

Land Price Differentials in Auckland – Effect on House Prices? A Discussion Paper

Susan Fairgray

January 2017





Land Price Differentials in Auckland – Effect on House Prices? A Discussion Paper

Susan Fairgray

January 2017

Auckland Council
Discussion paper

ISBN 978-0-9941450-6-2 (Print)

ISBN 978-0-9941450-7-9 (PDF)

This report has been peer reviewed by the Peer Review Panel.
Review completed on 23 January 2017 Reviewed by two reviewers
Approved for Auckland Council publication by: Name: Dr Lucy Baragwanath Position: Manager, Research and Evaluation (RIMU)
Name: Eva McLaren Position: Team Manager Economic and Social Research and Evaluation (RIMU)
Date: 23 January 2017

Recommended citation

Fairgray, S (2017). Land price differentials in Auckland – effect on house prices? A discussion paper

Cover image: park and houses at Long Bay by Jay Farnworth

© 2017 Auckland Council

This publication is provided strictly subject to Auckland Council's copyright and other intellectual property rights (if any) in the publication. Users of the publication may only access, reproduce and use the publication, in a secure digital medium or hard copy, for responsible genuine non-commercial purposes relating to personal, public service or educational purposes, provided that the publication is only ever accurately reproduced and proper attribution of its source, publication date and authorship is attached to any use or reproduction. This publication must not be used in any way for any commercial purpose without the prior written consent of Auckland Council.

Auckland Council does not give any warranty whatsoever, including without limitation, as to the availability, accuracy, completeness, currency or reliability of the information or data (including third party data) made available via the publication and expressly disclaim (to the maximum extent permitted in law) all liability for any damage or loss resulting from your use of, or reliance on the publication or the information and data provided via the publication. The publication, information, and data contained within it are provided on an "as is" basis.

Land Price Differentials in Auckland – Effect on House Prices? A Discussion Paper

Susan Fairgray¹
Research and Evaluation Unit
Auckland Council

¹ Now with Market Economics Ltd
PO Box 331297, Takapuna 0740, Auckland
susan@me.co.nz +64 9 915 5519

Executive summary

There is currently debate and pressure to release more land on Auckland's urban edge to alleviate land shortages and reduce average house prices.

Studies have identified large differentials in land prices on either side of Auckland's metropolitan urban limit (MUL).

These studies have limitations as they compare raw rural land values with fully serviced urbanised land values and therefore do not take into account the substantial land transformation costs such as infrastructure, earthworks, holding costs, area required for roads and other space, sales margins, etc.

A more appropriate scale for policy discussion should occur between the value of raw rural land and land ready for urban uses – i.e. once the land transformation costs have been accounted for.

This remaining differential (if any) would reflect the difference in private and social costs of urban expansion (including environmental effects and effects within the urban environment), and a residual (if any), which may imply a land constraint.

Separate modelling (in a different study) shows average dwelling prices have only a minor response to increased land supply.

Dwelling prices may be less responsive to land supply as the supply of raw land equates to a much smaller share of dwelling prices once land transformation costs have been accounted for.

Lower land prices may have adverse consequences for affordable housing where the construction of apartments and other higher density dwellings become less feasible.

Table of contents

1.0	Introduction.....	1
2.0	Land price differentials on Auckland’s urban edge	2
3.0	Limitations of studies.....	3
4.0	Raw rural land vs. urbanised land values.....	5
5.0	Land value as a component of house prices	8
6.0	A more appropriate scale for policy discussion	10
7.0	Appropriateness of a differential.....	12
7.1	Difference between private and social costs of urban expansion within current and future urban areas	12
7.2	Difference between private and social costs of urban expansion within rural areas	14
8.0	Linkages between land supply and house prices: Impacts on affordable housing within Auckland.....	16
9.0	Concluding comments and following stages of analyses.....	17
10.0	References.....	18

List of figures

Figure 1:	Differences in the cost of urban and rural land	7
Figure 2:	Current and alternative considerations of dwelling capital value components	9
Figure 3:	Stylised diagram of components of an urban limit land price differential	11

1.0 Introduction

Auckland is currently in the midst of a housing affordability crisis. The rate of dwelling price growth has continued to exceed income growth rates, making it increasingly harder for first home buyers to enter Auckland's housing market, and for upward movement of existing owners within the market. There have been a number of supply-side reactions to this situation. These include the provisions for urban expansion and development within Auckland's Unitary Plan, and the gazetting of the National Policy Statement on Urban Development Capacity (NPSUDC) with a focus on providing sufficient development capacity within Auckland to efficiently and effectively manage urban growth.

This discussion paper conceptually examines the issue of land supply in relation to Auckland's housing market. Specifically, it addresses the issue of land price differences occurring around Auckland's urban boundaries and the appropriateness of this measure in guiding land supply policy response to affordability within Auckland's housing market.

Auckland Council's Research and Evaluation Unit (RIMU) discussion papers are intended to generate and contribute to discussion on topical issues within Auckland. They represent the views of the authors and not necessarily those of Auckland Council.

