

PROPERTY **E**ECONOMICS



PORIRUA CITY

FUTURE URBAN ZONE

ECONOMIC OVERVIEW

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SCHEDULE

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1. INTRODUCTION

Porirua City Council (PCC) have engaged Property Economics to outline the potential impacts of Greenfield residential land provision on the propensity for brownfield / infill locations to be (re)developed. More specifically Property Economics were asked to comment on the propensity of infill development in the wake of additional greenfield Future Urban Zone (FUZ) land.

This report provides commentary, through an economic lens, on this issue and highlights the key considerations to inform Council's decision making on the appropriate extent of FUZ provision in the Proposed District Plan (PDP).

This report also makes specific commentary on submissions on the Porirua City PDP by Kāinga Ora Homes and Communities (**Kāinga Ora**) and Silverwood Corporation Limited (**Silverwood**) and their respective concerns regarding the matter of FUZ land.

1.1. OBJECTIVES

Key objectives in this overview are:

- Identify and comment on the relevant economic issues related to FUZ land.
- Review and summarise relevant economic literature.
- Summarise the costs, benefits and potential risks associated with rezoning land to FUZ.

1.2. DATA SOURCES

Information and data have been obtained from a variety of credible data sources and publications available to Property Economics including:

- Porirua City District Plan, including supporting information and evidence – Porirua City Council
- Population, Household and Dwelling Projections – Sense Partners
- Porirua City Residential Capacity Estimates – Property Economics

2. SUMMARY

This economic report provides an outline of the potential impact of increased greenfield and FUZ residential land on the Porirua housing market and community, as well as its potential influence on the PDP's ability to meet its (and the NPS UD¹) objectives of a compact urban form. Debate on the level and appropriateness of increased greenfield land supply is highly topical in a market that has seen substantial and potentially unsustainable price rises over the past two decades.

House prices in Porirua continued to rise in line with national growth levels over the annual period to December 2021 with the average house price rising 24% to just over \$1m. This growth and subsequent fall in affordability has raised the question of appropriate levels of land supply and specifically the potential need and impact of additional greenfield and FUZ land.

The 2021 Porirua residential capacity assessment has found that under the PDP and current market conditions the city has development potential for 21,500 feasible dwellings (out of 144,000 enabled through the PDP) within the existing urban area. Additionally, the plan allows for greenfield provision that accommodates over 3,600 potential dwellings.

This level of capacity represents a significant shift from both the ODP² and historical distributions of development potential within Porirua. With an estimated long term (30-year) demand (including 15% buffer as per NPS UD guidance) of just under 11,800 dwellings, the total provided for under the plan is sufficient to meet this need throughout the 30-year timeframe.

When considering an appropriate realisation rate for the feasible urban development the 21,500 feasible dwellings is reduced to just under 11,000. When considering this figure along with the 3,600 greenfield sites there is sufficient capacity (approximately 14,500) to meet the long-term 11,800 demand estimates. Based on these expectations there is no requirement to identify additional FUZ to meet sufficiency over this period.

The provision of greenfield residential land and FUZ provides several benefits to the community including:

- Potential to reduce land values;
- Increased certainty of growth accommodation;
- Increased flexibility in the market; and
- Increased 'ease' of development.

¹ National Policy Statement on Urban Development 2020

² Operative District Plan

However, as identified above, the Porirua PDP currently facilitates more than sufficient levels of capacity for expected growth. As such, additional greenfield and FUZ identification have the potential to result in material economic costs to the community including:

- Reduction of brownfield feasibility rates;
- Reduced land values reducing brownfield feasibility rates;
- Increased infrastructure costs (marginal costs);
- Reduced land use efficiencies;
- Reduced community and transportation efficiencies; and
- Less housing choice.

Additionally, providing increased greenfield and FUZ options to the market is likely to result in market outcomes that are not in line with the NPS UD, RPS³ and strategic objectives of the Porirua PDP.

Based on the discussion above, it is our opinion that:

- The level of FUZ currently identified in the PDP is appropriate and necessary for economic efficiency of housing land supply, and to provide sufficient housing development capacity over the next 30 years. This level of FUZ zoned greenfield land will not disincentivise intensification and brownfield redevelopment within existing urban areas (to an inappropriate degree); and
- While there are attributes to the Silverwood land (submitter 172) that make it potentially suitable for future urban development, the rezoning of the Silverwood Land would result in too much greenfield land being included as FUZ within the PDP. It is not needed to meet identified housing need over the next 30 years. If it was rezoned to FUZ, it would result in inefficiencies and distortions in the residential land market, create a disincentive for brownfield redevelopment and intensification, and a continuation of lower density urban form with associated inefficiencies.

