

Section 32 Report – Volume I

prepared for

Variation 3 to the Proposed Waikato District Plan

Enabling Housing Supply

September 2022



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I Introduction

This report has been prepared to fulfil the obligations of Waikato District Council (Council) required by section 32 of the Resource Management Act 1991 (RMA). This report should be read together with the text and maps of the Waikato Proposed District Plan (PDP) itself and Variation 3.

For any proposed change to a proposed district plan, Council is required under section 32 of the RMA to carry out an evaluation of whether objectives of a proposal are the most appropriate way to achieve the purpose of the Act (i.e., sustainable management of natural and physical resources).

A section 32 evaluation must also examine whether the provisions in the proposal are the most appropriate way to achieve the objectives by identifying other reasonably practicable options for achieving the objectives and assessing the efficiency and effectiveness of policies, rules and other methods in considering whether they are the most appropriate means of achieving these objectives.

The evaluation must consider the benefits and costs associated with each policy, rule or method and also the risk of acting or not acting if there is uncertain or insufficient information on the subject matter.

Accordingly, this volume of the section 32 evaluation report steps through:

- a. Background;
- b. Relevant legislation, strategies and policies;
- c. Consultation and engagement;
- d. Evaluation of the proposed objectives as required by section 32(1)(a);
- e. Identification and evaluation of options to achieve the objectives in accordance with section 32(1)(b)(i); and
- f. Evaluation of the proposed provisions as required by sections 32(1)(b) and 32(2).

Volume 2 of this document sets out the additional evaluations required by sections 77J and 77L of the Act for qualifying matters.

I.1 Overview and purpose of Variation 3

On 20 December 2021, the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 was enacted. While this has now been incorporated into the primary legislation of the RMA, it requires Tier I Territorial Authorities, of which Waikato District is one, to change their district plans to incorporate Medium Density Residential Standards (MDRS) and to give effect to Policies 3 or 5 of the National Policy Statement on Urban Development (NPS-UD).¹

The MDRS as set out in Schedule 3A of the RMA, must be applied to every “relevant residential zone” in the district and can be modified to be either more or less enabling of development in accordance with sections 77H and 77I of the RMA. Schedule 3B of the RMA amends Policies 3, 4 and 5 of the NPS-UD.

If a Territorial Authority is proposing to modify the MDRS to limit their application, it can do so only if one of the qualifying matters contained in s77I of the RMA are applicable. A qualifying matter is a matter identified in s77I of the RMA that makes the required higher density inappropriate in an area where there are significant factors or values present, such as high hazard risk.

Variation 3 – Enabling Housing Supply – constitutes Council’s Intensification Planning Instrument (IPI) under s80E of the RMA (Variation 3). Variation 3 seeks to vary the PDP to implement the Resource

¹ RMA s73 and 74 requires Variation 3 to be prepared in accordance with RMA Part 2 and must also give effect to the NPS-UD as a whole

Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (Amendment Act) by:

- a. Applying the MDRS to relevant residential zones; and
- b. Give effect to Policy 3 in the NPS-UD.

In implementing Variation 3, Council’s objectives are to:

- a. Meet legislative requirements;
- b. Enable additional residential capacity in the district’s larger towns subject to qualifying matters;
- c. Contribute towards achieving the targets for housing development capacity as set out in the PDP and Future Proof;
- d. Enable a variety of housing choice;
- e. Reduce pressure on urban expansion and associated infrastructure investment requirements by enabling more intensification of existing urban areas;
- f. Create quality built form outcomes; and
- g. Deliver on a more walkable and compact urban form by increasing residential intensification in close proximity to the town centres of the four largest towns.

1.2 The Relevant District Plan

While the PDP was publicly notified in July 2018, decisions on submissions and further submissions were released in January 2022. Due to the timing of the enactment of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 202, the PDP decisions could not reflect the new legislative requirements. In any event, the Hearing Panel on the PDP was constrained by the scope of the submissions received to the PDP in 2018.

As mentioned above, Variation 3 is Council’s response to the requirements to notify an IPI in accordance with section 80E of the RMA. Variation 3 proposes changes to the PDP as the most recent district plan, rather than the Operative Waikato District Plan.

1.3 Scope of Variation 3

Variation 3 applies to the existing urban areas in the towns of Huntly, Ngaaruawaahia, Pookeno and Tuakau. Key parts of Variation 3 are summarised below in terms of the PDP chapters:

		Proposal
Part 2: District Wide Matters	Strategic Direction	<ul style="list-style-type: none"> • Amend the strategic direction objectives and policies to incorporate a mandatory objective and policy relating to residential development.
	Subdivision	<ul style="list-style-type: none"> • Amend the policies to provide for residential subdivision in accordance with the MDRS. • Incorporate the MDRS and related changes.
Part 3: Area Specific Matters	New Medium Density Residential Zone 2	<ul style="list-style-type: none"> • Rename the Medium Density Residential Zone in Huntly, Tuakau, Ngaaruawaahia and Pookeno to Medium Density Residential Zone 2. • Amend the objectives and policies to incorporate a mandatory objective and policies relating to residential development. • Amend the policies to provide for residential development in accordance with the MDRS, except where qualifying matters apply. • Incorporate the MDRS, provisions for assessing proposals that do not comply with MDRS and other related changes.

		<ul style="list-style-type: none"> • Incorporate rules that modify the MDRS where necessary to accommodate qualifying matters.
	General Residential Zone	<ul style="list-style-type: none"> • Retain the existing General Residential Zone provisions in Huntly, Tuakau, Ngaaruawaahia and Pokeno to accommodate a qualifying matter: Urban Fringe.
	Medium Density Residential Zone	<ul style="list-style-type: none"> • Rename to Medium Density Residential Zone 1
	Consequential changes	<ul style="list-style-type: none"> • Consequential changes to other chapters to amend references to Medium Density Residential Zones 1 and 2.
Maps	Maps	<ul style="list-style-type: none"> • Amend the planning maps to replace the Medium Density Residential Zone in Huntly, Tuakau, Ngaaruawaahia and Pokeno with the Medium Density Residential Zone 2. • Amend the planning maps to replace the Medium Density Residential Zone in Te Kauwhata and Raglan to the Medium Density Residential Zone 1. • Amend the extent of the Medium Density Residential Zone 2 and the General Residential Zone.

Notably, some parts of the PDP are not proposed to be amended and these include:

- a. The provisions of the General residential zone. This is as a result of the qualifying matter: urban fringe which is addressed in Volume 2 of this report;
- b. The provisions for Medium density residential 1 zone, which will continue to apply to Raglan and Te Kauwhata;
- c. The spatial extent of Medium density residential 1 zone in Raglan and Te Kauwhata;
- d. The provisions relating to District-wide overlays which are located in Part 2 of the PDP (other than updating references to zone names);
- e. The spatial extent of the urban area is not expanded; and
- f. Properties will not be down-zoned from their current zoning in the PDP decision.

2 Legislation, strategies and policies

The following sections discuss the legislative and national, regional and local policy framework that provides the context for Variation 3.

2.1 Resource Management Act 1991 (RMA)

Section 74 of the RMA requires a territorial authority to change its district plan in accordance with the provisions of Part 2. Similarly, section 32(1)(a) of the RMA requires an evaluation report to examine the extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of the RMA. The purpose and principles are set out in Part 2, sections 5-8 of the RMA. Other sections of the RMA which are also considered relevant to Variation 3 are set out below.

Section 5 – Purpose of the Act

Section 5 sets out the purpose of the RMA, which is to promote the sustainable management of natural and physical resources. Sustainable management means

managing the use, development, and protection of natural and physical resources to enable people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, while -

- *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- *avoiding, remedying, or mitigating any adverse effects of activities on the environment*

Variation 3 is considered to be consistent with the purpose of Part 2 of the RMA as it will promote the sustainable management of the land resource available for residential development to enable people and communities to provide for their social and economic well-being. Variation 3 will also assist with meeting the reasonably foreseeable needs of future generations, safeguard the life-supporting capacity of the natural environment and avoid, remedy or mitigate any adverse effects of activities on the environment. A detailed assessment of the proposed objectives against the purpose of the Act is contained in chapters 5-7 of this report, as required by section 32(1)(a) of the RMA.

In achieving this purpose, councils also need to recognise and provide for the matters of national importance identified in section 6, have particular regard to other matters referred to in section 7 and take into account the principles of the Treaty of Waitangi under section 8.

Section 6 – Matters of national importance

Section 6 outlines matters of national importance that shall be recognised and provided for in achieving the purpose of the RMA. It is considered that these matters are recognised and provided for either through Variation 3 or the existing provisions of the PDP. Although Variation 3 provides for increased development opportunities it should be noted that these are within existing urban areas where PDP provisions are currently in place to address matters of national importance. The recognition of s6 matters is set out in Volume 2 – Qualifying Matters.

Section 7 – Other Matters

Section 7 outlines other matters which require Councils to have particular regard to in relation to managing the use, development, and protection of natural and physical resources. Variation 3 specifically seeks to address the efficient use and development of natural and physical resources through providing for a greater opportunity for residential development in close proximity to the town centres of the four largest towns. This will assist with using land and infrastructure more efficiently.

Section 8 – Treaty of Waitangi

All persons exercising functions and powers under the RMA must take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

In this regard, engagement has been undertaken with Tangata Whenua throughout the development of Variation 3 and will be ongoing. In particular, engagement has been undertaken with Te Whakakitenga o Tainui. This is further discussed below in Consultation and Engagement.

Section 31 – Functions of territorial authorities under the Act

Section 74(1) of the RMA requires a territorial authority to change its district plan in accordance with its functions under section 31. Section 31 of the RMA was amended in 2017 to give territorial authorities the function of the ‘establishment, implementation, and review of objectives, policies, and methods to ensure that there is sufficient development capacity in respect of housing and business land to meet the expected demands of the district’.

Access to housing is fundamental to providing for the well-being of current and future residents of Waikato District. Variation 3 will provide for additional residential development capacity and variety

to assist with meeting growth demands and needs, while supporting a walkable and compact urban environment.

Section 75 – Contents of district plans

This section of the RMA requires district plans to contain an appropriate framework to give effect to higher order statutory documents. It is considered that these matters are recognised and provided for either through the existing provisions of the PDP or Variation 3.

Section 76 – Effects of activities on the environment

Under section 76(3) of the RMA, when evaluating rules, the Council must have regard to the actual or potential effects of activities on the environment. The effects on the environment are considered through the options analysis in both volumes of the section 32 reports.

Where the MDRS have been incorporated in full without modification, no further analysis is undertaken as these standards are mandatory.

2.2 Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021

Intensification Planning Instruments (IPI)

An IPI is defined in section 80E of the RMA as a change to a district plan or a variation to a proposed plan that must incorporate the MDRS and give effect to the NPS-UD intensification Policy 3. The IPI may also include related provisions (including objectives, policies, rules, standards and zones) that support or are consequential on the MDRS and NPS-UD policies.

A territorial authority must only notify one IPI, when the MDRS is first incorporated into the proposed district plan which is via Variation 3.

Council must prepare an evaluation of the IPI under section 32 of the RMA as amended by sections 77J and 77L of the RMA.

The IPI may also amend or include related provisions (including objectives, policies, rules, standards and zones) that support or are consequential on the MDRS or Policy 3 in the NPS-UD. Section 80E provides that these related provisions can include:

- a. Qualifying matters identified in accordance with section 77I or 77O;
- b. Provisions for district wide matters such as fencing, infrastructure, stormwater management or subdivision of land as they relate to urban areas (s80E(2) of the RMA);
- c. Creation of new residential zones or amending existing residential zones provided for in s77G(4) of the Amendment Act that implement the MDRS and
- d. Related provisions which support the MDRS, such as open space.

Qualifying Matters

Section 77I RMA provides that Council may make the MDRS and the relevant building height or density requirements under Policy 3 of the NPS-UD less enabling of development in an area within a relevant residential zone only to the extent necessary to accommodate 1 or more qualifying matters. . A qualifying matter makes higher density inappropriate in an area. The qualifying matters are listed in s77I(a) to (j) and s77O(a) to (j) in the RMA. Council is proposing to accommodate qualifying matters in the IPI. Qualifying matters are discussed in detail in Volume 2.

Legal Effect

Section 86BA of the RMA provides that some permitted activity rules have immediate legal effect from the notification date of the IPI which is 19 September 2022. This applies if the rule authorises the construction and use of a residential unit in a relevant residential zone in accordance with the MDRS. Legal effect does not apply to:

- a. Restricted discretionary activities;
- b. Areas where a qualifying matter has been identified (either an existing or a proposed new qualifying matter);
- c. Areas not previously a relevant residential zone (this will include areas within the Medium Density Residential Zone 2 which were not in a residential zone in the Operative Waikato District Plan.);
- d. Subdivision rules and standards.

Intensification Streamlined Planning Process (ISPP)

The ISPP sets out a pathway for plan changes to implement the MDRS, Policy 3 of the NPS-UD and other supporting or consequential changes. Council must use the ISPP to incorporate the MDRS and NPS-UD intensification policies into the PDP. The ISPP is based on the Streamlined Planning Process under the RMA.

There are steps in Part 1, Schedule 1 of the RMA that apply to an ISPP. Council must enable the public to submit on the IPI and prepare a summary of submissions for further submissions and then hold a hearing into submissions on the IPI. An Independent Hearings Panel was appointed by Council on 22 April 2022 in accordance with section 96(1) of Part 6 in Schedule 1 of the RMA. The Independent Hearings Panel will conduct a hearing and make recommendations to Council. Council must consider those recommendations and either accept or reject them. If Council accepts the recommendations, Variation 3 becomes operative. If Council rejects the recommendations, the Minister for the Environment makes the decision and makes Variation 3 operative. The ISPP does not provide for Environment Court appeals. Pursuant to section 80L of the RMA, the Minister for the Environment can direct Council in relation to a number of matters. The Minister has directed Council to notify its decisions on the Independent Hearings Panel's recommendations in accordance with clause 102 of the RMA by 31 March 2024.

Under s75(3)(a) of the RMA, a district plan must give effect to any national policy statement. The various policy statements including NPS-UD, National Policy Statement on Freshwater and the National Policy Statement on Electricity Transmission are considered relevant to Variation 3 and are discussed below.

2.3 National Policy Statement on Urban Development 2020

The NPS-UD came into effect on 20 August 2020. The NPS-UD 2020 sets out the objectives and policies for planning for well-functioning urban environments.

The objectives of the NPS-UD seek to achieve the following:

- a. Well-functioning urban environment that enable people to provide for their social, economic and cultural well-being, and for their health and safety, now and into the future;
- b. Planning decisions that improve housing affordability;
- c. Enable more people to live in areas of an urban environment that are near centres, employment, well served by public transport or there is a high demand for housing;
- d. Recognition that urban environments and amenity values change overtime;
- e. Planning decisions take into the principles of the Treaty of Waitangi;

- f. Decisions on urban development are integrated with infrastructure and planning decisions, strategic over the medium and long term, and responsive;
- g. Local authorities have robust and up to date information about their urban environments and use it to inform planning decisions;
- h. Urban environments support reductions in greenhouse gases and are resilient to the effects of climate change.

The NPS-UD identifies Council as a tier 1 territorial authority.

Variation 3 gives effect to the NPS-UD as far as it is relevant to the requirements of the IPI. In particular, Variation 3 will enable the development of a variety of homes in terms of type, price and location. Variation 3 will assist with providing development capacity to meet expected housing demand.

The focus of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 is to give effect to Policy 3 in the NPS-UD, of which Policy 3(d) is most relevant to Waikato District:

Policy 3: In relation to tier 1 urban environments, regional policy statements and district plans enable:

- (d) *within and adjacent to neighbourhood centre zones, local centre zones, and town centre zones (or equivalent), building heights and densities of urban form commensurate with the level of commercial activity and community services.*

Development capacity is defined in the NPS-UD as:

means the capacity of land to be developed for housing or for business use, based on:

- (a) *the zoning, objectives, policies, rules, and overlays that apply in the relevant proposed and operative RMA planning documents; and*
- (b) *the provision of adequate development infrastructure to support the development of land for housing or business use*

The objectives and policies in the NPS-UD continue to focus on urban environments (as defined in the NPS-UD), enabling more people to live in areas in or near a centre with many employment opportunities, that are well-serviced by existing or planned public transport and there is high demand for housing in the area, relative to other areas. Planning decisions are to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi), and urban development is to be integrated with infrastructure.

2.4 National Policy Statement for Freshwater Management 2020 (NPS-FM)

On 3 September 2020, the NPS-FM was gazetted. The objective of the NPS-FM is that natural and physical resources are managed and prioritise:

1. The health and well-being of water bodies and freshwater ecosystems;
2. The health needs of people; and
3. The ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

Although the provisions are largely directed towards regional councils, clause 3.5(4) requires every territorial authority to 'include objectives, policies and methods in its district plan to promote positive effects, and avoid, remedy, or mitigate adverse effects of urban development on the health well-being of water bodies, freshwater ecosystems and receiving environments'.

This is relevant to one of the qualifying matters (Te Ture Whaimana) and is discussed further in that context in Volume 2 of the section 32 report.

2.5 National Policy Statement for Electricity Transmission (NPSET)

The National Policy Statement for Electricity Transmission (NPSET) identifies the need to operate, maintain, develop and upgrade the electricity transmission network as a matter of national significance. The sole objective of the NPSET is:

To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:

- *managing the adverse environmental effects of the network; and*
- *managing the adverse effects of other activities on the network.*

NPSET Policies 1 and 2 require decision-makers to recognise and provide for the National Grid in two complementary ways:

- a. recognise and provide for the national, regional and local benefits of sustainable, secure and efficient electricity transmission (Policy 1); and
- b. recognise and provide for the effective operation, maintenance, upgrading and development of the electricity transmission network (Policy 2).

This is a qualifying matter and is further addressed in volume 2 of the section 32 report.

2.6 Te Ture Whaimana o Awa

The Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 (Settlement Act) gives effect to the Deed of Settlement entered into by the Crown and Waikato-Tainui in relation to Treaty of Waitangi claims pertaining to the Waikato River on 17 December 2009. The Settlement Act has the overarching purpose of restoring and protecting the health and well-being of the Waikato River for future generations. Section 9(2) of the Settlement Act confirms that Te Ture Whaimana, the Vision and Strategy for the Waikato River, applies to the Waikato River and activities within its catchment affecting the Waikato River. As well as being deemed part of the Waikato Regional Policy Statement (RPS) in its entirety pursuant to section 11(1), the Settlement Act prevails over any inconsistent provision in a national policy statement. Sections 11 to 15 of the Settlement Act also prevail over sections 59 to 77 of the RMA (which relate to regional policy statements, regional plans and district plans) to the extent to which the content of the Settlement Act relates to matters covered under the RMA. The overall vision for the Waikato River is captured in clause 2.5.1 of the RPS which states:

Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and well-being of the Waikato river, and all it embraces, for generations to come.

Variation 3 includes a qualifying matter to give effect to Te Ture Whaimana. This is further discussed in volume 2 of the section 32 report.

2.7 National Planning Standards

Section 75(3) requires a district plan to give effect to a national planning standard. The first set of national planning standards came into force on 3 May 2019. They aim to make RMA plans more consistent and easier to use. They provide direction on the structure and form of plans, including definitions. Arising out of the PDP process, the Hearing Panel decided to implement as much of the National Planning Standards as possible in its decision. This means that the PDP is compliant with the

National Planning Standards in terms of structure, zone names, mapping, and definitions. Variation 3 has been developed in such a way to continue to be compliant with the National Planning Standards, although does depart slightly for the naming and mapping of the two versions of the Medium density residential zone.

2.8 Regional Policy Statement (RPS)

Section 75(3)(c) of the RMA states that a change to a district plan must give effect to any regional policy statement.

The RPS promotes the sustainable management of the Waikato region's natural and physical resources and identifies the resource management issues facing the region and the objectives, policies and methods to achieve the integrated management of these resources across the region.

The RPS contains a number of provisions that are of relevance to Variation 3. Of particular note, Chapter 2 contains Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River. The proposed provisions in Variation 3 must give effect to Te Ture Whaimana o Te Awa o Waikato and ensure that the health and well-being of the Waikato River is restored and protected. Chapter three of the RPS contains regionally significant objectives, each of which addresses a particular matter. Topic areas of relevance to the management of residential activities by territorial authorities include, energy and infrastructure, integrated resource management, iwi resource management, urban and rural growth management, and natural hazards. Part B of the RPS contains the policy and method framework.

Objective 3.12 RPS deals with climate change, the built environment and the values and benefits of regionally-significant infrastructure. Objective 3.12 RPS states that

Development of the built environment (including transport and other infrastructure) and associated land use occurs in an integrated, sustainable and planned manner which enables positive environmental, social, cultural and economic outcomes, including by ...

Objective 3.12(d) of the RPS is relevant to Variation 3 in that it seeks to integrate land use and water planning and to ensure that sufficient water is available to support future planned growth.

Chapter 6 of the RPS contains the policies that implement Objective 3.12, and focus on a number of matters, of which the most directly relevant is to co-ordinate growth and infrastructure. RPS Policy 6.1 seeks that subdivision, use and development of the built environment, occur in a planned and coordinated manner.

RPS Policy 6.1.7 seeks to ensure that before land is rezoned for urban development, urban development planning mechanisms are produced to facilitate proactive decisions about the future location of urban development; and RPS Policy 6.3 seeks that the nature, timing and sequencing of new development is co-ordinated with the development, funding, implementation and operation of transport and other infrastructure. This is to ensure that infrastructure has adequate capacity and is located in the right place.

There are policies in the RPS to adopt a Future Proof land use pattern, and density targets for Future Proof areas.²

Section 77G(8) of the RMA requires that to incorporate the MDRS into a relevant residential zone applies irrespective of any inconsistent objective or policy in a regional plan.

² Waikato Regional Policy Statement Section Policy 6.14 Adopting Future Proof land use pattern

The RPS was amended to incorporate housing bottom lines in accordance with s55(2A) of the RMA on 23 March 2022 and this resulted in the inclusion of Objective 3.27:

The housing bottom lines for feasible, reasonably expected to be realised development capacity for housing in the Future Proof area are met, in accordance with the requirements of the National Policy Statement on Urban Development (NPS-UD) 2020.

2.9 Regional Plans

Under Section 75(4) of the RMA a district plan must not be inconsistent with a regional plan for any matter specified in section 30(1). The purpose of the Waikato Regional Plan is to promote the sustainable and integrated management of land and water resources within the Waikato. To achieve this, the Plan has policies and methods (which include rules) to address issues of use, development and protection of land resources, geothermal resources and freshwater resources, including the beds and margins of water bodies.

2.10 Waikato Regional Land Transport Plan 2021 (RLTP)

Under section 74(2)(b)(i) of the RMA when changing a district plan, a territorial authority shall have regard to management plans and strategies prepared under other Acts. The RLTP is one of the relevant strategies.

The RLTP is prepared by the Regional Council and sets the direction for the region's land transport system for the next 30 years. It is a statutory requirement of the Land Transport Management Act 2003.

The RLTP recognises that there is a strong relationship between land use patterns and transport factors, such as viability of different modes. Of particular relevance are the policies in section 4.5 Access and Mobility:

Policy 24: Promote travel demand initiatives and technology that supports travel behaviour change, mode shift and compact urban form.

P25: Encourage the use of travel modes that reduce reliance on private vehicles, including public transport, walking, cycling, micro-mobility and ride-sharing

Through enabling greater housing capacity close proximity to the towns, Variation 3 supports strategic aspirations towards compact walkable urban environments. The creation of walkable catchments around commercial centres, community infrastructure and employment supports increasing usage of non-car modes of transportation, such as walking and cycling. Variation 3 provides the potential for greater uptake of public transport as it is often correlated to greater densities of people.

2.11 Adjacent District Plans

Under section 74(2)(c) of the RMA when changing a district plan, a territorial authority shall have regard to the extent to which the district plan needs to be consistent with the plans or proposed plans of adjacent territorial authorities.

