

# **Inclusionary Zoning and Brownfield Residential Development: A Feasibility Study**

**Report prepared for Auckland Council**

**July 2013**

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## Chapter 1: Introduction to the Study

Within the Unitary Plan notification process the Auckland Council has signaled a willingness to address housing affordability issues in the region. As part of this process the Council is considering the implications of introducing inclusionary zoning policies that are designed to require developers to provide affordable housing. The details of the proposed inclusionary zoning regime are set out in the Addendum to the draft Unitary Plan.

At a broad level it is proposed that:

“In simple terms, developments of ten or more dwellings would have to provide a set percentage of the homes (e.g.10% to 20%) at an affordable price. The District Plan would need to set out criteria, by which affordability could be measured, with these criteria able to keep up with changes to incomes and bank lending interest rates. For example the criteria could refer to homes being affordable where households on 80 to 120% of median household incomes pay no more than 30% of gross income on rent or mortgage payments (based on normal bank lending criteria)” (p 23).

The proposed policy distinguishes between greenfield areas (undeveloped areas), where inclusionary zoning will be compulsory and brownfield areas (existing urban areas) where inclusionary housing will be voluntary. The rationale for a voluntary inclusionary housing system is set out as follows:

“In areas identified for urban redevelopment, it is suggested that the affordable housing requirement be voluntary, based on a bonus scheme. These would apply to larger developments in the proposed Mixed Housing, Terraced Housing and Apartment zone and in metro, town, and local centre zones. This voluntary approach reflects the fact that the Unitary Plan will have already signalled these areas for more intensive development, and so the uplift in land values has already occurred. However, when areas are rezoned in the future, then a mandatory requirement could be introduced. The two main options for a bonus would be additional building height (extra storeys), or additional building coverage. It is suggested that in town centres, extra height could be available, up to 2 storeys, while in residential zones the bonus be based on extra coverage, although this would need to be evaluated against proposed coverage provisions in the draft Auckland Unitary Plan and potential impacts for storm water management” (p 24).

Murphy and Rehm (2013) provide an analysis of the possible impacts of an inclusionary housing scheme on greenfield development feasibility. Developing upon their analysis, this study examines the possible impacts of adopting a voluntary inclusionary zoning scheme on brownfield developments.

## **Chapter 2: Review of the Literature**

### **Introduction**

Inclusionary zoning policies are designed to extract public benefit from planning decisions and processes. In their analysis of inclusionary zoning and urban greenfield development in Auckland, Murphy and Rehm (2013) provide a detailed review of the academic literature relating to inclusionary zoning and development feasibility studies. Drawing on this literature they highlight the impact of inclusionary housing policies on residual land value, developer profitability, and development feasibility.

In contrast to the proposed mandatory inclusionary housing scheme for greenfield sites, the Addendum to the draft Unitary Plan proposes a voluntary scheme for brownfield sites. The voluntary nature of the proposed scheme has significant implications for understanding and modelling the impact of inclusionary zoning on development feasibility. Under a mandatory system, such as S106 in England, a developer includes affordable housing within a scheme in order to gain planning permission for a development. In effect, inclusionary housing is an additional cost incurred by developers in order to access development profit. Under a voluntary scheme affordable housing will be provided if individual developers see the economic merits of providing affordable housing.

Brownfield residential development processes differ from greenfield development in terms of site/development conditions and product types (Terraced housing, High rise apartments), as well as the proposed regulatory framework in which they will be governed.

The proposed inclusionary zoning policy for brownfield developments incorporates two important issues that need to be examined in detail. First, the policy recognises the distinct character of brownfield development processes that have implications for product type, design issues and development costs. These factors have a direct impact on development feasibility. Second, the policy proposes the use of density and/or height bonuses to induce development. The underlying rationale for the use of developer bonuses needs to be examined. The following literature review consists of four sections:

- 1) Development Feasibility and Residual Value
- 2) Brownfield Development- Definitional Issues
- 3) Brownfield development and the development process
- 4) Planning policy, inclusionary zoning and developer incentives.

## Development Feasibility and Residual Value

Murphy and Rehm (2013) review a range of issues relating to development feasibility and inclusionary zoning. The key factors involved in calculating residual land value and developer profit are set out in Table 1.

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

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

(Source: Atherton et al, 2008)

Developing upon the wider academic literature (Atherton et al, 2008; Byrne et al, 2011), which highlights the role of traditional (or static) residual valuation in determining initial development feasibility, and the increasing use of residual value development feasibility modelling in the UK planning system (Golland, 2010; Greater London Authority, 2010), Murphy and Rehm (2013) argue that “the basic traditional residual valuation continues to be employed in the industry and has merit as a form of analysis” (p 7). The static model is usually employed as an initial indicator of development feasibility.

Interviews with developers, undertaken as part of the study on greenfield development feasibility in Auckland, confirmed that “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” (Murphy and Rehm, 2013, p 16). While the standard residual valuation model usually models profit on gross development value, the initial decision-making hurdle for developers is calculated as profit on costs (see Wilkinson and Reed, 2008)). In the Auckland context, Murphy and Rehm (2013, p 19) found that, among the developers who were interviewed, the cost on profit measure was a key indicator of feasibility and that there was “a near consensus [that] 20 per cent of development costs” was required.

## **Brownfield Development - definitional issues**

Internationally, urban regeneration policies have been developed in order to address the problem of market failure in urban land markets (i.e. the on-going and persistent presence of derelict urban sites). Within the broader scope of urban redevelopment policies, residential brownfield developments have been encouraged in order to address housing affordability, urban sustainability and land contamination issues. The various ways in which brownfield development has been defined within national housing policies has implications for the nature and character of the policies implemented. At a broad level, the UK and US definitions of brownfield development represent the two major policy perspectives that govern brownfield development.

Adams et al (2010) trace the evolving definition of brownfield development in the UK and North America. In the UK, brownfield development emerged as simply the opposite of greenfield development. However, in the context of planning regulations that required 60% of new housing to be located on previously developed land, a more detailed definition of brownfield development has come into effect. In the UK brownfield development is defined as: "... previously developed land that is unused or may be available for development. It includes both vacant and derelict land and land currently in use with known potential for redevelopment (ODPM 2005 cited in Adams et al, 2010, p 79). In the USA and Canada, the most commonly used definitions of brownfield development, have emphasised the presence of land contamination. In the USA brownfield development has been legally defined as "Real property, the expansion, redevelopment or reuse of which may be complicated by the presence or potential presences of a hazardous substance, pollutant, or contaminant" (Adams et al, 2010, p 80).

The manner in which brownfield development has been defined has implications for the nature of policy development. The UK definition positions brownfield development as a part of a simple residential development process. Consequently, notwithstanding the specific challenges of developing on previously developed site, the development feasibility process for brownfield urban development is conceptualised as a residual valuation process (see Murphy and Rehm, 2013). Within the context of increased demand for urban living it is assumed that brownfield development will be profitable. In contrast, the US and Canadian perspectives emphasise the problem of land contamination and the need for explicit subsidies to induce urban redevelopment. In the North American context it is argued that, in the absence of subsidies, land remediation costs will impede development.

In New Zealand it is clear that residential brownfield development takes place in a context where land contamination is not viewed as a major constraint on development and where development profits have been realised without government subsidies. In this context, the New Zealand brownfield development process aligns closer to the UK experience than the US experience. This is an important point, especially considering that the proposed inclusionary zoning regime in Auckland will include either density or height bonuses (incentives) for developers. These incentives are offered as compensation for developers who include affordable housing in a development and are not viewed as necessary inducements to produce brownfield developments.

## **Brownfield Development and the Development Process**

The brownfield development process differs from greenfield development in a number of ways that have a bearing on development feasibility studies. In attempting to model development feasibility it is important to recognise specific contextual issues that shape the costs and decision-making environments faced by developers.

In contrast to the relative simplicity of developing large-scale housing developments on the urban periphery, brownfield developers face a number of land supply constraints, including planning, physical and land ownership constraints (Adams et al, 2010). Even under regulatory environments that favour urban redevelopment, opposition from existing residents and local authority policies designed to promote non-residential land uses can result in planning constraints on brownfield development. Moreover, the physical process of site preparation, especially in situations involving land contamination or complex earthworks (e.g. the redevelopment of a large industrial site) can constrain brownfield development processes. However, probably the most important constraint on brownfield development, relates to land ownership issues. Work undertaken in the UK identified a number of land ownership constraints faced by residential brownfield developers. These included: problems in identifying land owners, divided ownership rights, land assembly issues, land owners with unreasonable price expectations and land owners unwilling to sell (Adams et al, 2001). This study found that the most significant and disruptive land ownership constraints related to land assembly issues, especially in situations where there were multiple owners. The problem of land assembly in existing urban centres can delay the development process, resulting in higher holding costs that have significant implications for development feasibility.

In addition to the constraints faced by brownfield developers, brownfield residential development demands a different set of development competencies compared to greenfield development. In contrast to the standalone single house that dominates greenfield developments in New Zealand, brownfield developments consist of terraced townhouses and medium to high-rise apartments. These types of developments demand different construction methods as well as design and marketing skills. Adams (2004) in an analysis of the UK situation argues that conventional developers that elect to redevelop brownfield sites need to develop a suite of new core competencies including: new land acquisition skills, enhanced community and planning negotiation skills, and greater product design and marketing skills. In the UK, brownfield residential development involved a shift in production to “specialist companies or specialised subsidiaries of volume house-builders” (Adams, 2004, p 619). The importance of community and planning engagement and the shift to bespoke design solutions has potentially significant cost implications for brownfield development.

Murphy and Rehm’s (2013) analysis of inclusionary zoning and greenfield development feasibility highlighted the structural difference between the UK and NZ development process. In the UK greenfield development involved a developer undertaking land preparation and housebuilding activities combined. In contrast, and similar to Australia (see Ball 2006), greenfield development in New Zealand involves a land development industry and a housebuilding industry. This two industry structure meant that the impacts of inclusionary zoning on greenfield development needed to be examined in terms of house lot development and house development (see Murphy and Rehm 2013). In contrast, brownfield residential developers in New Zealand undertake land preparation and house building as a complete activity. Consequently, when modelling brownfield residential development feasibility the New Zealand experience accords well with UK models.

## Planning Policy, Inclusionary Zoning and Developer Incentives

In contrast to the proposed compulsory nature of inclusionary zoning in greenfield sites, the Addendum to the Unitary Plan proposes a voluntary inclusionary zoning regime in residential brownfield development. In recognising that planning uplift has already been priced into land values in existing urban areas, it is proposed that developers receive density and/or height bonuses to compensate for the inclusion of affordable housing units in a development. While developer incentives have been used overseas, the proposed incentives set out in the Addendum to the Unitary Plan are conceptually and empirically innovative and have an important bearing on development feasibility studies. In order to understand the nature and impact of the proposed incentives it is important to situate the proposal within the international experience of inclusionary housing policies.

The US and UK inclusionary housing regimes represent two major approaches to using the planning system to promote affordable housing. The US inclusionary housing system has a tradition of using developer incentives to promote affordable housing. In contrast, the UK inclusionary housing regime is based on mandatory requirement and does not usually include incentives.

The planning system in the US is fragmentary and based on very local, metropolitan scale, planning systems. Consequently, the history of inclusionary zoning in the US is characterised by a variety of different, locally based, schemes (see Calavita and Mallach, 2010). However, the United States Constitution's Fifth Amendment provides a major constraint on land use policies in that "bars the taking of private property without compensation" and creates "the framework for the extent to which the diminution of land value through regulation is considered a regulatory taking" (Mallach and Calavita, 2010, p 19). Arising from the complex interaction of local and federal policies, inclusionary zoning is usually associated with a set of benefits or incentives for developers. Mallach and Calavita (2010, p 36) state that "offsets are public sector actions that compensate developers for the costs associated with meeting inclusionary requirements, either by reducing the cost or increasing the return to the developer". Incentives can include: density or height bonuses, fee waivers, and 'fast-tracking' planning permission processes. The most commonly used incentive associated with inclusionary zoning is a density bonus "in which the municipality permits an additional number of market units in return for the developer's provision of affordable housing" (Mallach and Calavita, 2010, p 36).

In contrast to the US system, the inclusionary housing system in the UK has developed within a national regulatory system in which development rights have been effectively nationalised. The success of inclusionary housing policy in the UK rests on the fact that the:

"... government owns development rights to land independently of the private ownership of that land, and recent legislation has allowed for the mandate of the affordable housing provision as a prerequisite for planning permission.... Every development must obtain planning permission, and local authorities can accept or refuse applications based on a commitment to affordable housing" (Monk, 2010, p 125).

Within this system it is argued that affordable housing (Section 106) obligations are fully anticipated by developers and reflected in a lower gross development value. For any given profit margin of a developer, this lower gross development value reduces the residual value of a site and consequently the cost of affordable housing is borne by the landowner. Landowners carry this cost since the granting of planning permission ensures that the price of the land will increase compared to the existing use value. Under this regime there is no requirement to provide incentives to developers, as the granting of planning permission

ensures that developers have the opportunity to realise development profits (see Murphy and Rehm, 2013).

