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User Perceptions of the Public/Private Threshold within Intensive Housing.

A systematic survey-based study that evaluates user perceptions of public threshold and their successful implementation.

Ariana Faulkner

Nilesh Bakshi

Frances Moughan

Abstract

User Perceptions of the Public/Private Threshold within Intensive Housing.

The demand for intensive housing units in New Zealand is growing rapidly. The number of townhouses, flats and units consented to be built in 2018 (year ending September) was a record 6,059 (Stats NZ, 2018), up 29% from the previous year. This increase in construction demonstrates the movement from standalone housing to medium-density living.

This study aims to understand user perception of the private/public threshold within medium-density housing. Specifically by investigating the perception within the 'Front Yard' which is the transitional area between the front door and the street curb. Two Wellington based housing developments, The Altair (Newtown) and Britomart (Berhampore), were chosen as case studies against a specific inclusion criteria. A further two case studies, Regent Park and Nouvo, were defined and analysed but for the scope of this research only the initial two studies are interviewed.

Human experience within the public/private threshold is recorded and collated throughout a series of semi-structured interviews with the housing development residents. The objective of the study is to understand the residents' personal opinion on the space; what works and what doesn't. The results are analysed against relevant literature to reveal trends and design implications. Ultimately, a set of guidelines and design implications are produced, which can be followed at a design-level. These strategies will aim to guide the design-phase in future industry projects. Therefore, improving human experience within intensive housing.

Preface

This report presents the findings of the joint research project 'User Perceptions of Intensive Housing'. The project was initiated in response to results from a 2017/18 investigation which investigated industry-based perceptions of the public/private threshold within intensive housing.

This study aims to identify successful methods of 1) data acquisition of a new study including a different sample selection and 2) analyse user perception of the public private threshold in intensive housing.

Acknowledgments

Notes

This report is intended to aid designers for future New Zealand designs. User perceptions of the public private threshold will allow designers recognise personal opinion on the topic. Understanding human experience will give future designs deeper meaning in terms of user comfort and user preference.

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Introduction

This research investigates and evaluates user perceptions of the public/private threshold within New Zealand intensive housing. A preceding research project, Intensive Housing Phase One, funded by Studio Pacific Architecture (SPA) and Victoria University of Wellington (VUW) in 2017 reviewed similar perceptions established on industry-based interviews. As the surveyor group was limited to practitioners from a single architecture firm, phase one identified key perceptions drawn from expert designers with pre-existing knowledge of industry standards and a specialization in design. However, the fundamental limitation of this study is that it did not consider the perceptions of site occupants. These user groups have excellent knowledge of liveability within intensive housing. Thus, there is a potential for intensive housing occupants to highlight key design guidelines that may be crucial for successful design in the urban form.

It is therefore the aim of Phase Two to identify a set of guidelines and principles, based solely on user perception. These guidelines can be followed at design-level in order to optimise human experience within intensive housing. The qualities that influence human experience will be critically analysed to create correlations between the user experience and the private/public threshold.

Spatial qualities of the specific intensive housing projects, The Altair and Britomart, will be defined and discussed; explaining the limitations and scope of how this research can be applied. Two additional case studies will be defined and discussed as potential studies for proceeding future research. Semi-structed interviews will be recorded at the case study locations to understand correlations between user groups and locations. Then the interviews will be analysed to understand the effects of the threshold and common trends will be revealed.

Problem Statement

The Wellington City District Plan (72) has various minimum requirements set for the front yard of residential housing. The Residential Standard states that in residential Medium Density area's; the minimum depth of the front yard is to be 3 metres (Wellington City District Plan, 2000). Yet, there is no official minimum requirement for side and rear yards. The front yard is a mandatory requirement in housing yet, it is still an underutilized threshold within home. This means there are specific guidelines and minimums set for the public/private threshold, yet the public/private threshold is still unclearly defined within intensive housing.

Table 1: Minimum depth of Front Yards (5.6.2.2.1 DPC 72)

Medium Density Residential Areas	3 metres
Inner Residential Area (Exceptions below)	1 metre
IR4 – Mount Cook, Newtown, Berhampore	3 metres
IR5 – Oriental Bay Height Area	No requirement
Outer Residential Area	3 metres, or 10 metres less half the width of the road, whichever is the lesser

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To add to the specific District Plan requirements, the demand for intensive housing units in New Zealand is growing. A record high 6,059 townhouses, flats and units were consented to be built in the year ended September 2018 (Stats NZ, 2018). This increase means there is a large demand for medium-density dwellings. The demand for housing is there, what designers need to do is make sure the outcomes are successful in attaining and improving human comfort.

This study will gather a range of user perceptions on the public/private threshold within specific intensive housing developments in Wellington, New Zealand. The data will be collated and analysed in order to create guidelines that can be followed at a design-based level. By attaining current user perceptions, the outcome could be to improve human experience in future housing projects.

Research Questions

- **What is user perception of the public/private threshold within intensive housing for two specific case studies in Wellington, New Zealand?**
- **Can common trends emerge on user perception of the public/private threshold for two separate intensive housing case studies?**
- **How can user perception influence future intensive housing designs?**

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Background

Phase One Summary

This research adds to a previous study; Intensive Housing Phase One. This past research project, funded by Studio Pacific Architecture (SPA) and Victoria University of Wellington (VUW), was conducted in-between November 2017- February 2018. This research reviewed industry-based perceptions on the public/private threshold. The surveyed group was limited to practitioners from a single architecture firm. Meaning, all of the participants had pre-existing knowledge of industry standards and a specialization in design. The study encompassed industry-based perceptions only.

The fundamental limitation of this study is that it did not consider any intensive housing occupant perception. This user group has inhabitancy knowledge of the private/public threshold, without pre-existing knowledge of standards. Phase Two of this research will address the occupant user group by targeting specific housing developments and conducting a series of semi-structured interviews. The public sphere may highlight key design strengths and/or flaws only understood when inhabiting the complex. The information gathered from Phase Two may inform new design guidelines that can be followed at a design-level in order to optimise human experience in intensive housing.