³ *Regional Policy Statement (Objective 21)*

3. DEMAND FOR DWELLINGS IN PORIRUA

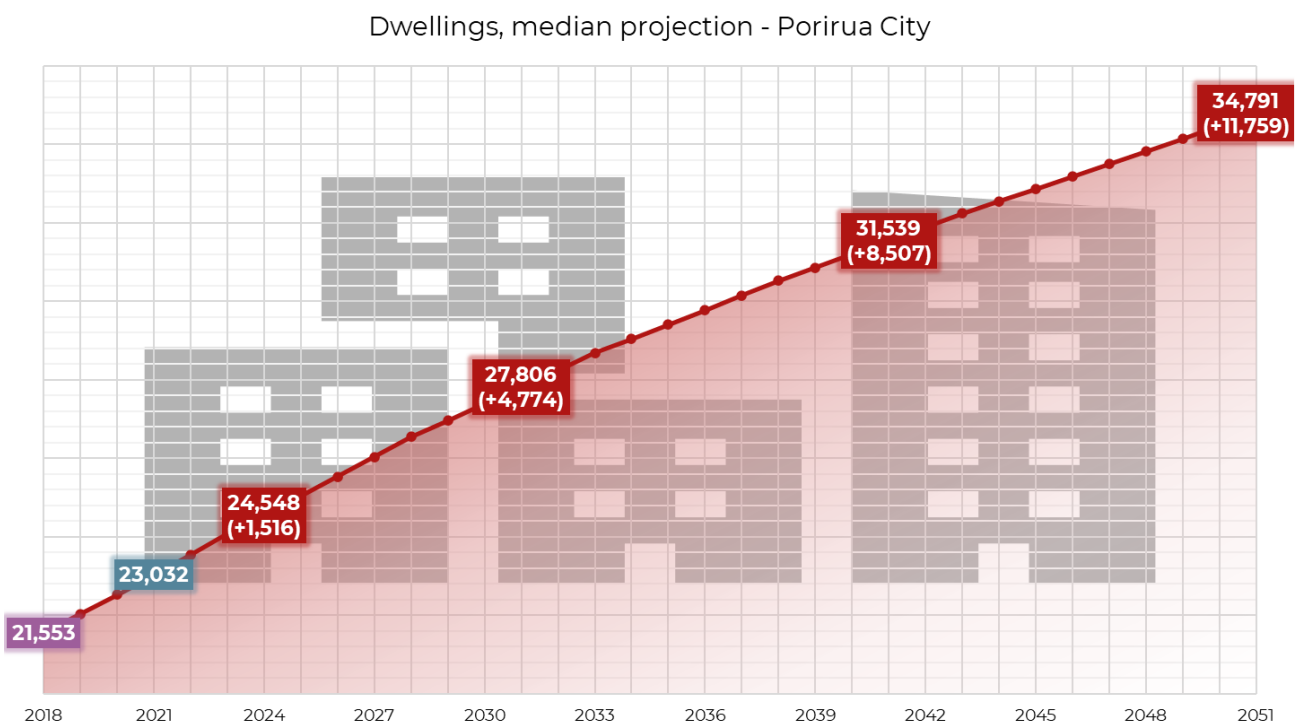
The following figure shows Sense Partners dwelling projections over the 2021-2051 period for Porirua City.

“Dwelling” refers to a physical dwelling, attached or detached, that need not be occupied permanently, i.e., it could be used for non-residential purpose or for short-term accommodation (rental, holiday home, etc.).

Sense Partners projections were used as these are the projections adopted by Council as part of their capacity estimates for the district (and region) and utilised to assist meeting their obligations under the NPS-UD and in their PDP review process. These projections therefore represent Council’s view of growth over the short-, medium- and long-term for the district (of 3-, 10-, and 30-years, respectively).

There are currently 23,032 dwellings in Porirua City, as of 2021. This is anticipated to grow to 24,548 by 2024, or growth of 1,516 net cumulative additional dwellings in the short-term. Porirua City is anticipated to reach 27,806 dwellings by 2031, or growth of 4,774 net cumulative additional dwellings in the medium-term. Porirua is anticipated to grow to 34,791 dwellings by 2051, or 11,759 net cumulative additional dwellings over the long-term.

FIGURE 1: PORIRUA CITY DWELLING PROJECTIONS (2021 – 2051)



Source: Sense Partners.

4. RESIDENTIAL CAPACITY AND SUFFICIENCY

Residential capacity has been assessed on the Porirua PDP based on proposed zoning extents and policy settings. Table 1 indicates there is currently feasible capacity within Porirua (existing urban area) in the order of 21,560 dwellings across all live-zoned areas. The following table outlines the potential locations and typologies of this capacity.

TABLE 1: PORIRUA FEASIBLE CAPACITY (MAX PROFIT) ESTIMATES BY SUBURB AND TYPOLOGY

Suburb	Theoretical Capacity	Feasible Capacity				Feasibility Rate
		Apartment	Terraced	Standalone	Total	
Aotea	5,803	-	384	-	384	6.6%
Ascot Park	3,934	49	236	-	285	7.2%
Camborne	2,330	-	223	-	223	9.6%
Cannons Creek	15,378	-	776	6	782	5.1%
Elsdon	7,090	620	831	-	1,451	20.5%
Hongoeka	1,004	-	55	-	55	5.5%
Kenepuru	9,589	260	1,036	4	1,300	13.6%
Papakowhai	3,255	24	149	-	173	5.3%
Paremata	4,880	479	588	202	1,269	26.0%
Plimmerton	7,397	37	1,541	108	1,686	22.8%
Porira City Centre	25,972	2,238	3,138	254	5,630	21.7%
Pukerua Bay	4,301	5	719	13	737	17.1%
Ranui	9,260	249	1,702	60	2,011	21.7%
Takapuwahia	4,055	-	520	36	556	13.7%
Titahi Bay	14,906	71	2,822	41	2,934	19.7%
Waitangirua	8,330	24	560	7	591	7.1%
Whitby	17,089	40	1,434	15	1,489	8.7%
Total	144,573	4,096	16,714	746	21,556	14.9%

Source: Property Economics.

There is anticipated to be a significant level of demand for dwellings within Porirua City over the life of these feasible capacity estimates (2021 – 2051). After accounting for the NPS-UD buffer, there is demand for almost 14,000 net additional dwellings over the next 30 years with much of this demand, around 8,000 dwellings, developing after the first 10-years.

