Inclusionary Zoning and Greenfield Residential Development: A Feasibility Study

Report prepared for Auckland Council

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Chapter 1: Introduction to the Study

As part of the Unitary Plan notification process, and in response to considerable housing affordability issues in the region, the Auckland Council is considering the use of inclusionary zoning policies as a means of promoting the supply of affordable housing. Specifically, it has been proposed that a requirement be included in the "Unitary Plan that larger housing developments (for example, comprising ten or more units) have to provide a proportion of housing that is affordable to low to moderate income households" (Auckland Council 2013-Addendum to the draft Unitary Plan, p21).

Using the planning system to require developers to provide affordable housing has become popular overseas and is referred to as inclusionary zoning (IZ) or inclusionary housing. The Council's stated objectives of an affordable housing requirement are:

1. "Enable more housing choices for low to moderate income households to support economic outcomes (such as access to labour, jobs, reduced transport costs);
2. Assisting with creating neighbourhoods with mixed communities rather than a very divided city. Mixed communities are a way of tackling deprivation by reducing the additional disadvantages that low income families face when they are concentrated in particular neighbourhoods;
3. Ensure affordable homes that are of quality design in good locations are retained for the long term (for future generations); and
4. Achieve the above objectives in an effective manner (in a way that minimises administrative, transaction and compliance costs)" (Auckland Council 2013-Addendum to the draft Unitary Plan, p23).

Council seeks to better understand the impacts that IZ may have on greenfield land development with the Rural Urban Boundary. In particular the Council desires to know whether or not residential developers are likely to realise sufficient returns under this affordable housing policy.

The authors have been instructed by Council to conduct an analysis of greenfield residential developments with the aim of determining the likely impacts of inclusionary zoning policies on the financial feasibility of such developments. This micro-economic analysis combines published construction and land development cost data with proprietary information collected from interviews with industry practitioners. The authors have strived to achieve a high level of validity and reliability in the numerous assumptions used in the analysis. This was accomplished by collecting and reconciling data from multiple, credible sources upon which individual assumptions were derived. The collected data shall not be used for any other purpose nor shall any proprietary information be disseminated without first being aggregated with other data. Furthermore the names of individuals and associated companies who provided information for this research shall remain confidential.

Chapter 2: Residual Value, Development Feasibility and Inclusionary Zoning

Introduction

Before undertaking a development feasibility study it is important to appreciate the key economic and accounting issues that underpin developer decision making processes. Residual value is a central concept affecting all development feasibility studies and refers to the maximum bid that a developer will make for a site in order to undertake a particular development (Jowsey, 2011; Whipple, 2006). The residual value is simply the difference between the total value of the proposed development and the total costs of construction (including profit). In order for a development to proceed, a developer's residual value needs to exceed the value of the site in its current use or any alternative use. Inclusionary zoning alters the revenues and costs associated with a development and therefore the residual value of the site and the feasibility of undertaking development on that site.

In this chapter we set out key issues relating to the conceptual and empirical analysis of residual value. In the first half of the chapter we address basic conceptual and practical issues involved in calculating a developer's residual value. In the second half of the chapter we examine the impact of inclusionary zoning on development feasibility. As part of our analysis we examine how residual value has been modelled under the so-called Section 106 inclusionary zoning regime in England. The purpose of this review is to identify key methodological issues arising from residential development feasibility studies that have been generated under an inclusionary zoning system.

Residual Value and the Development Process

Speculative developers are entrepreneurs that are involved in the production of different types of functional spaces (residential, office, retail, etc.) in anticipation of market demand. The development process is inherently risky and involves substantial 'upfront' expenditure in advance of any return or profit. The developer is required to fulfil several functions. These include: recognising the potential for development, assembling the site, obtaining planning permission, securing finance, constructing the project and arranging for the lease or sale of the completed development (Jowsey, 2011, pp 142-146). These functions are time consuming and prone to considerable risk and uncertainty. From an economic perspective risk conforms to a known probability distribution, whereas uncertainty refers to unknowable problems and incomplete information. The success of any development project is subject to site-specific temporal and locational processes, as well as broad macro-economic dynamics.

Two key interrelated questions that developers are required to ask in advance of undertaking any development project are: i) how much will they pay for a site and ii) what is the acceptable return for a project? These two questions have a significant bearing on the development feasibility process. Calculating the value of a site to a developer will determine whether the developer will be capable of successfully bidding for the site on the open market. Moreover, any bid that a developer makes for a site will need to take cognizance of the potential return on investment in light of the risks and uncertainties associated with that development. A basic tenet of investment practice is that higher risk projects require higher returns if they are to be feasible.

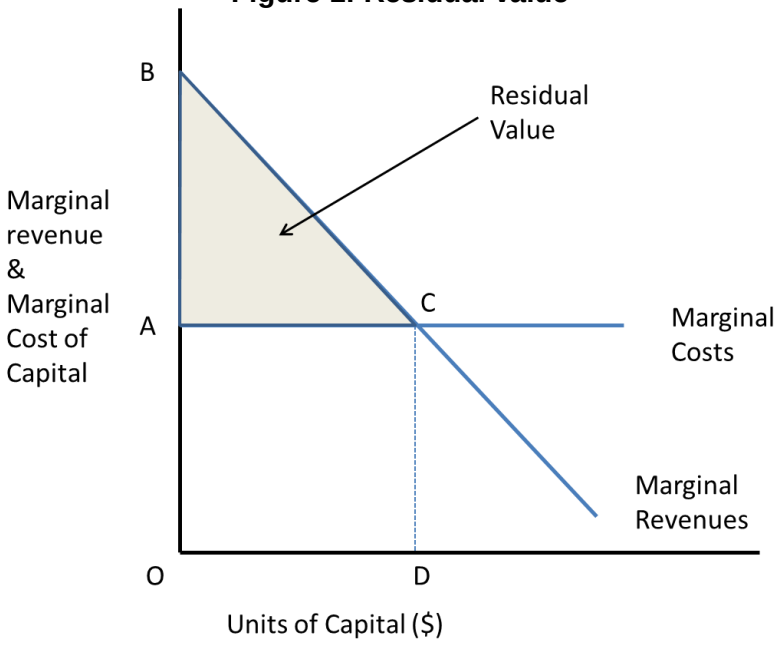
In real estate economics and property valuation theory, the value of a site is referred to as the 'residual value' of land. For the purpose of this study residual value can be viewed from two perspectives. First, from a property economics perspective, residual value represents the value of a site to a developer who is maximising profit. Under competitive market conditions a developer will make normal profits (i.e. the industry determined profit level reflective of risks and acceptable returns). If a developer exceeds normal profits for the

industry this will act to encourage new entrants into the market and the increased competition will reduce individual profits to the industry norm. Second, from an accounting perspective, residual value is simply the difference between the gross development value of the completed development less the total costs (construction and finance costs plus the developer's profit) incurred by the developer (excluding the cost of the land). These two perspectives offer different insights into the development feasibility problem and are developed in more detail below.

The economic model of residual value

Developer activities are subject to the law of diminishing returns. As capital is applied to a fixed site, the gross development value (GDV) of the site increases but at a diminishing rate. Consequently, the marginal revenue product curve is downward sloping. For ease of illustration, standard urban economics textbooks usually assume that developers borrow all of the funds required for development and as a result the marginal cost of development is simply the interest rate charged on borrowings. Figure 1 depicts the profit maximizing position of a developer and the residual value of the site for that developer.

Figure 1: Residual value



Under competitive market conditions a developer maximises profit where marginal costs equal marginal revenues. In Figure 1 the GDV is represented by the area OBCD and the total cost of development (including the developer's normal profit) is the area OACD. Subtracting the total costs from the GDV gives the residual value (ABC). This residual value is the maximum monetary amount that a developer is willing to bid for a site.

This simple urban economics model offers important insights into the development process. It should be noted that the residual value of land for a developer is a product of the GDV (value of the development placed on the site) minus costs (including profit) (Office of Fair Trading, 2008: Jowsey, 2011). Therefore depending on the nature of the proposed development, differences in designs and the productivity of individual developers, each developer will generate a different residual value for a site. There is no unique or fixed residual value for a given site. Under competitive market conditions, where developers bid for the site, the land will go to the developer with the highest bid (or highest residual value)

(Oxley et al 2005). Moreover, once a developer has purchased the land, any changes in the final value of the development (the sale price of the houses) or costs (material, labour or financing costs) will have a significant bearing on the profitability of the development.