2.0 Land price differentials on Auckland's urban edge

Significant discussion has recently occurred within the media and policy settings on the impact of an urban limit on house prices. Studies such as the Grimes and Liang (2007a; 2009) and Zheng (2013) have identified a differential in land prices on either side of Auckland's metropolitan urban limit (MUL). They suggest from these differentials that an urban limit is a planning tool which creates a binding constraint on land supply, consequently pushing up land prices. Debate extrapolates from the findings of the Grimes and Liang (2009) paper to propose that this then flows through to increases in dwelling prices.

It is claimed that a significant component of Auckland's housing affordability crisis can be resolved through removing this constraint on land supply so that land markets can operate efficiently and competitively, bringing down the price of land². The studies imply that Auckland's urban area should be allowed to expand outward to the point at which no differential in land prices occurs between rural and urban land. This is on the basis that in a competitive land market, a dwelling price should equal the cost of land plus the construction cost of dwellings (and including a profit margin).

² Indeed, they claim this is evidenced through lands increasing share of capital values (Zheng, 2013).

3.0 Limitations of studies

As a consequence, these arguments have acted to put significant pressure on major policy decisions around the supply of land. It has been suggested that land supply is an essential policy lever in mitigating Auckland's current housing affordability crisis³. The Independent Hearings Panel (IHP) (2016) recommendations⁴ on Auckland's Rural Urban Boundary (RUB) reflect this line of reasoning, quoting the Grimes and Liang (2007) paper's value differential as a key driving factor in their recommendation.

However, there are several key aspects that are not well understood; and such a major policy decision on land supply affecting Auckland's urban form and spatial economy requires a sound evidential basis. This is not only to understand the effectiveness of such a policy response (on housing supply and affordability in Auckland), but also due to the significant effects it could have on other crucial parts of the market – i.e. households, communities, the environment, etc.

The key aspects that appear to be not well understood are:

- i. The actual differential in land prices around the RUB (as distinct from the MUL)⁵; and how these differ by RUB location.

³ Increasing Auckland's urban footprint is one of the main assessment options for addressing Auckland's housing affordability crisis in the Auckland Council Chief Economist Unit's analysis of the housing market (Parker, 2015). Nunns and Denne (2016) also find the MUL to be a binding constraint on land supply, thus increasing land prices. Central government has proposed a National Policy Statement on Urban Development Capacity (NPSUDC) (Ministry for the Environment and Ministry of Business, Innovation and Employment, 2016) to ensure there is adequate supply of land for urban development. A suggested indicator is the differences in land prices at the rural-urban boundary, where large differences show more development capacity is needed. This NPSUDC cites the New Zealand Productivity Commission (2015) *Using Land for Housing* inquiry, which considers the full scale of the differential between raw rural and fully serviced urban land in signaling release of further greenfield land for development.

⁴ The IHP refers to the Grimes and Liang (2007) paper as a study on the impact of planning constraints on land values in their discussion on the rural urban boundary (Auckland Unitary Plan Independent Hearings Panel, 2016).

⁵ The MUL defined the urban area, outside of which 'urban activities' (such as residential or commercial development) were subject to strict limitations. The MUL was defined by maps in the Regional Policy Statement that each territorial authority (TA) had to 'give effect to' in their District Plans. The MUL in more recent times was located close to or at the actual limits to the urbanised area of Auckland, and changed gradually in response to applications for extensions from or supported by the TAs to the Auckland Regional Council. The main policy purpose of the MUL was to provide for urban containment and environmental protection. The RUB (as recommended by the IHP) operates in a similar way with several main differences. Firstly, the RUB is now located within the District Plan level (enabling private plan changes as well as council ones to move it). Secondly, it is located (in many cases) far from the existing urbanised area and encompasses the majority of the land covered by the MUL as well as significant areas of land identified as being suitable for urban expansion (such as future urban zones). The key policy purpose of the RUB is to identify (major) areas of new greenfields growth to facilitate efficient infrastructure provision.

- ii. The presence of any differentials across different types of land irrespective of the RUB.
- iii. Understanding exactly what drives this differential in land prices.

These aspects are critical in establishing the linkage between house prices and land supply. Three key studies have identified a differential (Grimes and Liang, 2009; Zheng, 2013; New Zealand Productivity Commission, 2012), and from that have concluded that land markets are constrained, therefore pushing up house prices. Crucially, all of these studies have only implied this linkage without further investigation to understand or explain why it occurs. Moreover, none of the studies have taken the next stage and assessed the linkage between land supply and house prices. Separate analysis, such as that cited in the Minister's meeting on Housing Affordability (Ministry of Business, Innovation and Employment, 2014) have contrary results where an increased land supply has only minimal effect on housing prices⁶.

⁶ The Minister's meeting notes state that "[i]f land prices fall by 1% per quarter, the NZ Regional Housing Model forecasts that house prices will only be 0.2% lower after 5 years (p6)". Fernandez (2016) further corroborates this finding where very large expansions to Auckland's urban area are required to significantly affect house prices in Auckland. International modelling on the relationship between house prices and land supply by Aura and Davidoff (2008) also finds very little responsiveness of house prices to the release of more greenfield land.

