INTENSIFYING CITIES
An exploration into methods of transitioning Auckland into higher densities
Explanatory Document

A Research Project submitted in partial fulfilment of the requirements for the degree of
Master of Architecture (Professional).
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Abstract

Like many other large cities, Auckland is facing an exponential increase in population. With the drastic increase of people moving to the cities, comes the problem of providing enough housing in the cities. With the current state of high density architecture in Auckland, it is no surprise that the people in this city are apprehensive about the introduction of measures to intensify the city, such as the unitary plan.

This project explores the opportunities for the integration of high density housing on the fringes of suburbs in a context where detached housing is still seen as the ideal home. The intention of this project is to develop a mixed use model which could be adapted for other places in the city. The scheme will be a solution that will be medium rise and of high density and introduced to an underdeveloped site in Auckland and will consider the impact it has on within its immediate and greater context, and most importantly the existing residential community. Fundamentally, the scheme needs to be a positive addition to the site, making it necessary to consider amenities to the new and existing residents of the area. As a result of this, not only architecture is involved, but the planning of such amenities will be explored in this research project.
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1.0 Introduction

1.1 Background of the project

It is no secret that the migration numbers into Auckland from both places overseas and elsewhere in New Zealand are on the rise, exponentially increasing the population of Auckland. More and more people are moving into the cities for work and education opportunities. How does this currently affect our housing market? As a result of both the increase in population and the increase in people buying investment properties, the demand for housing in Auckland has inevitably risen.

Today, the population of Auckland stands at 1.4 million. In 30 years, the projected population is expected to be 2.5 million in a worst case scenario, which is almost double the current population. To meet this growth, we need to build another city the same size as Auckland to accommodate all of these people – and more if we are to future proof our city.

So why can we no longer build outwards? What’s wrong with expanding the borders of Auckland? Unfortunately, the developers are not aware of (or do not care about) the negative effects of building detached two storey houses, such as many of the ones we see today being built in Flat Bush. Their ‘contribution’ to Auckland is exacerbating the ever growing borders of the city as urban sprawl jeopardises the characteristics of rural living and threatens agricultural productivity. If we continue to expand our borders, the transport and infrastructure will need to be expanded concurrently to serve the population living on the fringes of the city. Furthermore, according to Griffith University’s VAMPIRE study, people who live on the periphery of cities suffer

Figure 1: Projections for the population of Auckland
from social and financial isolation.\footnote{Jago Dodson and Neil Sipe, “Shocking The Suburbs: Urban Location, Housing Debt And Oil Vulnerability In The Australian City,” Urban Research Program (Brisbane: Griffith University, 2006) http://www.vampire.org.nz/Dodson_Sipe_2006_VAMPIRE_Urban_Location_Housing_Debt_and_Oil_Vulnerability_in_the_Australian_City.pdf.}

The obvious solution is to ‘intensify’ the city. When we look at how people in other over-populated cities such as Hong Kong, we see their solution of giant residential towers. In suburban Auckland we still embrace the luxury of personal gardens around our detached housing and we continue to build these detached houses, causing the city’s boundaries to seep into rural land like an ever-growing virus.

1.2 Project Outline

The outcome of this project is to be an architectural contribution to the issue of population growth in Auckland. The project is divided into two parts; the first being the urban design elements of the project, which establishes the site, community, and amenities – during which the development’s use for higher density housing will be determined. The second is to focus on the architecture of a chosen area within the site. At this stage of the project, one section of the site will be chosen within the established development as a basis for architectural design.

1.3 Research Question

Considering the social implications of high density housing, how can higher densities be addressed within the context of suburban Auckland?

1.4 Aims and Objectives

The intention of this project is to develop a model for high density housing to raise awareness of what housing typologies needed to be considered to prepare for Auckland’s future. The result of the project would be a model that is adaptable to different locations throughout Auckland, factoring in the social needs of its residents, its community, and its context.

1.4.1 Objectives

- Determine the elements that the development’s residents will need to forfeit while living at higher densities, and identify what can be done to mitigate the negative impacts of living at these densities.
- Overcome the stigma and lack of identity associated with the architecture of the apartments.
- Test the viability of high density housing on the fringes of suburbia.

1.5 Scope

As discussed in section 1.2, this project is comprised of two parts – urban design and architecture.

1.5.1 Urban Design

The scope for part one of this research project includes:

- Designing the massing of the development, taking into consideration the heights and building widths and how these affect the buildings around it and overall context
- Establishing the functions of each building and surrounding areas
- Establishing the different activities involved in each area of the development
- Consideration of existing public transport and car parks within the
vicinity of the development

• Consideration of the impact of this development on the city’s context

The scope of this part of the project does not include:

• The detailed form of every building within the development
  (suggestions of the building envelope and form may be made in the
  renders of the project to show context, however these are not within
  the design scope and are only included for the aesthetics of the
  rendered image)
• The plans of every building; only the chosen building will be
developed further

1.5.2 Architecture

The scope for part two of this research project includes:

• The design of the building floor plans, including the building façade
• Establishing the relationship between the building and its context
  within the development
• Considering the potential demographics of the residents of the
  building and choosing the appropriate typologies that will suit their
  needs or potentially developing a typology that residents will adapt to
2.0 Methods

As proposed above, the project is divided into two sections: urban design and architecture. The urban design part begins by researching the statistics that brought about this project – population growth and projection within Auckland. Auckland has already begun its process of building at higher densities, so during this stage existing solutions to higher density will be investigated through critically analysing the buildings on site visits. These site visits would be to both potential sites for the research project and for studying examples of higher density housing in Auckland.

Throughout the whole project, published media in the form of journals, magazines, news articles, reports, books, and documentaries will be used as reference material. It is particularly important to reference media reports as this provides a question to be discussed and because published news articles about the housing crisis and the Auckland Unitary Plan are subjects of debate this year.

The research of precedents will not only focus on Auckland housing, but will also look to international examples, particularly in cities that face the same population issues such as in Melbourne and European cities including Amsterdam and London. Examples in Hong Kong and parts of Asia will also be considered. However, due to the great cultural difference between New Zealand and Asia, it will not be useful to focus on Asian examples or base a project on precedents from these countries; they will only be considered as a part of the research.

The urban design part of this project looks at the needs of the potential residents through researching the precedents of high density housing solutions with regards to the existing context of the site. During this stage, both physical models and computer models will be made to experiment with
the layout on the chosen site.

In the second part of this project, one residential based building will be chosen to develop further. This will include the development of the building's layout, floor plans and façades. Working these out will give an idea of what the densities of these buildings are.
3.0 Literature Review and Case Studies

3.1 Literature Review

The selected literature covers three fundamental; Housing in Auckland, Urban Design and The Social Dimension. These publications will inform major design decisions in the development stages of this research project.

3.1.1 Literature concerning Housing in Auckland

*A Brief History of Auckland’s Urban Form* gives an insight into the process of the colonisation of Auckland, specifically when and where residential settlements were established, why Auckland looks like it does today, and projections on how it may look in the future. During the economic boom of the 1920s, the types of housing at the time were predominantly detached single storey units, the most common style of house being the villa. In the 1930s, state housing was introduced by the government due to the lack of private loan finances during the Great Depression coupled with deteriorating conditions of inner city rental properties; the government’s purpose was to try to improve living conditions. Higher density apartments were introduced to inner city areas in the 1940s, but the government state housing initiative focused on building detached units due to the fact that they were considered to be more suitable for families. The concept of consolidating urban growth was first introduced in Auckland in 1951, and was driven by the idea of controlling the growth on the urban fringe. However the large amount of state housing being constructed heavily influenced the urban form, particularly in south Auckland. The idea of intensifying urban development to make better use of the existing public transport system has already been in place since the 1950s; however this proposal in the 1970s was met with negative response from the public due to having already experienced poor examples of infill housing such as the ‘sausage flats’ of the 1960s. The 1980s saw an increase
of infill units and flats in suburbs like Remuera in an effort to intensify on existing land. However, the 1990s saw a change in looser immigration laws, bringing many people from overseas which put a strain on the struggling public transport systems and housing, resulting in new eastern suburbs being established outside of the Metropolitan Urban Limits.  