The Accounting Model of Residual Value

In practice, developers adopt a set of accounting procedures to calculate the residual value of a site and their profit. Atherton et al (2008) provide an insightful overview of static, or back of the envelope, calculations and more sophisticated discounted cash flow analyses employed by developers. Their analysis highlights the interrelationship between residual value and profits. Table 1 sets out the basic accounting procedure that is involved in calculating residual value and a developer's profit.

Table 1: Calculating the Residual value of Land and Developer Profit

Residual Value of land **Gross development value** (GDV)- value of the completed development	**- Total Costs** All construction costs. Interest on construction, professional fees and developer's profit	**= Residual Value** Maximum bid for site includes acquisition costs, professional fees and finance of land purchase.
Residual to Profit **Gross development value** value of the completed development	**- Total Costs** All construction costs as above but including land value as a cost	**= Developer's Profit**

(Source: Atherton et al 2008)

Focusing on the calculation of a developer's profit, Atherton et al (2008) provide three important insights into understanding development feasibility analysis. First, they review the traditional residual valuation process and argue that it looks at all of the variables (sales and costs) "as a snapshot in time and can be used as a 'rough indicator' of a development viability" (Atherton, et al, p 167). Second, they note that in reality developments take time to put into effect and that the staging of financing payments and the sale of final outputs influence costs and returns. Moreover, any profits earned in the future need to be discounted to present prices to assess the developer's rate of return. On this basis they argue that a cash flow approach offers a more sophisticated method for assessing development viability. Third, they argue that "regardless of the residual technique used" (p169) developers should employ some form of sensitivity analysis and note that a "small change in any of the input variables may have a disproportionate impact on the resultant output" (p169). For example, they show how a small change in the finance rate over the course of the timing of the development can have a significant impact (positive or negative) on the developer's profit. Their analysis places considerable attention on the impact of uncertainty and change on the profitability of developers.

Significantly, while advocating sophisticated cash flow analysis, the Atherton et al (2008) study highlights the role of the static or snapshot residual valuation in determining initial development feasibility. In light of dramatic changes in the UK planning system and the increasing importance of "tests of the financial viability of development projects" (Byrne et al 2011, p249) within negotiations between developers and planners, increasingly attention has been given to the role of residual value. Significantly, in their study of modelling

development viability, Byrne et al (2011) conclude that "simple and simplistic models may produce similar outputs to more robust and disaggregated models" (p249). Thus despite the call for more sophistication in analysing development viability the basic traditional residual valuation continues to be employed in the industry and has merit as a form of analysis.

The planning system can, and does, have significant impacts on residual valuation and development feasibility (Crook and Monk, 2011: Whitehead, 2007). Planning rules on plot densities and height restrictions affect the gross development value of the site, while planning fees and levies alter the costs associated with any development. From a developer perspective, planning interventions raise two issues. First, planning rules and levies are associated with a quantum of costs and benefits. Second, the regulatory system can create certainties and uncertainties. Uncertainty can increase the risk associated with a development and alter the level of returns required to make a development feasible. The next section examines how planning practices affect residual value and development feasibility.

Inclusionary Zoning

Development processes are designed to increase the income that can be extracted from a site. For example, under normal circumstances the addition of new houses or commercial spaces on any given site increases its value. At its simplest, development value can be viewed as "the difference between the value of a site arising from new development and its value in its existing use" (Crook and Monk, 2011, p997). Planning regimes have profound impacts on the capacity of the development industry to generate development profits. Granting planning permission for a development to take place facilitates uplift in the value of land and increases the development value of a site. The role of the planning process in raising development value, or betterment, has been subject to considerable analysis and debate.

Planning gain is the process by which local planning authorities seek to extract some of the land value uplift that accrues to landowners by charging developers some form of betterment levy (Crook and Monk, 2011). Usually this levy is used to fund infrastructure and public amenities, or to address the negative externalities of urban development (e.g. increased traffic congestion). Increasingly, at an international scale, local authorities have used this planning gain to facilitate the provision of affordable housing via what is termed inclusionary zoning.

Inclusionary zoning has as its objective the promotion of affordable housing or the fostering of social inclusion. Calavita and Mallach (2010) state that inclusionary housing:

> "… refers to a programme, regulation or law that requires, or provides incentives to, private developers to incorporate affordable or social housing as part of market driven developments, either by including it in the same development, building it elsewhere, or contributing money or land for the production of social or affordable housing in lieu of construction" (p1).

Inclusionary zoning policies have been widely implemented in the USA and England. The US has a long history of inclusionary zoning with Montgomery County, located in the Washington DC metropolitan area, being the first to implement such policies in 1974 (Wood et.al. 2013). In the US context inclusionary housing policies can be either mandatory of voluntary. Under mandatory policies developers are required to provide a designated proportion of units in a development for households that meet set income targets (e.g. 80 per cent of the area's median income). As an incentive for developers local authorities often use

density bonuses, expedited planning permission or waive other fees (Hughen and Read, 2013; Wood et.al. 2013). Density bonuses are designed to subsidise the "fixed costs of development" and "increase the total stock of affordable housing without unduly burdening real estate investments" (Wood et al.2013, p 88). Voluntary inclusionary housing depends primarily on public sector incentives designed to encourage developers to provide affordable housing. In addition to this basic structure, inclusionary housing policies can include "fee-in-lieu options, relaxed design standards" (Hughen and Read, 2013 p 3) and deed restrictions on the resale value of affordable housing units (Temkin et.al. 2013).

For the most part, researchers in the US have been concerned with the price implications of inclusionary zoning. In a recent study Hughen and Read (2013) highlight the extent to which price impacts are subject to local market contexts and temporal dynamics. They argue that:

> "Housing prices are most likely to increase in strong markets where density bonuses are not offered to fully offset the private sector's cost of constructing affordable units. Prices may also increase modestly in weak markets when severe affordable housing stigma effects encourage developers to dramatically reduce production in an attempt to preserve profits levels after the implementation of an inclusionary housing policy. Density bonuses can limit the upward pressure on housing prices in strong markets, but may prove much less effective in weak markets where developers have little incentive to increase production in response to this type of economic incentive.
> In relatively strong markets, robust demand provides developers with an incentive to continue building after an inclusionary housing policy is implemented. Prices may, however, fall in some of these situations when density bonuses are provided due to a combination of downward sloping demand, density effects, and affordable housing stigma effects" (Hughen and Read, 2013, pp20-21).

Significantly, especially given the focus of this research study, the US literature on inclusionary zoning has given little attention to development feasibility. This lack of attention is unsurprising given the nature in which inclusionary zoning has been implemented and the fact that these policies have resulted in the production of affordable housing units (e.g. 10,600 affordable housing units in Montgomery County see Wood et.al. 2013). Given affordable housing is being produced this demonstrates that developers can meet development feasibility criteria.

In England, since the 1990s, the planning system has been used as a catalyst for the development of affordable housing (Monk, 2010; Monk et al 2008; Monk and Whitehead, 2010; Monk et al 2006; Monk et al 2005). The Town and Country Planning Act (1990) introduced new powers for local planning authorities to implement affordable housing policies. Under Section 106 of the Act, the provision of affordable housing became a material consideration for granting planning permission for all residential development.

Under Section 106 all local authorities, that can show the need for affordable housing, can require that affordable housing units be provided at the level of individual sites. Affordable housing is either rental housing units owned by a registered social landlord or low-cost home ownership that receives some form of state subsidy and is allocated by a housing association. Under the scheme it is envisaged that that developer's contributions will primarily consist of the provision of on-site affordable housing units. However, the scheme also allows for the option of developers providing alternative sites for affordable housing or making a financial contribution in lieu of developing affordable units (Monk et al 2008).

The English experience of inclusionary zoning is important at two levels. First, the extensive application of inclusionary housing policies has resulted in a significant shift in the nature of provision of affordable housing in England. Within England the majority of affordable

housing is now provided through inclusionary housing policies (Crook et al 2006; Monk and Whitehead, 2010). Second, the widespread adoption of inclusionary housing policies has necessitated that greater attention be given to development feasibility in the implementation of these policies.

The manner in which inclusionary housing has evolved in England has meant that local planning authorities and developers have had to negotiate over development feasibility issues, and the appropriate level of affordable housing required, at the level of individual sites. These mandatory negotiations have resulted in new developer/ local authority practices and behaviours. Moreover, and of particular importance to this study, the negotiations between local planning authorities and developers have centred on issues around the calculation of residual value and developer profit. Byrne et al (2011) argue that:

> "Since Circular 05/05 proposed the submission of "financial information" to provide a basis for negotiations between developers and local planning authorities about viable levels of affordable housing, tests of the financial viability of development projects have become an integral part of the planning process, both at the forward planning and development control stages" (p249) and "… viability appraisals are carried out to inform negotiations about affordable housing levels" (p250).

