Solo in the City

Restructuring Space, Privacy, and Autonomy in Housing for a Contemporary Solo Demographic

An explanatory document submitted in partial fulfilment of the requirements of the degree of Master of Architecture (Professional)

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Megan Kully
ABSTRACT

Whether constructed for an individual or a group, homes were once a reflection of the needs and preferences of their occupants, providing the foundation for stability, identity, and control. The commodification of shelter in western nations resulted in a steady supply of dwellings suited to the most popular social unit, the nuclear family. Demographic changes over the past several decades, however, have reduced the dominance of this unit, with other households beginning to take shape and grow in number. Of these, the solo dweller represents the fastest growing segment of the population, brought about by changing views on marriage and family, as well as the contraceptive and gender revolutions. Somewhere in this process, architects, developers, and public policy initiatives have failed to make the same accommodations for these demographic shifts as were exercised during the Baby Boom. The result is a demographic that has little choice but to reside in dwellings that were not designed for their specific needs for space, privacy, and autonomy. This has significant social, psychological, and economic consequences for an expanding segment of the population, particularly in housing stressed markets.
DECLARATION OF AUTHENTICITY

This explanatory document has been prepared by myself, Megan Louise Kully, in partial fulfilment of the requirements of the degree of Master of Architecture (Professional). I declare that all work within this document is my own work and has been carried out in accordance with the guidelines stated in the Unitec Student Handbook 2013. Where the work or ideas presented are not my own they have been referenced in accordance with the Chicago Referencing Style, 16th edition.

Signed:                                            Date:

Megan Louise Kully                                            25 February 2014
Student ID:  1346851
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Having left my previous career to pursue architectural study, this thesis completes my ten year adventure in tertiary education. I am lucky to have had the university experience twice, on both sides of the globe, allowing me to make some truly lasting friendships, and to act much younger than I currently am. Despite the late nights, sacrifice, heavy work load, and moments of abject panic and self-doubt, I have no regrets about my decision to pursue a field that, at the end of it all, brings immense satisfaction and excitement about projects to come.

To my friends, family, and partner: I could never have completed this programme without your unwavering support, be it emotional, recreational, financial, or most importantly, food-based. I look forward to making up lost time (and groceries).

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# Table of Contents

Abstract ........................................................................................................................................................................ii
Declaration of Authenticity ............................................................................................................................................iii
Acknowledgements ......................................................................................................................................................iv

1 Introduction .................................................................................................................................................................1
   Research Question .......................................................................................................................................................1
   Key Terms .................................................................................................................................................................2
   Background and Objective ........................................................................................................................................3
   Scope and Limitations of Research ............................................................................................................................4

2 Literature survey ..........................................................................................................................................................6
   Introduction to Demographic Transition Theory .......................................................................................................6
   The Second Demographic Transition and the Emergence of Non-Traditional Households ........................................7
   Self-Realization vs. Traditional Markers of Adulthood ..............................................................................................8
   Home Ownership, Territoriality, and the Effect on Adult-Identity ........................................................................10
   Theoretical Basis of Design .....................................................................................................................................18

3 Precedents & Problems ..............................................................................................................................................19
   The Single Detached Family Home ............................................................................................................................19
   Multi-Unit Designs ....................................................................................................................................................25
   Hostels and Single Room Occupancies ....................................................................................................................29

4 Design Process & Development ..................................................................................................................................32
   Target Households ....................................................................................................................................................32
   Site Analysis .............................................................................................................................................................33
   Tenure & Financing Structure ..................................................................................................................................41
   Size and Costing Considerations ..................................................................................................................................41
1 INTRODUCTION

Research Question

With an increasingly solo population in housing stressed cities, how can housing respond to their specific needs for space, privacy, autonomy, and affordability?
Key Terms

adult - someone who accepts responsibility, makes independent decisions, and becomes financially independent.¹

affordability – the ability of a household to meet the ongoing costs of housing, and the availability of discretionary income after these costs are met.²

autonomy - self-directing freedom and especially moral independence.³

choice connectivity - the freedom of an individual to navigate between degrees of connectedness and solitude.

demography - the statistical study of the characteristics of human populations, which illustrate the changing structure of countries and societies.⁴

household - broadly defined as a group of people living in a house together. For the purposes of this paper, ‘traditional,’ ‘typical,’ and ‘conventional’ households refer to those consisting of a nuclear family or heterosexual couple. This thesis argues that a solo adult forms their own household, regardless of whether or not a dwelling is shared.

privacy – the ability of an individual to control interaction with others; this includes preventing unwanted interaction as much as achieving desired interaction.⁵

solo demographic – the segment of the adult population who do not share their normal place of residence with a partner or spouse.

territory – space controlled by an individual or group, for which they have authority and responsibility.

westernized nations – countries that have achieved post-industrial, service oriented economies, and a tradition of democracy and egalitarianism.

Background and Objective

The solo demographic can be broadly described as a segment of the adult population who do not share their normal place of residence with a partner or spouse. This demographic includes single people, whether divorced, separated, or never married, as well as the widowed, solo parents, and those in relationships but living apart. As a demographic, it has become the most rapidly growing segment of the population in many westernized nations, and is reflective of changes brought about by complex economic and social conditions.

This thesis began as an inquiry into the potential for alienation to occur within the solo dweller demographic as a result of falling outside of traditional social norms, particularly couple or nuclear family structures. My underlying assumption was that members of this demographic were significantly more prone to isolation and its resultant anomic effects, such as depression, neglect, and suicide. My intent was to investigate what might cause anomie in the built environment, particularly while conventional housing remained preoccupied with the nuclear family as the dominant social unit for residential developments.

However, early research indicated that in Western economies, those able to afford to live alone are choosing to do so in unprecedented numbers, while the idea of the alienated, isolated, and lonely singleton is the exception. Numerous studies, such as that conducted by Duane Alwin et al., indicate that those who live on their own are typically quite happy to do so, and often compensate by being more actively social outside the home than their coupled or married counterparts. As Eric Klinenberg tells us in Going Solo, “living alone helps us pursue sacred modern values – individual freedom, personal control, and self-realization – whose significance endures from adolescence to our final days.” Which begs the question: are individual freedom, personal control, and growth into adult identities hindered when the ability to afford the space, privacy, and autonomy of living alone becomes unattainable?

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Housing affordability crises in major cities in New Zealand and abroad have pushed the housing market increasingly beyond the reach of first-time buyers, particularly for those surviving on a single income who would have until recently expected to be able to afford this basic necessity with an investment in higher education and skilled careers. Once considered part of a right-of passage into adulthood, home ownership levels in New Zealand and other nations are at historic lows. Many who are ineligible for mortgages or government assistance remain trapped renters well into adulthood, with little option but to live with friends, family, or strangers indefinitely. My core assumption was at odds with the social and economic reality of much of the solo dweller demographic; the larger issue was not the alienation of those who could afford their independence, it was the lack of independence tacitly accepted by those unable to afford to live autonomously. The inability to choose the time, place, and intimacy with which we connect with others places us in a state of near-perpetual connectivity, confounds the need for restorative solitude, and forces the suppression of feelings and impulses that are the purest expression of the self. This thesis aims to investigate the ways in which typical Western residential typologies are ill-suited to changing household demography, while establishing more affordable design solutions that provide residents with choice connectivity: the freedom to navigate between degrees of connectedness and solitude as they require.

Scope and Limitations of Research

This thesis will focus on how barriers to privacy and autonomy are exacerbated or manifested in traditional housing forms, and examine ways to reduce or eliminate them altogether through the application of architectural theories and methods. The core demographic for this project is the skilled solo adult, aged from early 20s to mid-30s, which is a category of solo dweller that until recently would normally have expected to progress into self-reliance and independent living. Solutions will also be examined for solo parents and multigenerational arrangements as they form a growing but overlooked component of the solo population. This research is significant as it will investigate the disparity between the status quo in residential building and the way of life of a demographic that is increasingly solitary.

The study focuses on Western nations, defined as those having achieved post-industrial, service oriented economies, as well as a tradition of democracy and egalitarianism. Literature
on developing countries, then, is largely outside the scope of this work, particularly as the trend to solo dwelling is predominantly a trait of developed nations as a result of economic prosperity and political freedom allowing the pursuit of individual goals. Discussion on demography is limited to an overview of the history and core arguments as related to trends in Western societies; this field is at times controversial, and judgements on the validity of various theories associated with modern demography are outside the scope of this thesis, except as they pertain to measurable changes in the structure and definition of households. Arguments about the morality of particular demographic behaviours and life-courses will not form a part of this work, the assumption being that notable changes in behaviour and lifestyle within a population require adequate consideration within the realm of human living environments, rather than encouraging a ‘one-size-fits-all’ approach to dwelling. For the purposes of this paper, ‘traditional’, ‘typical’, and ‘conventional’ households refer to those consisting of a nuclear family or heterosexual couple, and the dwelling typologies that cater to them.

This project will draw from urban precedents in cities experiencing the combined effects of population growth and housing shortages, as this is predominantly where demographic and housing affordability changes are best illustrated. Proposed design solutions will be applicable to 4-6 storey urban developments, which is in line with the need for greater density in growing cities in order to accommodate increasing populations within finite geography. The Auckland context is decidedly appropriate as a locale for this thesis; rapidly increasing house prices, limited housing supply, sluggish development of public transportation, and high fuel prices have created a growing demand for housing in proximity to employment and amenity centres, which are frequently the central city and its fringe suburbs. However, such demand has continued to spill well outside the city fringes, making even marginally amenable suburbs financially inaccessible to many, particularly those who rely on a single income. While the debate about urban sprawl is peripheral to this study, sustainability goals necessitate the use of brownfield sites and density strategies to make up housing shortfalls. A challenge of this thesis lies in achieving a sense of both restorative solitude and choice connectivity within a dense urban environment.
2 LITERATURE SURVEY

Introduction to Demographic Transition Theory

Demographic studies have long been used to quantify the changing characteristics of human populations, such as fertility, mortality, migration, and aging, to provide a statistical portrait of societies over time. Demographic transition theory developed from the particular study of decreasing fertility and mortality rates observed in Western countries as they moved through the process of industrialization. Dov Friedlander et al. describe the classical transition model based on three stages of demographic change; high birth and death rates, followed by rapid population growth as death rates declined ahead of birth rates, leading finally to a balance of low birth and death rates. This model was limited to the study of marital fertility rates, but did consider some social criteria such as mass urbanization, higher costs of child-rearing, increased parental and individual aspirations, increased literacy and status of women, and declining religiosity as key factors of fertility decline in industrialized nations.\(^8\)

The classic model took on more significance after World War II and the Baby Boom, with demographers such as Kingsley Davis arguing that “demographic transitions should be analyzed in terms of the entire range of relevant demographic changes....[which] include the delay of marriage, celibacy, contraception, sterilization, abortion, overseas emigration, and rural to urban migration.”\(^9\) In doing so, Davis sought to correlate aspects of migration, nuptiality, and total fertility rates to a transition model. Davis also suggested that changes in demographic behaviour were essentially multifaceted responses to economic strains arising from dramatic population growth, which required a transition model that considered these behaviours in the socioeconomic context of communities; the definition of strain in Davis’s theory was later developed to include any change in society likely to widen the discrepancy between current welfare and that which could be achieved or aspired to.\(^10\)

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9 Ibid., 501.
10 Ibid.
While debate over the exact drivers of demographic transition continues, many demographers now incorporate social, economic, and cultural conditions into their study of human populations, with the focus in post-industrialized countries beginning to shift to the specific demography of household formation. As Stefan Buzar et al. explain, the structure and definition of households has evolved in response to sociodemographic processes such as increases in divorce and cohabitation, broader ties of kin and friendship, and increasingly complex transitions through various household arrangements.\(^\text{11}\) These changes correspond to what is described as the ‘second demographic transition,’ and highlight the importance of “households as agents of urban transformation.”\(^\text{12}\) However, despite a growing awareness of these demographic changes, they have yet to translate into widespread community planning and policy initiatives that are reflected in the built environment.