The following table shows the realisable capacity by suburb and typology within the existing urban area. Realisable capacity is the feasible capacity that takes practical considerations into account. The main sensitivities considered are dwelling typology, development options, and the level of proposed and current greenfield competition.

It is worth noting that feasible capacity is temporary and demand dynamic and will change with conditions in the future. As relative demand increases so too will the dwelling price level, and this in turn will unlock realisable capacity as the market will recognise market opportunities for development.

TABLE 2: PORIRUA REALISABLE CAPACITY ESTIMATES BY SUBURB AND TYPOLOGY

Suburb	Theoretical Capacity	Realisable Capacity				Realisation Rate
		Apartment	Terraced	Standalone	Total	
Aotea	5,803	-	109	47	156	2.7%
Ascot Park	3,934	-	15	8	23	0.6%
Camborne	2,330	-	59	39	98	4.2%
Cannons Creek	15,378	-	114	49	163	1.1%
Elsdon	7,090	-	101	220	321	4.5%
Hongoeka	1,004	-	7	27	34	3.4%
Kenepuru	9,589	67	349	526	942	9.8%
Papakowhai	3,255	7	22	12	41	1.3%
Paremata	4,880	71	286	434	791	16.2%
Plimmerton	7,397	13	517	926	1,456	19.7%
Porira City Centre	25,972	11	2,046	1,535	3,592	13.8%
Pukerua Bay	4,301	-	177	132	309	7.2%
Ranui	9,260	15	298	265	578	6.2%
Takapuwahia	4,055	-	136	189	325	8.0%
Titahi Bay	14,906	-	869	549	1,418	9.5%
Waitangirua	8,330	-	51	112	163	2.0%
Whitby	17,089	8	420	119	547	3.2%
Total	144,573	192	5,576	5,189	10,957	7.6%

Source: Property Economics.

The table above shows that there is significantly less realisable capacity within Porirua than feasible capacity; just over half of the feasible capacity is also likely to be realised. There is currently a little under 11,000 dwellings of realisable capacity within Porirua. This level of capacity far exceeds the short- and medium-term dwelling demand for the district, and because market conditions will change, there is likely no shortfall capacity for the long-term either.

The following table summarises the current sufficiency, or net position, of Porirua City residential dwelling capacity. The only potential shortfall that exists is a small shortfall in long-term realisable which is likely to be transitory.

Additionally, these capacity estimates do not consider the existing greenfield land which the PDP anticipated to be provided over the next 30-years.

TABLE 3: PORIRUA CITY SUFFICIENCY SUMMARY

Capacity	Total	Cumulative Demand			Cumulative Sufficiency		
		Short	Medium	Long	Short	Medium	Long
Theoretical	144,573				143,057	139,799	132,814
Feasible	21,556	1,516	4,774	11,759	20,040	16,782	9,797
Realisable	10,957				9,441	6,183	-802

Source: Sense Partners, Property Economics.

The timing of this demand is an important consideration for FUZ land as later stage demand suggests a greater need for FUZ over current live-zoned land to provide a greater level of flexibility for the roll out of infrastructure staging.

However, if a significant proportion of dwelling demand is anticipated in the long-term 30-year timeframe it is possible that FUZ land could be detrimental to planning outcomes because structural changes to the way the economy, and Porirua City, operate may make the location and quantity of FUZ land inefficient on a comparative basis. Since the provision of FUZ is often a “one-way-street” (i.e., irreversible once developed), its use at an early stage could be highly detrimental to long-term outcomes, and the efficient development and operation of the city.

It should be noted, for parsimony, that the provision of FUZ land can have a positive impact on growth and growth rates which, in turn, impact the realisation of FUZ land and demand in general. This means that by zoning land FUZ a Council is encouraging its development, i.e., bringing forward its development in the timeline. This creates a positive feedback loop where more growth creates more demand for land which creates more growth, *ad infinitum*. Contrarywise, restricting the amount of FUZ land may stymie district level growth.

Later staged demand is also surrounded in uncertainty, not just as to whether it will occur but in what form it will be as tastes and preferences for dwelling stock change over time. Known and speculated timeline events in the next 30-year period that will impact the housing market include:

- At the end of 30-years it is likely that a greater proportion of the Baby Boomer generation will have passed. This generation holds more wealth (including real estate property) than any generation before or since which will be passed on to subsequent generations as they die off. This ‘frees up’ existing lower density housing across all pricing brackets.
- A general shift towards terraced and apartment living options based on:
 - Taste and preference for higher density dwellings;
 - Increase in tertiary sector jobs requiring proximity to large urban centres as the economy modernises;
 - Affordability issues surrounding the costs of maintaining a lower density dwelling;
 - Smaller households – fewer children per household and less inter-generational living arrangements;
 - Changes in technology making inner city living more attractive; and
 - Increased domestic wealth inequality.

- Increased employment mobility and internet use. As travel costs decrease people move around the country / world for employment opportunities that suit their needs / lifestyle. This trend will be boosted by the proliferation of employment that can be conducted remotely via the internet.
- Greater reliance on external trade for building materials as the economy becomes more integrated with the global economy. This creates external threats to supply and demand shocks that could rapidly change the cost of construction in the event of such shocks.

We note that these indicative changes do not all move in the same direction, for-or-against intensification, but are key factors to consider.

EXISTING GREENFIELD FUZ

The following table identifies the suburbs / developments of existing greenfield and greenfield FUZ land with anticipated dwelling capacity.