As part of the negotiation process developers are required to provide financial information on any proposed residential development to the local planning authority. The local planning authority then uses this information to model the feasibility of imposing an affordable housing component on that development.

The manner in which the local authorities in England model development viability provides useful insights into appropriate methodologies for examining the impacts of inclusionary zoning on development feasibility in Auckland. In this context, the next section examines the ways in which Section 106 has been implemented.

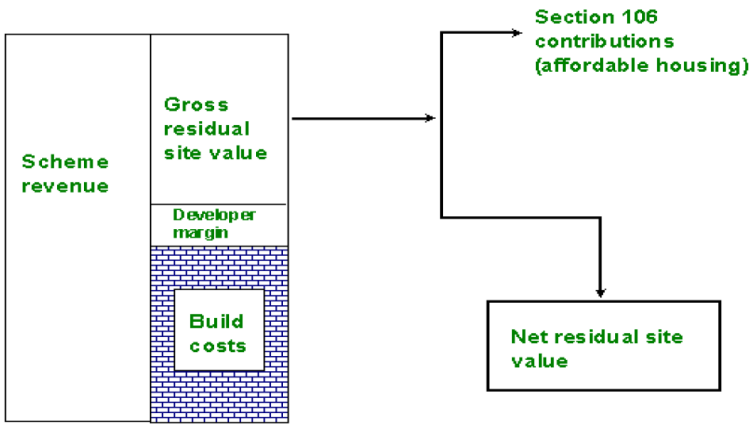
Methodological Issues in Assessing Development Viability under Section 106

In this section we review two studies that specifically address development feasibility and the provision of affordable housing. This review is primarily concerned with examining the methodologies that have been employed in these studies.

The first study, undertaken by Andrew Gollard (Three Dragons consultancy) is entitled *South Bucks Development Economics Update*. Three Dragons are leaders in the field and created a development feasibility model for the Greater London Authority (GLA) that is now used widely among local authorities in England. The Three Dragons Toolkit is an MS Excel-based model that can be used by local authorities and developers to examine the impact on residual land value of varying affordable housing targets.

Figure 2 depicts the underlying logic of the model, which is implemented in two stages. The first stage involves calculating the residual value of the site. The total costs of the development (including the developer's profits) are deducted from the total revenues of the development to produce the gross residual value. This gross residual value becomes the starting point for negotiations between the developer and the local authority. The S106 contributions are then deducted from the gross residual value to generate a net residual value. Once the net residual value has been calculated the second stage of the model involves comparing this value with the existing use value, or a realistic alternative use value, of the site. This comparison is useful in determining "whether a site is likely to be brought forward for housing" (Gollard, 2010, p7).

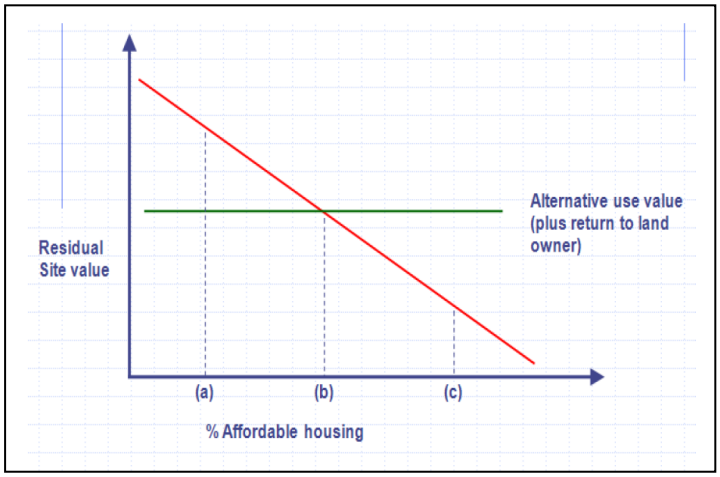
Figure 2: The theory of the S106 process



(Source: Golland, 2010)

Figure 3 provides a schematic diagram outlining second stage of the process. As the percentage of affordable housing increases (X-axis) the residual value of the site (Y-axis) declines. At point (a) the residual value exceeds the alternative use value and the development, including the affordable housing component, is viable. At point (b) the alternative (or existing) use value is equal to the residual value. At this point as long as the return to the land owner is sufficient then it is likely that the development will go ahead. At point (c) the inclusion of a greater proportion of affordable housing results in a residual value that is below the alternative use value of the site and the development is no longer viable.

Figure 3: Affordable Housing and Alternative Use Value



(Source: Golland 2010)

Using this methodology the study examines "the viability for mixed tenure residential development for a number of different proportions and types of affordable housing" (Gollard, 2010, p9) in the South Bucks District Council area. The report offers a detailed analysis of the viability of S106 housing across a variety of sub-markets within the district and, interestingly, argues that the council needs to consider reducing the threshold size of development (15 units) that triggers the inclusion of affordable housing.

At a general level the analysis generates three broad findings. First, as the proportion of affordable housing increases the residual value of the site declines. Second, given the significant variation in house prices across housing sub-markets in the District, the impact of providing affordable housing on residual values varies considerably. This is an important finding as it highlights the site-specific impacts of the policy. Finally, the study indicated that while the inclusion of affordable housing was viable in high housing cost areas, affordable housing might not be viable in all areas.

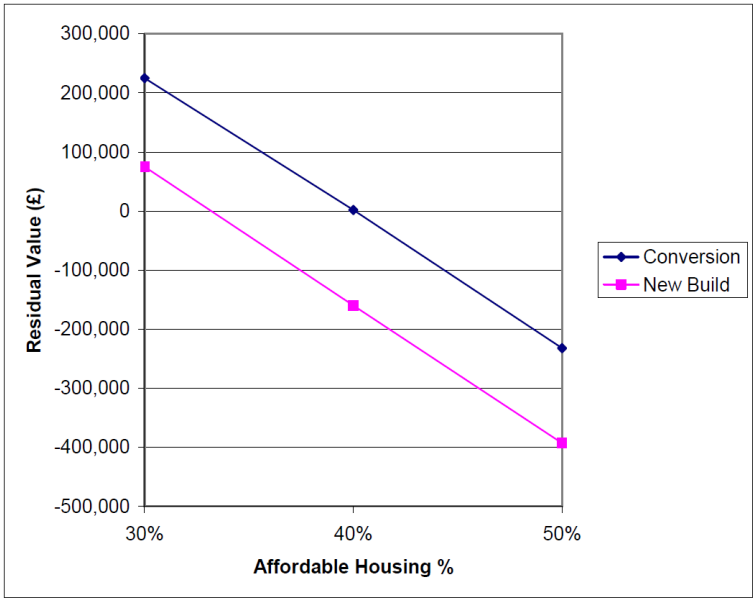
The second study, entitled '*Affordable Housing Viability Study*', comes from research undertaken for the City of London Development Framework Core Strategy. Adopted in 2011, the Core Strategy operates alongside the London Unitary Development Plan. The study addresses the viability of new build developments and housing conversions in the City of London, which is "one of the most expensive places to live in the country due to its position as the world's leading international financial and business centre" (p6).

Focusing on residual values the study employed a similar methodology to Gollard (2010). The study examined three different site typologies involving the development of 10, 25 and 60 housing units. The analysis involved the generation of a variety of sales points and costs. Significantly, the report notes the impact of the global financial crisis on the required profitability of the developers. It states:

> "In 2007, profit levels were generally assumed to be in the range of 15% to 17% of Gross Development Value. However, with the impact of the credit crunch and the collapse of interbank lending and the various government bailouts of the banking sector, profit margins have increased. The minimum generally acceptable profit level is now around 20%, while the banks will require some riskier schemes to show a higher profit level, of perhaps up to 25%" (p12).

The study examined the viability of providing affordable housing units either as new build or conversions. Figure 4 shows the results of the analysis and the viability of including different proportions of affordable housing for a 10 unit development. In this case the analysis suggested that 40 per cent affordable housing was viable in a conversion scheme but anything above 30 per cent affordable housing would make a new build development unviable.

