

Regulatory Impact Statement

Regulatory Impact Statement for the Proposed National Policy Statement on Urban Development Capacity under the Resource Management Act 1991

Agency Disclosure Statement

This Regulatory Impact Statement has been prepared by MRCagney, Covec and Beca on behalf of the Ministry for the Environment (MfE) and the Ministry of Business, Innovation and Employment (MBIE).

It provides an analysis of options to address the perceived problem with territorial authorities' supply of appropriate urban development capacity to enable existing and future communities to sustainably provide for their wellbeing, in the context of RMA planning.

Caveats, uncertainties and limitations of analysis

There are various uncertainties and limitations to this analysis:

a) Overall assessment of policy options:

Assessment of the effectiveness of the policy options assumes that any new statutory processes or regulatory requirements they impose will be implemented by local authorities in a timely and effective manner, and that new requirements for evidence-based policy-making will result in meaningful changes to local authority planning policy and decision making regarding development capacity. The ultimate effectiveness of the policy options in ensuring local authorities provide sufficient development capacity will depend on local authority behaviour, and potentially also Government's responses to information that suggests outcomes are not being achieved. The effectiveness of providing sufficient development capacity in achieving the objectives of increased housing choice and providing for social, economic and environmental wellbeing will depend on interactions of the regulatory environment with private-sector actors in the land and urban development markets (i.e. developer and landowner behaviours).

b) Cost benefit analysis: There are gaps in the availability of data and models that result in limitations to our cost benefit analysis. When assessing the costs and benefits of existing land use plans, policies, and rules in district plans, and of the benefits of enabling more competitive and responsive urban development, it has been necessary to model the impact of policy changes on the housing market and on a range of positive and negative externalities. This modelling has generally assumed that markets will be able to respond efficiently in response to changes to regulations – e.g. in the medium- to long-term we do not assume any limits on resources other than urban land, such as building labour or infrastructure.¹ Key modelling assumptions and estimates are based on empirical evidence and/or validated through several analytical approaches.

c) A particular gap relates to the impact of limits on infrastructure supply. The coordination failures that exist between RMA planning and infrastructure planning - while addressed as much as is possible through the NPS-UDC - mean that there is a residual risk that the infrastructure needed to support more competitive and responsive urban development may not be supplied, or not supplied in a timely manner. While the cost benefit analysis has taken into account the social

¹ While the construction industry may be capacity-constrained in the short run, it is able to respond to these constraints by training new builders, recruiting them from overseas, or investing in techniques to increase construction productivity.

costs of providing and using infrastructure, limits imposed under the legislation that governs infrastructure planning², or broader political incentives to under-supply infrastructure, have not been analysed as they are outside the scope of this work. We note that outcomes are likely to vary between different infrastructure networks (e.g. transport, water, electricity) or between councils.

d) In addition, during departmental consultation, the Ministry of Education stated its concerns that the scope of the national policy statement as drafted is too narrow and may risk driving down the quality and sustainability of urban development. In particular, the Ministry is concerned that the NPS-UDC does not require:

- Development that provides access to community amenities;
- Good urban design; and
- Integrated planning of social infrastructure, through local authorities coordinating with agencies such as the Ministry of Education.

In response, MfE and MBIE note that these matters are outside the specific scope of the focus on urban development capacity, but the NPS-UDC does not preclude local authorities from providing for these matters.

Amanda Moran, Director Resource Management System, Ministry for the Environment

² In particular, councils may be constrained from taking on additional debt by the debt servicing benchmarks established in the *Local Government (Financial Reporting and Prudence) Regulations 2014* issued under the LGA.² These regulations require high-growth councils to ensure that borrowing costs (interest payments on debt) do not exceed 15% of revenues (excluding DCs and gains on financial instruments or assets).

Status quo and problem definition

Understanding the problem

Cities are complex. In the words of Edward Glaeser:

“Cities are the absence of physical space between people and companies. They are proximity, density, closeness. They enable us to work and play together, and their success depends upon the demand for physical connection.”

A corollary of this is that cities are also concentrations of *effects*, both positive and negative. They are shaped by a wide range of market actors, as well as by local and central governments, whose actions in turn have repercussions for people around them. This complexity is one of the factors that in turn creates the potential for various market failures and regulatory failures.

Urban growth provides an opportunity to improve social and economic outcomes for people and communities. However, it also creates challenges for resource management. The balance between positive and negative effects may not be realised: local governments face political incentives that mean that they may make planning decisions based on the potential adverse effects of development without appropriately (or adequately) providing for the positive effects that urban development delivers. Consequently, the following high-level “presenting” problem has been identified:

“Existing RMA land use planning practices appear to respond poorly to the opportunities and challenges arising from urban development. In particular, planning policies can constrain development capacity and limit the ability of the market to meet demands in growing cities. This results in a limited supply of housing and rising property prices, as well as some localised problems meeting demands for business space.”

This problem of insufficient development capacity is caused by a range of factors present in urban land and development markets, only some of which can be attributable to RMA planning practices.³ We identify five specific regulatory failures that arise within the context of RMA land use planning by local authorities:

1. Unresponsive urban planning policies, including plan-making, plan changes, and resource consenting, that change slowly in response to new information;
2. An inadequate information base on demand for residential and business land or the development capacity (particularly ‘market-feasible’ capacity) enabled by plans;
3. Existing policies and rules that are inefficient – i.e. that have high costs that are not justified by their benefits – or which are not adequately compared to non-regulatory policy options;
4. Potential coordination failures between RMA planning and infrastructure planning, which are governed by separate legislation, and the potential for social costs to arise as a result of infrastructure provision and use; and
5. Planning practices that place priority on some effects over others that are not necessarily consistent with the purpose of the RMA – e.g. weighting current interests over future interests, or local effects over regional / national effects.

The first four causes relate to *technical* shortcomings related to RMA planning practices, while the fifth addresses the *political incentives* facing local governments. The political economy of planning is a fundamental driver of observed outcomes (Fischel, 2015). Although urban development policies have

³ Others include economies of scale in infrastructure provision and limits on debt held by councils and used to fund infrastructure

significant effects on both current and future generations, there is evidence that future interests are underrepresented in planning processes.

The interests of current homeowners are well represented in planning processes, as they have the opportunity to elect representatives and submit on plans (Fischel, 2015).⁴ On the other hand, there is evidence of a “democratic deficit” in local government processes, as younger people vote and submit on planning processes at lower rates (Productivity Commission, 2015).

In a similar vein, there is tension between localised negative externalities associated with urban growth and benefits that often accrue at a regional or national level (as identified below). This can create a “wedge” between local and regional / national interests. This gives local political actors an incentive to limit growth through planning regulations (and non-regulatory mechanisms, if available). This may be rational for individual areas, but in the aggregate it will reduce social wellbeing (Albouy et al, 2014).

Section 3 of the RMA provides for the consideration of both local, regional, and national effects, while Section 5 encompasses consideration of the social, economic and cultural wellbeing of future generations. However, the current dynamics of public input and democratic participation appears to create a bias against enabling urban development to meet future needs and provide for regional or national wellbeing.