Scope Search

Literature Review

Four international databases were used for the literature review; ProQuest, SpringerLink, JSTOR and Scopus. These websites were recommended databases on the Victoria University Website for databases that specialise in Architecture. These databases have also been successful in finding critical evidence in past CBPR reports. This search was successful at redefining scope and understanding defining relevant information.

Government funded websites such as Wellington City Council, BRANZ, Ministry for the Environment, Statistics NZ, CRSEA and Housing New Zealand were used to find any relevant grey literature. This includes any relevant building standards, government produced building codes, and previous government funded surveys and housing examples. The grey literature found is relevant to the New Zealand context in terms of building codes, statistics and data. This will give the study significant reference when producing data and analysing results on previous local trends. Google was also used as a pilot search engine to find any relevant user-perceptions on the public/private threshold.

The literature review includes information collected in:
Journal Articles
Books and Book Chapters
Statistical and Analytical Reports
Local and Regional Government Reports
Conference Papers
Master's and Doctoral Theses

Key Word Search Terms:

Intensive Housing
Medium Density Housing
Public
Private
Threshold
User Perception
User Experience
Front Yard

Article Selection:

The selected databases were used with specific key word search terms. From the results articles were assessed by relevance of the Title and Abstract to the key word search terms. If the articles are relevant, then the full text is read, and the reference is recorded. The selection criteria basis was formed by the independent reviewer.

Key Literature (Further literature and full summaries in Appendix 1)

- Housing As If People Mattered: Site Design Guidelines for the Planning of Medium-Density Family Housing by Clare Marcus and Wendy Sarkissian.
- Medium Density Housing: Case Study Assessment Methodology. Ministry for the Environment.
- The New Zealand Housing Preference Survey: Attitudes towards medium-density housing.
- Social Interactions at the neighbourhood-level as a function of external space enclosure.

Key Definitions

Intensive Housing:

There are a range of different definitions of intensive housing in New Zealand. For this research, intensive housing refers closely to the Ministry for the Environment's (2016) definition of Medium Density Housing:

"Medium-density housing means comprehensive developments including four or more dwellings with an average density of less than 350m^2 per unit. It can include stand-alone dwellings, semi-detached (or duplex) dwellings, terraced housing or apartments within a building of four stores or less. These can be located on either single or aggregated sites, or as part of a larger master-planned developments."

User Perception:

This refers to the opinions and attitudes presented by pilot study interview participant and residents at the selected housing complexes. These opinions will be based on the usability and functionality of the public/private threshold. These perceptions will be recorded on-site by handwritten noting of two researchers.

Public/Private Threshold:

For this research the private/public threshold has many terms and definitions. It is the transition from the user's perception of private space to public space. This transition can include interior and exterior spaces. Yet this definition will vary depending on the house typology. The extremely loose definition will vary immensely depending on location, housing typology, landscaping, typography, surrounding context, site, density and demographic. The threshold has multiple layers that are yet to be unravelled.

For the scope of this research; the public/private threshold is largely defined as the area to the 'front' of your medium-density dwelling. This area may be bound by adjacent dwellings, commonly seen in terraced housing. This threshold will usually have boundaries connecting to the street, and neighbourly dwellings, adding another layer to the private/public sphere. These multiple layers add to the staggered nature of the zones between public and private. In medium-density housing the Front Yard will usually be clearly defined as it is part of the urban planning of the overall complex.

Private Open Space:

Private open space is the exterior area that is bounded by adjacent units. This area of open space is physically exclusive for the occupiers of that unit, contained by a gate or a similar item. But, can be visually open to other units/public areas. Usually described as the outdoor area of a unit.

Shared Open Space:

The open space that is provided on-site for all occupants. This is an area is intended for communal mixed use of residents. Usually this will be somewhere for activities such as a small park. According to the Wellington City District Plan (72) this space shall have a minimum width of 3 metres.

Research Method

Inclusion Criteria and Selection

Firstly, a statistical analysis of all the immediate suburbs surrounding Wellington Central was undertaken. Wellington Central was not considered as there is a lack of medium-density housing complexes and its demographic is not broad enough for the study. This initial statistical analysis recorded Gender, Age Range, Ethnic Group, Housing Typology, Median Weekly Rent and Median Income. This information briefed the researcher of what to expect in each suburb. The objective of the research is to gain a range of user perceptions therefore suburbs with the most diverse attributes were favoured.

The suburb of Newtown and its surrounding suburbs of Berhampore and Mount Cook) were chosen for their successful diversity range when analysing the results of the statistical analysis. These results were put against an 'inclusion criteria' which follows. These suburbs also have a large amount of existing medium-density housing complexes.

Inclusion Criteria:

- The large ethnic diversity within the suburb. Newtown has a more stabilised ethnic group range than Wellington City; less European and more diverse ethnicities.
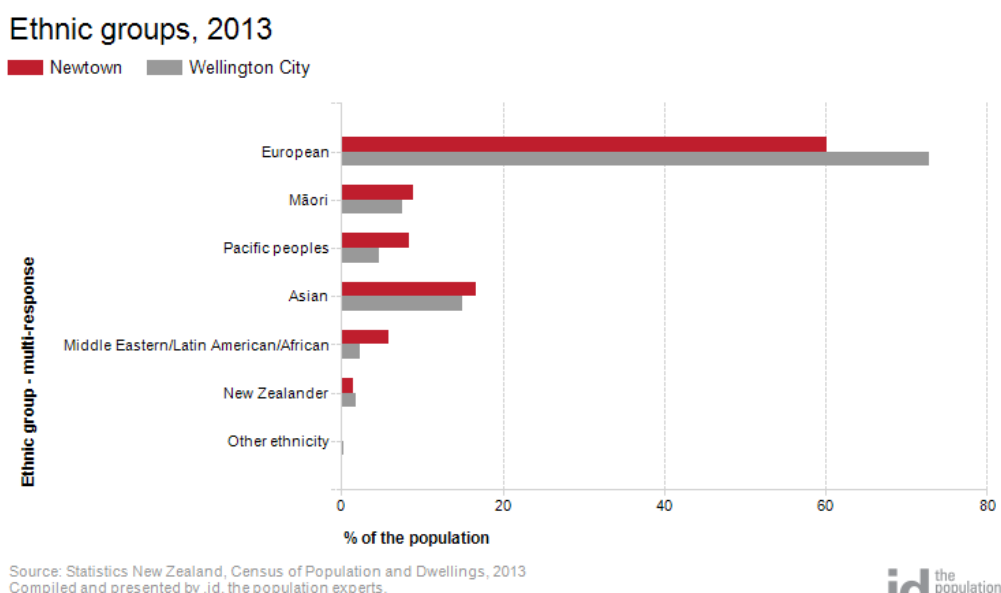