**The Second Demographic Transition and the Emergence of Non-Traditional Households**

One of the key features of Second Demographic Transition (SDT) theory is its consideration of non-material preferences in the evaluation of needs and values in post-industrialized societies. As Ron Lesthaeghe explains:

Abraham Maslow...noticed that greater economic development produced a shift in concerns about material needs (subsistence, shelter, physical and economic security) to a focus on non-material needs (freedom of expression, participation and emancipation, self-realization and autonomy, recognition). With such a shift in needs, a shift in the values structure would also occur, with tolerance for diversity and respect for individual choices gradually taking over as prime values from solidarity and social group adherence and cohesion. ...the first demographic transition is considered as anchored mainly in the stage of the realization of basic material needs, whereas the second demographic transition is the expression of the development of higher-order, non-material needs and of expressive values.\(^\text{13}\)

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\(^\text{12}\) Ibid., 413.

This “post-materialist” value-shift was set in motion by contraceptive, sexual, and gender revolutions, all of which signaled a rejection of the prescriptive and patriarchal norms supported by group authority structures such as church and state. Women asserted control over their fertility and made strides to overcome subservience at home and in the workplace, while younger generations sought to enjoy sex for its own sake. Instead, Lesthaeghe tells us, “the new regime is governed by the primacy of individual choice.” Sex and procreation have been decoupled from marriage, and marriage from economic and domestic stability, leading to increasing numbers of never-married and divorced persons as well as smaller but more prolific households. The concept of postponement is often associated with this shift towards individual choice, with the timing of traditional life-course decisions left up to self-realizing and self-fulfilling motives, regardless of gender. Delayed marriage, delayed child-bearing, or none at all are features of the SDT. Consequently, household structure has shifted from the traditional nuclear family unit to a more diverse array of household configurations. The concepts of house and household no longer coalesce, with many households forming within a single dwelling, or individuals considering themselves to be part of several households depending on their relationship status and living arrangements.

Self-Realization vs. Traditional Markers of Adulthood

The cultural importance placed on individual goals and freedoms often lies in contradiction to the commitments and responsibilities associated with achieving adulthood. At a certain point, self-realizing motives are expected to give way to obligations to others, most traditionally in the form of spouse, children, and wider community and family. Sue Heath points out that “couple households – particularly those formed within the context of marriage – [have] come to form the pinnacle of a hierarchy of domestic arrangements to which all young heterosexual adults should aspire.” A traditional life-course, then, consists of life-stages that progress from dependent childhood to young adulthood, marriage and child-rearing in the early to mid-twenties, and

14 Ibid., 216.
15 Ibid., 217.
finally on to retirement and old age.\textsuperscript{17}

Marriage and parenthood, in particular, have long been considered the defining features of adulthood, the absence of which carries connotations of immaturity or slackness, sometimes referred to as post-adolescence. This state of being is often critically considered to be a new, elongated, and persistent life-stage of leisure, narcissism, and irresponsibility, brought about by the value shift of the SDT. As Heath tells us, there is a pervasive view that living alone or with unrelated peers is merely a transition between dependence on a family of origin and the independent formation of a destination family. Young adults in such households are “seen as occupying – quite literally – a halfway house: neither fully dependent nor fully independent.”\textsuperscript{18} She argues that young adults born between the late 1960s to early 1980s suffer from contradictory stereotypes about their generation, being somehow both lazy and workaholic, apolitical but activistic, neglectful of kin-ties but overstaying with parents, as well as being selfish loners who spend too much time networking.\textsuperscript{19} Harry Blatterer elaborates on this dichotomy, noting that “young people are supposed to ‘settle down,’ yet contemporary structural and cultural conditions demand mobility and flexibility.”\textsuperscript{20} This is particularly true in terms of employment; personal growth and self-realization become means for upskilling and adapting to instability and uncertainty in the labour market. The idea, then, that youthfulness or post-adolescence must be overcome and terminate in a settled, static concept of adulthood does not resonate as strongly with contemporary young adults as it may have with previous generations. Or as Blatterer contends, “making once and- for-all decisions about life makes as little sense as deciding that you have grown enough.”\textsuperscript{21}

A similar, self-realizing motivation can be extended to the way in which contemporary young adults form both platonic and romantic relationships. It is important to note that they are among the first cohort to have experienced widespread instances of divorce and separation during their formative years, whether in their immediate families or those of their peers. Such

\begin{thebibliography}{99}
\bibitem{17} Ibid., 38.
\bibitem{18} Ibid., 6.
\bibitem{19} Ibid., 191-92.
\bibitem{21} Ibid., 70.
\end{thebibliography}
experience could arguably be a contributing factor in the postponement of marriage, as desire for fulfillment begins to outweigh that of security and religious acceptance. As Heath describes, the result is a generation who approach relationships in a more honest and democratic manner, based on freely chosen ties that last as long as they remain mutually beneficial.\textsuperscript{22} This further highlights a preference for autonomy and self-determination over the gendered and economically-dependent relationships that were more characteristic of the subsistence-based first demographic transition. While Heath notes that traditional life-courses such as partnering and parenting are not unimportant to today’s young adults, she advises that their notion of being fully independent adults is “not necessarily contingent on living with a partner.”\textsuperscript{23}

Despite this, Heath also found that “many young people feel themselves to be in limbo with regard to their claim to ‘adult’ status. For as long as considerable emphasis is placed on marriage and parenthood as the ultimate markers of maturity, it is likely that young people who have not ‘settled down’ in these terms will continue to be regarded by older generations as ‘not yet adult’ or, at best, not quite adult.”\textsuperscript{24} Falling outside this standardized description, then, implies a lesser level of personhood which may help explain the continued void in policy and design initiatives aimed at this demographic.

### Home Ownership, Territoriality, and the Effect on Adult-Identity

#### Tenure & Affordability

When considering marriage and family formation as traditional markers of adulthood, home ownership has become integral to the domestic life-course. It remains a strong goal in western societies, particularly in New Zealand, but is becoming increasingly unattainable for many, including those who would have until recently expected to be able to do so with higher education and specialist careers. Jenny Pennington et al. assert that cuts to social housing have made government assistance “inaccessible [to] households other than the most disadvantaged,”\textsuperscript{25}

\begin{itemize}
  \item Heath and Cleaver, Young, Free and Single?: Twenty-somethings and Household Change. 47.
  \item Ibid., 24.
  \item Ibid., 186.
  \item Jenny Pennington et al., “No Place to Call Home: The Social Impacts of Housing Undersupply on Young People,” (London:
while New Zealand research group Beacon Pathway points out that middle and lower income households receiving minimal government assistance can now only access housing in outer suburbs with high transportation and infrastructure costs. Heath likewise suggests that high rates of youth unemployment, job instability, and house price rises well in excess of wage increases have caused economic strain in young populations since the 1980s. These changes, along with rising tertiary education costs, have made it increasingly difficult for young people, partnered or otherwise, to establish independent households. This remains true today as the after-effects of the 2007/8 global financial crisis persist in western economies, further perpetuating the notion of post-adolescence and inhibiting the formation and maintenance of romantic, kin, and peer relationships.

Over the next twenty years, increases in the number of one-person households in the Organisation for Economic Co-operation and Development (OECD) nations are largely forecast to come from ageing populations, a logical assertion given their higher average earnings overall and often existing residential portfolios on which to trade. However, younger, first time buyers typically do not possess such assets, with Guy Marriage noting that “an average single-wage-earner cannot now afford the price of even half an average house. Single people ... therefore have no option when buying property except to seek out the cheapest, and often, smallest apartment on the market.” Statistics on declining home ownership reinforce this contention; in New Zealand, for example, over 35% of households do not own their home, and the majority of this figure are renting. In Auckland City the proportion of households who do not own their own home is much higher, at about 44% as of 2006. The largest declines in ownership

27 Heath and Cleaver, Young, Free and Single?: Twenty-somethings and Household Change, 18.
for Auckland occurred in the 15-29 and 30-49 age brackets, dropping 10.6% and 17% respectively between 1986 and 2001.\textsuperscript{32} It bears noting that these figures are before the onset of the 2007/8 global financial crisis and the more recent and severe housing shortages in Auckland and Christchurch.

OECD data also suggests that increases in the number of one-person households will put additional pressure on housing markets,\textsuperscript{33} arguably a potential consequence of the mismatch between contemporary demographics and residential design and planning. For instance, average new dwelling sizes in the US, Australia, New Zealand, and Canada are now nearing or in excess of 200 square metres, well oversized for a solo dweller but often the only viable or desirable option. Of dwellings in Auckland with 4 or more bedrooms, 2006 figures indicate that over 25% were occupied by only one or two people.\textsuperscript{34} Moreover, less than 7% of occupied private dwellings in the Auckland region in 2006 were 1-bedroom, whereas 3 or more bedroom dwellings made up over 73% of the housing stock.\textsuperscript{35} These figures are troublesome in light of statistics indicating that one person households are expected to make up 30% of all New Zealand households by 2030, while up to 40% of households with dependent children are anticipated to be sole-parent families\textsuperscript{36} – the majority of which have been shown to include only one dependent child.\textsuperscript{37} These discrepancies further demonstrate the potential for market strain and underutilization of resources as household sizes shrink and proliferate in the coming decades.

These figures suggest the opposite response to significant demographic changes of the past, such as the baby boom or mass urbanization in the late 19\textsuperscript{th} century. As Klinenberg notes, “public support for suburban home development and highway construction to accommodate the growing population of middle-class families reshaped the urban landscape.”\textsuperscript{38} He argues that

\begin{itemize}
  \item \textsuperscript{33} International Futures Programme OECD, “The Future of Families to 2030 – A Synthesis Report”, 13.
  \item \textsuperscript{34} Auckland Regional Council, “Housing and Households in the Auckland Region”, 29.
  \item \textsuperscript{35} Ibid., 10.
  \item \textsuperscript{38} Klinenberg, “Going Solo,” 223.
\end{itemize}
the rise in solo living should be afforded the same significance, rather than being considered “an unmitigated social problem, a sign of narcissism, fragmentation, and a diminished public life.”

These perceptions still persist and may partially explain why no concerted effort has been made to recognize these changes in the building environment.

