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Creating improved housing outcomes: Medium-density housing liveability and wellbeing literature review

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Abstract

Medium-density housing (MDH) is an increasingly common housing typology as New Zealand's towns and cities respond to growth challenges, yet little is known about the success or otherwise of past and present MDH developments. Specifically, opportunities exist to better understand the degree of liveability being achieved by MDH developments and how this contributes to the wellbeing of residents, neighbours and wider communities.

This report undertakes a review of national and international literature to identify the degree of liveability currently being achieved by MDH across New Zealand and how such liveability could be improved. Findings are intended to inform the building and construction industry, developers and policy makers at the national and local levels, enabling the settings necessary to design and deliver liveable MDH.

Keywords

Medium-density housing, MDH, wellbeing, liveability, dwelling liveability, neighbourhood liveability, urban liveability, liveable cities.

Contents

Figures

Executive summary

This report presents the findings of the first of five research reports (Allen & O'Donnell, 2020a, 2020b, 2020c, 2020d) commissioned by BRANZ to understand the degree of liveability currently being achieved by medium-density housing (MDH) developments across New Zealand. These reports also identify how the liveability of MDH could be improved. Specifically, this report outlines the outcomes of a national and international literature review of liveability and wellbeing in relation to housing and the built environment. Key insights from the literature review can be summarised as follows.

Insight 1: There is no commonly used definition of liveability in New Zealand

The absence of a clear definition means that there is no common understanding of what liveability means and how it could be improved within the context of MDH in New Zealand. Development of a common definition of liveability would be useful in guiding future efforts to secure good liveability outcomes for MDH.

Insight 2: Liveability outcomes need to be considered across scales

Since the emergence of the term 'liveability' after the Second World War, it has evolved from considering liveability at the individual dwelling scale to the neighbourhood scale to the wider urban scale. This progression and the interrelationships across this scale need to be understood and considered when seeking to improve MDH liveability either through detailed design, construction or policy settings. What may represent good liveability outcomes at a dwelling scale, for example, may not have such a positive impact from a neighbourhood or urban liveability perspective.

Insight 3: Liveability generally refers to place, while wellbeing refers to people

The term 'wellbeing' has become increasingly popular in New Zealand with the release of a suite of government documents to guide and measure societal progress within a wellbeing framework as opposed to a financial framework. In the built environment, wellbeing has focused on aspects such as human health (physical and mental) as impacted by housing and the spaces people inhabit. Although the concept of wellbeing is still developing in the context of the built environment, it is inherently related to liveability and can even be viewed as a measure of liveability (Stephens, Szabo, Allen & Alpass, 2018). It is possible that more emphasis may be placed on the relationship between wellbeing and the built environment in the current political climate, and further research on this subject may therefore be beneficial.

Insight 4: There is a need for a better method of evaluating how MDH typologies may affect liveability

Similarly to the need for a common definition of liveability as identified in Insight 1, it would be beneficial to establish a consistent method for evaluating the liveability of MDH for residents, neighbours and wider communities. This would allow a thorough analysis of MDH liveability issues across towns and regions, with a view to improving liveability outcomes from the dwelling to the urban scale.

These key insights provide direction as to how a liveability agenda for MDH could be progressed in New Zealand. Understanding such liveability considerations provides a starting point from which the building and construction industry, developers and policy makers at the national and local levels can understand and create the settings necessary to design and deliver liveable MDH across New Zealand.

1. Introduction

In 2017, BRANZ commenced a research programme focused on medium-density housing (MDH). This programme was designed to provide background information regarding MDH in the New Zealand development context, along with a suite of tools to enable the construction industry to build liveable MDH. It also sought to ensure that MDH in New Zealand would meet the needs of the people who live in it and be accepted by wider communities as an alternative to traditional stand-alone housing (BRANZ, n.d.).

In order to ascertain whether MDH is meeting the needs of its inhabitants, it is important to gauge the liveability of current MDH developments across the country. This will enable an understanding of the ability of this form of development to contribute to wider social, economic, environmental and cultural wellbeing. This is particularly topical given the strong focus of the current government on achieving wellbeing for all New Zealanders, as evidenced by initiatives such as the Wellbeing Budget 2019 (The Treasury, 2019), the Living Standards Framework (The Treasury, 2018) and the reinstatement of wellbeing into the purpose of local government under the Local Government Act 2002.

To this end, BRANZ commissioned an MDH liveability project to answer two questions: How liveable is the MDH we are building? How can we do better?

The MDH liveability project was then divided into four separate phases to address the above research questions. These included:

- a national and international **literature review** of opportunities and challenges for MDH to improve liveability and enhance the wellbeing of residents and communities (this report)
- a review of current **legislation and regulation** applicable to MDH in New Zealand to understand any impacts of such on liveability and wellbeing
- **focus groups** conducted with representatives from New Zealand's most populous territorial authorities (Auckland, Christchurch and Wellington) to obtain insight into opportunities and challenges to achieving the consistent delivery of liveable MDH
- completion of a **residents' survey** to understand the experiences and preferences of existing MDH residents and how they perceive liveability and wellbeing.

Information from each of these four phases of the MDH liveability research project provides a comprehensive picture of MDH liveability and wellbeing from the perspectives of those planning for it, authorising it and living within it. It is intended to enable policy makers at the national and local levels to create the settings necessary to deliver liveable MDH. This research also provides a voice for the building and construction industry and for the residents of MDH developments nationwide to express their unique perspectives and lived experiences.

1.1 This report

This report represents the first phase of the wider MDH liveability project. It includes a review of national and international literature as it relates to the liveability of MDH and the potential for MDH to enhance the wellbeing of both its residents and the wider community within which MDH developments are located. It provides a broad framework within which to contextualise and consider wider MDH liveability issues before proceeding with the subsequent three phases of the research, each of which

provide additional levels of insight. For the purposes of this report, MDH is defined as multi-dwelling units of up to 6 storeys (Bryson & Allen, 2017).

1.2 Methodology

The literature review contained in this report was undertaken between July 2017 and March 2019. It canvassed a wide range of sources, as included in the References section of this report.

Specifically, this literature review included consideration of:	Relevant books Journal articles Conference papers Master's and doctoral theses Reports and consultation documents National strategy and advisory research National, regional and local government research reports Documents related to urban growth management, housing strategy and policy
The search engines used included:	SAGE Journals Taylor & Francis Online Informit SpringerLink JSTOR Trove and Blackwell Reference Online
Other online searches involved groups' and organisations' websites including:	BRANZ Ministry of Business, Innovation and Employment Ministry for the Environment Statistics New Zealand Beacon Pathway Centre for Research Evaluation and Social Assessment Territorial authority websites
Search terms used included:	'Liveability principles' 'Liveability factors' 'New Zealand liveability' 'Urban liveability' 'Liveable cities' 'Neighbourhood liveability' 'Dwelling liveability' 'Housing and liveability'

In March 2018, at approximately the midpoint of the project, a stocktake was completed to understand what other liveability and wellbeing research was under way at the time. The purpose of the stocktake was to ensure that the literature review encompassed all relevant national literature and initiatives so that it would remain as useful as possible to the wider building and construction industry and housing sector. The results of this stocktake are summarised in Appendix A of this report. The approach to undertaking this literature review therefore remained agile over the period of the research, given the dynamic nature of the political environment over the course of the past 2 years. It has captured the majority of relevant international and national literature available regarding MDH liveability and wellbeing, as now summarised in the following sections of this report.

2. MDH liveability and wellbeing

This section outlines key themes arising from the international and national literature reviewed in relation to MDH liveability and wellbeing. It is structured to first explain the emergence of both liveability and wellbeing. It then discusses three scales of liveability (dwelling, neighbourhood and urban), before summarising findings specifically regarding liveability and MDH in the New Zealand context.

The information and observations contained in this literature review are wide-ranging, being reflective of the complex nature of MDH as a rapidly growing building typology in New Zealand. In this way, the literature review will provide a broad framework within which further analysis of MDH liveability and wellbeing can be contextualised and referenced within the remaining three phases of this wider research project.

2.1 The emergence of liveability

To respond to the issue of how liveability is understood in the changing context of urban growth and intensification in New Zealand cities, towns and neighbourhoods, a discussion about what constitutes liveability in relation to MDH is required.

2.1.1 Dwelling liveability

The term 'liveability' came into popular use across the built environment professions after the Second World War. In an early example of its use, Halbert (1947) surveyed 1,000 residents about how the internal arrangement of space in their homes affected liveability. In a later example, the US Department of Housing and Urban Development considered liveability to be "simply stated, a measure of suitability for human living". It went on to comment that it depended "upon all the physical factors within and around a person's dwelling which affect the person physically and psychologically" (Urban Research & Development Corporation, 1977). These early definitions continue to be relevant across all housing scales, including MDH.

2.1.2 Neighbourhood liveability

As the concept of dwelling liveability evolved, discussions of liveability at the scale of the neighbourhood developed in the late 1950s and early 1960s. Internationally, it can be seen in official publications such as *Community Development Area Planning in the Denver Region: Toward Greater Livability* (Inter-County Regional Planning Commission, 1963) and *Intensity of Development and Livability of Multi-Family Housing Projects: Design Qualities of European and American Housing Projects* (Katz, 1963).