FIGURE 1 (STATISTICS NEW ZEALAND, 2013)

- There is a large age span within the suburb of Newtown, there is a flux in the population within people ages between 20-29. This flux does not impede the study as this age range will likely be a key user group for medium-density housing living.

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- The range of housing typologies fit the research; 51.7% of dwelling types are of medium or high density, comparative to the 35.2% of Wellington City's total dwellings. The research is based on medium–density housing complexes so this statistic this shows there is ample amount of relevant housing typologies within the suburb.
- The semi-suburban nature of the location; the suburb is still within walking distance to the CBD (25.7% of users not having a motor vehicle) therefore creating a spectrum of transport needs and variations. This semi-suburban location also means that it is used as a 'thoroughfare' suburb, not an end destination, this adds to the amount of 'public' sphere which is necessary for the research. In Newtown 2013 24.5% of people used the public bus as their method of travel to work. This compared to 13.8% of Wellington City; Newtown has diverse methods of travelling to work.

Methods of Data Collection (Case Studies)

The case studies were found by online database searching and online medium density housing examples by the Wellington City Council. Only case studies that are located in Newtown, Berhampore and Mount Cook were considered. Multiple case studies were attained and rated against the specific inclusion criteria that follows:

- Has to be of medium-density (defined in report section 'Key Definitions")
- Cannot be a standalone house. Needs to be terraced housing/attached housing.
- Has to have physical transitional area from public to private eg. Has to have a front yard.

Of all of the medium-density housing developments assessed; 4 housing developments were deemed suitable for the study. 3/4 of the selected developments were seen as key examples of medium-density housing on the Wellington City Council Website. One Case Study, Britomart Complex, was chosen as a recommendation by the industry partner; Studio Pacific Architecture.

Prerequisite Case Study Analysis

For the scope of this research four selected case studies will be analysed but due to time constraints, only two studies, The Altair and Britomart, are interviewed. Leaving the remaining two case studies, Regent Park and Nouvo, available as resources for further research.

The Altair

Project Information

Location	108 – 126 Rintoul Street, Newtown, Wellington
Year completed	2006
Architect	Architecture+
Project manager/developer	Stratum Management Ltd
Number of dwellings	71 total
Building typology	Row style terrace houses (2, 3 and 4 storey townhouses)
Site Size	Approximately 100m x 100m
Site density	Between 130m^2 and 180m^2. Averaging 142m^2 excluding courtyard.

Project Description:

"A development of 70 three-bedroom townhouses with the focus on quality of the public realm." (Architecture+, 2018)

Townhouses are arranged around two large courtyards to enhance community interaction. Modulations in form, materiality and colour produce a sense of identity for each of the occupants. This is established by staggering the unit sizes to create an irregular aesthetic. This irregular aesthetic also provides a greater degree of privacy between units. There is also a large range of urban modulation; vehicle access, private courtyards, common areas and foliage are used to separate spaces.

Parking:

- 11 units with private locked garages (double)
- 58 units with private locked garages (single)
- 13 visitor parking

Only a small portion of the townhouses have a street-front facade. Two housing blocks are separated by a vehicle entry and exit zone. The two housing blocks have different conditions;

1. Private gated courtyard with direct pedestrian access from street and parking access from the rear.
2. Separate vehicle parking and access from Rintoul Street and private courtyards at the rear.

There are three communal landscape zones within the complex for residents to inhabit.

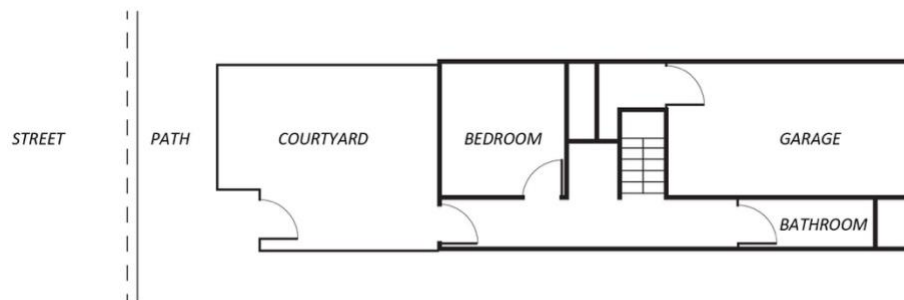GROUND LEVEL FLOORPLAN TO STREET FABRIC (UNIT 13)

FIGURE 2. VIEW OF THE ALTAIR FROM RINTOUL STREET

Britomart (Te Maru o Tawatawa apartments)

Project Information

Location	135 Britomart Street, Berhampore, Wellington
Year completed	2018
Architect	Studio Pacific Architecture
Project manager/developer	Housing New Zealand
Number of dwellings	36 units in total
Building typology	
- Terraced Housing	- 36 units
Site Size	2023m²
Site density	-

Project Description: Social Housing

The Britomart housing development is built to help the social housing demand for smaller apartment-style homes in Central Wellington. The development has been designed with community focus, whilst still maintaining privacy for residents.