The New Zealand planning context differs from the US and UK systems. In the Addendum to the draft Unitary Plan the legislative basis of the proposed inclusionary zoning scheme are situated in the provisions of the RMA and various court decisions. The Addendum argues that the:

“Environment and High Court decisions have established that affordable housing is a relevant issue for RMA plans to consider, but how plans are to best deal with the issue is dependent upon local context and circumstances” (Addendum to the draft Unitary Plan, p 28).

Moreover the Addendum notes that:

“In July 2010 the Environment Court ruled that the Queenstown Lake District Council can address housing affordability under the Resource Management Act. In February 2011 the High Court found the Queenstown Lakes District Council could address affordable housing through a proposed plan change following an appeal by three parties to the 2010 decision of the Environment Court’ (p 28, Footnote 14).

In general, the stated legal basis for inclusionary zoning in New Zealand has similarities with the UK context. In effect, developers are being asked to address the negative outcomes of development (i.e. the lack of affordable housing) by providing affordable housing. However, the proposed brownfield scheme represents something of a hybrid of the UK and US system in that it allows for developer incentives. However, in contrast to the US system, where incentives are viewed as required compensation for developers’ reduced development values, the proposed incentives represent a simple incentive to induce voluntary developer participation. It is clear that the proposed scheme is more favourable to developers than the UK S106 regime.

## **Conclusions**

Developing upon the review of inclusionary housing and development feasibility studies set out in Murphy and Rehm (2013), this literature review has addressed key issues relating to brownfield residential development. The review highlights the specific development constraints faced by brownfield residential developers and comments on how the UK and the US planning systems have promoted affordable housing. It has been argued that brownfield development demands core competencies and new product types that different from the traditional greenfield development process. In addition, it has been argued that the proposed brownfield inclusionary zoning regime in Auckland is more generous to developers than the UK system and offers incentives akin to the US system.

Arising from this literature review it is clear that the development feasibility models developed in Murphy and Rehm (2013) need to be modified when considering the impact of inclusionary housing on brownfield development. First, the models need to take account of different product types (apartments versus standalone houses), as different housing types will affect developers’ costs and returns. Second, modelling the impacts of inclusionary housing on brownfield development needs to take cognisance of the incentives on offer to developers.

## Chapter 3: Methodology and Data Collection

### Introduction

As the proposed inclusionary zoning policy regarding brownfield residential developments is voluntary rather than mandatory it differs fundamentally from the greenfield policy. In particular developers will have the ability to opt out and choose not to provide affordable dwellings. As the policy gains traction and an increasing number of brownfield developers incorporate inclusionary housing, the choice between volunteering and opting out will shift from being a purely economic one towards a strategic decision regarding consumers' perception of the development firm's commitment to social responsibility. During the policy's infancy, however, developers' choice to embrace inclusionary zoning will hinge on financial feasibility.

The methods and analysis featured in this report attempt to mimic the feasibility studies that brownfield developers will likely conduct during the early stages of their development projects. Such analysis would need to be carried out early as the developer would need to signal Council their intentions to participate and incorporate affordable apartments as part of their resource consent application. The essential question in the mind of a developer is:

*Will the additional market-rate and affordable apartments made possible through the inclusionary zoning bonus result in profits that sufficiently offset any anticipated risks to the pricing and marketability of the development's market-rate apartments?*

The first step towards answering this question involves quantifying the 'benefits' of the inclusionary zoning bonuses in terms of additional market-rate and affordable apartments that would not have been achievable without the bonuses. The researchers have elected to employ a series of hypothetical developments to determine how many extra apartments are likely to be produced by the policy and whether or not the estimated profits generated by these extra units will meet developers' expected profit margin.

The size of the development site is held constant for each hypothetical case but the location varies across five zones outlined in the Draft Unitary Plan:

- 1) Metropolitan Zone;
- 2) Mixed Use Zone;
- 3) Terraced Housing and Apartment Buildings Zone (General);
- 4) Terraced Housing and Apartment Buildings Zone adjacent to a Town Centre; and
- 5) Terraced Housing and Apartment Buildings Zone adjacent to a Metropolitan Centre.

The first two are forms of business zones that attract residential land uses while the remaining zones are variants of a residential zone with differing height limitations depending on adjacency to Metropolitan and Town Centres.

The hypothetical developments also vary in terms of their quality. This mainly involves the submarket where the development is located. Locations within Auckland that are experiencing brownfield residential development such as Grey Lynn are more sought after than less popular submarkets like Manukau Central. Closely related to this is the physical and aesthetic quality of the development's building and unit design, the interior finishes, fittings and fixtures featured within the common areas and the apartments themselves, and onsite amenities such as swimming pool, fitness centre, residents' lounge, etc. These two aspects of quality are merged to form a matrix between the above five Draft Unitary Plan

zones and two quality levels: high quality and medium quality. The result is a series of ten feasibility studies ranging in development quality and zone (e.g. high quality development within a Mixed Use Zone).

## **Interviews**

Prior to carrying out the present study on brownfield development, the researchers completed a report for Auckland Council on the financial feasibility of a draft inclusionary zoning policy for greenfield residential developments (Murphy and Rehm, 2013). As part of that earlier research a series of eleven interviews were held with property professionals. All but two interviewees were greenfield residential developers with extensive experience. The interviews were semi-structured and covered several topics, most of which focused on greenfield developments. However two topics were more general and equally apply to brownfield projects as well, these are:

1. Approach to development feasibility; and
2. Capital structure of residential developments.

## **Feasibility Approach**

The first topic discussed with each interviewee was the general approach used by developers to test development feasibility. Information gathered on these themes guided the design of the model used to test the financial feasibility of inclusionary zoning from a developer's perspective.

Essentially each development opportunity is assessed using a static financial model 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. This is sometimes referred to as a 'back-of-the-envelope' analysis and lies at the heart of a developer's due diligence, which is conducted prior to fully committing to a development project.

This broad-brush approach to determining financial feasibility uses rough cost data from recent experience along with construction cost information from publications such as the *Rawlinsons Construction Handbook* and Davis Langdon's *Blue Book*. In the case of brownfield developments the allowable intensity is largely determined by the district plan and tends not to be limited by availability of necessary public services (water supply, electricity, sewerage, stormwater and roads) since they are already in place. Although there is the possibility of site specific limitations arising from difficult topography, height in relationship to boundary, view shafts and sunlight admission, these restrictions vary widely across the city with the latter two primarily affecting sites in the central business district. For the sake of simplicity the researchers have assumed that the hypothetical development sites being analysed are unaffected by such nuances and are capable of reaching the level of intensity permitted under the draft Unitary Plan.

If the opportunity is deemed feasible, the developer and equity partner then explore the development further and bring in third party professionals such as architects and planning consultants to determine more precisely the location and size of buildings on the site and how many apartments, commercial units and car parks can be produced. 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.

If a brownfield residential developer is considering to incorporate inclusionary housing that decision will be made during the preliminary back-of-the-envelope feasibility analysis rather than a subsequent exercise employing more explicit discounted cash flow modeling. Therefore the methods employed within the present study are static in nature and do not attempt to model detailed development costs and specific timing of cash flows. Furthermore the decision to participate in the Unitary Plan's inclusionary zoning policy centres on the marginal difference between the planned development without inclusionary housing and an alternative form of the development where affordable housing is integrated. Hence the methodology employed in conducting this study centres on a cost-benefit analysis of those marginal market-rate and affordable apartments that are a product of the inclusionary zoning policy as it applies to brownfield residential developments.

### **Capital Structure of Residential Developments**

The second topic covered in the interviews with property professionals related to residential development finance. This involves the main parties' (developer, equity partner and lender) expected financial returns in exchange for investing debt and equity into a given development. In general, the effective annual interest rate charged by the main trading banks for providing debt financing to new developments 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. Overall, the median effective annual interest rate quoted by interviewees was 8.8 per cent. This figure was adopted and used in the 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. 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 2 per cent of the development costs.

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 development land that is in need of resource consent to achieve the land's highest and best use. 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 75 per cent of development costs post-resource consent. As with the effective interest rate the loan-to-cost ratio can vary depending on the particular issues surrounding the development, which lender is involved and the reputation and financial strength of the developer requesting the loan. Given that the present study purely analyses extensions of larger developments rather than the projects as a whole, the researchers have chosen to adopt a 100 per cent loan-to-cost. In other words, it is assumed that developers will use debt financing to cover all the costs of developing the additional, marginal apartments made possible through the Council's inclusionary housing scheme.

## **Hypothetical Brownfield Residential Developments**

As briefly discussed earlier the researchers have considered ten hypothetical development projects in order to broadly gauge the economic viability of inclusionary zoning from the perspective of brownfield residential developers. The projects range in terms of zoning under the draft Unitary Plan. These zones include the Metropolitan Zone, Mixed Use Zone and three variants of the Terraced Housing and Apartment Buildings Zone. For each of the five zones analysed a high quality and a medium quality development is considered.

The physical size of each development site is held constant. The hypothetical site is 2,000 square metres in area with a street frontage of 40 metres and a depth of 50 metres. This shape and size is meant to represent the amalgamation of two smaller parcels that may have historically been full residential sections in the past. The site is further assumed to be an inside lot with a 40 metre road frontage and developed parcels to both sides and rear. Developing such a site is considerably more challenging than a corner lot, a site that spans across a block and commands two street frontages or a site with public open space to the side or rear of the lot. The key difficulty lies in achieving the mandatory outlook space for dwellings within the development, particularly outlook space for the principle living area of each apartment.

In order to determine the number of apartments that each site can accommodate under the Unitary Plan, the various development controls need to be considered. These of course differ between business and residential zones therefore each category will be considered separately.

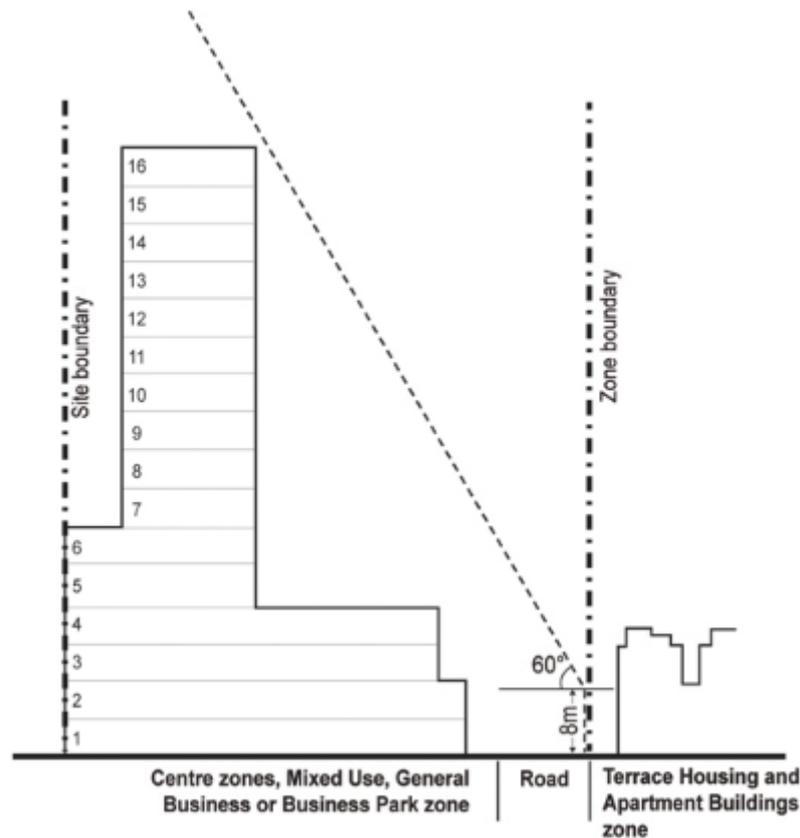
### Business Zone Development Controls

This study considers two business zones, the Metropolitan Zone and the Mixed Use Zone. According to the draft Unitary Plan (section 4.1.1) newly constructed buildings within the Metropolitan Zone are permitted to reach a maximum height of 72.5 metres, or 18 storeys, while buildings in the Mixed Use Zone can reach 16.5 metres, or 4 storeys. Overlaying this restriction the permitted building height is also limited if the site boundary is within close proximity to a differing zone with lower height limitations or public open space. As previously mentioned such height in relationship to boundary limitations will not be considered in either business zone or the Terrace Houses and Apartment Buildings residential zone. In other words each of the hypothetical development sites shall be assumed to be located well within their own zone and shall be unaffected by such height limits.

Figure 1 provides an example of a height in relationship to boundary limitation where a site within the Metropolitan Zone lies across a road from a Terraced Housing and Apartments Building Zone. In this particular example the building cannot achieve a height of 18 storeys. Moreover the effect of this restriction increases towards the site boundary nearest to the zone featuring lower building heights. Undoubtedly many development sites within Auckland

would be subject to such height restrictions. However the numerous varieties of this development control makes modeling its effects unwieldy. Therefore the researchers have chosen to acknowledge but not consider this particular form of limitation on development intensity.