4.0 Raw rural land vs. urbanised land values

The difference between what is often implied from studies identifying the differential and, those modelling the effect of land supply on house prices, is possibly because these researchers have not attempted to develop a comprehensive understanding of the drivers of the difference between raw rural land and land that is ready for urban uses.

Generally these studies apply statistical models that include very few variables. The key variables relied upon are binary in nature, which identify properties within the boundary of the MUL as distinct from properties outside of the MUL. In these studies, the resulting statistical relationship for the binary MUL variables has been assumed to be caused by the presence of the MUL.

However these simple models are likely to suffer from ‘omitted-variable bias’, which is a common mistake in regression modelling, where the researcher incorrectly leaves out one or more important factors. This form of error in the model specification means that the relationships in the model are likely to be biased and not reflect the true impact.

Specifically, these studies have failed to include any variables that take into account the fact that raw rural land cannot be freely transformed to urban uses. For example it is impossible to use raw rural land for urban development without spending significant amounts of money on infrastructure. This spend on infrastructure will then be internalised into the value of the land when the developer sells the land for urban use. It is likely that much of the effect attributed to the MUL in these models will actually be caused by the difference between raw land and serviced land.

Studies identifying a differential have compared the value of fully serviced and build-ready (including already built on) land with raw rural land that is not serviced by infrastructure or ready to be built on. This is because they use the land value component of the Auckland Council rating database⁷. A capital value based on market sales prices is made up of the improvement value plus a land value, where the land value component is based on vacant land sales prices in the surrounding area. Thus, the land value of the urbanised area (inside the MUL) reflects fully

⁷ The Grimes and Liang paper (2007a; 2009) uses an annual database of land values at the meshblock level that was constructed in their earlier paper (Grimes and Liang, 2007). Land values (i.e. rateable values for land used for property tax purposes) were obtained from Quotable Value New Zealand (QVNZ). Land values in-between each valuation were interpolated by combining with the annual QVNZ sales data, and assuming that land prices are strictly correlated with house sale prices and that land price movements within meshblocks within the same Territory Authority (TA) are identical.

serviced urban land, while the land value of rural land (outside the MUL) reflects land that is not fully serviced or ready for development.

There are substantial costs involved in the transformation of raw rural land to land ready to be built on, and therefore, naturally there is always going to be a substantial difference in value (Hazeldine, 2016). These costs are a normal consequence of the transition of land from raw state to build-ready which any developer must face. They are not abnormal, nor could they be viewed as an indication of a market constraint.

These costs that accrue directly to those involved within the land transformation process (and therefore reflected in the final sales price) include resource consenting and compliance (Grimes and Mitchell, 2015), development contributions, earthworks and engineering, surveying, further infrastructure site connections (in addition to development contributions), holding costs and finance, land taken up by roads and other areas outside the privately owned sections, and sales profit margins that occur with each transaction⁸ (including GST on the final sale to the end user).

Figure 1 shows conceptually the difference in land costs (as distinct from price) between rural land outside of the MUL and urban land within the MUL. These costs explain at least a significant part of the differential between raw rural land and urbanised land. It shows that the actual raw land component accounts for a smaller component of the value of land than suggested by studies which equate the land value component of a capital value on urbanised land with that on rural land.

Infrastructure and other land transformation costs are substantial (New Zealand Productivity Commission, 2015). While these costs are currently being investigated further by Auckland Council's Research and Evaluation Unit (RIMU), Mead (2014) provides a useful starting point in response to the Productivity Commission *Using Land for Housing* inquiry in relation to the magnitude of costs. Mead (2014) illustrates that for greenfields areas with a rural land cost of \$100,000 per hectare, the addition of infrastructure, sales margins and finance costs could see the land cost rise to \$2.1million per hectare (or approximately \$200,000 per section). As such, these costs would result in a 20 fold difference in the value of raw rural vs. fully serviced urbanised land – a greater difference than that identified in the studies of land value differentials around the MUL.

⁸ There are usually at least two sales which occur as part of this process. The first sale usually occurs from the rural land owner who must be incentivised to sell the land at a greater cost than the benefit gained from existing or alternative rural uses. The second sale usually occurs from the developer once land has been divided into individual lots. Sometimes the second sale may occur to a further developer who may buy groups of lots to develop and build on before a final sale to the owners of each individual property (house and land).