In *Urbanized Society*, Taylor wrote, "Livability is important in residences, neighborhoods, communities, places of work, recreation areas — indeed in all life systems areas" (1980, p. 134). Dwellings were still included in this definition, but most writers on the subject thought of liveability as something more communal. Spink (1979) wrote: "Livability is a much-used word. For most of us, it conjures up both positive and negative aspects by which we measure the personal satisfaction we experience from our environment and the way we live."

Given that New Zealand is transitioning from low-density to more medium-density neighbourhoods with a variety of MDH typologies, an understanding of both dwelling and neighbourhood liveability is pertinent.

2.1.3 Urban liveability

With the impact of globalisation and the view that cities are competing with one another for increasingly mobile knowledge workers, liveability evolved into a term used to market and rank cities. It was in this context that urban liveability came to the forefront of urban studies research. The concept of urban liveability, and in particular of liveable cities, is controversial due to its evolution as a political as well as a place-making tool.

When opening a new commercial building in Christchurch, then New Zealand Prime Minister John Key acknowledged that Cantabrians had faced many frustrations since a series of devastating earthquakes in 2010 and 2011, such as problems with insurance payouts. But he assured them that Christchurch would soon become "the most liveable, best city in New Zealand" (McClure, 2015). John Key's assurance for the people of the region was unspecific but bold: liveability is undefined but will be achieved in the rebuilding of the city. Similarly, liveability was also one of the aims of the Greater Christchurch Urban Development Strategy – a document that aimed to ensure that "Greater Christchurch is a liveable, safe, sustainable and healthy" place to live (Greater Christchurch Partnership Committee, 2016).

The introduction to the 2012 Auckland Plan similarly began: "Auckland's time has come. We have a widely-shared vision to be the world's most liveable city" (Auckland Council, 2012). The aim of the Auckland Plan was to transform Auckland into the world's most liveable city through four transformational shifts: an outstanding public transport system, environmental action and green growth, improved quality of urban life and accelerated prospects for children and young people.

Beyond the liveability references in non-statutory city-scale policies, it is unclear from the literature how MDH issues at a dwelling scale connect directly to the concept of urban liveability other than at the scale of national housing strategies, which must be responsive to macro urban issues. New Zealand does not currently have a national housing strategy. However, the creation in 2018 of a new Ministry of Housing and Urban Development may signal a change in this regard.

2.1.4 Objectivity and subjectivity

The idea that liveability has both objective and subjective dimensions has continued to evolve and is now embedded in many liveability studies (Bramston, Bruggerman & Pretty, 2002; Luca, 2014; McCrea, Marans, Stimson & Western, 2011; McCrea, Shyy & Stimson, 2006; McCrea, Western & Tung-Kai, 2011; Stimson, McCrea & Western, 2011; Tuan Seik, 2000; Yang, 2008). The objective dimension identifies how physical features of cities, neighbourhoods and dwellings can impact human behaviour either positively or negatively, resulting in either enhanced or diminished liveability outcomes (Haarhoff, Beattie & Dupuis, 2016; Raman, 2010).

The subjective dimension addresses residents' perceptions about how their environments impact the liveability they experience. This is a cognitive construction of liveability (Campbell, Henley, Elliott & Irwin, 2009; Haarhoff et al., 2016). Any study developed to address liveability issues must identify whether it is viewed through a subjective or an objective lens or whether it responds to both. It is indicated in New Zealand literature that, given community resistance to increasing MDH (represented by NIMBYism – 'not in my back yard') and the relative newness of such widely available MDH typologies, subjective liveability issues are as important as objective when researching liveability (Allen, 2016b; Beattie & Haarhoff, 2012; Haarhoff et al., 2016).

2.1.5 The multifarious nature of liveability

Recently, a widely cited definition of liveability was developed by the US-based organisation Partners for Livable Communities (2017). This definition is broad and all-encompassing and represents the way that liveability as a concept has become multifarious. The organisation considers liveability to mean "the sum of the factors that add up to a community's quality of life — including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment and recreation possibilities". Yuan, Yuen and Low (1999) also comment on the interchangeable use of these terms, adding that they have identified over 100 definitions of quality of life and liveability in the literature. Kashef adds that:

> Despite its frequent appearance in the educational and professional literature, livability is an ambiguous term that is used differently by various groups in different circumstances. However, the growing attention to the subject and the increasing number of academics and professionals who are engaged in liveability issues have brought to the surface a need for a clear understanding of liveability, in general, and urban liveability, in particular. Liveability refers to various constructed views regarding the quality of life in any human living environment. (2016, p. 240).

In line with the broadness of this thinking, in a study of liveability dimensions and attributes, Lau Leby and Hashim confirm that "the term liveability is an umbrella to a variety of meanings, which depend both on the objects of measurement and on the perspective of those making those measurements" (2010, p. 71). This realisation led to a segmentation of liveability studies reviewed in this report into three distinct categories: urban liveability, neighbourhood liveability and dwelling liveability.

2.2 The emergence of wellbeing

While liveability predominantly refers to place, wellbeing predominantly refers to people. A recent shift towards human-centric architecture has seen the rise of wellbeing in building design, and a promising new field of study is emerging.

The concept of wellbeing, however, is not new.

Debate over the definition of wellbeing is believed to date back centuries, with its origins traced to the philosophers of ancient Greece, whose definitions of wellbeing incorporated concepts of happiness, pleasure and flourishing (Disabato, Goodman, Kashdan, Short & Jarden, 2016). During the enlightenment era, wellbeing developed as a science and so followed sociologists, psychologists and political philosophers into the arena of wellbeing research (Janahi, Raman & Zapat-Lancaster, 2018).

Over the past 40 years, there has been a rise in wellbeing as a field within economics, alongside an interest in the measurement of wellbeing in the second half of the 20th century (McDaid & Cooper, 2014). It has since become a global focus rising up policy agendas, with governments worldwide investing in measuring and quantifying their nations' wellbeing. In 2015, the United Nations introduced 17 Sustainable Development Goals under the 2030 Agenda for Sustainable Development, with number three on the list being good health and wellbeing (United Nations, 2015). This prompted further discussion about how wellbeing can be achieved worldwide. Wellbeing is especially pertinent in New Zealand, with the government recently adopting a broad agenda of wellbeing and committing to putting people's wellbeing at the heart of its policies. The Wellbeing Budget (The Treasury, 2019) seeks to broaden the Budget's focus beyond

economic and fiscal policy and adopt a Living Standards Framework as an important step towards embedding wellbeing in New Zealand public policy (Robertson, 2018).

Similarly, at a local city scale, the language around liveability is changing, and wellbeing is emerging as the preferred terminology. For example, while the previous 2012 Auckland Plan focused heavily on liveability, the 2018 Plan (released while this research was under way) focuses heavily on wellbeing. In the review document *Developing the Auckland Plan 2050*, both terms are used: "There was feedback about the importance of recognising the value of natural and cultural heritage and its importance for liveability of the city and individual well-being" (Auckland Council, 2018b, p. 18), whereas in the Plan, wellbeing is almost exclusively used to explore Māori identity as well as being connected to health, social connectedness and economic prosperity (Auckland Council, 2018a). Quality of life was also briefly mentioned.

In this way and covering a range of scales, the Auckland Plan followed through from the review documentation and connected wellbeing at a dwelling scale and city scale. It states the following:

- "A healthy home is a core foundation for positive health and wellbeing" (Auckland Council, 2018a, p. 106).
- "Secure, healthy and affordable housing is fundamental to the health and wellbeing of Aucklanders" (Auckland Council, 2018a, p. 111).
- "… a higher-quality and safer built environment … also deliver improved economic and social wellbeing outcomes" (Auckland Council, 2018a, p. 167).
- "The quality of city design is integral to how it functions, which affects our overall wellbeing" (Auckland Council, 2018a, p. 207).

2.2.1 Wellbeing and the built environment

However, it has not been until relatively recently that wellbeing has gained the attention of the built environment sector, and there has been growing evidence, which has become more widely discussed, about the health and wellbeing impacts of the physical environment (Pineo & Rydin, 2018). It has now become an influential agenda in the built environment, and human-centred priorities are fast becoming increasingly significant across the built environment industry (Watson, 2018).

Wellbeing in the context of the built environment has been further defined in the literature as physiological wellbeing, psychological wellbeing or social wellbeing and has implications both at neighbourhood and dwelling scales (Janahi et al., 2018). Furthermore, there are both subjective (or hedonic) and psychological (or eudaimonic) aspects to wellbeing, concerned with satisfaction measures and theory-based indicators respectively (Disabato et al., 2016; Weiss, Westerhof & Bohlmeijer, 2016).

Similarly to liveability, wellbeing is a broad term that is still evolving. It encompasses many domains of a person's life, and their physical environment is just one of these. Research into the relationship between housing and user wellbeing is growing, but there is still a lot to be done. Cooper (2014) eloquently summarises the need to fill this research gap:

> The two central dimensions of wellbeing and the environment are people and places. To understand this relationship, it is important to understand (a) how humans engage sensorially with their environment, (b) the type and quality of environment, and (c) its impact on people throughout their life course. Quite

> simply, people are affected by their environment through their senses … The more we know about this process and the intervening variables the more we may be able to design better places, moderate effects, and influence behavior (2014, p. 1).