**Figure 1: Example of Height in Relationship to Boundary Limitation**



The remaining key development controls within the draft Unitary Plan that effect brownfield residential developments within business zones are:

1. building setback at upper floors (section 4.1.3);
2. minimum tower separation (4.1.4);
3. maximum tower dimensions (4.1.4); and
4. outlook space (4.19).

The first development control, building setback at upper floors, requires the building facades fronting a road to be setback at least 6 metres once the building reaches a given number of storeys. In the Metropolitan Zone that height is 6 storeys, while in the Mixed Use Zone the setback is required above 4 storeys.

The second development control of concern is minimum tower separation which is similar in nature to the aforementioned setback rule. However, the tower separation rule only impacts buildings over 6 storeys in height and dictates that such towers need to be setback at least 6 metres from any side or rear boundary. For the present study this second development control only impacts the hypothetical developments situated in the Metropolitan Zone.

The third key development control is the maximum tower dimension. This rule limits the bulk of tall buildings towers to a maximum distance of 50 metres across measured from furthest

corner to furthest corner. Given the relatively small 2,000 square metre site area and impacts of the various development controls, the hypothetical developments considered in this report do not threaten to exceed this maximum.

The fourth and most influential development control is outlook space. This regulation effects all new developments featuring residential dwellings regardless of whether the project is located in a business or a residential zone. The intention of the rule is to enhance the privacy of occupants and ensure adequate daylight. The amount of outlook space required depends on the type of room and the room's height within the building. Bedrooms require a minimum of 6 metres of outlook space measured outwards perpendicularly from the building façade. The main challenge, however, lies in the outlook space rules surrounding each dwelling unit's principle living area. The minimum outlook space for such rooms is 15 metres, which is a considerable distance within a 40 by 50 metre site.

For bedrooms and living areas located above 6 storeys the required outlook space increases to 20 metres. The rule does provide some leeway in terms of allowing up to 3 metres of this distance to be contained within balconies that are entirely enclosed within the building envelope. The researchers have taken advantage of this option where applicable while laying out the hypothetical developments.

Given the sites being considered are inner lots the options for outlook space is limited. Essentially the outlook space must either be provided over the public road along the development's street frontage or within the middle or rear of the site. The draft Unitary Plan does allow for outlook space to be provided over a side boundary but this is only permissible if the building is setback at least 10 metres from the road. However within Metropolitan and Mixed Use Zones, development control rule 4.1.5 mandates that at least 50 per cent of new buildings' lengths must front the street to "provide an attractive streetscape and enhance pedestrian amenity". Perhaps these conflicting rules are accidental and will be rectified in the operative Unitary Plan but at present achieving outlook space over a side boundary is not possible within business zones.

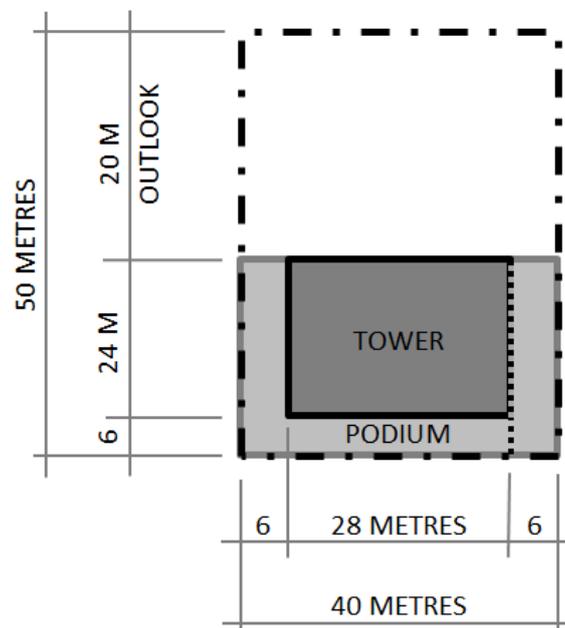
Even if the rules were modified to allow for such a solution to outlook space, the developer would need to negotiate with the adjoining land owners and obtain their written consent as part of their resource consent application. For the hypothetical developments within the Terraced Housing and Apartment Buildings Zone such a strategy is not considered as it would be overly complex and would likely involve compensation from the developer and/or some form of reciprocity (e.g. consenting adjacent landowners are provided shared use of outlook spaces on the development site which comes into play when their own sites are re-developed in the future).

In light of the above-mentioned key development controls, the researchers attempted to layout the hypothetical developments onto 40 by 50 metre inside lots. Figure 2 provides a site plan showing the site boundary, a 6 storey podium and a tower rising above it. The 6 metre minimum building setback at upper floors is shown at the bottom of the plan where the site meets the road. Additional 6 metre tower separations are then provided along the two side boundaries. Furthermore, a 20 metre wide outlook space is provided for those apartments facing the rear of the lot while the apartments facing the street obtain their outlook space via the public road. Although it is possible to extend the podium and tower into this outlook space, the deep floor plates already present significant architectural challenges in laying out apartments. Additional depth will further reduce the amenity of the resulting apartments, which would need to be narrow and maintain a large proportion of floor area at considerable distances from the glazed perimeter. The researchers do not feel the potential added development intensity sufficiently offsets such a loss in amenity. Lastly a 6 metre access way is provided through the podium on the right-hand side which will lead traffic to a parking garage entrance and enable emergency services to access the rear of the

building. In order to accommodate large service vehicles such as rubbish trucks, furniture trucks and fire equipment it is assumed that the access way will be two storeys in height.

As previously mentioned, the width of the tower is 24 metres which is possibly too wide for laying out anything other than large luxury apartments. The podium is even wider at 30 metres which would be a considerable architectural challenge. With these imperfections noted, the gross floor area of each podium level is 1,200 square meters measuring 30 by 40 metres, and the tower floor plate is 28 by 24 metres, or 672 square metres. Given the present study is focused on the cost-benefit of the marginal, additional apartments generated under the draft Unitary Plan's inclusionary zoning policy the floor area of importance belongs to the uppermost levels. This is because in a Metropolitan Zone the IZ policy provides 2 additional floors above the stated height limit of 18 storeys. This translates into an additional 1,344 gross square metres of building area as a result of the IZ bonus.

**Figure 2: Site Plan for Hypothetical Developments in Metropolitan Zone**

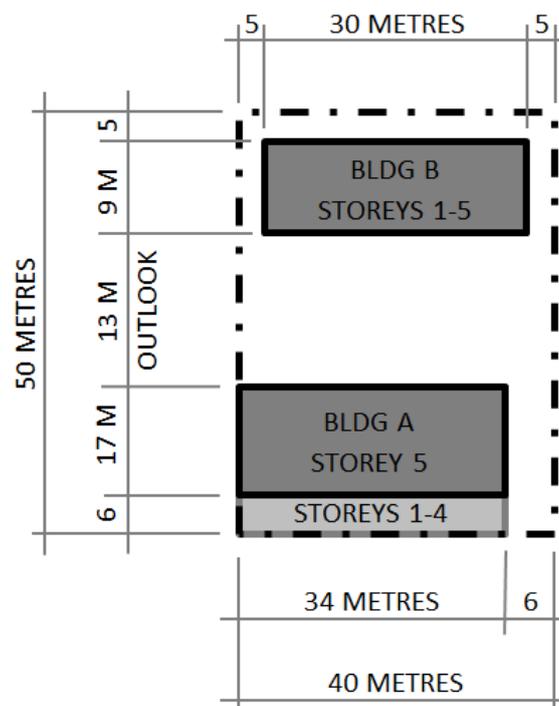


Several options were considered for the Mixed Use developments. The alternative that provided the highest intensity is presented in Figure 3. Here the hypothetical development features two freestanding apartment buildings (Building A and B). With Building A occupying the street frontage it is subject to the building setback at upper floors. In the Mixed Use Zone this only effects the 5th storey and higher. Similar to the site layout within the Metropolitan Zone, Building A occupies the boundary and provides a 6 metre wide access way at the right-hand side boundary to enable vehicles to reach the interior of the property. Although it is possible for the upper storeys to span this access way, as in the case of the Metropolitan Zone's podium, the researchers did not feel this would be the most sensible solution. Not only would there be a general loss of amenity, the access way as shown in Figure 5 enables bedroom outlooks over the 6-metre access. If upper floors extended over the access, this outlook and its provision of necessary daylight would be sacrificed.

The middle of the site is dedicated to a 13 metre wide outlook. Given the shorter building heights permitted within the Mixed Use Zone, the maximum required outlook for the apartments' principle living area is 15 metres. It is assumed that the apartments within Building A facing the centre of the site and all of the units within Building B shall feature 2

metre deep balconies within the building envelope to meet the Unitary Plan's 15 metre outlook space requirement. Balconies up to 3 metres deep are permitted but the researchers feel such a depth would come with excessive amenity loss as rooms located behind these deep balconies will enjoy considerably less daylight. Such a design constraint is not an issue for apartments overlooking the public road at the bottom of the site plan regardless of the narrowness of the street.

**Figure 3: Site Plan for Hypothetical Developments in Mixed Use**



The resulting width of Building A is somewhat wide (23 metres) at storeys 1 through 4 but fairly narrow at storey 5 (17 metres). At all levels the apartments are assumed to be accessed from an internal double-loaded corridor running along the building's long axis. For an example of this design approach see the building floor plans for "Newton's First" within the new, high-quality apartment development in Grey Lynn called *The Isaac* ([www.theisaac.co.nz](http://www.theisaac.co.nz)). The width of Building B is well proportioned assuming the apartments are entered from the extreme rear of the site and are laid out so that the units span its 9-metre width with each apartment's living room facing onto the central outlook space shared with Building A. See the building floor plans of "Newton's Second" for an example of such a layout, which features somewhat less space efficient single-loaded open-air corridors.

Although Building B could legally lie on the rear and side boundaries, a setback of 5 metres is included to enable 6 metre outlook spaces for bedrooms along these facades. Other strategies could be employed to provide bedroom outlook spaces via light wells without building setbacks but this would reduce amenity value. The researchers felt the resulting higher density would not represent a satisfactory tradeoff. As with the central, shared outlook space the bedrooms would need to feature balconies within the perimeter of the building. In the case of bedrooms the balcony depths are assumed to be 1-metre rather than 2-meters for living rooms. In terms of the marginal, additional floor space produced under the inclusionary zoning policy, the extra one storey provided in the Mixed Use Zone results in an additional 578 gross square metres from Building A and 270 square metres from Building B. Overall, developers would be permitted to build an additional 848 square

metres of apartments on the site given the layout shown in Figure 3 and the assumptions made regarding apartment design.

### Residential Zone Development Controls

In addition to considering the above two business zones, this report studies hypothetical developments within three variants of the Terraced Housing and Apartment Buildings Zone, which is one of the newly created zones within the draft Unitary Plan designed to enable intensification of residential areas. The variation that exists within the TH & A Zone involves allowable building height. The general permitted height is 16.5 metres, or 4 storeys. However, if a TH & A Zone is adjacent to select Town Centres, 5 storey heights are permitted, and if the TH & A Zone is adjacent to a different selection of Town Centres or a Metropolitan Centre, developments are permitted to achieve 6 storeys in height. These variations are laid out in a Council publication titled "*The draft Auckland Unitary Plan: Detailed factsheet on proposed residential controls*".

Aside from height restrictions there are several other key residential zone development controls stated in the draft Unitary Plan that influence the achievable intensity of a given site. These are:

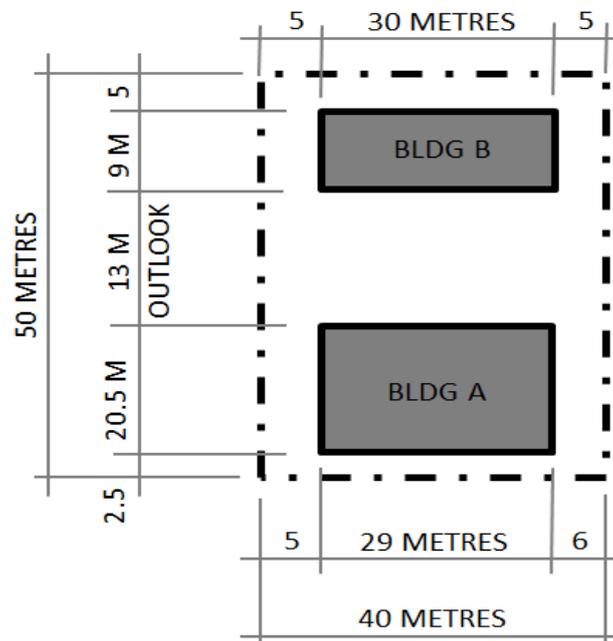
1. Front yards (section 4.4.2);
2. Building setbacks at upper floors (4.4.2); and
3. Outlook (4.4.5).