Understanding the problem

In growing cities, RMA land use planning practices that inappropriately limit development capacity will in turn limit the ability for people and communities (both existing and future) to provide for their social, economic, cultural and environmental wellbeing. The limit on development capacity contributes to high and increasing housing costs, relative to incomes, in some urban areas in New Zealand (although it is not necessarily the sole contributing factor). Reduced housing affordability in turn has both local and national impacts.

Rising prices favour current home-owners at the expense of people who wish to enter the housing market. It may also adversely impact renters, depending on the extent and speed at which rents move with property prices. However, there are also flow-on effects throughout the economy, including:

- Discouraging people from living and working in productive locations
- Increasing the costs of capital for investment in other parts of the economy, including export sectors
- Increasing the financial stability risks arising from volatility in housing prices
- Increasing social and economic inequalities, including wealth inequality
- Exacerbating health problems associated with inadequate or overcrowded housing
- Imposing fiscal costs to Government as a result of expenditures on accommodation supplements for a large share (60%) of rental properties. At present, the Government spends \$2 billion a year on accommodation supplements; if constrained supply pushes up rents, these expenditures also increase.

⁴ However, all current *residents* may not be equally well represented. Morrow (2013) finds that changes to urban planning in Los Angeles between 1965 and 1992 were strongly influenced by input from affluent, predominantly white home-owners associations, while residents of low-income and minority communities had less input. In a similar vein, there were significant variations in submission rates on the Auckland Unitary Plan from different local board areas. Some local boards had as few as 0.4-0.8 submissions per 1,000 residents (Otara-Papatoetoe, Mangere-Otahuhu), while others had as many as 12.3-12.5 submissions per 1,000 residents (Orakei, Rodney). A statistical analysis showed that local boards with higher median personal income and a greater share of residents over 65 were more likely to submit at higher rates.

Assessing the magnitude of the problem associated with the status quo

The regulatory failures arising in the context of RMA planning for urban development have the following consequences:

- Limited competitiveness of urban land and development markets as a result of regulatory constraints on development capacity and barriers to entry such as regulatory uncertainty for developers. This results in a less responsive urban development market that delivers less housing (or business floorspace) at a higher cost.
- Planning regulations that address externalities (or other market failures) in an inefficient way – i.e. they have high costs and relatively few benefits. In Auckland, this includes rules that limit development capacity, such as the Metropolitan Urban Limit and building height limits, as well as regulations that affect building characteristics, such as minimum parking requirements and minimum apartment sizes.

We identify several key pieces of evidence for the existence and magnitude of these problems.

First, there are “discontinuities” in land prices at Auckland’s Metropolitan Urban Limit (MUL), suggesting that regulations have limited development capacity in the city. Several studies have found that land just inside the MUL is five to ten times as valuable as land just outside the MUL (Grimes and Liang, 2009; Productivity Commission, 2012; Zheng, 2013).

These discontinuities reflect the impact of multiple, overlapping regulations that limit development within the city. For example, building height limits and other rules that limit development within the urbanised area or make it more costly will push up demand for fringe land and thus exacerbate the impact of the MUL. Consequently, policies that enable more intensive development within the urbanised area *and* policies that enable an increased supply of land by extending the urban limit can assist in better matching rising demand for land and housing, thereby reducing the gap between demand and development capacity (which has the consequential impacts on prices).

Second, constraints on competition in land and development markets reduce the flexibility, or elasticity, of housing markets (and other development markets). Over time, this results in a slower supply response – and higher prices – in response to growth.

Empirical evidence suggests that New Zealand’s housing supply is relatively inelastic, with measured elasticities of supply ranging from 0.7 to 0.9 (that is, a 1% increase in price is associated with a 0.7-0.9% increase in construction). Furthermore, given ongoing increases in prices and the relatively slow pace of construction, it is considered likely that supply has become less price-responsive in some cities, including Auckland, over the last decade.

Third, there is evidence that the costs of existing planning policies and rules outweigh the benefits. To supplement previous research into the costs (and sometimes benefits) of planning regulations (MRCagney, 2013, 2014, 2015; NZIER, 2014, 2015a; Grimes and Mitchell, 2015), we have analysed the costs and benefits of loosening Auckland’s MUL and building height limits to enable increased development capacity. Table 1 summarises our estimates of these costs and benefits – the underpinning sources and calculations are detailed in an Appendix to this RIS. This analysis suggests that the long-term gains from loosening particular planning constraints are likely to be large.

However, we note that the benefits (and costs) of loosening regulations would not arise instantaneously but over time as development adjusted to different plans, policies and rules. There may also be other factors constraining councils’ ability to achieve these benefits. For example, debt servicing ratios established by the *Local Government (Financial Reporting and Prudence) Regulations 2014* issued under the LGA may limit councils’ ability to take on more debt to provide infrastructure to greenfield areas. In this regard, changes to regulation alone may not remove all market and regulatory failures in improving development capacity.

Table 1: Net benefits of changing regulations limiting development capacity in Auckland

Expanding the Metropolitan Urban Limit		Lifting building height limits	
Cost / benefit	Present value (7% discount rate)	Cost / benefit	Present value (7% discount rate)
Benefits for city residents (lower housing costs) ⁵	+\$5,761 million	Benefits for city residents (lower housing and transport costs)	+\$6,258 million
Cost of additional road infrastructure	-\$1,270 million	Benefits of reduced road infrastructure costs	+\$866 million
Cost of other network infrastructure	Not estimated	Benefits of reduced costs for other network infrastructure	Not estimated
Cost of foregone peri-urban open space	-\$578 million to -\$1,011 million	Cost of overshadowing	-\$993 million to -\$2,308 million
Net benefits	+\$3,481 million to +\$3,914 million	Net benefits	+\$4,816 million to +\$6,131 million

Objectives

The Government goals or objectives to respond to the problems arising from insufficient development capacity are to:

- Maximise the economic, social and cultural benefits of urban environments at the local and national level in a sustainable manner;
- Improve the availability and choice of housing and economic opportunities in urban areas to enable more people in communities to provide for their wellbeing (particular for those on medium to moderate incomes for whom access to housing in urban areas is becoming increasingly constrained);
- Promote greater efficiency in the supply of development capacity to respond to change and growth in urban areas (providing for the social, economic, cultural and environmental wellbeing of future generations).

The extent of the problems identified above suggests that there is scope for improving local authorities’ planning processes and policies under the RMA so that their role (in managing land use and the allocation of resources) will assist in delivering to the above government objectives.

Options and impact analysis

After identifying specific problems associated with RMA planning for urban development, we reviewed a range of policy options for addressing problems. The “long list” of options we considered included:

- Maintaining the status quo: This option would entail no change to existing arrangements, other than changes that have already been signalled, such as the RMA Amendment Bill, which addresses slightly different problems. As this approach would not involve any incentive for change in the planning processes of territorial authorities, it is concluded that this would not

⁵ These estimates of benefits to households assume that all households rent their dwellings and thus pay for housing on an annual basis. This contrasts with the modeling that we undertake later, which focuses on purchases of properties. We note that rents and prices implicitly reflect short- and long-term demands for housing – i.e. people rent houses because they need a place to live *today*, and buy houses partly in anticipation of future housing needs.

result in any measurable change to the problem. As such, it is not considered to be an efficient approach.