The Waikato councils work closely together, particularly through regional growth initiatives such as Future Proof. Engagement has been undertaken with Hamilton City Council and Waipa District Councils on Variation 3 to align where this makes sense while responding to the unique issues of each of the jurisdictions. A joint hearing will be held on the IPI for all three councils.

2.12 Iwi Management Plans

Under section 74(2A) of the RMA a territorial authority, when changing a district plan, must take into account any relevant planning document recognised by an iwi authority and lodged with the territorial authority.

Within the jurisdiction of Waikato District, the following iwi management plans are relevant:

- a. Waikato Tainui Environment Management Plan 2018; and
- b. Maniapoto Iwi Environment Management Plan 2018.

The key strategic objectives in Tai Tumu Tai Pari Tai Ao include tribal identity and integrity, including “to grow our tribal estate and manage our natural resources”.

Of particular relevance to Variation 3 is Chapter 25 which includes issues, objectives, policies and methods that deal with land use. The objectives have a focus on environmental improvements and seeks to achieve urban environments that are well-planned, and the environmental, cultural, spiritual, and social outcomes are positive. Land development or subdivisions are not supported where the effects or the cumulative effects of the proposed development or subdivision decreases existing environmental, cultural, spiritual, or social outcomes; and development in new growth cells enhances the environment. The use of low-impact development principles is to be implemented in all new subdivisions and developments.

Similarly, Maniapoto Environmental Management Plan contains a number of objectives and policies that are relevant to urban areas, such as:

- Policy 18.3.1.3 which seeks to ensure that urban planning and development is conducted in accordance with best practice principles, and infrastructure services provide for the environmental, social, economic, and cultural needs of Maniapoto within the financial capacity of the community.
- Policy 22.3.4.1 Transport networks reduce costs and impacts on the environment through improved energy efficiency.

The relevant parts of these environment management plans have been taken into account when drafting Variation 3.

2.13 Strategies

When changing the district plan, regard is to be had to strategies prepared under other acts. The growth areas of the Waikato region are identified in the following strategies.

2.13.1 Future Proof 2022

The Future Proof 2022 Strategy is a 30-year growth plan for the Hamilton, Waipaa and Waikato sub-region, and includes information and tables that are intended to give a general long-term indication of where the growth is likely to be now and into the future. The Strategy identifies seven transformational moves for change:

1. Iwi aspirations: enhancing the health and wellbeing of the Waikato River in accordance with Te Ture Whaimana, the Vision and Strategy, and iwi place-based aspirations;
2. Putting the Waikato River at the heart of planning;
3. A radical transport shift to a multi-modal transport network shaped around where and how communities will grow;
4. A vibrant metro core and lively metropolitan centres;
5. A strong and productive economic corridor at the heart of the metro area;
6. Thriving communities and neighbourhoods including quality, denser housing options that allow natural and built environments to co-exist, and increased housing affordability and choice;
7. Growing and fostering water-wise communities through a radical shift in urban water planning, ensuring urban water management is sensitive to natural hydrological and ecological processes.

The Strategy has growth targets to support a compact and concentrated approach to development. For the Waikato District, approximately 90 per cent of growth will be in identified urban areas that include Tuakau, Pookeno, Te Kauwhata, Ohinewai, Huntly, Ngaaruawaahia, and Raglan.

Table 1: Minimum targets for the Waikato District

	Short to Medium term 2020- 2030	Long term 2030- 2050	30 Year Total
Waikato District	6,900	11,200	18,100

Future Proof seeks to concentrate development to help support modal shift from the private car to more sustainable modes of transport. The minimum net residential density targets which are to be achieved over time are 25-35 dwellings per hectare in defined intensification areas in the larger towns of the Waikato District (Pokeno, Tuakau, Te Kauwhata, Ohinewai, Huntly, Taupiri, Horotiu, and Raglan) and 30-50 dwellings per hectare in defined intensification areas in Ngaaruawaahia.

Chapter 8 of the Future Proof Strategy has a hierarchy of major commercial centres in the wider Waikato region, with Hamilton being a City Centre. Ngaaruawaahia is identified as a town that may become a metropolitan centre in the long term (30 years+). This provides the context for projected housing demand, and the provisions in Variation 3.

Table 2: Future Proof hierarchy of major commercial centres in the Waikato Region

Functional type	Location	Function description	Long-term future function (subject to pre-conditions being met)
Town centres	Cambridge Te Awamutu Ngaaruawaahia	Retail, administration, office and civic centres providing most commercial and servicing needs, together with non-retail economic and social activity, to their urban and rural hinterland.	Metro centre in long-term (30+ years). *Ngaaruawaahia/Hopuhopu will be considered further through the priority development areas – northern corridor action as part of precinct planning for Ngaaruawaahia, Hopuhopu and Taupiri.
Town centres	Huntly, Raglan Te Kauwhata Pokeno* Tuakau*	Retail, administration, office and civic centres providing most commercial and servicing needs, together with non-retail economic and social activity, to their urban and rural hinterland.	Town centre *The future role of Pokeno and Tuakau will be defined in consultation with Auckland Council and other stakeholders. *The future role and function of Hamilton’s town centres and future town centres will be defined through Hamilton Urban Growth Strategy and District Plan updates in future.

Future Proof states that the demand for dwellings is projected to increase by around 56 per cent from 2020 to 2050:

Overall, the Future Proof sub-region is not likely to have any projected shortfalls in housing and business capacity over the next 30 years. This is contingent on the timely provision of infrastructure. If there are delays in the provision of infrastructure this will impact on our ability to provide sufficient development capacity.

The NPS-UD Housing Development Capacity Assessment undertaken by Market Economics assessed the current demand as of 2020 as follows³:

The district currently has an estimated demand for around 27,400 dwellings. Approximately 40% of the demand is for urban dwellings. This equates to an estimated demand for around 10,800 urban dwellings across the main urban areas and settlements. Nearly all (95%) of the urban demand occurs within the main urban areas (that are subject to the feasibility assessment), with a smaller share (540 dwellings) in the smaller urban settlements.

With an estimated demand for approximately 2,800 urban dwellings, Huntly is currently the district's largest urban area, account for around one-quarter (26%) of the district's urban dwelling demand. Together with Te Kauwhata, Ngāruawāhia and Taupiri, over half of the district's urban dwelling demand occurs within the mid section of the district. Within this area, Ngāruawāhia also accounts for a significant share (19%) of the district's urban demand.

A significant share of demand also occurs within the northern area, spread across the townships of Pōkeno and Tuakau. Together, these areas account for 24% of the district's demand. The remainder of the urban dwelling demand is spread across Raglan (17%) and the smaller urban settlements (5%).

Market Economics were engaged as part of the Future Proof update to model residential capacity that would be enabled by the MDRS and PDP. An overview and assessment of the Residential Capacity Assessment in relation to Huntly, Ngaaruawaahia, Pookeno and Tuakau is addressed later in this report.

The modelling confirmed that the MDRS will enable commercially-feasible capacity as intended in the towns of Ngaaruawaahia, Pookeno, and Tuakau. The modelling indicates that Huntly is not an urban area that would generate commercially-feasible development options, however, there is still a high level of plan-enabled capacity available. Further, it is noted that more recently, greenfield development has been taken up within this urban area, in which the findings show significantly increased capacity. The assumption can also be adopted whereby redevelopment or infill development options may be feasible at a lower profit margin than that considered in the modelling assessment or through time as demand grows for higher density development patterns.

2.13.2 Waikato 2070

Waikato 2070 is the growth strategy recently adopted by Council in 2020. As it was prepared under the special consultative process in the Local Government Act 2002, it has the same status as Future Proof 2017 in terms of the RMA requirement to "have regard" to it in accordance with section 74(2)(b)(i) of the RMA. While Council is required to have regard to Waikato 2070, it is a useful document for indicating the future level of growth anticipated for each town and village and where that growth is likely to be located.

The underpinning vision of Waikato 2070 is to create liveable, thriving and connected communities. It identifies development plans for the following areas:

- Tuakau (projected population to grow from 5,000 to 8,000);

³ NPS-UD Housing Development Capacity Assessment Future Proof Partners, Market Economics, July 2021, Section 3.3.1

- Pookeno (projected population to grow from 2,500 to 16,000);
- Meremere, Mercer and Hampton Downs;
- Te Kauwhata (projected population to grow from 2,000 to 10,000);
- Taupiri (projected population to grow from 500 to 4,000);
- Huntly and Ohinewai (projected population to grow from 7,000 to 13,500);
- Te Kowhai (projected population to grow from 500 to 4,000);
- Ngaaruawaahia (projected population to grow from 7,000 to 10,500); and
- Raglan (projected population to grow from 4,000 to 12,500).

To support future growth, Waikato 2070 sets a development pattern for the district, including identifying specific growth areas and timings (subject to further investigation and feasibility). Each development plan identifies the type of land use activities, and the timeframe for development.

2.13.3 Local Area Blueprints

The aim of the Blueprint is to provide a high-level 'spatial picture' of how the district could progress over the next 30 years, address the community's social, economic and environmental needs, and respond to its regional context. The Waikato District Blueprint works to achieve the overall vision established by the Council for the district:

Liveable, Thriving and Connected Communities / He noohanga aahuru, he iwi whai ora, he Haapori tuuhono tahi

To achieve the vision and respond to the opportunities identified through the process, nine district-wide themes were developed. Each theme has a series of associated initiatives. The nine themes are as follows:

1. Identity: create a world class Waikato River corridor identity and strengthen Raglan's local character.
2. Nature: protect the natural environment with revegetated biodiversity links and clean waterways.
3. Iwi: build on the Joint Management Agreements and other agreements, celebrate Maaori culture, and promote the use of Te Reo.
4. Communities: strengthen, enable and connect local communities and citizens, and support those most in need.
5. Growth: direct cohesive growth outcomes which support all community needs.
6. Economy: support the rural and urban economy, and attract more visitors, entrepreneurs, and employment uses.
7. Transport: leverage value off accessibility, help those disadvantaged by a lack of transport options, prepare for future passenger rail.
8. Infrastructure: develop and maintain efficient infrastructure that is environmentally clean and will serve the community well into the future.
9. Governance: devolve some decision making, and engage more effectively at community and hapuu level.

In addition to the nine district-wide themes and related initiatives, 15 Local Area Blueprints have been developed for the towns and areas. A number of the feedback received in the context of the Blueprints is relevant to Variation 3, for example some of the feedback from the Tuakau community includes:

- There is an issue related to the affordability of housing;
- There are reverse sensitivity issues between the industrial zone and the adjacent residential zone.

Feedback from the Huntly community was that growth is welcomed, as this will induce new energy, diversity and greater viability into the community. The community felt there may be opportunities for housing (re)development, especially on the western side of the river. A number of communities expressed a strong desire for improved public transport accessibility (train and bus) among the community.

3 Consultation and Engagement

3.1 Clause 3 consultation

Schedule 1, clause 3(1)(a) and (b) requires consultation with the Minister for the Environment and other affected Ministers of the Crown. An email has been sent to the Minister for the Environment, Minister for Housing and Minister for Urban Development.

Consultation has been targeted due to the requirement in the RMA and the Minister's direction for a Variation to be developed and notified in a short timeframe and the narrow scope for change.

The government requirements are that Council uses the IPI as a 'fast track' process for the Enabling Housing Supply Variation process. While the usual RMA Schedule 1 plan development process involves more public consultation on a draft before notification, the compressed timeframe does not allow for this to occur.

While no specific consultation has been undertaken with members of the public, a comprehensive public process was recently undertaken in respect of the PDP, and the s32 reports, s42A Reports, submissions, technical reports and evidence presented at the hearings have been used where these have been able to inform the evaluation of Variation 3. In addition, the feedback through other non-statutory processes such as the development of Future Proof 2022, Waikato 2070 and the Blueprints has informed Council's strategic direction for Variation 3.

Table 3: Record of engagement on Variation 3

Date	Group	Subject Matter	Feedback
29 May 2022	Internal Resource Management Policy staff	Initial feedback on approach and criteria assessment	General support however drafting approach to adapt existing residential zones was preferred.
16 July 2022	Internal Resource and Building Consents Staff	Initial feedback on draft provisions and qualifying matters	Feedback on specific provisions and preferred wording was provided.
19 July-3 August 2022	Onewhero-Tuakau, Ngaaruawaahia, Raglan, Taupiri, Huntly Community Boards Pookeno and Te Kauwhata Community Committees	Verbal update and summary of Variation 3 and changes to affected towns	Main discussion points related to key dates, provision of infrastructure and supporting facilities, where and how provisions would apply.
19 July 2022	Local government: Hamilton City Council Waipaa District Council Waikato Regional Council	Formal notice for consultation on draft provisions and qualifying matters	Receipt of notice was received.
25 July 2022	Minster for the Environment and Minister of Housing	Formal notice for consultation and summary of changes	Receipt of notice was received.
9 August 2022	Internal Resource Consents Staff	Follow up feedback on draft provisions and qualifying matters	Feedback on specific provisions and preferred wording was provided.
23 August 2022	Local government: Hamilton City Council Waipaa District Council Waikato Regional Council	Formal notice for consultation of delaying notification to 19 September 2022.	Nil.

3.2 Advice from Iwi Authorities

Section 32(4A) of the RMA requires the s32 report to include a summary of the advice received from iwi authorities and the response to the advice, including any provisions of the proposal that are intended to give effect to the advice.

Table 4: The following table outlines the parties in which engagement was sought.

Name of iwi Maaori party	June	July follow up	Acknowledged receipt	Immediate or ongoing engagement
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	invitation to engage			
1. Hauraki Maori Trust Board	x	x		
2. Horahora Marae / Horahora Pa - name change with land court as of 22/7	x	x	x	
3. Hukanui a Muri Marae	x	x	x	
4. Hukanui Marae	x	x	x	
5. Kaitumutumu Marae	x	x		
6. Matahuru Marae	x	x		
7. Maniapoto Maori Trust Board	x	x	x	
8. Mangatangi Marae	x	x		
9. Maurea Marae	x	x		
10. Motakotako marae	x	x		
11. Ngaa Tai e Rua Marae	x	x	x	
12. Ngaa Uri o Maahanga Trust	x	x	x	
13. Ngaa Muka Development Trust	x	x		
14. Ngaati Aamaru	x	x		
15. Ngaati Hine	x	x		
16. Ngaati Hauaa Iwi Trust	x	x		
17. Ngaati Naho Trust	x	x	x	x
18. Ngaati Paoa Iwi Trust	x	x		
19. Ngaati Tamaoho Iwi Trust	x	x	x	
20. Ngaati Tamainupoo Trust	x	x	x	
21. Ngaati Wairere	x	x	x	
22. Oomaeroa Marae	x	x		
23. Oraeroa Marae	x	x		
24. Pukerewa Marae	x	x		
25. Poihakena Marae	x	x		
26. Raukawa Settlement Trust	x	x	x	
27. Tauhei Marae	x	x	x	
28. Taniwha Marae	x	x		
29. Taupiri Marae	x	x	x	x
30. Tauwhare Marae	x	x		
31. Tauranganui Marae	x	x	x	
32. Te Akau Marae	x	x	x	
33. Te Iti o Hauaa Marae	x	x	x	
34. Te Awamaarahi Marae	x	x		
35. Te Kauri Marae	x	x		
36. Te Kotahitanga Marae	x	x		
37. Committee – Chair Te Kopua 2B3 Incorporated	x	x		
38. Te Ohaaki Marae	x	x		
39. Te Papa o Rotu Marae	x	x	x	
40. Te Papatapu marae	x	x		
41. Te Taniwha o Waikato	x	x		
42. Te Whakakitenga o Waikato	x	x		
43. Tikirahi Marae	x	x	x	
44. Tuurangawaewae Marae Trust Board	x	x	x	x
45. Waahi Paa	x	x	x	

46. Waahi Whaanui Trust	x	x	x	x
47. Waikato River Authority	x	x	x	
48. Waikato-Tainui	x	x	x	x
49. Waikeri Marae	x	x	x	
50. Waingaro Marae	x	x	x	
51. Waimakariri Marae	x	x		
52. Waiterimu Marae	x	x		
53. Weraroa Marae	x	x		
54. Committee - Trustee Whaingaroa ki te whenua	x	x	x	

In brief, fifty-four (54) parties were contacted, twenty-six (26) acknowledged receipt of project information, and five (5) have engaged further with the work on proposed Variation 3.

Table 5: The following table includes a summary of engagement and advice received from iwi Maaori parties.

Date	Subject matter	Response received
21-24 June 2022	Communications seeking preferred engagement methods in relation to Variation 3 were sent, via email, from Council to JMA partners, iwi, hapuu, marae representatives and trusts with interests within affected towns,	One response was received from a representative of Tuurangawaewae Marae Trust Board. The main issues raised were to restrict the intensification to urban areas only and keep away from the fringe and rural areas to areas where there is sufficient infrastructure capacity (schools and services), and to keep away from marae and culturally significant areas. Tuurangawaewae Marae Trust Board supported the application of Qualifying Matters and requested that they be involved in the identification of those matters and identifying those areas.
18-22 July 2022	Formal notice for consultation on draft provisions and qualifying matters was sent to JMA partners, iwi, hapuu, marae representatives and trusts with interests within the Waikato District boundaries.	Twenty-five (25) separate parties confirmed receipt of information. Specific comments were received from Waikato-Tainui, Ngaati Naho Trust, Tuurangawaewae Marae Trust Board, and Waahi Whaanui Trust. Taupiri Marae committee representatives were interested in arranging a meeting. A representative of Whaingaroa ki te whenua advised that they did not believe there would be any effect unless additional areas in Raglan are proposed for medium density residential development. Meetings with several parties were undertaken as outlined further below.
July - September 2022	Meetings hosted with the project team were held online with Ngaati Naho Trust representatives, Waikato-Tainui Taiao Team, and Waikato-Tainui JMA committee. Details of these meetings are provided further below.	
2 August 2022	Site-visit with a Waahi Whaanui Trust representative was undertaken.	
23 August 2022	Engagement via email correspondence was sought from fifty-four (54)	Receipt of acknowledgement was received from: <ul style="list-style-type: none"> • Maniapoto Maaori Trust Board • Ngaati Naho Trust

	parties in total including JMA partners, iwi, hapuu, marae representatives and trusts with interests within the Waikato District boundaries. Formal notice of notification delay and responses to frequently asked questions to date was provided.	<ul style="list-style-type: none"> • Taupiri Marae committee
12 September 2022	Project update was sent to JMA partners, iwi, hapuu, marae representatives and trusts with interests within the Waikato District boundaries.	The update was to advise of the final approach Variation 3.
13 September 2022	Hui arranged with the project team at Taupiri Marae.	The purpose of the hui was to provide an overview of the variation to the Taupiri Marae Committee and to answer any questions. Engagement is ongoing.

Table 6: The following table outlines specific engagement communication.

Date and discussion	Waikato District Council Comment:
Turangawaewae Marae Trust Board	
<p>21 June 2022 Initial information sent seeking engagement.</p> <p>3 July 2022 Initial feedback provided:</p> <ul style="list-style-type: none"> • to restrict the intensification to urban areas only and keep away from the fringe and rural areas to areas where there is sufficient infrastructure capacity (schools and services), • to restrict development close to from marae and culturally significant areas. • supported the application of Qualifying Matters • requested to be involved in the identification of those matters and identifying those areas, especially where the areas are culturally significant. <p>4 and 19 July 2022 Acknowledgement that Turangawaewae had provided feedback on 3 July. Details provided about the draft Variation and notification dates.</p> <p>17 August 2022 Feedback was received via email correspondence from Turangawaewae Marae Trust Board on draft provisions and qualifying matters. Feedback regarding Qualifying Matters was provided, including:</p>	<p>Our approach did not propose that the MDRS changes be applied to any additional areas outside of the residential zone. The approach is to restrict development to residential areas with access to community services rather than on the outskirts of these towns. We have restricted this by identifying the relevant areas as a qualifying matter in relation to the urban fringe.</p> <p>Three waters infrastructure was also identified within the Te Ture Whaimana o te Awa o Waikato qualifying matter whereby various provisions were applied.</p> <p>Relationship of Maaori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga has been included as a qualifying matter where no changes are proposed to be made to SASM areas and marae.</p> <p>Natural character of waterbodies and Te Ture Whaimana o Te Awa o Waikato have been identified as a QM in our approach with additional provisions and no changes to existing waterbody setbacks.</p>

- Support to give effect to Te Ture Whaimana o Te Awa o Waikato - the Vision and Strategy for the Waikato River due to increased stormwater volume and effects.
- Support limiting building heights around Tuurangawaewae marae and along Waikato and Waipaa riverbanks.
- Support to provide input into which areas, (recorded and not recorded) that have historical and cultural importance to Tuurangawaewae.
- Support the use of qualifying matters for providing public access to the river.
- Support the use of qualifying matters in areas with long-term significant infrastructure limitations including wastewater and stormwater.

23 August 2022

Communication between parties, seeking clarification of issues.

The Trust Board expressed concerns for building height around Tuurangawaewae Marae for the following reasons.

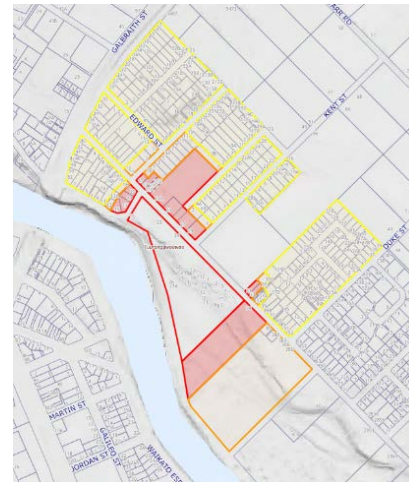
- It would diminish the cultural character of the area
- It would visually obstruct Tuurangawaewae whanau views of the marae and possibly the awa.
- These areas also include papakainga and a vast majority of Tuurangawaewae whaanau live in this area.
- The multi storey buildings will also add as a distraction to the importance and status of the marae and Kiingitanga.

12 September 2022

Response provided to items raised.

In relation to historical and cultural significance and public access, it is proposed that district-wide provisions still apply to housing development in both the Medium density and General residential zones.

Noted and discussed with project team in detail.



The project team advised that limiting building height to sites already zoned Medium density residential under the PDP review and are currently in the appeals process, were unable to be downzoned as a sufficiently robust planning assessment to support decreasing development potential was unable to be prepared in time for notification of Variation 3. Council staff recommended that a submission be made to support downzoning of the sites of concern so that the project team could investigate potential options for rezoning or other mechanisms to reduce height.