The implications for those unable to find suitable housing in stressed markets are bleak, with Pennington alleging that “undersupply and its direct impacts mean that there is no longer a functioning pathway for young people into sustainable, long term housing.” Until such time as young adults can afford to enter the property market, they must house themselves in accommodation that has typically been designed for another demographic, and is often meant to be (or is inherently) temporary, such as rental flats or familial dwellings. Extended stays in such transitional housing arrangements parallel that of an elongated post-adolescent life-stage, with many seeing little other housing choice for the foreseeable future. In the meantime, they are prone to a number of ill-effects, such as stifled ambitions, identity crises, privacy intrusions, and the loss of security, stability, and control within the home. Pennington’s study supports such assertions, noting that home owners report greater levels of satisfaction, stability, and community engagement than those who rent, whereas unsuitable housing is linked to poor health and poor educational achievement in children. Similarly, Sarah Lowe asserts that “subjective adult identity is associated with a variety of mental health benefits, whereas, conversely, feeling that one has not achieved adulthood is related to depression, anxiety, and social maladjustment.”

**Intimacy, Territoriality, and Choice Connectivity**

Returning briefly to Davis’s theory of demographic transition, rising discrepancy between costs and expectations for home ownership constitutes a plausible source of economic strain affecting household formation among contemporary young adults, particularly first-time buyers who are financially on their own. The ensuing demographic response has been a shift to frequently ill-

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39  Ibid., 6.
40  Pennington, “No Place to Call Home,” 16.
41  Ibid., 3-4.
42  Ibid., 19.
suited housing, such as returning to the parental home or extended stays in shared houses, both of which having been predominantly designed with the close interior intimacy suited to raising young children. Heath observes that graduates and young professionals are over-represented in these domestic arrangements, and as such are “in the vanguard of social change with respect to the transformation of intimacy and household formation.”

Mismatched interior intimacy is most glaringly obvious in the arrangement of bedrooms in a single-family house. “The boundaries of privacy and intimacy for adult sharers,” Heath points out, “are rather different to those of cohabitating partners and couples with children….the overhearing of couples having sex can take on increasing significance if all adult members of a shared house are sexually active.” Furthermore, the innate hierarchy of bedrooms can make it difficult to allocate space, and confers ‘status hierarchies’ between the adult residents. These factors are also of concern when adult children return to the parental home, with Pennington noting that adults who live with their parents tend to feel romantically stifled, as well as undermined professionally and socially by the arrangement.

The implication is that such environments can lead to the conscious and unconscious suppression of feelings and impulses that are expressive of an individual’s personality, while stunting the formation of an adult identity that is so often centered on the concepts of personal choice, freedom, and financial independence. Social psychologist Irwin Altman’s views on privacy substantiate this link between spatial environment and well-being; he maintains that individual control over privacy and togetherness allows for self-observation and reflection, which in turn facilitates identity formation.

While Heath acknowledges that young adults are becoming “increasingly adept at (re)negotiating intimate relationships both within and across a variety of domestic settings,” she emphasizes that “not all young people negotiate these relationships from a position of strength, and those with restricted resources and few realistic alternatives may feel that they are being forced into ways of relating to strangers, friends, parents and partners which are not of their choosing.”

44 Heath and Cleaver, Young, Free and Single?: Twenty-somethings and Household Change. 192.
45 Ibid., 188.
46 Ibid., 3.
47 Altman, Environment and Social Behavior: 50.
48 Heath and Cleaver, Young, Free and Single?: Twenty-somethings and Household Change. 193.
Altman’s concept of privacy is one of boundary regulation whereby an individual will choose at times to be in contact with or separate from others, seeking balance between the two undesirable extremes of isolation and crowding.\(^{49}\) Prior to this, privacy was generally described as an exclusionary device to keep public, exterior influences from reaching the interior of a dwelling. The privacy between individuals within a dwelling, however, is often an afterthought in the design process, particularly among adult sharers. Individual control of space, transitions to private areas, and their physical structure all play an important part in achieving desired levels of connectedness or solitude. The concept of territory, for instance, is vital to establishing recognized zones of control within a dwelling; for the individual, full control over a territory or personal space allows the ultimate freedom in which to express the desired range of emotions, expressions, and proclivities, be it alone or with selected others. The stability or longevity of this territory, as Altman notes, can also impact the ability to make and execute plans.\(^{50}\) Rachel Sebba and Arza Churchman, in their work on environmental psychology, argue that hospitality hinges on the sense of ownership of a space, noting that “one can extend an invitation only to a place under one’s own control.”\(^{51}\) Control, they suggest, encourages the care, defense, and free use of space by the individual in charge.\(^{52}\) Limits to this control, then, may affect the who, when, how, or if-at-all of personal connections, restricting the autonomy of individuals within the spaces they should feel most at home.

Altman refers to these controlled zones as primary territories, arguing that they are essential to privacy regulation and a sense of refuge. Such control is explored in Altman’s work with Dalmas Taylor on ‘social penetration theory,’ which claims that interpersonal relationships must grow from initial, superficial exchanges before graduating to progressively more intimate revelations; this is reflective of the layers of human ego that are consciously and subconsciously applied by an individual in various situations to regulate their communication, behaviour, and display of identity. Boundaries, therefore, are sacrosanct, requiring invitation to cross, while violations marginalize an individual’s sovereignty and self-worth.\(^{53}\) At times, particularly in the built environment,

\(^{49}\) Altman, *Environment and Social Behavior*: 207.
\(^{51}\) Ibid.
\(^{52}\) Ibid., 196–97.
boundaries may be vulnerable to less intentional visual and acoustic intrusions from adjacent territories, which then inadvertently disrupt the privacy of both the source and neighbouring territories. Sources of disruption could include other primary territories, or public territories and secondary territories, which Altman describes as linking primary and public (open to all) territories.\(^5\) Examples of these territories and potential intrusions are illustrated in Figure 2.1.

![Figure 2.1: Primary and secondary territories with potential boundary overlaps.](source)

Oscar Newman’s theory of defensible space takes the concept of territory a step further, arguing that resident control of semi-private and semi-public areas encourages surveillance, improving the buffer against the public world while reducing crime and neglect in the exterior spaces of communities (refer Figure 2.2). While his theory is based on a desire for security to keep wider problems of crime and impoverishment at bay, the concept of conferring control of buffering territory to individuals inside a dwelling can contribute to its proper use and care. There are also parallels between social penetration theory and the intimacy gradients described by architectural theorist Christopher Alexander, who highlights the importance of interior transitions from less-private to private in order to avoid awkward intrusions by visitors as shown in Figure 2.3.

\(^{5\text{a}}\) Ibid., 114.
Figure 2.2: The territories of Newman’s defensible space.


Figure 2.3: Alexander’s intimacy gradient of interior space.

Source: Ibid.
Theoretical Basis of Design

The premise of choice connectivity in this thesis is combines aspects of the theories of Altman, Newman, and Alexander, applied to the interior environments of individuals. Rather than advocating isolation, choice connectivity is about providing the same concern for privacy, transitions, and defensible territories that has hitherto been applied to households as a connected unit; most typically the nuclear family. It is a recognition that a solo adult forms their own household, regardless of whether or not a dwelling is shared, and is as worthy of the same freedom to control their connection to or separation from others outside their household as any other domestic unit. This can be achieved by providing an individual with secondary territories of control that extend outside of their primary, or most private territory, as shown in Figure 2.4, in order to minimize boundary violations.

Figure 2.4: Proposed territory gradient for individuals.
3 Precedents & Problems

The Single Detached Family Home

Despite a recognizable need for housing single dwellers as early as the 1930s, Gael Ferguson notes that the New Zealand government insisted that minimum housing standards be based on the needs of families. Figure 3.1 illustrates a standardized 1930s era state-housing floor plan, while Figure 3.2 details a 1950s version, both designed for a nuclear family. As evidenced by the similar layouts, these plans varied little from the 1930s to 1960s, and involved a clustering and hierarchy in bedrooms, either in size or arrangement. The hierarchy reflects the supervisory role of parents in relation to small children kept close, while the dining and living spaces form shared familial hubs. Kitchens, at that time considered women’s space, are relatively closed off and tied to back-of-house and service spaces; they are designed for the sole activity of cooking and are economized for a single-cook and standard set of appliances, formalized as the kitchen work triangle in the mid-1940s. Group builders seemed to have found a plan-type that met minimum state housing standards and appealed to families with young children. Those applying for government loans were more likely to be approved if they chose a standardized plan and, by extension, fit within the mainstream family demographic.

Figure 3.1: Plan from State Advances Corporation design book for private house builders and buyers.

Source: Adapted by author from Ferguson, Gael; Historical Branch-Department of Internal Affairs; Building the New Zealand Dream (Palmerston North: The Dunmore Press Ltd, 1994). 144.

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55 Ferguson, Gael; Historical Branch-Department of Internal Affairs; Building the New Zealand Dream (Palmerston North: The Dunmore Press Ltd, 1994). 145.
56 Ibid., 190.
Group builders today have expanded, quite literally, on these plans in their contemporary designs, examples of which can be seen in Figures 3.3 and 3.4. Layouts are much the same, the noticeable differences being the attached garages, larger floor areas, and a greater number of bedrooms and bathrooms despite shrinking family size. This is largely due to changes in what constitutes affluence or even a basic standard of living, which is often influenced by international trends, particularly those from Australia and the United States. Another factor is high land cost, which some commentators suggest forces builders to maximize floor areas in order to meet acceptable profit margins. Marriage’s research supports this, noting that “the typical 1970s single story [sic] 120 m² house on a 1012 m² section (11.85% site coverage), has evolved into a house around 210 m² on a 450 m² site, (46% site coverage)....we are now housing less people, in larger houses, on less land, and yet costing more money.” For example, G.J. Gardner, one of New Zealand’s largest home builders, advertises only one 2-bedroom design on their website, as shown in Figure 3.5. A scan of other top New Zealand group builder’s websites, including Golden Homes, Cavalier Homes, and Jennian Homes, reveals a complete void in designs of less than 3 bedrooms.

Figure 3.3: Cavalier Homes 3-bedroom single family home, 204 m$^2$ (excluding garage and outdoor area).

Figure 3.4: Devine Homes 3-bedroom single family home, 178 m$^2$ (including garage).


The prevalence of this typology in New Zealand, and other countries, increases the likelihood that it will be used by flat sharers and other non-nuclear family demographics. An analysis of these layouts with the privacy needs of independent adults in mind highlights issues with the use of this typology for contemporary young adults, as shown in Figure 3.6. Bedrooms and bathrooms are the most intimate areas of a house, but are typically clustered along a shared hallway or entryway, with one access point driving all traffic past primary territories. The bedroom is most likely the only primary territory that each resident has, but the shared hallway offers no transition from shared to intimate space, effectively making each individual’s bedroom door their front door. Combined with dubious soundproofing, this affords residents little privacy or disinhibition in such activities as conversing, arguing, playing music, singing, watching videos, attempting to sleep, fornicating, or attending to calls of nature. The term ‘walk of shame’ colloquially describes one such lack of visual privacy, as a person must endure the embarrassment of walking past other occupants after a (typically) sexual encounter with a member of the household. While humorous on the surface, this exemplifies an acquiescence to design that has not considered the daily realities and valid privacy needs of its occupants. This arrangement is perhaps even more untenable when adult children remain with or return to living with their parents.
Figure 3.6: Analysis of typical single family home for use by independent adults.