The homes are all north-facing, designed to attain maximum sunlight all year round. Ground floor units are all accessed by a small private fenced patio; which have built in planter boxes and clotheslines. Using design elements to create an extremely functional space. Level 1 units are accessed by a shared entry staircase, creating a sense of community within the entranceway.

On-site parking is minimised to favour a pedestrian-based landscape. This is a response to the close proximity to local amenity and public transport routes.

Parking:

- A small number of on-site car parks. Favour is given to off-site parking.

GROUND LEVEL FLOORPLAN TO STREET FABRIC (UNIT 6)

FIGURE 3. VIEW OF BRITOMART FROM BRITOMART STREET

Regent Park

Project Information

Location	148 Owen Street, Newtown, Wellington
Year completed	2012
Architect	Designgroup Stapleton Elliot Architects
Project manager/developer	Wellington City Council
Number of dwellings	27 units in total
Building typology	
- **Apartments**	**-** 18 x 2 bed units
- **Terraced Housing**	**-** 4 x 4 bed units
- **Detached Housing**	**-** 5 x 3 bed units
Site Size	6447m²
Site density	42 DW/HA

Project Description: Social Housing

"The proposed design provides modern housing that is safe, secure, durable, healthy and affordable." (Designgroup Stapleton Elliot, n.d.)

A project undertaken by Wellington City Council (WCC) to upgrade their housing profile. The site previously had 38 one-bedroom units that were deemed not fit for purpose. The new and improved complex accommodates a range of user demographics; families, couples, singles and accessible units.

The variety of housing typologies creates a harmonious fit within the direct suburb context and local neighbourhood, physically and socially.

The site and urban planning has been carefully directed to integrate with the natural landscape. The centre of the site is a topographical low; leading to geographical instability and the inability to build on. This has led to the dwellings to be placed around the periphery of the site, with a central open environment. This centre is landscaped with gardens to aid the storm water retention system.

The architectural design is modern and promotes safety. Elements such as windows and balconies facing communal areas provides passive surveillance for resident's. Variations in architectural conditions such as setbacks and colour palette changes add to the character of the complex.

The designers have used planting to provide a visual aid from public to private; using obscure tree's such as cherry blossoms within the complex. These specific trees are un-common and are not planted on main streets.

Central stairwells are used as entries to apartments; these stairwells are fully glazed and visually open so indoor/outdoor activity is shown. This leads to a socially transparent community. These stairwells can be opened therefore, joining one household to another. Not just strangers passing each other.

Carport and front entrance is covered by an overhang; not only for shading and rain protection but also defines the housing typology.

Parking:

Group parking with a total of 30 spaces

FIGURE 4. VIEW OF REGENT PARK

Nouvo

Project Information

Location	Alfred St, Newtown, Wellington
Year completed	2014
Architect	Architecture+
Project manager/developer	Stratum Management
Number of dwellings	54 units
Building typology	
	- 43 One & two bedroom apartments (five storey apartment block)
	- 11 two storey townhouses
Site Size	
Site density	
	- 50m^2 One bedroom apartments

-	65m^2 Two bedroom apartments

Project Description: Social Housing

"Stewart described the $20 million Nouvo development as the new version of affordable inner-city housing." (Schouten, 2014).

Nouvo was developed as a response for the urban housing need. The development location allowed resident's the ability to walk to work. The development was aimed at people of all age groups and even families.

The façade of the apartment block is considerably flat par the slight balustrade exclusions. There is some visual variation in window size and placement and a very small adjustment in roof height. The façade is brick on ground floor with black metal clad on level one upwards. Entrance to these apartments can be off Alfred Street, or also pedestrian access from State Highway 1. For the scope of this research; the study will only focus on the townhouses of the Nouvo complex.

The townhouses are predominately brick with small sections of black metal cladding. The design is very rectilinear; no module, form, material or colour variations. The townhouses are split into two blocks, with a driveway in-between. The townhouses are separated from the apartments parking zone that fits approximately 25 cars. Main entry to the townhouses is from Alfred Street, off Adelaide Road.

Parking:

A small amount of 'Residents Parking Only' on site.

The complex has little security in terms of access and fencing; all townhouses have no gating or fencing. There is no area for community landscaping or activities. Car parking takes majority of the section on ground level. There is a small section of 'front yard' in front of each townhouse with a total of approximately 2m^2 of grass.

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FIGURE 5. VIEW OF NOUVO

Observational Study

Method

Before any interview procedure was initiated, an on-site observational study of the selected programs commenced. This evaluation is systematic (recorded, analysed, written down), and is based on function or use rather than aesthetics alone (Marcus & Francis, 1998). The observation focused on how the people and the selected forms interact.

Each of the 4 selected developments were visited on the 17/12/18. Each site was observed for a total time of 30 minutes. The sites were visited again on the 28/01/19 to record more information.

Information was recorded on-site about access, facilities available to the public and residents and the character of the complex. The observation spent a minimum of 5 minutes each focusing on each of the following senses:

- Sight: The kinds of people using the space, textures that attracts the eye, qualities of the volume of space
- Hearing: what sounds are there, where is the source of the sounds, are these sounds nice or irritating, how do people react to these sounds

- **Touch:** textures that feel good or bad to touch, movement of air, changes of temperature, how do the sensations make you feel?
- **Smell:** does the location smell fresh or stuffy? How does the smell affect your comfort levels?

Results

THE ALTAIR: SITE OBSERVATIONS 4.00pm – 4.30pm 17/12/18:

- Residents are seen to be walking on the vehicle roads more than the footpath. There is a flat hierarchy between human and vehicle.
- Uniform structure provides little room for personalisation of the dwelling.
- Common area was un-used.
- Is witnessed as a busy complex; a constant flow of people coming and going.

BRITOMART: SITE OBSERVATIONS 2.00pm - 2.30pm 17/12/18

- The planning is compact; the car parking is tight and close to the units.
- There are no specific garages for each unit.
- The complex is connected to a busy road; the street-facing units are busy and loud compared to the other reserved units.
- No children are seen; demographic is of an older arrangement.