- **Non-regulatory options:** These include a range of options, such as providing local authorities with best practice guidelines, training, or grants to assist them to make planning decisions that are more responsive to changes in housing demand. These options are typically voluntary in nature and rely upon council participation to be effective. Given the existing pressures for councils to maintain planning processes they already have in place, it is considered they are unlikely to be effective in addressing the problem.
- **Regulatory interventions:** These options include amendments to legislation,⁶ ministerial intervention, and issuing national direction or regulations under the RMA. While a number of these options would be effective by requiring responses from local authorities, they may not be efficient. In particular, the ability for standard regulation to apply to all territorial authorities without these authorities (and their communities) being able to define their own responses to development capacity gaps is likely to be costly or inefficient. On balance, a National Policy Statement on Urban Development Capacity (NPS-UDC) that provides clear direction while allowing flexibility in response is most likely to achieve an appropriate balance between effectiveness and efficiency.

We have evaluated the degree to which an NPS-UDC, as an option, is able to address the underlying causes of the problem (set out in Section 1.2). It is likely to be more effective at addressing some than others, which suggests that it will be necessary to progress Government reforms in other areas, or to look at further areas of reform. In particular, in regard to the responsiveness of planning, an NPS could require more frequent monitoring and evidence gathering, and impose an obligation for councils to be more responsive, which will improve the responsiveness of local authorities in identifying problems. The NPS-UDC itself will not change the fundamental drivers of the speed of planning processes⁷.

Through improving the evidence base and the flow of information between local authorities and infrastructure providers, an NPS-UDC could contribute towards better coordination between RMA and infrastructure planning. However, it cannot address the wider problem of potential social costs arising from infrastructure provision and use, as this is influenced by a number of things (including legislation and governance / institutional arrangements) that sit outside the scope of the RMA⁸.

In addition, an NPS-UDC could stimulate more explicit consideration of the costs and benefits of urban planning decisions in relation to future interests, and their effects at a regional / national scale, and support this through better information. However, it cannot fully address some of the political incentives on local decision-makers that tend to act against providing more urban development capacity.

Options for an NPS-UDC

On the basis of the above, a “short list” of three options for an NPS-UDC has been developed. These options are summarised in the following table, alongside the status quo option. These options all provide direction on outcomes / expectations for urban development, and varying levels of policy

⁶ Potentially including amendments to legislation to change incentives or costs to enable development, e.g. changes to pricing for infrastructure networks.

⁷ Some changes proposed in the Resource Legislation Amendment Bill (RLAB) may go some way to addressing these.

⁸ Other reforms may help to address parts of this problem, including some of the proposals in the Better Local Services reforms to the Local Government Act 2002 (LGA). In addition, the Government intends to look further into a wider range of possible governance arrangements and pricing tools for water infrastructure.

requirements to support or enable these outcomes: Option 1 is 'one size fits all', while Options B and C provide more tailored responses to the local authorities experiencing significant urban growth.

- Status Quo Option: As discussed above, this would entail no changes to existing arrangements other than changes that have already been signalled.
- NPS-UDC Option 1: This would set outcomes and expectations for all local authorities in respect of their processes to plan and provide for sufficient development capacity. However, it would not provide specific policies to guide local authorities' responses to these processes;
- NPS-UDC Option 2: This would add to Option 1 by requiring more specific actions (policies) for high-growth and medium-growth local authorities. This option sets out processes for evidence-based decision-making, co-ordinated decision-making and ensuring that enabling and responsive regulations are established to provide sufficient development capacity within main urban areas.
- NPS-UDC Option 3: This would add further to Options 1 and 2 requirements for selected high growth areas (e.g. Auckland Council, Hamilton, Christchurch). These policies would require territorial authorities to set targets for residential development capacity and development, to monitor development against these targets and to implement a future land release and intensification strategy.

Assessment of Policy Options

The assessment takes account of the Treasury's *Regulatory Impact Analysis Handbook*, as well as Section 32 of the RMA, which establishes evaluation reporting requirements for policy interventions under the RMA.

In order to assess these policy options, we:

- Analyse the costs and benefits that may arise as a result of implementing an NPS-UDC, relative to the Status Quo option, and the extent to which it would achieve the Government's objectives; and
- Assess the degree to which more specific policy requirements included in NPS-UDC options 2 and 3 are necessary to contribute to achieving the objectives (and hence the net benefits of doing so), taking into account the following five assessment criteria:
 1. Consistency with the purpose (Section 5) of the Resource Management Act 1991 (RMA)
 2. Effectiveness—the extent to which any policy meets the objectives of increasing capacity for urban development;
 3. Efficiency—whether the policy option has benefits that exceed the costs;
 4. Feasibility—the practicality of the policy; and
 5. Degree of risk—the likelihood that the estimated costs and benefits will be materially different from the primary estimate.

Cost benefit analysis of achieving the objectives of the NPS-UDC options

We have undertaken a cost benefit analysis to understand the potential impact of achieving the Government's objectives through the NPS-UDC options. In doing so, we note that:

- the end outcomes from an NPS-UDC, including the magnitude of costs and benefits, will depend upon how councils (and other actors in RMA planning) respond to statutory guidance – and, consequently, the degree to which an NPS-UDC creates incentives or requirements for councils to change existing behaviours

- an NPS-UDC is not likely to address all of the problems that arise in the context of more responsive urban development, as some are outside the scope of RMA land use planning.⁹

The stated objective of all NPS-UDC policy options (as set out in their shared objectives) is that urban planning will “support urban systems that enable people to provide for their social, economic, cultural, and environmental wellbeing” and that plans will “enable sufficient development capacity to meet long-term demand.”

Following our analysis of the problem, we consider that enabling sufficient development capacity would result in more competitive and responsive land and development markets that would enable growth in demand for housing (and business floorspace) to be met at a lower cost. Achieving this outcome would:

- Result in benefits to consumers of housing (and business floorspace), who would benefit from lower growth in prices. This benefit will primarily accrue to new entrants to the housing or business land market, but also (to a lesser extent) to those already in the housing market who are either buying additional property (e.g. for investment purposes) or who are moving between housing sub-markets.
- Result in larger cities over time by enabling increased development in urbanised areas and greenfield areas. This would in turn lead to:
 - Added negative externalities associated with development, which may include congestion, overshadowing from tall buildings, loss of access to peri-urban open space, water and air quality externalities, and various noise and nuisances. These costs would often, but not always, accrue at a localised level in areas experiencing development.
 - Added positive externalities from increased agglomeration in production and consumption. These benefits would accrue at a regional or national level.

To understand the magnitude of these costs and benefits, we develop two microeconomic models for understanding the impact of marginally increasing the responsiveness of housing supply on house prices and city size. These models are explained in an Appendix to this RIS. Importantly, this analysis does not assume that housing supply becomes *fully* flexible, or that additional supply would result in a *reduction* in house prices – rather, it considers a scenario in which other elements of the status quo scenario, or residual problems (such as the ability of the construction industry to meet demand) left unaddressed by an NPS-UDC, continue to impose some limits on supply responsiveness.

Based on these models, we estimate that the consumer benefits of enabling more flexible / responsive urban developments are in the order of \$110,000 to \$129,000 per added household. (These models have been calibrated to Auckland; however, scenario testing suggests that they can also be applied to other cities, with comparable results.¹⁰)

⁹ We have addressed this in our modelling by assuming that an NPS-UD would result in incremental improvements to housing supply responsiveness but not necessarily enable supply to increase to the point where prices declined or stopped rising.