Wellbeing, however it is defined, has an inherent relationship to place and liveability (Fuller, 2016). Moreover, wellbeing can be used as a measure of liveability, since liveable environments can inform and support residents' wellbeing (Stephens et al., 2018). In this context, liveability is an overarching term and is used primarily in regard to the assessment of place (on a range of scales), as explored in the remainder of this literature review.

2.3 Three scales of liveability

In considering the literature, it became clear that liveability functions across three scales within the built environment: liveability can be dwelling-scaled, neighbourhood-scaled and urban-scaled. These scales are explored in the following subsections.

2.3.1 Dwelling liveability

A definition of dwelling liveability is related to the structure or built form of the home and its impact, whether subjective or objective, on the health and wellbeing of residents. Categories include:

- typological choice to suit needs and spatial properties of the home, including storage, entertaining spaces, relationship to socio-cultural understanding of space, shared spaces (and trade-offs between private and shared spaces).
- amenity factors such as natural light, ventilation, safety, privacy (both acoustic and visual), outlook, ease of use (i.e. somewhere to hang out washing/put rubbish).

There has been a considerable amount of research into the topic of health and safety in housing. However, this is not always specifically regarding MDH.

A renewed interest in the relationship between housing quality and health have emphasised the considerable links between health (both physical and mental) and housing quality (Bennett, 2010; Buckenberger, 2009, 2012, 2013). Bennett (2010, p. 24) concludes that there are six basic human requirements that, when met, help to provide healthy, comfortable, safe and liveable built environments (see Figure 1). These function at the scale of both neighbourhood and dwelling liveability and strongly link to the idea of housing quality.

Nelson and Schneider (2018) define the dwelling not exclusively as a contained unit but also in the wider context of its location and neighbourhood and its housing density. The arrangement of dwellings relative to one another informs liveability, with shared spaces between dwellings spanning both dwelling and neighbourhood to cultivate stronger and more social communities (Defign.blog, 2018). Sirgy and Cornwell's (2002) model of satisfaction also connects dwelling and neighbourhood liveability by connecting housing and home satisfaction to neighbourhood and community satisfaction. The World Health Organization's housing and health guidelines (2018) highlight the importance of both the dwelling and what lies beyond its walls, including the local community and the immediate housing environment, in supporting a state of complete physical, mental and social wellbeing.

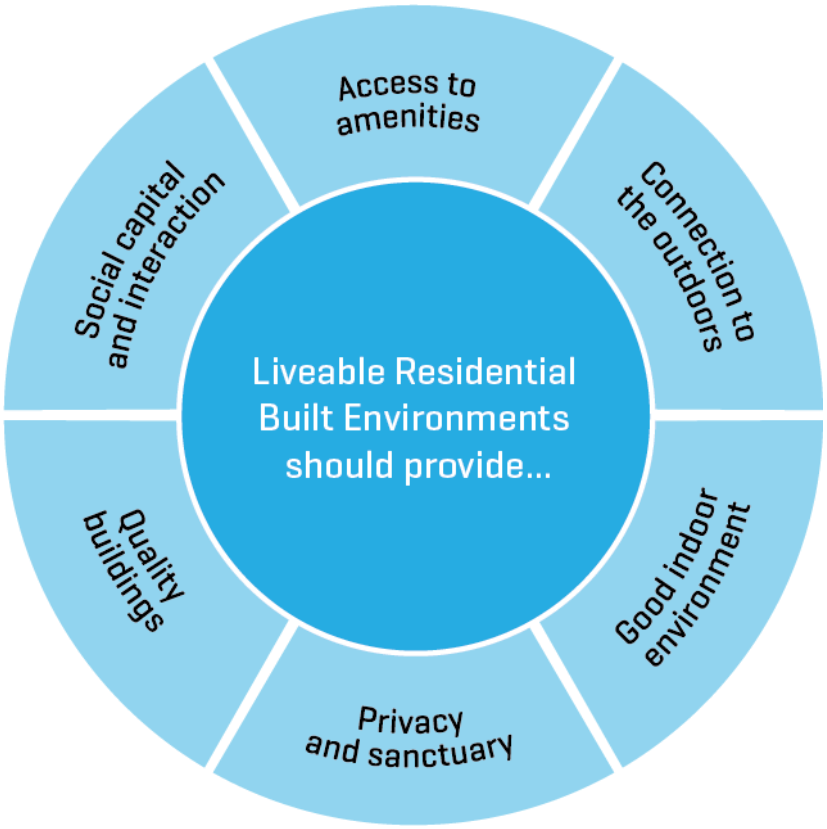

Figure 1. Six human requirements in the residential built environment (based on Bennett, 2010, p. 45).

The connections between dwelling, neighbourhood, wellbeing and liveability are not straightforward, however:

> The relationship between housing and wellbeing is complex and multidimensional. Moreover, behavioural, biological, cultural, social, physical and political factors are variables that affect this relationship. While studying physical environments and users, various theories and concepts can be found such as wellbeing, quality of life, happiness, life satisfaction and sustainability. (Janahi et al., 2018, p. 1)

In recent years, an effort has been made to measure and standardise this relationship through the development of research-based standards for liveability and wellbeing through design. These include the WELL building standard (International WELL Building Institute, 2014) and Fitwel standards launched in 2017 (Fitwel, 2019). While other sustainable building standards focus on a building's environmental performance, these guides have the user at their heart (Heath, Jackson & Goode, 2018b). Both standards are score-based, giving weight to each assessment category, and incorporate both quantitative (indoor air quality, lighting levels) and qualitative (biophilia, user comfort) measures. Reviewing these reveals common goals that can be summarised under the following headings:

- Amenity and location.
- Active design – encourage users to use stairs where possible and locate building to encourage walking and cycling.
- Nature – connection to outdoors, light and biophilic design principles.

- Comfort and safety – interior environment (air, water, light, noise, psychological comfort).
- Layout – opportunities for sanctuary as well as interaction, plus addressing all of the above.

It is interesting to note that these standards do not specify any minimum space dimensions for dwellings, possibly because the standardisation of minimum space requirements is a contentious issue (Park, 2017). While it is acknowledged that overcrowding in houses can have serious health implications (Reynolds, 2005; Herarth & Bentley, 2018), various studies have found that the evidence of a positive relationship between living environment size and subjective wellbeing is inconclusive (Ala-Mantila, Heinonen, Junnila & Saarsalmi, 2017). This supports the recent movement towards designing dwellings not to be bigger but better by placing value on quality of design.

One clear overarching theme amongst these standards and other guidelines reviewed (Channon, 2018; Heath, Jackson & Goode, 2018a; UK Green Building Council, 2016; WBDG Productive Committee, 2018; WHO, 2018) is the importance of nature in designing buildings for liveability and wellbeing. This can be attributed to humans' innate affiliation with nature and an instinctual drive to return to natural elements (Heath et al., 2018a). Specifically, design for wellbeing should incorporate natural daylight (to support circadian rhythms and promote physiological and psychological health), places for both prospect and refuge (to provide for both exploration and mental/physical focus), natural views (to induce a more positive emotional and physiological state), references to nature (natural materials, patterns, textures and colours) and the incorporation of water (which can reduce stress and lower heart rate and blood pressure). The scientific evidence for this stretches back decades, with the first notable study having been conducted by Roger Ulrich in 1984 (Sternberg, 2009). Recent collaborations between the fields of neuroscience, health, design and architecture have provided valuable insight into this approach. For instance, several studies have found that the simple design decision to include wood in interior spaces can reduce blood pressure and heart rate and increase feelings of relaxation and comfort (Tsunetsugu, Miyazaki & Sato, 2007; Ikei, Song & Miyazaki, 2017; Jalilzadehazhari & Johansson, 2019).

Research gaps

These methods can be applied not only to the dwelling scale but also the urban and neighbourhood scales. In the context of MDH research, a review of the literature has indicated that dwelling liveability is best researched alongside neighbourhood liveability in an approach where both quantitative and qualitative methods can be employed and examined through comparative analysis.

Overall, this is an area of research where individual technical projects have not always resulted in a complete picture of dwelling liveability. It is a notable research gap in New Zealand. While the WELL building standard and Fitwel provide useful frameworks for a standards-based liveability or wellbeing assessment for buildings, they lack specificity in terms of MDH and do not cater for New Zealand's unique culture. The work of Bennett (2010) may be the closest link. This study identifies how liveability in New Zealand is affected by acoustics (including internal and external control of sound) (p. 325), building quality (including airtightness, design of communal areas, landscaping, safety and security features and weathertightness) (pp. 326–327), building services and amenities (including drainage, emergency escape, facilities, lifts, parking, rubbish and recycling, water and utilities) (pp. 328–329) and indoor air

quality. Maintenance, building management and materials quality are also considered as components of dwelling liveability. This study also provides insight into a weighted hierarchy of building features and indicators, which could be a useful way to research dwelling liveability further.

2.3.2 Neighbourhood liveability

The Death and Life of Great American Cities advanced a set of urban design guidelines for maintaining the quality of life in cities. Jacobs (1961) emphasised that healthy cities required fine-grained gridiron urban blocks, high densities and a mix of residential and commercial uses. It is at the neighbourhood liveability scale that terms such as quality of urban life (Allen, 2016a) become prevalent.