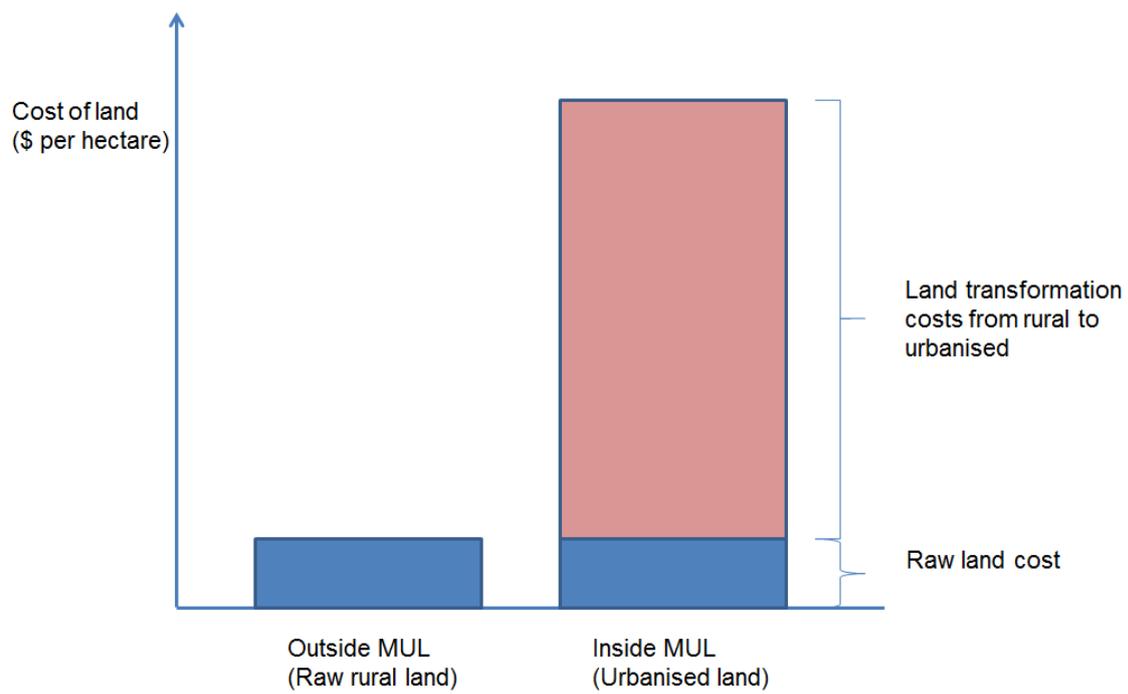


Figure 1: Differences in the cost of urban and rural land

5.0 Land value as a component of house prices

As shown above, the raw land value component of a capital value (or dwelling sale price) is less than the land value component of the capital value. This in itself explains a large part of why the evidence suggests that dwelling prices are less responsive to the supply of land. Put simply, increasing the supply of land is influencing a much smaller share of a dwelling's overall price than implied by the studies which quote the rising share of capital values made up by land values⁹.

It would therefore be more effective to consider dwelling prices as a sum of raw land¹⁰, land transformation costs, improvement values and any other residuals (displayed in Figure 2). Policy responses could then be directed more appropriately to the component of dwelling prices most affecting prices. Land supply policy responses erroneously grouping together raw land and build-ready land could be ineffective if the cost of build-ready land was increasing due to land transformation process costs rather than the supply of raw rural land.

⁹ For example, the Zheng (2013) paper states that on average in Auckland, land values make up 60% of the capital value. From this they conclude that land values therefore are driving up prices because of the large share of value they account for. However, the actual raw land supply component of this is likely to represent a much smaller share of the price.

¹⁰ A continuum of raw land prices exist broadly corresponding with distance from the city centre so that raw land values are influenced by the location of the land. In this case, it is most appropriate to consider comparisons to the raw land value closest to the boundary of the urban area as the focus is on the transition from rural to urban uses.

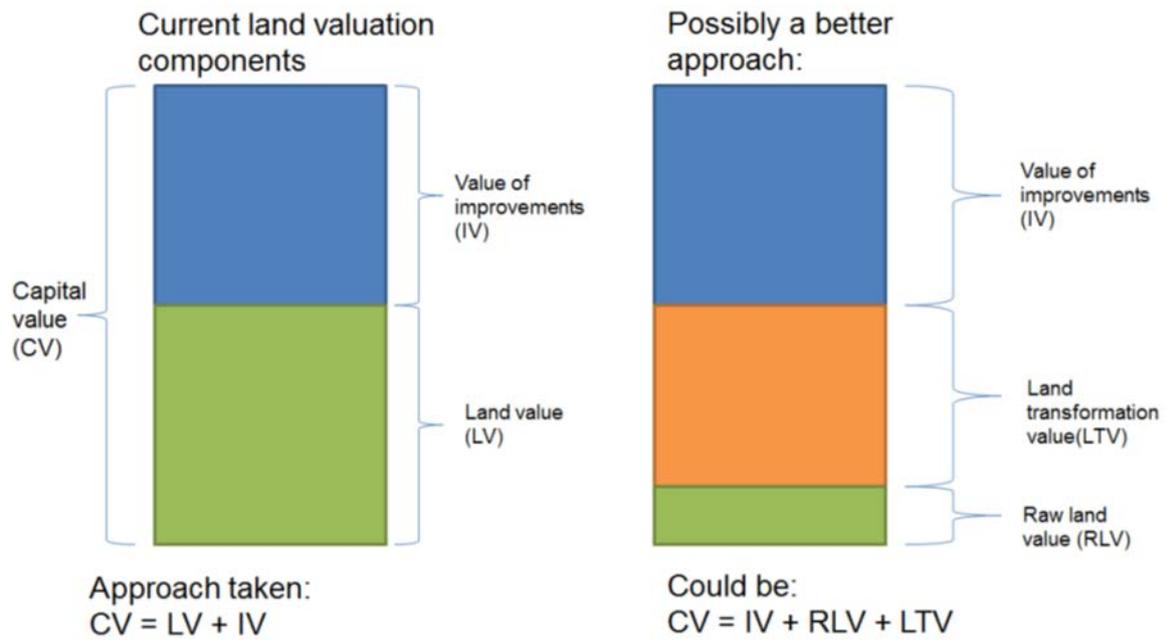


Figure 2: Current and alternative considerations of dwelling capital value components