Figure 4: Residual Value- 10 unit residential scheme, City of London

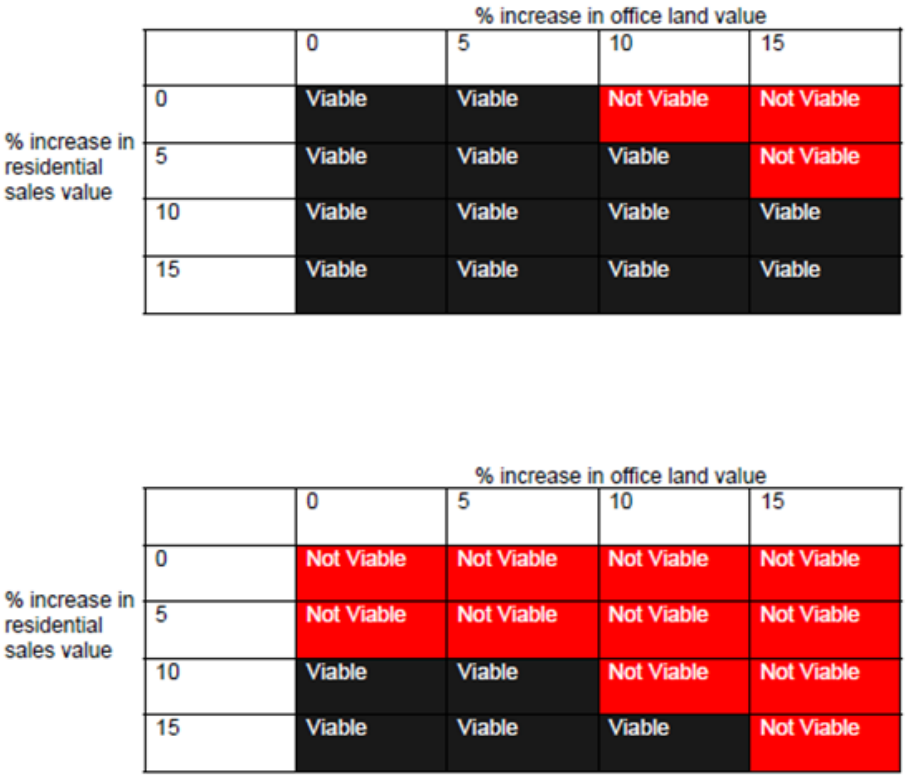


The modelling suggests that up to 40% affordable housing could be viable in a conversion scheme, but that affordable housing at percentages much above 30% for a new build scheme would not be viable.

(Source: City of London, 2010)

Significantly this study also included sensitivity testing. Recognising the difficulties of modelling future costs and values the study modelled the "potential implications of changes in house prices and changes in alternative office values upon the viability of affordable housing provision" (p16). Figure 5 set out the results of the sensitivity analysis for a 25 unit conversion scheme.

Figure 5: 25 unit conversion scheme 30% and 40% affordable units



% increase in residential sales value	% increase in office land value: 0	5	10	15
0	Viable	Viable	Not Viable	Not Viable
5	Viable	Viable	Viable	Not Viable
10	Viable	Viable	Viable	Viable
15	Viable	Viable	Viable	Viable

% increase in residential sales value	% increase in office land value: 0	5	10	15
0	Not Viable	Not Viable	Not Viable	Not Viable
5	Not Viable	Not Viable	Not Viable	Not Viable
10	Viable	Viable	Not Viable	Not Viable
15	Viable	Viable	Viable	Not Viable

(Source: City of London, 2010)

The sensitivity analysis clearly demonstrates that within the City of London the operation of the office market has a significant impact on the viability of providing housing developments that include a large component of affordable housing. Moreover, the analysis also highlights that rapidly rising house prices increases the viability of providing affordable housing units.

The two studies that we have reviewed are representative of the standard analysis employed under the S106 inclusionary zoning regime in England. At the core of the analysis is the calculation of the residual value of the site. In order to facilitate the modelling of residual values researchers need to estimate the potential revenue from development and the price points of the affordable housing units. Moreover, the models involve "(1) assumptions about how the development process and the subsidy system operate and (2) assumptions about the values for specific inputs such as house prices and building costs" (City of London, 2010, p8). The standard Three Dragons Toolkit, which is widely employed by councils in England to examine development feasibility, employs benchmark values for costs and revenues. The use of benchmark values facilitates the modelling process but has been subject to critique (Atisreal, 2007; Greater London Authority 2012) as it fails to take account of site-specific costs. However, the purpose of the modelling is to generate a broad measure of development feasibility that assists councils with developing inclusionary zoning plans and to generate a starting point for negotiations with individual developers. As a method of determining development feasibility the 'static' residual valuation model constitutes a robust and useful tool.

National Differences in the House building Industry

The English experience of development feasibility analysis under the Section106 regime offers a number of important methodological insights but it needs to be acknowledged that the residential development system in England differs significantly from the New Zealand system. The English house building industry is vertically integrated and is dominated by companies that incorporate both land preparation and house building activities (Ball, 2003 and 2006). In contrast, the New Zealand house building sector consists of two distinct industries. First there are companies that specialise in land development processes and produce serviced sites or lots for house builders. Once the land has been subdivided house builders buy the serviced sites and build housing to order.

The existence of a two-tier house building sector complicates any analysis of the impact of inclusionary zoning on development feasibility, especially on greenfield development sites. It is unclear whether the affordable housing requirement relates to the provision of affordable land sites within a development or relates solely to the housing units placed on the sites.

Conclusion

This chapter has reviewed key issues relating to development feasibility studies. Our review clearly positions residual value as central to any analysis of development feasibility. Moreover, notwithstanding the importance of sophisticated cash flow analysis in the overall financial management of individual companies, the literature indicates that a traditional (or static) residual valuation is a key measure of development feasibility. In addition, it should be noted that the Three Dragon Toolkit, the leading feasibility modelling tool used by councils in England, adopts the traditional residual valuation approach as part of its methodology.

In creating development feasibility models it is necessary to make assumptions regarding the nature of the development process and the values of inputs, such as house prices and building costs. Under the Section 106 inclusionary zoning regime in England local planning authorities make use of benchmark data in their models. In the absence of accepted benchmark data the models employ empirically justified estimates of costs and prices (see City of London, 2010). The purpose of these models is to provide a broad measure of the viability of including an affordable housing component in a residential development; the actual negotiations between developers and local planning authorities include site-specific cost data.

The financial feasibility of any residential development project is subject to site-specific (e.g. infrastructure costs, remediation cost) and macro-economic (e.g. house price dynamics, interest rate changes) processes. Reflective of the uncertainty associated with residential property markets, developments that are deemed viable in boom conditions can become unviable during a property slump. To accommodate the effects of market dynamics it is useful to include sensitivity analysis in creating a development feasibility model.

Chapter 3: Methodology and Data Collection

Introduction

There is limited information on new greenfield residential developments in the public realm. Information that is readily accessible is comprised of marketing materials for current projects and technical information held by the local council detailing resource and building consent activity. Neither of these sources provides the information needed to conduct a development feasibility study. In addition data related to land development and residential construction costs, raw block land prices and development financing is commercially sensitive.

Given the absence of suitable secondary data, it was necessary to collect primary data from industry professionals actively involved in greenfield residential developments. This chapter outlines the methods used to gather information and derive the many assumptions used in the feasibility analyses.

Interviews

The researchers carried out a total of eleven interviews with property professionals. All but two interviewees were greenfield residential developers with extensive experience. Some developers interviewed were employed by large development companies while others operated with few support staff and were effectively sole proprietors. The other two professionals interviewed consisted of a senior property valuer with expertise in appraising residential block land and an equity investor who has invested in numerous large-scale greenfield developments. Five interviews were held over the phone while six were conducted in-person. The interviews were semi-structured and covered the following main topics:

1. Approach to development feasibility;
2. Land development process;
3. Land availability and pricing;
4. Land development costs;
5. House construction costs;
6. Residential development finance; and
7. Pricing of group sales of sections in new subdivisions.

Not all interviewees were able or willing to contribute information towards each of the above topics but at least four interviewees provided independent data on each. Where possible the information collected through interviews was cross referenced against published data before deriving assumptions for use in the feasibility analyses.

The extent and quality of information gained from the interviews varied. A small group of interviewees elected to provide mainly cursory information and shared their general views on the development process and housing affordability. In contrast some interviewees offered detailed data on current development projects. The majority were more reserved but did openly advise on development costs and project finance arrangements. The land development cost data in particular was often provided as ranges rather than definitive figures due to the wide variety of opportunities and challenges associated with each project site.

Feasibility Approach and Development Process

The first topic discussed with each interviewee was the general approach used by developers to test development feasibility, and the second topic sought to understand the prevalent development processes found in the Auckland housing market. Information gathered on these themes guided the design of the model used to test financial feasibility and the impact of inclusionary zoning.

