Establishing a Conceptual Model for Residential Development in New Zealand

Thesis Report to fulfil the requirements of a

Masters of Environmental Planning

By Joel Bishop

Supervised by Iain White

28th February 2025

Index of Figures

Index of Tables

Appendices

1. Introduction

Housing is a universal requirement for health and wellbeing, and the home is something to which great economic, social, and cultural value has been ascribed across diverse cultures and time periods. Most New Zealand households either own, or aspire to own, their own home (Eaqub and Eaqub 2015). This prioritisation has made housing the primary economic asset for the bulk of the New Zealand population (Property Council 2021).

The provision of adequate housing is therefore essential to a well-functioning society. Historically, responsibility for housing supply has been assumed by many diverse actors, including the state, religious and other community institutions, and individual homesteaders (Dodd 2020). In a typical liberal democracy, new housing is mostly provided by a 'free market' of developers, financiers, planners, and other actors. The state - although it does provide a small stock of housing - primarily acts as regulator, controlling the supply and use of land through planning policies and setting construction standards, among myriad other functions (Murphy 2014).

The prevailing normative assumption is that this system provides an efficient housing equilibrium informed by supply and demand. However, there is increasing recognition of the system's failures – most notably, the rising costs of housing and how the development sector may not be adequately responding to natural hazard risks or the future impacts of climate change (Shahzad et al. 2022).

The challenge facing contemporary policymakers is therefore to address these failings in the system by developing policies that can enable an adequate supply of housing to be delivered without transferring risk or liabilities to future generations. Better policymaking and future scenario modelling will require a deeper understanding of the decision-making logics employed by key agents in the housing development sector. If the values and rationales that influence decision-making within the development system can be modelled, then more targeted policy interventions can be made to manage future risk.

Research on housing in New Zealand from the past two decades has instead been largely focused on affordability in the context of the emergent 'housing crisis', and projections of future housing development are rooted in traditional economic or demographic analysis such as the potential value of developable land or population growth, or regulatory or deregulatory impulses (White and Nandedkar 2019). Given the influence of development actors in New Zealand, it is surprising that there is a lack of research investigating housing development in a New Zealand context that specifically focuses on behavioural analysis of key actors under different policy settings. This present research will contribute to plugging this gap in the existing corpus by developing a conceptual model of housing development in

New Zealand based on the decision-making of individual agents and the economic, social, and cultural rationales which inform it.

This research will therefore focus on the following guiding questions:

1. What conceptual models of housing development exist in the literature?

2. What are the main events, drivers, actors, and relationships involved in housing development?

3. What typologies of housing developers exist in the literature?

4. What typology of developers is most applicable to a New Zealand context?

2. Review of Existing Conceptual Models

2.1. Introduction

To answer these questions, we will first review the four existing conceptual models currently dominant in the literature, discussing the strengths, weaknesses, and common applications in each. We will then proceed to an overview of the research context – housing development in contemporary New Zealand – in order to determine which of these existing conceptual models, if any, are applicable to this context.

2.2. Methodology

To answer the first of these questions, a systematic literature review was conducted using the PRISMA methodology. The primary source of screened records was the Scopus database, with some additional records identified from the Google Scholar database. While searching Google Scholar generally returned a greater number of results, this database has significant issues with irrelevant, irreputable, and non-retrievable records, meaning that a much greater number of the results were excluded at the screening stage.

The identification stage began with a series of test searches to determine which phrases and key words would be most effective at producing relevant results. The following searches were then selected for inclusion:

- 12 records found by research supervisor
- “agent based modelling housing development”, Scopus (249 results)
- “agent based modelling housing development”, Google Scholar (top 100 results)
- “conceptual model of property development”, Scopus (top 50 results)
- “model of property development”, Scopus (top 50 results)

- “model of residential property development”, Scopus (top 100 results)
- “role of investors in residential development”, Scopus (top 100 results)
- “actors in residential development”, Scopus (top 50 results)
- “equilibrium model of housing development”, Scopus (top 50 results)
- Backsearch of Gerlach and Peng (2005) (33 citations)

Search results were ordered by number of times cited in other works.

These searches produced a set of 794 identified records. These were screened by a manual review of their title and publication information, with the key considerations being relevance to the research questions; quality of the publication; and reputability of the authors and publisher. Works published prior to 1990 were accepted only when they were important to the history of a particular modelling tradition or there were no more recent records available to supersede them. These criteria excluded the majority of the records.

The remainder were then subjected to a secondary screening involving a review of the abstract (for academic journal articles) or introduction (for books). Reasons for exclusion at this stage included that the source did not include a conceptual model; was focused on modelling population rather than development; was focused on commercial types of property; was specific to a type of land development with negligible presence in New Zealand; or provided only a summary introduction to the model or modelling type.

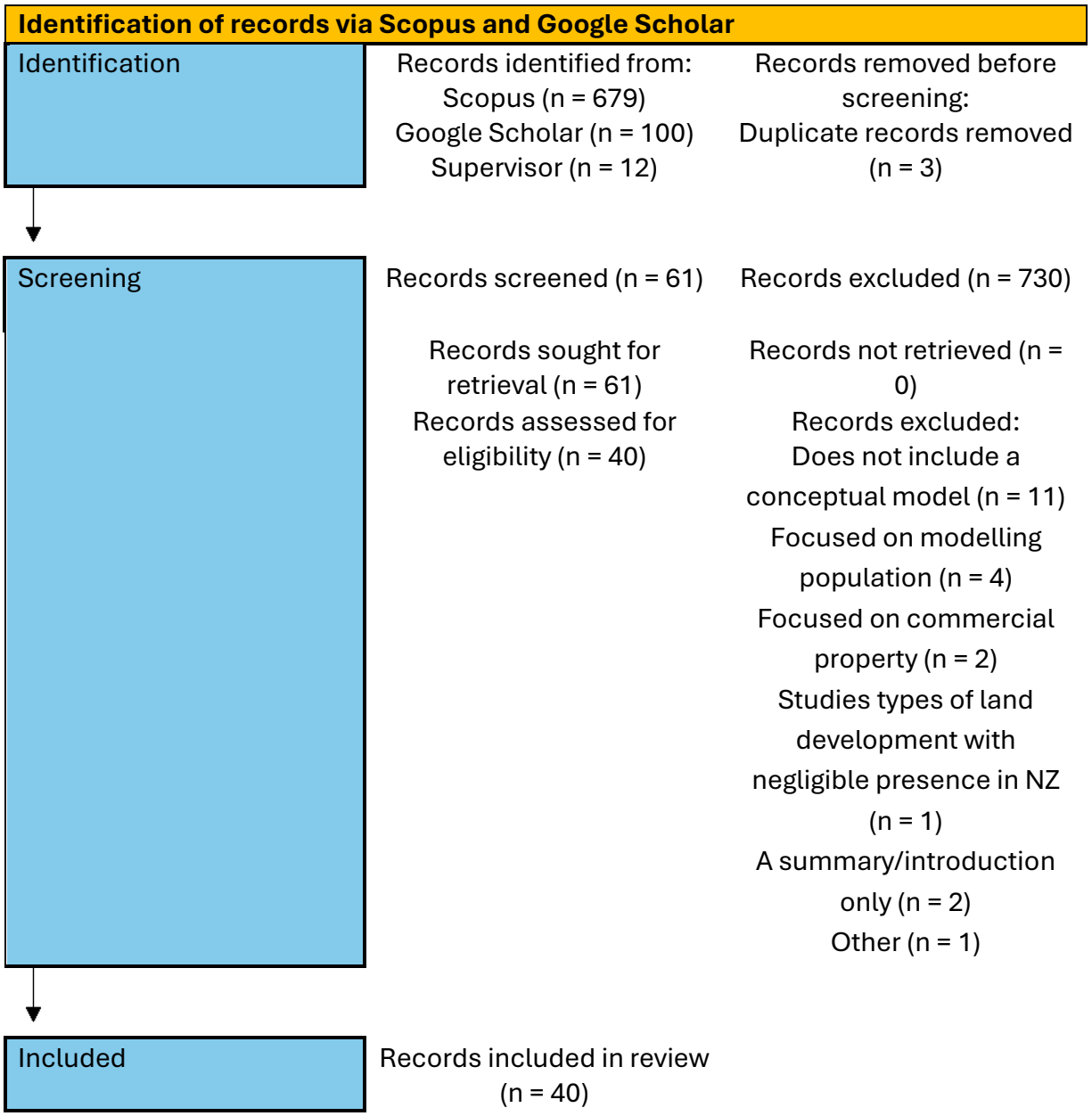


Figure 2.1 - PRISMA Flowchart

Previous reviews of existing models of real estate development, beginning with Healey (1991) and continued by Ratcliffe et al. (2009), Adams and Tiesdell (2013), and most recently Squires and Heurkens (2016), have categorised the models into four distinct types based on their theoretical origins and focus of analysis.

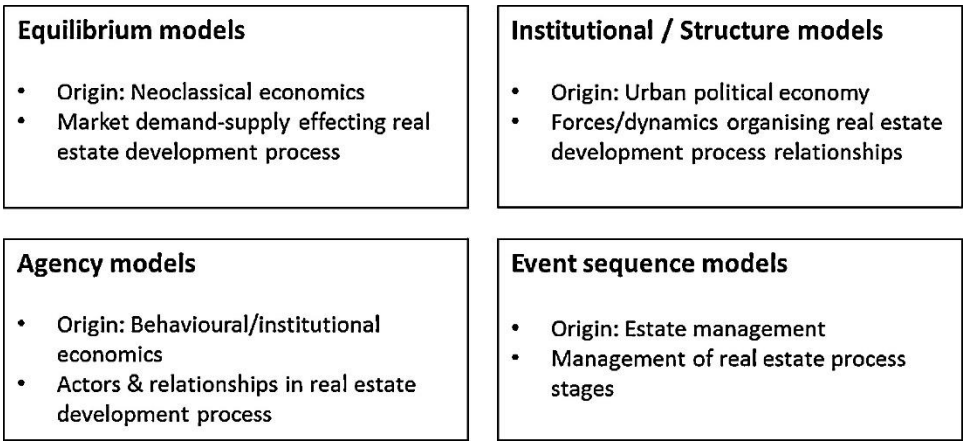


Figure 2.2 - Conceptual Models of Real Estate Development (Squires and Heurkens 2016)

24 of the records included in the final review presented unique conceptual models of real estate development. These were typologised using this same system, as summarised in the table below:

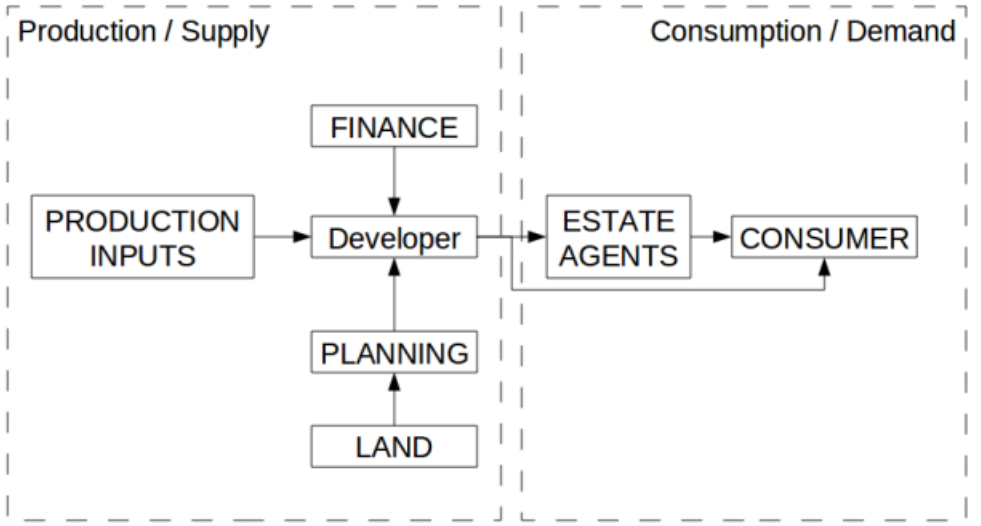
Table 2.A - Summary of Results

Model Type	Number Reviewed
Equilibrium	11
Agent-Based	6
Event-sequence	4
Structural	3

2.3. Spatial Equilibrium

Spatial Equilibrium models have their origins in Neoclassical economic theory. They reduce the markets and processes of development down to a simple conceptual 'economy' composed of consumers, suppliers, and sometimes a few other intermediary parties. For example, consider Healey (1991):

Figure 2 The position of developers in a market framework



Source: adapted from Healey, 1991, 225

Figure 2.3 - Conceptual Representation of an Equilibrium Model of Development (Healey 1991)

In Healey's model, focus is placed on the relationship between 'production/supply' and 'consumption/demand', with the developer acting as coordinator of the inputs required to produce new housing units – primarily land with planning approval and finance – and real estate agents functioning as intermediaries negotiating between developers and the households that 'consume' new housing.

Developer behaviour is typically viewed as being 'unproblematic': developers are presented as rational and unbiased actors that will always pursue profit to the best of their abilities. Behavioural differences among developers are explained as the product of how well each developer was able to 'read' the relevant market signals, and any failures of the housing market to efficiently meet the needs of all households are attributed to market inefficiencies like:

- the inadequacy of existing information and the high cost which developers accrue gathering additional information;
- the effects of planning restrictions (Squires and Heurkens 2016);
- the low transaction volumes of the housing market;
- the heterogenous/subjective nature of many of the physical attributes of housing (Dong et al. 2022), and;

- major supply-side constraints like the monopolisation of land ownership and availability of affordable credit.

Developers 'read' the market through signals about supply and demand like house prices and market rents. Spatial equilibrium models assume that, under perfect market conditions, the production and consumption of new housing will trend towards an equilibrium state in which the amount of housing developed in each location within an urban system will be perfectly reflective of the relative value which that location and unit possess to consumers (Magliocca et al. 2011).

To represent this value, spatial equilibrium models assign each site in the development environment a bundle of attributes which determine how attractive it is to consumers, and thus how likely it is to be selected for future development. Metzner et al. (2018) identify 31 such variables, which they group into seven categories:

- Macro location (including accessibility, demographics, and image)
- Micro location (including technical and social infrastructure)
- Real estate market (supply and demand)
- Land (including dimension, rights, and value)
- (for already-developed sites only) Building characteristics
- Use
- Transaction parameters

The development of a new spatial equilibrium model therefore typically begins with an identification of the key variables of interest to the researcher or users. While simple spatial equilibrium models may consider only the immediate physical characteristics of a site, more advanced models use hedonic pricing to identify both the 'internal' (physical) and 'external' factors the determine the market value of a site. These 'external' factors are differences between consumer households that affect their willingness to pay for a housing unit. Differing household preferences for particular features and amenities, household budgets, and transport modes and costs might explain why the same site is developed under one socioeconomic and demographic context, and left vacant under another (Geurs and van Wee 2004).

One notable variant of spatial equilibrium modelling is the dynamic time-to-development model pioneered by Turnball (1988). The development of this type of model begins with a specific optimal timing of development which there is evidence that developers seek to achieve: for example, developers might develop a site as soon as the forecasted profit or rental income first exceeds the predicted cost of the development.

Common Applications

Spatial equilibrium models are most commonly used by researchers, policymakers, and planners for scenario modelling: testing the effect that changing one or more variables is likely to have on future development in a simulated urban environment. For example:

- To study the effects of planning rules restricting the release of greenfield land into the development market. In these cases, the models are often used to argue that such restrictions are the primary cause of housing underdevelopment or unaffordability because they create market inefficiencies (Squires and Heurkens 2016).
- To test the effects of various economic incentive instruments used by planners and policymakers in an attempt to shape the urban environment; common examples include property taxes, fuel taxes, and public transport subsidies. For example, Mendonca et al. (2020) modelled the effects of increasing public transport subsidies on future land use patterns in a simulated urban environment:

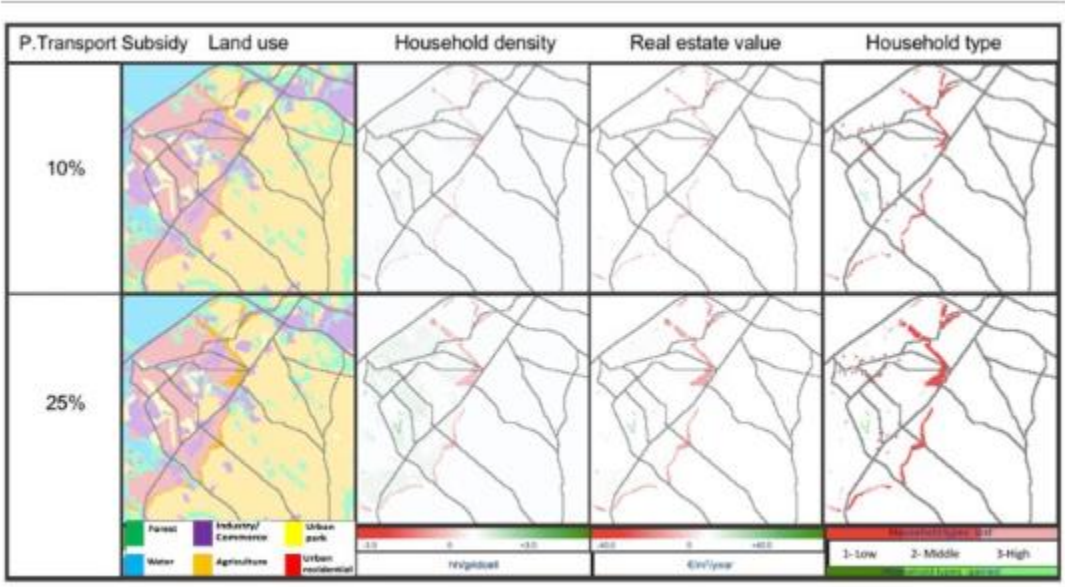


Figure 2.4 - Land Use Mapping Using a Spatial Equilibrium Model (Mendonca et al. 2020)

- To predict the response of the property sector to the provision of new infrastructure: for example, Bao et al. (2021) applied spatial equilibrium modelling to a recent historical case study, concluding that the increased transport accessibility from a new tunnel connecting Tuen Mun and Chek Lap Kok in Hong Kong China prompted new residential development in nearby areas.

Strengths and Weaknesses

The key strength of spatial equilibrium models is their comprehensiveness: especially when integrating hedonic pricing, they can model a wide multitude of the diverse variables which influence housing development, enabling users to understand how modifying specific economic, social, infrastructure, and planning-policy variables – whether in isolation, in combination, or under broader sociopolitical policy settings or scenarios – may impact future development patterns (Squires and Heurkens 2016).

However, a number of notable critiques of these models have arisen in recent critical reviews. Equilibrium models tend to reduce or outright ignore heterogeneity between groups of actors or agents, instead presenting them as monolithic producer or consumer groups with similar interests, understandings, and responses. They also require substantial data on each variable or attribute before a sufficiently comprehensive model can be produced; data which is often unavailable or prohibitively difficult for the user to acquire.

2.4. Agent-Based Models

Agent-Based Models (ABMs) emerged from economics theory in response to growing critical recognition of the failure of equilibrium models to capture heterogeneity within agents.

As identified in the introduction, a defining feature of contemporary housing development is that it involves multiple agents composed of individual developers, households, and others which differ significantly from one another. The development of a new ABM typically begins with an identification of the key agents which must be captured in the model. A summary of the most commonly included is given in the table below.

Table 2.B - Roles, Interests, and Heterogeneity of Key Agents Involved in Development

Agent	DEVELOPERS	HOUSEHOLDS	LOCAL GOVERNMENT	LENDERS/ FINANCIERS	MARKETERS	LANDOWNERS	CONSULTANTS	STAKEHOLDERS	CENTRAL GOVERNMENT
Roles	Create development concepts and manage the development process	Create demand, occupy new dwellings	Create planning policies and rules, judge planning consent applications from developers	Provide capital	Connect supply and demand, maximise developer profit, create the 'image' of the development (Almatarneh et al. 2012)	Supply land for development	Translate development concepts into feasible plans and manage the delivery of specific items	Attempt to influence development to promote their special interests	Set high-level and/or strategic policy
Interests	Profit (and other benefits) from the disposal of the new units to the market	Meeting their housing needs	Meeting local housing needs while also appeasing stakeholders and achieving strategic and policy goals	Return on investment	Fees for their services	Profit from the sale, sometimes ongoing rights/benefits	Fees for their services	Promotion of their special interests	Balance encouraging housing development against various policy interests
Heterogeneity	Various typologies exist to describe developer heterogeneity	Preferences/willingness to pay for housing/site: location, type, size, environmental amenities, risk tolerance, and other variables (Metzner et al. 2018)	Policies, relationships with developers (Coiacetto 2001)	Size, experience, specialisation, organisation type (Rowley et al. 2014)	Size, experience, specialisation, organisation type	Willingness to sell informed by personal interests, expectations, and observations of the surrounding area (Gillen and Fisher 2002)	Size, experience, specialisation, organisation type	Organisation, interests, level of influence	Contemporary politics and policies

ABMs conceptualise development as occurring through the interactions of individual actors who differ in their motivations, characteristics, strategies, resources, relationships, and opportunities (Adams and Tiesdale 2013).

Incorporating agent heterogeneity means that, unlike in spatial equilibrium models, agent-based models recognise that agents do not always act according to perfect economic rationality, but are instead often influenced by a variety of different biases, motivations, and characteristics (Magliocca et al. 2011).

Relationships Between Actors

Despite their differences, these agents are interdependent: in order to achieve their objectives and generate profit, each one is reliant upon the behaviour and decision-making of others, making development a highly social process in which relationships matter greatly to project costs, timeframes, successes, and outcomes; and in which trust and reputation among agents is vital (Van Dijk et al. 2007). A favourable position for an agent is therefore one in which others are dependent on them to achieve their own goals, creating relationships of dependency. However, this dependency is rarely, if ever, perfect: for example, although one might initially assume that all developers are dependent on the authorisation bestowed by local government (i.e. planning and building permissions for development projects), research focused on differences between developers has established how developers are often able to manipulate, challenge, and circumvent local government decision-making authority (Coiacetto 2000).

Exactly how actors go about fulfilling their various interrelated roles is determined by the 'rules of the game': the regulations, institutionalised standards, behavioural norms, and cultural contexts that determine what is considered acceptable behaviour (van Dijk et al. 2007). Although the collective action of developers, especially the more innovative among them, can gradually change these rules, if any one individual developer deviates too far from what is currently acceptable they risk a failure of lender and customer confidence, market failure, and/or legal punishment.

Alongside agent heterogeneity, ABMs also attempt to model these relationships and the 'rules of the game' which govern them. For example, to provide a conceptual underpinning to his new ABM Ward (2018) produced a 'web' model of the relationships between developers and the dozens of different agents which they interact with as a development progresses from site identification through to construction, all governed by an overall political, economic, cultural, and legal structure.

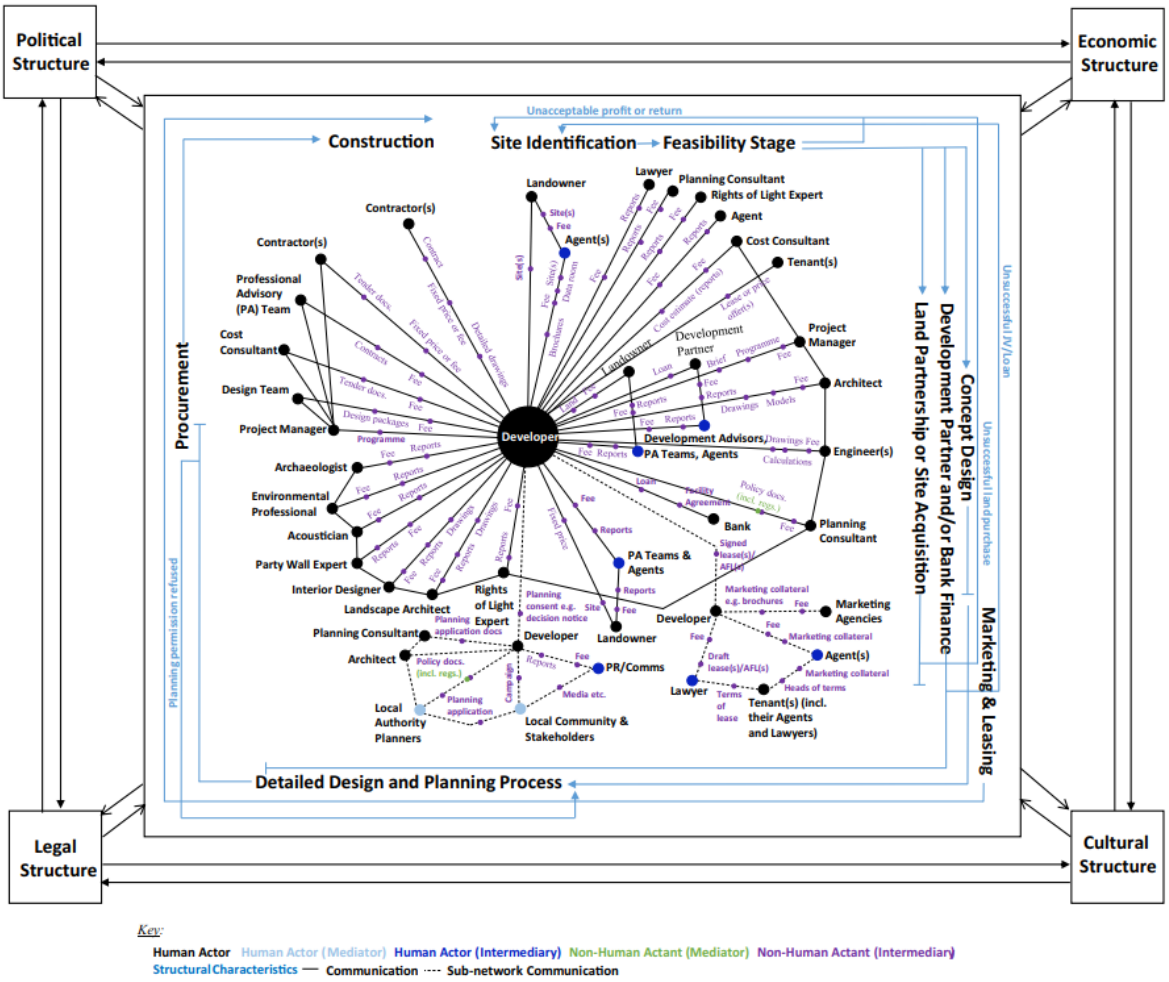


Figure 2.5 - Conceptual Model of the Agent-Relationships in Development (Ward 2018)

As with the agents themselves, the development of each new ABM typically begins with an identification of the most important agent-relationships. A brief description of those most commonly identified in the literature is provided in the table below:

Table 2.C – Agent Relationships in Development

	Small Developers	Large Developers	Households	Marketers	Landowners	Local Government	Lenders/Financiers	Consultants	Stakeholders	Central Government
Small Developers		Small developers tend to copy large ones	Direct interactions more common							
Large Developers	Few direct interactions		Direct interactions less common							
Households				Marketers connect households with developers, promoting the units and facilitating the transaction						
Marketers		May also use marketers to reimagine/vision a development								
Landowners		Developers have relatively more power in sales negotiations	N/A	N/A						
Local Government	Consultants provide technical input to turn development concepts into reality				Some landowners have brought as a strategic investment based on the planning status and future property					
Stakeholders	Try to influence developer behaviour in their favour	Central government may consider the largest developers as nationally-important, too big to fail. The largest developers also attempt to influence central government decisionmaking	N/A Central government policies influence household performance + demand. Central government also provides housing for some households	N/A Marketing may be used to appease/appeal to particular stakeholder groups	N/A	N/A Stakeholders will seek to influence LG and use the channels it provides to promote their interests				
Lenders/Financiers	Smaller loans involving lower staff/smaller financiers; lenders make demands of developers e.g. pre-sales	Larger loans involving large companies, large liabilities, extensive due diligence and risk management	Banks and other financial institutions finance household purchases of new housing units	Effective marketing might increase financier willingness to support a project?	N/A	N/A	Financiers may require consultant advice/input on the proposal before they grant funding			
Consultants		Large developers more likely to interact with high-level staff and able to lobby, manipulate, legally challenge, threaten to leave area, etc.	Local government provide housing for some households	LG sometimes employ marketers to promote/vision the city/district	N/A					
Central Government	Regulate the real estate sector				N/A	Central government gives some policy directives, targets, etc. to local governments	Regulate the finance sector, set OCR etc.	N/A	Government may protect/promote/privte dge certain stakeholder groups e.g. Maori	

As noted in the table above, ABMs may also incorporate ways in which heterogeneity within agent-groups can change the way that different actors relate to other agent-groups. For example, small developers have very little, if any, influence on central government. They interact with local government through frontline and formal channels, and have little choice but to comply with all the rules and policies which councils enforce. They must enter into protracted and tit-for-tat negotiations with landowners and financiers, and perceive of themselves as supremely beholden to the demands of the current market. This is in contrast with large developers who approach all these interactions with much greater resources, influence, and agency – in other words, power. There is evidence in the literature to suggest that large developers might form relationships with high-level staff at councils, through which they share strategic information and attempt to influence local government policy, strategy, and decision-making in alignment with their own values and strategies (Ruming 2010). Where the planning rules remain unfavourable, large developers might attempt to circumvent them, or else leverage their large socioeconomic presence and contributions to the local area by threatening to leave unless more favourable working conditions are offered (Coiacetto 2000).

Developers tend to establish networks of financiers, local government staff, consultants, suppliers, and contractors with which they consistently collaborate, building strong relationships and reducing inefficiencies. One way in which this can differ between small and large developers is in the level of vertical integration: some developers decide to perform roles in the production and distribution of new housing traditionally performed by other actors in the development sector. Developers may choose to pursue greater vertical integration to improve their strategic position viz-a-viz major competitors, as greater upstream vertical integration – meaning the developer performing their own feasibility assessment, land preparation works, construction and/or building works, manufacturing of materials and provision of labour, et cetera – can inhibit competition and increase market power. This type of vertical integration also allows developers to attempt 'price squeezing': by controlling aspects of the necessary inputs to production, the developer can simultaneously increase in the input cost for competitors while decreasing their own output price. Alternatively, vertical integration may be pursued as a strategy to evade the monopoly of one upstream firm over the entire production of a particular input. Either way, vertical integration is generally beneficial for developers because it helps them capture a greater amount of the residual profit available at each stage of production and reduce the transaction costs incurred when a development project must proceed through different stages involving many different parties. However, most smaller developers lack the will, capital, and capacity to expand their operations beyond development itself. Some of these may instead substitute vertical integration with a relatively small network of strong

contractual relationships with production and distribution firms, thereby generating similar benefits in terms of improved efficiency and greater market power (Meijer and Buitelaar 2023).

ABMs also draw attention to the conflict between the agency of individual actors and the restrictions imposed by the structures within which they operate. There is usually a varying topography of restriction: while most agents must accept working within the confines of established structures and norms, some possess the resources and socio-relational capital to challenge these 'rules of the game', manipulating the governing structures to their advantage (Adams and Tiesdale 2013).

Some recent agent-based models of housing development have integrated game theory, in order to account for the conflicting preferences of each actor. Developers are conceived of as each possessing a strategy which guides their decision-making by determining which interactions in the development sector they will pursue and which outcomes from these interactions are acceptable to them.

Common Applications

Like spatial equilibrium models, ABMs have been used to model future urban development and land use change under various different scenarios. They tend to be preferred for use in research contexts involving highly heterogenous agent-groups, especially developers and households, with for example Marini et al. (2019) modelling the effect of immigration and changing demographics on future land-use patterns.

ABMs are also commonly used in understanding the process of competition between different 'players' of the 'game' of development that determines who benefits from development outcomes. For example, Samsura et al. (2010) apply game theory to the different types of greenfield land development processes in the Netherlands by generating decision trees for each of the four types of developer they identify which predict which developers will 'win' and 'loose' a specific battle for a developable site.

Finally, ABMs have also been developed for modelling housing development in coastal areas, where reactions to the conflicting amenity values from coastal-environmental amenity versus natural hazard risk varies between different developers and households according to a variety of variables (Walls et al. 2018).

Strengths and Weaknesses

By incorporating agent heterogeneity, competition between actors, and relationships of collaboration, competition, and dependency, ABMs provide a much more detailed and nuanced representation of a diverse development market than a spatial equilibrium model.

They are also uniquely suited to revealing how simple rules, patterns, trends, and policies at the agent level may result in complex system-wide outcomes as these things are filtered through the individualities of individual actors.

The principal weakness of ABMs is that they require a large amount of detailed information about agent types, variables, and relationships before their interactions can be modelled with any accuracy. The creation and analysis of this data is typically a complex, expensive, and time-consuming process, and any attempts to account for insufficient data through assumptions and inferences inevitably introduce outsized inaccuracies into the final model (Squires and Heurkens 2016).

2.5. Event-Sequence

Event-sequence models (alternatively called event-based models) conceptualise housing development as a series of distinct or semi-distinct stages through which a development project must proceed before the new housing units are disposed to end users and profit is created. Different combinations of actors, relationships, resources, and external forces, are important at each stage, and certain parameters must be met before a project can proceed through one key 'gate' to the next.

Central to each event in the sequence is the developer, who connects and coordinates the various other agents involved in the production and disposal of the new units, applies for the necessary consents, engages with the local government and community, and ultimately receives the greatest part of the profit. The role of the developer is a highly social one, as to achieve its own goals the developer must mediate between the separate and sometimes conflicting interests of local government, financiers and other investors, consumers, and others, aiming to facilitate compromise outcomes that appease all parties while still achieving an acceptable level of profit. The position of the developer is not one of autocrat determining where, when, and how housing is developed, but rather of motivator and coordinator of the collective decision-making of a network of diverse project stakeholders. Modern developers tend to conceal themselves behind layers of intermediary organisations and structures when interacting with local communities or the public sector, making the actual system of governance and power behind a proposed development sometimes highly oblique – the layman cannot tell who is in charge (Brill 2020).

A review of existing event-sequence models of housing development reveals two common varieties: a simple linear conceptualisation, and a more complex, cyclical conceptualisation known as the 'development pipeline.

Linear

Simple event-sequence models presented development as a linear progression through a series of distinct phases. Each model differs in how it lists, names, and describes the key events involved in housing development; however, they can be broadly synthesised as follows:

1. The maturing of circumstances: meaning when changing economic, social, planning, and environmental circumstances make the (re)development of a site feasible. This might occur because of general trends like population growth, or specific causes like a major infrastructure project or rezoning.
2. The purchase of the land by a willing developer, typically after a process of due diligence and feasibility assessment to ensure that the land can be successfully developed in alignment with the developer's strategy, character, and targeted Return on Investment, and that sufficient finance can be secured when required at step 5.
3. The preparation of the development scheme and acquisition of the necessary consents, requiring to developer to involve planners, architects, and other technical consultants. Within this event stage relationships with councils may become highly important.
4. The preparation of the land for development, requiring the developer to assemble and utilise a group of technical specialists involved in the physical and legal preparation of the site.
5. The arrangement of finance for the development.
6. Construction.
7. Occupation by either the developer, a new owner, or a tenant.

While these linear models provide a useful basic understanding of how an individual development project occurs, recent researchers have criticised them for failing to capture how development projects interact with one another to create a cyclical 'pipeline' of development in which the successful completion of one development project contributes to the context in which future projects occur.

Development Pipeline

In response to these criticisms, Adams and Tiesdale (2013) pioneered their development pipeline model:

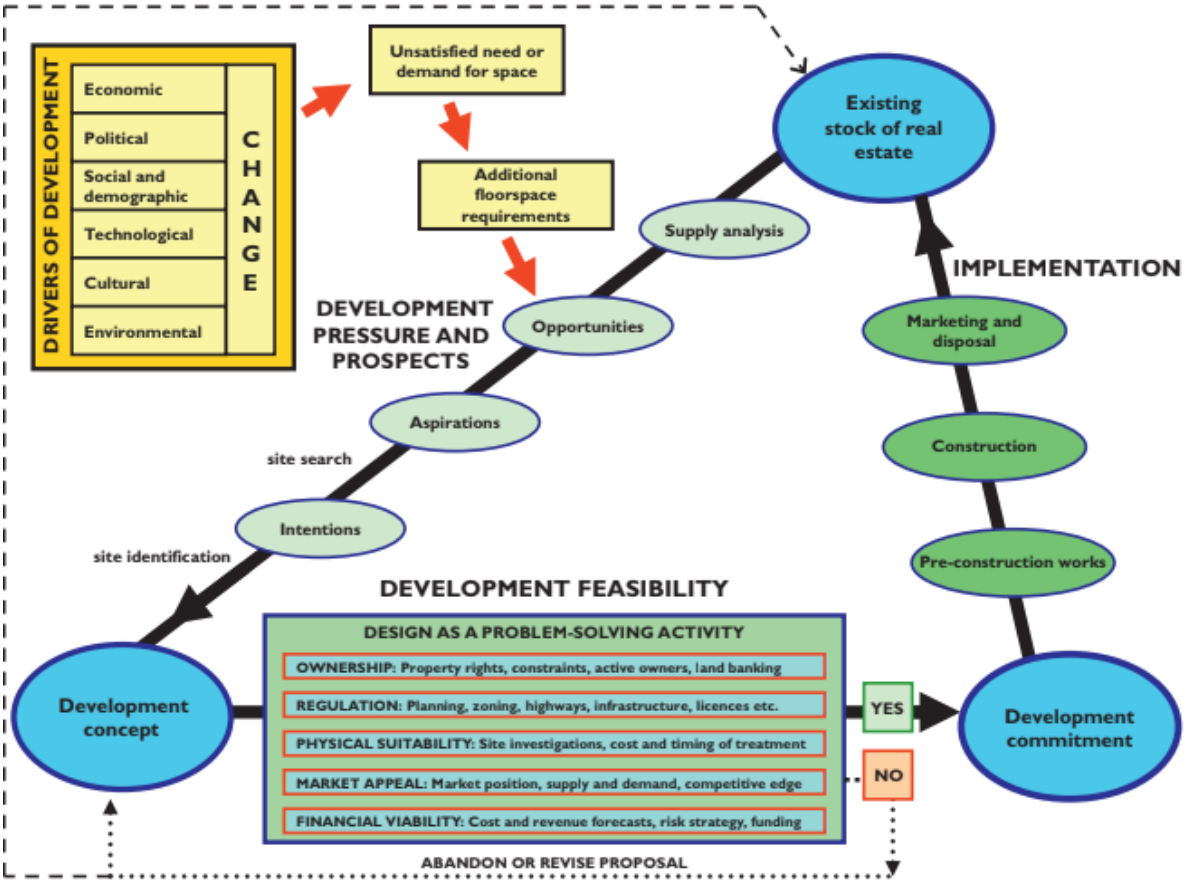


Figure 2.6 - Development Pipeline Model (Adams and Tiesdale 2013)

Unlike in linear models, in a development pipeline model the exact order in which the events occur may vary; however, each phase (or side of the triangle) must be completed before the next one can commence: for example, a developer must fully complete a project and dispose of the new units to the market before those units become part of the existing stock of real estate (Adams and Tiesdale 2013).

Development projects are conceived as progressing through the 'pipeline' at varying speeds depending on local demand, the expertise and connections of the project managers, site-specific factors, and other variables. External drivers of development create the 'pressures and prospects' that prompt a developer to conceive of a potential project. This idea must then pass - in no particular order - various feasibility tests related to site selection and evaluation, market analysis, and financial feasibility assessment, before it can proceed to detailed design and construction. Once a development is 'implemented' it must then be marketed and 'disposed', meaning sold, rented, or otherwise transferred to the intended consumers. The new units then enter the existing housing stock which developers are reacting to, hence the cyclical nature of the pipeline (Gore and Nicholson 1991).

Drivers of Development

Event-sequence models conceptualise developers as being prompted to action by various ‘drivers of development’: factors over which the individual developer has little-to-no influence over, but which create the ‘maturing of circumstances’ which entice a developer to invest in a site. The literature identifies a wide variety of such ‘drivers’, as summarised in the table below:

Table 2.D - Drivers of Development

Driver	Example or Explanation
Economic indicators	The national economy is growing, causing general growth across many industries, including housing development
Finance availability	Liberalisation of the finance sector makes it easier for developers and households to access capital, leading to longer housing 'booms' (Agnello et al. 2019)
Household wealth, income, and employment	Household 'consumption' of housing (meaning the number and value of dwellings owned) increases with income (Lu et al. 2020) but only to a certain level of household wealth, beyond which only a limited number of households choose to become multi-property investors (Yang et al. 2018), with most instead preferring investments in financial assets. While in some locations housing development is strongly tied to the local labour market, other housing markets instead exhibit a spatial division of housing consumption as people live and work in separate areas (Allen et al. 2018)
Inflation	Rising inflation reduces developer profit margins, shrinking the range of feasible projects (Rowley et al. 2014)
Interest rates	Interest rates negatively impact developer financial feasibility calculus, reducing housing development (Iossifov 2008)
Insurance premiums	The private sector announces an increase in insurance premiums for residential properties in high flood risk areas, reducing property values and discouraging future development in those areas (Indaco et al. 2019)
Population growth	Although population growth is generally correlated with housing development, the degree of correlation varies by neighbourhood type (Denowitz 1984)
New household formation	A city has a young population where young adults are regularly leaving their parents' households and establishing new ones, thereby increasing housing demand
Urban land supply	Land supply and availability influences the types of development which arise to meet demand. For example, in cities like Auckland and Wellington, there is high demand for new housing but little available greenfield land. This discourages greenfield subdivisions in favour of higher-density developments
Regional and local economies and populations	Demand will be concentrated in regions, districts, cities, and areas with growing economies and/or populations. For example, the strong tourism industry in Lisbon, Portugal has over-concentrated the rental housing stock near tourist attractions (Lestegás et al. 2019)
Demographic change	Demographic change influences the types of new housing units demanded and thus the types of developers which are able and willing to meet that demand. For example, the population is aging, reducing demand for family homes but creating new demand for small housing units and retirement villages (Productivity Commission 2012)
Planning instruments	Planning instruments like spatial plans, strategies, objectives, and policies can direct demand away from certain areas and towards others. For example, environmental protections that restrict residential development in a sensitive area
Major infrastructure investments	State investment in a major infrastructure project will concentrate development in the surrounding area

Information

Developer understandings of these drivers of development and the demand they create, as well as of market conditions and dynamics, the value and suitability of potential sites, and the potential risk and profit from a particular development, is always imperfect and filtered through their limited corpus of information (Hino and Burke 2020). This information can be divided into three broad categories: expert, relational, and experiential.

Firstly, some of the information which developers use to conceive of new development concepts and develop them into finished products comes from the research and analysis of experts specialising in fields like market analysis and forecasting, site yield estimation, and financial feasibility analysis. This expert information might be produced in-house, sourced from external consultants, or provided through official public channels of information like central government announcements and new local government strategies. This is the most reliable and comprehensive source of information but can also be the most expensive to acquire (Dodd 2020).

Secondly, the formal guidance of experts may be supplemented or substituted with the informal knowledge that comes from interactions with, and observations of, other actors in the developer's actor-relationship network. Any of the different actor groups can provide such information; for example:

- Small developers may observe and imitate the successful developments of their larger peers, or else identify market niches which these developers are not operating in (Ro et al. 2019)
- Developers might receive informal signals about demand directly from households – for example, a small developer might hear from a few house-hunting young adults that there is a lack of affordable housing near a university, and investigate low-cost development options in the area
- A developer might have an established relationship with a particular staff member at council, who advises them about future planning and development trends and provides informal advice on proposed projects (Ruming 2010)
- The network of consultants, suppliers, and contractors which the developer utilises might share their market insights and experiential knowledge

Thirdly and finally, developers apply the lessons learned from their past projects to guide their future endeavours, with the strength and breadth of this knowledge naturally growing with developer age and experience (Ro et al. 2019).

Many event-sequence models attempt to conceptualise how information acts as an intermediary between the drivers of development and actual development activity, and

some also identify how the relative prevalence and importance of each source of information varies by developer size: while both small and large developers will draw on their own past experiences to guide future behaviour, small developers tend to rely more on informal, relational knowledge, whereas large developers possess the resources and organisational capacity to consistently supplement this with formal, expert knowledge (Coiacetto 2001, Ruming 2010).

Concept Stage

Possessing information about market demand for new housing units – what types of units are demanded in which areas - developers are prompted to conceive of a development concept, the first distinct event in the sequence of development, and attempt to make this both feasible and profitable. For example, a developer might know that there is a severe lack of small, affordable housing units in a city and conceive of the general idea for a high-density, low-cost housing complex in an inner-city area.

Site Selection

Next, the developer will search for a site where circumstances have sufficiently 'matured' so that it can feasibly meet this market demand through enabling development that aligns with the developer's character, experience, capability, and strategy.

Feasibility Assessment

Once a site with the potential for development has been identified, the developer will then assess whether that development would be financially feasible. This is another area in which a difference between small and large developers can be observed. For many small developers, their predominant financial feasibility assessment methodology is a simple 'back of the envelope' calculation of present profit minus predicted costs based on their previous experience. Such methodologies do not employ future discounting, risk premiums, or other such accounting techniques.

This is in contrast to large developers, which tend to use more advanced financial feasibility calculus methodologies like Internal Rate of Return, Margin on Development Cost, and Net Present Value. These are more in line with contemporary mainstream capital budgeting theories and better at accounting for future uncertainties and trends, giving the large developer a more realistic expectation of return and thus a greater chance of a successful development. The difference in methodologies can be explained by a combination of access to more expensive accounting tools, the greater need for risk management when working with larger sums of money, and the expectations of banks and shareholders to see such techniques employed (Rowley et al. 2014).

Development Commitment

Once proven feasible, the developer commits to the project by unconditionally purchasing, or otherwise acquiring development rights over, the land, and proceeds with the design and consenting elements. Technical experts like architects, engineers, and planners convert the development concept into a detailed plan based on their own past experience and industry norms, and assist in preparing applications for planning and building consents. While small developers generally accept the decisions of local government and must operate within existing planning restrictions, large developers may have sufficient resources and influence to challenge planning decisions, agitate for favourable policy and rule changes, and landbank in expectation of future rezoning (Coiacetto 2000).

The developer now has a sufficient level of project detail and confidence to approach financiers and lenders, who will apply their own financial feasibility analysis to the proposal and may impose conditions like a requirement that a certain proportion of the new units be pre-sold (common in a New Zealand context). Small developers have limited cashflow and resources, making them very reliant on financing; larger developers may be able to self-fund part or all of their future developments (Ruming 2010).

Pre-Construction, Construction, and Disposal

Finally, the development proceeds through the site preparation (pre-construction), construction, and disposal stages. There are the most expensive stages, wherein developers closely monitor their costs and timeframes to ensure that the project generates the expected level of profit. For small developers, these stages may be ‘make or break’, as they must invest most of their resources in a single development and cannot recover from a major delay, cost overrun, unexpected challenge, or project failure; but rather must sell all the new units within a limited timeframe to recoup costs, restore financial balance, and proceed to their next development (Ruming 2010). This makes developers more risk-adverse during these final stages of the development sequence, and for some developers, especially small and/or inexperienced ones, any unexpected change in the market or disruption to production may cause them to panic and pursue options which reduce their final profit but allow them to offload their risk quicker. For example, a small developer might worry that market sales prices are trending lower than expected and sell at a significantly lower price in order to extract themself from the existential threat of a major development failure (Mohamed 2006).

Decisions at this stage around project team selection, cost planning, and (sub)contracting have major ramifications for the risk level and future profit of the project. The type of information relied upon at this stage once again varies by developer size: for small-scale

residential construction projects, it is common to use pre-established and suitably-priced bills of quantities as the prime cost estimating method. The accuracy of this is primarily determined by the expertise and experience of the estimator. For larger projects, various complex calculative methodologies are employed (Kam et al. 2016).

Once complete, the developer must now 'dispose' of the units in a way that maximises profits and aligns with their other goals and values. To increase the sales price of the units, gain brand recognition, increase their market share, or curate a certain type of demographic community at the development, larger developers may engage in marketing campaigns, which typically present a lifestyle and community vision to potential consumers. This practice is especially strong among luxury developments, gated communities, retirement villages, and other specialist forms of housing developments (Almatarneh et al. 2013).