As identified above the capacity anticipated within the existing urban area has the potential to supply nearly 11,000 dwellings under current market conditions. However, Table 3 identifies a capacity of over 3,600 dwellings within greenfield areas with 'full urban zoning'. This, in itself, would suggest that greenfield capacity could provide for over 30% of Porirua's 30-year residential housing demand. This would then require only 8,000 dwellings to be developed within the existing urban area (less than 40% of the feasible assessment and 6% of theoretical or plan-enabled capacity). Even when considering the potential for typology reconciliation with demand preferences, this level of feasible development could meet these levels of demand.

When considering the medium-term timeframe over the next 10 years it is anticipated that Porirua will require approximately 4,800 new dwellings to meet demand. When considered over this timeframe the existing greenfield provision would account for 75% of the dwellings required.

It is estimated there is currently capacity for 1,900-2,000 dwellings within identified FUZ land, around 14% of total anticipated demand over the next 30-years. This realisable capacity represents dwellings that could be realised with today's market conditions, but, because it is FUZ land, it is anticipated to be realised in the next 30+ years. Note that there is sufficient existing, live-zoned, cumulative capacity over the next 30-year timeframe excluding FUZ land.

This FUZ capacity "buffer" could be enabled with the advent of unanticipated events that consume other capacity. For example, if growth were to increase at a rate significantly faster than the most recent Sense Partners projections, or low-density housing development options were to be consumed faster than expected. This buffer has the potential to provide both:

1. Additional flexibility for Council to meet their obligations under the NPS-UD to provide sufficient capacity and choice of location and dwelling typology; and
2. Certainty to the market about the anticipated growth pattern of the city.

SILVERWOOD FUZ PROPOSAL

The Silverwood submission on the identified sites suggest that they have capacity to accommodate approximately 500 (presumably low density) dwellings⁴ across the identified area, or around 25% of the existing FUZ capacity.

In relation to the level of demand estimated by Sense Partners, and the proposed urban realisable capacity along with existing greenfield capacity, there is no shortage foreseen in the Porirua residential market unless other significant constraints exist on greenfield sites. As such, there is no foreseeable requirement (in terms of sufficiency) to identify additional FUZ within Porirua, such as that proposed by the Silverwood submission.

As alluded to, the identification of FUZ residential land has the potential to result in economic costs, benefits and risks as well as directly impacting upon the ability of Porirua's PDP to meet its Strategic objectives.

⁴ Submission on publicly notified Proposed Porirua District Plan - Submission Number 172 p.43.

TABLE 4: LIVE GREENFIELD AND FUZ LAND DWELLING CAPACITY

SA02 Area	Council Greenfield Areas	Full Urban Zoning	Housing Capacity
Aotea			
	Aotea	Yes	100
Paekākāriki Hill			
	Plimmerton Farm	Yes	2,000
	Mount Welcome (FUZ)	No	500
	Grays land (FUZ)	No	250
	Northern Growth Area – remainder (FUZ)	No	450
Pāuatahanui			
	Judgeford Hills (FUZ)	No	500 - 600
	Silverbrooke (Blackdragon)	Yes	223
Porirua Central			
	Kenepuru Landing	Yes	821
Pukerua Bay			
	Carrod's farm (FUZ)	No	300
Ranui Heights			
	Ranui	Yes	60
Whitby, Endeavour, Postgate			
	Pacific Heights - Silverwood	Yes	75
	Navigation Heights – stages 2A, 2B, 2C and 2D, and Stage 3	Yes	69
	72 Exploration Way and 5 Wheelhouse Lane (Progeni)	Yes	47
	Stages 3 & 5, Brookside – Tradewinds Drive	Yes	32
	47 and 49 Cleat Street[2] (only 4.15ha)	Yes	125
	30, 31, 32 Adventure Drive[3] (cumulatively over 5ha)	Yes	102
	Total, including Future Urban Zone		5,525 – 5,725
	Supply with full urban zoning	3,625	

Source: Property Economics.

5. BROWNFIELD VS GREENFIELD DEVELOPMENT

The relativity between a greenfield site and a brownfield or existing urban site must be considered in relation to several existing factors.

The first is the intrinsic value difference from an economic efficiency standpoint. This relates to the resulting accessibility to existing (future planned) infrastructure, land use values, access to amenity, employment and social opportunities as well as the potential for improved environmental outcomes.

The second set of conditions in relation to planning economics relate to the overall objectives of the district plan. While these objectives are generally guided by the above outcomes either through the NPS UD or RPS objectives, the potential to meet them should be considered when assessing the potential outcomes of relative provision between the competing levels of capacity.

It is important to note that there are market and practical consideration constraints on the level of development that occurs within a city, with these constraints often appearing as trade-offs between greenfield and brownfield development.

Greenfield and brownfield land is not explicitly defined within the Porirua PDP so the common use definitions have been applied.

Brownfield land is development land where development is constrained by the existing built form – buildings and infrastructure – and is most often found in built up urban areas.

Greenfield is development land that is unconstrained (or constrained only to a small degree) as there is little to no existing built form to impeding development. Greenfield occurs most often in rural or urban fringe locations.

All FUZ is assumed to be Greenfield as one of the key benefits of FUZ is the lack of built form constraints which promotes these locations as growth areas as they are relatively unconstrained. This matches Porirua City's PDP on FUZ, "*the Future Urban Zone applies to Greenfield land that has been identified as being suitable for these purposes [additional land for housing and business purposes over the next 30 years]*", as well as explicit objectives to prevent the ad-hoc development on FUZ land to ensure more comprehensive development at a later stage.

There is a significant body of economic work that has reviewed the impacts of restricting residential land for development with specific reference to greenfield expansion.

