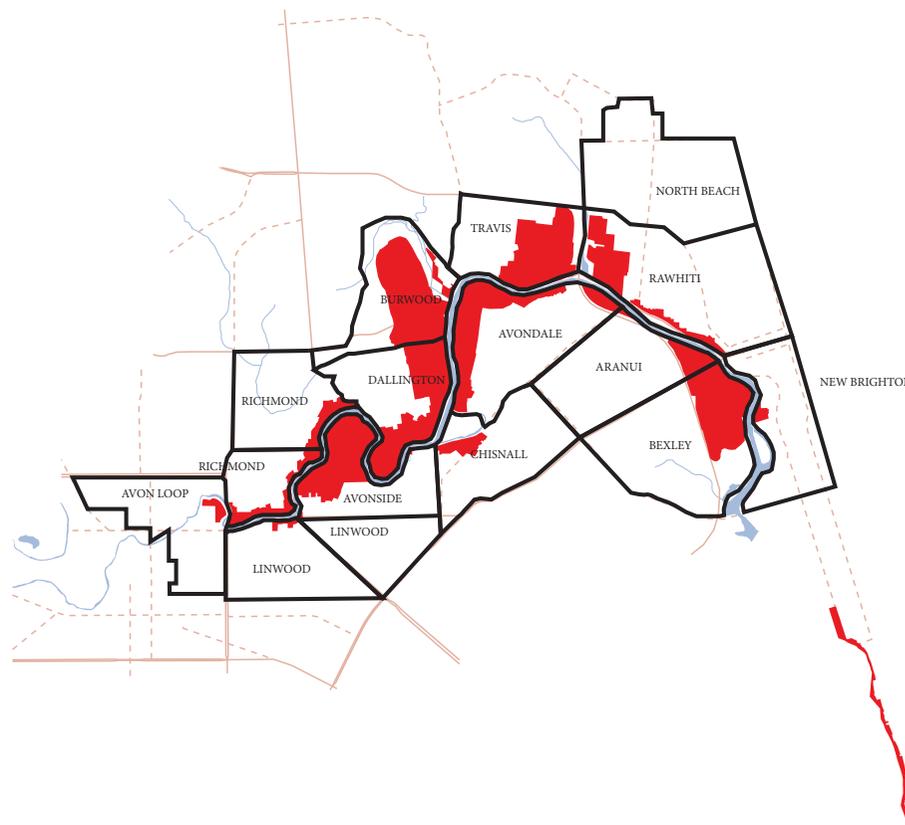


Figure 1.02: Map of suburbs within East Christchurch

## CONTEXT

At 12:51pm on the 22nd of February 2011 Christchurch changed forever. The magnitude 6.1 earthquake caused widespread damage across the city creating billions of dollars' worth of damage; collapsing many city buildings, destroying much of the city's infrastructure, generating thousands of tons of liquefaction and ending 181 lives (figure 1.03 through figure 1.10). 5100 homes had been deemed unsafe for habitation and the land and buildings on these properties too badly damaged for remediation or rebuild and have been labelled 'red zone' houses. Red zoned home owners had until April 2013 to accept or decline a government and insurance compensation for the value of the property as of the 2007 Governmental Valuation (GV). This was the last credible source of the property's value. But, what seemed like a solution actually posed further problems.



Figure 1.03: Infrastructure damage



Figure 1.04: Building Collapse



Figure 1.05: Suburban damage



Figure 1.06: Suburban damage



Figure 1.07: Suburban damage



Figure 1.08: Suburban damage



Figure 1.09: Recovery effort



Figure 1.10: Recovery effort

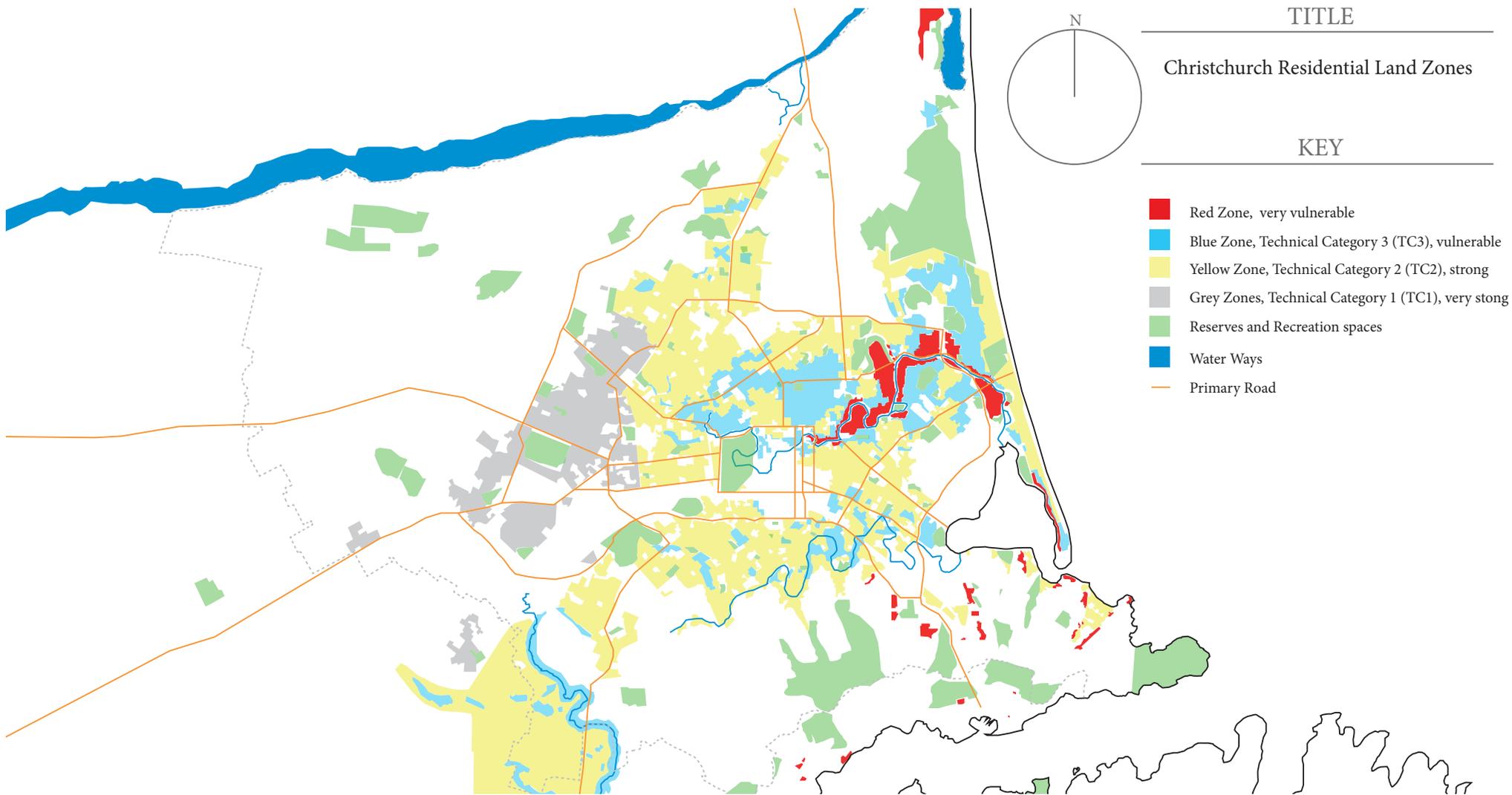


Figure 1.11: Map of land categories

## PROBLEM

House and rent prices of the low socioeconomic Eastside suburbs cannot compete with more affluent central and western suburbs. A significant gap of capital has emerged as red zoner's are stuck with their 2007 values which fail to be enough to purchase a suitable home. This has seen a migration of East Christchurch residents relocating to the extremities of the city with other residents moving further still to neighbouring satellite towns such as Kaiapoi and Rangiora. As a result, communities within and neighbouring the red zones are disintegrating as local spirit and businesses progressively dwindle.

Traditionally new suburban developments around Christchurch have favoured large sections and large houses. These houses often have a footprint greater than 150m<sup>2</sup>, multiple living and dining areas, two or three bathrooms and four or more generous bedrooms. In typical suburban fashion new developments continue to spread further from the centre of the city, yet a new house in the latest suburb has always been a strong status symbol within Christchurch. Though the suburban dream remains achievable for some, an expensive new suburban home is a fantasy for others.

East Christchurch has previously absorbed a great portion of the demand for less valuable property. Since the Earthquakes, however, affordable housing stock has seen a dramatic reduction. The ensuing wave of demand for housing has realised the creation of many more traditional subdivisions on the outskirts of the city. Though some of the new developments offer smaller scaled options, the price of purchase still remains out of reach for many. This leaves hundreds if not thousands, of individuals and families being financially forced out of homeownership and forced out of home-ownership and forced to relocate to the extremities of Christchurch, thus, separating them from their previous communities, networks and lifestyles in order to live affordably.



Figure 1.12: East Christchurch humour



Figure 1.13: New East Christchurch (Tamara Park) subdivision @ 1:2000



Figure 1.14: Old East Christchurch (Avondale) subdivision @ 1:2000

## AIM AND SCOPE

To address this problem, the aim of this thesis is to provide an alternative type of suburban development that re-introduces affordability within a desirable environment to live.

The scope of this thesis is bound by practicality. It is intended to be a serious proposition and therefore remains practical in its research and design. As the research is relevant to a particular area and the groups and individuals within it, a lot of ground up research has been completed that seeks specific requirements for the area, groups and individuals within it. The area in question, East Christchurch, is the only red zone area investigated. This study area focuses on the eastern suburbs which represent a significant portion of red zoned homes. Other red zoned homes are scattered North and South of the study area but are not considered (figure 1.02 and 1.11). The design of houses, apartments and the urban environment must satisfy the needs that the research determines with reasonable and practical approaches. Designs must also follow methods of affordable construction, while satisfying the design requirements.

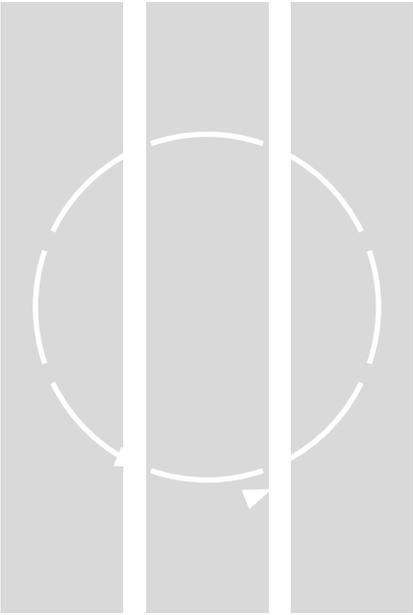
## SIGNIFICANCE OF STUDY

This thesis' target audience is the residents of East Christchurch, the hard working men and women, the beneficiaries and the families that have suffered through the process of trauma, recovery and are now moving into the rebuild phase of their lives. Among the residents, local government are also an intend reader of this thesis. It is hoped that this research will be part of a wider rebuild plan for Christchurch in which the government has begun publishing

and distributing rebuild and redevelopment plans for many affected suburban centres and even the central city.

## OVERVIEW OF STUDY

This thesis consists of ten chapters within two main parts. Part one reviews relevant information on design theory, East Christchurch and successful examples of design. Part one includes Chapter two, three, four, five and six. Chapter two establishes the research methodology of the thesis. In chapter three a discussion is formed of relevant design theories that assist the development of the designs. This includes a review of diversity, affordability, identity and density and argues for their sensitive inclusion into the designs. Chapter four is concerned with analysis of East Christchurch and distils characteristics and qualities that are identified with East Christchurch. These include the physical environment, the culture that has formed, the abstract qualities that people abide, and looks at the people themselves and their preferred ways of living. Chapter five reviews a series of built works that exhibit qualities which reflect the design theories and elements of the East Christchurch. Chapter six investigates suitable sites and concludes with site analysis of one chosen site to test design theories. In part two, initial research is put to the test. Chapter seven reviews and critiques a series of design generations and concludes with a final design. Chapter eight concludes the design testing with a set of design principles that aim to be a good approach to medium design and to reflect and support the lifestyle of East Christchurch residents. Chapter nine and chapter ten discuss and conclude the research respectively.



## CHAPTER TWO

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# RESEARCH METHOD

To achieve the aims of this thesis two methods of research are used: Research for design and research through design. Each method of research contributes to the design process and is simultaneously used to achieve the desired outcomes. The combination of the two research methods creates the design led research methodology for this thesis.

Research for design is concerned with collecting relevant information that informs design. Peter Downton in his book *Design Research* indicates that research for the design of a specific project requires establishing specific knowledge of site, program and other key characteristics. “Initially designers need enough information and data in a form that is suitable for comprehension and assimilation to aid in an understanding of ways of going forward” (23). This includes obtaining knowledge from literature and theories and detailed analysis of East Christchurch’s social, physical and abstract characteristics. This is fundamental research that happens before design starts but continually develops as the design progresses. From this point the design can progress by either summoning the designers existing design knowledge or by conducting further research to generate design ideas (Downton 22).

Design led research is the process of designing and testing the design in order to focus the design towards the end goal. Eastside analysis, which is developed in chapter four, with research for design, is used as a tool to test a design’s ability to be a successful solution. Testing is aimed at the production of new

knowledge and evolving the known and is achieved through intentional actions of testing to discover an unknown yet desired outcome (Downton 75). For testing to be validated Marvin Minsky advocates the use of models as a representation of the design which answers questions posed by the designer about the design (426). Furthermore a model’s perception of reality promises to be a speculative tool to suggest unique hypotheses into the principal area of inquiry and evaluate propositions (Black 237). Design knowledge can therefore be subjected to methods of propagation, eliminating and selecting design outcomes as they are discovered through this process.

The combination of research for design and research through design creates a process of design led research. Design led research is used from the outset and throughout with a simultaneous unison of research for design and research through design. As a result of these two approaches to research, multiple generations of designs are tested and altered until a final design conclusion is reached.

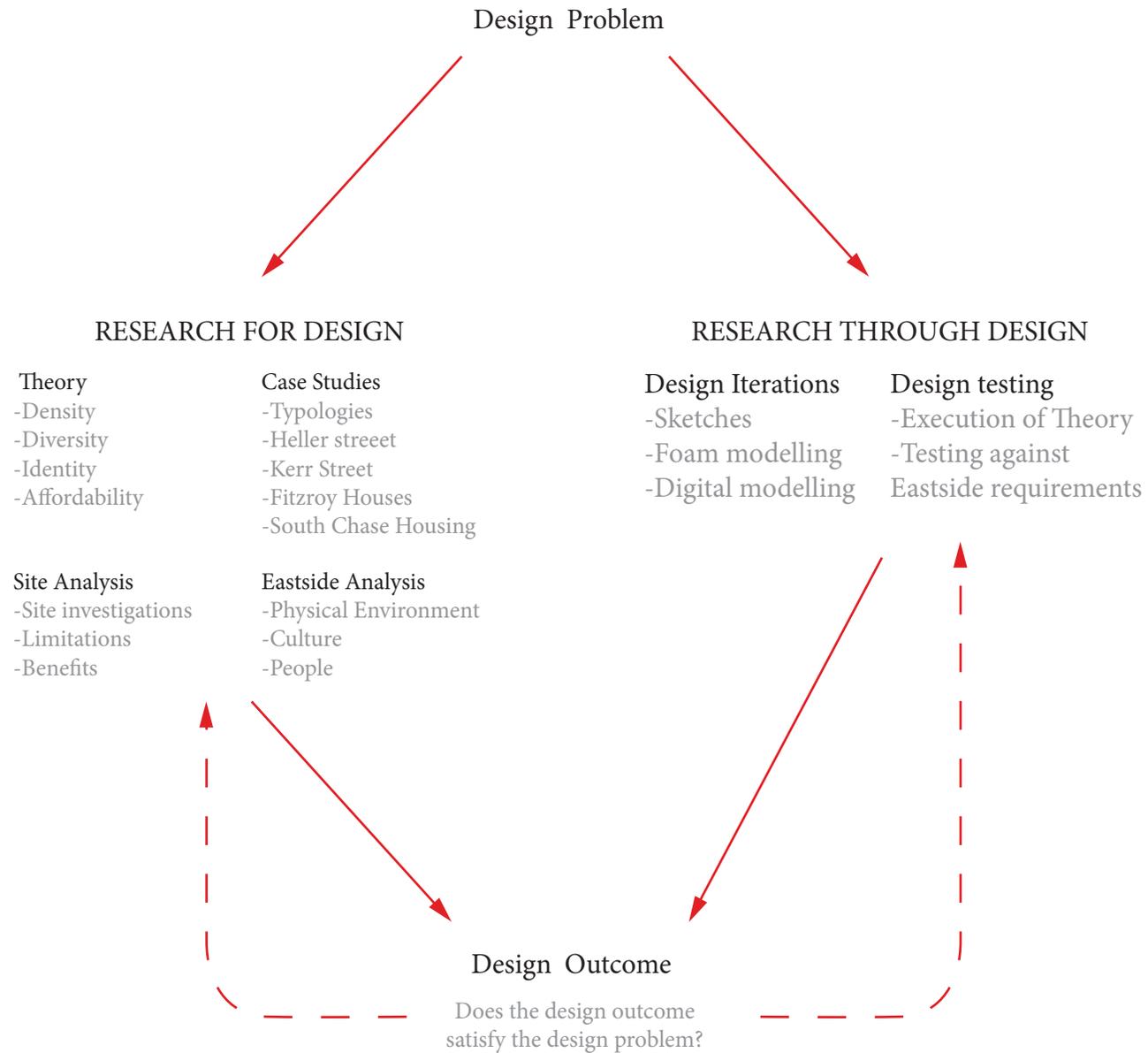


Figure 2.01: Diagram of design led research process



## CHAPTER THREE

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# THEORY REVIEW

The aim of this chapter is to establish a set of existing knowledge that relates to the creation of a comfortable place in which to live. As this thesis is associated with medium density housing the theory reviewed is concerned with campaigning for density and its benefits on urban form, diversity and how variety promotes a more pleasant place to reside, how identity of a community can be created and transmitted and finally how desired outcome can be made more affordable than current housing options.

## AFFORDABLE HOUSING

The term “affordable housing” has a variety of connotations and definitions. It can evoke ideas of social housing, housing for low-income people, or any form of subsidised housing. But it is the ratio between one’s living expenses to one’s annual income which defines whether specific housing costs are affordable or not. An affordable house requires annual living costs (rent, power, etc.) to not exceed one third of the household’s gross annual income (Friedman 1). Similarly the “median multiple” which represents the median house price divided by the gross median income, should not exceed 3.0 if it is to be considered ‘affordable’ (Cox 1).

Part of the cause of ever increasing house prices is that the home itself has drastically changed. The houses of the post war era were compelled to modesty and designed for the nuclear family. Across the suburbs sprouted detached homes approximately 90 to 110 metres squared with three bedrooms and a small detached garage. But society has progressed from these times as have the way in which we dwell and who we dwell with. Change in society will inevitably meet a change in housing design. The following are examples that have brought about change in housing and have decreased housing’s ability to be affordable:

- Building codes require stringent standards to be met
- There are more senior members of society
- Technology within the home continues to develop
- Land is not being made available for development by local and central government
- The dream home is now twice as large as it was 60 years ago
- The nuclear family is not as dominant as previously. Now there are solo

parents, young couples, empty nesters, multi-person households and people living on their own

There are numerous ways of creating more affordable housing. Not for profit groups, politics, laws, changes in land use and architectural design are all potential contributing factors to the solution. As this thesis is concerned with design that affects affordability, the following techniques will be analysed:

- Medium density design which fits more people into the same unit of space which reduces infrastructure and land costs
- More efficient and flexible housing design allows a home to take on other uses thus being more adaptable
- Small home design keeps building costs down
- Attached housing reduces construction costs and provides better thermal insulation than a detached house
- Building houses to two or three storeys provides density with ample open spaces

Affordability is becoming a scarce characteristic in New Zealand housing. Despite international trends of falling house prices, New Zealand’s market continues to increase. Deputy Prime minister of New Zealand: Bill English, has publicly recognised the housing crisis. “In 1980, the ratio of the median house cost to median income was around 2. By 1990 it was around 3 and today Demographia shows the median house in New Zealand costs 5.3 times median income” (English i). As a nation property prices have become unaffordable but the larger centres such as Christchurch have experienced a predictably larger growth. Today, in Christchurch, the median house price is 6.6 times higher than median annual income (Cox 15).



Figure 3.01: Hong Kong High Density Housing

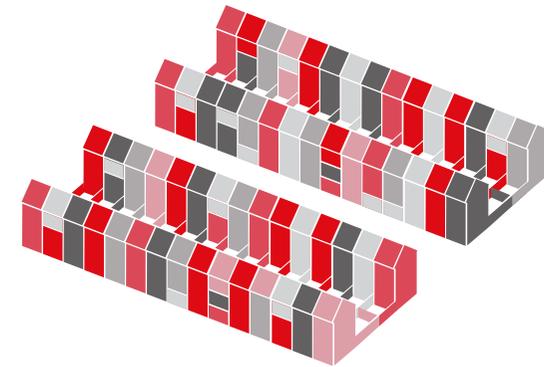
## DENSITY

The stereotype for density, in New Zealand, is of slum and squalor; thoughts of tower blocks populated by the poor, the unsocial and the unfriendly spring to the laymen's mind (figure 3.01). It is understandable since the majority of the population reside in the comforts of suburbia. New Zealand's attempts at high density housing have been rather unspectacular. However, Jane Jacobs indicates "the supposed correlation between high densities and trouble or high densities and slums is simply incorrect" (263). Rather, density brings choice, opportunity, and diversity of all manners of people. Essentially higher density offers a better range of living.

Density is a measure of how much of one unit is within another unit. Architecturally, density is most commonly described as dwellings per hectare (dph). There are other methods of measurement though. Habitable rooms per hectare (hrph) and people per hectare (pph) are also common measurements of housing density (figure 3.02). Plot ratio is also used to describe the floor area relative to the plot area.

There are generally three classifications of density; low density, medium density and high density. Throughout this thesis the density categories will be viewed as:

- low density 0 – 25 units per hectare
- medium density 25 – 50 units per hectare
- high density 51 units per hectare and above



Units per Hectare



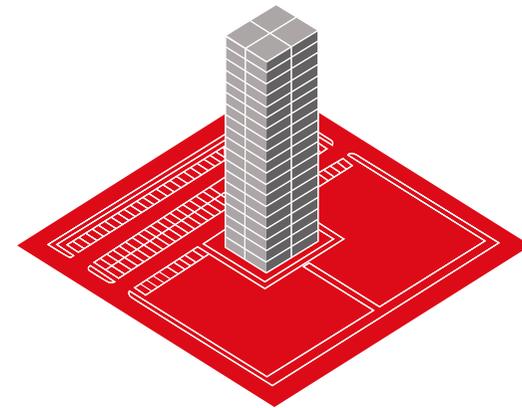
Habitable rooms per Hectare

People per Hectare

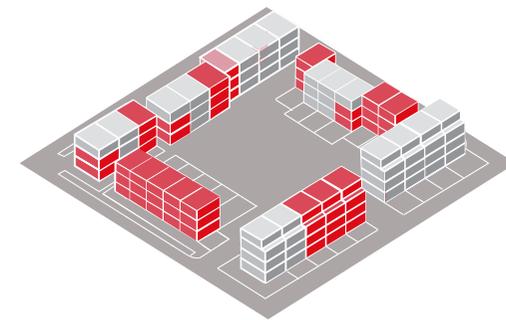


Figure 3.02: Methods of measuring different densities

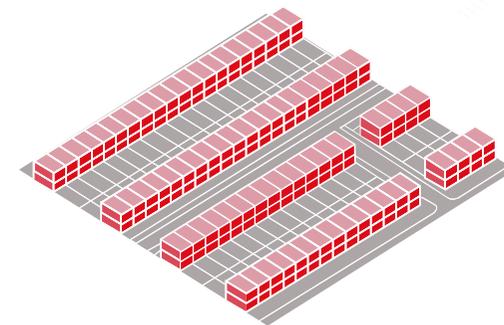
There are a variety of forms of designing dense housing. Each form offers a distinctive urban grain which contributes to a distinctive urban environment. Tower blocks, flat blocks and terraced housing of similar dwelling sizes can comfortably accommodate similar densities (Rogers 20) (figure 3.03). In support of this Robert Dalziel's and Sheila Quershi Cortale's research show a range of densities linked with the housing form. This analysis demonstrates that high densities can be achieved without intimidating tower blocks but rather with low building heights (23)(figure 3.04 through figure 3.21). Dalziel and Cortale continue to say these traditional forms of density challenge the densities of suburban multi-storey flat blocks (24).



Tower block



Low rise flats



Row Housing

Figure 3.03: Variety of urban forms with the same density of 75 units per hectare

COPENHAGEN  
Kartoffelraekeme  
(Potato Rows)  
Row House  
500 HR/ha



Figure 3.04: Row house grain



Figure 3.05: Row house environment

MELBOURNE  
Victorian Terraces  
Row House  
600 HR/ha



Figure 3.06: Melbourne terrace house grain



Figure 3.07: Terrace house street

TOKYO Mini Houses  
Detached House  
600 HR/ha



Figure 3.08: Mini house grain



Figure 3.09: Mini house

LONDON Georgian  
Houses  
Row House  
800 HR/ha



Figure 3.10: Georgian house grain



Figure 3.11: Georgian house street environment

NEW YORK Brown  
Stone Houses  
Row House  
1000 HR/ha



Figure 3.12: Brown stone house grain



Figure 3.13: Brown house street environment

PARIS Post-Haussmann  
Flat Blocks  
Flat Blocks  
1200 HR/ha



Figure 3.14: Post-Haussmann apartment grain



Figure 3.15: Post-Haussmann street environment

BERLIN Altbauhnung  
Apartment  
1200 HR/ha



Figure 3.16: Altbauhnung grain



Figure 3.17: Altbauhnung street environment.

MEXICO CITY Vecindades  
Apartment  
700 HR/ha



Figure 3.18: Vecindades apartment



Figure 3.19: Vecindades street environment

SHANGHAI Shikumen and lane  
housing  
Row House  
1000 HR/ha



Figure 3.20: Shikumen lane house grain



Figure 3.21: Shikumen house

There is an inverse relationship to quantity and quality of street life with the quantity of buildings' storey height (figure 3.22). At lower rises the architecture can support a more vibrant and social public environment. Jan Gehl observed this in the streets of Melbourne's row houses; low rise architecture allowed activities to flow from inside the dwelling to the street and vice versa, 46% of these transitions lasted less than a minute (185). Gehl proclaims the following features allow such an occurrence to happen

- Easy access in and out
- Good staying areas directly in front of the houses
- Something to do, something to work with, directly in front of the houses (184)

It is clear to see how flow of low rise architecture, which is capable of supporting high densities and therefore a high concentration of people, creates sociable public outdoor spaces. Public space to private space flow is not easily achieved with higher building heights. While referring to modernism Jan Gehl explains how this easy flow is not generated with high rise buildings:

The functionalists made no mention of the psychological and social aspects of the design of buildings or public spaces. That building design could influence play activities, contact patterns, and meeting possibilities was not considered. One of the most notable effects of this ideology was that streets and squares disappeared from the new building projects and the new cities (45).

While Gehl says there is no intimacy in the public realm in a functionalist's

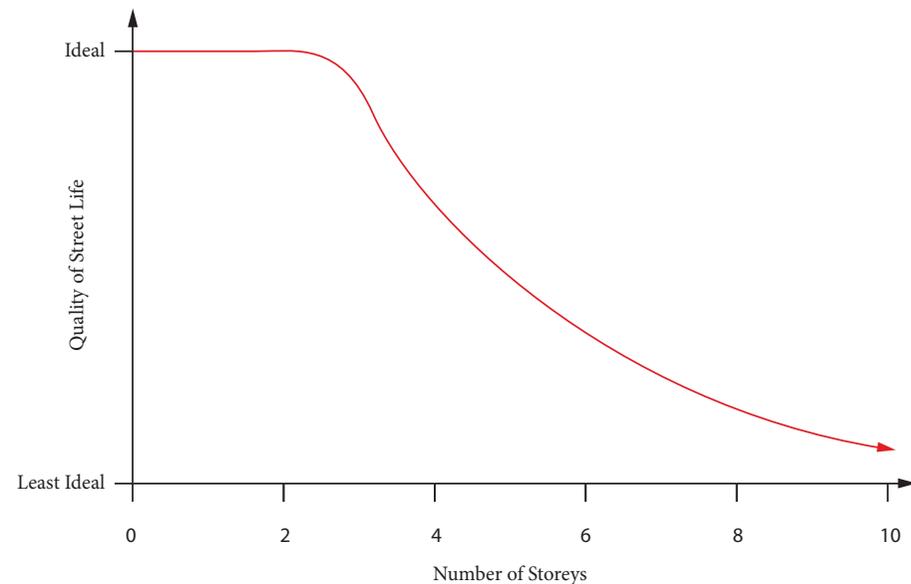


Figure 3.22: Graph of quality of street life versus number housing storeys

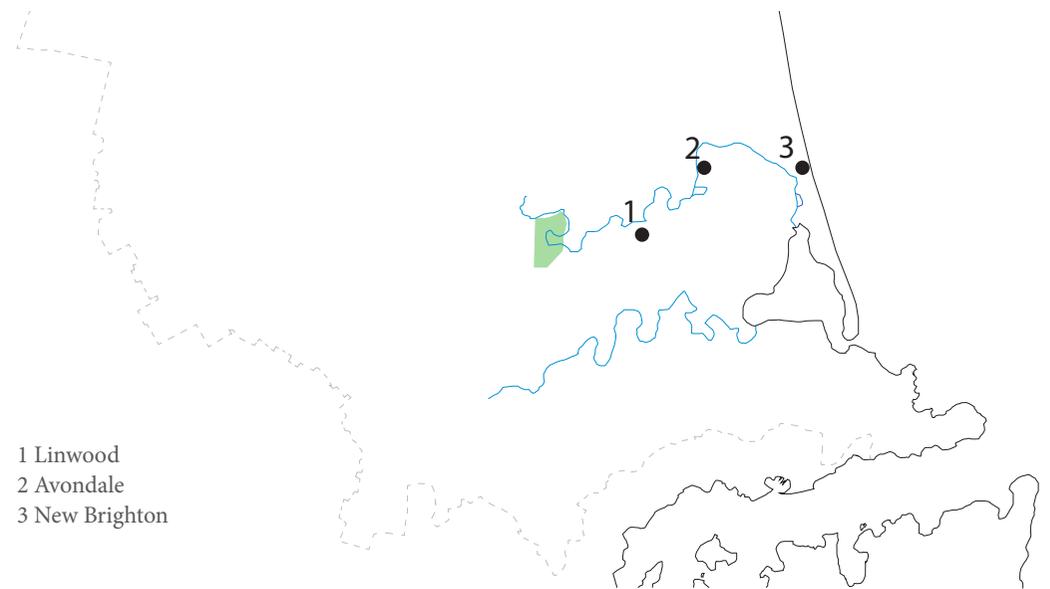
city Dalziel continues to add further points as to why high rise high density is not as ideal as low rise high density. Stating that high rise:

- is less ideal in providing the right conditions for a sense of community
- separates residents from street life
- creates ambiguous intermediate space between the public street and the front door
- cannot be easily adapted to other uses (22).

The architectural forms of varying density approaches create a difference in the dwelling's relationship with public and private space. Low rise medium to high densities provide ease of street access and the easily defined public space which create social and habitable streets, squares and parks from which character and identity can grow and resonate.

A density study of East Christchurch reveals existing densities are low and vary very little across the Eastern suburbs. Three suburbs were chosen that represent a range of situations:

- New Brighton: an old beachside suburb neighbouring New Brighton shopping mall
- Avondale: is central to the Eastern Suburbs and close to a variety of primary, intermediate and high schools
- Linwood; on the western side of East Christchurch, Linwood is close to the popular Eastgate Shopping Mall and within a short distance to the CBD



1 Linwood  
2 Avondale  
3 New Brighton

Figure 3.23: Reference map for density studies

Despite having experienced some small scale development, New Brighton has the lowest density of all with 10.4 units per hectare (figure 3.24). The typologies in this area are:

- free-standing family homes with detached garage behind the house
- attached units mostly with single garage
- between two and five bedrooms
- predominantly one storey units with some two storey units

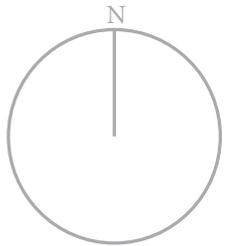


Figure grounds @1:500



Figure 3.24: Density study of New Brighton



Figure 3.25: Density study of Avondale

Despite Avondale's central location within East Christchurch and a variety of schools, Avondale has not attracted development and remains true to its original design of long, thin blocks 2 sections deep (figure 3.25). Avondale achieves a density of 13.6 units per hectare and accommodates housing typologies which are:

- free standing houses with detached garage behind the house
- Three or four bedrooms
- predominantly one storey in height with houses rarely two storeys
- house located close to street providing a large backyard

As a result of Linwood's close proximity to the city centre and Eastgate Shopping Mall, these suburban blocks have been heavily developed with compact housing and achieve a density of 16.6 units per hectare. These developments commonly involve demolition of the existing house and the land developed to accommodate between four and six housing units (figure 3.26). The characteristics of the typologies are:

- series of houses or "units" joined together with party walls or a garage
- between one and three storeys in height
- bedrooms range between two and four

The methods of development in East Christchurch currently do not achieve medium to high densities. Even within a heavily developed situation, small scale private developments cannot reach more than 20 units per hectare. In addition to this, the spatial limitations of this method create inefficiencies due to the adaption of many units onto a small area of land. A larger scale development can remove these inefficiencies and optimise densities to any desired level.

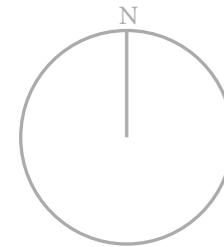


Figure ground @1:500



Figure 3.26: Density study Linwood



unbroken rows are avoided (12).

For the fruition of a socially and aesthetically vibrant place to become manifested, the architecture and urban design must embrace and encourage diversity in as many facets of design as feasible.

Diversity becomes naturally occurring over time as numerous generations add their influence to a previous layer. Large new developments do not have the luxury of time, therefore, the choice of diversity must be planned from the beginning of the project. Tudor Walters elaborates:

It is not enough merely to cover the ground with streets and houses. The site should be considered as the future location of a community mostly engaged in industrial pursuits having many needs in addition to that of house room. Their social educational, recreational and other requirements should, therefore, be considered and, when not already adequately provided for on the surrounding areas, should be met as part of the layout of the scheme (12).

While Walters initiates diversity through planning, Tarbatt offers a strategic method to insure a range of designs are realised:

- the allocation of individual blocks to different developers
- the allocation of parts of blocks to different developers, co-housing groups, or building cooperatives
- the allocation of individual plots within blocks to different developers, including building cooperative groups and/or self-builders (figure 3.29 to figure 3.31)(90)

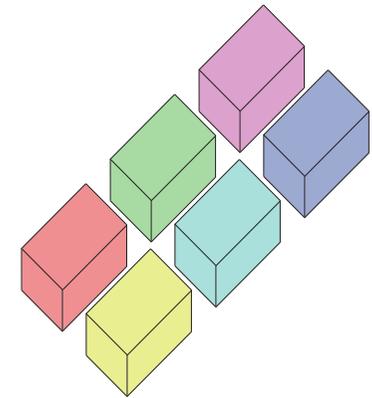


Figure 3.29: Developers building entire blocks

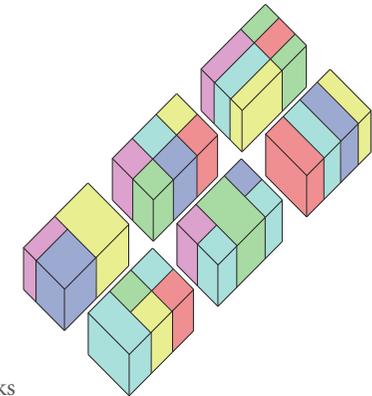


Figure 3.30: Developers building large portions of blocks

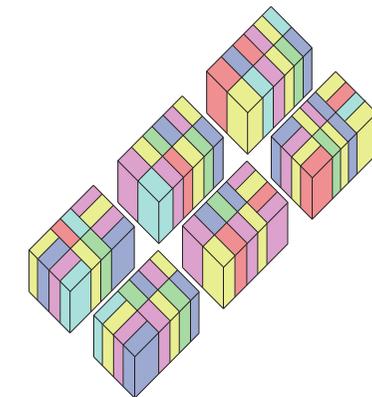


Figure 3.31: Developers building small portions of blocks

While these methods provoke a range of designs to emerge, the last option offers the most diversity but Tarbatt goes on to say a mix of these methods will further the range of diversity to the extent where one developer can employ multiple architects to design sections of their block (91).

Diversity in the suburbs of Christchurch is a dwindling commodity. The older suburbs are the exception but more recent subdivisions exhibit a lack of diversity. Where the older areas have house to house variation (figure 3.32), newer divisions contain houses of the same generic nature, 'spec' houses of a limited material and design selection. This phenomenon is becoming more extreme and is most observable in the development of Waitikiri where all houses are of similar form and abide by a very limited material palette (figure 3.33). It is important this phenomenon is not repeated in the 'New Eastside.' In this new development a variety of land use, housing types, house size, tenure and urban form and design must be considered to enable a strong community and sociable environment.

Though it seems a contradiction, diversity can be encouraged, designed and achieved through planning principals. Successfully managing the contributing factors of diversity creates designs which will ensure the 'New Eastside' will become an enticing place to live.



Figure 3.32: A selection of East Christchurch homes



Figure 3.33: Waitikiri homes with same materials and similar form

## IDENTITY

In support of density and diversity is identity. Identity is a powerful and emotive force. It has the potential to divide and unite entire nations and societies, it forms stereotypes both positive and negative in nature, it is both individual and global, it can even personify buildings and infrastructure. But one aspect remains constant: we all have an identity whether it is forced upon us or voluntary. Hiedegger elaborates “Everywhere, wherever and however we are related to beings of every kind, identity makes its claim upon us” (26).

Identity can be primarily perceived through visual perception. Though visual aesthetic can be subjective in nature, Nasar reveals people assess their environments with criteria broader than that of visual aesthetic with five main attributes that Nasar has identified of a ‘liked’ environment:

- Naturalness-environments that have a natural aesthetic over a constructed aesthetic.
- Upkeep/Civilities-well maintained and cared for environments.
- Openness and defined space-the weaving of defined open space with views and integration of pleasant elements.
- Historical significance/content-environments that provoke favourable association.
- Order-organisation, coherence, congruity, legibility and the clarity of an environment. (62-73)

As these characteristics evolve with time, visual identity also evolves with time as layers of events and developments gradually alter the image of a society. From vernacular beginnings, through natural and manmade disasters,

evolution of industries and changes to the fast paced consumerism of today, visual identity continually evolves with the city and with the society who shape it.

At times the essence of the space and therefore a facet of its identity are not communicated through a visual medium. As Scott Lash notes, a space can only be truly experienced through the fourth dimension; time (85). Relph adds “identity is in the experience, eye, mind and intention of the beholder” (45). Therefore the perception of an identity or culture of a space is to be determined by the individual through multi-sensory experiences. While elaborating on the subjective link between design and identity Kevin Lynch explains the various characteristic traits of people allow themselves to perceive their environments differently. These characteristics include background, occupation, class and temperament. That is to say people notice and experience different qualities of “paths, edges, landmarks, nodes and districts” of the city (111). This suggests the designer needs to create multiple qualities with design that not only satisfies one specific type of character but a rich selection. This strategy of intensifying design aspects builds the foundation for an identity to be formed not by one narrator but many readers.

Identity is not solely experienced by the tangible and abstract qualities of a place but also through social interactions with common users who have come to embody that identity. How we behave in the space and therefore the identity one forms is largely determined by observations and interactions with the greater community. Referring to social interactions with the community, Relph examines how “it is the manner in which these qualities and objects are manifest in our experience of places that governs our impressions of the uniqueness, strength and genuineness of the identity of these places”

(45). Thus a link is clearly formed between the community and its identity. If people influence a space's identity then the influences of urban and architectural design will contribute abstract qualities to a place's identity.

Of all the arts, architecture and urban design are perpetually ingrained within the public realm, being critiqued by a society who witness, experience and socialise within its paths, spaces and buildings. A society that is inextricably diverse in culture, character and attitude. Therefore it is with great importance that urban and architecture designs consider the direct and indirect implications of the design upon East Christchurch residents who become emotionally and psychologically attached to the identities of The New Eastside.



## CHAPTER FOUR

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# EASTSIDE ANALYSIS

East Christchurch hosts a range of people. The success of this research will be in its ability to satisfy each individual's needs. The aim of this chapter is to distil salient characteristics of East Christchurch to insure the new development holds strong potential to feel like "home." These features can be arranged into three groups: Demographic, Physical Environment and the Eastside Lifestyle. To gather a thorough understanding of the Eastern suburbs census data was investigated. The latest valid census was 2006. The 2011 census was cancelled due to the February 2011 earthquake. To add to this my personal observations and experiences as a local will also reveal qualities of the Eastern Suburbs.

## DEMOGRAPHIC: THE PEOPLE OF EAST CHRISTCHURCH

### Age:

Many generations live within these suburbs. The Eastern suburbs are among the older areas of Christchurch. Suburbs surrounding New Brighton were quickly developed as New Brighton gained city wide popularity when New Brighton shops were granted the only licences in Christchurch to open in the weekend. And much of the suburbs from the city to Brighton were quickly established as post World War II housing. Older members of the community can still remember when the red zone was once rich pastures for grazing farm animals. Now of course ten houses to the hectare consume the space. The median age of the study area is 35 while 13% are above 65 years of age and 20% below 15. This presents east Christchurch as a generationally diverse community. This is a great place to bring up to raise a family.

-New Developments must cater to all ages and allow flexible housing solutions to enable generations of families to call The New Eastside home.

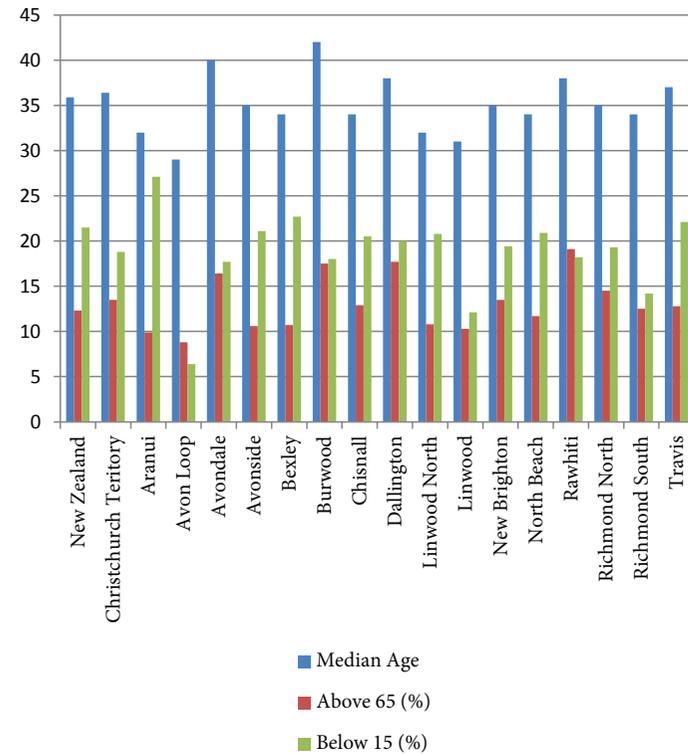


Figure 4.01: Graph of median age and age brackets

**Housing and Family Types:**

The majority of homes represent the single family dwelling; one or two parents living with their growing children (61%). Living alone is more popular (30%) than living in a flat situation (7%). Multiple family homes are not prevalent in East Christchurch (2%). Though there is a variance in household types, the nuclear family situation significantly reigns most popular. This is reflected in the current housing stock. The clear majority of homes have three bedrooms with a median floor area of 90m<sup>2</sup>. These are almost exclusively detached single storey dwellings with minority of units and townhouses making up the numbers.

-The New Eastside must embrace the possibility for all these household types with a variety of housing typologies which contribute to make a flexible and sustainable urban housing environment.

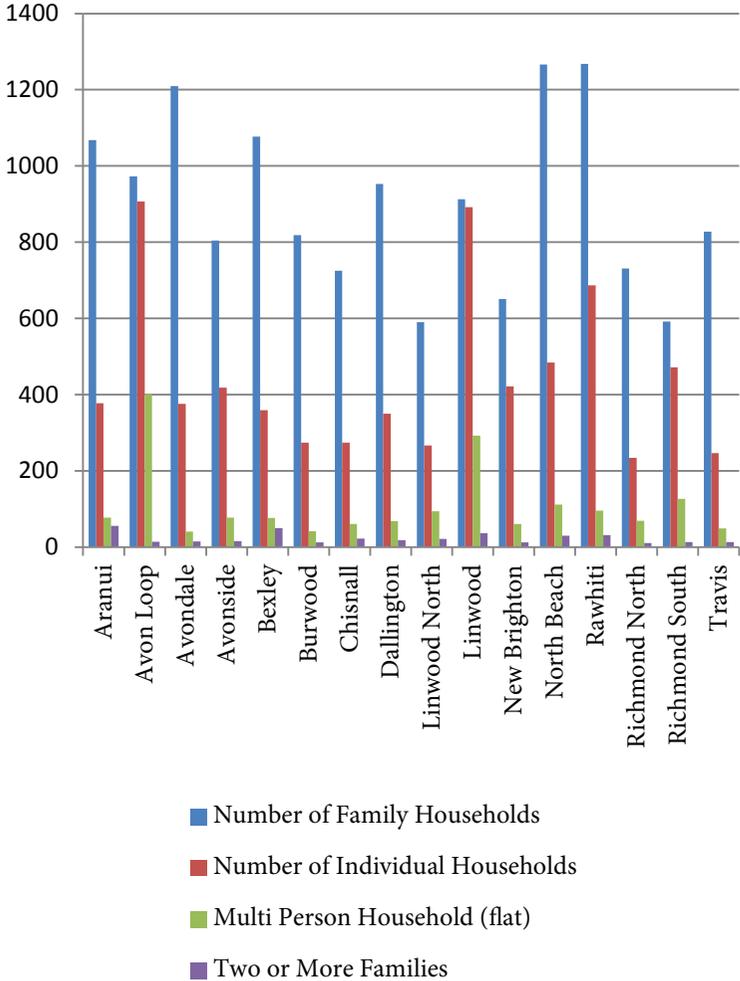


Figure 4.02: Household types

Wealth:

The Eastern Side of Christchurch is by no means affluent. This is the area most desperate for affordable housing in Christchurch. The median income of the area rests at a modest NZ\$21,550. An “affordable” housing budget at this income would be \$138pw.