Stair-Step

Stair-step models are a variant of event-sequence models specifically focused on how land and property value increases over the different event-stages of a development project. This value is determined by both the existing use and expectations of future uses once the proposed development is complete, with the value-add growing as the project gains detail, regulatory approval, financial backing, and finally, physical form (Christensen 2014). They have been employed by researchers interested in the precise financial mechanisms by which developments proceed, or those studying large, masterplanned developments occurring in stages over a long period.

Common Applications

Unlike equilibrium and agent-based models, which are primarily used to simulate development and understand the effects of specific policies, variables, and scenarios on future development, event-sequence models are primarily used to understand and analyse the process of development and how it varies across national, local, temporal, typological, and other boundaries.

For example, Adams and Tiesdale (2013) developed their development pipeline model for the purpose of conceptually identifying the key causes, processes, and consequences of 'development failure': the failure of the market to develop a site with high development potential that should theoretically have been developed. The development pipeline model identifies key 'pipeline blockages' – the inability to pass key financial, technical, and regulatory gates – which are points at which a development might fail.

It is important to note that event-sequence models are often subsequently adopted as part of the conceptual framework for equilibrium and agent-based models.

Strengths and Weaknesses

Event-sequence models provide a conceptual understanding of the process of development that is separate from specific contexts, scenarios, and variables. This means that they do not require large supporting datasets and are applicable to a much wider range of real-world development situations than equilibrium models or ABMs. It also means that, as introduced in the previous section, event-sequence models enable comparative analysis of development processes.

These models also include not just those development activities which proceed successfully to the construction and/or sale stages, but also the many projects that are abandoned or significantly altered at various decision points along the event-sequence, thus giving a much more holistic understanding of all development activities and better insight into the 'gates' at which key decisions are made, particular variables become paramount, and development may fail (Adams and Tiesdale 2013).

However, Healey (1991) and others criticise event-sequence models for over-generalising the events, sequence, and important roles involved in development, presenting a highly prescriptivist model of the 'normal' development that excludes the many alternative courses of action and parallel activities that are in reality commonplace. Particular criticism is levelled at the idea that development must always begin with a maturing of circumstances: depending on their character, resources, and influence, developers may instead act to actively create those circumstances instead. Event-sequence models also inaccurately present external variables as undifferentiated things only of influence at specific stages, and model variables like the existing housing stock and land supply as static quantities rather than dynamic and relative/relational (Squires and Heurkens 2016).

2.6. Structuralism

If equilibrium models represent an attempt by neoclassical economists to develop an explanatory 'theory of housing', then structuralist approaches represent a similar attempt from the realm of contemporary Marxist economics. Like event-sequence models, structural models provide a conceptual mapping of the development process, however, instead of focusing on a linear progression of events, structural models focus on the key groups, institutions, systems, norms, and markets that form the 'structure of provision' which determines what housing is built, where, how, and for whom (Ruonavaara 2018). For example, consider Ball (1986):

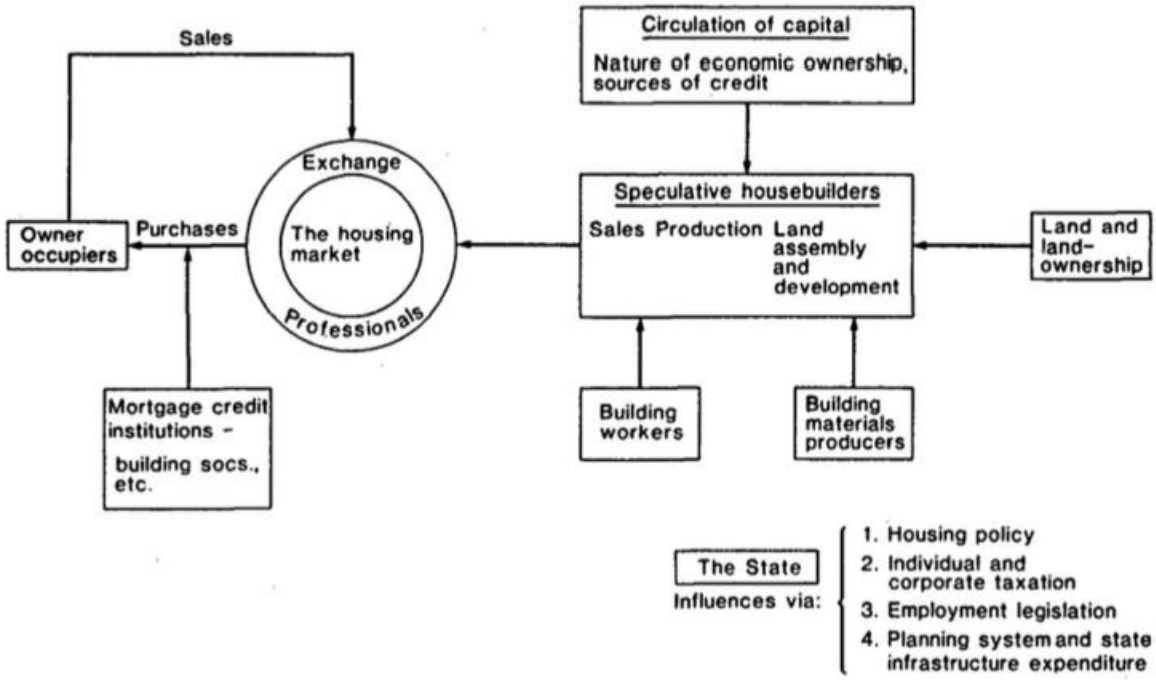


Figure 2.7 - Structure of Provision Model for Private-Sector Development (Ball 1986)

Particular focus is placed on the circulation of capital through market exchanges and the role of the state as determinant of the 'rules of the game' which govern these spaces. Adams and Tiesdale (2013) identify seven markets involved in the real estate development process, each being dominated by the interests of different economic classes or interest groups.

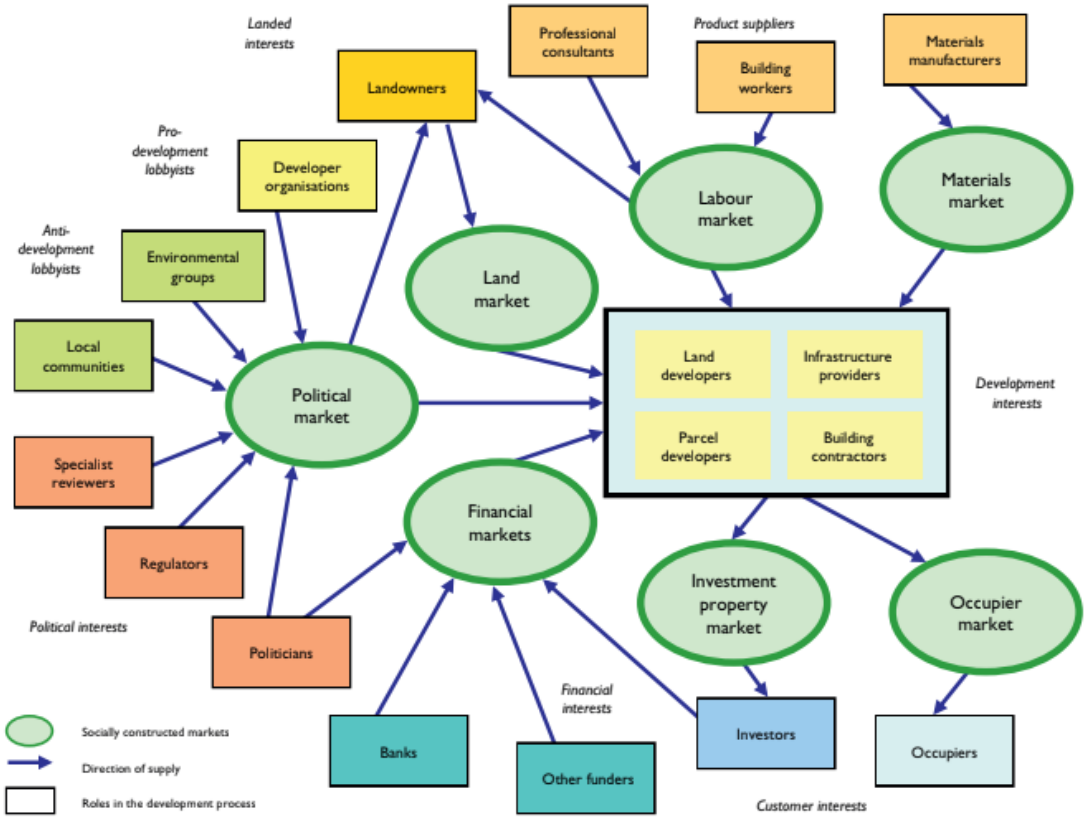


FIGURE 5.8 A role-based model of the real estate development process.

Figure 2.8 - Roles, Markets, and Structures Involved in Development (Adams and Tiesdale 2013)

Common Applications

Structural models emerged from Marxist economics primarily as a means of identifying and critiquing the sociocultural, economic, political, and institutional forces that shape the outcomes of what in many cases are seen under the dominant paradigm as being 'neutral' processes within development. Ball (1986) and other researchers intended for their models to highlight these forces as causes of housing market failures like homelessness and unaffordability, and to thereby encourage policymakers to challenging existing norms in favour of more equitable outcomes.

However, more recently Adams and Tiesdale (2013) and others have applied structuralist approaches to a more general and neutral study of the key roles, institutions, and markets in development – how these vary between contexts, how they are constructed and challenged, and how they effect current and future development outcomes.

Like event-sequence models, structural models and theory are also sometimes used as part of the conceptual underpinning of other models.

Strengths and Weaknesses

The key value-add of the structuralist approach is its examination of the importance of institutions (both formal and informal) and sociocultural norms and values in creating the context in which development occurs. However, this model type has had the least uptake in the literature due to its historical ties with a specific politico-economic ideology and limited scope, disregarding for example the important role of agents in circumventing, resisting, and reshaping those institutions, structures, and norms.

2.7. Analysis

Table 2.E - Summary of Modelling Discipline, Strengths, and Weaknesses

Model Type	Applications	Strengths	Weaknesses
Spatial Equilibrium	Scenario modelling and the effect of changing specific variables on future development	Enable comprehensive scenario modelling with many variables	Limit or ignore agent heterogeneity
Agent-Based Models	Scenario modelling involving high agent heterogeneity, understanding competition between actors	Incorporate agent heterogeneity, reveal the relationships between agent-level variables and system-wide outcomes	Require large datasets to be accurate
Event-sequence	Conceptual understanding of the process of development and comparative analysis of different development contexts	Provide a conceptual understanding of the development process identifying key 'gates'; capture projects which fail at these gates	Over-generalise and can be overly prescriptivist
Structuralism	Identifying and critiquing dominant forces and norms in development	Highlight the importance of often hidden institutions and norms	Limit or ignore agent heterogeneity

As the table above summarises, each modelling type is unique in its applications, strengths, and weaknesses. Event-sequence and structural models provide complementary conceptual understandings of development processes, highlighting different elements – the

temporal progression of a development and the key requisites which must be met at in each stage in the former case, and the role of institutions and norms in the latter. However, both also tend towards simplification, myopia, and a disregard for the specific contextual differences between the contexts and actors through which real development occurs.

Both of these conceptual models can be integrated into either spatial equilibrium or agent-based models to investigate specific development contexts, scenarios, and variables. Since equilibrium models and ABMs have similar applications, the key test when determining which to use appears to be: is there significant agent heterogeneity among the population or developers, or other development actors, which is to be modelled?

Thus, to determine which model is most appropriate for the research context, it is necessary to first investigate the level of diversity in the contemporary New Zealand development sector.

2.8. Diversity in the Contemporary New Zealand Development Sector

For the bulk of New Zealand history there has been an assumed sociocultural norm of homeownership as the desirable end point for a majority of familial households. Homeownership was actively encouraged by successive governments during the 20th century through policy programmes that included the provision of low-interest loans for first home buyers and allowing households to capitalise their family benefit for use as mortgage deposit. These policies succeed in raising homeownership rates from about half in 1936 to a peak of 73.8% in 1991 (Stats NZ 2020).

Homeownership offers financial security, cultural conformity, and a sense of belonging to a community. Although newly-formed households might temporarily rent, this is typically under the assumption that they will eventually purchase a home upon attaining a sufficient level of income and wealth. The ‘normal’ New Zealander moves out of their parents’ household relatively young, progressing up the ‘property ladder’ until they own a home from which their own children will eventually depart. State housing is presented as a temporary last resort for the ‘deserving poor’ (Murphy 2014).

The legacy of this norm continues to informs the contemporary development sector in two relevant ways. Firstly, the majority of the existing housing stock is catered towards small nuclear homeowning households. Secondly, there is also a significant class of ‘mum and dads’, homeowning households with the personal resources to invest in upgrading, subdividing, or redeveloping that property (as opposed to simply selling it to a development company).

However, New Zealand is currently experiencing two concurrent demographic trends which are changing housing demand and development norms. Firstly, there has been consistent growth in ethnic diversity since immigration was greatly liberalised in 1987. Many of these new ethnic communities have cultural norms of large households, with children remaining with their parents for longer periods and relatives beyond the nuclear family often living at home too. Secondly, the population is aging, resulting in a growing number of small households composed of an elderly couple or individual. The net effect of these two countervailing trends has been to encourage the development of a greater range of housing sizes and typologies catering to households beyond the traditional nuclear family (Productivity Commission 2012).

General consumer preferences are also changing. Historically there was a strong preference for dwellings that are vertically and/or horizontally separated from others – typified by a detached family home on a quarter-acre lot – in opposition to the higher-density, often semi-attached styles of living favoured in many other global regions (Dodd 2020). This preference is evaporating rapidly as housing unaffordability issues, increased planning permissiveness, and cultural, demographic, and household character changes have prompted a recent period of intense higher-density housing development, especially in large cities.

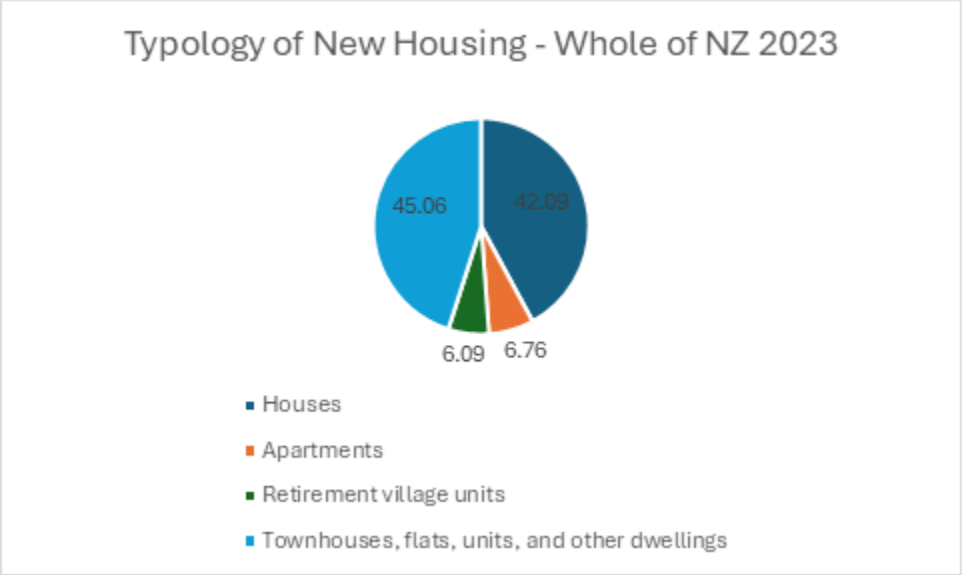


Figure 2.9 - Typologies of New Housing Units Consented in 2024

2022 was notable for being the first year on record in which a majority of new dwellings were apartments, townhouses, or units, rather than the traditional standalone suburban family home which had previously dominated the urban environment of New Zealand.

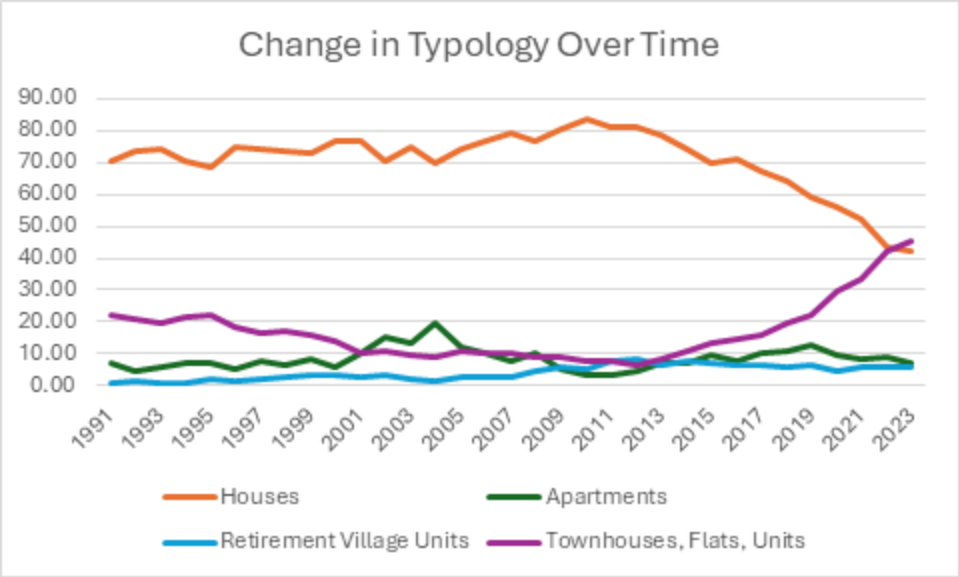


Figure 2.10 - Evolution in the Production of Major Housing Typologies Since 1991

This is mostly attributable to a rapid growth in the number of new townhouses, with the number of new apartments and retirement village units remaining largely consistent over the last three decades (the number of new apartments was actually highest in 2004 (19.55%), when increased migration from Asia and changing family typologies prompted a temporary apartment boom (Stats NZ 2005)). Should this trend continue, future areas of greenfield and brownfield development will likely be dominated by townhouses rather than standalone homes, creating a very different suburban built environment than what is currently dominant.

This rapid growth in diversity of demand and output reflects the diversity among developers in contemporary urban New Zealand which is detailed in section 3.12. To summarise, the research context is one of significant and growing diversity in the population of active housing developers, the types of housing being demanded and provided, and the households creating that demand.

2.9. Conclusion

This section has presented the results of a literature review identifying existing conceptual models of housing development. There are four dominant model types, each with its own common uses, strengths, and weaknesses. While event-sequence and structuralist models provide valuable conceptual underpinnings, the two existing ways of modelling specific development contexts and scenarios are spatial equilibrium and agent-based models, with the key test of applicability therefore being whether the research context has a significantly high level of agent heterogeneity.

The heterogeneity among developers, development projects, and households observed in the present research context makes an agent-based model the most applicable and useful option. Modelling this agent diversity will enable a more nuanced and accurate understanding of the broad range of development activity occurring in the country, enabling more accurate scenario modelling and enabling better understandings of how specific variables and actor-groups affect development outcomes in this context.

3. Typology of Developers

3.1. Introduction

The previous section has established that there is significant diversity among developers in contemporary New Zealand. However, individually analysing the behaviour of every developer in a particular location, region, or market is a Sisyphean task; it is much more efficient and useful to instead create a typology by grouping developers on the basis of their common features or in a way that reflects the structure of local markets. While individual in action, when aggregated these different types of developers may have similar motivations, values, and rationales and, given they operate within the same policy settings, can be expected to make similar decisions at key points during the development process when presented with similar circumstances.

What typologies of housing developers exist in the literature? And which of them (if any) might be applicable to the research context? To answer these two questions I conducted a systematic literature review following the PRISMA protocol. This enquiry revealed twelve existing typologies of residential development based on a broad spectrum of different developer characteristics and behavioural traits.

3.2. Methodology

The primary source of screened records was the Scopus database, with some additional records identified from the Google Scholar database. While searching Google Scholar generally returned a greater number of results, this database has significant issues with irrelevant, irreputable, and non-retrievable records, meaning that a much greater number of the results were excluded at the screening stage.

The identification stage began with a series of test searches to determine which phrases and key words would be most effective at producing relevant results The following searches were then selected for inclusion:

1. “residential developer typology”, Scopus (45 results)

2. “residential developer typology”, Google Scholar (top 100 results)
3. “developer” + “typology” + “dwelling”, Scopus (32 results)
4. “property developer typologies, Google Scholar (top 100 results)
5. “modelling housing developers”, Scopus (top 50 results)

Search results were ordered by number of times cited in other works.

These searches produced a set of 327 identified records. These were screened by a manual review of their title and publication information, with the key considerations being relevance to the research questions; quality of the publication; reputability of the authors and publisher; and age of the record, with works published prior to 1990 being rejected as too old. These criteria excluded the vast majority of the records.

The remainder were then subjected to a secondary screening involving a review of the abstract (for academic journal articles) or introduction (for books). Reasons for exclusion at this stage included that the full document could not be retrieved; that the work does not include a typology of developers; that it is in a foreign language and there is no good translation available; and that it provides a typology of the development process rather than developers.

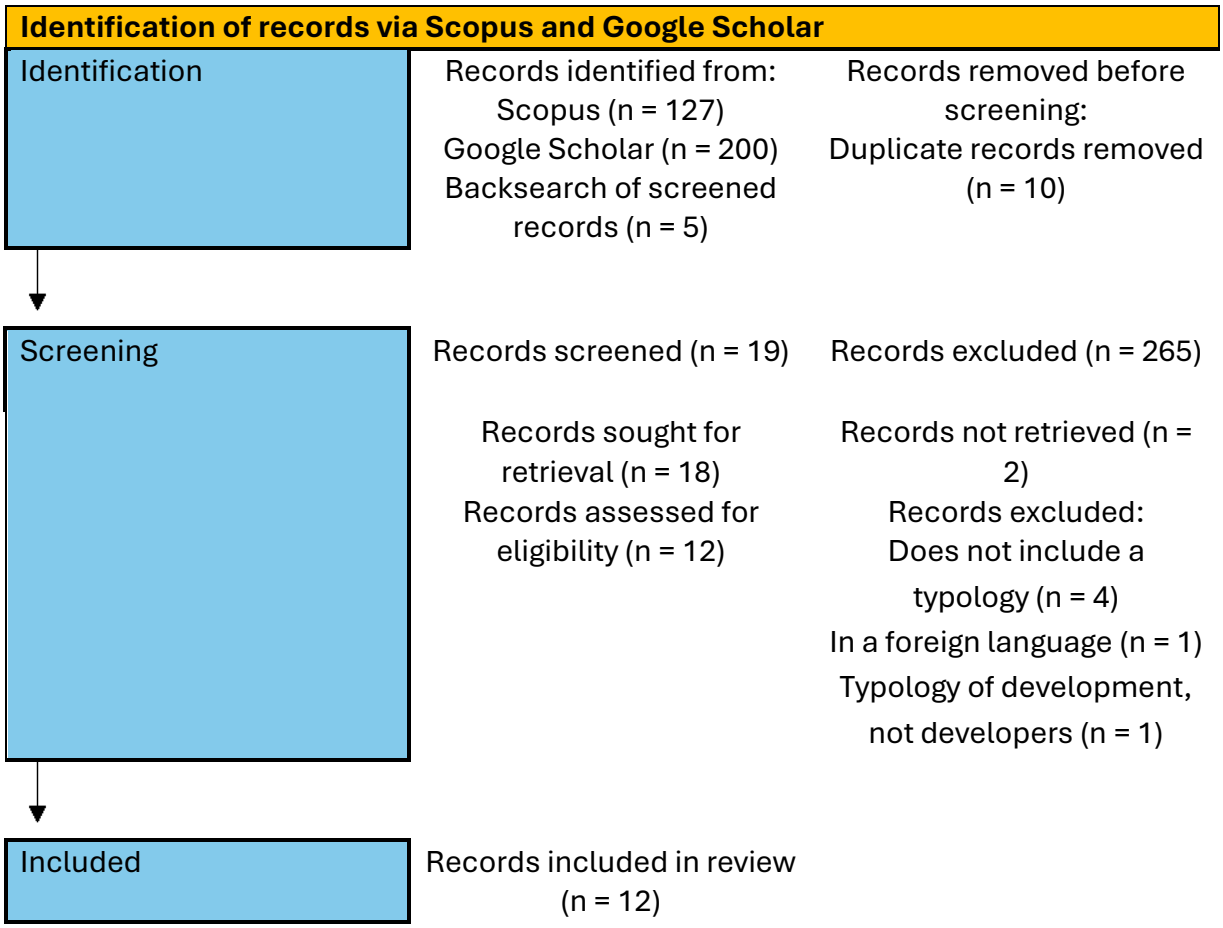


Figure 3.1 - PRISMA Flowchart

Reviewing each of the 12 typologies included in the final analysis revealed that each one focused on a particular characteristic by which developers can be categorised. For example, some used developer size, whereas others focused instead on whether the developer operates at a local or super-local level. The records have accordingly been sorted by this method in the paragraphs below.

3.3. Organisational/Ownership Structure

One way of typologising developers is by their organisational and/or ownership structure, with common types including:

- A public entity like Kāinga Ora – Homes and Communities
- A community organisation providing housing (e.g. an NGO, charity, or religious group)
- A small private company with a director and employees
- A company with stocks traded on a public exchange, legally beholden to its shareholders

There are often strong distinctions in purpose, values, and strategies between these types. Public and community organisations typically develop with a specific set of social objectives (e.g. provision of housing for those who cannot afford it on the private market), seeking to meet this need through the efficient use of available resources. They might also require sites with specific features, like proximity to important community centres or locations with the greatest need.

Privately-held or publicly-listed companies both tend to pursue profit first and foremost. However, while a director may be able to adopt whatever strategy he wishes, shareholders demand a secure and predictable investment, enforcing conservative behaviour (Ball 2003).

3.4. Primary Type of Development

International case studies have found that developers typically specialise in one primary type of housing development. This specialisation affects their strategy and behaviour. For example, Parker et al. (2023) found that in Waterloo, Canada, there was a strong distinction between greenfield, infill, and student housing developers. These groups differed significantly in their target demographics: while the infill developers chose sites, designed projects, and made strategic decisions with the goal of attracting a wide range of households and individuals, greenfield developers specifically targeted homeowning families, giving relatively little consideration to renters and/or smaller households.

Different development specialisations mean that developers prioritise different variables and concerns when planning their next development. Parker et al. (2023) found that while for greenfield developers, infrastructure servicing, support from local and regional governments, and accessibility to major roads are especially important; for infill developers, employment, service, and amenity density, proximity to public transport, and development contributions may be the more important variables.

3.5. Size

Perhaps the most common way of categorising developers is by size, which has been variously measured by number of employers, number of projects, typical project size, and typical project value. Morgan (2010) investigated how many key behaviours differ between small and large developers, including market and parcel knowledge, approach to managing risk, and territoriality.

Table 3.A - Summary of Key Behavioural Differences Between Small and Large Developers (Morgan 2010)

SMALL DEVELOPER APPROACH	BEHAVIOUR	LARGE DEVELOPER APPROACH
Inaccurate, focused on local area rather than wider property market. Lack of financial resources also makes their assessment inaccurate.	**Market Knowledge**	The financial resources available usually mean forecasting and or other techniques are used to increase accuracy of market assessment.
Knowledge of local attributes of the parcel offsets less detailed approach to the residual value calculation.	**Parcel Knowledge**	As above. The financial resources put into the residual value calculation usually means assessment of parcel profit is more accurate.
'Gut' instinct type approach to managing risk. More successful based on experience level of developers.	**Risk**	Usually measured and planned approach to development. Will not shy away from risk, but dependent on the reward.
Less prevalent, because amount of capital tied up in future development restricts level of current development.	**Landbanking**	Commonly used to ensure a steady stream of development projects and ability to purchase large parcels with high expected returns.
Mimics previous successful developments and moves away from previous unsuccessful development opportunities.	**Habit Persistence**	Choice and type of development based on best choice at time of development.
Critically important, often a 'make or break' type of scenario. Commonly requires development soon after purchase.	**Timing**	Able to handle a mistimed development because of increased financial resources. Might hold back development until better time.
Small in size and local to developer's home, Development operations are predominantly focused within territory.	**Territoriality**	Large area of interest to the point of no real territory. Developments are chosen based on factors other than territory.

Table 4.1: Summary of key developer behaviour

Large developers possess sufficient resources and organisational capacity to invest in a formal investigation of the potential risks, possible yield, and expected profit from each site they consider developing. Many parts of their decision-making, including the creation of a development concept, site selection, and marketing, will be informed by quantitative market evaluation and long-term forecasting.

Meanwhile, small developers are often operating on a project-by-project basis, with very little spare capital or capacity to make these types of information investments. They instead rely on other sources of information, oftentimes less accurate and reliable but still valuable:

information shared through a network of industry and local government contacts, personal experience, and 'back of the envelope' calculations. The quality of such information is highly subjective, determined by the level of experience, historical performance, and strength of network of the developer.

Dodd (2020) observes that developer size is strongly correlated with willingness to tolerate risk: while small developers have tied their financial future to a single project and will tend to act conservatively, large developers may be simultaneously investigating and investing in multiple properties across a dispersed area, making them less psychologically and monetarily invested in any one single site or project. The accuracy with which developers are able to predict risk and profit also varies by size, which is correlated with the quantity and quality of information available to a developer at each stage of the development process.

Another way that developer size affects behaviour is timing. The timing of a development is an important contributor to profitability: developers wish to minimise the length of financing and land purchase negotiations, site preparation, input assembly, and construction, while also releasing the units onto the local market when demand is strong. For a small developer, their limited cashflow and financial resources make development timing make-or-break. They must move rapidly through the land purchase, development, and sale processes, attempting to find the optimal timing of each stage within the limited window of opportunity available to them, but being sometimes forced to accept suboptimal timing rather than jeopardise their overall financial viability.

This contrasts with large developers, who have enough savings and cashflow from multiple ongoing investments to create landbanks of sites which they can then choose to develop whenever their market and risk assessment information indicates that profit will be acceptable. They are not immune to accidentally mistiming their projects, or having a project fail due to unexpected changes in the market, but they are more likely to be capable of successfully absorbing this loss.

Authors like Wahyudi et al. (2019) have identified a connection between developer size and geographical distribution of activities. Small developers tend to operate in only one or a few districts, whereas larger developers may operate regionally, nationally, or even internationally. Within a single urban area, the development projects of small developers tend to be further away from the inner city, following an inconsistent locational pattern, whereas large developers are able to peruse a more coherent and connected spatial pattern of behaviour including high-value inner-city sites.

Typology by Size and Scale of Operations (Ruming 2010)

Ruming (2010) presented a detailed size typology based on developers engaged in urban renewal development in the middle and outer ring suburbs of Auburn, Bankstown, Fairfield, and Penrith, Sydney, linking size with scale of operations, predominant type of development, strategy, and other behavioural characteristics.

One-Off

These are individuals, households, small groups of people, or trusts whom Ruming associates with the one-off development of a site they have owned for an extended period, usually building townhouses or similar. This is not typically part of a proactive strategy but rather a reaction to changing circumstances which have increased the development potential of the site – for example, increased demand for housing in the area, or a change in planning rules, or the development of infrastructure and the appearance of other intensification developments in the environs.

Each project is pursued for private reasons, with common motivations including to fund retirement and/or provide additional housing for family or community members.

Small Local (less than 10 dwellings per typical project)

These are typically an individual or small company for whom development is their primary employment, engaged in a sequential process of residential intensification and small subdivision projects, doing 1 – 3 projects per year. With limited cashflow, tight budgets, and little flexibility, they are very cautious and conservative. One somewhat paradoxical aspect of small local developer behaviour is that their financial conservatism leads them to project manage their own developments with minimal assistance from external consultants, yet this leaves them reliant on often-subpar information, leading to suboptimal economic outcomes.

Another consequence of this self-reliance is that, although they represent a significant proportion of development activity, small local commercial developers are characterised by difficultly understanding the formal planning and financial rules governing development, which leads them to purchase sites on the basis of an overestimated site yield.

Medium Local and Regional (10 – 30 dwellings per typical project)

These are small companies of up to five staff, engaged in larger developments on a more frequent basis, up to about 30 dwellings. It is at this level that some developers begin to acquire sufficient financial resources to self-fund some of their projects and thus escape complete control by financiers, but this does not reduce their inherent conservatism. Ruming observes in them a strong tendency to produce minimum-quality, poor-design,

standardised dwellings that have well-proven market appeal. They generally develop a single type of housing across multiple local government areas, in which they are well-established.

These medium-sized developers dominate the urban renewal sector because they occupy a middle-ground between small developers, unable to afford the higher costs and other challenges associated with the development of brownfield areas, and large developers, who are often unwilling to engage in an extended period of lot consolidation.

Large Regional (more than 30 dwellings per typical project)

Ruming discusses this type of developer only very briefly, as they had very little presence in the inner-city suburban areas that she studied. concludes that there are very few large-scale developers engaged in urban renewal as they limit their activities to greenfield subdivisions. This aligns with the New Zealand data, which indicates that the very large nationwide house and land, design and build, and consultancy developers only have a significant presence in the cities of Hamilton, Tauranga, and Christchurch, where there are still significant greenfield areas within the urban council boundaries.

Typology by Typical Project End-Value (Rowley et al. 2014)

Rowley et al. (2014) use a typology of developers by the typical end-value of one of their projects to discuss how developers differ in their ability and methodologies to secure financing.

Low Value (less than NZD 3.23 million)

The vast majority of developers fit into this category. Their low capital and cashflow make them critically reliant on project financing, yet it also makes financiers more cautious about lending to them, meaning that projects are highly scrutinised and sometimes rejected.

This means that for small developers, long-term financial security is possible only if they maintain an exceptional reputation with financiers through consistent and predictable project delivery. This requirement makes small developers low value developers much less likely to experiment, innovate, or diversify; instead, they will tend to behave conservatively, developing cheap and low-risk projects at minimal design quality, mimicking previously-successful projects ad infinitum and changing their practices only when forced to. This conservatism can even lead some small developers to sacrifice profit by choosing to develop a known ‘safe’ option over the best option available for that site.

However, low value developers’ lack of long-term capital commitments also makes it easy for them to enter and exit markets according to demand, costs, and finance availability.

Medium Value (NZD 3.23 - 21.54 million)

Medium value developers enjoy greater financial security because they are able to rely on strong local knowledge and relationships to secure financial and regulatory support. While they might conduct multiple projects simultaneously, they will still approach each project (or project stage) as separate for the purposes of financial feasibility assessment and financing.

High Value (more than NZD 21.54 million)

Because such high-value projects present an enormous financial risk to banks and other lenders, they are typically only feasible for large and highly professional developers able to demonstrate a high level of consistency, regularity, efficiency, and project risk management. However, these developers are then able to capitalise on the economies of scale that arise from large, regular developments, increasing profit

Only the very largest developers are able to assemble the combination of equity and financing required to operate at this scope and scale. These firms operate at a multi-regional, national, or even multinational level.

There is a series of trade-offs which govern their decision-making: large projects present an enormous financial risk to banks and other lenders, as well as the developer themselves, but greenfield development at a large scale can introduce economies of scale and general regularity which reduce overall project risk. It is common for large developers to engage in joint ventures – including with local, regional, and central governments - to disperse project risk, however, they are also typically reluctant to share profits with any other actors. This dual drive for regularity, efficiency, and profit capture leads larger developers to engage in vertical integration, incorporating the inputs to production and the post-project marketing and management into their own corporate structures.

3.6. Primary Business Activity (Moorhead et al. 2023)

Moorhead et al. (2023) propose a typology of developers by their primary business activity – either ‘trading’ or ‘investing’. They developed this using a case study of developers in Australia for the purpose of investigating the relationship between developer size, type, and methods of financial feasibility methodology.

Trader Developer

These are developers operating with the intention of immediately selling the new units on the property market upon project completion. In both an Australian and a New Zealand context, where the practice of development for rent is relatively rare, a majority of developers operate with this model. It is the only option available to most small developers

unable to absorb the costs of maintaining ownership over any of the projects they develop sequentially, yet it also predominates among large developers, which may engage in landbanking and greenfield development under the speculative assumption that the new sites or house and land packages will be immediately saleable at profit.

Investor Developer

Alternatively called portfolio developers by Zollig and Axhausen (2011), these are agents engaged in development with the intention of retaining ownership of at least some of the units and generating long-term rental profit and capital gains, possibly as part of a larger multi-project property portfolio. These are a minority of developers, mostly small private investors with a few larger investment firms. Compared to trader developers, they are more likely to consider long-term investment horizons over short-term opportunities.

3.7. Financial Feasibility Methodology

Developers differ in their financial feasibility methodology, meaning the calculus used to determine whether the expected profit from a development is sufficient to justify the investment (Moorhead et al. 2023).

For most small developers, this is a simple and informal estimation of residual value based on their previous experience and the limited information available, possibly simply some variant of the fundamental economic formula ‘profit = value – costs’; wherein the ‘value’ of a development decision refers to the value added to the site by the development – features like the design materials, design quality, and site amenity – and the costs are principally the land price and the financing required to fund the development.

Larger developers are more likely to use one of a range of advanced financial feasibility methodologies, the most prevalent being Internal Rate of Return, Margin on Development Cost, and Net Present Value. Although these methods are generally more accurate, analysis by Coleman et al. (2013) highlights how each has areas in which it does not align with mainstream capital budgeting theory, leading to inaccuracies when calculating fundamental financial variables. The ‘textbook’ calculations used by many developers simply input current values and costs without forecasting or accounting for inflation; the required profit is presented as a fixed cash sum rather than a target rate of return adjusted for timeframes and other variables; and all-debt financing is commonly assumed.

3.8. Timeframe

Another way in which developers may differ is in the timeframes that inform their behaviour. How long do they intend to be active developers? Are they looking to make a profit as soon

as possible, or are they willing to make a greater profit by waiting? Do they think in the 'here and now' only, or do they have a long-term vision, strategy, and goals?

Foot-Holders and Network-Extenders (Winsaro 2000)

Winarso (2000) divided the developers of Jakarta, Indonesia into 'foot-holders' and 'network-extenders':

Foot-Holders

These are people and organisations making short-term investments in property development without a long-term strategy. They 'hold on to the feet' of their more strategic peers by making low-risk investments in areas and types of development which others have already pioneered. They seek to maximise their immediate profit, and are therefore typically unwilling to make unnecessary capital commitments to a project, thus precluding land development or strategic landbanking. This conservatism means that foot-holder developers often fail to realise the maximum development potential of a site.

Network-Extenders

These are developers with a long-term commitment to the market, building a portfolio of potential and actual developments guided by a strategy that might include landbanking, multi-stage projects, land development, and other capital commitments that increase project timeframes and capital commitments but ultimately increase overall profit. Network-extenders are interested in their image and local presence, meaning that they invest more in marketing, building relationships with local government, and influencing local planning decisions.

3.9. Strategy (Coiacetto 2001)

Coiacetto (2001) developed a detailed typology based on a case study of developers in Ballina and Byron shires, two neighbouring local government areas in north-eastern New South Wales, Australia which have small, diverse populations experiencing significant growth at the time of study. He found that developers here could be divided into distinct groups based on their strategy, or lack thereof. This strategy then affects various aspects of their behaviour.

Passive Local Property Owners

These are small developers that were usually not actively seeking development opportunities; rather, the opportunity arose because rezoning, urban encroachment, or some other external circumstance either made the current land use unviable and/or a change of use both achievable and profitable. While some may have originally purchased

their property with the expectation of future development potential, this was not their primary motivation in making the purchase. Because Coiacetto's study areas were two rural and/or small-town areas, he found that passive local property-owning developers were primarily doing small residential subdivisions, with intensification or other types of site redevelopment being relatively rare.

This type of developer often has a negative view of the development process due to the high level of risk perceived in developing a personal property, difficultly understanding the process and negotiating for desired outcomes, and an inability to exert influence over local government decision-making. Their behaviour is strongly influenced by conversation with neighbours, friends, and real estate agents, and reaction to minute local changes, rather than any professional appraisal or advice. In the two shires over the period studied, passive local property-owning developers were 50 – 70% of the agents engaged in residential subdivision developers but were collectively responsible for only 20% of new residential lots due to the small size of their projects when compared to local greenfield developments. Coaicetto speculates that the presence of these developers increases when local planning rules restrict the available of greenfield areas, making the subdivision and/or redevelopment of the existing urban form more attractive.

Means to a Mission Developers

Coiacetto identifies these as organisations that develop to further the objectives of a particular community, following a strategy characterised by long time frames, significant preplanning, and inherent conservatism. Examples include educational and religious institutions developing communal housing for their members. For these developers, profit is secondary and incidental to meeting the needs of the community. Decision-making is by the organisational and/or community leadership and usually informed by professional consultant advice. In Ballina and Byron shires these represented only 2 – 3% of residential subdivision developers but about 10% of subdivisions.

Specialised Client Developers

These are developers that work regularly for a specialised clientele or type of development, for example high-rise apartment complexes or retirement villages, over a wide geographical area with few competitors. They engage in new projects by responding to calls for tender and are then required to identify and purchase a suitable site and develop it according to the criteria established by the client. The greatest risks to them are overpaying for the site or a lack of new work from their limited client base, and their organisational focus is more on appeasing the client than attending to local factors, which might prompt them to partner with local firms.

Showpiece Developers

These develop unique sites into unique developments of exceptional appearance and/or design quality. This type of development is higher-risk but also higher-reward, and often sets benchmark examples which other developers follow. These developers are characterised by having a vision beyond profit and possessing significant financial resources or easy access to finance. They may be wealthy individual investors, specialist investment firms, or architectural designers, and represent 1-2% of total developers.

Again, Coaicetto identifies these as primarily engaged in commercial development; there may be some investors or architects specialising in showpiece residential developments, but these are already captured under the 'specialist' category and don't appear to have the same industry-leading role.

Value-Adding Opportunity Developers

These are large, combined finance, insurance, and property investment firms, operating at a nationwide or multinational level, that invest significant resources in researching market trends and have a strategy based on identifying opportunities to add value to currently undervalued and underdeveloped sites, often identifying these through the operations of their other business sectors. They operate with little local experience, relationships, or commitment and all their decision-making is governed by formal financial assessment. Coaicetto estimates these as about 2% of residential subdivision developers and 10% of development.

3.10. Community Interactions

Finally, developers can be typologised by the ways in which they typically interact with the broader development community in their area(s) of operation – other developers and participants in development, local governments, and the general public.

For example, Coiacetto (2001) draws a distinction between the 'small-town' developer that operates within a single local government area via an established framework of relationships with various local development actors, accepting the current development environment and working within it, versus the 'extra-local perspective' developer that is proactively engaged in focused on achieving a particular vision of what the community should be like.

3.11. Analysis

Table 3.B - Summary of Literature Reviewed

Author(s) and Year of Publication	Typology of developers by...	Research Methodology	Case Study	Applicability to Research Context	Applicability to Research Data	Limitations
Ball (2003)	Organisational/ ownership type	Agent Based Modelling	None Specified	Medium: there is a diversity of organization/ownership types but the vast majority of development is done by private developers		Ball's 'social' developer category fails to capture the range of central and local government agencies, Māori groups, and charities which provide community housing in an NZ context
Parker et al. (2023)	Primary type of development	Interviews with developers	Waterloo, Canada	Low: most NZ developers engage in multiple types of development		Difficult to apply to developers regularly engaged in multiple types of development
Ruming (2010)	Size	Interviews with developers	Inner-city suburbs of Sydney, Australia	High: diversity of sizes observed and data captures size information		Ruming's inner-city suburban case study means that he fails to capture the significant diversity between different 'large' developers with widely different goals, behaviours, and characteristics
Rowley et al. (2014)			Australia			
Moorhead et al. (2023)	Primary business activity; Financial feasibility methodology	Interviews with developers	Australia	Medium	Low: the research data does not provide this information	The authors do not identify specifically which types of developer employ which types of methodology
Winarso (2000)	Timeframe	Interviews with developers	Jabotek, Indonesia	Medium	Low	Developers may transition between roles over time
Coiacetto (2001)	Strategy	Interviews with developers	Ballina and Byron shires, Australia	Medium: many developers found in the research data can categorised into one of Coiacetto's types	Low: the research data does not provide this information and some of Coiacetto's types are non-residential developers	Coiacetto's data and analysis includes non-residential development
Coiacetto (2000)	Community interactions	Interviews with developers	Ballina and Byron shires, Australia	Medium	Low: the research data does not provide this information	

As the table above summarises, the literature provides a wide variety of existing typologies of developers, each unique in its means of typologisation and original case study.

Which of these, if any, are applicable to the research context of development in contemporary New Zealand? To answer this question it is necessary to consider the applicability of the typology to the research context given the limitations of the research data and the key limitations of each typology.

Research Context

To be useful for this present research, a typology must be applicable to the current demographics and characteristics of housing developers in New Zealand.

Developers in this context are usually diverse in their activities, with companies of all sizes frequently engaging in both greenfield and infill, detached and townhouse or apartment developments simultaneously. This means that a typology by primary type of development like that of Parker et al. (2023) is unlikely to be useful.

However, the data presented in section 2.8 and part 4 of this report reveals that these developers are diverse in their organisational and ownership structures: although the majority of development is performed by the private sector, public agencies like Kainga Ora and local governments, indigenous groups like iwi/hapu/whanau, and educational and other institutions have a small but significant and growing presence. There is also evidence of diversity in business models, financial feasibility assessment methodologies, timeframes, strategies, and community interactions among developers. This means that the majority of the typologies have some overall applicability to the research context.

Research Data

A general review of the existing literature and datasets reveals a significant lack of data on the diverse characteristics and behaviours of housing developers in contemporary urban New Zealand. The present research helps to address this gap through providing new data as detailed in section 4.

However, prior to the acquisition of this new data it was necessary to identify an existing dataset that could give an indication of the current nature and composition of the development sector in New Zealand. Requests were made to six major urban councils (Auckland, Hamilton, Tauranga, Wellington, Christchurch, and Dunedin) for datasets containing the name of every individual, business, or organisation that was granted a building consent for a new residential development in the period January 2023 – April 2024 (the time at which the request was made). This data provided a sufficient snapshot of active developers against which the applicability of the existing typologies could be further tested.

This data enabled the categorisation of developers by:

- Type of individual/company
- Number of projects per annum
- Typical project size and range of project sizes
- Typical project type and range of project types
- Areas/locations of activity

The limitations of the existing data eliminated typologies by primary business activity, financial feasibility methodology, timeframe, strategy, or community interactions because there is insufficient data on any of these variables to allow the creation of a new typology.

3.12. Necessity of a New Typology

This section has presented the results of a literature review identifying existing typologies of housing developers. There are twelve dominant variables upon which these typologies have been constructed, each with its own purposes and contextual applicability. Although other typologies of developers might also be applicable in this context, a combination of the high diversity of developer sizes observed in the New Zealand sector and the availability of existing data make a typology by size the most applicable to the research context. However, the question then becomes: are the existing typologies of developers by size directly applicable to the research context, or is a new typology required?

Analysis of the research context and data reveals several significant features which the existing typologies of Ruming (2010) and Rowley et al. (2014) fail to capture:

Mum and Dad Developers

A large proportion of smaller-scale development projects in New Zealand are funded by what Coiacetto (2001) labels ‘mum and dad’ developers: individuals, families, trusts, and small organisations who typically engage in a single development project only. Because of their limited capital, access to finance, and willingness to accept risk, these developers typically engage in small residential intensification or subdivision projects producing an average of 1 – 4 new dwellings.

Many mum and dads are ‘passive’: they did not purchase the property with the immediate intention of developing it; rather, exterior changes like rezoning, urban growth, and market trends created significant development potential at the site which they then realised. However, others may be ‘active’, having purchased a property for the purpose of developing it as a financial investment.

Because they are engaged in only one development project, most mum and dads lack a strategy; rather, they are motivated by specific goals like profit from the sale of the new units, long-term rental income, and/or provision of housing for family or community members (especially among some ethnic minority communities). Their behaviour and decision-making is informal, relational, and personal. The information guiding them through every stage of the development process typically comes from conversation with their neighbours and peers, observation of other developments in their area, and a 'back of the napkin’ financial calculus rather than any formal expert advice. They cannot usually afford to self-finance their project and must apply for financing. Because a very large part of their financial

portfolio is tied to the project, mum and dads tend to be very attached to their specific development concept and its expected return, meaning a lower willingness to abandon, alter, or compromise than among their larger peers.