While older material relating to Auckland's MUL (Metropolitan Urban Limit) has been produced by **Grimes and Liang** (2009), **Zheng** (2013), and the **Productivity Commission** (2012) indicated mixed results on the impact of an urban boundary, a key finding of all the research was a significant increase in price for residential land inside the MUL.

Similarly, and more recently in 2020, **Martin and Norman** examined if converting farm or lifestyle-sized land outside the Rural-Urban Boundary (RUB) into 'infrastructured' residential sections similar to already developed land inside the RUB would deliver land to the market more cheaply. Their results demonstrated that land outside the RUB has the lowest value in each size category. Inside the RUB, where land has the promise of infrastructure, some of the value is in land prices. The land values are highest in already developed areas inside the RUB, where infrastructure already exists.

International studies on the development impact of urban limits / boundaries, for instance, **Fu et al. (2019)** investigated the effects of Beijing's urban growth boundaries (UGBs) on land development using the dataset of land use permits issued between 2003 and 2010. Their findings show that UGBs have curtailed urban development outside UGBs. After the imposition of UGBs, the development probability of land parcels located just outside UGBs is lower by 1.4-7.7 percentage points than those just inside UGBs.

Another strand of literature tends to focus on the price differentials caused by rural-urban boundaries. One example was **Ball et al. (2014)**, which examined the land price impact of the undeveloped land transactions at the urban fringe of the Melbourne metropolitan area in Australia. Their modelling estimates indicated that land prices rose substantially inside the UGB after its enactment in 2003 but did not rise much outside of it. These results suggest that the urban growth boundary has had a significant upward effect on the trajectory of the urban region's house prices.

In the United States, **Mathur (2013)** provided evidence of the impact of UGB on housing and land prices in Washington. The results show that although the UGB increases land prices by 230 per cent, it decreases housing prices by 1.3 per cent. Mathur noted that policymakers need to adopt a policy framework in which a UGB's anticipated inflationary land price effect is mitigated by policies that increase housing supply. Such policies could include minimum density requirements, zoning for multi-family housing, and ordinances enabling the construction of accessory dwelling units.

These strains of research illustrate several points, not least of which is the impact of limiting urban expansion on land prices. The research, when viewed in the round, found that, on average, the addition of residential land through greenfield development generally provides cheaper land that lowers the overall market value of residential land.

This additional land for housing has been the argument for both:

- a) the provision of more greenfield land for development, decreasing the overall price of land and therefore contributing to affordability and local demand through improved competitiveness relative to other districts; and
- b) the reduction in new greenfield land as its expansion causes both a decrease in the competitiveness of intensified residential development, and also the resulting decrease in land values reduces the overall feasibility of urban redevelopment.

The potential impact of price on intensification is identified in the Ministry of Housing and Urban Development's publication 'Understanding and implementing intensification provisions for the NPS-UD'. Page 38 of this document highlights areas of high land value and low improvement value (or capitalisation) as signalling increased potential for intensification and redevelopment.

The inverse of this on the market in general is likely to result from increased greenfield supply, redirecting potential urban demand, lowering prices and impacting directly on the feasibility of intensified residential development.

5.1. RESIDENTIAL DEVELOPMENT INTENSITY IMPETUS

Developers have an incentive to develop a property to the greatest density that will simultaneously satisfy the conditions that:

- a) the market will accept a product at a given price;
- b) the regulator(s) will allow and enable such development to take place; and
- c) the developer will maximise profit without exiting their desired risk profile (greater density usually means higher risk / higher reward).

This is because density allows developers to maximise land use which is generally the costliest marginal input of a development.

When there is a significant level of greenfield land available for development there is a low premium on land because the supply of land is less constrained. The low premium on land reduces the market's appetite for higher density development since the substitute (low density) is readily available (low relative cost) and this in turn reduces the profit potential for brownfield developers.

Since all land contains some level of monopoly power – all land is unique – there are limitations to the efficacy of increasing the supply of greenfield land to reduce land premiums. This is especially true when the greenfield land is sufficiently distant from the key activity areas (CBD or Metropolitan Centres) of a city or district.

More liberalised land markets (greater levels and quantities of up-zoned land) tend to operate in and around centres. This is because of the demand driven factors from residential and commercial tenants that value proximity to key activity nodes and prompted authorities to allow greater levels of density in these locations.

Conversely, fringe areas tend to have stricter density controls in place to protect the existing amenity values of the natural environment that would be disrupted with density (noise, light, loss of greenery, loss of built form, etc.)

As stated earlier, land with higher value (per unit area) tends to be developed to greater levels of density so developers can maximise the land use, and land that has a higher value (per unit area) tends to be located in and around centres. So the land that gets developed to higher density is driven by the demand to be located in and around key activity nodes, but this demand can be displaced by lower prices on the city fringe.

5.2. POTENTIAL MONOPOLY IMPACTS OF FUZ

Zoning FUZ increases the propensity for landholders to land bank for uncompetitive pricing of future urban land. From an economic theoretical point of view all real estate has some degree of monopoly power based on the land's uniqueness (no two parcels are identical). Together with zoning rules, which add extra layers of unique characteristics to land, this can create substantial monopoly power for land holders with large tranches of land.

If one or a small handful of landholders are given exclusive right to FUZ land, which is the planned future greenfield expansion of the city, their monopoly (or oligopoly) power can increase prices artificially to capture consumer surplus. This uncompetitive environment can have negative outcomes for society through super-normal pricing and displace the zoning of additional capacity that is likely to be developed.