- individual “owns” bedroom only
- bedroom door effectively front door for that individual
- no privacy when transitioning to and from intimate space
- internal acoustic concerns
- one or more residents may be territorial over shared spaces

Legend
- Entry or accessible to visitors
- Shared or semi-public zone
- Semi-private zone
- Lowest heirarchy bedroom
- Lower heirarchy bedroom
- “Master” bedroom
- Transition zone
- Uncontrolled connectivity
- Choice connectivity
- Visual &/or acoustic concern
- Work triangle

There are also hierarchy, functionality, and security implications to the single family layout. Such entitlements as priority use of parking space, kitchen and bathroom use during ‘rush hours,’ and rights to the master bedroom all presuppose a social hierarchy. Kitchen design often remains based on a single work triangle and assumes the operation of one cook, whereas Heath notes that “independent sharers... may all decide to cook independently but at the same time.”\(^{58}\) Bathroom functionality is also limited by the same simultaneous need.\(^{59}\) Security fears may be exacerbated when flat sharers are strangers to begin with, whose partners or friends may be unfamiliar or disagreeable to the other residents. A lack of secondary spaces under individual jurisdiction results in a loss of control over who is present in the spaces adjacent to primary territories. While some visual or acoustic intrusions may be marginal or even acceptable at times, such as between kitchen, lounge, and outdoor spaces, conflicts arise when different residents require these areas for multiple uses at the same time, such as one individual entertaining guests while another plans to watch television. Hierarchy may resurface as a means to assert dominance in these shared territories, with the person who owns all or most of the furnishings in common areas potentially feeling more entitled to use them than the other residents. Flexible acoustic and visual controls in these spaces are therefore important to satisfying the needs of multiple, individual users, rather than designing for a collective family or household unit.

\(^{58}\) Heath and Cleaver, Young, Free and Single?: Twenty-somethings and Household Change. 188.
\(^{59}\) Ibid.
Multi-Unit Designs

While recognizing a need to curb suburban sprawl and provide housing for those on lower incomes, the New Zealand government largely limited this assistance to other favoured social groups, such as couples, particularly those without children or with older children. The ‘Star’ flats provided an efficient design for significantly increasing densities “without totally abandoning the idea of the family home surrounded by land.”60 They ranged from 1 to 4 bedrooms, and were built in urban and suburban areas, although were found to be difficult to rent or sell at the time. This may have been due to the desirability of suburban detached or less dense units, and the subsidised loans that made such housing accessible to even low income families in the mid-to-late 1950s. A 2-bedroom version, as can be found in Freemans Bay in Auckland, is shown in Figure 3.7. While the single entry still creates the issue of a shared hallway outside private space, this supervisory intimacy could suit a solo parent with up to two underage children, who could share the room beyond the kitchen, thereby affording the parent a measure of privacy and access when hosting an overnight guest. It may also meet the needs of a solo dweller who requires a spare room for guests or a home office. The lounge, however, occupies the most protected part of the plan, and requires travelling past more intimate spaces to reach it; combined with the one-cook kitchen and shared hallway, this layout may be less than ideal for flat sharers with simultaneous cooking, bathing, and entertaining needs.

60 Ferguson, New Zealand Dream: 190.
Figure 3.7: Star flats.

- kitchen and utility rooms provide buffer between bedrooms
- bedrooms similarly sized but one has better access to entry and exit
- no secondary territories or transition space outside of intimate areas
- direct view from exterior public corridor into first bedroom

Source: Adapted by author from Ferguson, New Zealand Dream: 193.
The predilection towards design for families continues today, even in multi-unit and apartment developments. Figures 3.8 and 3.9 are two such examples of recent developments in Auckland; a suburban 2-bedroom terraced house at Hobsonville Point, and a downtown Auckland apartment. Both examples are subject to the same limitations as described above, and are too large to be considered affordable for a solo dweller or single parent.

Figure 3.8: Universal Homes 2-bedroom terraced house.
Figure 3.9: 3-bedroom Vincent Street apartment, Auckland City.

Hostels and Single Room Occupancies

Despite this focus on familial privacy in the early 20th century New Zealand, including the requirement that families be able to cook and eat separately in multi-unit designs, extending these benefits to dwellings for single people was deemed uneconomical, resulting in a less considered set of requirements for flats for single persons. Often, the only accommodation for a solo dweller was hostels or bedsits, as subsidized loans were limited to families. This was especially true for single, working women, who had the added disadvantage of earning significantly less than a man’s wage. As pressure mounted and funding allowed, an effort was eventually made to provide housing for single people, albeit gender segregated and based on the bed-sit or hostel model.

An illustrative example of such housing comes from a YWCA development in the UK, as shown in Figure 3.10. The majority of rooms were small bedsits consisting of space for a single bed and a tiny kitchenette, a small closet, and a little desk presumably on which to eat alone, day in and out. Bathrooms are shared between what appears to be at least half a dozen units, and are along an active, communal hallway from their users. Guests to these bedsits are immediately and perhaps awkwardly invited into the intimate bedroom space, although designing for a single bed may have been an attempt to encourage chaste behaviour. There seems to be an assumption that residents have little need for storage, and will be happy to entertain what few friends and family they have in the public communal lounges, or perhaps somewhere else entirely. The large bedsits improve on this by providing in-room lounge space, although this is again open to the bedroom space. The bedroom is, however, screened from the entry, and an individual bathroom is provided. The 1-bedroom flats, on the other hand, are relatively amenable, with generous living and bedroom spaces and in-house kitchens and bathrooms. The lounge is screened from the entrance, while the angle of the bedroom wall also provides a screening function as guests enter the living area. The remaining drawbacks are the bedroom designed for a single bed, minimal fixed storage space, and the internal communal hallway that provides little in the way of threshold or greeting space for each unit, much like the one shown in Figure 3.11.

61 Ferguson, New Zealand Dream: 145.
Figure 3.10: Historical housing for single women.

- visiting space coincides with intimate space of bedroom
- no choice connectivity between living and bedroom areas

Birmingham YWCA

48. Built several years ago to accommodate 62 women. On a corner site about a mile from the city centre, on one of the main roads. An L-shaped block with five floors of accommodation with access from a central corridor, over club rooms, offices and shops. The two upper floors extend along only one frontage.

49. Eighteen people have self-contained bed sitting room flats with bathroom and kitchen, and six flats have a separate bedroom. There are 38 bed sitting rooms or flatlets with a cooking alcove containing sink, cooker, and wash basin behind folding doors. The flatlets are not self-contained in that every seven residents share two bathrooms, with w.c.s opening off the corridor away from the accommodation unit. In the main entrance hall is a reception desk, and leading off this is a pleasant lounge with TV. There is also a dining room which serves as a luncheon club and is hired out for private functions.

- living & kitchen separate from bedroom – allows for guests outside intimate zones
- internal transitions less important in single occupancy
- angled access to bedroom provides transition & screening from entryway

- entire area is intimate space
- visiting in room or exterior communal spaces forces connectivity
- shared bathroom outside across hall reinforces this

The fully contained units of the Birmingham YWCA were at the time quite generous given the shortage of accommodation for solo dwellers, and are gargantuan in comparison to some contemporary urban examples in Auckland City. Figure 3.12 illustrates a 1-bedroom apartment in the Zest building in downtown Auckland, with 20 m² of internal floor space, no private outdoor space, and an internal bedroom. There is very little space to host a single guest, let alone multiple visitors, and the bathroom is only accessible by passing through the bedroom. An apartment of this size and layout essentially dictates that gathering, entertaining, and socializing activities occur almost exclusively outside of the home, while presupposing that any guest invited to the dwelling are at a level of intimacy suited to accessing the bedroom. Like the bedsits, the space feels transient and temporary, as if to reinforce the notion that the solitary life is meant to be evolved from.

Figure 3.11: Stark, featureless entry corridor.


Figure 3.12: 1-bedroom Zest apartment, Auckland City.

4 Design Process & Development

Target Households

Based on the housing arrangements and demographic trends of contemporary young adults, four categories of solo dweller accommodation will be developed for this project:

Solo Units will cater to one-person households that consist of adults who are either single or who do not normally reside with their partner or spouse. Design for these units will focus on one occupant, with the potential to work from home and/or accommodate visitors.

Solo Parent Units will accommodate one parent and at least one dependent child, and at most two in a shared room. Design for these units will consider the access and security concerns that may be particular to a solo parent.

Flat Units will be designed for unrelated persons living together, with a focus on creating individual private entrances and internal transitions between private and shared areas.

Multigenerational (Multigen) Units will facilitate an adult child sharing accommodation with at least one parent, either of whom may or may not have a partner or spouse that lives with them. These units will be designed to facilitate both individual and familial activities, with the potential to accommodate one dependent child.
Site Analysis

Location and Amenity

Site selection was confined to cities in westernized nations experiencing the pressures of housing affordability and availability, as illustrated in Figure 4.1. New Zealand stands out for the fact that all of its major housing markets are considered seriously and severely unaffordable, despite being significantly smaller than many of their international counterparts. Auckland, located in the central North Island of New Zealand as shown in Figure 4.2, is the country’s largest city with 1.42 million usual residents; it has been ranked severely unaffordable in all 10 of the Demographia International Housing Affordability Surveys and is currently the 7th most unaffordable city out of 85 major western markets.

Figure 4.1: Major westernized cities with severe housing affordability pressures.

Source: Author.

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Specific site selection was guided by the Housing Corporation UK’s Scheme Development Standards, with key criteria listed in Figure 4.3 below. Brownfield and underutilized sites with depressed property values close to downtown Auckland were investigated in order to provide higher local amenity without premium land prices. Proximity to current and proposed public transportation, as well as easy access to shops, services, recreational facilities, and employment centres were the primary considerations.

Figure 4.2: Site relative to Auckland extents.

Figure 4.3: External Environment – List of Essential Items

- healthcare facilities
- local retail — food and general
- post office
- banking and services
- pre-school/primary/secondary school
- play and care facilities for children
- park/public open space
- public transport
- major commercial centre
- leisure/sports facilities

The site chosen for the development is located at 6 Carlaw Park Avenue, Parnell, Auckland, as shown in Figure 4.4. The land experienced a decrease in capital value as of the latest Auckland Council revaluation (refer Figure 4.5) and would benefit from a scheme that generates greater revenue. It is assumed that the west and east areas shown will be acquired from the owner, Carlaw Heritage Trust, and amalgamated as one site with a total area of approximately 6800 m$^2$, excluding the rail right-of-way that bisects the site. Currently used for open-air parking and rail corridor landscaping, the property is somewhat barren and cut off from the wider amenity of Parnell Village, as shown in Figure 4.6; it is also subject to the visual and acoustic intrusion of the rail line, motorway noise, and potential air quality issues.

Despite these impediments, the location has immense opportunity for walkability and access to public transportation hubs, Parnell Village, schools and childcare, the Auckland Domain, the Waitemata Harbour, and the central city with its extensive employment opportunities, entertainment venues, lifestyle amenities, and arterial routes (refer Figure 4.7). The site offers the potential to rejuvenate and connect the overlooked fringes of a popular suburb, while providing a tailored design solution for a young and productive demographic most likely to take advantage of the local amenity.

Figure 4.4: Site location and area.

Figure 4.5: Significant decrease in capital valuation of site, 2011.


Figure 4.6: Current site use.

View up hill from entry at north. Facing southwest.

View to north from central site.

View to southeast from central site.