When mum and dad developers interact with councils, it is at a relative disadvantage due to their lack of experience or established relationships with council staff. Their applications are processed by low-level, frontline staff – duty planers and building consent officers – and the mum and dads must operate within the official channels and 'rules of the game' at all times. If council are unwilling to accept their proposal as is then they may adopt a strategy of 'fishing around', going back and forth with council until an acceptable outcome is achieved or the proposal is explicitly rejected.

Specialist Developers

The contemporary New Zealand residential development sector has a significant presence of what Coiacetto (2001) calls specialist developers. These are large organisations engaged in large but infrequent projects of special types of units like high-rise apartment buildings and retirement villages. These firms require very specific types of demand, e.g. large numbers of elderly people or an urban area with extremely high housing demand and population density, as well as very specialised types of sites. This specialization makes them sufficiently different from other 'large' developers to warrant separate analysis.

Community Developers

Finally, in a New Zealand context community developers, especially iwi/hapu/whanau, have a significant and growing role as actors operating outside of the normal values, methods, and strategies that govern development by the private sector. These are organisations who develop to further their own specific objectives, with a strategy defined by long time frames, significant preplanning, and conservatism. Examples include educational institutions providing student accommodation, iwi and hapu developing papakainga, and state agencies like Kainga Ora. For these developers, profit is often incidental and secondary to their primary objectives of providing specific community services and increasing community welfare. Decision-making is by organisational leadership informed by professional consultant advice.

Conclusion

Because none of these unique features are adequately captured by the existing typologies of developers by size, the creation of a new typology that incorporates these groups is required.

3.13. Proposed New Typology

The previous analysis has established that a typology by size is the most applicable to the research context, but also that the existing small – medium – large typologies based on Australian case studies of Ruming (2010) and Rowley et al. (2014) exclude significant groups of developers unique to the New Zealand research context.

To capture these excluding groups, it is proposed to typologise developers in a quadrant along the dual axes of frequency of projects (number per annum) and scale of operations.

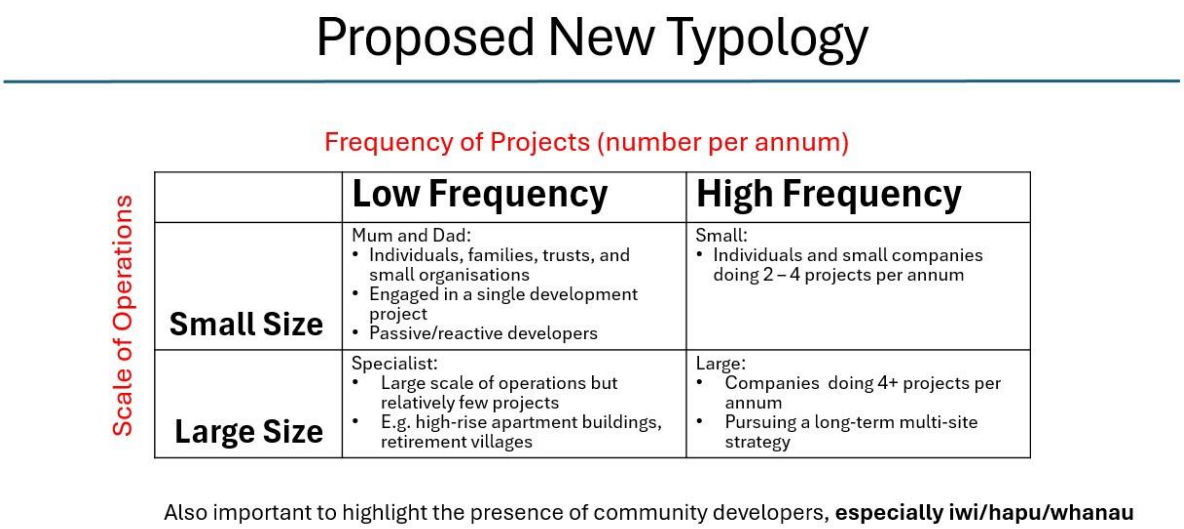


Figure 3.2 – Proposed New Typology of Developers

This typology recognises the major differences between small and large developers identified by many of the existing typologies while also identifying mum and dad and specialist as distinct categories of developer. Community developers are not incorporated into the typology proper because although they exist as a distinct type of developer, they vary greatly in both their frequency of projects and scale of operations.

3.14. Conclusion

This section has demonstrated that while a typology of developers by size is the most useful given the research context and limited corpus of available data, there are several unique features of the contemporary New Zealand development sector which the existing typologies fail to capture. It then went on to present a new typology of developments in this context which may form a useful basis for future research into housing development in New

Zealand and other similar contexts. This new typology also provides a useful basis for future agent-based modelling of these diverse developers, further contributing towards better policymaking and scenario modelling.

4. Introduction to Survey and Interviews

4.1. Rationale

The previous combined literature review and data analysis revealed a lack of existing data on the diverse characteristics and behaviours of housing developers in contemporary New Zealand and proposed a new typology of housing developers suited to this context. It now remains to apply this typology to real data and thereby provide insights into the main events, drivers, actors, relationships, values, and rationales that drive housing development.

A survey was selected as the best methodology for providing a large dataset of both quantitative and qualitative data that captures the diversity in housing developers previously identified. This survey was then supplemented through a series of interviews in which select respondents were invited to expand on their survey responses, providing further qualitative data on developer behaviours, rationales, values, and responses to various prompts. This methodology was based on Ruming (2010), who used the identification of developers via building consent data, surveying of a large population, and interviewing of a smaller group, to investigate the importance of informal relationships with local governments to developer behaviour and decision-making. The interview methodology was also informed by Glaser and Laudel (2004).

However, this methodology had several significant limitations. Given a relatively small population of potential respondents, the survey had to kept relatively short, simple, and approachable in order to maximise the response rate, which limited both the range of questions that could be asked and the complexity of the data gathered. This was however somewhat remedied by the interviews, which enabled some respondents to provide additional complexity and scope to their answers.

4.2. Methodology

Survey Development

The survey contained twelve questions grouped into three categories: demographic, site selection and development feasibility, and reactions to natural hazard scenarios. The following table provides the text of each question, alongside the research purpose(s) justifying its inclusion in the survey and literature references where applicable.

Table 4.A – Survey Questions and Justifications (Questions 1 – 5)

#	Question	Purpose(s)	Literature Reference (if applicable)
1	What is the primary type of development that you build?	1. To provide demographic data and confirm the diversity identified in the BC datasets 2. To determine whether there are any correlations between type of development and developer values, rationales, and behaviours	Parker et al. (2013) typologise developers in an inner-city Canadian case study into greenfield, infill, and student housing developers with different values, rationales, and behaviours. The typology of new dwellings used by Statistics New Zealand was workshopped with the project team to produce the following labels: • Standalone homes • Duplexes/townhouses • Apartment complexes • Retirement villages • Small prefabricated homes • Papakainga
2	Do you also build other types of development?		
3	How many projects do you or your organisation typically complete in a year?	To provide demographic data and a potential means of typologising developers by size	Ruming (2010) established a typology of small (1-3 projects), medium (4-10), and large (11 or more), based on an inner-city Sydney case study. Because the BC data also identified single-project 'mum and dad' developers as having a significant presence in NZ, this option was separated out.
4	How many new dwellings (homes or units) does your typical project contain?	To provide demographic data and a potential means of typologising developers by size	Ruming (2010) uses small (less than 10 dwellings), medium (10-20), and large (30+). However, the BC data suggested that in an NZ context the majority of developers are engaged in single-dwelling projects, with the remainder roughly split between 2-4, 4-10, and 11+ categories.
5	How long does it take you to complete a typical development project?	To provide important data to inform the development of the ABM	

Table 4.B - Survey Questions and Justifications (Questions 6 – 12)

#	Question	Purpose(s)	Literature Reference (if applicable)
6	For how many years has your organisation been active in the property development industry?	To determine whether there is any correlation between developer age/experience/maturity and differences in behaviour	
7	What are your primary areas of activity?	1. To provide demographic data 2. To confirm that the survey respondents are representative of the entire country 3. To identify any differences between developers from different places 4. To determine whether there is any correlation between the geographical scale of a developer's operations and any other variable(s)	
8	Rank the following things in terms of how important they are to you in determining the development potential of a site:	To determine what variables are most important to developers when they evaluate the development potential of a site	The literature identifies over 30 unique variables that determine the likelihood of a site to be developed. These were workshopped with the project team and reduced down to six broad categories: • Proximity to greenspace • Current land use and infrastructure servicing • Natural hazard risk • Transport accessibility • Site is in a high-end neighbourhood • Size
9	Rank the following things in terms of how important they are to you in determining whether a development concept is feasible:	To determine what variables are most important to developers when they evaluate the feasibility of a development concept	The literature identifies planning policies (Adams et al. 1992), the past experience of the developer (Dodd 2020), and their observations of other developers (DeCoster and Strange 2012) as the primary determinants of how developers conceive of, and evaluate, a possible development. In discussion with the project team, it was suggested to add social need to better capture the values of developers like iwi.
10	Please rate how likely it is that you would be willing to proceed with a development under each of the following conditions related to flood risk:	To indicate developer behaviour responses to various natural hazard scenarios	The list of scenarios was workshopped with the project team.
11	Please rate how likely you would be to change your development plans if new flood hazard mapping depicted the site as having…	To determine whether developer tolerance of natural hazard risk may vary by any demographic characteristics	Low/medium/high risk categories were used as they are common across all industries, mapping schemes, et cetera.
12	If your plans would change with an increase in flooding risk, how would your plans typically change?	A general answer question intended to indicate the range of possible developer behavioural responses to natural hazard risk	

4.3. Site Selection Variables

Survey Question 8 asked developers to indicate the relative importance of various categories of variables or characteristics in their overall evaluation of the development potential of a site. The literature identifies a great number of individual variables affecting land value, house prices, and other indicators of development potential or relative attractiveness to developers, all of which could be important to the site selection behaviour of an individual developer. However, for the purpose of a survey it was necessary to simplify these many variables into a few broad categories.

Proximity to Greenspace

The literature identifies the importance of environmental amenities to land and property values, household wellbeing and preferences, and therefore in determining geographical and physical patterns of development. Site selection can be influenced by a myriad of specific environmental amenity features, ranging from geographical features like the coastline, to natural forests and wetlands, to manmade landscapes like urban parkland. There are also different ways of quantifying the effects of such features, with some researchers focusing on the physical distance from site to feature and others instead focusing on the quality of the view which the site has over the feature.

Table 4.C - Environmental Amenity Variables Identified in Literature Review

Variable	Source and Comment
Distance from the coastline	Ward et al. (2018)
Distance from a protected natural area	Martínez-Jiménez et al. (2022)
Distance from a forest	Usually positive unless the proximity of the forest increases fire risk or introduces security and/or amenity concerns (Martínez-Jiménez et al. 2022)
Distance from an open space landscape	Positive but effect varies by household (Schlapfer et al. 2015)
Diversity of surrounding land uses	Schlapfer et al. (2015)
Distance from a wetland	Effect varies depending on whether the wetland is maintained (Chi and Marcouiller 2013)
Distance from public land	Bolitzer and Netusil (2000)
Distance from a golf course	Bolitzer and Netusil (2000)
Distance from an urban park	Piaggio (2021)
Distance from any urban open space	Bolitzer and Netusil (2000)
Distance from a stream	Usually positive, unless it is polluted or introduces flooding risk (Arsanjani et al. 2013)
View of trees/forests	Joly et al. (2009) and Schlapfer et al. (2015)
View of farmland	Joly et al. (2009) and Schlapfer et al. (2015)
View of roads	Negative (Joly et al. 2009)
View of topographical features	Positive (Joly et al. 2009)
View of water	Chi and Marcouiller (2013)

Environmental amenities have a generally positive effect on site development potential, because people usually prefer properties with the tangible presence of features and areas of high natural value. For example, Tyrväinen and Miettinen (2000) found that in Salo, Finland, a one kilometre increase in proximity to the nearest urban forest resulted in a 6% increase in market price, while views onto a forest increased dwelling prices by an average of 5%. A similar investigation by Bolitzer and Netusil (2000) into the housing market of Portland, Oregon, USA, found that sites within ~500m of an urban park sold for an average of $2262 USD more. Environmental amenities can be both natural (e.g. the coast, a lake, or a forest) and manmade (e.g. an urban park or golf course). Developers can also incorporate new environmental amenities into their developments; for example, a large subdivision in a coastal area might feature new artificial canals.

However, some environmental features can have an either positive or negative impact on development potential depending on their exact nature: what may be an environmental

amenity in one context can also be a retardant to development in another. For example, a case study of San Jose, Costa Rica revealed how development potential was low in areas bordering undeveloped forests and other natural spaces on the urban fringe due to associated pollution and safety concerns: had the same forest been a protected and managed natural park, the effect would probably have been positive instead (Piaggio 2021).

Environmental amenities are different from many other site variables in that they are typically non-essential: while most households would prefer to live at a site with high environmental amenity, many cannot afford it, or choose to instead live closer to centres of employment, commerce, and services instead. A much greater proportion of the population accept living without environmental amenities than without essential infrastructure or services. Environmental amenities doubly decline in value during economic recessions and households are both less willing to pay extra for them and less willing to accept low environmental amenity when house prices are reduced (Chadourne et al. 2013). Environmental amenities are therefore likely to attract upper-class communities willing to pay a premium for them and generate high-cost, low-density, housing development (Walls et al. 2018). This helps explain why natural amenities have the greatest effect on rural areas adjacent to existing metropolitan areas: affluent households encourage the development of housing in high-amenity areas at the urban fringe (Chi and Marcouiller 2013).

These amenities are also subject to significant spatial heterogeneity because they are highly subjective: households value sites with similar levels of environmental amenity differently according to their accessibility, affordability (as discussed prior), amenity interactions, and personal preferences. The mere proximity of an environmental feature is of little valuable if it is not visible and accessible from the site. Households tend to value amenity features highest when they have a tangible, interactive presence: thus marketers will advertise a house and/or land as featuring mountain *views* or beach *access*.

Because the full diversity and complexity of environmental amenities could not be feasibly incorporated into the proposed survey, it was decided instead to specifically test the importance of ‘proximity to greenspace’, a term intended to capture both proximity to, and views over, both natural and manmade natural areas.

Current Land Use and Infrastructure Servicing

The current land use and infrastructure servicing is frequently identified in the literature as a key determinant of development feasibility and therefore site selection. Unlike environmental amenities, most developers view evidence that the site can be developed without requiring an unaffordable process of site (re)development in order to make it compatible with their intended (re)development.

Aburas et al. (2016) identify this term as encompassing:

- How the land is legally divided and owned, and whether it can accommodate the proposed development without subdivision or consolidation of titles
- Whether the existing contour support the development
- Geotechnical, natural hazard, and contamination issues
- The compatibility of existing buildings on site and the cost to demolish them
- The current land use classification under the planning system and the difficulty of changing this if required (Aburas et al. 2016)

For smaller projects, essential infrastructure typically includes roading connections, telecommunications, and 3 waters; for larger projects, it may also include new transport corridors and linkages, new local infrastructure facilities, and hazard defence schemes (Martínez-Jiménez et al. 2022).

Natural Hazard Risk

The literature indicates that the impact of natural hazard risk on developer site selection is complex: developers are influenced by the perceived risk at the site, the level of government and council restrictions on development in the area, the perceptions of potential homebuyers as to how safe the new units will be, and, perhaps most importantly, whether the developer and future homeowners will be able to acquire private insurance.

The international literature discusses how natural hazard risk is often correlated with environmental amenities, with the positive impact of the amenities often overpowering the negative impact of the hazard: for example, Walls et al. (2018) developed a dynamic agent-based spatial simulation model of coastal areas at risk from hurricanes and found that an increase in event frequency had very little effect on future land use patterns in high-amenity coastal areas.

Transport Accessibility

Hansen (1959) defines accessibility as the spatial distribution of activities around a residential unit, adjusted for the ability and desire of residents to overcome spatial separation in pursuit of those activities. His ‘Gravity-Based Measure’ of accessibility defines the accessibility of House X to Activity Y as directly proportional to the size of the activity and inversely proportional to the distance/travel time between them. This definition has since become the most commonly accepted in the literature on the subject. Households are willing to pay a certain accessibility premium to increase their ease of access to important places and activities (Bao et al. 2021).

According to Geurs and van Wee (2004), accessibility consists of multiple components, including:

- Land-use: the amount, quality, distribution, and demand for places hosting activities that people want to travel to
- Transportation time, cost, and effort
- Temporal factors: the availability of different transport options at different times, and the limitations imposed by people's schedules (e.g. the CBD may be less accessible during rush hours)
- Individual preferences – the access needs of the population varies greatly by demographic and class groupings

The literature is in near-universal agreement that transport accessibility represents an important component of site development potential, however, the relative importance of different transport systems vary by socioeconomic context: for example, while Campbell et al. (2019) identify semi-formal public transport and walking as key transport modes in a developing country like Kenya, using access within one hour of travel time as the key metric of accessibility, East Asian case studies tend to instead emphasise the importance of rapid transit (Bao et al. 2021), while North American authors use road distance or travel time by car. The scale of effects also varies by transport mode: because most users must either walk or use active transport to travel from their home to a public transport node, the effects on development are much more localised that for an equivalent roading project. In a New Zealand context, this latter approach is the most applicable, as the vast majority of trips are made by private car. In car-dominated societies, the presence of public transport nodes can actually reduce the development potential of neighbouring sites due to associated crime and noise pollution concerns (Dore et al. 2013) - although the same may be true of motorways and other major roading projects (Jun and Kim 2016).

Accessibility in a New Zealand urban environment is therefore likely to be viewed as highest at sites with easy access to existing motorways, highways, and other major road transport corridors. A site that is very far away from local transport corridors or lacks any existing transport linkages will have very low development potential and may be unviable, as households are unable to practically access centres of employment, commerce, and services from the area.

There is also the question of: accessibility to what? Past researchers traditionally assumed that development potential (and therefore land value) was positively correlated with proximity to the CBD alone, but in today's polycentric cities the variables of accessibility are much broader (Gedal and Ellen 2018), leading authors like Winarso (2000) to discuss

‘accessibility to activity centres’. The literature identifies a broad range of potential access needs:

- The CBD or other urban centres,
- Commercial and employment areas,
- Services like schools and hospitals,
- Recreational sites,
- Major transport nodes like railway stations and airports,
- Neighbouring towns and cities,

And various others. As mentioned prior, the relative importance of these varies by individual and household characteristics.

As a final note, Wahyudi and Liu (2019) discuss how differences in site accessibility on site development potential crate a stratification in the activities of large versus small developers, wherein large developers capture the high-accessibility sites near the CBD and other urban centres, while small developers focus on a dispersed and disconnected distribution of sites around the outer urban form.

Neighbourhood

The literature indicates that developers do not select sites in isolation, but rather in the context of socioeconomic dynamics at a regional, urban, and local level. Urban areas tend to be divided, either formally or informally, into semi-distinct ‘neighbourhoods’, which are used by planners and administrators, property market analysts, and the general public, as well as by developers when making their site selections. It is common for developers to target neighbourhoods with strong local property markets and avoid areas with poor popular reputations and low property values.

Cai et al. (2023) and Chesire and Sheppard (1989) identify some of the many ways in which different neighbourhoods vary:

- Amount, distribution, and quality of local restaurants, shops, entertainment, and leisure (and associated employment opportunities)
- Amount, distribution, and quality of local education, healthcare, public service, and personal care services
- Population density
- Transportation network
- Socioeconomic demographics like income, class, and ethnicity

Gedal and Ellen (2018) have observed that in urban areas with extreme socioeconomic inequalities, a site viable for development may be left vacant or underutilised if it is located in a low-value neighbourhood, indicating a pronounced rejection of the neighbourhood by local developers.

Size

The size and shape of a site are essential determinants of its potential yield and the range of development options it presents, suggesting that it will be a major variable in developer site selection. However, because larger sites are also more expensive and require more resources and capacity to develop, Wanago et al. (2024) found that smaller developers typically limit themselves to small, dense developments, while large developers seek larger sites which allow diversification of output, staged development, and increased profit due to lower marginal costs per unit. There is also evidence to suggest that the marginal benefit of increased site size is concave: a case study from Nevada, USA found that the value per acre for residential land was maximised around 14 acres (5.67 hectares), after which the marginal value of land begins to decline (Clauretie and Li 2019). This could mean that the relative importance of site size varies by developer size.

4.4. Feasibility Assessment Variables

In a similar vein, question 9 asked developers to indicate the importance of four variables in their feasibility assessment process. These variables were also chosen due to their strong foundation in the existing literature.

Planning Policies

Local, regional, and central government planning rules all have a significant impact on the behaviour and decision-making of developers. Adams et al. (1992) discuss how in some cases the strategic directives and development guidelines of planners may be more important than the features of the site itself in determining how developers evaluate feasibility.

Planning policies can completely forbid the development of a site, or limit the range of development options, or impose restrictions that reduce the economic viability of the units, all of which may reduce the development potential of a site. The planning system can also unintentionally hinder development through long, costly, and unpredictable consenting processes that change the risk calculus for potential developers and force them to commit to particular project details early, compromising their ability to respond to market trends later in the project timeline and thereby threatening the final financial performance of the development (Grimes and Mitchell 2015).

In a New Zealand context, Grimes and Mitchell (2015) discuss the special significance of planning rules for apartment developers, with design standards in the Auckland Unitary Plan costing developers up to $100, 000 for apartment in terms of both compliance costs and forfeited revenue from reduced yield.

Developer perceptions of planners and the planning system vary across a spectrum stretching from a negative view of planning as a rules-based bureaucratic hinderance, to a more positive perception of planning as a process of future visioning and place-making in which the developer is an eager stakeholder-participant (Coiacetto 2000). However, regardless of their position on this spectrum, developers do not always unquestioningly accept the logic, rules, and decision-making of planners. Whether the product of an intentional strategy or merely the byproduct of becoming well-established in a particular location, developers often use their social capital and economic importance to manipulate the planning sector. For the smallest developers, this entails establishing relationships with particular staff within local government, helping to expedite consenting processes and negotiate compromise outcomes (Tandel et al. 2023). Medium-sized developers will alternatively appeal to council directors, managers, and team leads. However, the largest developers tend to ignore this type of local politicking and instead try to influence plan- and law- making at a higher level.

Where they cannot outright change local planning rules, developers may instead seek ways to circumvent them: for example, developers in Toronto historically sought to escape rent control polices by developing condominiums which were not covered under the existing rent polices (Rosen 2016).

The largest developers may also attempt to leverage their large economic presence by threatening to leave the area or abandon projects unless the local government offers more favourable tax rates, planning rules, development benefits, etc. These threats are never made explicitly but rather are communicated obliquely as references to unfair or uncompetitive local regulatory environments. In this way the developers make different councils compete with one another for their jobs, tax money, and community investments. Their ability to achieve this is greatest in areas with high administrative fragmentation, and lowest in areas with strong community participation and/or inter-district cooperation (Kang 2022).

Past Experience of the Developer

The literature indicates that developer behaviour and decision-making is greatly influenced by their own past experience and the prevailing external economic, political, social, demographic, technological, cultural, and environmental contexts in which they operate,

over which individual developers have very little control (Murphy 2019). Developers in New Zealand consider their provision of housing to be determined by their vision of the 'normal' household: who are they, what are their needs and wants, what type of dwelling do they require, and how this should best be designed, built, and marketed? This norm may exclude many non-traditional households, with for example most developers still planning primarily for nuclear families despite these now being a minority of households (Dodd 2020). Murphy (2020) understands housing markets as devices through which certain calculative practices are institutionalised. House prices are determined by the cumulative calculative actions of many different market actors, with the dominant parties imposing their calculative norms upon the other participants, until such practices become inescapable norms. Despite the plentiful research demonstrating how context-specific and ever-changing the 'rules' of the development 'game' (Van Dijk et al. 2007) are, most developers still nonetheless view the prevailing development system as something universal, natural, and inevitable (Murphy 2019).

Observations of Other Developers

The phenomena of the development cycle and herding demonstrate how development is a behavioural feedback loop. Development actors collectively establish norms of behaviour and decision-making which are enforced through consumer demand, regulatory mechanisms, and reputation. Developers know that standard and conservative developers are the most likely to achieve financing and consent, proceed without significant unexpected delays or complications, and fulfil current consumer demand. Deviations from these norms are discouraged by reputational loss and development failure.

However, because market dynamics, consumer demand, macroeconomic conditions, and productive technologies are always changing, there are always profitable niches available for the few firms willing and able to successfully innovate and challenge the current norms. The majority eventually follow their lead, until these new behaviours become the norms against which the next generation of developers rebel.

This means that developers have a major role in creating the values, aspirations, goals, practices, and visions that determine their own behaviour. Although most developers perceive themselves as subject to market conditions and consumer demand, they have the power to collectively change consumer lifestyles and demographics, thereby changing the demand which they must meet. Rosen (2016) gives the example of condominium developers in Toronto, Canada, in the 1970s, who collectively endeavoured to repopularise high-density inner-city housing and overcome stigmas of crime, overcrowding, and low housing quality by re-imagining these areas as ideal for young, affluent singles, thus creating a new 'yuppie' demographic to demand their product.

The literature identifies how developer behaviour is influenced by their observations of other developers through discussions of the phenomena of herding: the irrational tendency of developers to copy the successes of their peers by purchasing sites in similar locations and develop similar types of housing on them. Behavioural mimicry is common among developers because it is usually easier, cheaper, and quicker to supplement one's own limited information with those of others rather than always engaging external experts. This tendency only becomes problematic when developers fail to engage in their own evaluation of potential sites, development potential, and market demand, and instead rely entirely on flawed information about the past successes of themselves and their peers when planning new projects. At worst, herding developers outright ignore the warning signs of their own feasibility assessment on the assumption that their project is somehow special and superior to their competitors (Ro et al. 2019.

There are three primary causes of herding.

Firstly, developers are always imperfectly-informed about market supply and demand. Acquiring objective expert information is difficult and costly, and so developers tend to instead rely on a combination of personal knowledge and experience with what they can learn from the choices, experiences, and information of others in their social network. This information is always imperfect and typically out of date (due to the time lag inherent in all development projects), and these errors increase with each new iteration of copying (Ro et al. 2019).

Secondly, developers tend to avoid making unconventional or unusual decisions because this will weaken the confidence of their investors and collaborators and, if unsuccessful, threaten their general reputation. It will often save a developer time, resources, and effort to copy the actions of others rather than face the research costs and heightened reputational risk of attempting to find a radical new development opportunity (DeCoster and Strange 2012).

Thirdly, herding is strongest when the market is experiencing a boom: at these times there is less information available to inform development decision-making, greater pressure on developers to seize the moment and maintain a market presence, easy access to finance, and a general optimism among many less-experienced developers that the boom will be long-lasting. Overconfidence is common among the less experienced developers that enter the market during boom times, but exists among all types of developers, and is worsened by local, regional, and national policies promoting growth by projecting images of long-term investment stability and reducing barriers to market participation (Su and Qian 2023). Once cascading, development will continue despite weakening markets and declining consumer

demand, thus helping to explain why overbuilding is often an issue immediately after a property 'boom' (Ro et al. 2019).

Social Need

Finally, the literature identifies how specific groups of developers like central and local government organisations, NGOs, and iwi, hapu, and whanau, may primarily consider social need when evaluating the development potential of a site (Coiacetto 2001).

4.5. Natural Hazard Scenarios

There is increasing interest among policymakers in understanding and predicting how developers will react when presented with different natural hazard scenarios in order to inform the development of more effective and realistic natural hazard policy. To help meet this need, it was decided to include in the survey questions asking respondents to rank their likelihood of developing a site subject to one of six natural hazard scenarios.

These scenarios were selected through a combination of a general literature review and discussions with the project team. To ensure that the survey was quick and approachable (and thereby to maximise the response rate), it was decided to test only the likelihood of each respondent to developer under each scenario, rather than investigate a range of complex behavioural responses.

Figure 4.D - Natural Hazard Scenarios and Hypotheses

Scenario	Hypothesis
The site was affected by a recent flooding event	Developers will be more reluctant to develop a site that has recently experienced a hazard event than a site that has an identified hazard risk, as communicated through mapping and/or other related means. This is because humans are generally biased towards recent and real events over historical and/or unrealised threats (National Academy Press 1989).
Flood hazard mapping indicates that the site is at risk from flooding	Hazard mapping will have a relatively weak effect on developer decision-making due to (a) the bias discussed above, (b) these maps often being inaccurate (Dewi et al. 2016), (c) a subsequent discrediting of these maps among some developers, and/or (d) the 'pull' of amenity features is greater than the 'push' of hazards (Ward et al. 2018).
The site is protected by hazard-engineering structures	Developers will be highly willing to develop such a site because they tend to overestimate the risk reduction effects of such structures (Fridirici 2008).
Future homeowners may find it hard to acquire private insurance	This was greatly reduce developer willingness to invest (Benson and Clay 2004).
The developer is required to provide a 10-year development guarantee	The Building Act 2004 holds developers responsible for any defects that occur in a newbuilt home within ten years of construction; however, this currently excludes defects caused by natural hazards. Although there is little existing literature on the topic, it is assumed that this will cause a greater reduction in willingness to develop than the presence of a hazard alone because it is forcing the developer to accept direct financial risk.
The developer is required to contribute financially towards building hazard-engineering structures	Although there is little existing literature on the topic, it is assumed that this will cause a greater reduction in willingness to develop than the presence of a hazard along because it is forcing the developer to accept direct financial risk.

4.6. Survey Distribution

The survey was initially sent to a group of 141 developers who (a) appeared in the BC datasets and (b) had publicly-available contact information at the time the survey was sent. This second restriction eliminated the majority of developers in the BC dataset, as most small property investors and 'mum and dad' developers do not provide their contact information online. This group of 141 were sent an email with a brief description of the survey.

The distribution was then later expanded with additional developers identified through the following methodologies:

1. Google Search and Google Maps searches for housing developers in each region of New Zealand. This identified 127 additional developers which were also emailed, bringing the total number of developers contacted directly to 268
2. The survey was then distributed to the members of the Urban Development Institute of New Zealand and the New Zealand Planning Institute

The survey was therefore sent to approximately 500 – 600 developers active throughout New Zealand.

4.7. Interviews

At the end of the survey, respondents were asked whether they consented to be contacted for an interview: 13 said yes. These respondents were then sent an email containing a suggested meeting date, time, and location, a brief methodology statement, and an information sheet (Appendix 4), and asked to review this information and confirm understanding and acceptance. Three failed to reply and one declined to participate any further in the research, reducing the final number of interviews conducted to 9.

Each interview was between 30 minutes – 1 hour. Audio was recorded and transcribed. Participants were asked seven questions intended to expand upon their responses to the survey (Appendix 3), with the interviewer sometimes asking additional questions when the opportunity arose. Interviewees were sometimes allowed to respond beyond the intended scope of the questions if it was still relevant to the overall research objectives.

1. What are the most important values and rationales that influence your behaviour and decision-making as a developer?
2. What are the most important factors that you consider when evaluating the development potential of a site?
3. Describe your typical process for evaluating the feasibility of a development concept
4. How do you evaluate the natural hazard risk of a site or project?

5. How does your development behaviour change with an increase in natural hazard risk?
6. Would you ever develop a high-risk site?
7. Now that you know more about the research and the specific questions that I am asking in these interviews, can you recommend anyone else that I should talk to?

An anonymised summary of the interview participants is given below:

Figure 4.E – Anonymised Summary of Interview Participants

Name	Location	Number of Projects	Size of Projects	Activities	Experience
1	Bay of Plenty	Low	Large	Diverse	11+ years
2	Auckland	Low	Large	Apartments	11+ years
3	Wellington Region	Medium	Medium	Standalones and Townhouses	11+ years
4	Hawkes Bay	High	Medium	Diverse	6-10 years
5	Christchurch and Selwyn	High	Small	Standalones and Townhouses	11+ years
6	Auckland	Low	Large	Apartments and Townhouses	11+ years
7	Christchurch	Low	Medium	Standalones and Townhouses	1–5 years
8	Auckland	High	Large	Apartments, Townhouses, and Standalones	6-10 years
9	Hawkes Bay	Low	Medium	Apartments	1-5 years

4.8. Results and Data Issues Identified

50 recipients provided responses, with 3 providing partial responses only. This gives an estimated response rate of 8 – 10%.

The data was mostly high-quality, with only a few issues identified, requiring either editing, assumptions of intended meaning, or a disregarding of some parts of the data:

- Four respondents identified their primary type of development as “sections”, however, because they also housing development as a secondary activity, their responses were kept
- Multiple respondents also selected their primary type of development from question 2 as one of their other types of development in question 3. The duplicate results were deleted

- One respondent responded to question 5 by stating that the question was too simplistic, but then gave a general timeframe answer. This was used as their response
- One respondent responded to question 8 with “cut regulations”. This was interpreted to mean regulations other than planning rules, e.g. under the Building Act
- Some respondents entered duplicate values into the ‘years’ and ‘months’ boxes, e.g. 0.5 years and 6 months. It was assumed that these were duplicates (i.e. the respondent meant six months, not a total of one year)
- One respondent entered “5” for question 7. This could mean that they are active in five areas, but this response was deleted
- It appears that the phrasing of question 11 confused many respondents, as they entered higher results for low flood hazard than high. In these instances the responses were mirrored

While not compressively representative, the final data included respondents active across 15 different districts and 7 regions, plus one active nationwide. The data therefore encompasses most of the major urban areas and housing development centres of the country.

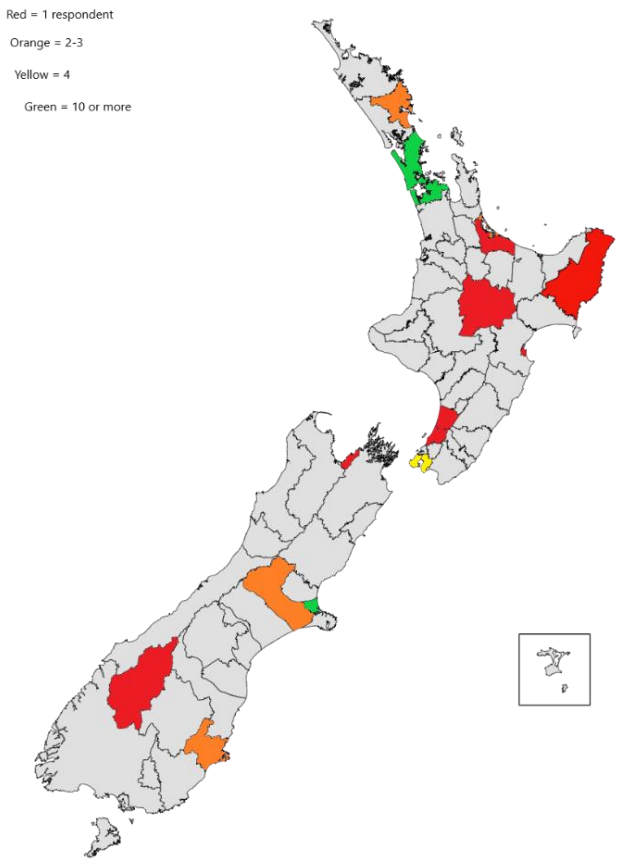


Figure 4.1 - Number of Respondents Identifying Each District

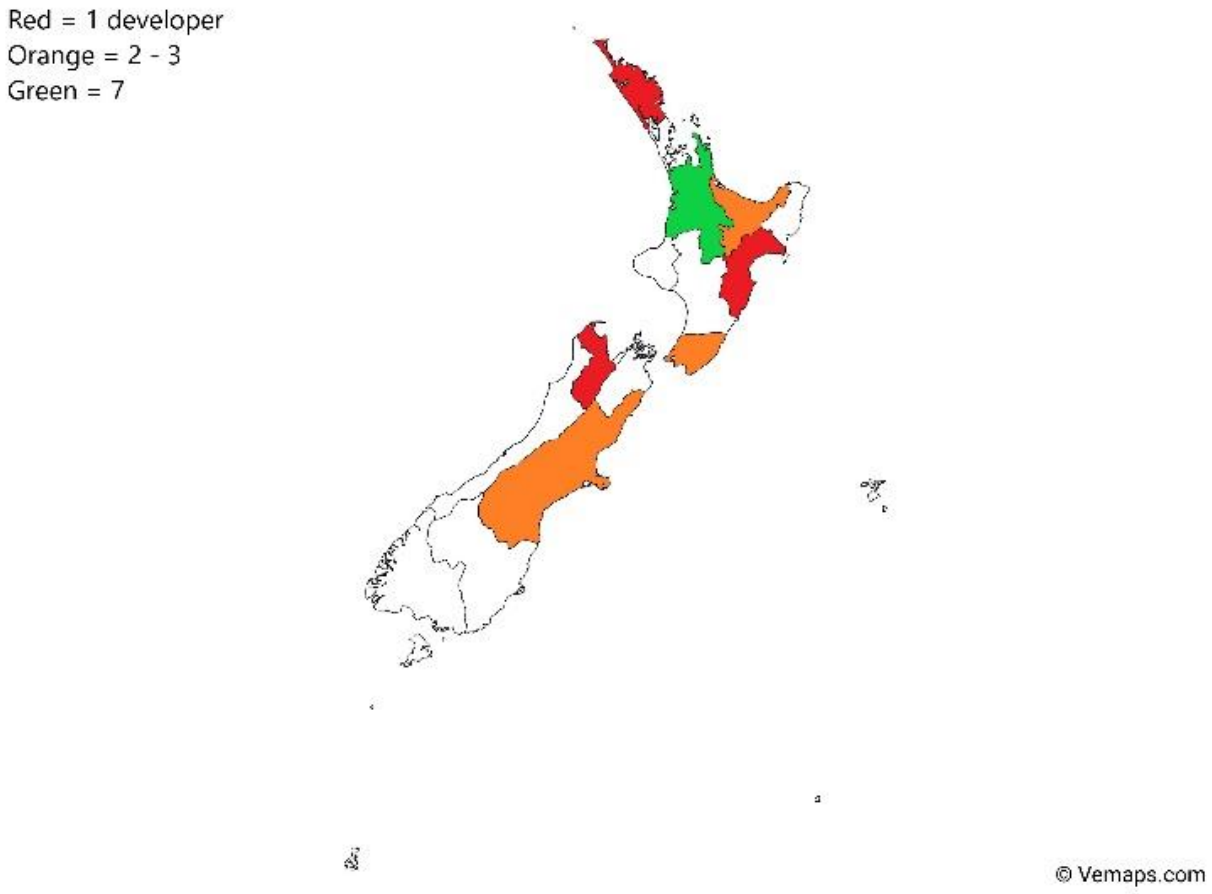


Figure 4.2 - Number of Respondents Identifying Each Region

5. Data Analysis

5.1. Diversity of Activities

Although differences in the two datasets mean that a direct comparison is not possible, the demographic composition of the respondents generally corresponds with the diversity observed in the BC datasets: housing developers in contemporary New Zealand vary significantly in their size, typology of developments, and scale of operations.

56% of respondents primarily develop standalone homes, however, less than 20% of that group engage in this activity alone. This reflects the trend (discussed in section 2.7.) of the declining production of new standalone housing units in favour of townhouses, especially in major cities: of the 28 respondents active in large cities only, just 10.7% are standalone-only developers.

Of the remaining respondents, 26% primarily develop duplexes and/or townhouses, 6% apartment complexes, and 2% retirement villages. One respondent stated that they were engaged in all of these types of development, and 8% said they engage in the preparation of sections for future housing development alongside their direct housing development activities. No responses were received from primarily papakainga or small prefabricated homes developers, although some were engaged in these as secondary activities.

Table 5.A - Primary and Secondary Activities

Primary Activity	**%**	**Secondary Activity**	**% (e.g. % of primary standalone developers also doing duplexes)**
Standalone homes	56	Duplexes/townhouses	57.14
		Apartment complexes	10.7
		Retirement villages	14.29
		Papakainga	7.14
		Small units	10.71
		None	17.86
Duplexes/townhouses	26	Standalone homes	61.54
		Apartment complexes	30.77
		None	30.77
Apartment complexes	6	Standalone homes	33.33
		None	66.66
Retirement villages	2	Standalone homes, duplexes/townhouses, apartment complexes, small units	100
Sections	8	Standalone homes	100

Developers in contemporary New Zealand are generally diverse in their activities, with only 20% of developers engaged in just one type of development. All but one of the interview participants indicated that they did a mixture of typologies. Diversity of activities is greatest among primarily-standalone homes developers, with duplex and apartment developers being more specialised. This could indicate that established standalone home developers are gradually diversifying their output, while new firms sometimes forego standalones

entirely. A plurality (48%) of respondents develop both standalone homes and duplexes/townhouses, with only 18% doing just one of either. This diversity suggests that a typology by activity type would not be useful in this context. Only one of the interview participants specialised in a specific type of units (apartments).

5.2. Number of Projects

Slightly less than half of all respondents engage in 12 or more projects per typical year. The distribution is not even, with there being significantly less developers doing 4 –11 projects per annum than 2 – 3 or 12 or more. This was discussed by some of the interview participants, as detailed below.

Table 5.B - Dividing Respondents by Projects per Annum

Number of Projects per Annum	% of Respondents	Observations
1	14	• Combination of greenfield subdivisions and apartment complexes • Subdivisions featuring both standalone and attached housing • Majority of projects are large (11+ units) • Majority active in one city/district only
2 - 3	26	• Equal number of primarily standalone versus attached developers • Higher rate of specialisation (38.46% doing one activity only) • Majority of projects are large (11+ units) • Mostly active in one city/district only but some multi-regional/nationwide • Four interview participants
4 - 11	12	• Majority combined standalone-attached developers • Typical project size 5-10 units • Majority active in one city/district only • One interview participant
12 or more	48	• Majority doing diverse activities • Greatest diversity of project sizes: 45.83% 11+ units, but others range from 1 – 10 units • Three interview participants

Table 5.C - Development Activities by Size Groupings (Number of Projects)

Number of Projects Per Annum	Standalone Only	Attached Only	Combination	Other Activity Only	Diverse Activities
1	0%	0%	28.57%	42.86%	28.57%
2-3	23.08%	23.08%	15.38%	23.08%	23.08%
4-11	16.67%	16.67%	50%	0%	16.67%
12 +	16.67%	0%	37.5%	4.17%	41.67%
Note: 'Combination' = developers doing both standalone and attached but no other activities. 'Diverse activities' = developers doing standalone and/or attached plus one or more other activities					

No developer doing only one project per year was completely specialised in either standalone or attached homes. Because their projects also tend to be quite large, this could indicate that larger housing development projects typically feature a combination of these two types.

There appears to be a general correlation between number of projects and diversity of activities: 69.24% of small (2-3 projects per annum) developers specialise in a single type of unit, versus only around 20% for large developers, suggesting that as developers increase their number of projects, they tend to have more projects of differing types and/or mixed typologies.

5.3. Typical Project Size

Table 5.D - Dividing Respondents by Typical Project Size

Typical Project Size (number of units)	% of Respondents	Observations
1	16	• Majority do 11 or more projects per year • Diversity of scales of operation (from a single city to nationwide)
2 - 4	10	• Almost all do both standalone and attached units • Diversity of project frequencies and scales of operation • One interview participant
5 - 10	24	• 58.3% combined standalone-attached developers • 25% engaged in diverse activities • 33% do 1-3 projects per year, 4-10, and 11 or more, respectively • Diversity of scales of operation • Three interview participants
11 or more	50	• Greatest diversity of activities • 75% doing 11 or more projects per annum • Four interview participants

As stated in a prior section, the categories used for number of projects and typical project size were adapted from Ruming (2010) under the assumption, based on the BC datasets, that NZ developers are generally smaller than what Ruming observed in her case study. However, the survey data shows that around half of all developers do 11/12 or more projects/units, suggesting that Ruming's original typology may have actually been more applicable. A relative lack of medium-sized developers is also observed along this axis.

Multiple interview participants discussed the economic incentive to grow their business and develop at a greater scale, because the marginal cost of adding an additional unit to a project declines due to (a) increased efficiency and (b) many project costs being flat. Developer 3 said "we're trying to keep growing and trying to get our teeth into some bigger stuff. There's as much work for us in doing three or four houses out the back of a residential lot as there is in doing a 40-lot subdivision. So we might as well just put that time and resources into doing something a bit bigger." Developer 5 said "for a building developer, it is about scaling…there's significant cost savings with scaling that we can then pass on to the customer." However, increasing typical project size also requires the developer risking more loaned capital on each project. Developer 6 expressed the view that small developers experience a 'danger zone' period as they grow from small to large developers: "I think that [developers falter due to] the nuances of borrowing money. The value of money today will be

different to the value of money tomorrow, and having a long-term plan to manage that and manage any fluctuations in development is quite key... larger developments of housing [require] a lot of money - infrastructure, roading, easement issues, legal costs, design fees, build costs, leasing fees, selling fees...at any stage, those projects can go bang - you might find a community of bats that live on the site and you can't build because the bats are there, right? So then that five percent profit you were going to take from the development is down to two, and then all of a sudden build costs go up, and then actually it's not two, it's one...global developers are probably doing well, and they're probably there for the long term. Small term developers are good, they're probably there for the long term also. In my opinion, it's the people in the middle, who are taking that step to go from small scale to 'I'm going to chance out, going to go up [to] twenty', that's where a good understanding of feasibility, the value of money and where it can go wrong is really key."

5.4. Timeframes

Typical project lengths varied greatly, from six months up to ten years, however, 1.5 years was the mean and modal response, and seems to be the typical length for a standard new standalone or townhouse development, with apartment complexes and subdivisions taking longer depending on their size. Developer 6 said that small-scale developers "can punch out four houses within a year and a half, and they've probably made a really good return on investment." Where a developer is inexperienced and encounters unexpected delays, their first few projects might be significantly slower: for example, first-time Developer 9's apartment development took more than 3 years to complete.

Landbanking is generally uncommon among New Zealand developers, with all of the interview participants stating they engage in it very rarely or never. Most are unwilling to accept a large amount of equity being stored in an investment generating no short-term return and/or unable to afford a loan for such an investment. Developer 2 said "[landbanking] can be a good strategy, but it's generally lazy money, because land doesn't pay anything, right? People do pretty good returns on paper, but often with land, if you put debt on it, then you've sort of set a time bomb for yourself...a lot of people in land development come unstuck because they've just got a debt clock ticking and they can't get out of it." Large developers can tolerate a delay in a project due to an unexpected problem with the development or indications from their financial modelling that doing so would maximise sales prices, because their investments are spread across numerous assets; however, they still view this as sub-optimal and prefer to always develop a site as soon as they have unconditionally acquired it. Conversely, very small 'mum and dad' developers are often pre-committed to a site well in advance of beginning development and must persevere in developing it despite any delays.

Developers are somewhat more willing to consider rezoning, but only when they have assurance from council that the zone change application is very likely to be accepted. Developer 2 said that "infrastructure is absolutely critical for a rezoning, because if you've gotta drag pipes or build wastewater treatment or whatever else, you can be sunk pretty quick, or at the very least you've just got to be really big to get over your major infrastructure hurdles."

5.5. Experience/Maturity

The majority (60%) of respondents were mature developers with 11 or more years' experience. 24% had between 1 – 5 years' experience in the industry, while only 16% had between 6 – 10, which could indicate either that less new developers emerged during this period (approximately 2014 – 2018) or that developers are most likely to exit the market after 5, but before 11, years of experience. As would be expected, less experienced developers engage in fewer projects, with 63.6% involved in three or fewer projects per annum.

6-10-year-old developers differ most in their approach to assessing site suitability, listing the current land use and servicing, natural hazard risk, and size as all very important and ranking them significantly higher than both their less and more experienced peers. A similar trend is observed in both feasibility assessment and reactions to natural hazard scenarios. The 6-10 group places greater emphasis on planning policies and social need, and slightly reduced emphasis on observing the behaviours of other developers. It also exhibits significantly greater willingness to invest a site subject to a recent flooding event.

Many of the interview participants who self-identified as high-experience said that they had been very successful in their development history, with very few projects being abandoned or finished at a financial loss.