Under the development control rules for the TH & A Zone, a front yard of at least 2.5 metres in width is required. Similarly building setbacks are required at the side and rear boundaries with the setback distance depending on the building height. For buildings that are no greater than 4 storeys the minimum setback for all floors is 3 metres. For buildings that are either 5 or 6 storeys in height the building setback for the lower 4 storeys is increased to 5 metres and then further increased to 7 metres for storeys 5 and 6.

The provisions related to outlook are identical to those discussed above in relation to the hypothetical development within a Mixed Use Zone. Essentially bedrooms require outlook spaces of at least 6 metres while living rooms require a minimum outlook of 15 metres.

Figure 4 provides a site plan of a hypothetical apartment development within a general TH & A Zone that is not located adjacent to a Town Centre or Metropolitan Centre. Therefore this modeled development is limited to 4 storeys in height and is subjected to the milder 3-metre setback requirements. Despite the narrow minimum setback, the buildings are positioned 5 metres from the side and rear boundaries to enable 6 metre outlooks from bedrooms following the design strategies employed in the hypothetical Mixed Use development.

**Figure 4: Site Plan for Hypothetical Developments in a General (4 storey) Terraced Housing and Apartment Buildings Zone**



Similar layout strategies can be seen between this and the Mixed Use development. The key differences are that rather than being required to provide a frontage along the public road, located at the bottom of the site plan, the site features a mandatory 2.5 metre wide front yard. Also the larger Building A at the front of the site is not permitted to lie on either of the side boundaries but also does not have the 6 metre setback to upper floors as in the case of the Mixed Use Zone development.

Another similarity is the 13 metre outlook space that is shared between Buildings A and B. Lastly Building B within both developments feature a 5 metre setback from the side and rear boundaries to enable 6 metre outlook spaces for bedrooms on those facades. As the inclusionary zoning policy regarding residential zones offers developers a different form of incentive to provide affordable housing, the method of quantifying the marginal effects of the policy is different. In the case of brownfield developments within TH & A Zones, the policy offers an increase in the building coverage area from the draft Unitary Plan's mandated 40% of site area to 45% of site area. This bonus 5% is then translated into additional gross building area incorporated into the development. However given that the hypothetical site is an inside lot, the setback and outlook requirements take a heavy toll on the possibility of breaching the Unitary Plan's 40% limit. Based on the hypothetical development within the general TH & A Zone, the gross footprint of Building A is 494.5 square metres while Building B is 270 square metres.

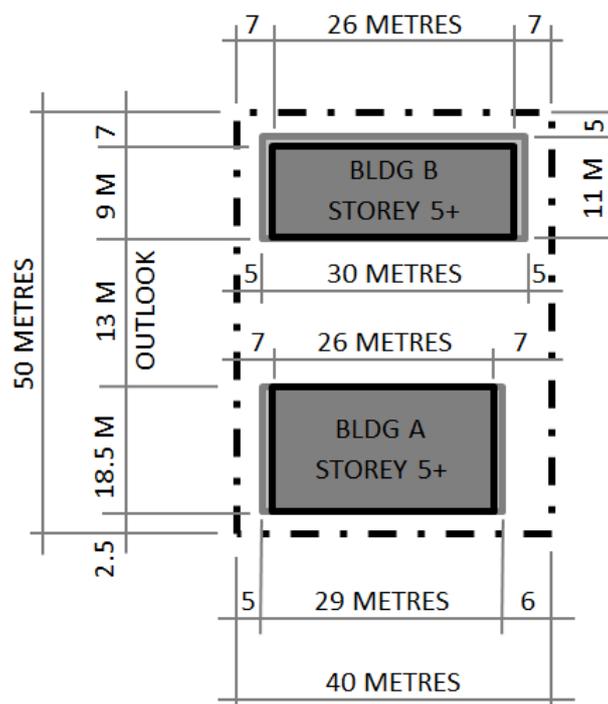
Combined this is total building coverage of 864.5 square metres which occupies 43.2% of the site. Therefore based on the assumptions and efforts made by the researchers the maximum effective IZ bonus in this case would be 3.2%. This comes short of the 5 per cent bonus building coverage area stipulated in paragraphs 103 and 104 in Appendix B (Possible Retained, Affordable Housing Provision) of the Unitary Plan Addendum. If an alternative hypothetical site is considered the full bonus may be fully achievable. This may be the case if the site is larger in size, occupies a corner lot or is located adjacent to a public open space. The 5% bonus may also be achievable if alternative design strategies are employed but as

explained these strategies may come with reduced amenity. There are design strategies that may enable developers to realise the full 5% bonus without a reduction in amenity but these involve detailed architectural study of undulations of the building facades to place measured amounts of floor area within the outlook space while avoiding loss of privacy. Since not all developers will fund detailed architectural investigations at the initial feasibility stage, the researchers felt it would be imprudent to incorporate such design strategies into their analysis.

The final hypothetical developments to consider are those located within TH & A Zones which are either adjacent to select Town Centres or a Metropolitan Centre thereby permitting taller buildings. As the development controls affect the 5<sup>th</sup> and 6<sup>th</sup> storeys equally, a single site plan is considered for both. This plan is presented in Figure 5.

Reflected in the building layouts are the wider building setbacks required for taller buildings in the TH & A Zone. The site plan indicates the higher storeys (5 and 6) in dark grey and the lower floors (1 through 4) in lighter grey. Due to the wider setbacks at higher levels the building footprints are larger at the lower floors. The same strategies are employed regarding outlook space and vehicular access to the inside of the site. Arguably the building widths in the 4 storey development, depicted in Figure 4, are more conducive to apartments than in the case of the taller developments shown in Figure 5. Of course the size of apartments, which relates to development quality and the project's target market, would ultimately determine the 'ideal' building proportions. In any regard the gross footprint at ground level of Building A is 536.5 square metres while Building B is 330 square metres. The resulting total building coverage of 866.5 square metres takes up 43.3% of the site. Therefore the effective IZ bonus in these cases is an additional building coverage of 3.3%. For the purpose of this study, however, an effective building coverage bonus of 3% shall be used in the cost-benefit analysis.

**Figure 5: Site Plan for Hypothetical Developments in a Terraced Housing and Apartment Buildings Zones adjacent to Metropolitan and Town Centres**



## Further Assumptions

Box 1 provides the various assumptions used in the cost-benefit analysis of the additional, marginal market-rate and affordable apartments made possible through the inclusionary zone bonuses. Under the heading 'Development Description' the floor plate areas are provided for the lowest (podium) floors within the Metropolitan and Mixed Use zones. These figures were derived from the above analysis of layout the sites in order to maximise the development intensity. In regards to the Metropolitan Zone developments the podium height was assumed to be equal to the building height at which mandatory 6 metre setbacks are enforced.

The following line item stipulates the number of lowest floors that will be dedicated to non-residential uses. The draft Unitary Plan discourages ground floor residential in business zones and prohibits such ground level apartments in Metropolitan and Town Centres. Given this view, the researchers have assumed that the entire ground floor of the hypothetical developments in the business zones will be non-residential. This assumption does not affect the amount of additional gross floor space generated by the IZ bonuses but it does influence the number of affordable units mandated as this related to the residential floor area rather than overall building area.

The next heading is "Product Description" under which contains assumptions relating to the apartments included in the developments. The standard apartment floor areas of medium quality and high quality developments is based on current listings and marketing brochures from new apartment projects in Auckland that are presently being sold. Examples of high quality developments are *The Isaac* in Grey Lynn ([www.theisaac.co.nz](http://www.theisaac.co.nz)) and *Urba Residences* in Freeman's Bay ([www.urba.co.nz](http://www.urba.co.nz)). Examples of medium quality apartment developments used in this study include *M Central* in Manukau ([www.mcentral.co.nz](http://www.mcentral.co.nz)) and *Nikau Apartments* in Flat Bush (<http://www.barfoot.co.nz/493632>). These developments and others including *132 Vincent Street* (<http://www.vincentst.co.nz>) and *SugarTree* (<http://www.sugartree.co.nz>) in Auckland Central and *Vert* in Herne Bay (<http://www.vert.co.nz>) also guided the analysis and adoption of assumptions.

## Box 1: Assumptions Used in Analysing the Hypothetical Developments

<b>DEVELOPMENT DESCRIPTION</b>		<b>Soft construction costs</b>	
Site area (sqm)	2,000	Professional fees (arch, eng, qs) (% hard cost)	10%
<b>Business Zone Assumptions</b>		Development contributions per unit	10,500
Podium coverage (Storeys 1 & 2) (Metro Zone)	1,020	Infrastructure growth charges per unit	8,500
Podium coverage (Storeys 3 - 6) (Metro Zone)	1,200	Developer (Management) Fee (% dev't cost)	2.0%
Podium coverage (Mixed Use Zone)	1,052	<b>BANK FINANCING COSTS</b>	
Number of full podium storeys	4	Effective interest per annum	8.8%
Number of partial podium storeys w/ access way	2	Construction loan LTV	100%
Number of lowest storeys non-residential	1	<b>PRICES (INCL CAR PARK AND GST)</b>	
Tower floor plate area (Metro Zone)	672	Market unit (high quality) price psm	8,000
Additional floor plate area (Mixed Use Zone)	848	Market unit (med quality) price psm	5,500
<b>PRODUCT DESCRIPTION</b>		<b>SALES EXPENSES (EXCL GST)</b>	
Standard market apt floor area (high quality dev't)	90	Legal per sales transaction	1,000
Std affordable apt floor area (high quality dev't)	90	Commission on unit sales	4.0%
Standard market apt floor area (med quality dev't)	70	<b>DEVELOPMENT TIMEFRAME</b>	
Std affordable apt floor area (med quality dev't)	70	Building construction (months)	12
Balcony area per unit (high quality dev't)	20	<b>INCLUSIONARY ZONING POLICY</b>	
Balcony area per unit (medium quality dev't)	15	Ratio of affordable space to total additional	25%
Basement car parking pro rata area per unit	25	Affordable home price	365,396
Basement car parks per marginal unit (market)	1	Affordable apartment price rate psm	4,567
Basement car parks per marginal unit (affordable)	1	Benchmark annual household income	73,372
Overall efficiency ratio (net to gross building area)	85%	Annual interest rate	5.25%
Marginal efficiency ratio (IZ policy created space)	90%	Home deposit	10%
<b>MARGINAL DEVELOPMENT COSTS (EXCL GST)</b>		Loan term (years)	30
<b>Hard construction costs per gross bldg sqm</b>		<b>Inclusionary Zoning Bonuses</b>	
Multi-unit high-rise (high quality)	3,010	Additional storeys in Metropolitan Zone	2
Multi-unit high-rise (medium quality)	2,620	Additional storeys in Mixed Use Zone	1
Multi-unit low-rise (high quality)	2,760	Extra bldg coverage in Terraces & Apts Zone	3.0%
Multi-unit low-rise (medium quality)	1,940		
Balconies (high quality)	750		
Balconies (medium quality)	740		
Basement car parking	1,340		

Regarding the apartment sizes of market-rate versus affordable, the researchers considered several ways to model this relationship but elected to maintain the same size with the understanding that in the case of the higher quality developments, the internal configuration of affordable apartments may differ from market-rate units. For instance a 90 square metre 2 bedroom, 2 bathroom market-rate apartment may accommodate a 3 bedroom, 1 bathroom affordable unit in the same footprint. Although this approach will require some additional effort by the architect, separate design decisions will need to be made regardless since affordable units will likely be fitted out to a lower specification than their market-rate counterparts.

Aside from deriving apartment sizes and balcony areas, asking prices quoted within listings for new apartments were used to estimate current sales prices per square metre. These

prices were determined for net apartment areas excluding balconies. Furthermore the collected asking prices were adjusted to reflect the inclusion of a secure, covered car park. Lastly the adjusted asking prices were reduced by 5% to translate asking into estimated sales prices.

Returning to the assumptions under 'Product Description', the gross building areas generated from the site layout exercises needed to be converted into net areas that account for actual apartment floor space less common areas such as corridors, fire stairs, elevators, lobbies, etc. At the early stages of feasibility before architectural plans are drawn up, the conversion between gross building area and net usable area (in the case of residential), or net leasable area (in the case of commercial property), is made by multiplying the estimated gross building area by an efficiency ratio (typically 80 to 95% depending on the product type and specific design). As this analysis is concerned solely with the additional, marginal units created under the IZ policy, the researchers' have adopted an efficiency ratio of 90%. This is higher than a typical ratio for a whole apartment building, which the researchers have assumed to be 85%. The reason for this is that the larger common areas such as main lobby, mailroom and spaces allocated for onsite amenities such as a fitness centre would be included irrespective of the developer's decision to provide inclusionary housing. One may argue that adding more units can result in slightly larger fitness rooms or lap pools but this not likely given the relatively small number of additional apartments. What is important is the marginal increases in corridor and elevator lobby areas that will surely accompany the additional apartments.