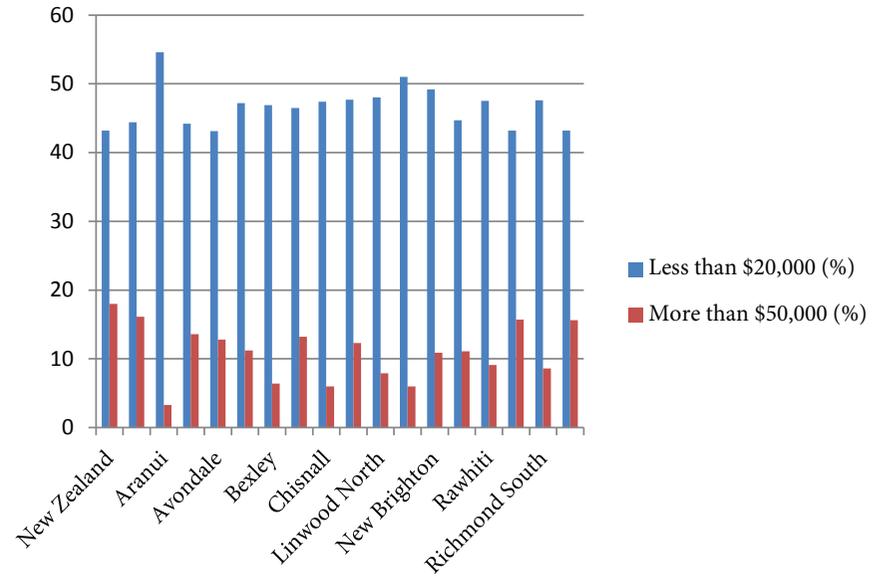


Figure 4.03: East Christchurch salary brackets

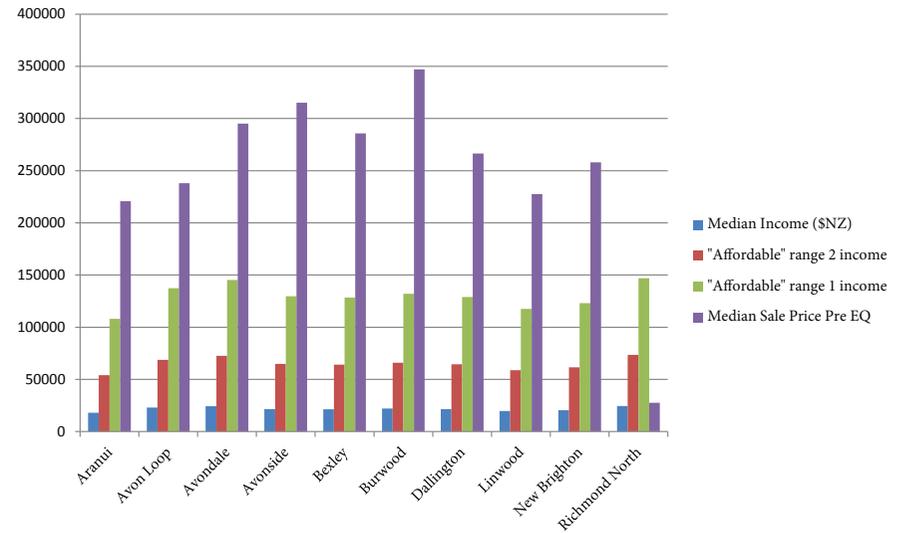


Figure 4.04: East Christchurch median income compared to housing affordability

## PHYSICAL ENVIRONMENT; THE PLACES AND SPACES THAT SHAPE EAST CHRISTCHURCH

A dramatic transition exists as one moves from an environment of ten units per hectare to one of forty units per hectare. It is therefore paramount that the urban and architectural design relates to the character of the existing built environment.

### Vegetation:

Christchurch is known as “The Garden City.” This is due to the central Hagley Park and its abundance of reserves, recreation spaces and flora throughout the city (figure 4.05). The suburbs contribute to this with the vast majority of homes having large gardens at the front and the back. Large grass verges planted with trees also contribute to the garden aesthetic. With the spatial limitations of medium density housing it is easy for the garden aesthetic to be made redundant as design searches for efficiency.

- Maintaining the garden aesthetic remains a top priority during the design of medium density housing for East Christchurch. The vacant red zone holds possibilities to further enhance the garden city image.

### Individuality of Buildings:

The beauty of East Christchurch suburbia is in the layers of history and individuality of each home. Diverse is an apt expression. Turn of the twentieth century homes, post war weather board homes, summer hill stone homes and “modern” G.J. Gardner homes all neighbour each other in a random order along the street. Single detached, attached elderly units and attached town-houses further embellish the street with aesthetic variety. This is a result of the long standing individuality of East Christchurch (figure 4.06 and 4.07).

The visual impact of the eastern suburbs is low. Because of the small scale of the houses and their largely detached nature, a coarse housing grain has become accepted. However, medium density housing lends itself to finer grain housing. Finer grain housing has a strong visual impact which clearly defines public and private space.

- The New Eastside will need to take measures to consider whether strong visual impact will be suitable in the new development and may need to find ways of keeping the block visually permeable to reduce the impact.
- Contemporary designs tend to favour clean lines where each units are repeated in a rigid manner. East Christchurch favours a more variable and individual aesthetic



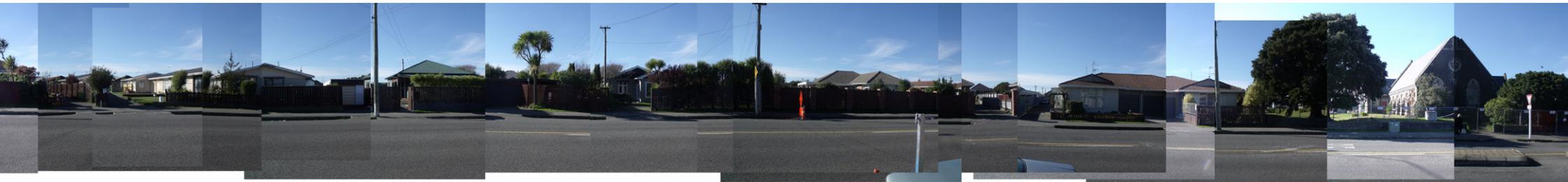
Figure 4.05: Typical suburban recreation space



Figure 4.06: Shaw street west



Figure 4.07: Shaw street east



### Vehicle Dependence:

Like almost every outer suburb in New Zealand, Christchurch's Eastern suburbs have a great dependency on private transportation. This is a result of, and a contributing factor to the built environment. The vast separation between destinations can't always be conveniently reached by the public bus system. Locals prefer the freedom of personal transport. This has a consequence on both land use and housing typology. Roads and plot widths are wider to accommodate parked vehicles. Garages become a necessity for storage and security. Car-lined streets and wide garage doors feature on the street façades which create an inactive and bland appearance.

Car ownership in East Christchurch is higher than the rest of the City's and Nation's averages. Only 12% of people are without access to a car while 43% of people have access to one private vehicle, 33% have access to two and 12% have access to three or more vehicles.

-It is irrefutably important to recognise the preference for private cars in East Christchurch and support their existence, however, the car spaces need to be managed to maintain a positive urban environment.

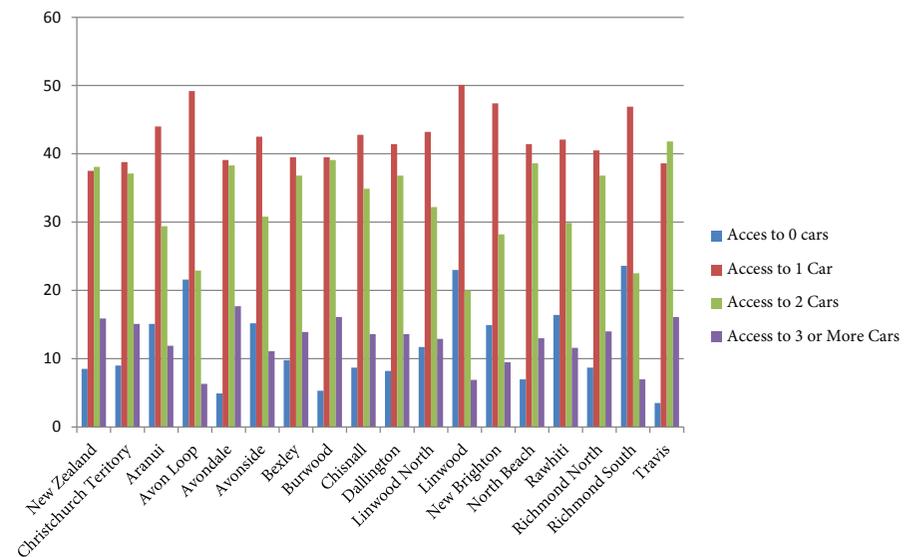


Figure 4.08: Graph of car ownership

### Crime Prevention:

East Christchurch is not a prosperous area of Christchurch. In actuality it hosts the most financially desperate suburbs in Christchurch. It is also fair to say that a significant portion of undesirables live in the area. Although it is not generally a place riddled with crime and is unsafe to walk the streets after sun down, these hazardous areas do exist. The existing suburbs do not align with contemporary crime prevention through environmental design (CPTED) theory. Bedrooms face the street, high street fences, long setbacks and dimly lit streets favour a criminal's environment.

-The housing and urban designs need to produce an environment that optimises crime prevention. This will make higher density living secure, safer and inviting to inhabitants

### EASTSIDE CULTURE; THE LIFESTYLE OF THE EASTERN SUBURBS

#### Car Culture:

As mentioned earlier Christchurch and especially East Christchurch have a dependency on cars. Ultimately, this leads to a strong car culture. Though not all East Christchurch residents are a part of this culture, it holds potential to affect the design of medium density design. Men and women like to personally maintain and modify their cars. It is not unusual to see someone's dream project in a yet to be completed state. Many garages and yards are filled with piles of parts, rust buckets and doer-uppers (figure 4.09). Along with this culture are the undesirable boy racers that have plagued Christchurch for many years.

-It is important to allow people the luxury of maintaining and modifying their cars and facilitate the extra storage for project cars. While at the same time restrict the ability to cause a nuisance to other residents



Figure 4.09: A locals project

### Casual Lifestyle:

Everything moves a bit slower in the Eastern Suburbs. It's a humble environment where people are not always particular about their appearance, their belongings' appearance or their house's appearance. Comfortability comes to mind. This is also expressed in the social behaviour. Patrons of the friendly streets always greet one with a warm smile and a conversation.

-The designs must reflect and be a canvas for the casual lifestyle of East Christchurch. The developments cannot become rigid cookie cutter buildings that strictly follow one design aesthetic.

### Active Lifestyle:

Located close to the beach and with an abundance of recreation and reserve spaces East Christchurch supports an active lifestyle. Every suburb has a large home field usually close to schools and along main roads. A series of domains and courts support the lesser practiced sports such as bmx, tennis, basketball, athletics and archery. Sand dunes, Bottle Lake forest, the estuary, wetlands and the Avon River offer scenic places to walk and ride as well as accommodate other more specific activities. On fine summer days everyone flocks to the beach to catch a few rays and a few waves. In the weekends sport fields fill with families as they watch their kids, siblings, parents play football, rugby, cricket and many other sports (figure 4.10). After school, kids run around the parks and quiet streets nestled in amongst suburbia and retirees play golf all week long.

-To maintain a healthy and active lifestyle, the development must allow for, and promote activity with a variety of public spaces.



Figure 4.10: Weekend cricket



## CHAPTER FIVE

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# CASE STUDIES

The aim of this chapter is to establish a series of built designs that have proved to exhibit ideal characteristics relevant to this thesis. This chapter will investigate examples with successful typology design, car management and urban and social environment.

The architecture of housing hosts an immense range of typologies. Each typology has a multitude of variations creating endless possibilities. For medium density housing the most successful typology is the Row or Terrace house (figure 5.01). Row housing has transcended time, been used for many centuries and has been adapted to vernacular needs throughout the built world. Row housing is a series of attached dwellings which create a wall of housing that defines and creates an intimate street environment. However, row housing does not often easily allow generous car park space, especially at higher densities. In these instances cars are almost exclusively parked on the street and in alley ways.

In a medium to high density environment car parking has a detrimental effect on the urban environment and the ability for housing to be affordable. Furthermore, the space required for car storage and roads impacts the quality and quantity of open public space. To satisfy both off street parking and public space needs, the density will unfortunately decrease. However, East Christchurch's dependence on private vehicles has forced residents to live within a car dominated urban and architectural environment that is at risk of reducing the affordability of housing and quality of public space.

In architecture there exists a range of typologies that deal with the placement of privately owned cars. The most common within New Zealand is the

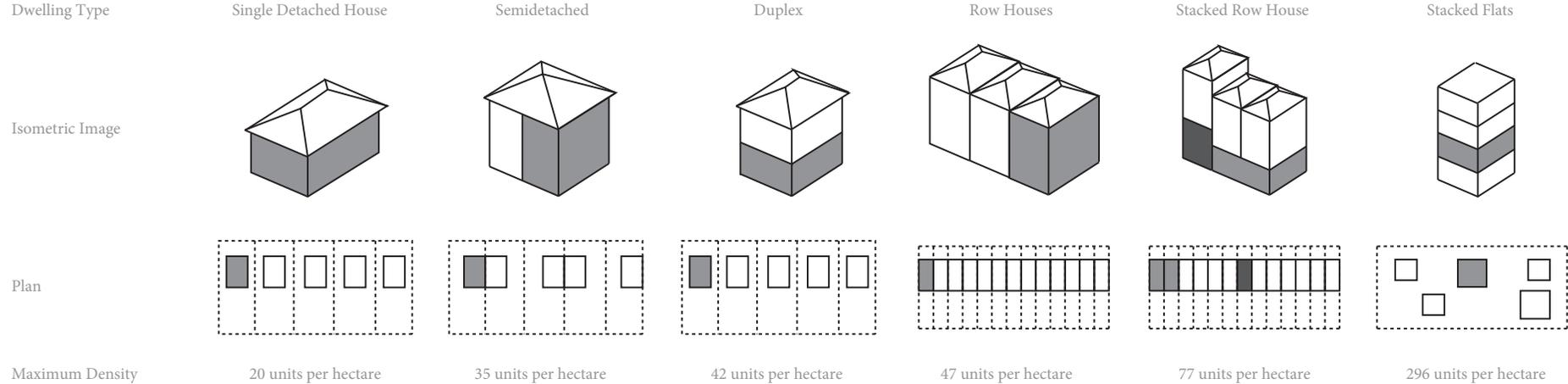


Figure 5.01: Table of housing typologies

privately owned garage. An older house will likely have a single garage detached from the house towards the back of a property, but, more recently double garages toward the street edge of the property's boundary are popular with developers. Also used but uncommon is a carport which is a simple structure that is not enclosed but offers some shelter for cars. These typologies are suitable to suburban practices (figure 5.02).

At higher densities however, more efficient methods of managing car space is required. It is not uncommon for cars to be grouped into a hub of parking storage. This can essentially be a car park or a portion of space with a larger building. In some instance entire floors are dedicated to car parking, especially at high densities. In this context the car park can be within a simple open air structure. The designated area is likely to serve housing or apartment units within a very close proximity, but, this may also require the occupants of the vehicle travel vertically or horizontally to reach their dwelling (figure 5.03).

The following precedents were chosen for their ability to effectively manage housing typologies with car parking typologies, their contribution to an ideal street and urban environment and allow identity and character to be expressed through variety and design.

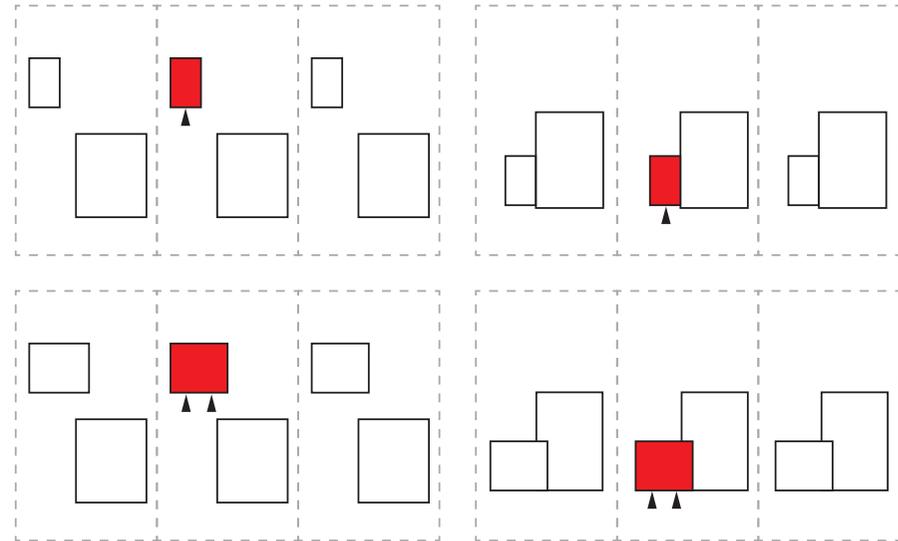


Figure 5.02: Table of low density garage typologies

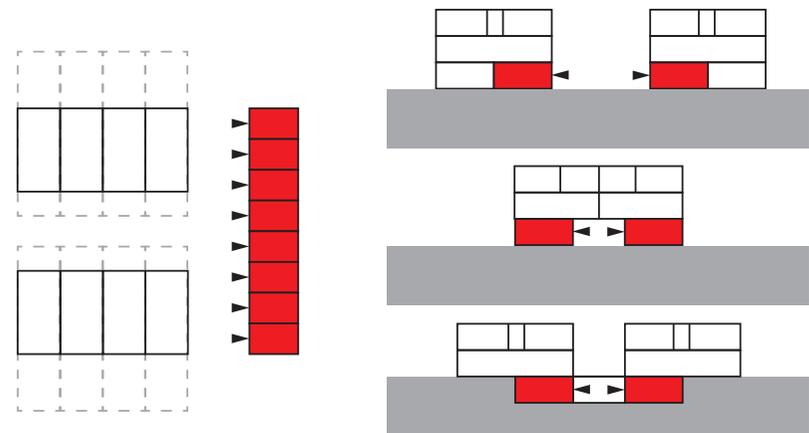


Figure 5.03: Table of medium and high density garage typologies

## HELLER STREET PARK & RESIDENCES BY 6 DEGREES

This project sits on a remediated site in Brunswick, Melbourne that was formerly used as a rubbish dump. To bring new life to the dreary site 6 degrees proposed to build 10 row houses at the back of the site and offer the other two-thirds of the land as a public park space. The result has produced a very successful sociable space, which the families of the row houses and the residents of Brunswick can freely use.

The transition from public to private spaces is carefully managed by a series of thresholds:

- Within the park are small mounds that obscure views directly into the ground floor of the houses
- The park is separated by a gravel footpath that serves the residences at the back of the park. This threshold signifies the end of the public park
- Between the path and the house is a patio area. It provides a multiple use outdoor space that can be used for outdoor living and gardening opportunities. Tall pot plants can be put here, and the structure above allows further vegetation to grow.

- Privacy begins with the living spaces of the houses.
- Total privacy is reached for the bedrooms on the first floor. The basement level also achieves total privacy.

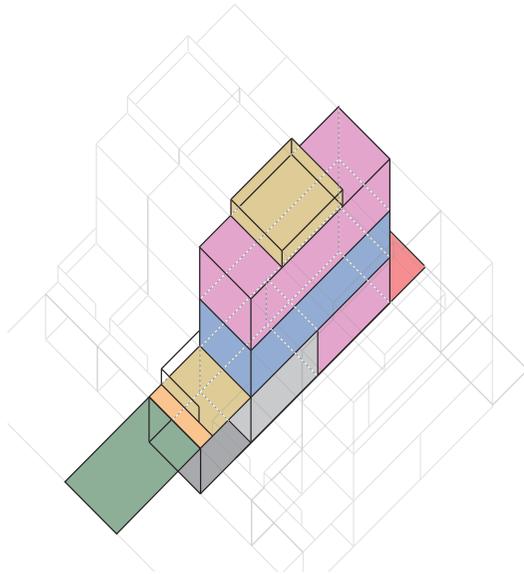
While the site was being remediated, an underground private vehicle laneway was created and a basement level was excavated. This successfully removes vehicle from the well design urban environment.

These row houses are certainly not affordable to the average family, however there are still principles that can be extracted to a more affordable scale.

- The plan of the houses and it relationship to the public space create a very comfortable symbiosis between living and playing
- This strong relationship proves an expansive yard space is not required, especially when houses open onto a well-designed park area.
- Having public space separated by only a patio and a footpath creates secure and social living and public spaces
- The simple arrangement of ground floor living and first floor sleeping remains an easy and optimum row housing solution



Figure 5.04: Location map of Heller Street Park and Residences



- Public Park
- Gravel Footpath
- Patio
- Underground Vehicle Access
- Garage
- Sleeping Area
- Private Outdoor Area
- Living Area

Figure 5.05: Row house spatial diagram



Figure 5.06: View from street



Figure 5.08: Public space



Figure 5.07: View of path and adjoining patios



Figure 5.09: Interior view

### 32 KERR STREET BY NMBW ARCHITECTURE

This project is nestled within the popular suburb of Fitzroy, Melbourne. 32 Kerr Street is a low rise apartment building with seven apartments with between two and three bedrooms. All seven of these units support standard row house design with windows at opposite ends, and entire floors dedicated to sleeping and living spaces. The three apartments facing Kerr Street have standard party walls while the four apartments facing the lane have more dramatic party walls which forms a more interesting plan (figure 5.12 and figure 5.13).

Though these apartments are well designed and well finished, the most interesting part of this building is the garaging. Garaging is on the ground floor and entered through the lane at the rear of the building. Cars enter a six metre wide private laneway that takes them to their respective double garage. The garage door however is entirely glazed with a custom design. A private exhibition is created among the apartment dwellers as the contents of their garages are displayed through the glass. This bold approach turns vehicles

from the concealed to the revealed. Identity is suddenly created in a car park that would otherwise be a banal wall of garage doors. The building itself has a unique design with intricate metal work as cladding and screens for the balconies but each apartment is distinguished by the contents of its garage.

32 Kerr Street is yet another not so cheap living option, in part of location and in part of architectural embellishment. Yet some attributes remain influential for this thesis:

- Simple row housing plans are still sought after and desirable today, even within an apartment context
- Successful car management yields great design
- The variety of apartments from unique to traditional attracts variety of people, and their identity of which can and should be expressed



Figure 5.10: Location map of 32 Kerr Street apartments

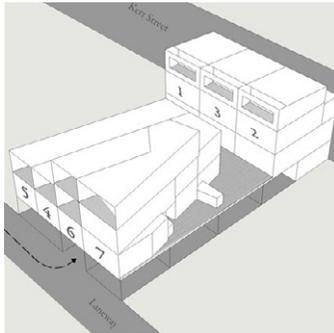


Figure 5.11: Diagram of building

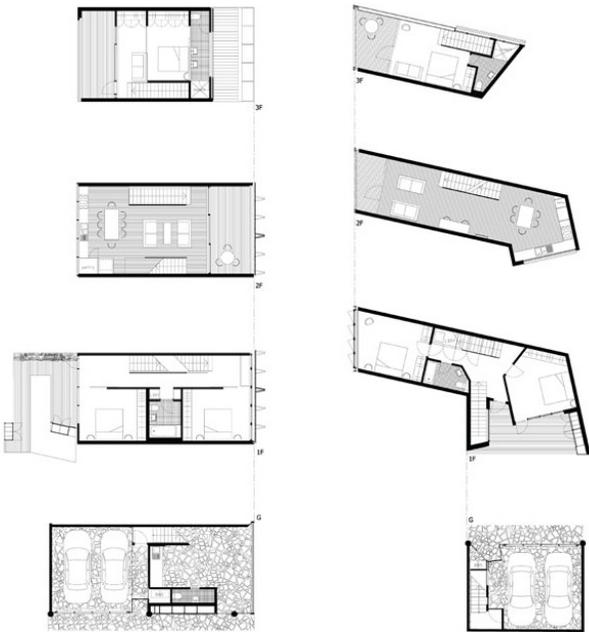


Figure 5.12: Plan of more “traditional” apartment layout

Figure 5.13: Plan of more “dramatic” apartment layout



Figure 5.14: Kerr St view



Figure 5.16: Kerr St view



Figure 5.15: Interior view



Figure 5.17: Garage

## THE FITZROY TOWN HOUSES DESIGNED BY KERSTIN THOMPSON ARCHITECTS

Also in the suburb of Fitzroy, this development combines row housing with a unique spin on vehicle storage. In this project the council made sure each unit had two private car park spaces. However the site location is very close to strong public transport links and the CBD. Thompson therefore realised that people's need for cars is severely reduced and was able to foresee an opportunity to provide flexible spaces in an otherwise compact design. Each garage is connected to a courtyard which provides the opportunity for the extra space in the garage to be converted to an alternative use such as sleeping or office space. The majority of the units use a double-stacked garage. This garage formation offers two immediate benefits:

- the street appearance of a single garage is created
- on narrow plots, the width of one garage allows the ground floor to host practical activity spaces and have a relationship to the street

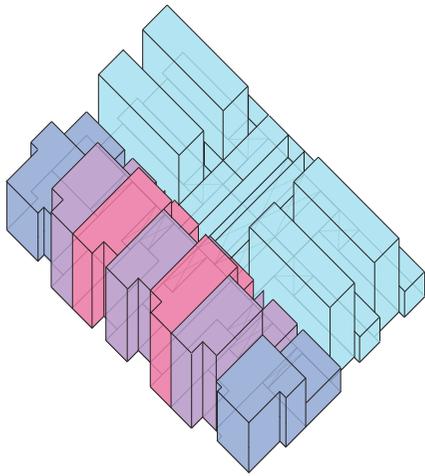
Thompson uses bedrooms on the ground floor. Living spaces are promoted to the first floor and a second floor hosts another bedroom. Attached to the living spaces is a large balcony that utilises the roof space of the garage below. This creates a third aspect for the living spaces and allows the visual impact of row housing to be reduced.

As a more compact design than the previous two case studies, this project offers many practical influences:

- Stacked garaging offers a reduced vehicle appearance to the street
- Stacked garaging allows a narrow plot width while maintaining habitable spaces on the ground floor
- The use of balcony design breaks down the wall of housing between each unit and offers a permeable solution
- Allowing the garage access to light enables it to take on other programmes should future inhabitants not require a double garage.



Figure 5.18: Location map of Fitzroy Houses



- 4 bedroom double stacked garage
- 2 bedroom double tandem garage
- 3 bedroom single garage
- 2 bedroom double stacked garage

Figure 5.19: Author's diagram of varying typologies



Figure 5.20: Laneway view



Figure 5.22: Interior view



Figure 5.21: Napier St view



Figure 5.23: Webb St view

## SOUTH CHASE HOUSING BY ALISON BROOKS.

This recent 84 unit development in the new neighbourhood of Harlow, Essex, England accommodates a variety of housing typologies. As a large scale development it was important for diversity to be present from the start. Of the 84 units 14 are detached houses, 29 are courtyard houses, 7 are row houses and 34 are apartments. The variety of housing types allows the streetscapes to be distinguishable from one another by mixing the larger scale stand-alone houses and apartments on the street corners with terrace and courtyard housing in between.

As a development, the identity is strong with the unique visual aesthetic created by Brooks. Each street also has its own unique environment with the combination of typologies but individuality and identity within the each typology is lacking.

Though there are no garages provided in this design rather an area in front each unit allocated to car storage, the overall design of the large development provides a combination of living options from affordable housing to more up-scale housing, which provide a desirable urban environment by doing the following:

- Variety of living options attract people looking for affordable housing, compact housing and detached housing.
- Placing the variety of typologies around the development allows each street to be different and take on its own identity



Figure 5.24: Location map of South Chase Housing



Figure 5.25: Diagram of development



Figure 5.27: Street view of courtyard houses



Figure 5.26: Interior view



Figure 5.28: Street view of row houses

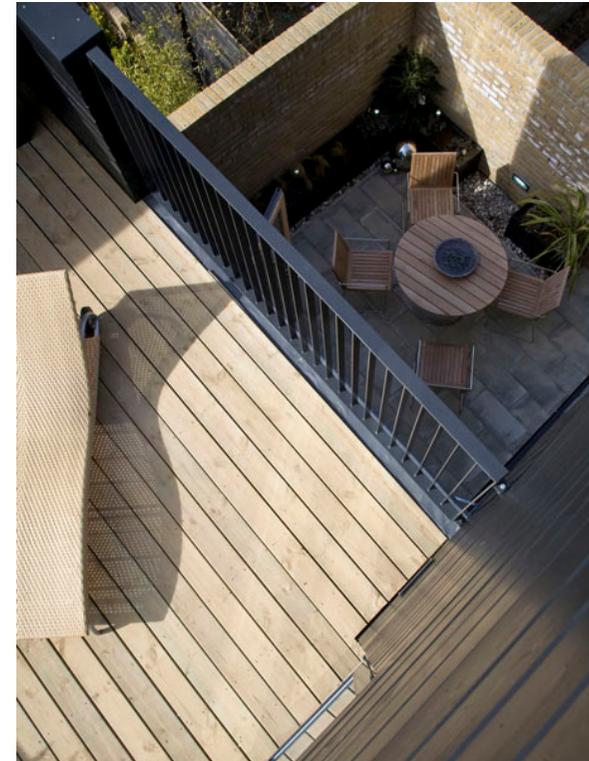


Figure 5.29: View of courtyard

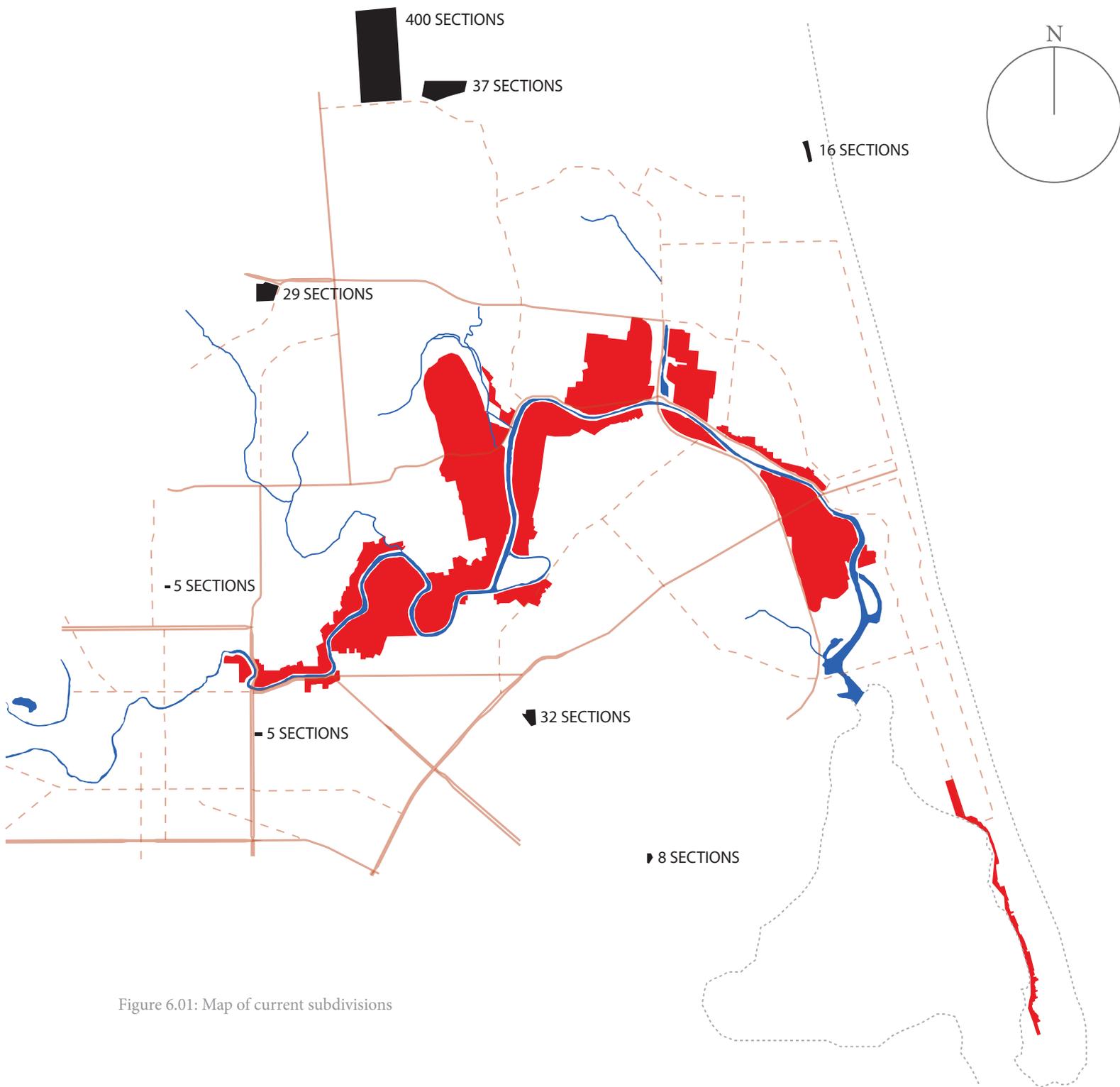


## CHAPTER SIX

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# SITE INVESTIGATIONS

Sub-dividing existing properties is a very small and slow method of development and does not produce the desirable densities. To achieve a medium density of 40 units per hectare an alternative development strategy is required. Developing medium density housing on empty sites would house more people and house them faster than subdividing small plots. It is the aim of this chapter to establish a series of potential sites suitable for large scale development. This chapter will also locate a chosen site suitable for detail design testing and conduct a site analysis. It is important to know there are four land categories in Christchurch that represent an area of residential land's susceptibility to future damage from earthquakes. Technical category 1 (TC1), technical category two (TC2), technical category three (TC3), and the red zone. These categories represent a scale from strong land to weak land with TC1 being strongest and vastly unaffected by future earthquakes and the red zone being weakest and vastly susceptible to future earthquake damage. To find a potential site for creating a New Eastside a thorough mapping analysis was conducted (figure 6.01 through figure 6.08).



TITLE

Current Subdivisions in East Christchurch

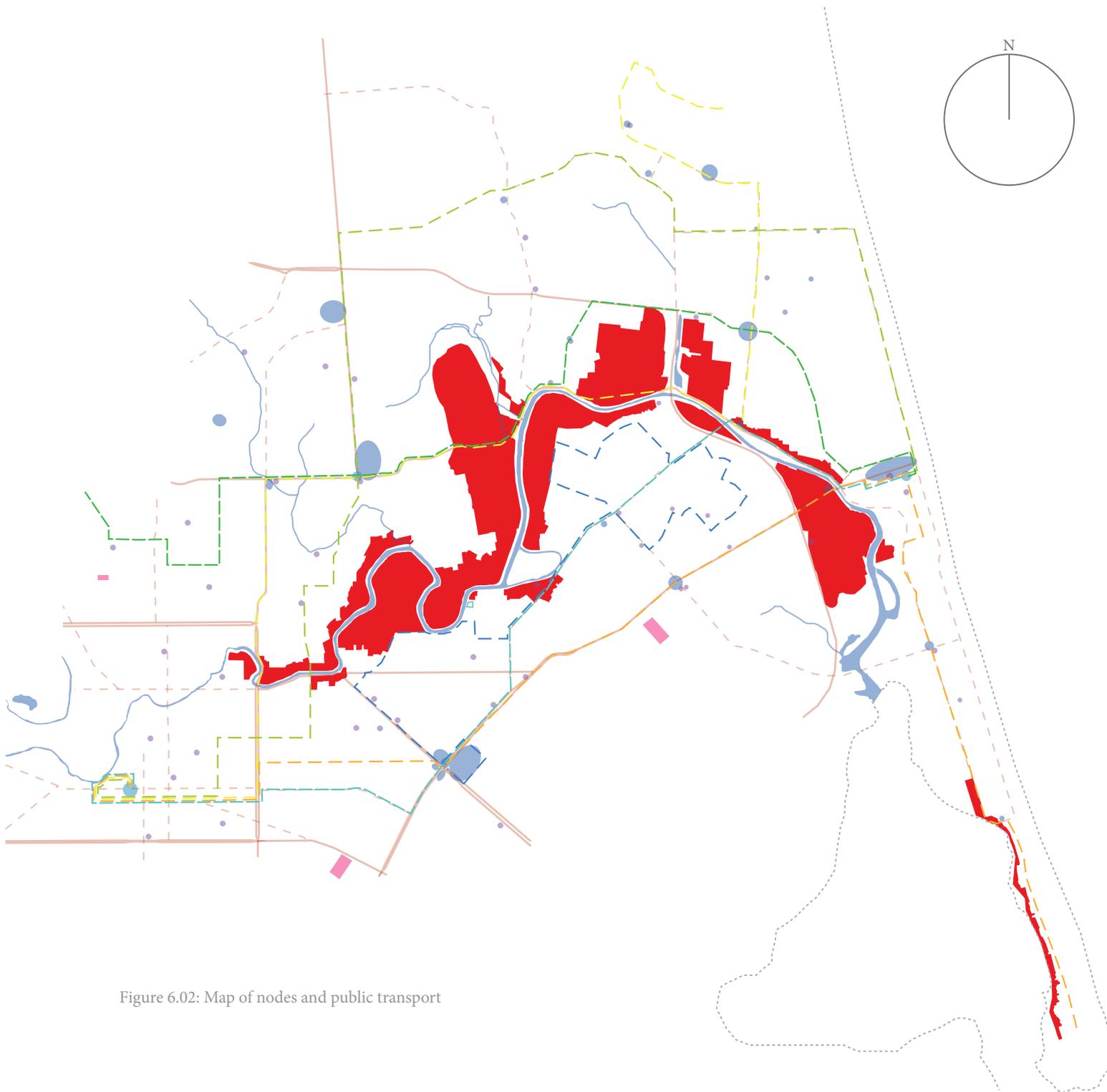
KEY

- Red Zone
- Subdivision
- Primary Road
- Secondary Road

SIGNIFICANCE

Currently there are few subdivisions available on the east side of Christchurch. They are spread around the extremities of “East” Christchurch. There are scattered developments and one expansive development on the Northern Part of Christchurch. This expresses the need to centralise development around the family based suburbs around the red-zone.