Source: Author.
Figure 4.7: Site amenity and walking radii.

**Context & Features**

Sitting at latitude 36.5 south, Auckland straddles subtropical and temperate climate zones and is subject to changeable weather patterns, but generally has mild, wet, and frost-free winters and warm, humid summers. Average annual rainfall is moderate at 1100–1300 mm per year, while the city enjoys about 2100 hours of annual sunshine. Predominant winds are southwesterly, with secondary northeasterlies.

The site is narrow, ranging from 11 to 41 m wide, with steeply sloping sides on the south and west boundaries as shown in Figure 4.8. A gabion wall retains the slope on the west boundary, above which the site flattens out and is well suited for building the majority of the development, before stepping up to the northeast side of the site at a retaining wall just past the rail line. Linking these two sides of the site will create a passage to wider Parnell, and the southeast tail of the property is well suited to a pedestrian and cyclist route into the Auckland Domain (refer Figure 4.8). Currently, however, vehicular and pedestrian circulation to surrounding

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areas and amenities are restricted by fencing, vegetation, and poorly developed pathways. Some shelter from southwesterly winds is provided by medium sized trees along the west boundary, as well as by the new, 6-storey student residences being constructed on the site beyond the southern boundary (refer Figure 4.9).

The site is presently zoned for mixed business use, although it assumed for the purposes of the project that the development will be rezoned under the Terrace Housing and Apartment Buildings zone of the proposed Auckland Unitary Plan. This is in line with other developments near the site, such as the high-rise university accommodation and the existing 3 and 4 storey apartments on Heather Street beyond the northeast boundary (refer Figures 4.6 and 4.9). Building height is generally limited to a maximum of 20.5 m (6 storeys) in the Terraced Housing zone, although height to boundary rules may potentially be exempted as the neighbouring lots are zoned for mixed business use, or are buffered by greenspace and roads.65

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Initial Site Massing and Density

While density is not meant to be used as a blanket control for the development, estimates are useful for providing a comparison to surrounding areas, and to begin to measure affordability. Normalizing for an average dwelling size of 95 m², the initial target was for a medium density development of 50–60 dwellings per hectare (dph), with the potential to increase should the site be suitable. This was found to be quite low for the Carlaw Park site, given its essentially downtown location and proximity to smaller apartment buildings. Similarly, above-ground parking was undesirable owing to the narrowness of the site and the likelihood of an overwhelming visual and planning impact. Rules of thumb and affordability considerations necessitated a development of at least 130 dph in order to justify underground parking and the provision of 5–6 storey buildings. Some initial site and density planning, based on an average of 4 storeys, is illustrated in Figure 4.10.

Figure 4.10: Clockwise from top left: 100 dph, 118 dph, 143dph, 153 dph.
Tenure & Financing Structure

For the purposes of this project, the site will be leased from the owner by a non-profit housing association for a period of at least 150 years. The non-profit organization will ensure that units are offered for sale to those who fit the demographic criteria, and will provide right-to-buy and rent-to-own options as well. Flat units will allow for shared ownership between flatmates, or be rented out by the housing association. Multigen units will be available for shared ownership between adult children and their parents, and will also include right-to-buy and rent-to-own schemes.

The land currently has little conventional development value due to its shape, steep access-way, and poor existing vehicular and pedestrian circulation to adjacent sites and amenities. It is assumed that these factors and the long-leasehold arrangement will ensure that land values remain similar to those in more suburban areas, which is reflected in the affordability analysis in Appendix A. Making use of the site to provide more affordable housing for a neglected demographic will fill a social need while creating value through sustained rates revenue, engaged residents, and the activation of forgotten fringe spaces.

Size and Costing Considerations

Currently, there are no minimum national size standards for dwellings in New Zealand. In 2005, the former Auckland City Council implemented minimum size standards for new apartments due to public backlash against a proliferation of small apartments of 20 m\(^2\) or less, particularly in the Auckland CBD,\(^{67}\) an example of which was shown in Figure 3.12. The future applicability of these minimums, provided in Figure 4.11, remains uncertain with the recent amalgamation of Auckland and surrounding territories into a single regulatory body, and the draft status of its latest council regulations, the Auckland Unitary Plan. However, it is assumed for this development that these minimum floor areas will be adopted as standard for the Auckland area, with the intent being to exceed them as much as affordability will allow in the final design.

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## A Matrix of Minimum Gross Floor Areas (in m²) for Components of Various Residential Apartment Types

<table>
<thead>
<tr>
<th></th>
<th>Living</th>
<th>Kitchen/</th>
<th>Bedrm 1</th>
<th>Bedrm 2</th>
<th>Bedrm 3</th>
<th>Bathrm 1</th>
<th>Bathrm 2</th>
<th>Laundry</th>
<th>WR-Entry</th>
<th>Balcony</th>
<th>TOTAL</th>
<th>ROUNDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio</td>
<td>11.00</td>
<td>5.10</td>
<td>9.00</td>
<td>0.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.00</td>
<td>0.84</td>
<td>0.72 + 0.36</td>
<td>5.00</td>
<td>35.02</td>
<td>35.00m²</td>
</tr>
<tr>
<td>1 bed</td>
<td>15.00</td>
<td>10.80</td>
<td>9.00</td>
<td>0.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.00</td>
<td>0.84</td>
<td>1.08 + 0.36</td>
<td>5.00</td>
<td>45.08</td>
<td>45.00m²</td>
</tr>
<tr>
<td>2 bed ¹</td>
<td>24.00</td>
<td>13.20</td>
<td>9.00</td>
<td>9.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.00</td>
<td>1.26</td>
<td>2.16 + 0.36</td>
<td>8.00</td>
<td>69.98</td>
<td>70.00m²</td>
</tr>
<tr>
<td>3+ bed ²</td>
<td>28.00</td>
<td>16.20</td>
<td>9.00</td>
<td>9.00</td>
<td>9.00</td>
<td>3.00</td>
<td>3.00</td>
<td>1.26</td>
<td>3.24 + 0.36</td>
<td>8.00</td>
<td>90.06</td>
<td>90.00m²</td>
</tr>
</tbody>
</table>

**Note:**

a) The 'rounded off' figures for the minimum gross floor areas in the extreme right hand column result in a Studio which is 50% of the floor area of a 2 bedroom unit and a 1 bedroom unit which is 50% of the floor area of a 3 bedroom unit. This has the advantage of producing two sets of compatible modules, which will each promote flexibility in the mix of apartment types within the same structural grid, and provide potential commonalities in their respective dimensions for use when articulating building elevations.

b) The above minimum component areas shall be provided for each type of apartment, except as provided in (c) below.

c) If a balcony of the required minimum size is provided, the minimum gross floor area of the residential apartment can be reduced by subtracting the required balcony area from the total rounded area.

d) Where non-permanent accommodation is not self-contained only the minimum gross floor area standard for bedrooms shall apply.

¹ The minimum gross floor area for a 2 bedroom residential apartment indicated in the table above includes the minimum of only one bathroom (it would be 73m² for a two bedroom two bathroom apartment).

² The minimum gross floor area for a 3 bedroom residential apartment indicated in the table above includes a minimum of two bathrooms.

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Space standards for dwellings in New Zealand (measured by dividing dwelling floor area by household occupation rates) have increased significantly during the period since the post-1950 baby boom. Average household size dropped from 4.9 to 2.7 people per dwelling between 1901 and 2006,\(^{68}\) with further declines expected in the coming decades, while average new dwelling size has increased from about 95 m\(^2\) to 175 m\(^2\). As a result, floor space has increased from 19 m\(^2\) per person to 65 m\(^2\) per person in an average dwelling. However, the space allocations for studio and 1-bedroom apartments, including the minimums outlined above, remain significantly less than these national averages. This seems to imply that a solo dweller has less need for space and storage than does an individual in an average dwelling, and perhaps contributes to the perception that living solo is a temporary life-stage from which to upgrade. Design for units in this thesis will therefore attempt to achieve similar space allocations to the national per person average, with adjustments made for higher construction costs typically associated with medium and higher density developments in the city fringe. Cost and sizing estimates are provided in Appendix A.

**Affordability Analysis**

One of the more well-known housing affordability studies is the Demographia International Housing Affordability Survey, which determines a housing affordability index, called a median multiple, by dividing a region’s median house price by its gross annual median household income. While arguments about the efficacy of this method are outside the scope of this thesis, the median multiple provides an internationally recognizable guide from which to compare affordability across several countries and a large number of cities. The 2013 median multiple for Auckland was 8, meaning that the median purchase price of a property is 8 times that of the median household income, which suggests that Auckland housing is less affordable than that of Los Angeles, London, and New York.\(^{69}\)

It is important to note that a median household income consists of one full time male income, 50% of one female median income, and a Working for Families income support payment for

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one 5 year old child. If the median income for a single earner were to be used, the median multiple for Auckland would jump to about 12 (refer Appendix A), further highlighting the need for design and tenure options that are responsive to the younger solo demographic. Demographia considers a median multiple of 3 or less to be affordable, while a multiple of 5.1 or more is considered severely unaffordable, as shown in Figure 4.12. Achieving a median multiple of less than 3 may no longer be practical for burgeoning cities such as Auckland, but aiming for a more affordable index of approximately 4 to 5 is within the scope of this thesis. Detailed calculations are provided in Appendix A and discussed further in this paper.

Figure 4.12: Demographia Affordability Ratings.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Median Multiple</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severely Unaffordable</td>
<td>5.1 &amp; Over</td>
</tr>
<tr>
<td>Seriously Unaffordable</td>
<td>4.1 to 5.0</td>
</tr>
<tr>
<td>Moderately Unaffordable</td>
<td>3.1 to 4.0</td>
</tr>
<tr>
<td>Affordable</td>
<td>3.0 &amp; Under</td>
</tr>
</tbody>
</table>


Flat Units

Design Basis

These units were explored in the first instance as they are designed for solo dwellers on lower incomes, and as such provide the limiting case for personal space allowances. Design was predicated on individual entries and a degree of shared amenity, as shown in Figure 4.13. In traditional residential typologies, an entry is typically provided to the household as a whole unit, such as a family. This study, however, defines a household as one independent adult, who requires control over their connection with others. Separate entries allow an individual to decide how a visitor may be admitted to the household, based on the degree or manner to which they are known, while also allowing connections to take place without undue scrutiny by others. Some visitors may be allowed in by degrees, some kept at bay, and others allowed directly into primary territories; the individual reserves the right to decide how these invitations apply, and when. In this way, residents and their visitors are not forced to connect, intentionally or otherwise, with other occupants and visitors, even when inhabiting the same dwelling. An entry via the shared space would either be redundant or force initial connections to occur in a communal space, as depicted in Figure 4.14, with a loss of privacy and control occurring during transition to primary territories. With entry established, each household then requires space in which to receive and entertain their guests, separate from other and perhaps uninvited residents; these secondary spaces and transition zones serve to buffer the primary territory of the individual from the entry, public exterior, and shared interior. Figure 4.13 illustrates these buffers diagrammatically, while Figure 4.15 illustrates conceptual plans that position primary territories such as bedroom and bathroom beyond the secondary territory of a small office or lounge. These private compartments are then internally connected to the shared space of the Flat Unit to allow the same buffering between entries and primary territories.
Figure 4.13: Diagrammatic Flat Unit.