For this research project, initially the intention was to develop only the building typology to satisfy the scope of the project. Instead, the decision to design a development model as a solution to the research question is a decision made based on the report Future Intensive: Insights for Auckland’s Housing. This report took findings from interviews conducted with residents of medium density housing developments in Albany, New Lynn and Onehunga. The authors found that people chose to live at high densities for reasons to do with the physical context in which the development is located, such as proximity to transports, shops, facilities and motorway connections. Social context was also a factor in their choice of residence in the New Lynn development, such as a majority of the interviewees who were of Chinese descent; they wished to be in an area with an established Chinese community. Inevitably, research shows affordability of the units to be a driving factor as to why they chose to live in these developments, along with lower cost of living in these suburbs.

Despite the stigma in New Zealand attached to any density higher than suburban, the report claims that their research shows residents in these developments are content with the lifestyle that comes with living in medium density housing.

“These studies reveal that the experiences of residents living in higher density living environments are valued in different ways and that urban amenities can contribute to residents’ quality of life. In this regard, the building development on its own is not sufficient; the quality of the neighbourhood and its social amenities are also important.”

Trying to contribute something positive to the residents of the city isn’t only about the building type they live in; the building and its amenities will define the way residents live and their quality of life. Therefore it is rational to extend the scope of this study to a larger scale and include urban design.

If we look at The Residential Design Guide for Developments in Residential Zones in Specified Growth Areas, the guide defines ‘good practice’ elements for designated development zones within the Isthmus section in Auckland, and expresses the importance of good urban design to improve the quality of the urban environment in those areas. One of the aims of their strategy is

“To provide an urban structure of walkable neighbourhoods clustering around centres of compatible mixed uses in order to reduce vehicle dependence for access to employment, retail and community facilities.”

The guide indicates the factors that would need to be considered for providing an optimal quality of life to the residents such as necessary exposure to sun light and ventilation through building separation and planning devices such as height in relation to boundary, character of streets, public spaces and orientation on the site. These factors will inform some of the decisions for the design of the development model.

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3.1.2 Literature concerning The Social Dimension

One of the concerns about dramatic densification of a city is losing the city’s character and social dimension. In the documentary *The Human Scale*, the example of modern day China is presented. China is one of the most rapidly growing countries in the world, and high rise apartments with over 40 storeys are a common sight. Amongst this rapid development, traditional Chinese houses like the *hutong* are lost. The traditional *hutong* house typology is a set of houses built around a communal courtyard and it reflects the way the Chinese used to live; it told the story of how their lives revolved around these courtyards and gave the houses a social dimension to show the importance of being together.

“If you think about how we lived historically – we lived in tribes, clans, extended households, big villages, and big family groups. And I guess our natural thing is to be together with other people. It is a very modern phenomenon that we suddenly live either in tiny households with two or three people or live completely on our own.” – David Sim of Gehl Architects

It is a natural instinct to be together and to live together in large groups, in humans and animals alike. In parts of the world affected by dramatic modernisation such as Hong Kong and New York City, this ‘togetherness’ and a community environment is forfeited. This ultimately affects us as people - it defines the way we live, our behaviour and shapes our personalities. Copenhagen faced a similar situation on a smaller scale; since the 1960s, city planning was constructed around the motor car. An analysis lead by Jan Gehl and his team analysed how people behave in streets and found that human occupation, spontaneous meetings with acquaintances, and conversations

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were focused in areas where cars were absent. A similar social experiment was performed in New York’s Times Square, where the team set up a make shift square for people only, and yielded similar results.

In *The Rise of the Private City*, Goldberger discusses the positive and negative impacts that the rise of the suburban lifestyle brings. He suggests that the suburban lifestyle is desirable because living in the suburbs give the residents the benefits of being in a city but without exposure to the problems the city inevitably brings such as poverty and crime. The result is an unintentional class-driven segregation within the city and its surrounding suburbs. He also argues that the differences between a city and its suburbs are blurred with the development of modern day urbanism, and that our desires for the suburban lifestyle have defined “the urban experience.” These new urbanism experiences have been demarcated from the traditional city through the aspects of suburbs we value the most – privacy. Goldberger argues that cities today have become increasingly closed off and privatised, such as malls or tall corporate towers where shops, restaurants, and open places used to be.

From these reviews, the ideas which will influence the design of the research project will be the use of communal spaces to bring people together. The spaces will be of different levels of privacy; private, semi-private, and public space, with semi-private being a communal place only residents of the apartments can use. The separation of public and private should not simply be a wall but should include a transition, for example, a transition of levels. An open public space will be implemented in this project, and the buildings within the vicinity should interact with this space, creating a more welcoming environment in the public area. From *The Rise of a Public City*, the building should not adopt the suburban ideal of privacy; it should open up to these public spaces at ground level. However, the residents’ privacy shall not be compromised. The logical way to separate private from public in this case is to use the ground floor of the development for public activity, whilst the residential block is located above.

Another idea from *The Human Scale* that will influence the project is the impact of cars on a site with intensive human activity. Gehl had already come to the conclusion that human activity centred on areas without cars, and for this reason, services for cars will be implemented in moderation and should not impose on space for human occupation. However, it is irrational to ignore the idea of implementing services for cars, as car ownership is at 680 vehicles per 1000 people within Auckland. From *The Rise of a Public City*, the building should not adopt the suburban ideal of privacy; it should open up to these public spaces at ground level. However, the residents’ privacy shall not be compromised. The logical way to separate private from public in this case is to use the ground floor of the development for public activity, whilst the residential block is located above.

3.1.3 Literature concerning Urban Design

Melbourne city planner Rob Adams contributed many reports about better urban planning for the city of Melbourne. His 2010 TED talk gave us an insight about his strategies for transforming cities to be more dense and efficient. His ideas are driven by utilising existing infrastructure, such as reusing old office towers and retrofitting them to be residential blocks, which changed the centre of Melbourne without building new structures. Adams analyses the areas outside of the CBD that have a concentration of activities, and found that these are usually focused around rail way stations. The most prominent idea of his talk stems from the idea of public transport, that intensification should predominantly take place along transport corridors with bus and

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7 New Zealand ranks number 8 in list of countries by number of motor vehicles per capita with 712 vehicles per 1000 people. This statistic includes all vehicles such as vans, buses, freight trucks and is not limited to only private cars.


tram routes, whilst leaving the buildings in between untouched to retain the characteristics of the suburb. With residential buildings along transport corridors being denser, more people will be able to make use of the existing underutilised public transport system.10

In *The Image of the City*, Lynch presents the idea of breaking down the elements that make up a city, and this technique was used to analyse three different cities to determine how successful their city structure is. His analysis of the city is broken down into the following elements:

- **Paths** – access ways which help navigate the city, and not necessarily restricted to streets.
- **Edges** – linear elements that are not considered as paths and may define the boundary between two different kinds of areas.
- **Districts** – delineates an area within the city which have a common character, and can be recognised internally, whilst sometimes being used as an external reference when someone walks by or approaches it.
- **Nodes** – strategically implemented foci which the observer can enter. It can be an overlapping series of paths or junctions. They depend on the scale at which the city is being analysed.
- **Landmarks** – used as a point of reference to the external observer, it is often a simple physical element which may vary in scale.