Figure 6.01: Map of current subdivisions



TITLE

Red Zoned Land vs Nodes

KEY

- Red Zone
- Primary Road
- Secondary Road
- River

NODES

- Transport Node
- Shopping Node
- Church
- Marae

BUS ROUTES

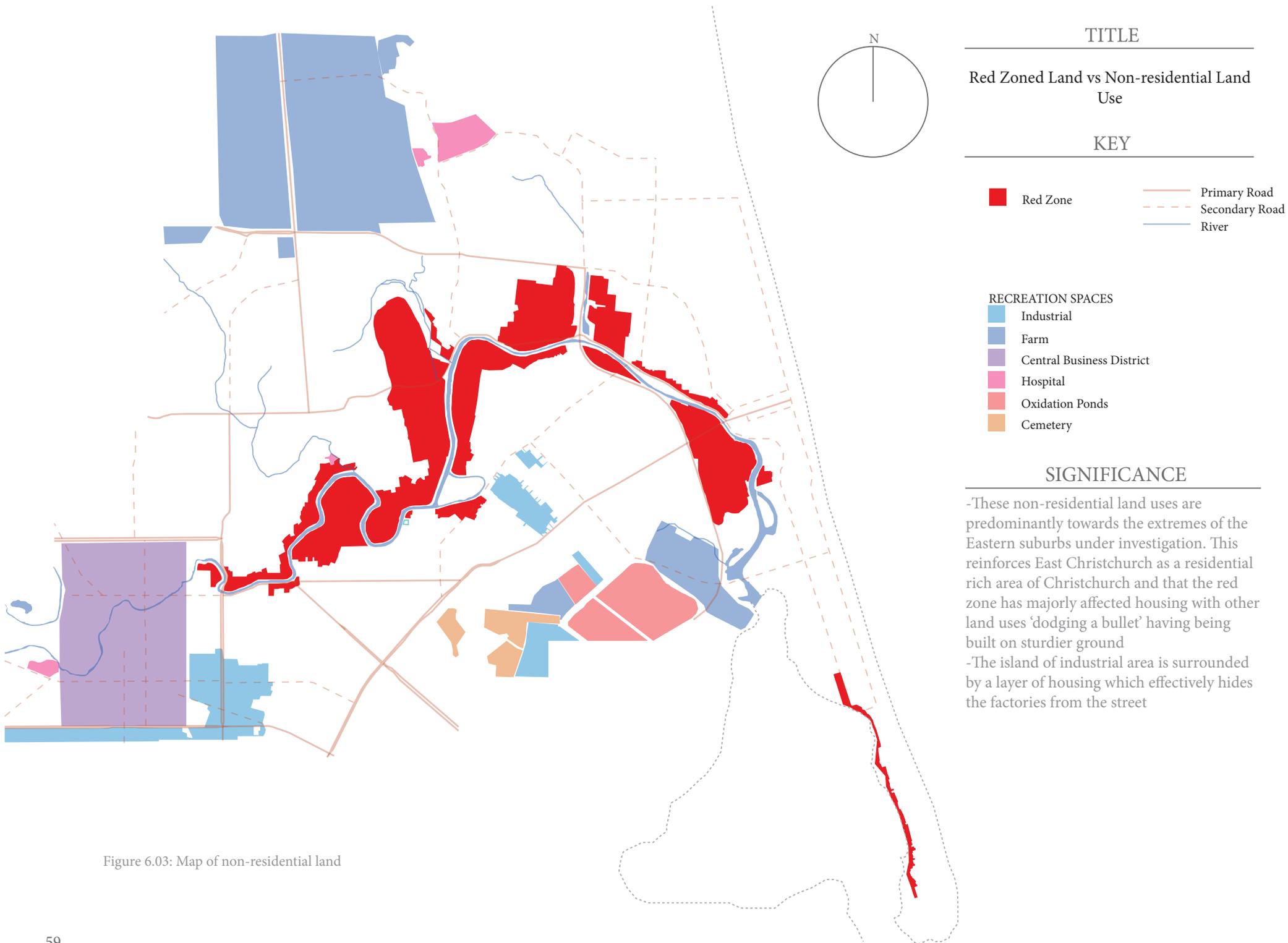
- 5
- 7
- 60
- METRO
- 40
- 510

SIGNIFICANCE

-A comprehensive public transport system can reduce the need for privately owned cars. Cars hold a strong presence in Christchurch so it is worth analysing the bus network that serves East Christchurch. It is however quite comprehensive with all bus routes passing through several economic and community nodes. It seems that anyone can get to any location in east Christchurch with one or two bus trips and a small amount of walking. The bus network remains largely unaffected by the red zone however some routes would need adjustment to better serve surround areas

-There is an abundance of Churches in Christchurch but only a few appear to be affected by the red zone

Figure 6.02: Map of nodes and public transport



TITLE

Red Zoned Land vs Non-residential Land Use

KEY

- Red Zone
- Primary Road
- Secondary Road
- River

RECREATION SPACES

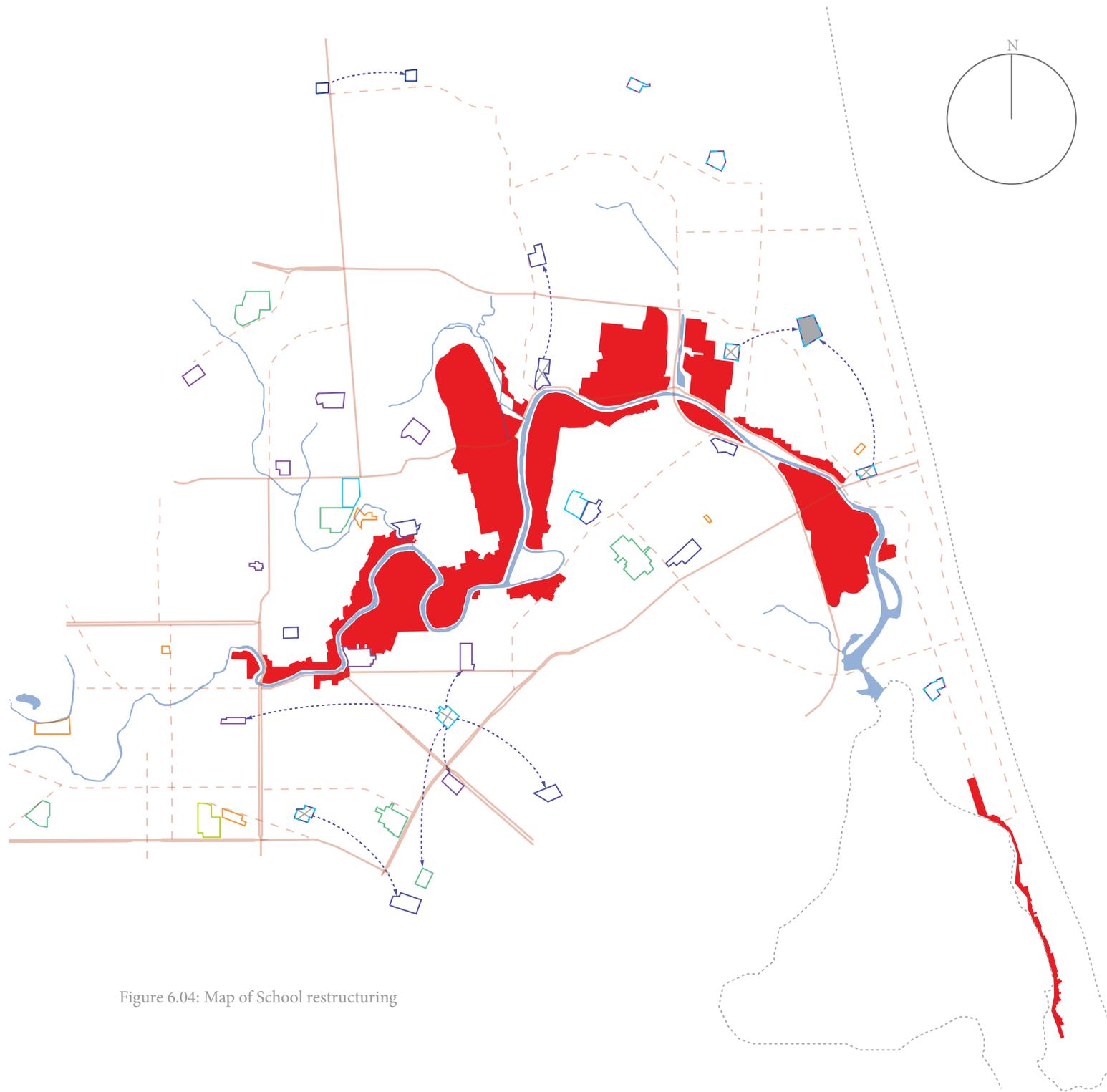
- Industrial
- Farm
- Central Business District
- Hospital
- Oxidation Ponds
- Cemetery

SIGNIFICANCE

-These non-residential land uses are predominantly towards the extremes of the Eastern suburbs under investigation. This reinforces East Christchurch as a residential rich area of Christchurch and that the red zone has majorly affected housing with other land uses 'dodging a bullet' having being built on sturdier ground

-The island of industrial area is surrounded by a layer of housing which effectively hides the factories from the street

Figure 6.03: Map of non-residential land



TITLE

Red Zoned Land vs School Restructuring

KEY

- Red Zone
  - Primary Road
  - Secondary Road
  - River
- SCHOOLS
- Primary School
  - Intermediate School
  - Primary and Intermediate School
  - High School
  - Tertiary Institution
  - Religious School
  - New Site
  - X Closing School

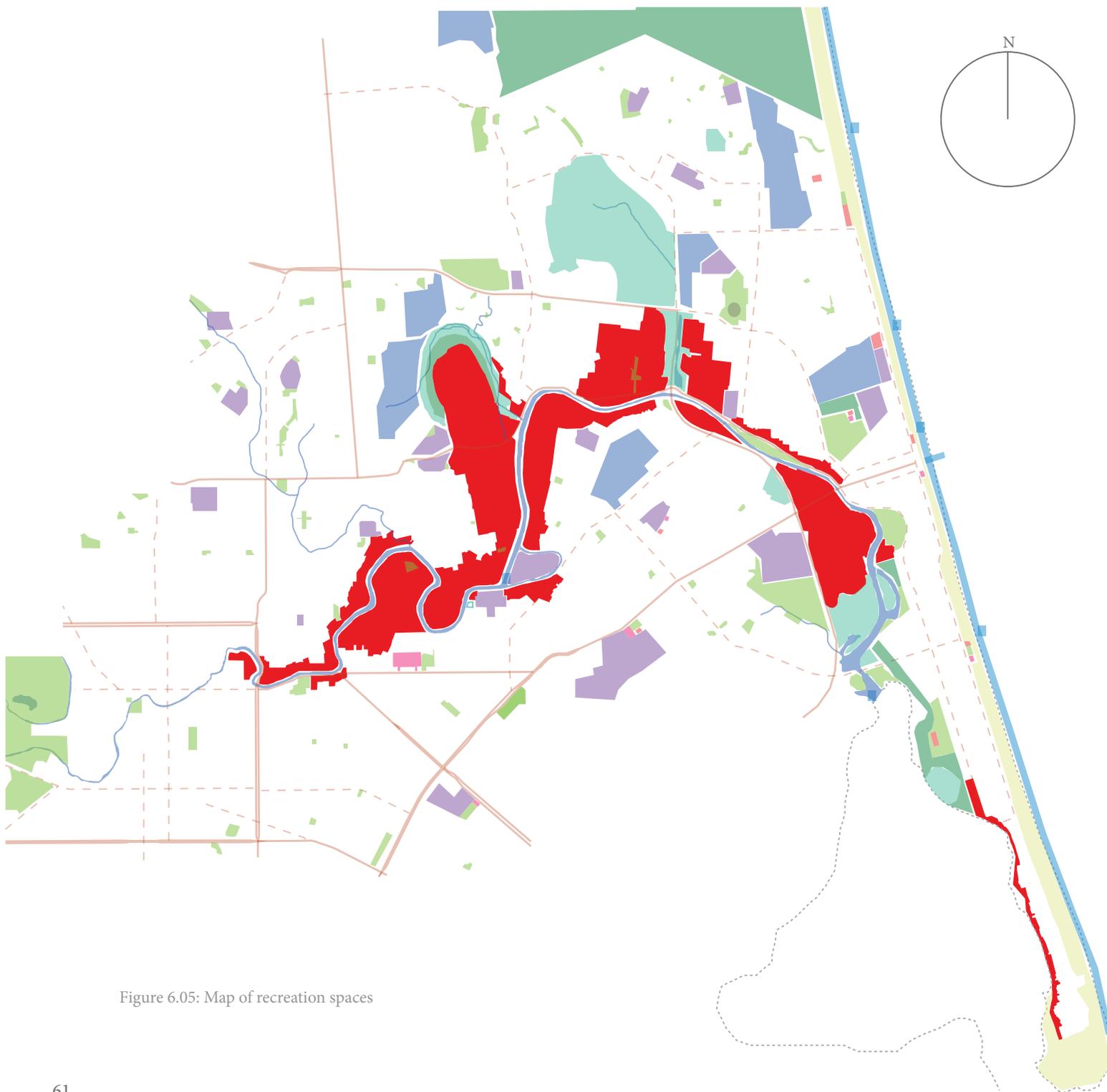
SIGNIFICANCE

-Christchurch has recently undergone a restructuring of public schools. Many of the victims of this procedure are on the East of Christchurch especially schools surrounding the red zone. The closure of schools lends land available to other uses and should be considered as a potential option for housing development. The question beckons however: What happens to existing, closed and relocated schools when East Christchurch becomes repopulated?

- It seems that the closures are a response to the high supply and low demand of schools particularly primary schools.

-Does this land be kept aside for schools to re-open or develop it and allocate other land for future schooling?

Figure 6.04: Map of School restructuring



TITLE

Red Zoned Land vs Recreation and Reserve Spaces

KEY

- Red Zone
- Primary Road
- - - Secondary Road
- River

RECREATION SPACES

- Water Sports
- Golf Course
- Field Sports
- Court Sports
- Playgrounds

RESERVES

- Beach
- Grass/Field
- Forest
- Wetland

SIGNIFICANCE

-There is an abundance of activities to do in East Christchurch. From any number of water, court and field sports to a variety of golf courses. There is also a plentiful supply of playgrounds for the children

-As a former swamp, East Christchurch still hosts plenty of wetland reserves, in addition to this, there are small and large forests, as well as other grassed reserves.

-As a coastal area, East Christchurch has a long beach reserve used by many for surfing, swimming, kite sports and walks along the beach.

Figure 6.05: Map of recreation spaces

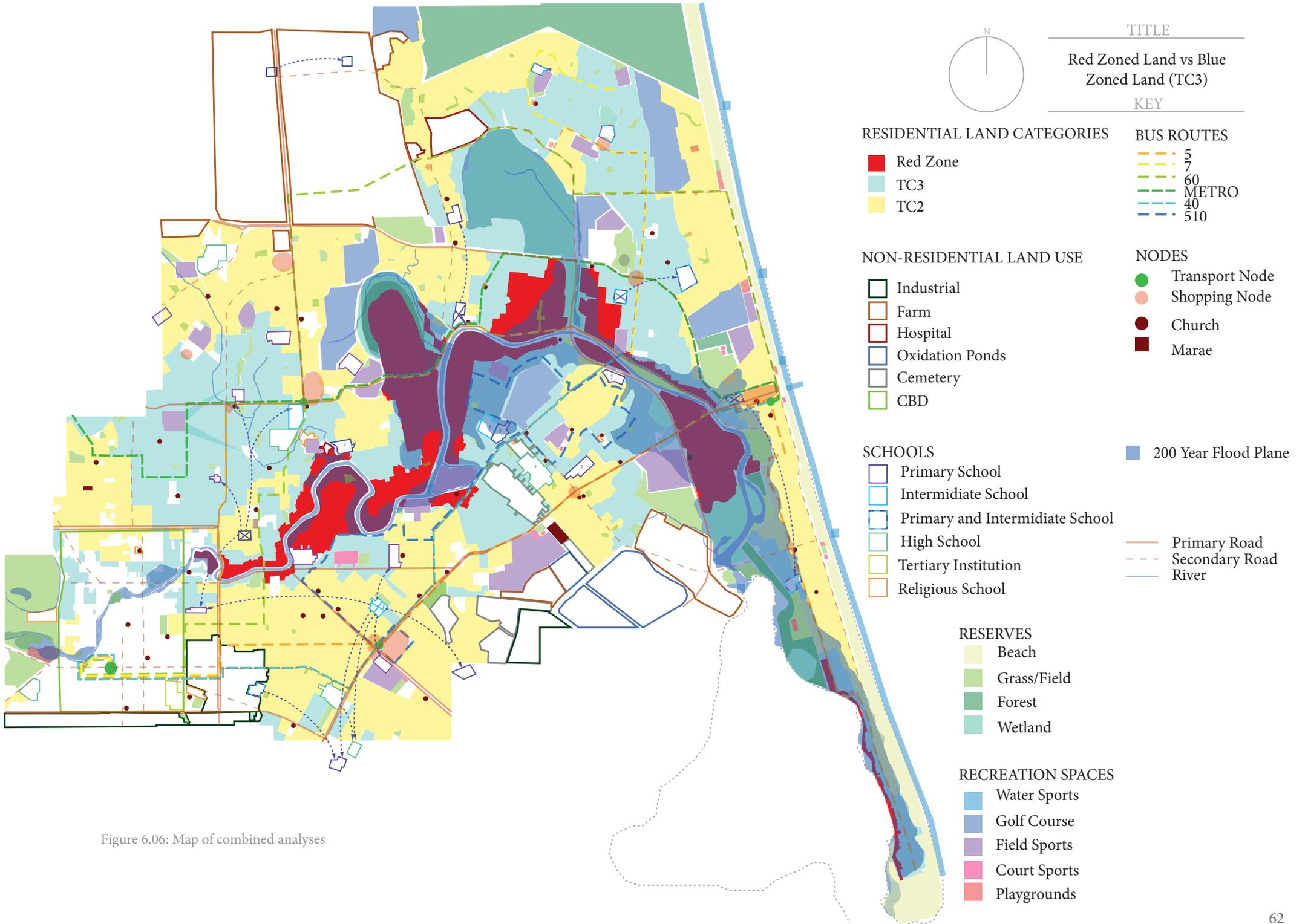
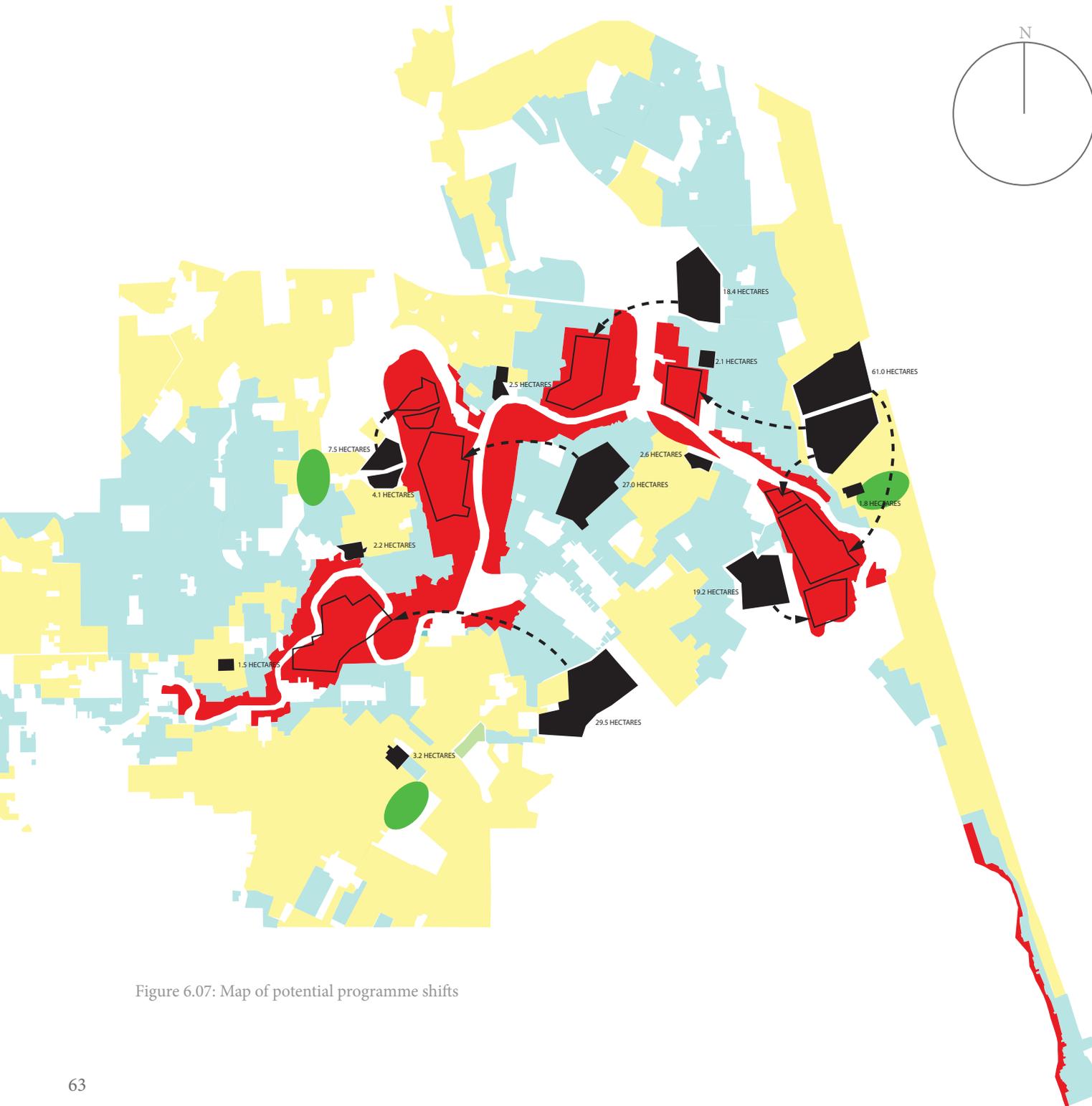
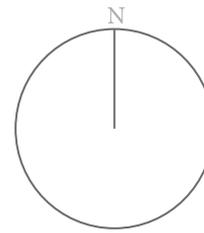


Figure 6.06: Map of combined analyses



-  Red Zone
-  TC3
-  TC2
-  Potential Site for Development
-  Programme Relocation
-  Potential Site of New Relocated Programme
-  Commercial and Retail Nodes

Figure 6.07: Map of potential programme shifts

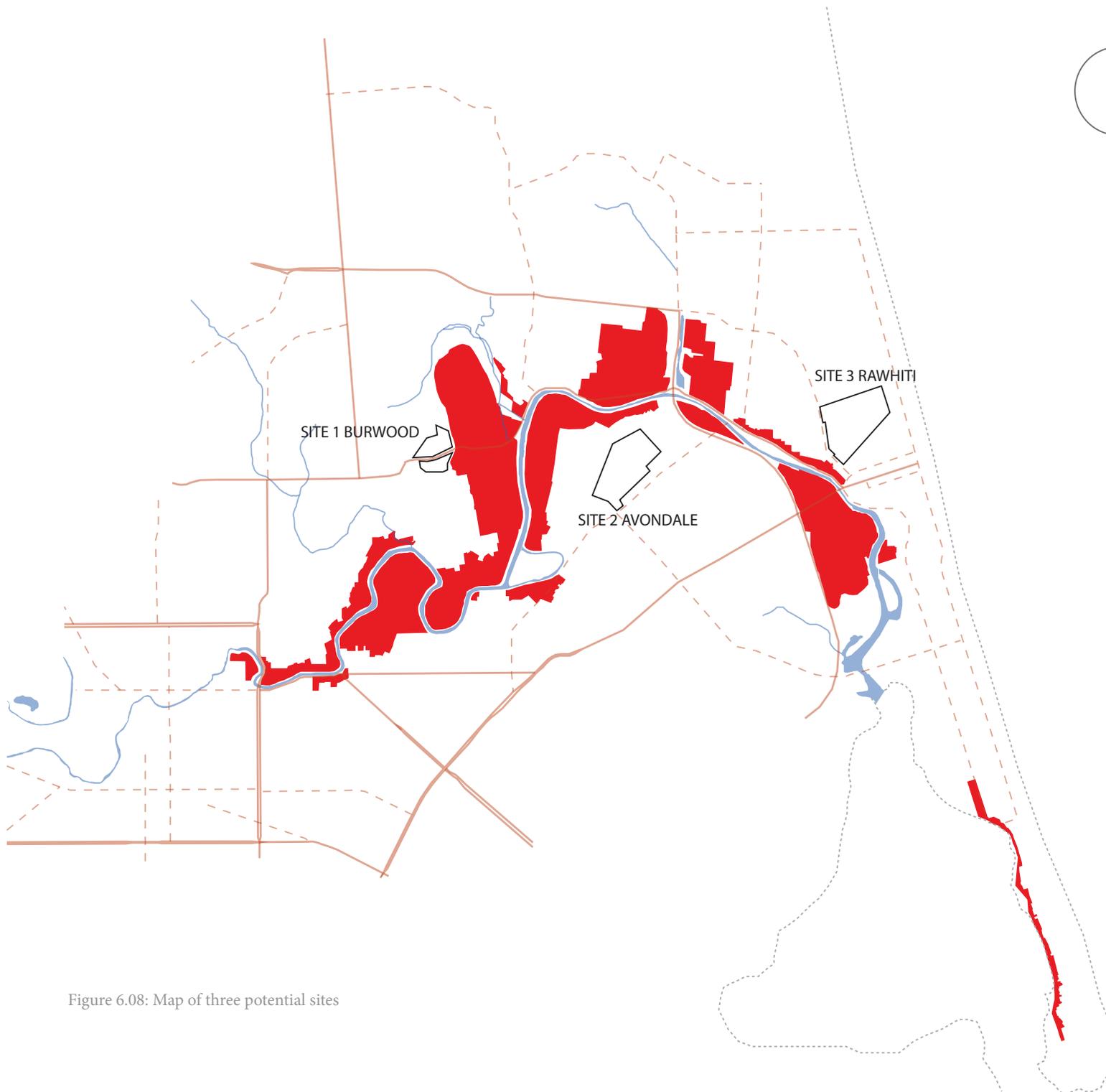
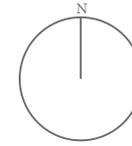


Figure 6.08: Map of three potential sites

The solution is a programme swap. If parks and recreation spaces that are currently located on good land in East Christchurch are moved to the red zone, then medium density developments can be created on the good land that was occupied by sports or recreation facilities. As the red zone represents land susceptible to damage from future earthquakes, it is logical not to invest capital in such a vulnerable area. In case of future earthquake, the housing stock will be largely safe and repairable, leaving the parks and fields suffering from most damage. A field will be much cheaper to fix than a block of housing.

This swap of programme also has the potential to create a city to sea park and recreation zone which will link with surrounding facilities and reserves to create a large green 'vein' of varying functions and extensive biodiversity (figure 6.09 and figure 6.10).



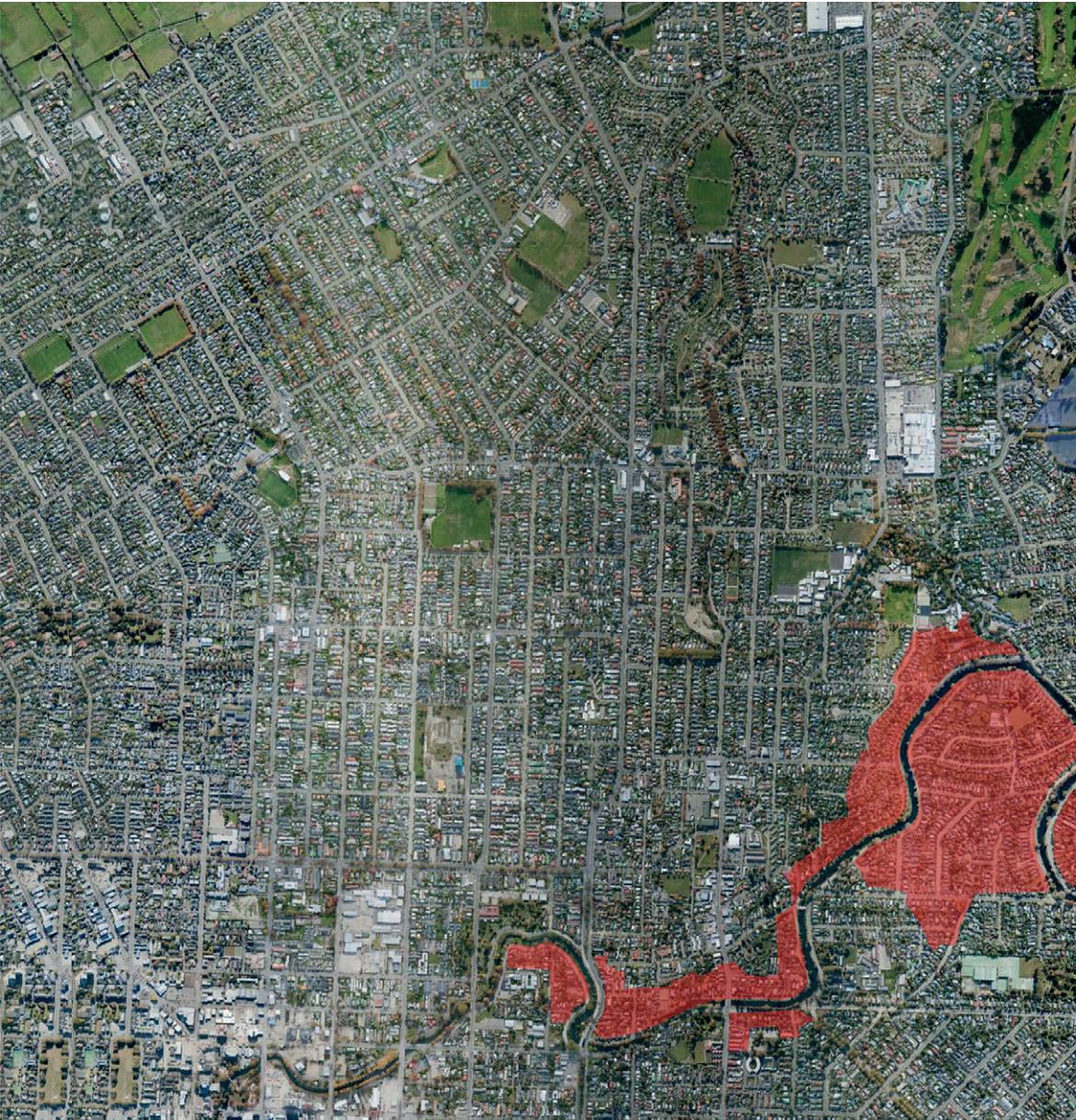


Figure 6.09: Aerial image of East Christchurch with red zones and potential sites indicated



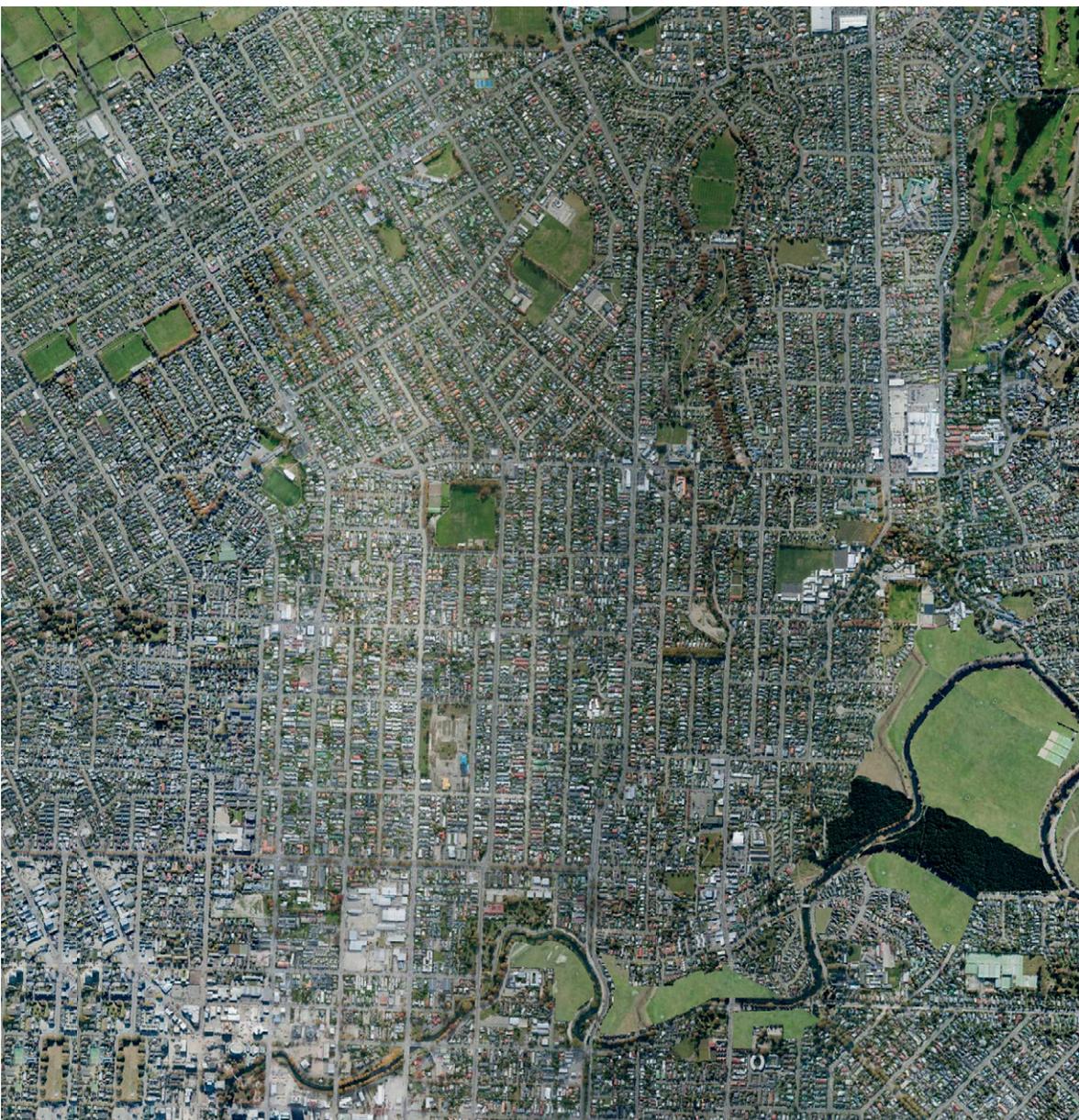


Figure 6.10: Photoshopped aerial image of red zoned land turned to parks, reserves and recreation spaces and sites turned into housing



## SITE ANALYSIS

The Burwood Park site was chosen as the site for detailed design for the following reasons:

- Burwood is a thriving East Christchurch family suburb.
- Burwood is located close to a range of primary, intermediate and secondary schools and one of the main retail areas in East Christchurch
- Burwood has a strong sense of community.
- Burwood is also one of the most damaged suburbs
- the site is close to existing infrastructure and the red zone

The site consists of a mix of programme and can occupy a wide range of activities. It, like much of Christchurch is on a flat site. New Brighton Road runs through the park but is a vital link between Burwood and New Brighton.

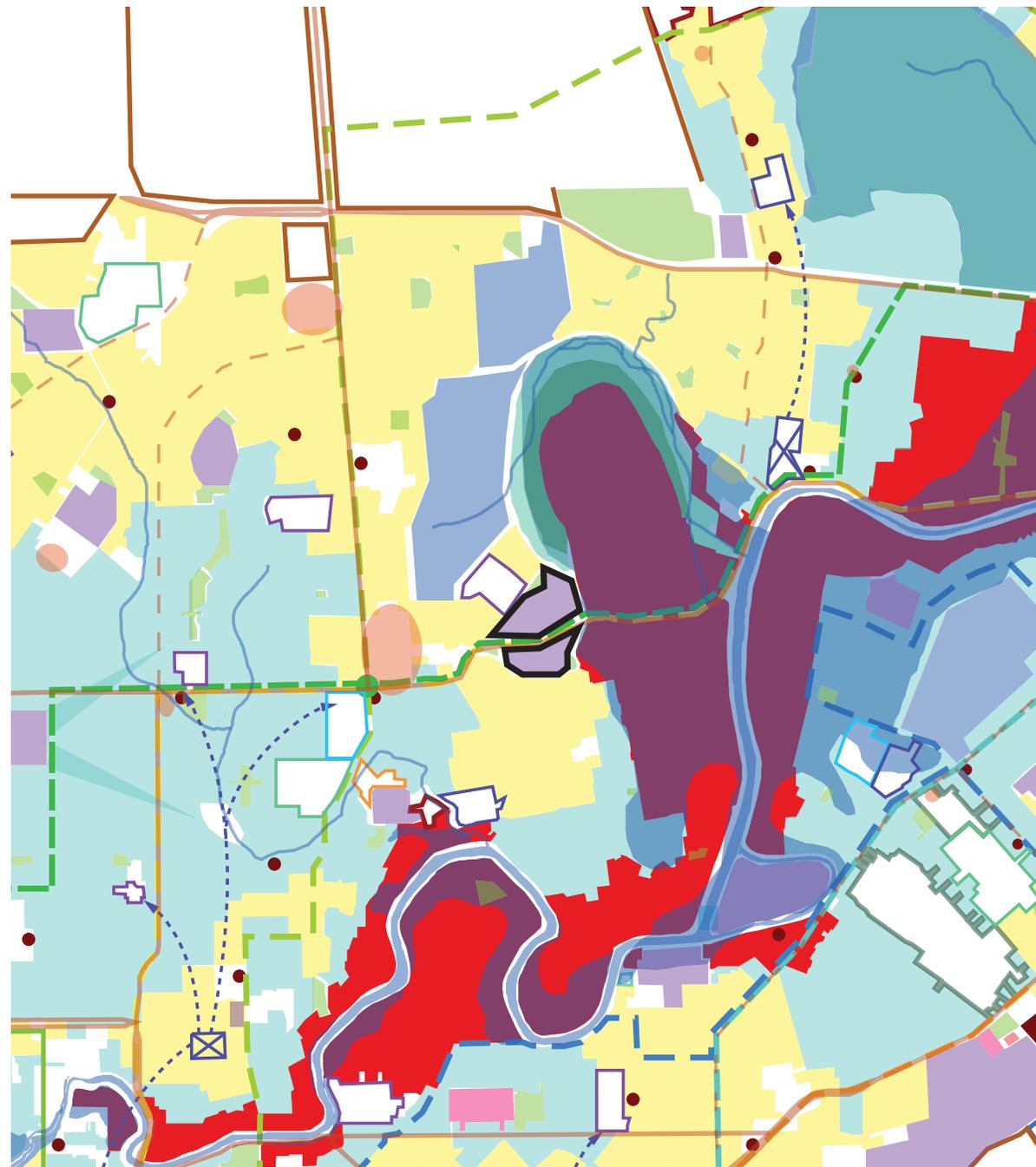
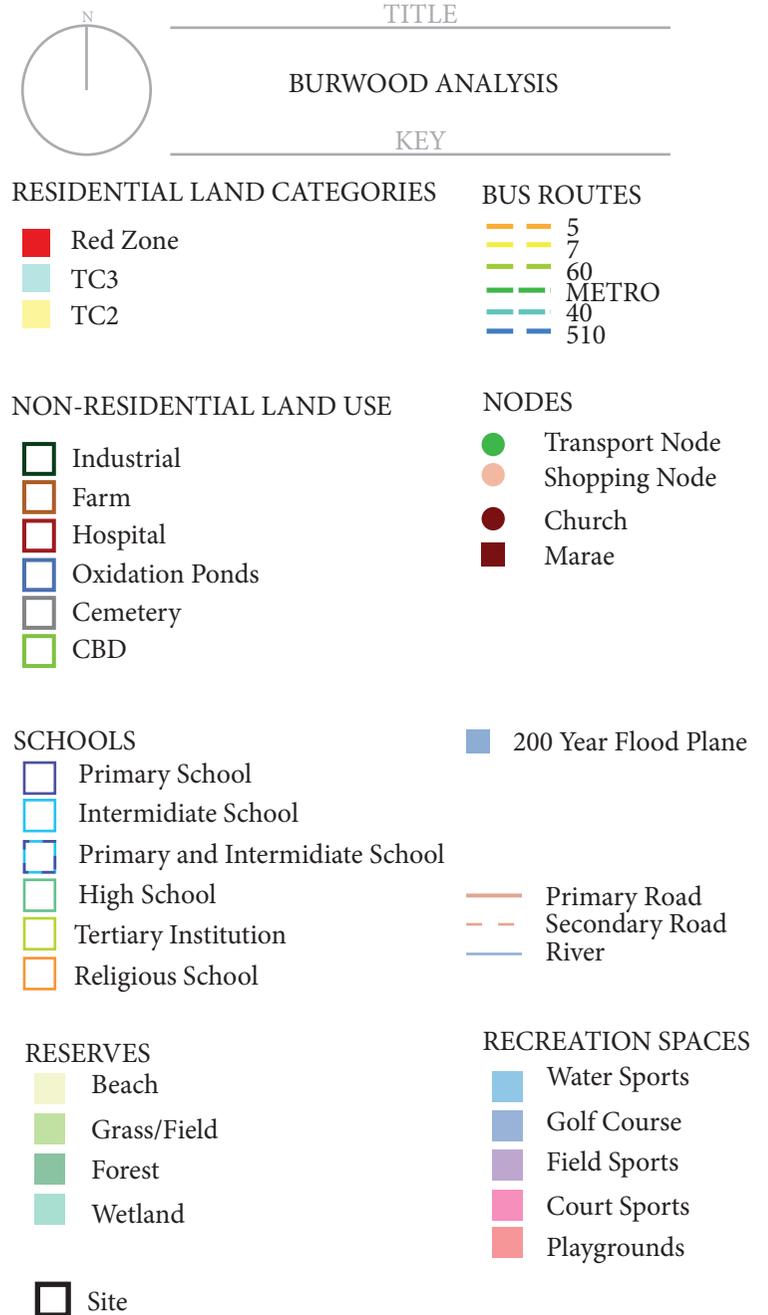


Figure 6.11: layered analysis of central East Christchurch with Burwood park at the centre.



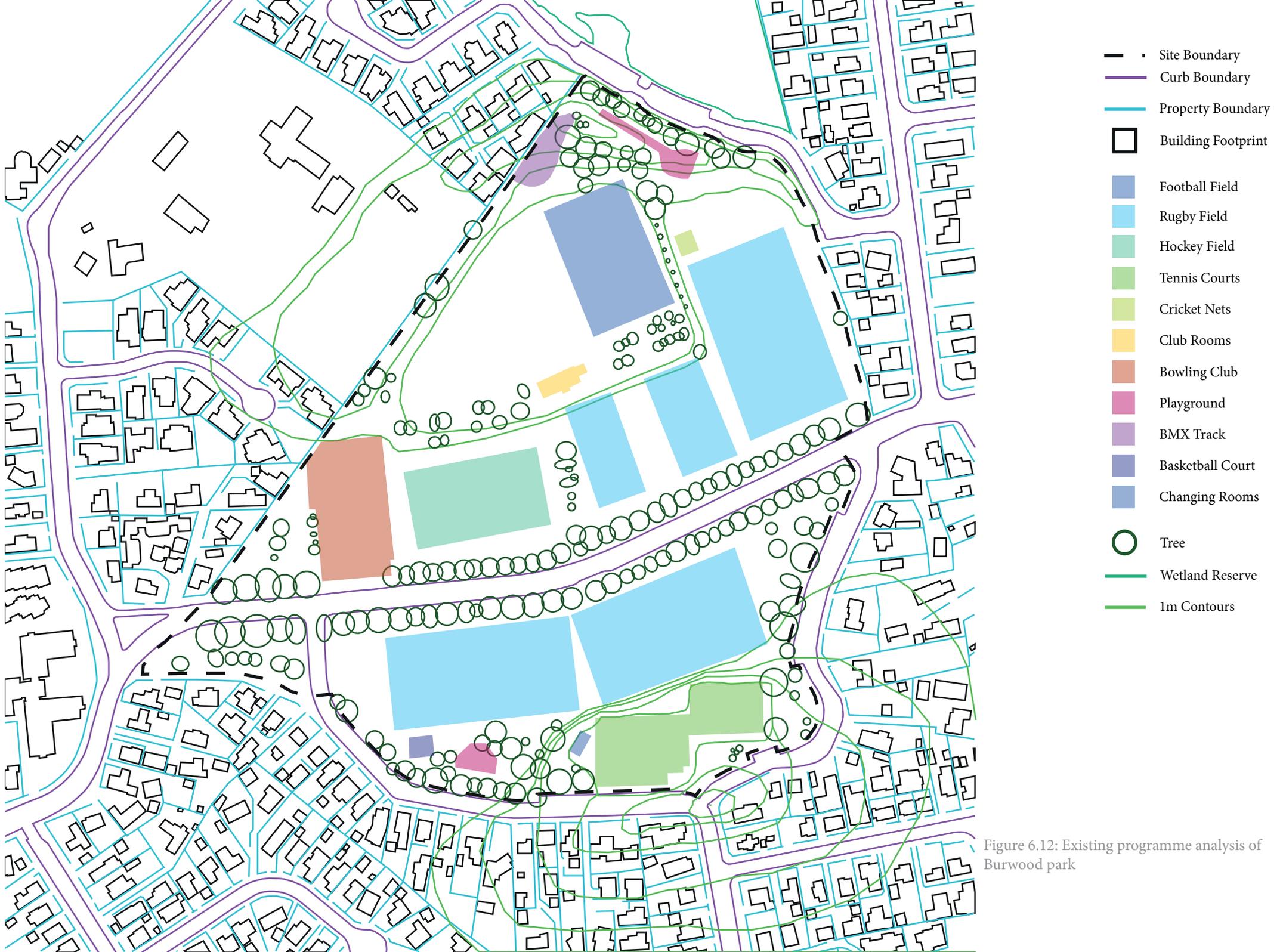


Figure 6.12: Existing programme analysis of Burwood park

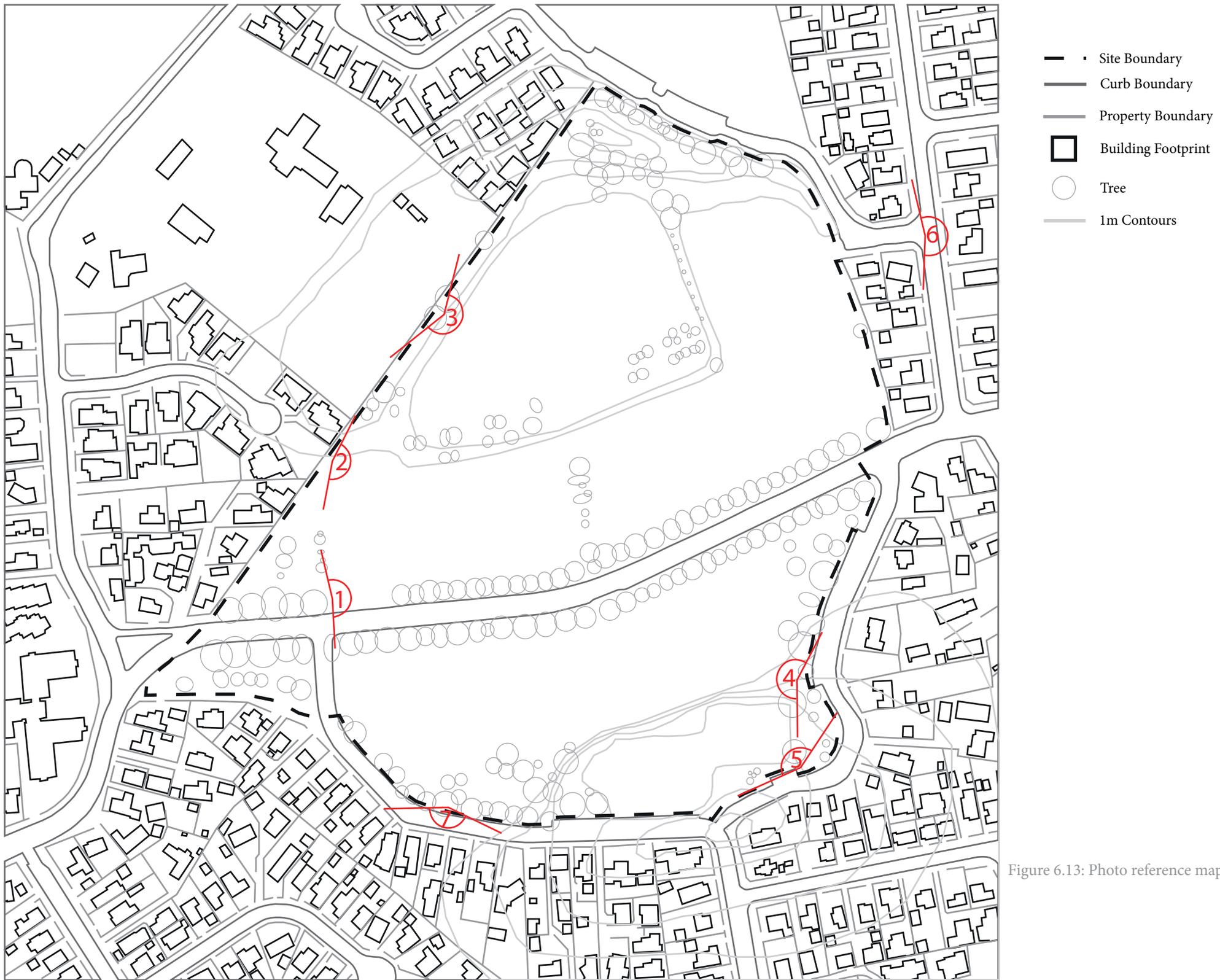


Figure 6.13: Photo reference map

1



Figure 6.14: Burwood park hockey field

2



Figure 6.15: Burwood park

3



Figure 6.16: Burwood park football field

4



Figure 6.17: Burwood park rugby field

5



Figure 6.18: Burwood park tennis courts

6

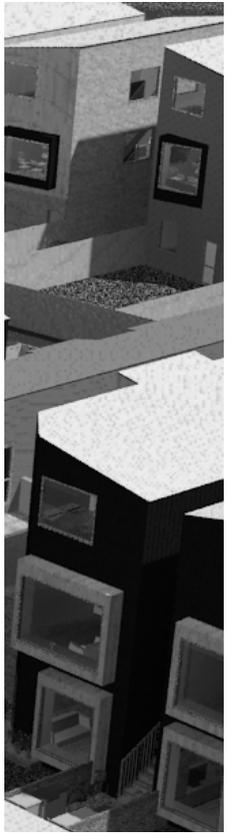
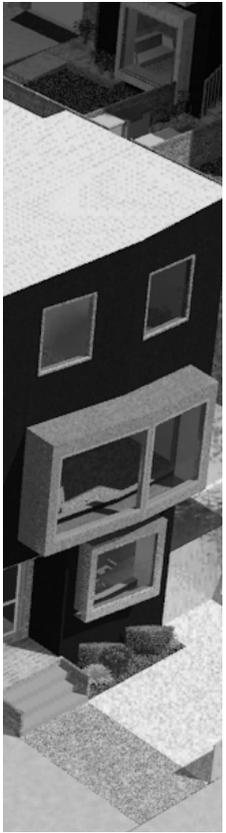
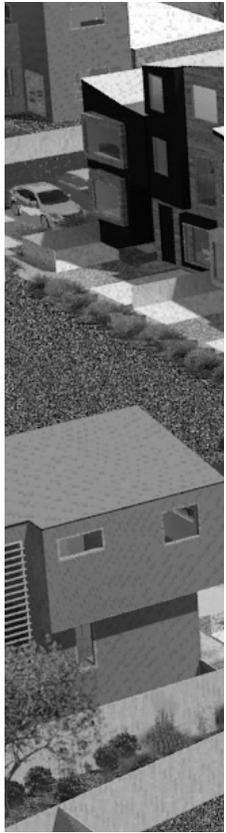
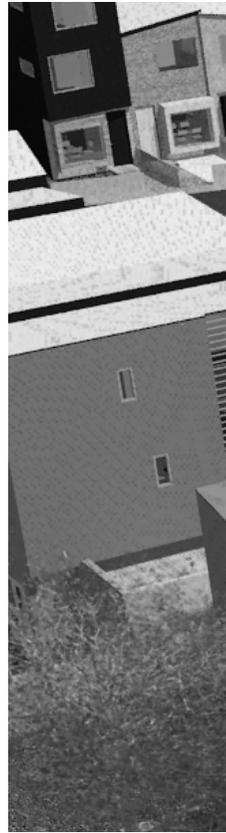
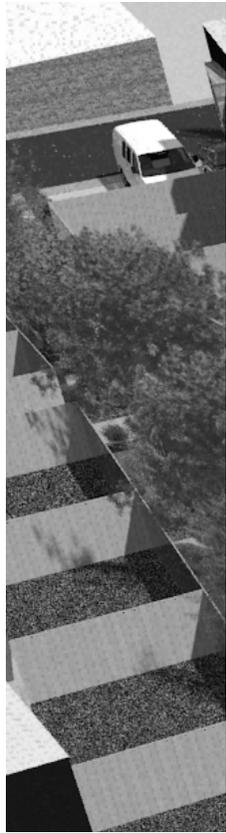


Figure 6.19: Partially demolished Burwood red zone

7



Figure 6.20: Current Burwood housing



## CHAPTER SEVEN

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# DESIGN TESTING

The current single detached housing typology that almost exclusively features within the suburbs of East Christchurch does not offer efficient or sustainable densities. The generous portions of land on all sides of the dwelling restrict the potential for higher densities. In addition this typology is frequently single storey. To achieve higher densities, designs have to become more compact. But more compact living spaces tend to limit flexibility and restrict lifestyle. It is therefore the aim of this chapter to design typologies and a corresponding urban environment that will allow present and former East Christchurch residents the opportunity to fulfil their desired lifestyle within a medium density context.