Creating pedestrian-friendly enclosures and neighbourhoods where residents can conveniently walk from home to work, school and parks is central to the liveable cities vision of new urbanists. Streets that were lined with small shops, cafés and other entertainment hubs constituted the backbone of communities and acted as generators of urban vitality. Social interaction, sense of community and civility are perceived as byproducts of such urban configurations, which also work better in terms of sustainability and socio-economic viability.

The concept of neighbourhood liveability was firmly established, to the detriment of other kinds, with the publication of *Livable Streets* in 1981 (Appleyard, Lintell & Gerson 1981). The book was concerned with the effects of traffic on neighbourhoods and combined quantitative data – information collected on the features of the streets – with qualitative information from interviews with residents. The researchers compared the responses of residents on streets with high, medium and low traffic volumes and measured the effects of traffic on social interaction, perceptions of home territory and the comfort of people's daily lives.

Saunders' healthy streets approach (Transport for London, 2017, p. 4) builds on this, looking at the street to inform healthy neighbourhoods and creating fairer, sustainable and attractive urban spaces by providing an evidence-based strategy and putting people at the centre of design, management and use of public spaces.

The influential work of Jan Ghel (2010) in his book *Cities for People* proposes a way to quantify and measure liveability by identifying urban patterns and walk times, proposing that liveability can be improved by focusing on improving the human scale of neighbourhoods. In this sense, he connects his ideas to urban liveability by contending that to consider the neighbourhood is to solve the problems of the city.

Recent qualitative studies take a more subjective approach to measuring neighbourhood liveability by asking residents about their perceptions (Bramston et al., 2002; Campbell et al., 2009; Permentier, Bolt & van Ham, 2011; McCrea, Marans et al., 2011; McCrea, Western et al., 2011; Stimson et al., 2011). These studies are designed around surveys, questionnaires and interviews where responses are grouped according to themes and analysed comparatively to identify notions of satisfaction with neighbourhoods. New Zealand studies to follow this method include Allen (2016a) and Haarhoff et al. (2013). Neighbourhood satisfaction in these studies is a direct measure of neighbourhood liveability.

While focused predominantly at the scale of the neighbourhood, the work of Marans and Stimson (2011) identifies that understanding satisfaction can connect all three scales of liveability. To them satisfaction can include satisfaction with housing,

satisfaction with neighbourhood and satisfaction with the wider community or broader region (Marans & Stimson, 2011, p. 70).

Yang defines this satisfaction as "the degree to which people perceive their residential environment as able to meet their needs and further the attainment of their goals" (2008, p. 309) and argues that the subjective nature of liveability has not been adequately addressed in research. A number of researchers argue that subjective perceptions of satisfaction are best researched at a neighbourhood scale (Alves, 2006; Del Rio, Levi & Duarte, 2011; Randolph, 2004). Marans and Stimson (2011) contend that subjective liveability research should include an investigation of the subjective satisfaction residents have in their housing, the neighbourhood in which they live and the community to which they relate. A study by Gregory et al. (2018) found that wellbeing in the home is intrinsically linked to a sense of wellbeing in the neighbourhood, and the quality of the social fabric of the neighbourhood in which a home is embedded is directly connected to wellbeing.

2.3.3 Urban liveability

The focus of liveability research has shifted over the decades. When social scientists began defining and measuring urban liveability in the 1960s, they did so because they wanted to make cities more equitable. The thinking then was that social indicators would help inform and shape policies that would benefit everyone, especially those who were economically and socially disadvantaged.

By the 1980s, research objectives began to shift. Researchers moved towards studying urban liveability to determine what made cities more competitive. The aim was to inform policy makers looking to improve living conditions in order to attract mobile talent and capital. The economist Richard Florida is perhaps one of the most well-known proponents of this mode of thinking. In his 2002 bestseller, *The Rise of the Creative Class*, Florida (2002) contended that, in the knowledge age, cities needed a "people climate", meaning that cities had to cater to the preferences and lifestyle aspirations of knowledge workers.

The Centre for Liveable Cities Liveability Framework, which is based on Singapore's development experience, straddles the objectives of fostering both an equitable and a competitive city (Centre for Liveable Cities & Civil Service College, 2014). It defines liveability at an urban scale in terms of three broad development outcomes: competitive economy, sustainable environment and a high quality of life. In other words, a liveable city should have an efficient economy that provides good jobs for people with diverse skills, makes judicious use of scarce resources and provides a high quality of life for everyone. This triple bottom line is underpinned by good governance and an integrated approach to planning for development.

But even this solution is quite simplistic. High-level evaluative questions do not say anything specific about people's satisfaction with the cities they live in or the level of satisfaction stemming from aspects of life that are within a policy maker's control. As such, policy makers may be better served if they collected their own data on the self-reported satisfaction of various aspects of city living such as mobility, employment opportunities and others.

The International Making Cities Liveable Conference (IMCL) focuses the discussion of liveability on the need for efficient mass transit, bike lanes and networks, child-friendly city spaces and mixed-use urban fabrics. Similar to new urbanism, IMCL aims to revive the city centre, create compact neighbourhoods and create human-scaled public places

where people can gather to participate in farmers' markets, festivals, outdoor cafés and community life.

The urban environment incorporates many interacting factors that affect health and wellbeing, directly and indirectly (see Figure 2).

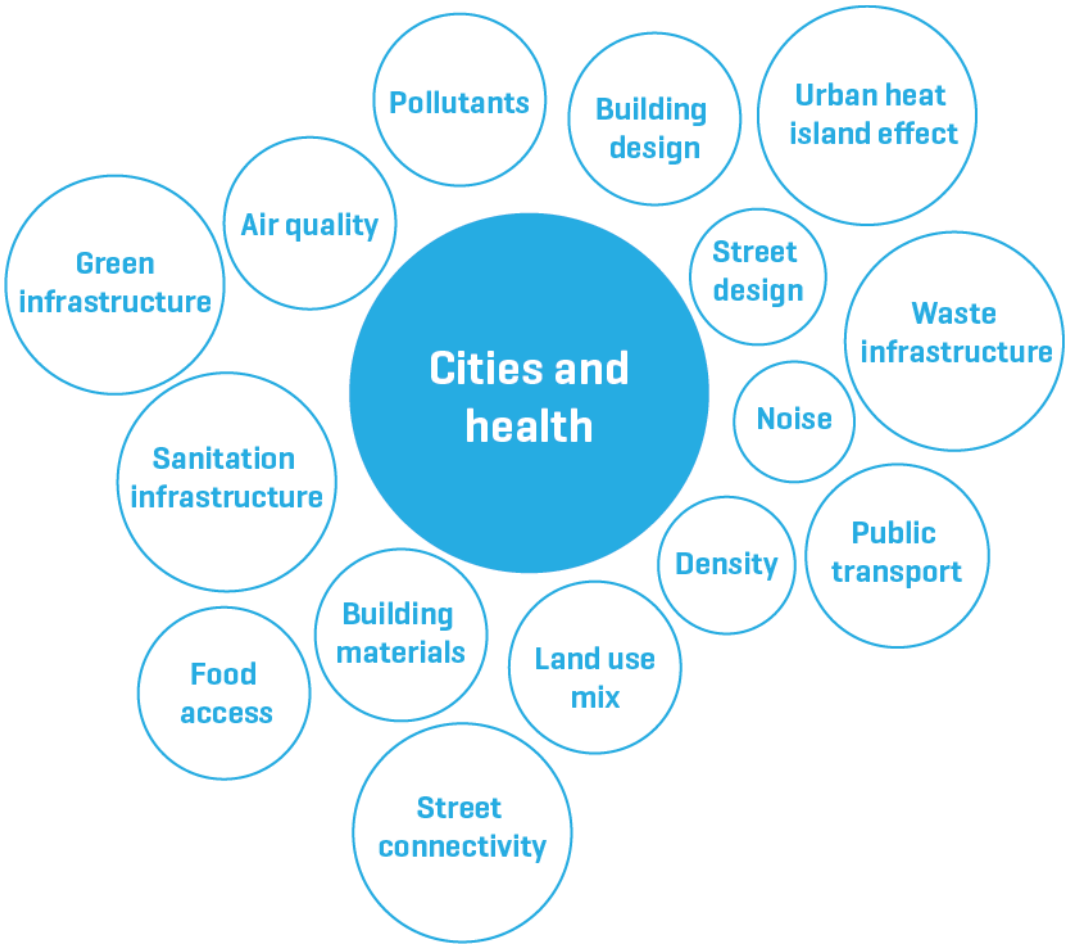

Figure 2. Physical urban environment factors impacting health and wellbeing (based on Pineo & Rydin, 2018, p. 15).

The human experience of density is difficult to quantify. To understand how density is experienced by people, other physical characteristics of the built environment including building proximity, building height, open space ratio and layout need to be considered (Raman, 2010).

Mouratidis (2018), for example, explores liveability in terms of social wellbeing, investigating how urban form affects social life and relationships. Through both path analysis and qualitative analysis, it is found that shorter distances to the city centre, higher densities and mixed land uses positively contribute to overall social wellbeing. Results indicate that residents of compact neighbourhoods are significantly more satisfied with their personal relationships compared with residents of low-density neighbourhoods.