6.0 A more appropriate scale for policy discussion

Currently, studies on the land price differentials suggest policy discussion on land supply should occur at the full scale of the differential. However, it is important to break the differential down into its component parts. The following provides a more appropriate scale for policy discussion.

Firstly, it is important to quantify the differences between any differentials that occur at the MUL and the RUB. The RUB is located significantly further out than the MUL, and encloses large and deep areas of land for the city to expand in a number of locations (Fairgray, 2015)¹¹. Therefore, it provides room for competition within the land market to occur¹².

Secondly, as discussed above, a significant share of the differential can be accounted for in the land transformation process. Figure 3 is a stylised diagram to illustrate the different categories of costs that occur in the land transformation process from raw rural to fully serviced urbanised land. These costs should be directly reflected in the private transactions as they are accrued by the different land owners involved in the land preparation process.

¹¹ While many areas of land within the RUB are raw rural land, a price differential may still occur at the boundary as the placement of the RUB sends a signal to the market that those areas will be serviced by infrastructure, meaning that this is reflected within the value of the land. Not all infrastructure provision is paid for by the land developer as there is some infrastructure for which development contributions cannot be collected, and some infrastructure provided by central government.

¹² Indeed, Grimes and Liang (2009) note that “if a city’s current and prospective expansion is well within the growth limit, no city-wide effect should be experienced and little local effect will be apparent (p24).”

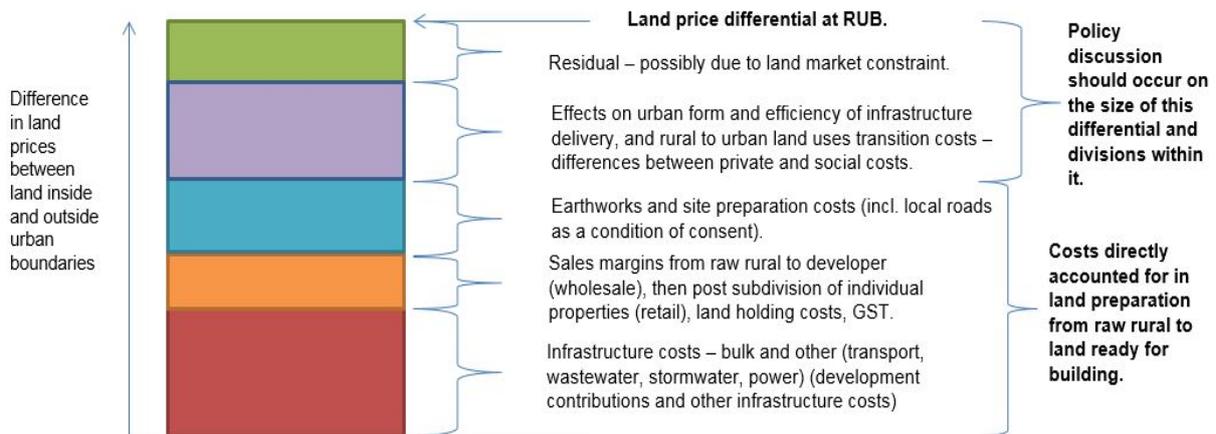


Figure 3: Stylised diagram of components of an urban limit land price differential

Any remaining differences between the cost and value of the land would form a more appropriate scope for policy discussion on land supply. This residual is comprised of three components, which should be recognised individually, but assessed in combination. They include a difference between the private and social costs of urban expansion as they occur within the existing and future urban area (part 1) and as they occur within a rural area into which the city is expanding (part 2); and a residual making up the remainder (part 3). These are discussed further below.

7.0 Appropriateness of a differential

Thus far, some studies on the differential at Auckland's MUL have suggested that Auckland should expand geographically until no differential exists in land prices between urban and rural uses. The above discussion illustrates why, even in a free market situation absent of an urban limit or any other zoning, this would be very unlikely to occur – i.e. the presence of land transformation costs. If such a differential were to disappear, then it would either imply that land transformation costs were zero, or that the developers were operating at a loss. Neither condition is likely to hold true.

It is now important to focus on the appropriateness of a differential once all land costs (to those involved in the private transactions) have been taken into account. The following two sub-sections consider the differences between private and social costs of urban expansion.

7.1 Difference between private and social costs of urban expansion within current and future urban areas

It is likely that a difference exists between the private and social costs of urban expansion. A component of the private costs of expansion relates to the increased travel cost from the greater distance people have to travel from being located out on the urban edge. On average, they are located further away from amenities and central areas resulting in greater travel and less amenity value (Arbury, 2015)¹³. To an extent, these costs are reflected in lower dwelling costs (relative to other more accessible locations).