Following on from this logic, the hard and soft construction costs considered in the cost-benefit analysis do not take into account the consideration paid for the development site itself or the money paid to planning consultants to contribute to the project's resource consent application. Furthermore expenses related to site works like landscaping are not pertinent here as these costs will be borne regardless of the inclusion of affordable apartments. The actual marginal construction costs relate to the additional floor areas and underground parking stalls that will be built. The hard costs have been inflated by 10% to estimate the additional soft costs associated with them. Although there may be limited additional work required of an architect or engineer to accommodate the additional apartments, these consultants tend to charge as a percentage of the hard construction costs. Therefore their fees will increase along with the additional building work that will be carried out. Another group of marginal development costs include the development contribution fees and infrastructure growth charges associated with each additional unit.

The per square metre cost figures used in the analysis are sourced from the *Rawlinsons Construction Handbook 2012* (Giddens, 2012) and the *Blue Book 2012* (Davis Langdon, 2012). Both publications are regularly used by property professionals, including developers, in estimating construction costs for multi-unit residential and non-residential construction. Both sources provide per square metre prices for multi-unit residential construction by quality and building scope. In terms of quality, the high quality construction costs are applied to market-rate apartments in high quality developments while costs for medium quality construction is applied to both market-rate and affordable apartments within medium quality developments as well as affordable apartments within high quality developments. The reasoning for this is that although the building exterior, building services and common areas associated with these units it is expected that the specifications of the affordable unit's interior finishes, fittings and fixtures will be of a lower standard than those found within market-rate apartments. In the case of balconies, the slightly higher cost estimate for high standard balconies is applied to all apartments within high quality developments since balconies are essentially extensions of the exterior and therefore the appearance and quality must be held constant and high.

Another important consideration with construction costs is the scope of the project. The relationship between cost per square metre and building height is not linear. Short buildings tend to be simpler to build and feature less elaborate and less expensive building services. An important threshold is when a building that passes from 5 storeys to 6 storeys in height. Often 3- to 5-storey buildings are considered mid-rise and less expensive on a per square metre basis than buildings 6 storeys and higher, which are commonly categorised as high-rise.

In the case of the hypothetical developments within the Metropolitan Zone, the allowable building height places such projects squarely in the high-rise category. The zone that is open for debate is the 6-storey Terraced Housing and Apartment Buildings Zone. In order to provide a degree of conservativeness, the construction prices for developments in this zone are assumed to fall in the high-rise category. Lastly all cost data used in the analysis is exclusive of goods and services tax (GST).

Other assumptions such as the developer (management) fee, lender financing costs and sales expenses result from interviews with greenfield residential developers. Such assumptions are readily transferrable to brownfield situations.

Lastly, the definition of affordable housing used in this report is an adaptation of the following definition provided by Murphy and Rehm (2013):

*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 is \$365,396. As this definition of an affordable home is based on a house rather than an apartment, it is necessary to adapt the definition to accommodate apartments which tend to be smaller in size and often feature fewer rooms.

In collaboration with Council, the researchers have translated the affordable home price per dwelling unit to an affordable price per square metre of net apartment floor area. To arrive at this amount the researchers have divided the aforementioned affordable home price of \$365,396 into 80 square metres, which is midway between the high quality and medium quality developments' standard apartment sizes. This results in an affordable apartment price rate of \$4,567 per square metre.

## Chapter 4: Cost-Benefit Analysis of Marginal Units

### Introduction

Given the assumptions set out in Box 1, models were created in MS Excel for each of the ten hypothetical developments. The analysis was conducted in two stages. Initial models were developed to determine the number of additional, marginal market-rate and affordable apartments produced under the inclusionary zoning policy. With these unit numbers computed the associated marginal development costs and sales proceeds were used to estimate the profit or loss associated with each apartment type: market-rate and affordable. The overall profit is then compared to a set of development margins ranging from 20 to 30 per cent. When the calculated profit derived from the marginal apartments exceeds the developer's required profit margin, that particular hypothetical development is deemed financially viable at that risk level and it is expected that the developer will elect to volunteer and integrate affordable units into the project.

### Quantifying the Additional, Marginal Units

After modelling the hypothetical developments and adopting the required assumptions, the next step towards determining the feasibility of the draft Unitary Plan's voluntary brownfield residential development inclusionary zoning programme is to ascertain how many market-rate and affordable apartments will be produced by the IZ bonuses. The researchers have developed a series of MS Excel models to determine these figures.

Boxes 2 and 3 provide the model results for the high quality and medium quality developments, respectively. The specific model results presented in these Boxes have adopted the IZ policy requirements set out in paragraphs 103 and 104 in Appendix B (Possible Retained, Affordable Housing Provision) of the Unitary Plan Addendum. Specifically this policy reads "the additional bonus floor space available shall be at a maximum rate of 1 m<sup>2</sup> of additional floor space for every 0.25 m<sup>2</sup> of affordable housing floor space". The researchers have further assumed that if developers participate in the inclusionary zoning scheme, they will take full advantage of it and achieve the maximum rate. Furthermore in the case where 25 per cent of the additional, bonus floor space is less than the size of a standard affordable apartment, it is assumed that participating developers will be required to provide a single standard size affordable unit.

From Box 2 the hypothetical high quality development located in a Metropolitan Zone is estimated to produce 131 market-rate apartments without any IZ bonus. Considering an IZ bonus of 2 additional storeys, the same development is estimated to achieve a total of 144 units, 13 more than without the bonus. In this example, through participating in the Council's inclusionary housing programme the developer has gained the ability to produce and sell 10 additional market-rate units as well as 3 affordable units.

As discussed earlier all hypothetical developments except those located in Metropolitan Zones feature balconies positioned inside the building perimeter. Placing balconies within the building envelope is done to help satisfy the outlook space requirements without sacrificing excessive site area. Of course bringing balconies inside the envelope occupies floor area. Therefore when determining the number of units achievable within the hypothetical developments, apartment floor area is combined with any internal balcony spaces.

Box 3 provides the model results for the medium quality hypothetical developments.

**Box 2: Determination of Additional Market-Rate and Affordable Apartment Units  
and Floor Areas within High Quality Developments**

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	Mid-rise Apts	Mid-rise Apts	High-rise Apts
Site area	2,000	2,000	2,000	2,000	2,000
Podium floor plate area (full)	1,200	1,052			
Podium floor plate area (partial)	1,020				
Additional storey(s) floor plate area	672	848			
Unitary Plan max building coverage			40%	40%	40%
Unitary Plan max storeys	18	4	4	5	6
IZ Bonus building coverage (effective)			3.0%	3.0%	3.0%
IZ Bonus storeys	2	1			
Additional gross floor area from IZ Bonus	1,344	848	240	300	360
Residential gross floor area excl IZ Bonus	13,884	4,208	3,200	4,000	4,800
Gross residential floor area incl IZ Bonus	15,228	5,056	3,440	4,300	5,160
Net residential floor area incl IZ Bonus	12,944	4,298	2,924	3,655	4,386
Standard market unit size incl inside balc	90	110	110	110	110
Std affordable unit size incl inside balc	90	110	110	110	110
Gross area for affordable units	336	212	110	110	110
Gross area for market units	14,892	4,844	3,330	4,190	5,050
Affordable units under IZ policy	3	2	1	1	1
Percentage of affordable space in project	2.2%	4.2%	3.2%	2.6%	2.1%
Market units under IZ policy	141	37	26	32	39
Total units under IZ policy	144	39	27	33	40
Market units without IZ Bonus	131	33	25	31	37
<b>Total additional units under IZ policy</b>	<b>13</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>3</b>

**Box 3: Determination of Additional Market-Rate and Affordable Apartment Units  
and Floor Areas within Medium Quality Developments**

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	Mid-rise Apts	Mid-rise Apts	High-rise Apts
Site area	2,000	2,000	2,000	2,000	2,000
Podium floor plate area (full)	1,200	1,052			
Podium floor plate area (partial)	1,020				
Additional storey(s) floor plate area	672	848			
Unitary Plan max building coverage			40%	40%	40%
Unitary Plan max storeys	18	4	4	5	6
IZ Bonus building coverage (effective)			3.0%	3.0%	3.0%
IZ Bonus storeys	2	1			
Additional gross floor area from IZ Bonus	1,344	848	240	300	360
Residential gross floor area excl IZ Bonus	13,884	4,208	3,200	4,000	4,800
Gross residential floor area incl IZ Bonus	15,228	5,056	3,440	4,300	5,160
Net residential floor area incl IZ Bonus	12,944	4,298	2,924	3,655	4,386
Standard market unit size incl inside balc	70	85	85	85	85
Std affordable unit size incl inside balc	70	85	85	85	85
Gross area for affordable units	336	212	85	85	90
Gross area for market units	14,892	4,844	3,355	4,215	5,070
Affordable units under IZ policy	4	2	1	1	1
Percentage of affordable space in project	2.2%	4.2%	2.5%	2.0%	1.7%
Market units under IZ policy	181	48	34	42	51
Total units under IZ policy	185	50	35	43	52
Market units without IZ Bonus	169	42	32	40	48
<b>Total additional units under IZ policy</b>	<b>16</b>	<b>8</b>	<b>3</b>	<b>3</b>	<b>4</b>

## General Findings

The results of the cost-benefit analysis across the five high quality hypothetical developments are presented in Box 4 and the results for the medium quality developments are provided in Box 5.

The models used to quantify the number of additional, (marginal) units are not complicated. They represent straightforward arithmetic organised into three sections. First, the profit/loss associated with the additional market-rate apartments is calculated. The second section of calculations presented in Boxes 4 and 5 relate to the additional affordable apartments. In most cases the affordable units sell above cost and therefore generate a modest profit. However, each hypothetical development within the Metropolitan Zone and the 6-Storey Terraced Housing and Apartment Buildings Zone experience losses with the sale of affordable apartments. Essentially the cost of constructing apartments exceeds the capped price associated with them.

The final portion of the cost-benefit analysis compares the combined profit/loss associated with additional, marginal apartments with three different development (profit) margins ranging from 20 per cent of marginal development cost to 30 per cent. Development margins reflect the perceived risk and uncertainty associated with a given development opportunity. Such an opportunity can also take the form of a subset of a larger development project such as a developer's choice to embrace inclusionary zoning. If the estimated profit resulting from the decision to participate in the Council's inclusionary housing programme exceeds the developer's required profit margin associated with the affordable housing component of the development then it is expected that the developer would embrace IZ as a viable investment.

It should be noted that the required profit margin associated with inclusionary housing may be different than the margin applied to the feasibility of the development without the integration of affordable units. The main reason why the profit margins may differ relate to the pricing and marketability of the development's market-rate apartments. It is probable that developers will perceive an additional risk associated with the market price that can be achieved for the development's unsubsidised units. This risk is anticipated to be more prominent in high quality developments where prospective buyers of market units would likely be more averse to being neighbours and fellow body corporate members with those qualifying for project's affordable units. Some buyers of high end apartments may champion such social egalitarianism at large but be put off when it involves their personal affairs. Such discontent buyers may elect to purchase in a competing development that does not feature subsidised units. With the IZ policy being voluntary for brownfield developments this is a distinct possibility and will likely be viewed by developers, particularly those producing high quality apartments, as a risk that could potentially be mitigated through use of a higher development (profit) margin.