## Urban Design

It is important to consider the environment in which the house sits. The suburban environment does not create the most socially ideal physical environment. Low density, houses far away from boundaries and vehicle priority has generated intensely private neighbourhoods. The purpose of urban design is to create an urban environment that achieves density, provision of privacy, appropriate sunlight access, sufficient and subtle vehicle provision and the provision of private and social spaces.

## Typology Design

The Row House has proven to be a compact and versatile design used by architects and planners for hundreds of years in many cities around the world and is the primary means for investigation in this thesis. Row housing is a simple template of rectangular plan with multiple levels with identical units repeated side by side. Yet row housing has many variables:

- Footprint; the size and ratio of the footprint can provide a variety of form options and are able to facilitate different configurations of internal spaces
- Height; traditionally row houses are two storeys in height however there are examples of 3 or 4 storeys and even single storey terraces are common in Australia
- Facade; the endless possibilities of form, detail and proportions allow an immense range of variation and the articulation of façade elements
- Repetition; the repetition of the above elements or the disregard of which can create interesting neighbourhoods with strong place identity

The design strategy within this research is to simultaneously design housing typologies with urban typologies. This ensures each aspect develops along with the other and consequently supports critique and development of the other. In addition to this, different methods of research for design (chapter three through chapter six) will be used to direct design toward a desirable conclusion. As a result of this process four distinct design generations were created. Each generation attempts to answer the aim of the thesis. Though a single generation may not entirely satisfy the aim, it is used to test the research at that stage of the thesis. In this respect it helps move the design forward.

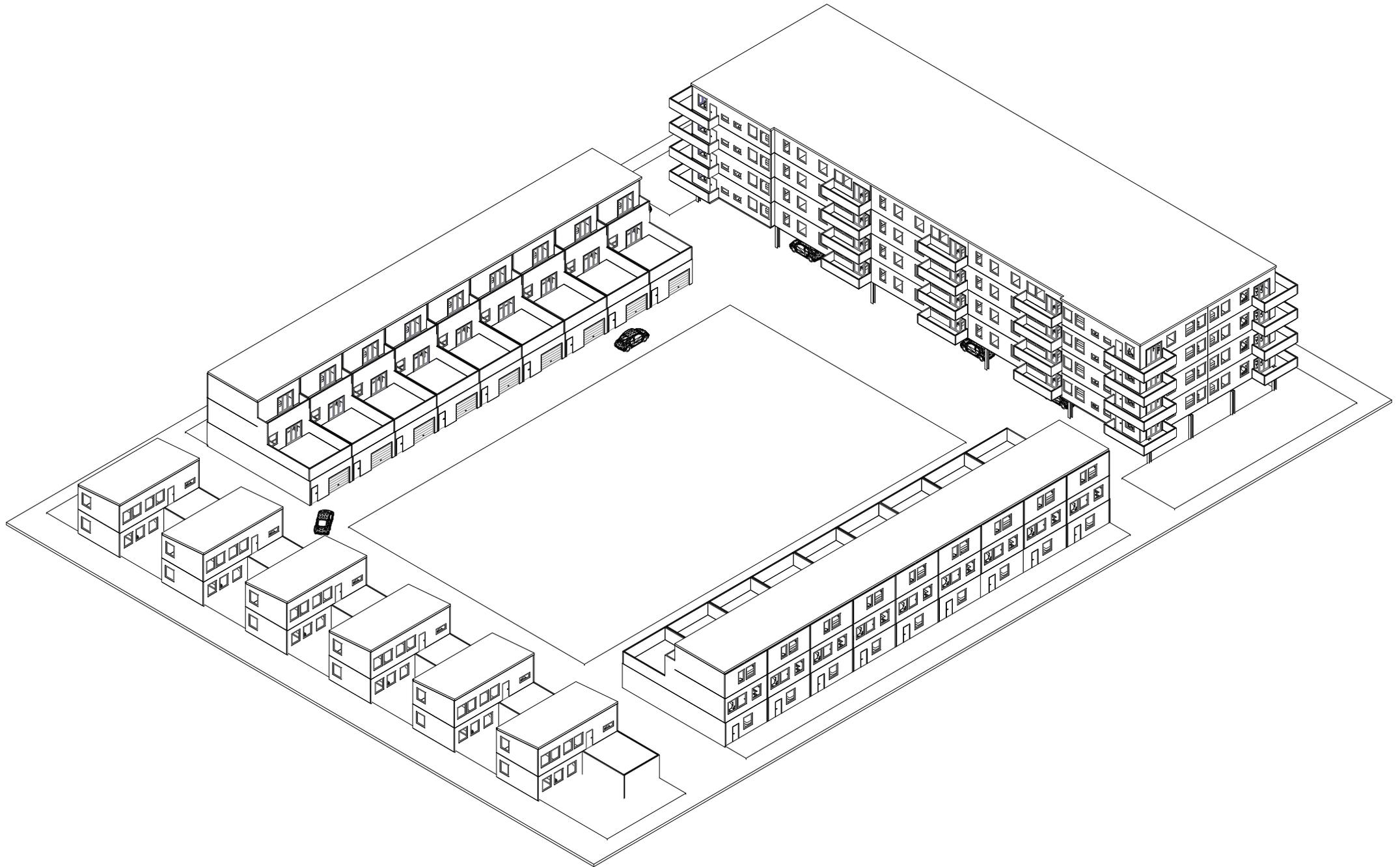


Figure 7.01: Design generation one 3D axo of prototype block

## DESIGN GENERATION ONE

Design generation one contains 96 units with 5 variations over 1.53 hectares of land giving 63 dwellings per hectare.

This initial block was a quick first design that accelerated the design process, and represents 'square one' in the design process. It is meant to be considered as a prototype block that could be adapted to varying sites across East Christchurch. It forms a block with an internal public space which is surrounded by housing options. The following issues were quickly realised:

### Urban Design:

- the diversity is very limited with only two housing options and three apartment options.
- the row houses are relatively large and do not offer flexibility in living options.
- similarly the generic nature of the apartments do not support an East Christchurch lifestyle.
- with minimal outdoor private space many of the activities valued by East Christchurch cannot be supported.
- the apartment was useful for raising the density however, the large monolith scale of the building does not sit well within the desired medium density block.

### Typology Design:

- vehicle access from the inside of the block alleviates vehicle pressure from the roads surrounding the block, however, it has merely shifted the problem to the inside of the block. The internal public space is now surrounded by a

wall of garages

- there is a very limited amount of private outdoor space
- designs are not compact enough
- lack of diversity between units with only one type of row house
- apartment designs do not suit a suburban context

Despite the list of issues with design generation one, some benefits were experienced and offered guidance for future designs. This design proved early on in the design process that high densities can be achieved while still offering an abundance of open public space. To achieve this again the next design had to achieve lots of open space without an apartment block that is six storeys high. The typologies had to remain within three floors. Similarly row house typologies had to become more varied and offer windows on both sides of the ground floor. This will require a better garaging strategy that does not shift the problem to another public area.

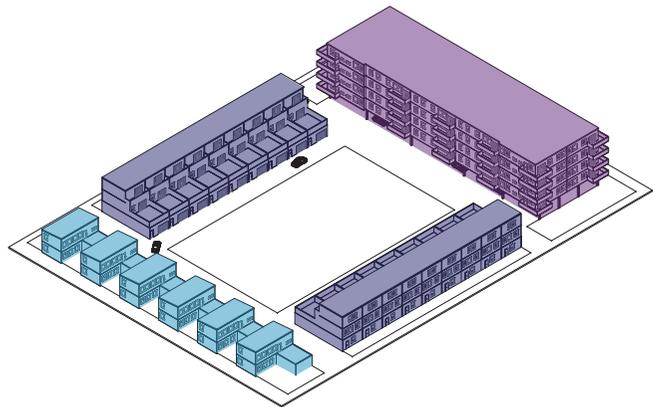


Figure 7.02: Diagram of different typologies

### Courtyard House

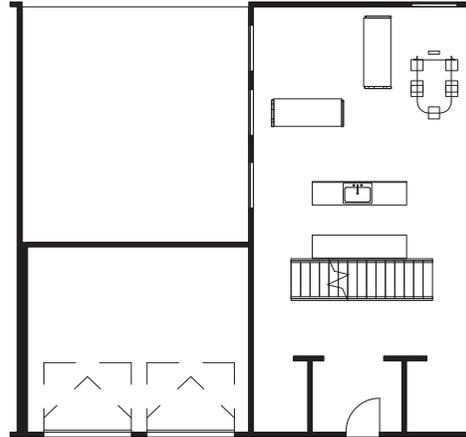


Figure 7.03: Ground floor @ 1:200

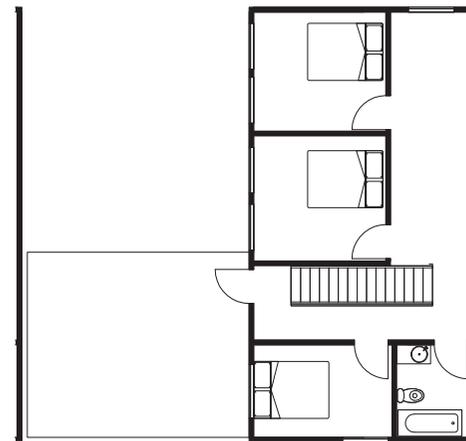


Figure 7.04: First floor @ 1:200

### Row House

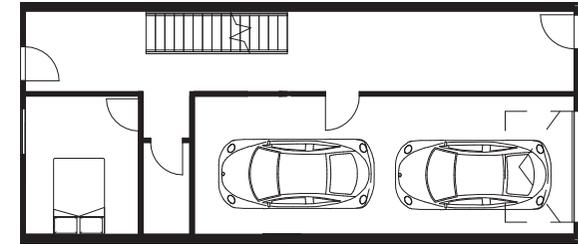


Figure 7.05: Ground Floor @ 1:200

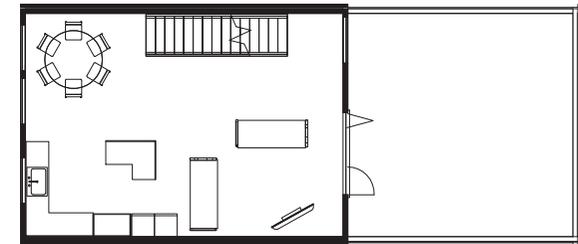


Figure 7.06: First floor @ 1:200

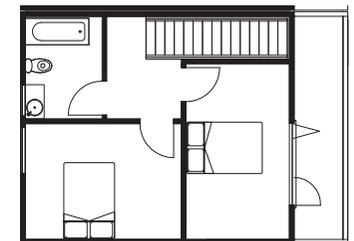


Figure 7.07: Second floor @ 1:200

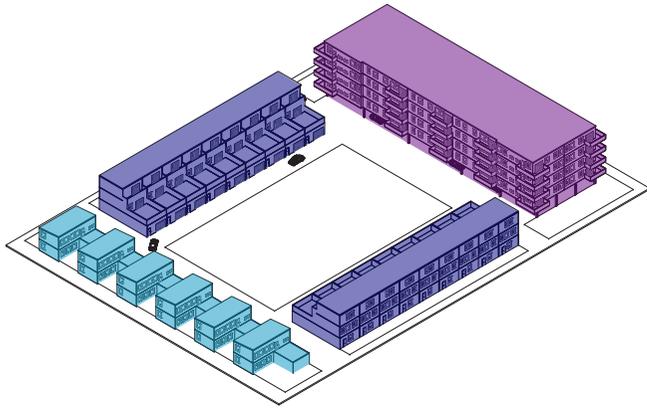


Figure 7.08: Diagram of different typologies



Figure 7.09: Diagram of apartment plan

APARTMENT TYPE 1

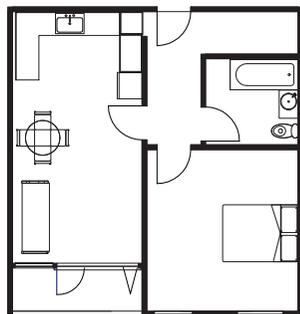


Figure 7.10: Plan @ 1:200

APARTMENT TYPE 2

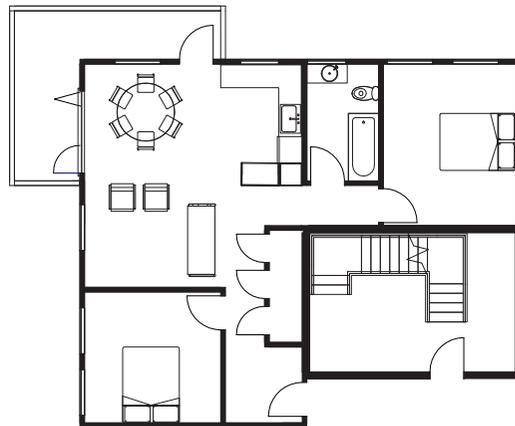


Figure 7.11: Plan @ 1:200

APARTMENT TYPE 3

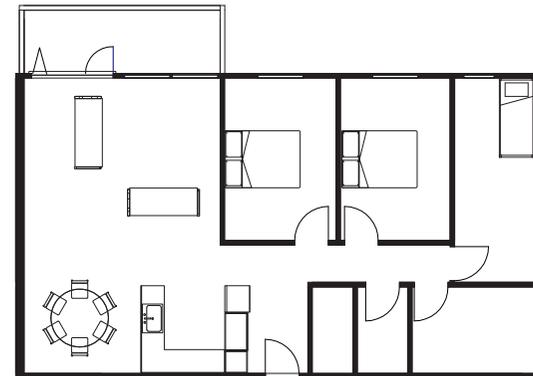


Figure 7.12: Plan @ 1:200

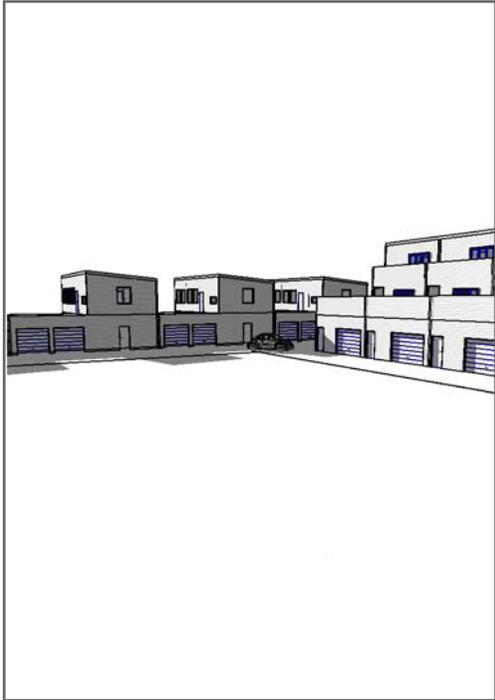


Figure 7.13: Courtyard view

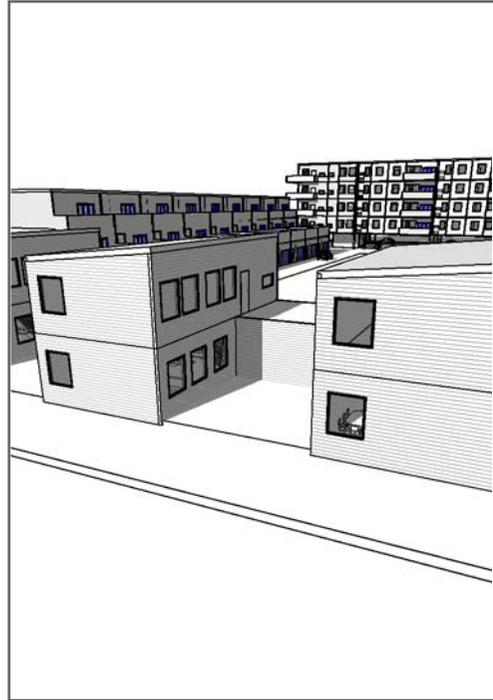


Figure 7.14: Courtyard typology view

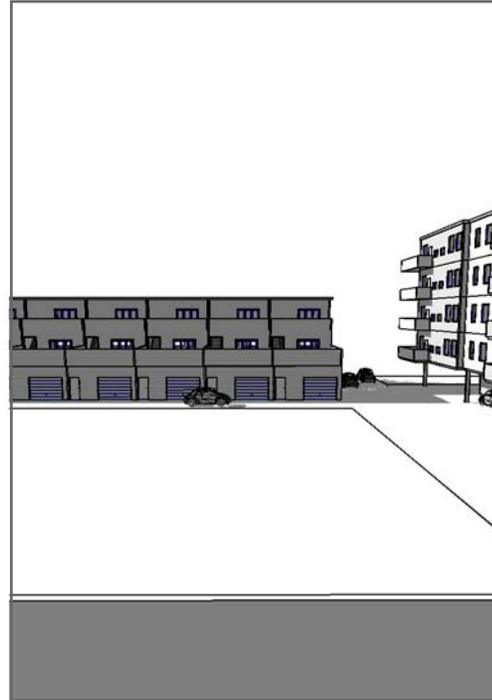


Figure 7.15: View from row house balcony

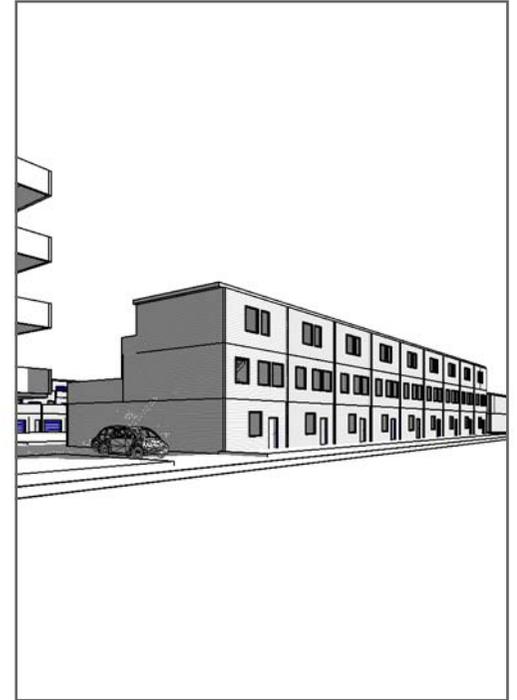


Figure 7.16: Street view





## DESIGN GENERATION TWO

Also following a perimeter block design and intended to be another prototype block, generation two is a refinement of the principals of generation one. More diversity is introduced with more compact and flexible living options, as well as a refined internal space. Most of the garaging has been located at the centre of the block in garage hubs where residents store their cars and go for a short walk to their homes. The rest of garaging has been attached to some residences that are furthest away from the garage hubs. Row houses which do not have attached garages offer a very street friendly design. Apartment units are placed at the corners of the block with open car storage below and two storeys of apartments. Further apartment options exist above the garage hubs.

Design generation two contains 64 units with 9 variations over 1.46 hectares of land giving 44 dwellings per hectare.

Though this generation benefits from an increase in research the following criticisms emerged from critical consideration of the design:

Urban design:

- large internal space may be too passively viewed
- large internal space is perhaps too large for every block to contain one
- too regular in nature with repeated components placed similarly around the block without achieving sense of place
- Eastside specifics are not clear in the urban design

Typology design:

- generic use of row house
- it is very much a planners design as opposed to an architects
- Eastside specifics are not clear in the typology design
- the backyards were small and not private and none of the backyards had rear vehicle access

Among the criticisms, however, there were lessons to be learned from this design:

- the desired density of 40 units per hectare is achievable through efficient housing design
- large amounts of public space are still easily achieved at 40 units per hectare
- car hubs effectively remove the visual impact of cars. However, on street parking was not possible with the use of a private parking space on the street façade

The following lessons need to be translated into generation three.

- apartment designs that satisfy East Christchurch Lifestyle
- public space is still too large to be frequently repeated
- more interesting geometry, both urban and architectural, will allow variation and character to develop

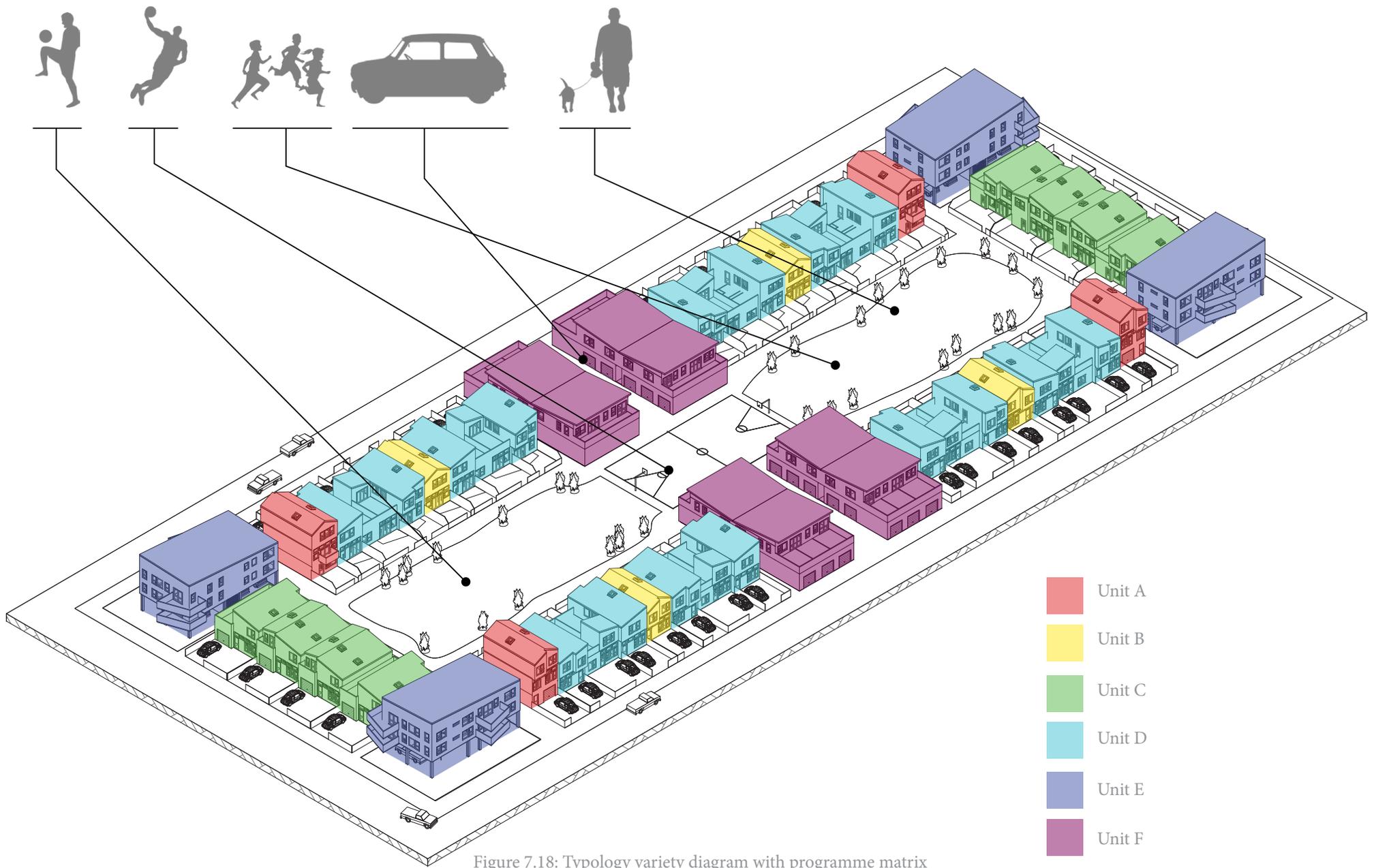


Figure 7.18: Typology variety diagram with programme matrix

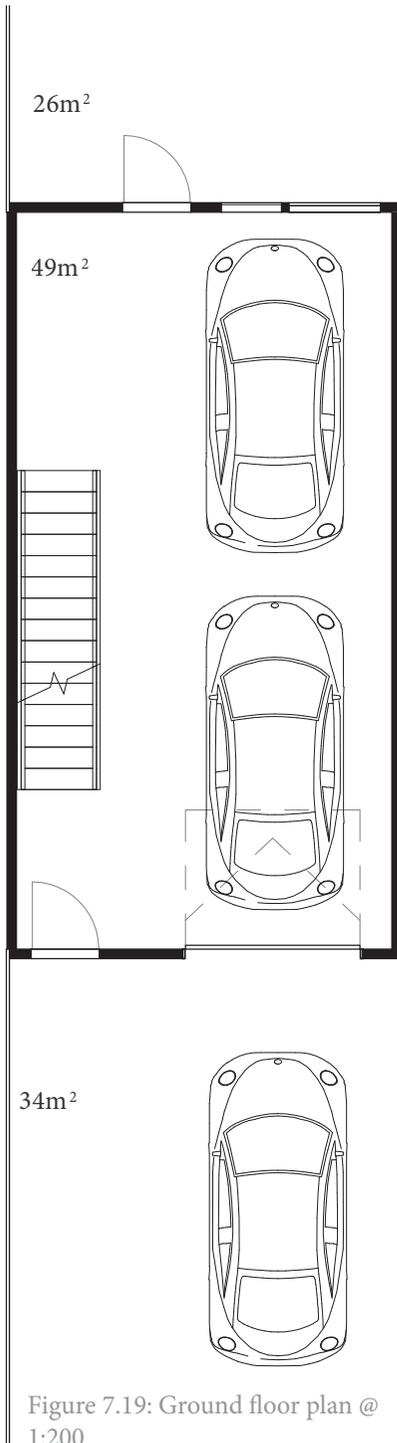


Figure 7.19: Ground floor plan @ 1:200

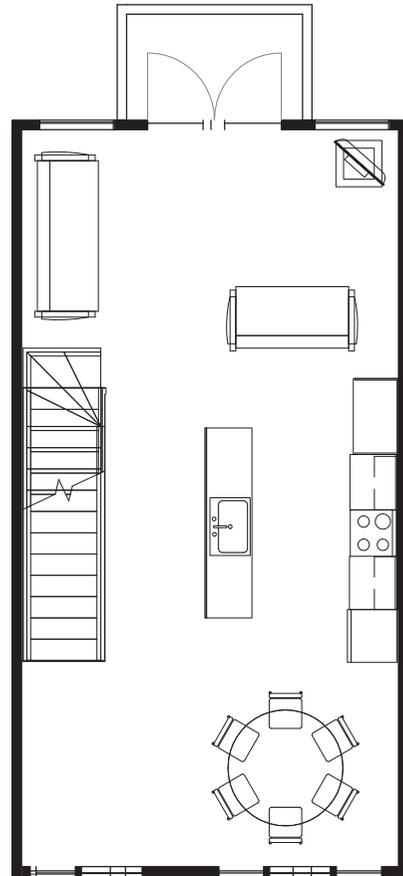


Figure 7.20: First floor plan @ 1:200

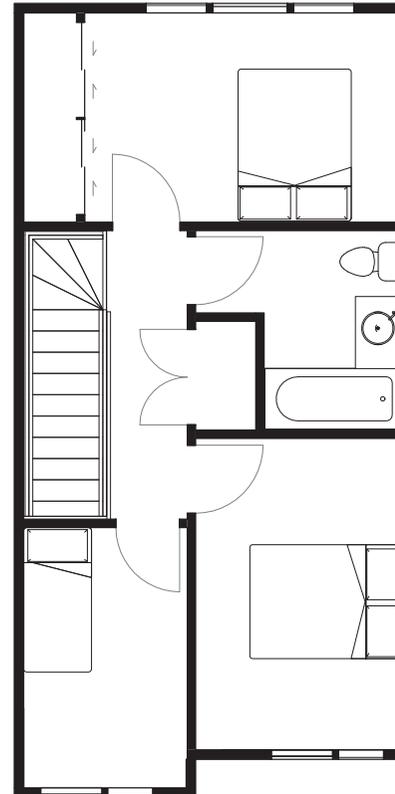


Figure 7.21: Second floor plan @ 1:200

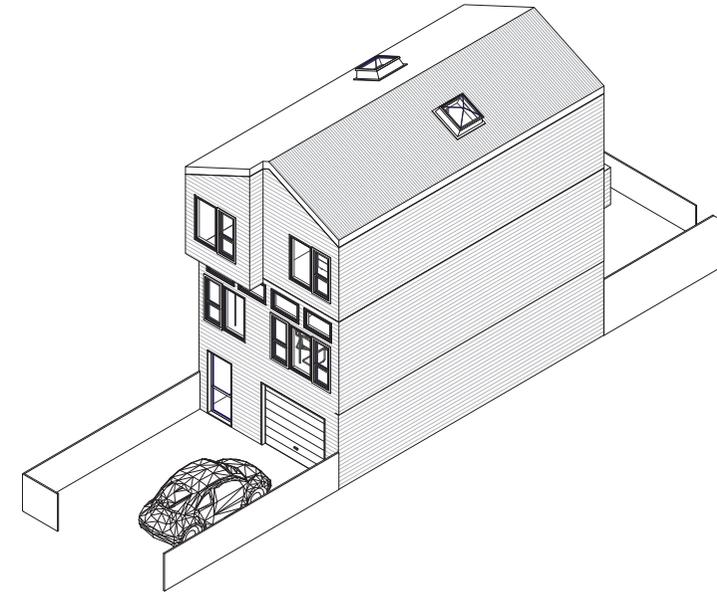


Figure 7.22: 3D view @ 1:500

## UNIT A

Unit A offers a simple row house configuration with stacked garaging on ground floor, living on first floor and private rooms on the second floor. The large garage space offers a flexible space for activities and has potential to be converted to a study or another bedroom. This typology will suit inhabitants who have a space demanding hobby, require a large attached workshop space or foresee future family growth.



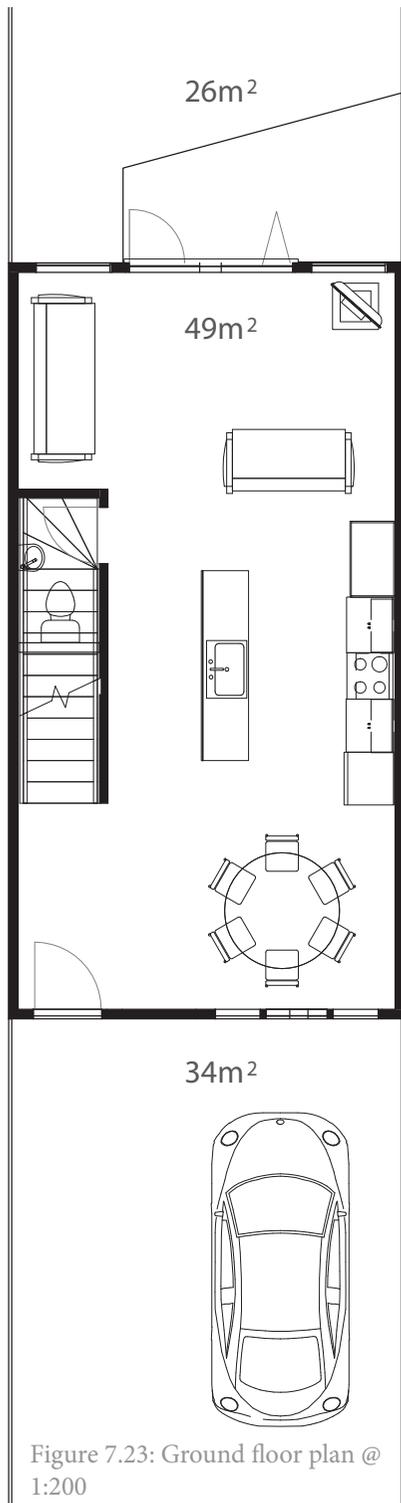


Figure 7.23: Ground floor plan @ 1:200

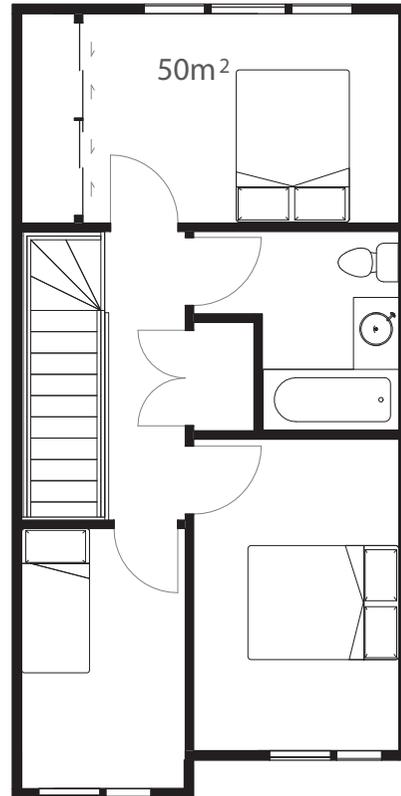


Figure 7.24: First floor plan @ 1:200

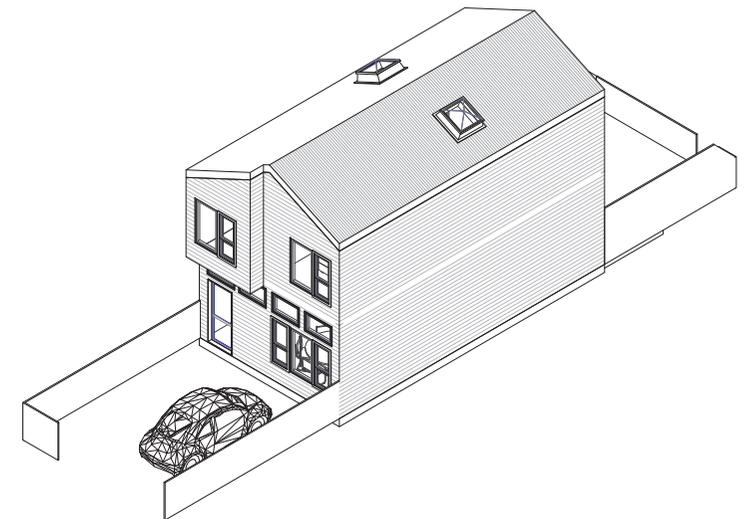


Figure 7.24: 3D view @ 1:500

## UNIT B

Unit B offers a simple row house configuration with detached garaging. A parking bay exists on ground floor. Living is on the ground floor and private rooms located on the first floor. The plan offers a flexible arrangement of living spaces depending on one's preferences. The upper floor can be either 2 or 3 bedrooms. Out door spaces extend from the living areas.



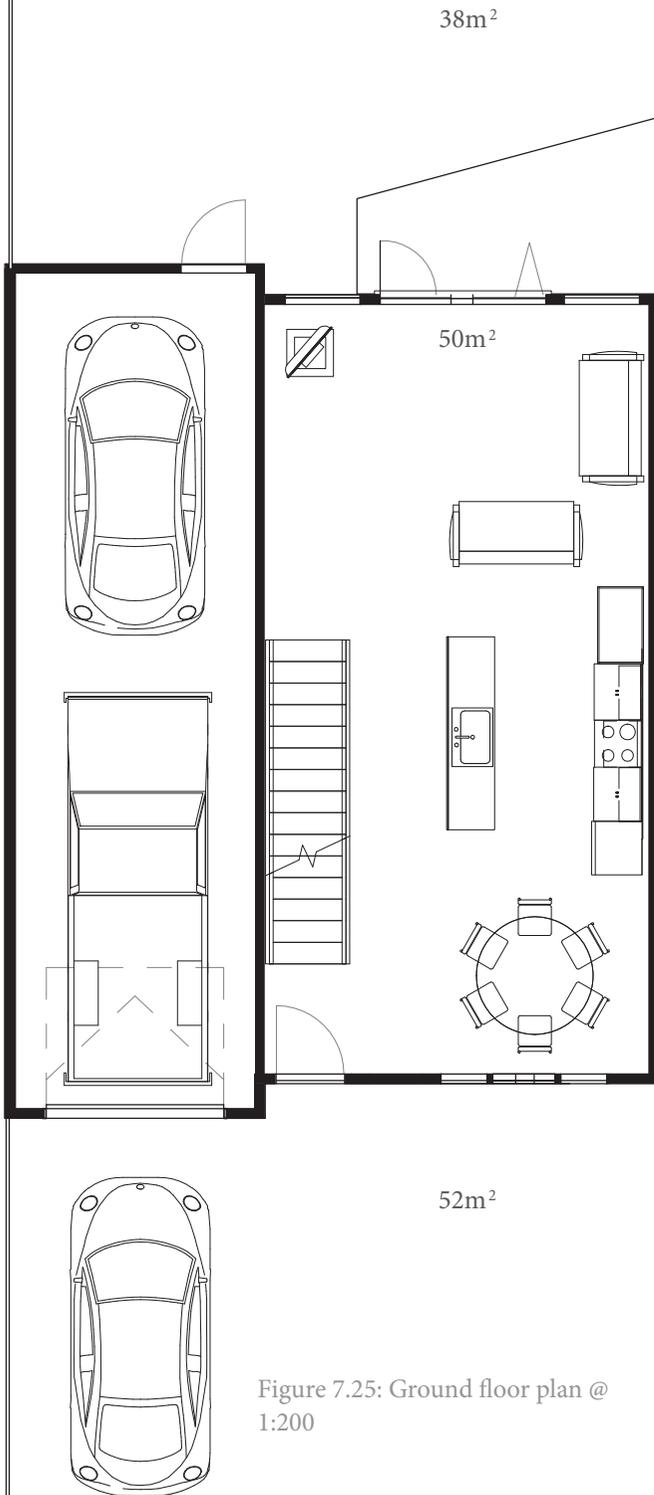


Figure 7.25: Ground floor plan @ 1:200

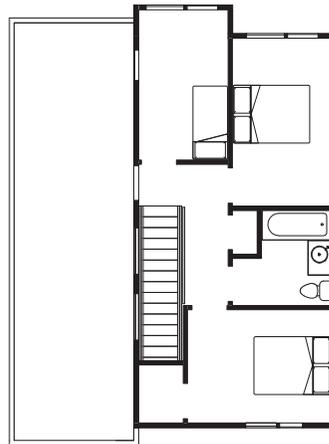


Figure 7.26: First floor option @ 1:200

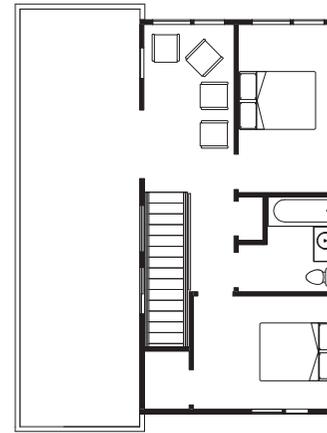


Figure 7.27: First floor option @ 1:200

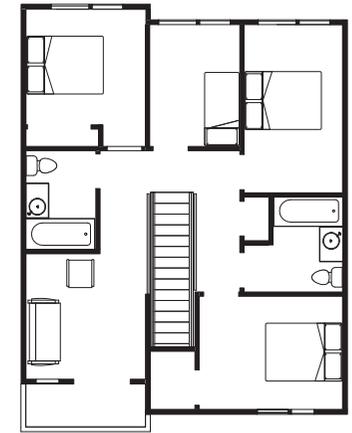


Figure 7.28: First floor option @ 1:200

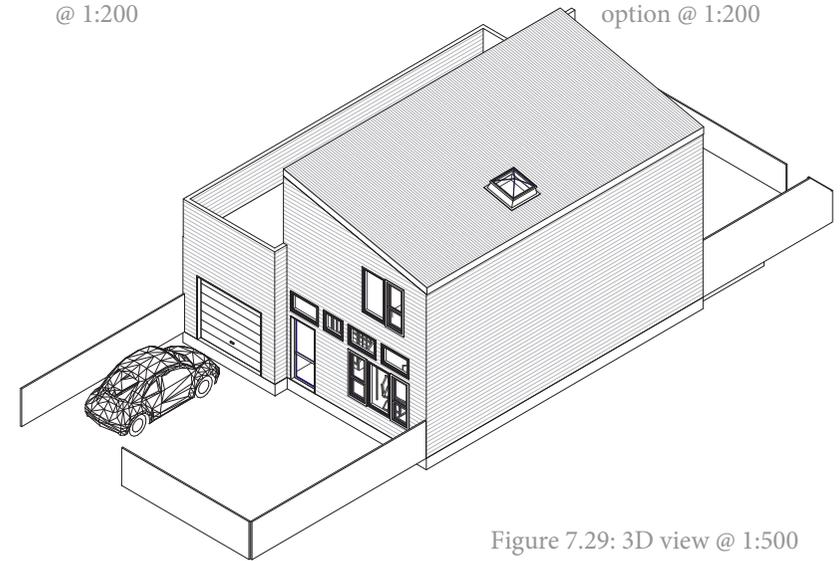


Figure 7.29: 3D view @ 1:500

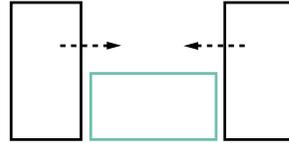
## UNIT C

Unit C offers a simple row house configuration with an attached garage whose roof terrace can be used as an outdoor space or to extend the living options. A parking bay exists on ground floor. Living is on the ground floor and private rooms located on the first floor. The plan offers a flexible arrangement of living and private spaces that can support the growth of a changing family. Unit C also offers larger outdoor spaces to accommodate growing inhabitants.



# UNIT D

Unit D is a hybrid typology that combines a one storey unit inbetween two row houses that utilise the roof space of the lower unit.



## UNIT D-1

Unit D-1 is similar to Unit C but instead of an attached garage, it is attached to the lower unit. This offers a larger roof terrace in which to extend the home or to use as a roof terrace.

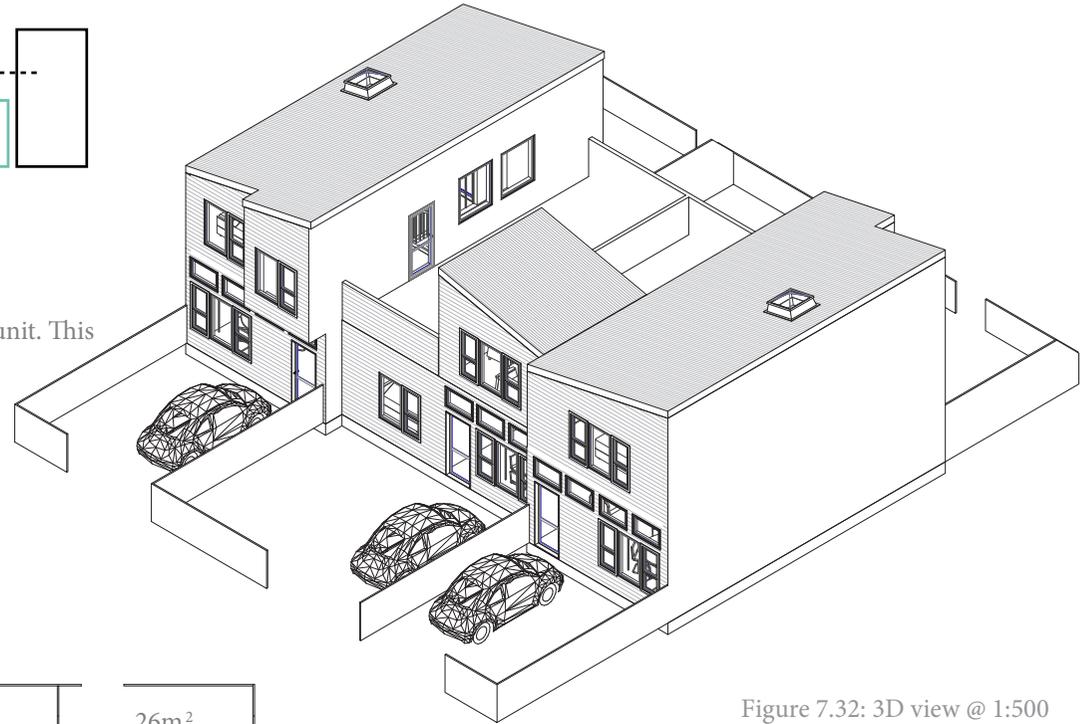


Figure 7.32: 3D view @ 1:500

## UNIT D-2

Unit D-2 is aimed at offering affordable housing to disabled persons. It is kept to a single storey and offers a compact design that contributes to density of the block. Unit D-2 has much larger garden spaces and may also appeal to an older generation. Unit D-2 can come with a single garage option.