- resident controls transition-based spaces such as a sitting room
- spaces reflect proposed territory gradient of individuals
- individual entry - control over who enters and to what degree
- visual & acoustic concerns to be minimized, removed, or controlled

Source: Author.
**PROS** of public-shared-private arrangement:

- shared part of dwelling is arguably least intrusive when visitors arrive
- single public face/entry most traditionally recognizable

**CONS**

- public face and entry of dwelling is shared, therefore individual control over immediate access is lost
- drives entry/exit of individual through shared space if no individual entries provided
- access to shared space allows access to all private compartments, whereas entry through private compartment allows screening of visitors by appropriate resident.
- redundancy if also providing individual entries

Source: Author.
Figure 4.15: Primary and secondary territories of conceptual private compartments within a Flat Unit.

Source: Author.
**Shared Space**

The provision of separate areas for individual residents to greet and entertain their guests brought about the question of what amenities would be shared. While there is limited data on the subject of preferred amenities in shared households, evidence from a 1970s English study suggests that kitchens and bathrooms were most often desired for individual use. This, however, could arguably be due to the fact that such facilities would have been shared with many more people than is proposed in the Flat Units here. The decision was made to include a shared kitchen, due to the expense and reduced amenity of providing small kitchenettes to each resident in already limited space. Furthermore, expecting guests or residents to commute through shared space to reach a shared bathroom was completely at odds with the intimacy and privacy goals of this thesis. A shared kitchen, along with lounge, dining, and outdoor space, could also be used to create a focal point for the flatmates; designing for use by multiple cooks, as suggested by the work triangles in Figure 4.16, reduces the problem of ‘rush hours’ and allows the option of discrete groupings of residents and their guests. Shared laundry and storage facilities are also provided in the shared space.

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Figure 4.16: Conceptual Flat Unit shared space.

Legend
- Entry or accessible to visitors
- Shared or semi-public zone
- Secondary territory
- Primary territory
- Transition zone
- Work triangle

Source: Author.
As can be seen in the above figures, the number of flat sharers has been limited to four; exceeding this was likely to result in a temporary, hostel-like atmosphere in the communal spaces, while less than four could result in the formation of cliques, and further complicate internal and external circulation. Development of the circulation proved cumbersome for the four private compartments when arranged on both single and two storeys, becoming excessive and intrusive as shown in Figures 4.17 to 4.19. This led to the development of the three-storey stacked arrangement shown in Figure 4.20, which was found to create internal and external circulation efficiencies by including a central, stair core within the Flat Unit, while eliminating the need for costly lift access to shared space levels in the wider development. This arrangement is repeated throughout the development and ensures that external circulation remains opposite to the view and bedroom side of the private compartments.
In order to increase affordability for this category of solo dweller, space allowances were kept to an approximate maximum of 50 m$^2$ per person, or 200 m$^2$ total for the flat. A number of private compartments were conceptualized with varying degrees of success, as shown in Figures 4.15 and 4.21, but a core private unit of about 31 m$^2$ was developed that could be effectively replicated, flipped, and linked to a central shared floor, resulting in a total interior floor area of 191 m$^2$ (refer Figure 4.22). Variations of this layout, as shown in Figures 4.23 to 4.28, will be used in the final design scheme, with alterations to accommodate aspect and entry variations as dictated by the site plan. Based on four median incomes, the unit shown in Figure 4.24 achieves median multiples of 2.9 and 3.6, dependent on the provision of underground parking per person or not (refer Appendix A). Several features of these layouts were found to be repeatable in the design of subsequent units, particularly those for multigenerational families.
Figure 4.21: Flat Unit conceptual private compartments.

Figure 4.22: Flat Unit: variation of repeatable private compartment.
Figure 4.23: Developed Flat Unit, aspect same side throughout, 201 m$^2$ internal area.

Legend
Entry or accessible to visitors
Shared or semi-public zone
Secondary territory
Primary territory
Transition zone
Work triangle

Figure 4.24: Developed Flat Unit with flipped aspect at top, 191 m$^2$ internal area.

Source: Author.

Source: Author.
Figure 4.25: Flat Unit short section.

Source: Author.

Figure 4.26: Flat Unit long section.

Source: Author.
Figure 4.27: Flat Unit private compartment, view from internal entrance.

Source: Author.

Figure 4.28: Flat Unit private compartment, view from lounge to entries.

Source: Author.
Solo Units

Design Basis

Design for these units was predicated on the need for full, self-contained amenity, including cooking, dining, entertaining, sleeping, storage, laundry, and private outdoor space. The units cater for one person, but consideration was given to occasions where guests might visit or stay overnight, thus requiring some essential internal transitions between primary and secondary territories, as well as the ability to temporarily screen certain areas for privacy as required. Similarly, transitional space was required between the entry and primary territories, unlike what is typically constructed in studio apartments and bedsit dwellings (refer Figure 3.10).

Circulation and Layout

A single entry point for each unit simplified the external circulation when compared to the Flat Units; access was therefore largely dependent on the shape and arrangement of the plan. A number of layouts were conceptualized, as shown in Figure 4.29, of varying shape and of either single or multi-level construction. Two-storey arrangements necessitated a large amount of internal circulation that hindered the development of practical spaces and transitions, particularly when attempting to keep space allowances near the national average. Single-level, rectangular units were found to be the most efficient and effective for integrating the territories and transitions outlined in the design basis, and could either be stacked with the Flat Units or developed into a separate block of Solo Units. Figure 4.30 illustrates a Solo Unit based on the floor plate of the Flat Units, which creates a wide, dual-aspect plan-form. Figures 4.31 to 4.34 depict a narrow, dual aspect plan that creates the basis for a separate block of units. Both allow flexible use of space and internal transitions, and a version of each will be included in the final scheme.
Figure 4.29: Conceptual Solo Unit plans.

Source: Author.
Figure 4.30: Solo Unit for stacked tower floor plate. Wide dual aspect.

Figure 4.31: Solo Unit for separate block. Narrow dual aspect.

Legend

Entry
Accessible to visitors
Secondary territory
Primary territory
Transition zone

Source: Author.
Size and Affordability

The national average of 65 m² per person was the initial target internal space allowance for the Solo Units, with reductions made to increase compatibility between the floor plates of the Flat Units, and subsequent Solo Parent Units. Figure 4.30 has approximately 57 m² of internal space which results in median multiples of 4.2 and 3.5, with and without parking, respectively. Figure 4.31 has an internal area of about 58 m², resulting in similar median multiples. Refer to Appendix A for affordability calculations.
Solo Parent Units

**Design Basis**

The Solo Parent Units created the next limiting case for personal space allowances, as they are designed for up to three people, but with only one supporting income. Allocating separate entries for independent adults in the flat scenario brought up the issue of whether dependent children should have the same level of privacy and control of access, outside the scrutiny of the parent occupant, as outlined in Figure 4.35. While this arrangement is tenable for autonomous adults, and possibly older adolescents, it was determined that the broad application of this feature to dependent minors was at odds with the supervisory nature of parent-child relationships in early to mid-childhood. This relationship, however, evolves over the life-stage of the child, as shown in Figure 4.36, which requires consideration in the placement of primary territories and the buffers and transitions between them.
- Infant – close spatial proximity and supervision, parent relationships can be peripheral with less impact
- Toddler – close spatial proximity and supervision, child has more awareness of people and situations therefore parent relationships may require screening from child.
- Primary School – relaxed spatial proximity, early stages of autonomy. Discipline and supervision still required, parent relationships may require screening from child.
- Secondary School – more relaxed spatial proximity, direct supervision becomes less important but discipline and boundary/behaviour controls remain; parent relationships may also require privacy.

Source: Author.

**Circulation and Layout**

External circulation was less complicated for the Solo Parent Units than the Flat Units as a maximum of two entry points were considered; a single main entry to the household and a potential separate entry for the parent that could facilitate visitors and perhaps a small home office. Internal circulation was developed from these different access types, the former being based on a more traditional, supervisory parent-child relationship, and the latter for those wanting an sense of transition and secondary territory between the parent and child’s primary territories. As with the Solo Units, it was found that internal circulation requirements of multi-level arrangements reduced the efficacy of space usage, and it was determined that a single-level plan was most viable. As shown in Figure 4.37, the single entry model provides close proximity between bedrooms, with a shared hallway as is often found in single-family homes. The dual entry model places bedrooms at opposite sides of the layout and features internal transitions to both spaces, as illustrated in Figure 4.38. In the wider development scheme, discussed later in

Figure 4.36: Life-stage supervision considerations and privacy gradients between solo parent and child.
this thesis, the single entry layout could be arranged in conjunction with a separate block of Solo Units, while the dual entry option was found to be compatible with the same floor plate as that of the Flat Units, and could be placed either above or below the stacked Flat Unit. Subsequent site layout and the recreational needs of children resulted in these units being placed at the ground level, as shown later in this document.

Figure 4.37: Solo Parent Unit, single entry model. Supervisory parent-child relationship.

Figure 4.38: Solo Parent Unit, dual entry models. Left to right: early to late versions.
Size and Affordability

Keeping costs down for the Solo Parent Units involved limiting internal space allowances to an approximate maximum of 70 m², which is achieved in the single and dual entry models described previously. The 59 m² single entry unit achieves median multiples of 4.4 and 3.7, with and without parking, respectively, while the 69 m² dual entry unit achieves median multiples of 5.0 and 4.3, with and without parking (refer to Appendix A for calculations). Variations of these layouts will be used in the final design scheme. Refer to Figures 4.39 and 4.40 for interior perspectives.
Multigen Units

Design Basis and Layout

These units were intended to facilitate two to three generations of family members, and are meant to consider the needs of the solo demographic that may prefer to live within their larger family structure. The Multigen Units will cater to the situation of an adult child, who may or may not be a solo parent, who lives with an adult parent or parents. This arrangement may of course be flipped, whereby a small family shares the unit with an elder family member. However, the focus remains on the internal transitions required to provide a sense of primary and secondary territory to the private adult compartments, while creating shared facilities that, similar to the Flat Units, can be used by multiple users or create a focal point for all of the residents. As a result, the lessons learnt from the development of the Flat Units can largely be repeated here, with separate entries and lounges provided for the individual adult compartments, which are then connected to the shared space. In this way, the family members can connect and withdraw from each other as they choose. Figure 4.41 illustrates this arrangement diagrammatically, while Figure 4.42 depicts conceptual and developed Multigen Unit layouts.
Figure 4.42: Multigen Units. Left to right: Conceptual and developed versions.

Legend
- Entry or accessible to visitors
- Shared or semi-public zone
- Secondary territory
- Primary territory
- Transition zone
- Work triangle
As with the Flat Units, the kitchen, dining, lounge, laundry, and outdoor space were included in the shared amenities, while bathrooms remained part of the individual compartments. Kitchen design was also based on multiple cooks and the potential for a large group or multiple discrete groups to use the facilities at once.

**Circulation**

The circulation efficiencies of the three-storey stacked arrangement of the Flat Units were repeated here in order to capitalize on their ability to provide transitions, territories, and affordability. As a result, they can be combined in blocks alongside the Flat Units to share external circulation routes, and be stacked with Solo and Solo Parent Units that use the same floor plate. Internal circulation remains based on a central, vertical stair core, as per the previous illustrations.