**Box 4: Cost-Benefit Analysis of Marginal Units  
within High Quality Developments**

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	4-Storey Apts	5-Storey Apts	6-Storey Apts
Number of additional market units	10	4	1	1	2
Gross area of additional market units	1,008	556	110	170	210
Net area of additional market units	907	500	99	153	189
Main building costs (high quality)	-3,034,080	-1,534,560	-303,600	-469,200	-632,100
Balconies (high standard)	-150,000	-60,000	-15,000	-15,000	-30,000
Basement car parking	-335,000	-134,000	-33,500	-33,500	-67,000
Professional fees (arch, eng, qs, etc)	-351,908	-172,856	-35,210	-51,770	-72,910
Development contributions	-105,000	-42,000	-10,500	-10,500	-21,000
Infrastructure growth charges	-85,000	-34,000	-8,500	-8,500	-17,000
Bank finance costs	-357,367	-174,013	-35,755	-51,785	-73,921
Developer management fee	-81,220	-39,548	-8,126	-11,769	-16,800
Sales of market units	7,257,600	4,003,200	792,000	1,224,000	1,512,000
Legal conveyancing costs	-10,000	-4,000	-1,000	-1,000	-2,000
Sales commissions	-290,304	-160,128	-31,680	-48,960	-60,480
Net GST payable	-434,446	-279,248	-52,952	-87,836	-91,427
Profit/loss on additional market units	2,023,275	1,368,847	256,177	434,180	427,362
Number of additional affordable units	3	2	1	1	1
Gross area of additional affordable units	336	172	90	90	90
Net area of additional affordable units	302	155	81	81	81
Main building costs (medium quality)	-880,320	-333,680	-174,600	-174,600	-235,800
Balconies (high standard)	-45,000	-30,000	-15,000	-15,000	-15,000
Basement car parking	-100,500	-67,000	-33,500	-33,500	-33,500
Professional fees (arch, eng, qs, etc)	-102,582	-43,068	-22,310	-22,310	-28,430
Development contributions	-31,500	-21,000	-10,500	-10,500	-10,500
Infrastructure growth charges	-25,500	-17,000	-8,500	-8,500	-8,500
Bank finance costs	-104,315	-45,034	-23,268	-23,268	-29,192
Developer management fee	-23,708	-10,235	-5,288	-5,288	-6,635
Sales of affordable units	1,381,061	706,972	369,927	369,927	369,927
Legal conveyancing costs	-3,000	-2,000	-1,000	-1,000	-1,000
Sales commissions	-55,242	-28,279	-14,797	-14,797	-14,797
Net GST payable	-20,612	-24,742	-13,458	-13,458	-3,360
Profit/loss on additional affordable units	-11,220	84,934	47,706	47,706	-16,787
<b>Total profit on additional units under IZ</b>	<b>2,012,056</b>	<b>1,453,781</b>	<b>303,883</b>	<b>481,885</b>	<b>410,576</b>
Development margin (20%)	1,162,600	551,599	148,632	188,998	259,658
Difference b/w margin and calc profit	849,456	902,182	155,251	292,887	150,918
Development margin (25%)	1,453,250	689,498	185,789	236,248	324,572
Difference b/w margin and calc profit	558,806	764,282	118,093	245,638	86,004
Development margin (30%)	1,743,900	827,398	222,947	283,497	389,486
Difference b/w margin and calc profit	268,156	626,383	80,935	198,388	21,089

**Box 5: Cost-Benefit Analysis of Marginal Units  
within Medium Quality Developments**

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	4-Storey Apts	5-Storey Apts	6-Storey Apts
Number of additional market units	12	6	2	2	3
Gross area of additional market units	1,008	546	125	185	225
Net area of additional market units	907	491	113	167	203
Main building costs (medium quality)	-2,640,960	-1,059,240	-242,500	-358,900	-436,500
Balconies (medium standard)	-133,200	-66,600	-22,200	-22,200	-33,300
Basement car parking	-402,000	-201,000	-67,000	-67,000	-100,500
Professional fees (arch, eng, qs, etc)	-317,616	-132,684	-33,170	-44,810	-57,030
Development contributions	-126,000	-63,000	-21,000	-21,000	-31,500
Infrastructure growth charges	-102,000	-51,000	-17,000	-17,000	-25,500
Bank finance costs	-327,516	-138,470	-35,453	-46,720	-60,221
Developer management fee	-74,436	-31,470	-8,057	-10,618	-13,687
Sales of market units	4,989,600	2,702,700	618,750	915,750	1,113,750
Legal conveyancing costs	-12,000	-6,000	-2,000	-2,000	-3,000
Sales commissions	-199,584	-108,108	-24,750	-36,630	-44,550
Net GST payable	-158,436	-152,260	-28,370	-51,932	-57,281
Profit/loss on additional market units	495,852	692,867	117,251	236,940	250,682
Number of additional affordable units	4	2	1	1	1
Gross area of additional affordable units	336	182	70	70	75
Net area of additional affordable units	302	164	63	63	68
Main building costs (medium quality)	-880,320	-353,080	-135,800	-135,800	-196,500
Balconies (medium standard)	-44,400	-22,200	-11,100	-11,100	-11,100
Basement car parking	-134,000	-67,000	-33,500	-33,500	-33,500
Professional fees (arch, eng, qs, etc)	-105,872	-44,228	-18,040	-18,040	-24,110
Development contributions	-42,000	-21,000	-10,500	-10,500	-10,500
Infrastructure growth charges	-34,000	-17,000	-8,500	-8,500	-8,500
Bank finance costs	-109,172	-46,157	-19,135	-19,135	-25,010
Developer management fee	-24,812	-10,490	-4,349	-4,349	-5,684
Sales of affordable units	1,381,061	748,075	287,721	287,721	308,273
Legal conveyancing costs	-4,000	-2,000	-1,000	-1,000	-1,000
Sales commissions	-55,242	-29,923	-11,509	-11,509	-12,331
Net GST payable	-12,184	-28,747	-8,666	-8,666	-1,610
Profit/loss on additional affordable units	-64,942	106,250	25,623	25,623	-21,573
<b>Total profit on additional units under IZ</b>	<b>430,911</b>	<b>799,117</b>	<b>142,873</b>	<b>262,563</b>	<b>229,109</b>
Development margin (20%)	1,099,661	464,924	137,461	165,834	214,628
Difference b/w margin and calc profit	-668,750	334,194	5,413	96,729	14,481
Development margin (25%)	1,374,576	581,155	171,826	207,293	268,286
Difference b/w margin and calc profit	-943,665	217,963	-28,953	55,270	-39,177
Development margin (30%)	1,649,491	697,386	206,191	248,752	321,943
Difference b/w margin and calc profit	-1,218,580	101,732	-63,318	13,811	-92,834

## **Viability of Inclusionary Zoning in Brownfield Residential Developments**

To explore sensitivities, the cost-benefit models were re-analysed using varying percentage requirements under an inclusionary zoning (IZ) policy. The goal was to identify at what IZ requirement the cost of providing affordable housing outweighs the financial benefit to the developer. When this threshold is breached the hypothetical development at that risk level is deemed 'not viable' and it is expected that a developer would not participate in the Council's voluntary IZ programme. The risk perceived by developers is captured in development margins ranging from 20 to 30 per cent. Furthermore three market conditions are considered. Firstly, developers conducting their cost-benefit analysis of participating in the scheme are assuming the market prices will remain steady and in-step with construction costs. Secondly, developers make the decision on the basis that market apartment prices will become depressed and shall decline by 10 per cent, all else held equal. Thirdly, developers believe the market's buoyancy will continue and apartment prices shall outpace development costs by 10 per cent. The results of this sensitivity analysis are presented in Figure 6.

**Figure 6: Inclusionary Housing Viability by Development Quality and Planning Zone under a Range of Housing Market Conditions**

Margin	Zone	Storeys	IZ Bonus	Market Conditions		
				Bouyant	Steady	Depressed
20%	Metropolitan	20	2 Storeys	Viable	Viable	Viable
	Mixed Use	5	1 Storey	Viable	Viable	Viable
	Terraces & Apts	4	3% Bldg cover	Viable	Viable	Viable
		5		Viable	Viable	Viable
		6		Viable	Viable	Viable
25%	Metropolitan	20	2 Storeys	Viable	Viable	Not Viable
	Mixed Use	5	1 Storey	Viable	Viable	Viable
	Terraces & Apts	4	3% Bldg cover	Viable	Viable	Viable
		5		Viable	Viable	Viable
		6		Viable	Viable	Not Viable
30%	Metropolitan	20	2 Storeys	Viable	Viable	Not Viable
	Mixed Use	5	1 Storey	Viable	Viable	Viable
	Terraces & Apts	4	3% Bldg cover	Viable	Viable	Viable
		5		Viable	Viable	Viable
		6		Viable	Viable	Not Viable

Development Quality = High

Margin	Zone	Storeys	IZ Bonus	Market Conditions		
				Bouyant	Steady	Depressed
20%	Metropolitan	20	2 Storeys	Not Viable	Not Viable	Not Viable
	Mixed Use	5	1 Storey	Viable	Viable	Viable
	Terraces & Apts	4	3% Bldg cover	Viable	Viable	Not Viable
		5		Viable	Viable	Viable
		6		Viable	Viable	Not Viable
25%	Metropolitan	20	2 Storeys	Not Viable	Not Viable	Not Viable
	Mixed Use	5	1 Storey	Viable	Viable	Not Viable
	Terraces & Apts	4	3% Bldg cover	Viable	Not Viable	Not Viable
		5		Viable	Viable	Not Viable
		6		Viable	Not Viable	Not Viable
30%	Metropolitan	20	2 Storeys	Not Viable	Not Viable	Not Viable
	Mixed Use	5	1 Storey	Viable	Viable	Not Viable
	Terraces & Apts	4	3% Bldg cover	Not Viable	Not Viable	Not Viable
		5		Viable	Viable	Not Viable
		6		Not Viable	Not Viable	Not Viable

Development Quality = Medium

Based on the assumptions used in the study, high quality brownfield developments appear to benefit most from participation in Council's planned affordable housing scheme. Even under the a depressed market where market-rate prices fall 10 per cent relative to development costs, all hypothetical developments are deemed viable under a 20 per cent profit margin. Beyond this margin, however, the two high-rise developments falter.

The medium quality developments are also primarily viable under the more optimistic 20 per cent margin but again the high-rise developments struggle. In particular the Metropolitan Zone hypothetical development fails to reach viability in even buoyant market conditions regardless of the profit margin applied. Also as the modelled market conditions deteriorate the number of viable hypothetical medium quality developments diminishes. The extreme example is under 25 and 30 per cent profit margins in the context of depressed market conditions. Here not a single medium quality project achieves economic viability. Overall the smaller profits generated by the sale of additional market-rate apartments place a considerable drag on the medium quality developments.

In addition to the aforementioned challenges faced by developers of high quality apartment developments there are potential impediments to marketing such high end residences comingled with subsidised units. This issue was raised during the interviews. Many developers expressed concerns that potential buyers of market-rate units will reconsider when they are informed that the development shall accommodate affordable units with less affluent owner-occupants than themselves. Moreover these comments were made regarding greenfield developments comprised largely of freestanding units on freehold titles.

Apartments are more complex and feature strata title and are managed collectively through body corporates. In the case of high quality apartments, these buildings are often marketed as vertical gated communities with owners buying into an exclusive residence. For ultra-high end apartments such as *Vert* in Herne Bay, with units selling for nearly \$3 million per apartment and over \$14,000 per square metre, the integration of affordable units at one-third the price is unrealistic.

For such developments there may be an opportunity to allow developers to avail themselves to the IZ bonuses without forcing the provision of integrated affordable units. Instead the developer could commit an agreed amount of funds or share of the marginal profits to the Council. These funds will then be used to construct affordable dwellings or acquire land with the intention that affordable units are developed through partnerships with experienced greenfield and brownfield residential developers.

Box 6 provides examples of the estimated profits generated by five hypothetical, high quality developments using the same assumptions as before but setting the IZ requirement to zero. If 50% of the estimated additional profits were shared with Council, the funds available for producing off-site affordable housing would range from \$1.4 million in the case of the Metropolitan Zone down to \$225,000 for high quality developments in the 4-storey Terraced Housing and Apartment Buildings Zone.

Although such a policy would work counter to providing inner suburb accommodation for key workers, it would offer an avenue for developments such as *Vert* to assist in addressing Auckland's affordable housing crisis while at the same time generate additional profits. Without this possibility such projects will simply opt out and not incorporate affordable units.

**Box 6. Estimated Profit for High Quality Developments  
under an IZ Policy Requirement of Zero Per Cent**

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	4-Storey Apts	5-Storey Apts	6-Storey Apts
Number of additional market units	13	6	2	2	3
Gross area of additional market units	1,344	728	200	260	300
Net area of additional market units	1,210	655	180	234	270
Main building costs (high quality)	-4,045,440	-2,009,280	-552,000	-717,600	-903,000
Balconies (high standard)	-195,000	-90,000	-30,000	-30,000	-45,000
Basement car parking	-435,500	-201,000	-67,000	-67,000	-100,500
Professional fees (arch, eng, qs, etc)	-467,594	-230,028	-64,900	-81,460	-104,850
Development contributions	-136,500	-63,000	-21,000	-21,000	-31,500
Infrastructure growth charges	-110,500	-51,000	-17,000	-17,000	-25,500
Bank finance costs	-474,367	-232,699	-66,167	-82,197	-106,511
Developer management fee	-107,811	-52,886	-15,038	-18,681	-24,207
Sales of market units	9,676,800	5,241,600	1,440,000	1,872,000	2,160,000
Legal conveyancing costs	-13,000	-6,000	-2,000	-2,000	-3,000
Sales commissions	-387,072	-209,664	-57,600	-74,880	-86,400
Net GST payable	-582,929	-357,244	-94,275	-129,159	-129,038
Profit/loss on additional market units	2,721,087	1,738,799	453,020	631,023	600,495
Number of additional affordable units	-	-	-	-	-
Gross area of additional affordable units	-	-	-	-	-
Net area of additional affordable units	-	-	-	-	-
Main building costs (medium quality)	0	0	0	0	0
Balconies (high standard)	0	0	0	0	0
Basement car parking	0	0	0	0	0
Professional fees (arch, eng, qs, etc)	0	0	0	0	0
Development contributions	0	0	0	0	0
Infrastructure growth charges	0	0	0	0	0
Bank finance costs	0	0	0	0	0
Developer management fee	0	0	0	0	0
Sales of affordable units	0	0	0	0	0
Legal conveyancing costs	0	0	0	0	0
Sales commissions	0	0	0	0	0
Net GST payable	0	0	0	0	0
Profit/loss on additional affordable units	0	0	0	0	0
<b>Total profit on additional units under IZ</b>	<b>2,721,087</b>	<b>1,738,799</b>	<b>453,020</b>	<b>631,023</b>	<b>600,495</b>
Development margin (20%)	1,194,542	585,979	166,621	206,988	268,214
Difference b/w margin and calc profit	1,526,545	1,152,820	286,399	424,035	332,281
Development margin (25%)	1,493,178	732,473	208,276	258,735	335,267
Difference b/w margin and calc profit	1,227,909	1,006,325	244,744	372,288	265,228
Development margin (30%)	1,791,814	878,968	249,932	310,482	402,320
Difference b/w margin and calc profit	929,274	859,831	203,088	320,541	198,174

## 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 (Murphy and Rehm 2013). Under the Unitary Plan, the proposed inclusionary housing scheme for brownfield sites will be voluntary and height and density bonuses will be used to incentivise developers to provide affordable housing.