REGENT PARK: SITE OBSERVATIONS 3.20pm – 3.50pm 17/12/18:

- Cars seem to be equal with human: children run on streets so the cars drive slowly.
- Large amounts of passive surveillance happening; parents watching and talking at children playing in middle landscape zone.
- All front yards have variations in shrubbery and foliage; the ability to personalise.

NOUVO: SITE OBSERVATIONS 2.40pm – 3.10pm 17/12/18:

- Very quiet considering the close proximity to a main road.
- Front Yard is very small; only a small patch of grass with a few small shrubs.
- No personalisation.
- Nowhere to sit or dwell.

Interview Procedure

Interview Guidelines and Procedures

This procedure has ethical approval from the Human Ethics Committee at Victoria University of Wellington.

Semi-Structured Interview.

The semi structured interview method is used as a tool to uncover any relevant information for the study. Open ended questions that relate directly to the research topic are used to create space for participants to narrate their experiences (Galletta & Cross, 2013). During the interview, the questions and prompts become more specific and detailed; uncovering user specific opinions on the public/private threshold. Concluding the interview, the topic will reflect on the points discussed, asking the participant what could improve the characteristics discussed and how their genuine comfort in their unit could be enhanced.

Interview Conditions

Before the interview commences the introductory conditions are discussed. The purpose of the interview and confidentiality conditions are discussed. The participant is obliged to sign the consent form before the interview begins. This ensures the participants understanding of their rights, including the right to not answer a question and to end the interview should they feel they need to do so (Galletta & Cross, 2013). The length of interview and contact information of the interviewer is also attained before the recordation starts.

Data Collection Methods

Voice recording the interviews was not in the scope for this research due to ethics constraints. The data was recorded by note-taking (physical writing) whilst the interview was being conducted. The main researcher asked the questions and took brief notes whilst the respondent spoke. There was an additional research assistant present; exclusively to take notes of the resident's response.

Pilot Study Interviews

In-house RA (Research Assistant) Interview

To begin the procedure, two pilot study scenarios were undertaken. The first sample is of fellow Research Assistant's (RA); interviewed to understand human response to the interview questions and ques. Ethical approval from the Human Ethics Committee at Victoria University of Wellington was not needed for these interviews as they are in-house studies. Minimal background information of the area they were describing was recorded since these interviews were undertaken to understand human response and gauge understanding on the topic as a whole. A total of 4 interviews were recorded; 3 female and 1 male

participants. On average, each interview took 10.25 minutes. The interviews were recorded between the 11/01/19 to the 14/01/19.

The semi-structured interview results were grouped into sub-headings. Each interview was assessed against the qualities found in the Residential Design Guide by Wellington City Council (2014). Some quality sub-headings were deemed after suggestion from the research Industry Partner; Studio Pacific Architecture. The grouped assessment headings follow:

Industry Based Interview

After the in-house semi-structured pilot interviews with 4 Research Assistants various changes were made to the questions. The first aspect changed was the order of the questions. The results were categorized into different topics therefore, improving the flow of the question asking. This clearer distinction between topics allowed the interviewee to understand the transition and general framework of the interview. The questions were also refined to create more specific outputs and concise responses.

Then, another pilot-study interview set was undertaken with members of Studio Pacific Architecture. Ethical approval from the Human Ethics Committee at Victoria University of Wellington was not needed for these interviews as they are in-house studies.

A total of 7 industry-based participants volunteered interest in taking part in the semi-structured interview; 5 female and 2 male participants. On average, each interview took 11.04 minutes. The interviews were recorded on the 16/01/19.

Case Study Interviews

After the two pilot interviews knowledge of human response, note taking abilities and comfortability with the interview process was gained. This process also allowed the interview questions to be refined to create an understandable framework for the public. Industry-related jargon was removed, and questions were formatted to be easily understandable and clear; allowing the interviewee to feel comfortable whilst answering. An example of this is the removal of the terms such as *threshold, intensive and medium-density.* These terms may confuse participants therefore leading to unreliable responses. The questions are arranged into a simple framework with a clear head theme to promote a coherent structure.

Questions based on Spatial Qualities and Recreation are asked at towards the beginning of the interview to ease into the topic of 'private/public'. By initially discussing how the threshold is occupied allows the user to build an understanding of the topic with easy knowledge. Starting with straightforward questions and easing into more thought-provoking topics (such as privacy needs) thus provides a schooling for critical feedback. These opening questions also allows the researcher to gauge an understanding of the user's comfortability and attitudes towards the threshold at an early stage.

The final interview questions follow:

1. **Space Qualities**
   a. Do you enjoy being able to personalize your outdoor area?
2. **Recreation**
   a. What activities do you like to do in your outdoor area?
   b. Are there any activities you would like to do in your outdoor area but can't?
   c. How often do you use the communal facilities of the complex?
3. **External Environments**
   a. Would an external space need any particular shelter? (From wind, rain or sun?)
4. **Community**
   a. Do you like to be able to easily communicate or socialise with your immediate or close neighbours?
   b. Would you like to live in an integrated way with families and other demographic groups in neighbouring dwellings?
5. **Public and Private Environments (Privacy needs)**
   c. It is important to you to have privacy from the other units and/or road?
   d. Does it bother you that people or other units can see into your outdoor space?
   e. Would you rather have more sun or more privacy?
   f. Does the public walk/see through this dwelling area? How does this affect you?

The two case study developments were then interviewed on separate days:

The Altair: 31/01/19 - 1/02/19

Britomart: 7/02/19

Interview Analysis

THE ALTAIR

SPATIAL QUALITIES

Majority (6/8) of residents' state they like to personalise the space to their needs. Resident #1 states that personalisation is not necessary because of the tenure. This resident rents the property so prefers to maintain the original state of the area. Noting if the property was privately owned, the area would be well tailored to his own preference. This is a common theme with 2 other residents' agreeing with this statement; more personalisation would be done if the property was privately owned. Resident #6 notes being dissatisfied with the threshold because of the lack of sunlight; the occupant does not spend "any time" there. There were no common themes across unit locations, this response seemed purely personal.