Taupiri Marae

<p>21 June 2022 Initial information sent to Taupiri Marae, seeking engagement.</p> <p>22 July 2022 Taupiri Marae confirmed receipt, did not raise concerns, but requested a meeting at the Marae to provide an update to the wider community.</p> <p>13 September 2022 The project team attended a hui at Taupiri Marae.</p>	<p>Noted</p> <p>The purpose of the hui was to provide an overview of the variation to the Taupiri Marae Committee and to answer any questions. Engagement is ongoing.</p>
Waikato-Tainui	
<p>21 June 2022 Initial information sent to Waikato-Tainui, seeking engagement.</p> <p>22 July 2022 Confirmed receipt of information and recommended contacting Kahurimu for further engagement.</p> <p>27 July 2022 An Online Meeting was held with the Waikato-Tainui Taiao Team. The team were supportive of changes only applying to residential areas and would supply further feedback once the provisions had been assessed. No specific concerns were raised.</p> <p>10 August 2022 Waikato-Tainui JMA Committee meeting between Council and Waikato-Tainui was held online which included updates on the variation programme whereby feedback and/or concerns regarding draft provisions and qualifying matters was sought. Support for qualifying matters and to continue engagement with individual marae and interested parties.</p> <p>8 September 2022 The project team held an informal online meeting with the Waikato-Tainui Taiao Team. The purpose of the hui was to keep the Taiao Team updated on progress of the variation.</p> <p>Supportive of the proposed qualifying matters was provided, particularly those relating to:</p> <ul style="list-style-type: none"> • Te Ture Whaimana o te Awa o Waikato • Natural character of the waterbodies and their margins • Outstanding natural features and landscapes 	<p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted. It was reiterated that our approach has been to restrict development from occurring on the urban fringe by identifying it as a qualifying matter.</p>

<ul style="list-style-type: none"> • SASM • Historic heritage <p>Additional comments included:</p> <ul style="list-style-type: none"> • Support the approach developed to give effect to the infrastructure constraints. • Collaboration on Te Ture Whaimana QM was sought <p>Gaps in engagement with mana whenua from the Tuakau area was raised whereby Waikato-Tainui offered to support to seek feedback from marae representatives.</p>	<p>Noted. Te Ture Whaimana QM was sent to Waikato-Tainui to provide input.</p> <p>Noted. Follow up information was sent to the team to distribute where appropriate.</p>
<p>Ngaati Naho Trust</p>	
<p>21 June 2022 Initial information sent to Ngaati Naho, seeking engagement.</p> <p>22 July 2022 Confirmed receipt of information and arrangement made for hui.</p> <p>26 July 2022 An online meeting was held with Ngaati Naho Trust representatives. The purpose of the meeting was to provide an overview of the Variation 3 programme and seek feedback and/or concerns regarding draft provisions and qualifying matters in addition to answering initial questions.</p> <p>Ngaati Naho Trust were supportive of extending the notification period to provide quality engagement and feedback and ensuring that qualifying matters were not a blanket approach but specific to the affected towns including natural hazards and infrastructure capacity.</p> <p>Concerns were raised regarding value added to the community and providing certainty that high density developments would not be enabled. The main interest was ensuring that there would be good urban design outcomes.</p> <p>5 August 2022 The project team held an informal online meeting with Ngaati Naho Trust representatives to address concerns previously raised.</p>	<p>Noted</p> <p>An extension to notification, from 19 August to 19 September, was sought and acknowledged from the Minister for the Environment. The extension was sought in order to provide time to assess in more detail the impacts on our communities and district.</p> <p>Each town and residential area were assessed for appropriateness of applying the MDRS. Three waters infrastructure and natural hazards were assessed and included in the relevant qualifying matters whereby various provisions were applied.</p> <p>An urban fringe qualifying matter has since been confirmed as the appropriate approach to restricting development on the outskirts of towns.</p> <p>The project team outlined that they would investigate potential options for incorporating urban design outcomes in objectives and policies.</p> <p>Noted and addressed above.</p>

<p>Ngaati Naho Trust were supportive of qualifying matters and approach to focus intensification around accessibility to community services and amenities in town centres. Interest was raised in ensuring urban design is incorporated and protection of cultural landscape.</p>	
<p>Waahi Whaanui Trust</p>	
<p>21 June 2022 Initial information sent to Waahi Whaanui Trust, seeking engagement.</p> <p>19 July 2022 Confirmed receipt of information and requested further discussion.</p> <p>2 August 2022 A site-specific visit with a Waahi Whaanui Trust representative was undertaken to understand context and historical use of a rural site, bordered by residential zoned sites, in which the Trust believed was appropriate for the MDRS and zoning.</p>	<p>An assessment of the site and property file was undertaken. Feedback from Council recommended that a submission be made with site-specific planning assessments to support any zoning.</p> <p>The project team outlined that they would investigate potential options of rezoning through a future plan change.</p>

4 Implementing the RMA amendments

While not a requirement of a section 32 evaluation, this section sets out Council’s approach to the IPI and how Variation 3 responds to the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.

4.1 Which towns does Variation 3 apply to?

Section 77G(1)(1) requires every *relevant residential zone* of a specified territorial authority must have the MDRS incorporated into that zone. While the meaning of “relevant residential zone” is discussed in more detail below, the key part of the definition is that it does not include “an area predominantly urban in character that the 2018 census recorded as having a resident population of less than 5,000, unless a local authority intends the area to become part of an urban environment”. Therefore, the resident population as at 2018 census becomes important for the towns indicated in Waikato 2070 as having less than 10,000. The population projections developed by the University of Waikato which include the 2018 census data for each town are set out below.

Table 7: Population projections (source: University of Waikato)

Town/ Village	2018 census	2020	2021	2022	2030	2040	2041	2050	2060
Huntly	8,342	8,867	9,086	9,307	10,909	12,183	12,252	13,101	13,706
Huntly Rural		1,952	1,966	1,979	2,337	3,250	3,364	4,215	5,164
Ngaaruawaahia	6,261	8,439	8,602	8,760	9,468	9,829	9,858	10,179	10,512
Pookeno Urban	2,517	3,959	4,254	4,550	6,704	8,404	8,489	9,056	9,522
Pookeno Rural		865	879	894	986	1,243	1,288	1,777	2,427

Raglan	3,279	4,095	4,240	4,376	5,218	5,879	5,931	6,377	6,621
Te Kauwhata	1,617	2,848	2,994	3,145	4,698	6,994	7,236	9,003	10,429
Tuakau	5,016	6,137	6,302	6,478	7,184	7,498	7,521	7,638	7,672

Tuakau, Huntly and Ngaaruawaahia each had a population greater than 5,000 as at the 2018 Census data and therefore meet the criteria for being a relevant residential zone.

Section 77G(1) imparts a duty to incorporate MDRS and give effect to policy 3 or 5 in *relevant residential zones*, and in particular Section 77G(2) requires every residential zone in an *urban environment* of a specified territorial authority must give effect to policy 3 or policy 5, as the case requires, in that zone.

Policy 3 of the NPS-UD relates to “tier 1 urban environment”, which leads to the question: what is an urban environment? The NPS-UD provides the following definition of “urban environment”:

means any area of land (regardless of size, and irrespective of local authority or statistical boundaries) that:

- (a) is, or is intended to be, predominantly urban in character; and*
- (b) is, or is intended to be, part of a housing and labour market of at least 10,000 people*

The complexity with this definition is that it is not limited by geographic size, jurisdictional or other boundaries. There are different ways that clause (b) could be interpreted. One perspective is that clause (b) requires separate housing and labour markets, each of 10,000 people. Another perspective is that housing and labour should be read together and mean an urban area where there are housing and labour markets operating in a population of at least 10,000 people. Council is more persuaded by the Ministry for the Environment’s Regulatory Impact Assessment for the NPS-UD which states:

“The NPS-UD applies to all urban environments of more than 10,000 people, which are then categorised into three tiers”

Turning to the growth numbers, a further complexity is that the growth in the RPS has been superseded first by Future Proof 2017, and further by the more recent 2022 Future Proof update. It is worth noting that the Future Proof Strategy 2022 is relied on in preference to Waikato 2070, as Waikato 2070 contains aspirational goals whereas the Future Proof Strategy 2022 responds to the NPS-UD and is underpinned by robust analysis of data. Future Proof Strategy 2022 has identified Pookeno, Tuakau and Ngaaruawaahia as Tier 1 urban environments and Huntly / Ohinewai as a Tier 3 urban environment.⁴

While Pookeno appears to have had less than the 5,000 population threshold in 2018, its recognition as being an urban environment in Future Proof Strategy 2022 means that Pookeno too is included as being a relevant residential zone in terms of the amendments to the Act and inclusion in Variation 3. Thus Variation 3 applies to:

- a. Tuakau;
- b. Pookeno;
- c. Huntly; and
- d. Ngaaruawaahia.

4.2 Relevant residential zones

Section 77G of the RMA requires MDRS to be incorporated into every relevant residential zone of a specified territorial authority. “Relevant residential zone” is defined in the RMA as:

⁴ Future Proof Strategy, 2022, page 29

(a) means all residential zones; but

(b) does not include—

(i) a large lot residential zone:

(ii) an area predominantly urban in character that the 2018 census recorded as having a resident population of less than 5,000, unless a local authority intends the area to become part of an urban environment:

(iii) an offshore island:

(iv) to avoid doubt, a settlement zone

As the PDP decision has adopted the naming convention of the National Planning Standards, there are two zones which would qualify as a relevant residential zones, being General residential zone and Medium density residential. While there are other residential zones such as Settlement zone, Large lot residential zone and Rural lifestyle zone, these are specifically excluded by clause (b)(i) of the definition.

In response to requirements of the RMA, a new Medium density residential zone 2 is proposed which contains all the medium density residential standards that are set out in Schedule 3A of the Act. The reasons for this approach are simplicity, and conformity with the National Planning Standards. As there is already a Medium density residential zone which applies to Raglan and Te Kauwhata, the existing provisions had to effectively be split with one set for Raglan and Te Kauwhata, and a separate set for the four towns subject to variation 3, being Tuakau, Pookeno, Huntly and Ngaaruawaahia. While this could be achieved within a single zone by making each provision specific to the two sets of towns, it would result in an unnecessarily complex approach. A simpler approach is to create a new zone called “Medium density residential zone 2” which applies to Tuakau, Pookeno, Huntly and Ngaaruawaahia. This means that “Medium density residential zone 1” applies unchanged to Raglan and Te Kauwhata. Each zone is identified separately on the planning maps, with the same orange colour as required by the National Planning Standards, but with Medium density residential zone 2 differentiated on the maps.

While the definition of “relevant residential zones” would capture the General residential zone, Variation 3 does not propose to modify the standards of the General residential zone in any way. This is for two reasons:

- a. The General residential zone outside of the 4 towns applies to areas that do not meet the definition of an “urban environment” and thus do not need to be affected by Variation 3; and
- b. The application of the qualifying matter: urban fringe means that the outer edges of Tuakau, Pookeno, Huntly and Ngaaruawaahia retain their current General residential zoning (and attendant provisions).

For further information on the qualifying matters, please see Volume 2 of the section 32 evaluation.

In accordance with the definition of “relevant residential zone”, Variation 3 does not propose to amend either the provisions or the zoning of sites that are currently zoned Large lot residential zone or Settlement zone, even though in Tuakau there are some sites with this zoning which sit within the 800m walkable catchment of the town centre.

4.3 Medium density residential standards

Section 77G(1) requires MDRS to be incorporated into every relevant residential zone of a specified territorial authority. Section 77G(5) requires a specified territorial authority—

- (a) must include the objectives and policies set out in clause 6 of Schedule 3A:
- (b) may include objectives and policies in addition to those set out in clause 6 of Schedule 3A, to—
- (i) provide for matters of discretion to support the MDRS; and
 - (ii) link to the incorporated density standards to reflect how the territorial authority has chosen to modify the MDRS in accordance with section 77H.

However, section 77G(6) allows a territorial authority to make the requirements set out in Schedule 3A or policy 3 less enabling of development than provided for in that schedule or by policy 3, if authorised to do so under section 77I. While qualifying matters are addressed in more detail below, the entirety of the MDRS contained in the RMA are included in the new Medium density residential zone 2 as there was no reason (i.e., qualifying matter) to depart from those standards. However, a site zoned Medium density residential zone 2 may not be able to develop to the full potential of the MDRS where one or more qualifying matters applies to the site.

4.4 Qualifying matters

Section 77I allows territorial authority to make the MDRS and the relevant building height or density requirements under policy 3 less enabling of development in relation to an area within a relevant residential zone only to the extent necessary to accommodate 1 or more of the following qualifying matters that are present:

- (a) A matter of national importance that decision makers are required to recognise and provide for under section 6;
- (b) a matter required in order to give effect to a national policy statement (other than the NPS-UD) or the New Zealand Coastal Policy Statement 2010;
- (c) a matter required to give effect to Te Ture Whaimana o Te Awa o Waikato—the Vision and Strategy for the Waikato River;
- (d) a matter required to give effect to the Hauraki Gulf Marine Park Act 2000 or the Waitakere Ranges Heritage Area Act 2008;
- (e) a matter required for the purpose of ensuring the safe or efficient operation of nationally significant infrastructure;
- (f) open space provided for public use, but only in relation to land that is open space;
- (g) the need to give effect to a designation or heritage order, but only in relation to land that is subject to the designation or heritage order;
- (h) a matter necessary to implement, or to ensure consistency with, iwi participation legislation;
- (i) the requirement in the NPS-UD to provide sufficient business land suitable for low density uses to meet expected demand;
- (j) any other matter that makes higher density, as provided for by the MDRS or policy 3, inappropriate in an area, but only if section 77L is satisfied.

While Volume 2 of the section 32 provides more detail on each of the qualifying matters and their effect on the provisions, this section provides more detail on the general approach.

The decisions version of the PDP that was notified in January 2022 was structured to be compliant with the National Planning Standards. This means that Part 2 of the PDP contains all the District-wide provisions which relate to matters in section 6 of the RMA such as:

- HH Historic heritage
- SASM Sites and areas of significance to Maori
- TREE Notable trees
- ECO Ecosystems and biodiversity
- NATC Natural character

- NFL Natural features and landscapes
- NH Natural hazards and climate change

The provisions in each of these chapters have the effect of limiting development within the relevant overlay illustrated on the planning maps. For example, the ECO Ecosystems and biodiversity provisions apply where a significant natural area is identified on the planning maps, and similarly the provisions of the NH Natural hazards and climate change provisions apply where a natural hazard is identified on the planning maps. It is worth noting that the District-wide provisions only apply to the spatial extent of the overlay identified on the planning maps. This is important given that section 77I requires that the MDRS is modified *only to the extent necessary*.

There are some additional rules in the Medium density residential zone 2 to accommodate qualifying matters and these rules either impose setbacks or restrict development within close proximity to a feature. The additional rules are:

- Setbacks from buildings, structures and sensitive land uses within the National Grid Yard
- Subdivision within the National Grid Subdivision Corridor
- Impermeable surface limits
- Building setbacks for new buildings or alteration to an existing building for a sensitive land use from the:
 - designated boundary of the railway corridor
 - designated boundary of the Waikato Expressway
 - boundary of the Alstra Poultry intensive farming activities located on River Road and Great South Road, Ngaaruawaahia
 - centreline of the gas transmission line; and
- Setbacks from waterbodies including lake, wetland or rivers including the Waikato and Waipa Rivers.

4.5 Background to the existing Medium density residential zone in the PDP

The planning rationale of the Medium density residential zone in the decisions version of the PDP lies in the submission from Kainga Ora Homes and Communities to the Proposed Waikato District Plan which was notified in July 2018. The submission from Kainga Ora sought inclusion of a new zone for the district, being Medium density residential zone with an accompanying suite of objectives, policies and rules. The zone sought by Kainga Ora was designed to give effect to the NPS-UD and enable apartment, terrace housing and multi-unit developments – enabling higher intensity development than typically found in the notified General Residential Zone. The spatial extent of the new zone was proposed to be located within the urban settlements of Tuakau, Pookeno, Te Kauwhata, Huntly, Ngaaruawaahia and Raglan. The proposed spatial extent of the zone was based on detailed analysis of each town and each site utilising ground truthing, slope analysis, walking catchment analysis, natural hazard analysis. It was deliberately proposed close to town centres, strategic transport corridors and in proximity to community services / amenities. The zone was applied to sites within a walkable catchment of the Town centre zone in each of the towns and varied between 400m and 800m depending on the physical characteristics such as slope, natural hazards, connectivity and location of cadastral boundaries.

The decision from the Hearings Panel accepted the analysis undertaken by Kainga Ora and applied Medium density residential zone to the central areas of Tuakau, Pookeno, Te Kauwhata, Huntly, Ngaaruawaahia and Raglan.

However, the submission and evidence of Kainga Ora pre-dated the gazetting of the NPS-UD. With the PDP decision being notified in January 2022 and the scope limitations of the original submission

from Kainga Ora, the Hearing Panel were unable to import the new standards contained in the amendments to the RMA. It is for this reason that the Medium density residential zone that is in the PDP decision does not match the MDRS standards in the Act.

4.6 Provisions

The provisions for the Medium density residential zone 2 assume the starting point of the Medium density residential zone provisions in the decisions version of the PDP. While the amendments to the Act were enacted too late in the decision-making process for the PDP Hearings Panel to be able to incorporate them in its decisions, the PDP Medium density residential zone provisions are relatively similar to the MDRS in the Act. The Medium density residential zone 2 therefore starts with the PDP Medium density residential zone provisions as a baseline and inserts the MDRS. This was the same approach for the subdivision provisions. A few provisions from the PDP Medium density residential zone provisions needed minor amendments so that they better support the MDRS.

As outlined in chapter 7 of this report, some additional standards have been brought across from the General residential zone to address qualifying matters.

The objective and policy in Schedule 3A of the Act have been inserted into the Strategic Direction chapter as these were considered to be of a strategic level rather than specific to the Medium density residential zone 2.

A small number of definitions are proposed to be included to improve the clarity of the provisions.

Essentially Variation 3 will result in similar residential intensities and built form to the PDP Medium density residential zone.

Table 8: Broad comparison of the PDP Medium density residential zone and the Variation 3 Medium density residential zone 2

Feature	PDP Medium density residential zone	Variation 3 Medium density residential zone 2
LANDUSE ACTIVITIES		
		<ul style="list-style-type: none"> • Adds in the rules regarding sensitive activities within the National Grid Yard • Deletes the rule regarding building in close proximity to electricity distribution lines • Deletes the rules about obscuring the Whaingaroa navigation beacon
BUILDING STANDARDS		
Number of houses on a site as a permitted activity	3	MDRS 3
Maximum height	11m	MDRS 11m Same maximum height but different allowances for additional height
Height in relation to boundary	30 + 45°	MDRS 4m + 60°
Setbacks	Front 3m Side 1 metre Rear 1m	MDRS Front 1.5 metres Side 1 metre

Feature	PDP Medium density residential zone	Variation 3 Medium density residential zone 2
	Additional standard for balconies	Rear 1 metre
Waterbody setbacks	<ul style="list-style-type: none"> • 20m from the margin of any lake; • 20m from the margin of any wetland; • 23m from the bank of any river (other than the Waikato River and Waipa River); • 38m from the margin of either the Waikato River and the Waipa River • 23m from mean high water springs 	<ul style="list-style-type: none"> • 20m from the margin of any lake; • 20m from the margin of any wetland; • 21.5m from the bank of any river (other than the Waikato River and Waipa River); • 26.5m from the margin of either the Waikato River and the Waipa River
Other setbacks		<ul style="list-style-type: none"> • 5m from the designated boundary of the railway corridor; • 15m from the boundary of a national route or regional arterial; • 25m from the designated boundary of the Waikato Expressway; • 300m from the edge of oxidation ponds that are part of a municipal wastewater treatment facility on another site; • 30m from a municipal wastewater treatment facility where the treatment process is fully enclosed; and • 300m from the boundary of the Alstra Poultry intensive farming activities located on River Road and Great South Road, Ngaaruawaahia. • 6m from the centre of a gas transmission line identified on the planning maps
Maximum building coverage	45%	50%
Outdoor living space	Different requirements	MDRS Requirements for above ground and ground level
Outlook space	Not present	MDRS
Windows to the street	Not present	MDRS
Landscaped area	Not present	MDRS
Minimum residential unit size	<ul style="list-style-type: none"> • 35m² for studio dwellings; and 	<ul style="list-style-type: none"> • Not included

Feature	PDP Medium density residential zone	Variation 3 Medium density residential zone 2
	<ul style="list-style-type: none"> 45m² for one or more bedroom dwellings. 	
Ground floor internal habitable space	Garages shall occupy less than 50% of the ground floor space internal to buildings on the site.	Garages shall occupy less than 50% of the ground floor space internal to buildings on the site.
Fences or walls – road boundary	<ul style="list-style-type: none"> Be no higher than 1.5m if solid; Be no higher than 1.8m if: <ul style="list-style-type: none"> Visually permeable for the full 1.8m height of the fence or wall; or Solid up to 1.5m and visually permeable between 1.5 and 1.8m 	<ul style="list-style-type: none"> Be no higher than 1.5m if solid; Be no higher than 1.8m if: <ul style="list-style-type: none"> Visually permeable for the full 1.8m height of the fence or wall; or Solid up to 1.5m and visually permeable between 1.5 and 1.8m
SUBDIVISION		
	RDIS activity	<p>New MDRS rule for controlled activity</p> <p>Deleted the rule for subdivision of contaminated land sites due to the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health adequately covering this matter</p> <p>Inserted a rule for subdivision within the National Grid Subdivision Corridor</p> <p>All other rules remain the same</p>

4.7 Residential Capacity

Market Economics were engaged to model the residential capacity that would be enabled by the MDRS if it were applied to General residential and Medium density residential zoned sites in the following urban areas:

- Pookeno
- Tuakau
- Te Kauwhata
- Ohinewai
- Huntly
- Taupiri
- Hopuhopu
- Ngaaruawaahia
- Horotiu
- Raglan

The purpose of the report was to understand the capacity enabled by the MDRS as an important first stage in understanding the implications of the MDRS. It is noted that the modelling does not take into consideration any infrastructure constraints or other qualifying matters.

The modelling initially calculated plan enabled capacity of the PDP. The modelling then added a scenario that introduced the MDRS to both the General residential zone and Medium density residential zone in the urban areas, acknowledging that the existing medium density residential zone already allows for a similar level of development to the MDRS ⁵.

The report author then estimated the capacity that is likely to be commercially feasible; that is, the share of plan enabled capacity that is a feasible development option for commercial developers to construct a dwelling(s) which is likely to be taken up by market growth ⁶. Allowances were taken for areas with a structure plan, and also 30% for roads and reserves.

The modelling calculated an estimated plan enabled capacity for an additional 122,300 dwellings under the PDP. Just over half (53%; 64,400 dwellings) of the capacity is within the existing urban area, and the balance is within urban zoned areas that are yet to develop.⁷

Not surprisingly, the report calculated that the MDRS provides for increased development capacity, 17% of which is likely to represent commercially feasible capacity of an additional 20,500 dwellings. This amounts to double the existing amount⁸. It should be recognised that the Market Economics report calculated the effect of applying the MDRS to all urban areas in the District, and thus applying the MDRS to both residential zones would result in a supply of residential that well exceeds demand.

The findings indicate that lower amounts of feasible capacity are likely within Ngaaruawaahia, and no feasible capacity in all other urban areas. The report author attributes this to the residential markets being less established and focused on lower density development patterns. The report author states that these areas may be feasible at a lower profit margin than that adopted in this modelling assessment or will increase over time with market growth and demand for higher densities⁹.

The findings indicate that over the short-term, higher density development enabled by the MDRS will be more feasible on the periphery of the towns where large sites have been zoned for residential development but are yet to develop. However, lower density developments are still likely to occur until demand increases for higher density dwelling options⁴.

On this basis, the modelling confirms that the MDRS will enable commercially feasible capacity as intended in the towns of Ngaaruawaahia, Pookeno, and Tuakau. Although the modelling indicates that Huntly is not an urban area that would generate commercially feasible development options, there is still a high level of plan enabled capacity available. Further, it is noted that more recently, greenfield development has been taken up within this urban area which significantly increases capacity. The assumption can also be adopted whereby redevelopment or infill development options may be feasible at a lower profit margin than that considered in the modelling assessment or through time as demand grows for higher density development patterns.

5 Scale and significance

The section 32 evaluation must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. In order to determine the scale and significance, the following criteria have been used:

⁵ Residential Capacity Modelling prepared by Market Economics, Page 3, 12 June 2022

⁶ Residential Capacity Modelling prepared by Market Economics, Page 7, 12 June 2022

⁷ The Market Economics report uses the term “greenfield” to describe sites that are zoned for residential development but are yet to develop.