Table 5.E – Interview Participant Experience and Development Success History

Developer	Experience	Comment
2	High	About 99% of projects fail the due diligence stage, then a couple of projects falter after commitment due to market conditions
3	High	Do 10 – 50 projects per year, only walk away from about one per year
4	Medium	Done 65 projects for the company and haven't lost money on any of them
5	High	Has never abandoned a site because the natural hazard risk is too high, but has had to spend significantly on mitigations

They spoke of a connection between developer experience and ability to accurately detect and evaluate development risks, with Developer 3 saying "even though [developers] come and go, if you've got a bit more experience then you're assessing that risk better [and] the results will be better long term." Conversely, Developer 7 spoke about how inexperienced developers buy sites without doing proper due diligence: "I've had one guy which [had] only just started to do developing work, so he was a little bit inexperienced, but he had a little bit of money and some investors and he went around buying all these sites without even going to look at them or researching them properly, and then only finding out there are certain things that would drive costs up or certain restrictions that [mean that] they couldn't get as many units on there as they thought".

Developer 3 spoke about how the development cycle creates periods in which immature developers are especially vulnerable to failure: "you know, let's say every seven or eight years, you get the economy kind of fizzing up and then a bit of activity and then it might peak and drop down the other side. If you do a development either side of that peak, that's kind of where a lot of guys go broke. So I think you've got to be able to structure development in the current market so it can survive a downturn and you can still trade it through the next phase..." However, he also identified how some developers enter the market with an intentionally short-term strategy: "...and a lot of guys don't that, they just want to be in and out and get the money in the bank and move on. And sometimes they time it right, and sometimes they don't." Developer 9 said that after his current project he will "basically just sell and move on to the next one."

5.6. Geographical Distribution of Activities

A majority (58%) of respondents were active in a single city only, with a further 16% being active across just one district, bringing the total active in a single location to 74%. Of the remainder, most were active in a major city and its adjacent districts (e.g. Tauranga and the

Western Bay of Plenty) or across several major centres (e.g. Auckland, Wellington, and Christchurch). Only one respondent (2%) was active nationwide. Where developers are active in multiple disconnected locations, the interview participants indicated that they typically divide their operations regionally or operate on a franchise model: for example, although Developer 2's company was active across multiple cities, he was responsible for Auckland only.

Many of the interview participants spoke about the ways they adapted their activities to unique local markets, with for example Developer 5 saying: "one of the things that drives us here in Christchurch is [that] there is a significant amount of land that we've got available around us…after the earthquakes, the entire Christchurch community kind of diminished because a lot of people went elsewhere. So it's about growing this back up. I mean, our city centre is fantastic now, so it's about wanting to bring more people into our region."

Location also helps determine which variables are most important to developers when they are evaluating the development potential of a site. For example, in the Hawkes Bay, Developer 4 said that "we would always do stormwater analysis because it's usually our biggest issue out of the three waters, having to allow enough stormwater attenuation and storage devices to meet pre-development discharge"; whereas, in Canterbury, Developer 3 said "it's really site-specific. I mean, a lot of the services in Canterbury are relatively new [because of the earthquake]. So that's already been renewed and we can just tap into that."

5.7. Risk Tolerance

For small and inexperienced developers, there is a significant amount of risk at every stage of a project. Larger and more experienced developers believe that their due diligence and feasibility analysis process eliminates most foreseeable risks tied to the physical aspects of the site, but still recognise a risk that market demand will not be sufficient to achieve the targeted price point, or the risk described by Developer 6 of a project "costing too much for you to do it. And that could come in the form of building materials or contractors." The survey and interview responses suggest that there can be significant differences in risk tolerance among developers. This can be explained as a combination of experience, capital structuring, modus operandi, and differences between the corporate 'personalities' of developers.

The interview respondents ranged from very conservative to balanced. Developer 2 described his firm as "very conservative, very, very risk focused". Developer 5 described her company's attitude towards risk as "sort of 50/50. We do take a bit of risk, but then again, if the risk is too high we scale back completely and just go, well this is not for us." Developer 4 said that "there's different types of risks. So, for example, we won't take any risk on

contaminated land or stormwater. We just know that councils are not gonna fly with them. [But there are] particular areas where we will take risk in, like what the market's doing and [what] the value of the properties might [do]".

Developer 2 explained his conservatism by explaining how his risk tolerance is tied to the size and capital structuring of his firm: "we as a private equity business have relatively expensive money and that, you know, we're trying to deliver 25% IR up, so 20, 25%. That means that if we get caught sitting on a piece of land, that's really hard to achieve, those sorts of levels. And so we have an exit pathway mapped out pretty clearly, not always, but, you know, within reason you need to be pretty sure you can get out of it... there are other developers that are happy to lose money, you know, they might do five [developments] where we do two, but they'll assume they're going to lose money on one or maybe two of those and sort of end up in roughly the same place."

5.8. Feasibility Assessment Processes

Developers begin the development process with the intention of developing a certain type of unit, in a certain area, at a certain price. This will be determined by a combination of both their past experience and their ongoing market research, with Developer 5 listing property data services like CoreLogic and OneRoof, real estate agents, and the developer's own research and connections to specific areas as her primary sources of information. They use this data to ask, as Developer 1 put it, "what is the product I'm going to sell to the consumer? What does the consumer want in a house? What's the price point at which he will be comfortable?" This will determine the size and type of dwellings they will develop, which will in turn inform the size and general location of the site required to achieve this. The target price will be one that achieves a Return on Investment (RoI) which the developer considers acceptable. Although there is some variance within the sector, and larger developers were generally reluctant to share this information, some interview participants said that the standard target RoI is between 8 – 15%.

They will then identify sites that could feasibly fulfil these general criteria, considering firstly the current zoning and overlays of the site: Developer 4 described following a "predetermined check sheet...and the first thing that anyone checks are the district plan rules". Developer 3 spoke for most developers when he said that he looked for sites that "already have the proper zoning in place", as New Zealand developers rarely engage in landbanking or rezoning unless they can identify sites where there is existing infrastructure and support from council; for example, Developer 2 spoke about targeting special purpose zones where the special purpose activity had recently ceased operations, making the council amenable to redevelopment as residential.

Developers will then consider the compatibility of the proposed development with the existing property values, styles, and demographics of the neighbourhood; any value-adding features like proximity to existing urban centres, proximity to blue-green environmental amenities and/or good views; and any high-cost features like known geotechnical or natural hazard issues. Many of these early judgements are assumptions based on the developer's own experience: for example, Developer 1 described how often his previous experience in land development is enough to tell him that a site cannot be feasibly developed just by driving past it. Most of the information at this stage comes from desktop sources like property information services, regional and district council hazard mapping and geotechnical databases, and Google Maps.

The presence of a natural hazard at this stage could present an absolute 'no' to the developer if they think that the council will never allow it, or insurance companies will not insure the future dwellings. Developer 1 said that the only time he abandons a site because of natural hazard risk alone was when he looks at it and thinks "oh, I'm in for a hell of a battle [with council] here."

Some developers require specific value-adding features to fulfil their strategy. For example, Developer 2 requires sites with high daylighting and views onto blue-green environmental amenities in areas with a large natural catchment of affluent, downgrading households, to enable him to deliver high-value apartment complexes with sufficient market demand. However, most developers prioritise such features only when they have evidence that consumers are willing to pay a premium for them. Multiple interview participants talked about how, as housing unaffordability has worsened over recent years in New Zealand, they have reduced the amount of higher-amenity sites they develop or amenity features they include in their developments.

If the site passes this high-level, informal feasibility investigation, the developer will then proceed to a more detailed and comprehensive financial feasibility analysis, typically through the use of premade checklists, spreadsheets, and financial modelling tools. Their primary focus at this stage is identifying development costs: Developer 2 described this process as "[investigating] a suite of things that could result in extraordinary costs, and if they are collectively or individually too high, then you can't make a buck".

It is at this stage in the development where a larger developer might sign a conditional contract for the land, agreeing to purchase the land provided that it passes various site-specific feasibility tests. This is done to reduce the risk of due diligence costs being wasted on a site which then ultimately cannot be purchased.

Developer 4 described how after he looked at “the district plan rules”, his next step is look at “…infrastructure. So once you know what you can build in the area, you look at how the site is serviced, looking at all the three waters, fibre, power, understanding what your client needs and then making sure there's capacity in the network.”

The costs associated with different types of infrastructure very greatly by project type, site location, and site features. Multiple interview participants affirmed that stormwater infrastructure is among the costliest to provide, with for example Developer 1 saying “stormwater is a big deal, wastewater and water are reasonably simple” and Developer 4 saying “our biggest issue out of the three waters [is usually] having to allow enough stormwater attenuation and storage devices to meet pre-development discharge.” Developers 2 and 5 also spoke about the high costs involved when new on-site wastewater treatment systems are required.

Geotechnical conditions were mentioned by many survey participants and all of the interview participants as a major concern at the feasibility stage. Large developers may begin the process with a desktop review of soil conditions, with Developer 1 saying “there is a lot of information around…nowadays, most geotechnical reports are publicly-available and most councils have a geotechnical library”. However, they will typically always require a site-specific geotechnical investigation report before going unconditional on a land purchase agreement. Geotechnical conditions are important primarily because they determine the cost of any building foundations and stormwater infrastructure, as well as introducing new costs by requiring the construction of retaining walls and other stabilising structures.

If hazard mapping and/or consultation with council reveals a significant natural hazard risk, then it is at this stage that the developer will investigate the costs required to mitigate this risk. Developer 2 said about natural hazards “if they're low-level effects, you can engineer around them, if they're high level then whether we care or not [is] almost immaterial if you think insurance companies are going to [refuse to insure].”

At this stage, most large developers will engage a planner to review the practicality and costs of the project in light of any land contamination or special cultural, heritage, or ecological protections, often as part of the resource consenting process.

Upon completion of these items, the developer is able to estimate:

- The revenue which they expect to make on the project
- The costs of the project
- The likelihood of the relevant councils to approve the project

This information enables them to perform their final feasibility analysis. If the project is practical and provides the required RoI, then the developer will agree to go unconditional on the sale and purchase agreement of the land and proceed through the design, consenting, construction, and sale phases.

Small Developers

Small developers follow the same general feasibility assessment process as their large peers, however, they are less likely to employ advanced financial modelling, which increases their risk of being forced to hold onto new units after completion or sell at below their expected price. For example, Developer 1 said that his company had “tried some terraced housing [in the Bay of Plenty] and it's not selling” because they misjudgement medium-term local market demand.

Some small developers, especially inexperienced ones, may also commit to sites without completing a detailed due diligence process. Developer 7 said about providing development management for small investor-developers: “I’ve found there's always a range of percentages which they want to get back in terms of investment. I think the number is between 8 - 15%. Some are a little bit higher. Anything below 10% is regarded low and not as high risk and no one really wants to do anything for under that, but there are some developers that have already bought the land and then they’re like “damn”, they want to do something with it and they’ve committed and then found out, oh, it's going to cost so much more and they're going to get less in return because of maybe the soil conditions, for example, but they’ve already committed and they're like, okay, I just want to be done with it, maybe not get as much back, but at least not lose money, and to on-sell it, the project might just be a waste of their time.”

Mum and Dad Developers

Mum and dad developers have a different approach to feasibility because they already own the property they are interested in developing. They are therefore unable to reject a site and are thus much more willing to compromise on yield and return on investment if it is the only way to make any development of the site possible.

5.9. Site Selection

Respondents ranked the key site selection variables as follows:

Table 5.F - Mean Responses to Site Selection Variables

Variable	Mean Response	Mean Category	Also Mentioned by Interview Participants?
Current land use and infrastructure servicing	4.16	Very important	Yes
Size	3.82	Somewhat important	Yes
Natural hazard risk	3.66	Somewhat important	Yes
Transport accessibility	3.11	Somewhat important	Yes
Proximity to greenspace	3.05	Somewhat important	Yes
Site is in a high-end neighbourhood	2.86	Not very important	Yes

Table 5.G - Importance of Site Selection Variables

Variable	% Ranking It as Very Important (5)	% Ranking It as Not Very Important (1)
Current land use and infrastructure servicing	46	2
Size	28	4
Natural hazard risk	30	6
Transport accessibility	12	8
Proximity to greenspace	8	10
Site is in a high-end neighbourhood	10	16

They also identified the following additional variables:

Table 5.H - Additional Site Selection Variables Identified by Respondents

Variable	Number of Respondents	Ranking in Survey (if applicable)
Real estate market activity and sales data for the area	6	4 - 5
Topography	4	4 – very important
Geotechnical conditions	5	5 – extremely important
Views	3	4 – very important
Price	3	5 – extremely important
Transport accessibility	3	
Contamination	3	
Natural catchment	3	
Whether the land is useable and the cost to mitigate any risks	1	4 - 5
Non-planning regulations	1	5 – extremely important
Proximity to existing population centres	1	
Compatibility of current zoning	1	
School zones	1	
Compatibility of the development with the property prices and styles of the existing neighbourhood	1	
Acoustic requirements	1	
Interest rates (help determine price of land)	1	
Covenants	1	
Iwi claims to land	1	
Heritage values	1	
Ecological values	1	
Fire engineering analysis	1	
Carparking	1	

Figure 5.I - Variables Mentioned in Interviews, Divided by Participant Size

Small and Medium Developers Only	Large Developers Only	Both
• Proximity to existing population centres • Compatibility of current zoning • Geotechnical conditions • School zones • Compatibility with neighbourhood • Acoustic requirements • Neighbourhood market • Carparking	• Views • Environmental amenities – blue and green spaces • Size, shape, and streetscape/edges • Interest rates • Covenants • Iwi claims to land • Heritage values • Ecological values • Fire engineering analysis	• Transport accessibility • Price • Topography • Infrastructure • Natural hazards • Contamination • Natural catchment

Current Land Use and Servicing

Across all demographic factors, developers consistently identified the current land use, infrastructure servicing, and capacity of existing infrastructure, as the most important factors influencing their behaviour and decision-making around site selection, with 46% identifying current land use and infrastructure servicing as an extremely important factor. This is consistent with the literature - see for example Aburas et al. (2016) and Martínez-Jiménez et al. (2022) - as well as the survey results.

Size, Shape, Streetscape, and Daylighting

Developer 2 evaluated site size, shape, and streetscape in terms of "access to light…if your site is too deep then your interior spaces will have poor access to light, or if it's hemmed in, if it doesn't have enough edges. So if you've got a corner site, or even better, one with three edges, you've got light on three sides, right? Your only antidote to that [not having good light] is to just pull yourself off boundaries, but then you can be buying a bunch of land that you can't use. So there's a certain kind of rectangular shape on a corner and facing northwest that will give the best access to light." He also spoke about there being an optimal site size beyond which marginal profitability begins to decline.

Natural Hazards

Developers rarely conceive of natural hazard risk as risk to human and environmental wellbeing; rather, for them the 'risk' from a natural hazard is mostly in the scale of effects, cost of mitigation measures required by councils, experience with council, and effects on insurance.

Developer 2 said that while it was very rare for him to be involved in developing a site where the risk simply cannot be mitigated at all (due to an effective process of due diligence beforehand), there were many sites that he abandoned because the required mitigations

would not be profitable: “I think last year we had about 200 deals that got onto our deal sheet that were worth a look, and we did about two of them…we'd like a slightly higher success rate than that, five would have been a good year…a material amount of those would have been just sort of engineering costs. The typical development margin on costs might be like 20%, maybe a bit better, it doesn't take a huge amount to suddenly make that 14 – 15%, and then it’s just not worth doing, the bank wouldn't give you the money even if you did want to do it.”

Developers are much less willing to develop a site where the hazard risk cannot be mitigated on-site, requiring coordination with other property owners and other stakeholders in the area. Developer 2 said “where the engineering risk requires some degree of coordination with other parties, that becomes a commercial risk, and coordinating multiple people to do multiple things at the same time is generally next to impossible.”

Developer 4 said that in extreme cases, there are some sites that are “just forecast to be flooded, whatever you do, there's no engineering solution and it doesn't matter whether you're happy with that risk or not because the insurance companies won't be. And if you can't insure you can't develop, you can't buy, can’t sell.” He gave the example of low-lying areas in Napier which a recent regional council report indicated will be subject to severe coastal inundation by 2075, saying that he would personally not develop in these areas.

Developer 7 spoke about how, especially for smaller developers, the experience of interacting with council may put them off attempting developments in at-risk areas: “I did one site subject to flood management in Wellington – it was one of the first ones which that developer had done in Wellington, and after that [the developer] was like, ‘never again am I going to do one in the flood management area’, not because of market pricing, but I think it was council issues.”

Transport Accessibility

Small and medium developers rank transport accessibility and proximity to existing urban centres higher than large respondents in the survey, with two of the small interview respondents mentioning it as a key factor for them. Interestingly, accessibility does not appear to be more important for developers doing high-density projects versus low-density ones.

Proximity to Blue and Green Spaces

Proximity to greenspace was of low overall importance to the survey respondents and significantly less important than natural hazard risk, challenging Ward et al. (2018)’s findings that the positive ‘pull’ of environmental amenities is usually stronger than the negative ‘push’

of natural hazard exposure. Many developers view environmental amenities as optional extras which may increase the value of a project, but are secondary to other concerns because generally consumers are willing to sacrifice them in pursuit of an affordable housing options, as multiple interview participants attested to.

However, environmental amenities are important for developers specialising in high-value developments like Developer 2, who said in the high-value apartment sector, most of the developer profit comes from capitalising on consumer willingness to pay a high premium for views onto a 'blue' (waterbody) or 'green' (greenspace) feature. "We developed in Wynyard Quarter…the value range between the cheapest apartment and the most expensive apartment on a per square metre basis is about 125%. So you go from something like about 14 grand a metre through to like 30 a metre, and that's just a function of being higher up the building, having a better view… your ability to achieve those premium values is entirely locationally dependent."

Neighbourhood Factors

Neighbourhood factors were consistently ranked lowest by the survey respondents. However, multiple interview participants said that their development decision-making was greatly informed by neighbourhood demographics and property prices. Most developers target the 'natural catchment' of a neighbourhood, meaning the existing population of an area that may be looking to change housing. For example, speaking about high-end apartment developments, Developer 2 stated they were generally only possible in areas with a large population of older, affluent households looking to downgrade the size of their dwelling: "we do have a residential scheme in Hobsonville, which has sold pretty well; it struggled a bit for the last few sales, just because of the market turning down, and one of the reasons it struggled is it doesn't have a particularly deep pool of downsizes there. Like generally the prices we're selling for are approximately the prices they're selling for. And so that's, you know, even though that's an amazing coastal location, et cetera, it just doesn't quite have that depth of buyer pool. The same respondent also spoke generally about the benefits of developing in high-value areas: "steel costs just as much in Otara as it does in Remuera and so, you know, if you look if you look to maximize value, you generally operate in areas where you can achieve a premium value." Similarly, Developer 5 said "when we do any sort of development, we're looking at what the housing is around it, to make sure that we're not putting two-million-dollar homes in a $500,000 suburb."

Differences in property values between neighbourhoods help determine the volume of costs which a developer will be willing to absorb. For example, Developer 3 spoke about how a site with geotechnical conditions that require a more expensive type of foundations might be feasible in a high-value suburb, but not somewhere with low property values: "we just

looked at another [site] near Ngaruawahia, and you've got peat requiring TC2 foundations…you've got to quantify that at a price. Like if you're in a suburb where the house is only going to be saleable up to X price, well then any of that stuff is just going to be a killer for your development at any stage."

Price and Market Dynamics

Real estate market activity and sales data for the area was mentioned as an important factor by 10% of the survey respondents, and many of the interview participants also affirmed its importance. A further 3 mentioned price and 1 mentioned interest rates. Developers are constantly researching what households are willing to pay for different typologies of housing in different areas, and staying abreast of changes in market demand, with Developer 3 saying "we are definitely [thinking]: what is the end buyer of a house or an apartment or a townhouse or a retirement home or a daycare centre wanting? We're very much trying to try to set [our activities] to where we see the market."

However, Developer 3 considered the price of the land itself relatively unimportant: "I would say it's less important [than the other site selection variables] because if you get all the other things right, the value proposition of pricing takes care of itself, if you just go and chase a piece of land that's cheap, then you bring all those other problems potentially into it. So I'm always kind of looking to solve those problem before we worry about what we're paying for it."

5.10. Values and Rationales

Table 5.J – Values and Rationales Given by Interview Participants

Developer (interview respondent)	Values and Rationales
1	Feasibility; managing costs and delivering a product that the market demands at a price point acceptable to consumers
2	Ensuring long-term profit to shareholders by maintaining a reputation for delivering high-quality developments. Central ethos of “we would never undertake development that we wouldn't want to use or occupy ourselves”
3	Identifying sites that the consumer wants and delivering high-quality developments over a long timeframe, with an intergenerational business ethos wherein “100 years is a short time”; business growth
4	Operating ‘by the books’ and preserving a reputation for following the rules; concern for human health
5	Financial feasibility through meeting market needs
6	"the ability to know that the project can be started and completed in a reasonable amount of time with success from the outset”
7	“the number one key [value] is always the return on investment”. Aesthetics are important to about 60% of developers but some don’t care about anything other than costs and profit. Also the practicality of the design
8	Balancing financial, community, and environmental interests and always delivering the highest-quality/best-impact product while remaining profitable
9	Return on investment

When asked to list the key values and rationales that guide their behaviour and decision-making as a developer, the interview respondents generally affirmed the central importance of maintaining long-term feasibility through careful due diligence, high-quality and ‘by the

books' development, and maintaining a good reputation in the sector. There was however some variance in this: Developer 2 expressed an ethos of "we would never undertake development that we wouldn't want to use or occupy ourselves", while Developer 7 said that a significant number of his clients cared about nothing but the return on investment.

In these concerns developers are partially motivated by corporate and personal ethics and partially by the knowledge that such commitments are key to sustainable long-term profit. Developer 2 said "…fundamentally, we are entrusted with other people's money to generate a service return, right? So we have a profit motive. The way that we as a business have tried to enable ourselves to develop a service return sustainably is to ensure that we maintain a reputation for doing, and actually doing, high-quality development."

Developers 1, 2, 3 all spoke about how they have a specific targeted rate of return that they must deliver to their clients by managing project costs, with Developer 2 saying "our strategy is in large part determined by return target and that's a function of who our investors are and what we promised to achieve." This differentiates developers from listed property funds or groups, which have lower return expectations and 'cheap money', and therefore adopt different approaches.

Most of the interview participants, especially those from larger companies, were quick to criticise developers that adopt a short-term, minimum-quality approach, with Developer 3 saying "you look at some of the stuff that they've built in Hawkes' Bay, and when the cyclone came through a couple of years ago [I just thought], how did they build floor levels below road levels? Because they just didn't want to move their dirt around, right? The council approved it and they just kind of got in and out and they got their minimum overland flow paths and a few things blocked up and a few things went wrong and the whole thing suddenly went pear-shaped. It wouldn't have actually been that much more [expensive or difficult] to future-proof it, and I'd just be horrified if we'd delivered some of that stuff, and got caught out in that respect."

They identified there existing in every market a fluctuating population of 'cowboy' developers who enter the market with the goal of maximum short-term profit, developing at minimal quality without regard for aesthetic, social, or environmental concerns, and searching for opportunities or circumvent or disobey standards and norms. Such developers exist at the margins of the sector, being established and dissolved within relatively rapid timeframes. Some of the interview participants defined themselves in opposition to these 'cowboys': Developer 4 said "we're not a cowboy…we do things correctly. Reputation always comes into as well. So for example, you could do 50 good projects or work within the limits and then if you do one big slip in behaviour to try and go around a rule, everyone will remember you for the one project that you became a dirty developer on…you're in the public

eye here, so you've got to be careful, someone can see that you do something that sits outside the norm and that's going to affect you badly. Your reputation as a development leader in the industry [will be compromised] and that ultimately will affect people coming in and wanting to be a client for you."

In a similar vein, Developer 3 said "[we were in a] resource consent hearing at the council [recently] and one of the councillors stood up and said 'oh, you guys are only in it for a quick buck.' Well, we're not. Yeah, some people are, but you know, some lawyers are ratbags, some are good, some developers are bad, some developers like to build something that stands the test of time."

Some of the interview respondents also expressed specific sociocultural and environmental commitments. Developer 2 said: "we want to be providing something that is of premium quality to communities as well as individual users", and spoke about being aware of how socioeconomic inequalities between neighbourhoods can result in differences in development quality, saying "steel costs just as much an Otara as it does in Remuera". Both Developers 1 and 2 expressed a general ethos of 'developing as if it were our own': perusing high-quality sites and developments that they themselves would be willing to own, with Developer 1 saying "we need to be able to be proud of what we build when we take our family past it."

Developer 6 expressed a hope that his developments bring benefits to local communities by increasing holistic sustainability and encouraging further development in the area, creating new centres of employment and housing: "so there's a big development that takes place…they will need a supermarket, a church, a community centre, sports area, and so it creates all of these different entities for the community. I think that's really important."

However, it is difficult to identify any specific ways in which these high-level values or commitments affect the day-to-day activities of these developers, because in the vast majority of cases, developers' actions are governed by financial calculus and regulatory requirements. Developer 6 said "in my opinion, success [in development] is quality buildings that will stand the test of time and are good value and good for the community. [But] you've [also] got to have the business acumen. There's no point in building a development that's good for the community, that's good for the world, but that's not good for your pocketbook."

5.11. Long-Term Strategies

Table 5.K – Long-Term Strategies Given by Interview Participants

Developer	Strategy
1	No strategy
2	Targeting high-amenity sites in affluent neighbourhoods with existing populations of wealthy households looking to downsize
3	No strategy, other than a general long-term commitment/approach
4	No strategy, other than a general commitment to 'not cutting corners'
5	Growth strategy, targeting inner-city suburbs of Christchurch which are now recovering from post-earthquake population loss, and also finding market niches through superior design, e.g. thermal modelling to combat temperature issues in newbuilt townhouses
6	Owns and rents the properties he developers, so incentivised to do high-quality and durable designs. Strong personal commitment to sustainable design beyond just 'greenwashing' (which for him includes visual appearance and quality of life)
7	No strategy
8	No strategy
9	No strategy, although previous poor experience with conversion of existing buildings as directed him towards newbuilt development instead

The majority of developers interviewed are not following any specific long-term strategy, with two saying that their only strategy is a general long-term commitment to market presence and quality of delivery. However, two respondents did identify specific strategies:

Developer 2 discussed how his company target affluent clients by developing high-quality apartments with strong environmental amenities in areas where there is a strong demographic of old, affluent households seeking to downsize their housing. This strategy means that they frequently develop for clients from "certain parts of the market with land owners that might not have a purely profit motive themselves - so councils, for example,

local governments, central government, people that want a design outcome rather than just the maximum buck for their land."

Developer 6 described how his strategy of developing-to-rent gives him a different attitude towards natural hazard mitigation than others because the costs cannot be passed on to customers: "we recently completed a development where it was a demolition of an existing facility, and that had an overland floor path, and the revised design needed to have an overland flow path which was around the development [and] that was very significant… that had to be factored in to the developer cost, and we couldn't pass that cost on to any customers, it's just part of the development and it's a requirement." This makes him more conservative and less willing to develop in at-risk areas.

5.12. Relationships with Councils

The interview participants can be broadly divided into two groups with regards to their opinions of, and ways of interacting with, councils.

Firstly, there are the collaborationist-developers, who have a positive, proactive, and collaborative relationship with councils, who value the role of councils as regulator and protector of broader social and environmental interests and believe that they contribute to those outcomes by 'playing by the rules'.

Developer 4 said "if we're looking at purchasing a block and subdividing that, we're always going to have a preapplication meeting, saying, 'hey look, we've done this pre-check analysis…this is what we're trying to achieve, here's where we think are some of the problems', and then we'll put it in front of council and they'll say, 'actually, these are the hazards you need to consider.' Most of the time it's just a good open, honest conversation saying, 'hey look, this is what we're trying to achieve. What are the red flags, how can we overcome them?'"

Developer 6 described a similar relationship: "if you work with the council, you get a lot further, as opposed to being like 'oh, I don't agree with what you're doing, I don't like this approach, that's not right', and honestly, I think the council have been maybe stung in certain areas in the past, where they've signed things off and they haven't been quite right to how it's supposed to be done. So they're a bit more stringent with what the requirements are. Everyone bags the council for being slow and kind of pedantic, but they kind of have to be, and it's process-driven. So I think if you can take the weight off the councils as much as you possibly can, you get things done quicker and almost the way that you want them to be, so if you can meet up with council and say 'this is our design, this is how we think it'll work because of this, this, and this, and we'll pay for this report to be done, like a peer review, so you don't have to peer review it, we'll peer review it for you', [then] I think you go a long way."

Secondly, there are the antagonist-developers, who speak of councils as being bureaucratic obstacles against which a developer must do battle.

Developer 3 said that his typical response to a natural hazard risk at a site is "basically our engineers battling with the council engineers to get an approved solution through. It might be something where there's no current flooding issue, but…on a one-hundred-year plan, it might show that there's 20 millimetres of water…"

Developer 7 said that "within council there's probably two or three different departments that deal with [natural hazards], and sometimes they're not always on the same page and things don't get communicated very well. So it gets through one [department], only to get a no from the stormwater team or another one of their engineering teams, the geologists, saying that, 'oh no, the slope of this site is not suitable for this."

5.13. Feasibility Assessment

Table 5.L – Importance of Feasibility Assessment Variables

Variable	Mean Response	Inexperienced Developers	Experienced Developers
Planning policies	4.29	3.92	4.4
Our past experience	4.07	3.83	4.28
Social need	3.07	2.75	3
Observing other developers	2.62	3	2.68

Planning Policies

Developers consistently rank planning policies as the most important variable in their feasibility assessment methodology. The mean response (4.29) is higher than for all of the site-specific factors, potentially confirming the finding of Adams et al. (1992) that planning rules can be more important than the site itself in how developers calculate development potential. Challenging the conclusions of Coiacetto (2000), none of the large respondents indicated significant willingness to challenge or manipulate the planning system, considering planning policies to be just as important to site development feasibility as their smaller peers. Contrary to what Grimes and Mitchell (2015)'s data might suggest, apartment developers do not rank planning policies as more important than other types of developers, and the interview participants gave no indication of this. Developer 2's interview responses suggest this is because developers tend to development apartment complexes only in areas where population density and pro-intensification policies already encourage them.

Beyond rules and policies that outright prohibit certain forms of development on a site, planning policies can also retard development by reducing potential economic yield and

thus feasibility. For example, speaking about greenfield development on land near a significant natural area in the Wellington Region, Developer 3 said "you used to be able to get a nice landscaped development with a hundred houses on it and now on that same bit of land, you might be you might not be able to do the cut and fill [because you need to preserve] a perceived wetland, which might be a bit of Manuka scrub and a kind of swale… you end up going from a hundred sites down to 30 and those 30 sites become a lot more problematic."

Developer 3 also talked about how planning regulations can reduce developability by introducing requirements around landscaping and stormwater management that necessitate more intensive council maintenance, thus also increasing property rates: "the council [are requiring] a lot more green edges on the road, less curving, more swales, more landscaping…[this makes the development] a lot more intensive for the councils to look after, so the rates are going up, [making it] more expensive to build, so there's less houses on them."

Observing Other Developers

Developers also consistently rank the observation of other developers as not very important, although inexperienced developers do rank it higher than social need. This could indicate that herding is not common, however, developers may perhaps be influenced by the behaviours of others without being actively aware of such. None of the interview participants mentioned observing or reacting to the behaviours of other developers, other than their high-level interest in areas of recent concentrated development activity.

Social Need

Smaller developers are generally less concerned with social need than their larger peers, and none of the small developers mentioned social concerns in their responses. However, it is important to note that no community developers (e.g. Māori groups or Kainga Ora) completed the survey.

Past Experience

The survey results also indicate that developers, especially experienced ones, are quite reliant on their own past experience in guiding their current practice. For example, Developer 1 discussed the importance of experience in how he assesses a site, stating that he often relied on his past experience more than data provided by local governments: "I don't pour over the council mapping information because we don't put a lot of [stock in them]…you can sort of get a feel for the land, once you have a look at it and [have] gone through the stuff, so the first things I look for is the aerials and the contours, and what other

infrastructure is around it?" Developer 2 echoed this, saying "Sometimes the council stuff isn't always accurate - it's a sort of sign post. We wouldn't use it to make a decision, we just use it as a sort of guide post to help decide on further due diligence."

Developer 9 said that his previous negative experience was guiding his approach to future development opportunities: "next time I will go for a new building [instead of a change of use/conversion], because [my previous project] was an older building, so the council had a lot of seismic and structural concerns…the process with council was very difficult, much slower and more expensive that I expected."

Variation Between Developer Groups

The greatest variance is observed among the medium-sized, 4-11 project developers, who place above-average importance on all four variables, perhaps indicating a higher level of general caution and careful calculation among this group. All of the medium-sized respondents stated that their past experience was extremely important to their assessment of project feasibility, compared with 31.6% of large developers and 30% of small ones. Respondents engaged in small projects were also significantly more informed by their past experience, while their medium-sized peers were more focused on observing social need, and slightly less informed by their past experience.

5.14. Development in At-Risk Areas

Introduction

How significant is new housing development on land subject to significant natural hazard risk to the contemporary New Zealand context?

To provide an indicative answer to this question, it was decided to estimate the number of new dwellings and other buildings constructed both within and without the statutory hazard areas of the Waikato Region by using a series of LINZ building outline datasets from the following time periods and locations:

- 2012 – 2013: Waikato Region, excluding the urban areas of Waikato District
- 2014: Urban Areas of Waikato District (e.g. Tuakau, Pokeno, Huntly)
- 2016 – 2019: Waikato Region

These layers can be overlaid to track all development in the region over the period between around 2013/2014 to 2016, a 3 – 2 year period of study. For example, the image below shows the development of new housing in the Broman Road area of Hamilton (buildings existing in 2012 are shown in red, buildings added by 2019 are shown in green):

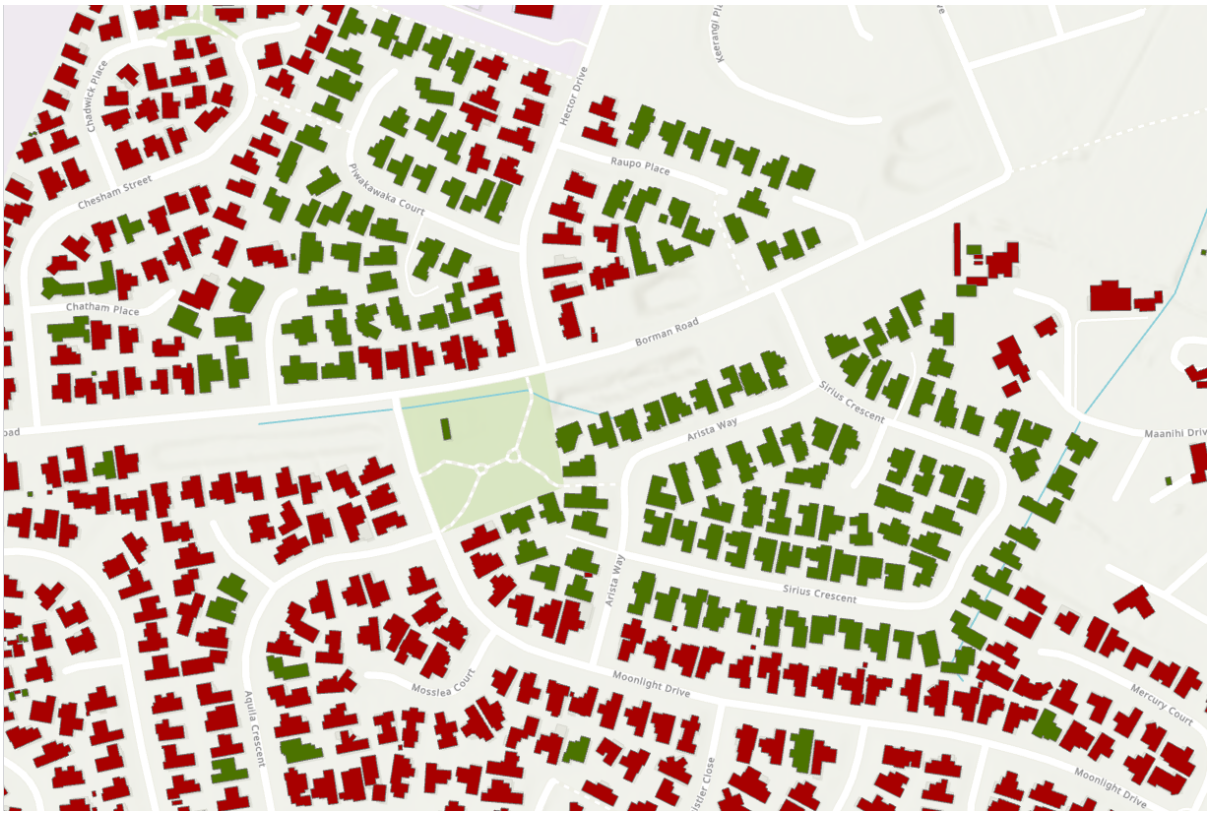


Figure 5.1 – Example of Tracking Housing Development Using Building Outline Datasets

Limitations

Unfortunately, these datasets do not distinguish between residential and other types of buildings, nor do they indicate the number of units contained within each structure.

There are also many instances within the datasets where the outline of a building varies between the 2012 and 2016 data. It is difficult to determine in such cases whether the change represents an error in the data or a newbuilt extension to an existing building. For example, the area shown in green below has been identified as a new building outline, but may actually be an extension to the existing building it borders:

Figure 5.2 – Example of a Problematic Data Point

It was decided to treat all such overlaps as errors and to eliminate them, a centroid was generated for each 2012 building outline and all 2016 building outlines which intersected with these centroids were removed. The data does not therefore account for new housing units established within, or as extensions to, existing buildings, and furthermore some degree of error and inaccuracy should still be anticipated in the results.

Because the new buildings datasets are limited to the Waikato Region only, it became necessary to identify, quantify, and map natural hazards in the Waikato only. Significant hazards were identified through a general review of relevant literature which produced the following list of significant natural hazards in the Waikato region:

- Coastal flooding
- Riverine flooding
- Tsunamis
- Land erosion, slippage, and subsidence
- Coastal inundation and erosion from sea level rise

- Earthquakes
- Volcanic eruptions

From this list, earthquakes, volcanic eruptions, and coastal flooding were excluded from the analysis because of their very large and dispersed areas of impact. The Waikato Region has an extensive network of seismic fault lines and long coastlines lacking consistent and uniform flood modelling. A similar issue was encountered with land erosion, slippage, and subsidence, and this hazard was substituted with a dataset of significant historical landslides in the region.

Waikato Regional Council provide datasets containing the broad outlines of areas at significant risk from riverine flooding and tsunami inundation. It is important to note that no distinction is made within these high-level datasets between gradations of hazard, which means that, for example, the entire lengths of some rivers are considered as part of a single flood zone without distinction between high – medium – low frequency, severity, et cetera.

In an attempt to capture land instability hazards, a buffer zone with a radius of 1 kilometre was generated around each of the historic landslides, under the assumption that these areas have heightened risk of future hazard events.

Sea level rise was modelled using the latest data from NIWA. A maximalist approach was adopted, with all areas at risk from 80cm of sea level rise by 2125 along SSP2 – 4.5 M without accounting for vertical land movement. This may be a significantly higher level of hazard than is planned for by central and local government bodies at this stage, and is intended to cover a broad 'coastal hazard area'. It is notable that under this model, most of the Hauraki plains and Port Waikato area are considered at-risk.

Combining these datasets produces the following composite map of significant natural hazards in the Waikato, over which the building datasets were overlaid:

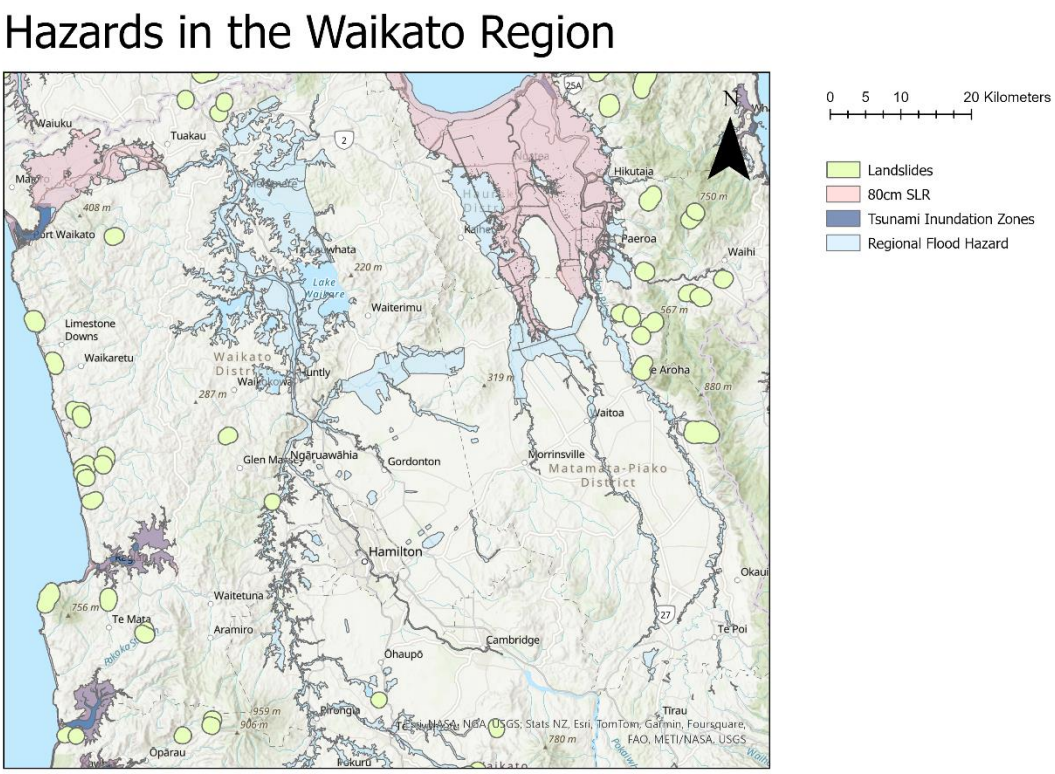


Figure 5.3 – Selected Hazards in the Waikato Region

Results

A large volume of development occurred in the region from 2012 – 2019, with the total number of building outlines increasing from 346, 119 to 507, 045 (a change of +46.49%). A significant proportion of this occurred in at-risk areas, with for example more than 10, 000 new buildings, mostly dwellings, being constructed within regional flood hazard zones:

Table 5.M – Proportion of New Development Occurring in Hazard Zones

Regional Flood Hazard	Tsunami Zone	Within 1km buffer of a landslide	Coastal Inundation at 80cm of SLR
9.70	3.47	1.89	3.90

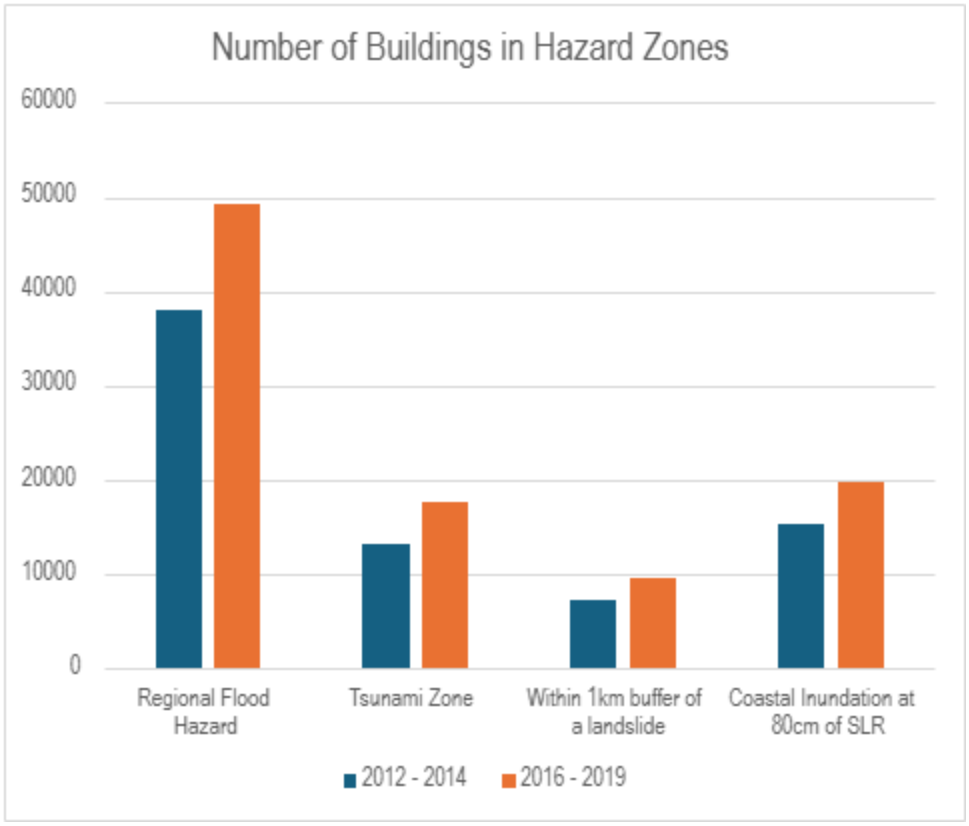


Figure 5.4 – Change in Number of Buildings Within Hazard Zones

As of 2019, a total of 18.96% of all buildings in the Waikato region were located within at least one of the hazard zones studied.