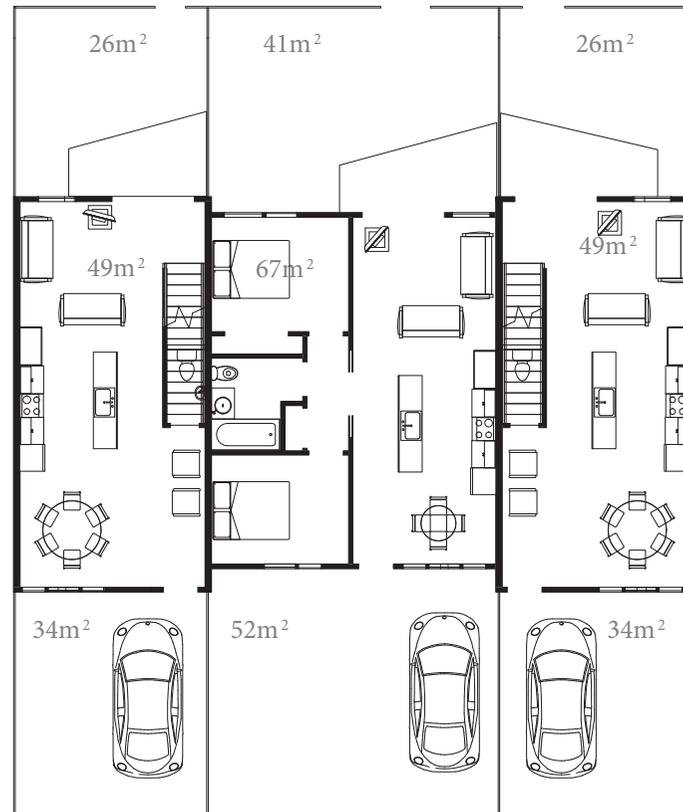


Figure 7.30: Ground floor plan @ 1:200



Figure 7.31: First floor plan @ 1:200

# UNIT E

Unit E is aimed to be an affordable apartment option within a medium density context. It offers a compact design that takes advantage of a triple aspect, Covered parking exists below the apartment with one car per unit. There are 2 units on each of the 2 floors. These apartments would suit people looking for affordable living without having to maintain open spaces while still able to take advantage of the public spaces. The apartments are kept low to reduce shadowing over the neighbouring houses and public spaces.

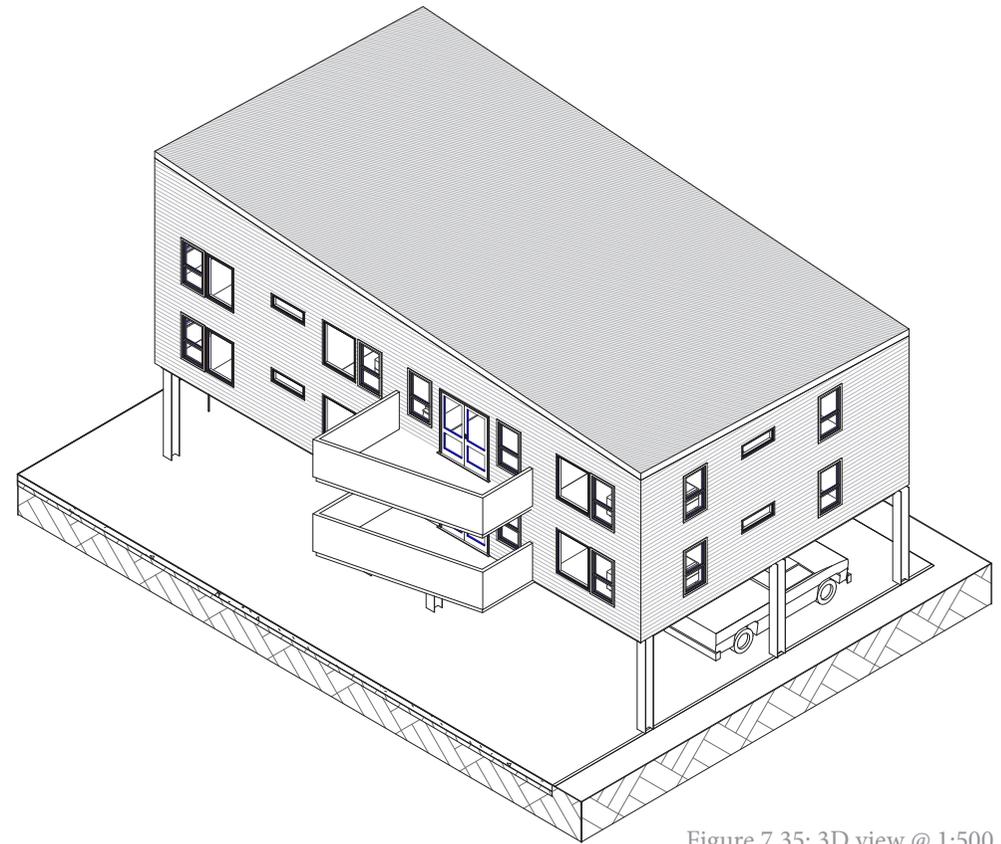
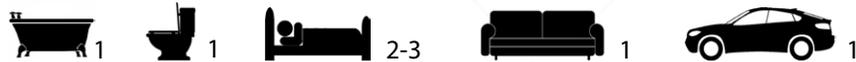


Figure 7.35: 3D view @ 1:500

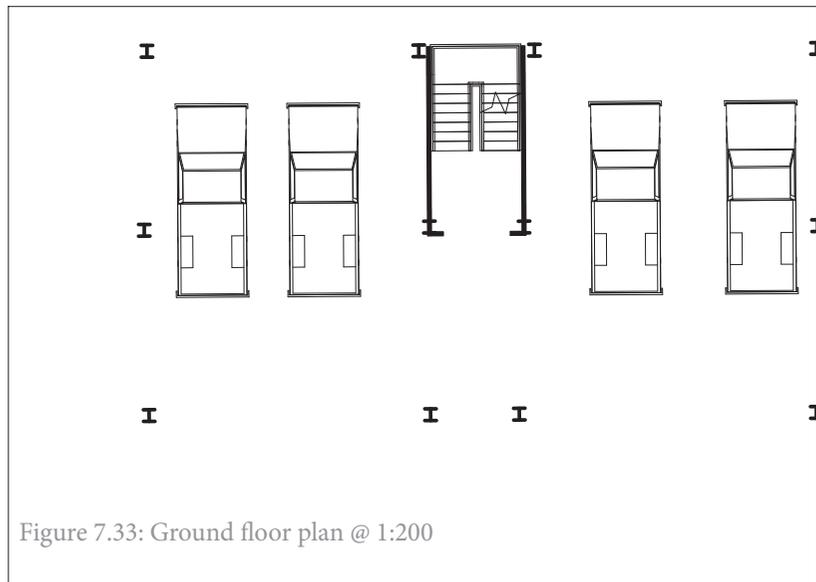


Figure 7.33: Ground floor plan @ 1:200

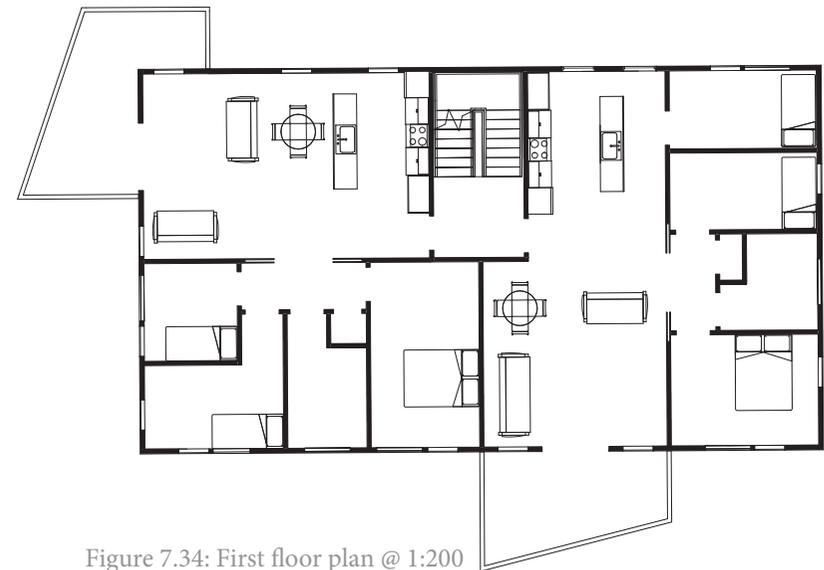


Figure 7.34: First floor plan @ 1:200

# UNIT F

Unit F is also aimed to be an affordable apartment option within a medium density context. Unit F is located above the private garages at the centre of the block. Despite being an apartment, the area offers ample outdoor space for an apartment. It offers a compact design that takes advantage of a triple aspect, and parking is in one of the garages below. These apartments would suit people looking for affordable living without having to maintain open spaces while still able to take advantage of the public spaces. The apartments are kept low to reduce shadowing over the neighbouring houses and public spaces.

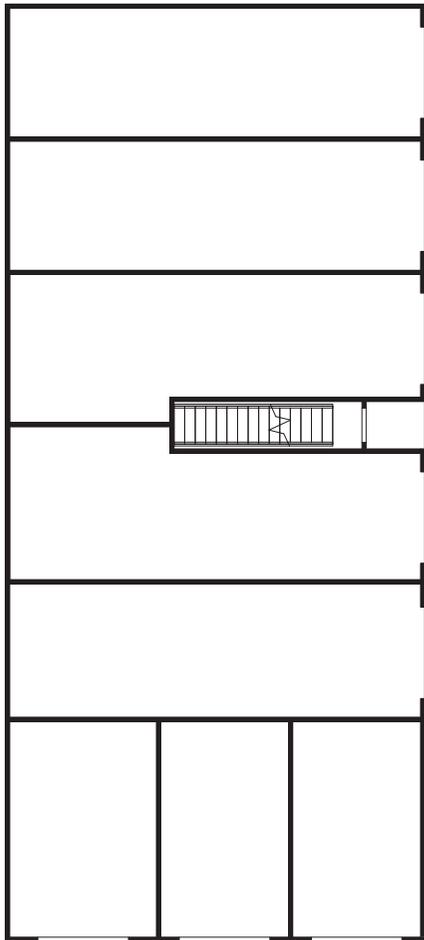
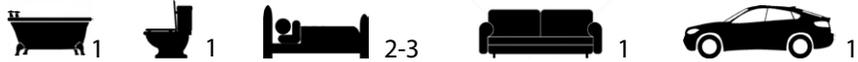


Figure 7.36: Ground floor plan @ 1:200

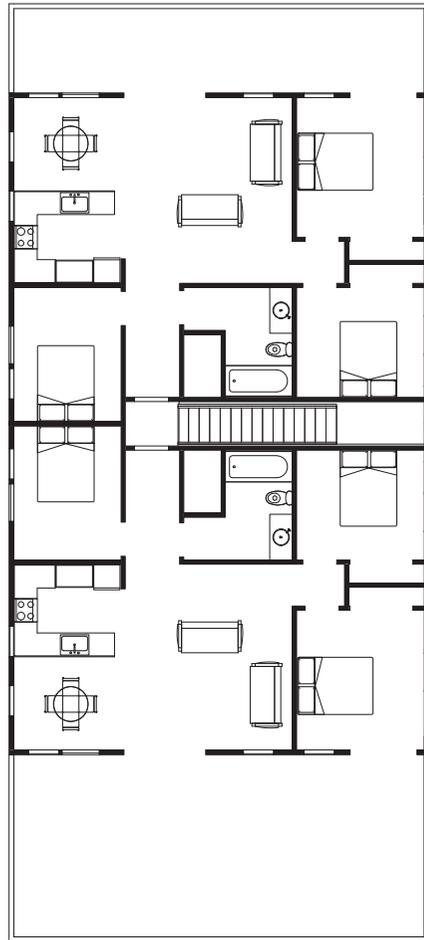


Figure 7.37: First floor plan @ 1:200

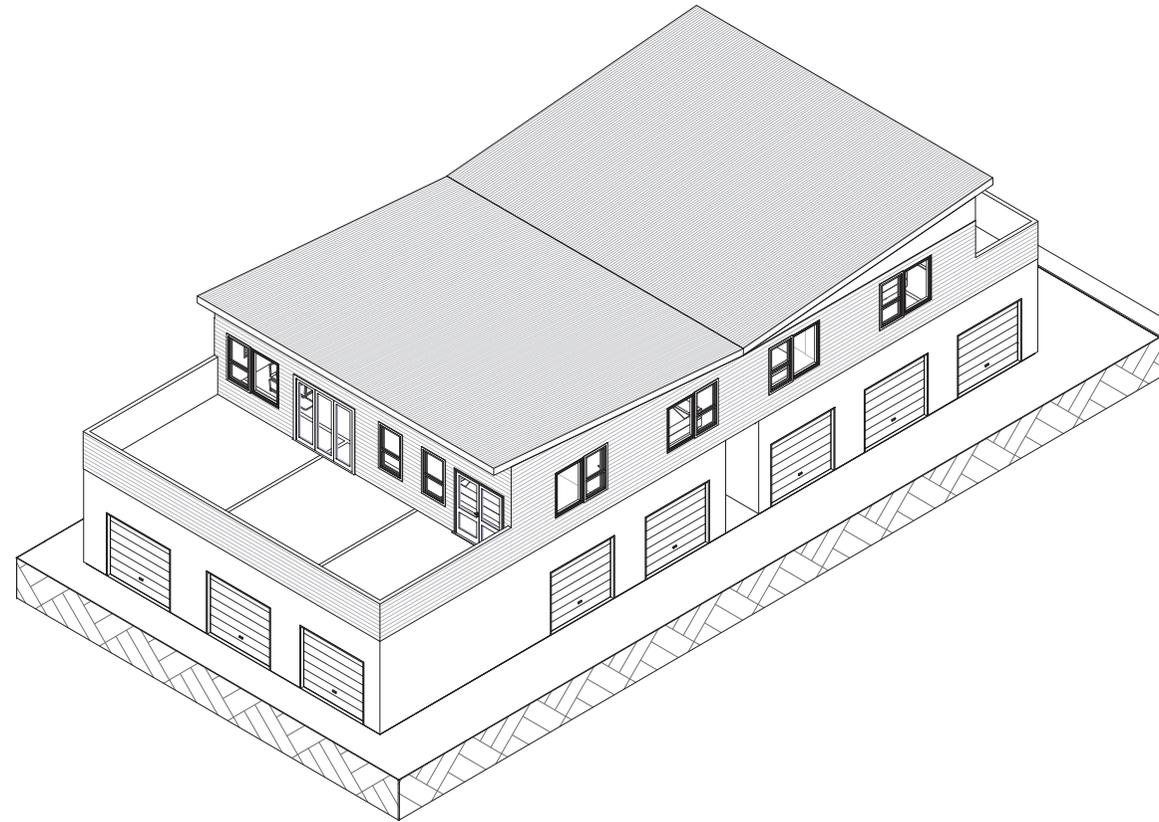


Figure 7.38: 3D view @ 1:500



Figure 7.39: Central public space view



Figure 7.40: Central public space view



Figure 7.41: Street view

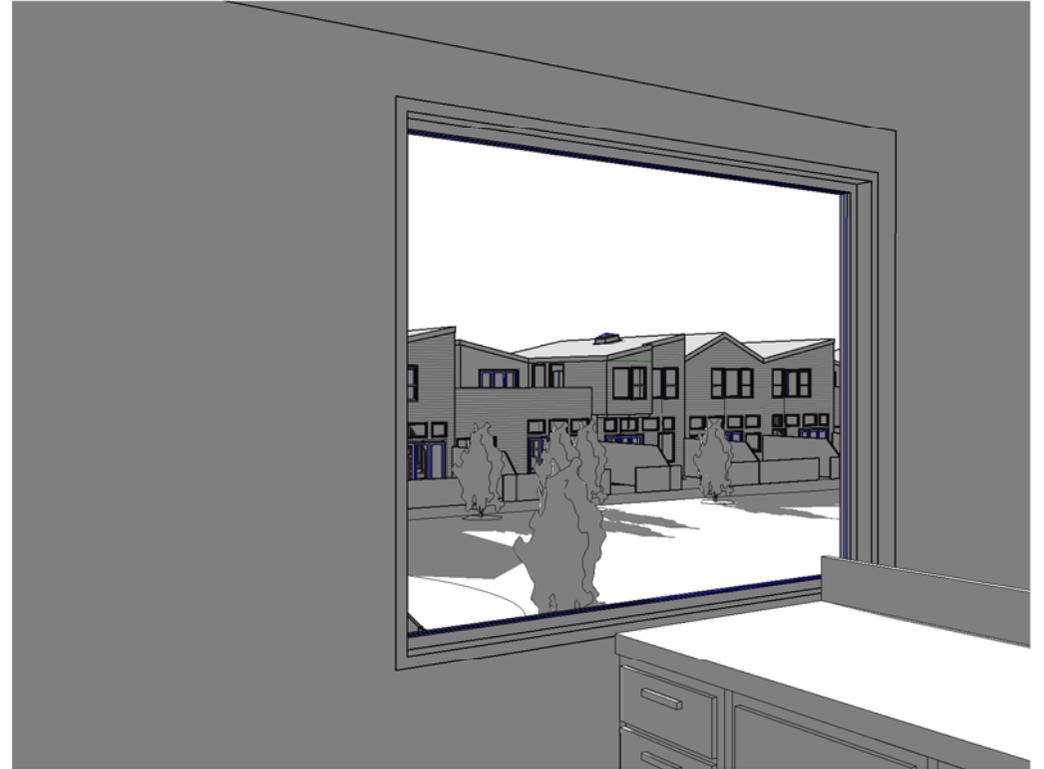


Figure 7.42: View of central space from within an apartment



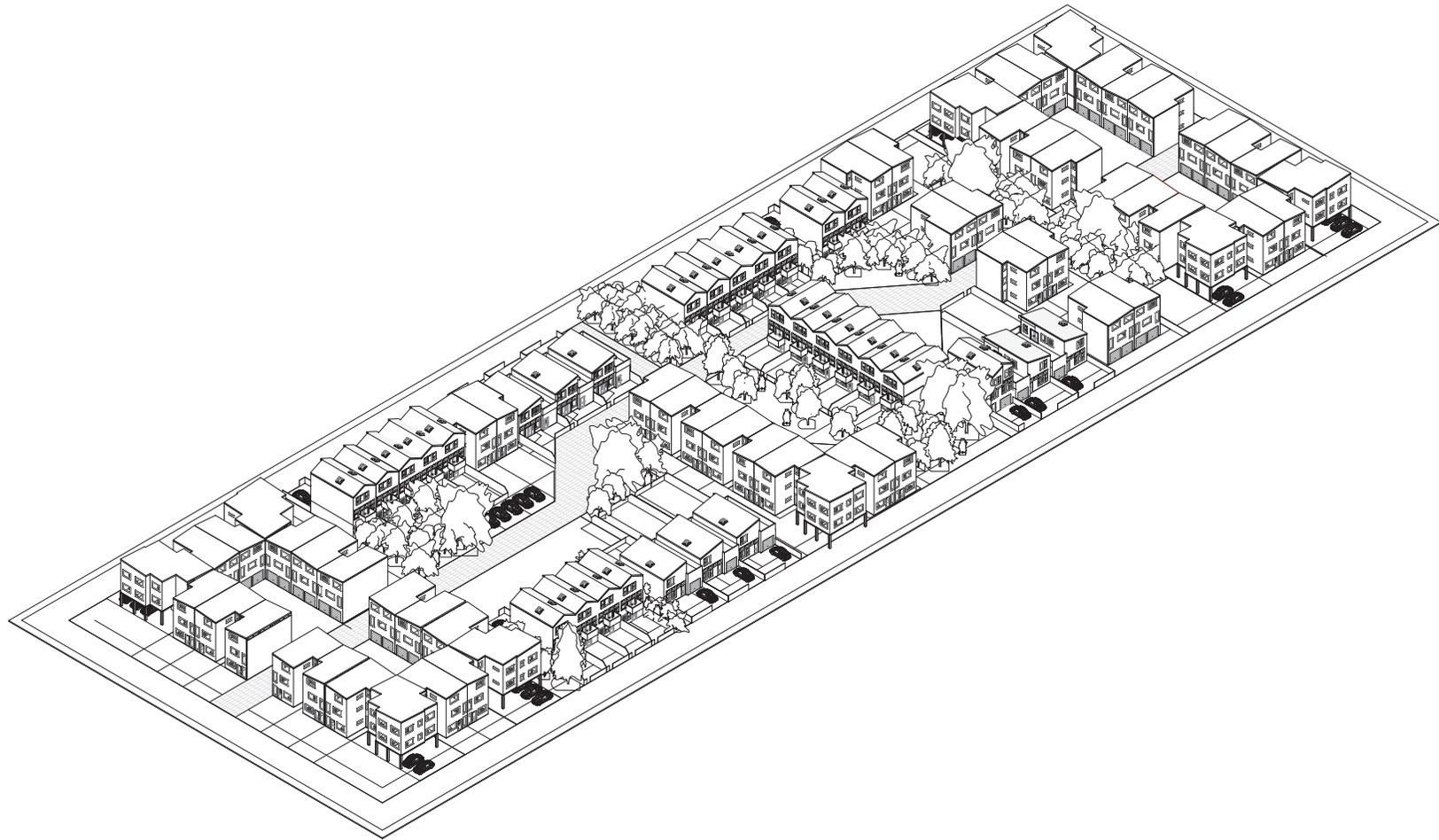


Figure 7.43: 3D axo of design generation three prototype block

## DESIGN GENERATION THREE

Generation three was intended to break the rigidity of generation one and two. A simple design exercise was carried out where foam blocks were made to fall into a random arrangement (appendix 3). The results were quite constructive. Through this test, ideas of smaller scale spaces linked with pedestrian and vehicle laneways were created. This approach broke the homogeneity of the row house typology and offered varying spatial and social opportunities.

A hybrid was designed that aimed to contain a practical organisation with intimate spaces and laneways throughout the block. As another prototype block, the laneways on this block were intended to join with corresponding laneways on similar neighbouring blocks.

Design generation three contains 95 units with 4 variations over 2.04 hectares of land giving 46 dwellings per hectare.

Though this generation created only two new housing designs and used the same typologies from generation two, a completely different internal environment was created. A strong variety of small spaces allowed a range of activities to be supported. These included spaces for recreation and spaces for rest and relaxation. In addition to this private outdoor space was more varied throughout the block.

Despite this pivotal design change, some persisting criticisms emerged.

-The scale of the block is still too large in both breadth and depth. This created some excessively large public and private outdoor areas and created a number of internal units that did not have direct street access. This would be

fine if the laneways were developed further to cater for these houses

-The two new typologies are too car focused and again do not support an East Christchurch lifestyle

In addition to this, the method of developing a prototype block and applying it over a site is not site specific and does not offer variation from block to block. In a field of repeated housing identity becomes hard to transmit. This led me to recognise that the process of designing a prototype block and then repeating it to suit a large site was not sensitive to specific site characteristics. More specific application to a particular site was required.

Despite these criticisms, the following lessons were learned:

-medium density is achievable without compromise on design and public amenity

-a series of small linked public spaces achieves an intimate atmosphere and offers variety in home options and therefore identity

-a variety of public and private outdoor spaces are able to emerge with different typology and urban design approaches

For the next design generation, the following ideas need to be pursued:

-site responsive design

-refinement and further tests of the notion of a series of linked intimate spaces

-maintain density

-a range of typologies that support an East Christchurch lifestyle

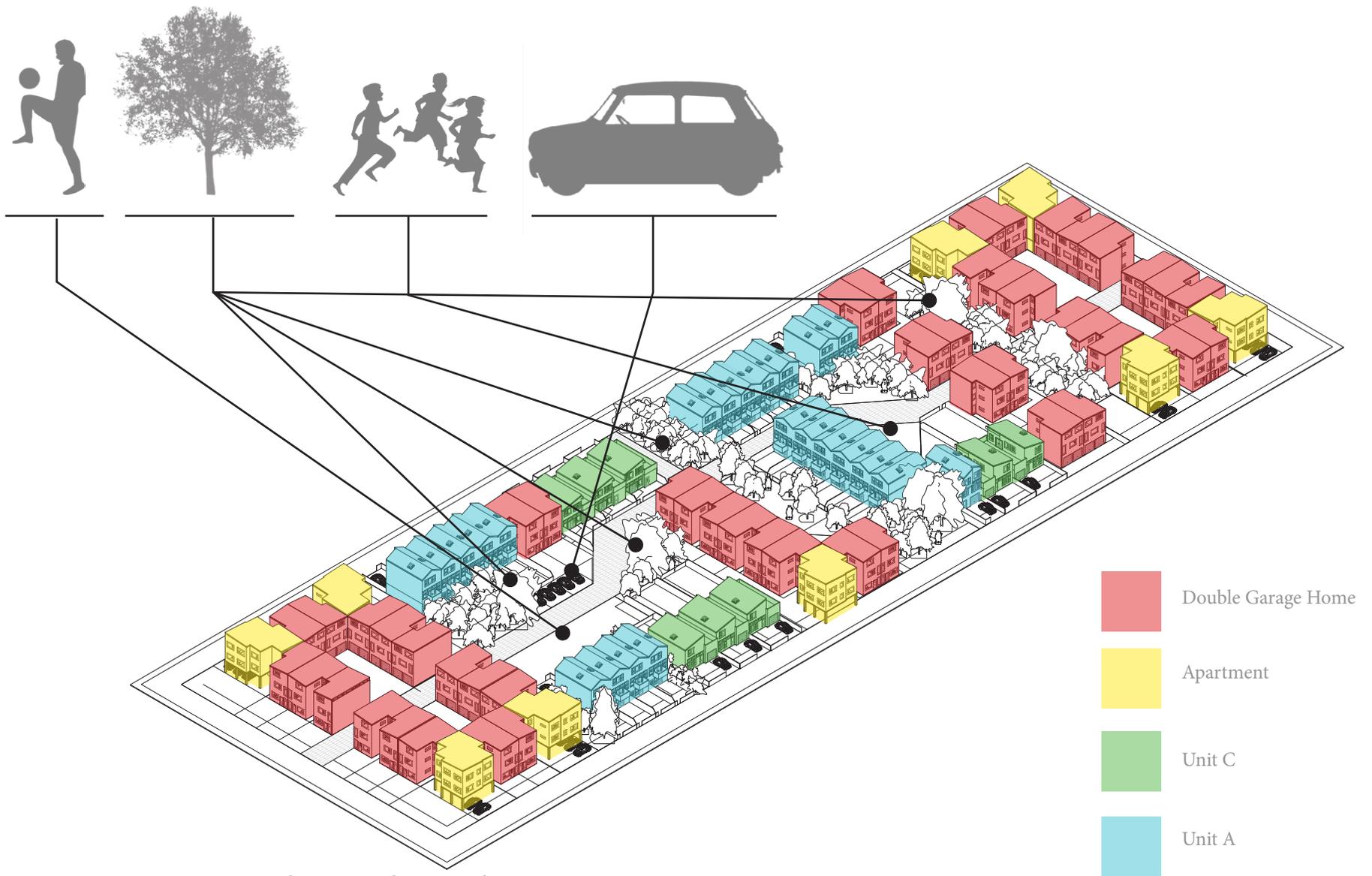


Figure 7.44: Typology variety diagram with programme matrix

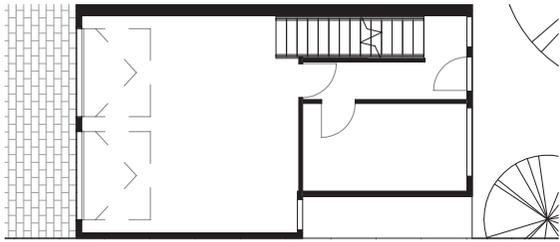


Figure 7.45: Ground floor plan @ 1:200

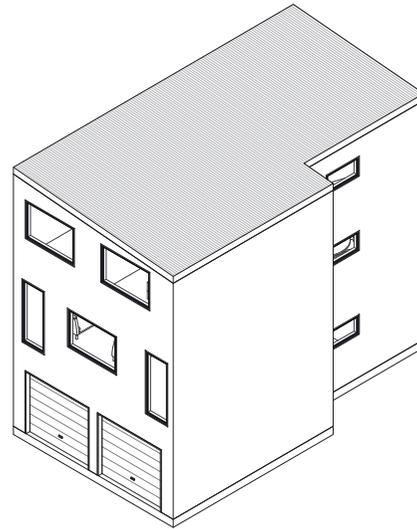


Figure 7.48: 3D view @ 1:500

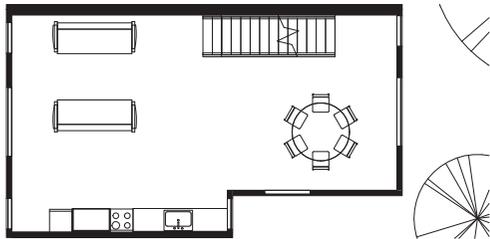


Figure 7.46: First floor plan @ 1:200

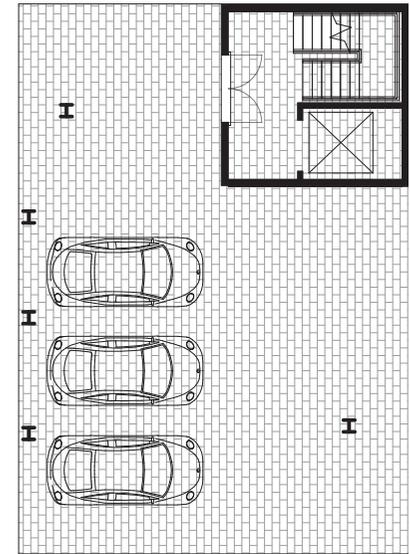


Figure 7.50: Ground floor plan @ 1:200

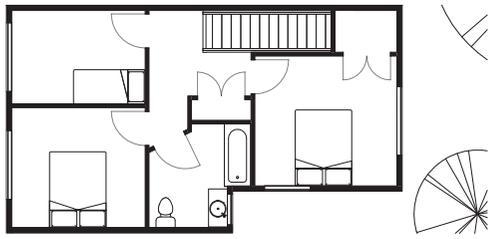


Figure 7.47: Second floor plan @ 1:200

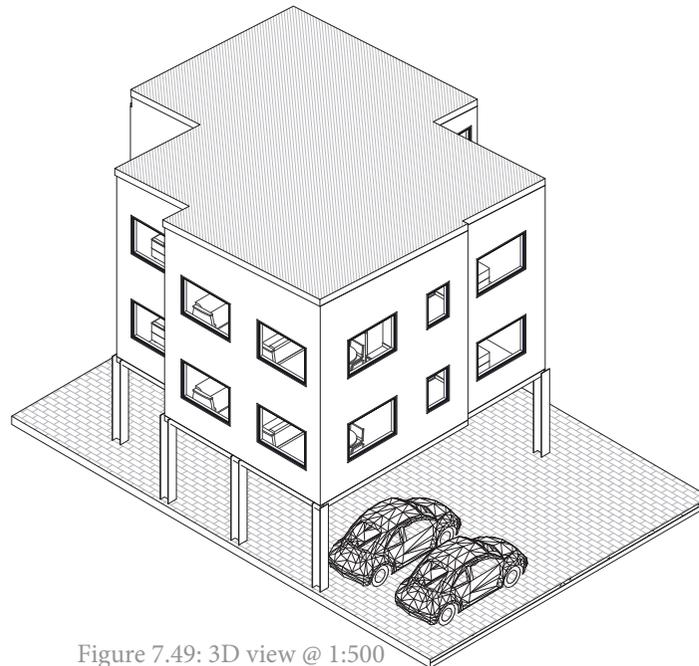


Figure 7.49: 3D view @ 1:500

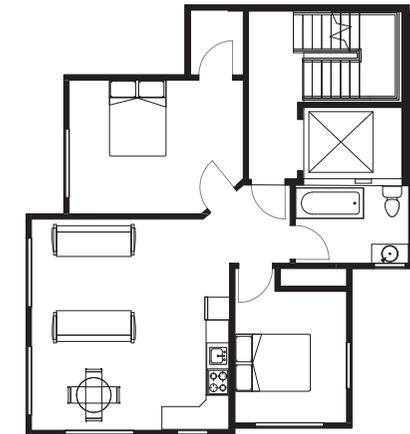


Figure 7.51: Apartment plan @ 1:200

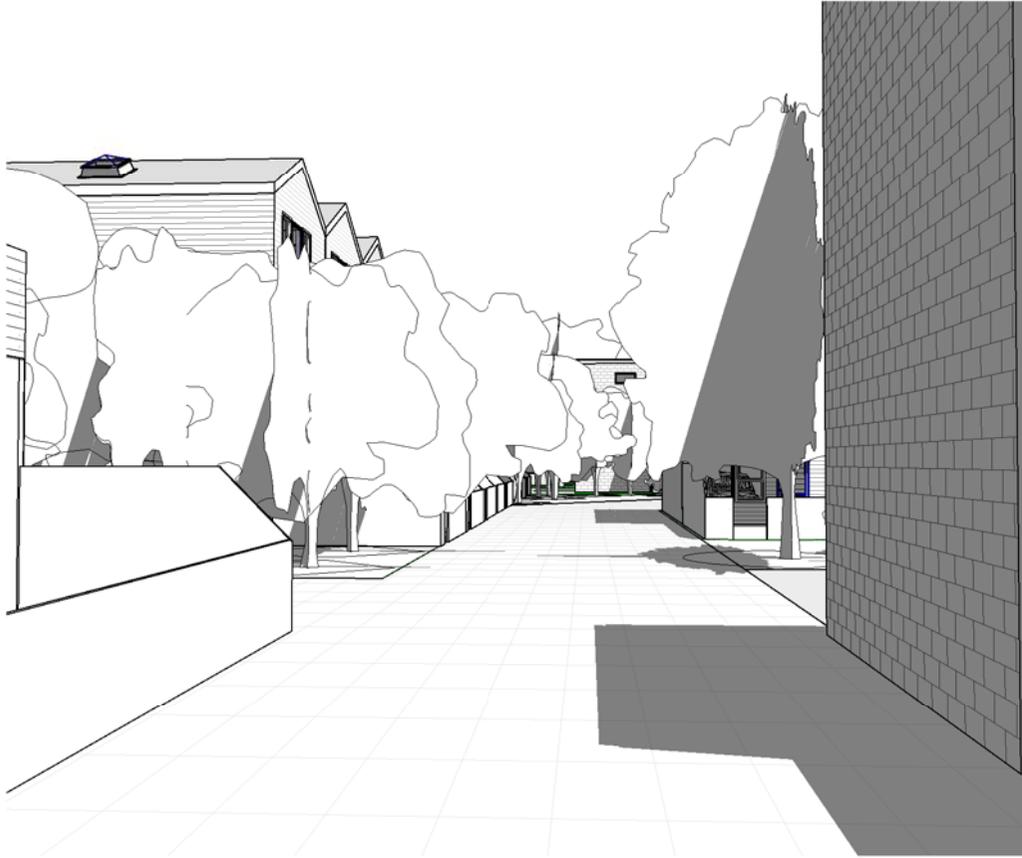


Figure 7.52: Rear laneway view

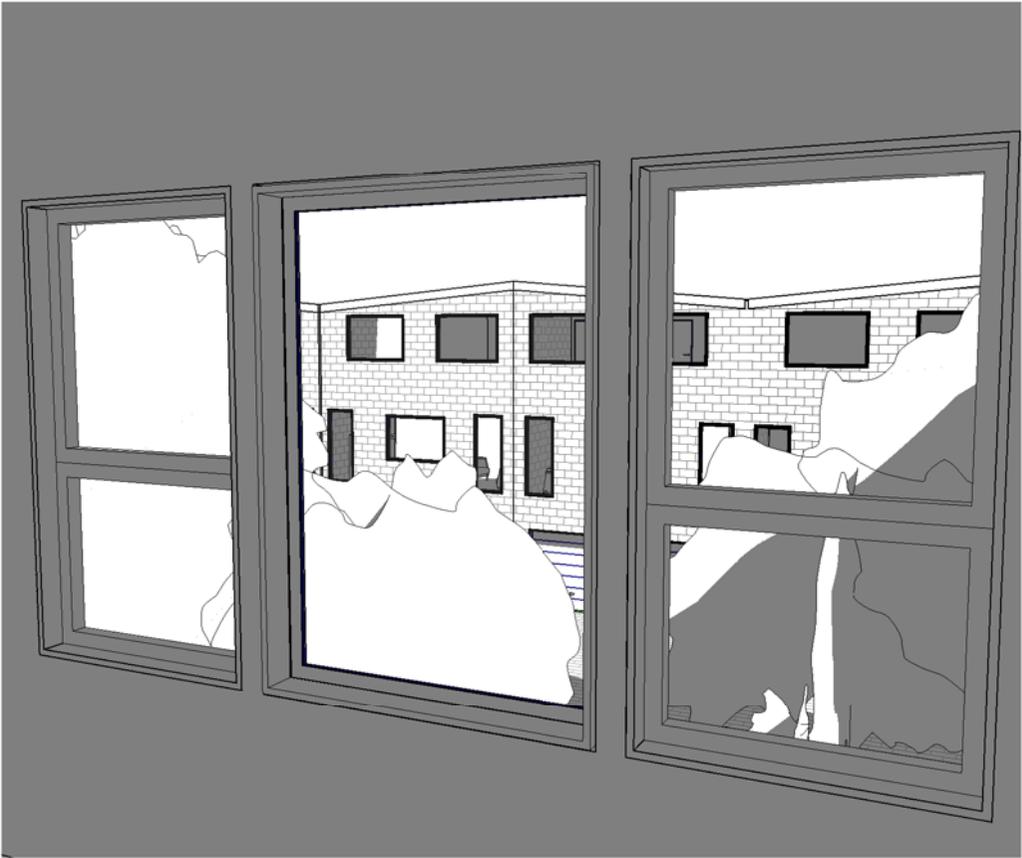


Figure 7.53: Apartment view of public garden

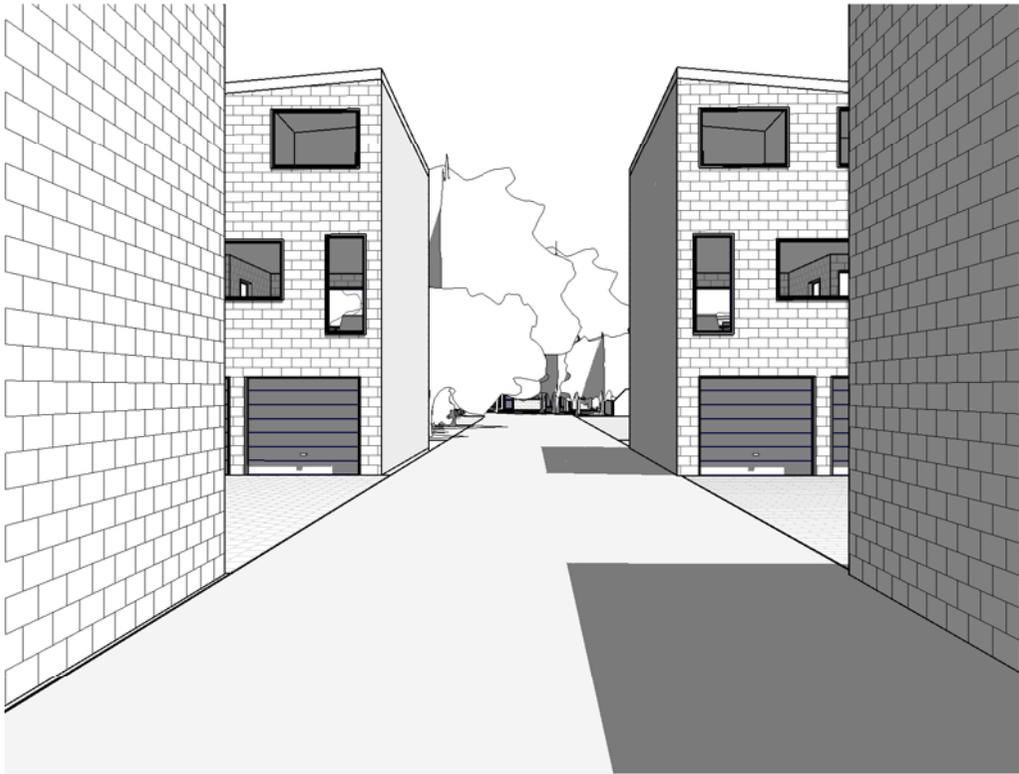


Figure 7.54: Rear laneway view



Figure 7.55: Rear laneway view



Figure 7.56: 3D view of developed Burwood Park

## FINAL DESIGN GENERATION

The final design forms two blocks. It is conceived as one block with a small row of housing running through the centre of it. Larger houses are located on the periphery while the compact houses are located toward the central public space. In this design there is a large range of housing options including mix use homes, single garaged homes, double garaged homes, homes with detached garaging, and duplexes. These homes vary in size from 84 to 185m<sup>2</sup>. Plot size varies from 132 to 293m<sup>2</sup>. The public space in the middle offers plenty of outdoor space to smaller units.

The final design generation contains 72 units with 27 variations over 1.81 hectares of land giving 40 dwellings per hectare.

## URBAN DESIGN

Each block in the subdivision is to have its own small public space. This public space is intended to be a social area for people to gather and interact; a place where adults can converse and children can play. In addition to this, the public space offers a programme that can support its neighbouring blocks. Each neighbouring block has a different public space. One may be paved and be suitable for basketball, handball and cycling another space may be grassed and support playing rough and tumble. Other spaces may be devoted to a playground of swings and slides. These spaces are connected through a pedestrian network and aim to reduce kids' need to crossing hazardous roads. The network of paths and lane ways helps break blocks into smaller groups of buildings where pathways disrupt long walls of housing.