¹⁰ For example, if we re-estimate Model 1 with a starting city size of 60,000 households, average house prices of 450,000, and a 20% demand shock – somewhat similar to Hamilton or Tauranga – it gives us a consumer surplus estimate of \$65,000 per added dwelling. This is likely to be substantial to exceed the magnitude of additional externalities from development in those areas – noting that Auckland-specific evidence on some externalities cannot necessarily be applied directly to smaller cities that are less congested.

Table 2 compares these benefits with quantitative estimates of the magnitude of positive and negative externalities associated with urban development in either existing urban or new greenfield areas.¹¹ While the magnitude of costs and benefits differs depending upon model specification, the overall findings are clear: enabling more flexible / responsive urban growth will result in net social benefits under any scenario for growth. The consumer surplus benefits associated with doing so outweigh the negative externalities (and external infrastructure costs not borne by users) under either urban or greenfield growth scenarios. Furthermore, the presence of agglomeration economies in production and consumption means that the net direction of externalities associated with urban growth may in fact be positive.

This suggests that policy interventions to enable urban development, such as the NPS-UDC options, are likely to be socially beneficial.

Table 2: Costs and benefits of achieving NPS-UDC objectives in Auckland

Costs / benefits	Model 1 results (forward-looking model of supply elasticity)		Model 2 results (backward looking model of supply, prices, and rationing over 2001-2013 period)	
	<i>Low cost (urban)</i>	<i>High cost (greenfield)</i>	<i>Low cost (urban)</i>	<i>High cost (greenfield)</i>
Modelled consumer benefits of increased housing supply	\$2.6bn		\$7.2bn	
Modelled change in city size (households)	23,256		55,560	
<i>Externality scenario</i>	<i>Low cost (urban)</i>	<i>High cost (greenfield)</i>	<i>Low cost (urban)</i>	<i>High cost (greenfield)</i>
Estimated increase in negative externalities	-\$0.7bn	-\$2.4bn	-\$1.7bn	-\$5.6bn
Estimated increase in agglomeration economies	\$2.2bn	\$1.1bn	\$5.2bn	\$2.6bn
Net benefits	\$4.0bn	\$1.3bn	\$10.7bn	\$4.1bn

Distribution of costs and benefits

This analysis also provides us with a basis for understanding the distribution of costs and benefits between locations and between existing property owners and new entrants to the city. In particular, we observe that:

- Consumer surplus benefits from enabling more flexible housing supply will accrue primarily to new entrants to the housing market.
- There will be some transfers between current property owners and new entrants, and between landlords and renters, as a result of the fact that the price of existing housing rises more slowly. (However, under these model parameters, existing property owners would not suffer an actual loss in value.)
- There is a significant difference in the composition of externalities in greenfield and urban areas: externalities in greenfield areas are more likely to relate to infrastructure costs that are not fully borne by users (and hence externalised widely across ratepayers and taxpayers), while externalities in urban areas are more likely to relate to localised “spillovers” to neighbouring properties. Agglomeration benefits, on the other hand, accrue to many firms and employees, as well as to central government as a result of taxes on increased labour income.

¹¹ A full explanation for the derivation of these estimates is beyond the scope of this RIS; however, we provide a brief summary in the Appendix.

Analysis of the degree to which the status quo and the NPS-UDC options deliver these benefits

After quantifying the benefits associated with achieving the policy objectives via an NPS-UDC, we undertake a more detailed, qualitative assessment of the policy options. The key question here is the degree to which NPS-UDC options will create incentives or requirements for local governments to change existing behaviours, and the degree to which they may leave “residual” problems that may need to be addressed through other means.

Our key finding is that there is a NPS-UDC options that include additional policies targeting high-growth and medium-growth urban areas are likely to be more effective and efficient. All options are technically feasible based on MfE’s review of current local authority practices.

Option 1 requires all local authorities to provide sufficient development capacity to meet demands for residential and business space (as well as considering other objectives). However, the effectiveness of this option is likely to be limited in urban areas facing challenges in accommodating growth for two reasons.

- First, this option does not include any specific requirements around evidence and monitoring to support decisions. This means that there is a risk that councils (and Government) will be unaware of the existence of problems that exist as a result of existing plans, policies, and rules. This may reduce their ability (or willingness) to respond to those problems.
- Second, this option provides little specific guidance how councils should seek to respond to evidence of problems. Consequently, it is likely to result in a high degree of variability between councils and the risk that some councils simply choose not to address problems.

Option 2 provides more specific policy guidance to high-growth and medium-growth local authorities in response to documented problems related to inadequate information on urban development demand and capacity, unresponsive and inefficient planning policies and processes and lack of alignment between RMA and infrastructure planning and funding. The effectiveness and efficiency of this option is likely to be greater, for two reasons:

- First, it provides specific guidance on the evidence that councils must gather in order to support plan-making and implementation. These requirements address specific biases and gaps in current practices that may undermine planning processes, including (1) incomplete information on demand for housing and business space, (2) a lack of information on the degree to which development capacity enabled by plans will be taken up in practice, and (3) price signals.
- Second, it provides specific guidance on the policy options that councils must consider in the short, medium, and long term in response to evidence that development capacity is insufficient. This recognises that there are a range of potential responses, and that requiring one particular approach is not likely to be efficient in all contexts. However, it does not necessarily require councils to act in response to evidence, which again creates the risk that some councils will choose to leave problems unaddressed.

Option 3 provides additional specific policy guidance for high growth urban areas (Auckland, Hamilton, Tauranga, Christchurch, and Queenstown) to set residential development capacity targets and develop a future land release and intensification strategy. This option is likely to be more effective and efficient than other NPS-UDC options for two reasons:

- First, requiring specific development capacity targets to be set and incorporated into Regional Policy Statements (RPS) creates an additional lever for achieving the desired outcomes in plan-making and plan implementation. While RPSs currently set objectives to be realised through other plans, policies, and rules, these are not typically stated in quantitative terms and hence it may be possible to avoid their implications for policy. The inclusion of quantitative targets will make it harder to leave RPS objectives un-met.

- Second, requiring councils to provide a future land release and intensification strategy, with a process for flexible interpretation, is likely to shift councils' focus from short-term outcomes to medium- and long-term outcomes and thereby reduce the bias towards current interests over future interests.

Targeting these policies to high-growth urban areas is likely to be efficient, as these areas are most likely to experience problems as a result of the combination of urban growth and existing plans, policies, and rules that restrict development capacity (and hence the competitiveness and responsiveness of urban development markets).

Lastly, we note that all NPS-UDC options may result in some residual risk of problems remaining unaddressed in two areas.

First, as discussed in the problem definition, the potential for coordination failures between RMA planning and infrastructure planning and funding may remain partly un-addressed, due to the fact that these areas of policy are governed by separate legislation. To that end, the NPS-UDC options include objectives and policies that attempt to manage the risk of coordination failures; however, we acknowledge that this risk cannot be fully avoided under current arrangements.