This report presents an analysis of brownfield residential developments and estimates the financial feasibility of additional market-rate and affordable apartments produced under inclusionary zoning policies. The analysis centres on a hypothetical 2,000 square metre infill development site in Auckland. The hypothetical development is analysed across five planning zones (metropolitan, mixed use and three terraced housing and apartment buildings zones that vary in terms of permitted height) and two levels of development quality (high and medium). In total 10 development scenarios are considered with the aim of determining whether developers of these hypothetical projects are likely to participate and integrate inclusionary housing into their developments. This participation ultimately hinges on the economic viability of the developer's decision to accept the Council's proposition to increase development intensity in exchange for providing affordable apartments.

Overlaying this analysis the researchers considered various potential inclusionary zoning policy requirements that could be imposed on brownfield developers. The modelled IZ requirement is set out in paragraphs 103 and 104 in Appendix B (Possible Retained, Affordable Housing Provision) of the Unitary Plan Addendum. Effectively an amount of gross floor area equal to 25 per cent of the additional bonus floor area made possible under the inclusionary housing scheme needs to be dedicated to affordable apartments. These apartments do not necessarily need to occupy the bonus spaces themselves (e.g. uppermost floors) but they must be integrated somewhere in the development.

The researchers also considered varying development profit margins that may be applied by developers when weighing their decision of participating in the Council's inclusionary housing scheme. These margins ranged from 20 per cent to 30 per cent of total development costs. Lastly the researchers considered three different market conditions (steady, depressed and buoyant) which may also influence developers' decisions to participate or not.

Figure 6 summarises the viability of these 10 hypothetical developments overlaid with varying market conditions and development margins. Based on the assumptions made the high quality developments appear to be the primary beneficiaries of the IZ scheme. The returns are exceptionally generous to developers. The researchers suggest more consideration be given to the IZ requirements given that the modelled high quality developments have proven to be economically viable even in the most pessimistic scenario where real prices drop 10 per cent and developers are applying an elevated risk margin of 30 per cent. Perhaps there is an opportunity for Council to require higher proportions of the additional bonus floor area to be dedicated to affordable apartments. Alternatively the ratio may remain the same but the assumptions used to determine the affordable price rate can be adjusted to reduce the price rate and enable households of more modest means become recipients of the programme's affordable apartments.

Of course there is another important factor to consider regarding the feasibility of integrating affordable units into market-driven developments. The development profit margin is central to determining the economic viability of inclusionary housing from the perspective of a

developer. By electing to participate and integrate affordable units into the project the developer might assume that by doing so the entire development is subject to greater risk associated with the marketability and pricing of the project's market-rate apartments. This risk is likely to range from negligible, in the case of medium quality developments where the price differential between market-rate and affordable units is relatively small, to unbearable in extreme cases, such as *Vert* in Hearn Bay, where the developers are marketing their expansive luxury apartments as exclusive residences.

For more modest high quality developments such as *The Isaac* in Grey Lynn the perceived risks associated with integrating affordable apartments will likely play a role in the developer's decision to participate or not. The researchers suggest that for high quality developments a development margin of 25 to 30 per cent is more likely to be used by developers. It is possible, however, that developers will require a greater return given that the inclusionary housing component is small yet it has the potential to negatively impact the entire project.

Although it is anticipated that brownfield developers' reluctance to integrate affordable housing will increase alongside development quality, the potential profit realised by the greater development density under IZ policy also increases with development quality. Therefore the researchers suggest that the Council considers alternative methods for developers of luxury brownfield residential developments to avail themselves to the inclusionary housing scheme without having to integrate affordable units into the development. A possible arrangement could involve developers contributing to Council operated affordable housing fund. This could be based on an estimate of profits associated with additional market-rate apartments produced under an IZ policy requirement of zero per cent affordable units. Such an analysis is presented in Box 6 and suggests that considerable profits can be generated through increased development density.

The methods employed by the researchers do feature some limitations. Firstly the physical configuration of the hypothetical development sites was held rigid at 40 by 50 metres, or 2,000 square metres, and is assumed to occupy an inside rather than corner lot. If the same analysis was made to hypothetical sites of different configurations, the results would differ. As explained the analysis does not investigate the effects of development controls such as height to boundary restrictions. An attempt to address these issues to the degree that the researchers have modelled setbacks and outlooks to determine allowable development intensity would be a massive undertaking and well beyond the scope of the present study.

Overall the developed models provide a useful broad brush measure of the impact of inclusionary zoning on the financial viability of brownfield residential developments in Auckland within the current market conditions. The findings suggest that inclusionary housing as set out in the Unitary Plan Addendum is viable across most planning zones studied and is more viable in the case of high quality apartment projects rather than medium quality developments. Nevertheless the potential exists for all apartment developers to contribute to the provision of affordable housing in Auckland.

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## **Addendum**

**August 2013**

### **Mandatory Policy for Brownfield Developments**

#### **Introduction**

In light of policy decisions made by Auckland Council, the preceding report has been extended to include analysis of the financial impacts of a mandatory inclusionary zoning policy imposed on brownfield residential developments. This alternative approach does not incorporate IZ bonuses (additional floors or building coverage areas). Since developers do not have an option to opt out of the inclusionary housing scheme the analysis must consider the entire development rather than simply the marginal additional units that arise from voluntarily incorporating affordable units.

Therefore several elements that were omitted from the main report's analysis must now be considered. In brief this entails the market price of development land in Auckland, the cost of holding the land from acquisition through to the selling of apartments, the development costs related to obtaining resource consent, construction costs associated with exterior works such as landscaping and internal roading, and some other minor expenses such as building consent fees and council rates paid by the developer over the development process.

In addition to these extra assumptions that must be made there is another alteration from the preceding cost-benefit analysis that involves a recent policy announcement from the Reserve Bank. Effective 1 October 2013, the Reserve Bank will impose limits to trading banks in terms of the number of new home mortgages that feature high loan-to-value ratios in excess of 80%. Under the new limits only 10% of new mortgages can be originated with such high LTVs. In light of this the formula used to determine the affordable housing price rate used in the analysis now assumes a down payment of 20% rather than 10%.

All other assumptions are carried forward from the main report's analysis.

#### **Methodology**

As with the main report's Box 1, the following Box A provides the various assumptions used in the analysis. Arguably the key new assumptions relate to the market prices of development land suitable for apartment projects. The approach used in determining these prices was to research land transactions at specific points (e.g. Auckland CBD land representing high quality Metropolitan Zone sites) and then interpolate the remaining price estimates to create a price gradient that will span from high quality Metro Zone sites down to medium quality 4-storey Terraced Housing and Apartment Buildings Zone sites.

## Box A. Assumptions Used in Analysing the Hypothetical Developments

<b>DEVELOPMENT DESCRIPTION</b>		<b>Soft construction costs</b>	
Site area (sqm)	2,000	Professional fees (arch, eng, qs) (% hard cost)	10%
<b>Land purchase price per sqm</b>		Development contributions per unit	10,500
Metro Zone (High Quality)	4,500	Infrastructure growth charges per unit	8,500
Metro Zone (Medium Quality)	2,000	Developer (Management) Fee (% dev't cost)	2.0%
Mixed Use Zone (High Quality)	2,000	Resource Consent (fees, prof advice, etc)	200,000
Mixed Use Zone (Medium Quality)	1,000	Building Consent Fee	25,000
Apartments Zone 6 Storey (High Quality)	1,000	<b>Holding costs</b>	
Apartments Zone 6 Storey (Medium Quality)	600	Council rates (annual)	30,000
Apartments Zone 5 Storey (High Quality)	900	<b>BANK FINANCING COSTS</b>	
Apartments Zone 5 Storey (Medium Quality)	500	Effective interest per annum	8.8%
Apartments Zone 4 Storey (High Quality)	800	Construction loan LTV	75%
Apartments Zone 4 Storey (Medium Quality)	400	Land acquisition LTV	50%
<b>Business Zone Assumptions</b>		<b>PRICES (INCL CAR PARK AND GST)</b>	
Podium coverage (Storeys 1 & 2) (Metro Zone)	1,020	Market unit (high quality) price psm	8,000
Podium coverage (Storeys 3 - 6) (Metro Zone)	1,200	Market unit (med quality) price psm	5,500
Podium coverage (Mixed Use Zone)	1,052	<b>SALES EXPENSES (EXCL GST)</b>	
Number of full podium storeys	4	Legal per sales transaction	1,000
Number of partial podium storeys w/ access way	2	Commission on unit sales	4.0%
Number of lowest storeys non-residential	1	<b>DEVELOPMENT TIMEFRAME</b>	
Tower floor plate area (Metro Zone)	672	Resource consent (months)	18
Additional floor plate area (Mixed Use Zone)	848	Building construction (months)	12
<b>PRODUCT DESCRIPTION</b>		<b>INCLUSIONARY ZONING POLICY</b>	
Standard market apt floor area (high quality dev't)	90	Percentage of floor area to be 'affordable'	10%
Std affordable apt floor area (high quality dev't)	90	Affordable home price	398,614
Standard market apt floor area (med quality dev't)	70	Affordable apartment price rate psm	4,983
Std affordable apt floor area (med quality dev't)	70	Benchmark annual household income	73,372
Balcony area per unit (high quality dev't)	20	Annual interest rate	5.25%
Balcony area per unit (medium quality dev't)	15	Home deposit	20%
Basement car parking pro rata area per unit	25	Loan term (years)	30
Basement car parks per marginal unit (market)	1	<b>Inclusionary Zoning Bonuses</b>	
Basement car parks per marginal unit (affordable)	1	Additional storeys in Metropolitan Zone	0
Overall efficiency ratio (net to gross building area)	85%	Additional storeys in Mixed Use Zone	0
<b>DEVELOPMENT COSTS (EXCL GST)</b>		Extra bldg coverage in Terraces & Apts Zone	0%
<b>Hard construction costs per gross bldg sqm</b>			
Multi-unit high-rise (high quality)	3,010		
Multi-unit high-rise (medium quality)	2,620		
Multi-unit low-rise (high quality)	2,760		
Multi-unit low-rise (medium quality)	1,940		
Balconies (high quality)	750		
Balconies (medium quality)	740		
Basement car parking	1,340		
<b>Exterior works costs per site sqm net of bldg footprint</b>			
Lawn, roading & paving	100		

The transactions referenced to estimate land values in the Metropolitan Zone include underdeveloped sites in the Auckland CBD that have recently sold such as the Farmers Carpark, Victoria Market Carpark, Chancery Carpark and the Sail City Hotel in Wellesley Street. Although each of these sites were sold with existing improvements the impetus behind each sale was to redevelop the land. Other specific transactions used in determining land prices include 168 Beach Road and the former Palmers Garden Centre site in Remuera Road being redeveloped by Mansons. These transactions were used to estimate the value of high quality Mixed Use Zone development sites. Although the Beach Road site is not in a Mixed Use Zone the development controls (e.g. height limitation) are similar in nature.

At the lower spectrum the method used to estimate development land values shifted towards the approximate cost of purchasing two adjacent neglected residences in a Terraced Housing and Apartments Building Zone, both in a sought-after high quality suburb and a medium quality suburb.

## **Results**

The below Boxes B and C present the results of the financial modelling for the high quality and medium quality hypothetical developments under a mandatory policy requiring that 10 per cent of all apartments be 'affordable' units. Furthermore the results in Boxes B and C also assume steady market conditions with market apartments in high quality developments selling at \$8,000 per square metre and medium quality apartments commanding \$5,500 per square metre.

Under the assumptions made the high quality developments are financially viable across all zones and under each development margin. The only instance where viability is not achieved is the high quality Metropolitan Zone development where a developer demands a 30 per cent profit margin.