**Size and Affordability**

Based on a minimum of three adult occupants, the internal space allowances per person come to 63 m$^2$, with a total unit internal area of 191 m$^2$. It was assumed that the Multigen Units would have three supporting incomes, and therefore achieve median multiples of at most 4.8 and 3.9, with and without parking, respectively. Variations of the above layouts will be used in the final design scheme, with alterations to accommodate aspect and entry variations as dictated by the site plan.
**Site Planning & Massing**

The core driver for site arrangement was to activate the neglected edges of the property while allowing links to the wider context and amenity. The arrangement also needed to provide good solar access and an element of view or aspect to as many units as possible, while creating a semi-private yet interconnected streetscape. In this way, residents are provided with alternate routes to their dwellings, while the layout becomes reflective of the need to both shield and connect the development to the wider surroundings.

Figures 4.43 to 4.46 illustrate conceptual site massing of predominantly 3 and 4 storey blocks, based on the 3-storey stacked arrangement of the Flat and Multigen units, and the early assumption that multi-level Solo and Solo Parent units would be effective. Estimated density at this stage is just over 70 dph, with a site coverage of 30%. Care has been taken to ensure entries and aspects do not interfere with each other, but greater edge activation is required along the western boundary. Circulation also does not adequately link the distinct blocks of units, and greater density is needed to justify underground parking. Later attempts, shown in Figures 4.47 to 4.51, ranged from 2 to 7 storeys, the variation being used to ensure adequate solar access and views, and to visually break up the blocks of units. Densities were limited to about 108 dph until the development of the narrow, dual-aspect Solo Unit described previously, which was found to be effective at increasing density without significant changes to site coverage, layout, and street character. This site layout is shown in Figures 4.52 to 4.54, a variation of which will be used in the final design. Adjustments will be made to bring building coverage down to the 40% maximum allowed for the Terrace Housing and Apartment Buildings zone, and to reintroduce some height variation in the tower blocks.
Figure 4.47: Intermediate site massing, 108 dph, 41% site coverage, plan view.

Figure 4.49: Intermediate site massing, 2-7 storeys, view from northwest.

Figure 4.48: Intermediate site massing, view from west.

Figure 4.50: Intermediate site massing, southwest boundary. Aspect and entries.

Figure 4.51: Intermediate site massing, view from Heather Street. Aspect and entries.
Setbacks from Carlaw Park Ave and Heather Street are minimized, as shown in Figures 4.54, and 4.55, allowing the buildings to follow the street and activate the boundary by placing the entry face for residents just off of the sidewalk. Transition between the public space of the street and the privacy of the unit will be accomplished by a minor, elevated setback, creating small private stoops or terraces that will be detailed in the final design.
External Circulation

Circulation on site is intended for pedestrian access, with vehicular entrance limited to emergency and maintenance services. The pathway leading up the hill from Carlaw Park Ave forms a subtle, main entrance, with the change in level providing a transition into the neighbourhood; the angled arrangement of the units at the end of this path creates a deflection and curiosity as to the space beyond (refer Figure 4.56). Deflection of this sort is also applied between the central stacked units and those on the southwest boundary, as shown in Figure 4.57, encouraging further progression and leading to successive routes into the Domain, Parnell Village, and beyond. The widths of the pathways fluctuate, which provides a sense of enclosure without restricting movement; path widths are less than the height of adjacent buildings, making them human in scale. In order to connect the site, at least one pedestrian and cycle connection will bridge the rail line, located as indicated in Figure 4.59. This will be refined in the final design.

Figure 4.56: Deflection in view up hill from Carlaw Park Ave.

Figure 4.57: View between stacked towers.

Source: Author.
A mix of horizontal, vertical, and individual access is provided to units in the development. Open-air horizontal access gantries are cantilevered from the facades of the stacked towers, and form communal entry platforms for the Flat, Multigen, and other units of the same floor plate, as shown in Figure 4.58. These are reached from stair and lift cores at one or more ends. While horizontal access circulation can at times result in an institutional or claustrophobic atmosphere, the gantries are largely single-loaded and meander with the façade, mimicking the circulation on the ground to create a sense of interest and movement (refer Figure 4.57). In the wide, dual aspect units, bedrooms and lounges are placed opposite to the circulation gantry in order to maximize privacy and views; in certain locations, the circulation gantries are flipped at higher floors for this to be achieved (refer Figure 4.58).

Figure 4.58: Section showing aspect and entry of stacked units, and cantilevered access gantries.
Individual walk-up access is provided to the narrow, dual-aspect Solo units, with vertical access to the upper units provided by stair cores as indicated in Figure 4.59, allowing the block of units to be broken up visually while servicing apartments on either side. These stair cores are also open-air, allowing light from one side to the other.

Three lift cores have been planned, as marked in Figure 4.59, which connect to the circulation gantries and the underground parking. For the most part, stops are on every other level, with access having been eliminated to contiguous shared space levels of the Flat and Multigen units.

**Public & Semi-Public Space**

Public open space is provided as illustrated in Figure 4.59, and serves to balance the scale of the development and provide additional outdoor amenity to residents. The spaces on the northwest and northeast sides of the site are open to the rail line; a fence or other barrier will be required for safety reasons on the west side of the rail line, while the retaining wall and subsequent grade separation serves this purpose on the east side. Such a barrier will be investigated during detailed design, but will allow the visual connection to the rail line and the

*Figure 4.59: Circulation and public space plan.*
east side of the site to be maintained. Housing developments often turn their backs to rail lines, ostensibly to shield residents from noise and visual intrusion. However, this is accomplished within the units through the buffering action of secondary territories, as well as considered acoustic solutions in the final design. The overarching theme of the site layout is to make use of existing amenities while creating better links to them for the residents, of which the rail line is symbolic.

Semi-public space is provided between the central blocks of stacked units, as shown in Figures 4.59 and 4.60, access to which will be from the Solo Parent units located at ground level (refer Figure 4.58). This space will essentially be inaccessible from the rest of the development, with maintenance access only provided at either or both ends, and will serve as a communal back yard with space for veggie gardens, leisure, and children’s play. Closing this area off to the wider development, with access only via invitation through an individual unit, is reflective of the need to regulate access to the core self, which is emulated in young offspring. The space is relatively narrow but provision for light and air will be achieved through the use of transparent materials at the circulation cores, deck space in the tower units, and by limiting storey height at certain points on the surrounding tower blocks.

**Structure and Materiality**

Primary structure will likely consist of steel members, owing to spanning capability and potentially faster construction time than similar concrete or timber solutions. Smaller member depths result in greater floor to ceiling heights, which allows flexibility in acoustic solutions for walls, floors, and ceilings, and the accommodation of service ducts. For this reason, a tray deck solution may be preferable for the final design, which has the added potential for underfloor heating and passive solar collection.

A drained and vented cavity cladding system is a probable solution for weathertightness, the materiality of which will be investigated in the final design. A number of materials may ultimately be incorporated to reflect the differing blocks of units and to variegate the facades.
Acoustic Solutions

Loud music, traffic noise, children playing, and the occasional argument are all part of life, especially life in the city. Similarly, the sounds of early-morning showers, toilets flushing, laundry and kitchen appliances, doors slamming, and residents stomping around their homes are part of the everyday process of living, but needn’t unnecessarily disturb other residents. Acoustic considerations are required for all housing typologies and densities, but they are often externally focused. While problems of extra-household airborne and impact sound may be exacerbated in medium and high density housing, consideration of noise between rooms is equally important to achieving desired levels of privacy, particularly when sharing a dwelling with others. For this reason, and contrary to conventional advice, individual bedrooms and bathrooms are buffered from each other in shared dwellings, thereby reducing the transmission of the most personal noise to other residents in the dwelling.

Robust acoustic detailing of walls, floors, and ceilings will be investigated in the final design, and will likely consist of platform floor finishing above a steel-concrete tray deck structure, with suspended plasterboard ceilings. This provides a Robust Standard Detail, developed to meet strict acoustic standards in the UK and Wales. Wall structures, particularly party walls and those between bedrooms and bathrooms, will need to accommodate adequate sound insulation such as multiple layers of plasterboard and wool-type insulation, and also consider flanking noise. Detailing such as resilient bars and separating strips are important to achieving the required level of acoustic privacy for the dwellings. The goal is to utilize smart detailing to reduce airborne and impact noise intrusions in order to allow residents the freedom to carry on as they please in their homes.

Sustainability

Medium and higher density housing developments within an existing urban framework offer one way to approach sustainability in the built environment, as they allow the use of existing infrastructure and amenities while taking advantage of economies of scale when mobilizing construction and materials. Reducing urban sprawl in this way also saves arable land and lessens commutes. Other approaches to sustainability include natural ventilation, passive and
active solar heating, shading devices, green roofs, material and colour selection, rainwater collection, and biofiltration strategies.

The development is well suited to the use of passive solar and ventilation strategies due to the abundance of dual-aspect units and their arrangement on site. The roof space of the interconnected blocks provides an excellent opportunity for active solar heating, rainwater collection, and the provision of a communal green roof to take advantage of the city and surrounding views. Appropriate vegetation would help to screen the railway and public outdoor spaces and improve air and water quality. Similarly, the lack of surface parking encourages walking, cycling, and the use of permeable surfaces throughout the site. These strategies will be investigated in the final design.

Parking

The final design will incorporate one level of underground parking; this solution best suits the topography and dimensions of the site, while creating a safer and more welcoming streetscape above ground. Access will be on the southwest boundary at the Nichols Lane junction with the new university accommodation, depicted in Figure 4.58. Vehicle access above ground will be limited to emergency and maintenance services.

Allowing 1 car park per adult resident would require nearly 160 car parks; the Auckland Unitary Plan proposes parking maximums of 1 space per 1 bedroom dwelling, 2 spaces per 2 or more bedroom dwelling, and 0.2 visitor spaces per dwelling. At the time of writing there were 47 Solo Units, 27 Solo Parent units, 13 Flat units, and 14 Multigen units. Assuming the Solo and Solo Parent units each have one space, while the remaining units have 2 spaces each, this equates to 128 spaces, with an extra 20 visitor spaces required. A maximum of 148 spaces is thus assumed, although additional spaces may be considered to facilitate leasing to surrounding businesses, or the general public. Underground parking resulted in higher median multiples for all units, therefore it is assumed that parking spaces will be made available for long term lease to residents who can or wish to afford them, with the remainder rented to the public and local businesses. One level of underground parking is expected to be sufficient for these purposes in the final design.
Security & Maintenance

Public & Visitor Access

The neighbourhood boundary is formed by the grade change on the south and west sides, and reinforced by the placement of tower blocks along this edge. Similarly, the northeastern boundary is demarcated by the towers along the sidewalk, which shield the rest of the development from the immediate public. The intent is not to forbid public access so much as to de-emphasize it, maintaining an element of privacy for the development’s paths and walkways and creating a sense of solace and retreat to residents and guests, despite being near the heart of the city. Providing this distinction from obvious and open-ended city streets reinforces the idea that a person is entering a neighbourhood, and that they are potentially subject to casual or even overt surveillance, which produces an expectation of a standard of behaviour.