Second, while NPS-UDC Options 2 and 3 direct councils to gather specific data that is relevant for understanding the impact of plans, policies, and rules, and to respond to this information, they do not compel councils to undertake any specific actions (e.g. "upzoning" a specific quantity of land for development). This does create a risk that councils will choose not to address documented problems. This is mitigated by the fact that there are a number of "points of intervention" at which NPS-UDC objectives and policies can drive change, including:

- Major plan reviews: When councils undertake periodic plan reviews, they will be required to take account of NPS-UDC objectives and policies. If they choose not to, Environment Court appeals create an additional opportunity for review of plans against requirements.
- Other RMA processes: NPS-UDC objectives and policies, including for an improved evidence base, are likely to affect the outcome of resource consent applications and plan change processes by placing a greater weight on provision for urban development.
- Government involvement in the planning process: As a final point of recourse, the Government has the option to legislate further changes to planning processes, e.g. to enable independent hearings on plan reviews along the lines of the Auckland Unitary Plan or Christchurch Replacement District Plan. NPS-UDC policies around evidence to support plan-making will provide additional information on when and where this may be necessary.

Error! Reference source not found. summarises our assessment of the three short-listed options against the five assessment criteria: Consistency with the purpose of the RMA; effectiveness; efficiency; feasibility or practicality; and degree of risk.

Consultation

In accordance with section 46(a) of the Resource Management Act 1991 (RMA), consultation on the proposed National Policy Statement on Urban Development Capacity (NPS-UDC) took place between 3 December 2015 and 5 February 2016.

In addition, a number of stakeholder engagement meetings were held with councils that are facing growth, infrastructure providers, developers, iwi, peak bodies, professional organisations and members of the planning, legal and economics professions, businesses and universities, both as part

of specific research undertaken to inform the status quo and problem definition¹², and to inform the development of the NPS-UDC itself.

Formal consultation

Through the formal consultation under s46(a), two hundred and sixty consultation letters were sent to all iwi authorities, all local authorities and selected stakeholders. A total of 47 submissions were received, more than 79% (37) of these submissions indicate some level of support for a NPS-UDC (this included some, but not all of the high growth council's as defined by the in the NPS-UDC).

Out of the 47 submissions received: 6 were from regional councils, 6 from city councils and 14 were from district councils. Eight were from industry groups and 5 were from businesses; 2 were from infrastructure providers, 1 was from a professional body and 1 was from an iwi authority. Three additional submissions were provided by a trust, an education provider and a regional health service.

Of the submissions from local authorities, 11 were from those councils experiencing highest population growth such as Auckland, Tauranga and Christchurch; however no submissions were received from Queenstown, Waipa or New Plymouth (who are also experiencing high growth). Fourteen were from councils with lower growth including rural areas such as Rangitikei, Clutha and Timaru.

The main reason submitters gave for supporting a NPS-UDC was that direction at a national level will ensure local authorities have greater certainty, consistency and clarity for managing growth and pressures from urban development. A NPS was seen by submitters as helping local authorities plan for growth/change their plan making processes. Some submitters supported a NPS-UDC if it only applied to areas where urban development was an issue (recognising that engagement at this time did not specifically discuss the range of options being considered by the NPS-UDC). It was suggested that the NPS apply to high growth, urban areas rather than impacting small, rural authorities.

Support from submitters was based on the view that a NPS-UDC would:

- support better integrated planning strategies
- ensure business activity can operate efficiently and effectively in urban environments
- enable cities and high-growth areas to develop quality built environments
- provide more of the national direction that was always intended in the RMA to support decision makers.

A number of submitters expressed support that was conditional on a better understanding of the proposed NPS-UDC. Some felt it should only have a broad scope including:

- direction on urban form particularly on encouraging more intensification
- better integration of planning including the provision and funding of infrastructure
- direction on the management of natural resources.

Only three submissions, including the Western Bay of Plenty District Council, which includes some of the Tauranga urban area, did not support the development of a proposed NPS-UDC. These submitters considered that a NPS-UDC would not assist local authorities planning for growth as it would not address key aspects of the problem. They also felt that there are sufficient tools already in place to manage growth.

¹² MfE and MBIE commissioned two key pieces of research to support the development of the NPS-UD: a study of the methodologies that selected high-growth local authorities use to estimate the demand for and supply of development capacity, and a research report looking at any problems that exist around the supply of business land in local authorities around New Zealand.

Feedback was sought on the challenges planning for growth brought and that a NPS-UDC and supporting guidance could help to address. Some common themes included:

- planning for urban development that incorporates good urban design and amenity value (55%)¹³
- coordinating the release of development capacity in RM plans and the funding and provision of infrastructure to support that (53%)
- managing the balance between greenfield development and brownfield intensification, with brownfield development seen as desirable for a range of reasons but difficult to enable (51%)
- ensuring a strategic approach to urban development including the balance between residential and business land (43%)
- managing reverse sensitivity (the protection of activities generating negative externalities from new sensitive uses) (43%)
- ensuring accurate estimates of the demand and supply of development capacity (38%)
- ensuring that impacts of urban development on natural resources such as freshwater, soil and rural areas are well managed (32%)
- encouraging collaboration between local authorities so that they take a regional approach to addressing growth (30%).

Submitters were asked what a NPS-UDC and supporting guidance could contain. Suggestions include:

- aligning the NPS-UDC with legislation (LGA/LTMA) and other NPS (51%)
- common definitions and data sources for estimating supply and demand (49%)

considering a contextual rather than a one-size-fits-all approach to different areas of the country to address issues of urban development (27%)

- requiring local authorities to provide certain amounts of development capacity (25%)
- monitoring requirements that link to clear definitions (19%)
- considering and aligning with Treaty settlements (9%).

Overall the feedback has been supportive of a NPS-UDC with a strong interest in further informal engagement on the scope and direction.

How it informed policy development

All of this feedback has informed the analysis of the problem and the development of options. In particular, the NPS-UDC aligns with consultation feedback through:

- a preferred option which targets more stringent requirements to where growth is occurring (i.e. avoiding a 'one-size-fits-all' approach)
- supporting integrated planning with infrastructure providers and encouraging collaboration between local authorities that share jurisdiction across a common market, as much as is possible
- requiring a more robust evidence base, and the use of common terms and definitions.

¹³ Percent of total submissions

During consultation, a number of stakeholders also raised other, more fundamental reform options, such as looking at ways to create a more coherent planning framework (e.g. through statutory linking of plans), or a more fundamental review of planning and resource management legislation. These are outside the scope of this work, and are also the subject of broader, more detailed work by the Productivity Commission (through its inquiry into urban planning) and by Natural Resources Sector agencies.

One issue that was particularly raised during consultation was the issue of reverse sensitivity (which is when more sensitive land uses locate near to activities that generate effects e.g. noise and odour, which then has impacts on continued operation for that activity through increased cost to mitigate effects). While reverse sensitivity is related to the provision of development capacity, e.g. councils will be wary about repurposing land around heavy industrial activities for residential or even some commercial uses because of reverse sensitivity, it is not central to the intent of the NPS-UDC. In addition, it is a highly complex issue, with much local variation, and the time available to undertake this analysis meant that there was a high risk that any specific policies to address reverse sensitivity would have had unintended consequences.