Other recent planning approaches associate urban liveability with other all-encompassing terms, such as sustainability, biodiversity and resilience (Ruth & Franklin, 2014; Nassauer, 2011). Smart growth and transit-oriented development have also been proposed to enhance urban liveability and create more sustainable cities

(Bressi, 2002; Calthorpe & Fulton, 2001; Duany, Speck & Lydon, 2013; Kashef, 2008; Leccese & McCormick, 2000).

Liveability rankings

In the last 15 years, liveability has come to be associated with rankings of major cities. This is a product of globalisation, in particular the ability of corporations to establish global networks with branch offices in many cities across the world. Rankings are useful to them for choosing where to locate their offices and for calculating the compensation for their executives. Rankings are also valuable to professional people who want to work overseas for making comparisons between cities. The governments of the cities concerned are interested in these rankings as a means of attracting corporations and professionals. The phrase often used is that a city is "world class".

The cities generally considered the most liveable – in that they usually dominate the liveability surveys – are remarkably similar. They are typically harbour cities with temperate climates and attractive natural hinterlands. These characteristics are the result of natural and historical circumstances rather than anything that could now be done by planners. One methodological gap in current research is an investigation into the extent that perceived liveability relates to natural qualities. Another is the relation to visual qualities. Work could be done in the manner of Kevin Lynch's *The Image of the City* (1960), which surveyed how visitors and residents saw a city, what features were visually significant to them and the mental maps these people made. This research might show liveability to be far more subjective than previous studies have admitted.

When considering urban-scale liveability, liveability rankings emerge as having drawn confusion to the debate about the term liveability and its use in growth strategy, most notably because liveability rankings are designed for global companies that are seeking to attract or place the globally mobile creative class in their workplaces and not for citizens already living in the cities that are being ranked. The literature of liveability rankings has in turn raised the question, liveability for whom? The pivot towards using wellbeing may be because it is more universally accepted as wellbeing for everybody.

2.4 Liveability and MDH

Of particular interest to the BRANZ MDH research programme is the extent to which MDH leads to the urban growth management aim of delivering enhanced liveability, now widely labelled as wellbeing, for residents.

Alves (2006) observes that the provision of higher-density typologies, which include MDH, to meet the aim of consolidation by intensifying existing neighbourhoods is one of the most contentious urban growth management issues that cities must address. Randolph (2006) argues there are a variety of complex issues that need to be included in the planning process if the delivery of urban intensification is to be achieved. While policy changes are well documented, there is a need to strengthen the growing body of knowledge concerned with addressing how policy changes are playing out at the neighbourhood and dwelling scale (Beattie & Haarhoff, 2012; Randolph, 2004). At this local scale, it is important to examine the household as the nexus around which the impacts of planning policy and the larger forces of urban change play out socially, including those associated with housing markets, demographics and housing preferences (Randolph, 2004).

Within this process, Randolph (2004) has argued that "the language of community has come back with a vengeance in policy areas that ignored it for many years" (p. 483). The housing choices and aspirations of residents are some of the most important factors that demonstrate the connection between macro urban development processes and those occurring in neighbourhoods.

Economic, social and technological changes over the last 30 years have reshaped how residents conceptualise their housing and locational aspirations and thus how they make their housing choices (Allen, 2016a), and these choices have affected the form of cities (Darroch Ltd, 2010; Preval, Chapman & Howden-Chapman, 2010). Housing choices are generally framed by the trade-offs residents make between their housing needs and their housing preferences (Kelly, Weidmann & Walsh, 2011; Mead & McGregor, 2007; Yeoman & Akehurst, 2015), decisions further constrained by price considerations. These necessary trade-offs affect neighbourhood desirability, housing type, size and build quality (Thomas, Walton & Lamb, 2010).

Links have also been made between MDH choices and neighbourhood satisfaction (García-Mira, Uzzell, Real & Romay, 2005), defined by Yang (2008, p. 309) as "the degree to which people perceive their residential environment as able to meet their needs and further the attainment of their goals" and thus a core component of liveability. For example, a survey of residents by Thomas et al. (2010) found that they trade off "elements of their environment against each other for their overall neighbourhood satisfaction" (p. 418). Research on housing choices reveals information about neighbourhood satisfaction (Bijoux, Lietz & Saville-Smith, 2007; Howley, Scott & Redmond, 2009; Lau Leby & Hashim, 2010; Randall, 2008; Saville-Smith, 2010). In turn, neighbourhood satisfaction is a core component of the overall liveability experienced by residents.

Research gaps

To complement the literature review, tables were developed (see Appendix B) to review and summarise the methodological approaches used when researching liveability in both New Zealand and internationally. This included addressing how the studies represent an intersection between dwelling and neighbourhood liveability and MDH research, considering what could be learned from this study for future research and identifying any research gaps identified by the research.

New Zealand liveability studies (see Appendix B) revealed that there is a need for ongoing research into liveability concerns in New Zealand MDH. A key research gap identified was that there is a real need for a better method of evaluating how MDH typologies may affect the liveability experienced by residents at both the scale of the dwelling and the neighbourhood. In addition, the relationship between MDH residents' dwelling liveability and the neighbourhood liveability for all local residents is currently poorly understood within New Zealand.

Where MDH typologies have been considered, they have predominantly been apartment typologies. Terraced houses and the specific liveability outcomes they create has not been researched in New Zealand.

The international review of liveability studies (see Appendix B) found that there have been relatively few attempts to investigate people's perceptions about the places they currently live, especially what makes their neighbourhoods a good or bad place to live.

A variety of methodologies have been used to study liveability issues. A key divide between studies is whether their methodology applies an objective or subjective measure of liveability. Any study developed to address liveability issues must therefore identify whether it is framed by either a subjective or an objective lens or whether it integrates both.

Current studies mostly support previous findings that indicate housing satisfaction has a strong correlation to neighbourhood satisfaction. These findings also link the idea of dwelling and neighbourhood liveability and strengthen the argument that multiple scales should be investigated in tandem in future MDH liveability research.

3. Summary

This report has summarised the outcomes of a national and international literature review of liveability and wellbeing in relation to housing and the built environment. Specifically, it has outlined the opportunities and challenges for MDH in New Zealand to improve liveability and enhance the wellbeing of residents and communities.

The main findings of this literature review can be distilled into the key insights summarised below. These insights provide a starting point from which the building and construction industry, alongside policy makers at the national and local levels, can understand and create the settings necessary to design and deliver liveable MDH in New Zealand.

Insight 1: There is no commonly used definition of liveability in New Zealand

The absence of a clear definition means that there is no common understanding of what liveability means and how it could be improved within the context of MDH in New Zealand. Development of a common definition of liveability would be useful in guiding future efforts to secure good liveability outcomes for MDH.

Insight 2: Liveability outcomes need to be considered across scales

Since the emergence of the term 'liveability' after the Second World War, it has evolved from considering liveability at the individual dwelling scale to the neighbourhood scale to the wider urban scale. This progression and the interrelationships across this scale need to be understood and considered when seeking to improve MDH liveability either through detailed design, construction or policy settings. What may represent good liveability outcomes at a dwelling scale, for example, may not have such a positive impact from a neighbourhood or urban liveability perspective.

Insight 3: Liveability generally refers to place, while wellbeing refers to people

The term 'wellbeing' has become increasingly popular in New Zealand with the release of a suite of government documents to guide and measure societal progress within a wellbeing framework as opposed to a financial framework. In the built environment, wellbeing has focused on aspects such as human health (physical and mental) as impacted by housing and the spaces people inhabit. Although the concept of wellbeing is still developing in the context of the built environment, it is inherently related to liveability and can even be viewed as a measure of liveability (Stephens et al., 2018). It is possible that more emphasis may be placed on the relationship between wellbeing and the built environment in the current political climate. and further research on this subject may therefore be beneficial.

Insight 4: There is a need for a better method of evaluating how MDH typologies may affect liveability

Similarly to the need for a common definition of liveability as identified in Insight 1, it would be beneficial to establish a consistent method for evaluating the liveability of MDH for residents, neighbours and wider communities. This would allow a thorough analysis of MDH liveability issues across towns and regions, with a view to improving liveability outcomes from the dwelling to the urban scale.

These key insights provide a succinct summary of the findings of this literature review and provide direction as to how best to progress a liveability agenda for MDH in New Zealand. It is in this context that the next phase of this wider liveability research focuses on how the legislative and regulatory environment – nationally and of different cities across New Zealand – impacts liveability outcomes in MDH typologies ((Allen & O'Donnell, 2020a).

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Appendix A: Summary stocktake of New Zealand liveability research

A stocktake was undertaken in March 2018 to develop an understanding of the following:

- What is under way/planned regarding liveability research?
- Who is undertaking that work and when will it be delivered?
- How does it duplicate or complement what BRANZ is doing or is planning to do?
- Recommendations for what additions or changes BRANZ could make to its project plan for ER0918 Medium Density Housing liveability.