Development within Regional Flood Hazard areas has occurred in all the urban areas of the region, but has been especially significant in the townships of the Hauraki Plains and the Coromandel Peninsula, like Ngatea, Thames, Tairua, as well as Otorohanga (new buildings within hazard areas shown in green):

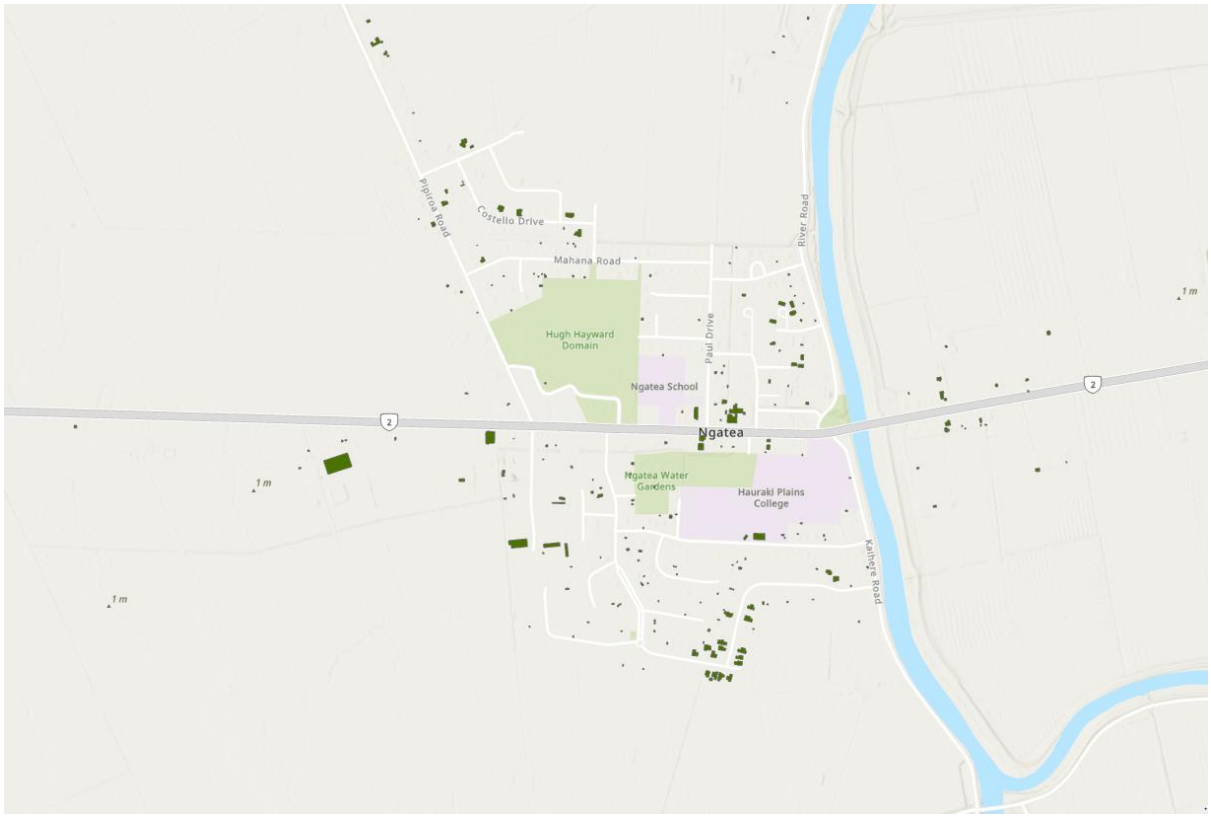


Figure 5.5 – Development in Flood Hazard Areas in Ngatea

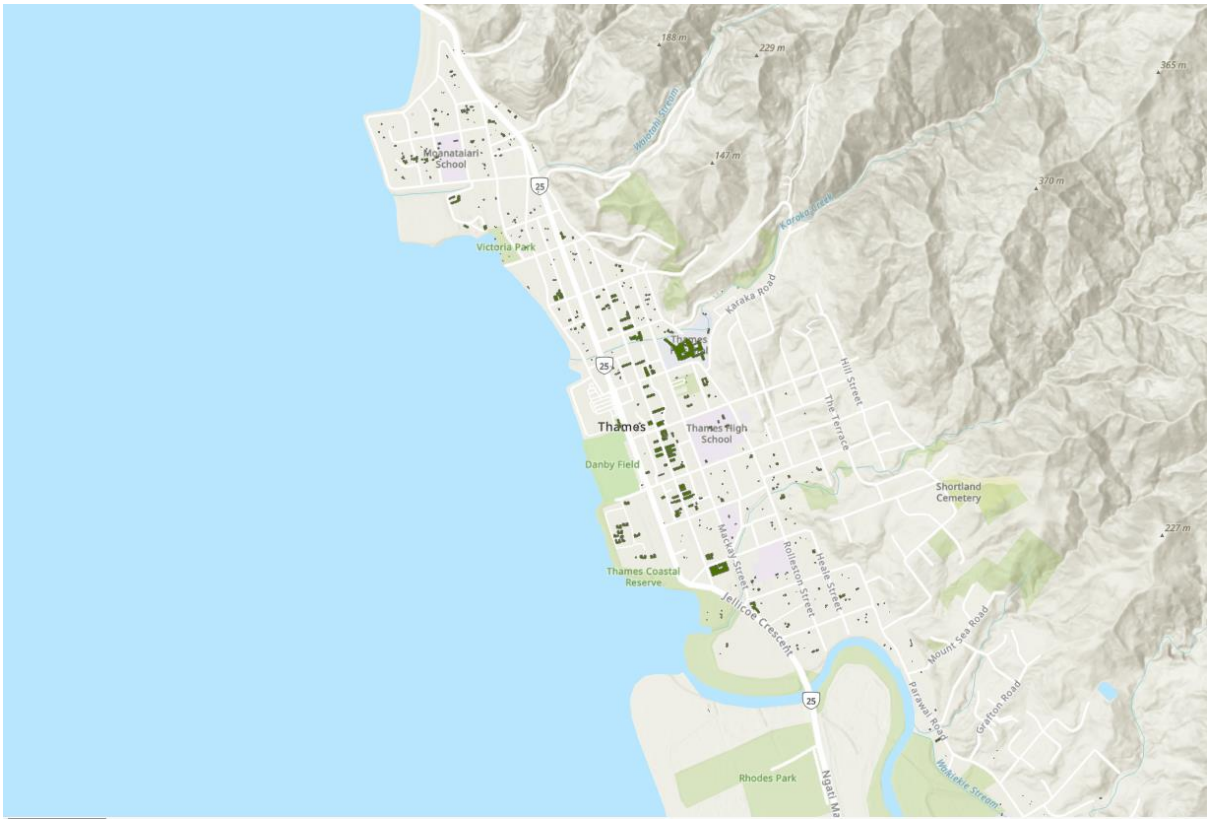


Figure 5.6 – Development in Flood Hazard Areas in Thames

For Tsunami zones, the hotspots are the Tairua – Pauanui area and Whangamata in the Coromandel Peninsula of the eastern coast and Raglan along the west coast (new buildings within hazard areas shown in red):

Figure 5.7 – Development in Tsunami Zones in Pauanui

Figure 5.8 – Development in Tsunami Zones in Raglan

Multiple major areas feature significant development at risk from future sea level rise, some specific notable areas being recent housing developments like for example that at Benner Drive and Merrimana Drive, Ngatea (as shown below).

Figure 5.9 – Development at Risk From Sea Level Rise on Benner Drive (left) and Merrimana Drive, Ngatea

It is finally interesting to note that residential development is starting to progress rapidly in the Tuakau – Pokeno area; townships both ringed by coastal, riverine, and land stability hazards, meaning that near-future greenfield developments are likely to be subject to these hazards.

5.15. Reactions to Natural Hazard Scenarios and Policies

Table 5.N - Likelihood of Developing in Select Natural Hazard Scenarios

Scenario	Mean Response	% Either Unlikely or Extremely Unlikely	% Extremely Unlikely
The site is protected by hazard-engineering structures	2.50	40	24
Flood hazard mapping indicates that the site is at risk from flooding	2.40	46	22
The developer is required to contribute financially towards building hazard-engineering structures	2.17	54	34
The site was recently affected by a flooding event	2.02	60	30
The developer is required to provide a 10 year development guarantee	1.93	56	46
Future homeowners may find it hard to acquire private insurance	1.52	72	54

Differences Between Developers

Developers do not respond to all natural hazards equally, with the strength of their reaction being determined by a combination of:

- How this risk is communicated to them by councils and the amount of trust they place in council maps, modelling, and reports
- The scale and severity of the hazard
- The risk tolerance of insurance companies and households to each hazard
- Developer personality and general risk tolerance

For example, while Developer 4 said that “a new report [on coastal inundation risk] was released [recently] that's pretty damning for Hawkes Bay’s future. So we won't cut corners around that…we [would] need to have a clear-cut direction from council on that before we'd make a decision on purchasing land for development. There are essentially no-go zones.” However, he also said “Here in Hawkes Bay…earthquakes or cyclones, they just don't come into our thinking…like, we won't build a development saying shit, we're gonna get a slight earthquake at this position because I think it's just too hard, if every developer did that we wouldn't build anywhere, especially in the Hawkes Bay.” In a similar vein, Developer 1 said that while he would trust and take very seriously the Bay of Plenty Regional Council’s data on coastal hazard risk, his personal experience and opinions as a developer lead him to react very differently with regards to geotechnical hazards, as discussed elsewhere.

Hazard-Engineering Structures

The greatest willingness to develop (60%) was found in a scenario wherein the site is under the protection of hazard-engineering structures, indicating a moderate level of trust put in such structures. Although such structures help mitigate hazard risk, thus increasing chances of council and insurer endorsement of a proposed development, this is somewhat counterbalanced by the fact that developers are wary of situations where they must collaborate with other landowners or pay fees to councils to mitigate hazards. Developer 8 spoke about her company was considering a major expansion in the Papamoa area of Tauranga, viewing it as a very safe area despite coastal hazard risks because she believed that the value of the ongoing development activity there will almost guarantee that the public sector will provide effective engineered solutions.

Hazard Mapping

54% of developers are more likely than not to develop a site which flood hazard mapping indicates is at risk from flooding. The interview responses suggested that the value which developers ascribe to local and regional government hazard mapping varies by place: while Developer 5 said that the Canterbury regional risk registers are “really, really good” and Developer 3 Developer 1 said that he “[doesn’t] put a lot of stock” in the Bay of Plenty Region’s modelling and frequently challenges it as outdated and inaccurate.

Table 5.O – Trust in Council Hazard Mapping by Region (Interview Participants)

Region	Trust in Council Hazard Mapping (interview participants)
Bay of Plenty	Low – they are often outdated and inaccurate
Auckland	Medium – they provide a useful starting point, but we usually commission additional modelling
Wellington and Kapiti Coast	Medium – council models are outdated
Hawkes Bay	High– although they recognise that accuracy is sometimes poor and understand the limitations inherent to long-term modelling, local developers are taking coastal inundation mapping seriously and thinking long-term
Canterbury	High – said that the risk registers are "really, really good"

The level of trust which the interview respondents placed in these maps corresponded with their willingness to develop in such areas: Developer 4 said he would never develop in the high-coastal-inundation-risk areas of the Hawkes Bay, whereas Developer 1 frequently attempts projects in areas considered unstable land by the Bay of Plenty Regional Council because he is highly sceptical of such designations.

Recent Flooding Event

The hypothesis that a recent flooding event is a more effective deterrent of development than hazard mapping was also confirmed, with 40% of developers being willing to develop in the former case versus 54% in the latter. For example, Developers 2 and 9 spoke about how the 2023 Auckland Anniversary Floods have prompted greater general concern for flooding risk among both developers and council in the Auckland region, leading developers to reject projects in areas which prior to the major flooding event they may have considered viable, with Develop 9 specifically saying "[in] some places, there is a big flood and people just don't want to live there any more, like in Auckland now they are saying 'don't buy in this area because it was part of the big floods'".

Insurance

The ability of future households and property owners to acquire private insurance is the single greatest deterrent of development in an at-risk area: "So natural hazards, obviously a big one nowadays, coastal inundation, you know we think very carefully about those things, that's sort of long-term resiliency. If they're kind of low-level effects, you can engineer

around them, if they're high level then whether we care or not, it's almost immaterial if you think insurance companies are going to care." Developer 2 said "If [insurance companies are] not there, there can't be any development, doesn't matter whether you care about it or not. So they're quite an interesting barometer for development risk."

Multiple interview participants spoke about how providers of insurance are already creating large 'redlined' areas where future development will be practically impossible – Developer 2: "[the banks are] essentially just redlining areas at the moment and aren't renewing finance exposure in certain suburbs in the city. But they would never tell you that. I'm not sure if that's strictly okay, but they're doing it."

Variation by Developer Size

Table 5.P - Unwillingness to Develop by Developer Size (Number of Projects)

Developer Size	**% Unlikely to Develop**					
	Hazard-engineering structures	Hazard mapping	FCs required	Recent flood event	10-year development guarantees	Insurance problems
Small	40	55	55	65	60	70
Medium	33	66	83	83	66	83
Large	42	33	46	25	50	71
(Mean)	40	46	54	60	56	72

The survey data indicates that there are significant differences in how different-sized developers react to natural hazard scenarios.

The greatest difference is between medium and large developers, with the former being much more conservative than the latter: while the majority of medium-sized developers are willing to develop in only one of the scenarios, large-developers are discouraged only by potential difficulties in the ability of future homeowners to acquire private insurance. Large developers are the least influenced by hazard mapping, with only 33% saying it would make them unlikely to develop. They are also the least influenced by a recent flooding event. These two datapoints reflect their general focus on hazard mitigation and belief in site-specific investigation and mitigation.

Responses to Natural Hazard Risk

Figure 5.Q - Stated Responses to an Increase in Natural Hazard Risk

Response to an Increase in Risk	Number of Respondents
Abandon site	8 (16%)
Redesign site	10
Increase finished floor level/freeboard	6
Establish stormwater overland flow paths	2
Engineering options	2
Elevate the site (increase ground levels)	4
Modelling of flood risk	1

It is important to note that many of the interview participants questioned the original framing of this question as given in the survey, arguing that it is too context-dependent a behavioural response to give an accurate answer.

Nonetheless, when presented with an increase in natural hazard risk, a minority of developers said they would abandon the site (16%), while 50% (76% of respondents who answered this question) would instead seek to redesign the site or proposal to mitigate this risk. There are no notable differences in responses between developers of different sizes or levels of experience, and the responses of the interview participants reflected this diversity, with Developer 2 indicating that they abandon a large number of sites due to natural hazard risk, while Developer 3 said that they only walked away from a site only once every two years.

Land redevelopment responses, including redesigning the site, altering the overland flow paths, and/or increasing ground levels, were significantly more popular than building design responses (primarily increasing FFL/freeboard), due partially to the greater profit margins in land development versus building development. There was however some regional variation in this, for while Developers 3 and 5 emphasised how the high costs of foundations in a high-hazard area can often make-or-break a project, Developer 7 said that in Christchurch “you still get a lot of developers, especially bigger developers, where it doesn't really worry them too much because they’ve got volume. They’ve got so much volume and they’ve bought the land cheap, so they can afford spending a little bit of extra money to beef up foundations or do better construction, and even though it might not be worth as much in the market, say if it was in a TC 2 or TC 1 [site], because of the volume, they still make their ends meet like that, and a good profit a lot of the time.”

6. Discussion

6.1. Contributions to New Zealand Housing Theory

A large amount of the existing corpus of New Zealand planning theory, especially the older literature, is built upon the fundamental assumption that new housing is mostly standalone family homes mostly built for New Zealand European nuclear families. The present research has revealed this to be increasingly inaccurate. Firstly, the majority of new housing is now attached units, located both in infill or urban redevelopment projects and mixed-typology subdivisions, with the statistics suggesting that standalone homes are likely to further decline in production over the foreseeable future. Secondly, a rapid increase in demographic diversity has created a much more diverse and heterogenous population of households, to which the market is gradually reacting by deemphasizing the reproduction of old 'family homes' in favour of new dwelling sizes, types, and features.

Accompanying this heterogeneity of housing types and households, the research identified a significant diversity among developers in the New Zealand context which no existing typologies sufficiently capture, necessitating a new typology as proposed in section 3.13. It is suggested that this typology could form the theoretical basis for further research into the specific nature and characteristics of some of these developer types. Of special interest are Māori developers like iwi, hapu, and whanau, who have a significant and growing role in the production of housing and operate in ways distinct from the normative global-capitalist approaches to development.

One key contribution of this research to New Zealand housing theory is therefore to both reveal and emphasise the importance of diversity – of development types, of developers, and of households – and how this is creating new norms of development, leading ultimately to fundamental changes in way that our cities will evolve and function in the future. These trends are rapidly necessitating a new body of theory of housing development in the contemporary New Zealand context, which it is hoped that this present research may represent a small step towards.

The research also identified some features which are shared among the bulk of developers within the New Zealand context. Most developers are diverse in their activities and governed by an understanding that to maintain long-term profit, they must also maintain a good reputation in the market. They employ a strong process of due diligence and feasibility assessment which ensures that development failure is very rare for most established developers. They share an average project timeframe of about 1.5 years and a strong concern for the current land use and infrastructure servicing of a site, real estate market activity and sales data for the neighbourhood, geotechnical conditions, and land price as

key site selection variables. However, it also revealed that some variables – like for example blue-green features, views, and other environmental amenities – are important to some specialist developers only, further enforcing the need for future housing theory to recognise and incorporate this diversity.

Another key contribution of the research is that activity in areas subject to natural hazard risk represents a significant portion of new housing development, with many developers willing to consider developing such sites under current regulatory and policy regimes. Differences in developer values, rationales, strategies, and risk tolerances, combined with differences in the quality and reputation of local natural hazard mapping and policy, have created a diversity of developer responses to natural hazard risk, of which the present research represents only an overview.

6.2. Relationship to Existing Research

The research affirmed the applicability to the New Zealand context of Adams et al. (1992)'s finding that planning policies are the most important determinant of site development feasibility. It also affirmed that households are typically willing to sacrifice environmental amenities for better prices (Chadbourne et al. 2013), that developer perceptions of planners and the planning system vary across a wide spectrum – from a strongly negative view of planning as a rules-based bureaucratic hinderance, to a more positive perception of planning as a proactive process of future visioning and place-making in which the developer is an eager and active participant (Coiacetto 2000), and finally, that developers are more affected by a recent hazard event than by a site being mapped as having a high hazard event probability (National Academy Press 1989).

Conversely, the present research challenged the applicability of Parker et al. (2013)'s typology of developers by primary development type, or Ruming (2010)'s division of developers into small – medium – large, and the assertion of Fridirici (2008) that developers overestimate the risk reduction effects of engineered protections.

In addition to the other recommendations for future research made in section 6.7 below, it is suggested that further research is conducted into the applicability of the international literature to the New Zealand context given its many unique features outlined in this present report.

6.3. Implications for Policymakers

This research has affirmed the vital importance of the role of planners and policymakers in determining where development occurs, what types of development occur, and the level of natural hazard risk exposure which households are exposed to. New Zealand developers

consistently rank planning policies as the most important variable in their due diligence and feasibility assessment methodologies, with the District Plan often being the first thing they check when deciding whether to develop a site. Developers generally understand the values and interests which guide contemporary planning practice, but they differ in how they relate to councils – some are highly critical of perceived excesses in the existing planning regime and seek to avoid or circumvent planners wherever possible, while others have a collaborationist attitude towards councils, believing that by 'playing by the rules' they can actively contribute to better whole-of-system outcomes. This means that policymakers have an opportunity to identify these collaborationist-developers and actively involve them in creating and implementing objectives and policies, both within specific areas as part of spatial planning schemes and across boundaries through coordination with large developers active in multiple locations.

The research data shows that New Zealand has already passed a key turning point in the production of new housing, with the majority of new units now being duplexes or other attached units rather than the standalone houses which have previously dominated the sector. This trend is likely to continue for the foreseeable future, and it will change the ways that developers behave in terms of the sites they select for development, the design features they prioritise, and their strategies and responses towards natural hazard and other risk factors. This gradual shift from low- to medium- and high- density development also means the role of planners is changing from controllers of the release of greenfield land for subdivision to controllers of densification, and thus the patterns and characteristics of future development: because the majority of existing planning zones and policies have been created for standalone housing, planners now have the opportunity to direct new development into hyper-specific areas within the urban environment and implement new controls over land development and building design.

New Zealand developers view regional and district planning policies as one of the two key determinants of whether they will develop a site subject to natural hazard risk, the other being the ability of the end-user to acquire private insurance. Although policymakers do set boundaries on development which sometimes result in them absolutely denying the possibility of development in an area, their more significant role in controlling housing development is in requiring developments to implement specific risk mitigation measures. It is the cost of these mitigations which primarily determines whether or not development will occur in an at-risk area. The level of importance which developers place on flood hazard mapping is relatively low, with a small majority still willing to develop a site mapped as being at-risk. There is significant regional variance in how developers evaluate hazard mapping based on perceptions of outdatedness, accuracy, and modelling limitations. This implies

that many existing natural hazard policies are not achieving their full intended effects or reflecting the full scope of available and current information.

Finally, the general unwillingness of New Zealand developers to engage in landbanking due to financial constraints and high perceived risk implies a potential hinderance to future spatial planning schemes, like for example the Future Proof Strategy for the Auckland – Hamilton area.

6.4. Implications for ABM Developers

This research has revealed that in order to be accurate and useful for the purposes of scenario modelling and future development simulation, any new Agent-Based Models of housing development in contemporary New Zealand will need to recognise several unique features of this context which distinguish it from many of the international contexts for which existing ABMs in the literature have been developed.

Unlike in the North American, European, and Australian contexts in which most of the existing literature is grounded, New Zealand housing developers are very diverse in the types of units and sites they develop. This means that they generally should not be grouped or typologised by primary type of development activity, type of development opportunity targeted, or type of site typically selected for development (e.g. location within the urban area), exempting a minority of specialist developers as identified in part 4. The New Zealand development sector further differs from international contexts in that it also features a relative absence of medium-sized developers (in terms of both average number of projects per annum and typical project size). Finally, landbanking and rezoning are uncommon practices for New Zealand developers and should not therefore form a major part of any future model of their activities.

Diversity

New Zealand developers vary in three key ways with important implications for future agent-based modelling: risk tolerance, values and rationales, and strategies.

New Zealand developers vary in their attitudes and strategies towards risk, ranging from very conservative to more balanced approaches, with there also being a small but notable minority of small, inexperienced, and short-term-oriented ‘cowboy’ developers. However, the majority of established developers are risk-adverse enough to always engage in a predetermined and multi-stage process of due diligence and feasibility assessment integrating a wide variety of information sources and variable considerations. This process ensures that they are successful in nearly all of their development projects. This implies that if an ABM can be developed which accurately captures the range of variables detailed in this

research, it should produce an accurate, reliable, and consistent model of housing development in the New Zealand context, enabling useful scenario modelling and predictions of future development patterns.

Their values and rationales range from an exclusive concern for short-term return on investment, to a balanced approach that leads them to pursue opportunities to produce better social and environmental outcomes without compromising their profit, to a meaningful long-term commitment to quality outcomes that sometimes come at the expense of short-term return.

Although many developers have no specific long-term strategy they are pursuing, many do, ranging from targeting specific types of sites, areas, or demographics, to a general commitment to maintaining a strong market reputation for high-quality outcomes and ownership of the final product.

To be accurate and useful, any future ABM developed for this context will need to model this diversity and the variety of development outcomes it produces.

Site Selection

This research has provided a set of variables which developers used to select a site for development. These variables vary in their relative level of importance and differ between developers depending on their size, values, and strategy. Different sets of site selection variables are also prioritised when a developer is engaged in one form of development versus another.

6.5. Recommendations for Policymakers

The author has five key recommendations for planning and natural hazard policymakers.

Firstly, it is recommended that policymakers actively seek to identify, include, and collaborate with the population of collaborationist-developers that currently form a significant presence in the sector. Incorporating them in planning and policymaking will enable more realistic, effective, and targeted interventions while reducing conflict between the public and private sectors.

Secondly, when creating and reviewing natural hazard policy, greater attention should be paid to the financial implications of these policies on developers – specifically the cost required to implement the mandated mitigation measures, and whether the project will subsequently remain profitable for the developer. Understanding the financial/feasibility implications of policies for developers will enable policymakers to (a) create policy that better controls future patterns of development without imposing absolute regulatory

barriers and (b) allow for more nuanced policymaking that targets specific forms of development and types of risk exposure.

It is recommended that policymakers in the urban development planning and natural hazard sectors anticipate the aforementioned densification trend in new housing development and ensure that all policymaking and predictions of future development patterns and outcomes are reflective of it, rather than being rooted in outdated norms of production and consumption.

Another key research finding is that the level of trust which developers in place in local and regional government hazard mapping and other natural hazard risk communications, which determines their willingness to accept and value those risks rather than seek to challenge council restrictions on those areas, is significantly determined by what they perceive to be differences in the quality, reliability, and reasonableness of those resources between locations. It is therefore recommended that policymakers conduct a critical review of these tools in collaboration with developers and other users, and consider ways in which their usefulness can be improved by the integration of better modelling techniques and the large volume of site specific data on variables like geotechnical and flooding hazards which developers are continuously collecting as part of their investigative processes.

Finally, if policymakers wish to encourage long-term strategic planning and investment behaviours among developers, then it is recommended that they provide greater certainty and provide opportunities for developers to collaborate with policymakers in the creation and implementation of spatial strategies.

6.6. Recommendations for ABM Developers

The research also leads to multiple important recommendations for future ABM developers.

Firstly, it is recommended that future ABM developers focus on targeted rates of return and methods of financial feasibility analysis as the principal organising logics of development, determining when, where, and what kind of development occurs within a market environment.

Secondly, any ABM designed for the New Zealand context should furthermore account for local and regional differences in site selection variables, particularly with regard to the existing infrastructure and infrastructure requirements, local natural hazard risk exposure, and neighbourhood-level demographic and socioeconomic compositions. They should also account for regional, local, and neighbourhood differences in real estate sub-markets.

Models for this context should also represent developers as engaged in multiple types of development simultaneously and incorporate a diversity of risk tolerances, values and

rationales, strategies, and prioritisations in terms of site selection variables. To help facilitate this, it is recommended that future modellers adopt the typology of developers proposed in section 5 of this present report, and furthermore utilise the new data provided in the appendices as a useful starting point for a comprehensive modelling of developers in the contemporary New Zealand context.

6.7. Recommendations for Further Research

The research data revealed that there is a significantly smaller population of developers in the middle size and experience categories, suggesting that as developers attempt to grow their operations from small-scale to large, they enter a critical period in which development and/or business failure is commonplace. Although some of the interview participants were able to opine on the causes of this, the existing literature suggests little research has been conducted into this phenomenon. It is recommended that future researchers investigate the causes and consequences of this, as it could lead to better understandings of development failure, the development cycle, and the processes by which the normative behaviours and assumptions of the large, well-established developer group are established and reinforced.

7. Conclusion

A variety of conceptual models of housing development exist in the literature. An Agent-Based Model is best-suited to capturing the heterogeneity of the agents performing housing development in contemporary urban New Zealand, making it highly applicable to this research context and purposes.

While there are a number of existing typologies of housing developers, none capture all the key features of the New Zealand context, like the strong and growing role of Māori in housing development, the ongoing transition away from detached housing to townhouses and other units, and the importance of 'mum and dad' or small investor developers. A new typology of developers is therefore needed to capture this uniqueness and diversity, and this was presented in section 3 of this report.

The survey and interviews confirm that developers in New Zealand are diverse in their demographics, behaviours, values and rationales, strategies, and reactions to natural hazard scenarios.

Developers are diverse in their activities and sizes, with some distinct behaviour differences existing between small, medium, and large developers. The market is somewhat dominated by large, high-experienced players, with lower-experience developers often faltering in the

transition to a greater scale of operations despite strong economic incentives to grow. There are also differences in developer behaviour by region of operations, with for example developers tending to trust regional council natural hazard mapping in some regions, and question its validity in others.

Large developers perceive of themselves as conservative, operating ‘by-the-books' in order to preserve their long-term reputation and profitability. They contrast this with those they call ‘cowboys’, interested only in short-term profit. Experienced developers follow a complex and comprehensive due diligence process, investigating a set of variables that varies by developer size, location, and strategy, leading to a final feasibility test based on an overall financial analysis of whether the proposed development achieves the targeted Return on Investment. Current land use and infrastructure, geotechnical and natural hazard risks, and neighbourhood market dynamics are among the key variables. Developers also place relatively little importance on the observation of their peers, possibly indicating the absence of behaviours like herding.

Finally, New Zealand developers place relatively little importance on hazard mapping and recent natural hazard events when deciding whether to pursue development of a site. Instead, the key indicator they look to is the insurability of the final product, suggesting that the insurance industry has a paramount role to play in determining future patterns of urban development in this country.

8. Bibliography

Aburas, Maher Milad, Yuek Ming Ho, Mohammad Firuz Ramli, and Zulfa Hanan Ash'aari. "The Simulation and Prediction of Spatio-Temporal Urban Growth Trends Using Cellular Automata Models: A Review." *International Journal of Applied Earth Observation and Geoinformation* 52 (2016): 380–89. doi:10.1016/j.jag.2016.07.007.

Adams, C.D., H.G. May, and T.J. Pope. 1992. "Changing Strategies for the Acquisition of Residential Development Land." Journal of Property Research 9 (3): 209–26. doi:10.1080/09599919208724068.

Adams, David, and Steven Tiesdell. *Shaping Places : Urban Planning, Design and Development*. London: Routledge, 2013.

Agnello, Luca, Vitor Castro, and Ricardo M Sousa. "The Housing Cycle: What Role for Mortgage Market Development and Housing Finance?" *The Journal of Real Estate Finance and Economics* 61, no. 4 (2020): 607–70. doi:10.1007/s11146-019-09705-z.

Allen, John, Chris Hamnett, and John Allen. *Housing and Labour Markets : Building the Connections*. Edited by John Allen and Chris Hamnett. First edition. Boca Raton, FL: Routledge, 2018.

Almatarneh, Rana Tawfiq, and Yasser Mohamed Mansour. "The Role of Advertisements in the Marketing of Gated Communities as a New Western Suburban Lifestyle: A Case Study of the Greater Cairo Region, Egypt." *Journal of Housing and the Built Environment* 28, no. 3 (2013): 505–28. doi:10.1007/s10901-012-9326-1.

Ball, Michael. "Markets and the Structure of the Housebuilding Industry: An International Perspective." *Urban Studies* 40, no. 5/6 (2003): 897–916. http://www.jstor.org/stable/43084296.

Ballard, Richard, and Siân Butcher. "Comparing the Relational Work of Developers." *Environment and Planning. A* 52, no. 2 (2020): 266–76. doi:10.1177/0308518X19893684.

Bao, Helen X. H, Charlotte Chunming Meng, and Jing Wu. "Reference Dependence, Loss Aversion and Residential Property Development Decisions." *Journal of Housing and the Built Environment* 36, no. 4 (2021): 1535–62. doi:10.1007/s10901-020-09803-y.

Bao, Helen XH, Johan P Larsson, and Vivien Wong. "Light at the End of the Tunnel:The Impacts of Expected Major Transport Improvements on Residential Property Prices." *Urban Studies (Edinburgh, Scotland)* 58, no. 14 (2021): 2971–90. doi:10.1177/0042098020967308.

Barlindhaug, Rolf, and Berit Irene Nordahl. "Developers' Price Setting Behaviour in Urban Residential Redevelopment Projects." *Journal of European Real Estate Research* 11, no. 1 (2018): 71–86. doi:10.1108/JERER-03-2017-0014.

Benson, Charlotte, and Edward J Clay. *Understanding the Economic and Financial Impacts of Natural Disasters*. Vol. 4. The World Bank, 2004. doi:10.1596/0-8213-5685-2.

Bolitzer, B, and N.R Netusil. "The Impact of Open Spaces on Property Values in Portland, Oregon." *Journal of Environmental Management* 59, no. 3 (2000): 185–93. doi:10.1006/jema.2000.0351.

Brill, Frances. "Complexity and Coordination in London's Silvertown Quays: How Real Estate Developers (Re)Centred Themselves in the Planning Process." *Environment and Planning. A* 52, no. 2 (2020): 362–82. doi:10.1177/0308518X19860159.

Cai, Zipan, Yoonshin Kwak, Vladimir Cvetkovic, Brian Deal, and Ulla Mörtberg. "Urban Spatial Dynamic Modeling Based on Urban Amenity Data to Inform Smart City Planning." *Anthropocene* 42 (2023): 100387-. doi:10.1016/j.ancene.2023.100387.

Campbell, Kayleigh B, James A Rising, Jacqueline M Klopp, and Jacinta Mwikali Mbilo. “Accessibility across Transport Modes and Residential Developments in Nairobi.” *Journal of Transport Geography* 74 (2019): 77–90. doi:10.1016/j.jtrangeo.2018.08.002.

Chadourne, Matthew, Seong-Hoon Cho, and Roland K Roberts. “Identifying Priority Target Areas for the Knoxville–Knox County Hillside and Ridgetop Protection Plan: Using the Value of Visual Amenity during the Real Estate Boom of 2002–2007 and the Recession of 2008.” *The Annals of Regional Science* 50, no. 3 (2013): 911–34. doi:10.1007/s00168-012-0519-z.

Charney, Igal. “Downtown Redevelopment and Land-Use Regulation: Can Planning Policies Discipline Property Development?” *Land Use Policy* 47 (2015): 302–8. doi:10.1016/j.landusepol.2015.04.019.

Chen, Chang, Haoyu Zhai, Zhiruo Wang, Shen Ma, Jie Sun, Chengliang Wu, and Yang Zhang. “Experimental Research on the Impact of Interest Rate on Real Estate Market Transactions.” *Discrete Dynamics in Nature and Society* 2022, no. 1 (2022). doi:10.1155/2022/9946703.

Chen, Yi-Ling. “‘Housing Prices Never Fall’: The Development of Housing Finance in Taiwan.” *Housing Policy Debate* 30, no. 4 (2020): 623–39. doi:10.1080/10511482.2020.1714691.

Chen, Ziyang, Maggie Rong Hu, Ginger Zhe Jin, and Qiyao Zhou. *Haste or Waste? The Role of Presale in Residential Housing*. Cambridge, Mass: National Bureau of Economic Research, 2024.

Cheshire, Paul, and Stephen Sheppard. “On the Price of Land and the Value of Amenities.” *Economica (London)* 62, no. 246 (1995): 247–67. doi:10.2307/2554906.

Chi, Guangqing, and David W Marcouiller. “Natural Amenities and Their Effects on Migration along the Urban–Rural Continuum.” *The Annals of Regional Science* 50, no. 3 (2013): 861–83. doi:10.1007/s00168-012-0524-2.

Christensen, Finn Kjær. “Understanding Value Changes in the Urban Development Process and the Impact of Municipal Planning.” *Land Use Policy* 36 (2014): 113–21. doi:10.1016/j.landusepol.2013.07.005.

Clauretie, Terrence M, and Herman Li. “Land Values: Size Matters.” *The Journal of Real Estate Finance and Economics* 58, no. 1 (2019): 80–110. doi:10.1007/s11146-017-9628-x.

Coiacetto, Eddo. “Diversity in Real Estate Developer Behaviour: A Case for Research.” *Urban Policy and Research* 19, no. 1 (2001): 43–59. doi:10.1080/08111140108727862.

COIACETTO, EDDO. “PLANNING-IN-PRACTICE AND PLANNING-IN-PRINCIPLE: Is Planning Facilitative of the Real Estate Development Process?” *Australian Planner* 37, no. 3 (2000): 120–29. doi:10.1080/07293682.2000.9657893.

Coleman, Charlotte, Neil Crosby, Pat McAllister, and Pete Wyatt. “Development Appraisal in Practice: Some Evidence from the Planning System.” *Journal of Property Research* 30, no. 2 (2013): 144–65. doi:10.1080/09599916.2012.750620.

Coleman, Mark S, and Ralph Gentile. “Exploring the Dynamics of Building Supply: A Duration Model of the Development Cycle.” *The Journal of Real Estate Research* 21, no. 1/2 (2001): 21–42. doi:10.1080/10835547.2001.12091046.

De Sousa, Christopher, "Residential Development Activity on Urban Brownfields in Milwaukee and Chicago: An Examination of Redevelopment Trends, Developer Perceptions and Future Prospects" (2006). https://dc.uwm.edu/ced_pubs/35

DeCoster, Gregory P, and William C Strange. “Developers, Herding, and Overbuilding.” *The Journal of Real Estate Finance and Economics* 44, no. 1–2 (2012): 7–35. doi:10.1007/s11146-011-9309-0.

Deng, Kuang Kuang, Jie Chen, Zhenguo Lin, and Xianling Yang. “Differential Selling Strategies Between Investors and Consumers: Evidence from the Chinese Housing Market.” *The Journal of Real Estate Research* 44, no. 1 (2022): 80–105. doi:10.1080/08965803.2021.2008609.

Denowitz, Ronald M. “‘Where Have All the People Gone?’: Recent Inconsistencies between Population Growth and Housing Development in Suburban Chicago.” *Urban Affairs Quarterly* 20, no. 2 (1984): 255–64. doi:10.1177/004208168402000208.

Dewi, Ratna Sari, Wietske Bijker, Alfred Stein, and Muh Aris Marfai. “Fuzzy Classification for Shoreline Change Monitoring in a Part of the Northern Coastal Area of Java, Indonesia.” *Remote Sensing (Basel, Switzerland)* 8, no. 3 (2016): 190–190. doi:10.3390/rs8030190.

Dijk, T. van, D. Muñoz-Gielen, and D. A. Groetelaers. “Expanding Cities: A Grounded Conceptual Model That Allows Comparing Systems of Greenfield Land Development.” *The Town Planning Review* 78, no. 3 (2007): 279–310. http://www.jstor.org/stable/40112723.

Dodd, Francesca Jane. “Exposing the Hidden Politics of Housing Provision in Aotearoa New Zealand: The Complex Governance Landscape of New Housing in Hamilton.” The University of Waikato, 2020.

Dong, Zhi, and Tien Foo Sing. “Developer Heterogeneity and Competitive Land Bidding.” *The Journal of Real Estate Finance and Economics* 48, no. 3 (2014): 441–66. doi:10.1007/s11146-013-9408-1.

Dore, Mohammed, Roelof Makken, and Erik Eastman. “The Monetary Transmission Mechanism, Non-Residential Fixed Investment and Housing.” *Atlantic Economic Journal* 41, no. 3 (2013): 215–24. doi:10.1007/s11293-013-9371-5.

Eaqub, Shamubeel, and Selena Eaqub. *Generation Rent: Rethinking New Zealand’s Priorities*. 1st ed. Wellington: Bridget Williams Books, 2015.

Eves, Chris, and Sara Wilkinson. “Assessing the Immediate and Short-Term Impact of Flooding on Residential Property Participant Behaviour.” *Natural Hazards (Dordrecht)* 71, no. 3 (2014): 1519–36. doi:10.1007/s11069-013-0961-y.

Fan, Gang-Zhi, Ming Pu, Tien Foo Sing, and Xiaoyu Zhang. “Risk Aversion and Urban Land Development Options.” *Real Estate Economics* 50, no. 3 (2022): 767–88. doi:10.1111/1540-6229.12346.

Fontaine, Corentin M, and Mark D. A Rounsevell. “Agent-Based Approach to Model Future Residential Pressure on a Regional Landscape.” *Landscape Ecology* 24, no. 9 (2009): 1237–54. doi:10.1007/s10980-009-9378-0.

Frankel, Arthur. “Comment on ‘Why Earthquake Hazard Maps Often Fail and What to Do about It’ by S. Stein, R. Geller, and M. Liu.” *Tectonophysics* 592 (2013): 200–206. doi:10.1016/j.tecto.2012.11.032.

Fridirici, Roxane. “Floods of People: New Residential Development into Flood-Prone Areas in San Joaquin County, California.” *Natural Hazards Review* 9, no. 3 (2008): 158–68. doi:10.1061/(ASCE)1527-6988(2008)9:3(158).

Fuerst, Franz, and Anna Maija Grandy. “Rational Expectations?: Developer Behaviour and Development Cycles in the Central London Office Market.” *Journal of Property Investment & Finance* 30, no. 2 (2012): 159–74. doi:10.1108/14635781211206904.

Gedal, Michael, and Ingrid Gould Ellen. “Valuing Urban Land: Comparing the Use of Teardown and Vacant Land Sales.” *Regional Science and Urban Economics* 70 (2018): 190–203. doi:10.1016/j.regsciurbeco.2018.03.006.

Gerlach, Stefan, and Wensheng Peng. “Bank Lending and Property Prices in Hong Kong.” *Journal of Banking & Finance* 29, no. 2 (2005): 461–81. doi:10.1016/j.jbankfin.2004.05.015.

Geurs, Karst T, and Bert van Wee. “Accessibility Evaluation of Land-Use and Transport Strategies: Review and Research Directions.” *Journal of Transport Geography* 12, no. 2 (2004): 127–40. doi:10.1016/j.jtrangeo.2003.10.005.

Geva, Yinnon, and Gillad Rosen. “The Regeneration Deal: Developers, Homeowners and New Competencies in the Development Process.” *Geoforum* 96 (2018): 10–20. doi:10.1016/j.geoforum.2018.07.011.

Gillen, Mike, and Peter Fisher. “Residential Developer Behaviour in Land Price Determination.” *Journal of Property Research* 19, no. 1 (2002): 39–59. doi:10.1080/09599910110110653.

Gläser, Jochen, and Laude, Grit. *The Expert Interview and Content Analysis*. 1st ed. Institut für Soziologie/ FG Techniksoziologie: 2004.

Gore, T., & Nicholson, D. (1991). "Models of the Land-Development Process: A Critical Review." *Environment and Planning A: Economy and Space,* 23(5), 705-730. https://doi.org/10.1068/a230705

Grenadier, Steven R. “The Strategic Exercise of Options: Development Cascades and Overbuilding in Real Estate Markets.” *The Journal of Finance (New York)* 51, no. 5 (1996): 1653–79. doi:10.1111/j.1540-6261.1996.tb05221.x.

Grimes, Arthur, and Andrew Aitken. “Housing Supply, Land Costs and Price Adjustment.” *Real Estate Economics* 38, no. 2 (2010): 325–53. doi:10.1111/j.1540-6229.2010.00269.x.

Grimes, Arthur, and Ian Mitchell. “Impacts of Planning Rules, Regulations, Uncertainty and Delay on Residential Property Development,” 2015. doi:10.22004/ag.econ.290579.

Groves, Jeremy R. “The Impact of Positive Property Tax Differentials on the Timing of Development.” *Regional Science and Urban Economics* 39, no. 6 (2009): 739–48. doi:10.1016/j.regsciurbeco.2009.07.004.

He, Sylvia Y. “Regional Impact of Rail Network Accessibility on Residential Property Price: Modelling Spatial Heterogeneous Capitalisation Effects in Hong Kong.” *Transportation Research. Part A, Policy and Practice* 135 (2020): 244–63. doi:10.1016/j.tra.2020.01.025.

Healey, Patsy. “Researching Planning Practice.” *Town Planning Review* 62, no. 4 (1991): 447–59. doi:10.3828/tpr.62.4.0l65405746487668.

Hino, Miyuki, and Marshall Burke. *Does Information About Climate Risk Affect Property Values?* Cambridge, Mass: National Bureau of Economic Research, 2020.

Ho, David Kim Hin, Eddie C.M Hui, Tai Wing Ho, and Satyanarain Rengarajan. “Strategic Behavioral Pricing of the Private Residential Development Market – a Simplified Experimental Approach.” *International Journal of Housing Markets and Analysis* 12, no. 4 (2019): 526–57. doi:10.1108/IJHMA-03-2013-0018.

Improving Risk Communication. 1st ed. Washington, D.C: National Academy Press, 1989.

Indaco, Agustín, Francesc Ortega, and Süleyman Taşpınar. “The Effects of Flood Insurance on Housing Markets.” *Cityscape (Washington, D.C.)* 21, no. 2 (2019): 129–56.

Iossifov, Plamen, Martin Cihak, and Amar Shanghavi. *Interest Rate Elasticity of Residential Housing Prices*. 1st ed. Washington, D.C: International Monetary Fund, 2008.

Irwin, Elena G, and Nancy E Bockstael. “Interacting Agents, Spatial Externalities and the Evolution of Residential Land Use Patterns.” *Journal of Economic Geography* 2, no. 1 (2002): 31–54. doi:10.1093/jeg/2.1.31.

Jokar Arsanjani, Jamal, Marco Helbich, Wolfgang Kainz, and Ali Darvishi Boloorani. “Integration of Logistic Regression, Markov Chain and Cellular Automata Models to Simulate Urban Expansion.” *International Journal of Applied Earth Observation and Geoinformation* 21, no. 1 (2013): 265–75. doi:10.1016/j.jag.2011.12.014.

Joly, Daniel, Brossard Thierry, Tourneux François Pierre, Céline Tritz, Cavailhès Jean, Mohamed Hilal, and Pierre Wavresky. “GIS-Based Hedonic Pricing of Landscape.” *Environmental & resource economics* 44, no. 4 (2009): 571–90.

Jun, Myung-Jin, and Hee-Jae Kim. “The Effects of Seoul’s Suburban Beltway on Accessibility, Residential Development, and Housing Rents: A Transport–Land Use Simulation Approach.” *The Annals of Regional Science* 56, no. 2 (2016): 565–89. doi:10.1007/s00168-016-0756-7.

Kam, Kenn Jhun, Shi Yi Chuah, Tze Shwan Lim, and Fuey Lin Ang. “Modelling of Property Market: The Structural and Locational Attributes towards Malaysian Properties.” *Pacific Rim Property Research Journal* 22, no. 3 (2016): 203–16. doi:10.1080/14445921.2016.1234361.

Kang, Ki Eun. “Local-Level Economic Development Conflicts: Factors That Influence Interactions with Private Land Developers.” *Urban Affairs Review (Thousand Oaks, Calif.)* 58, no. 3 (2022): 706–31. doi:10.1177/1078087421991240.

Kijewski-Correa, Tracy, Debra Javeline, William Kakenmaster, and Angela Chesler. “Economic Incentives for Coastal Homeowner Adaptation to Climate Change.” *Climate Policy* 23, no. 10 (2023): 1314–26. doi:10.1080/14693062.2023.2215207.

Kosavinta, Satakhun, Donyaprueth Krairit, and Do Ba Khang. “Decision Making in the Pre-Development Stage of Residential Development.” *Journal of Property Investment & Finance* 35, no. 2 (2017): 160–83. doi:10.1108/JPIF-05-2016-0030.

Lestegás, Iago, João Seixas, and Rubén Camilo Lois-González. “Commodifying Lisbon: A Study on the Spatial Concentration of Short-Term Rentals.” *Social Sciences (Basel)* 8, no. 2 (2019): 33-. doi:10.3390/socsci8020033.

Lo, Alex Y, and Faith Chan. “Preparing for Flooding in England and Wales: The Role of Risk Perception and the Social Context in Driving Individual Action.” *Natural Hazards (Dordrecht)* 88, no. 1 (2017): 367–87. doi:10.1007/s11069-017-2870-y.

Lu, Xiaomeng, Jiaojiao Guo, and Li Gan. “International Comparison of Household Asset Allocation: Micro-Evidence from Cross-Country Comparisons.” *Emerging Markets Review* 43 (2020): 100691-. doi:10.1016/j.ememar.2020.100691.

Luque, Jaime. “Assessing the Role of TIF and LIHTC in an Equilibrium Model of Affordable Housing Development.” *Regional Science and Urban Economics* 80 (2020): 103377-. doi:10.1016/j.regsciurbeco.2018.06.005.

Magliocca, Nicholas, Elena Safirova, Virginia McConnell, and Margaret Walls. “An Economic Agent-Based Model of Coupled Housing and Land Markets (CHALMS).” *Computers, Environment and Urban Systems* 35, no. 3 (2011): 183–91. doi:10.1016/j.compenvurbsys.2011.01.002.

Magliocca, Nicholas, Virginia McConnell, and Margaret Walls. “Exploring Sprawl: Results from an Economic Agent-Based Model of Land and Housing Markets.” *Ecological Economics* 113 (2015): 114–25. doi:10.1016/j.ecolecon.2015.02.020.

Manaswini, and Monica Aggarival. “Dimensions of Market Conduct for Indian Real Estate Industry: A Theoretical Review.” *ICFAI Journal of Business Strategy* 20, no. 2 (2023): 5–19.

Marini, Marcello, Ndaona Chokani, and Reza S Abhari. “Immigration and Future Housing Needs in Switzerland: Agent-Based Modelling of Agglomeration Lausanne.” *Computers, Environment and Urban Systems* 78 (2019): 101400-. doi:10.1016/j.compenvurbsys.2019.101400.

Markusen, James R, and David T Scheffman. *Speculation and Monopoly in Urban Development : Analytical Foundations with Evidence for Toronto*. Toronto: University of Toronto Press, 2020. doi:10.3138/9781487579692.

Martínez-Jiménez, Estebania Teyeliz, Julie Le Gallo, Enrique Pérez-Campuzano, and Alonso Aguilar Ibarra. “The Effects of Land Price in the Peri-Urban Fringe of Mexico City: Environmental Amenities for Informal Land Parcel Purchasers.” *Urban Studies (Edinburgh, Scotland)* 59, no. 1 (2022): 222–41. doi:10.1177/0042098020960968.

McFarlane, Bonita L, Tara K McGee, and Hilary Faulkner. “Complexity of Homeowner Wildfire Risk Mitigation: An Integration of Hazard Theories.” *International Journal of Wildland Fire* 20, no. 8 (2011): 921–31. doi:10.1071/WF10096.

Meijer, Rick, and Edwin Buitelaar. “What Drives Developers? Understanding Vertical (Dis)Integration Strategies in the Land Development Process.” *Land Use Policy* 131 (2023): 106718-. doi:10.1016/j.landusepol.2023.106718.

Mendonça, Rita, Peter Roebeling, Filomena Martins, Teresa Fidélis, Carla Teotónio, Henrique Alves, and João Rocha. “Assessing Economic Instruments to Steer Urban Residential Sprawl, Using a Hedonic Pricing Simulation Modelling Approach.” *Land Use Policy* 92 (2020): 104458-. doi:10.1016/j.landusepol.2019.104458.

Metzner, Steffen, and Andreas Kindt. “Determination of the Parameters of Automated Valuation Models for the Hedonic Property Valuation of Residential Properties: A Literature-Based Approach.” *International Journal of Housing Markets and Analysis* 11, no. 1 (2018): 73–100. doi:10.1108/IJHMA-02-2017-0018.

Miles, Mike, and Charles H Wurtzebach. “Risk Analysis in the Real Property Development Process: A Conceptual Framework and a Computer Simulation Model.” *Journal of Business Research* 5, no. 4 (1977): 325–57. doi:10.1016/0148-2963(77)90019-4.

Mohamed, Rayman. “The Psychology of Residential Developers: Lessons from Behavioral Economics and Additional Explanations for Satisficing.” *Journal of Planning Education and Research* 26, no. 1 (2006): 28–37. doi:10.1177/0739456X05282352.

Moorhead, M., Armitage, L. and Skitmore, M. (2023), "Feasibility practices of types of property developers", Journal of Property Investment & Finance, Vol. 41 No. 1, pp. 92-105. https://doi.org/10.1108/JPIF-03-2022-0022

Muhammad Najib Razali, Siti Hafsah Zulkarnain, Zakri Tarmidi, Nurul Hana Adi Maimun, Yasmin Mohd Adnan, and Muhamad Ali Yuzir. “Property Market Price Response to Flood-Hazard.” *Natural Hazards (Dordrecht)*, 2020, 1–16. doi:10.1007/s11069-018-3495-5.