Lynch calls on the participants of his experiment to recount how their respective cities are structured, and from this, determines how well structured the different cities are. For example, the language that was used by the participants to describe the metropolitan area of Los Angeles were “spread out”, “formless”, and “without centres”, with subjects commenting on how

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Rob Adams, TEDxTalks, *Melbourne city planner reckons that bigger cities are better cities: Rob Adams at TEDxSydney*, YouTube video, 18:02, 1 June 2010, https://www.youtube.com/watch?v=ZYJpdH-VGwc
easy it was to be lost in the city, and depending heavily on street signage for navigation.\textsuperscript{11}

From the literature on urban design investigated, the ideas which would greatly influence the planning of the project would be Adam’s idea of intensifying along transport corridors to make better use of existing public transport infrastructure. This will help inform the different sorts of sites which will be considered for this project.

Once the site has been chosen, Lynch’s method of analysing the structure of the city will be used at multiple scales to explore the different elements that would need to be implemented to make the development an asset within its context.

\textsuperscript{11} Kevin Lynch, \textit{The Image of the City} (USA: The MIT Press, 1960)
3.2 Case Studies

3.2.1 Victoria Street Developments, North Richmond, Melbourne

The site consists of three blocks of separate apartments, with heights ranging between six to ten storeys. Flockhart Apartments and the Quest Hotel have frontages facing the major transport corridor that runs through North Richmond, located east of Melbourne’s CBD. It currently provides two different tram routes that frequently run through to the CBD.

Victoria Street prior to the arrival of this development was fronted by many single or two storey residential buildings to the eastern side. On the western side of Victoria Street, small businesses ran in deteriorating two storey buildings. No particular landmarks or activities made this site a destination and despite it being a main road, it was devoid of people. The only foot traffic in this area was its residents coming and going.

The reason this site was chosen for a case study lies in this divide between single storey residential units and this new development of ten storeys. Currently, Flockhart Apartments and the Quest hotel sit opposite single storey houses, with the main road dividing the two different housing typologies. This is a built example showing Rob Adams’ idea of intensifying along the transport corridors, and the transition between the two different typologies. The group of apartments coupled with Victoria Street separate single storey residential from large, single storey industrial buildings.

One of the things that make the Flockhart Apartments successful within its context is the use of a podium building form. The frontage of the building, which provides spaces for retail at street level and two storeys of residential above, are aligned to the other buildings on the street. The large residential block is set back twenty metres from the street and in doing so, the street
feels less intimidating and oppressed, while the residential block retains privacy from the street. The upper levels of the residential tower being set back establishes a pedestrian scale at street level, mitigating unwanted wind effects and allowing the street to retain character. The set back also provides a space for a small rooftop garden, although in this case it seems to be a series of private gardens for the residents on that level. Unfortunately, while standing on the street, it is easy to see into the two residential floors that align with the retail frontage. These floors would be more suitable as commercial floors which would benefit from exposure to the street.

Both Flockhart Apartments and Shamrock Apartments provide courtyard spaces which orientate to the north, and can be accessed by the public. Strangely, the courtyard also contains private outdoor areas, separated only by a hedge. This makes the private outdoor areas feel very exposed, as the courtyard is essentially a semi-public area and is easily accessible to the public. One positive aspect of the courtyard is that it’s a pleasantly landscaped area with a corner café. Although the courtyard is a semi-public space, the café becomes a communal meeting place for its residents and this area of activity brings life to this site. Unfortunately, the courtyard is defined by apartments that are too close together and as a result, sitting within the space feels very claustrophobic and confronting. The balconies and living areas of the apartments also look into the opposite apartments as the building separation is approximately fifteen metres. The building complex could be more successful if the façade facing the courtyard was terraced down, giving the façade texture and variation, and breaking up the oppressive wall which hinders the quality of space in the courtyard.
3.2.2 Odham’s Walk, London – Greater London Council Architect’s Department

Completed in 1981, Odham’s Walk was designed to be social housing in the city of London and is situated amongst neighbouring medium to high density residential blocks. The development is made up of modular floor plans stacked in ways to create communal spaces such as courtyards and private rooftop gardens to create a sense of community within the complex. At 154 dwellings per hectare, it is comprised of 102 patio flats set on a grid at different levels, and these flats are accessed by complicated circulation routes and stairs.

Although this was originally established as a social housing development, the architecture and planning of this complex has been highly praised by architects for its treatment of private and public space. At street level, spaces are provided for retail establishments, providing amenities to the residents and contributing to its context, while patios allowed for planting which brought nature into the area. The theme of ‘nature’ flows through the site on all levels; trees, vegetable gardens, and shrubs crawl across and on top of buildings, and together with the brick clad modules stacked seemingly random, create an organic sense within the site.

The modular stacking model is an interesting approach to organising housing as this allows for floor plans to be replicated, but without seeming repetitive. At first glance the stacking appears to be random, but upon closer analysis of the composition, the modules follow a grid and are symmetrical. The irregularities that allow the development to seem ‘random’ are the variation of the sizes and configuration of flats, allowing a mix of different people to occupy the site.

The absence of cars on the site helps the livability of the housing complex. Car parks are provided underneath the development, allowing people to use the space freely without having to worry about safety from vehicles.
3.2.3 Ely Court, London – Alison Brooks Architects (ABA)

Ely Court is a four storey social housing development located in the north eastern suburbs of London, and consists of 43 dwellings across two blocks laid out in parallel. The development is the result of the mission of providing a better solution for higher density social housing to previously segregated communities. The Ely Court development provides private garden spaces for the tenants in between the two blocks, clearly distinguishing between public and private space. However, since the structures run in the east-west orientation, the gardens to the southern block do not get sunlight due to the shadows cast from the housing block.

The new development fits in well within its context, being designed in the style reminiscent of the English Victorian houses. ABA seemingly derived the characteristics from them, such as the brick cladding, the building form, and the frontage on the street. The development is given a modern twist through the placement of openings on the façade whereas in the typical Victorian fashion, openings are placed on a grid. Balconies provide a private outdoor living space orientated to the south to obtain optimal sunlight exposure, with the ground units protruding out onto the street. This part of the building seems to be uncomfortably close with the public street, which could be mitigated by placing the building on a higher level.

The earthy tones of the brick used in the development, coupled with the surrounding green areas of Ely Court and lush trees that line Chichester Road generates an organic sense as you walk along the street.
3.2.4 The Mountain, Copenhagen, Denmark – Bjarke Ingels Architects (BIG Architects)

The Mountain housing scheme combines the needs of car parking with residential spaces, using a foundation built up with car parks to allow homes to step down like a mountain. The result is a ten storey building, two thirds of it dedicated to parking and one third residential, merged together in a symbiotic relationship. The houses were laid out on a 10m x 10m grid and terraced down, providing 80 modular apartments over 8000m². The stepped form of the houses provided private roof top gardens to each of the dwellings and orientated to the south, providing sunlight and ventilation to each unit.

Similar to the podium effect of the North Richmond apartments, an observer standing on the street looking at the building from the south would not be able to tell it was a ten storey building. The space adjacent to the Mountain that discloses the building’s height at the highest point is a site for future development, and adjacent to that is an over bridge, which meant that these spaces are not affected by the presence of such a large building mass.

The use of materials in this development is also quite effective, on the southern side, the entirety of its façade is timber clad, with small pockets of nature littered throughout the development, creating an organic sense within the site. In contrast, the back of the building is finished with a low maintenance metal type cladding. The justification of using different claddings on the back of the building comes from the high amount of maintenance that comes with uncoated timber cladding, and the back of the building is difficult to access for the maintenance.
3.2.5 Commonwealth Games Athletes Village Housing, Melbourne, Australia – McBride Charles Ryan

The Commonwealth Games Village located in Melbourne’s north eastern suburbs is made up of three different housing typologies, arranged on a site adjacent to the Tullamarine Freeway, and served as housing for the athletes in 2006.