In short there are a range of development processes employed by developers depending on their own business model and core competencies. Based on the feedback gathered, the majority of active developers tend to focus on converting raw block land into serviced residential sections for group sales to homebuilders. A key reason for this is that land conversions demand a lower amount of equity capital to carry a development from inception through to completion. Furthermore bank lending conditions imposed on the majority of developers require projects to achieve pre-sales covering 50-100% of the desired line of credit. This is extremely challenging for projects whose consumers are individual homeowners and residential investors who purchase completed homes rather than vacant lots. In the case of developers who carry out land conversions, the 'consumers' are a relatively small number of homebuilders who purchase groups of serviced sections, construct houses and sell these to end users. This 'raw land to sections' business model enables developers to secure sufficient pre-sales to satisfy lender requirements.

There are some developers that convert raw land to sections and proceed to construct homes but these players represent the minority. This smaller group of developers either contract with homebuilders to construct the homes or act as general contractor themselves if construction is a core competency.

Regardless of the development process employed the approach towards development feasibility is the same, according to those professionals interviewed. Essentially each development opportunity is assessed using a static residual land value analysis to determine if the difference between the anticipated revenue and development costs provides the developer and equity partner with a profit margin sufficient to justify the risks associated with a particular venture.

At this level of analysis rough cost data from recent experience is used and approximate land utilisation rates are applied to the raw site area. Although an absolute consensus was not achieved the interviewees largely suggested that 70 per cent of the gross land area can generally be converted into sellable sections with the balance of land dedicated to roads, retention ponds, parks, etc.

If the opportunity is deemed feasible, the developer and equity partner then explore the development further and bring in third party professionals such as planning consultants to more precisely determine the layout of roads, house lots and other elements. As more details are determined, more specific assumptions can be made. Eventually a second feasibility exercise is conducted using discounted cash flow analysis with the timing and magnitude of explicit cash flows modeled in either MS Excel or specialty property software such as EstateMaster or Argus.

Hypothetical Greenfield Residential Developments

In order to gauge the potential impact of inclusionary zoning on greenfield residential development in Auckland, the researchers have considered two hypothetical projects. Both are assumed to be 3 hectares in size, feature a flat contour and are adjacent to services (sewerage, water supply, power, etc) and within the Auckland's Metropolitan Urban Limit (MUL). The assumed size represents an area of land that can reasonably facilitate a single stage within a multi-stage greenfield development.

The first hypothetical development is located in Papakura which is a submarket to the extreme south of Greater Auckland and is currently experiencing greenfield development activity. This submarket is home to some of the lowest priced houses on the secondary market with an April 2013 median house price of $367,000 according to the Real Estate Institute. The new subdivisions in the submarket are price above this level but below Auckland's current median house price of $555,000.

The second hypothetical development is located in Upper Harbour, home to the new Hobsonville Point development. The key difference with Papakura is that Upper Harbour commands considerably higher house prices on the secondary market with an April 2013 median house price of $715,000. Correspondingly residential land prices, both vacant sections and block land, are higher in Upper Harbour than in Papakura reflecting the former's more attractive location. Another difference is that new homes constructed in more sought-after, pricier submarkets such as Upper Harbour tend to be built to a higher specification both in terms of design and quality of finishes.

Key Assumptions

The most critical variables associated with determining the financial viability of a given greenfield residential development relate to the market price of land suitable for development, the cost of converting this raw land into serviced sections, the cost of constructing dwelling units on those sections and the financial returns demanded by the financiers and developer.

Table 2 provides summary statistics for the above-mentioned key assumptions that lie at the heart of any development feasibility study. The table clearly shows that the most wide ranging assumptions are raw land prices and the cost of converting land into serviced sections. The data gathered for the last three assumptions are considerably more consistent.

All cost data presented throughout this and the subsequent chapter is inclusive of goods and services tax (GST). For certain line items such as raw block land and serviced sections, the transactions are assumed to involve GST registered vendors and purchasers. For instance in the case of greenfield developments producing sections rather than completed houses, both the developer selling the section and the homebuilder purchasing the land are assumed to be GST registered. As per the recent amendments to the Taxation (GST and Remedial Matters) Act 2010, transactions between GST registered parties involving the sale of land are zero-rated.

Table 2: Summary Statistics for Key Assumptions Used in Feasibility Analysis

	Raw block land market price per sqm	Land development cost per lot	House construction cost per sqm	Effective annual interest rate (bank debt)	Development feasibility margin (Profit & Risk)
Minimum	60	55,000	1,380	6.5%	20%
Maximum	300	146,000	2,128	10.0%	30%
Mean	150	90,864	1,527	8.4%	22%
Median	125	90,000	1,440	8.8%	20%
ADOPTED	**125**	**90,000**	**1,440**	**8.8%**	**20%**
Interviewee responses	*6*	*8*	*7*	*5*	*6*

As shown in Table 2, the number of interviewees who have data on the key assumption range from eight down to five. Based on the spread of estimates, the researchers have elected to adopt the median values for use in the financial analysis of the hypothetical development in Papakura. Of the key assumptions listed in Table 2 three are largely universal and do not vary considerably by submarket. These are land development cost, effective annual interest on bank debt and development margins required by developers and their equity partners. However two of the assumptions, block land price and house construction cost, cannot be directly applied to both the Papakura and Upper Harbour submarkets without proper adjustment.

In regards to block land prices, the general feedback from interviewees was that the more sought-after submarkets experiencing greenfield development activity, such as Upper Harbour, command above average prices. Although a consensus on 'high-end' block land prices was not achieved, the property professionals interviewed tended to suggest $200 per square metre was the upper limit to block land prices in Auckland that would enable a workable development. This figure was adopted for the Upper Harbour feasibility study.

As previously mentioned newly constructed homes in more expensive submarkets tend to feature higher quality design and finishes. Frequently such homes are marketed as 'architect-designed'. However the researchers requested from the interviewees costs of building groups of basic, not extravagant, homes. It is this low-to-medium specification that is captured in Table 2. Therefore an adjustment is necessary to adopt a reasonable house construction cost for group architect-designed homes. In order to arrive at the appropriate adjustment the researchers elected to use the Department of Building and Housing's online "Quick Calculator", which is designed to assist territorial authorities in assessing building consent fees (see http://www.dbh.govt.nz/bofficials-estimated-building-costs). The online calculator's current estimated cost for small houses (145 sqm) that are constructed as a group is $1,430 per square metre which is effectively the same as the adopted assumption for house construction cost stated in Table 2. According to the explanation provided on the calculator, the cost premium for an architecturally designed home is 20 per cent, or roughly $300 per square metre. The researchers elected to conservatively inflate this premium to $400 per square resulting in an estimate of $1,850 per square metre for group constructed, architecturally designed homes in the Upper Harbour submarket.

Capital Structure of Residential Developments

The final two key assumptions involve expected financial returns in exchange for investing debt and equity into greenfield developments. In general the effective annual interest rate charged by the main trading banks for providing debt financing to new subdivisions is around 9 per cent per annum. This includes an establishment fee and a fee for maintaining a line of credit sufficient to fund the development. It is possible for some well-capitalised, large development firms to acquire funding at lower costs and it is equally plausible for banks to charge higher rates to developers that lack a sound record of managing successful projects. By and large, however, the interviewees who advised on debt financing felt 9 per cent was a reliable figure for use in a feasibility analysis.

In terms of the development margin, or profit and risk margin, the interviewees came to a near consensus of 20 per cent of development costs. These costs include all expenses necessary to produce the end product: serviced sections or completed houses. Debt finance costs associated with the lead mortgage are included but disbursements of cash flows to the equity partner or payments towards secondary mortgages (mezzanine finance) are not included as development costs. In many cases there is a blurred line between developer and equity investor and the feasibility of the project is determined jointly by these players with the sharing of profits contingent on a number of factors.

While some developers inject their own cash equity into projects, the norm is for developers to form close partnerships with third party equity investors who supply all of the cash equity. In such cases the developer negotiates with the equity investor as to how their own firm's overhead costs will be funded over the duration of the project and how proceeds from the development will be shared between the developer and investor. A common approach is for the developer to include into the development costs a "management fee" paid incrementally to the developer. If the negotiation between the developer and equity partner results in a sizable fee, the developer will likely forego much of the profit realised towards the close of the project after the bank debt has been cleared. Alternatively the developer may cover their overhead during the project and subsequently receive a larger proportion of the development profit.

In the case of this report, the development structure will assume the involvement of a developer working in partnership with an equity investor who agrees to partially fund the developer's overhead with a management fee equal to 3 per cent of land development costs (excluding costs associated with home construction).

Often developers and their equity partners solicit debt financing from the main trading banks to leverage their returns and free up investment capital for development opportunities that arise. In general banks are willing to lend 50 per cent of the purchase price of raw block land that is in need of resource consent. After consent is approved, lenders are willing to issue loans at higher loan-to-cost ratios. According to those interviewed, it is common for banks to fund 70 per cent of costs associated with improvements such as the installation of civil infrastructure and construction of houses.