However, the social cost of urban expansion is likely to be greater than the private costs. The increased travel distance does not just occur locally, but has effects across the rest of the transport network (Arbury, 2015) as households travel across a range of areas within the city (within private vehicles due to lower public transport access). Congestion is currently un-priced in Auckland so these cost differences are not internalised to private individuals¹⁴.

¹³ Arbury (2015) states that significant research into travel effects of different urban forms was undertaken for the development of the Auckland Plan. A compact urban form was the most efficient development strategy from a transport network and travel perspective.

¹⁴ This means that road pricing is not currently in place to charge people for their contribution to congestion on the road network. If people are made to pay an amount that better reflects their congestion cost on the network, it affects travel behaviour.

A social cost also arises through the effects of expansion on urban form. A dispersed development pattern (as typically observed in outer areas, and especially in a free-market situation) is less conducive to the coordinated formation of central areas of amenity for the surrounding communities. Effective centres that play an important social function (such as through the provision of public space and public transport nodes) rely on critical levels of concentrations of residential activity in surrounding areas and transport configurations to support their accessibility.

The formation of effective centres (including an efficient centre hierarchy) is crucial for the efficient delivery of infrastructure. This includes not only public transport, but also social infrastructure such as community facilities. The efficient delivery of these services is reliant on the formation of an effective centres network¹⁵.

The delivery of infrastructure is typically more expensive in outer areas because they are more dispersed and less dense (Arbury, 2015). This is particularly so where there is an absence of structure planning, with development occurring on an incremental piecemeal basis.

The cost differential between private and social costs is further widened where development contributions do not cover the full infrastructure cost of growth. There are areas of infrastructure cost which cannot be recouped through development contributions. These include some community infrastructure and central government supplied infrastructure¹⁶. Greater infrastructure costs also arise in the absence of structure planning in some areas. If structure planning exists, public space can usually be purchased in advance at a cheaper rate (even taking account of holding costs) before land prices rise when areas become urbanised.

Commercial-market-driven incremental urban expansion approaches often fail to (adequately) take into account the importance of long-term planning of infrastructure delivery. Infrastructure costs do not occur on a pro-rata basis with marginal population growth. Rather, they have effects that occur across the network. This is because the required infrastructure development is not just a function of the

¹⁵ Indeed, this is recognised through the courts where, for example, the Environment Court found that councils should be able to consider the viability of centres as “a collective physical resource of public benefit and interest – having regard to the centre’s community function and status, its level of importance to the people within the surrounding area associated with it, and the co-ordinated provision of infrastructure such as street facilities, amenity improvements, other utilities, and transport services (including parking) (Bollard, et al. para 16)”. Sections 5 and 7 are key areas within the RMA 1991 relating to the effect of urban form.

¹⁶ While residents would provide an additional tax base, this is unlikely to cover the cost due to differences in urban form (i.e. less dense) than other areas on average. Also, these would mostly be a relocation from an alternative location, which may be in a denser area.

geographical area of expansion, but often requires upgrades to other parts of the network¹⁷.

Moreover, efficient infrastructure delivery requires significant forward planning. This ensures not only the achievement of scale economies through optimal network designs, but also the future proofing of infrastructure delivery. Contrastingly, outward expansion on an unplanned basis (within the wider city context) would result in infrastructure extensions that meet only the needs of the area of expansion without consideration for further future expansion. This may make future development more expensive where existing infrastructure may need to be redeveloped to be upgraded (Arbury, 2015; Fairgray, 2015).

The current framework for development contributions also requires a long-term planning of infrastructure. The regulatory process requires inclusion of planned areas of development within a council's financial Long-term Plan (LTP) to enable the charging of development contributions¹⁸.

A commercial market-driven approach contends that urban expansion should be allowed to occur within any location as long as the developer pays the full cost of that expansion. However, this line of reasoning relies on the existence of perfect information flows to accurately identify this cost; as well as a system to calculate, administer and enforce this situation, including the fair distribution of any payments to those adversely affected by such an expansion. This system would require the creation of a body governed by the appropriate legislation and jurisdiction as commercial markets alone cannot undertake this task. Indeed, such an entity, local government, exists and is recognised by the courts as an important part of the wider market (Fairgray, 2015a)¹⁹.

7.2 Difference between private and social costs of urban expansion within rural areas

Any assessment of the appropriateness of a differential needs to be cognisant of the effects of urban expansion into a rural area. The full range of effects is unlikely to be

¹⁷ This in itself does not occur on a linear basis as tipping points on existing infrastructure are reached at certain levels and locations of development (Auckland Council, 2015).

¹⁸ Discussions with Auckland Council Resource Consents, Development Contributions and Financial Strategy staff found that development contributions can only be charged from projects that are included within council's financial plans. If development were to occur on a piecemeal and unplanned basis, then it would be impossible to anticipate and therefore include infrastructure projects within the plans to recoup costs.

¹⁹ This is not to say that local government always represents an efficient entity or that all regulation is necessary or of net benefit. In some cases it is efficient and necessary, and in some cases not.

capitalised into the prices of different land uses. Here too exists a difference between private and social costs.