Murphy, Laurence. “‘Houston, We’ve Got a Problem’: The Political Construction of a Housing Affordability Metric in New Zealand.” *Housing Studies* 29, no. 7 (2014): 893–909. doi:10.1080/02673037.2014.915291.

National Academy Press (USA). *Improving Risk Communication*. 1st ed. Washington, D.C: 1989.

New Zealand Productivity Commission. *Housing Affordability Inquiry*. Wellington: 2012.

Nordahl, Berit Irene, and Dag Einar Sommervoll. “Reaping the Premium in Urban Redevelopment.” *Cities* 141 (2023): 104450-. doi:10.1016/j.cities.2023.104450.

Owusu-Ansah, Anthony, Kenneth W Soyeh, and Paul K Asabere. “Developer Constraints on Housing Supply in Urban Ghana.” *International Journal of Housing Markets and Analysis* 12, no. 1 (2019): 59–73. doi:10.1108/IJHMA-07-2018-0052.

Oyetunji, Abiodun Kolawole, Chiemela Victor Amaechi, Emmanuel Chigozie Dike, Adeyosoye Babatunde Ayoola, and Michael Ayodele Olukolajo. “Factors Influencing Stakeholders’ Decision to Invest in Residential Properties: A Perceptual Analysis of Flood-Risk Areas.” *Buildings (Basel)* 13, no. 6 (2023): 1560-. doi:10.3390/buildings13061560.

Ozbakan, Tolga A, Serdar Kale, and Irem Dikmen. “Exploring House Price Dynamics: An Agent-Based Simulation with Behavioral Heterogeneity.” *Computational Economics* 54, no. 2 (2019): 783–807. doi:10.1007/s10614-018-9850-5.

Pacione, Michael. “Private Profit, Public Interest and Land Use Planning—A Conflict Interpretation of Residential Development Pressure in Glasgow’s Rural–Urban Fringe.” *Land Use Policy* 32 (2013): 61–77. doi:10.1016/j.landusepol.2012.09.013.

Parker, Dawn Cassandra, Shahab Valaei Sharif, and Kaitlin Webber. “Why Did the ‘Missing Middle’ Miss the Train? An Actors-In-Systems Exploration of Barriers to Intensified Family Housing in Waterloo Region, Canada.” *Land (Basel)* 12, no. 2 (2023): 434-. doi:10.3390/land12020434.

Piaggio, Matías. “The Value of Public Urban Green Spaces: Measuring the Effects of Proximity to and Size of Urban Green Spaces on Housing Market Values in San José, Costa Rica.” *Land Use Policy* 109 (2021): 105656-. doi:10.1016/j.landusepol.2021.105656.

Ploegmakers, Huub, and Friso de Vor. “Determinants of Industrial Land Prices in The Netherlands: A Behavioural Approach.” *Journal of European Real Estate Research* 8, no. 3 (2015): 305–26. doi:10.1108/JERER-04-2015-0016.

Property Council New Zealand. *New Zealand 2021 Property Industry Impact*. Auckland: Property Council New Zealand, 2021.

Radosław Wanago, Justyna Kleszcz and Anna Szczegielniak. "The investment market of non-corporate developers in Poland – analysis of the feasibility studies". Środowisko Mieszkaniowe/Housing Environment Sciendo, 46, no. 1 (2024): 22-36. https://doi.org/10.2478/he-2024-0003

Ratcliffe, Peter. “Re-Evaluating the Links between ‘Race’ and Residence.” *Housing Studies* 24, no. 4 (2009): 433–50. doi:10.1080/02673030902938405.

Ro, SeungHan, Paul Gallimore, Sherwood Clements, and Gang-Zhi Fan. “Herding Behavior among Residential Developers.” *The Journal of Real Estate Finance and Economics* 59, no. 2 (2019): 272–94. doi:10.1007/s11146-018-9675-y.

Rosen, Gillad. 2016. “Toronto’s Condo-Builders: Development Approaches and Spatial Preferences.” Urban Geography 38 (4): 606–25. doi:10.1080/02723638.2016.1179426.

Rowley et al. *The Financing of Residential Development in Australia*. Australian Housing and Urban Research Institute: Canberra, 2014.

Ruming, Kristian J. “Developer Typologies in Urban Renewal in Sydney: Recognising the Role of Informal Associations between Developers and Local Government.” *Urban Policy and Research* 28, no. 1 (2010): 65–83. doi:10.1080/08111140903356403.

Ruonavaara, Hannu. “Theory of Housing, From Housing, About Housing.” *Housing, Theory, and Society* 35, no. 2 (2018): 178–92. doi:10.1080/14036096.2017.1347103.

Samsura, D. Ary A, Erwin van der Krabben, and A.M.A van Deemen. “A Game Theory Approach to the Analysis of Land and Property Development Processes.” *Land Use Policy* 27, no. 2 (2010): 564–78. doi:10.1016/j.landusepol.2009.07.012.

Schläpfer, Felix, Fabian Waltert, Lorena Segura, and Felix Kienast. “Valuation of Landscape Amenities: A Hedonic Pricing Analysis of Housing Rents in Urban, Suburban and Periurban Switzerland.” *Landscape and Urban Planning* 141 (2015): 24–40. doi:10.1016/j.landurbplan.2015.04.007.

Shahzad, Wajiha Mohsin, Adeel Hassan, and James Olabode Bamidele Rotimi. “The Challenges of Land Development for Housing Provision in New Zealand.” *Journal of Housing and the Built Environment* 37, no. 3 (2022): 1319–37. doi:10.1007/s10901-021-09896-z.

Squires, Graham, and Erwin Heurkens. “Methods and Models for International Comparative Approaches to Real Estate Development.” *Land Use Policy* 50 (2016): 573–81. doi:10.1016/j.landusepol.2015.10.005.

Statistics New Zealand. *Downtown dwellers 2005 : New Zealand's CBD residents*. Wellington: 2005.

Statistics New Zealand. *Housing in Aotearoa 2020*. Wellington: 2020.

Su, Xing, and Zhu Qian. “Interpreting China’s Overbuilding through a Behavioral Perspective: The Role of Developers’ Excessive Optimism.” *Journal of Urban Affairs* ahead-of-print, no. ahead-of-print (2023): 1–19. doi:10.1080/07352166.2022.2157729.

Sun, Shipeng, Dawn C Parker, Qingxu Huang, Tatiana Filatova, Derek T Robinson, Rick L Riolo, Meghan Hutchins, and Daniel G Brown. “Market Impacts on Land-Use Change: An Agent-Based Experiment.” *Annals of the Association of American Geographers* 104, no. 3 (2014): 460–84. doi:10.1080/00045608.2014.892338.

Swapan, Mohammad Shahidul Hasan, and Saalem Sadeque. “Place Attachment in Natural Hazard-Prone Areas and Decision to Relocate: Research Review and Agenda for Developing Countries.” *International Journal of Disaster Risk Reduction* 52 (2021): 101937-. doi:10.1016/j.ijdrr.2020.101937.

Tandel, Vaidehi, Sahil Gandhi, and Alex Tabarrok. “Building Networks: Investigating the Quid pro Quo between Local Politicians & Developers.” *Journal of Development Economics* 164 (2023): 103138-. doi:10.1016/j.jdeveco.2023.103138.

Tsounta, Evridiki. *Is the Canadian Housing Market Overvalued? : A Post-Crisis Assessment*. 1st ed. Washington, D.C: International Monetary Fund, Western Hemisphere Dept., 2009.

Turnbull, Geoffrey K. “THE EFFECTS OF LOCAL TAXES AND PUBLIC SERVICES ON RESIDENTIAL DEVELOPMENT PATTERNS.” *Journal of Regional Science* 28, no. 4 (1988): 541–62. doi:10.1111/j.1467-9787.1988.tb01373.x.

Tyrväinen, Liisa, and Antti Miettinen. “Property Prices and Urban Forest Amenities.” *Journal of Environmental Economics and Management* 39, no. 2 (2000): 205–23. doi:10.1006/jeem.1999.1097.

Valaei Sharif, Shahab, Dawn Cassandra Parker, Paul Waddell, and Ted Tsiakopoulos. “Understanding the Effects of Market Volatility on Profitability Perceptions of Housing Market Developers.” *Journal of Risk and Financial Management* 16, no. 10 (2023): 446-. doi:10.3390/jrfm16100446.

Wahid, Abdul, Oskar Kowalewski, and Edmund H Mantell. “Determinants of the Prices of Residential Properties in Pakistan.” *Journal of Property Investment & Finance* 41, no. 1 (2023): 35–49. doi:10.1108/JPIF-06-2021-0051.

Wahyudi, Agung, Yan Liu, and Jonathan Corcoran. 2019. "Generating Different Urban Land Configurations Based on Heterogeneous Decisions of Private Land Developers: An Agent-Based Approach in a Developing Country Context" ISPRS International Journal of Geo-Information 8, no. 5: 229. https://doi.org/10.3390/ijgi8050229

Walls, Margaret, Nicholas Magliocca, and Virginia McConnell. “Modeling Coastal Land and Housing Markets: Understanding the Competing Influences of Amenities and Storm Risks.” *Ocean & Coastal Management* 157 (2018): 95–110. doi:10.1016/j.ocecoaman.2018.01.021.

Ward, Emily. “An Actor–Network Theory Model of Property Development.” *Journal of European Real Estate Research* 11, no. 2 (2018): 246–62. doi:10.1108/JERER-06-2017-0022.

Wheaton, William C. “Real Estate ‘Cycles’: Some Fundamentals.” *Real Estate Economics* 27, no. 2 (1999): 209–30. doi:10.1111/1540-6229.00772.

White, Iain, and Gauri Nandedkar. *The Housing Crisis as an Ideological Artefact: Analysing How Political Discourse Defines, Diagnoses, and Responds*. Routledge, 2019.

Winarso, Haryo. “Access to Main Roads or Low Cost Land? Residential Land Developers’ Behaviour in Indonesia.” *Bijdragen Tot de Taal-, Land- En Volkenkunde* 158, no. 4 (2002): 653–76. doi:10.1163/22134379-90003760.

Yang, Zan, Ying Fan, and Liqing Zhao. “A Reexamination of Housing Price and Household Consumption in China: The Dual Role of Housing Consumption and Housing Investment.” *The Journal of Real Estate Finance and Economics* 56, no. 3 (2018): 472–99. doi:10.1007/s11146-017-9648-6.

Yanotti, Maria B, and Danika Wright. “Residential Property in Australia: Mismatched Investment and Rental Demand.” *Housing Studies* 38, no. 6 (2023): 1110–31. doi:10.1080/02673037.2021.1929858.

Yazdanifard, Yekta, Masoud Talebian, and Hosein Joshaghani. “Metro Station Inauguration, Housing Prices, and Transportation Accessibility: Tehran Case Study.” *Journal of Transport and Land Use* 14, no. 1 (2021): 537–61. doi:10.5198/JTLU.2021.1622.

Zillante, Artie, Dustin C Read, and Michael J Seiler. “Using Prospect Theory to Better Understand the Impact of Uncertainty on Real Estate Negotiations.” *The Journal of Real Estate Research* 41, no. 1 (2019): 75–105. doi:10.1080/10835547.2019.12091521.

Zulkarnain, Siti Hafsah, and Abdol Samad Nawi. “The Relationship between Macroeconomic Variables on Residential Property Price: Case Study in Malaysia before and during COVID-19.” *International Journal of Housing Markets and Analysis* 17, no. 3 (2024): 702–25. doi:10.1108/IJHMA-01-2022-0013.

Appendix 1

Survey

*This survey is aimed at people and organisations involved in residential development. It is part of a Masters thesis sponsored by the Natural Hazards Commission - Toka Tū Ake. The results will be used to help develop a conceptual model for how residential development happens in New Zealand.

The survey has 14 questions takes approximately 5 minutes to complete.

Declaration to Participants
Your survey responses will be anonymised. The data will be stored securely and only shared with the research team. Any data used in the final Masters thesis will be grouped/generalised to avoid any individual participant being identified.

If you take part in the survey, you have the right to refuse to answer any particular question.

If you have any questions about the survey or research project, please email me at: joelbishop62@gmail.com

Do you consent to participating in this research?

- ◯ Yes
- ◯ No

*Do you wish to be sent a copy of the thesis?

- ◯ Yes
- ◯ No

Page 1 of 3

This page contains questions about the primary type(s) of development that you/your organisation are working on and the primary locations of your activities.

*Q1. What is the primary type of development that you build?

- ◯ Standalone homes
- ◯ Duplexes/townhouses
- ◯ Apartment complexes
- ◯ Retirement villages
- ◯ Small prefabricated homes (relocatable units, sleepouts, etc.)
- ◯ Papakāinga
- ◯ Other (please specify:) _____

Q2. (Optional) Do you also build other types of development? If so then please tick all that apply:

- [ ] Standalone homes
- [ ] Duplexes/townhouses
- [ ] Apartment complexes
- [ ] Retirement villages
- [ ] Small prefabricated homes (relocatable units, sleepouts, etc.)
- [ ] Papakāinga
- [ ] Other (please specify:)

*Q3. How many projects do you or your organisation typically complete in a year?

- ◯ 1
- ◯ 2 - 3
- ◯ 4 - 11
- ◯ 11 or more

*Q4. How many new **dwellings** (homes or units) does your typical project contain?

- ◯ 1
- ◯ 2 - 4
- ◯ 5 - 10
- ◯ 11 or more

*Q5. How long does it take you to complete a typical development project?

Years:

Months:

*Q6. For how many years has your organisation been active in the property development industry?

- ◯ Less than 1 year
- ◯ 1 - 5 years
- ◯ 6 - 10 years
- ◯ 11 or more years

*Q7. What are your primary areas of activity? (e.g. "Auckland and Christchurch")

Next page ›

Page 2 of 3

This page contains questions about how you select a site for development and assess development feasibility.

Q8. Rank the following things in terms of how important they are to you in determining the development potential of a site
(1 = not important at all, 5 = extremely important)

	1	2	3	4	5
Proximity to greenspace	◯	◯	◯	◯	◯
Current land use and infrastructure servicing	◯	◯	◯	◯	◯
Natural hazard risk	◯	◯	◯	◯	◯
Transport accessibility	◯	◯	◯	◯	◯
Site is in a high-end neighbourhood	◯	◯	◯	◯	◯
Size	◯	◯	◯	◯	◯
Other (optional, please specify):	◯	◯	◯	◯	◯

*Q9. Rank the following things in terms of how important they are to you in determining whether a development concept is feasible
(1 = not important at all, 5 = extremely important)

	1	2	3	4	5
Planning policies	○	○	○	○	○
Our past experience	○	○	○	○	○
Observing other developers	○	○	○	○	○
Social need	○	○	○	○	○

Next page ›

*Q10. Please rate how likely it is that you would be willing to proceed with a development under each of the following conditions related to flood risk:

	1 - Extremely unlikely	2 - Somewhat unlikely	3 - Neutral	4 - Somewhat likely	5 - Extremely likely
The site was recently affected by a flooding event	○	○	○	○	○
Flood hazard mapping indicates that the site is at risk from flooding	○	○	○	○	○
The site is protected by hazard-engineering structures (e.g. stop-banks, levees, or seawalls)	○	○	○	○	○
Future homeowners may find it hard to acquire private insurance	○	○	○	○	○
The developer is required to provide a 10 year development guarantee covering any flood damage due to design defects	○	○	○	○	○
The developer is required to contribute financially towards building hazard-engineering infrastructure	○	○	○	○	○

*Q11. Please rate how likely you would be to change your development plans if new flood hazard mapping depicted the site as having...

	1 - Extremely unlikely	2 - Somewhat unlikely	3 - Neutral	4 - Somewhat likely	5 - Extremely likely
Low flooding risk	○	○	○	○	○
Medium flooding risk	○	○	○	○	○
High flooding risk	○	○	○	○	○

Q12. (Optional) If your plans would change with an increase in flooding risk, how would your plans typically change?
(e.g. increase freeboard, redesign site, develop somewhere else, etc.)

Next page ›

Appendix 2

Survey Information Sheet

(Sent as an email)

Hi there,

My name is Joel Bishop and I am a masters' student at the University of Waikato.

I am working with the Natural Hazards Commission (formerly EQC) to develop a new conceptual model of how residential development happens in New Zealand. To help with this, I am sending out a short survey to housing developers across the country.

The survey has 14 questions and will only take about 5 minutes to complete. All responses will be anonymised.

I would greatly appreciate it if you could please complete this survey, or send it on to someone else in your company who it might be better suited to.

https://waikato.qualtrics.com/jfe/form/SV_ai4yiB7KReFHlyu

Thanks heaps in advance,

Joel Bishop

Appendix 3

Interview Questions

1. **What are the most important values and rationales that influence your behaviour and decision-making as a developer?**

- Do you have a long-term strategy?
- Do you have any special values that guide your development activities?
- What are your key goals as a developer?

2. **What are the most important factors that you consider when evaluating the development potential of a site?**

- What would give a site high development potential?
- What would make a site undevelopable?
- Can you give examples of these?

3. **Describe your typical process for evaluating the feasibility of a development concept**

- What are the most important factors you consider?
- Can you give an example?

4. **How do you evaluate the natural hazard risk of a site or project?**

- What makes a site too risky (natural hazard risk) to develop?
- What are your key sources of information?

5. **How does your development behaviour change with an increase in natural hazard risk?**

- Design/engineering responses?
- Abandon the project/develop somewhere else?
- Increase freeboard/level?

6. **Would you ever develop a high-risk site?**

- What are the key factors that influence your decision whether or not to do this?

7. **Now that you know more about the research and the specific questions that I am asking in these interviews, can you recommend anyone else that I should talk to?**

Appendix 4

Interview Information Sheet

Hello,

I am contacting you because you completed my recent developer survey, and you have indicated that you are willing to participate in a follow-up interview.

This information sheet will explain the purpose, details, and ethics of this interview.

BACKGROUND INFORMATION

I am a Masters student at the University of Waikato. I am involved in a research project for the Natural Hazards Commission (formerly EQC) with the goal of developing a new model of residential development in New Zealand. My role within the project is to research the decision-making of developers of new housing. I want to understand:

- The decision-making process of developers
- The values and rationales that inform their decisions
- How they conceptualise the development process and their role within it

This information will help the research team model developer behaviour and understand how development activity might change in response to climate change or changes in planning rules.

THE INTERVIEW

I have requested an interview with you. The purpose of this interview is to help me establish a deeper understanding of developer decision-making by talking about your own experiences, values, and rationales for decision-making.

The interview will be approximately 30 minutes – 1 hour in length, depending on your availability. It will be conducted at one of the following locations:

- At your office
- On the University of Waikato – Hamilton campus
- At another mutually agreed location, e.g. a cafe
- Online via Teams or Zoom

The location will be chosen based on what is convenient and preferable for both parties. If I have not already arranged a location with you, we will talk about it soon.

The interview will be semi-structured, meaning I will ask you some prepared questions but we can discuss whatever other topics come up during the conversation. You will be free to answer each question however you wish.

YOUR RIGHTS

You have the right not to participate in this interview.

If you do not want to participate in an interview, please reply to this email with something like "I no longer wish to participate in this research".

If you do want to participate, please confirm by replying to this email.

Once you have consented to participate, I will proceed with arranging the interview with you.

You have the right to refuse to answer some or all of the questions.

You have the right to withdraw from this interview before or during the interview.

You also have the right to withdraw up to one month after I provide you with the transcript of our interview.

After one month, the interview data will be anonymised to protect your privacy and data confidentiality.

DATA ETHICS

The audio of the interview will be recorded. I will inform you of when the recording begins and ends. This recording will be used to develop a transcript of the interview, which will be sent to you to review. If there are any errors you would like corrected, or parts which you would like redacted, please inform me and will change the transcript accordingly.

Your interview transcript, and any notes derived from it, will be anonymised and confidential. The data will be stored digitally on my personal computer and only shared with the other researchers involved in this project. Any data shared in the final Masters thesis will be completely anonymised and grouped by developer typology to avoid any individual participant being identified.

SUPPORT

If you would like more information about the project or the survey, or need help completing the survey, please email me using this email address.

Appendix 5

Survey Results

Respondent Number	Primary Development Activity	Other Development Activities	How many projects do you or your organisation typically complete in a year?	How many new dwellings (homes or units) does your typical project contain?	How long does it take you to complete a typical development project? - Years:	How long does it take you to complete a typical development project? - Months:	For how many years has your organisation been active in the property development industry?	What are your primary areas of activity? (e.g. "Auckland and Christchurch")	Proximity to greenspace	Current land use and infrastructure servicing	Natural hazard risk	Transport accessibility	Site is in a high-end neighbourhood
1	Standalone homes	Standalone homes,Duplexes /townhouses	11 or more	1	1	6	1 - 5 years	Christchurch	4	3	4	4	4
2	Duplexes/townhouses	Standalone homes	2 - 3	5 - 10	1	6	1 - 5 years	CHRISTCHURCH	2	5	4	4	2
3	Apartment complexes	Standalone homes	1	5 - 10	3	1	1 - 5 years	Napier	3	4	3	2	3
4	Standalone homes	Duplexes/townhouses	11 or more	1	1	6	11 or more years	Christchurch	2	3	1	1	1
5	Standalone homes	Small prefabricated homes (relocatable units, sleepouts, etc.)	11 or more	1	1	0	11 or more years	Nationwide	3	3	5	2	3
6	Duplexes/townhouses	Standalone homes	11 or more	2 - 4	1	00	11 or more years	Selwyn: Lincoln and Rolleston	1	5	4	1	3
7	Standalone homes	Duplexes/townhouses	11 or more	11 or more	2	24	11 or more years	Tauranga	4	5	5	4	4
8	Standalone homes	Duplexes/townhouses	11 or more	11 or more	1	6	11 or more years	canterbury/South Canterbury	3	3	4	2	2
9	Duplexes/townhouses		2 - 3	5 - 10	1	6	1 - 5 years	dunedin	3	4	3	2	4
10	Standalone homes	Renovation Work	4 - 11	1	1	0	6 - 10 years	Wellington	3	5	4	3	5

35	Duplexes/townhouses	Standalone homes	11 or more	5 - 10	1	5	6 - 10 years	Hawke's Bay, Gisborne, Waikato, Wairarapa	3	5	5	2	2
36	Standalone homes	Duplexes/townhouses	11 or more	11 or more	0	9	11 or more years	Wellington	3	5	2	5	5
37	Standalone homes	Duplexes/townhouses,Small prefabricated homes (relocatable units, sleepouts, etc.)	11 or more	2 - 4	0	6	1 - 5 years	Waikato	5	3	3	3	4
38	Most of the above	All	11 or more	5 - 10	12	6	6 - 10 years	Central north island	1	5	5	2	2
39	Land development (sections only)	Standalone homes	2 - 3	11 or more	o	9	11 or more years	Selwyn	2	3	2	2	1
40	Standalone homes	Duplexes/townhouses,Apartment complexes,Retirement villages,Papakāinga	11 or more	5 - 10	1	0	11 or more years	Waikato	3	4	3	3	2
41	Standalone homes		2 - 3	11 or more	4	0	11 or more years	Whangarei					
42	Standalone homes	Duplexes/townhouses	11 or more	1	0	8	11 or more years	Waikato, Coromandel, South Auckland	4	4	3	3	3
43	Standalone homes	Retirement villages	11 or more	11 or more	2	6	11 or more years	Waikato	5	5	3	4	5
44	Standalone homes		11 or more	5 - 10	1	1	6 - 10 years	AKL	1	1	1	1	1

11	Duplexes/townhouses	Standalone homes	4 - 11	5 - 10	3	0	11 or more years	Wellington, Hutt Valley, Kapiti and Horowhenua	4	5	5	5	3
12	Duplexes/townhouses	Standalone homes,Apartment complexes	11 or more	11 or more	3	0	6 - 10 years	Auckland	4	5	5	5	3
13	Duplexes/townhouses	Apartment complexes	2 - 3	11 or more	1	15	11 or more years	Auckland	4	3	2	4	4
14	Apartment complexes	A range of non-residential and mixed use projects including commercial, retail and civic uses	2 - 3	11 or more	5	0	11 or more years	Auckland, Wellington and Christchurch	4	4	5	4	5
15	Standalone homes	Duplexes/townhouses	2 - 3	2 - 4	1	8	1 - 5 years	Tauranga and WBoP	2	4	3	2	1
16	Duplexes/townhouses		2 - 3	11 or more	2	0	1 - 5 years	Auckland	2	5	5	5	1
17	Standalone homes	None	2 - 3	11 or more	6	0	11 or more years	Auckland	3	4	4	4	3

18	Duplexes/townhouses		4 - 11	2 - 4	1	0	1 - 5 years	Christchurch	4	5	4	4	4
19	Duplexes/townhouses	Standalone homes	4 - 11	5 - 10	0	11	6 - 10 years	Dunedin	3	5	5	2	3
20	Land development	NA	2 - 3	11 or more	1 year	0	11 or more years	Christchurch and Selwyn		5	5	5	
21	Duplexes/townhouses	Standalone homes,Apartment complexes	1	11 or more	4	0	6 - 10 years	Auckland	4	3	5	4	2
22	sections		1	11 or more	2	0	11 or more years	whangarei	4	5	4	2	4
23	Standalone homes	Standalone homes,Duplexes/townhouses,Retirement villages	2 - 3	11 or more	This question is too simplistic, I have been in the land development/ civil engineering industry for most of my working life and can't tell you what typical development means. but I know what components make up a development.	If appropriately zoned and serviced, 12 to 18 months for circa 50 lots, depends on extent of earthworks etc.	11 or more years	Waikato, Bay of Plenty	3	5	3	5	3
24	Standalone homes	Duplexes/townhouses	4 - 11	5 - 10	1	0	11 or more years	Wellington	5	3	4	4	3
25	Standalone homes		11 or more	1	1	1	11 or more years	Christchurch					
26	Standalone homes	Duplexes/townhouses	1	5 - 10	5	4	1 - 5 years	5					

27	Standalone homes	Duplexes/townhouses	11 or more	1	0.5	6	11 or more years	Christchurch, Auckland, Northland, Waikato, Wellington, Queenstown and Bay of Plenty					
28	Duplexes/townhouses		2 - 3	11 or more	2	0	1 - 5 years	Auckland	4	5	5	4	3
29	Duplexes/townhouses	Standalone homes,Duplexes/townhouses,Apartment complexes	11 or more	11 or more	1	6	11 or more years	Auckland					
30	Standalone homes	Duplexes/townhouses	1	11 or more	7	0	11 or more years	Tauranga					
31	Standalone homes	Standalone homes	11 or more	11 or more	999	6	1 - 5 years	Christchurch	4	5	2	2	2
32	Retirement villages	Standalone homes,Duplexes/townhouses,Apartment complexes,Small prefabricated homes (relocatable units, sleepouts, etc.)	11 or more	11 or more	2	0	11 or more years	Levin	3	3	1	1	1
33	Standalone homes	Apartment complexes	4 - 11	5 - 10	3	0	6 - 10 years	Auckland	3	5	3	4	4
34	Standalone homes		11 or more	11 or more	0	6	11 or more years	Christchurch	2	5	4	4	3

45	Standalone homes		2 - 3	1	1	1	1 - 5 years	AKL	2	2	2	2	2
46	Standalone homes	Duplexes/townhouses,Apartment complexes,Retirement villages,Small prefabricated homes (relocatable units, sleepouts, etc.),Papakāinga	11 or more	11 or more	3 - 5 years	1	11 or more years	Canterbury	3	5	3	2	1
47	Standalone homes	Duplexes/townhouses	11 or more	11 or more	1	0	11 or more years	Auckland	1	5	5	3	1
48	Apartment complexes		1	11 or more	3	0	11 or more years	Auckland	5	4	5	3	5
49	Subdivisions I.e land for others to build standalone houses	Other (please specify:)	1	11 or more	2	0	11 or more years	Nelson tasman	1	5	3	4	3
50	Standalone homes	A mix of vacant sections, stand alone, townhouses etc	11 or more	2 - 4	3	0	11 or more years	Kāpiti Coast	2	3	5	3	3

Appendix 6

Interview Transcripts

Appendix 6.1

Interview with Developer 1

JOEL

So if you wouldn't mind, just to start off, just giving a brief introduction of yourself and your history and your experience in housing development.

DEVELOPER 1

I've got an engineering background, I've been involved in earthworks and construction for most of my working career, both overseas and locally, I've done a lot of land development. I'm not involved in the building side per say, but most of the land development for most of my clients is focused on the house and land product. So you end up satisfying what the builds want or what the market is, [what] the house buyers want in any case, developing different section sizes and amenities and things like that for a couple of key clients.

JOEL

My first question for you is what are the most important values and rationales that influence your behaviour and your decision making as a developer?

DEVELOPER 1

Feasibility, which is which is really cost. So, mainly working for housing developers, they are quite different to land developers. They start on a top-down model: what is the product I'm going to sell to Joel? What does Joel want in a house? What's the price point at which he will be comfortable? So that's where they start, then they will look back, okay, this is the size house we're gonna do, bedrooms, garages, then they work out what the section size needs to be and how much that needs to be priced in. And then everything else follows. Land developers look at from a different point, they look at [it] well, generally these builders are happy to have 5, 000m2 sections and they seem to be selling for around 500 or 450 or 475, so let's just do those. So there is a bit more to it than that, but that's in simplified terms.

JOEL

Right, so the housing developers are looking at what the market is demanding, what consumers want, and the land developers are just trying to make a product that builders will purchase?

DEVELOPER 1

Yes, what's the price point they can maximize it because really the house and land developers, they get a margin on the land and a small margin on the build. So therefore they want their sections to be a lot cheaper, but they also demand, like most buildings, you would have noticed, they do a, nowadays everybody does it a, ribraft, hardly anybody does any conventional strip foundations anymore. So ribraft, there's not many step foundations, unless you're sort of high end. So everybody wants a flat site. So half of my job is delivering earthworks coming up [?], and with retaining walls completed, everything. So they can just come and strip 15mm of topsoil and away they go. So really minimising the post-title earthworks, so to get the builders cracking as soon as possible.

JOEL

Yes, so two of the key concerns for the builders are that the land is as flat and that the earthworks are done and it's ready to be developed as soon as possible and as cheaply as possible?

DEVELOPER 1

And it will get the consent within twenty working days or whatever, and away they go. So they want a high level of certainty, they don't want to bugger around with, they want to know where the building restriction lines area or things like that, and that's recently become a problem and in we'll go into that later.

JOEL

And are there any other values that you consider?

DEVELOPER 1

Again it’s about the feasibility, how many sections you can get in there? And access, roading, infrastructure, stormwater is a big deal, wastewater and water is reasonably simple, and then obviously, like, is there a lot of peak on site, is there flooding issues, are there slope stability issues, but most developers don’t sort of, once they go to a site, they experience that sort of, like I don't pour over the council mapping information because we don't put a lot of [stock in them]. I do look at their flood modelling stuff, because that is quite often a bit more accurate, although some of their data is behind sometimes, but flood modelling is mostly a bit more accurate. So we do look at that and just in terms of, but again, all of those things, developers sort of, and I look at it sort of, from a point of like, we know there's gonna be risks. Once we strip the topsoil people might have buried tires, there might be all kinds of these all kinds of things you can't see. But from your experience, when you see a slope or it looks like there’s a slip there or there is a bit of a wetland you know there's gonna be issues with preloading and peat, or you’re gonna have to deal with setbacks and slope stability issues. So you can sort of get a feel for the land, once you have a look at it and [have] gone through the stuff, so the first things I look for is the aerials and the contours, and what other infrastructure is around it?

JOEL

So you're using your past experience, you're using the aerials and the contours, you're not so reliant on council mapping?

DEVELOPER 1

Not slope stability mapping, that's highly inaccurate and is desktop study stuff and I'll show you why just now, but do look at their flood modelling, especially if it’s recent.

JOEL

And are there any other sources of information that you're using or things you you’re testing when you're evaluating the feasibility of a site?

DEVELOPER 1

Not upfront, you don't do a lot of things upfront normally, some people may spend a bit more money, depends on how deep their pockets are and how keen they area on getting the land, but sometimes you can also know too much, which can cause you to have a low price, because you know you've got all these lists, and so [?] the market of people who want the land and they might not do the same due diligence so there's a bit of [?] to it but so typically we don't do geotech investigation, we wouldn't do contamination investigation before purchase, you would make that as part of your due diligence and settlement package, so hey final settlement is subject for all of these things and you your consents being granted and [that] would sort of give you a deposit and maybe drip feed you if it's a massive piece of land, you know? But give us time to do our good diligence and so that's the way the things get structured so you don't have to do everything up front when you sign up for it.

JOEL

And so you wait to do some of those due diligence things until after the client has signed up because you don't want all those risk factors to increase the prices and the costs?

DEVELOPER 1

No not just that, you don't want to waste money on a piece of land where you don't have a contract. A good example is recently on a site in Tauranga the Minister of the Environment spent about 300k of our taxpayer funds on geotech and contamination of a site that didn't even have a contact with us, no agreement that they would purchase [?], but this is tax money you're wasting. You may not get this site, there's no agreement anywhere? Why are you doing this? Oh, no, this is the way we do it - to me that's just dumb. That's your responsibility.

JOEL

And is that quite common?

DEVELOPER 1

For government departments yes, not so much for the private sector - you'd go broke. What happens if you don't get the site? And you spent 300k on it? You need a lot of turnover to have 300k sitting around. So, yeah, just - but there is a lot of information around. There's so many like geotech things, nowadays most geotech reports are available and most councils have a geotech library and I think there's a New Zealand database for technical reports people upload it too and so you connect is all the things of here really you can go way back to 1948 or something, maybe even before. So there's a lot of stuff like. For example, if I was buying a property in the Esk Valley I would quickly realize that in 1938 it was a huge flood through the same place. So I wouldn't touch with a barge. But people don't learn, you see. But I would assume that you wouldn't last very long as a developer in New Zealand if you didn't follow similar processes of intelligence and useable experience you would lose your shirt very quickly.

JOEL

You touched on it earlier talking about natural hazard risk being one of the factors that you consider when you're evaluating your sites: what's your thinking and your methodology there, how do you evaluate what the level of risk is at a site?

DEVELOPER 1

It's just about how how much do you gonna think you gonna spend to mitigate it, so for example if you were at Mauao along the beach, there you would be having to think about liquefaction in the sand and shallow water tables and that's the spread and maybe some tsunami or coastal erosion perhaps, if you're really close to the beach front and the development, I've never done one of those before, I've been a bit more inland, about a kilometre inland, so we don't have to worry about coastal erosion, but more the ash and the pumice and the sand soils in the east of the Bay of Plenty and the gravels over here, you sort of worry more about slope stability and flooding. But flooding can be mitigated quite easily. If you've got enough of a source of fill on site, for example, if you have to court it but now follow on site and you've got to raise yourself by three meters, different story, well then it becomes almost very fit and like a cigarette box. You could work out that' something that's not going be feasible. So you've [got to either] get the land for free or not go there.

JOEL

Right, so most of the time the key test is not whether it's feasible but whether it's affordable for a client, or whether it's cost effective?

DEVELOPER 1

If you can mitigate the risk within the feasible amount, so it doesn't effect your end product, whether it's a house of land or section. So it's really just what sort of engineering solutions can you apply to the piece of land to mitigate the risks you think there are going be?

JOEL

Right, so are looking for an engineered solution would be your most common response to a natural hazard? And do you ever encounter sites where you decide that the risk is just too high and it can't be mitigated?

DEVELOPER 1

Yes, I have encountered sites and I've told clients to see if they can get the deposit back and run for the hills. So, yeah, I'm doing one in Waihi Beach, consent for land that's been raised by three meters and we don't have a wheelbarrow-full on site. and that development is not feasible. If we can get 2021 prices for at least some properties, that might but...yeah. So yeah, there's some real basic science, like out at Temple View, for example, on the way to Temple View, that's quite dodgy ground, and on the way there, there's a, I don't know what the suburb is, there's a race track - before you get to Temple View, there's a race track. It's got horses and it's more for training, not a public racetrack. It's right close to that road that goes to Temple View, I don't know what it's called, but that whole area, when I drive there I tell my wife, this is all just swamp, how do you know? Well, look at the state of the road. Look at the cow poles and the telephone lines and things like that, you don't have to be a rocket scientist, just have to know a little bit about engineering to know that this is just a really old swamp that's been drained. And yeah, so that whole low lying area is just swamp...I mean, in winter the water table is just about to the surface. So when you look at that kind of thing you think, oh, I'm in for a hell of a battle here.

And then it’s, how do you quantify that? The only solution is engineering solutions. So in that instance, [we] wanted to buy the whole farm. I told them to run a mile off and they haven’t bought it. So fortunately they didn't pay any money, any deposits. we just we spend a day on site with a 20 ton excavator digging test pits, and off the first test pit I knew the rest of the day I was just gonna get sunburnt. But I just went through it and I just surrendered...just the peat and the water down below and stuff. And that's and that's not a lot of money, you know, the excavator, it's maybe 140, 150 an hour.. and my time so very soon and then I have a geotech engineer to come and just confirm things, [he] will give us a little report, so not a lot of money you spent, maybe ten K, so for a twenty or thirty million dollar purchase that’s peanuts, you know, so it's not really big dollars. But you wouldn't go sign it for that and then [do it] and they found out stuff, right.

For me, some people, some developers, would have elected to go and get a CPT done or something like there, you know? I think that I [?] that, but for me a test pit [is enough], I’m just a dumb South African so I can look at a testpit, you know, that tells me a whole lot of story I can understand without having all the technical geotech analysis behind it, just yeah, we’ve got a huge scrap here.

JOEL

And do you think that, because of your experience and how much experience you’ve had, you're confident in just trusting that little amount of testing?

DEVELOPER 1

Yeah, absolutely...the testpits down the line. So, if you don’t understand what you're looking at then you should be sending out a professional who does, so it's really just how confident - and all developers, if they're not confident, if they’re more housebuilders, they would get a CMW or a geotech, because of [?] they would get someone to go and take a look at it, and they might do a different level of investigation if you go for the big boys, but guys like CMW, they’ll quite happily go and do testpits and things like that.

JOEL

Right. So, developers that aren't commonly doing house and land or subdivisions, they'll go to the big consultants because they’re less confident?

DEVELOPER 1

Typically, not all of them but typically, if you're just a builder and that's your business doing building and stuff, then you wouldn't really understand earthworks. There's not a lot of [them that] understand earthworks and ground conditions that much and the Building Act is all that kind of stuff, and products and subbies. So it's just different horses for courses.

JOEL

And does that change the decisions they make? Does a big consultancy give different advice and will a developer receive different advice from getting a consultant to do a full review that versus just doing some test pits?

DEVELOPER 1

It won't be different advice. It's just the level of analysis I suppose. So for example, just as testpits, you just get like, a summary and photographs and 2m below where sand is a 3m of water squirted in, tunnel collapse, you know that kind of stuff is overall. You wouldn't get any CPT...you might get some sheer strength and things like that, but you wouldn't get the whole, you wouldn't get any other analysis really. And then they would tell you whether you need to preload it or whatever, but that sort of kind of stuff now, and whether you'd have liquefaction or not, whether it's a risk, but they wouldn't quantify it, you wouldn't expect them to, because that's not what you're paying for. So it depends on what you want from what it I suppose, costs of the investigation or how much you willing to spend. I suppose, the more confident and experienced you are with ground conditions in New Zealand, which are very different to the West or to Africa, or the more experienced you are, the less investigation, you will be comfortable with your decision.

JOEL

And what are the key factors that determine how much money a developer is willing to spend on the testing and on the engineering and on preparing a piece of land for development?

DEVELOPER 1

That's a difficult one. I suppose as little as possible is the simple answer. It just depends. I don't think there's a right or wrong answer. Every person looks at it differently. I don't think there is actually...

JOEL

So it's something that's unique for every developer?

DEVELOPER 1

I think so, that's a sort of a personal decision of how comfortable you are with risk or your people advising you. So, typically you wouldn't go into the experience...like, I wouldn't, for example, if I was working in the ashfields in Tauranga, I wouldn't go to a geotech consultant who doesn't work in ashfields, because they're completely different. Like anything else, you need specific knowledge of that stuff. So I'd be comfortable taking advice from someone who has experienced the ash soils and not be relying on investigation, but others might fix some other consultant, who knows? It's not an easy answer. I don't think there's an easy right or wrong answer. It's more of a personal thing about how much you think you know about the site or want to know in advance, or what's your appetite for risk, I suppose, at the end of the day. I don't know how you quantify that.

JOEL

I guess one thing I wonder is, mature, experienced developers that have been operating for a long time, are they more tolerant of risk or less tolerant or about the same, it doesn't make a difference.

DEVELOPER 1

No, I think they're more tolerant because they are more comfortable on what solutions they gonna try to mitigate it without having to spend hundreds of thousands on reports telling them what to do. So I think it's like anything in life, with experience you get confidence. Suppose it's like planners, the first time you go to a hearing or the Environment Court thing, you just about wet yourself. But then after a couple of them, it's like anything in life. I think the more you get exposed to it the most confidence you get with the

decisionmaking, but that doesn't mean you get it all right, that's another story that especially when you're dealing with ground conditions in New Zealand, it can change before your eyes.

JOEL

Does it ever happen that halfway through a development, or at some stage in the development, you find some new information or something changes and you have to readjust, suddenly the level of risk is higher than you thought it was?

DEVELOPER 1

It happens all the time, until you've got your earthworks completed. I've just gotta have a solution to any [problem]. A lot of engineering and development and stuff is problem-solving, if you can find the quickest fix to problems with a solution. So for an example, a development I worked in Tauranga for the lakes there at the corner of State Highway 29 and State Highway 36 (Tauriko - Tauranga Crossing area), I worked on their sections, and after the plan changed there was a big flood in Matua and Cherrywood in 2004, and the council there, the regional council, completely changed the flood modelling criteria from two years ago, all of the stormwater pounds and everything just about doubled in size and everything just got way bigger. So you can't do anything about that. You just gotta deal with it, just get on with it. Once you've bought the land you're committed, so you've just gotta make the best of it.

You'd have to change things. You're not doing it for -, you have to make a profit, otherwise you won't be doing the next one. So you might, for example, reduce the section sizes, something like that, or you might try and get smaller roads in, trying to maximise [profit]. So there's a lot of things you can do. Or you might, where you just wanted to have a batter, you might just say, well, I'm just gonna put in a small retaining wall. Or, I might have to chuck in a palisade wall here so I can build a bit closer to the edge or something. There's so many options you've got, you've just gotta choose from all the solutions.

JOEL

So you have to pull on your experience and the advice you're getting, and find solutions that are specific to that situation.

DEVELOPER 1

Correct, and what it will cost to deliver that, so it's always coming back to the cost, feasibility. So there's no point, for example, doing a palisade wall at a cost to five hundred thousand when [you] might only get [?] sections. For example, that's just a rough example. Maybe you're better just to lose this section then build another story, make it a double-story dwelling. Just things like that. I don't think there's a right way or wrong way to approach it. Every developer looks at it slightly differently.

JOEL

We've talked a little bit about section sizes, and that being tied to what builders are wanting. Do all builders want the same size section or is there different demands? Is that changing?

DEVELOPER 1

It's changing all the time. And it's all driven by price point and what the market wants, [what] you can sell. Like, those across the road there (development around Ruru Street, Cambridge), ten years ago, I don't think you would have been able to sell [even] one of those in Cambridge, where they've traditionally had six to 800 square metre sections. Just look down the road at those sections. These have just recently gone up and Joe's Garage is here at the centre, previously it was just paddocks and nobody wanted to buy this farm. So that would never have worked, so that's changed. They've sold them, and they don't look too bad, so it's just, the market changes, and what people can afford changes. So if you ask anybody there, would you prefer a 600 square metre section on a level, with no neighbours within four meters of you, I bet you they'll all say yes, if it can be at the same price as that one. But that's what they can afford, so really it's all market driven at the end of the day. And if you don't understand the market, like if you're a house and land builder, and you can't get the market right, you're gonna sit with product. For example, [we] tried some terraced housing and stuff like that in Omokoroa and in Papamoa and it's not selling. They've sold some of the sections, they've actually built some, but in the one area they've done a mixture of standalone and terraced housing, they've only sold half the terraced housing. Terraced housing, you've got to build it in a whole block, so typically you won't be able to pre-sell all of them, like you've gotta get the funding and [?]...so there's a lot of trickier things to do with terraced housing. You can [presell terraced housing] in a very good market, like we had back in 2021, but not now.

Appendix 6.2

Interview with Developer 2

Joel

What are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 2

Yeah, so I mean fundamentally, we are entrusted with other people's money to generate a service return, right? So we have a profit motive. The way that we as a business have tried to enable ourselves to develop a service return sustainably is to ensure that we maintain a reputation for doing, and actually doing, high-quality development. And so that's a bit of a luxury, I think, in terms of development because there are many ways and many types of real estate development, right? And so, you know, we operate in the sort of quality end of the spectrum and so we do have this sort of luxury of being able to do kind of nice things, but that has also been a sort of long term strategy for the business to do that on purpose. And so, because that enables us to then access, certain parts of the market with land owners that might not have a purely profit motive themselves - so councils, for example, local governments, central government, people that want a design outcome rather than just the maximum buck for their land. You pay too much for land, you cut corners elsewhere, right. So that's a sort of fairly long-winded way of saying the values we look for, you know, we look for very high quality locations. We would never undertake development that we wouldn't want to use or occupy ourselves. So that's sort of central ethos. We need to be able to be proud of what we build when we take a family past it. Our founder uses it as a test a lot. So would you be proud to take your family past it? So to distil that to values, we want to be providing something that is of premium quality to communities as well as individual users. At a practical level, that sort of dictates where you operate to a degree. So we will - this is a bit of side bar - like, steel costs just as much in Otara as it does in Remuera and so, you know, if you look if you look to maximize value, you generally operate in areas where you can achieve a premium value. So that sort of leads us to higher end locations and high quality developments. Does that answer the question?

Joel

When you say a high quality or a higher end development, what sort of things define that?

Developer 2

People will pay a lot of money for a view. It seems obvious, but I suspect - to give a live example, we developed in Wynyard Quarter just out the window here. The value range between the cheapest apartment and the most expensive apartment on a per square metre basis is about 125%. So you go from something like about 14 grand a metre through to like 30 a metre, and that's just a function of being higher up the building, having a better view. And there are some nice finishes and so on and so forth with that. Now your ability to achieve those premium values is entirely locationally dependent. Most of that building say probably 80-85% of the cost of a building is going to be the same wherever you build it. That's just concrete, steel, and glass, services, whatever. So your ability to really monetize that extra 15% is entirely dependent on location. And so the location you look for, you look for some sort of natural advantage - green and blue spaces as a rule. So blue being the coast, green being sort of reserves and parks, things like that. And so that sort of green and blue space is a sort of north star for your location, one that we follow pretty rigidly because that enables you to really monetize all the generic stuff that you have to put in. So it's essentially, and look, if you really want to sort of unpack it, we sell to a - residentially, most of our marketers as downsizes. So they're baby boomers that have made a bit of dough, they're in a big place and they want to release a bit of equity. And so they're sort of our natural constituency and so really you need to follow them to a degree. Wynyard's a little bit different, there's no natural catchment to Wynyard. But, you know, you are still sort of trying to collectively gather people in that city fringe and sort of bring them into a central point. So you sort of crudely follow the money and that gives you sort of relatively narrow range of locations that you can operate in if that's your market.

Joel

When you say a natural catchment, what do you mean by that?

Developer 2

I just mean like, you know, in Remuera there's a lot of old people sitting in big piles of houses that want to downsize, so your sort of addressable market is your sum total of

downsizes. Your more expensive suburbs, basically, because the buyer behaviour in the high market, high apartment space is probably about, I guessing here, but I'd say 60% to two-thirds just downsizes. People who might be sitting on a house with four mil, they'll buy an apartment for two and they'll release a bit of money so they can travel and move around and retire. It's not the whole show, but I mean, without that, you don't have an apartment market really at the high end. And so the sort of natural locations are where those people already are. So that's kind of, you know, it's sort of coastal North Shore, eastern suburbs, city fringe, those kind of locations. We do have a residential scheme in Hobsonville, which has sold pretty well; it struggled a bit for the last few sales, just because of the market turning down, and one of the reasons it struggled is it doesn't have a particularly deep pool of downsizes there. Like generally the prices we're selling for are approximately the prices they're selling for. And so that's, you know, even though that's an amazing coastal location, et cetera, it just doesn't quite have that depth of buyer pool.