RECREATION

All residents do a mix between function and recreational activities in their outdoor area. This includes drying clothes, gardening, sitting, eating meals, having a BBQ, drinking, listening to music and playing with

children. Resident #7 notes spending a vast amount of time in the outdoor area because of the large amounts of sunlight.

Alternatively, dissatisfaction from residents for recreation within the threshold is noted for lack of sunlight in the outdoor area, frustration with building layout and lack of areas to entertain. Resident #5 notes that the outdoor area would be used more often if it was connected to a living area, not the guest bedroom: "*The space is currently connected to the spare room which isn't used. If this space was next to the lounge I would eat here and have a BBQ*". More areas to entertain was mentioned by half of the residents; there is a lot of willingness to move the private body into the public sphere for entertainment purposes. User's want to have BBQ's and invited friends over to dwell in sunny outdoor areas.

When asked about the communal resident's park, only one resident responded yes to using the park. This resident explains their family use it "*almost every da*y" since it is enclosed and feels safe for the children to play there. Since two rows of units overlook the residents park it creates passive visual surveillance for children playing; a safe environment. This is expected as children are by far the greatest users of shared outdoor space in multifamily housing (Marcus, 1986, p. 126). Residents whom don't use the communal park note that there isn't enough amenity for adults within this zone, making it un-attractive for anyone without children.

EXTERNAL ENVIRONMENTS

Majority of residents (6/8) noted that rain shelter is necessary. Resident #3 notes their displeasure with the lack of weather-resistance of the balcony; stating that water slips through the deck making underneath un-usable. The residents located towards the west side of the complex (the back area) were all satisfied with the current protection since their property is "fairly protected as it is". Resident #7 of the back area notes this satisfaction accustomed to the large tree outside the property, this provides "great shelter and shade all year around".

COMMUNITY

All resident's par one agrees that they like to socialise with immediate or close neighbours. A resident with children explains agreement by following up with *"The kids play with other children in the area and its absolutely amazing. It's a great way of meeting new people"*. This explains that meeting other resident's may be easier if children are present in the scenario. The outlier who disagreed explained the hesitancy is accustomed to the lack of time within the complex; this resident has just moved in. This shows a degree of public interaction within a private zone. The vast number of residents enjoy the collaboration traits of their threshold.

All residents located on the East side of the complex (street-front side) are not open to living in a more integrated way with families and other demographic groups in neighbouring dwellings, Resident #2 explaining he is "happy the way it is". Resident #3 states liking the idea of communal living, but not in the current complex. These preferences favour privacy over public interaction. This may be accustomed to the location of their unit; these residents do not enter the complex as their unit has street front access. This means the residents located near the street have less daily interaction with other residents; a possible reason for the lack of desire to integrate with families. Residents located on the West side of the complex (the back side) are all open to the idea, Resident #7 stating that there are facilities for kids to interact but

not adults. This may be accustomed to the comfortability with neighbouring units, as people whom live at the rear of the complex move past adjoining units; creating a more comfortable scenario.

PRIVACY

All resident's located on the West side of the complex (street-front side) agree that privacy from the other units and/or road is of a medium-high priority. Resident #2 adds the dissatisfaction with noise pollution from the road. This resident is unhappy with the current visual and audio privacy, showing that the public/private threshold is more than just a visual aspect. All other residents that live away from the street-front are satisfied with their current privacy from other units/road. With 4/5 residents stating that they enjoy having a unit located away from the street fabric. Resident #7 explaining the satisfaction or privacy is accustomed to safety reasons; even stating that the outdoor area wouldn't be used if their unit was situated near the road, in fear of safety issues for children. The is a clear disconnect of privacy satisfaction between users situated near the road compared to those whom are not.

2/3 of residents situated near the road agree that people/other units seeing into their outdoor space is of partial irritation. Resident #2 notes that if the property was owned; large trees would be planted to create a visual barrier. The remaining resident situated near the road is fine with the visual obstruction. The remaining residents whom are situated at the rear of the complex are tolerable that people/other units can see into their outdoor space. Resident #7 again accustoms this tolerance to the large tree next to the property which provides a visual barrier.

Majority (2/3) of residents situated near the street-front rate privacy needs higher than sunlight within their threshold. The remaining residents all rate sunlight higher than privacy needs within their threshold. A divide is seen for privacy needs associated with location of the unit.

Overall, public interaction generally doesn't affect the residents irrespective of location of unit. The only dissatisfied responses came from Residents #3 and #5 whom are unhappy with the noise pollution that the public bring and have a small fear of robbery, but both confirm this opinion would be relevant in most suburban contexts. A content resident explains the satisfaction by saying "I think the place is designed in a way that makes you feel like the public cant wander through. Either way, people walking past arent usually peering in".

BRITOMART
SPATIAL QUALITIES

All residents enjoy being able to personalise their outdoor space, especially enjoying gardening and potting their own vegetables to suit their needs.

RECREATION

All residents thoroughly enjoy recreational and functional activities in their outdoor threshold. These include gardening, sitting, reading and drying clothes. Resident #11 describes the success of the raised garden bed in the outdoor area, explaining that it is much easier to reach the garden.

To improve recreational aspects, all residents would like to grow more vegetables and one resident would like more space to entertain (room for a BBQ). Gardening is a great success among the elder demographic.

All residents state not-often to never using the communal facilities of the housing complex. Two residents explain they have previously, when they moved in. But the facilities are now inaccessible due to the demographic of the residents. The residents are all elderly and the access to the drying room is too steep for them. Resident #11 notes the slope either needs a handrail/shallow steeps need to be added because the area can be slippery in winter.