**Courtyard houses** – these houses are a modular approach to designing the athlete’s village, with the main feature being the central shared courtyard, bound by three separate residences. The two residences on the ground floor surround a communal meeting place, yet each residence still retain visual privacy from one another. The third residence is an upstairs single unit, which has its own balcony and separate entrances. All three apartments vary in size, catering to different types of families, yet still merged together in a symbiotic relationship centred around a hearth of communal space. These units are designed so that they are able to be replicated and built next to one another, and in the master plan, they are laid out in rows to create a grid. The void space in the centre acts as a giant light well and allows for all habitable rooms of the courtyard house to be ventilated and lit by natural light.

**Dual Lock housing** – This housing typology wraps around the existing Mental Health Research Facility, which the village shares its site with. These units are created so that two modules are able to be locked together like two pieces in a puzzle. One unit faces the village’s own parklands and the other faces the research facilities. The units are organised so that they are very tightly arranged together, yet still retain privacy within each individual dwelling. Unfortunately, the south facing units has all its habitable rooms facing south, which means there is no solar access in any of the living areas.

**Mixed Apartments** – These are five level towers built up of three different modular typologies and are placed on grid with the courtyard housing. These are designed to relate to the smaller scale of the courtyard houses directly adjacent, so the lower levels of the mixed apartment typology are town houses and surround a similar courtyard space on ground floor. All of the balconies on these apartments have exposure to the sunlight, providing each unit with a private outdoor space.
3.2.6 Lygon Street, Melbourne

Lygon Street is located north of Melbourne CBD, and is colloquially known as ‘Little Italy’ to locals. It is famous for being a continuous strip of eateries and outdoor dining, with an abundance of Italian restaurants. The eateries engage with the street by including outdoor seating, which is a continuous theme throughout the northern part of Lygon Street. To ensure the engagement of the street frontage is consistent, rules have been put in place by the Moreland City Council, with minimum sizes on shop fronts, down to the requirements of percentage of glazing on the street frontage of a building.\textsuperscript{12}

On this street, the pedestrian route is located between the walkway and the outdoor dining, allowing direct access into the food outlets. The State of Victoria has set in place specific regulations for the operation of outdoor dining areas, to maintain control over access and circulation on these streets. For Lygon Street, the minimum requirement of pedestrian clearance is 2000mm.\textsuperscript{13} Evidently, this dimension is higher in central city streets in Melbourne to allow for more pedestrian traffic.

However, the minimum dimension on Lygon Street did not account for people who line up outside popular establishments, generating crowds of people in certain parts of the street during the rush hour dinner service. This is further exacerbated by the waiters using the pedestrian clearance area to walk in and out to serve customers.
4.0 Site and Context

4.1 Current Issues with Housing in Auckland

Over-population in cities is the main driver for the problem with housing density; Auckland is an example. Between 1987 – 2006, Auckland’s borders grew 24% due to the poor public transport and state funding of the development of motorways. Aucklanders still see the typical detached suburban house to be their idea of ‘home’, with a private garden and a backyard and therefore most people living in a lush suburban setting are quick to disregard the credibility of medium to high density housing typologies. This is apparent in the 2013 New Zealand census where survey results show that 81.1% of private dwellings in New Zealand are still detached houses. Survey results also show that in 30 years, the population of Auckland is projected to be almost double what it is today in a worst case scenario, with an average population projection of 2,161,000 (1,493,200 in 2013).

The housing crisis is exacerbated by developers who continue to build detached houses, as this is the housing typology that is ‘accepted’ in Auckland, and therefore would be easy to find buyers for. The high land values, foreign investment, and high number of investment properties create a divide between Generation Y and their goals of owning their first home, while many investment properties sit empty – dubbed ‘ghost homes’. The number of unoccupied dwellings rose 16.4% between 2006-2013 according to the New Zealand Census.

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Zealand Census.\textsuperscript{17}

If cities build at medium to high densities (80-120dph), they are fitting more habitable space on a given site. For example, if a developer purchases a large piece of land and plans to build a 4 house subdivision on the plot - each with their own private open space on ground floor – they are only providing dwellings for 4 families. However, on the same piece of land they could build higher, increasing the floor area ratio (FAR) and increasing the yield of apartments or flats, thus providing more dwellings for more families. The land value stays the same, meaning these apartments would be more affordable, and in turn, the developers make more money by selling more units.

Medium to high density dwellings are long overdue in Auckland, and the council can also be to blame for their lack of awareness on the issue. The Unitary Plan – introduced in 2016 - has strategies to allow Auckland developers to build at higher densities, but the city was already in need of solutions for high density housing. The Unitary Plan, which aims to zone parts of suburban areas for higher density housing, has been met with mixed criticism, which is no surprise due to the typical 'not in my back yard' (NIMBY) attitudes of Aucklanders – particularly those of established home owners currently living in the suburbs.

This all comes down to one main point: how can architecture and urban design help Aucklanders accept that medium to high density housing models are the way of the future? There are two types of people affected by the proposal of high densities in Auckland – the people that are already living in their own homes and who do not care for high density developments, and the people that would live in these apartments. Currently, the stigma attached to high density housing typologies in Auckland mixed with the anti-development attitudes of established home owners discourage developers and buyers from high density housing.

At this point the architecture of these dwellings becomes important, the floor plans and the vertical circulation define how these residents live. The potential residents will look at the things they have to compromise to live at high densities such as privacy, access to sunlight, ventilation, and leafy private outdoor spaces at ground floor. The development also needs to be a positive addition to the existing community, and have a positive effect on the existing residents of the area. The aesthetics of the façade for example, should be unique and exciting, and should create an identity for the residents of that development. Too many of the existing apartment blocks in the greater Auckland area suffer from a lack of identity due to the architecture being repetitive and bland, and residents miss out on the basic amenities they would otherwise get by living in detached housing. A new apartment block needs to be an improvement in the quality of life for both the residents in the proposed development, and the existing residents of the surrounding areas, so people would choose to live there for what the development has to offer rather than living there because they could not afford a house in the suburbs.

While medium to high density developments are becoming more common in Auckland, it is rare to find a good local example of such building typologies. To design and build an apartment building is not only to maximise profits, but it is also to provide a desirable lifestyle for the buyers or tenants. This in turn would make the apartments easier to sell and the apartments would be able to offer greater rental returns in the long run - and it all comes down to the architecture and what quality of lifestyle it can provide for potential buyers.

4.2 Potential Sites

For this investigation, the site will need to include elements relevant to the issues this project is endeavouring to address. Eligible sites will need to have a strong residential presence in order for the development to respond to, and extend the established housing environment. For example, factors that will affect existing residents brought upon by a new development would unavoidably include the generation of traffic and foot traffic, reduced privacy, or reduced exposure to sunlight and views. A good design needs to recognise and mitigate these incursions.

From the research on Rob Adams’ urban planning for Melbourne city, the site should also be in proximity to a transport corridor and public transport nodes to make better use of the existing infrastructure. Depending on the extensiveness of the public transport on or near the site, it could supplement but in some cases replace car ownership of each household.

Another factor which will be important for the chosen site would be the existing context and what mix of people it generates. A desired outcome of the proposed development would be housing that caters to different kinds of households such as small families, students and professional couples. Therefore it is fundamental to select a site that currently generates a mix of different demographics such as areas with schools, universities, and culturally diverse amenities.

Three sites will be analysed not only as part of the site selection, but also to look at how these developments respond to the surrounding context of residential neighbourhoods, whether or not these are successful.
Figure 30: Figure ground diagrams were produced at the same scale to compare the urban fabric of potential sites in Auckland (From left to right, Dominion Road, New Market Station Square, St Lukes Westfield Mall, Ponsonby Road)
4.2.1 Dominion Road

Dominion Road is one of the busiest roads for both cars and foot traffic - on average, Dominion Road carries approximately 2.2 million bus passengers a year through its bus lanes, making it a major arterial road. However this road still has a dominant presence of its use by private vehicles.