Joel

Okay, so the majority of the people who are downsizing and purchasing these high-value apartments are buying an apartment in the same sort of general area of the city that they currently live in?

Developer 2

As a rule, yeah, so I think we've done around 400 apartments in Wynyard and less than 10 people have come from the North Shore. And you can see it from the North Shore. Most people don't really want to move that far, that’s been our experience.

Joel

So it sounds like natural location and natural amenity are really important. Are there any other important factors in your site selection?

Developer 2

Yeah, this is kind of hard to answer in a way because everything can be like - when I was doing your questionnaire, like you're sort of ranking stuff and well, on any given day, one of those things could be the most important thing because if it's a problem to an unusual

degree, anything can be fatal. As a general rule, location, you know, that sort of green-blue space thing is something we really think about in terms of location because that just leads you generally to better amenity. We think a lot about the developability of any given site. So your efficiency of build. So that could be size and shape. So there's an optimum, you can be too big, you can be too small. Access to light is probably the best way to sum up size, shape, position, and street. So residential has a lot to do with access to light. So if your site is too deep then your interior spaces will have poor access to light, or if it's hemmed in, if it doesn't have enough edges. So if you've got, you know corner site, even better sort three edges, you've got light on three sides, right? Your only antidote to that [not having good light] is to just pull yourself off boundaries, but then you can be buying a bunch of land that you can't use. So there's sort of a certain kind of rectangular shape on a corner and facing northwest that will give the best access to light. And then collectively you've sort of got engineering considerations. So natural hazards, obviously a big one nowadays, coastal inundation, you know we think very carefully about those things, that's sort of long-term resiliency. If they're kind of low level effects, you can engineer around them, if they're high level then whether we care or not, it's almost immaterial if you think insurance companies are going to care. In Wellington, we did the first ever base isolated apartment, that's Victoria Lane Apartment, so they completed that a couple of years ago. So that was a sort of move to try and overcome consumer concern around safety and especially insurability. So a lot of the insurance premiers for Wellington residential is just astronomical. So we do think about those sort of collective engineering concerns. And then, you know, things like contamination or servicing or whatever. But those are, you know, again, generally not showstoppers, but, you know, when they're, you know, extreme, could be. So you sort of have a suite of things could result in extraordinary costs and if they are collectively or individually are too high, then you can't make a buck.

Flood risk is, post the Anniversary Weekend floods a couple of years ago, that's a sort of new focus. So it's something we look at pretty hard now. We walked away from looking at a site in Karaka up here recently that on paper looked pretty good, but we just couldn't work out how feasibly we'd mitigate the flood risk. And so sort of flood risk is kind of, it's basically a consent risk nowadays because, you know, councils are adjudicating it pretty thoroughly. But there's a commercial dimension as well where, you know, buyers will be alive to it and insurers will be alive to it. But it's essentially, probably the councils will gatekeep it. So it's just another thing you've got to look at, seems like they get more every year, unfortunately.

Joel

And in terms of those engineering considerations, when you're considering a site, what's the typical process for working out the level of engineering risk or the types of interventions that will be required?

Developer 2

Yeah, so sort of procedurally we will take a, you know, initially, if we can get some time on a contract, you just take a general view, a bit of a gut feel on what you think it should be, you contract it so that you control the site, and then you'll spend money on due diligence to clarify those engineering matters. So generally we look at three waters provision, geotechnical stability, liquefaction, the like. We have a geotechnical report, it doesn't matter how many of those things I read, I still don't understand them. I just flick to the part that says foundations and give it to a QS to price. In certain instances, acoustics and traffic, but that to lesser degrees. Your main costs are in servicing in your foundations. But yeah, you know, they can be other sort of extraordinary things you might look at, but I think contamination as well if things are, you know, if there's a, you know, that conversion sort of Brownfield stuff. Even greenfield, actually, some of the old orchards and golf courses and stuff being spread pretty horrendously. And that, you know, all that stuff was just, you know, it's just straight off your bottom line so ultimately you need to reflect on land purchase price.

Joel

And in terms of natural hazards, it sounds like most of the time you're basing that on what the council has available, the regulations and their information?

Developer 2

Yes, so like first review is just GIS systems, most councils have pretty GIS stuff now. Regional councils generally maintain hazard inundation maps. If we get serious about a site, then you would generally have an engineer create a proper hydraulic model. Sometimes it's just so obvious it's a problem that you don't need to go, but if it's a bit fringe, you have a proper engineering report and they will, you know, tell you whether it's an engineerable issue or not. But earthquake [risk] has always been there. We think of earthquake as sort of generally an engineering issue. Base isolation is pretty good, I think

it's the best option; floods are a bit different, it's not always possible to just mitigate it on your site, it can cause problems for everyone else. If you just raise your land, so if you've got a big parcel of land, the one at Karaka that we looked at, we had that exact solution, I said, well, raise the whole site by a metre - that actually then would have raised the flood level, flood severity by 200 mm on the neighbouring sites. I mean not clear on, you know, you're mitigating your effects on your sites, so you're mitigating the effects on your site but creating them on others, that's some sort of resource management conundrum, right? So it was like, and so then you get into this, well, you've all got to raise your land by a metre or whatever, but the neighbour doesn't want to do it, and so then it's just too hard, right. So flood risk is a little bit different. Like earthquake you can just manage your own stuff. Flood, coastal inundation, they're trickier. So there I think they will just create a certain amount of big no go areas where to people just look at it [and say], it's just too hard. So we we're quite nervous about that at a due diligence level.

Joel

You mentioned also being engaged in some greenfield and brownfield developments. Does that ever involve identifying a site and investing that or a client investing in that, in anticipation of future planning changes, rezoning, sort of land banking?

Developer 2

Yeah, we are currently looking at two sites. One is sort of rezoning from a kind of sui generis use, somewhere between green and brownfield, like it has had development on it, but pretty low intensity. And it's a specialized. I can't talk about a specifically, but it's specialized, it's got one of those - in the AUP you've got these grey zones which are, you know, a range of kind of medical or educational and things like that. The moment that use is no longer required, it's actually a pretty easy path to rezoning so you sort of default to, you know, because you can't, you know, like if somebody's got a medical facility and they don't want a medical facility anymore the council can't really dictate that it should be a medical facility, it defaults to, what's a sensible and natural zone in that location absent that demand. So we are looking at one and that space. We're looking at another one, which is subject to a public plan change that we would then sort of enable. So the short answer is yeah, we're not actively doing any, not sure we've done any in the past. I mean, I've done it, but my history was Countdown, I ran their development department for four years and - we didn't land bank, more a case of fucking your numbers up sometimes and you have to just put the site away for a while. But we did rezoning; you can make quite a large amount of

money, but it's quite binary. Like if you lose, then if you've just got to a bit of land that you can't do anything with. And so in that instance, you know, it's very much in the population plane [for] residential. You're trying to sort of just follow, you know, follow population, find somewhere where there's land scarcity. So if there's no land scarcity, there's no point in rezoning.

Joel

Are there other variables or other pieces of due diligence that you might do to evaluate whether it's worth taking the risk on a rezone?

Developer 2

Yes, so with rezoning there's a political dimension to it. We have a sort of long term industry debate around the RMA and, you know, whether it needs reform or whatever and I'm sort of a development heretic in that I think that there's nothing wrong with the RMA or at least - there is plenty wrong with it - but there's nothing wrong with it that a new bit of legislation would fix because you've got 62 or 64 or 60 something councils. They all use the RMA and you can have it applied extremely easily or extremely difficultly, and it really depends on the people applying it. And so you can put whatever bit of legislation you want, some councils are going to be easy, some councils are going to be difficult. And so you need, like one thing you identify is whether you're going to have a great big fight or not, and it's not to say that, you know, you can fight the good fight, if you think it's winnable, but you've got to be prepared for a very long and litigious period. Some developers, that's how they role. For us, there's easier ways to make money. A good example is what our good friends at Winstones have done in Takanini, you know, really cool development I saw proposed but it was always going to be hard and it's just going to be a massive long-term litigious battle, big upside if you can win it. They do that really, really well, you know, they take those controversial sites and muscle them through. I don't think anyone does it better. It's just there's a sort of risk tolerance that you've got to have to be operating in that space. For our parts, you know, probably prefer things to be it bit easier. So that sort of political level, and the other thing is just infrastructure, infrastructure is absolutely critical for a rezoning because you can, you know, if you've gotta drag pipes or built, you know, wastewater treatment, whatever else and, you know, you can you can be sunk pretty quick or the very least you've just got to be really big to get over, you know, your major sort of infrastructure hurdles.

Joel

And then like in terms of the risk tolerance - you've mentioned size, are there other factors that kind of determine whether one developer is willing to take that risk and another isn't? Is it just a personality thing?

Developer 2

Capital structuring is part of it, part of it is just personality. So you know, we as a private equity business have relatively expensive money and that, you know, we're trying to deliver 25% IR up, so 20, 25%. That means that if we get caught sitting on a piece of land, that's really hard to achieve, those sorts of levels. And so we have an exit pathway mapped out pretty clearly, not always, but, you know, within reason you need to be pretty sure you can get out of it. So that concept of landbanking - land banks generally - it can be a good strategy - but it's generally lazy money, because land doesn't pay anything, right? People do pretty good returns on paper, but often land is very, you know, you can't really - if you put debt on it, then you've sort of set a time bomb for yourself. You know, you've got to - a lot of people in land development come unstuck because they've just got a debt clock ticking and they can't get out of it. If you put all equity and then that's not very efficient either because, you know, a lot of generating service returns is putting the minimum amount of equity you can, maximum amount of debt without getting ahead of your skis. So back to your original question around what determines [strategy], our strategy is in large part determined by return target and that's a function of who our investors are and what we promised to achieve. Contrast that with someone like an institutional who's doing it precinct, someone like that. They have a sort of broader balance sheet. They're a listed entity listed, you know, that're trying to do, I don't know, what they consider a good return, eight percent something. [?] listed prop co. is actually not bad going and so they can take a slightly different approach to it, because they have cheap money, basically. It doesn't make it any easier to make a profit from a development, development's still gotta be profitable, but they can you know, they're collectivised, their assets are collected over a bunch of assets rather than just single development and so they can sort of smooth it around a bit, go a bit slower, whereas for us, if we yeah, if we get stuck holding something, it can be a bit ugly.

Joel

How frequently do you get caught out in your feasibility stage estimates of the return and the timeframe - something unexpected happens, and the project is suddenly [off track]?

Developer 2

Time fixes most things other than debt, if you have sort of capital structuring right, and by that, I mean like say for apartments, if you presell to a level that covers your debt, then you might not make as much money as you thought you're gonna make, but you're never going to lose your shoes. So that's sort of a discipline. We've, you know, the last three years have been a major property downturn. You probably only get three or four of those in your career. And we've had one problem in that might ultimately lose money, I think in that 35 years of [the company] that would be the only one. But, you know, we are as far as the development goes very conservative, very, very risk focused and there are different approaches, not saying it's right or wrong. You get certain approaches that would do far more than we would, but just on the assumption that you're going to have a few flameouts. It's our approach is trying to sort of minimize those close to zero as possible being a bit more selective from what you do. So not saying that it's the right way, it's a way, there are other developers that are happy to lose money, you know, they'll do might do five where we do two, but they'll assume they're going to lose money on one or maybe two of those and sort of end up in roughly the same place. It's just, you know, it's, yeah, it's sort of horses for courses really.

So yeah, like nobody's bigger than the market. And, just go back to your original question, we have four or five developments that we haven't progressed because of the market. So, you know, that otherwise would be building that are just sitting and waiting. Through sort of some combination of good luck and good management, we haven't been, you know, stuck with those at a bad time. You know, again, we've used option contracts a lot on land so that we're not actually the landowner. So the one at Takapuna, for example, which we've got here with accounts there on the under option contracts, we haven't paid any money for those land parcels. So yes, we've spent money on design and things like that essentially a bit of a cash drag. But in the context of whole scheme it's not actually that much, difference is a few if you've lumped 20 odd mill for a piece of land and it's not earning you money, that can start to look a bit ugly, but so we sort of insulate it, often through use of options. Often it's a contractual mitigation. But, you know, going back to I said at the start, we've been lucky enough to be able to access those types of developments, not always

possible. You know, we've got those because, council wants, or at least says it wants, you know, good outcomes rather than just purely ‘write us a big check and we will let you off into the wild and do what you do.’ So, yeah, I mean, so, yeah, short answer is no one’s bigger than the market and everyone's been caught this last year, it’s been pretty brutal. I think it's the biggest in history. I read something once that the interest rate increase, some Bank of England records go back like 600 years or something, and it had never increased that much in that short a space of time in the 600 years that the English base rate, which is about the same as ours you know.

Yeah, so it's been quite yeah, fortunately it's coming down pretty quick again, so a lot of people have just been able to ride it out, but it's been tough, a tough couple of years. I mean, we do other stuff as well. We've been buying existing assets that look cheap, rather than developing, sort of fortunate enough to be able to kind of duck and weave a wee bit, but yeah, you're not quite the market, but this one, it'll get a name at some point, you know, GFC or whatever, I'm not sure what it'll be.

Joel

Going back to natural hazards, what makes a site too risky in terms of natural hazards to develop?

Developer 2

It would be primarily, put it in the context of flood risk and coastal inundation, flood risk probably more so because coastal inundation's a little bit more predictable in the sense that, it's a big, sort of slow moving problem and you can probably engineer around it in a lot of cases. Flood risk is a bit more kind of sudden, right? and unpredictable. So anything that is, you know, when we look at a hazard that isn't site specific, site specific generally you can engineer around. If it's more kind of local area or suburb or, you know, sort of street level where you’re dependent on multiple entities responding, then it then becomes a sort of more kind of commercial risk rather than engineering one. So an engineering risk within reason, can just be dealt with out of land value. And oftentimes it's not possible because land owner doesn't get it, but theoretically, the engineering costs on the land should just find its way to the land price at some level, where the engineering risk requires some degree of coordination with other parties, that becomes a commercial risk, and coordinating multiple people to do multiple things at the same time is generally next to

impossible. It's while it’s like the same principle of just buying, you know, develop to buy it for sites and do a development, it's generally next to impossible, because you just can never coordinate four people to do something at the same time. So same with that. So that's sort of the real concern, and there's a sort of severity dimension whereby some places are just forecast to be flooded, whatever you do, there's no engineering solution and it doesn't matter whether you're happy with that risk or not because the insurance companies won't be. And if you can't insure you can't develop, you can't buy, can’t sell. So there's this sort of proxy things that look out for, like, we do sort of watch insurance company behaviour a wee bit, because they will make your mind up for you. If they're not there, there can’t be any development, doesn't matter whether you care about it or not. So they're quite an interesting barometer for development risk.

Banks [are important] to a degree as well. You know, the banks will - I know from a certain banker they're just essentially just redlining areas at the moment and aren't renewing finance exposure in certain suburbs in the city. But they would never tell you that. I'm not sure if that's strictly okay, but they're doing it.

This is bit of a piece of string thing, but we look at just, you know, is there an engineering mitigation that you can manage on your own site? I think if the answer there is no, then you've probably got an unmitigable risk.

Joel

And do you ever get in a situation where there is a engineering solution to an onsite risk, but it's not profitable, like it would be too costly?

Developer 2

Yeah, we see that routinely, yeah. I think last year we had about 200 deals that got onto our deal sheet that were worth a look, and we did about two of them. So, I mean, we'd like a slightly higher success rate than that, but I mean, you know, five would have been a good year, so, you know, under that basis, you sort of, you know, you're still at a two or three percent strike right and some subset, don't how many, but I, you know, a material amount of those would have been just sort of engineering costs. The typical development margin on costs might be like 20%, maybe a bit better, it doesn't take a huge amount to suddenly

make that that 14 to 15 and then it’s just - and if it's like it was only 18, 17, 18 to begin with, it's only 12, 13 now, and it's just not worth doing, the bank wouldn't give you the money even if you did want to do it. So it doesn't take a huge amount for engineering cost to tip something upside down. And that applies particularly with land development, which is where you sort of engineering - vertical [developments] are a bit different. Generally, your engineering costs are a small percentage of your total costs, versus horizontal, where engineering costs are higher - it’s all engineering, basically.

Appendix 6.3

Interview with Developer 3

Joel

What are the most important values and rationales that influence your behaviour and your decision-making as a developer?

Developer 3

In general, we're looking for sites that are sort after. Why would they be sought after? - because of transport [accessibility], close to the current population, that have much of the proper zoning already in place, and just as importantly, the ground conditions from a geotechnical point of view would lead to a fairly straightforward development. Those would be my key four things that we're hunting of - and then out the back end of that would be price, price can always be negotiated, but yeah, we're looking at those other four things and then price would be the fifth.

Joel

Would you say that price is less important than those other things?

Developer 3

Yeah, I would say it’s less important because if you get all the other things right, the value proposition of pricing takes care of itself, if you just go and chase a piece of land that’s cheap, then you bring all those other problems potentially into it. So I'm always kind of looking to solve those problem before we worry about what we're paying for it. We still wanna pay the best price, but it's not as important as those other items.

Joel

So can you maybe describe like a high value site, one that that's got a lot of potential? What sort of features does that have?

Developer 3

Mainly looking for market demand, so we're looking for a spot that people want to live or actually, a spot that we think people would want to live, but they don't actually know it exists yet. So once we create it, they'll like it, because sometimes, if everyone wants to live there then the value is already maxed out, you know, before we come looking. So we're always looking for something that we can value add I, suppose, at that front in, but that would be - I think that the transport situation is quite a biggie, especially for having a having a 10 minute suburb and having some of those green aspects to it that we're searching for, but you know, I look at a place like Wellington, most of my development is in Wellington and Kapiti Coast and just with the topography, a lot of the so-called good land has gone. So we've got to work out how we can develop the stuff that's a bit more hilly or a bit more out of the way or has got other kinds of perceived negatives on it that we can try and convert.

Joel

And all of those aspects of the site, all those things you're looking for, are you looking for those because that's what the consumer wants or is that something that comes from your own interests?

Developer 3

No, ultimately we've got to be able to sell them, so we've gotta be able to sell a - so we're in the land development and we're in the construction side of things as well. So we are definitely looking there for a - what is the end buyer of a house or an apartment or a townhouse or a retirement home or a daycare centre, like, what are they going to be wanting? We're very much trying to try to set [our activities] to where we see the market.

Joel

And in terms of your overall activities, would you say that you follow a long-term strategy in how you're choosing sites to develop or is it sort of case by case?

Developer 3

Nah, the strategy is long term, so I guess we're not trying to be in and out too quickly. So, yeah, if there's an issue we deal with it because we're in here for the long haul. So, you know, nothing frustrates me more than - we're in a resource consent hearing at the council at the moment and one of the councillors stood up and said 'oh, you guys are only in it for a quick buck.' Well, we're not. Yeah, some people are, but you know, some lawyers are ratbags, some are good, some developers are bad, some developers like to build something that stands the test of time. I always try and always think that we're better placed to do a development, to go through a second development cycle. So what I mean by that is you know, let's say every seven or eight years, you get the economy kind of fizzing up and then a bit of activity and then it might peak and drop down the other side. If you do a development either side of that peak, that's kind of where a lot of guys go broke. So I think you've got to be able to structure development in the current market so it can survive a downturn and you can still trade it through the next phase and a lot of guys don't that, they just want to be in and out and get the money in the bank and move on. And sometimes they time it right, and sometimes they don't. I mean, you're based at Waikato Uni, you'd see you'd see plenty of development around Hamilton - there's a heap of different approaches, you know, some guys do subdivisions, some do small, some do infill, some do mixtures, there's a whole [bunch of] different ways of doing it, but the guys who usually don't really mind about, you know, a 10 or 20 year philosophy, they're the ones that will do better in the long term, I think.

In New Zealand, the way that we run a business, we're very much about, 'oh, let's make a buck and just sell everything and then kind of take it easy until we retire', whereas if you look at say how the Italians or the Japanese [do it], they're building stuff for their family, they are they looking at it a hundred years, 100 years is young in Japan. So I kind of look to some of those kind of models with some of my system and that's what we're trying to do.

Joel

I think you mentioned having the value of delivering a high quality product, would you say that's a value for you as a developer?

Developer 3

Well, you can tell the difference, right? That value comes at a cost. So if you're chasing the bottom, you are chasing the low of the low market, well then you need to skin your cost to do it. But if you get stuck in the downturn, and there's no funding available for those places, then there's always a kind of struggle through that. So we tend to go for more of a middle market [so that we can] just appeal to a bigger group of people. I want to stay away from that top end where, you know, in any given year, you have only potentially got five clients and I want to start away from the bottom end where your client base can dry up any time. I want to be in that middle area where your clients are a bit more financially sound, a bit easier for them to lend money. They're not kind of exposed to the whims of the market. And the quality in that one can be as simple as, you know, if you were if you were doing a subdivision, you look at some of those stuff that they've built in Hawkes Bay and when the cyclone came through a couple of years ago and you think shit, how did they build floor levels below road levels? Because they just didn't want to move their dirt around, right? They just wanted to - the council approved it and they just kind of got in and out and they got their minimum overland flow paths and a few things blocked up and a few things went wrong and the whole suddenly went pear shaped. It wouldn't have actually been that much more to future proof this other version of it and I'd just be horrified if we'd delivered some of that stuff, and got caught out in that respect. I'm dealing with an engineering consultant at the moment who's advising us and he goes, oh, you know, you wouldn't want to do that because you're going to lose four sites and it's going to affect your yield, and I said yeah, but it's going to be a nicer subdivision if we put a wider access in there and we can take those places out and it opens it up and that's just kind of got a better amenity. And I think you get that price back, rather than just trying skin everything to the dollar and wonder why it didn't quite work out.

Joel

So what makes a site undevelopable? What are the sort of things that you see in a site and you say, look, we're not going to go there?

Developer 3

So I've got one in Kapiti, and we just looked at another near Ngāruawāhia, and you've got peat issues, so the TC2 foundations, some of that stuff, you've got to quantify that at a price. Like if you're in a suburb where the house is only going to be able to be saleable up to

X price well then any of that stuff is just going to be a killer for your development at any stage. So that geotech stuff is very important, like whether it's soakage for stormwater systems or whether it's [something else], how it's laying out from an excavation or earthmoving point of view, all those are quite important up front. You can kind of handle you, can handle a lot of setbacks by just putting a dollar figure on it, and, you know, if it's kind of within budget, I guess you can deal with it, but some of those bigger ones are just a bit unknown. And that might be - we're doing one at the moment where we're trying to build on a fairly steep street, which would be a 10% percent gradient and the type of walls that we're using, we're not quite sure, you know, you can do the drilling, the testing and what have you, but we're not quite sure until we actually start building some of these walls, what's actually in there because there was pine trees on the property before we built it. So you've a bit limited with drilling rigs...so we've made an educated guess on what we're doing. Sometimes you do your homework beforehand to a similar degree and it just doesn't stack up so then you wouldn't develop it. You just kind of move to something else that was a bit more straightforward, a bit more certain.

Joel

And in terms of natural hazard risk specifically, I wonder if you could talk a bit more about that, starting off: with what sources of information do you use to evaluate the natural hazard aspects of a site?

Developer 3

A lot of that mapping is done - like it should be done by council or regional council, but I find that the more and more developments that we've got into in the last five years, I find that the council is almost getting asked to update their plans and their models, and that might be, you know, they might have had an all attachments study done 15 years ago and they probably haven't - they've probably done some basic modelling and updated it, but we're the ones who are having to spend 300 grand to update their models. A lot of our stuff is kind of driven by those models that we're paying for council, and then we're also getting them peer reviewed as well, so that's kind of a big drag on what we're doing because we never used to have to do that; like some of the some of the land that was not problematic, we would never have had to go through that expense. There's some other example and that stuff that you know, I guess it's common sense has kind of gone out the window and all of a sudden everything needs to go through a certain set of, you know, tests or protocols and all that happens is guys like yourself who are coming through in your 20s and 30s, you're

thinking ‘umm shit, why is a house so expensive’, you know, well, it's so expensive because we've got to jump through a lot more hoops than we used to. And yeah, there was some average development done, but there's also some bloody good development.

I kind of worry now that, especially with the focus on wetland and ecology and all that kind of stuff, that some of the land that we're consenting, it's almost too hard to develop. You used to be able to get a nice landscaped development with a hundred houses on it and now in that same bit of land, you might be you might not be able to do the cut and fill, you might be, you know, preserving a perceived wetland, which might be a bit of Manuka scrub and a kind of swale, and that will be treated as a significant natural area and that's kind of been abandoned for the last 40 years, and they kinda graze stuff around it. And, you know, you end up going from a hundred sites down to 30 and those 30 sites become a lot more problematic. The council, they’ve got a lot more green edges on the road, they've got a lot more less curving, more swales, kind of more landscaping, a lot more intensive for the councils to look after, so the rates are going up, more expensive to build so there’s less houses on them. I just think we could kind of moderate that a bit. I mean, all that side of it has gone a bit crazy.

Joel

When you have a site that does have a natural hazard risk, like a, you know, maybe a flooding risk, what type of responses do you have to that? Do you default to an engineering response?

Developer 3

Yeah, mainly an engineering response, it’s basically our engineers battling with the council engineers to get an approved solution through. And that might be something where there’s not a flooding issue, but it might come up on a hundred-year plan, it might show that there's 20 millimetres of water on a 100 year plan so then you've got to go an engineer that subdivision. It's not like there’s 300 millimetres coming through, it's only if everything, you know, all the upstream effects of being dammed up and the stopbanks have burst and the rain has kind of carried on for twice as long as ever happens. But I mean, you look around the country and you see some of the disasters, Hawkes Bay and Auckland and a bunch of other ones, I can see why they just think oh, bugger it, we'll just do a blanket approach to everything. I'm sitting here at the moment by the Manawatu River and they’ve got the river

and then coming up out of the river you've got a flat-ish ground then you've got a stop bank and then you've got houses on the other side of the bank, I suppose, you know, but this area was totally flooded probably six years ago. They worked out a way to mitigate it you know, but I wouldn't go and build a subdivision here, I'd keep my wits about me, I'd build a house on piles, but it's not the way we work. You go and get some of those things in Hawkes' Bay, I'm just trying to think, and the Esk Valley, GJ Gardeners have built a home on a slab on grade on subdivision, they'll just go and build a slab on grade in the Esk Valley, the slab at a similar level to the driveway, to the front lawn and bang the water just goes through it.

Joel

And do you ever encounter sites where you could mitigate the hazard through engineering, but it just wouldn't be profitable?

Developer 3

Yeah, yeah, frequently.

Joel

How frequently would you say that you like abandon projects or, you know, back away from sites because of natural hazard risk?

Developer 3

The scale of what we do, so we probably, you know, we'd probably be developing, in a good year we might develop 50 sections, in a quiet year we might develop ten, how many blocks would we walk away from? God. Maybe one every two years. More so when the market's a bit tighter, you just think yeah, I could get that through but it's just not worth it.

Joel

Does that mean then that your high level due diligence and early research is quite reliable?

Developer 3

Yeah, to a degree, yes. The worst thing we can get is we can get one that's marginal and we pay too much for the land and then the values go down and then, we kind of always knew what we're going to have to do but then we're kind of looking for it. But you know, it's a market thing, you know, we just have funding in place that will ride out another cycle so we can kinda figure it out on the other side. We don't have to build it and sell it before the banks foreclose on us.

Another thing is that we do of mixture of sizes but, you know, we're trying to keep growing and try and get our teeth into some bigger stuff. For us, there's as much work for us, doing three or four houses out the back of a residential lot as there is to do a 40 lot subdivision. So we might as well just put that time and resources into doing something a bit bigger. And that drives our efficiency. So yeah, around the whole natural hazards side of things, maybe part of that comes with experience as well. I mean, you know, just with kinda what we've done over the last thirty years in the building industry that's kind of what we would do.

Joel

So in terms of developer experience and maturity, would you say that the more experience a developer has, the more willing they are to tolerate some natural hazard risk?

Developer 3

Ah yes, yeah. And the most experienced guys will either take it on 100% or just [won't go there]. So I guess the experience gets you a few more deals.

Interesting point about the developer experience, because even though they come and go, if you've got a bit more experience and you're assessing that risk better, you definitely, the results will be better long term. Earthquakes are another thing in Wellington, like we're doing sites near the fault lines and what have you, but I don't know, like you'd understand it more than me, I know there is a technical explanation somewhere, but it just seems to me that every decent earthquake has happened in the last 40 years has been on a kind of a, you know, in an area that was troubled, but a previously unknown fault, so I don't quite know we analyse that side of it. But we've got one at the moment where we're staying out of the way of a couple of known folks, I suppose. Sea Level Rise is the big one for us, I know

the councils, with their modelling, they've definitely raised that bar with the kind of, with the climate change side of it then what we were doing ten years ago.

Joel

And is that changing the types of sites that you develop and the types of sites that you can see as being feasible?

Developer 3

Yes, definitely. I think so. And even in a place like Kapiti, they've spent a lot of time trying to trying to rezone or requantify, not only their coastal stuff, but their ponding areas. So yeah, I wouldn't touch those just with the complexity involved.

Appendix 6.4

Interview with Developer 4

Joel

What are the most important values and rationales that influence your behaviour and your decision-making as a developer?

Developer 4

it would come down to standards and building codes, you know, we're not going to go and build something if it’s against the building code. So we're pretty straight shooters here, so essentially district plan rules and building consents, the building codes, set the perimeters for our decision making, you know, we're not gonna go and challenge any of those positions and as part of our pre-purchase due diligence, would always highlight what those parameters are, and when we're going to acquire new land opportunities, you know, we'll work through a list of predetermined, like a predetermined check sheet, that ensures that, you know, in new development in key areas we’re working within those parameters. We've found it very difficult in the past to progress a development that sits outside of those parameters, i.e. such as, you know, building and flood zones or contaminated land, whatnot. We've found that catching those kind of things early, allowing for them and not trying to cut corners is the best way to work, you know, and you just create yourself a headache later if you try to go around those rules or try to loophole them in anyway. So we understand the rules and regulations that we're building to, and that's probably the most important part.

District Plan rules, what our codes of practice rules, like, you know, minimum grades for sewers and stormwaters, those kind of things, sizing of pipes, all that kind of stuff between the codes of practice, which is more local council, then you've got your building code, which is more countrywide, we always understand that each district is different and we'll just make sure that when we’re acquiring those new lands, we work within those parameters.

Behaviour potentially could be set from a client if they're pushing back on several items, but we would usually provide advice to say if any client wanted to break those rules, we would say, look, we wouldn't recommend it. Yeah, I think it's a pretty straight and narrow

path that you've got to follow when it comes to the building code because, you know, worst case scenario here, if you don't capture any of those key issues then you're going to run into costs down the track. So I'd close by saying that our behaviour is pretty - we're not a cowboy. As such we do things correctly, like you know. Sorry, reputation always comes into as well. So for example, you could do 50 good projects or work within the limits and then if you do one big slip of the behaviour to try and go around a rule, everyone will remember you for the one project that you became a dirty developer on or you know, you're in the public eye here, so, you know, you've got to be careful, someone can see that you do something that sits outside the norm and that's going to affect you badly. Your reputation as a development leader in the industry and that ultimately will affect people coming in and wanting to be a client for you.

Joel

You mentioned earlier that sometimes you do have clients that are pushing you to go outside of those parameters - do you have any examples of that?

Developer 4

Yeah, two examples that come to mind are, one person wanted to cut cost, so going down a correct pathway would have incurred like an additional fee of $25,000 for undertaking further earthworks to comply with the plan, he pushed us not to do those earthworks to try and save some money, you know, the engineering plans had a slope that we needed to be three to one and he goes, no, make it steeper or make it less steep. He wanted less earth to come out, so he wanted to make it flatter, he wanted to make it have a bigger platform, but ultimately that went against some of the engineering matters. The other example was, that was cost and the other one was design. He didn't like to look of the alternative product that we were using, and he wanted to use a lower spec product that looked a little bit nicer and because he's building a very, very nice home, he didn't agree with using this type of product so he wanted us to push away from that and use a lesser product and paint it, a different kind of grade steel. So that's the only time, those are two examples that come to mind.

Joel

And in terms of your behaviour and your decision making as a developer, do you have a long term strategy that you're following?

Developer 4

Nah, we don't really have a strategy in our work. We've just got our two directors are pretty clear cut that there's no corners to be cut, they're pretty clear, you know, they want to be seen in the public eye, it's their name on the building saying, well, you know, if you guys are doing developments for us, you need to be following the rules, you know, they're adamant on that, we have meeting every six to 12 months, strategic meetings, it is reiterated at those meetings that, you know, by any means, we don't want to become that dirty developer, we don't want to have our name tarnished by being a cowboy or cut corners or compromise on quality. So that's reiterated from the top down, but we don't have a specific policy.

Joel

What are the most important factors that you consider when you're evaluating the development potential of a site?

Developer 4

So I think I alluded to it earlier. We have a predetermined check sheet. So first and foremost I think would be the district plan rules, you know, it's probably the first thing anyone checks, like what you can and can't do in the particular zoning. Coming down from that it's probably infrastructure. So once you know what you can build in the area, you look at how the site is serviced. So, you know, looking at all the three waters, fibre, power, understanding what your client needs and then making sure there's capacity in the network. We'd then look at key items such as geotechnical conditions, land contamination, and hazards chapter would be included in that third stage, and so we'd do planning, infrastructure and then we kind of do a combination of the land hazards and the geotechnical. That's how I would kind of break it down, into those five key categories. And then I guess the last one would be making sure once you understand the parameters of all the issues, what could be affected i.e. geotech conditions or there might be a little bit of contaminated soil or there's a little infrastructure issue, and then we'll do a financial lens over the bottom saying, hey look, what's the risk? What are the costs to develop and then we finish with that financial analysis.

Joel

And so in terms of infrastructure, are you mostly looking at the existing infrastructure at the sites or are you sometimes willing to you know, improve infrastructure or add new infrastructure to develop a site?

Developer 4

So ultimately, the path of least resistance, the most cost effective solution, is to try and utilise what's there. And if we can if we can fit a new development i.e. 50 lots into the existing infrastructure, by all means, that's the most economical way to develop and it's probably going to improve the developer's bottom line. If like I said before there's deficiencies or there's gaps, capacity concerns within the network, then as part of our due diligence we usually say, hey, look, we need to provide another sum of money let's say, let's call it $200,000 for this argument to extend the sewer line or the water main to feed the development to a level of service at council will accept, it's then that $200,000 into that financial lens to then say, look, after all these constraints does the project still financially? and then there'll be kind of yes-no, let's proceed kind of thing. So again, we don't cut the corners. We understand the level of service requirements, what each lot requires under most district plans so it's just a case-by-case basis, you know. But we will always try and push the limit with council to say, hey look, we can service the development with this, ultimately lowering the cost. Ultimately it's council's decision to say no TW need to do X Y and Z to increase the level of service up to the district plan level of service that's in line with our code of practice.

Joel

And then in terms of natural hazards risk, when you're evaluating the natural hazard risk at a site, what sources of information do you use for that?

Developer 4

So the two big ones that we use here in the Hawkes Bay are, we've got a hazards portal on the council website, so that that takes everything from flood hazards to coastal inundation to wetland to slip hazards, contamination, it's got all of that on a single webpage. And then - that's the regional council because we're not a unitary council with both councils, we've got split councils, so Hawkes' Bay Regional Council and we've got five subcouncils that sit

under that around the districts. So all of those district councils like Napier City and Hastings have their own GSI maps and they've got hazard portals on those. So we've got hazard portals on local councils and our regional council maps and we go through and I do an analysis on all of those as well. The accuracy of those is sometimes a little bit on, you know, you've got to take a look with a pinch of salt because the level of accuracy or detail in some areas is not as good as it should be. So our engineers that we use also have a great knowledge of it and they can do sort of their own little analysis to confirm, you know, what a flood height might look like in that area we take, always where if it's really close or it's really looks like there's going to be a bit of an issue, then we'll use our engineering team to try and vet that and say, look, this is real close do we have problems? and then we also use the actual councils. So for example, if we're looking at purchasing a five hectare block and subdividing that we're always going to have a preapplication meeting, saying, hey look, we've done this pre-check analysis. There may be a few little bits and pieces here on stormwater that might pose a bit of a problem or there might be a coastal inundation zone or something like that so it might be a bit of a coastal inundation zone that we need to consider, so we would package up an email saying, hey look, this is what we're trying to achieve. Here's where we think are some of the problems and then we'll put it in front of council and they'll actually give us a lens from their perspective and say, actually these are the hazards you need to consider. Most of the time it's just a good open, honest conversation saying, hey look, this is what we're trying to achieve. What are the red flags, how can we overcome them?

Joel

And then in terms of working with your engineers, are they mostly just conducting desktop surveys of those hazards or are they conducting field testing also?

Developer 4

So it's depending on the level, or where we're at in the project, so if it's a pre-purchase, it'll just be desktop analysis and if we think the desktop analysis comes back and there's grounds for further investigation, i.e that the desktop is saying that this is feasible then we'll go and actually progress that to maybe like a next stage where we'll invest some money and actually go and do some ground testing and we'll go and do some analysis of the actual stormwater in more detail, do some network modelling or something like that to say, actually, we can stand behind this, and then ultimately that'll form - a civil engineering servicing report will form part of a resource consent application. But in terms of the

business and commercial perspective we would always try and get a property under a conditional contract, do that high level due diligence and if the due diligence is saying go ahead, then we would look to purchase the property subject to a resource consent, and then we'd get into the resource consenting phase where we'd invest some money, knowing that, you know, we think it's got grounds for obtaining that consent, invest the money and then if we don't get the consent, we've only lost, you know, 50 grand from doing some technical inputs and we still don't have to commit to purchasing the property. So there's a commercial structure there that our company uses to protect ourselves financially.

Joel

And did you ever get in a situation where your um analysis at that early stage, you later find out that it wasn't accurate or there was a mistake somewhere and you end up being caught out with an unexpected problem on a site after you've committed?

Developer 4

Yep, that that's happened a few times and in those situations the bottom line gets pressured, you know, I'm a civil engineer by qualification so the company relies on me to make those good decisions and analysis and that's why I'm in this position. So you just got to sometimes take those on the chin and I don't know, I think I've done about 65 developments here and we're still yet to lose money on a single one. So I'd say we're doing pretty well. It's about having that good system in place, you know, and if we do get something wrong, we usually have a project contingency available. We usually got council looked over it before we've purchased and we've usually got our engineers to look over it. So if I've missed it, council's missed it, and our engineer's missed it, then it's a pretty unforeseen kind of error, and then still we've got a project contingencies for little bits, rats and mice like that that can creep up that we do miss, so ultimately, the end of the day, you know, we've got a multi-layered system in place that protects us from those kind of minor errors in judgment.

Joel

And in terms of risk tolerance, where would you place yourself as a developer on a spectrum from the most conservative, minimal risk developer to maybe someone who's much more willing to accept a risky project?

Developer 4

There’s different types of risks. So for example, like we won't take any risk on contaminated land or stormwater. We just know that councils are not gonna fly with them. So there’s particular areas where we will take risk in terms of like what the market's doing and you know, the value of the properties might, you know, will take a risk that we can get $400,000 for a section, like we'll take a punt on the market because we've, you know, we think the properties going like this (miming a graph line trending upwards), when it comes to the contaminated land, we won't take a risk, we'll make sure we always test and do full due diligence on that, because you know, that there has the potential to blow a project up. We would always do stormwater analysis because it's usually our biggest issue out of the three waters, having to allow enough stormwater attenuation and storage devices to meet pre-development discharge. So stormwater and contamination, no corners cut whatsoever, we’re super conservative in those two spaces because they have the ability to stop projects. Water, sewer, we would take more risk around those, you know, there's more simple solutions for those and they're usually not land intensive or cost intensive, we can usually get water mains and pump sewage solutions to work that no matter where you are, in terms of what other risks are in the project, yeah, we usually wouldn't take a project on if we haven't done our due diligence, which again has got the council in on it, but yeah, that’s about all I've got really on this, just stormwater and this contamination are the two biggest risk areas - oh, and the natural hazard stuff.

So for example, like I said earlier the coastal inundation zone is bigger here in Hawkes Bay, it's really starting to pick up a lot of momentum here, it only came out like 12 months ago. A new report was released and that's pretty damning for Hawkes Bay’s future. So we won't cut corners around that as well. We need to have a clear cut direction from council on that before we'd make a decision on purchasing land for development. There are essentially no-go zones, essentially. Can't ensure properties or they're not habitable. So I guess, now I think about it, it's human health. So if you can't provide a safe - like, contaminated land, you don't want someone to be in a garden and eating a carrot that's full of arsenic, those are just some ethical barriers that we will just not consider.

Joel

So one thing you touched on there was market conditions and market prices. Obviously the market's constantly changing. So are you willing to pause development or sit on a piece of land to allow the market price to reach your target?

Developer 4

So we've got financial models here that tell us when the best time to sell would be. So for example, if we've committed to purchasing land and we've built civils and we've built infrastructure, we'll say, well, what's our leverage positions, what's the holding cost on that debt? [It might be] better to actually, in this case, you know, take a price of 350 over 400. So we've got analysis. We've got accountants in the background giving us advice on those situations. So it's not like we're taking risk, but we're just saying, look, based on the actual numbers, this is our position and the debt we're holding, if we sell it for 350 now, it's better than selling it for 400 in 12 months. So we let the numbers do the talking essentially, and, you know, we've got good enough analysis on understanding the cost at what we're at, our leverage positions. We've got also, and we're lucky enough, the company that we've got, we've got 450 real estate agents across the Central North Island. So we've got good access to market analysis in terms of what we think the market's doing.

Joel

Going back to natural hazard risk specifically, it sounds like you're coming from an engineering background. So when you have a site with natural hazard risk that you know can be mitigated, what are your common responses to that?

Developer 4

So the natural hazards, in terms of mitigation, we've done a couple here in Hawkes Bay where we've been in a coastal inundation zone, and that dictates a finish flood level, so if we were to have an exudence event, then the tidal surge would be this high. So we've had to do developments where we raise those out of the ground. We've said hey, well this is the ruling within the District Plan, here's the detail in terms of where we need to build to, is that financially viable, i.e. is the cost of the doing the earthworks to relift the site economical, are we going to get our return on investment back? So it's just a financial-based decision. Purely a financial-based decision. We're not going to try and build something that's in a flood zone and try and sell it for premium dollars. We know we've gotta try and - it's just common sense, I guess. It's understanding the cost to develop and the cost at the finish, you know, getting out of that flood zone adds value, people look at that and go, shit, this is futureproofed. I want to live here.

Joel

Do you ever find, like, I'd imagine, sometimes in an area like the Hawkes Bay, there would be a bit of a conflict where sometimes the land with the highest amenity values, like coastal land, land by rivers and things, is also land with natural hazard risk.

Developer 4

Yeah, I'm trying to think, so when I talk natural hazards, I'm pretty much only talking flooding and sort of coastal stuff, maybe a little bit of landslide. I don't, we're here in Hawkes Bay, where we don't really - I don't think of anything like earthquakes or cyclones, they just don't come into our thinking. We don't even, like we won't build a development saying shit, we're gonna get a slight earthquake at this position because I think it's just too hard to, you know, if every developer did that we wouldn't build anywhere, especially in the Hawkes Bay. So I guess the only hazards I really consider from an engineering perspective are going to be those coastal inundation ones for, you know, where there's potentially like a - I wouldn't call it a tsunami, but it's like a tidal surge - and flooding, and potentially landslides if we're doing... So out of those three, those are the three factors that we use, so I wanted to make sure that was clear because, when you talk natural hazards, are you talking like - I'm just looking and trying to do some research, like there's eight examples of natural hazards and they've got like droughts and earthquakes, heat waves, cyclones, volcanoes and stuff. Is that what you're asking?

Joel

No, no, I was primarily meaning flooding and coastal inundation. That's the two natural hazards that I'm sort of focusing on in my research.

Developer 4

[Returning to the original question] it depends on how council treat the hazard pretty much. So for example, if - what do they call them, inundation notices, section 73s - so if that land is going to be subject to a certain ruling, then that's going to lower that property value. So when we're considering developing in those high hazard areas, we'd always try and future proof them as such to how council will interpret them. So for example, council will interpret: if 90% of the property sits outside of flood zone, they won't put the hazard notice on it or 100% of the flood zone. If councils say hey, look, if you don't do this, it's

going to sit in that, technically in that hazard zone, and then when you go to get your building consent, we're going to have to put a section 73 inundation notice or a hazard stamp on your title, all of a sudden the bank's going to see that insurance premiums go up, harder resell, over time the hazard is going to get worse, and over time it's going to detrimentally affect the value of the property. So if we're worried about that, we would always ask the question. We ask them to our insurers, ask them to our banks, we asked them to council saying, hey, look, this is what we're looking at doing. If we do this, going to get that notice, what's it going to mean for our insurance premiums, what's it going to mean for long-term value, so we do have it in the back of our minds and we'll take advice from either insurance companies, councils, banks, saying, look, we recommend that you should be, you know, lifting this site to RL X over Y because for that reason and that just helps future proof it. And it just helps long term with saleability, you know, people get spooked when they see hazard chapters on there because like, I don't know if you're aware or not, like this hazard zone, like this coastal inundation in Hawkes Bay is going to be a massive thing in the next sort of 50 to 75 years where the Hawkes Bay airport is actually going to be underwater. So it's going to be a tipping point, we're calling it in Hawkes Bay, where the hazard becomes too great to insure the property. So at that point in time, if you've got a mortgage and your premiums go too high up and you can't insure your property, but you've got a mortgage, there's going to be some real difficult conversations where banks potentially might come in and, you know, say, we're not giving you a mortgage anymore, if you can't pay it back, well, we're going to sell your property. So pretty scary kind of thoughts, as a hazards get greater, at what point will the banks, insurance companies goes, well, we can't assure that property? It's really going to affect people. I think 60% of Hawkes Bay or 60% of Napier is going to be in this position by the year 2075, which is only 50 years away.

It's sinking, it's reverting back to pre- earthquake, so where the airport was centimetres lower in 1930. So that all shelf/terrace lifted up. It's actually, Hawkes Bay is actually sinking three to five mills per year. At the same time sea levels coming up, so if you take a hundred year span, sea level, it's about a 1.6 metre swing in Hawkes Bay, and you're going to start to see groundwater coming through people's backyards, hydraulic connectivity where at high tide you'll start to see, you know, groundwater pooling, and over a period of time it'll start to come through the roads, people's back yards, and it's just, you know, we're not going to be able to live there. The hazard is going to be [great enough for] people to say, well, you can't keep living in these areas safely. We're not going to insure you, if you got a cash only on your house, you could probably stay there but it's set your own risk and at that point in time, the hazard is going to be so high that your property is going devalue significantly.

Joel

And is that something that you're already factoring into your decision making as a developer?

Developer 4

Yeah, 100%. So council have these coastal inundation maps that we use, and they form part of our due diligence assessment, they tell you where the flood levels are gonna be in certain particular years. So we've got access to really good information, councils, you know, in the last 20 years they've got pretty good data now saying - they've got survey points all along the Hawkes Bay coast saying, over 20 years on average it's falling this much per year, on average sea levels are coming up this much per year. So then they can start to project out 50 to 100 years more accurately. You know they're still projections, so there's still going to be some kind of plus or minus on them, but, you know, the more data we get to tell the story, the higher the accuracy of that projection is going to get. So yeah, they've gotten multiple hazard maps now that developers have access to, which is so critical for us developing in these areas. Without those, we would be like, we wouldn't be able to do it. It would just be too hard.

Joel

And would you say those maps and those other tools are mostly accurate?

Developer 4

Oh, there's plus or minus variances in them. There's raw data sitting behind it. So like I said before, if it's touch and go, we'd obviously do more investigation and we use our engineers. So for example, the hazard map that we've got is like a block map, it's just got an average surface, but it's only as the LIDAR or the ground profile that the map's also using. So in that case, we could get our engineer to take that flood map and then we'd potentially get a more accurate ground survey of the area and then actually work out what it was like because sometimes, when these old - our web map contours can be out by a meter, going back, we don't have accurate LIDAR or anything on certain areas of the district. But yeah, just getting that second analysis or second opinion when we think it's tight from our engineer.