Risks associated with residential development

As with any property development venture the developer, equity investor and lender involved in a greenfield residential development assume a certain amount of risk. Lenders attempt to offset these risks by charging interest and fees as well as taking security on the title of the land and improvements. The equity partner may also take security on the property but this is secondary to the bank's position and the likelihood of realising benefit as a subordinate mortgagee is much lower than the lead mortgagee. Therefore the cash invested by the equity partner and the cash, time and expertise invested by the developer are most at risk. In the event of a downturn such as the 2008 Global Financial Crisis, the developer and equity investors can incur significant financial losses. Therefore the required return dictated by the development team is substantially higher than the interest charged on a typical commercial loan.

Aside from such general market risks, land development assumes site-specific risks as well. These involve unforeseen complications that can arise from geotechnical issues regarding the land itself, resistance to the development by neighbouring landowners and unanticipated civil infrastructure costs imposed on the developer by Council. On this latter point, the interviewees consistently lamented the uncertainty ingrained in the stages of the development process that involved Council. Uncertainty is a key factor in risk and where uncertainty is elevated, required rates of returns increase in tandem. In practice this means higher development margins in the case of residual land studies or higher minimum internal rates of return computed from discounted cash flow models.

As outlined by many of the interviewees, Council-invoked uncertainty centres on the availability and quality of information on public infrastructure such as sewer lines and stormwater pipes. The majority of those individuals interviewed shared examples of disputes that have emerged with Council which apparently could have been avoided if sufficient, accurate information was readily available during the developer's due diligence prior to fully committing to the project. Furthermore when information is made available it is sometimes inaccurate resulting in unnecessary expenses incurred by the developer and lost time.

In some cases Council approvals have been withheld until the developer commits to funding off-site infrastructure costs. Several of those interviewed dubbed such obligatory improvements to and extensions of off-site water supply, sewerage, stormwater and road infrastructure as "hidden costs" since they claim there was no reasonable way of foreseeing these expenses until well into the project. By this point the development site had been purchased and a considerable amount of time and money had been invested. According to examples presented by interviewees these infrastructure costs were substantial and could well exceed development contributions and infrastructure growth charges, which are calculated using standard formulae. In light of these "additional" expenses, the interviewees perceived a lack of transparency on behalf of the Auckland Council and Council-controlled organisations. This results in greater risk being assumed by the development team.

According to interviewees, a second source of Council-induced uncertainty and risk comes in the form of dealing with Council staff charged with processing consents who are somewhat isolated and at times provide conflicting direction to developers. Interviewees suggested that developers be provided by Council with "relationship managers" to internally coordinate the consent process. For the minority of interviewees who have been assigned such managers it is has proven to be a significant positive change from the past struggles of gaining consents. Some interviewees felt an additional fee for such a service would be well worth the expense as precious time and effort can be saved in these vital early stages.

Other Assumptions

Boxes 1 and 2 provide all the assumptions used in conducting the residual land value studies for the hypothetical developments in Papakura and Upper Harbour. Many of the remaining assumptions are self-explanatory but some deserve additional attention. In the Papakura model, for instance, the serviced section and new home prices are largely derived from an actual development in that submarket. Similarly, the prices of sections and homes in Upper Harbour are derived from current projects in that area. The same approach was used to determine average lot sizes of freestanding versus terraced houses. Both hypothetical developments are assumed to take advantage of Council's integrated consent process to achieve smaller final lot sizes and overall higher density.

Lastly, the application of an inclusionary zoning (IZ) policy assumes that the compact terraced houses will be earmarked for affordable units to satisfy Council requirements. The definition of affordable housing used in this report is as follows:

> *An affordable home is one that is priced at a level which allows a household on the Auckland Region's median income to spend no greater than 30 per cent of its gross income on mortgage payments.*

According to Statistics New Zealand the 2012 median household income for the Auckland Region is $73,372. Assuming 30 per cent is used to service a 30-year fixed-rate mortgage at 5.25% per annum with a 10 per cent down payment, the current affordable house price would be roughly $365,000. This is just below the $367,000 April 2013 median house price in Papakura but substantially below the $555,000 Auckland Region median house price and roughly half of the $715,000 median price of a home in Upper Harbour.

From this affordable house price of $365,000, an affordable section price was derived by subtracting from the house price the Department of Building and Housing's "Quick Calculator" estimated cost of constructing a one-off speculative 120-sqm terraced house on the section. The resulting affordable section price is roughly $148,000. Again this price is below assumed market prices for terraced house sections in Papakura and Upper Harbour.

Box 1: Assumptions Used in Paparkura Greenfield Residential Development Feasibility Study

SITE DESCRIPTION		**DEVELOPMENT COSTS**		**SECTION AND HOUSE PRICES**	
Location	Papakura Area	**Raw block land cost per unit**		**Serviced section prices (group sales)**	
Topography	Flat, services nearby	Freestanding home	62,500	Freestanding home	180,000
Size (sqm)	30,000	Terraced house	49,342	Terraced house	160,000
Raw Block Land Price ($/sqm)	125				
Land Asking Price	3,750,000	**Conversion of block land to serviced lots**		**Mid-spec new home prices**	
		All inclusive (hard, soft, council) cost per unit	90,000	Freestanding home	500,000
PRODUCT MIX				Terraced house	480,000
Freestanding home net lot size (sqm)	350	**House construction costs psm (mid-spec)**			
Freestanding home floor area	150	All inclusive (bldr margin, landscaping, etc)	1,440		
Terraced house lot size incl access lot	275			**DEVELOPMENT TIMEFRAME**	
Terraced house floor area	120	**House construction costs per dwelling unit**		Land purchase to sections (months)	18
Share of freestanding homes	50%	Freestanding home	216,000	House construction (months)	6
Share of terraced houses	50%	Terraced house	172,800		
LAND UTILISATION		**Developer (Management) Fee (% land dev't cost)**		**INCLUSIONARY ZONING POLICY**	
% of land occupied by roads, etc	30%	Developer overhead during project	3.0%	Percentage of units to be 'affordable'	10%
No. of freestanding house lots	30			Number of affordable units	7
No. of terraced house lots	38	**Sales Expenses**		Affordable Terraced House Price	365,396
		Marketing per unit	2,300	Benchmark Annual Household Income	73,372
DEVELOPMENT MARGIN (PROFIT & RISK)		Legal per sales transaction	1,150	Annual Interest Rate	5.25%
% of total costs incl bank finance costs	20%	Commission on land sales	6.0%	Home Deposit	10%
		Commission on house sales	5.0%	Loan Term (years)	30
BANK FINANCING COSTS					
Effective interest per annum	8.8%			DBH Quick Calc for Spec-build psm	1,810
				Affordable Terraced Lot Price	148,196
FINANCING MIX					
Raw Land ONLY (pre-resource consent)					
Bank	50%				
Equity investor	50%				
Improvements (civil infrastructure & houses)					
Bank	75%				
Equity investor	25%				
Annual Council Rates	10,000				

Box 2: Assumptions Used in Upper Harbour Greenfield Residential Development Feasibility Study

SITE DESCRIPTION		**DEVELOPMENT COSTS**		**SECTION AND HOUSE PRICES**	
Location	Hobsonville Point	**Raw block land cost per lot**		**Serviced section prices (group sales)**	
Topography	Flat, services nearby	Freestanding home	85,714	Freestanding home	250,000
Size (sqm)	30,000	Terraced house	63,830	Terraced house	200,000
Raw Block Land Price ($/sqm)	200				
Land Asking Price	6,000,000	**Conversion of block land to serviced lots**		**Arch designed new home prices**	
		All inclusive (hard, soft, council) cost per lot	90,000	Freestanding home	775,000
PRODUCT MIX				Terraced house	625,000
Freestanding home net lot size (sqm)	300	**House construction costs psm (arch designed)**			
Freestanding home floor area	200	All inclusive (bldr margin, landscaping, etc)	1,850		
Terraced house lot size incl access lot	225			**DEVELOPMENT TIMEFRAME**	
Terraced house floor area	120	**House construction costs per dwelling unit**		Land purchase to sections (months)	18
Share of freestanding homes	50%	Freestanding home	370,000	House construction (months)	6
Share of terraced houses	50%	Terraced house	222,000		
LAND UTILISATION		**Developer (Management) Fee (% land dev't cost)**		**INCLUSIONARY ZONING POLICY**	
% of land occupied by roads, etc	30%	Developer overhead during project	3.0%	Percentage of units to be 'affordable'	15%
No. of freestanding house lots	35			Number of affordable units	12
No. of terraced house lots	47	**Sales Expenses**		Affordable Terraced House Price	365,396
		Marketing per unit	2,300	Benchmark Annual Household Income	73,372
DEVELOPMENT MARGIN (PROFIT & RISK)		Legal per sales transaction	1,150	Annual Interest Rate	5.25%
% of total costs incl bank finance costs	30%	Commission on land sales	6.0%	Home Deposit	10%
		Commission on house sales	5.0%	Loan Term (years)	30
BANK FINANCING COSTS					
Effective interest per annum	8.8%			DBH Quick Calc for Spec-build psm	1,810
				Affordable Terraced Lot Price	148,196
FINANCING MIX					
Raw Land ONLY (pre-resource consent)					
Bank	50%				
Equity investor	50%				
Improvements (civil infrastructure & houses)					
Bank	75%				
Equity investor	25%				
Annual Council Rates	15,000				