Conclusions and recommendations

In summary, our assessment of policy options finds that:

- There are significant social costs associated with maintaining the status quo approach to urban development, as a result of reduced supply of urban land and development markets and higher costs of land and housing from the existence of local authority plans, policies and rules that have higher costs than benefits.
- Addressing the problems associated with a lack of sufficient development capacity to provide for demand for housing and business space in cities from population growth is likely to reduce these costs. Consequently, we find that achieving government objectives through an NPS-UDC and enabling more flexible and responsive urban development would deliver substantial net social benefits.
- Of the three NPS-UDC options considered, Option 3, which provides specific policy guidance for setting residential development capacity targets and developing a land release and intensification strategy, is the recommended option because it is most likely to achieve the Government's objectives and deliver the net benefits associated with enabling more flexible and responsive urban development. This reflects the fact that it includes specific policy guidance to address identified causes of the problem, reduce the likelihood of ineffective implementation by councils, and manage risks associated with uncertainty about future urban development demands and potential coordination failures between RMA planning and infrastructure planning.

Implementation plan

The NPS-UDC will be supported by a package of non-statutory guidance and implementation.

There are a number of topics that guidance could be provided on. During consultation on the proposed NPS-UDC in June and July 2016, MfE and MBIE intend to seek feedback on topics where guidance would be most useful. These include:

- Best practice methodologies for assessing demand and development capacity
- Best practice methodologies for specified monitoring indicators, and other indicators that may provide useful information
- Understanding market realities, including assessing development feasibility, monitoring and interpreting price signals

- How local authorities can work with other actors, including local authorities and infrastructure providers
- Assessing market failures, and making the case for planning regulations (including cost benefit analysis)
- How to balance the NPS with different national direction (for example the National Policy Statement on Fresh Water Management and the New Zealand Coastal Policy Statement).

The Government is also seeking feedback on other ways it could support the successful implementation of the proposed NPS. This could include:

- Facilitating sharing of best practice between local authorities
- Providing training, or other ways to increase local government capability
- Monitoring and reporting on the implementation of the NPS
- Providing access to technical models.

Monitoring, evaluation and review

MfE and MBIE will monitor the effectiveness of the NPS-UDC in achieving the Government's objectives. This will include:

- Whether and how well local authorities in High Growth Urban Areas and Medium Growth Urban Areas have implemented specific requirements in the NPS-UDC, such as the preparation of Housing and Business Land Assessments, and preparing minimum targets for residential development capacity.
- How effective the requirements have been at enabling more development capacity. This will include:
 - Evaluation of specific local areas by drawing on the information generated by local authorities through Housing and Business Land Assessments
 - Monitoring plan changes in response to the requirements of the NPS-UDC
 - Monitoring of market activity, through the review of monitoring data collected by local authorities, including pricing signals, and other data that Government has access to
 - More qualitative assessment measures where appropriate, including the views of market participants

Many of the additional requirements expected of local authorities in High Growth Urban Areas and Medium Growth Urban Areas are required to be implemented no later than 2018, with the exception of more frequent monitoring, which must commence six months after the NPS-UDC comes into effect. Therefore, while pricing signals and market activity can be monitored almost immediately, a more complete set of information about demand and the state of development capacity will likely not be available until the end of 2018. Where the information generated by a local authority is insufficient, the Government may work with it to address information gaps.

Non-compliance with the NPS-UDC

As noted in the assessment of options, the end outcomes from an NPS-UDC will depend upon how well local authorities give effect to it. Within the RMA, there are options available to the Minister for the Environment to:

- Investigate the performance of local authorities in giving effect to the NPS-UDC;
- Provide recommendations to local authorities on improving their performance; or

- Take stronger actions, including directing plan changes, or, as a last resort, residual powers to appoint someone to carry out the local authority's functions and duties.

Appendix: Background to modelling

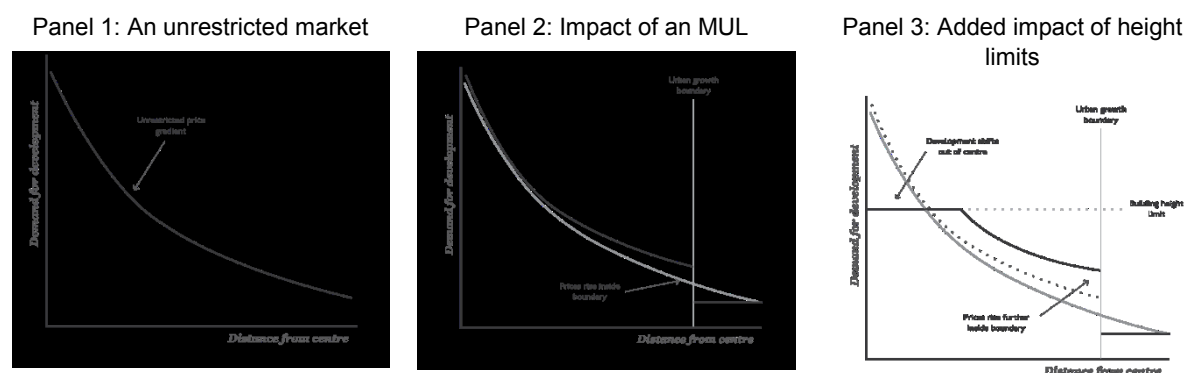
In this Appendix, we briefly describe the basis for our cost benefit analysis of existing planning regulations and of the impact of enabling more flexible / responsive urban development.

Analysing the impacts of Auckland’s MUL and building height limits

Planning rules that limit development, such as MULs, building height limits, and density controls, will alter development outcomes and raise housing costs. This reflects the fact that people will have to either pay more for housing or incur additional transport costs to live in an undesirable location.

Figure 1 illustrates the expected impacts of these rules on urban development. Relative to an unrestricted market (Panel 1), adding a binding MUL will tend to raise prices just inside the urban fringe, and lower them immediately outside (as shown in Panel 2). This reflects the fact that land just outside the MUL will not be able to be converted from agricultural use to higher-value urban use. However, restrictions on denser development within the city, such as building height limits, will also inflate the magnitude of the discontinuity, by shifting some development out of higher-value central areas and towards the fringe. (In this respect, urban development is a little like a waterbed or a game of whack-a-mole: if you push down growth in one area, it pops up in another.)

Figure 1: The causes of discontinuities in land prices at the MUL



These effects can be observed empirically; however, economic modelling is required to understand the potential effects of relaxing (or tightening) restrictions on wellbeing. NZIER (2014, 2015a) use the Alonso-Muth-Mills “monocentric city” model¹⁴ to estimate the impact of expanding Auckland’s MUL or relaxing building height limits on the overall housing and transport costs faced by city residents. We use their results in order to understand the benefits of relaxing regulations:

- NZIER (2014) model the impact of a 22% increase in the amount of land available within the MUL, finding that this would result in annual benefits of \$859 per household. When extrapolated over the approximately 470,000 households in Auckland (as of the 2013 Census) this equates to annual benefits of approximately \$403 million.
- NZIER (2015a) model the impact of a of a three-storey building height limit throughout the city, finding that relaxing this restriction would result in annual benefits of \$933 per household. When

¹⁴ In the Alonso-Muth-Mills model all employment is assumed to take place in the city centre. Households then choose whether to live close to work in a smaller cheaper house or live further from town in a larger house that comes with a longer commuting time.

extrapolated over the approximately 470,000 households in Auckland (as of the 2013 Census) this equates to annual benefits of approximately \$438 million.