Figure 7.57: Figure-ground of new development and surrounding suburban context



Figure 7.58: Diagram of subdivision

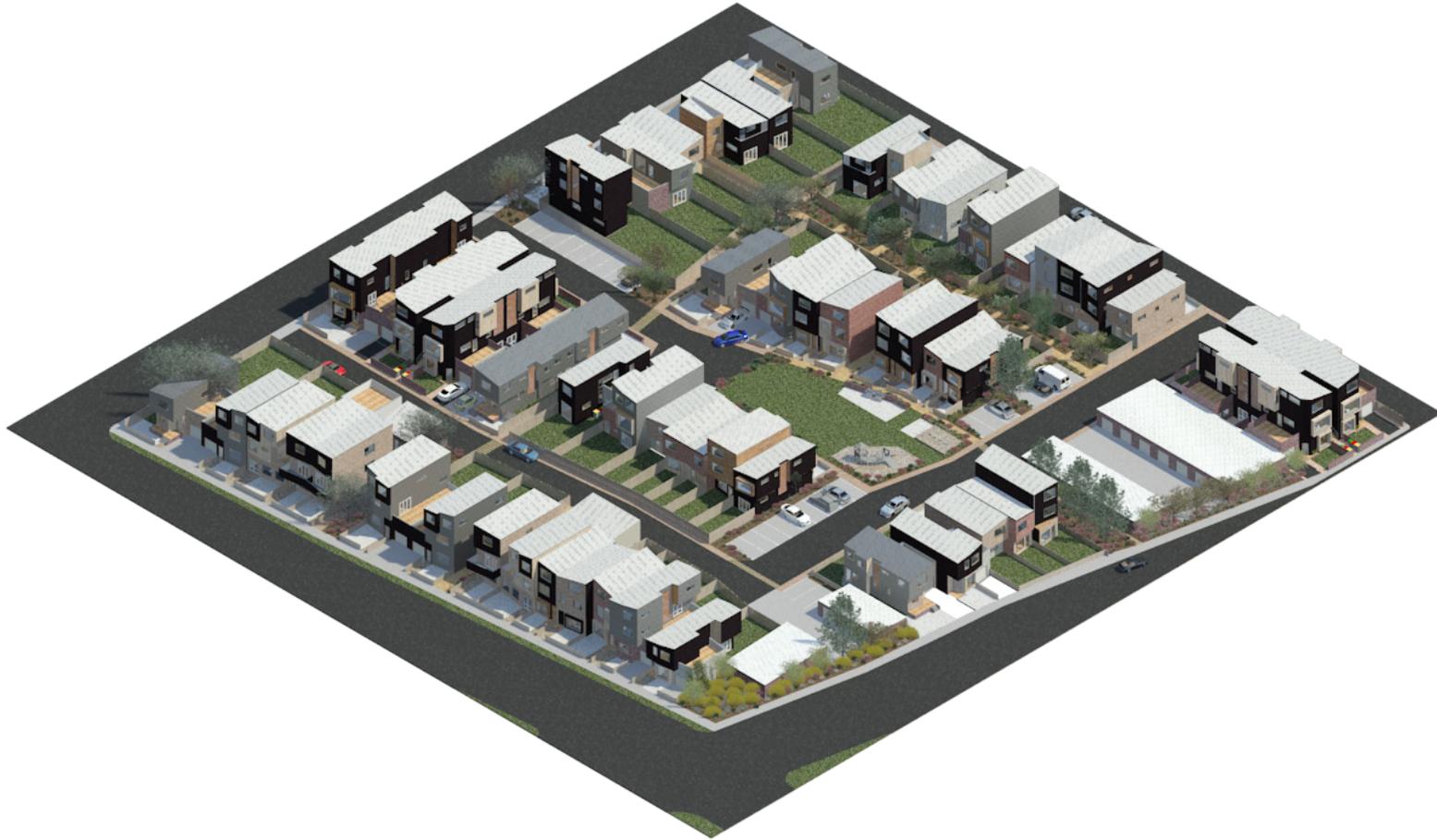


Figure 7.59: 3D view of detail design block

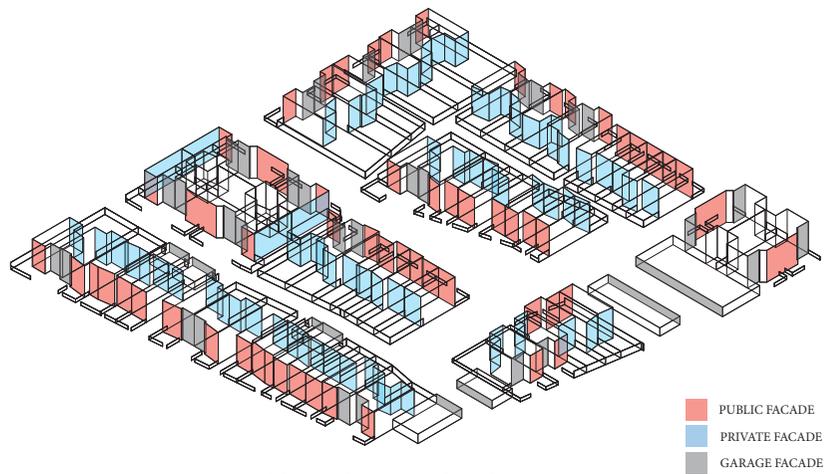


Figure 7.60: Diagram public and private facades

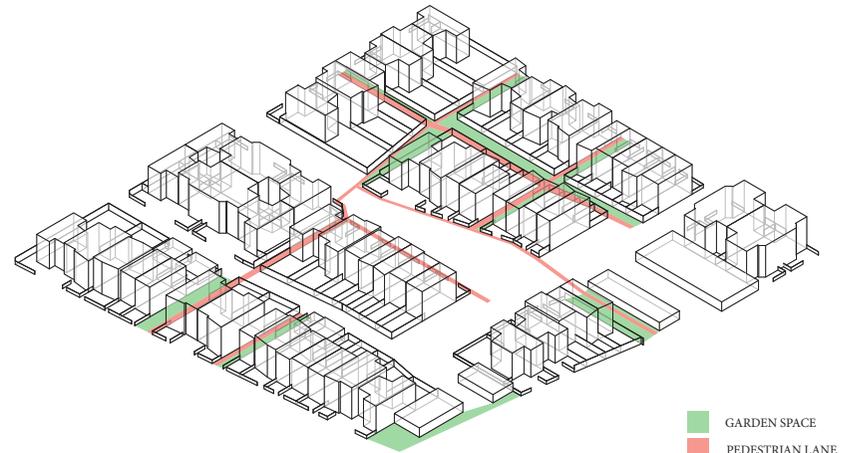


Figure 7.61: Diagram of public garden spaces and pedestrian lane ways



Figure 7.62: Site plan @1:1000



Figure 7.63: Ground floor plan @ 1:1000

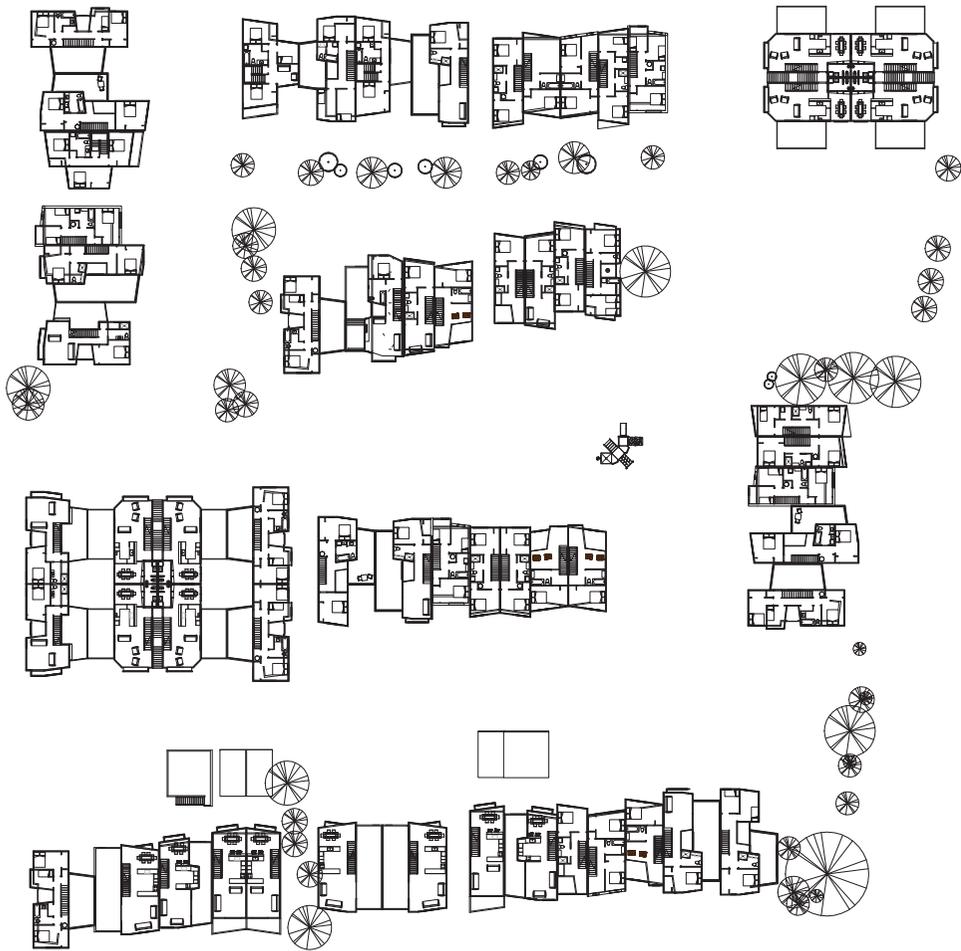


Figure 7.64: First floor plan @ 1:1000

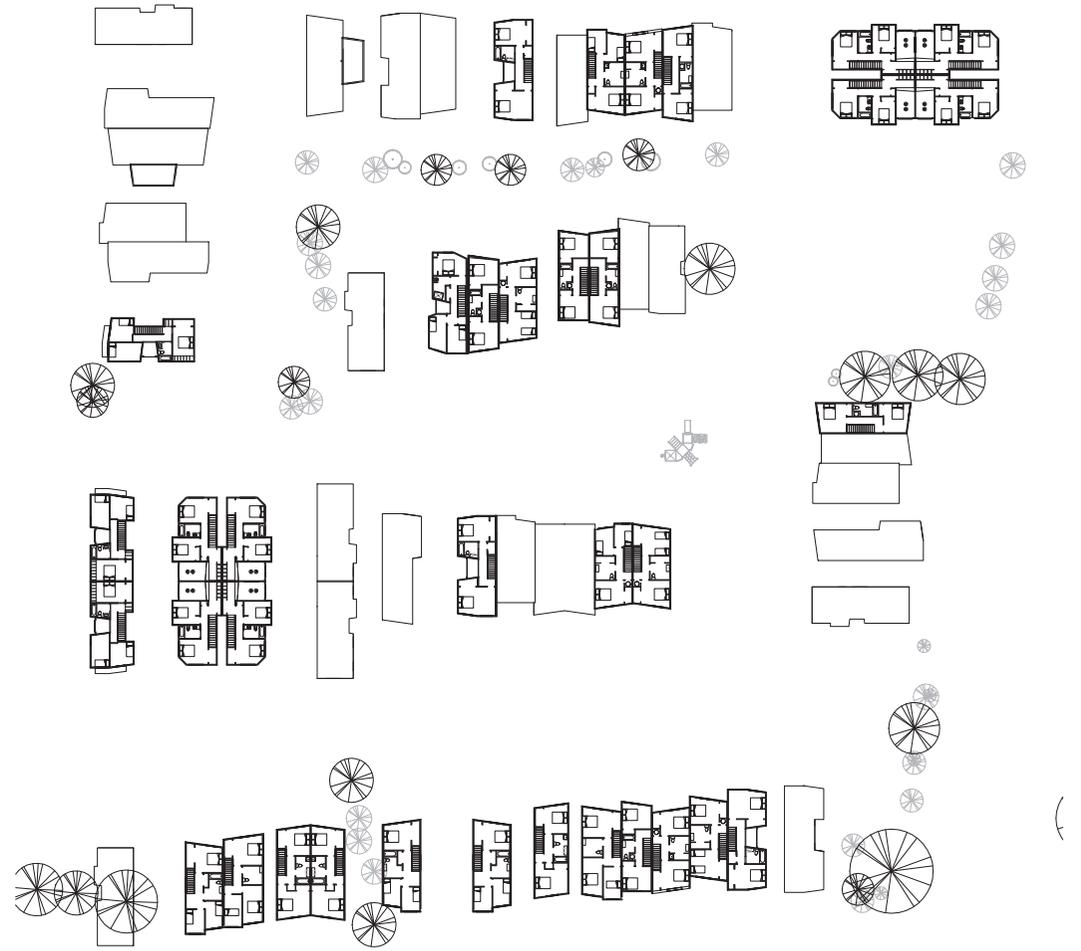


Figure 7.65: Second floor plan @ 1:1000



Figure 7.66: View from pedestrian walkway overlooking the central public space



Figure 7.67: View from pedestrian walkway overlooking the central public space



Figure 7.68: View down rear pedestrian lane way



Figure 7.69: View down vehicle lane way overlooking the central public space



Figure 7.70: View down secondary road bordering the design test block



Figure 7.71: View down rear vehicle lane way



Figure 7.72: View of block from edge of red zone



## TYOLOGY DESIGN

There are five primary typologies with four of these containing between three and seven variations. Each variation takes the template from the primary typology and adjusts parameters such as single or double garage, number of bedrooms, bathrooms, living spaces, and number of storeys. This allows a variety of housing options to exist for a variety of circumstances. Such circumstances include young families, big families, young and old couples, shared flats and solo dwellers. Some variations are more architecturally interesting by incorporating double height spaces to allow more light to enter the centre of the row houses. Each typology gives easy flow from inside to outside to aid the social efforts of the urban design

GARAGE  
PUBLIC  
PRIVATE

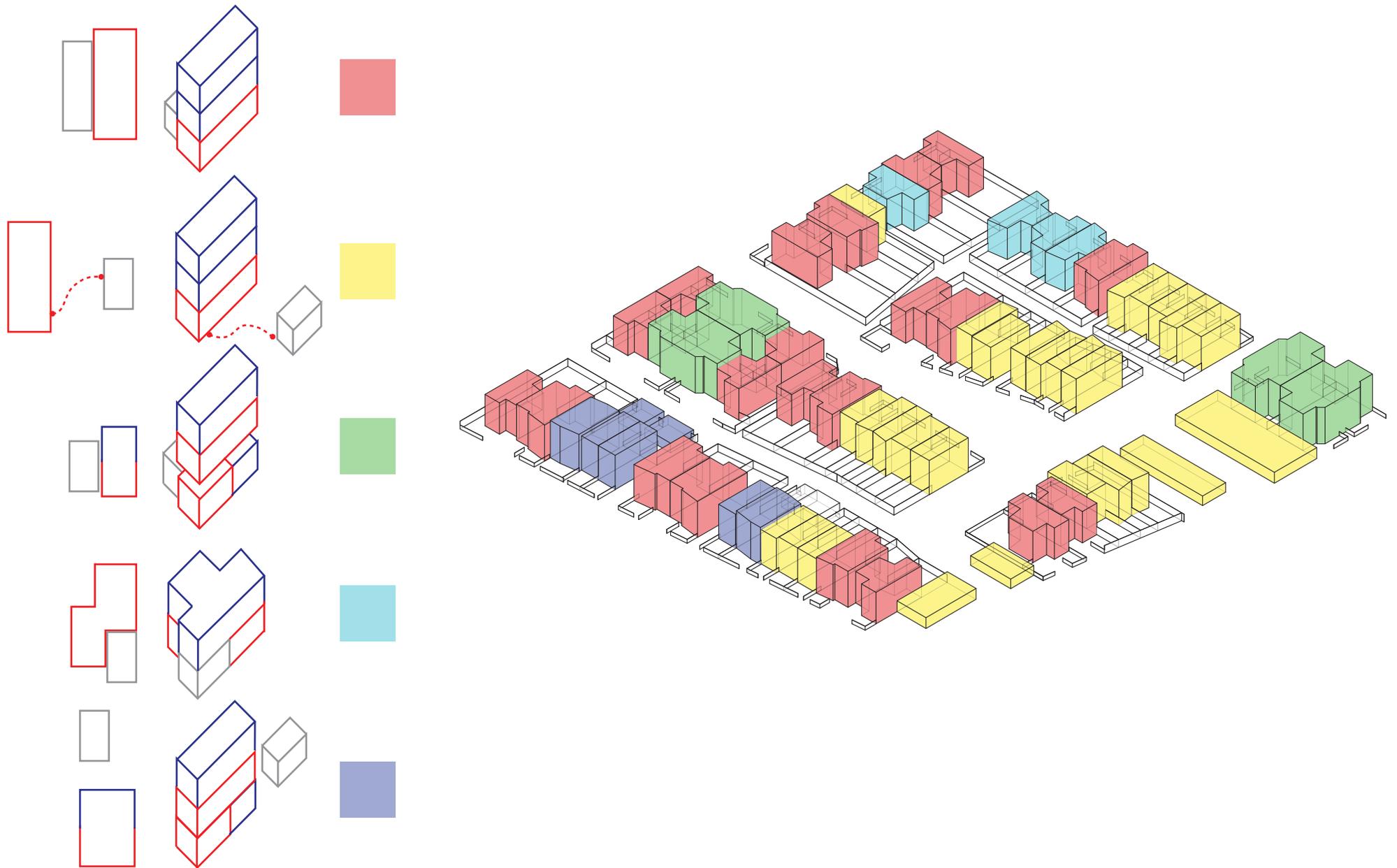


Figure 7.73: Diagram of varying typologies within final design generation

### Attached Garage (Single)

Attached garaging housing offers the convenience of row house design while still maintaining easy access to one's vehicles. To fit within a narrow plot and maintain a ground floor relationship to the street, single width garages are used. Living on the ground sleeping on the first floor. A small double height space brings natural light down to the centre of the plan. As the site area is wide, private outdoor space offers good flexibility.

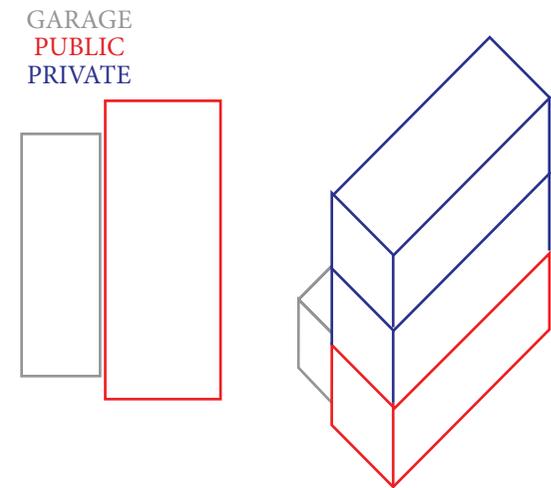
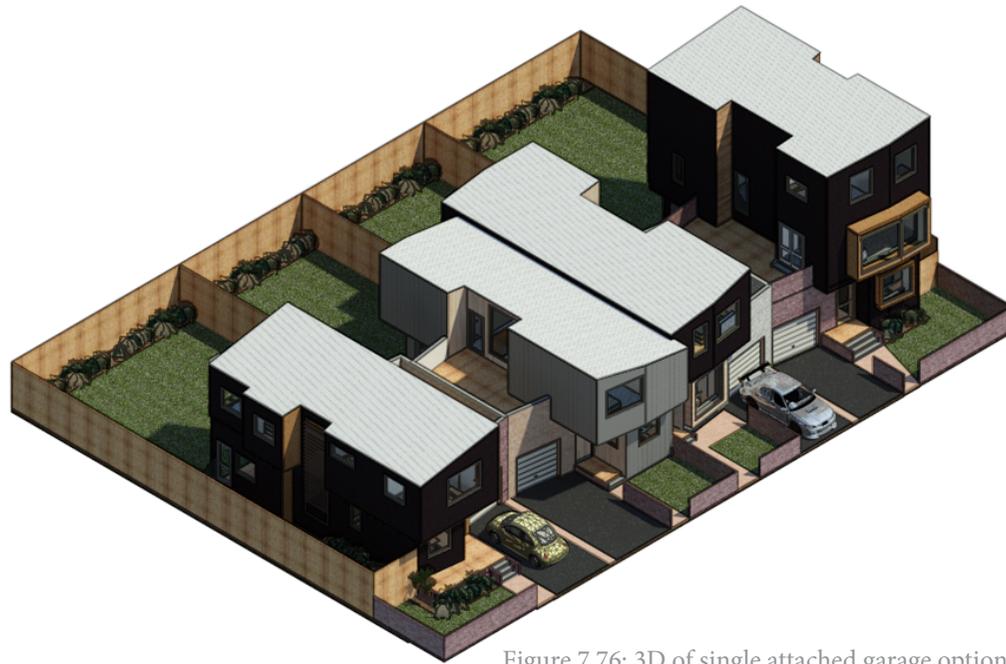


Figure 7.74: Spatial diagram of attached garage typology



Figure 7.75: Plans of attached garage (single) options @ 1:200



- Garage
- Living
- Circulation
- Kitchen
- Bathroom
- Bedroom
- Balcony
- Storage
- Void

Figure 7.76: 3D of single attached garage options

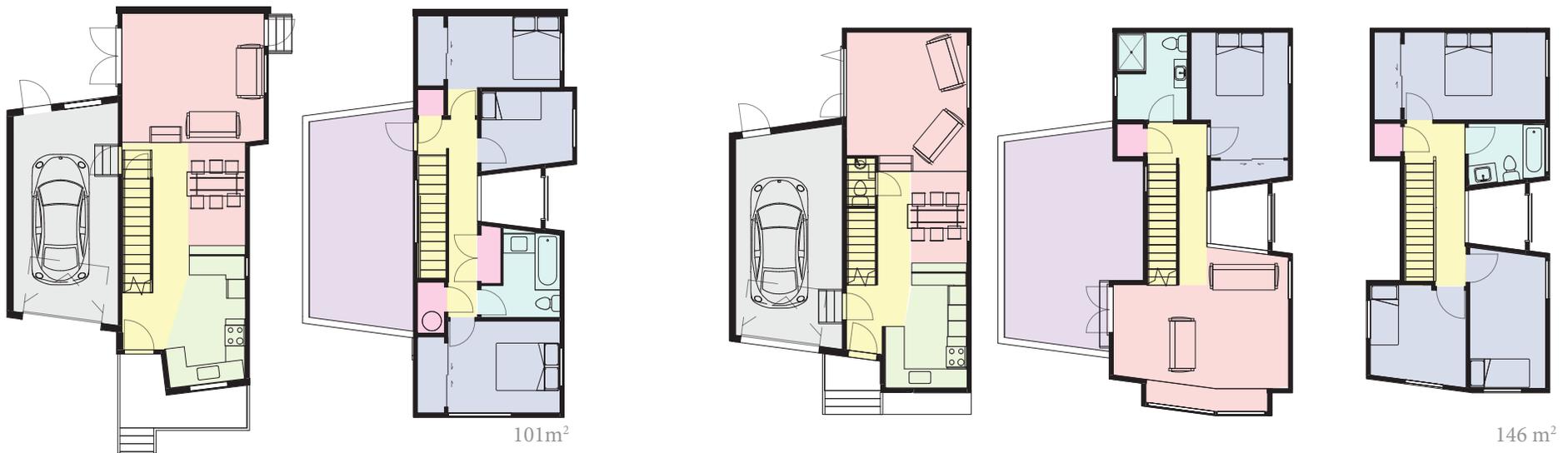




Figure 7.77: Kitchen and living room of single attached garage home



Figure 7.78: View from balcony above garage

### Attached Garage (Double)

Similar to the single attached garage option, the double attached garage option provides more vehicle flexibility. Double and even triple height spaces are used to light to the middle of the ground floor which would otherwise be undesirably dark. Again, living is on the ground floor but further living options can exist on the first floor, with bedrooms on the first and second floors. Additional outdoor space can be had above the garage as the roof forms a balcony.

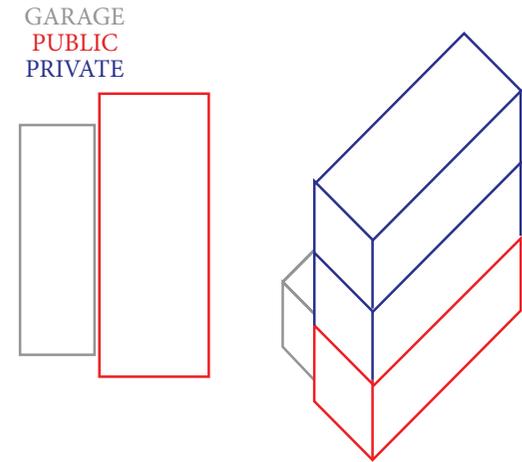


Figure 7.79: Spatial diagram of attached garage typology



Figure 7.80: Plans of double attached garage options @ 1:200



Figure 7.81: 3D of double attached garage

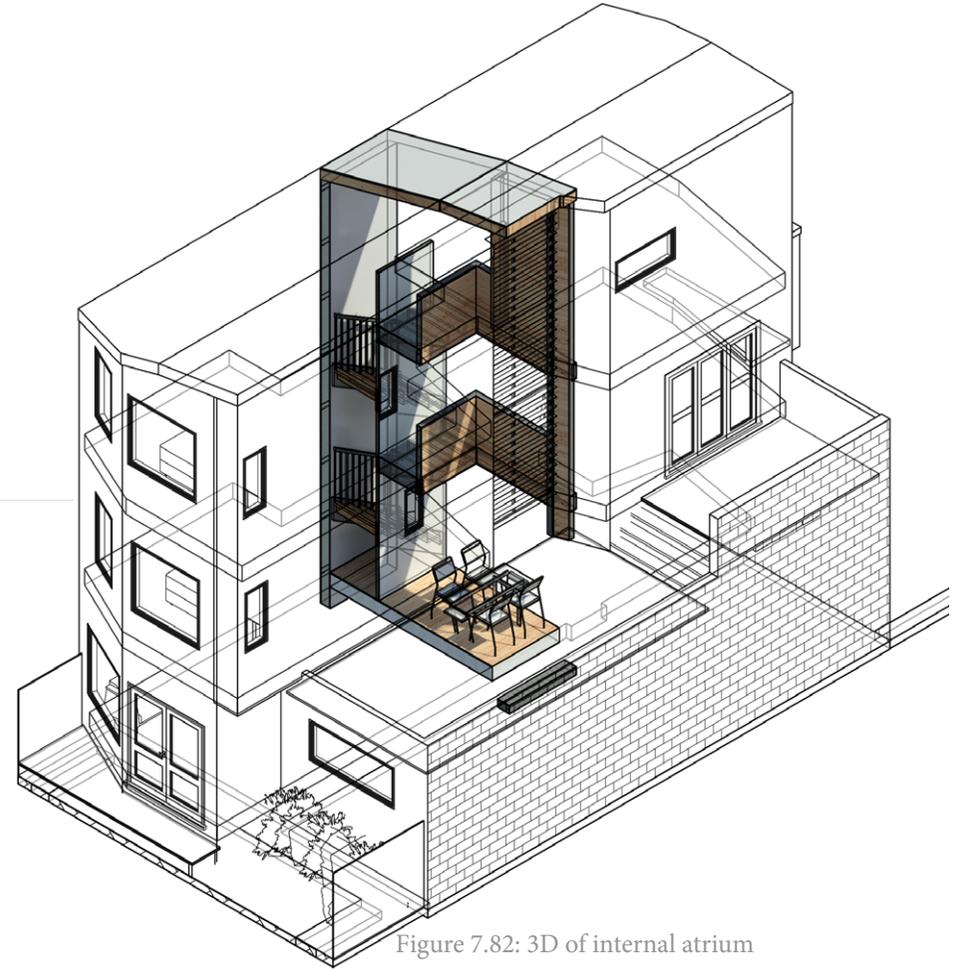
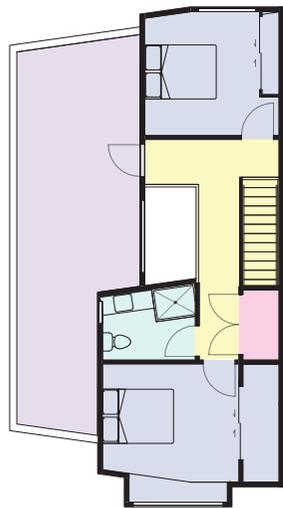
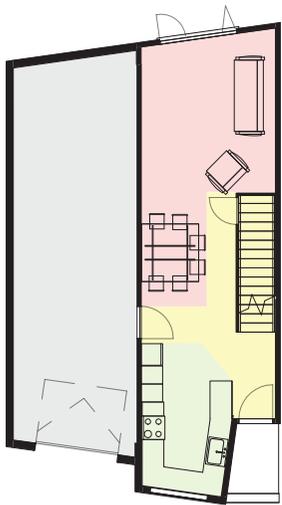


Figure 7.82: 3D of internal atrium



94m<sup>2</sup>

- Garage
- Living
- Circulation
- Kitchen
- Bathroom
- Bedroom
- Balcony
- Storage
- Void



Figure 7.83: Kitchen and living room of double attached garage home



Figure 7.84: View of first floor living area

### Split Garage

This option offers a variation to the attached single garage. It offers a further set back of living spaces and a more private living room.

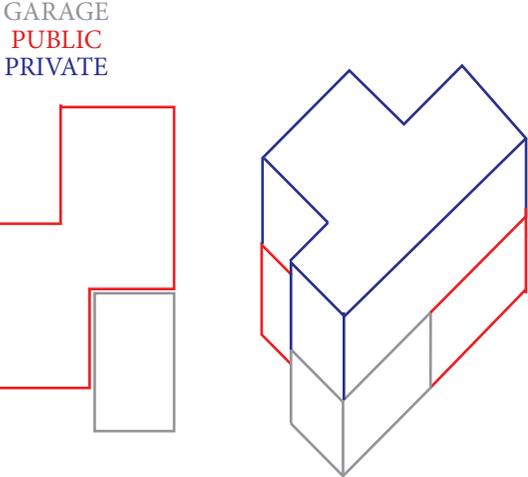


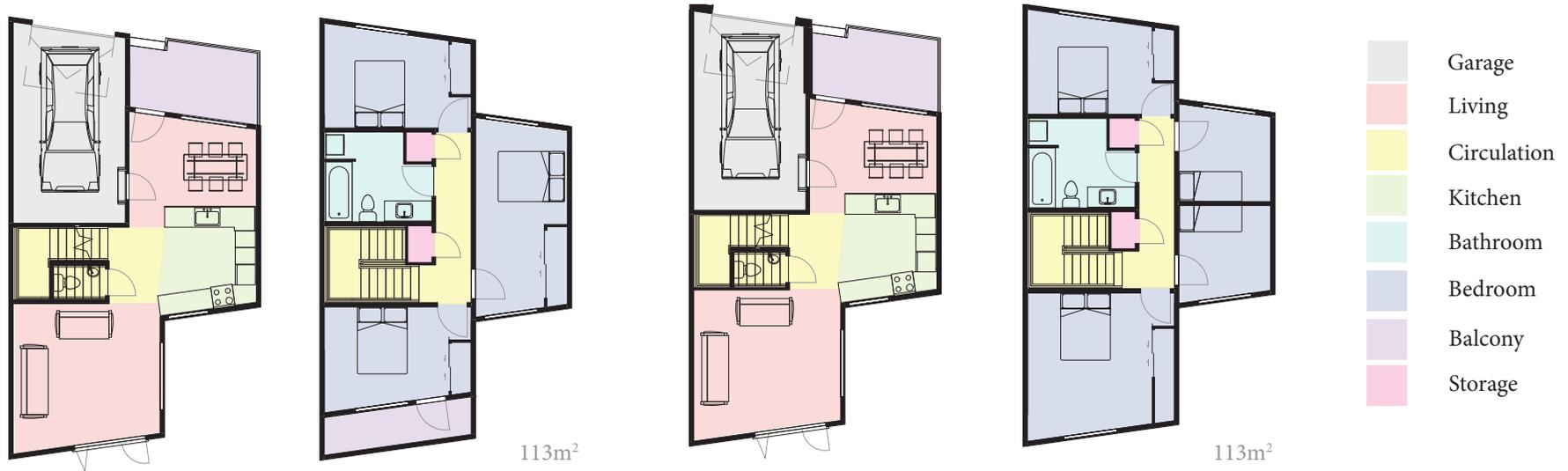
Figure 7.85: Spatial diagram of split garage typology



Figure 7.86: Plans of single split garage options @ 1:200



Figure 7.87: 3D of split garage options



## Mixed Use

Located along the primary roads this typology offers the potential to operate a business on the ground level. This space does not need to be an office or boutique shop. It can still hold residential functions. In this typology living spaces are on the first floor with one sleeping space on the ground floor overlooking the private outdoor space. Other bedrooms are on the second floor. Garaging in this typology is primarily at the back of the property accessed by a rear vehicle lane way.

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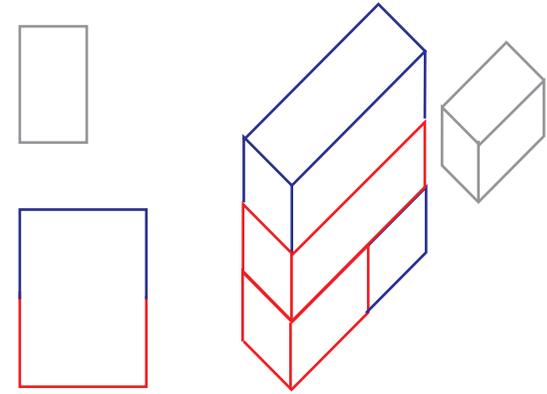


Figure 7.88: Spatial diagram of mix use typology



Figure 7.89: Plans of mix use housing options @ 1:200

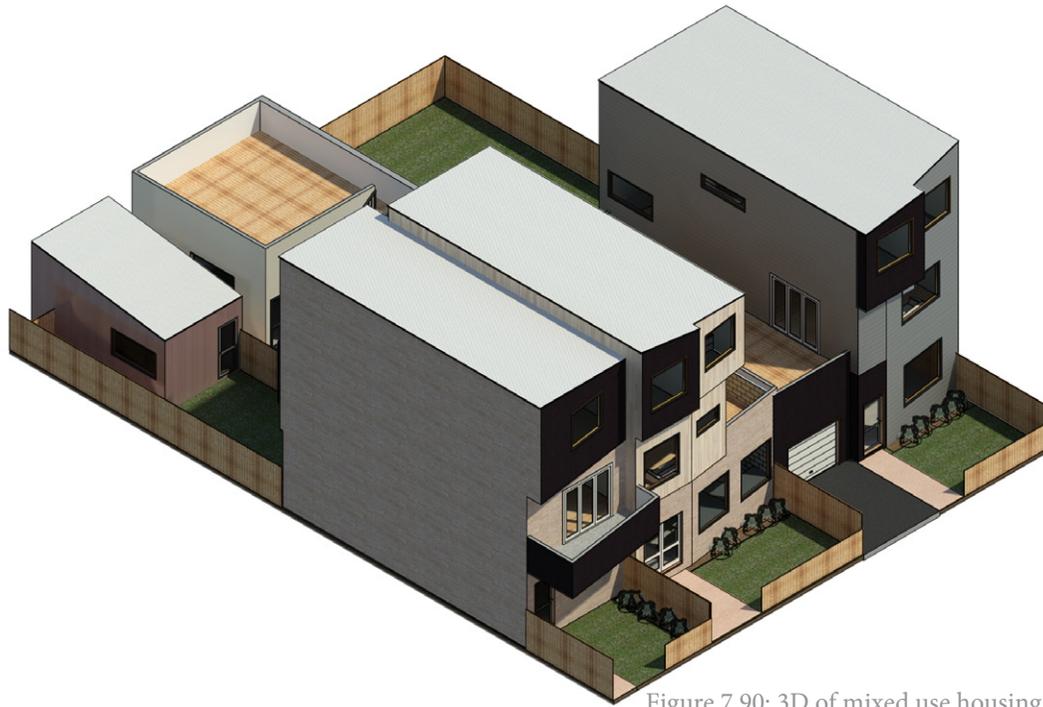


Figure 7.90: 3D of mixed use housing options

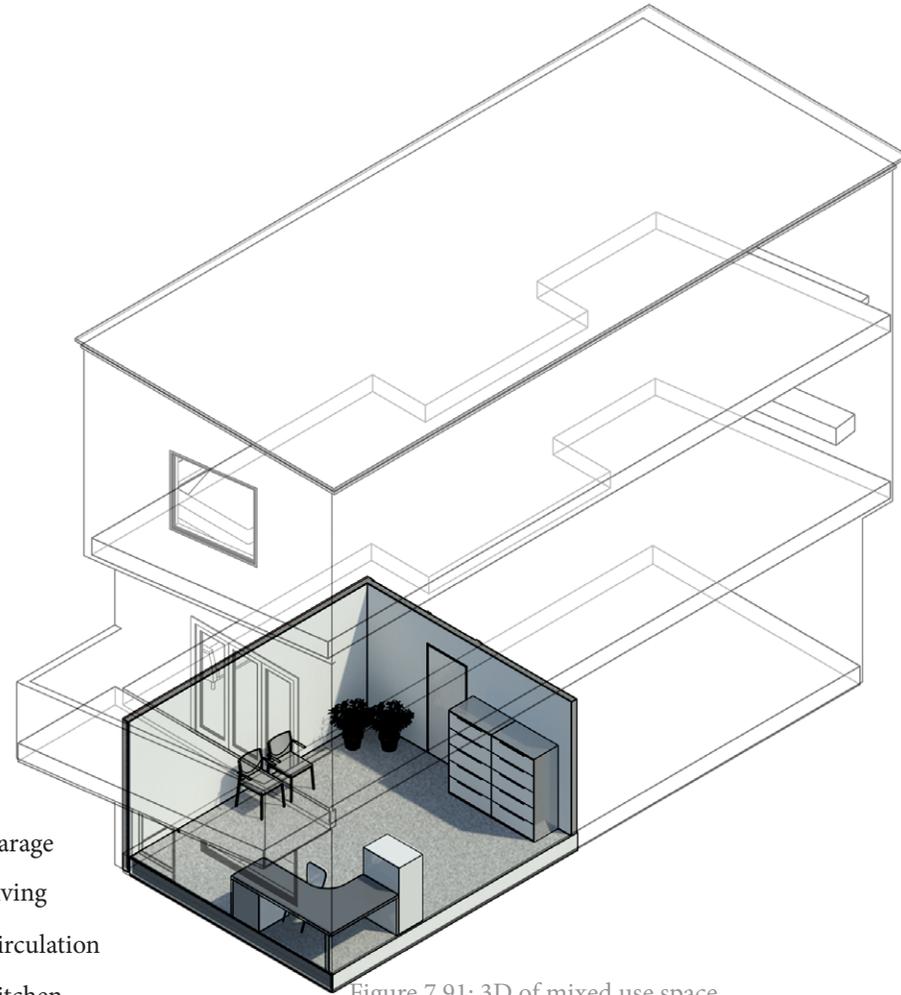


Figure 7.91: 3D of mixed use space



163m<sup>2</sup>

- Garage
- Living
- Circulation
- Kitchen
- Bathroom
- Bedroom
- Balcony
- Storage
- Mix Use space



Figure 7.92: Dining area, kitchen and living room of split garage typology



Figure 7.93: View from dining of mixed use house

GARAGE  
PUBLIC  
PRIVATE

### Detached Garaging (4m width)

Detached garaging represents a more affordable housing option. Living is on the ground floor and sleeping spaces are on the upper levels. Larger units have a double height space above the dining room. This aids daylight in reaching the kitchen space. The garaging is located at the car hubs. Each house has an allocated garage and may be either single or double. Outdoor spaces flow from the dining room and the lounge.

In this design generation there are two widths: four and five metres. Four metre wide units are useful for aiding density and allowing path ways to go through the block without losing units. For instance: a path with a four metre wide unit either side allows the path to be wider without sacrificing unit numbers.

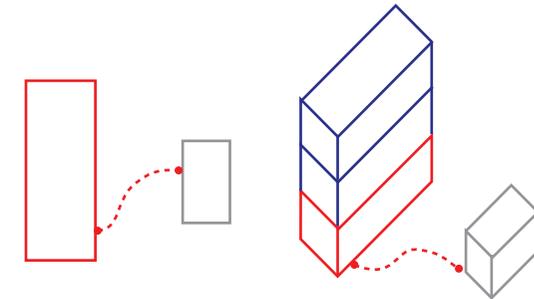


Figure 7.94: Spatial diagram of detached garage typology



Figure 7.95: Plans of detached garage options @ 1:200



Figure 7.96: 3D of detached garage home options

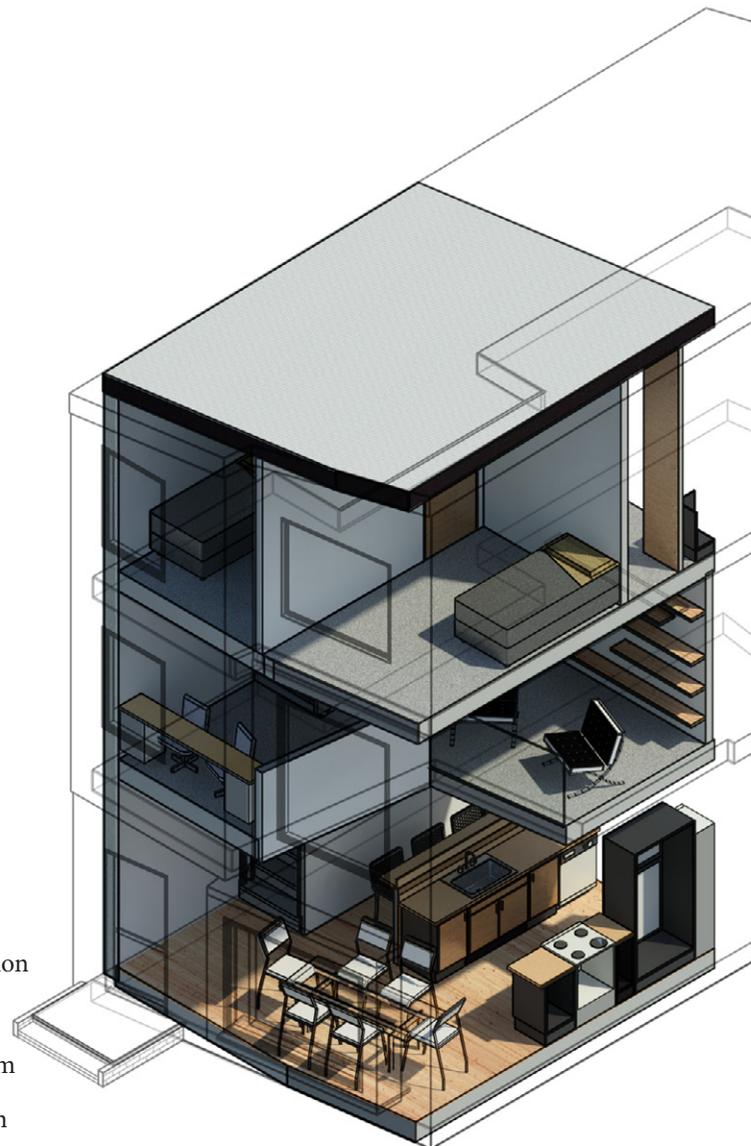


Figure 7.97: 3D of double height space



- Living
- Circulation
- Kitchen
- Bathroom
- Bedroom
- Balcony
- Storage
- Void

84m<sup>2</sup>

135m<sup>2</sup>

### Detached Garaging (5m width)

Detached garaging represents a more affordable housing option. Living is on the ground floor and sleeping spaces are on the upper levels. Larger units have a double height space above the dining room. This aids daylight in reaching the kitchen space. The garaging is located at the car hubs. Each house has an allocated garage and may be either single or double. Outdoor spaces flow from the dining room and the lounge.

The five metre wide option offers a more spacious and flexible plan than the four metre width and therefore suit larger families.

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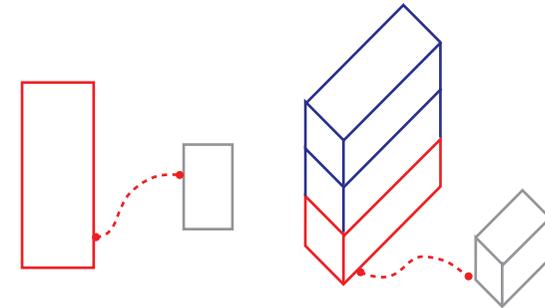


Figure 7.98: Spatial diagram of detached garage typology

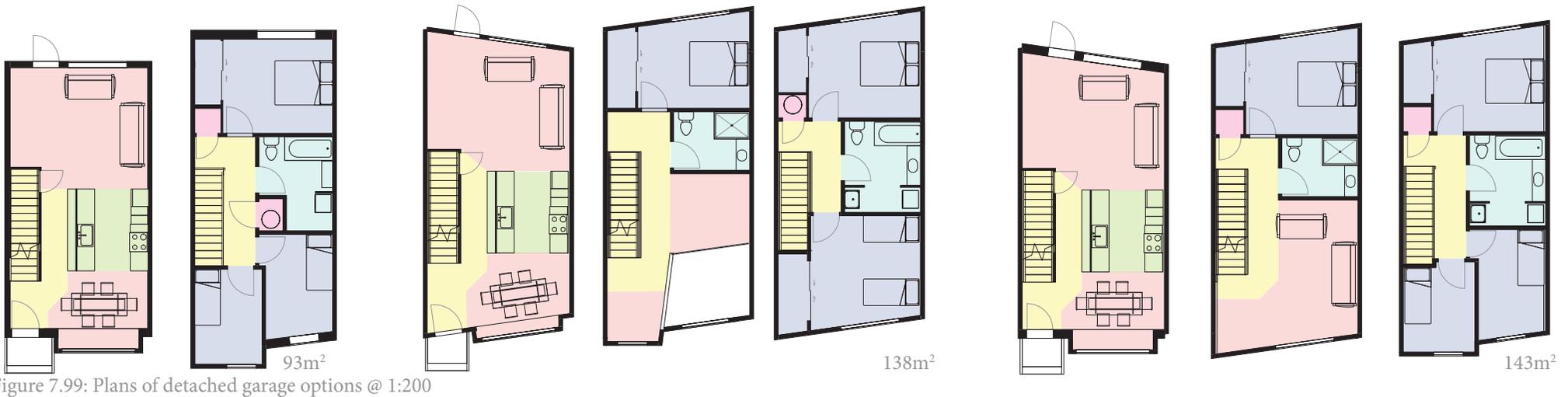


Figure 7.99: Plans of detached garage options @ 1:200



Figure 7.100: 3D of detached garage homes

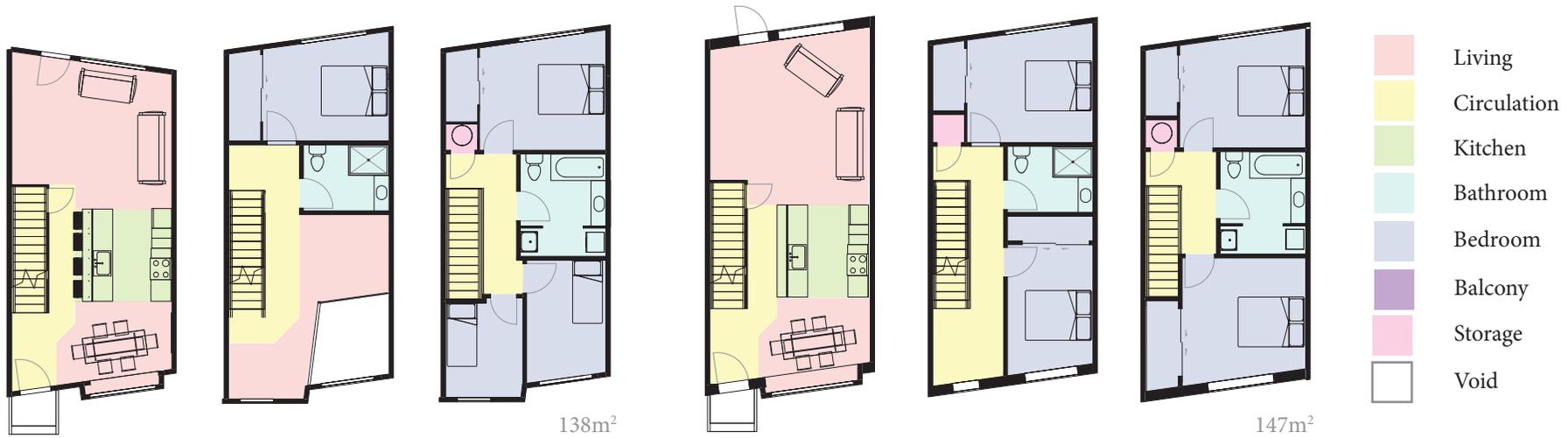




Figure 7.101: Kitchen and living room overlooking central public space of detached garage home



Figure 7.102: View from lounge of dining and kitchen of detached garage home

## Duplex

The duplex offers apartment like living within a suburban context. The ground floor contains a single room apartment with an attached garage and a small rear courtyard. The first floor contains a two storey two bedroom apartment and receives outdoor living via the roof space of the garage of the lower apartment.