The stocktake involved contacting organisations that have been known to undertake research or work in this space and included the Ministry for the Environment (MfE), Ministry of Business, Innovation and Employment, New Zealand Centre for Sustainable Cities, University of Otago, Centre for Research, Evaluation and Social Assessment, SHORE & Whariki Research Centre (Massey University), Urban Research Network (University of Auckland), New Zealand Early Career Urban Research Network (University of Auckland), Building Better Homes, Towns and Cities National Science Challenge, Land Information New Zealand, Auckland Council Research Unit (RIMU), Housing New Zealand, Beacon Pathway, The New Zealand Initiative, Motu and Opus Research.

Below is a summary of findings from this stocktake of liveability research:

- There remains no nationally agreed definition of liveability and how it can be measured. This provided the main source of confusion when contacting the organisations listed above, because where there were no specific liveability projects under way, people were unsure about what other research might overlap or touch on liveability issues.
- There is a range of research and strategic planning work going on across both public and private institutions that can be related to liveability. However, very little is specifically focused on liveability research, and no liveability research was specifically focused on MDH.
- Where liveability is or is proposed to be the focus, there is no research occurring at the dwelling scale as proposed in the BRANZ research. The most aligned research, occurring at MfE, is focused at the broader urban scale. Therefore, the key research gap identified in the literature review (that there is a real need for a better method of evaluating how MDH typologies may affect the liveability experienced by residents at both the scale of the dwelling and the neighbourhood) seems likely to remain a research gap unless BRANZ continues work in this space.
- There is very little coordination between the various entities undertaking research that is either specifically termed as research on liveability or is under the banner of other subject matters. However, there does appear to be cross-referencing of previous work published.
- There is no specific liveability programme of work defined or confirmed within MfE, and planning for future work will be finalised once the new Statement of Intent and strategic objectives are set for the department (MfE was interested in the outcomes of this report to assist with this planning). This may have changed since the establishment of KiwiBuild and the Ministry of Housing and Urban Development, which has occurred since the stocktake was completed.

- An interesting link that mentions Māori thinking on liveability was found: https://localgovernmentmag.co.nz/lg-magazine/infrastructure/auckland-liveability/
- Understanding cultural diversity and its impact on housing is an additional research gap that could be addressed through future research.

Appendix B: Reviewing liveability studies

New Zealand liveability studies

Ancell, S. & M. Thompson-Fawcett. (2008). The social sustainability of medium density housing: A conceptual model and Christchurch case study. *Housing Studies, 23*(3), 423–442.

Description/type of study and methodology used	Employs the notions of social equity and social justice as a starting point for analysing social sustainability while recognising that there is no broad consensus on the meaning of the term. Observes that planning strategies such as compact city design and urban intensification are claimed to positively affect levels of social sustainability within the city but questions this claim. MDH is identified as a component of an urban compaction approach that is becoming more prevalent in New Zealand. Develops a model of the social sustainability of housing derived from key themes in the literature. The model is used to ascertain the extent to which MDH in central Christchurch meets residents' social needs. Information from in-depth interviews is used to examine how MDH contributes to the social sustainability of the city.
How does this study represent an intersection between liveability and MDH research?	Intensification of inner city Christchurch over the past two decades provides an opportunity to assess the social sustainability of new more compact housing forms. Areas zoned by Christchurch City Council for MDH in the central city were used for qualitative research. (p. 429) Seven key themes for investigation were identified: overall social sustainability, housing affordability, housing quality, transport issues, access to facilities, neighbourhood quality and relationships within communities. The basis for the model was derived from Maslow's hierarchy of need and from Meadows' (1999) model of the path to sustainable development. (p. 432)
What can be learned from this study for future research?	MDH in the city was found to be far from socially sustainable. Alternative mechanisms are needed to better facilitate a favourable transformation. A multifaceted, collaborative strategic planning approach would be welcomed by many interviewees to tackle the issues raised by the research relating to social sustainability and sustainability in general. "Nevertheless, further research into the variables of social sustainability via more extensive case study analyses, both in New Zealand and overseas, would continue to refine the model, particularly in terms of its sub-variables. In addition, research into the social sustainability of other forms of housing would extend understanding of the relationships between built form and social sustainability." (p. 438)
Does this study reveal any research gaps?	Themes identified in the research model could be used to guide the assessment of processes and outcomes in relation to housing in other contexts, in particular the value of a more holistic and integrated understanding in the name of social sustainability. "Given the importance that normative ideals for future urban form and management will have in terms of shaping our cities for many years to come, it is necessary to probe the broad-ranging implications of their use for long-term sustainability." (p.439)

Arbury, J. (2005). *From urban sprawl to compact city – an analysis of urban growth management in Auckland* (Master's thesis). The University of Auckland, Auckland, New Zealand.

Description/type of study and methodology used	The premise is that intensification could have great benefits but could be impossible to implement in a manner that would be acceptable to existing residents. This thesis focuses on Auckland as an example of a developed world city that is characterised by many of the problems associated with urban sprawl and looks at ways in which local government is attempting to implement policies throughout the next 50 years at regional and district levels to create a more sustainable urban future for Auckland. (p. 9) Auckland's growth management strategies are examined at the neighbourhood level of the West Auckland suburb of Avondale. (pp. 127–157) "Auckland's more recent planning strategies clearly show a shift towards advocating a more 'compact city' style of urban development, and a shift away from predicting and providing for peripheral urban expansion through motorway construction. However, it is also clear that intensification in Auckland needs to be done 'better' than it has been in the past, and that significant cultural, economic and social issues affecting the 'acceptability' of intensification will need to be overcome for it to be effectively implemented. The purpose of this thesis is to suggest ways in which this can occur, so that Auckland can contribute to a more sustainable urban future." (p. 13)
How does this study represent an intersection between liveability and MDH research?	Plans for Auckland's urban future follow a theoretical debate over the virtues of urban sprawl and compact city types of development, which has dominated urban planning literature over the past 15 years, as overall Auckland's strategies look to move away from sprawl as the basis for urban growth and focus more on intensification. "However, as is outlined in the literature, there are many critiques of the compact city thesis, and those critiques can be readily applied to Auckland, especially with regards to feasibility and acceptability problems that have already plagued the implementation of intensification, as higher-density urban living contradicts with what most New Zealanders perceive to be an ideal lifestyle. To achieve Auckland's growth management goals, feasibility and acceptability issues with urban intensification will need to be overcome." (p. 160)

Bennett, J. (2010). *New Zealand apartment living: Developing a liveability evaluation index* (Master's thesis). Victoria University of Wellington, Wellington, New Zealand.

Description/type of study and methodology used	Presents the development of an assessment methodology to enable prospective buyers/tenants to easily and quickly evaluate and compare apartment liveability. Considers over 100 factors that influence liveability in higher density housing. Followed the methodology of three similar tools: • Building quality assessment – developed for assessments of health and safety in New Zealand office and retail buildings (Baird, Gray, Isaacs, Kernohan & McIndoe, 1995). • Building quality index –developed in Hong Kong for assessing health and safety in apartments (Wong, Cheung, Yau, Ho & Chau, 2006). • Housing performance evaluation model for multi-family residential buildings – developed in South Korea to evaluate housing

	environment, function and comfort in multi-unit residential buildings (Kim, Yang, Yeo & Kim, 2005). Methodology used in the development of the New Zealand apartment liveability index (NZ ALI): • Hierarchy development – based on findings from the literature review. • Index development – extension of hierarchy, including assessment methods for each indicator. • Index calibration – development of weightings for indicators from survey with stakeholders and end users. • Index validation – consultation with end users and use of NZ ALI to ensure that results are valid and accurate. (p. 39)
How does this study represent an intersection between liveability and MDH research?	Six main relationship nodes between housing and liveability were identified: access to community amenities, connections to the outdoors, satisfying indoor environments (visually, aurally, thermally and spatially), privacy and sanctuary, well-built buildings (buildings that won't collapse or trap occupants), social capital and interactions (social inclusion). (p. 24) Connects to BRANZ research because it identifies how liveability is affected by acoustics (including internal and external control of sound) (p. 325), building quality (including airtightness, design of communal areas, landscaping, safety and security features, and weathertightness) (pp. 326–327), building services and amenities (including drainage, emergency escape, facilities, lifts, parking, rubbish and recycling, water and utilities) (pp. 328–329) and indoor air quality. Maintenance, building management and materials quality are also considered as components of dwelling liveability.
What can be learned from this study for future research?	Provides insight into a weighted hierarchy of building features and indicators. Connected liveability factors at both the scale of a dwelling (an apartment) and the neighbourhood by developing a tool that considered factors such as safety and access and proximity to urban amenities (including entertainment, food, green spaces, public transport and employment). (pp. 215–218) Compared academic knowledge to public opinion (represented by the New Zealand popular press) in the literature review. Identified a difference in the importance placed on liveability factors: "The public places importance on issues that can easily be assessed (i.e. views and outdoor access) whereas academia is more concerned with factors that cannot easily be assessed and often affect liveability through longer term exposure (e.g. air quality). This suggests that the public makes purchasing or tenancy decisions based on readily assessed information, ignoring other issues." (p. 24)
Does this study reveal any research gaps?	It concludes that "there is a real need for a better method of evaluating how higher-density housing may affect liveability." (p. 24) Focuses on apartment typology, indicates research gap around whether liveability assessment would be different for different MDH typologies, i.e. terraced housing. Only asked six residents so there is scope to do a broader study to have more conclusive data. (47 interviews total – also interviewed designers/developers etc.)