⁸ Residential Capacity Modelling prepared by Market Economics, Page 15, 12 June 2022

⁹ Residential Capacity Modelling prepared by Market Economics, Page 1, 12 June 2022

Table 9: Assessment of scale and significance of effects

Criteria	Summary of effects	Evaluation (1 is low and 5 is high)
Reason for change	Required by the amendments to the RMA	4
Degree of shift from status quo	Variation 3 creates a new Medium density residential zone 2 and applies this to the walking catchment around the centres of Tuakau, Pookeno, Huntly and Ngaaruawaahia. The new zone modifies the standards which applied under the PDP decision. Variation 3 also proposes to rezone a small number of properties	3
Who and how many will be affected, geographic scale of effects	There will be a high degree of public interest given that a plan change is required by each of the Tier 1 councils. However, the effect of Variation 3 will be limited to the existing residential areas of Tuakau, Pookeno, Huntly and Ngaaruawaahia.	3
Degree of impact on or interest from Maori	There will be a moderate level of interest by Maori, particularly with regards to the effect of housing intensification on the natural environment and the Waikato River.	3
Timing and duration of effects	The effects of Variation 3 will be ongoing into the future.	3
Type of effect:	The effects of Variation 3 will likely be of a social and economic nature. A modest amount of development will be enabled over and above the decision version of the PDP. This is due to the proposed rezoning of 444 sites currently zoned General residential zone and 2 General rural zone sites. Increased residential development in close proximity to the town centres will enable transport choice and support a compact and walkable urban form. It will also support the development of a public transport network.	2
Degree of risk or uncertainty:	The reaction of the community is likely to be mixed, with those opposed to the changing character and amenity of their neighbourhoods, whilst others will welcome opportunities to develop. Variation 3 will modestly increase the number of dwellings available (primarily through the proposed rezoning of sites), and will increase the variety of living opportunities.	3
Total (out of 35):		21

6 Appropriateness of Objectives

While a number of objectives are proposed in Variation 3, not all of these require an evaluation under section 32. Schedule 3A of the Act requires Council to insert the following objectives:

- SD-O14 Well-functioning urban environment
- MRZ2-O1 Housing typology

As these are mandatory, there is no value in assessing them in accordance with section 32(1)(a).

Variation 3 proposes to retain the following objectives from the existing PDP Medium density residential zone:

- MRZ2-O2 Efficient use of land and infrastructure
- MRZ2-O4 Activities

Variation 3 proposes to amend a number of objectives from the existing PDP Medium density residential zone, or insert new objectives as follows:

- MRZ2-O3 Residential amenity (this is amended from the PDP Medium density residential zone)
- MRZ2-O5 Qualifying matters (new)
- MRZ2-O6 Reverse sensitivity (new)

Below are the objectives that are proposed to be introduced or amended through Variation 3. The PDP objectives proposed to be retained and applied to the Medium density residential zone 2 have also been assessed. Having considered a range of options including retaining unchanged the current objectives of the PDP, these objectives are considered to be the most appropriate way to achieve the purpose of the RMA, as demonstrated in the table below.

Objective or group of objectives	
MRZ2-O2 Efficient use of land and infrastructure MRZ2-O3 Residential amenity MRZ2-O4 Activities MRZ2-O5 Qualifying matters MRZ2-O6 Reverse sensitivity	
Evaluation of objectives	
Part 2 RMA	Comment
Section 5 Purpose	<p>The proposed objectives achieve the purpose of the RMA as they promote the sustainable management of natural and physical resources. This is achieved through providing for a variety of housing types and sizes and using the urban land resource efficiently by enabling medium density in specific locations that are accessible to services and facilities. This will assist with enabling people and communities to provide for their well-being and also with meeting the reasonably foreseeable needs of future generations.</p> <p><u>MRZ2-O2 Efficient use of land and infrastructure</u></p> <p>These objectives clearly state the environmental outcomes sought for the Medium density residential zone 2 insofar as spatially locating (consolidating) residential intensification and promoting a compact urban form. Further, the objectives seek to ensure residential function is the dominant function within the zone. This objective achieves the purpose of the Act by encouraging efficient use of the urban environment. Maximising development within the existing urban zoned areas will limit the need for rural land to be rezoned and for sprawl to occur.</p> <p>Compact urban settlements support more sustainable transport forms such as walking and cycling. Concentrating development within a smaller area means efficiencies for</p>

infrastructure. Pipes do not need to be as long and the amount of roading is reduced. All of these reduce the effects of intensifying the urban environment.

Concentrating development around the town centre supports the economic viability of the town centre, as well as enabling centralised community facilities. A compact urban settlement pattern more readily enables people and communities to meet their social, economic, and cultural well-being. It is noted that there are numerous adverse effects of dispersed residential development / intensification – including increased demand on the transport network (both public and private) due to the increased number and length of trips required to access dispersed activities.

MRZ2-O3 Residential amenity

The minor changes to the existing objective better describe the outcomes sought for the zone. The creation of a medium density environment comprised of primarily three storey buildings, including semi-detached and terraced housing, townhouses and low-rise apartments will enable people to meet their housing needs in accordance with section 5(2).

MRZ2-O4 Activities

The minor change to this existing objective is to make the wording clearer and does not constitute a significant departure from the outcome expressed. While it is acknowledged that small-scale non-residential activities (that is, neighbourhood centres and / or commercial activities) are generally required to assist residents in meeting their social, cultural and economic needs - by providing residents with access to goods and services that they may require on a daily basis – these are provided at discretion to ensure the function of the Medium density residential zone 2 is not undermined through inappropriate location of non-residential activities. A mix of complementary activities will ensure that people and communities can meet their social, economic, and cultural well-being.

MRZ2-O5 Qualifying matters

Objective MRZ2-O5 recognises that the presence of qualifying matters may limit development on sites. Qualifying matters include section 6 matters and in protecting these features, the objective achieves the purpose of the Act. In addition, the qualifying matters includes nationally significant infrastructure. Limiting development on sites in close proximity to nationally significant infrastructure will manage reverse significance effects and preserve the security of the infrastructure. The infrastructure is required to support the social, economic, and cultural well-being at a broader national level and thus the objective achieves section 5.

MRZ2-O6 Reverse sensitivity

Residential activities are often sensitive to effects such as odour, vibration, lighting, noise and dust generated by other activities. The objective recognises that minimising reverse sensitivity effects will result in an environment that is pleasant for people to live in. In this regard, the objective will achieve an urban environment that provides for the health and safety of people and communities in accordance with section 5(2). The objective also achieves section 5(2)(c) in that it recognises the potential for reverse sensitivity effects and seeks to avoid, remedy or mitigate them.

<p>Section 6 Matters of national importance</p>	<p>MRZ2-O5 Qualifying matters is the key objective which achieves section 6. “Qualifying matters” is the umbrella term which may make the MDRS and the relevant building height or density requirements under Policy 3 of the NPS-UD less enabling of development. Section 77I(a) enables this to include a matter of national importance that decision makers are required to recognise and provide for under section 6. The effect of the various section 6 matters is that they will limit development to varying degrees in order to protect and provide for matters of national importance. MRZ2-O5 provides that protection and thus achieves section 6.</p>
<p>Section 7 Other matters</p>	<p><u>MRZ2-O2 Efficient use of land and infrastructure</u> This objective achieves Section 7(b) and 7(g) by ensuring the efficient use of the urban land resource. Compact development will reduce the need for urbanisation of rural land and therefore sprawl. The objective recognises that consolidation and intensification of living opportunities within walkable catchments from town / business centres (and associated amenities) and alternative modes of transport prevents uncontrolled and inappropriate development (urban sprawl). This results in the inefficient use and development of land (Section 7(b)) and promotes the efficient end use of energy and a reduction of vehicle emissions (Section 7(ba)).</p> <p><u>MRZ2-O3 Residential amenity</u> This objective achieves section 7(c) by recognising the type of urban environment created by the Medium density residential zone 2. A key issue is striking the right balance between quality development and ensuring development is not unnecessarily constrained. Typically, as density increases quality design is needed to offset the bulk of buildings and loss of open space and garden areas.</p> <p><u>MRZ2-O5 Qualifying matters</u> The identification of qualifying matters and the modification of the MDRS in response to them will achieve a number of section 7 matters. For example, the setbacks from significant industries and activities will minimise the potential for reverse sensitivity effects and result in a higher residential amenity in accordance with section 7(c) the maintenance and enhancement of amenity values. Similarly, the application of the qualifying matters associated with section 6(c) regarding indigenous vegetation will assist in protecting the intrinsic value of ecosystems in accordance with section 7(d).</p> <p><u>MRZ2-O6 Reverse sensitivity</u> Minimising the potential for reverse sensitivity effects achieves the maintenance and enhancement of amenity values as well as maintenance and enhancement of the quality of the environment.</p>
<p>Section 8 Treaty of Waitangi</p>	<p>The definition of well-functioning urban environment in the NPS-UD includes enabling a variety of homes that enable Maaori to express their cultural traditions and norms. Therefore, the objectives in the Medium density residential zone 2 contributes towards taking account of the principles of Te Tiriti o Waitangi. In addition, MRZ2-O5 recognises that residential development may be constrained by the presence of a qualifying matter. The qualifying matters include both Sites and Areas of Significance to Maaori as well as matters required to give effect to Te Ture Whaimana. Both of these mechanisms align with the principles of Te Tiriti o Waitangi.</p>

The proposed objectives are the most appropriate way to achieve the purpose of the RMA because:

- The proposed objectives are in line with national best practice and implement national and regional guidance and direction (section 5, NPS-UD, RPS) by providing for a wide range of activities (including residential) while also giving clear guidance on intended outcomes for the zone.
- The proposed objectives provide greater certainty to decision makers and plan users.
- While the existing objectives provide some direction, they do not fully reflect the higher level direction of the NPS-UD.
- The objectives will assist in providing for the economic, social and cultural well-being expressed in section 5 of the RMA by supporting residential intensification.
- The proposed objectives will be effective at creating a well-functioning urban environment that meets the needs for people and communities.

6.1 Identification and Evaluation of Options to Achieve Objectives

The following section identifies reasonably practicable options for achieving the objective(s) identified above. This evaluation of the options has been undertaken to determine the preferred option to be taken forward for further, more detailed evaluation.

Five broad options for achieving the objectives have been identified, and these are:

Option 1: Status quo

This option would retain the current pattern of residential zoning as contained in the PDP decision. The General residential zone and Medium density residential zone provisions would all remain unchanged.

Option 2: Replace all residential zones with an amended Medium density residential zone

This option would require deleting the General residential zone (from the maps and provisions) and rezoning all sites currently zoned General residential zone to Medium density residential zone. This option also would involve inserting the medium density standards into the existing Medium density residential zone.

Option 3: Limit development on the urban fringe of four towns

This option would require applying a Medium density residential zone to the areas within a walkable catchment of the four towns that qualify as an urban environment (Tuakau, Pookeno, Huntly and Ngaruawaahia), and retain the General residential zone for the urban fringe of those towns.

Option 4: Limit development on the urban fringe of six towns

Limit the application of the medium density residential standards to the 800m walkable catchment around the Town centre zone in each of the six towns, being Tuakau, Pookeno, Huntly, Ngaruawaahia, Te Kauwhata and Raglan.

Option 5: Increased density of the General residential zone

Modify the medium density residential standards outside the 800m walkable catchment around the Town centre zone to result in an intermediary density somewhere between what the Medium density residential zone will enable and General residential zone

Option 6: Limit development on sites with a qualifying matter through a zone which enables less development

This option would involve zoning all existing residential zoned sites with a qualifying matter, General residential zone to limit development on them.

Option 7: Do not notify an IPI

A number of councils have signalled their concern with the requirements of the RMA amendments and the fact it will substantially change the character and amenity of their urban areas. All councils have now notified an IPI apart from Waikato District Council and Christchurch City Council. A failure to notify a plan change could result in the Minister for the Environment engaging intervention powers if councils are not adequately performing their role.

The “Regulatory Impact Statement: Bringing Forward the Upzoning of land for Housing” dated 20 May 2021 prepared by the Ministry for Housing and Ministry for Environment states that there are general options under the RMA available to the Minister for the Environment to:

- a. investigate the performance of local authorities in giving effect to the MDRS;
- b. provide recommendations to local authorities on improving their performance;
- c. direct plan changes; and
- d. as a last resort, apply residual powers to appoint someone to carry out the local authority’s functions and duties.

If Council does not notify a variation to implement the MDRS, there appears to be a cascading response from investigate to appointing someone to prepare the variation for Council. If the later occurs, the variation may be notified without any qualifying matters as qualifying matters are discretionary.

Table 10: Broad options

Option	Relevance <i>Is the option related to addressing the resource management issues</i>	Achievability <i>Can the option achieve the outcome / objective?</i>	Acceptability / Reasonableness <i>How acceptable is this to the community? What are the likely effects on the community – i.e., widespread or limited</i>	Recommendation
Option 1: Status quo	This option will partially address the issue that the amendments to the RMA are intending to resolve – namely to enable the increase in housing supply.	This option is achievable in that it is already existing. The existing Medium density residential zone does already allow a level of development comparable to the medium density residential standards.	<p>This option does not incorporate the medium density residential standards as required by the Act.</p> <p>The requirements imposed by the Act in terms of the MDRS and implementation of Policy 3 of the NPS-UD represents a significant shift towards enabling greater densities in the residential zones. While some may see this as an opportunity to address housing issues, it is likely that this will be met with reluctance from parts of the community.</p> <p>The response from the community will be similarly mixed with support from those wishing to retain the current character and amenity, and opposition from those wishing to develop and provide additional housing.</p>	<p>DISCARD</p> <p>Section 77G imparts a duty to specified territorial authorities to incorporate MDRS and give effect to policy 3 or 5 in residential zones.</p>
Option 2: Replace all	This option is fully compliant with the RMA amendments.	This option may not achieve a well-functioning urban	The requirements imposed by the Act in terms of the MDRS	DISCARD

Option	Relevance <i>Is the option related to addressing the resource management issues</i>	Achievability <i>Can the option achieve the outcome / objective?</i>	Acceptability / Reasonableness <i>How acceptable is this to the community? What are the likely effects on the community – i.e., widespread or limited</i>	Recommendation
residential zones with an amended Medium density residential zone		environment as it will enable medium density residential development on the urban areas furthest from the town centres. This will retain dependence on private vehicles for transport, and not achieve the density of development needed to support a vibrant and economically viable town centre.	and implementation of Policy 3 of the NPS-UD represents a significant shift towards enabling greater densities in the residential zones. While some may see this as an opportunity to address housing issues, it is likely that this will be met with reluctance from parts of the community. The response from the community will be similarly mixed with opposition from those wishing to retain the current character and amenity, and support from those wishing to develop and provide additional housing. This option would provide substantially more housing supply.	While this option is fully compliant with the amendments to the RMA, it will result in a sub-optimal urban form. It will result in residential development on the edges of the towns as these will be the easiest areas to achieve higher density development due to it being greenfield development. It will also significantly affect the character and amenity of places such as Raglan that have been identified as having a unique character.
Option 3: Limit development on the fringe of four towns	This option addresses the resource management issue of increasing the supply of houses; and achieves SD-O4 which is to provide a variety of housing types to meet the community's housing needs.	The option can achieve the objectives.	This option is likely to be the most favoured by the community as it balances additional housing supply near the town centres, while enabling lower density development further out on the edges. This	RETAIN This option strikes a balance of incorporating the medium density residential standards into a newly created Medium density residential zone 2 which applies around the

Option	Relevance <i>Is the option related to addressing the resource management issues</i>	Achievability <i>Can the option achieve the outcome / objective?</i>	Acceptability / Reasonableness <i>How acceptable is this to the community? What are the likely effects on the community – i.e., widespread or limited</i>	Recommendation
	This option achieves UFD-O1 which is to create a compact urban form that provides for connected, liveable communities.		option also only applies to the four relevant towns, those having a population of over 5000 people in 2018, or is planned to be part of a housing and labour market of 10,000)	town centres of Tuakau, Pookeno, Huntly and Ngaaruawaahia which meet the criteria for a relevant residential zone (and an urban environment in the case of Pookeno), while retaining a lower level of development on the edges of these towns. This approach supports a compact and walkable urban form and will result in a well-functioning urban environment. It also enables housing choice by providing a range of housing options and living opportunities.
Option 4: Limiting development on the fringe of six towns	This option addresses the resource management issue of increasing the supply of houses; and achieves SD-O4 which is to provide a variety of housing types to meet the community's housing needs. This option achieves UFD-O1 which is to create a compact	The option can achieve the objectives.	This option balances additional housing supply near the town centres, while enabling lower density development further out on the edges. However, there is likely to be concern from the residents in Raglan where there is an identified special character.	DISCARD This option applies the medium density residential standards to two towns that do not qualify based on the definition of a relevant residential zone.

Option	Relevance <i>Is the option related to addressing the resource management issues</i>	Achievability <i>Can the option achieve the outcome / objective?</i>	Acceptability / Reasonableness <i>How acceptable is this to the community? What are the likely effects on the community – i.e., widespread or limited</i>	Recommendation
	urban form that provides for connected, liveable communities.			
Option 5: Increased density of the General residential zone	<p>This option partially addresses the resource management issue of increasing the supply of houses.</p> <p>This option partially achieves UFD-O1 which is to create a compact urban form that provides for connected, liveable communities.</p>	The option will not be effective in achieving the outcomes sought.	This option will result in a sub-optimal urban design with potentially higher densities in inappropriate areas. It will result in a less effective General residential zone.	<p>DISCARD</p> <p>This option unnecessarily complicates the clear delineation of two separate residential zones and the different environments and living options each creates.</p>
Option 6: Limit development on sites with a qualifying matter through retaining a zone which enables less development	<p>This option partially addresses the resource management issue of increasing the supply of houses; and achieves SD-O4 which is to provide a variety of housing types to meet the community’s housing needs.</p> <p>This option will not achieve UFD-O1 which is to create a compact urban form that provides for connected, liveable communities.</p>	The option partially achieves the objectives.	This option will result in a sub-optimal urban design with potentially higher densities in inappropriate areas. It will result in a less effective General residential zone.	<p>DISCARD</p> <p>This option will result in a patchwork zoning pattern. In addition, this approach does not meet the test of making the relevant building height or density requirements under policy 3 less enabling of development only to the extent necessary to accommodate the qualifying matter. If a qualifying matter only applied to a small portion of the site but the whole site was down-zoned, it would not be “to the extent necessary” to</p>

Option	Relevance <i>Is the option related to addressing the resource management issues</i>	Achievability <i>Can the option achieve the outcome / objective?</i>	Acceptability / Reasonableness <i>How acceptable is this to the community? What are the likely effects on the community – i.e., widespread or limited</i>	Recommendation
				accommodate the qualifying matter.
Option 7: Do not notify an IPI	This option would retain the existing character and amenity of the urban areas within the District.	This option would not comply with the amendments to the Act. However, the existing Medium density residential zone already enables similar levels of development to the MDRS.	The response from the community would be mixed with support from those wishing to retain the current character and amenity, and opposition from those wishing to develop and provide additional housing as of right (noting that additional housing can already be provided through gaining a resource consent if required).	REJECT The requirements to insert the MDRS and notify an IPI are mandatory

7 Evaluation of Preferred Option Against Objectives

This section contains an assessment of the preferred option identified above for further evaluation. Provisions have been bundled together where they are expected to work together to achieve an objective or group of objectives. For efficiency this section focuses on the general approach as a package rather than a detailed analysis of every provision. The provisions have been packaged into the following discrete sets of provisions to enable a more comprehensive and integrated assessment:

- a. Subdivision policies and rules
- b. Reverse sensitivity
- c. Infrastructure
- d. Policy and definition for qualifying matters
- e. Amendments to existing Medium density residential provisions
- f. Rezoning

Schedule 3A of the Act contains policies and rules which form part of the MDRS package. Because these are mandatory and have been included in the Medium density residential zone 2 unaltered, an evaluation in accordance with section 32 has not been undertaken.

In addition, there are a number of provisions which have been imported from the existing Medium density residential zone in the PDP. Through the hearing and decision process of the PDP, these provisions have already been assessed in accordance with section 32AA. As Variation 3 does not propose to amend them, there is no need to undertake an evaluation in accordance with section 32. The provisions that have been imported from the PDP decision version of the Medium density residential zone include:

- MRZ2-P5 Streetscape, yards and outdoor living spaces
- MRZ2-P8 Changes to amenity values
- MRZ2-P9 Home businesses
- MRZ2-P10 Non-residential activities
- The land use activity rules in MRZ2-R1 through to MRZ2-R12
- MRZ2-S10 Impervious surfaces
- MRZ2-S11 Ground floor internal habitable space
- MRZ2-S12 Fences or walls

Detailed explanation and discussion of key provisions can be found in Appendix I Explanation of Proposed Provisions

7.1 Subdivision policies and rules

Variation 3 proposes modest amendments to the SUB Subdivision chapter. Of most significance is the inclusion of SUB-R154 which inserts the MDRS standards from Schedule 3A of the Act for the Medium density residential zone 2, but also includes a minimum 200m² standard for vacant lot subdivision as the Act is silent on this form of subdivision. The 200m² minimum lot size for vacant lots matches the approach of the Medium density residential zone already in the PDP. As the inclusion of the MDRS relating to subdivision is mandatory, this has not been assessed in terms of section 32.

A number of subdivision rules that already apply to the Medium density residential zone in the PDP have been applied to the Medium density residential zone 2. These also have not been assessed in terms of section 32 as they underwent those tests through the PDP process.

Variation 3 also proposes amendments to the following policies in the SUB Subdivision chapter:

- An exemption for residential subdivision MRZ2 in SUB-P3(1) Lot sizes
- A new clause (3) to SUB-P3 which enables medium density residential outcomes in the MRZ2
- A new policy SUB-P23 which is specific to subdivision in the Medium density residential zone 2
- Inclusion of SUB-R162 regarding subdivision in the National Grid Subdivision Corridor (this currently only applies to the General residential zone, not the Medium density residential zone)

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	There may be environmental effects as a result of subdivision and consequential development, such as runoff from earthworks and noise from construction.	<p>Protects section 6 matters through requiring subdivision to not compromise any qualifying matters that are present on the site to be subdivided.</p> <p>Likely to enable more compact urban developments that could have a range of associated environmental benefits including:</p> <ul style="list-style-type: none"> • Reduced vehicle trip requirements and associated reduction in carbon emissions • Reduced pressure on rural production land. <p>The recognition of qualifying matters in the policy also will assist in maintaining water quality of waterbodies. The setbacks from waterbodies is a qualifying matter.</p>

		<p>Enables the ongoing protection of established matters of natural and environmental importance including Te Ture Whaimana o Te Awa o Waikato (through provisions relating to qualifying matters).</p> <p>Ensures that subdivision takes into consideration the constraints that may be applied by a qualifying matter being present on the site.</p> <p>Reduced chance of flashovers.</p>
Economic	<p>May restrict development on the sites where a qualifying matter applies.</p> <p>Costs associated with obtaining a resource consent and supporting technical assessments.</p> <p>May not result in optimising the existing urban land resource.</p> <p>Increased time required to create new dwellings due to resource consents being required.</p> <p>The 200m² minimum lot size for vacant lots may reduce the level of development that could be achieved through a comprehensive development approach (i.e., concurrent land use and subdivision, or construction of residential units first before subdivision).</p>	<p>Provides option for landowners to create income through subdividing vacant sites</p> <p>Will enable a more efficient use of land</p> <p>May contribute to housing affordability if it results in an increase of housing supply.</p> <p>Increased densities will enable infrastructure to be provided more efficiently on a per allotment basis.</p> <p>Increased protection of the National Grid Corridor provides for a more efficient mechanism to manage potential adverse effects on this nationally significant infrastructure.</p> <p>Retained ease of access for inspection, operation and maintenance for the network provider.</p>

Social	<p>There may be conflict between parts of the community with different opinions over the value of qualifying matters, particularly section 6 matters.</p> <p>May result in sub-optimal subdivision configurations</p>	<p>May result in more variety of living environments</p> <p>Ensures that where there is qualifying matters, this is taken into consideration and the subdivision configured in such a way that a vacant site will be able to be built upon.</p> <p>Provides additional housing stock through enabling medium density residential development.</p> <p>Increased certainties around expectations for future urban form.</p> <p>Protects buildings and structures from flashovers.</p> <p>Public safety is better maintained.</p> <p>An increased level of amenity for those living in close proximity to lines.</p> <p>Raises public awareness of the location of high voltage lines.</p> <p>In the case of greenfield development, the corridor can be used for other purposes such as roading or public open space.</p> <p>Security of electricity supply is a significant benefit to residents in Waikato District and NZ.</p>
Cultural	<p>May limit the development of Maaori owned land.</p>	<p>The application of qualifying matters will assist in protecting the mauri of the waterbodies through setbacks from waterbodies.</p> <p>Reduces the potential for degradation of the Waikato River.</p> <p>Protection of culturally significant features or areas as a qualifying matter.</p>
Economic growth	<p>The presence of qualifying matters may reduce the development potential of individual sites and will cumulatively reduce the number of additional dwellings possible. Ultimately the option may facilitate the more efficient development of compact urban forms within</p>	

provided or reduced	Huntly, Ngaaruawaahia, Pookeno and Tuakau. Increased residential densities are likely to support the economic viability and vibrancy of these town centres.
Employment opportunities	The presence of qualifying matters will only have an effect on employment opportunities insofar as a slightly reduced number of additional houses are possible and therefore slightly less demand over time for labourers and those in the construction industry.
Uncertain or insufficient information	The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3, and therefore the impact of the qualifying matters and the subdivision rules.
Risk of acting or not acting	The risk of not acting is that a connection is not made between the subdivision rules and qualifying matters. The presence of a policy in the SUB chapter ensures these matters are considered.
Effectiveness	
<p>SUB-P23 will be efficient in ensuring that any qualifying matters are considered when assessing resource consent applications for subdivision. The inclusion of the policy will be effective in ensuring that the rules in the District-wide matters and the MRZ2 chapter regarding qualifying matters are not overlooked.</p> <p>SUB-P23 will also be effective at enabling intensification in the Medium density residential zone 2 in accordance with MDRS. It also provides development options for landowners who may not be able to afford to construct residential units before selling. The proposed provisions are considered to be the most appropriate method of meeting the objectives as they provide clear requirements for subdivision outcomes within the MRZ2 – Medium density residential zone 2. The provisions provide a degree of certainty to developers, residents and Council regarding future subdivision patterns within Huntly, Ngaaruawaahia, Pookeno and Tuakau.</p> <p>The inclusion of a 200m² minimum lot size for vacant lots will support intensification in the Medium density residential zone 2 whilst ensuring that sites created are large enough to be built on while still able to comply with the standards for the zone.</p>	
Efficiency	
<p>The inclusion of the qualifying matters as a policy is an efficient approach that draws attention to the fact that qualifying matters may reduce the development potential of a site. The inclusion of a 200m² minimum lot size for vacant lot is an efficient use of land within the Medium density residential zone 2.</p> <p>The provisions are not considered to result in significant additional costs onto landowners. The policies and rules set out clearly how the objectives will be achieved and complement the mechanism of the proposed MRZ2 - Medium Density Residential Zone 2.</p>	

Summary

The inclusion of a new policy recognising the constraints of having a qualifying matter is an effective and efficient way to achieve both SD-O14 and MRZ2-O5. This approach aligns with section 771 of the Act by recognising that relevant building height or density requirements under Policy 3 of the NPS-UD may be less enabling where a qualifying matter is present. This approach gives effect to Policy 4 of the NPS-UD.