We then compare these benefits with the costs associated with relaxing these restrictions, in terms of additional (socialised)¹⁵ infrastructure costs and negative externalities. We estimate the magnitude of these costs based on NZIER's model outputs and a review of various urban externalities. We find that:

- Extending the MUL will increase demand for transport and other network infrastructure and reduce benefits associated with access to peri-urban open spaces. NZIER's modelling results suggest that expanding the MUL would result in an 8.2% increase in peak vehicle kilometres. Serving this increased demand would result in road infrastructure costs of approximately \$0.65/year/peak veh-km (Wallis and Lupton, 2013). Similarly, increasing the size of the city would incur disbenefits of approximately \$38,750-\$67,750 per hectare (based on the findings of a meta-analysis by Brander and Koetse, 2011).
- Raising building height limits will increase the potential for overshadowing, while reducing demand for transport and other network infrastructure (leading to cost savings). NZIER's modelling suggests that relaxing building height limits would result in taller buildings in the inner 10km area of Auckland. Based on a review of several data sources, we estimate that this will result in costs of \$3,900-\$11,500 per dwelling in these areas. However, against this, NZIER's modelling implies a 5.6% reduction in peak vehicle travel (and other infrastructure requirements), resulting in savings.

Analysing the impacts of enabling more flexible / responsive urban development

We consider that an NPS-UDC will, if successfully implemented, have two main effects:

- The primary effect will be to enable urban development to happen more flexibly and at a lower cost. This will result in benefits to consumers of housing (or business space), who will be able to locate in New Zealand cities at a lower cost. We estimate the magnitude of these benefits using two economic models of housing demand and supply dynamics.
- All else equal, enabling more flexible urban development will allow New Zealand cities to grow larger, and potentially with different spatial forms. This may result in additional positive and negative externalities associated with housing / business development and city size. We estimate the magnitude of these costs and benefits based on a comprehensive literature review, supplemented where needed with new analysis.

The consumer benefits of enabling more responsive housing supply

To analyse the benefits of enabling more responsive housing supply, it is necessary to define alternative scenarios for comparison and to clearly identify beneficiaries (or potential beneficiaries).

Following our analysis of the impact of existing plans, policies, and rules on New Zealand's urban development markets, we consider that the main impact of policies that restrict development capacity is to reduce the elasticity of housing supply – that is, to reduce the degree to which new housing is constructed in response to rising prices. An alternative approach would be to assume a uniform increase in supply costs without changing the slope (elasticity) of the supply curve. However, the

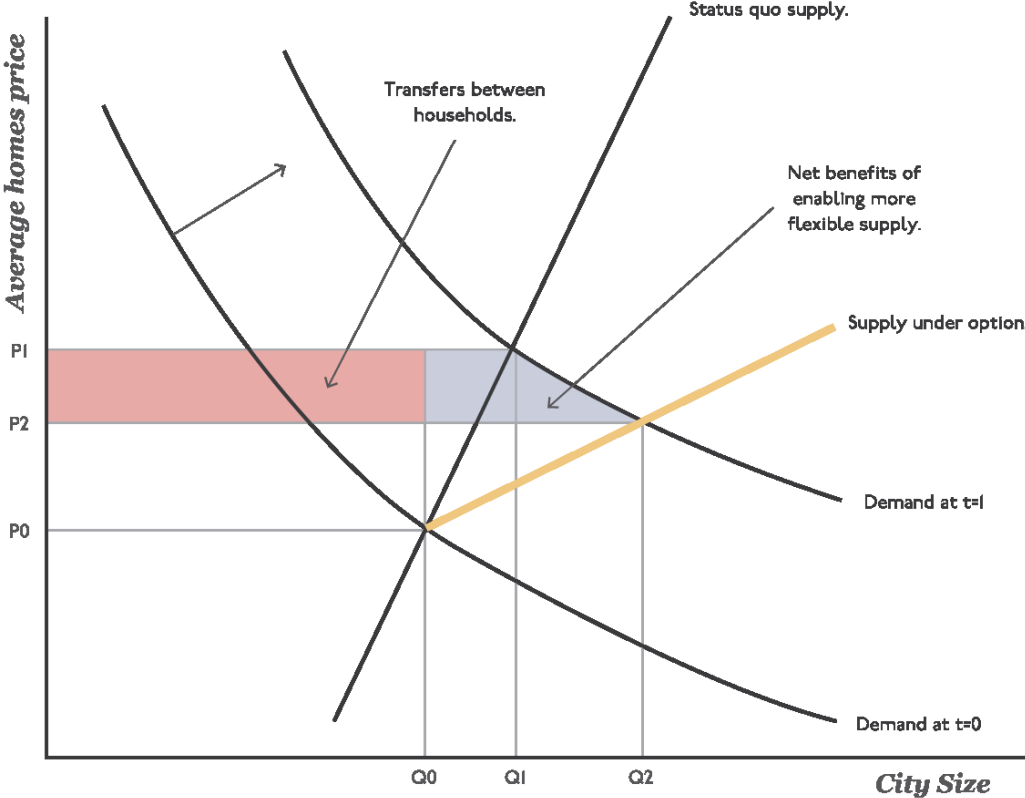
¹⁵ That is paid for by society, e.g. as rates, rather than by developers or property owners

impacts of development restrictions (e.g. MUL, height limits) are likely to be felt increasingly as supply increases.

Figure 2 illustrates these dynamics in a simple supply and demand diagram. It includes the following elements:

- A demand curve that shifts outwards over time, showing the impact of population growth from natural increase or migration as well as income growth increasing demands for housing
- Two supply curves – the “status quo” curve is steeper than the “option” curve, indicating that housing will be constructed more slowly in response to rising demand.

Figure 2: Consumer surplus arising from more responsive housing supply



We can use this analysis to estimate net consumer benefits for entrants to the housing market (e.g. new entrants to the city, people forming new households, or people buying new rental properties to meet demand), excluding transfers between existing households and new entrants.

If we compare between the two supply scenarios, we observe that:

- Growth under the “status quo supply” scenario will result in some increase in city size (Q1) and significantly higher prices (P1) relative to time t=0. This primarily reflects the fact that some people will be unable to live in the city due to high prices (or will be forced to accept crowded living conditions).

- Growth under the “option” scenario will result in a larger city size (Q2) than at time t=0 and relative to Q1, and lower prices (P2) than for the same point in time under the status quo supply option.

We can use this analysis to identify the distribution of costs and benefits between parties.

The blue-shaded area between Q0 and Q2 represents an increase in consumer surplus that accrues to those who constitute the additional demand. This reflects the fact that there is an increase in dwellings due to construction of new supply. This area can be estimated as follows:

$$Consumer\ surplus = (P_1 - P_2) * \left[\frac{(Q_1 + Q_2)}{2} - Q_o \right]$$

By contrast, the red-shaded area between zero and Q0 represents a transfer between households. This reflects the fact that the value of existing homes (Q0) will tend to appreciate less rapidly if more new homes are built in response to growth. This is described as a transfer, rather than a net benefit or net cost, because the benefits accruing to buyers of these houses (in terms of cheaper housing) are offset by the fact that existing owners can’t sell (or rent) their houses for as much. We have therefore excluded the red-shaded area from our calculations of consumer surplus to avoid over-stating the benefits of enabling a more responsive urban development market.