In terms of the medium quality hypothetical developments, only one planning zone, the 5-storey Terraced Housing and Apartment Buildings Zone, achieves viability across all three profit margins. At a 25% profit margin only two of five are viable while with a 20% margin all three mid-rise apartment developments are viable. As will be made more vivid when looking across the range of IZ requirements, the researchers found that high-rise medium quality developments were not financially feasible even if no inclusionary housing requirement were imposed. In brief the cost of constructing a high rise apartment building according to the 2012 Rawlinsons Construction Handbook and Davis Langdon Blue Book do not enable developers to realise sufficient profit margins.

## Box B: Financial Feasibility Analysis of High Quality Developments under 10% IZ Policy

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	4-Storey Apts	5-Storey Apts	6-Storey Apts
Number of market units	118	30	23	28	33
Gross area of market units	12,508	3,890	2,988	3,682	4,376
Net area of market units	10,631	3,307	2,540	3,130	3,720
Main building costs (high quality)	-37,647,664	-10,737,374	-8,247,529	-10,163,294	-13,173,176
Balconies (high standard)	-1,770,000	-450,000	-345,000	-420,000	-495,000
Basement car parking	-3,953,000	-1,005,000	-770,500	-938,000	-1,105,500
Professional fees (arch, eng, qs, etc)	-4,337,066	-1,219,237	-936,303	-1,152,129	-1,477,368
Development contributions	-1,239,000	-315,000	-241,500	-294,000	-346,500
Infrastructure growth charges	-1,003,000	-255,000	-195,500	-238,000	-280,500
Pro rata consent costs (market)	-202,500	-202,500	-202,500	-202,500	-202,500
Pro rata council rates (market)	-67,500	-67,500	-67,500	-67,500	-67,500
Pro rata exterior works (market)	-72,000	-85,320	-108,000	-108,000	-108,000
Bank finance costs	-3,319,254	-946,237	-733,546	-896,506	-1,138,899
Pro rata land finance cost (market)	-891,000	-396,000	-158,400	-178,200	-198,000
Developer management fee	-998,995	-279,632	-214,727	-264,108	-337,561
Sales of market units	85,051,200	26,454,400	20,320,000	25,040,000	29,760,000
Legal conveyancing costs	-118,000	-30,000	-23,000	-28,000	-33,000
Sales commissions	-3,402,048	-1,058,176	-812,800	-1,001,600	-1,190,400
Net GST payable	-4,685,913	-1,654,394	-1,255,480	-1,564,046	-1,692,083
Profit/loss on market units	26,030,173	9,407,423	7,263,195	9,088,162	9,606,096
Number of affordable units	13	3	2	3	4
Gross area of affordable units	1,376	318	212	318	424
Net area of affordable units	1,170	270	180	270	360
Main building costs (medium quality)	-3,606,353	-616,235	-410,824	-616,235	-1,109,647
Balconies (high standard)	-195,000	-45,000	-30,000	-45,000	-60,000
Basement car parking	-435,500	-100,500	-67,000	-100,500	-134,000
Professional fees (arch, eng, qs, etc)	-423,685	-76,174	-50,782	-76,174	-130,365
Development contributions	-136,500	-31,500	-21,000	-31,500	-42,000
Infrastructure growth charges	-110,500	-25,500	-17,000	-25,500	-34,000
Pro rata consent costs (market)	-22,500	-22,500	-22,500	-22,500	-22,500
Pro rata council rates (market)	-7,500	-7,500	-7,500	-7,500	-7,500
Pro rata exterior works (market)	-8,000	-9,480	-12,000	-12,000	-12,000
Bank finance costs	-326,406	-61,670	-42,148	-61,836	-102,433
Pro rata land finance cost (market)	-99,000	-44,000	-17,600	-19,800	-22,000
Developer management fee	-98,151	-17,898	-11,932	-17,898	-30,200
Sales of affordable units	5,830,110	1,345,410	896,940	1,345,410	1,793,880
Legal conveyancing costs	-13,000	-3,000	-2,000	-3,000	-4,000
Sales commissions	-233,204	-53,816	-35,878	-53,816	-71,755
Net GST payable	-95,755	-53,131	-33,068	-52,753	-24,917
Profit/loss on affordable units	19,056	177,506	115,708	199,398	-13,437
<b>Total profit on units under IZ</b>	<b>26,049,229</b>	<b>9,584,929</b>	<b>7,378,903</b>	<b>9,287,560</b>	<b>9,592,659</b>
Development margin (20%)	-12,194,015	-3,403,352	-2,586,258	-3,191,736	-4,127,430
Residual Land Value	13,855,215	6,181,577	4,792,645	6,095,824	5,465,229
Development Land Price	9,000,000	4,000,000	1,600,000	1,800,000	2,000,000
<b>Difference</b>	<b>4,855,215</b>	<b>2,181,577</b>	<b>3,192,645</b>	<b>4,295,824</b>	<b>3,465,229</b>
Development margin (25%)	-15,242,518	-4,254,189	-3,232,823	-3,989,670	-5,159,287
Residual Land Value	10,806,711	5,330,740	4,146,080	5,297,890	4,433,372
Development Land Price	9,000,000	4,000,000	1,600,000	1,800,000	2,000,000
<b>Difference</b>	<b>1,806,711</b>	<b>1,330,740</b>	<b>2,546,080</b>	<b>3,497,890</b>	<b>2,433,372</b>
Development margin (30%)	-18,291,022	-5,105,027	-3,879,387	-4,787,604	-6,191,145
Residual Land Value	7,758,207	4,479,902	3,499,516	4,499,956	3,401,515
Development Land Price	9,000,000	4,000,000	1,600,000	1,800,000	2,000,000
<b>Difference</b>	<b>-1,241,793</b>	<b>479,902</b>	<b>1,899,516</b>	<b>2,699,956</b>	<b>1,401,515</b>

### Box C: Financial Feasibility Analysis of High Quality Developments under 10% IZ Policy

Line Item	Metropolitan Zone	Mixed Use Zone	Terraced Housing & Apartment Zone		
	High-rise Apts	Mid-rise Apts	4-Storey Apts	5-Storey Apts	6-Storey Apts
Number of market units	152	38	29	36	43
Gross area of market units	12,484	3,808	2,900	3,600	4,300
Net area of market units	10,611	3,237	2,465	3,060	3,655
Main building costs (med quality)	-32,708,080	-7,387,520	-5,626,000	-6,984,000	-11,266,000
Balconies (med standard)	-1,687,200	-421,800	-321,900	-399,600	-477,300
Basement car parking	-5,092,000	-1,273,000	-971,500	-1,206,000	-1,440,500
Professional fees (arch, eng, qs, etc)	-3,948,728	-908,232	-691,940	-858,960	-1,318,380
Development contributions	-1,596,000	-399,000	-304,500	-378,000	-451,500
Infrastructure growth charges	-1,292,000	-323,000	-246,500	-306,000	-365,500
Pro rata consent costs (market)	-202,500	-202,500	-202,500	-202,500	-202,500
Pro rata council rates (market)	-67,500	-67,500	-67,500	-67,500	-67,500
Pro rata exterior works (market)	-72,000	-85,320	-108,000	-108,000	-108,000
Bank finance costs	-3,079,957	-730,480	-563,662	-693,697	-1,036,014
Pro rata land finance cost (market)	-396,000	-198,000	-79,200	-99,000	-118,800
Developer management fee	-926,480	-214,251	-163,247	-202,651	-306,384
Sales of market units	58,362,700	17,802,400	13,557,500	16,830,000	20,102,500
Legal conveyancing costs	-152,000	-38,000	-29,000	-36,000	-43,000
Sales commissions	-2,334,508	-712,096	-542,300	-673,200	-804,100
Net GST payable	-1,381,528	-897,665	-666,879	-841,536	-533,733
Profit/loss on market units	4,807,747	4,841,701	3,639,751	4,614,892	2,097,023
Number of affordable units	17	4	3	4	5
Gross area of affordable units	1,400	400	300	400	500
Net area of affordable units	1,190	340	255	340	425
Main building costs (medium quality)	-3,668,000	-776,000	-582,000	-776,000	-1,310,000
Balconies (med standard)	-188,700	-44,400	-33,300	-44,400	-55,500
Basement car parking	-569,500	-134,000	-100,500	-134,000	-167,500
Professional fees (arch, eng, qs, etc)	-442,620	-95,440	-71,580	-95,440	-153,300
Development contributions	-178,500	-42,000	-31,500	-42,000	-52,500
Infrastructure growth charges	-144,500	-34,000	-25,500	-34,000	-42,500
Pro rata consent costs (market)	-22,500	-22,500	-22,500	-22,500	-22,500
Pro rata council rates (market)	-7,500	-7,500	-7,500	-7,500	-7,500
Pro rata exterior works (market)	-8,000	-9,480	-12,000	-12,000	-12,000
Bank finance costs	-345,168	-76,911	-58,501	-77,077	-120,338
Pro rata land finance cost (market)	-99,000	-44,000	-22,000	-22,000	-22,000
Developer management fee	-103,836	-22,517	-16,888	-22,517	-35,626
Sales of affordable units	5,929,770	1,694,220	1,270,665	1,694,220	2,117,775
Legal conveyancing costs	-17,000	-4,000	-3,000	-4,000	-5,000
Sales commissions	-237,191	-67,769	-50,827	-67,769	-84,711
Net GST payable	-66,864	-68,570	-49,569	-68,192	-30,715
Profit/loss on affordable units	-169,109	245,134	183,501	264,825	-3,914
<b>Total profit on units under IZ</b>	<b>4,638,638</b>	<b>5,086,835</b>	<b>3,823,252</b>	<b>4,879,717</b>	<b>2,093,108</b>
Development margin (20%)	-11,369,254	-2,703,870	-2,066,044	-2,559,068	-3,831,928
Residual Land Value	-6,730,616	2,382,965	1,757,208	2,320,649	-1,738,820
Development Land Price	4,000,000	2,000,000	800,000	1,000,000	1,200,000
<b>Difference</b>	<b>-10,730,616</b>	<b>382,965</b>	<b>957,208</b>	<b>1,320,649</b>	<b>-2,938,820</b>
Development margin (25%)	-14,211,567	-3,379,838	-2,582,554	-3,198,836	-4,789,910
Residual Land Value	-9,572,929	1,706,997	1,240,697	1,680,882	-2,696,802
Development Land Price	4,000,000	2,000,000	800,000	1,000,000	1,200,000
<b>Difference</b>	<b>-13,572,929</b>	<b>-293,003</b>	<b>440,697</b>	<b>680,882</b>	<b>-3,896,802</b>
Development margin (30%)	-17,053,881	-4,055,805	-3,099,065	-3,838,603	-5,747,892
Residual Land Value	-12,415,243	1,031,030	724,186	1,041,114	-3,654,784
Development Land Price	4,000,000	2,000,000	800,000	1,000,000	1,200,000
<b>Difference</b>	<b>-16,415,243</b>	<b>-968,970</b>	<b>-75,814</b>	<b>41,114</b>	<b>-4,854,784</b>

Figures A, B and C present the financial viability of the various hypothetical apartment developments for each of the three development margins (20, 25 and 30 per cent) and market conditions (steady, depressed with 10% lower sales prices and buoyant with 10% higher prices).

**Figure A: Financial Viability of Hypothetical Developments under Steady Market Conditions**

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+	
20%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
25%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
30%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									

Development Quality = High

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+
20%	Metropolitan	18	Not Viable								
	Mixed Use	4	Viable								
	Terraces & Apts	4	Viable								
		5	Viable								
		6	Not Viable								
25%	Metropolitan	18	Not Viable								
	Mixed Use	4	Not Viable								
	Terraces & Apts	4	Viable								
		5	Viable								
		6	Not Viable								
30%	Metropolitan	18	Not Viable								
	Mixed Use	4	Not Viable								
	Terraces & Apts	4	Viable								
		5	Viable								
		6	Not Viable								

Development Quality = Medium

**Figure B: Financial Viability of Hypothetical Developments  
under Depressed Market Conditions**

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+	
20%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
25%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
30%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Not Viable									

Development Quality = High

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+	
20%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Not Viable									
		5	Not Viable									
		6	Not Viable									
25%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Not Viable									
		5	Not Viable									
		6	Not Viable									
30%	Metropolitan	18	Not Viable									
	Mixed Use	4	Not Viable									
	Terraces & Apts	4	Not Viable									
		5	Not Viable									
		6	Not Viable									

Development Quality = Medium

**Figure B: Financial Viability of Hypothetical Developments  
under Depressed Market Conditions**

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+	
20%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
25%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									
30%	Metropolitan	18	Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Viable									

Development Quality = High

Margin	Zone	Storeys	None	5%	10%	15%	20%	25%	30%	35%	40%+	
20%	Metropolitan	18	Not Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Not Viable									
25%	Metropolitan	18	Not Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Not Viable									
30%	Metropolitan	18	Not Viable									
	Mixed Use	4	Viable									
	Terraces & Apts	4	Viable									
		5	Viable									
		6	Not Viable									

Development Quality = Medium