Joel

And so, if say a piece of land in a coastal flat area near Napier where the current coastal inundation model is saying that it's going to be unsafe in 50 years. So you wouldn't develop that at all?

Developer 4

Well, depending on the type of hazard, so for example, if the current hazard was saying it's going to be a flood, there's going to be a coastal hazard for - let me give you an example.

[at this point Developer 4 started screensharing the Hawkes Bay Regional Council hazard map portal]

So this is Napier and this is our Hawkes Bay hazard portal. So for example, we've got different models here we've set up saying, this is the coastal inundation two percent and then we can click this button here saying this is one percent. So that shows you where the sea level is predicted to be at the year 2100, and you can see just in here, this is where the Hawkes Bay airport is. So we use these kind of models here as a baseline to say, hey look, there might be a problem in this area, we need to do some further analysis here to actually figure out what's done, and then we can actually drill down to this if we ask the council, they can say, well, what that flood level is actually going to be in terms of an actual relative level, and then we'll take their relative level and put into more accurate, like an autoCAD kind of drawing. But yeah, this has everything from fault lines to liquefaction, flood hazards, you've got more layers in here where we can see if, for example, there'll be different ones in here where stopbanks breaches or if it's going to be a river breach, stuff like that. tsunami, landslides, geology and sort of the hazardous activity, which is the HAIL stuff. So this is another map saying all these points in here saying there is an area over here where there used to be an old landfill, watch out for soil. So yeah, this is kind our source of truth in analysing those hazards.

Appendix 6.5

Interview with Developer 5

Joel

what are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 5

Location is really important when we're looking at any sort of developments, you know, school zones, those sorts of things, proximity to city, commute, the general neighbourhood, especially in Christchurch, you know, there has been a lot of rebuilds happening, so it's making sure that that neighbourhood fits that style. When we do any sort of developments, we're looking at what the housing is around it to make sure, you know, we're not putting two million dollar homes in a 50,000 suburb. So we've taken into account all of those things. Another thing that we're looking at is ground conditions and additional costs. So things like making sure that it is good ground, because otherwise that can significantly affect the cost of the actual structure. It's mainly in the foundations. There are certain other things that we take into account, acoustic requirements if it’s next to a motorway or something like that, how they can impact the bill cost and ultimately the end user. Yeah, there’s a lot of other things that we consider, but in terms of the overall development, it's just looking at all of those factors and making sure whether it is a viable development or whether it's not a viable development.

Joel

And by viable, do you primarily mean like financially viable?

Developer 5

Financially viable and meeting the market in there as well. So a lot of that is driven by the community. You need to look at what sort of families or are they working professionals,

who's going to be going into these communities based on who is currently in those communities and making sure that they're going to be the right fit.

Joel

And so, when you're thinking about who is going to be the target market for a development, you're looking at the current neighbourhood?

Developer 5

Generally we're looking at the current neighbourhood, but it's based on locations as well. So, you know, if for example, you've got a new commercial, industrial zone that's opening up that's going to open up jobs and those sorts of things, then you'll be looking at what sort of jobs, are there going to be e professional, are they going to be for working families and then also designing the homes around that?

Joel

Okay, awesome. And in terms of understanding the market and your understanding of local demand, what sources of information do you rely on for that understanding?

Developer 5

Yeah, so we do a lot of our own research, and that's through things like CoreLogic or OneRoof, just to make sure that we are not overpricing [those homes], so that it does not make it unviable, I suppose, for the end user. We're also looking at, you know, like I said, talking to real estate agents and doing our own research. We also physically go there and have a look and see what else is potentially happening around that area. And I mean, in terms of when we're looking at our own sort of developments, it is a lot of, you know, speaking to those people that might be in their area and understanding what that environment was like.

Joel

Okay, awesome. And in terms of all of your developments, would you say that you're following a long-term strategy?

Developer 5

We do have a long term strategy, and a lot of that is around growth, momentum is what we it. So, you know, for us, I mean, we're a building developer, we're not necessarily a land developer. We are eventually going to be getting into that. But for a building developer, it is about scaling, and with that comes - there's significant cost savings with scaling that we can then pass on to our end customer.

Joel

It sounds like growth is a key goal at the moment for you. Are there any other key goals for you as a developer at this time?

Developer 5

I mean, one of the things that drives us really, especially here in Christchurch is, there is a significant amount of land that we've got available around us. And after the earthquakes, like the entire Christchurch community kind of diminished because a lot of people went elsewhere. So it's about growing this back up. I mean our city centre is fantastic now so it's about wanting to bring more people into our region. So there is that. The other aspect of what we do and why we do it is, you know, we've got the - there's been the new changes to the H1 building code, which is around thermal performance, which you may have heard about - things overeating in homes and things like that. So we're actually going down a model of thermally modelling every single home. So that basically we can tell by placing a wall or a window in a different direction we can actually effect thermal performance in that home, and that produces the overheating but also the cooling effect. So it means that our homes are significantly better performance-wise over some of the other group home builders.

Joel

When you're looking at a site and evaluating its development potential, I wonder if you could talk to some of the key factors that you're looking for?

Developer 5

I mean, a lot of it is the land, and making sure that it is viable to build on. We are, you know, looking at considerations like contamination because that can have a massive effect when you are looking at a development. The services are a huge thing as well. Are you connecting to council services? Are you having to bring in your own services? those source of things? Because those can significantly add to a cost as well. But the big one is it's, you know, sort of ground. It's also the levels. I mean, developing on a hill site, you're looking at some extreme costs compared to a flat level. So you're looking at those sorts of things, you're looking at the neighbourhood, and you're also looking at proximity to main arterial routes.

Joel

And just in terms of infrastructure, do you normally just work with the existing services and the existing connections or are you usually willing to invest in establishing new infrastructure, new services?

Developer 5

It's really site-specific. I mean, a lot of the services in Canterbury are relatively new and it's up to the earthquake. So that's already been renewed so we can just tap into the existing network. But in saying that as well, you know, there is also the issue with the gravity-fed sewer system. So a lot of our sites now have what's called an E1 chamber pump, a macerating pump, and then that then pumps it into the sewer network. So when we are looking at sites, we are making those considerations whether, say, for example, an E1 pump needs to be included, because that can add again additional cost to a build and to the end-user. But yeah, I mean, in terms of infrastructure as well, you know, we do a lot of off-grid things, so we are actually exploring a lot of alternative solutions compared to tapping into the existing council infrastructure. Where we do some of our developments or where we build some of our houses, those services aren't available whatsoever and you cannot connect into them so you have to look at those alternative solutions.

Joel

And what about in terms of planning zones and planning rules? Do you try to find sites that, you know, currently have a planning zone that allows the intended type of development or do you ever engage in land banking or rezoning?

Developer 5

Dabbled a little bit in rezoning. It's really risky, because when you are doing that, you've obviously got a contract that you have to adhere to. So in terms of, you know, if you are doing a landbanking opportunity or looking at rezoning, generally there's a lot of due diligence that you do before that time and that includes meeting with councils, making sure it's a viable option, [that] they'll consider it. So there is a lot more due diligence that you will do with rezoning, and you want to be doing that more sort of up front before any deal is done. But in saying that, you know, in terms of what the council are doing currently down in Christchurch, there is a significant amount of rezoned land anyway. So it does mean that when we are looking at developments, there are still a significant number of opportunities in that currently rezoned land and that too brings down the cost, because any time you are looking at doing a rezoning or anything like there, there is a significant contributions that you've got to put it into that. And then they can make the development not viable.

Joel

How do you go about evaluating the natural hazard risk of a site? What're your sources of information for that and process for responding to that?

Developer 5

I mean there's a lot of maps that get done. There's a lot of due diligence done initially, and whether that's with soil reports or, if it is in a hazard identified zone, you'd be getting in your engineers and those sorts of people to actually - consultants to come and look at those opportunities before you actually look to develop. I mean, for example, you know, with the sea level rise and all that sort of stuff, you'd be wanting to look at what the implications are to avoid those natural hazards. So whether it's building up the land or what you need to do in order to do that. And with that that comes additional cost, essentially. In terms of natural hazards like earthquakes and things like that, that's already measured and engineered by structural engineers who form their opinion based on what those specific ground conditions are. So, for example, you know, a lot of people are being predictive as they're looking to sell a site or anything like that, providing the soil report with it. So that it does become a viable option for a purchaser instead of just kinda having the land blank and then someone buying it, you know, there's a lot of risk associated with that and

lawyers and things like that will encourage basically everyone to have that there and available for any purchaser before they go and look at buying that piece of land.

Joel

And have you encountered sites in the past where you've done the due diligence and the investigation and then decided that the natural hazard risk is too high and not developed it?

Developer 5

No, not in terms of what I've done personally, but in saying that, you know, I was involved with the earthquake rebuild and we were rebuilding on sites that we had to rebuild on, so regardless of the hazards or anything like that, we had to actually come up with solutions for that specific site. So, yeah, I mean, we've come across a lot of things where we've had severe liquefaction, where we've had to put, you know, metres and metres of piles down, significant engineering. A lot of those TC3 sites in Christchurch, a lot of them were raised, you know, 1.2 to 1.4 out of the ground because of the flooding and the liquefaction side of things. But in terms of what we do specifically, we're very good, I suppose, we're removed from the Christchurch earthquakes that those sorts of things need to be really addressed before you look at any development to make sure that it's fine. We do have some really, really good registers. I mean, there's also the other effects, which are, you know, contamination and things like that, as I mentioned, that's extremely important, especially if you're looking at land development, because that can have a significant effect on how you develop that land and the cost associated with developing that land. So, yeah, personally, we haven't really gone through any of that because we know the due diligence that we need to do beforehand to make sure it's a viable option, but we have had sites where we had to basically suck it up and come up with solutions to deal with it. It's very costly. There's a lot of consultants involved in order to achieve that. And yeah, I mean it's not necessarily a viable option for developers.

Joel

And then and in those situations, how do you deal with that cost, how do you recoup that, I suppose?

Developer 5

Well, I mean, in terms of recouping it, through the earthquakes that was all insurance so that was all done through insurance. If you've got a customer that comes up to us and basically they've got a bare bit of land, their Geo report says that it's really poor and they have, you know, to be certain level out of the ground to avoid erosion or the flood level or anything like that, we are basically not signing them up until we've got more accurate costings. So we're basically engaging with engineers and those sorts of people beforehand and giving customers a rough indication. And that really makes them understand, well, is this a viable solution or not? So I mean, for some of those really poor bits of land, you could be, you know, [spending] 200 K just to get it out of the ground, but it's a significant cost for a mum and dad budget of say 400. Suddenly they got 200 to spend on the house and the house has to get smaller and that sort of stuff, in order to combat an additional cost for the land.

Joel

What would you say is the willingness of yourself and of your clients to absorb those costs of mitigation? Is that dependent on market conditions?

Developer 5

Yes and no. I mean, it really depends. If you're got a beautiful site overlooking the sea and all that kind of stuff, the customer - I mean, we as a builder or developer won't take that risk ourselves, especially if we don't own the site, that is solely on the customer um and we we're trying to do is inform the customer of their additional cost straight up so that they know what they're in for or not, you know. So it in some situations, yes, that risk is with the reward, but it all depends - it's got to be site specific and making sure that it all works. And if it doesn't work and they can't see that then, you know, at the end of the day are they going to have a house with the value of the land and the house that they build on it, then that might not be an option for them, they may look to resell the land.

Joel

I know we've already covered quite a few bits of it. But I wonder if you could just sort of outline like a general progression of a development from the client coming, the due

diligence to the going full commitment, like what boxes are you typically checking in that due diligence process?

Developer 5

So for example, someone comes to us with the site on the side of a hill in a certain area. The first thing that we do before we proceed much further is that we go and see the site. And the reason we do that is because what people call steep, compared to what we call steep as a developer or as a builder, can be significantly different. You know, a customer might say, oh, it's got a slight slope on it. We go down there and it's a vertical cliff, and suddenly we're talking a completely different game. So we make sure that we do a site visit, that's the first thing. Once we've done that, we were so say to our customers that if they haven't already, they should be getting a site specific geo report and a site survey, topo, basically to confirm the contours of the land. Now, what we say with that is that's not money not well spent because that stays with the land. So if this project doesn't go with you, you've always got that to pass to the new purchaser and then that part of it's done for them. So basically it's part of the purchase price of the land, you know, you've included those things. So once we've done those three steps and got those three things, we start, you know, we begin to talk into our customers about their - I mean, we're originally sort of talking about their budgets, after the site visit, if they come and they say we've got a 300,000 budget and it's on vertical cliff. We would automatically be saying to them look, we cannot help you. You've got potentially 200 just to get out of the ground, hundred from foundation up is not going to cover the cost of a build. It's not going to happen. And the reason behind it is all the material is going to cost, you know, at least a hundred thousand for a house, unless you're talking about a container or something like that. But there's other things that you've got to consider, scaffolding, you know, you've got [?], those sorts of things, you potentially got additional equipment that you need to bring onsite, pile drivers or those sorts of things that we'll need to take into account. You don't have a flat surface to store materials potentially as well. So you've got additional cartage to drop things up as they require. So anyway, so once they get going - so say for example, they've got a good budget, they've got the site levels, they've got the geotech, they're nothing too out of control, then we can start honing in on their design. And as we're honing in on their design, you know, we're starting to talk to them about whether they're going to have the pitch gables or anything like that, we're starting to talk to them about the additional costs associated with potentially the scaffolding, but also the trades get to work at heights and those sorts of things, all those health and safety aspects. Once we've got that, we drill it down a little bit more and provide them a pretty good rough estimate based on what we

expect. From that time, we're then looking at getting a plan deposit, which is basically for us to draw up some concepts to begin confirming that pricing. Once we've got those concepts, we can send it out to our trades to make sure that what we've estimated is in par with it. Once we've got that occurring and once, say, for example, all the costs are in, the clients happy, then we basically precede from that to the pricing plans, the pricing plans, then go to a contract, basically from that point. Now, we the customers potentially still at risk as if we have the site-specific geotech report [and it] has, you know, they poke holes around the section, if, for example, at one place they didn't poke a hole, there's suddenly a well directly underneath it. The customer is unfortunately at risk of that, because we couldn't, you know, estimate that that is going to happen. But yeah, that's basically the process from that, then once the contract's signed, working, drawing stuff, and then into goes into consent, and that's kinda how it all plays out. But yeah, generally the first thing that you're doing is a site visit to determine, based on the customer's budget, whether it's actually viable or not.

Joel

Well, I guess my only other question is just around risk tolerance. So, you know, if you had to place yourself as a developer on a spectrum from extremely conservative, we'll never do anything unless we're 100% sure, versus, like, you know, a very risk comfortable developer, where would you place yourself?

Developer 5

Sort of 50/50. We do take a bit of risk, but then again, if the risk is too high we scale back completely and just go, well this is not for us. I mean we're a small to medium sized enterprise, we're not a massive developer, we don't have a huge amount of funding behind us that if something goes incredibly wrong, we'll be okay. So I mean that's where we manage our risk. And that's where a lot of our due diligence is really important. So we are trying to reduce our risk as we go down to ensure that, you know, we're trying to cover ourselves as much as possible. So any development that we do look at, you've almost got a risk matrix, and once you can cross a few things off, your risk is coming down significantly, then you think, yeah, this is a viable option or not. Then you've also got a look at the financial aspect of as the risk versus reward, actually, is it something that you want to be doing? Because if it's not and it's slowly creeping up that line towards the risk is really high, that's when you might think that development is not...leave it to one of the other payers to actually give that one a go potentially. So yeah, I would say I'm 50/50, I'm not the riskiest

person, but I'm not the person who just sits on fence waiting for you know, things to happen, you've got to be proactive with these sorts of things.

Joel

You mentioned that there are other developers who might be more willing to accept risk. Do you think there's any specific factors that influence risk tolerance, things like the amount of experience or the size or anything like that?

Developer 5

I think there's also a problem with personalities, potentially ego to be honest...

I mean, I've seen some pretty risky developments that have failed, and a lot of that is due to ego potentially, and yeah, I mean, we just let those guys do whatever they want to do. But for us, we're just, yeah, we're a bit more risk-adverse on those types of things,, you know, we've got shareholders and things like that that we need to explain our pathway to, what we have been doing, what we have done and why it's been successful and why it's not, you know, so there is the accountability side of things. Some of those other people don't necessarily have those accountability requirements. So it means that, you know, they're taking that risk. There might be a very high reward to it, and good luck to them and if they do well, congratulations to them, but we've got the accountability side of things that we've got to make sure we're meeting.

Joel

Do you presell some of the units in your developments?

Developer 5

We do a little bit of pre-selling where possible. Preselling is a great thing for cash flow because it's basically a guaranteed contract at the end of it. But in saying that, you know, some of the developments we do, the customers can't see the big picture, and whether it's because they first-home buyers or whatever, they haven't been through this process before. They don't understand what they're going to get, so they need to see the product, touch and feel it, it all that of kind stuff before they'll make a commitment. But the likes of the investors and those sort of things, they're the ones that you mainly presell to because

they understand the market, they've done their own due diligence in the area and understand a lot more about the property market and what they getting into. So it is pretty much, you know, like ideally what as a developer you would like is a presale mix of kind of 50/50 or higher, so that your pre-sale is allowing you to fund the balance of the development and it just means that again, it reduces your risk so you, you know, you're crossing a few things off that risk register, I suppose.

Appendix 6.6

Interview with Developer 6

Joel

what are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 6

It's a big question. So just to explain my current situation, so I've been working with [anonymised] for about 10 years and [I've] just gone out on my own to start project management and development and sustainability consulting. I guess I will answer from my perspective having had experience with [anonymised] as a developer, although I'm also an architect so I've architectural influence on it.

One of the biggest drivers is having the ability to get the project complete, so what I mean by that is, if you talk about site selection, you talk about getting a building designed, getting a building built, there's a lot of factors that could slow down development and stop a development, so developers want successful projects and, it's not easier, but the ability to complete a successful project is probably a high factor on choosing to do one. And those errors could come in so many different ways, it could be a feasibility at the front end doesn't stack up. So you've got a site which is perfect, but if you can't afford land, then that's kind of shuts down the feasibility, which is what's been happening recently with interest rates being really high and yeah, it's just hard to lend money. So it could be the feasibility. It could be site constraints. It could be a perfect piece of land but you can't get the electrical infrastructure there or the drainage infrastructure, and it could be covenants, or it could be iwi claims to land, which would cause it to be problematic as far as in delivering the project in the timeframe. Could be design issues, could be consenting issues. So I feel one of them, one of the key drivers is the ability to know that the project can be started and completed in a reasonable amount of time with success from the outset. And then I guess there's always going to be the commercial factor to it, so the return on investment. And the learnings that I took from [anonymised] is that if you're going to develop and keep and own a building, the return on investment is not necessary just

how much money you can get back - if you're gonna build a building that you're going to keep for the next 50 years, it's gotta be a good design, it's gotta to be a durable product, so there's no good going out there and getting a door handle that's going to last for two years, and so we've gotta build to last; I think that's a really key factor of developing is that, if you're going to keep it - I mean, there's different models for different developers and you know, my experience at Goodman was that they would they build it and then they [would] lease it to customers. So it was really important for the durability of the project for the building at the end of it to be strong. And then obviously there is that sustainability component. In my final three, four years at [anonymised], we were already building five star, green star developments. That's something that I would like to do as a developer and project manager is ensuring that it is sustainable, not just green washing where you know, you use sustainable initiatives, but, you know, trying to get the buildings rated and making sure they're good for the planet as best as you possibly can. And I think that's quite key as well as making sure that when you sign up to doing something sustainable, it fits the bill, it's not just greenwashing and it does what you ask it to do, but also it pulls on communities, wants to work with the local communities, using sustainable products, getting those buildings rated, I think holistically having that one would be a key driver. So yeah, those are kind of it: return on investment, durability, ability to get the project done.

Joel

You mention sustainability and [the] community and social impacts being part of your personal practice. Are those values that you're adopting because they are what the market's demanding and what regulators are increasingly looking for, or is that something that comes from your personal values?

Developer 6

I do specialise in sustainable development so it's kind of a core interest of mine. I went through I architectural school over 20 years ago and there was a component about standability, which was not particularly interesting - I'm sorry, it wasn't in high demand. I chose to do that one, it was something that I was quite interested in, but that was very early understandings of what sustainability was, so I've got a real personal interest in that. However, it probably is worth noting that the drivers do come from the land. So if there are global companies who are implementing updates, that they have to get a green lease, for example, for a green building, then that kind of sets the agenda for the developer to meet the client requirements so then that has a bit of [?] within the industry that building quick

and cheap is not what people want at the high level and it'll filter down, so you've got, you know, blue chip, global companies who want the lease buildings which are sustainable, then you need to address that, because that's what the demand is in the market. If you bury your head in the sand and don't make those demands that you very quickly get left behind, despite how cheap you're building that building.

Sustainability is not just about making the building materials more sustainable. You've got to make the environment in which you'll work in more enjoyable as well from a visual perspective, from air quality, light quality, you know, living and working, you want to be able to enjoy the buildings that you're in. But that, to me, goes hand in hand with true sustainability, it's not just about making buildings that are lower in carbon, there's a more holistic approach to it, and I think as far as communities are involved, it kind of goes hand in hand with that, that we can make a sustainable environment in working or living and it's an enjoyable, clean, healthy space to bring, and to live it. I think that's quite important. I feel that in communities - you know, I live in Pukekohe near Auckland, outside of the main city of Auckland, and there's a lot of development going on in Pukekohe, and I'd like to think that I would be doing some work locally in Pukekohe, so for me a community [in that sense] is important. So, you know, I could build a development for a large company who needs a warehouse, which creates jobs for the local community, the people living around and it kind of all works together, right? So there's a big development that takes place, which creates a workplace, houses are then needed to house those people who are going to work there. They will need a supermarket, a church, a community centre, sports area, and so then you start a very - there's a lot of development, it creates all of these different entities for the community. I think that's really important. I think that's really important.

Joel

As a developer, would you say that you are following a long-term strategy in your activities?

Developer 6

[We] had a pretty clear strategy, which was: create five star green star building. And I think that is a real good way for developers to carry out their activities because it was a challenge for me as a project manager at Goodman. It was a challenge for the design teams that worked for me. It was a challenge for the contractors, but a changed the way the industry works, and I think yeah, having that long term approach helps, definitely has a

positive impact. So that's how I would kind of, yeah. I think it's really key to have values or a strategy, and I think the green star one's a really good one because it kind of sets an agenda, the company commits to it, you work to that agenda. It's challenging, but it causes change within the industry. I think that's really key.

Joel

What are the most important factors that you consider, or you have considered, when evaluating the development potential of a site?

Developer 6

So I guess that goes on and hand with the ability to deliver a successful project, and so you would kinda look at - for me personally, I would, in the workstream that I would looking at, it would be the land: what shape, what work needs to be done to it to make it viable to be developed upon, so with the warehouses you had to build a platform, and a platform would have - yeah, pretty much what I referred to earlier, which is infrastructure available to do it, and then you would have to, you know, engage with the correct third party providers to be able to ensure that that site can be accessed by fibre, power, water, drainage. And then again, looking at any potential easements - I've previously worked on a project where there was a Transpower station adjacent to the development area, and their power cables went under the ground and above, so they had an easement over a certain part of the land, and we still managed to create a development with two buildings, and we just had to make sure that the easement requirements were adhered to and Transpower were happy with our construction protocols, so that's really good example of some of the measures that you have to fact in while doing a development. On the same project we worked with the local iwi and conducted historical survey of the sites and got reports done to that effect. There were two iwi who were involved in that particular area. They were really helpful, they worked with our civil contractor, so they made it really a smooth process, because always going to be a - whether it's in New Zealand or my experience in the UK as an architect, but, you know, history, ecology, there's are real key factors that need to be considered. In London I was part of a development that had a historical site and it didn't put the brakes on the development, but it was something that had to be managed and worked on. And I guess also the ecology, I just touched on it, that's a huge thing. And then biodiversity is huge. That's something that needs to be really worked on and making sure that you're not being detrimental to the ecosystems that are there, in fact, being detrimental, I'd like to think that any developer would go out of their way to improve the ecosystem that's there

and that could be done in many different ways, it's not just, ‘oh, that's =not good for our development. We need to do some work on it’, you know, you can enhance it by still doing the development, but creating, by clever design, opportunities for the ecosystem to enhance and grow. I think that's a key factor as well. So infrastructure, easements, ecology, and access is an important one. So you want to be able to allow the customers, or if it’s a logistics warehouse, you would have trucks coming off the boats with the containers, they would go to the logistics warehouse, unload. They would transfer them to smaller scale trucks and then it would go off to the rest of New Zealand, so having the ability to have a piece of land, the proximity of which is close to a port and a motorway where they're not going to get stuck in traffic. That's quite a key decisionmaker as well, [will the site] allow the customer to do their work as easy as possible? I think they’re probably the big drivers.

Joel

Just on the infrastructure aspects, has it been your experience that most clients are unwilling to invest in adding new infrastructure to a site, i.e. they want to locate a site where there's already existing structure, or have you found that a lot of clients are willing to take that cost?

Developer 6

The answer is clients, whether they’re customers of tenants or whatever you choose to call them - they’re getting a warehouse, right? They're building a warehouse. They don't think that they have to build a road and a power line. So typically those costs would never really be passed on to the customer, unless there's a specific requirement. A good example would be: we recently did a development where, because they required gas for their operations, and typically we wouldn't have done gas. We would have done electric, fibre, you know, water, as a base build delivery. So then if they wanted gas, we would facilitate that but they would cover the costs of getting the gas to the site and they would cover the costs of any below-ground piping and any connections to that. So rather than thinking of it, like will they do it, will they not do it? It's more about understanding that the agreement of the scope that you're getting is this, if you want something above and beyond that scope, then you need to pay for that - that's a better way of looking at it. It's like oh, we're not going to pay for it. You'll pay for it. It's more like we'll have to pay for this. We'll get this infrastructure. But if you specifically want that then that's out of the scope, that's your

back. That's typically how it would be done. That's my experience with the clients and customers.

Joel

My next question is just around natural hazard risk specifically: have you had any experience in developing in an area subject to natural hazard risks?

Developer 6

I can't say I've had extensive experience with natural hazards or disasters or anything like that, but I have seen a change in - so I guess the example to give is, we recently completed a development where it was a demolition of an existing facility, and that had an overland floor path, and the revised design needed to have an overland flow path which was around the development that was significant. I think it was three metres by 3.5 metres, concrete, a U-channel - the best way I try describe it is if you've seen the Terminator movie, when he's driving on the motorbike and he's shooting the guys with the shotgun and he's driving down the U-channel (the LA River), and I was like - we had to build that U-channel! And I was like, man, that had to be factored in to the developer cost, and we couldn't pass that cost on to any customers, it's just part of the development and it's a requirement, and of course, as a project manager working for [anonymised], I was like, never mind, it's not my money, but like, you know, I look at those requirements to do it and I'm like, well, that seems like such a huge outgoing for something that would be very rarely used and I'm like - it doesn't seem right that they demand that. Then, however, in Auckland, two years ago, three years ago, it was the floods, and so then you go right, actually they had a point - when you're asked to do it, you're like what why we are doing all this? But then you end up realizing where they're coming from when you go actually, that make sense. So that's been my experience really. It would be: initially you question it, you go, that seems steep, but then nature has a funny way of explaining things to you. So yeah, that's kind of my experience.

Joel

Most of the time, when you are working on a site with natural hazard risk, do you find that council are able to prescribe a solution for you or you need to design something to meet this?

Developer 6

I think the designers that we've worked with are very aware that council responds well to being worked with. Council aren't going to come and tell us what their requirements are and this is how it's going to be designed. Typically they would be like, these are the requirements. The requirements get relayed to the design team. The design team will have to put forward a design, that gets submitted to council and they review it, and they accept it. Well the consultants I've worked with, they're very experienced, so they kind of know what's required. But I think it's just important to note that if you work with the council, you get a lot further, as opposed to being like 'oh, I don't agree with what you're doing, I don't like this approach, that's not right', and honestly, I think the council have been maybe stung in certain areas in the past, where they've signed things off and they haven't been quite right to how it's supposed to be done. So they're a bit more stringent with what the requirements are. Everyone bags the council for being slow and kind of pedantic but they kind of have to be and it's process-driven. So I think if you can take the weight off the councils as much as you possibly can, you get things done quicker and almost the way that you want them to be, so if you can meet up with council and say this is our design, this is how we think it'll work because of this, this, and this, and we'll pay for this report to be done, like a peer review, so you don't have to peer review it, we'll peer review it for you. And I think you go a long way along the way that you wanted to go.

Joel

So for a typical new warehouse project, I wonder if you could just outline the main pieces of information and reports and other things you're covering during your due diligence and your design process?

Developer 6

We would probably get given a bit of a plan, just showing a location, so an architect's basically drawn a square on a page. Typically due diligence for that site would have already been done. So for example, a lot of the work that I built was at Highbrook (business park in Auckland), which was a huge estate which Goodman had bought 15 years ago, so all the due diligence for that was already complete, and so when it came onto my table, it was more of a delivery of the project. So we got a [high-level] location plan and then we would have to flick that to a planer and say 'hey, what are the issues here?' They would identify any easements. They would identify any challenges we may face. We would also send it to

a civil engineer, and they would show us a [cut and fill?] diagram and they would identify any areas which are high and low, so therefore we know if there will be any retaining walls required, and they would also talk about traffic reports, and we would have to engage that. Geotechnical reports to understand the state of the earth that we're working on. And you'd have to get resource consent [so] it would be required to talk to the iwi and make sure they've got a report on the site, like a historical report, and you'd probably have an archaeological report done as well, and ecological report. I'd probably get an environmental management plan for the place and then you kinda understand the side constraints, once you've got those reports, and then once you've understood those reports and your constraints, then you can start designing. A fire report is quite important as well, and the reason the fire reports are interesting and important from a development perspective is there could be - like in Highbrook, for example, you might have an adjacent site and this site here has a building close to the boundary, so you have a no-build zone on site, so that would impact the design as well. Your fire report also identifies any potential risks from a development perspective.

Joel

In terms of planning and your experience, have all the sites that you've been working on already zoned appropriately for the proposed use, or have you been involved in any zone change processes?

Developer 6

I personally haven't dealt with rezoning of land because it's already been done before I get [involved].

...as a small scale developer, it's challenging to be able to afford the costs of green star, afford the costs of all the stuff that you need to do, to put it into effect. So you need the right investors. You need the right approach. I feel like to do a development successfully, it's not easy. And it could fall down at any point and, you know, the feasibility could just kill it off in the first seconds. So there is a conception that developers just take land, develop it, make a fortune. But there's also that supply and demand. There's gotta be

the people wanting to have the space for the developer to develop. Once the deal is done, then you've got to get a customer who needs a building. Then it's a straightforward, but also there's still risk in it costing too much for you to do it. And that could come in the form of building materials or contractors. In the market recently, with interest rates being high, borrowing money is very difficult, so, therefore developments don't get off the ground. Again, it all impacts the construction industry because if the developments don't get off the ground, less work to the contractors to build, that then goes, okay, well, the contractors then have a race to the bottom as far as price is concerned. So the contractors become cheaper than they were two years ago. And so if you go out to tender to get a contractor to do your work now than compared to a few years ago, it's probably a bit cheaper now. But it swings in roundabouts because the interest rates have come back and [?] are starting to rumble and the wheels are turning. Again that will impact the industry because the contractor rates will go up and all of sudden we'll be at low interest rates and high contractor rates. And that's back where we were two years ago. So I think it's really, I think...it really is a bit of a balancing act to be a developer, [at least] a successful one. And I also think that is quite important to identify who are successful developers, because anybody can go to a bank, lend some money, get some land, and then get some paper-thin houses built. And it's like, what you deem success? In my opinion, success is quality buildings that will stand the test of time and are good value and good for the community. That's how I would summarise what a good, successful development is. And also you've got to have the business acumen. There's no point in building a development that's good for the community, that's good for the world, but that's not good for your pocketbook.

[Developer 6's thoughts on development in the coastal environment]: if you can work with investors and developers to develop [?] near the coast, where it's beautiful and it's good, but then part of that development is that they have to give back and help a regeneration of the coast. I recognise something like that makes sense. However, you then get the flip side of it where natural disasters are occurring and flooding is occurring so why would you put people at risk by building on a coastal area. So that's a development quandary all in itself.

I think that [the number of recently-established developers that falter and exit the market] comes about with the nuances of borrowing money. So the value of money today will be different to the value of the money tomorrow, and having a long-term plan to manage that and manage any fluctuations in development is quite key, and I think yeah...there's a few

factors, but it's definitely interesting space because, I think you probably see that those quick turn-overs are, surprisingly, the larger developments of housing, because they are what takes a lot of money and can be challenging as far as getting it sold. So 50 houses, 20 houses, whatever, right? Infrastructure, road, easement issues, legal costs, and design fees, build costs, leasing fees, selling fees, the actual cost of getting this up just to start getting your returns - 20 houses - is quite significant, and can burn a hole. And again, as I was trying to say, at any stage, those projects can go bang, you know, you might find a community of bats that live on the site and you can't build because the bats are there, right? So then that five percent profit you were going to take from the development is down to two, and then all of a sudden build costs go up, and then actually it's not two, it's one, and then the net energy is zero, so all you've done is build an estate. People like Goodman, they can make that work. I mean, they're really stringent about how we do it. It's really kind of process-led and there are always going to be risks. Then you've got the small scale developers, so like literally around the corner here somebody just built four houses, landscaped, really lifestyle blocks, and they're beautiful, and they've been done by a small-scale developer whose probably punched out four houses within a year and a half, and they've probably made a really good return on investment. Global developers are probably doing well, and they're probably there for the long term. Small term developers good, probably there for the long term. In my opinion, it's the people in the middle, who are taking that step to go from small scale to 'I'm going to chance out, going to go up [to] twenty', that's where a good understanding of feasibility, the value of money and where it can go wrong is really key.

Appendix 6.7

Interview with Developer 7

Joel

What are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 7

I mainly do a lot of townhouses, just two-story to three-story multi-rez, and the number one key is always the return on investment. That's no doubt how most of them operate. I mean, you're not going to do something, spend millions of dollars, and you're not making the right returns, so that's always number one. I think in general also, probably the aesthetic is important to maybe over 50%, 60%, I'd say. There's some developers out there that don't regard highly - they don't care, basically, about what you do. They just want to know what's cheapest and how much they can sell it for, you know, in terms of, you know, construction costs, how to bring those down. Which, I mean, that varies from developer to developer, and it's also different for every sort of zone, in terms of where the property is - if it's in a nice, higher-end area, sometimes they know they can get more money for it, they want a higher-end product, just to fit in with the market. So yeah, the market value of their finished product is also something that comes into consideration. I guess anything after that would be how it's designed, the practicality of it, like if you have, say, car parking, or is your outdoor living area facing the right way. I mean, car parking's a big one because obviously it affects costs, but then it also depends on the development, if it's close to a university and it's for students, and there's public car parking, for example, then that's probably a little bit down the scale of importance, but most, I'd say 95% of developers out would regard car parking, for example, as quite important because it does set a market position for that type of development. So yeah, I guess those three sort of come to mind as how we really approach a project.

Joel

And in terms of amounts or rates of return that developers are concerned about, in your experience do developers normally come to you with a predetermined return they're expecting, and they're not too willing to compromise on that, or are they more flexible?

Developer 7

Usually. Sometimes it's not, but usually before they buy a property my clients call me and ask ‘how many units can I get on here?’ and then we work through a spreadsheet with all your costs and your documentation, developer contributions and council costs and consultants, and then [it] comes down to your square meterage costs and that all gets added up, along with how much mortgages may cost throughout the product life of the project.

Joel

What are the most important things that in your experience developers are looking for in a site? I know you've mentioned parking and transport aspects, and neighbourhood factors as well. Are there any other important ones in your experience?

Developer 7

Well, I guess the area, whether it's suitable for that type of development or not. I mean, some want to just build two or three standalone houses in a site which you can develop, say seven units, but, you know, those are the ones that like to take it slow, have a little bit of money and don't want to take so much risk and they’d rather go slow, build a good product and you know, say, for example, if it’s in a nicer area, you could probably cram say seven, but then they want a higher-end product for their branding, I guess. So they want to be known in the market for a higher-spec build and so they wouldn't try and cram it. But then that largely depends on the area, if that whole street is full of multi-rez, medium, lower-spec, then obviously they wouldn't build such types of higher-end housing because they can't get as much out of it when they sell it.

Joel

And in terms of the relationship between the neighbourhood premium, but then also the need to maintain those higher amenity values, is that something that developers are putting exact numbers on? Like are they saying, ‘the land in this neighbourhood is going to be costing X much more, but the sales price is going to be X much more on the units or is it more of like a rough thing?

Developer 7

I’ve found there's always a range of percentages which they want to get back in terms of investment. I think the number is between 8 - 15%. Some are a little bit higher. Anything below 10% is regarded low and not as high risk and no one really wants to do anything for under that, but there are some developers that have already bought the land and then they’re like “damn”, they want to do something with it and they’ve committed and then found out, oh, it's going to cost so much more and they're going to get less in return because of maybe the soil conditions, for example, but they’ve already committed and they're like, okay, I just want to be done with it, maybe not get as much back, but at least not lose money, and to onsell it, the project might just be a waste of their time. So yeah, it is factored in and it varies from person to person. Like, if you say, for example, because I work with some other group builders as well and basically, they do a lot of subdivisions as well, and to sell the land, they build a house on there, but they don't necessarily make really any money on the house, it's just to keep their guys alive, I mean working, having jobs for them to do, but then they sort of make money off developing the land. So from what I know it does vary, but it is between an eight to 15%. I have done another project recently though, where I squeezed in nine units, most other designers - well, the client had told me he went to a couple of other designers and they only wanted to do eight, but then I worked it through with him and we managed to get nine in there, so the return on the investment in terms of a percentage jumped from about 12% to over 25%, just because of that one extra unit. So of course he said yeah, I'm definitely doing nine, so it was a big driving factor. But then some of these things are a little bit hard if not enough research has been done - like in Christchurch, especially with our earthquakes and our soil conditions, like a technical category 2 soil is like the most common one, but then between that and the technical cat three, we call it TC three, the cost of foundations just go up by about 40% percent or more sometimes. And then that really brings down the final number percentage wise, but then that's because they haven't done enough research and they committed, or [it was] just something that was unknown to them. So sometimes you get TC two land which is in between a three as well and costs just go - we’ve gotta do piloting and all sorts of different,

more expensive methods. So yeah, the unknowns are what really drives some of these things down.

Joel

And in your experience, how many clients are you getting coming to you with a piece of land where, for example, they've brought it without a geotech report and so they've found that the soil, you know, is requiring those more expensive piles?

Developer 7

I've had one guy which [had] only just started to do developing work, so he was a little bit inexperienced, but he had a little bit of money and some investors and he went around buying all these sites without even going to look at them or researching them properly, and then only finding out there are certain things that would drive costs up or certain restrictions that [mean that] they couldn't get as many units on there as they thought, but that was still in early days, the developers that I work with now are mostly seasoned developers in that they've got a good grasp of what they should look at. I always do a preliminary check and tell them, because there's certain information that you can access without paying an engineer and you can sort of outline the criteria for a particular piece of land and from there they made their judgment whether that area has the market value price to fund the product they want to do or does that not work? So they also work with real estate agents as well, to try and get that final number.

Joel

And most of the time they'll make their decision on that desktop information?

Developer 7

Yeah, they will make a decision on whatever we can provide that is known to us, and it's usually, the more you do, the more you understand what the main important ones are. I think there was a question about flood management in your questionnaire. So that used to be a big one, but these days there are so many of those sites around that buyers aren't - either they don't really care or they have no choice because maybe they can't afford a house which is new but in a better area, for the same amount of money they can get a new

product, new house, but it's in a flood zone. But we [also] have ways to mitigate that, to not have hazard notices, but yeah that does affect market price as well.

Joel

Correct me if I'm wrong, but it sounds like you're saying that for your clients, for developers, they're looking at a site being in a natural hazard risk zone or something like that and that they're not too worried about it.

Developer 7

Depends what the hazard is, like the main one really in Christchurch is the liquefaction, TC 1, 2, 3, and you still get a lot of developers, especially bigger developers, where it doesn't really worry them too much because they've got volume. They've got so much volume and they've bought this land cheap. They can afford spending a little bit of extra money to beef up foundations or do better construction, and even though it might not be worth as much in the market, say if it was in a TC 2or TC 1,, but because of the volume, they still make their ends meet like that, and a good profit a lot of the time.

I recently did one, it was a private house though, it was in a slope instability area, like on a steep hillside, because they like the view so much, they will spend extra money to make it so it works construction wise...there's extra consultant fees for that, like extra Geotech design for piling and retaining walls and that kind of thing. But yeah, it's because they want to build on that site, so they can overlook it by spending more money. The other one would be like the flood management, I did one flood management in Wellington, [a site subject to flood management] Wellington - that was one of the first ones that developer had done in Wellington, and after that he was like never again am I going to do one in the flood management area, not because of market pricing but I think it was council issues. So that one stuck with me...because I remember we spent a lot of time back and forth with council, and council had requested we engaged specialist flood modelling consultants for that as well. So the process took really long and a lot of back and forth, and then council needed, you know, overland flow paths and, you know, you can't have blockage underneath and, you know, we had to raise the whole building like 1200 off the ground, have open areas underneath the foundation, the piles, and because it was a timber subfloor and we weren't allowed to put things like water tanks or whatever over so much - there's a lot of rules, a lot of criteria to what we want to build - and so we went through all

that and then at the end, when they were doing the building, the builder said, ‘oh, they've requested that we make some changes to certain parts of that’. And the council basically just said, ‘yep, you can do it’, and it was totally against what they were wanting us to do at the start, so we went through all of that trouble to just be like, [told] during construction, ‘oh it’s fine, you just do it.’ So they're like, well, what a waste of time. But I think there were other issues for code of compliance and stuff which I wasn't really involved in, but I know that it was quite a process to getting all that stuff sorted and these guys have done a lot, and they're sort of nationwide - they do probably four or five different places around New Zealand, but in the end they were like ‘nah, not doing one in Wellington flood management area [again]’. I think a lot of that was council uncertainty and inconsistencies, it just became really hard to deal with. So it wasn't because they thought they couldn't get any money for the sale - I mean, it was probably a lower return on investment because of just how much more expensive it would cost to build, but I mean, they weren’t phased about that at the start. I think it was just that whole process of getting through and all the changes in between and, I mean, within council, because there's probably two or three different departments that deal with these things, and sometimes they’re not always on the same page and things don’t get communicated very well. So it gets through one [department], only to get a no from the stormwater team or another one of their engineering teams, the geologists, saying that, ‘oh no, the slope of this site is not suitable for this. You got to change something. I think it was that which put them off rather than the actual flood hazards itself, because when they bought the land they knew it was in the flood hazard zone because it was cheap, so they were like, well, we might be able to do something with it, but then in the end, it just became a little bit too much involved where they could have just spent a little bit more money buying a more expensive site, but less drama. So that's my take on that that one.

Appendix 6.8

Interview with Developer 8

Joel

What are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 8

Obviously we're pretty much always looking for good community outcomes and to create a good community. From a financial point of view, obviously, the development needs to stack up financially - there's all sorts of different things that go with that, but it needs to work, needs to meet the existing needs and requirements.

Joel

And do you ever find that there is a conflict between your financial interests and your commitment to those community outcomes?

Developer 8

Obviously there is a little bit of conflict, and that conflict normally comes from the price that people are willing to pay. It's not always enough for us to provide all of the community benefits and amenities and so on. So there's constantly a requirement for us to look at those outcomes to determine: what are the most important things? What are the things that we can put in with regard to value and what are the things that just can't be afforded? We just need to make sure that we do as much as we can and make sure that our [development activity] is thoughtful and contributes to a future that people want. So for example, a lot of the climate stuff - we've developed houses where often the cost of implementing a green star model, for instance, that just doesn't work. But we can still look at implementing sustainable practices and materials and making the project as good as possible within that window of feasibility.

Joel

What are the most important factors that you consider when evaluating the development potential of a site?

Developer 8

You can't really look at feasibility without looking at some key areas. So firstly, what is the full cost of the build, which means: what sort of typology of home would you be putting here, what can be done, what's the final cost. And obviously also when we look at the site we also make sure that we look at the geotechnical conditions - whether it's stable. And then, like, water supply, wastewater, stormwater. And then what is the market doing. We have our own simulations and models as a developer, so that leads us to play around with difference practices and deals and sort of see difference scenarios, but all of the projects go into the same feasibility test, and sometimes larger projects gets broken into stages, which can affect how we look at their feasibility.

Joel

And what are your key sources of information on the market?

Developer 8

We sort of watch the market in general. We get sales information from CoreLogic and other similar services, and we also build relationships with builders and other developers operating in different areas to hear about trends in price and the relative demand of different housing typologies, as well as new opportunities for potential projects. So yeah, it's pretty wide-ranging...it also includes just watching other people, other developers...also we pay attention to political changes, like we've obviously been experiencing recently.

Joel

Can you describe your typical process for evaluating the feasibility of a development concept?

Developer 8

So we typically start with a discussion, a top-level review of the information available. And that is usually enough for us to gauge that initial level of feasibility, whether the opportunity is of any real interest to us. We might visit the site, possibly get our engineers to dig a couple of holes and just poke around a bit, but typically here in Auckland we have what we need available at that desktop level, and we can confident passing that to our engineers and other consultants, in the confidence that there's no unexpected risks and they'll be able to mitigate and achieve the high-level project vision.

Joel

Do you have any experience working with sites with significant natural hazard risk?

Developer 8

No, not really. I mean, the recent floods maybe changed what we understand to be 'risky' but for the most part, we are reasonably conservative, so we also check that early on, whether there is any sort of flooding risk at that location, and if it makes our engineer raise an eyebrow then we are pretty unlikely to proceed any further. That's just our personality and business model, financial model and fulfilment of obligations, I suppose.

Appendix 6.9

Interview with Developer 9

Joel

What are the most important values and rationales that influence your behaviour and your decision making as a developer?

Developer 9

Making money, return on investment. I think that's the reason anyone does development, right?

Joel

So the return on investment was the only factor you considered when purchasing and developing your property?

Developer 9

Yeah, so basically I was looking for a property to invest in, and I spoke to a real estate agent friend, and he recommended this property. I had done some research about property investment so I knew how to calculate the profit, key costs. I looked at sales prices for apartments in Napier city centre and then I looked at average costs for resource consent, building consent, retrofit design to change commercial to new apartments, mortgage, rates, you know? I had a target return that I wanted and it looked good, so I brought the property and got a local consultant to do the design and consenting, and now the construction work is almost complete.

But I did also think about, you know, this site is close to a nice park. It's in the city centre so good for working people, couples, people who just want to put down their stuff and go out. My thinking at that time was like, 'there is an existing building so it will be easy to make that into apartments, it will be low cost'. That was maybe not true.

Joel

How long are you intending to own the new apartment units?

Developer 9

So I will basically just sell and move on to the next one.

Joel

Are you going to be following a specific long-term strategy in your next development? Like, are you going to look for a similar property?

Developer 9

No, no specific strategy. Like, I'm not looking for another opportunity just like this. But next time I will be more careful and go for a higher return on the investment. Maybe next time I will go for a new building [instead of a change of use/conversion]. Because this was an older building, so council had a lot of seismic, structural concerns, the process with council was very difficult, much slower and more expensive that I expected. They had a lot of unexpected concerns also, like they were worried about the structure of the building, I had to get an engineer to design structural reinforcement which was extra consultant fees and also building costs. And then the consultant said 'oh, the structural needs a geotech report also'. And a seismic report, DSA, that was the most expensive part I think. This all changed my profit margin, made it worse, but I was also able to make some changes to the design of the apartments which reduced costs. Also the revenue from the commercial on the ground floor is higher than I expected so the project is still overall feasible, still profitable. But yeah, next time I will probably try to avoid old buildings, try to find a newish building or an empty site that can be developed.

Joel

Will you consider developing on a site that has a significant natural hazard risk?

Developer 9

It really depends, you know? Like, if I can do it and council will say yes and people will come and live there then yeah, that's okay. But some places, there is a big flood and people just don't want to live there anymore, like in Auckland now they are saying 'don't buy in this area because it was part of the big floods'.