The potential site is located at the Countdown supermarket complex, which is essentially a single storey strip mall bordering a courtyard of car parks serving these shops. The complex itself is located immediately next to a residential zone, with the back of the shops facing the back yards of the residential area, separated only by the property’s boundary fence and creating a harsh divide between public and private space.

The main issue with this site is that currently it is designed around traffic efficiency and getting people into the shops. Once on site, the complex seems devoid of any human occupation outside of the shops as there are no public spaces within the complex for the public to use. This is because a major part of the site is dedicated to car parks, including a ramp in the middle of the site, providing access to an underground car park area. Looking from the main road, the entry to the development is dominated by services for vehicles.

The back of the buildings facing Dominion Road and its services are exposed to the car park, diminishing the quality of the site, as well as the quality of the adjacent housing.

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4.2.2 New Market Station Square Apartments – L&Y Holdings

New Market Station Square is a square located adjacent to the New Market train station, situated behind the Broadway shops. The square is bordered by the Kings Square and Queens Lodge apartments, which have a very dominant presence in New Market, and can be seen from the main road and its adjacent streets.

The square is mostly occupied by shoppers coming from Broadway or by children during after school hours; most of the time it is empty and devoid of activity. The space feels oppressed and intimidating due to living areas and balconies looking over the square, and the apartment block looms over the space, creating a hard edge between private and public. Retail spaces line the edge of the squares on street level and on the section of the building facing Remuera Road. These establishments often change tenants, particularly those along Remuera Road. This could be due to poor planning on the street frontage, as the apartments are built on the boundary on a narrow pedestrian path. A bus stop is located here, which crowds the street with students during after school hours, making the shops harder to access and pedestrians tend to avoid walking through the narrow and crowded street. The orientation is also problematic, as the apartment building on this frontage is seven storeys high, which creates a down-draught trap for the south westerly winds hitting the side of the building, making the street very uncomfortable to be in.

The large mass of the apartment block creates problems both externally and internally. The developers used the train station and its railways to separate the suburban fabric from the large, bulky apartments that are the New Market Station Square apartments. However, this block looms over Broadway and while it signals the major pedestrian crossing that is the junction of Broadway and Remuera Road, it does not contribute to the street or its community. Rather, it diminishes the identity of the retail district that is New Market. The internal spaces of the apartments also have problems that come with the design of a large mass, such as windows of bedrooms facing onto circulation galleries, creating an uncomfortable relationship between private quarters and a public access way.

In principle, the elements are all there to make this site successful; retail on street level, apartments located next to train stations, and a public square. However the architecture and the poor execution of these elements have caused this development to be received negatively by the Auckland community\(^{19}\) and it demonstrates the errors in urban planning described earlier, rather than presenting an opportunity for change and good architecture.

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\(^{19}\) Andre Hueber, “New Market Square a Disaster?,” The Auckland 2012.
Figure 34: Queen’s Lodge as seen from Teed Street, a dominating presence in New Market

Figure 35: Atrium area at King’s Square, where some of the windows in this image are to habitable rooms that face a pedestrian walkway for residents

Figure 36: Access way for residents. Kitchen windows face the walkway for ventilation, but no daylight. Different smells of cooking seep into this area

Figure 37: The station square is mostly empty, and the large apartment blocks generate an unpleasant environment

Figure 38: Street section along Remuera Road showing the oppressive nature of tall buildings at street frontage

Figure 39: Down-draught trap created by the high building frontage on the street
4.3 Chosen Site: Melrose Street, New Market

For the purposes of this project, this site was chosen due to the well established context on which the site sits, and any new developments to it will serve as an addition to the community. The ideal site is one that would already have some foot traffic passing nearby, whilst being under-developed and often overlooked.

The Melrose street site is located near the Grafton train station and is opposite the University of Auckland’s engineering research labs, formerly the Lion Red brewery. Currently, the site is under-developed; with an estimated floor area ratio of 1 : 1.04 across 35,200m², while the majority of the land has been allotted to parking and services for cars. The buildings in this area are a mix of retail and commercial, however, the site currently generates a sense of industrial function, due to its low rise light-weight shed-like buildings with
The location of the site has a lot of potential; with its proximity to a range of schools, Asian supermarkets, and the University of Auckland’s research lab, all of which help generate a large mix of people of different ages and cultures who would use this site. However, people only access the site for parking or to eat at the famous café, ‘Little and Friday’, so there is very little human activity on the street. The rest of the buildings serve as mid-rise commercial spaces, with small amounts eateries of polka-dotted amongst the site at street level.

The northern boundary of the site is defined by Khyber Pass Road, a four-laned transport corridor with a designated bus lane and pedestrian access to several bus stops. The building frontage on Khyber Pass Road fails to engage with the street; in fact it does the opposite and creates an unsafe pedestrian space due to large parts of the street serving as driveways or car access to the buildings. On the opposite side of Khyber Pass Road, the layout of the university’s research labs further worsens the poor quality of the street. The main lab building is receded into the background, surrounded by a large car park area, which is then separated from the street by a wire fence. The lack of engagement with the street on both sides of the road creates an unpleasant walking experience along Khyber Pass Road, despite it being a busy road for...
Figure 46: Plan of existing public transport and car parks in New Market
both traffic and pedestrians. During after school hours, the street is filled with high school students walking to bus stops and the nearby Grafton train station, while the road is busy with buses and cars during rush hour traffic. With the poor quality of street and the lack of activities in the immediate area, it is no wonder the site is under used and neglected, despite it being so close to multiple public transport nodes.

It is a general rule in planning that people would not walk more than 400 metres to access public transport before choosing to drive,\(^2\) which is a driving factor in the decision of the choice of site. The site is within 400 metres of two train stations, New Market train station and Grafton train station. It is also connected via over 50 different bus routes on Khyber Pass road alone, making the area well connected and easy to access for people from all over Auckland. The site is also within 400 metres of five different public car parks, should people decide to drive to New Market.

A prominent feature of this site is the steep slope of the southern boundary. This slope defines the separation of commercial buildings from the fringes of Epsom’s suburbs. These houses are accessed from Seccombes Road, and can be loosely characterised as typical suburban bungalows, which range from one to two storeys. These houses sit between six to ten metres above the level of the chosen site, resulting in the back of these houses looking over the site.

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Figure 49: Circulation plan showing how people access the site
The urban fabric of New Market has a recurring theme of large building masses along main roads with ‘soft centres’, meaning smaller and lower height buildings fill the spaces in between. In the recent years, the back streets of Broadway such as Osbourne Lane and Teed Street have become home to small boutiques, eateries, and designer shops that are categorised as ‘hipster’ by today’s youth, signalling the start of laneway culture. Defining characteristics of this phenomenon can be observed, such as roads being paved with tiles rather than asphalt, reduced or lack of distinction between pedestrian and vehicular access, and shop fronts that engage with the street. Another example how these ‘soft centres’ have revitalised what used to be industrial-like outskirts of main streets can be observed in the new Fort Street and Fort Lane.

Figure 50 & 51: Before and after the transformation of Federal Street

Figure 52: Fort Lane went through a similar treatment
4.4 Demographics of New Market

Understanding the demographics of the people that currently rent and own property in Auckland is important, as this gives us an insight into who the design is for and what sort of tenants would be expected to live in this area. Analysing these statistics will better inform what sort of housing typologies need to be provided in the proposed development.

There was an increase of 2,958 people from 1,377 people (87.1%) people living in New Market from the 2006 census to the 2013 census. This large increase is most likely due to the construction of the New Market Station Square apartments during those years.