Land banking, like monopoly pricing, is also notoriously hard to prove which complicates and disguises the true impact on the market.

This may not be a significant cost if policy setters remain vigilant, however, as additional greenfield land can be unlocked through the plan change process, and the rent seeking behaviour of monopolists / oligopolists may encourage further intensification if their pricing is too exorbitant. Further, zoned and proposed future zoned land holdings can be expensive to maintain undeveloped which encourages development and on selling.

5.3. LOCAL COUNCIL INSTRUMENTS TO ENCOURAGE DEVELOPMENT

There are a number of tools available to the Council to encourage intensified development over greenfield sites. Councils can encourage development through the ratings system / property "taxes." Land taxes can encourage a greater level of development if the tax base is rated off the value of land rather than the value of the land and improvements, as they currently are. This is because land that is not being used for productive or residential use would become a greater detriment to hold for its aesthetic or amenity value, and a greater cost to hold for land banking.

Land holders would be encouraged to subdivide and develop or subdivide and sell land (to be used for residential or productive use in the future) excess to their personal requirement.

The capital valuation-based rating system does not encourage development to the same degree, and can even discourage development, as the development of a parcel would increase the tax owed by the owner since the improvement value increases the capital valuation.

It is worth noting that most of a property's value is tied up in the value of the land and that the distribution of the tax burden is not evenly split between the improvement(s) value and the land value, and there are also additional targeted rates for certain areas or property features.

A land-based ratings system would effectively shift this distribution entirely onto the land value of the property. Consequently, the current distribution of land values may not be reflective of the true tax base as land valuations are structurally dependent on the future cashflows of the land.

The theory of taxation holds that taxes ought to be equitable, which is the most salient reason against a land tax based ratings system. Land based rates impact people based on their land holdings, rather than services provided to them, which is not equitable. A person with 500sqm receives the same local council services as someone with 400sqm, for example.

Tax systems based on capital valuation, however, tax on a combination of land and improvements where the value of improvements acts as a stand in for a greater level of service provided (though an imperfect one).

An alternative rating base, that has not been widely studied, is to tax undeveloped land – the footprint of land that is not occupied by improvements. This has the added benefit to a straight land-based ratings system in that it rewards greater levels of development up to the margin of available land – though this reward does not necessarily encourage intensification of dwellings and can be more difficult to administer.

5.4. UPZONING AND DEVELOPMENT INCENTIVES

The term “upzoning” means to change an area’s underlying zone from one zone to another with fewer Land Use Regulations (LURs) i.e., a relaxation / liberalising of LURs. The transition from a FUZ to live-zoned urban (residential, commercial, industrial) land would be an example of upzoning. So too would a transition from an existing residential zone to a zone that allows a greater level of dwelling density to occur.

In contrast, a rezoning from a rural zoning to FUZ is not an example upzoning as the land use regulations remain fundamentally the same under FUZ as rural zones. Rather, the FUZ represents a signal from Council to the market that these are the intended future growth locations for the city / district over a longer timeframe.

The key points regarding the (re)development of land in relation to upzoning are:

1. Upzoning brings the (re)development lifecycle forward in time. The scale to which development can occur is now greater so the future rents from development are greater if the option to develop is exercised.
2. Property with existing capital improvements will take longer to be (re)developed than a property without capital improvements, *ceteris paribus*. This is because these improvements act as a constraint to development.
3. Property without improvements will appreciate at a faster rate following an upzoning than a property with improvements, *ceteris paribus*.

The theoretical / technical economic backing and sources are provided in Appendix 1.

6. POTENTIAL IMPACTS OF GREENFIELD ON THE RESIDENTIAL MARKET

As identified earlier the potential rezoning, or even anticipation of zoning, can influence the residential development market. Both land price and competition play pivotal roles in identifying where the market is likely to realise capacity provided for in the plan.

Ultimately greenfield capacity competes for residential demand with brownfield opportunities while at the same time offering the market additional choice. It is therefore important to understand the potential level of competing product and how this may influence the ability for the PDP to meet its objectives.

6.1. POTENTIAL ECONOMIC BENEFITS OF GREENFIELD (FUZ)

- **Increased Choice:** The provision of greenfield capacity increases locational choice and development options for the market.
- **Decreased Residential Land Values:** The increase of residential land supply is likely to lower potential land values. This, it is argued, has the potential to improve housing affordability. However, while the value of residential land per square metre may increase under a more intensified plan, the increased value allows for greater housing options and typologies decreasing the amount of land required per dwelling and potentially reducing the cost of housing. This essentially lowers the cost of residential land rather than the cost of housing.
- **Improved District Competitiveness:** Especially as the market transitions to more intensified development options, the provision of additional development capacity is likely to compete (over the short term) for wider residential growth.
- **Certainty in Future Growth Areas:** The provision of both greenfield and FUZ greenfield provides greater certainty to the market as to the direction of growth allowing for improved investment decisions.
- **Flexibility to Meet Unforeseen Growth:** While all care has been taken in assessing potential residential demand, flexibility for additional growth within the market that is highly responsive has the potential to service greater levels of population growth. It is important to consider the fact that the growth considered in the HBA assessment is considered 'robust' with current provision for the longterm 30-year timeframe, and it is considered highly unlikely that growth would exceed this over a short to medium term.
- **Generally 'Easier' Development Factors:** The preference by developers for greenfield sites is generally based on the ability for these to provide larger unconstrained areas with little to no improvement value to assess against. This coupled with the fact that these locations

typically provide for larger sites to the market has meant this product has remained highly competitive in the New Zealand and Porirua housing markets for the last few decades.