Firstly, many of the effects are likely to occur within the natural and rural environment where urban development encroaches onto rural areas, natural ecosystems and biodiversity habitat areas (Curran-Cournane, et al. 2014). These effects are not priced into the transactions of private landowners because they are a public good with benefits spread widely across the population rather than concentrated into one landowner (Overman and Venables, 2005)²⁰. It is extremely difficult to quantify these effects and therefore incorporate them into any process to internalise the externality. Indeed, we do not yet have the science to fully understand the scale and magnitude of these effects let alone quantify them²¹.

Secondly, urban expansion into a rural area involves the transition of one land use (rural) to another (urban). These uses often have different benefit timelines, meaning one use (usually urban) will almost always outbid the other in the short-term. However, short-run prices often do not fully capture these longer-term effects, which may occur once the economy reaches a new equilibrium – i.e. always responding to the short-term/immediate market signals may not always result in optimal outcomes in the longer-term, particularly when land cannot equally transition between uses (e.g. back from urban to rural)²². The longer-term effects are then further masked in evaluation through the application of discount rates²³.

²⁰ This can be seen where an action on one land parcel could have widespread impacts within ecosystems, both geographically and within different parts of the ecosystem.

²¹ An example is the past use of the pesticide DDT. An evolving body of research is continually identifying new environmental and ecosystem effects of DDT that were not anticipated at the time of development (US Environmental Protection Agency, 2015). Studies into its effects continue.

²² An important example, as described by Dr Curran-Cournane (2014) within the Auckland context is the presence of versatile soils (soils with a high productive potential). These can play an important longer-term role in rural productivity and food provision, but are outbid at least in the short-term by residential urban uses. However, if they are urbanised, then this ruins their environmental integrity, meaning they lose any future ability to transition back to rural uses even if this activity were to become more valuable on the site in the future.

²³ Discount rates act to favour short-term benefits over longer-term benefits. While this is appropriate in some evaluations, it creates challenges in ever being able to achieve strategic future scenarios. This is particularly so in the evaluation of urban form. Urban form develops incrementally and cumulatively through time, with the benefits of an optimal urban form being realised in the future as the city form tends towards the desired outcome (as recognised by the Supreme Court (Chisholm, 2011)). However, these benefits are minimised through discounting, with discount rate evaluations tending to favour the benefits of private behaviours to circumvent inefficiencies with urban form (e.g. greater car usage) that in aggregate generate substantial problems as they cumulatively occur into the future.

8.0 Linkages between land supply and house prices: Impacts on affordable housing within Auckland

If the release of further land did have an impact on urbanised land prices across the region, then it is important to take account of the possible effect on house prices. Importantly, the supply of different dwelling types is affected differentially by a change in land prices. It is therefore not adequate to simply consider an effect on average prices. This is because the housing market is made up of a range of different housing types and price points. A change in the mix of dwelling stock (such as a greater share of apartments) could have a significant effect on the average price without any actual movement within the market.

If urbanised land prices decrease through an increase in land supply at the edge of the city, then it is likely to have a greater impact on the supply of higher density, apartment dwellings. This is because these types of dwellings require higher value areas of greater demand to be feasible (CBRE, 2016). Land prices make up a much smaller share of the average apartment dwelling cost than standalone houses (as the land cost of one site can be divided into the number of apartments constructed on it). Because of this, a drop in land prices will have a much lower effect on apartment costs than their sale prices, meaning that the required profit margins disappear²⁴ making many developments unfeasible. The larger drop in prices (demand) occurs because of the larger relative drop in lower-density house prices, thus lowering demand for apartment dwellings. This effect will be greatest in suburban areas because the demand (and therefore sales prices) for these locations is lower while costs remain largely constant.

As such, a policy that lowers raw land prices²⁵ could inadvertently have negative consequences for housing affordability. This is because it negatively affects the market's ability to deliver higher density, lower cost dwellings. This may partly explain why modelling results show that raw land prices have little flow on effect on housing prices.

²⁴ Growth in apartment prices within Auckland are typically driven by commensurate growth in costs rather than a growth in the share of profit (CBRE, 2016).

²⁵ This is not to suggest that land should be artificially constrained to keep prices at a high level. Rather, any land supply policies should be refocused to a more appropriate scale that reflects the range of costs and benefits, including the indirect effects that occur across different dwelling typologies within the housing market and their welfare effects on balance.

9.0 Concluding comments and following stages of analyses

It is important to correctly understand the differential in land prices in any policy discussion on land supply. In particular, it is crucial to break it down into its component parts by taking into account land transformation costs (including infrastructure) to make robust comparisons between rural and urbanised land prices. The absence of these components generates inaccurate and therefore meaningless comparisons that have a risk of becoming sensationalised within a policy discussion. It is also paramount to consider this analysis on a geographical basis – location is not neutral - and a land constraint may exist in one area but not another.