4.4.1 Age and Cultural Diversity

The statistics show that the median age of residents in New Market is 29.8, where the median age for Auckland is 35.1 years. 11.1% of people are aged 15 years and under in New Market, compared with 20.9% for all of Auckland. While there are schools from primary level to high school level, these families with children are likely to reside in neighbouring suburbs such as Epsom, in order to live in what is considered to be a ‘family home’ or a detached house.

The census shows that the most common ethnic group living in New Market is Asian, with 47.7% of the population, and European at 46.3%. After English, the most commonly spoken language is Korean (11.6% of population). The table (figure 54) shows the cultural diversity of the residents in New Market. The large Asian presence in New Market could be due to the amount of cultural amenities (such as Asian supermarkets on Kent Street) available in the outskirts of the retail district. It could also be because of the established Asian communities that New Market offered, and as analysed from Future Intensive: Insights for Auckland’s Housing, the author of the report claims that people tend to prefer living in established communities of their own ethnic group.21

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>Newmarket (percent)</th>
<th>Auckland (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>48.3</td>
<td>59.3</td>
</tr>
<tr>
<td>Māori</td>
<td>4.3</td>
<td>10.7</td>
</tr>
<tr>
<td>Pacific peoples</td>
<td>2.4</td>
<td>14.6</td>
</tr>
<tr>
<td>Asian</td>
<td>47.7</td>
<td>23.1</td>
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<tr>
<td>Middle Eastern, Latin American, African</td>
<td>3.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Other ethnicity</td>
<td>1.1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Figure 54: Table of the ethnicities of the residents in New Market
4.4.2 Household types, Family Types, and Home Ownership

This statistic is derived from the New Market’s total population aged 15 years and over. 56.2% of people aged 15 years and over have never been married, while 34.3% are married, and 9.4% are separated, divorced or widowed. Of the 56.2% that have never been married, 25.0% of people who live in New Market live with a partner.

The most popular family type that currently lives in New Market are couples without children with 45.7% of families, while 31.3% of families are couples with children. 22.6% of families are single parent families. 59.2% households in New Market are occupied with one family, while 22.5% are one person households.22

Home ownership statistics in New Market showed that 33.0% of homes are owned while the majority of homes are rented.

From these statistics, the most popular configurations of households in the retail district are young professional couples and small families, as well as a significant amount of single person households. These three family types will be the intended (but not limited to) occupiers of the proposed development. However, due to the new additions to New Market such as the University of Auckland’s engineering research labs on Khyber Pass Road in 2015, student housing may also be required to be implemented, especially due to the proximity of the research labs to the chosen site. This will drive an increase in shared homes and single person households.

With 29.8 being the median age of New Market’s residents, this shows that the neighbourhoods of the retail district should offer a dynamic environment of night bars and eateries – a similar sort of scene to what Ponsonby offers. The influence of Ponsonby’s ‘hipster culture’ can be seen in Osbourne Lane’s food alley where Best Ugly Bagels and Burger Burger are located in New Market, amongst one of-a-kind designer boutiques. During the day time, this is a hub for New Market’s workers and a social gathering spot for young people. However, contrary to the liveliness and younger dynamic of the district’s scene, New Market remains mostly deserted at night, with limited night time activities and eateries targeted around Nuffield Street, on the other side of Broadway.

Figure 55 & 56: Graph of family types and graph of home ownership in New Market

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Figure 57: Food lane at Ponsonby Central

Figure 58 & 59: The influence of Ponsonby’s ‘hipster culture’ seen in New Market’s Osbourne Lane, characterised by outdoor seating and impromptu-esque spaces.
4.5 Unitary Plan

Under the proposed Unitary Plan for Auckland, the site is designated as a ‘mixed use’ zone. Controls have been put into place, such as planning regulations and building function on street level. For the sake of research, these rules will be considered, but not necessarily complied to. The design decisions made will consider the built environment and the effects it has on the context and through exploration, these regulations will be challenged to determine whether the proposed Unitary Plan is pertinent to a mixed use area.
5.0 Design Development and Outcomes

The project went through multiple stages of development before arriving at the final design. In this section, each stage is documented to demonstrate the process in which the final design was shaped. As proposed from the findings of the research stage, the addition of a development needed to contribute to the existing context, therefore commercial, retail, and open spaces were implemented in the early stages of the project.

The site was divided into different functions based on the existing context, such as placing retail on the north east of the site, the side closest to Broadway, to create an extension of Broadway's retail district. Massing models were used to show the building sizes and their functions were also established. The residential blocks were built on the cliff edge, creating a continuation of the existing residential area, to a higher density. To mitigate the negative impact of a large block placed against detached housing, the podium model was used and units were terraced down to ‘soften’ the hard edge of a super block. However, this meant that the terraced rooftops faced south, meaning these roof top spaces would be wasted, where if they were orientated to the north, they could be used as private outdoor spaces. Open spaces are defined by surrounding buildings, and these spaces are used for independently owned markets.

In the second stage of development, instead of building against the slope and attempting to integrate the proposed housing block with the existing residential area, a pedestrian walk way was introduced. The walk way is built over a landscaped area with trees to provide visual privacy for the existing residents from the new development, creating a nature strip next to the walk way area. Introducing nature into the site will be a positive contribution to the retail district of New Market, as currently it lacks open green spaces and trees. This iteration of the development demonstrates the beginnings of emulating
the existing urban fabric’s ‘soft centres’, where larger, commercial blocks are places along Crowhurst Street and Khyber Pass Road, with more private areas on the inside of the development. At this point, one building type was selected to be developed further, and this was the residential block adjacent to the public square, as it was important to establish a connection between the two elements on the site, but at the same time, differentiate between public and private space. During this stage, building forms were experimented with, particularly looking at how using the podium effect could separate public and private spaces. The form of residential towers were staggered and stepped on top of a retail base, to break away from the stereotypical rectangular apartment blocks which lack character. However, due to placing the public square adjacent to the nature strip at the south of the site, the residential block would overshadow parts of the square at certain hours of the day. Another problem this iteration of the site layout presented was that an alternate road was introduced through the site, which created problems with traffic controls and integration of a new road with existing roads.

The third iteration of the developments show the residential block being relocated to the east of the square, with the street level of the apartments forming a continuation of the food lane. The bulk of the functions around the perimeter remain the same, commercial on the outside along the main roads, and a square being its centrepiece, creating a ‘soft centre’. The idea of the laneway is being explored here, closing up loose, vacant spaces to define a street. The chosen residential building now creates a problem for the laneway, as the back of the building is hard up against the laneway eating spaces, and during the afternoons, the building would over shadow those spaces.
5.1 Master Plan

During the final stages of the site layout, it was decided that using the whole site was to extend the brief to an unnecessarily large area, as the massing of the northern half of the site presented a series of issues such as traffic controls, and in depth urban planning. It was also decided that a large portion of the proposed elements, such as retail centres already exist on Broadway. Therefore, the public elements that are retained in the final stage of development are unique features that cannot be found anywhere else in New Market, providing a new identity to this part of the retail district. Instead of developing a series of complicated urban planning devices around Khyber Pass Road and Crowhurst Street to try to draw people into visiting the site, the implementation of unique features to New Market will allow the site to speak for itself, even if it is not immediately seen from the street.

The chosen site was reduced to the southern half of the site (figure 66), placing an emphasis on the nature strip running through the site. The existing roads Melrose Street and McColl Street were retained as they are and Roxburgh Street was shifted north to make space for the new residential development and square. Although this does not exercise Adam’s idea of building along transport corridors, the buildings retained on the northern half of the site would be subject to future development. The development on the southern half of the site establishes a basis for this idea to emanate.