GARAGE  
PUBLIC  
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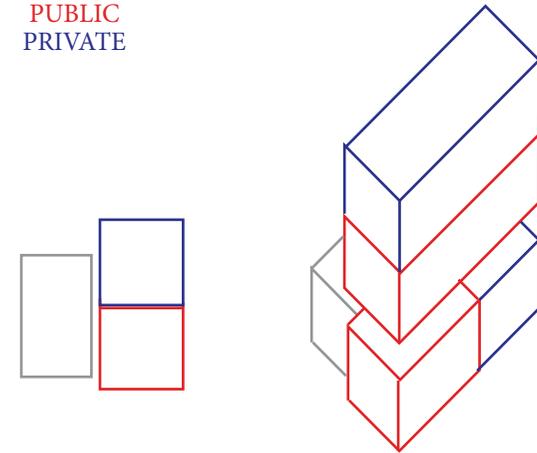


Figure 7.103: Spatial diagram of duplex typology

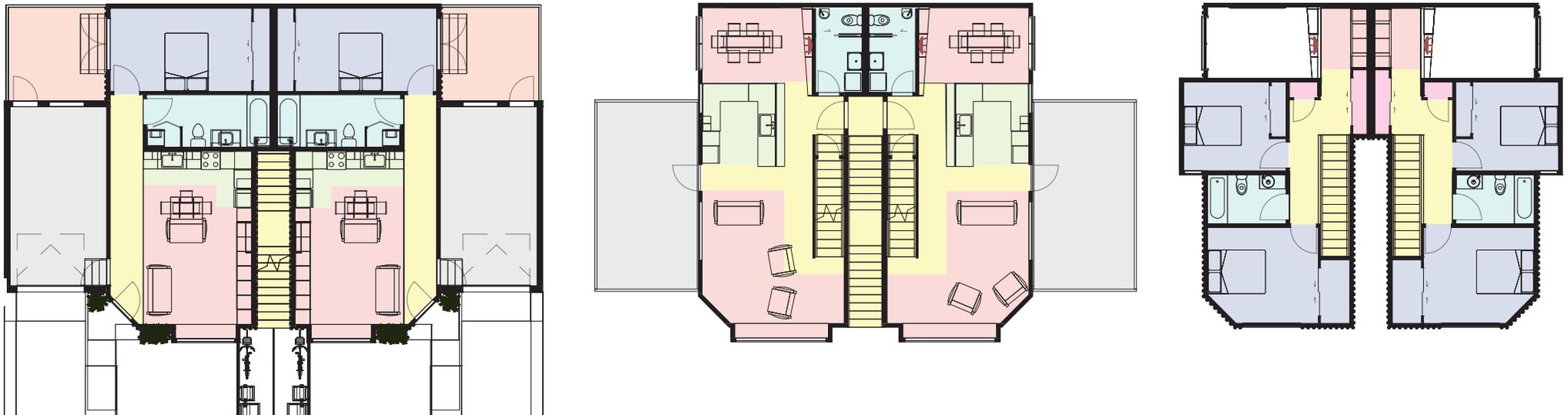


Figure 7.104: Plans of duplex @ 1:200



Figure 7.105: 3D of duple typology

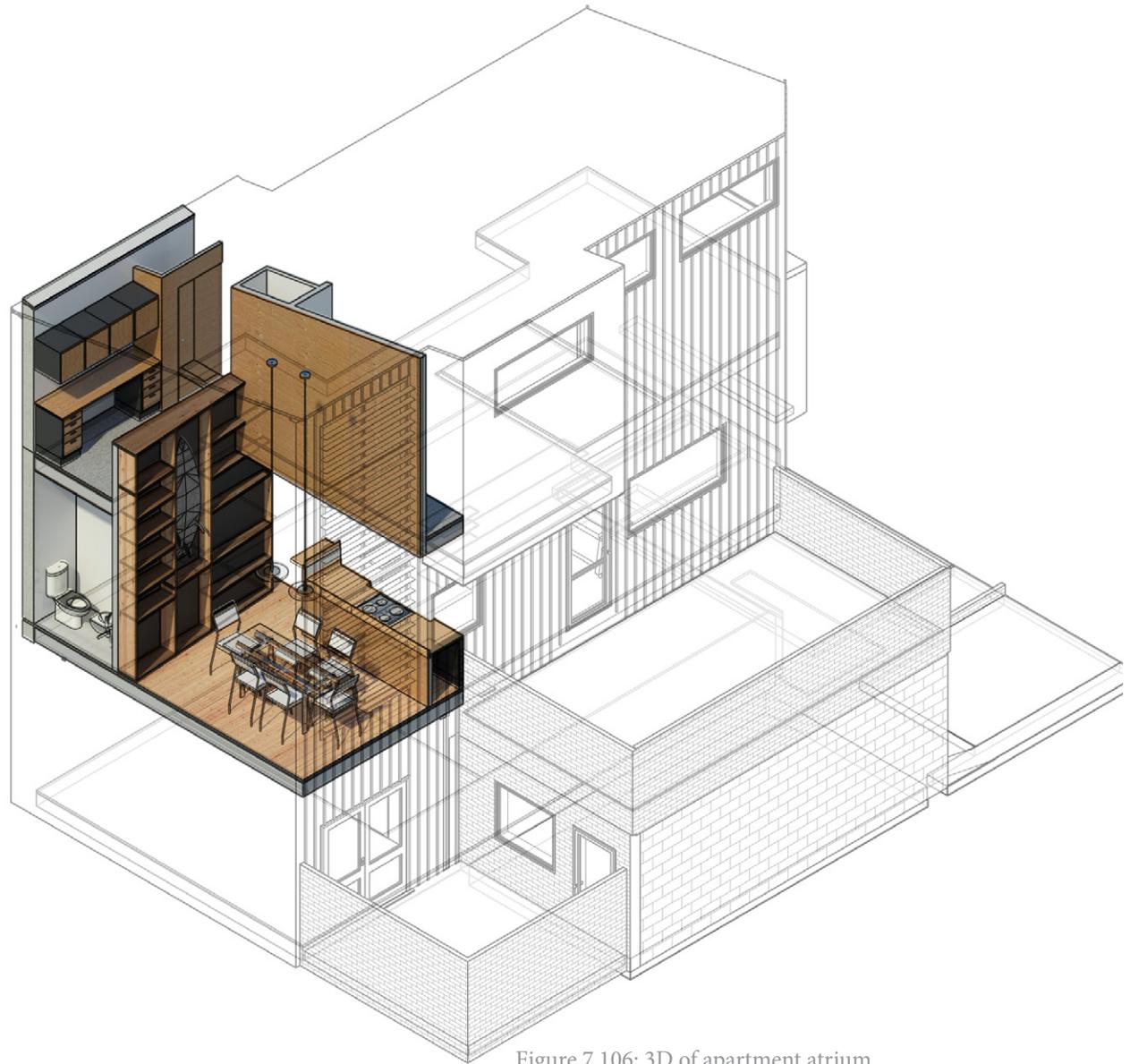


Figure 7.106: 3D of apartment atrium

- Garage
- Living
- Circulation
- Kitchen
- Bathroom/Laundry
- Bedroom
- Balcony
- Storage
- Courtyard
- Void



Figure 7.107: Kitchen, dining and living room of ground floor apartment

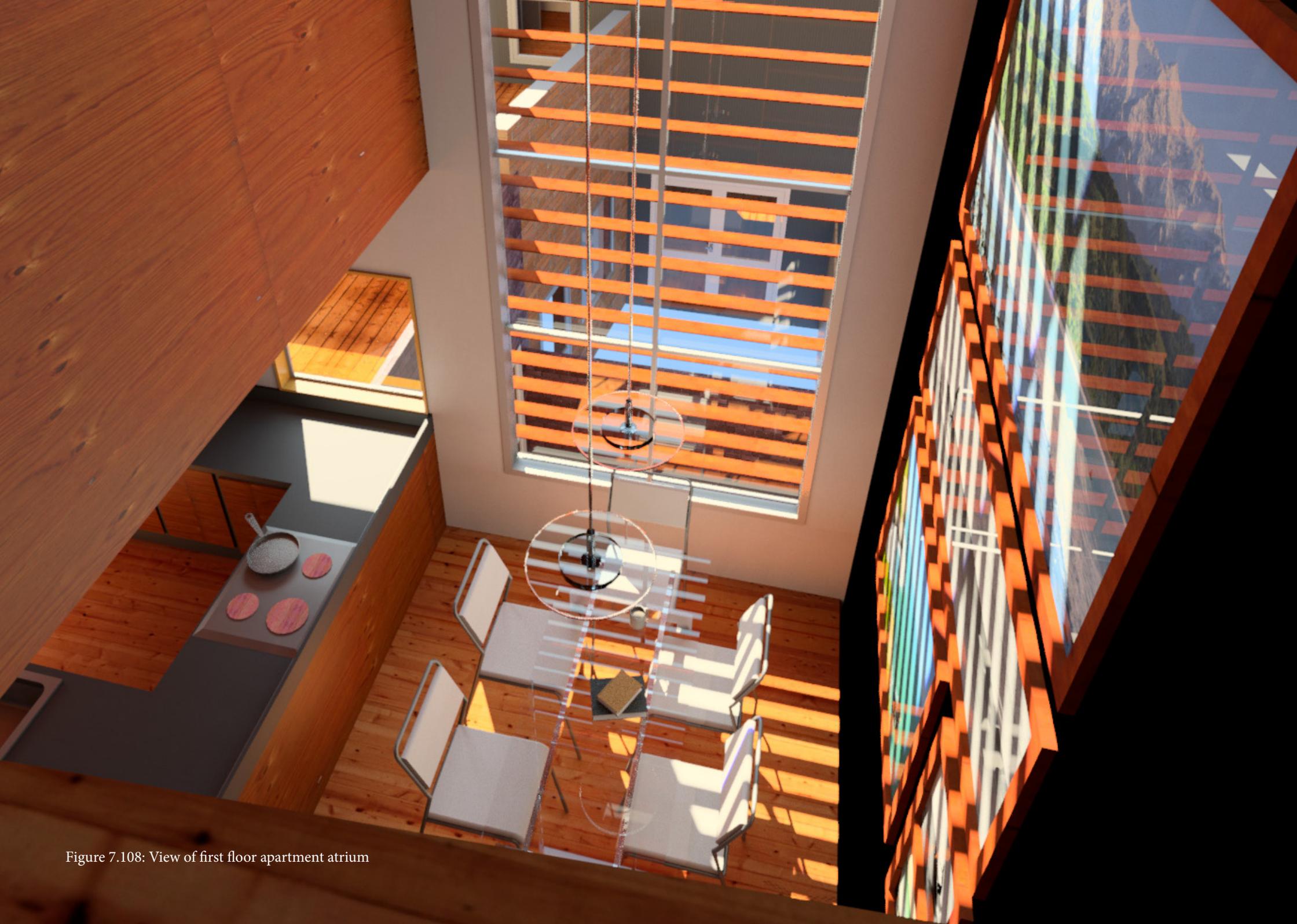


Figure 7.108: View of first floor apartment atrium



Figure 7.109: Section through block





Figure 7.110: Bird's eye view of block



If this design was to move to a commercial stage a few adjustments would need to be made. Though the amount of variety is excellent in this design, to make the development more economically feasible, the range could potentially be reduced to save costs. Having said this another typology that has a regular double garage may be required to add further flexibility in vehicle storage options.

To enhance range however, a range of architects would need to be employed to add variety to the different units. In this design all the units, though different, do appear to be designed by the same designer; roof slopes, building volumes, cladding and door and window treatment all have subconsciously followed similar patterns and parameters.

This particular development responds to the demand of Burwood. As a family oriented suburb, many of the typologies respond to housing families. Should this design strategy be used for other suburbs in East Christchurch, a further analysis into housing requirements will be required. New Brighton for example has many more solo dwellers than Burwood therefore a higher range of options for solo dwellers needs to be addressed.





## CHAPTER EIGHT

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# EASTSIDE DESIGN GUIDELINES

Creating a dense housing environment requires a certain set of principles to be fulfilled for it to become successfully desirable. The following is a set of requirements specific to East Christchurch.

#### Block size

The suburban block for medium density East Christchurch should be permeable both visually and physically. They should not be more than 120 metres in length and must allow passage through the block to support pedestrian and vehicular movement. This produces shorter walls of housing that encourage walking and help populate various public spaces throughout the development. A variety of shorter blocks also creates a more aesthetically pleasing environment where the monotony of long lengths of houses are avoided.

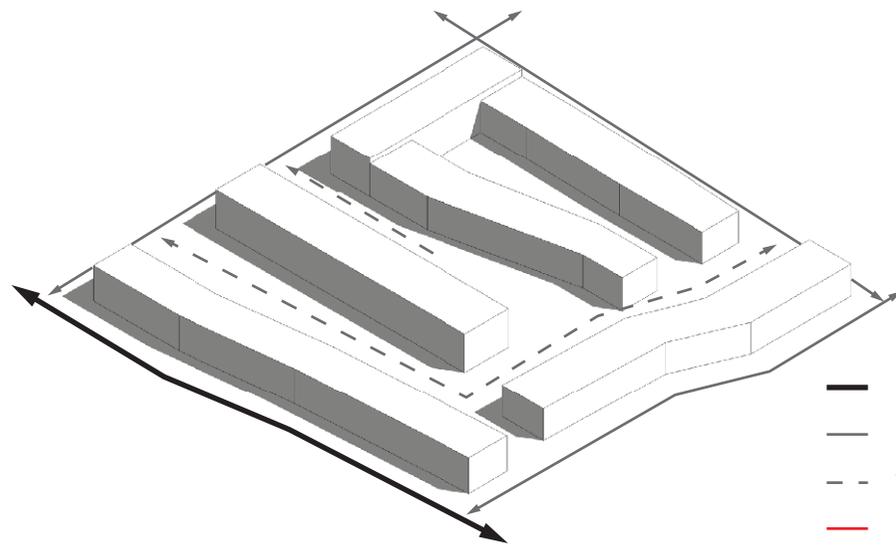


Figure 8.01: Long lengths of buildings promote vehicle movement

- Primary Roads
- Secondary Roads
- - Vehicle Laneway
- Pedestrian Laneway

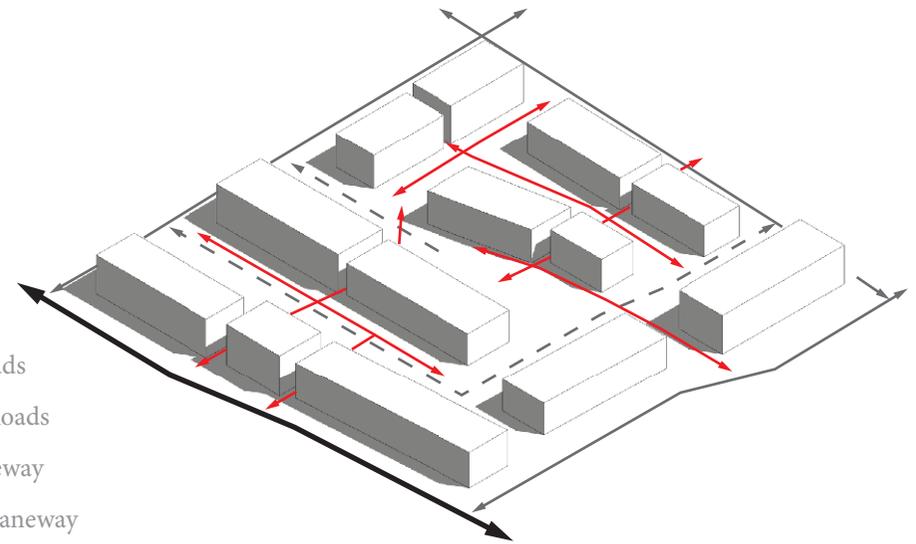


Figure 8.02: Short lengths of buildings promote pedestrian movement and a better public environment

## PUBLIC SPACE

In a medium density situation public space becomes very important. The subdivision should provide residents with a range of public spaces that support a range of activities which include garden spaces, playgrounds and soft and hard surfaced areas. As part of this network each block should have its own public space. Children should have easy access to most of these public spaces without needing to cross busy roads. Larger open spaces, primarily used for ball sports, should be within a short bike ride away.

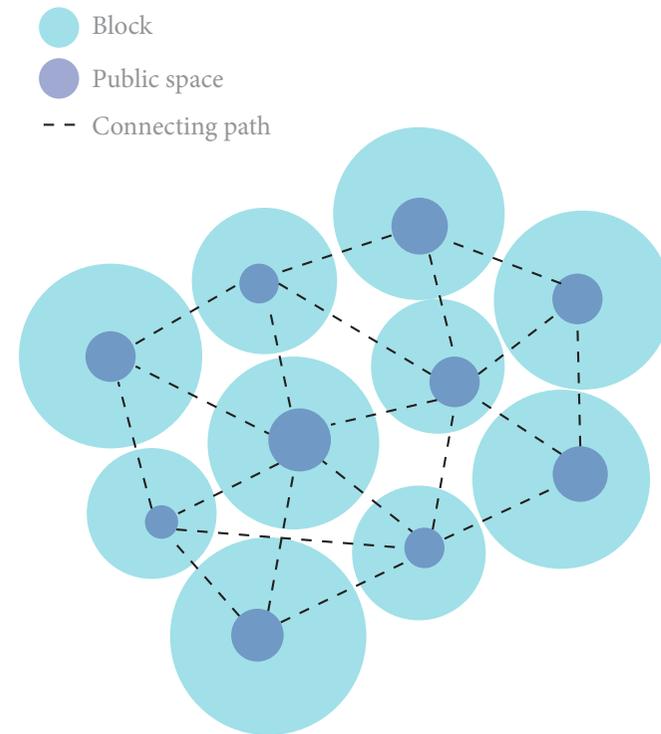


Figure 8.03: Concept diagram of interconnected blocks



Figure 8.04: Network of pedestrian paths and public spaces

## BUILDING PARAMETERS

### Setback

A short setback of 3-5m provides privacy and a social front yard. This saves space for the rear yard. The shorter distance also allows people to look out into the street or public space. A building need not be built flush with its neighbour; rather a little displacement is encouraged as it reflects the casual lifestyle of east Christchurch. The shorter setback also strongly defines the public space.

### Garage Setback

Similarly an attached garage setback shall be between 4 and 6 metres. This allows room for a parked car on the driveway without impeding on the footpath. A garage that is at the rear of a section is encouraged to be built on the boundary line. This saves space for the courtyard and allows the fence line of the laneway to be maintained

### Height

A maximum height of 11metres or three storeys is permitted. This allows buildings to achieve the desired floor area within the site boundaries while the spaces between the buildings will still have sunlight access.

### Distance Between Units

In a medium density context it is hard to prevent units looking at each other. This can be managed however, for distance that are less than 20 metres, a tree at least six metres tall should be planted between the two houses. This will restrict one's ability to overlook a neighbour.



Figure 8.05: 3D section of building parameters

## HOUSING VARIATION

A variety of house types attract a variety of markets which offers many advantages:

- a variety of size, form and typology create an interesting urban environment
- community groups are stronger when there are a variety of ages and incomes
- one is able to upscale or downscale their living options without moving out of the neighbourhood which creates lifelong communities. In a row of seven houses there must be four different housing types



Figure 8.06: Elevation of varying houses

Three Bedroom

Duplex

Duplex

Four Bedroom



#### UNIT VALUES

It is important that an East Christchurch subdivision does not provide for one financial bracket only. Rather there must be a range of affordable houses and market rate houses. This method is best to avoid the discriminative placement of lower income families and residents and avoid an exclusive reputation. It also supports a diverse community by introducing a range of incomes. The proportion of up market, standard rate and affordable houses needs to be determined through demographic analysis of the surrounding suburbs.



Figure 8.07: Affordable houses surrounding the central public space

## MOVEMENT MANAGEMENT-

To connect people to each other, locations and activities, a network of streets lanes and thoroughfares need to be considered.

### Primary roads:

-Should go through the centre of the subdivision and provide connections to neighbouring suburbs and main arterial roads. These roads handle a significant portion of the suburbs traffic and traffic moving through the subdivision

### Secondary roads:

- Need to service the blocks of the subdivision and are the main roads for directing traffic to the primary roads

### Vehicle Laneways:

- Laneways are much smaller in dimension but provide traffic flow to houses who would not otherwise receive access from primary and secondary roads

### Pedestrian Laneways:

- Though pedestrian foot paths shall flank both sides of primary and secondary roads, and at least one side of vehicle laneways, a separate pedestrian laneway shall offer a more direct opportunity for traversing a block. It is important for these spaces to be inviting with wide space, direct views to the end of the path and be planted in an attractive manner. These laneways can also support cyclist. The aim of pedestrian laneways is to make not driving a pleasure.

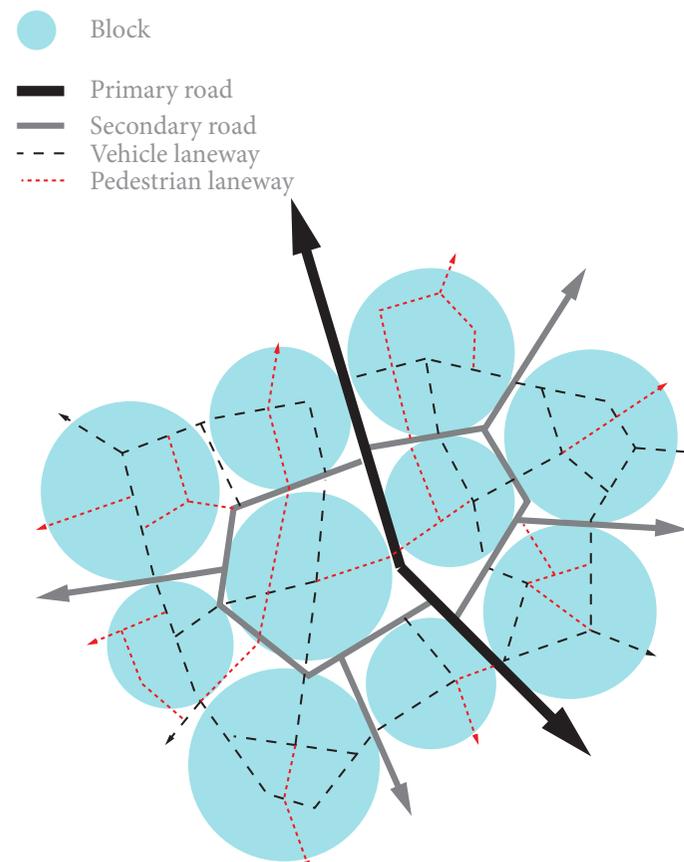


Figure 8.08: Concept diagram of road hierarchy



Figure 8.09: Interconnected networks

## CAR MANAGEMENT

Cars are a burden but can be managed. Sufficient car park spaces and garages must be planned and provided so that cars do not interfere with the well planned public environment. As has been made clear previously, East Christchurch has a love affair with private car ownership. Car storage is an essential element to the success of medium density design for East Christchurch

### Garages

Roughly speaking 10% of people have no access to a car, 40% access to one car, 40% access to two cars and 10% access to three or more cars. This needs to be designed for. A range of single and double garages can absorb much of the demand.

### Parking

Providing parking spaces is another way to absorb demand for vehicle storage and allow spaces for visitors to park. Since the driveway may not be vacant, a provided parking space allows cars to be parked in a common area.

### On Street Parking

All parking within the block will be in garages, driveways and the provided parking areas. On street should be made available along the primary and secondary roads. To optimise on street parking garages should be placed back to back. This allows along enough distance to park one's car between driveways.

### Rear alley ways

Vehicle access at the rear of the house removes the need for a front driveway, and removes the visual impact of cars from the street.



Figure 8.10: Garage hub



Figure 8.11: Rear vehicle lane way with rear access garages



Figure 8.12: Common parking area



Figure 8.13: Common parking area



Figure 8.14: Attached garages



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DISCUSSION

The immediate response to the housing shortage following the earthquake was to build more subdivisions. Though a necessary quick fix, the traditional method is sustaining the spread of the city further and further from existing networks and infrastructure. As a result residents of new suburbs on the outskirts become even more dependent on private vehicle ownership and become isolated from neighbouring communities. But if the sturdy ground within East Christchurch is developed into housing then a number of benefits arise:

- existing infrastructure is used such as roads, public transportation, storm water and sewerage
- new residents become less dependent on a private car ownership
- existing retail precincts will gain more business
- residents may be connected back to previous communities and the places in which they were brought up

Even though a new subdivision that follows traditional methods will suit some Eastside residents, current subdivisions do not reflect or support the unique characteristics of East Christchurch. Some suburbs don a uniform of exclusivity and remain out of reach for the average East Christchurch resident such as Waitikiri (figure 3.33), others have catered almost exclusively to the needs of the nuclear family and lack the diversity to support the range of demographics within the eastern suburbs. New developments need to meet the following criteria:

- lifestyle needs of East Christchurch
- the needs of a very diverse demographic
- affordable housing needs

This will ensure a smooth transition from a lower density to higher density but also and more importantly create a new subdivision that feels like home.

We have the opportunity to develop something great; a community diverse in age, character and income. Previously, moving to the latest subdivision can be seen as a status symbol, a mark of one's success. Inevitably this attitude makes the subdivisions and the houses increasing palatial and expensive. Unfortunately, this leaves new houses unattainable for much of the population. But if a development introduces a range of house designs and a range of house sizes then a large transect of society can be represented and move in.

Supporting diversity is density. Previously, suburbs become denser when an existing plot is divided into any number of smaller plots and construct attached units and town houses on the site. Since this is small scale development and relies on the ambitions of private developers, the maximum densities that result are a low 20 units per hectare. In these situations, this density does not allow large outdoor space, or provide extra outdoor public spaces or positively contribute to the urban environment. Being able to design an entire subdivision grants us the opportunity to optimise space and design of medium density housing. The design led research in this thesis reveals the following benefits to this approach:

- yard space varies between units and although some are small and some are large, the abundance of public space within the development allows usual yard activities to be carried out in these spaces, yet the yard can be private enough should one wish to access private outdoor space
- the diversity of house design attracts a range of demographic and a range

of affordable options. In future a resident will be able to upgrade or downgrade depending on their situation, without leaving the area

- medium density living has the potential to provide much better living options
- the sociable public environment it creates will allow communities to rapidly develop and grow with a mix of residents from young to old

Architecture is usually reserved for the civic and the rich, but, architecture can contribute to a more affordable housing solution. Medium density design and compact attached houses are key factors for achieving this. But ultimately affordability is a team effort between architects, planners, residents, and local authorities. An increase in demand is always coupled with a shortage of supply. It is the role of the authority to enable an increase in supply. Furthermore as the red zone and Burwood Park are council and central government land, the authorities hold the key to allowing this development to happen. By taking a not for profit stance on a portion of the buildings, and renting them to the neediest at a subsidised rate, will allow more people the ability to live in a strong healthy home. Perhaps for the first time in their lives, certainly the first time since February 22, 2011.



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CONCLUSION

New Zealand is a proud home-owner nation. But the dream of widespread home-ownership is coming under threat. Living costs in Christchurch have recently inflated greatly. Ever increasing house prices have met a sudden decrease of supply coupled with a sudden increase in demand. A large portion of Christchurch's housing stock has been deemed unfit for habitation; many of these homes were on poor ground and happened to be among the most affordable homes in Christchurch. Subsequently, to find affordable accommodation many families have had to flee to the outskirts of Christchurch and some have had to abandon home-ownership for rental accommodation. In doing so the eastern suburbs have lost friends, communities and businesses.

A traditional subdivision is not the best method to solve these problems. The density is too low and the urban environment does not follow ideal characteristics. This is partly due to government policy, economic climate and urban and architecture design. Though Christchurch is relatively conservative, and promotes wide spread suburbia, a change needs to happen. Changes towards medium density living will re-introduce affordable living options. It will become a suburb for the young, middle age and old, it will become a multi-generational development.

By repopulating the good ground in East Christchurch, people are brought back to the heart of East Christchurch. Car dependence is reduced as the sites rely on existing infrastructure, bus routes and established centres; all three proposed sites are within a very close distance to the main shopping areas in East Christchurch.

East Christchurch is an old community that has been developing since the Great War. As a result, a richness of diversity has grown. This needs to continue in future developments and although it seems hard to design, the correct planning strategies can enable density and diversity to flourish. Appropriate and contextualised medium density design can allow the majority of East Christchurch residents to return to their pre-earthquake lifestyles.

Above all, East Christchurch residents are a friendly group and though they seem rough around the edges, as some are, a heart of gold beats beneath, a heart that has been struggling for the past three years. It is time we breathed life back into this heart, back into the Eastside. New life will have new changes but changes for the better; these changes bring a strong community, and return the essence of East Christchurch. As a consequence the spirit of East Christchurch will be sure to rise.

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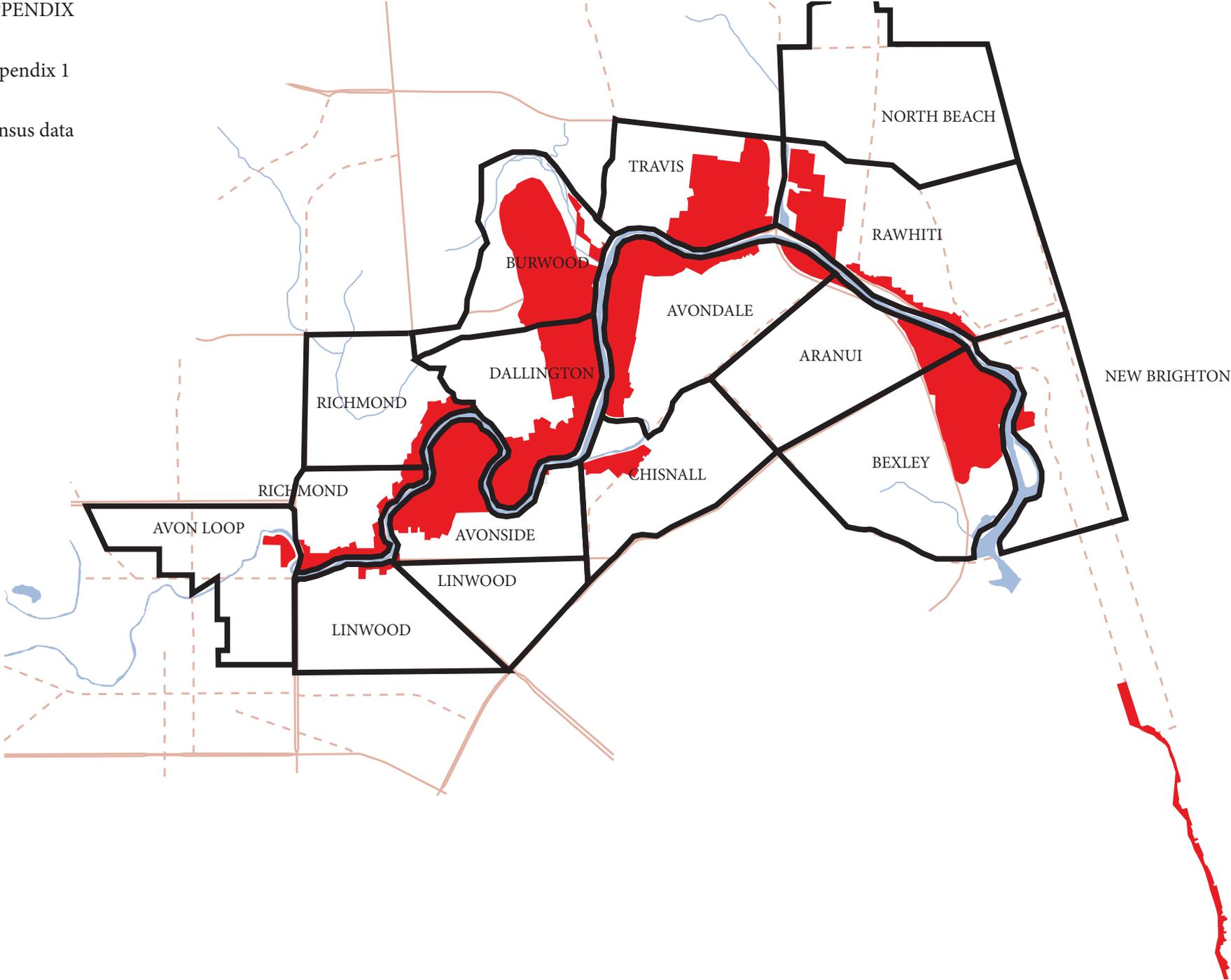
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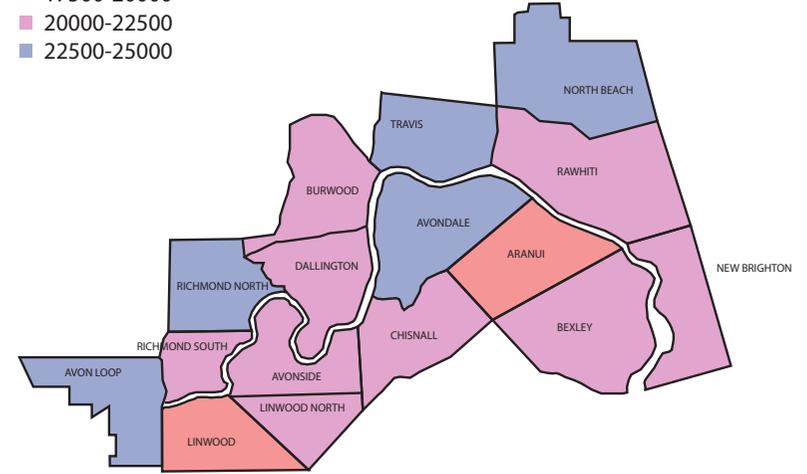
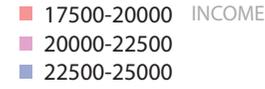
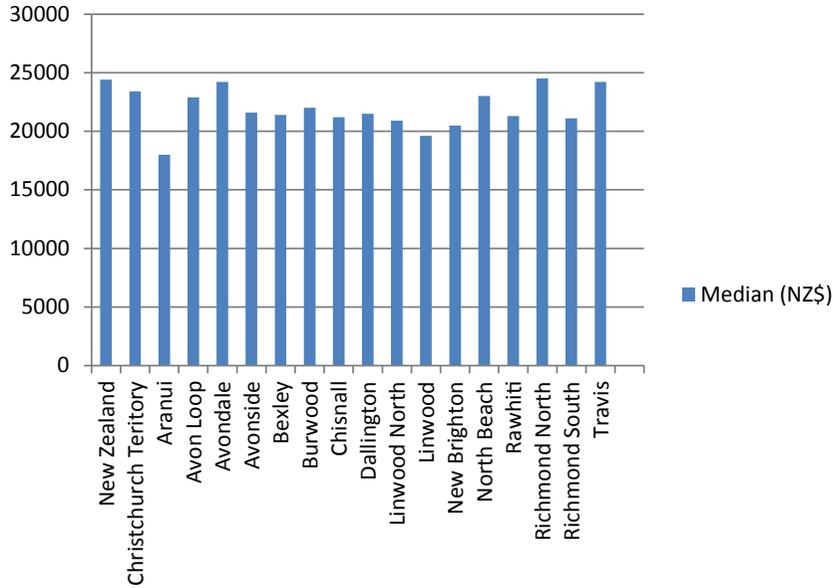
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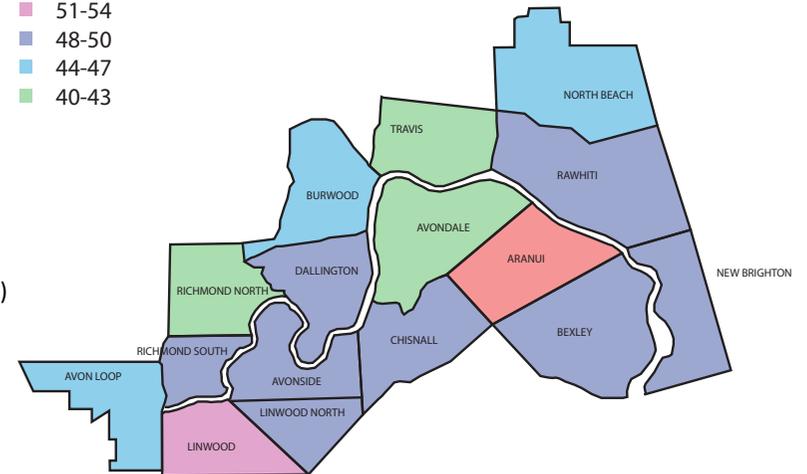
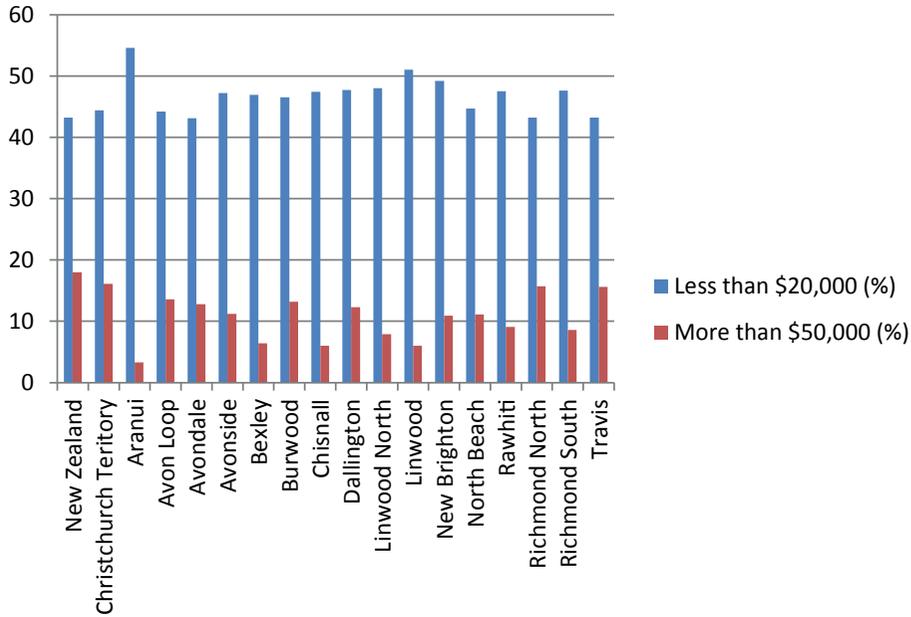
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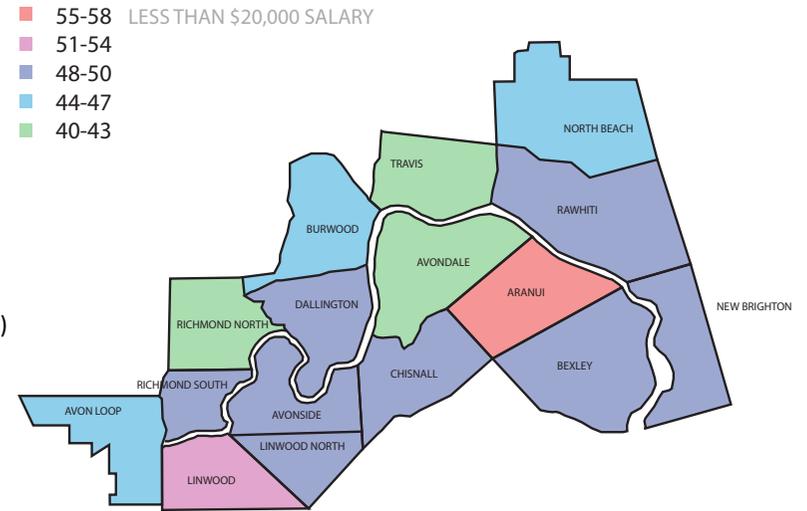
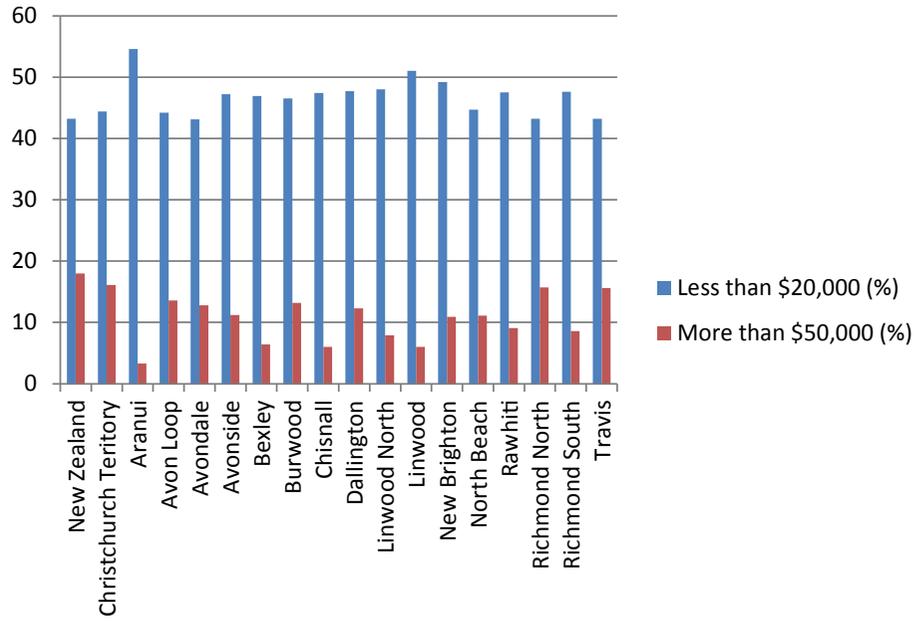
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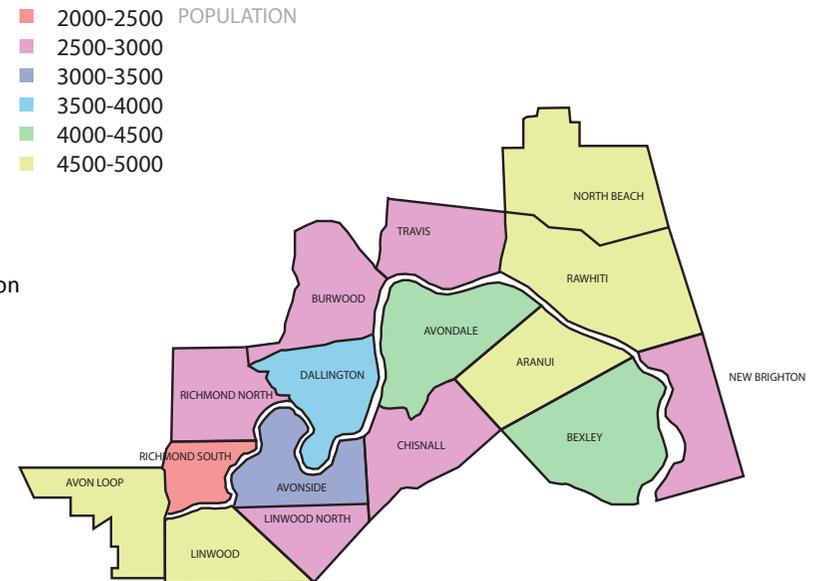
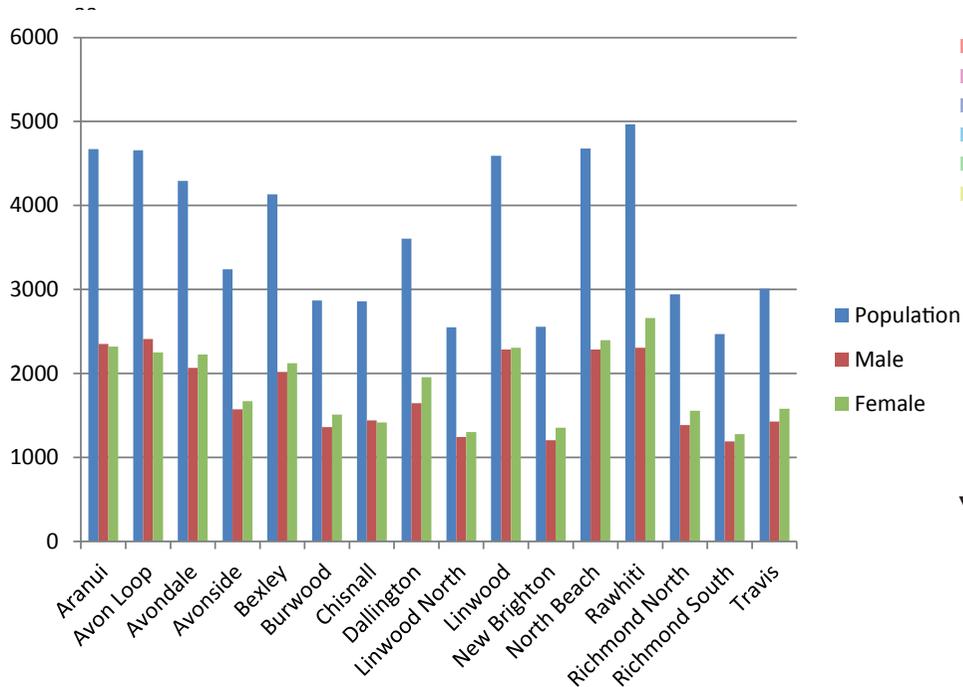
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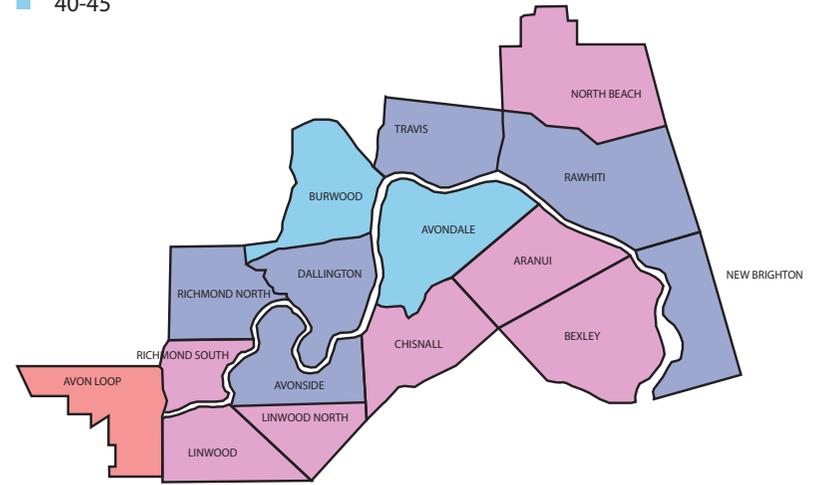
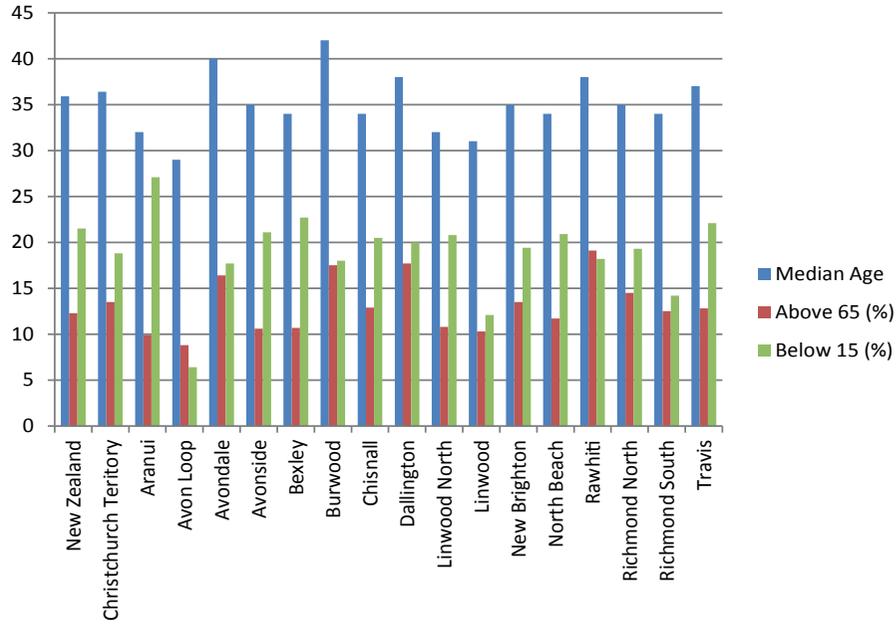
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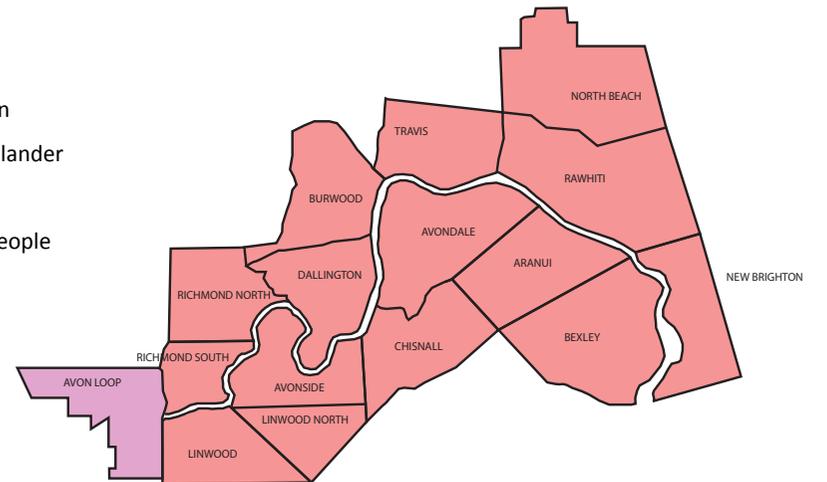
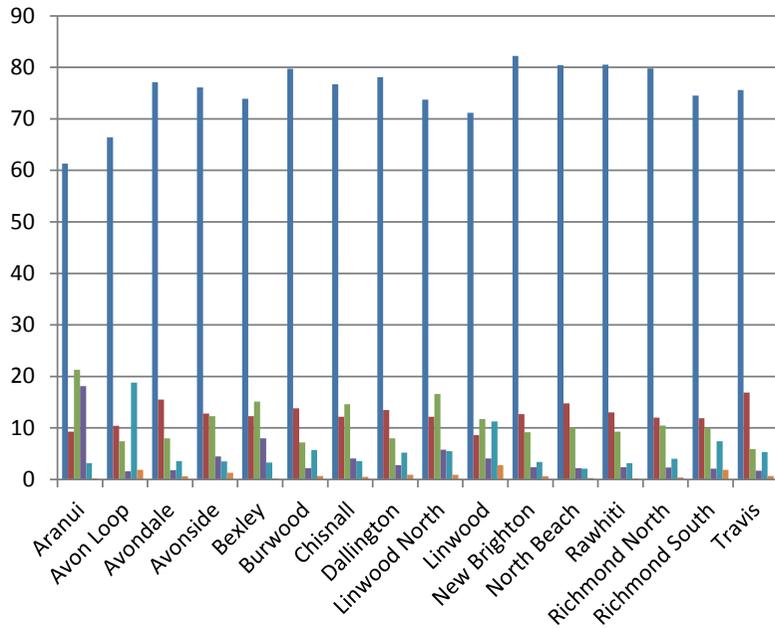
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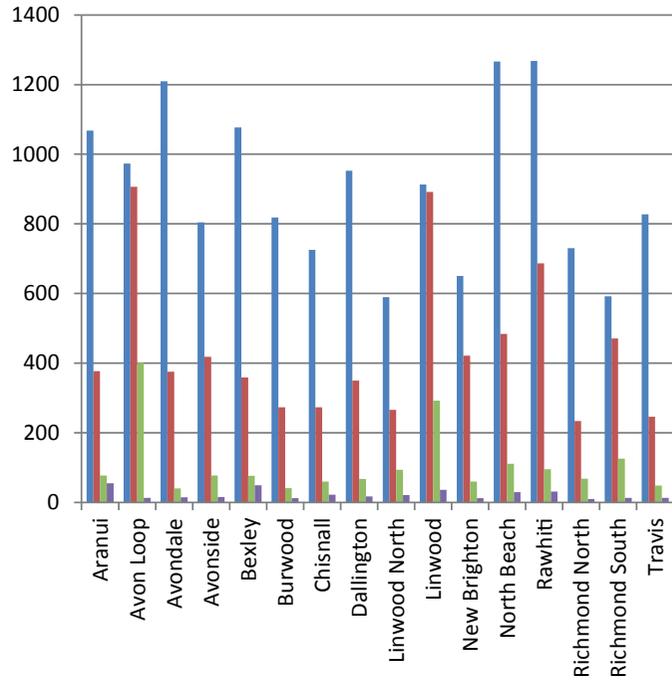
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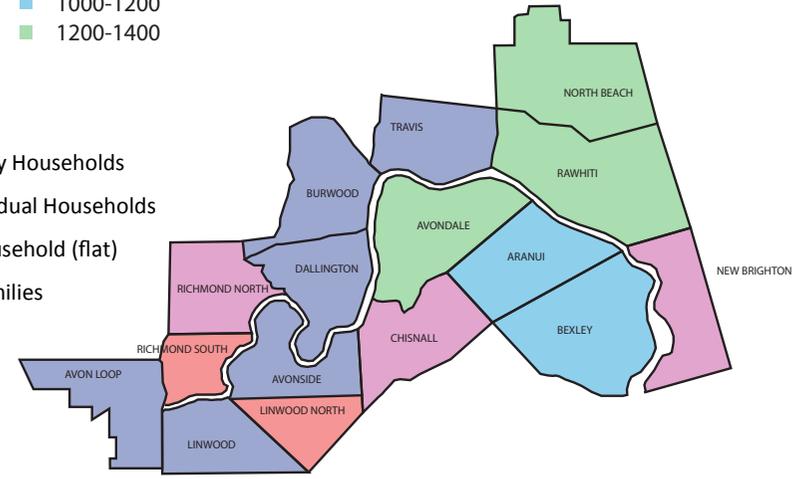
### ETHNICITIES