Once these have been taken into account, any residual difference between the underlying raw land component of urbanised and rural land prices becomes the more appropriate scale for policy discussion. It is then important to consider the appropriateness of having a differential in these land prices. This must balance the differences between the private and social costs of urban expansion with the benefits of urban growth.

Within this assessment, it is crucial to accurately understand the linkage between land supply and housing prices. This is critical because it has a major bearing on both the effectiveness of any land supply policy approaches to housing affordability; as well as the unanticipated consequences of such an approach on housing affordability. To do this, an assessment must consider the mixture of dwelling types, their corresponding (land and construction) costs and sales prices, and therefore, their differential responses to a change in land prices.

10.0 References

Arbury, J.R. (2015). *Statement of evidence of Joshua Reuben Arbury on behalf of Auckland Council. Proposed Auckland Unitary Plan (Strategic Transport – overview)*. Topic 016 RUB North/West and Topic 017 RUB South, 14 October 2015.

Auckland Council (2015). *Future urban land supply strategy*. Adopted 12 November 2015.

Auckland Unitary Plan Independent Hearings Panel (2016). *Overview of recommendations on the proposed Auckland Unitary Plan*. Report to Auckland Council, 22 July 2016.

Aura, S. and Davidoff, T. (2008). Supply constraints and housing prices. *Economic Letters*, 99, pp275-277.

Bollard, R.J., Hackett, A.H. and McIntyre I.G. (2001). Decision before the Environment Court in the matter of the Resource Management Act 1991 and in the matter of references under clause 14 of the First Schedule of the Act. Between St Lukes Group Limited et al., Appellants and North Shore City Council, Respondent.

CBRE Ltd (2016). *Residential advantage*. Presentation to Auckland Council on Auckland's apartment market, August 2016.

Chisholm, J. (2011). *Reserved Judgement of Chisholm J*. In the High Court of New Zealand Christchurch Registry, CIV-2010-409-002892. Between Terrence Stirling Appellant and Christchurch City Council, Respondent.

Currán-Cournane, F., Vaughn, M., Memon, A. and Fredrickson, C (2014). Trade-offs between high class land and development: recent and future pressures on Auckland's valuable soil resources. *Land Use Policy*, 39, pp146-154.

Fairgray, J.D.M. (2015). *Statement of Evidence of Dr James Douglas Marshall Fairgray on behalf of Auckland Council (Economic)*. Topic 016 RUB North/West and 017 Rub South, 19 October 2015.

Fairgray, S. (2015). *Understanding retail economics and implications for urban form*. Paper presented at the New Zealand Association of Economists (NZAE) 56th Annual Conference, 1-3 July 2015.

Fernandez, M. (2016). *Land supply constraints and housing prices in New Zealand*. Auckland Council technical report, TR2016/038.

Grimes, A and Liang, Y. (2007). *An Auckland land value annual database*. Motu working paper, 07-04, April 2007.

Grimes, A. and Liang, Y. (2007a). *Spatial determinants of land prices in Auckland: does the Metropolitan Urban Limit have an effect?* Motu Working Paper 07- 09, August 2007.

Grimes, A. and Liang, Y. (2009). Spatial determinants of land prices: does Auckland's Metropolitan Urban Limit have an effect? in *Applied Spatial Analysis and Policy*, 2:1, pp: 23-45.

Grimes, A. and Mitchell, I. (2015). *Impacts of planning rules, regulations, uncertainty and delay on residential property development*. Motu Working Paper, 12-02, January 2015.

Hazeldine, T. (2016). Urban limit helps make a region a liveable place, *New Zealand Herald*, http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11695120 accessed at 23 August 2016.

Mead, D. (2014). *Comments on Productivity Commission Inquiry: Land for Housing*, 22 December 2014.

Ministry for the Environment and Ministry of Business, Innovation and Employment, (2016). *Proposed National Policy Statement on Urban Development Capacity: Consultation Document*.

Ministry of Business, Innovation and Employment, (2014). *Housing Affordability: Outlook & Opportunities*, Minister's meeting 25 November 2014.

New Zealand Productivity Commission (2012). *Housing affordability inquiry*, March 2012.

New Zealand Productivity Commission (2015). *Using land for housing*, September 2015.

Nunns, P. and Denne, T. (2016). *The costs and benefits of urban development: a theoretical and empirical synthesis*. Paper presented at the New Zealand Association of Economists conference 2016.

Overman, H.G. and Venables, A.J. (2005). *Cities in the developing world*. Centre for Economic Performance, London School of Economics and Political Science.

Parker, C (2015). *Housing supply, choice and affordability: trends, economic drivers, and possible policy interventions*.

Resource Management Act 1991, retrieved from <http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html> accessed 23 August 2016.

US Environmental Protection Agency (2015). *DDT – A brief history and status*, <https://www.epa.gov/ingredients-used-pesticide-products/ddt-brief-history-and-status> accessed at 23 August 2016.

Zheng, G. (2013). *The effect of Auckland's Metropolitan Urban Limit on land prices*. New Zealand Productivity Commission Research Note, March 2013.

Find out more: phone 09 301 0101, email rimu@aucklandcouncil.govt.nz or visit aucklandcouncil.govt.nz and knowledgeauckland.org.nz