Modelling consumer benefits

We employ two microeconomic models of aggregate urban housing markets to estimate the potential consumer benefits of enabling urban development.

Our first model is a “comparative statics” model of housing supply dynamics under alternative scenarios for elasticity of housing supply. The key insight underpinning this model is that planning regulations can reduce the elasticity, or flexibility, of housing supply. Over time, this means that less housing will be built in response to rising demand, leading to higher prices, and ultimately a smaller city.

This model is a simple supply and demand analysis based on the linearised supply and demand curves described in Table 3. To calibrate the model to Auckland, we choose the parameters $Q_0=500,000$ households; $P_0=\$750,000$ /dwelling; $P_{max}=\$2,500,000$, $g = 20\%$ growth in demand (roughly equal to one decade’s worth of growth); $E_{dm}=0.8$; and $E_{opt}=1.0$. Alternative model calibrations could be used to estimate benefits for different cities.

Table 3: Linear supply and demand curves for modelling city growth under alternative elasticity of supply scenarios

Curve	Functional form
Demand at t=0	$Q_D = \frac{P_{max} * Q_o}{P_{max} - P_o} - \frac{Q_o}{P_{max} - P_o} * P$
Demand at t=1	$Q_D = \frac{P_{max} * Q_o}{P_{max} - P_o} * g - \frac{Q_o}{P_{max} - P_o} * P$
Supply under status quo regulation	$Q_{dm} = \left(E_{dm} * \frac{Q_o}{P_o} \right) * P + (Q_o - E_{dm} * Q_o)$
Supply with policy option	$Q_{opt} = \left(E_{opt} * \frac{Q_o}{P_o} \right) * P + (Q_o - E_{opt} * Q_o)$

Our second model is an econometric model estimating the quantity of new construction required to stabilise housing price growth in urban areas. This model was developed by the California Legislative

Analyst’s Office (2015) for use in policy analysis in the Californian context.¹⁶ The key insight underpinning this model is that, if housing supply is constrained, prices must rise until some households exit the market, which may mean moving to another location or crowding into existing dwellings.

The LAO estimated this model using panel data on housing prices and supply in large US counties (>850,000 people) from 1980-2010, controlling for exogenous supply and demand factors (geographic constraints, climate, unemployment). The model finds that a 10% increase in house prices in a county is associated with 8.3% slower growth in housing supply – evidence of price-driven rationing. Higher prices in neighbouring counties also tend to push up local demand for housing – evidence of “spatial spillovers” between adjacent housing markets.

Based on Census data and REINZ data on house prices, Auckland’s population grew by 22%, its housing stock increased by 19%, and real median house prices increased 78% over the 2001-2013 period. The LAO model allows us to “simulate” the impact of a lower rate of real house price inflation on housing demand in Auckland. For example, if Auckland house prices had appreciated half as rapidly over this period – i.e. if they had gone up 39% rather than 78% - then the resulting increase in housing purchases can be calculated as follows.

Equation 1: Estimated increase in housing demand associated with a lower rate of house price inflation

$$\begin{aligned} & \text{Increase in house purchase} \\ & = (\text{Reduction in real house price increase}) \\ & * (\text{Elasticity of housing demand w.r.t. real price}) = (-0.39) * (-0.83) \\ & = +32\% \end{aligned}$$

This suggests that, to limit house price increases to half of the level experienced over the 2001-2013 period, Auckland would have had to have expanded its housing stock by 32% rather than 19%. This would in turn be associated with faster urban growth and lower rates of household crowding than actually occurred.

Estimating the positive and negative externalities associated with urban development

Both models predict that enabling more flexible / responsive urban development will result in an increase in city size. Consequently, it is possible that it will also result in an increase in positive and negative externalities associated with urban development. This includes:

- Localised nuisances associated with development, such as building overshadowing and incompatible land uses
- Increased traffic congestion
- Environmental externalities
- Infrastructure costs that are not borne by users
- The benefits of increased agglomeration economies in production and consumption.

¹⁶ The LAO recently undertook a review of urban planning issues that covered much of the same territory as the Productivity Commission’s recent inquiries.

To estimate the magnitude of these externalities for Auckland, we review the existing New Zealand-specific evidence base and empirical literature from other jurisdictions. In some cases (e.g. with congestion and overshadowing externalities) it has been necessary to develop estimates, as none have been previously available. Our resulting estimates are summarised in Table 4 – a full derivation is available in a companion report. We report different estimates for development in different locations, e.g. within the existing urbanised area versus at greenfield sites.

Table 4: Estimated magnitude of externalities associated with housing development in urban and greenfield areas (externalities per dwelling)

Externalities	Urban intensification		Greenfield	
	Low	High	Low	High
External infrastructure costs				
• Transport	\$0	\$0	-\$6,787	-\$10,298
• Water / wastewater	-\$3,240	-\$12,740	-\$3,240	-\$21,432
• Stormwater	\$0	-\$1,626	\$0	-\$1,626
• Open spaces and community facilities	\$0	\$0	-\$2,086	-\$3,186
Congestion	-\$22,717	-\$29,682	-\$35,228	-\$48,975
Overshadowing from tall buildings ¹⁷	\$0	-\$9,832	\$0	\$0
Blocked views from tall buildings ¹⁸	\$0	-\$10,219	\$0	\$0
Loss of peri-urban open space	\$0	\$0	-\$2,664	-\$4,657
Air quality	-\$3,814	-\$4,217	-\$3,204	-\$3,814
Freshwater quality ¹⁹	\$0	-\$2,229	-\$1,783	-\$3,566
Coastal water quality ²⁰	\$0	-\$779	-\$1,914	-\$3,829
Noise, smells, and nuisances from incompatible activities	(Unknown)	(Unknown)	(Unknown)	(Unknown)
Agglomeration economies in production	\$92,895	\$46,419	\$92,895	\$46,419
Agglomeration economies in consumption	(Unknown)	(Unknown)	(Unknown)	(Unknown)
Total	\$63,124	-\$24,904	\$35,990	-\$54,964
<i>Total excluding agglomeration economies</i>	<i>-\$29,771</i>	<i>-\$71,323</i>	<i>-\$56,905</i>	<i>-\$101,383</i>

¹⁷ We considered three scenarios for the cost of overshadowing from new development in urbanised areas:

- A (1) a low scenario in which the potential for overshadowing from tall buildings is controlled by height and setback controls, which results in an overshadowing cost of \$0 per added dwelling
- A; (2) a medium scenario in which areas are built out to mid-rise (4-8 storey) density, resulting in an increase in household energy costs from overshadowing that is equal to \$3,9004,230 per apartment

A (in present value terms); and (3) a high scenario in which tall (4-8 storey) apartment buildings block sun from neighbouring standalone houses, resulting in an overshadowing externality of approximately \$11,5009,832 per apartment.

¹⁸ The empirical literature suggests that, in Auckland, water views are highly valued while views of land are less valuable. As a relatively small share of Auckland properties (~13% of houses sold between 2011 and 2014) have water views, view-related externalities are not likely to be common. However, in some particular cases they may be larger than the upper bound of the range reported here.

¹⁹ These effects are likely to be addressed under the NPS on Freshwater Quality; consequently, these figures are likely to be pessimistic.

²⁰ These effects are likely to be addressed under the NZ Coastal Policy Statement; consequently, these figures are likely to be pessimistic.