Buckenberger, C. (2009). *Housing qualities in suburban Auckland – the suburban 'pavlova' paradise?* Paper presented at the 4th Australasian Housing Conference, Sydney, Australia.

Description/type of study and methodology used	Explores housing quality perceptions in Farm Cove, a residential area in the Auckland suburb of Pakuranga North. The area was chosen because it consists of a predominant housing type – the 3-bedroom family home – and because it has a high level of home ownership. Owner occupants were interviewed about their perceptions of housing qualities, which were analysed on two different scales. Tag clouds were used to analyse perceived qualities of house and home as well as the home area – a small scale of neighbourhood in which residents' daily life routines take place. The study revealed two cohorts of people living in the area: those aged over 65 who were ageing in place, having had their families in the 70s and then have stayed in the area and those in their 30s and 40s who had moved to the area within the previous few years, some with teenage or younger families. (p. 10)
How does this study represent an intersection between liveability and MDH research?	Although not concerned with residents of MDH, the results are generally applicable There is a life cycle shift in qualities from physical to intangible or even emotional qualities in later life. Physical housing qualities seem to be central for families, as are the quietness of the location and proximity to good schools. For the elderly cohort, intangible qualities are more important, such as nature, gardens and lifestyle as well as accessibility to shops and public transport. Planning for the elderly should incorporate more environmental qualities as they contribute to their sense of place and quality of life when they age in place. (p. 10)
What can be learned from this study for future research?	Housing quality goes beyond the physical structure of buildings. The perceived qualities for particular age groups can become meaningful for future planning. Further research could be done in this area.
Does this study reveal any research gaps?	Empirical research is needed in particular for areas such as the Auckland region where many houses suffer from building defects. Occupants' insights of housing quality experiences are useful for future planning debates about housing for certain groups of people. (p. 10)

Crawford, H. & Miller, C. (2014). Making urban intensification work: A Tauranga case study. *New Zealand Surveyor*, *303*, 39–48.

Description/type of study and methodology used	This qualitative research looks at Tauranga's Smart Growth intensification strategy and its core policy of promoting MDH. Interviews with real estate agents and developers provided information on current market demand for MDH and possible reasons there is limited uptake of MDH developments in Tauranga. Buyers seemed reluctant to purchase MDH while adverse market conditions, including high cost of redevelopment, have confined MDH developments to greenfield sites. While design aspects were important, the availability of nearby amenities was considered crucial to successful MDH development. However, interviewees thought continued growth pressures would eventually make intensification a successful growth management strategy for Tauranga. (p. 41)
How does this study represent an intersection	Intensification was perceived as unlikely to succeed in the short term due to neighbourhood level rejection and the lack of financial viability in undertaking redevelopment. Suburbanites rejected intensification, and the

between liveability and MDH research?	pressures to intensify were not sufficiently great to compel it. Potential buyers appeared to want good local amenities, which the developers thought should be provided by councils. For developers, the costs of aggregating a suitably sized site, development costs, the lack of suitable redevelopment sites and financing difficulties all made MDH projects risky and speculative. (p. 47)

Dixon, J., Dupuis, A. & Lysnar, P. (2001). *Medium density housing: A local strategic response to urban sprawl*. Paper presented at the 8th European Real Estate Society Conference (ERES), Alicante, Spain.

Description/type of study and methodology used	An analysis of the Auckland Regional Growth Strategy, which includes a case study of Ambrico Place – an MDH development in West Auckland. In particular, it addresses the issues of the tension between intensification and urban amenity and the operation of body corporates. While these are issues that arose from a particular piece of research, they are germane to the development of MDH more generally across the Auckland region.
How does this study represent an intersection between liveability and MDH research?	The interests of various parties involved may not always be compatible. Trade-offs are required to provide a range of good-quality housing at affordable levels while at the same time ensuring profitability for the developer, flexibility for the developer in designing the development yet still ensuring certainty for neighbours and new residents about what might happen on the site, sufficient outdoor open spaces while still trying to maximise use of internal space and minimise off-site impacts such as parking and traffic generation and transparency about what constitutes private and public space within MDH developments and recognition of where the trade-offs have occurred.

Haarhoff, E., Beattie, L., Dixon, J., Dupuis, A., Lysnar, P. & Murphy, L. with Solomon, R. (2012). *Future intensive: Insights for Auckland's housing*. Auckland: Transforming Cities, The University of Auckland.

Description/type of study and methodology used	In-depth qualitative interviews were conducted with 84 residents from three case study areas: New Lynn – the Ambrico Place development previously studied by Dixon, Dupuis and Lysnar (2001), Albany and Onehunga. (p. 2)
How does this study represent an intersection between liveability and MDH research?	Residents were asked to identify the type of housing they would like to move to in future, with options ranging from stand-alone houses to multi-level apartments. Despite high levels of satisfaction expressed with their current MDH, well over half identified the stand-alone house as the likely housing type they would move to next. When asked about their preferred housing type in an ideal situation, approximately three-quarters opted for either a stand-alone house on a full site, a stand-alone house on a small site or a lifestyle block. "These data provide a clear indication that the 'Kiwi dream' of owning a detached house is still very much alive and well and extends to include overseas-born immigrants." (p. 7)
What can be learned from this study for future research?	The planning tools used to deliver the outcomes envisaged in plans and policies are, in part, deficient. Good plans and planning mechanisms on their own are not sufficient to ensure the delivery of the policy aims and quality outcomes anticipated. This is of significance regarding the Auckland Plan and the planning tools being developed to deliver the vibrant, liveable, community-oriented local environments and compact urban form

	envisaged. Planning instruments need to be more effective and more flexible to respond to changing circumstances in order to achieve the liveability envisaged. (p.)
Does this study reveal any research gaps?	Key areas for further research: the extent to which this may be regarded as the enhanced liveability envisioned in the urban management plans, a better understanding of the dynamic issues that link urban consolidation and associated planning policies and tools, governance, the demand drivers for higher-density living, what defines the community's perception of liveability and the extent to which the market is prepared to invest in the housing topologies associated with compact development. (p. 9)

International liveability studies

Bolleter, J. (2016). Background noise: A review of the effects of background infill on urban liveability in Perth. *Australian Planner*, *53*(4), 265–278.

Description/type of study and methodology used	Research question: "To what degree has background infill, in Perth to date, delivered the urban liveability that the Western Australian State Government is aspiring to through its planning for urban infill?" (p. 265) Geospatial driven modelling and correlational strategy was used to find correlations or otherwise between sites of background infill and criteria that can be used to assess liveability, including access to nature, cultural assets and public transport. An evaluative research strategy is used to evaluate whether the mapped conditions indicate an increase or decrease in urban liveability. This written evaluation was carried out in relation to the geospatial mapping in conjunction with surveys of community preferences. (p. 265) Methodology was influenced by Swaffield and Deming (2012).
How does this study represent an intersection between liveability and MDH research?	Background infill is characterised by semi-detached, survey strata, group dwellings (generally single storey) organised around a communal driveway space leading to private garages adjacent to the dwellings. (p. 268) This type is known in the USA as the bungalow court and is not common in New Zealand.
What can be learned from this study for future research?	Background infill is delivering mixed results for urban liveability. Arguably, the public open spaces in these densifying urban areas are not well adapted to the needs of people living in background infill – a situation that is compounded by diminished, residual outdoor space and a reduction of urban forest cover. "Furthermore because of the incremental and ad hoc way background infill is delivered, it is not producing the precincts of denser urban form that can support cultural and commercial assets to any large degree. Finally, much of the background infill is not well connected to public rail transport, a situation that is reflected in stubbornly high levels of car usage for commuting to work" (p. 276).
Does this study reveal any research gaps?	If the state government is resolute about increasing urban liveability in conjunction with urban densification, alternative strategies are required that lessen the emphasis on background infill. "Where these strategies are already enshrined in policy (such as Activity Centres and Activity Corridors) then research is required to understand why, from a spatial, governance, and economic point of view, these policies are not delivering infill development dwellings at a higher rate. Concomitantly, as background infill is likely to continue, further research needs to be conducted which

	explores how dispersed ad hoc infill development, in Perth, can be coordinated to leverage greater liveability outcomes for its residents" (p. 277).

Clayden, A., McKoy, K. & Wild, A. (2006). Improving residential liveability in the UK: Home zones and alternative approaches. *Journal of Urban Design*, *11*(1), 55–71.

Description/type of study and methodology used	Investigates home zones, which are intended to achieve a safer street environment through physical measures that ensure low vehicle speeds in order to allow soft modes of travel equal status with motorised users. Home zones should create places for social interaction and, by involving residents in the design of their street, engender a greater sense of pride and ownership in the street and community cohesion. As a consequence, home zones might help to reduce the fear of crime, reverse decline in low-demand housing areas, reduce road traffic accidents and provide places for children's informal recreation close to the home. This paper presents a summary of the findings from research into two retrofit home zones and the development work in Sheffield. The discussion is arranged in four sections. (p. 55)
How does this study represent an intersection between liveability and MDH research?	Research took place in existing MDH neighbourhoods but was not concerned with MDH itself. The research offers some useful ideas about management of traffic in such neighbourhoods.