A basic level of security will be provided to the lift and stair cores, such as swipe card access, the exception being at the platform(s) that cross over the railway. At this stage security gates are not provided; the routes and pathways within the development are available for public use should they come across them, but for the most part are designed for residents to connect to their surroundings and local amenities. A higher level of security may be desired by residents over time, but this can be adapted at a later date as needs and preferences of the neighborhood evolve.

Rubbish & Recycling

A refuse collection system can make-or-break a large scale housing development, and it is therefore important that access to and containment of this facility is as convenient as possible. Roadside collection from individual bins becomes unsightly and impractical at this density, therefore a communal collection point will be provided on both the east and west sides of the site. This will ideally include rubbish, recycling, and composting facilities. On the west side, screened collection bins at the entry to the underground parking will provide convenient access for collection, and ventilation can be shared with that of the parking. Residents can then access the bins from the street or by circulating through the parking levels. On the east side, communal
bins will be located at a screened point on Heather Street, providing similar access and collection opportunities. Card key or other security measures may be required to prevent dumping by the public and non-residents.

**Building Management**

It is assumed that a scheme of this size will have a body corporate, as well as a resident building manager who can perform daily service tasks such as handling mail and courier deliveries, arranging maintenance, and ensuring that agreed acceptable use and appearance standards are upheld in public space and pathways.
CONCLUSIONS

Summary and Appraisal

An analysis of current demography alongside the study of human environmental behaviour revealed a dearth of consideration in the built environment for non-traditional populations. The disproportionate development of housing to suit traditional nuclear families has led to the use of these residences by those outside their intended social structure. The result is a disconnect between desired and achieved levels of privacy and autonomy within the home, which affects the core issues of identity, security, and personal control. This is largely the problem of solo dwellers, who are most likely to resort to group living arrangements when a lack of suitable or affordable housing is available. Younger solo dwellers are particularly vulnerable, as they face greater job insecurity and generally have fewer assets on which to rely or trade, yet are among the most productive members of society and are crucial to its economic and social stability.

Despite this, there remains an underlying assumption that the solo demographic is essentially transitional, and that youth and mobility allow resilience to economic strain until such time as a stable family unit is established. This mobility, however, does not generally act favorably to cities facing the combined effects of economic and housing affordability crises. Inaccessible housing acts to the detriment of cities wishing to attract and retain young professionals as their existing labour force ages and retires, and confounds the aspirations of this group at their inception. This assumption also marginalizes the needs and way of life of the independent adult, which is exacerbated by housing and public policy that fits a family or transient solo narrative. Yet the ambitions of this demographic are not entirely different to those of the nuclear family; the desire for economic and housing stability, the opportunity to be prosperous, the freedom to pursue leisure activities inside and outside the home, and the ability to connect with and support friends, family, and community remain consistent goals. The difference is the adequacy and attainability of the space provided in which to do so.
Unlike a family, the young, professional solo dweller is predominantly part of an urban social sector. The central Auckland location of the project reflects this difference, and imposes a housing typology that is inherently more dense than its suburban counterparts. This urban proximity provides access to amenity, entertainment, and the professional, political, and social networks that this demographic is more likely to take advantage of, but brings with it increased cost and privacy concerns. The use of density and the exploration of private-public boundaries of space, internally and externally, have been applied throughout the development to ameliorate these issues.

Unlike a family, the internal intimate relationships of solo adults in a shared dwelling cannot be safely assumed; but like a family, a solo adult requires privacy and control over transitions by others into their private realm, regardless of whether the dwelling is shared. The design exercise of this project illustrates a different paradigm for housing, one that considers the household of the individual and the ways in which they may choose to navigate between degrees of connectedness and solitude.

This thesis has investigated how demographic shifts have largely been ignored in current and existing housing developments, and has explored the economic, psychological, and social impacts this may have on those who have no choice but to live in ill-suited housing. The complex fields of demography and environmental behaviour have been bridged in an architectural scheme that provides a range of design solutions specific to solo dwellers, whether they be solo parents or independent adults living with their elders or peers. In this way, the architecture of this proposal is responding to a social need, which is at the core of the process of housing supply.
Future Directions

A responsive approach to housing design allows architecture as a discipline to regain public trust and relevance to a broader audience. In recent decades, the field of architecture has narrowed, becoming increasingly focused on aesthetics and narratives, isolating it from the masses and undermining its experience and authority as a holistic field of art, technology, and social consciousness. This thesis has illustrated a number of social patterns and human relationships deserving of a full architectural understanding:

- An analysis of whether the spatial and tenure preferences of young, mobile demographics differ to their less mobile counterparts;
- Further analysis on the behavioral, social, and psychological implications of micro-apartments;
- Research and analysis of cultural distinctions and preferences for solo and multigenerational dwelling, and how multicultural cities can provide housing to suit these varied needs;
- Further research on the spatial needs of solo parents and their children, and how they are affected by custody arrangements, access to community, and personal support networks.
APPENDIX A – AFFORDABILITY CALCULATIONS
APPENDIX B – LIST OF FIGURES
List of Figures

Figure 2.1: Primary and secondary territories with potential boundary overlaps.......................................................... 16
Figure 2.2: The territories of Newman’s defensible space............................................................................................................ 17
Figure 2.3: Alexander’s intimacy gradient of interior space....................................................................................................... 17
Figure 2.4: Proposed territory gradient for individuals.................................................................................................................. 18
Figure 3.1: Plan from State Advances Corporation design book for private house builders and buyers........................................ 19
Figure 3.2: Plan from New Zealand Government plan service, 976 ft² (90 m²).............................................................................. 20
Figure 3.3: Cavalier Homes 3-bedroom single family home, 204 m² (excluding garage and outdoor area).............................. 21
Figure 3.4: Devine Homes 3-bedroom single family home, 178 m² (including garage)................................................................. 21
Figure 3.5: G. J. Gardner 2-bedroom single family home, 101 m² (including garage)................................................................. 22
Figure 3.6: Analysis of typical single family home for use by independent adults.......................................................................... 23
Figure 3.7: Star flats................................................................................................................................................................................. 26
Figure 3.8: Universal Homes 2-bedroom terraced house.................................................................................................................... 27
Figure 3.9: 3-bedroom Vincent Street apartment, Auckland City........................................................................................................ 28
Figure 3.10: Historical housing for single women.......................................................................................................................... 30
Figure 3.11: Stark, featureless entry corridor................................................................................................................................. 31
Figure 3.12: 1-bedroom Zest apartment, Auckland City......................................................................................................................... 31
Figure 4.1: Major westernized cities with severe housing affordability pressures........................................................................ 33
Figure 4.2: Site relative to Auckland extents........................................................................................................................................ 34
Figure 4.3: External Environment – List of Essential Items.............................................................................................................. 34
Figure 4.4: Site location and area.......................................................................................................................................................... 35
Figure 4.5: Significant decrease in capital valuation of site, 2011...................................................................................................... 36
Figure 4.6: Current site use........................................................................................................................................................................ 36
Figure 4.7: Site amenity and walking radii.......................................................................................................................................... 37
Figure 4.8: Figure-ground site plan and section.............................................................................................................................. 38
Figure 4.9: Southwest boundary. Gabion edge and new high-rise university residences...................................................... 39
Figure 4.10: Clockwise from top left: 100 dph, 118 dph, 143 dph, 153 dph..................................................................................... 40
Figure 4.11: Minimum floor areas for apartment types in Auckland.................................................................................................. 42
Figure 4.12: Demographia Affordability Ratings.......................................................................................................................... 44
Figure 4.13: Diagrammatic Flat Unit................................................................................................................................................. 46
Figure 4.14: Analysis of public-private-shared spatial relationship in Flat Unit............................................................................ 47
Figure 4.15: Primary and secondary territories of conceptual private compartments within a Flat Unit........................................ 48
Figure 4.16: Conceptual Flat Unit shared space..............................................................50
Figure 4.17: Diagram of Flat Unit external circulation requirements................................51
Figure 4.18: Single-storey circulation........................................................................51
Figure 4.19: Two-storey circulation............................................................................51
Figure 4.20: Stacked circulation................................................................................52
Figure 4.21: Flat Unit conceptual private compartments.............................................53
Figure 4.22: Flat Unit: variation of repeatable private compartment............................53
Figure 4.23: Developed Flat Unit, aspect same side throughout, 201 m² internal area...54
Figure 4.24: Developed Flat Unit with flipped aspect at top, 191 m² internal area........54
Figure 4.25: Flat Unit short section..............................................................................55
Figure 4.26: Flat Unit long section..............................................................................55
Figure 4.27: Flat Unit private compartment, view from internal entrance..................56
Figure 4.28: Flat Unit private compartment, view from lounge to entries.....................56
Figure 4.29: Conceptual Solo Unit plans.....................................................................58
Figure 4.30: Solo Unit for stacked tower floor plate. Wide dual aspect.........................59
Figure 4.31: Solo Unit for separate block. Narrow dual aspect.......................................59
Figure 4.32: Narrow dual aspect from kitchen..............................................................60
Figure 4.33: Narrow dual aspect from entry.................................................................60
Figure 4.34: Narrow dual aspect bedroom.................................................................60
Figure 4.35: Diagrammatic Solo Parent Unit...............................................................61
Figure 4.36: Life-stage supervision considerations and privacy gradients between solo parent and child.................................................................62
Figure 4.37: Solo Parent Unit, single entry model. Supervisory parent–child relationship.....63
Figure 4.38: Solo Parent Unit, dual entry models. Left to right: early to late versions........63
Figure 4.39: Single entry Solo Parent Unit, from entry.................................................64
Figure 4.40: Single entry Solo Parent Unit, from hallway.............................................64
Figure 4.41: Diagrammatic Multigen Unit....................................................................65
Figure 4.42: Multigen Units. Left to right: Conceptual and developed versions................66
Figure 4.43: Initial site massing, plan view...................................................................68
Figure 4.44: Initial massing, from west. Entry/circulation in yellow, aspect in pink.........68
Figure 4.45: Initial massing, southwest boundary. Aspect and entries..........................68
Figure 4.46: Initial massing, view from Heather Street. Aspect and entries....................68
Figure 4.47: Intermediate site massing, 108 dph, 41% site coverage, plan view..............69
Figure 4.48: Intermediate site massing, view from west...............................................69
Figure 4.49: Intermediate site massing, 2-7 storeys, view from northwest ................................................................. 69
Figure 4.50: Intermediate site massing, southwest boundary. Aspect and entries. .............................................................. 69
Figure 4.51: Intermediate site massing, view from Heather Street. Aspect and entries. ..................................................... 69
Figure 4.52: Developed site massing, 171 dph, 42% site coverage, plan view. ................................................................. 70
Figure 4.53: Developed site massing, view from west. 2-7 storeys. .............................................................................. 70
Figure 4.54: Developed site massing, view from southwest boundary. .................................................................. 70
Figure 4.55: Developed site massing, view from Heather Street .................................................................................. 70
Figure 4.56: Deflection in view up hill from Carlaw Park Ave. .................................................................................. 71
Figure 4.57: View between stacked towers ................................................................................................................. 71
Figure 4.58: Section showing aspect and entry of stacked units, and cantilevered access gantries. ........................... 72
Figure 4.59: Circulation and public space plan. ........................................................................................................ 73
Figure 4.60: Enclosed semi-public space. .................................................................................................................. 74
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