EXTERNAL ENVIRONMENTS

Residents located on the street-front row are exposed to a lot of wind produces and uncomfortable environment. Resident #11 stating that more trees would provide great shelter for the area. The resident in the back row of the complex is satisfied with the current shelter and explains that the location of the unit makes the outdoor space protected.

COMMUNITY

All residents like to communicate and socialise with immediate or close neighbour, but only in specific situations. Certain other residents make the interviewee's feel vulnerable and unsafe.

All residents would not like to live in a more integrated way with families and other demographic groups in neighbouring dwellings. All residents explain this opinion is linked to other careless resident's making the interviewee's feel unsafe. Producing safety issues for the interviewed residents. *For this reason, the user perception recorded has unfair bias due to unforeseen circumstances and this information will not be compared to the results from The Altair.*

PRIVACY

Privacy from the other units and/or road is of a high priority for residents on the street-front row, two residents explaining they have a high problem with privacy. Their outdoor area is overlooked by the upstairs neighbours, this makes the downstairs residents feel uncomfortable. Also, the front door of the units' are partially clear glass, this provides no privacy barrier when moving from exterior to interior. Giving all foot-traffic on the road-side path by the opportunity to look inside. This dissatisfied perception differs to Resident #11, located in the rear row, whom is satisfied with the current privacy stating that "*the design is great*". Resident #11 also states being very *lucky* with the location of the rented unit, as the rear location gives more privacy.

All residents aren't concerned about people/other units seeing into their space but do note needing a degree of privacy. Resident #11 states that the balcony of the upstairs unit can see directly into her outdoor space, making the resident very uncomfortable.

All residents located on the street-front side rate privacy needs higher than sunlight. This shows the that the closer proximity to the public sphere results in the higher privacy needs. Resident #10 situated at the rear of the complex would like a combination of both.

The public interaction bothers the most residents to a degree, but all are familiarized to it now. Outlier resident #12 states sometimes enjoying the presence of the public; stating that "it is nice to see people walk by". For some residents in an older demographic the public interaction is exciting and gives the residents an activity to do.

Common Trend Analysis

The patterns and findings of user perceptions from The Altair and Britomart have been analysed and collated. The following trends between both studies have been revealed:

 a. Most residents have a shared level of satisfaction with their threshold irrespective of their demographic. But, this satisfaction was lower within the residents located close to the road. Residents in this area noted that they would add more privacy layers to the boundary if they owned the property. Adding more layers such as 'trees' or 'hedges' to the street edge would make the occupants more comfortable.

 b. Following on; as expected, privacy needs are higher for the residents living on the street edge, with all respondents in this zone saying privacy is of a medium to high priority. 80% of residents situated on the street-front rating privacy needs as higher than direct sunlight. Residents living in other areas noted that they are pleased with the location of their dwelling. Specifically; some users stating their current privacy is "great" and they are *lucky* not to live near the street. All residents in these areas rated direct sun higher than privacy needs.

 c. It is of partial irritation that people/the public can see into their outdoor space for residents living on the street front edge. Compared to little or no irritation for the residents located to the rear-side of the complex.

  An outlier, Resident #5, noted being uncomfortable sometimes but notes this to his lack of time living within the complex. The remaining residents have either become accustomed to it or don't believe it's a problem, with one resident explaining "either way, people walking past aren't usually peering in". Resident #7 explaining that the landscaping and trees provide an adequate barrier but, more would be better.

 d. Residents are dissatisfied with the outdoor area in terms of places for entertaining. A couple resident's noted dissatisfaction with the dwelling layout. Their only outdoor area connects to the guest bedroom. Two residents noted that if the outdoor area was connected to the living space, they would use it much more often. Overall the private open space needs to have the ability for social aspects. This shows the willingness to blur the threshold between private and public; resident's want to bring social aspects into their outdoor area (bring their private life towards the public sphere).

 e. Residents who live on the street front typology are less inclined to live in a more integrated way with families and other demographic groups in the area. This may be accustomed to the lack of interaction with neighbours. The dwellings with street front access have little incentive to enter the housing complex to interact with neighbours or use the common areas. As Marcus explains a greater territorial sense can develop if residents frequently walk through communal spaces (1986, p. 120). Residents situated at the rear of a complex may begin to feel comfortable in the space, greet others and perceive the space almost as an extension of their dwelling (Marcus, 1986, p.120). To create a more interactive community, there needs to be more incentive for the street-front residents enter the complex.

 f. Some residents have noted that there are little communal facilities available to promote social encounters. The only resident that uses the common area has small children that play in this area. The lack of amenity for adults shows within the interviews. One resident explains "the common area doesn't have much to it, there is plenty for kids to do there but nothing for adults", also noting that the user would be uncomfortable sitting in this common space by himself since other units

look directly onto this space. Most people will avoid private ground-level open spaces lacking a barrier and abutting directly onto public spaces (Marcus, 1986, p. 127). This threshold between private to public is unsuccessful. The common area is shared by ALL residents, yet the area is very underutilized. The area needs more amenity to invite users to enjoy the space, especially street front residents who have no incentive to enter the space.

g. A small number of residents on the street-front fabric have explained that noise pollution from the road matters just as much as privacy. Not only visual privacy is needed but also sound privacy. Noise pollution problems was only mentioned by street-front users; meaning this may be of a high priority for a successful threshold.

Discussion

Design Implications

There are multiple distinctions when shifting from public to private within intensive housing. From the information gathered the public private threshold is much more successful in the more secluded zones of intensive housing; meaning the units that bordered the street fabric were less successful at creating a boundary. Users located on the street-front units of intensive housing have worsened perceptions of the public private threshold, comparing to those whom didn't live near the street.

Residents, majority living on the street front zone, are un-happy with the current acoustic threshold. Participants particularly noting their lack of barriers from road noise pollution. Natural barriers such as landscaping is recommended to dissipate not only the acoustic but also visual barriers.