Chapter 4: Analysis of Greenfield Residential Feasibility

Introduction

Given the assumptions set out in Boxes 1 and 2, models were created in MS Excel for each of the two hypothetical developments. The actual analysis is quite straightforward and determines residual land value by taking the sales revenue derived from selling sections or houses and subtracts sales expenses, development costs and the development margin to arrive at a residual land value. This amount is then compared with the assumed purchase (or firm asking) price. If the difference between the two is a positive number then it is likely that the project would proceed to the due diligence stage. However if the difference is negative, meaning that the computed residual land value is less than what is required to purchase the land, then the developer and equity partner would likely seek other development opportunities.

General Findings

The results of the financial analysis of the Papakura development is presented in Box 3 while the Upper Harbour site's feasibility results are provided in Box 4. Both sets of analyses assume an inclusionary zoning requirement that 10 per cent of developed dwelling units (or vacant sections) be provided at the above-mentioned affordable housing price. Under such a policy the Papakura model suggests that a developer considering the purchase of block land at $125 per square metre would only proceed if the business model entailed converting the raw land into completed homes. For those seeking development opportunities in the Papakura area who exclusively convert block land to sections, the model suggests this will not prove financially viable under the assumptions made.

The results of the Upper Harbour feasibility study are more promising for both the fictitious developer and the Council desiring to supply affordable housing. Based on a 10 per cent inclusionary zoning policy, the feasibility model suggests that a developer purchasing the hypothetical site for $200 per square metre will realise a development margin above 20 per cent through either the development of serviced sections or completed houses.

Box 3: Papakura Greenfield Residential Development Feasibility Study Results

LAND DEVELOPMENT TO SECTIONS			LAND DEVELOPMENT TO HOUSES		
Development Costs			**Development Costs**		
All inclusive conversion of raw land to sections	-6,120,000		All inclusive conversion of raw land to sections	-6,120,000	
			Construction of Freestanding homes	-6,480,000	
			Construction of Terraced houses	-6,566,400	
Development (Management) Fee	-183,600		Development (Management) Fee	-183,600	
Bank Financing Costs for Land	-247,500		Bank Financing Costs for Land	-330,000	
Bank Financing Costs for Civil Works	-605,880		Bank Financing Costs for Civil Works	-605,880	
			Bank Financing Costs for Home Construction	-430,531	
Council Rates	-15,000		Council Rates	-20,000	
Marketing	-156,400		Marketing	-156,400	
		-7,328,380			-20,892,811
Section Sales			**House Sales**		
Freestanding home sections (market)	5,400,000		Freestanding homes (market)	15,000,000	
Terraced house sections (market)	4,960,000		Terraced houses (market)	14,880,000	
Terraced house sections (IZ affordable)	1,037,372		Terraced houses (IZ affordable)	2,557,772	
		11,397,372			32,437,772
Less Sales Expenses			**Less Sales Expenses**		
Legal (conveyancing)	-78,200		Legal (conveyancing)	-78,200	
Commission on land sales	-683,842		Commission on house sales	-1,494,000	
		-762,042			-1,572,200
GST Refund Claimed		1,055,766	Net GST payable on sales		-1,731,416
Development Margin (Profit & Risk)		-1,465,676	Development Margin (Profit & Risk)		-4,178,562
	Residual Land Value	2,897,040		Residual Land Value	4,062,783
	Assumed Block Land Price	3,750,000		Assumed Block Land Price	3,750,000
	Difference	-852,960		Difference	312,783

Box 4: Upper Harbour Greenfield Residential Development Feasibility Study Results

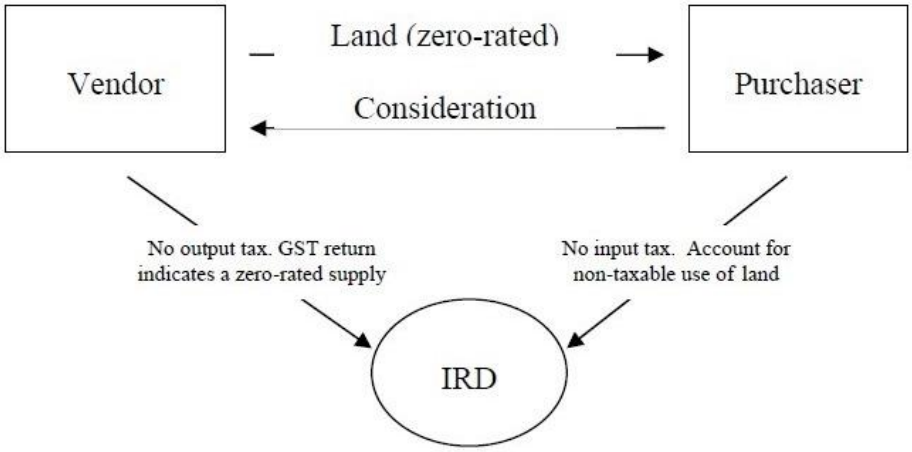
LAND DEVELOPMENT TO SECTIONS		
Development Costs		
All inclusive conversion of raw land to sections	-7,380,000	
Development (Management) Fee	-221,400	
Bank Financing Costs for Land	-466,895	
Bank Financing Costs for Civil Works	-730,620	
Council Rates	-22,500	
Marketing	-188,600	
		-9,010,015
Section Sales		
Freestanding home sections (market)	8,750,000	
Terraced house sections (market)	7,800,000	
Terraced house sections (IZ affordable)	1,185,568	
		17,735,568
Less Sales Expenses		
Legal (conveyancing)	-94,300	
Commission on land sales	-1,064,134	
		-1,158,434
GST Refund Claimed		1,309,055
Development Margin (Profit & Risk)		-1,802,003
Residual Land Value		7,074,170
Assumed Block Land Price		6,000,000
Difference		1,074,170

LAND DEVELOPMENT TO HOUSES		
Development Costs		
All inclusive conversion of raw land to sections	-7,380,000	
Construction of Freestanding homes	-12,950,000	
Construction of Terraced houses	-10,434,000	
Development (Management) Fee	-221,400	
Bank Financing Costs for Land	-723,825	
Bank Financing Costs for Civil Works	-974,160	
Bank Financing Costs for Home Construction	-771,672	
Council Rates	-30,000	
Marketing	-188,600	
		-33,673,657
House Sales		
Freestanding homes (market)	27,125,000	
Terraced houses (market)	24,375,000	
Terraced houses (IZ affordable)	2,923,168	
		54,423,168
Less Sales Expenses		
Legal (conveyancing)	-94,300	
Commission on house sales	-2,575,000	
		-2,669,300
Net GST payable on house sales		-3,120,190
Development Margin (Profit & Risk)		-6,734,731
Residual Land Value		8,225,289
Assumed Block Land Price		6,000,000
Difference		2,225,289

Treatment of GST

It is worth noting that the model is quite explicit in terms of accounting for GST inputs and outputs. This is because as of 1 April 2011 the GST rules regulating the sale of land between GST registered parties (e.g. a greenfield residential developer selling a group of sections to a homebuilder) simplified such transactions so that they are zero-rated. Figure 6 provides a diagram explaining the new regime. This graphic was included in a commentary by the Minister of Revenue in 2010 on the Taxation (GST and Remedial Matters) Bill.

Figure 6: Example of a Zero-rated transaction



What is important to understand is that in the case of developers converting raw land to serviced sections they shall be claiming GST input tax, which is charged to them in invoices by a wide range of service providers such as planning consultants and digger operators. When the land sections are on-sold to homebuilders the developers do not need to pay GST output tax to the Inland Revenue Department (IRD). This is because it is understood that the homebuilder, who is also GST registered, will pay output tax upon selling the completed homes at some point in the future. That said the price paid for the group sections by the homebuilder takes into consideration the future GST output payable to IRD.