The inclusion of policies enabling medium density residential outcomes in SUB-P3 will provide policy support for the outcomes of the zone and achieve proposed objective SD-O14.

Overall, the proposed subdivision policies and rules are considered to be the most appropriate way of achieving the objectives as they:

- Give effect to the requirements of the NPS-UD in terms of enabling increased residential areas.
- Give effect to the requirements of the RPS in relation to managing built environments including infrastructure provision in a sustainable manner.
- Enable the desired increased densities within the MRZ2 – Medium density residential zone 2 to be achieved.
- Require certain internal amenity outcomes to be achieved (through compliance with the MDRS or a land use consent).
- Require streetscape/public realm outcomes to be achieved (through compliance with the MDRS or land use consent).

7.2 Reverse sensitivity

The General residential zone currently includes GRZ-S20(1)(a)(vi) which requires sensitive land uses to be setback 300m from the boundary of the Alstra Poultry intensive farming activities located on River Road and Great South Road, Ngaaruawaahia. The 300m covers a portion of Medium density residential zone 2 and therefore this rule is proposed to be included by Variation 3 as MRZ2-S14(1)(a)(vi).

In addition, Variation 3 proposes to insert a new MRZ2-P1 I which seeks to maintain appropriate setback distances between new sensitive land uses and existing lawfully established activities that may result in reverse sensitivity effects.

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	The poultry farm may generate adverse effects in its operation.	The existing operation is protected from incompatible uses. Provides a framework to manage reverse sensitivity.
Economic	There is a cost to properties affected by this setback whereby development is constrained.	Continued benefits for the community including local employment. Continued operation of the activities.

	<p>Reduced ability to utilise the full extent of the properties within 300m of the operation.</p> <p>Costs associated with obtaining a resource consent and supporting technical assessments.</p> <p>May not result in optimising the existing urban land resource.</p> <p>Increased time required to create new dwellings due to resource consents being required.</p>	
Social	Reduced housing supply available.	<p>Continued local employment.</p> <p>Addresses public health and safety.</p> <p>Provision of benefits to the community.</p>
Cultural	Development on Maaori owned land may be constrained.	There are no cultural benefits.
Economic growth provided or reduced	<p>The presence of the poultry farm operation will cumulatively reduce the number of additional dwellings possible in the four towns.</p> <p>There may be other land uses that generate effects, and their presence may constrain the level of residential intensification possible.</p>	
Employment opportunities	<p>The presence of the poultry farm operation will have an effect on employment opportunities insofar as a slightly reduced number of additional houses are possible and therefore slightly less demand over time for labourers and those in the construction industry.</p> <p>However, the poultry farm provides employment for a number of people.</p>	
Uncertain or insufficient information	<p>The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3, and therefore the impact of the setbacks from the poultry farm.</p> <p>The other uncertainty is where additional intensification is undertaken in relation to an existing operation that generates effect that are incompatible with residential activities.</p>	

Risk of acting or not acting	<p>The risk of not acting is that development compromises the operation of the poultry farm through complaints and reverse sensitivity effects. There is also the risk of lowered amenity for residents in close proximity to the poultry farm through the generation of adverse effects such as odour, lighting and truck movements.</p> <p>The risk of not including a policy regarding reverse sensitivity is that reverse sensitivity is not addressed.</p>
Effectiveness	
<p>The rules limiting development in close proximity to the poultry farm will be efficient in ensuring that development does not compromise the on-going operation of the poultry farm. The rules also will result in a reasonable amenity for residents in close proximity to the poultry farm.</p> <p>MRZ2-P11 is an effective way of recognising the risk of reverse sensitivity.</p>	
Efficiency	
<p>The inclusion of the setbacks for sensitive land use activities in close proximity to the existing poultry farm is an efficient approach. It limits the impact of these rules to just those areas closest to the poultry farm and does not constrain activities that are not sensitive to the effect that may be generated from the poultry farm operation.</p> <p>The rules and policy are an efficient way to achieve MRZ2-O6.</p>	
Summary	
<p>The inclusion of rules managing development in close proximity to the existing poultry farm operation and the inclusion of MRZ2-P11 is an efficient and effective way to achieve MRZ2-O6 as well as SD-O10 in the Strategic Directions chapter.</p>	

7.3 Infrastructure

The rules in the Medium density residential zone 2 slightly differ from the Medium density residential zone decision version of the PDP in terms of infrastructure. The key differences are:

- a. Inclusion of the suite of rules regarding the construction or extension of sensitive land uses and subdivision in close proximity to the National Grid in MRZ2-R10 and R11, and SUB-R162;
- b. Inclusion of rules requiring setbacks for buildings for sensitive land uses in MRZ2-S14:
 - (a) 5m from the designated boundary of the railway corridor;
 - (b) 15m from the boundary of a national route or regional arterial;
 - (c) 25m from the designated boundary of the Waikato Expressway;
 - (d) 300m from the edge of oxidation ponds that are part of a municipal wastewater treatment facility on another site;
 - (e) 30m from a municipal wastewater treatment facility where the treatment process is fully enclosed; and

- (f) 6m from the centre of a gas transmission line identified on the planning maps
- c. MRZ-R8 relating to construction of a sensitive land use near an electricity distribution line has not been carried over into the Medium density residential zone 2.

The reasons for including the rules is to minimise the potential for reverse sensitivity, as well as protect the security and integrity of the infrastructure. The matters listed in clauses (a) and (b) are all qualifying matters and are addressed in detail in Volume 2.

The rules relating to electricity distribution lines have not been brought across because the Medium density residential zone 2 is expected to be an intensive residential zone. There is strong encouragement in the AINF All infrastructure and EDIS Electricity Distribution chapters of the PDP that electricity distribution lines are underground in the urban environment. While they are still overhead in some of the older parts of the District, the New Zealand Electrical Code of Practice for Safe Distances 34:2001 provides protection for these lines. The current rules in the Medium density residential zone require buildings to be set back 10-12m depending on the voltage. This would have the effect of making large parts of some sites unusable. This is not considered to be an appropriate qualifying matter, when protection is already provided outside the district plan by another mechanism. For this reason, the rule has not been included in the Medium density residential zone 2.

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	No environmental costs	Reduced effect of significant events such as accidents, fire or explosions from the infrastructure Reduced chance of flashovers
Economic	Reduced value of properties in close proximity to the infrastructure. Reduced development options in terms of land uses. Decreases the subdivision potential of properties in close proximity to the infrastructure.	Protects the integrity of the infrastructure and ensures continuous transport routes and gas supply Protects the integrity of the National Grid and ensures continuous electricity supply which is essential for economic activity Retained ease of access for inspection, operation and maintenance for the network provider. Security of critical transport routes is a significant benefit to business in Waikato District and nationally.

		<p>Increased security of the National Grid towers and supporting structures by limiting earthworks in close proximity.</p> <p>Security of electricity supply is a significant benefit to business in Waikato District and nationally.</p>
Social	<p>Sub-optimal arrangement of a site in terms of location of buildings.</p> <p>In the case of brownfield development, is likely to create unusable “dead space” on sites.</p>	<p>Protects buildings and structures from accidents and significant events.</p> <p>Public safety is better maintained.</p> <p>An increased level of amenity for those living in close proximity to significant infrastructure.</p> <p>Security of transport routes and gas supply is a significant benefit to residents in Waikato District and NZ.</p> <p>Security of electricity supply is a significant benefit to residents in Waikato District and NZ.</p> <p>Minimises the potential for reverse sensitivity effects.</p>
Cultural	<p>May constrain the development of Maori Freehold or Customary Land.</p>	<p>No cultural costs.</p>
Economic growth provided or reduced	<p>The presence of infrastructure and limitations on development of sites in close proximity will cumulatively reduce the number of additional dwellings possible in the four towns.</p>	
Employment opportunities	<p>The presence of infrastructure will only have an effect on employment opportunities insofar as a slightly reduced number of additional houses are possible and therefore slightly less demand over time for labourers and those in the construction industry.</p>	

Uncertain or insufficient information	The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3, and therefore the impact of the setbacks from infrastructure.
Risk of acting or not acting	The risk of not acting is that development compromises the safety and security of significant infrastructure. There is also the risk of lowered amenity for residents in close proximity to the infrastructure through the generation of adverse effects such as noise, dust, vibration, odour and lighting.
Effectiveness	
The rules limiting development in close proximity to infrastructure will be efficient in ensuring that development does not compromise the safety and security of significant infrastructure. The rules also will result in a reasonable amenity for residents in close proximity to the infrastructure.	
Efficiency	
The inclusion of the setbacks and rules for subdivision within the National Grid Subdivision Corridor is an efficient approach. It limits the impact of these rules to just those areas closest to the infrastructure. The rules are an efficient way to achieve MRZ2-O6.	
Summary	
The inclusion of rules managing development in close proximity to key infrastructure is an efficient and effective way to achieve both MRZ2-O6 as well as AINF-O2 in the All-Infrastructure chapter.	

7.4 Policy and definition for qualifying matters

A new policy MRZ2-P6 is proposed to be inserted as well as a new definition for qualifying matters. MRZ2-P6 seeks to restrict residential development to an appropriate level to provide for and protect any relevant qualifying matters. The costs and benefits for every individual qualifying matter is assessed in Volume 2.

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	There are no environmental costs.	Protects section 6 matters.
Economic	May restrict development on the sites where a qualifying matter applies. Costs associated with obtaining a resource consent and supporting technical assessments.	

	<p>May not result in optimising the existing urban land resource.</p> <p>Increased time required to create new dwellings due to resource consents being required</p>	
Social	<p>There may be conflict between parts of the community with different opinions over the value of features, particularly section 6 matters.</p>	<p>Minimises the potential for reverse sensitivity effects.</p> <p>May result in more variety of living environments.</p> <p>Contributes to and enhances the character and amenity of the District.</p>
Cultural	<p>May limit the development of Maaori land.</p>	<p>The mauri of the waterbodies will be protected.</p> <p>Reduces the potential for degradation of the Waikato River.</p>
Economic growth provided or reduced	<p>The presence of qualifying matters may reduce the development potential of individual sites and will cumulatively reduce the number of additional dwellings possible.</p>	
Employment opportunities	<p>The presence of qualifying matters will only have an effect on employment opportunities insofar as a slightly reduced number of additional houses are possible and therefore slightly less demand over time for labourers and those in the construction industry.</p>	
Uncertain or insufficient information	<p>The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3, and therefore the impact of the qualifying matters.</p>	
Risk of acting or not acting	<p>The risk of not acting is that a connection is not made between the zone rules and the Part 2 District-wide matters which may impose additional constraints. The presence of a policy in the MRZ2 chapter ensures these matters are considered.</p>	
Effectiveness		
<p>MRZ2-P6 will be efficient in ensuring that any qualifying matters are considered when assessing resource consent applications. The inclusion of the policy will be effective in ensuring that the rules in the District-wide matters are not overlooked.</p>		

Efficiency

The inclusion of the qualifying matters as a defined term is an efficient approach. The other option is that wherever the term is used, all qualifying matters are listed. This approach is cumbersome and unnecessarily complex. Defining qualifying matters provides certainty and clarity. The inclusion of MRZ2-P6 is efficient as it draws attention to the fact that qualifying matters may reduce the development potential of a site.

Summary

The inclusion of a new policy and definition for qualifying matters is an effective and efficient way to achieve both SD-O14 and MRZ2-O5. This approach aligns with section 771 of the Act by recognising that relevant building height or density requirements under Policy 3 of the NPS-UD may be less enabling where a qualifying matter is present. This approach gives effect to Policy 4 of the NPS-UD.

7.5 Amendments to existing Medium density residential provisions

While a large proportion of the Variation 3 provisions are derived from the existing Medium density residential zone in the PDP, Variation 3 proposes to amend some of them. The differences from the Medium density residential zone provisions are as follows:

- The building setbacks from waterbodies in MRZ2-S13 are different
- MRZ-R13 rule which makes any building, structure, objects or vegetation that obscures the sight line of the Raglan navigation beacons for vessels entering Whaingaroa (Raglan Harbour) (APP8 – Raglan navigation beacon) to be a non-complying activity has not been brought across into the Medium density residential zone 2.
- MRZ-S2 regarding the minimum residential unit size has not been brought across as this may have the effect of limiting the density of development and thus not comply with the MDRS.

The rationale behind the waterbody rule is that the following setbacks apply as a base level *plus* the yard setback for the zone

- a. 20m the margin of any lake;
- b. 20m from the margin of any wetland;
- c. 20m from the bank of any river (other than the Waikato River and Waipa River);
- d. 25m from the margin of either the Waikato River and the Waipa River; and
- e. 20m from mean high water springs.

The 20m setback distance is based on the minimum width for an esplanade reserve, although the width for the significant Waipa and Waikato River is in response to Te Ture Whaimana and the need to further protect the mauri of the Waikato River. MRZ2-S13 makes no changes to the distances from the margin of any lake or wetland but deletes the requirement from mean high water springs as none of the four towns are coastal. The distances from the banks of the Waipa River, Waikato River and any other river are amended to reflect the 1.5m setback of the MDRS.

The rule regarding the Raglan navigation beacon is not included in the Medium density residential zone 2 rules as the zone does not apply to Raglan.

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	<p>There are no environmental costs.</p>	<p>The setbacks from the waterbodies will result in less sediment entering the waterway from runoff.</p> <p>Setbacks reduces erosion by setting development away from waterbodies.</p> <p>Setbacks provides spaces for revegetation close to waterways.</p> <p>Setbacks provide opportunities to enhance biodiversity close to waterways and biodiversity linkages with the setbacks from waterbodies.</p> <p>Supporting the aquatic ecosystems of the Waikato River and its tributaries.</p>
Economic	<p>There is an opportunity cost to properties affected by this QM, who are prevented from developing within 20-26.5 from a waterbody (depending on the nature of the waterbody).</p> <p>Reduced ability to utilise the full extent of the property.</p> <p>Costs associated with obtaining a resource consent and supporting technical assessments.</p> <p>May not result in optimising the existing urban land resource.</p> <p>May limit housing stock with no opportunities for infill due to lack of available servicing which will increase the costs for purchasers.</p> <p>Increased time required to create new dwellings due to resource consents being required.</p>	

Social	<p>May result in a reduction of housing opportunities.</p> <p>May not enable people to meet their housing needs for their family.</p> <p>May result in a lack of diversity of housing typology if development is not enabled.</p>	<p>Improved amenity close to waterbodies.</p> <p>May result in more variety of living choices if intensification cannot occur in all areas.</p>
Cultural	<p>Development of Maaori owned sites may be limited if there is insufficient servicing for three waters.</p>	<p>The mauri of the Waikato River will be protected.</p> <p>Supports the vision and objectives of Te Ture Whaimana.</p> <p>Reduces the potential for degradation of the Waikato River.</p>
Economic growth provided or reduced	<p>The presence of waterbodies and limitations on development of sites in close proximity will cumulatively reduce the number of additional dwellings possible in the four towns.</p>	
Employment opportunities	<p>The presence of waterbodies will only have an effect on employment opportunities insofar as a slightly reduced number of additional houses are possible and therefore slightly less demand over time for labourers and those in the construction industry.</p>	
Uncertain or insufficient information	<p>The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3, and therefore the impact of the setbacks from waterbodies.</p>	
Risk of acting or not acting	<p>The risk of not acting is that development compromises the ability to achieve esplanade reserves (accepting that these will not be appropriate in all circumstances due to factors such as topography, connections and public safety). The most significant risk is that development leads to further degradation of the banks of waterbodies and water quality.</p>	
Effectiveness		
<p>The rules limiting development in close proximity to waterbodies will be efficient in ensuring that development does not compromise the stability of the riverbanks as well as maintains water quality. The rules also will result in a reasonable amenity for residents in close proximity to the waterbodies.</p>		

Efficiency
The modification of the rules regarding setbacks to the rivers is an efficient approach. It limits the impact of these rules to just those areas closest to the waterbodies whilst still enabling development on areas further away. The rules are an efficient way to achieve TETW-OI in the Te Ture Whaimana – Vision and Strategy chapter of the PDP.
Summary
The inclusion of rules managing development in close proximity to waterbodies is an efficient and effective way to achieve TETW-OI. The proposed rules give effect to the RPS as well as having regard to Tai Tumu Tai Pari Tai Ao.