Circumstances where the public private threshold extends and enters the interior of the dwelling is noted where there are large amounts of transparent materials facing 'public' zones. Resident #10 of the Britomart complex explains; the unit's front door is partial glass and connects to the user's living room. This user states feeling uncomfortable as the public can see directly into the living space, especially at night time. This user notes that screening or frosted glass would be preferred over a fully transparent material. In this instance the threshold is blurred.

A common trend was the opinion that if the property privately owned by the resident (rather than renting), there would be more demand for vegetation and landscaping in the outdoor area's therefore providing more privacy from other units/the road. Majority of participants give landscaping a very high priority in their outdoor area; multiple residents commenting on how *lucky* they are to have a tree in their outdoor area. Various residents also mentioned the lack of vegetation in their outdoor area. Therefore, the use of landscaping to increase the feeling of privacy (Marcus, 1986, p. 123) and ample room for gardening is recommended.

Another instance where the resident was unhappy with their threshold in intensive housing is where units had balconies physically overlooking a neighbouring courtyard.

A large amount of resident's note that landscaping provides a successful barrier between public and private. A few stating not only the visual barrier but also weather protection (shading/wind shelter). Majority of residents rate landscaping a high priority within their outdoor space; many saying they would plant more trees and plants if they owned the property.

Desired levels of privacy vary over individuals; so to design for inclusion and changeability is important to provide a comfortable design that covers the majority.

Limitations and Further Research

The nature of this research used a qualitative approach to gain insight into the meaning and lived experience of the participants, but one of the biggest limitations of this is that it is subjective. The researcher being the predominant tool. The subjective nature of the data collection and analysis is a

limitation of the study. The qualitative research seeks to understand what the responded meant and uncovering what prompted the response (Wardle, 2002), the research is hard to predict the future.

Due to the short time frame (10 weeks) of the research, the sample size is comparatively small; two case studies. Within these two case studies the data is controlled by the limited resident availability (interviews took place between 11am-4pm on weekdays so there was a large portion of residents not home), willingness to participate and pre-empt safety of the researcher (some residents recommended for the researchers to avoid certain units for safety reasons). Since the sample size was restricted to these two case studies the range is not large enough to create a liable result.

This research is based in specific suburbs of Wellington, New Zealand. The contextual nature of qualitative research means that careful thought must be given to the potential transferability of its results to other sociocultural settings (Kuper & Lingard & Levison, 2008). The results from this research is relevant to the context but careful thought needs to be considered when transferring results to other contexts. Relevant statistics and similar inclusion criteria's is recommended if the research were to be implemented to a different setting.

The next steps for this research will be to:

- Develop a statistically representative sample study including more interviews within more case studies, particularly the two case studies (Regent Park and Nouvo) analysed in this research.
- Develop a matrix to further define the public/private threshold within intensive housing.
- Investigate the boundaries of the public/private threshold for other housing typologies (such as standalone housing) and how the two definitions interact.

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APPENDIX 1 – Summaries of Key Literature

Bryson, K. (2017). *The New Zealand Attitude Preferences Survey: Attitudes towards medium-density housing.* BRANZ, Building Research Levy.

> This study is part of BRANZ's medium-density housing (MDH) programme, which aims to give industry the skills to deliver medium-density housing that meets the needs of New Zealanders. Increasing the acceptance of MDH in communities is a key success criteria for the programme. This piece of research establishes a baseline for understanding New Zealanders attitudes to MDH typologies and neighbourhoods.

Marcus, C C. Francis, C. (1998). 'Post-Occupancy Evaluation'. *People Places.* 2nd edn. John Wiley & Sons, Inc, Canada, pp. 345 – 356.

> Post-Occupancy Evaluation's of the built environment provide vital information for future design's. It is the process of evaluating the built environment in a systematic and rigorous manner after building completion and a varying amount of occupation time. POE's focus on the building effects and the building occupants. By gaining insight into the consequences of previous design's, information is gained to aid future building performance. The key topics relevant to this study relate to the evaluative methods and procedures of POE's. The chapter recommends Participation Methods. Before the data collection begins; an observation study on site is recommended. Recording information relating to sight, sound, touch, smell and feeling. Sketch plans of the location including all site features is recommended. On this plan you can map activity, behaviour, functional and non-functional areas. This initial study benefits the research as it provides key insights into the complex at the start phase, this could influence future procedures.

Davey, J A. (1978). *Medium Density Housing and its place in the Urban Environment.* Town & Country Planning Division, Ministry of Works & Development.

> This report investigates the success's and constraints of multiple medium density case studies in New Zealand. The study found that the most successful case studies are those which have a well-defined target group and a design that fits this target market. For successful design the highest design standards, convenient locations and a good environment must be promoted. The research notes the preference for standalone housing is still very strong for young families in New Zealand. But the increase in price of a standalone house and commuting costs will make medium density living more favorable.

Marcus, C.C. & Sarkissian, W. (1986). Housing as if people mattered : site design guidelines for medium-density family housing / Clare Cooper Marcus and Wendy Sarkissian ; with Sheena Wilson and Donald Perlgut.

> This book is a collection of guidelines for the site design of low-rise, high-density family housing. It is intended as a reference tool, primarily for housing designers and planners, but also for developers, housing authorities, citizens' groups, and tenants' organizations-anyone involved in

planning or rehabilitating housing. It provides guidelines for the layout of buildings, open spaces, community facilities, play areas, walkways, and the myriad components that make up a housing site

Boffa Miskell Ltd. (2012). *Medium Density Housing: Case Study Assessment Methodology.* Wellington: Ministry for the Environment.

Medium-density housing is a major growth area in New Zealand urban development. As housing density intensifies it is important that design quality improves. This project was initiated because of concerns often raised about medium-density housing including:

• public space quality
• privacy within developments
• parking provisions and access
• private open space provisions and arrangements
• service area provisions for storage and drying clothes.

This assessment methodology has been developed to provide a robust urban design rating system for medium-density housing developments that can be used for different building typologies. The methodology can be modified and adapted to provide a tool to assess proposed and existing medium-density housing.