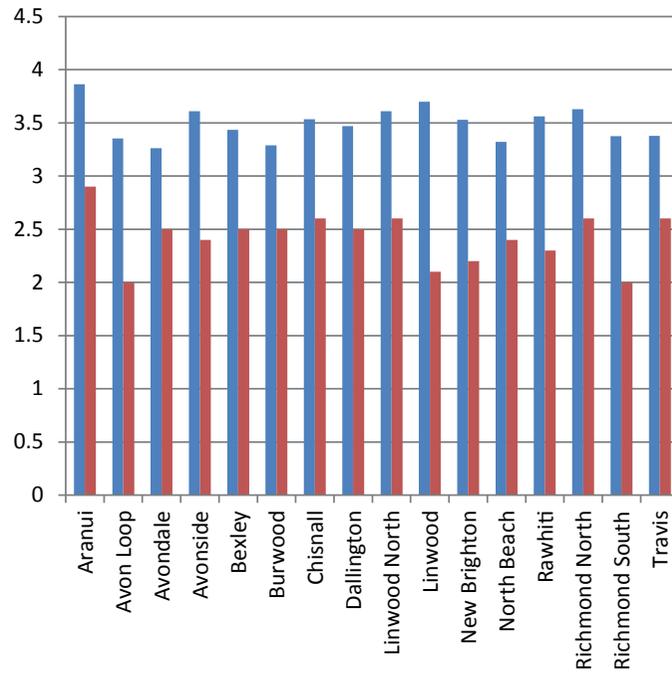
NUMBER OF HOUSEHOLDS



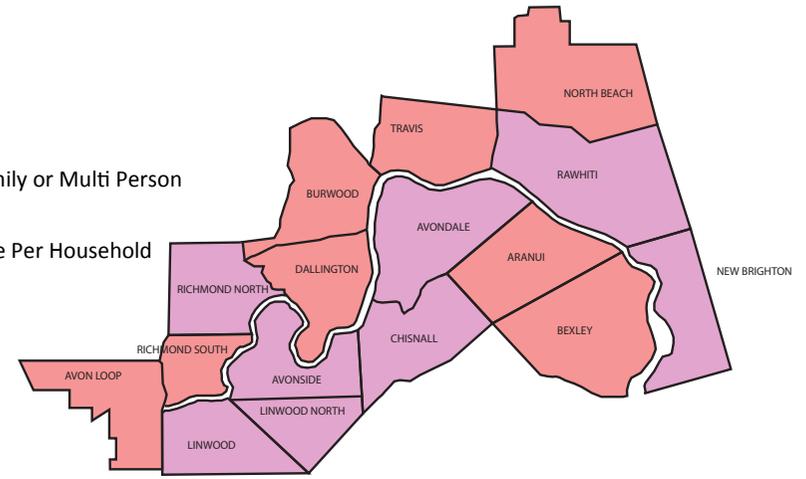
POPULATION OF FAMILY HOUSEHOLDS



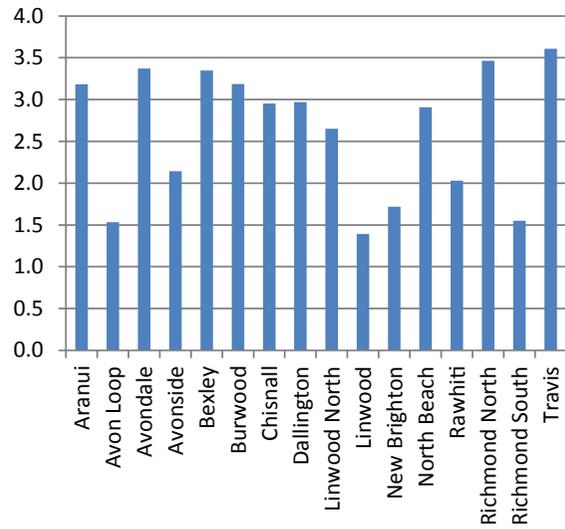
PEOPLE PER HOUSEHOLD



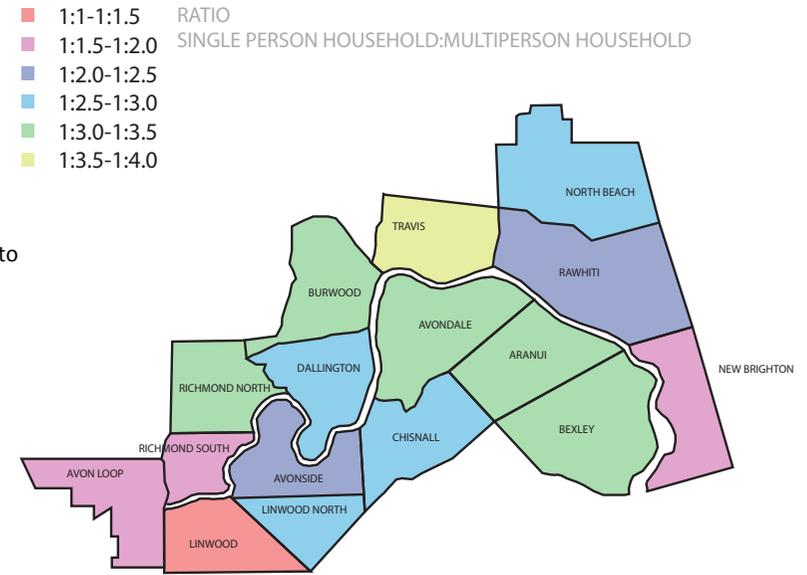
PEOPLE PER NON-INDIVIDUAL HOUSEHOLD



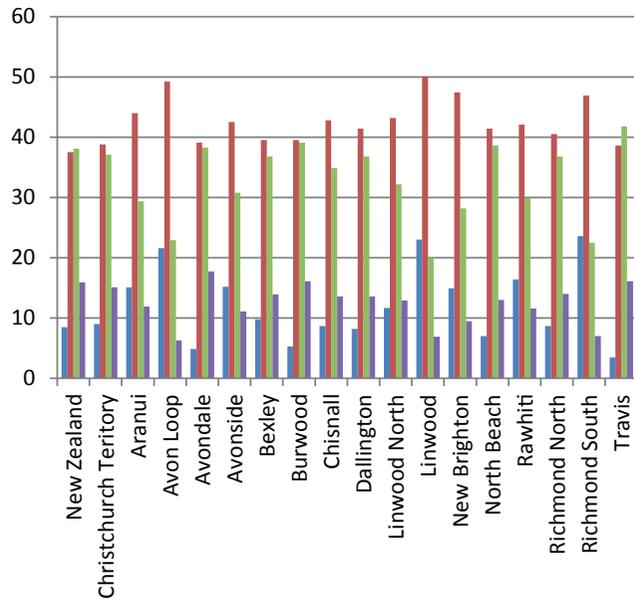
RATIO OF SINGLE PERSON UNITS TO MULTIPERSON UNITS



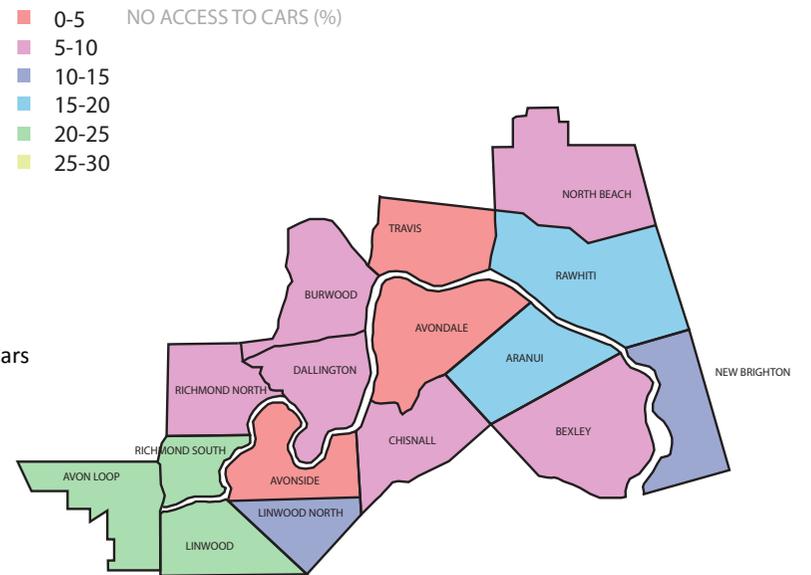
Ratio of One Person Units to Multi Persons Units



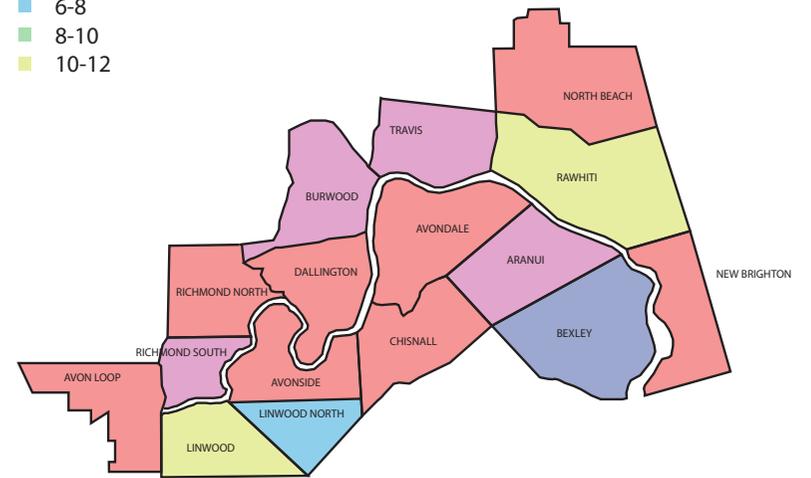
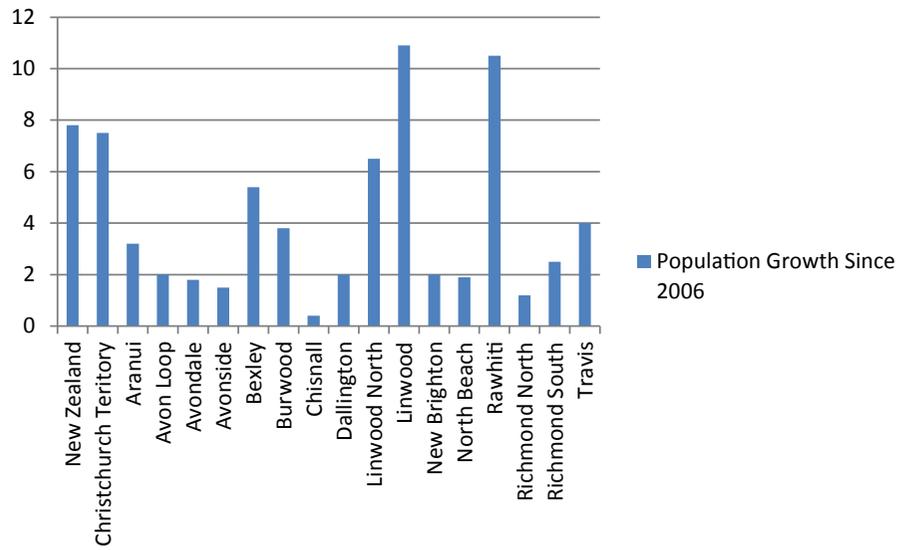
VEHICLE OWNERSHIP



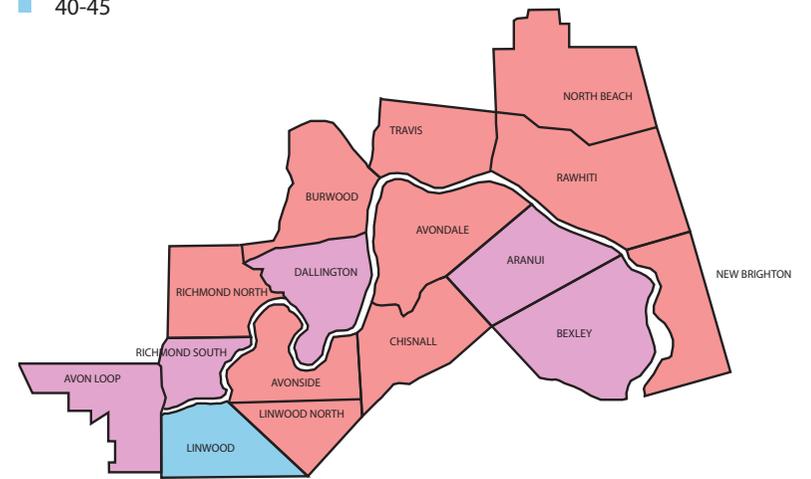
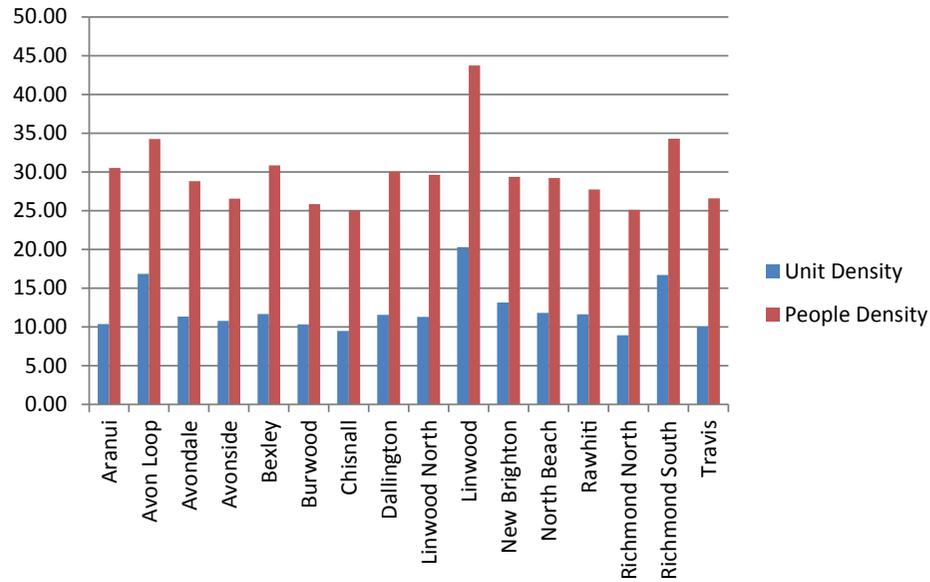
Access to 0 cars  
Access to 1 Car  
Access to 2 Cars  
Access to 3 or More Cars



POPULATION GROWTH

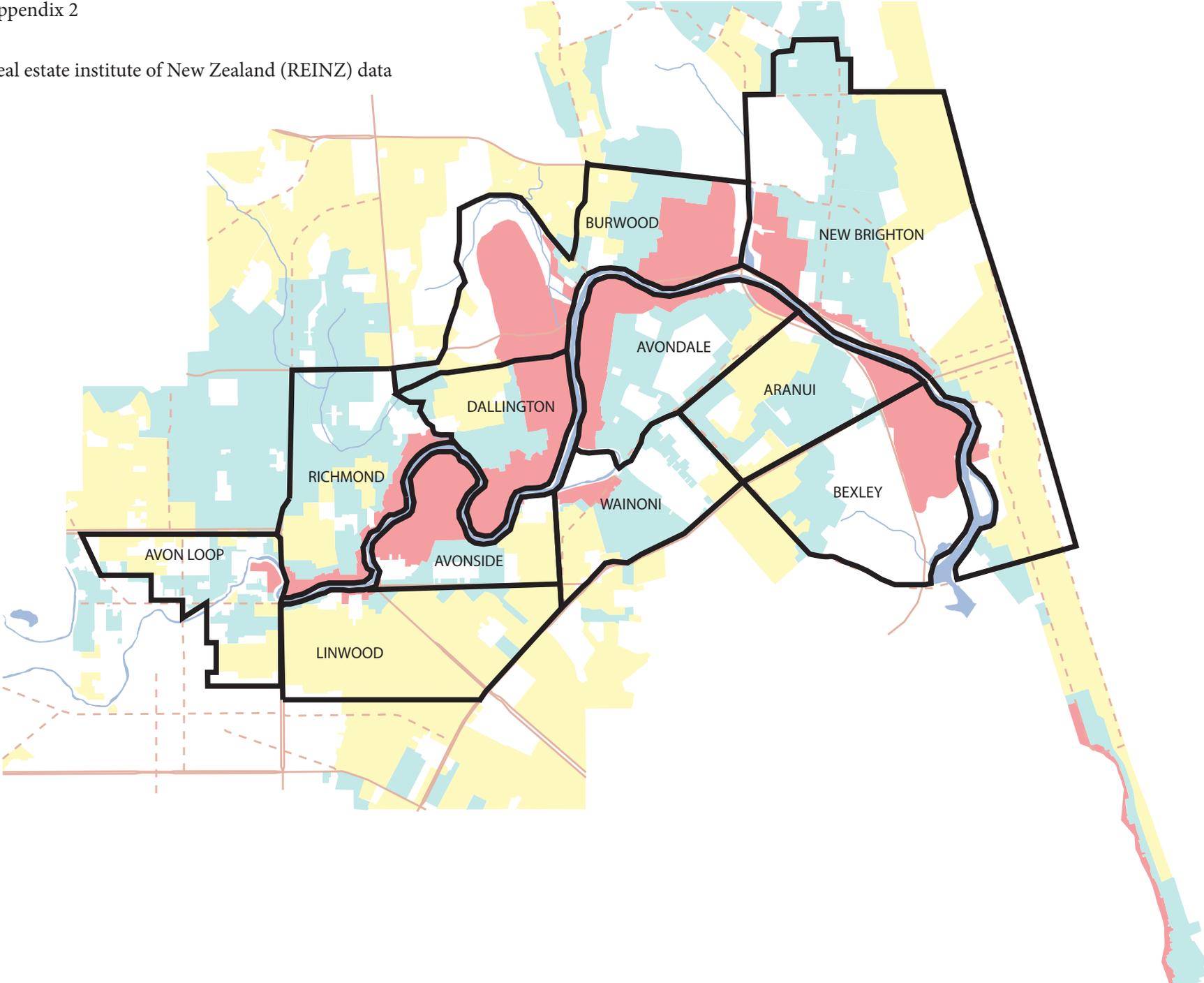


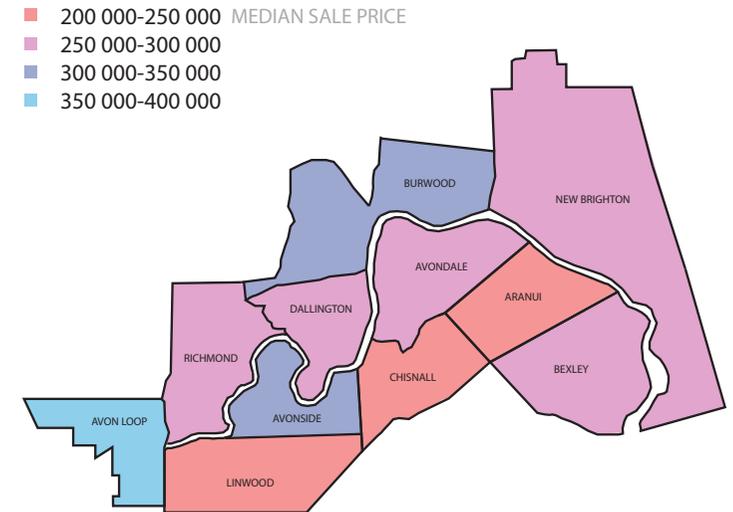
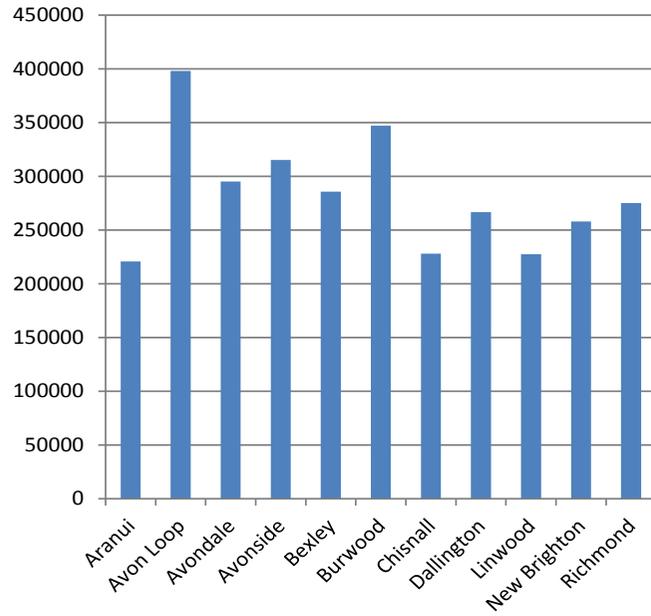
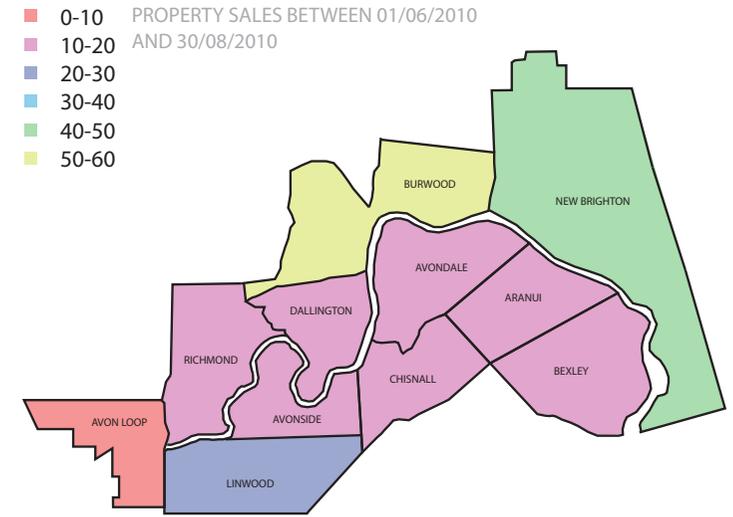
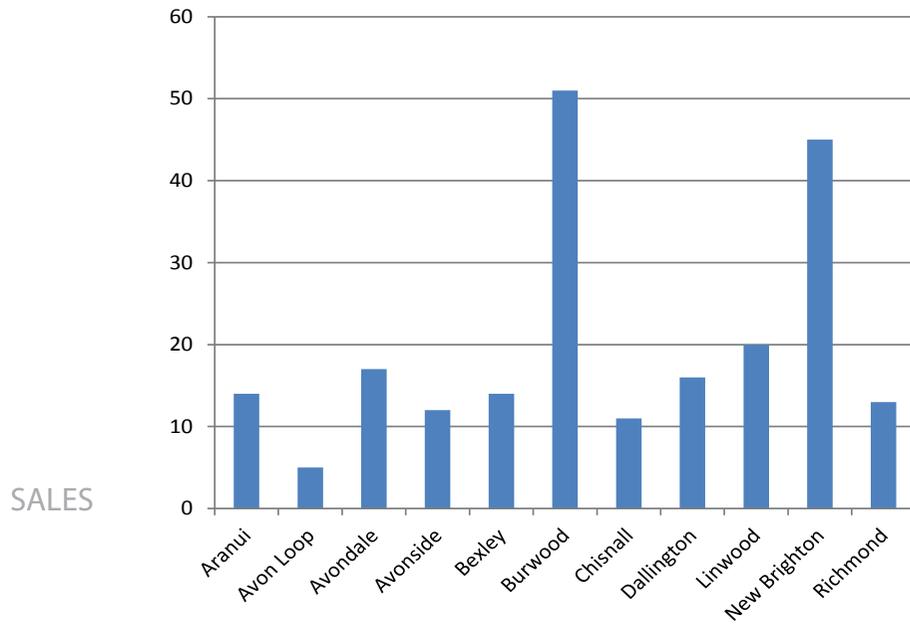
DENSITY



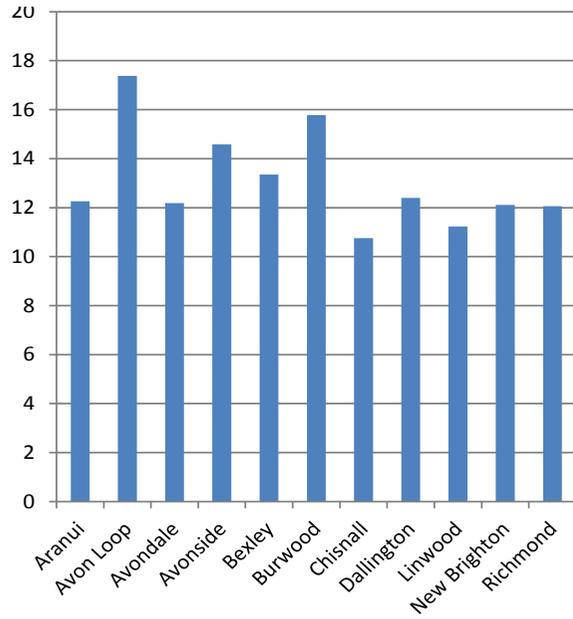
Appendix 2

Real estate institute of New Zealand (REINZ) data



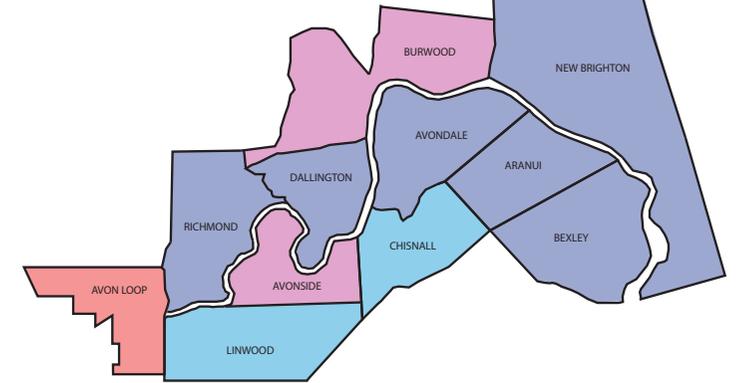


MEDIAN INCOME TO MEDIAN SALE PRICE RATIO

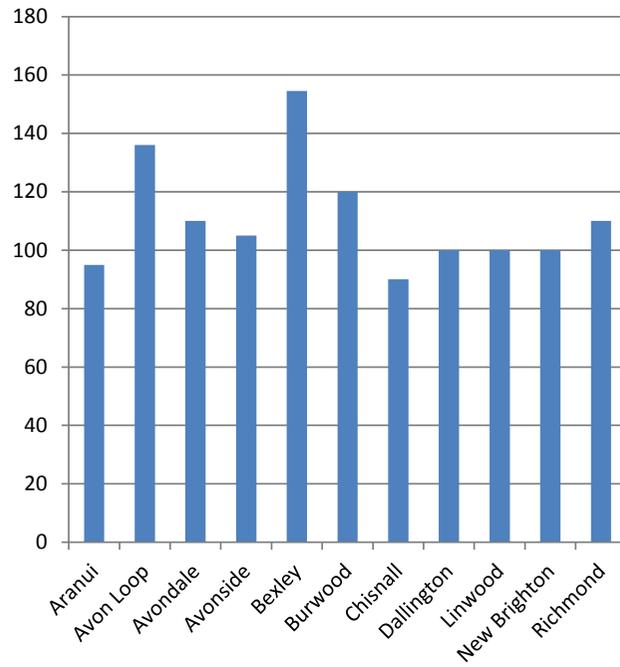


Ratio between Median Income to Median House Price

- 1:16-1:18 RATIO OF MEDIAN INCOME TO MEDIAN HOUSE PRICE
- 1:14-1:16
- 1:12-1:14
- 1:10-1:12

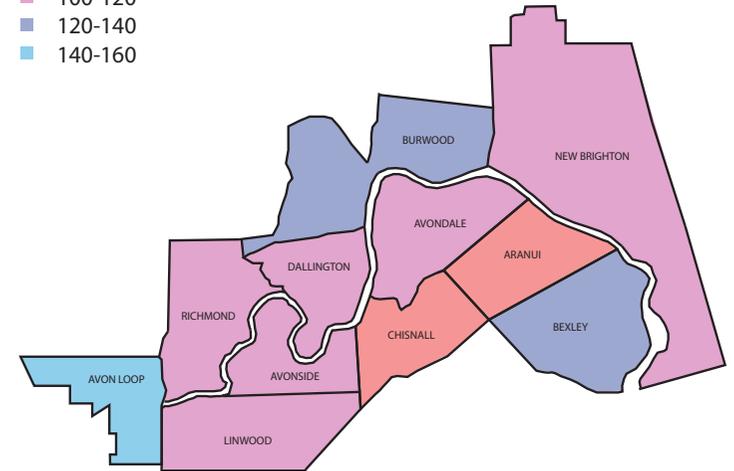


MEDIAN FLOOR AREA

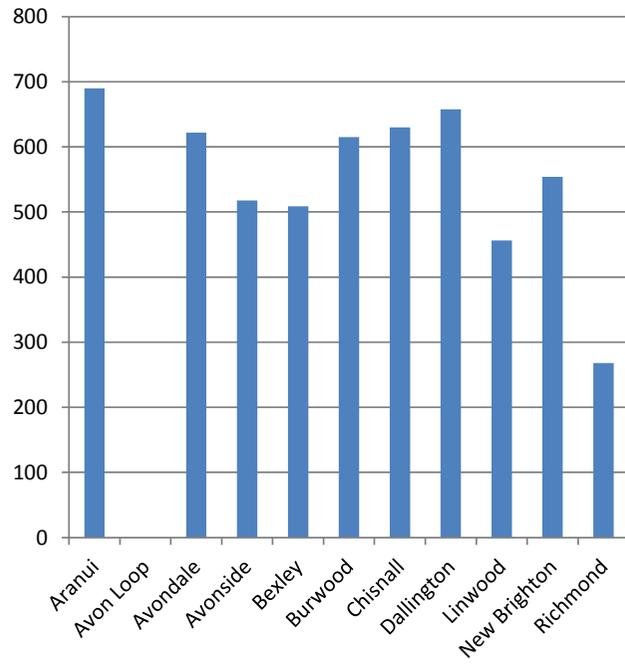


Median Floor Area

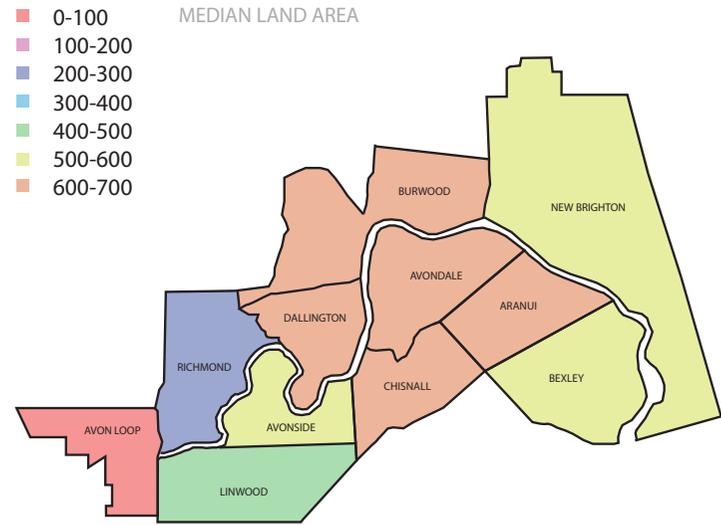
- 80-100 MEDIAN FLOOR AREA
- 100-120
- 120-140
- 140-160



MEDIAN LAND AREA

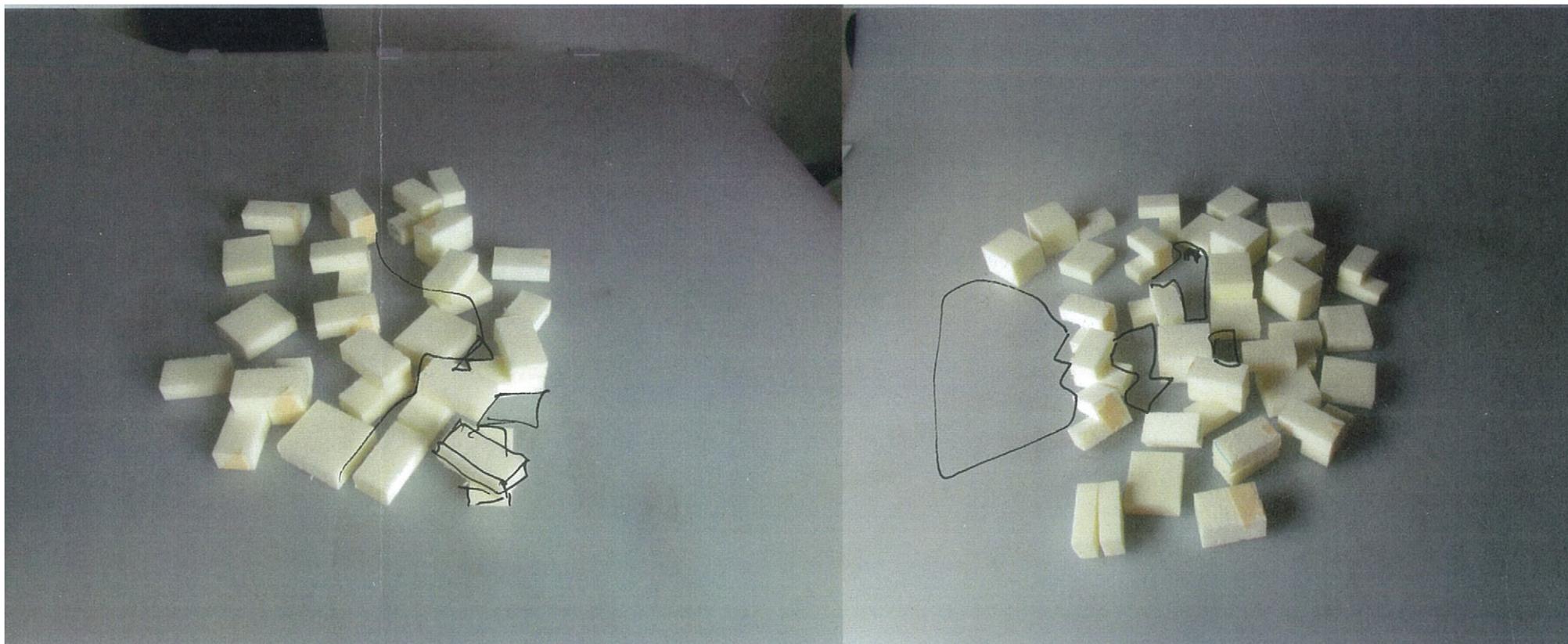


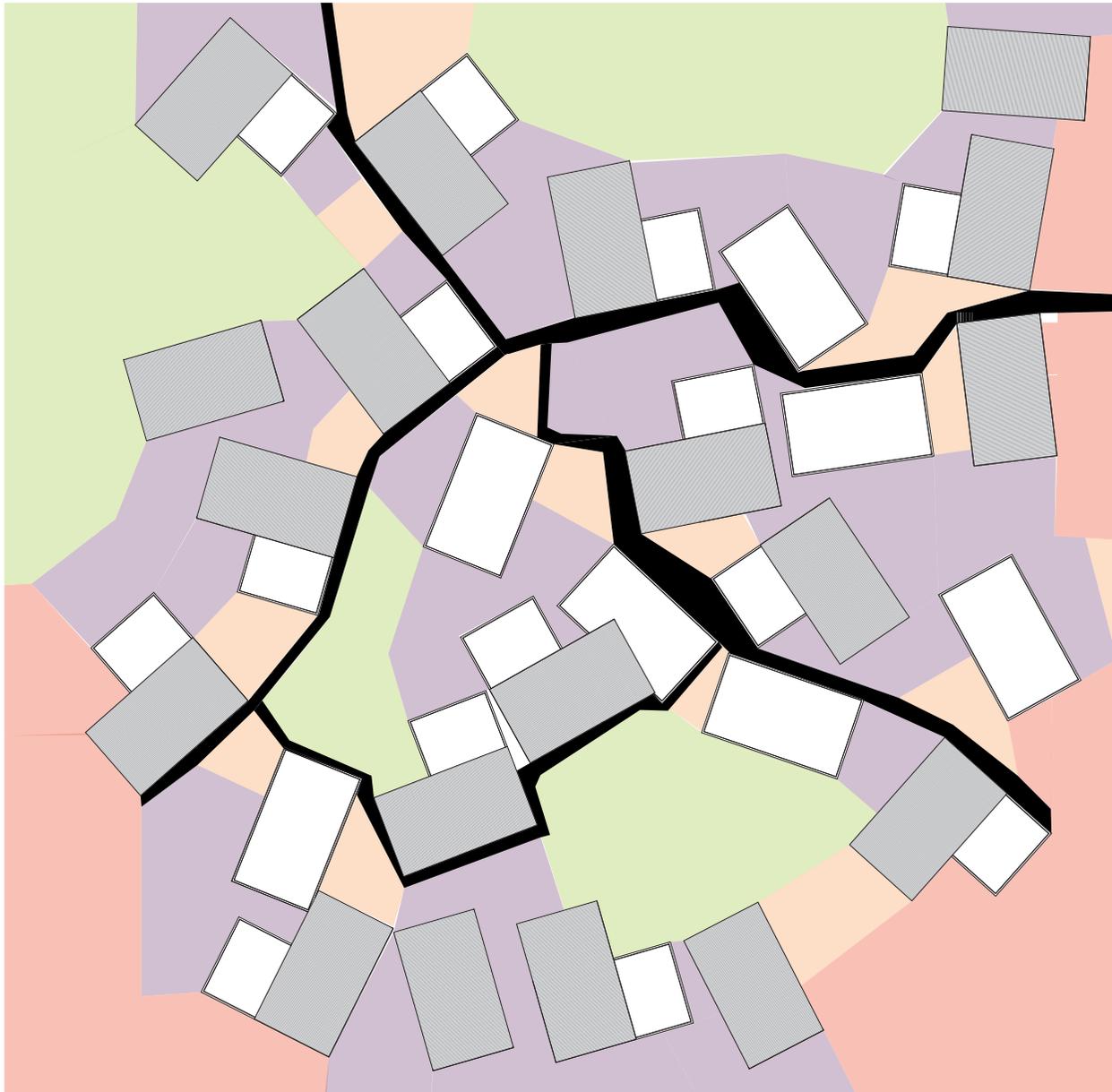
■ Median Land Area



Appendix 3

Random housing placement test





-  PEDESTRIAN WALKWAY
-  PRIVATE GARDEN
-  CARPARKING
-  PUBLIC GARDEN
-  PUBLIC OPEN SPACE

This approach has a random placement of dwellings with public and private amenities worked around the dwellings. Parking is detached at the corners of the block. With all units single detached dwellings randomly placed, each unit although identical will have unique surroundings and create its own identity and strong sense of place.

AREA = 0.77 hectares  
 NUMBER OF UNITS = 26  
 DENSITY = 33.7 uph