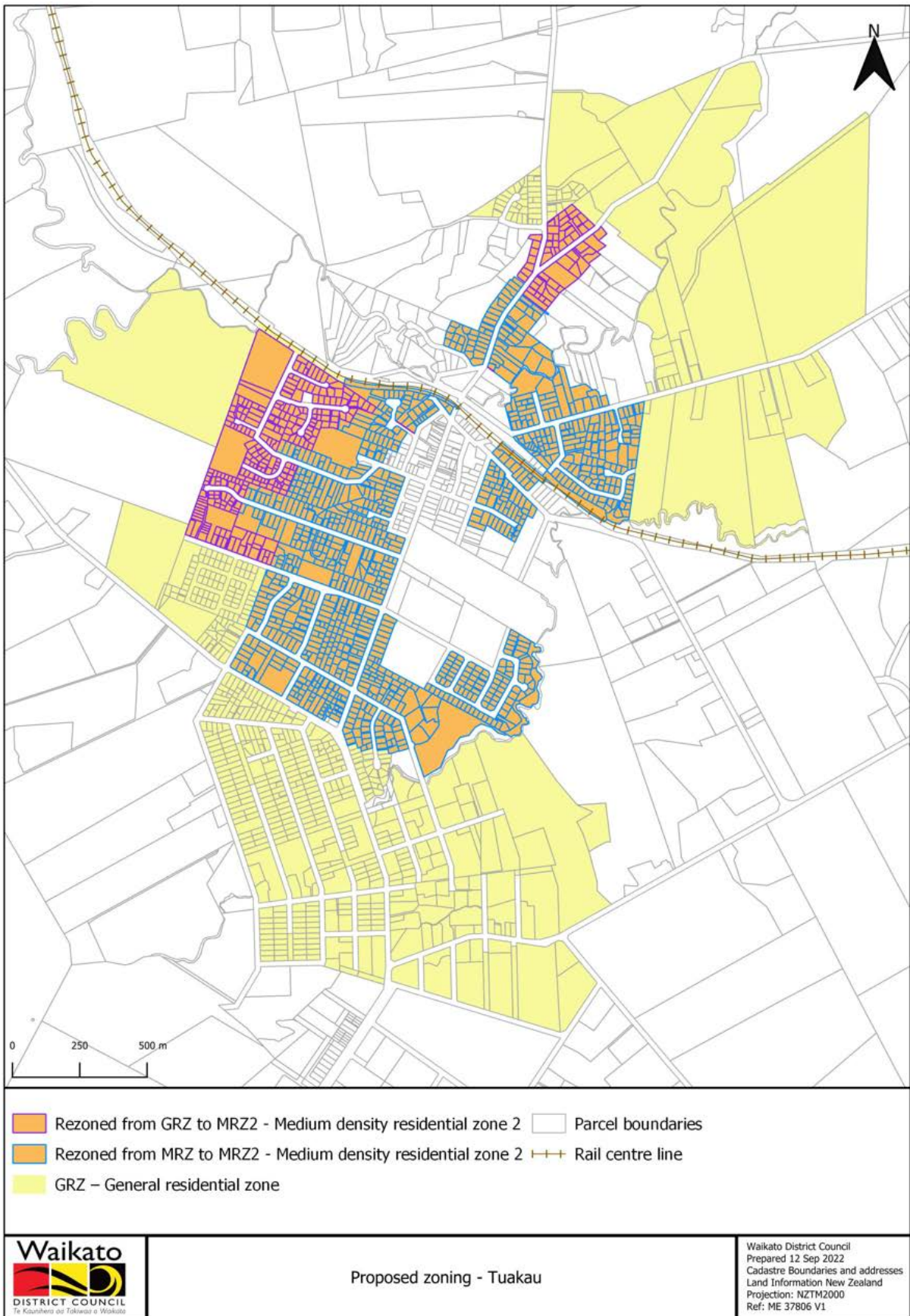
7.6 Rezoning

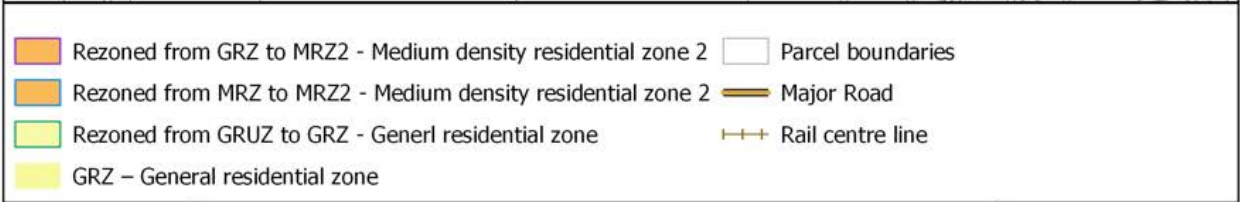
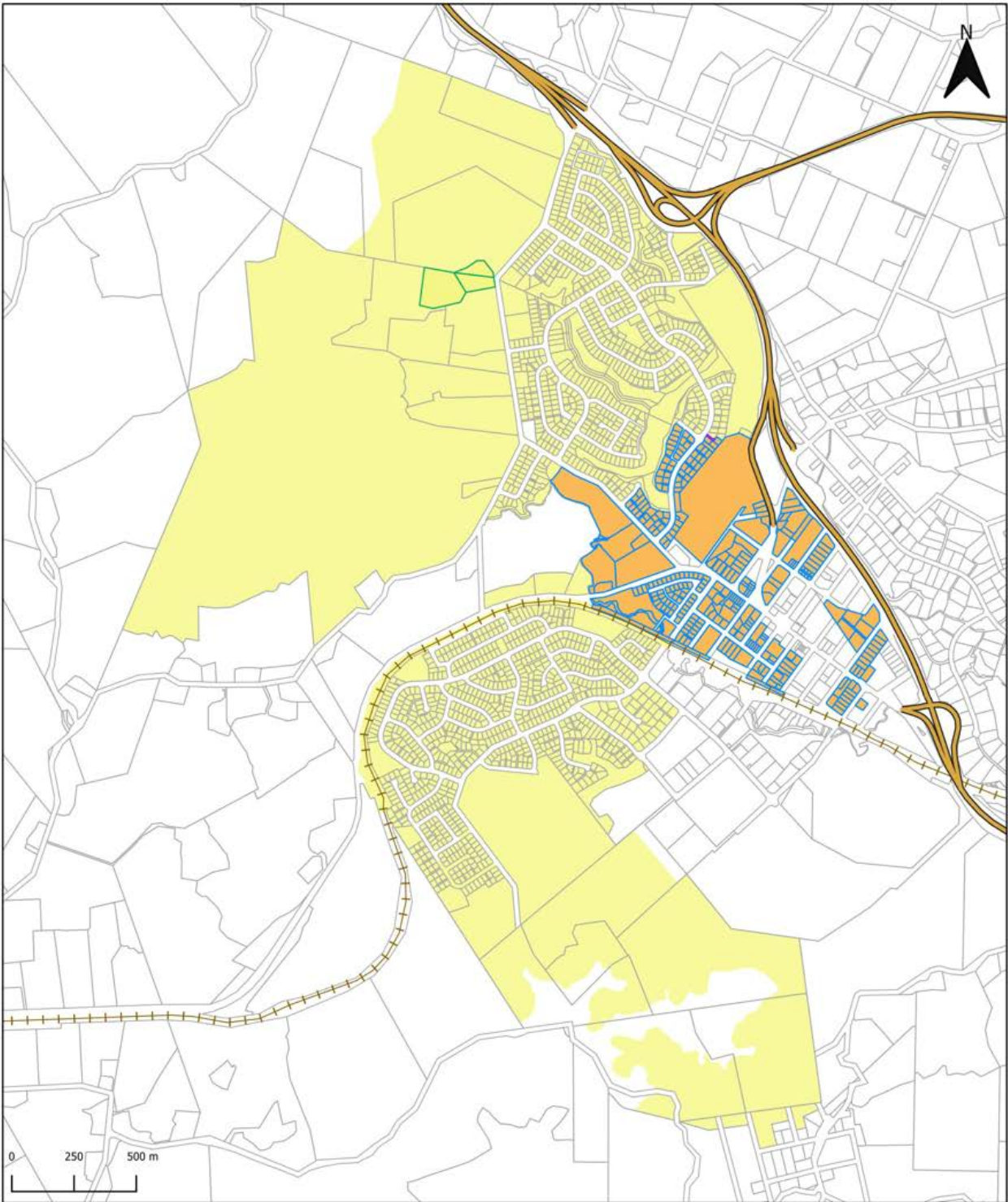
In addition to changing the zone of the properties currently zoned Medium density residential zone, to Medium density residential zone 2, Variation 3 proposes to amend the zoning of the following properties within the four towns of Pookeno, Tuakau, Huntly, and Ngaaruawaahia:

Town	Proposed change in zone	Number of properties
Pookeno	General residential zone to Medium residential zone 2	3
	General rural zone to General residential zone	2
Tuakau	General residential zone to Medium residential zone 2	307
Huntly	General residential zone to Medium residential zone 2	68
Ngaaruawaahia	General residential zone to Medium residential zone 2	66
TOTAL SITES PROPOSED TO BE UPZONED		446

There are two aspects to rezoning – changing the colour on the planning maps to accurately represent the new zoning, and more importantly changing the provisions which apply to the site and the potential development that those provisions enable. The assessment below concentrates on the effects of changing the zoning and the associated provisions, in particular the sites that are zoned General residential zone in the PDP and are proposed to change to Medium density residential zone 2.

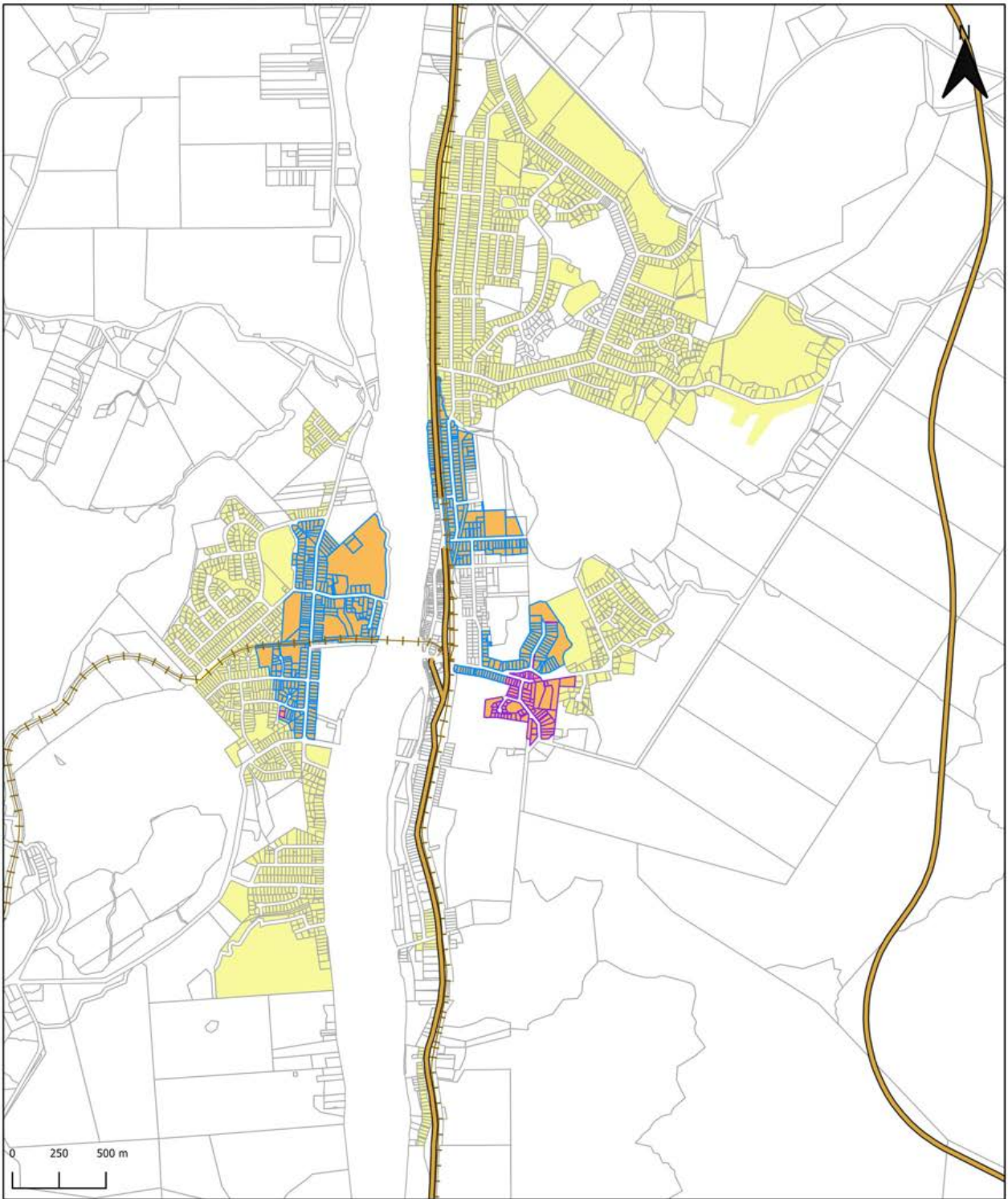
Figure I: Proposed zoning of sites





Proposed zoning - Pokeno

Waikato District Council
 Prepared 12 Sep 2022
 Cadastre Boundaries and addresses
 Land Information New Zealand
 Projection: NZTM2000
 Ref: ME 37806 V1

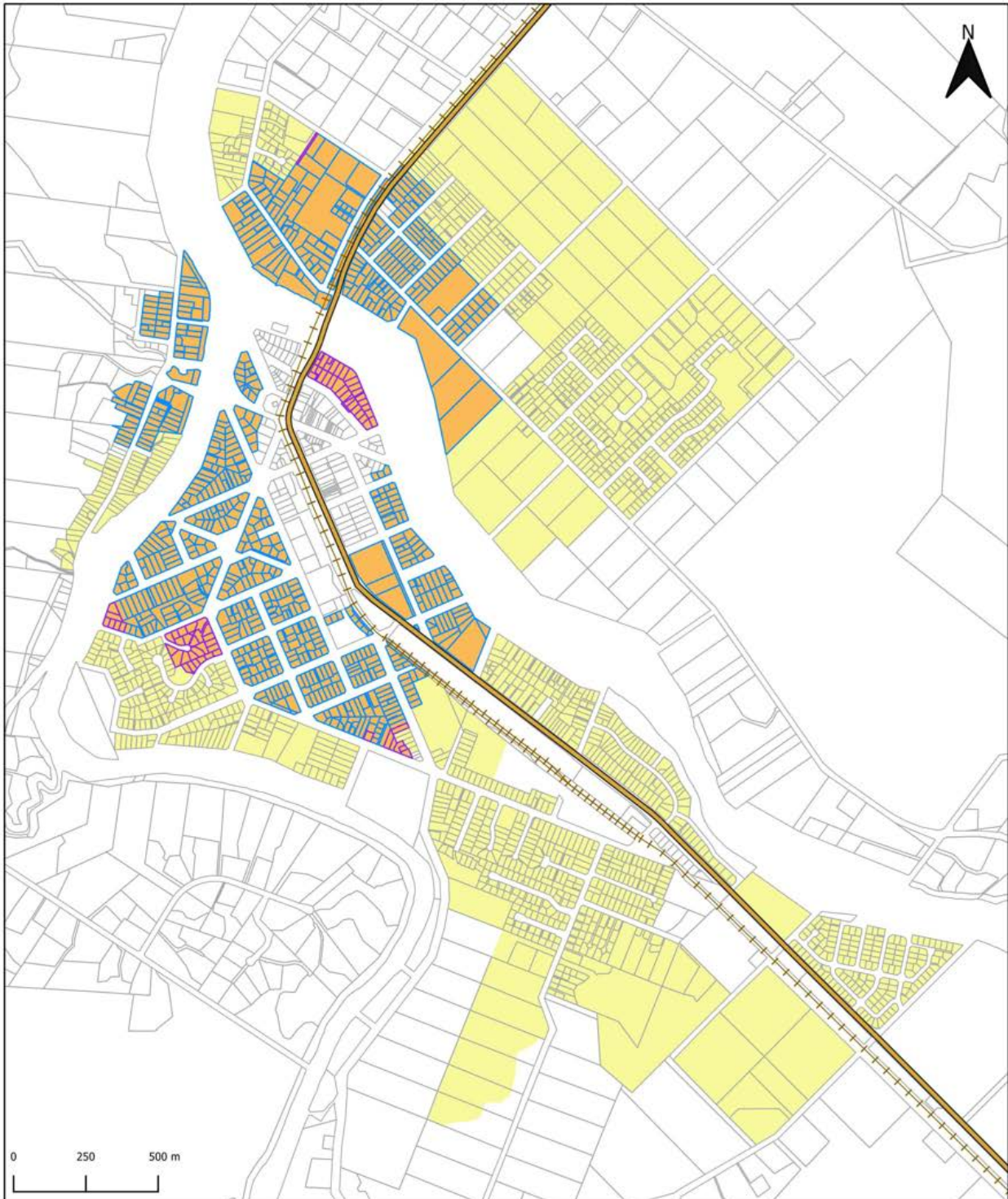


- Rezoned from GRZ to MRZ2 - Medium density residential zone 2
- Rezoned from MRZ to MRZ2 - Medium density residential zone 2
- GRZ – General residential zone
- Parcel boundaries
- Major Road
- Rail centre line



Proposed zoning - Huntly

Waikato District Council
 Prepared 12 Sep 2022
 Cadastre Boundaries and addresses
 Land Information New Zealand
 Projection: NZTM2000
 Ref: ME 37806 V1



- Rezoned from GRZ to MRZ2 - Medium density residential zone 2
- GRZ – General residential zone
- Rezoned from MRZ to MRZ2 - Medium density residential zone 2
- Major Road
- Rail centre line
- Parcel boundaries



Proposed zoning - Ngaruawahia

Waikato District Council
 Prepared 12 Sep 2022
 Cadastre Boundaries and addresses
 Land Information New Zealand
 Projection: NZTM2000
 Ref: ME 37806 V1

Evaluation of Preferred Option Against Objective(s)		
	Costs	Benefits
Environmental	<p>May result in reverse sensitivity effects where medium density residential development is enabled closer to the General rural zone where rural production activities take place. This is a particular risk for the western edge of Tuakau.</p> <p>Increased stormwater runoff generated due to higher levels of development and impermeable surfaces on the site proposed to rezoned.</p>	<p>Enables more people to live in close proximity to the town centres, where alternative transport options are more viable and reduces dependence on private vehicles for short trips.</p>
Economic	<p>Increased costs to service those sites.</p>	<p>Increased residential development potential.</p> <p>Increased value of the sites proposed to be rezoned.</p> <p>Increases the population within walking distance of the town centre, supporting the economic viability of the town centres.</p>
Social	<p>May change the character of those areas if development is promulgated.</p>	<p>Increases housing choice and a range of living options by enabling more development.</p> <p>Results in a logical zoning pattern.</p> <p>Increases the population within walking distance of the town centre.</p> <p>May make public transport more viable due to increased population density.</p> <p>Increases development options for those rezoned sites.</p>
Cultural	<p>There are no cultural costs.</p>	<p>Provides people to meet their cultural needs and way of living e.g., multi-generational living.</p>

Economic growth provided or reduced	The rezoning of these sites may result in modest economic growth of the town centres, simply because it will enable an increase in the population surrounding the towns. Rezoning will support the economic viability of the towns. The increased potential for additional houses will support the construction industry and associated services such as earthmoving and surveying.
Employment opportunities	The proposed rezoning may lead to employment opportunities associated with increased economic activity in the towns.
Uncertain or insufficient information	The most significant uncertainty is the level of uptake on the additional intensification enabled by Variation 3. While zoning can <i>enable</i> development, it does not <i>require</i> it.
Risk of acting or not acting	The risks associated with not acting are low. Variation 3 proposes a modest number of sites are up-zoned to create a more logical zoning pattern and to support development within the approximate 800m walking catching of the four towns. The rezoning of these sites could enable a modest increase in the housing stock and therefore population increase in the towns, with Tuakau proposed to have the largest number of sites rezoned.
Effectiveness	
The rezoning of sites within the approximate 800m walkable catchment of the four towns is the most effective way to create a compact, walkable town. The sites have been considered on a site-by-site basis and the characteristics of each site lends itself to intensification.	
Efficiency	
The approach is the most efficient to enable additional development within the approximate 800m walking catchment. Other options include amending the rules to enable development within 800m walking catchment, however zoning provides the most certainty for those landowners and their communities.	
Summary	
Rezoning 446 properties is the most effective and efficient way to achieve intensification around the four town centres. This will achieve UFD-OI which seeks to create a compact urban form that provides for connected, liveable communities. In addition, this approach gives effect to Objective I of the NPS-UD which seeks to create well-functioning urban environments. The rezoning of the sites as proposed will create a more logical zoning pattern and will support intensification within walking distance of the town centres.	

8 Conclusion

After undertaking an evaluation as required by Section 32 of the RMA, the objectives in Variation 3 are considered the most appropriate way to achieve the Purpose of the RMA (Section 5).

It is considered that the recommended policies and methods outlined above are the most appropriate way for achieving the objectives (both in Variation 3 as well as other parts of the PDP), having considered:

- a. other reasonably practicable options for achieving the objective; and
- b. assessing the efficiency and effectiveness of the provisions in achieving the objectives.

APPENDIX I: Detailed Explanation of Proposed Provisions

The table provides an explanation/rational of the provisions of the Variation, making references to where these are consistent with Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.

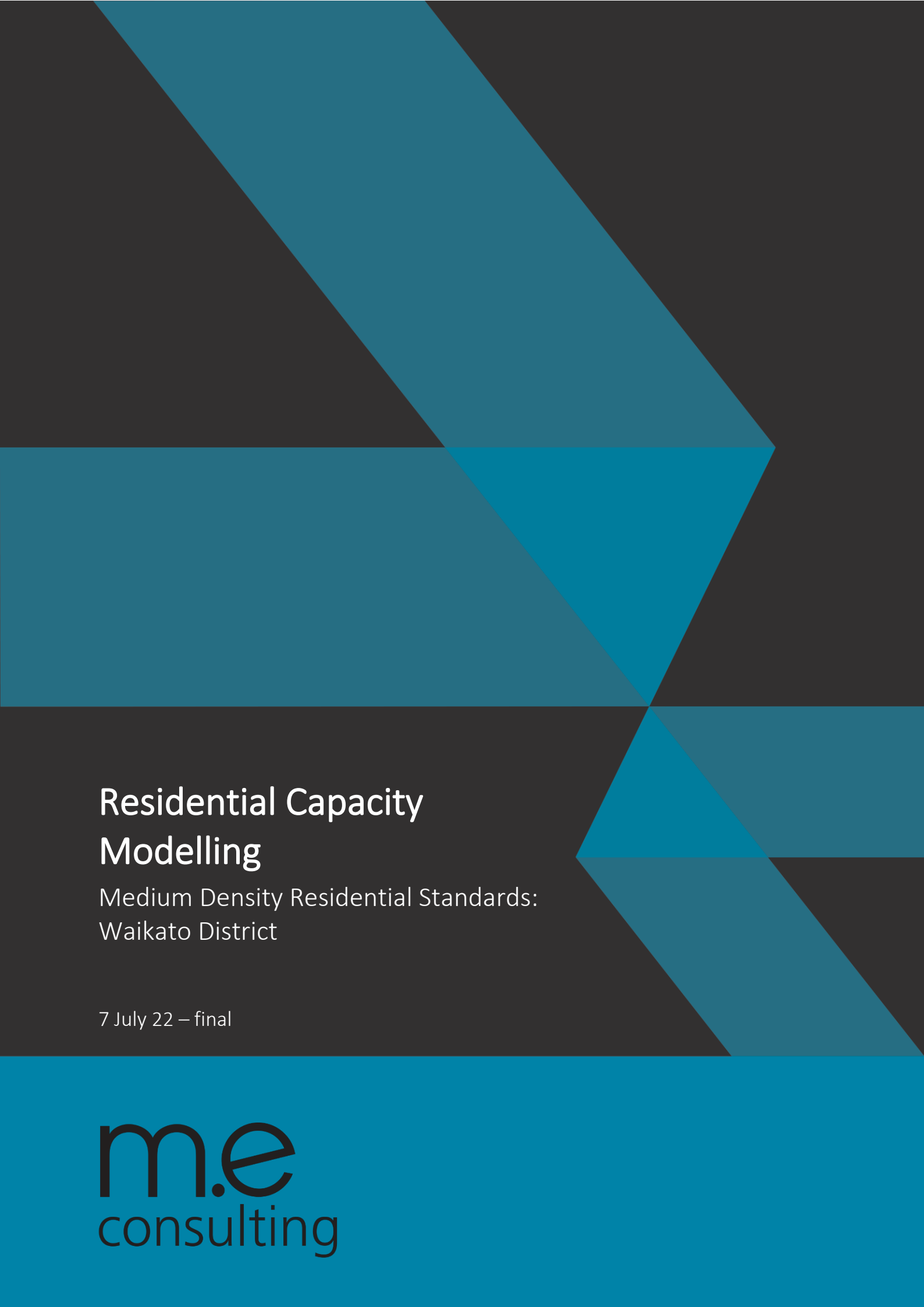
Provision	Rationale/Comment
Part 1: Introduction and General Provisions	
Definitions Include definitions for “landscaped area”, “MDRS”, “qualifying matters”, “servicing area”.	To clarify the meaning of words that are included within the provisions that are required to be included under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.
Abbreviations Abbreviation for MDRS	To clarify the meaning of the acronym which is referenced within the provisions that are required to be included under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.
Part 2: District-wide matters	
SD Strategic Directions: <ul style="list-style-type: none"> • Include new Objective SD-O14 • Include new Policy SD-P2 	The inclusion of this objective and policy relating to well-functioning urban environments and policy relating to relevant residential zones is required under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.
TRPT Transportation, EGEN Electricity Generation, TEL Telecommunications and radiocommunications, WWS Water, wastewater and stormwater, HAZS Hazardous substances, NH Natural hazards and climate change, EW Earthworks, LIGHT Light, NOISE Noise, SIGN Signs and TEMP Temporary activities: Amend references throughout the Chapters from MRZ – Medium density residential zone to MRZ1 – Medium density residential zone 1: <ul style="list-style-type: none"> • Include reference to MRZ2 – Medium density residential zone 2 throughout the chapters. 	The introduction of the new MRZ2 zone has necessitated an update to the referencing of MRZ to MRZ1 to clearly distinguish between the two zones throughout the district plan. Given the similarities between the MRZ1 and the MRZ2 zones it is considered appropriate to apply the district-wide rules of the MRZ1 to the MRZ2.
SUB Subdivision <ul style="list-style-type: none"> • Amend SUB-P3 	SUB-P3(1) relates to the use of minimum lot sizes to achieve character and density outcomes. The existing policy is not consistent with the desired outcomes of the MDRS. The Policy has been amended to exempt residential subdivision within the MRZ2 – Medium density residential zone 2 and instead seek to enable medium density residential outcomes within the MRZ2 (SUB-P3(3)).