Fullagar, S., Pavlidis, A., Reid, S. & Lloyd, K. (2013). Living it up in the 'new world city': High-rise development and the promise of liveability. *Annals of Leisure Research*, *16*(4), 280–296.

Description/type of study and methodology used	The growth of high-rise developments raises questions about how the emotional and social leisurescape of the city is evoked, produced and represented. This article examines how advertising images and texts promoting new high-rise developments produce notions of liveability through the depiction of idealised spatial experiences that typify urban leisure lifestyles. The focus of the analysis is three high-rise developments in Brisbane, a self-proclaimed 'new world city' and the capital of Queensland in Australia's northeast. It identifies how marketing images evoke particular emotions to construct desirable relationships between consumers, domestic space and urban leisurescapes. Analysis reveals social tensions between different constructions of the liveable city and the implications for leisure planning. While Brisbane City Council sought to be inclusive in its planning for urban liveability, developers imagined urban renewal projects through exclusive lifestyle practices and normalised consumer identities (white, middle class, heterosexual, without children).
How does this study represent an intersection between liveability and MDH research?	This study is concerned with high-rise developments and tourism, not MDH.

Howley, P. (2010). 'Sustainability versus liveability': An exploration of central city housing satisfaction. *International Journal of Housing Policy*, *10*(2), 173–189.

Description/type of study and methodology used	Examines issues surrounding central city residential housing using Dublin as a research subject because it has been successful in attracting large numbers of residents back into new residential developments within the central city. The paper raises questions about long-term sustainability of these developments, as residents express a preference to reside in lower-density locations, and focuses on housing satisfaction. Results from a logistic model of housing satisfaction indicate that background variables such as age and ethnicity as well as various design elements of the dwelling unit emerge as significant predictors of overall housing satisfaction within these newly regenerated residential areas.
How does this study represent an intersection between liveability and MDH research?	The aim of the paper is to examine respondents' perceptions relating to the quality and suitability of housing in newly regenerated residential areas within the central city. Using results from a household survey and focus groups, the paper evaluates the attractions of central-city living and future residential intentions of residents living in new developments within the central city. This is followed with an analysis of individuals' satisfaction with housing in the central city and concludes with a discussion of the implications of the findings and some recommendations for urban policy. (p. 175) The central area of Dublin city was chosen as study region because, since the early 1990s, a large number of residents have moved into newly regenerated apartment developments within the central area. The dominant form of housing provided to accommodate the new residential population has been apartment developments, which accounted for just over 80% cent of all new residential developments, mostly relatively small 1 and 2-bedroom units. (p. 176)
What can be learned from this study for future research?	Finds that high-density and urban liveability are not mutually exclusive concepts, as through appropriate urban design, a city can be both high density and liveable. (p. 187) Does not suggest further research.

Kennedy, R. & Buys, L. (2010). *Dimensions of liveability: A tool for sustainable cities*. Paper presented at the SB10mad Sustainable Building Conference, Madrid, Spain.

Description/type of study and methodology used	Six inner-city Brisbane neighbourhoods were selected as case study sites on the basis that inner urban areas are typically characterised by residential densities that are greater than conventional suburbs, diversity of land use, a supportive structure for walking and public transport, mixed building types and ages accommodating diverse tenancies, a culturally diverse population and an engaged community. These neighbourhoods have experienced considerable urban renewal of post-industrial sites over the past decade but are also the location of many detached houses described as 'character' housing as well as long-established apartment buildings and many newer types of multiple-residential typologies. (p. 1)
How does this study represent an intersection between	The research aimed to explore the actual and perceived social, environmental and economic impacts experienced by residents in higher-density environments within a subtropical region, identify any discrepancies between actual and perceived impacts and develop practical planning and design guidelines to respond to the key issues associated

liveability and MDH research?	with high-density living, including perceptions of environmental issues and how these relate to people's living environments and residential choices. (p. 2)
What can be learned from this study for future research?	This paper develops a tool to aid a variety of stakeholders to understand the relationships between perceptions of density and building design and inform high-density planning and building design to mitigate negative impacts, enhance positive impacts and integrate principles of subtropical design.

Lau Leby, J. & Hashim, A. (2010). Liveability dimensions and attributes: Their relative importance in the eyes of neighbourhood residents. *Journal of Construction in Developing Countries*, *15*(1), 67–91.

Description/type of study and methodology used	The aim was to identify the attributes and dimensions that residents consider in evaluating the liveability of their neighbourhood and to assess the importance of these attributes and dimensions. (p. 70)
How does this study represent an intersection between liveability and MDH research?	Housing type was not a concern of this paper.
Does this study reveal any research gaps?	The literature review finds there have been few attempts to investigate people's perceptions about the places they currently live in, especially what makes their neighbourhoods a good or bad place to live. Most studies have generally focused on residents' satisfaction with their living environment and rarely on the attributes or dimensions that are important to them. Not everyone finds the same characteristics to be important in their neighbourhood or evaluates neighbourhood satisfaction on the basis of the same criteria.

Lowe, M., Whitzman, C., Badland, H., Davern, M., Aye, L., Hes, D. & Giles-Corti, B. (2015). Planning healthy, liveable and sustainable cities: How can indicators inform policy. *Urban Policy and Research*, *33*(2), 1–14.

Description/type of study and methodology used	The research comprised two main phases: a literature review of liveability indicators and a series of consultation workshops and feedback sessions with Melbourne-based academics, government policy makers and community and private sector decision makers. (p. 134)
How does this study represent an intersection between liveability and MDH research?	Not concerned specifically with MDH.
What can be learned from this study for future research?	This research highlights some key considerations for those developing indicators. Clearly, indicators must be reliable and valid, but they also need to be policy-relevant so that they can accurately measure the effects of policies over time. Further research is required to establish clear links

	between environmental influences, intermediary impacts and long-term health and wellbeing outcomes. However, developing high-quality indicators based on the best available evidence and data must be balanced with making indicators usable and easy to incorporate into policy.
Does this study reveal any research gaps?	Greater commitment to using liveability indicators to measure the impacts and outcomes of policies and monitor progress towards reform might assist policy makers to achieve their policy goals of creating healthy, liveable and sustainable cities and enhance the nexus between urban planning and public health. Building on these findings, the next step in this research is to develop a set of liveability indicators that are robust, evidence-based and linked to urban planning policies. This study reinforces that policy makers should be involved in developing indicators to ensure that they are applicable to policy and practice and that they are 'owned' by decision makers.

McCrea, R. & Walters, P. (2012). Impacts of urban consolidation on urban liveability: Comparing an inner and outer suburb in Brisbane, Australia. *Housing, Theory and Society*, *29*(2), 190–206.

Description/type of study and methodology used	Densification around existing nodes of urban infrastructure has both positive and negative impacts on the everyday lives of residents (or their urban liveability as perceived by them), even though urban consolidation is commonly resisted by residents. This paper examines similarities and differences in impacts between two Brisbane suburbs: an outer fringe suburb (Wynnum) and an inner-city suburb (West End).
How does this study represent an intersection between liveability and MDH research?	Wynnum residents generally expressed less resistance to urban consolidation, with some residents willing to trade additional densification for additional amenities. Residents in both suburbs were concerned by aesthetics of high-rise development and traffic congestion. Building heights more than a few storeys above surrounding buildings were commonly seen as detracting from urban liveability. Other impacts differed between suburbs, reflecting their different values and ways of living.
What can be learned from this study for future research?	These interviews reinforce liveability as a primary focus for urban planning, and thus urban consolidation at the expense of liveability is a poor outcome for both local residents and urban planning. The impacts of urban consolidation on liveability differ between suburbs, and local neighbourhood plans should be sensitive to local notions of urban liveability because residents often stay after urban consolidation, even if they perceive negative impacts on their liveability. It is recommended that future studies develop from the idea that different neighbourhoods will have different ideas, and therefore multiple areas need to be studied to provide useful results

Ott, C. (2009). *Does housing make a community livable? Housing consumption and neighborhood satisfaction in metropolitan areas* (Master's thesis). Georgetown University, Washington, DC.

Description/type of study and methodology used	Tests the effect of the characteristics of a person's housing consumption on their perception of overall neighbourhood quality. Housing tenure, housing affordability, structure of the housing unit and housing conditions are expected to contribute to a resident's satisfaction with their

	neighbourhood. Data for analysis was obtained from the American Housing Survey Metropolitan samples for 2002 and 2004 to conduct an ordered logit regression model.
How does this study represent an intersection between liveability and MDH research?	In the sample population, about two-thirds live in single family detached housing units. The odds of having feelings that are more positive about one's neighbourhood are 1.22 times greater for people living in single family detached dwellings than for residents of row houses or apartments. (p. 19)
What can be learned from this study for future research?	Both home ownership and living in single family detached housing units increase the odds that residents will rate their neighbourhoods highly. Structural problems related to housing, older housing and housing units with insufficient space for the family's size decrease the odds that a resident will have positive feelings about the neighbourhood. Surprisingly, residents who spend a higher percentage of their income on housing are more likely to have favourable attitudes to their neighbourhoods. No further research suggested.
Does this study reveal any research gaps?	Study supports previous findings, which showed that housing satisfaction is a strong correlate of neighbourhood satisfaction. No research gap identified.