6.2. POTENTIAL ECONOMIC COSTS OF GREENFIELD (FUZ)

- Increased Competition with Intensified Capacity Options Reducing Brownfield Realisation Rates:** As identified above the competition for housing demand is spread across a number of typologies and locations both within Porirua District and competition with product outside of the district. Historically low redevelopment and intensification levels have predicated the need for increasing levels of greenfield land. This creates additional competing capacity (as identified above, often, with easier development parameters) that reduces the potential for infill and comprehensive redevelopment within existing urban areas.
- Lower Land Values Reducing Brownfield Feasibility Rates:** The prevailing argument with greenfield supply is that it creates additional residential land capacity, potentially decreasing the price of residential land. The effect of this price fall is to reduce the overall feasibility of brownfield development. To put this into context, recent changes in residential land prices have resulted in massive changes to Porirua feasibility rates.

Based on ODP provisions the feasibility rates within Porirua increased by 50% when considering the latest valuation data. It is important to note that an objective of the PDP provisions is to enable intensified residential redevelopment, and this provides for increased residential capacity within existing land areas. The resulting typology and land use changes are likely to result in proportionately higher valued land (per sqm) but lower nominal land costs per dwelling.

- Increased Infrastructure Costs (Marginal Costs):** The costs associated with infrastructure provision can be outlined in two ways:
 - 1) The 'upfront' cost associated with infrastructure provision. Depending on existing capacity this can often be the same for both brownfield and greenfield and depends heavily on the site and location.
 - 2) The costs associated with future infrastructure requirements. These are costs associated with the maintenance and replacement of infrastructure into the future. While the existing provision of infrastructure can be viewed as a 'sunk cost', servicing and replacing infrastructure for a more dispersed residential population with the same land tax base is ultimately more expensive. Recent replacement costs for infrastructure within Wellington City indicate billions of dollars are required. With a potentially lower residential density the costs are spread across a lower base increasing the marginal cost of this infrastructure replacement.

- **Reduced Land Use Efficiencies:** A further consideration (especially in light of the NPS on HPL⁵) is the impact of greenfield (and FUZ) provision on productive land. The signal provided to the market that more greenfield land can be supplied indicates an easy release valve to the market which would result in a lower acceptance of the risk associated with brownfield development. This is likely to result in increasing pressure on Council to live zone FUZ increasing residential development over potentially productive land holdings.
- **Reduced Community and Transportation Efficiencies:** As indicated with infrastructure above both public transport and community services require a critical mass of users to remain efficient and effective. The dispersal of residential activity has historically impacted upon the effectiveness of these services with public transport services struggling to meet patronage requirements to compete effectively with other forms of private transportation.
- **Less Housing Choice:** As indicated above the potential for lowered residential land values to reduce both the feasibility and realisation of brownfield development reduces its competitiveness and the provision of typologies that are associated with this form of development. Reducing feasibility rates are likely to result in lower levels of terraced housing and apartment developments, which in turn reduces housing choice and lowers the levels of accessibility to areas of amenity and household and employment services.

6.3. POTENTIAL RISKS TO PORIRUA PDP OBJECTIVES

As indicated above the assessment of effects of 'excess' greenfield and FUZ land is not simply based on market effects but on the impacts of the PDP to meet its stated objectives. UFD-01 of the PDP states '*Porirua grows in a planned, cohesive, compact and structured way.*' UFD-02 states '*There is a sufficient supply of land available at all times to meet the City's medium-term housing, commercial, industrial and recreational needs.*'

Ultimately the ability for Porirua to grow in a compact way will be impacted by both the level of zoned greenfield land and the indication provided to the market of the level of growth expected to be accommodated within FUZ land.

Historically Porirua has accommodated a significant proportion of its growth in greenfield areas. As identified above this accommodation has potentially led to economic and social inefficiencies.

⁵ National Policy Statement on Highly Productive Land – (Proposed)

Over the same time land and house prices have continued to rise in line with national growth rates. This national issue has led to the development of the NPS UD that not only seeks to provide for sufficient residential capacity within territorial authority areas, but to provide these efficiently through compact urban form and intensified development.

Under these conditions the Porirua PDP has provided sufficient residential development capacity within both its existing urban areas and in identified greenfield locations. While the identification of FUZ land has benefits in terms of certainty of direction it also presents risks in terms of a release 'valve' that has the potential to materially undermine meaningful levels of brownfield residential development to meet the NPS UD and PDP (UFD) objectives.

While the risks associated with FUZ may not be as high as that of excess 'live zoned' greenfield land, this signalled provision directs the market to increased expansion. This is especially true when considering over the short to medium term there is typically a greater propensity for the development of greenfield capacity. If this capacity is first to be developed the risk is that a review will potentially identify a shortfall in greenfield capacity (as a proportion of total residential capacity) thereby prompting the 'upzoning' of identified FUZ land.

7. SITE SPECIFIC FACTORS

The following addresses site specific characteristics of land sort for rezoning under the PDP.

This land is assessed based on two key factors:

- 1) the suitability of the land for residential activity in relation to its location and specific site values; and
- 2) the requirement for rezoning of this land considering the potential for economic cost and risk associated with over residential capacity sufficiency.

The majority of the Silverwood sites identified as a potential FUZ area is bounded between the New Transmission Gully highway to the east, the new Waitangirua link road to the north and the suburb of Waitangirua to the west. There is also a small site in the north, at the end of the existing Banks Boulevard, and overlooking Transmission Gully.