In the case of greenfield residential developers that directly produce completed homes rather than sections, GST on the sale of the homes to end users is payable to IRD. This is true even when the purchaser is a GST registered property investor since residential rents are not subject to GST. Therefore the transacted land will not produce taxable supplies going forward and does not qualify for zero-rating.

In terms of the GST effects on the analysis, the left-hand portion of Boxes 3 and 4 provides the results for developing raw land into service sections rather than homes. Since the burden of GST is shifted to the homebuilders who purchase groups of sections from the developer, the line item states “GST Refund Claimed” and is a positive figure. As previously mentioned, the purchase price paid by the homebuilders does reflect the GST burden assumed when they acquired the sections.

The right-hand potion of Boxes 3 and 4 offers the results for developing the land into completed homes for sale to owner occupiers or investors. Given that GST will be paid directly by the developer in this case, the line item here states "Net GST Payable on House Sales". This is the net difference between the GST output realised at the point of selling the houses and the GST inputs, or credits claimed by the developer, for third party services such as the selling agent, the subcontractor that formed and sealed the roads, and so on.

Greenfield Residential Development Viability

To explore sensitivities, the residual land value model was re-analysed using varying percentage requirements under an inclusionary zoning (IZ) policy. The goal was to identify at what percentage do the hypothetical developments lose financial viability, under the base assumption of a 20 per cent development margin and two higher alternative profit margins of 25 and 30 per cent. The results of this simplistic, two variable sensitivity analysis is presented in Figure 7. Assuming a 20 per cent margin, the development of raw land into serviced sections within the Papakura submarket would not be financially viable even in the absence of an inclusionary zoning policy. However when developers follow the business model of converting raw land into completed houses, the model suggests that developers and their equity partners can still achieve at least a 20 per cent development margin under an IZ policy mandating 15 per cent of the dwellings be sold at the stipulated 'affordable' price. However when the development margin is increased, business model applied in Papakura produces satisfactory returns to the developer and equity investor.

Figure 7: Development Viability by IZ Policy Requirements

Submarket	Business Model	Inclusionary Zoning Policy Requirement (% Affordable) None	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Papakura	Sections	Not Viable										
	Houses	Viable				Not Viable						
Upper Harbour	Sections	Viable							Not Viable			
	Houses	Viable					Not Viable					

Development Margin = 20%

Submarket	Business Model	Inclusionary Zoning Policy Requirement (% Affordable) None	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Papakura	Sections	Not Viable										
	Houses	Not Viable										
Upper Harbour	Sections	Viable						Not Viable				
	Houses	Viable				Not Viable						

Development Margin = 25%

Submarket	Business Model	Inclusionary Zoning Policy Requirement (% Affordable) None	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Papakura	Sections	Not Viable										
	Houses	Not Viable										
Upper Harbour	Sections	Viable				Not Viable						
	Houses	V	Not Viable									

Development Margin = 30%

With the prices of new houses, and houses in general, considerably higher in the Upper Harbour submarket than in Papakura, greenfield residential developments in the North Shore that produce competed houses would be impacted greater than developments producing only serviced sections. This said both business models in the more affluent Upper Harbour submarket can absorb more IZ policy requirements than Papakura, based on the assumptions made. Specifically, Upper Harbour developments converting land into serviced sections still provides a 20 per cent development margin under a 40 per cent IZ policy. The policy requirements in the same submarket would need to drop to 25 per cent to enable developers to convert raw land into completed houses. The clear difference lies in the gulf between market priced houses in Upper Harbour and the affordable housing price based on the median household income for Auckland Region.

When development margins are increased, the financial viability of greenfield developments in Upper Harbour reduces in-step. Under an assumed 25 per cent development margin, both business models are viable but the conversion of raw land to sections is viable when IZ policy prescribes no greater than 30 per cent of units be 'affordable'. In the case of developing completed houses, the highest IZ policy requirement is 15 per cent affordable units.

When the development margin is assumed to be equal to 30 per cent of development costs, the conversion of land into completed houses is not financially viable under any IZ policy. In other words, developers and their equity partners demanding such a high return for their time and capital would elect not to develop new houses in the Upper Harbour submarket, according to the assumptions made. However, the model suggests that converting block land into sections remains viable and can accommodate an IZ policy requiring up to 20 per cent of units to be sold at the mandated 'affordable' price.

Chapter 5: Conclusions

Inclusionary zoning affects the land development process and alters the residential developer's decision making environment. The incorporation of affordable housing units within a development alters the costs and gross development value of any project and consequently affects the development's financial feasibility. In England, where inclusionary zoning is legislatively mandated, development feasibility analysis focuses primarily on calculating a static residual land value. Models, such as the widely used Three Dragons model, employing simplifying assumptions and benchmark data (see City of London, 2010; Golland, 2010; Greater London Authority, 2012), are used to generate base case scenarios for discussions between individual developers and local planning authorities. Developing upon the English experience, this study employs a simple residual value model to explore the possible impact of inclusionary zoning on the financial feasibility of greenfield development in Auckland. Recognising that all residential developments have site-specific costs and revenue streams, our analysis offers general insights into how an inclusionary housing requirement could influence development feasibility in different parts of the Auckland RUB area.

This report presents an analysis of greenfield residential developments and estimates the impacts of inclusionary zoning policies on the financial feasibility of two hypothetical developments in Paparkura and Upper Harbour. The tool used in the analyses was a standard residual land value model with the assumptions derived from a combination of publicly available secondary data and primary data gathered during interviews with eleven property professionals. In the case of the Papakura model, the key assumptions were adopted at the median value of each variable (e.g. raw block land price). Necessary adjustments were then made to some assumptions to reflect the differences with the Upper Harbour submarket.

The 3-hectare size of the hypothetical developments was chosen to emulate a single stage of a larger development project. Furthermore each site was assumed to be flat and uncomplicated, and the projects are assumed to be adjacent to necessary infrastructure such as sewerage, water supply and power. A clear limitation of such an analysis is that the hypothetical developments do not reflect the complex realities of developing actual block land into sections and houses. For instance the analysis does not consider the holding costs of larger blocks of land that may be developed over many years across multiple stages.

The models provide a useful broad brush measure of the impact of inclusionary zoning on the financial viability of greenfield residential developments in Auckland within the current market conditions. Using the Papakura feasibility study as a guide, developments in lower-priced housing submarkets are potentially capable of delivering up to 15 per cent of their housing units at prices that a household on the Auckland Region median income can afford. In higher-priced submarkets such as Upper Harbour, new developments can potentially provide up to 25 per cent of their serviced sections at affordable prices and still provide a development margin in excess of 20 per cent. Lastly, the Upper Harbour residual land value model suggests that such developments can potentially supply up to 40 per cent of their completed houses at affordable prices and still generate a sufficient profit.

In closing it should be noted that developers may view an inclusionary zoning policy as an additional layer of risk. For instance it is plausible that in a sudden downturn a new subdivision will remain obliged to satisfy its affordable housing commitments. This could have dire financial implications for the developer, equity investor and lender. In addition some interviewees felt that incorporating policy-driven affordable homes into otherwise market-driven projects may potentially lower the market appeal and value of the unsubsidised units. The stated reason for this sentiment is that some potential homebuyers

may not approve of living in proximity to people of lower socioeconomic standing who acquired their home for a fraction of the price they paid. These perceived risks could potentially lead to a general increase in the development margin sought by developers and their equity partners, which is reflected in the results presented in Figure 7.

Inclusionary zoning may also have an indirect impact on block land prices. In the market's response to such a policy it is reasonable to assume that landowners may be willing to accept lower purchase offers due to the IZ requirements imposed on block land, all other factors held constant. In addition many interviewees suggested that the end result of inclusionary zoning would be an increase in the sales prices of the market-priced homes in order to compensate for the losses associated with the development's affordable homes.

This assumes, however, however, that inclusionary zoning requirements would not be "passed back" ' into the land price. It also assumes that market prices for new houses are largely set by developers. In fact, new house prices are strongly influenced by the secondary market consisting of existing homes for sale within a given submarket. Sales transactions of new houses tend to represent a small proportion (typically less than 25 per cent) of overall home sales across Auckland.

Such suggested secondary impacts of an inclusionary zoning policy were not explored in this report. Further research that incorporates more intricate multivariate sensitivity analysis (including policy effects on market-priced, unsubsidised units and pricing of block land) may provide useful insight into the potential knock-on effects raised by some interviewees.

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