5.1.1 Site Arrangement at Public Square

The new proposal retains some of the elements explored throughout the design development stages. The public open space remains the centrepiece of the development, bordered by an art gallery on the west side, two housing developments along the southern side, and a food laneway to the east, where most people will access the site. The open space is now defined by a diagonal grid, which gives the space structure, rather than leaving ‘loose’ spaces. The eastern part of the open space is to be used for open air markets on certain days of the week, at other times would show case local art and music, and the idea is that the food laneway would ‘spread’ to the north eastern section of the square, creating a soft transition from outdoor markets to laneway dining, reminiscent of European markets and outdoor dining spaces. The main access for the public is through the food laneway, although alternative entries utilise the existing streets. Standing from the main road at these entry nodes, passers-by are offered a view of the ‘soft centre’ that is the public square and the activities it hosts, utilising the concept of urban exploration and discovery.

On the western side of the site, hard up against the southern bank, the art gallery is implemented to bring a cultural function to the site, and generates an attraction which will invite people to visit the new development. The gallery is stepped up from the public open space, allowing it to be separated
Figure 67: Proposed master plan of the site
from the bustle of the activities happening in the open space. It would serve as a meeting place for both residents of the development and the general public.

5.1.2 Walkway and Nature Strip

As mentioned above, one of the most prominent features of the site is the contours that form the bank on the south side of the site, and separates the chosen site from development and existing detached residential housing. The nature strip was implemented to soften the divide between the two different housing typologies, and to implement trees which will help provide visual privacy to the existing residents. It provides an invigorating addition to New Market, as currently the area lacks any significant green spaces. Although the nature strip is located behind the residential blocks, ‘windows’ are implemented in these blocks to let glimpses of greenery to seep out into the square, allowing views into the strip from the main square. The idea of the nature strip is reinforced by the smaller pockets of greenery on the balconies of the residential development.

During the early stages of design development, the idea of a walkway at street level was applied to provide a route from Maungawhau Street to Crowhurst Street. However, with more exploration, this became an elevated walkway to allow a better fit against the contours. For the final iteration of the site layout, this walkway became the main point of access for the new residential blocks, with smaller paths bridging the gap between the development and walkway. The hard, staggered edges of the housing create a texture for the pedestrians of the walkway, contrasted by the soft, lush forest of the green strip. For the safety of the residents and pedestrians of the walkway, some units look over the walkway, allowing surveillance over the area.

5.1.3 Vehicular Access and Car Park

The existing roads remain the only public vehicular access on the site; no further roads are implemented to retain the quality of pedestrian space. The square holds together one continuous pedestrian space, allowing people to freely use the square without worrying about safety from vehicles. Furthermore, the existing car parks would be re-paved with concrete tiles, with the curbs removed to allow an ambiguity between pedestrian and vehicular space. Devices such as tiled roads and shared pedestrian and vehicular space make vehicle users feel like visitors, and causes them to be cautious around these areas, creating a safer environment for pedestrians.

The only implemented vehicular access on the site is the entrance to the underground car park for the residents. The ramp access for this car park is off Crowhurst Street, and is tucked underneath the walkway and behind the food laneway to separate vehicles from pedestrians. Adjacent to this is an area designated for vehicles to service the eateries and the markets at street level.

With the focus on pedestrian activity within the development, the proximity to existing public transport nodes and existing public car parks, it was considered to not include car parks within the development. However, considering the number of cars to people within Auckland as discussed in section 3.1.2, it was decided that parking for the residents only will be included. The number of public car park buildings within 400 metres of the site coupled with the connectivity via public transport justifies the decision to not account for visitor parking. With the proposed target market of the units being professional couples, single tenants or small families, a ratio of one car space for each apartment unit is proposed.
5.1.4 Food Laneway

The proposed laneway for food establishments is located on the eastern side of the site, and will act as a main entry point. The laneway provides an attraction to encourage activity in this area, and from the laneway, glimpses of the market area can be seen, leading people from one attraction to the next.

The building implemented for the laneway faces an existing block of buildings, which will be retrofitted to become part of the laneway eateries. The laneway features outdoor seating spaces in the middle of the street, with eateries on either side. The minimum pedestrian clearance allowed for this street on each side is 3500mm, allowing for pedestrians to safely walk through the street even during dinner hours while people are queuing into establishments.

5.2 Building Design Development

In the early design stages for the chosen residential building, the podium form was explored during the mass model exploration. This developed into a staggered and twisted shape, freeing up forms, allowing variation in floor plans, and giving the building character.

The final design is a residential block which at street level presents itself at a pedestrian scale, with activated edges to the square in the form of shops. These blocks would orientate to the north, giving residents a view of the public square, allowing the square to be under ‘surveillance’ to keep the spaces and streets free from undesirable activity. The form of the building’s base follows the winding curve of the contours forming the bank at the south of the site, while the residential floors above are staggered and stepped to free up what would otherwise be an oppressive wall of apartments over the public space. The residential grid is receded from the square, minimising the looming effect a medium rise building would have on an open space, and utilising the podium effect to support the idea of creating a pedestrian scale at street level.

During the development of the arrangement of building floor plans, the space between the core and the units were explored. In the end, the units were brought forward to allow for the ventilation of habitable spaces on the southern side, leaving the left over space to serve as a mail room for the block.
Figure 70: Early concept of breaking up forms in the residential block, exploring a twisted and stepped form.

Figure 71 to 73: An exploration of the terraced building form, which is an early concept design for the final design.
Figure 74 to 78: An exploration of the modular building form, using the idea of generating private outdoor spaces using the rooftops of units below.
5.2.1 Modular Floor Plans

The design of the floor plans of the residential development begins with the idea of the modular floor plan. This idea will reduce the costs of construction, where units are almost identical. Each floor is made up of three different modules and adapted to make the most of its placement on the floor. The reasoning behind this approach is to establish a structural grid; each module is based off a 3m x 3m grid, allowing living spaces to be organised around the structural grid. The three different floor plans range from one to three bedrooms, and are designed to allow for a mix of different family types to inhabit the units, creating a more diverse environment within the development.

The provided floor plans are base floor plans which may vary once applied to the floor layout of each level to suit the layout and make better use of available space.

- Configuration A is a studio type apartment designed to suit a working couple or a student. The operable wall divides private quarters from living areas, which could be closed off when receiving visitors. This allows for flexibility within the unit, giving the users control of their living spaces.
- Configuration B is a two bedroom unit that would suit a small family or two flatmates. This layout forms a structured grid, allowing all habitable rooms exposure to sunlight, while services are receded and face the walkway area. However, in providing all habitable rooms with sunlight, the users have little flexibility in the use of living spaces.
- Configuration C is a three bedroom unit that would suit a small family or flatmates. This layout provides spacious rooms and an open plan living space which allow occupants to manipulate the spaces to suit their living style.

All units have access to a private open space accessible through the living
area, with planters acting as balustrades on the balcony. At balcony areas where it is possible to look down in the balcony below, the planters will be thick enough to deter occupants from the edge of the balcony, whilst being high enough to control the privacy within the unit and outdoor space. The level of privacy between separate tenancies is prioritised in these open spaces to ensure that occupants do not feel as if their lifestyle and privacy is compromised by choosing to live in an apartment. For the same reason, habitable spaces such as bedrooms and living areas orientate to the north to allow for exposure to natural light where possible.

5.2.2 Vertical Circulation

The series of modular units is accessed through a service core of two lifts and a stairwell, and is clad with fire rated concrete to meet fire safety standards. The stair well includes a fire exit at street level directly into the service lane. The core services all levels of the apartment block, including the ground floor retail space and the underground car park area, and also includes a rubbish chute which allows the residents to dispose of their waste to a catchment at street level directly from their floor. This form of circulation lets the residents access the amenities offered at street level easily.

Each unit entrance is provided a smaller access way which is branched off from the main landing. This allows for windows facing the main landing to be separated, avoiding direct contact from people using the access way.