In terms of natural expansion paths for the city, subject to topographical, infrastructure and other environmental constraints, the location makes economic sense as a natural expansion area for Porirua City for the following reasons:

- The site will have good transport routes north and south once Transmission Gully's wider connector road network is completed and will be around 10-12-minutes' drive from Porirua's CBD. There are also existing public transport routes that could be extended to include the area without much disruption.
- The sites are on the city's fringe and would allow for a diverse range of housing typologies across a number masterplanned super lots or mega lots.
- The sites are similar to the surrounding suburbs, and much of Porirua City, marked by rolling hills and valleys. The residential environment would likely blend in with the city seamlessly.
- The site is not used for productive use and does not feature highly productive soils so the opportunity cost of live-zoning for residential would be slight.
- The site would form an extension to the Waitangirua suburb filling the area along the link road between the "old" suburb and Transmission Gully interchange.

As outlined in the preceding report the current level of realisable capacity facilitated through the Porirua PDP is more than sufficient to meet the city's projected demand over the longterm (30-year) period. Additionally, the provision of currently unnecessary residential land capacity in greenfield location is coupled with potential costs and risk to the key objectives of the PDP and the NPS UD from which these objectives are based.

As such this report would suggest that (given the information at hand) there is no strong economic grounds by which to rezone this land.

APPENDIX 1: REAL OPTION PRICING MODEL

The following shows the real option pricing model developed by Calpp and Salavei (2010) and implemented in Greenaway-McGrevy, Pacheco and Sorensen (2019) with an empiric solution for Auckland following the implementation of the Auckland Unitary Plan Operative in Part in 2016 using a hedonic pricing model.

Each developed property has a vector of characteristics \mathbf{q}_0 that earn rents \mathbf{p} and depreciate at rate δ . This is the hedonic pricing model of property. Without redevelopment, the present value of the property, V_0 , is:

$$V_0 = \int_0^{\infty} \mathbf{p}'\mathbf{q}_0 \cdot e^{-(\delta+\rho)s} ds = \frac{\mathbf{p}'\mathbf{q}_0}{\delta + \rho}$$

Where ρ is the discount rate. Future rents \mathbf{p} (and characteristics \mathbf{q}_0) are known with certainty. The property owner is permitted to redevelop to the standard given by \mathbf{q}_n . This is the value that regulatory bodies, such as local council, allows using zoning, precincts, building codes and other regulatory action to control the level of intensification – the theoretical development envelope. The cost of redevelopment is k if the property is redeveloped at time $T > 0$ the present value of the property is given by:

$$V_0 = \int_0^T \mathbf{p}'\mathbf{q}_0 \cdot e^{-(\delta+\rho)s} ds + \int_T^{\infty} \mathbf{p}'\mathbf{q}_n \cdot e^{-(\delta+\rho)s} ds - ke^{\rho T} = \frac{\mathbf{p}'\mathbf{q}_0}{\delta + \rho} + \left(\frac{\mathbf{p}'(\mathbf{q}_n - \mathbf{q}_0)}{\delta + \rho} - k \right) e^{-\rho T}$$

Solving for T, the (re)development date, that maximizes V_0 yields the optimal date of:

$$T = -\ln \left(\frac{\rho}{\rho + \delta} \frac{\mathbf{p}'\mathbf{q}_n - k}{\mathbf{p}'\mathbf{q}_0} \right) \frac{1}{\delta}$$

That is, the optimal time for exercising a onetime option to (re)develop a property, to maximise the present value of future rents, is given by the above equation.

The key points to note are:

1. An increase in the maximum allowable construction, such as an upzoning or loosening of regulations, will bring the optimal (re)development time of a property forward.
2. A property with existing capital improvements will take longer to be (re)developed than a property without capital improvements, *ceteris paribus*, because the cost of removing improvements and the loss of future rents of those improvements if factored into the present value calculation.

Greenaway-McGrevy, Pacheco and Sorensen further show that liberalising property development rights ('upzoning' or decreasing Land Use Regulations (LURs)) results in an increase in the overall value of a property (present value of rents) and that properties with lower initial levels of capital improvements (such as vacant / greenfield land) will experience a greater appreciation rate from a liberalising in property development rights.

Since greenfield land is, generally, sans improvements, an upzoning is likely to increase the value of land at a faster rate than non-greenfield land. Similarly, the relative loss of existing improvement value for exercising a redevelopment option on a property is lower for greenfield property as the present value of rents on the greenfield land is lower – as the development will not occur until it is enabled. This implies that an upzoning of greenfield property is likely to bring the development time forward in time further than if the upzoning was applied to an brownfield property, *ceteris paribus*.

Another insight that can be gleaned from the Real Option Pricing Model is the redistribution of development during largescale land use liberalisation policies. The introduction of the AUP-OIP in 2016 saw around 80% of Auckland's residential land upzoned to allow for higher density dwellings – multiple dwellings per lot, allowance of different typologies, greater height limits, smaller height in relation to boundaries, etc.

This widescale liberalisation resulted in upzoned dwellings being redeveloped and replaced with more dwellings on the same site. This development of upzoned properties came at the expense of less redevelopment for properties that were not upzoned. This phenomenon was able to be observed in Auckland as the introduction of the AUP was a widespread liberalisation of land use policy and was, from a socio-experimental view, “random” – i.e., it was not just following set patterns around corridors or transport hubs like liberalising of land use often does.

We note that the empirical model looked at differences in residential zoning that were upzoned to a higher density residential zoning rather than non-residential zoned land that was rezoned to residential. This means the empirical result cannot be directly applied as an evidentiary base in this case but rather that the theoretical backing has an observed evidentiary base.