<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Include new Policy SUB-P23 	<p>SUB-P23 relates to enabling medium density residential outcomes, except where a qualifying matter applies or where the relevant standards cannot be met. The policy provides directives that support the proposed new subdivision rules that are required under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Amend references throughout the Chapters from MRZ – Medium density residential zone to MRZ1 – Medium density residential zone 1 	<p>The introduction of the new MRZ2 zone has necessitated an update to the referencing of MRZ to MRZ1 to clearly distinguish between the two zones throughout the chapter.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Amend rule SUB-R153 	<p>SUB-R153 which has been amended to exclude general subdivision where SUB-R154 (residential subdivision) applies and to remove Council's discretion in relation to the likely future effects on the environment as a result of future building platforms. The amendments are necessary to remove inconsistencies with the outcomes sought by the MDRS.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • New Rule SUB-R154 	<p>SUB-R154 is required to be included under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. The rule provides for residential subdivision that complies with the MDRS as a controlled activity that is exempt from public or limited notification.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Do not apply Rule SUB-R155 	<p>SUB-R155 has not been brought across into the Medium density residential zone 2 as it relates to minimum lot sizes and is inconsistent with SUB-R154.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Do not apply Rule SUB-R159 	<p>While SUB-R36 applies rules regarding subdivision of contaminated sites to the Medium density residential zone, this rule has not been replicated for Medium density residential zone 2 as it is inconsistent with the management of contaminated land in the MDRS. The National Environmental Standard for assessing and managing contaminants in soil to protect human health (NES-CS) effectively manages subdivision and contaminated land.</p>
<p>SUB Subdivision</p> <ul style="list-style-type: none"> • Include Rule SUB-R163 	<p>SUB-R163 is included to manage subdivision within the National Grid Corridor. The National Grid Corridor is an identified Qualifying Matter and therefore the additional controls proposed are consistent with the outcomes sought by the MDRS.</p>
Part 3: Area-specific matters	
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Amend the purpose of the zone 	<p>The purpose of the zone has been updated to reflect the outcomes sought within the MRZ2 in relation to medium density residential outcomes specifically in Huntly, Ngaaruawaahia, Pookeno and Tuakau.</p>
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Include new Objective MRZ2-O1 	<p>The inclusion of new Objectives and Policies MRZ2-O1, MRZ2-P1, MRZ2-P2, MRZ2-P3, MRZ2-P4 is required by Schedule 3A of the Resource</p>

<ul style="list-style-type: none"> • Include new Policies MRZ2-P, MRZ2-P2, MRZ2-P3, and MRZ2-P4 	Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Amend MRZ2-O3 	The amendment of MRZ2-O3 in relation to residential amenity is to reflect the envisaged future urban character of the MRZ2.
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Include new Objectives MRZ-O5 and MRZ2-O6 • Include new Policies MRZ2-P6 and MRZ2-P11 	The inclusion of new Objectives and Policies MRZ2-O5 and MRZ2-O6, MRZ2-P6 and MRZ2-P11 in relation to Qualifying Matters and reverse sensitivity to support the underlying new rules that require setbacks to protect and provide for identified qualifying matters (consistent with the requirements of Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021.
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Include new Rules MRZ2-R10 and MRZ2-R11 	Inclusion of new rules MRZ2-R10 and MRZ2-R11 in relation to buildings, construction and uses within the National Grid Yard is in response to an identified qualifying matter and is therefore consistent with the requirements of Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. The new rule replicates the National Grid Yard rule contained within GRZ – General Residential Zone of the Proposed Waikato District Plan – Decision Version.
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Include MDRS Standards MRZ2-S1 – MRZ2-S9 	Inclusion of the MDRS standards (MRZ2-S1 – MRZ2-S9) and notification exemptions under Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. As required, the standards have immediate legal effect. The proposed matters of discretion are consistent with the matters of discretion for the equivalent rules/standards for the MRZ1 – Medium density residential zone 1.
<p>MRZ2 Medium density residential zone 2</p> <ul style="list-style-type: none"> • Amend Standard MRZ2-S13 	Amended setback requirements to water bodies to reflect the setbacks required to protect and provide for the natural character values of waterbodies (as qualifying matters). The setbacks are based on the approach of 25m + the normal setback for a building for the Waikato and Waipa Rivers, and 20m + the normal zone setback for other rivers.
<p>MRZ2 – Medium density residential zone 2</p> <ul style="list-style-type: none"> • Include Standard MRZ2-S14 	Inclusion of MRZ2-S14 is in relation to building setbacks to sensitive land uses. This standard responds to qualifying matters and is therefore consistent with the requirements of Schedule 3A of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. The new rule is also generally consistent with the sensitive land uses rule contained within GRZ – General Residential Zone of the Proposed Waikato District Plan – Decision Version.
<p>Chapters 2,4,8-11 TRPT Transportation, 4, 8, 9, TEL Telecommunications and radiocommunications, 11:</p>	The introduction of the new MRZ2 zone has necessitated an update to the referencing of MRZ to

<ul style="list-style-type: none"> Amend references throughout the Chapters from MRZ – Medium density residential zone to MRZI – Medium density residential zone 1. Include reference to MRZ2 – Medium density residential zone 2 throughout the chapters. 	<p>MRZI to clearly distinguish between the two zones throughout the district plan.</p> <p>Given the similarities between the MRZI and the MRZ2 zones it is considered appropriate to apply the district-wide rules of the MRZI to the MRZ2.</p>
PLANNING MAPS	
MRZ2 Medium density residential zone 2	<p>This new zone has been applied to sites within an approximate 800m walkable catchment of the Town Centre Zone in Huntly, Ngaaruawaahia, Pokeno and Tuakau. This is in response to the qualifying matter: urban fringe.</p> <p>This zone is applied to the sites in those four towns which are already zoned Medium density residential zone in the Proposed District Plan (decision version).</p> <p>In addition, 444 sites are proposed to be rezoned from General residential zone to Medium density residential zone 2 because these are located within the 800m walking catchment.</p>
MRZI Medium density residential zone 1	As a consequential amendment of Variation 3, the existing Medium density residential zone in Raglan and Te Kauwhata is renamed from Medium density residential zone to Medium density residential zone 1.
GRZ	Two sites on Helenslee Road, Pokeno are proposed to be rezoned from General rural zone to General residential zone to enable a more logical urban form. These sites are adjoined by General residential zone.

APPENDIX 2: Residential Capacity Modelling



Residential Capacity Modelling

Medium Density Residential Standards:
Waikato District

7 July 22 – final

m.e
consulting



Residential Capacity Modelling

Medium Density Residential Standards:
Waikato District

Prepared for

Waikato District Council

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Report author(s): Susan Fairgray-McLean

Director approval: Greg Akehurst (30 June 2022)

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1 Introduction

As part of the Future Proof Partnership¹ (FPP), Waikato District's urban areas are identified as a tier 1 high growth urban area. Tier 1 urban areas need to incorporate Medium Density Residential Standards (MDRS) into their district plans under the Resource Management (Enabling Housing Supply and Other Matters) Amendment Bill. The MDRS generally increases the level of development that is provided for within urban areas. This report calculates the amount of residential dwelling capacity is enabled within Waikato District's urban areas with the application of the MDRS.

The MDRS enables a higher level of residential development capacity in most areas. It increases the potential yield on each property parcel by enabling up to three dwellings on each site. It also increases the level of development opportunity on each site through expanding the three-dimensional development envelope² within which dwellings can be constructed. In combination, these provisions enable a shift in development patterns from those previously occurring across the district under the existing and past planning provisions. It is important for the FPPs to understand the level of residential capacity provided with the implementation of the MDRS.

M.E have been commissioned by the FPPs to undertake further residential capacity modelling across the urban residential zones in Hamilton City and the Waikato and Waipa districts to understand the level of capacity enabled by the MDRS. The additional modelling builds off the existing residential capacity modelling undertaken in 2021 for the FPPs to meet the requirements of the National Policy Statement on Urban Development (NPS-UD).

Understanding the capacity enabled by the MDRS is an important first stage in understanding the implications of the MDRS. It is likely that development will get taken up through time at a range of densities, including up to that of the MDRS in some locations. However, much of the development capacity delivered by the market is still likely to occur at lower densities, particularly within the short-term, as demand increases through time for higher density dwelling options.

The report briefly sets out the approach undertaken to model the MDRS provisions and presents the district's urban capacity calculations. It is not intended to be a detailed technical report on the model specifications, beyond outlining the key changes and extensions to the Waikato Residential Capacity Model used to model the MDRS. Further technical information on the structure of the Waikato Residential Capacity Model is instead contained within the FPPs Housing Development Capacity Assessment³ (HDCA) and associated technical documentation.

¹ The FPP is formed by Waikato District, Hamilton City, Waipa District, and more recently, the main urban centres of Matamata-Piako District.

² This occurs through a combination of the maximum height allowances (up to three storeys), building setbacks and height to boundary building recession planes.

³ M.E, 2021. *NPS-UD Housing Development Capacity Assessment: Future Proof Partners*, prepared for Future Proof Partners (Hamilton City Council, Waikato District Council and Waipa District Council), 30 July 2021.



The report is structured as follows. Section 2 outlines the changes in modelled development patterns with the application of the MDRS. The modelling approach is then described in Section 3. The focus of Section 3 is on the key stages and development of the modelling approach to reflect the MDRS from the residential capacity modelling undertaken for the HDCA in 2021. The summary results from the modelling are contained in Section 4, and concluding comment in Section 5.



2 Changes in Modelled Development Patterns

The development patterns enabled under the MDRS are substantially different to those that are currently provided for across parts of the district's urban area within the District Plan. If taken up, they would represent a significant step-change in density to past development patterns that have occurred across much of the district's urban areas.

The district's urban areas have previously predominantly been characterised by lower density development in the form of single detached dwellings on full sites. These have generally occurred up to the densities enabled under the Plan, where much of the urban general residential suburban areas have had minimum site size requirements ranging from 450 m² to 875 m². The minimum site size requirements, together with patterns of demand, mean that the development market has generally favoured single level, detached dwellings.

More recently, there has been some development at higher densities within structure plan areas, with the key area in Lakeside, Te Kauwhata. These have resulted in a number of medium density dwellings, including some two-level attached dwellings and two-level detached dwellings on much smaller sites. The Proposed District Plan (PDP) also includes a Medium Density Residential Zone, applied in central areas within a number of urban areas, which allows for a similar level of development to the MDRS.

The MDRS generally provides for a substantially higher level of development capacity across much of the district's urban residential areas. These are set out in the MDRS fact sheet⁴ and Schedule 3A Part 2 of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Bill. It enables up to three dwellings to be constructed on each site that are up to three storeys high. These are also able to be constructed within an expanded three-dimensional building envelope through the combination of greater allowances in height limits, required setbacks from boundaries and height to boundary recession planes.

These provisions, if applied across the district's urban residential areas, would enable higher density development and dwelling typologies than have previously been provided for within many parts of the district. This increases the total residential capacity within the district's urban areas.

If the MDRS provisions are applied to the existing underlying zoning structure, then they would produce a range of medium to higher density dwelling typologies. These range from smaller two-level detached dwellings on smaller sites, up to two to three-level attached dwellings on the smallest land areas (per dwelling) enabled by the standards. At the highest end of the modelled densities, the modelling has assumed that these would reflect horizontally attached 2-3 level walk-up terraced housing. The modelling assumptions around minimum site areas are outlined in Section 3.4.

⁴ Ministry for the Environment, 2022. *Medium Density Residential Standards: A guide for territorial authorities*, 21 April 2022, <https://environment.govt.nz/assets/publications/Medium-density-residential-standards-A-guide-for-territorial-authorities-v2.pdf>, accessed at June 2022.



3 Modelling Approach

This section outlines the modelling approach that has been undertaken to model the capacity enabled by the MDRS within the Waikato District’s urban areas. It identifies the key changes and extensions that have been constructed within the Waikato Residential Capacity Model to reflect the provisions of the MDRS.

The estimation of capacity has been undertaken at the parcel level, extending upon the M.E Residential Capacity Model developed for the 2021 HDCA. It is an estimation of the net additional dwellings that can be accommodated on each parcel.

The modelling firstly calculated the capacity enabled under the Plan (plan enabled capacity), and then estimated the share of capacity that is likely to potentially represent commercially feasible development options for profit-driven commercial developers. This section sets out the key changes and extensions developed for the 2021 HDCA capacity model to reflect the MDRS provisions. It is not intended to be a technical document describing the Model in its entirety, which can instead be found within the 2021 HDCA and associated documentation.

An outline of the approach, noting the key changes/extensions is set out in the sub-sections below.

3.1 Capacity Structure

Zoning and Urban Spatial Structure

Modelling has been undertaken across all urban residential zones within the district’s urban areas. These include zones that are developed at an urban density and exclude residential development in other zones that are developed at lower densities (e.g. rural and lifestyle dwellings).

As requested by Waikato District Council (WDC), the Proposed District Plan Decisions Version (PDP) has been applied as the underlying base zoning file for the modelling. This differs to the 2021 HDCA modelling, where the ODP was modelled in the short-term (measuring current capacity) and an earlier version of the PDP (as at the time of the assessment) modelled for the medium-term. A full comparison of the differences between the PDPs (2021 draft version and 2022 Decisions Version) can be undertaken through the Waikato District Council website. A key difference is the more widespread application of the Medium Density Residential Zone within the Decisions Version. WDC has also supplied further information on structure plan and development agreement yields within selected greenfield areas, which have been applied in this assessment.

The PDP urban residential zones across which the modelling has been undertaken include:

- General Residential Zone
 - Te Kauwhata Ecological Residential Area (sub-zone)
 - Lakeside zones (sub-zones)
 - All other areas
- Medium Density Residential Zone

- Rangitahi Peninsula Zone
- Hopuhopu Zone
- Ohinewai Zone
- Future Urban Zone (applied at the General Residential Zone densities, as requested by WDC)

Analysis was undertaken across the above zones using the same urban structure as the HDCA. The local areas within this structure include:

- Pokeno
- Tuakau
- Te Kauwhata
- Ohinewai
- Huntly
- Taupiri
- Hopuhopu
- Ngaruawahia
- Horotiu
- Raglan

Zoned areas within these locations were identified as either greenfield or existing urban areas. A similar approach to the HDCA was followed where the existing urban edge was identified through a combination of aerial photographs and analysis of the most recent LINZ parcel boundary file. There is likely to have been some outward expansion of the urban edge since the analysis undertaken for the HDCA.


Modelled Development Options and Dwelling Typologies

The modelling estimates the number of net additional dwellings that can be accommodated on each site. In line with the HDCA modelling, the Model tests for both infill and redevelopment capacity, and capacity within the existing urban vs. greenfield areas.

Within the existing urban area:

- **Infill capacity** refers to the number of additional dwellings that can be constructed within the existing urban area without the removal or demolition of any existing dwellings. It typically involves the construction of additional dwellings on the vacant areas of parcels (e.g. constructing an additional dwelling in a large back yard area of an already developed property parcel).
- **Redevelopment capacity** refers to the number of additional dwellings that can be constructed within the existing urban area through the redevelopment of sites. It involves the demolition or removal of existing dwellings on a site and the subsequent construction of a greater number of dwellings on the same site.

Within each category, three dwelling typologies are modelled, which each have different site size requirements. They also have different relationships between dwelling size and land area, where smaller sites can generally be developed more efficiently with attached dwellings. The modelled dwelling typologies include standalone (detached) dwellings, attached dwellings, and apartment dwellings. These are a combination of mainly two-level standalone dwellings on smaller sites, and attached dwellings. Attached dwellings are typically 2 storeys and are attached horizontally, with some 3-level development.



The capacity results also include maximums (across the three modelled typologies) of each of infill and redevelopment capacity within the existing urban area. Here, the model returns the greatest yield for each parcel out of the infill and redevelopment capacity options. Under the plan enabled capacity, the maximum redevelopment option will almost always represent the greatest yield. However, under the commercially feasible capacity often only a subset of the development options will be feasible (e.g. infill detached dwellings). This means that the model selects the highest yield from this subset (i.e. feasible dwellings), often resulting in smaller feasible maximums on a parcel than plan enabled maximums.


3.2 Plan Enabled Capacity

The plan enabled capacity estimates the total number of additional dwellings enabled through the application of planning provisions. It does not take into account the commercial feasibility of construction of dwellings or infrastructure constraints.

Modelling Stages

The key stages of the plan enabled capacity modelling are outlined within the HDCA. The main changes and extensions to the MDRS modelling include:

- **Defining the number of sites that can be formed through subdivision of each parcel/vacant area.** This step identifies the number of sites that can be formed through applying the minimum site areas required for subdivision. These are based on the existing PDP minimum site areas for each base zone.
- **Estimate the potential number of dwellings on each formed site.** This additional stage applies assumptions on the land area required to construct a dwelling of each typology and then calculates how many dwellings can be accommodated within each of the formed sites. In line with the MDRS, the model allows for up to three dwellings to be accommodated on each formed site. The model tests for three dwelling typologies – standalone (detached) dwellings, attached dwellings and apartment dwellings. Larger minimum land areas are required to accommodate detached dwellings than attached dwellings. The input table in Section 3.4 identifies the input assumptions for minimum land area required for each dwelling typology within each zone and scenario. These minimum land areas take into account the maximum densities observed in recent developments in other locations in relation to the average land area required to accommodate each dwelling. They have also been tested for their ability to accommodate a minimum floorspace area within a 3-dimensional building footprint (up to 3 storeys) and outdoor living space requirements.
- **Infill modelling.** A geometrical approach has been undertaken within FME GIS modelling software to identify the vacant areas of existing parcels that are suitable for infill development. The approach is outlined in more detail within the 2021 HDCA and associated documentation, and has been modified in the following ways to reflect the MDRS:
 - The setbacks from site boundaries as set out within the MDRS have been applied.
 - Vacant areas are tested for their potential road access.
 - Road accessible vacant areas are then tested for their ability to accommodate dwellings through the application of shape factor input assumptions. Under the MDRS modelling, up to three shape factors on each site were tested (compared to 1 to 2 shape factors under the HDCA modelling). The number of shape factors accommodated determined the



number of dwellings tested on each site. The shape factor input assumptions are included within the input table.

- Infill areas were then adjusted to allow for planning requirements to be met for any existing dwellings on the remainder of the site (using the MDRS parameters). The final areas were then input into the Residential Capacity MDRS Model to test for plan enabled and feasible capacity.

3.3 Commercially Feasible Capacity

The commercially feasible capacity estimates the share of plan enabled capacity that would represent potentially feasible development options for commercial developers to construct a dwelling(s). The calculations are undertaken at the parcel level to estimate the costs of constructing the dwellings estimated to be able to be accommodated under the planning provisions, then compared to a potential sales price to determine if there is a sufficient margin for developments to be potentially commercially feasible.


The MDRS commercial feasibility model expands upon the existing modelling capability developed under the HDCA. Different components of the model are replaced/expanded to reflect the MDRS provisions. The key components are:

- **Estimating the size and configuration of dwellings on each parcel.** The model firstly estimates the physical features of each potential dwelling on the formed parcels. It estimates the floorspace size and number of storeys of each dwelling, with the three different dwelling types (not additive) tested for each site. This component of the HDCA model is replaced with a new component that reflects the step-change in the nature of development under the MDRS. This is important because the relationships of dwelling size and type relative to site sizes are likely to be substantially different under the MDRS. This has implications for construction costs.

The model runs off a series of floor area ratio (FAR) curves that estimate the dwelling size that can be constructed on each site. These are established through assessing the dwelling sizes recently developed in higher density locations in other areas. They are also cross-checked against the three-dimensional parameters of the MDRS. This part of the model also identifies the number of storeys of each dwelling.

Minimum dwelling site area for each typology and for each underlying PDP base zone are contained in Table 3-1 in Section 3.4. The model will tend toward these dwellings as a minimum, but will generate a range of dwelling sizes based on the initial site size formation. The dwelling sizes allocated will be at these levels or larger as they are scaled to the calculated land area per dwelling on each site.

The outputs of this component of the model are the number of dwellings on each site, their floorspace size and storeys. This is calculated for each dwelling typology option (standalone dwellings vs. duplex/terraced dwellings vs. apartments). These are not additive, but a maximum yield is identified for each parcel (as set out in Section 3.1) where the model selects the highest individual yield that can be constructed. These outputs form the inputs to the next stage of the model where the cost is calculated to construct each potential dwelling.

- 
- **Estimating the cost to construct each dwelling.** This stage of the model estimates the total cost to construct each dwelling identified within the previous stage. The structure of the model is consistent with that used under the HDCA, with a number of updated components as noted below. Updates have occurred in relation to both updated base costs as well as updates to the structure of costs to reflect the shift in the nature of dwelling development.

The costs applied within the model include:

- i. Land costs.
 - ii. Existing dwelling costs (redevelopment).
 - iii. Site preparation costs including landscaping and driveway/parking areas and any demolition costs. These ratios to site area have also been updated from the HDCA.
 - iv. Construction costs. In addition to the base level cost increases in construction, further cost increases have been applied within the model to reflect a shift in the average number of storeys per dwelling where per metre rates increase with the number of storeys. These have been applied at an individual level to reflect the estimated number of storeys of each dwelling. As such, there is a substantial per m² cost increase within the model from the HDCA arising from a combination of base level shifts and changes in the nature of dwellings.
 - v. Ancillary costs (infrastructure/utilities connections, professional services, consents, development contributions). HCC have supplied updated development contributions information which has been applied within the model.
- **Estimating the potential sales price of each dwelling.** This component of the model has been updated significantly from the HDCA. Updates relate to the sales prices for higher density dwellings as well as the underlying spatial structure affecting prices.
 - **Base Spatial Structure.** At a base level, the model applies the same spatial structure as the HDCA, driven by the urban spatial structure identified in Section 3.1. This structure is also applied to the parcel land prices.
 - **Estimation from other markets.** Analysis of higher density dwellings within other urban economies was undertaken to inform the modelled sales prices within the urban areas across the district. This included considering the differences between sales prices of higher density dwellings and other dwellings at a density reflective of existing lower densities within similar areas. This approach was undertaken within the context of limited data from limited establishment of medium to higher density dwellings within the district's market.

As requested, commercial feasibility modelling has been undertaken within the current market and reflects the areas of plan enabled capacity that may potentially represent feasible options for commercial developers. Importantly, it should not be confused with growth – it is a measure of the potential capacity, some of which is likely to get taken up by the market with growth. Refer to the 2021 HDCA for a more detailed description of the measure of commercially feasible capacity.

3.4 Modelling Density Inputs

Minimum subdivision area requirements and land areas per dwelling formed inputs to the model. These are the initial land areas required to form a site within each zone, which could then be tested to accommodate up to three dwellings; and the land areas required, per dwelling, within these formed sites.



The minimum subdivision area requirements were supplied by WDC and reflect the subdivision requirements of the PDP. The minimum land area requirements were then established as input assumptions within the model. These are contained below in Table 3-1.

Initial three-dimensional modelling work undertaken by the Hamilton City Council (HCC) GIS team estimated the land areas required to accommodate different dwelling sizes and typologies. These were analysed as a starting point to determine parameters to apply to the Waikato District urban areas. The land areas per attached and apartment dwelling within each site reflect one-third of the initial site formation area to accommodate three dwellings upon each site. The viability of these densities was triangulated with the initial HCC modelling. Larger minimum areas (based on analysis of development patterns in other urban economies) were assumed to be required for detached dwellings to reflect the site area required to physically construct a standalone dwelling.

Zones with larger minimum subdivision site areas contained larger minimum land area per dwelling requirements. These were set at a minimum of one third of the subdivision area to ensure the model allocated only up to three dwellings per site.

Importantly, Table 3-1 contains the *minimum* land areas which are formed within the model to accommodate dwellings. These have been applied to the existing spatial structure of the WDC Ratings Database, with sites formed using the existing ratings parcel boundaries. In most cases, the existing parcel boundaries exceed the minimum areas, meaning that sites (and corresponding land areas per dwelling) are formed at lower densities than the minimums within the table⁵.


In several areas, agreed subdivision yields that were at densities that differed to the PDP zone, were supplied by WDC. The model was required to adopt these densities for the initial site formation to reflect the structure/development plan yields. The MDRS were then applied to these formed lots to accommodate up to three dwellings on each site.

Initial conversions have been applied to the Waikato District greenfield areas prior to the application of the land areas in Table 3-1. Greenfield areas were first multiplied by a factor of less than 100% to take account of the share of area within the greenfield growth cells that is unlikely to be developable. This is an important step as the PDP contains a number of greenfield areas that have been broadly identified as future growth areas that do not take into account land features that would likely limit the developable area.

The initial developable area conversion factors, applied by location are set out below. Lower conversion rates were applied in some locations to reflect the developable areas identified from structure plans or development agreements:

- Pokeno – 70%
- Tuakau – 70%
- Te Kauwhata – 70%
- Ohinewai – 59%
- Huntly – 70%

⁵ For example, if a General Residential Zone parcel of 850m² were entered into the model, it would form only one initial site due to insufficient land area to form two sites at the zone's minimum subdivision requirement of 450m². Consequently, the model would construct dwellings at an average land area of 283m² per dwelling.

- 
- Taupiri – 70%
 - Hopuhopu – 44%
 - Ngaruawahia – 70%
 - Horotiu – 70%
 - Raglan⁶ – 70%

Following the calculation of greenfield developable areas, these net areas were then multiplied by a further 70% to include an allowance of 30% of the developable area for roads and reserves⁷. The remaining net areas were then divided into lots and dwellings in accordance with Table 3-1.

⁶ Rangitahi Peninsula Zone lots by precinct were applied as individualised site areas within the model.