5.2.3 Privacy and Security

The separation of public and private space is achieved through the use of levels. By allowing all private dwellings to be elevated, it separates private from the public realm on street level. Privacy is further provided by implementing high planters as balustrades for private open spaces and allowing the perimeter of the building to be lined with trees grown in box

![Section showing the vertical circulation within the residential block](image1)

![Plan showing the access to each dwelling](image2)
planters. This not only increases the privacy of the residents, but fortifies the idea of introducing nature into the development.

Lift access to all residential floors require swipe card access, as well as the path that branches out from the walkway, to ensure the resident spaces are only accessed by its occupants. As mentioned above, dwellings will look over walkway areas and the public square, to provide surveillance around the clock.

5.2.4 Materiality

To echo the idea of bringing nature into the city and to compliment the organic form of the apartment block, the chosen materials to use for the development are timber and brick on a concrete structure, as these materials help generate an organic sense in the building. Timber would be used mostly in the private open spaces, to compliment the small plants being grown around the balconies, and also to reduce the load on the structure as some balconies are cantilevered. Other parts of the residential block will be clad with an earth toned brick cladding, giving the building some variation in materials, making the façade more dynamic, and letting observers see different forms and tones when viewing from different perspectives. The nature surrounding the development teamed with the timber balconies versus the earthy brick cladding of the main block creates a contrast in aesthetics, generating a balance between heavy and light.

Figure 84: A view of the residential block from the square
5.2.5 Density

The aim for this project was to design a scheme which would be high density. In the context of Auckland, high density can be defined as any figure over 80 dwellings per hectare (dph).

The density is measured using the boundaries of the development as highlighted in figure 85.

<table>
<thead>
<tr>
<th>Unit of Measure</th>
<th>Net Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwellings Per Hectare (DPH)</td>
<td>130 DPH</td>
</tr>
<tr>
<td>Habitable Rooms Per Hectare (HRH)</td>
<td>351 HRH</td>
</tr>
<tr>
<td>Floor Area Ratio (FAR)</td>
<td>1 : 1.5</td>
</tr>
</tbody>
</table>

Figure 85: Table of density of the residential block

5.3 Assessment Against the Proposed Unitary Plan

The following Unit Plan rules are implemented for mixed use zones that are relevant to the proposed development of this project. The outcome of the proposed development is also presented for comparison. The building control rules are regulations that have been implemented by the Unitary Plan for terraced and apartment buildings, which are automatically in place for any residential activity in a mixed use zone.

<table>
<thead>
<tr>
<th>PAUP Rules</th>
<th>Proposed Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLANNING CONTROL</strong></td>
<td></td>
</tr>
<tr>
<td>Building Height</td>
<td>16.5m or 4 storeys</td>
</tr>
<tr>
<td>Health in Relation to Boundary</td>
<td>2.5m above ground level with 45° recession plane</td>
</tr>
<tr>
<td>Setback at Upper Floors</td>
<td>6m min</td>
</tr>
<tr>
<td>Residential at Ground Floor</td>
<td>Not permitted</td>
</tr>
<tr>
<td>Minimum Floor to Floor Height</td>
<td>At ground level: 4m min Above ground level (residential): 2.55m</td>
</tr>
<tr>
<td><strong>BUILDING CONTROL</strong></td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>No density controls apply</td>
</tr>
<tr>
<td>Outlook</td>
<td>Minimum 6mx4m of clear space from main living room, 3mx3m for main bedroom and 1mx1m for all other habitable rooms</td>
</tr>
<tr>
<td>Daylight</td>
<td>Windows to main living rooms and bedrooms must be separated from other buildings on the site. The required distance depends on the height of the opposite wall/building</td>
</tr>
<tr>
<td>Dwellings Fronting Street</td>
<td>Minimum glazing requirements for the front façade of a dwelling (10%)</td>
</tr>
<tr>
<td>Minimum Dwelling Size</td>
<td>Studio – 30m² One bedroom – 45m²</td>
</tr>
<tr>
<td>Minimum Landscaping</td>
<td>Minimum 30% of the site Minimum 50% within the front yard</td>
</tr>
</tbody>
</table>

Figure 86: Table of PAUP regulations vs. proposed development
Discrepancies with the rules as proposed by the Unitary Plan are discussed below.

5.3.1 Building Height

The maximum building height in a mixed use zone is to be no more than 16.5m or 4 storeys in the current plan. This restricts much of the development that could potentially occupy this zone, and is arbitrary due to the fact that there are so many available modes of transport, amenities, and schools nearby. It is a zone with very high potential, and limiting building height to 4 storeys reduces the number of people that could be living or working at this site. It also seems irrational as the overlay designated this as a mixed use zone, while directly adjacent to this, lies within the metropolitan zone that is Broadway, where the building height is permitted to be up to 72.5m or 18 storeys. This is a drastic difference to the mixed use zone, and if the council were concerned about providing adequate housing numbers to Auckland, the maximum height for mixed used sites should be greater than the proposed figures.

5.3.2 Height in Relation to Boundary

For this site, the residential block infringes on the HIRTB recession plane. That is not to say the council’s proposal is unreasonable, however, within the context of this site it is irrelevant due to the raised bank on which the existing residential zone sits. During the design development of this project, sun angles were explored with regards to the height of the proposed building against the existing residential to the south of the site. It was proven that with the current design of the residential block, the detached houses behind the development still have exposure to sunlight in both winter and summer solstices. As for the impact of the building to the view from the detached housing, the previous site had little to offer in terms of a view. Furthermore, trees were implemented on the nature strip to ensure the impact of the proposed building is reduced and mitigated by the greenery.
6.0 Future Directions

Within its immediate context, the proposed development could influence the underused buildings immediately adjacent to the site. The council needs to reconsider the planning rules they have in place for mixed used zones, as this hinders the potential of the Melrose Street site.

The proposed development is a model that is intended to influence the way Auckland is built in the future, therefore this development could begin to influence similarly underdeveloped sites all over the city, such as the Dominion Road site as explored in section 4.2.1. Each site is unique, and would need modifications to the model at Melrose Street to work in other parts of the city. The important point is to observe its context, and analyse the needs of its users and its greater community, and to provide an architectural solution that would benefit the community.
7.0 Conclusion

As a result of the research carried out in this project, it is evident that Auckland is in need of a solution to the ever increasing population within the city. To try to mitigate the effects of this increase, a model was needed to help lead the city to building at higher densities. It is impossible to expect the communities of Auckland to accept thirty storey residential towers to solve this issue. Therefore, the intention of this project was to help ease the transition into higher densities in Auckland.

Through the process of research in precedents and selected literature, it is evident that solutions in high density architecture can be successful and urban planning can help cities become efficient. The challenge was to do the same within the context of Auckland, and the model produced as a result of this research demonstrates that issues that come with living at higher densities can be achieved through thorough planning and good quality design within our city. To implement high density dwellings so close to an established suburb, benefits must be provided in return to the existing community. The outcome of this research project was to be a medium rise, high density solution that is comprised of modular residential units, a public realm at ground level, amenities to benefit the community, and an abundance of planned green spaces.

Taking these elements into consideration, the forms were driven by the contours of the site. The bank created an anchoring point for the scheme, while the flatness of the site allowed for flexibility in design and in the presentation of public space. These aspects work together as essential elements to make high density dwellings work, making it an asset to both the immediate community of suburban Epsom and the greater community of the retail district that is New Market.
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Full name of author: Rebecca Chan

Full title of thesis/dissertation/research project ('the work'):
Intensifying Cities: An exploration into methods of transitioning Auckland into higher densities

Practice Pathway: Architecture
Degree: MArch (Prof)
Year of presentation: 2016

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Date: 30/09/2016
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Name of candidate: Rebecca Chan

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Principal Supervisor: David Turner

Associate Supervisor(s): Ainsley O'Connell

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Student number: 1379974