⁷ For example, a 10ha General Residential Zone greenfield block of land identified broadly within the PDP in Pokeno would translate into 7ha of developable area. This would then translate into 4,900m² of net land area that would be divided into lots at a density of 450m² per lot to form around 109 lots, each potentially accommodating up to three dwellings.



Table 3-1: Minimum Site Area Subdivision and Land Area per Dwelling Minimum Modelling Inputs by Zone and Typology (MDRS Applied)

Waikato District PDP Base Zone	Sub-Zone/Area	Dwelling Typology	Initial Subdivision Requirement - Land Area (m2)	Minimum Land Area per Dwelling (m2)
General Residential Zone	Reticulated Services	Detached	450	200
General Residential Zone	Reticulated Services	Attached	450	150
General Residential Zone	Reticulated Services	Apartments	450	150
General Residential Zone	Te Kauwhata Ecological Residential Area	Detached	875	290
General Residential Zone	Te Kauwhata Ecological Residential Area	Attached	875	290
General Residential Zone	Te Kauwhata Ecological Residential Area	Apartments	875	290
General Residential Zone	Lakeside Te Kauwhata Precinct - Medium Density Area	Detached	450	200
General Residential Zone	Lakeside Te Kauwhata Precinct - Medium Density Area	Attached	450	150
General Residential Zone	Lakeside Te Kauwhata Precinct - Medium Density Area	Apartments	450	150
General Residential Zone	Lakeside Te Kauwhata Precinct - High Density Area	Detached	250	175
General Residential Zone	Lakeside Te Kauwhata Precinct - High Density Area	Attached	250	83
General Residential Zone	Lakeside Te Kauwhata Precinct - High Density Area	Apartments	250	83
General Residential Zone	Lakeside Te Kauwhata Precinct - Non-Reticulated	Detached	2500	830
General Residential Zone	Lakeside Te Kauwhata Precinct - Non-Reticulated	Attached	2500	830
General Residential Zone	Lakeside Te Kauwhata Precinct - Non-Reticulated	Apartments	2500	830
Medium Density Residential Zone	Reticulated Services	Detached	200	175
Medium Density Residential Zone	Reticulated Services	Attached	200	67
Medium Density Residential Zone	Reticulated Services	Apartments	200	67
Future Urban Zone	Raglan	Detached	450	200
Future Urban Zone	Raglan	Attached	450	150
Future Urban Zone	Raglan	Apartments	450	150
Future Urban Zone	Huntly	Detached	450	200
Future Urban Zone	Huntly	Attached	450	150
Future Urban Zone	Huntly	Apartments	450	150
Future Urban Zone	Ohinewai	Detached	450	200
Future Urban Zone	Ohinewai	Attached	450	150
Future Urban Zone	Ohinewai	Apartments	450	150
Future Urban Zone	Pokeno	Detached	450	200
Future Urban Zone	Pokeno	Attached	450	150
Future Urban Zone	Pokeno	Apartments	450	150
Future Urban Zone	Tuakau	Detached	450	200
Future Urban Zone	Tuakau	Attached	450	150
Future Urban Zone	Tuakau	Apartments	450	150
Hopuhopu Zone		Detached	450	200
Hopuhopu Zone		Attached	450	150
Hopuhopu Zone		Apartments	450	150
Ohinewai Zone		Detached	450	200
Ohinewai Zone		Attached	450	150
Ohinewai Zone		Apartments	450	150

Source: M.E Waikato District Residential Capacity Model, 2022.



4 Modelled Capacity

This section contains the modelled results of the plan enabled and commercially feasible capacity through the application of the MDRS. It contains the summary tables of capacity by location across the spatial structure. More detailed information of capacity at a parcel level has been supplied as GIS files to WDC.

The capacity results are net additional dwellings where the existing dwellings have been removed from the calculated gross yields on each parcel. The tables within the following sub-sections show the net additional dwellings in accordance with the capacity structure outline in Section 3.1.

The first portion of the table shows the modelled capacity within each typology for infill development, including a maximum yield across the three typologies⁸. The middle section contains the redevelopment capacity across the three options, including maximums for redevelopment as well as redevelopment and infill options combined. The remainder of the table shows the greenfield capacity in this structure.

Importantly, the columns within the table are not additive. The maximum columns show the maximum yield combinations within each development pathway (infill, redevelopment or greenfield), as well as the final column containing the total across the greenfield and existing urban areas.

4.1 Plan Enabled Capacity

The modelled plan enabled capacity is contained in Table 4-1. It shows the net additional dwellings that would be enabled with the application of the MDRS to the PDP base zones.

In total, there is an estimated plan enabled capacity for an additional 122,300 dwellings. Just over half (53%; 64,400 dwellings) of the capacity is within the existing urban area, where redevelopment capacity is over double that of the infill capacity.

The plan enabled capacity, if taken up, would represent a larger increase in the number of households within the existing urban footprint of the urban areas of the district. If all existing urban area parcels were redeveloped, then it would result in a number of dwellings around seven times the size of the existing urban dwellings base.

The capacity is also large within the greenfield areas, enabling an additional 57,800 dwellings with the application of MDRS across these areas.

The plan enabled capacity is spread across the north, mid and southern parts of the district's urban areas. Over one-third (38%; 46,400 dwellings) is contained within the northern parts of the district in Pokeno and

⁸ The maximum yield has been calculated at the parcel level and then aggregated to each location within the table. This means that the maximums within the commercially feasible tables will in most cases not align with the largest column value by typology. This is because some parcels may have feasible development options across higher density dwelling options, while others may only have feasible capacity for lower yield options. Therefore, the aggregation of feasible yields at the parcel level is a combination of some development within higher density typologies, and others at lower density typologies.

Tuakau, with greenfield areas accounting for over half of this capacity. In total, nearly half (47%; 27,100 dwellings) of the district’s greenfield capacity occurs within the northern part of the district.

A further third (32%; 39,500 dwellings) of the district’s total additional capacity is contained within the southern parts of the district. This includes the areas within proximity to the northern parts of Hamilton (Taupiri, Hopuhopu, Ngaruawahia and Horotiu) and Raglan. Around two-thirds of this capacity is within the existing urban areas. These areas contain around one-quarter (26%; 14,800 dwellings) of the district’s greenfield dwelling capacity.

The remainder of the capacity (30%; 36,400 dwellings) is located within the mid part of the district in Te Kauwhata, Ohinewai and Huntly.

Table 4-1: Plan Enabled Capacity by Location within Waikato District with the Application of MDRS

LEVEL	INFILL				REDEVELOPMENT					Max Infill or Redevelopment	GREENFIELD			Max Greenfield and Existing Urban
	Standalone	Attached	Apartme nt	Max Infill	Standalone	Attached	Apartme nt	Max Redevelo pment	Standalone		Attached	Apartme nt	Max Greenfie ld	
Pokeno	2,000	3,500	3,500	3,500	4,100	7,000	7,000	7,000	7,100	8,400	13,500	13,500	13,500	20,600
Tuakau	1,500	3,800	3,800	3,800	4,300	12,200	12,200	12,200	12,200	8,700	13,600	13,600	13,600	25,800
Te Kauwhata	1,800	4,200	4,200	4,200	3,500	7,700	7,700	7,700	7,800	4,600	7,100	7,100	7,100	14,900
Ohinewai	-	-	-	-	-	-	-	-	-	2,700	4,100	4,100	4,100	4,100
Huntly	3,000	5,900	5,900	5,900	6,900	12,400	12,400	12,400	12,700	2,900	4,600	4,600	4,600	17,400
Taupiri	600	900	900	900	1,000	1,500	1,500	1,500	1,500	1,300	2,000	2,000	2,000	3,500
Hopuhopu	-	-	-	-	-	-	-	-	-	200	300	300	300	300
Ngaruawahia	2,100	5,200	5,200	5,200	5,600	12,800	12,800	12,800	13,000	2,600	4,200	4,200	4,200	17,200
Horotiu	500	700	700	700	800	1,300	1,300	1,300	1,300	800	1,200	1,200	1,200	2,500
Raglan	2,500	4,000	4,000	4,000	5,300	8,600	8,600	8,600	8,900	4,900	7,100	7,100	7,100	16,000
TOTAL	14,100	28,200	28,200	28,200	31,500	63,500	63,500	63,500	64,400	37,200	57,800	57,800	57,800	122,300

Source: M.E Waikato Residential Capacity MDRS Model, 2022.

4.2 Commercially Feasible Capacity

The estimated commercially feasible capacity is contained in Table 4-2 with the application of the MDRS to the PDP base zones. It shows the net additional dwellings that are estimated to represent potentially feasible development options for commercial developers. Importantly, the capacity should not be confused with growth – it is a measure of the potential capacity, some of which is likely to get taken up by the market with growth. Refer to the 2021 HDCA for a more detailed description of the measure of commercially feasible capacity.

The commercially feasible capacity modelled within this section does not take into account any limits occurring through infrastructure constraints. As requested, the modelling has been undertaken to identify areas of potential feasibility without the consideration of infrastructure constraints.

As requested, commercial feasibility modelling has been undertaken within the current market and reflects the areas of plan enabled capacity that may potentially represent feasible options for commercial developers. Furthermore, the modelling has been undertaken using a 20% profit margin. It is likely that some development outside of this range may occur at a lower margin as there are increased shares of plan enabled capacity with estimated lower profit margins.

It is likely that higher shares of the plan enabled capacity would become commercially feasible development options for developers through time with market growth. Medium to higher density development is not yet well established across many areas of the Waikato District. It is likely to become more established over the medium to longer-term.



Table 4-2 shows that there is an estimated commercially feasible capacity of an additional 20,500 dwellings across the Waikato District’s urban areas. This amounts to around 17% of the plan enabled capacity estimated to represent commercially feasible options.

Nearly three-quarters (72%; 14,800 dwellings) of the capacity is within the greenfield areas. A higher share (26%) of the greenfield area plan enabled capacity is estimated to be commercially feasible. In comparison, around 9% (5,700 dwellings) of the existing urban plan enabled capacity is estimated to be commercially feasible options. Part of the difference in these rates reflects the greater ease of greenfield development. Although, the higher potential yields on parcels are likely to have some effect in relation to increasing the feasibility within the existing urban area, particularly for redevelopment capacity.

The modelled feasible capacity is concentrated into the urban areas within the northern parts of the district. Pokeno and Tuakau are estimated to contain over half (58%) of the feasible development capacity (11,900 dwellings). Higher feasible capacity within these locations is due to a combination of a substantial share of the plan enabled capacity being located within these areas as well as higher rates of feasibility within these areas. It is likely that development within these areas will be influenced by pressures within the larger adjacent Auckland market, where these higher densities are more well established.

Other locations with higher rates of feasibility include Te Kauwhata, Raglan and Taupiri. Medium to higher density development is already occurring within Te Kauwhata within the Lakeside development.

A number of areas are showing no/only small amounts of feasible capacity within Table 4-2. The residential markets within these areas are less well established, and therefore are likely to have lower levels of feasibility for these increased development densities. The MDRS capacity within these areas may be feasible, albeit at a lower margin, or increase in feasibility through time with market growth.

Table 4-2: Commercially Feasible Capacity by Location within Waikato District with the Application of MDRS

LEVEL	INFILL				REDEVELOPMENT					Max Infill or Redevelopment	GREENFIELD			Max Greenfield and Existing Urban
	Standalone	Attached	Apartment	Max Infill	Standalone	Attached	Apartment	Max Redevelopment	Standalone		Attached	Apartment	Max Greenfield	
Pokeno	600	700	-	900	500	900	-	1,000	1,200	3,700	3,100	100	5,300	6,500
Tuakau	400	500	-	700	700	1,200	-	1,500	1,600	3,200	1,400	-	3,700	5,400
Te Kauwhata	300	100	-	400	300	100	-	400	400	1,700	90	-	1,800	2,200
Ohinewai	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Huntly	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taupiri	300	-	-	300	300	-	-	300	400	600	-	-	600	1,100
Hopuhopu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ngaruawahia	300	-	-	300	300	-	-	300	400	200	-	-	200	600
Horotiu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Raglan	1,000	100	-	1,100	1,200	200	-	1,300	1,500	3,100	-	-	3,100	4,700
TOTAL	2,800	1,400	-	3,700	3,300	2,300	-	4,800	5,700	12,600	4,600	100	14,800	20,500

Source: M.E Waikato Residential Capacity MDRS Model, 2022.



5 Conclusions

The MDRS provision enable a greater level of capacity and development across much of the urban residential areas of Waikato District. They would enable greater intensification within the existing urban areas, together with higher yields within the greenfield areas.

The total capacity enabled by the provisions would represent very large increases to the existing urban dwelling base. It has been estimated that a share of the plan enabled capacity is likely to represent commercially feasible options for developers, which amounts to around two times the size of the existing household base.

The types of capacity enabled by the MDRS is at a substantially higher density than that provided within many of the main urban residential zones of the PDP, and nearly all zones within the ODP. If capacity is taken up at these densities, then it would represent a significant shift to the development patterns that have previously characterised growth across much of the district's urban areas.

Understanding the capacity enabled by the MDRS is an important first stage in understanding the implications of the MDRS. It is likely that development will get taken up through time at a range of densities, including up to that of the MDRS in some locations. However, much of the development capacity delivered by the market is still likely to occur at lower densities, particularly within the short-term, as demand increases through time for higher density dwelling options.

**APPENDIX 3: The Medium Density Residential Standards
under the Resource Management Act: Estimates of
development impacts at the Statistical Area 2 level**

The Medium Density Residential Standards under the Resource Management Act

Estimates of development impacts at the Statistical Area 2 level

Prepared for
Ministry for the
Environment

14 July 2022





Strictly confidential

Jym Clark
Ministry for the Environment
23 Kate Sheppard Place
Wellington, 6011

14 July 2022

Estimates of development impacts at the Statistical Area 2 level under the Medium Density Residential Standards

Dear Jym,

We are pleased to present to you our report estimating the local level impacts of the Medium Density Residential Standards (MDRS) in the five Tier 1 urban areas. Note that the key results for each local authority are presented in Section 4 and the full results by Statistical Area 2 are provided in Appendix A.

This report is intended to stand alone without need to reference the original cost-benefit analysis of the MDRS. For completeness, we have included the relevant elements of the methodology description from the original CBA.

This report is submitted in accordance with our Consulting Services Order (CSO), dated 2 June 2022, and is subject to the restrictions included at the end of this report.

If you have any queries please do not hesitate to contact us.

Yours sincerely,

A handwritten signature in blue ink that reads 'Colin Lynch'.

Colin Lynch
Partner
Colin.j.lynch@pwc.com
T: 0212417752

Context

In response to housing supply shortages, the Ministry for the Environment required cost-benefit analysis (CBA) of two amendments to the Resource Management Act that require councils to up-zone:

- Implement a new default Medium Density Residential Standards (MDRS) in their residential areas.
- Bring forward the timing of implementation for the intensification policies of the National Policy Statement on Urban Development (NPS-UD), to enable denser housing close to jobs, transport options and areas of high demand.

Now local councils are updating their district plans to comply with the Resource Management (enabling housing supply and other matters) Amendment Act 2021 (‘the Act’). Part of this process involves making applications for “qualifying matters” under the Act – exceptions to the policy in areas that would otherwise be subject to its MDRS. Applications for qualifying matters require, among other things, that councils provide an assessment of the costs and impacts of the implied reduction in development capacity (Section 77J).

However, the CBA for the Act provided aggregate totals for each urban area. The Ministry of Housing and Urban Development is seeking an estimate of the expected development impact of the MDRS within individual Territorial Authority boundaries. The purpose of this estimate is to support local authorities in selecting and preparing their applications for qualifying matters under the Act.

This report provides an estimate of the expected development impact of the MDRS within individual Territorial Authority boundaries, and within each Statistical Area 2 (SA2) area.

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1 Executive summary

The Government introduced a new default Medium Density Residential Standard (MDRS) to reduce barriers to housing supply and improve housing affordability

In late 2021, Government passed the Resource Management (Enabling housing supply and other matters) Amendment Act 2021 ('the Act'). The amendment requires councils in Tier 1 urban environments to up-zone in two ways:

1. Bring forward the timing of implementation for existing intensification policies of the National Policy Statement on Urban Development (NPS-UD).
2. Implement a new default Medium Density Residential Standard (MDRS) in residential areas.

The costs and benefits of the intensification policies in the NPS-UD are estimated elsewhere,¹ but the timing implications are important.

The MDRS is new and:

- a) allows three-storeys and three-units as of right per site
- b) enables:
 - more flexible heights in relation to boundary standards to enable three storeys on average sized sites
 - smaller private outlook spaces (that is, space between windows and other buildings) and private outdoor spaces (for example, balconies)
 - development closer to side boundaries
 - more planning consents (when needed) to proceed on a non-notified basis without neighbour approvals.

The MDRS applies to all existing residential zones, with minor exemptions. The MDRS also applies to new residential zones, such as when rural land is urbanised, as a minimum enablement. It does not apply to land zoned for recreation, open space, or business.

The change implied by the MDRS amounts to a permanent shift in the responsiveness of housing supply to rising prices. This means the impacts of the policy will begin slowly, but continue to build as long as the MDRS remains in place.

A spatial estimate of impact is needed to support local authorities

The purpose of this report is to provide a spatial estimate of the development impact of the MDRS. We aim to do this at a level of granularity that can assist local authorities in meeting their obligations under the NPS-UD as they prepare plan changes in response to the Act. To do this, we build on a proprietary spatial-econometric model originally developed for the cost-benefit analysis that supported the Act during its parliamentary process. We achieve this by using existing parcel-level redevelopment probabilities to simulate 1,000 likely outcomes for each urban area.

¹ See PwC 2020.

The CBA model assesses impacts on the supply of dwellings by understanding the impact of the Auckland Unitary Plan

Our analysis of development impact relies on a spatial econometric model to generate forecasts for Auckland and then adapts the model to data from the wider urban areas of Christchurch, Wellington, Hamilton, and Tauranga for application to those cities.

Our modelling is based on a standard theoretical framework, calibrated to the housing market in each city to arrive at a forecast. The increase in dwelling supply in Auckland following the 2016 enactment of the Auckland Unitary Plan (AUP) provides a natural experiment. The changes under the MDRS create a new city-wide minimum allowable density level similar to the building constraints for one of the AUP zones (Residential Mixed Housing Urban or MHU). We use this recent observed increase in response to a similar policy change to calibrate our forecasts.

However, there are important ways with what happened under the AUP that are different from what we expect to happen under the MDRS. The AUP favoured development at the urban fringe over intensification near the city centre and left in place other constraints to development beyond zoning rules, resulting in some measured results that do not align with the demand patterns predicted by theoretical frameworks for urban spatial equilibrium. The MDRS is intended to alter this. To align our forecasts with that intent, we adjust our model to neutralise the AUP bias toward urban fringe development, allowing demand and opportunity cost characteristics to drive the response to up-zoning instead. When we adjust the model to neutralise the AUP bias toward urban fringe development, we find the most intensive development moving much closer to the city centre. Our base-case scenario shows development closely hugging the NPS-UD walkable catchments around public transport and metropolitan centre areas. This bodes well for the NPS-UD intensification policies, suggesting that previous estimates of their impact may have been understated.

Table 1 shows the estimates from the original MDRS CBA of the additional new dwelling consents in residential areas subject to the MDRS policy during the *five to eight years* following policy enactment. Additional dwellings are those dwellings **over and above** what would be expected to have otherwise occurred without the MDRS. The MDRS is estimated to result in nearly 75,000 additional dwellings above what would otherwise take place in New Zealand’s fastest growing cities in the medium term.

Table 1: Five-to-eight-year additional dwellings added forecasts with sensitivity range

	<i>Base estimate</i>
<i>Auckland</i>	39,200*
<i>Hamilton</i>	8,300
<i>Tauranga</i>	5,800
<i>Wellington</i>	9,800
<i>Christchurch</i>	11,500
<i>Totals</i>	74,600

Source: CBA of the proposed MDRS (2021).

* This base estimate was adjusted downward to 37,500 in subsequent analysis following a change to the policy requirements after the second reading in Parliament. The change concerned the minimum height-in-relation-to-boundary (HIRB), adjusting down from 6m and 60 degrees to 4m and 60 degrees.

Our original CBA did not consider where these development sites are within each city. In this report, we generalise the initial CBA by analysing where these development sites might be within each urban area. We provide an average expected development for each Territorial Authority (TA), at the Statistical Area 2 (SA2) level.

Table 2 below shows the estimates of additional new dwelling consents in residential areas subject to the MDRS policy during the *five to eight years* following policy enactment for each TA. Estimates at the SA2 level are presented in Appendix A. As noted above, the additional dwellings shown in Table 2 are those **over and above** what would be expected to have otherwise occurred without the MDRS.

These estimates are based on various assumptions and a custom metric called the *quality score*. The quality score incorporates the interaction between zone and demand characteristics. We also assume that the average rate of participation in the development market among homeowners, including participation by selling to developers (holding our model variables constant), is similar over time between cities. In addition, wider factors that are not included in the modelling, such as capacity of the construction sector, will influence the actual number of additional dwellings that are realised in this timeframe. Our key model features and assumptions are described in Box B (see page 25).

Table 2: Five-to-eight-year additional dwellings added forecasts by TA

Territorial Authority	Mean Impact	Median Impact	25th Percentile²	75th Percentile³
Auckland	45,839	45,478	37,810	53,429
Waikato District	-425	-429	-619	-232
Hamilton City	10,166	10,142	9,136	11,190
Waipā District	-445	-452	-638	-253
Western Bay of Plenty District	886	880	722	1,038
Tauranga City	3,931	3,906	3,350	4,486
Kapiti Coast District	1,632	1,617	1,382	1,871
Porirua City	474	466	253	690
Upper Hutt City	589	584	458	713
Lower Hutt City	2,087	2,062	1,674	2,470
Wellington City	4,134	4,068	3,414	4,769
Waimakariri District	269	255	45	476
Christchurch City	9,419	9,350	7,521	11,232
Selwyn District	669	661	447	880

Source: Author's analysis

² The 25th percentile is the value that 25% of all estimates lie below, or 75% of all estimates lie above.

³ The 75th percentile is the value that 75% of all estimates lie below, or 25% of all estimates lie above.

We forecast that all but two areas will see an increase in additional dwellings as a result of the MDRS. However, some smaller areas have a negative expected impact due to a reduction in demand as more development occurs in more attractive areas in the wider region. For example, some of the increase in development in Hamilton City is at the 'expense' of development in Waipā District (which may see a lower level of development compared with what would have otherwise occurred without the MDRS).

The range of additional dwellings added in each TA reflects the nature of the model being based on probabilities and the model being run 1,000 times (with different results each time). In reality, predicting the exact occurrence of development is impossible, and we would expect a range of future results across the different TAs, and then again at the SA2 level. The use of a probabilistic approach also means there may be a difference when comparing the aggregate estimates in the original CBA with the sum of our new SA2 estimates for the same corresponding areas (though these estimates are within the same range of uncertainty). We wish to point out that the modelling undertaken in this report is not intended as a revision to the original CBA estimates, which were determined using a different methodology designed for estimating overall regional impacts (in aggregate).

2 The Medium Density Residential Standards

2.1 Overview

2.1.1 The MDRS is estimated to have a significant effect on supply

The new MDRS will affect about 33,600 hectares of residential land in Auckland, including all of the four major residential zones established by the AUP. This is comparable in size to the total area zoned for 3 dwellings or more per site under the AUP, but on average allows for significantly more intensification than the AUP did. In the four other Tier 1 urban areas, the policy will affect most of the residential land.

We have a fortunate alignment of timing with the AUP and post-AUP data that allows us to form a robust estimate of the supply response to a policy change that was a lot like the MDRS. We have high quality data on what happened under the AUP and can use it to inform a forecast for what the MDRS is expected to do in Auckland and other Tier 1 cities. This helps us understand how closely Auckland's case aligns to theoretical predictions, despite the many real-world factors that theoretical models ignore. In other New Zealand cities, we can use local data where it is available, and triangulate between theory and observations of Auckland where it is not.

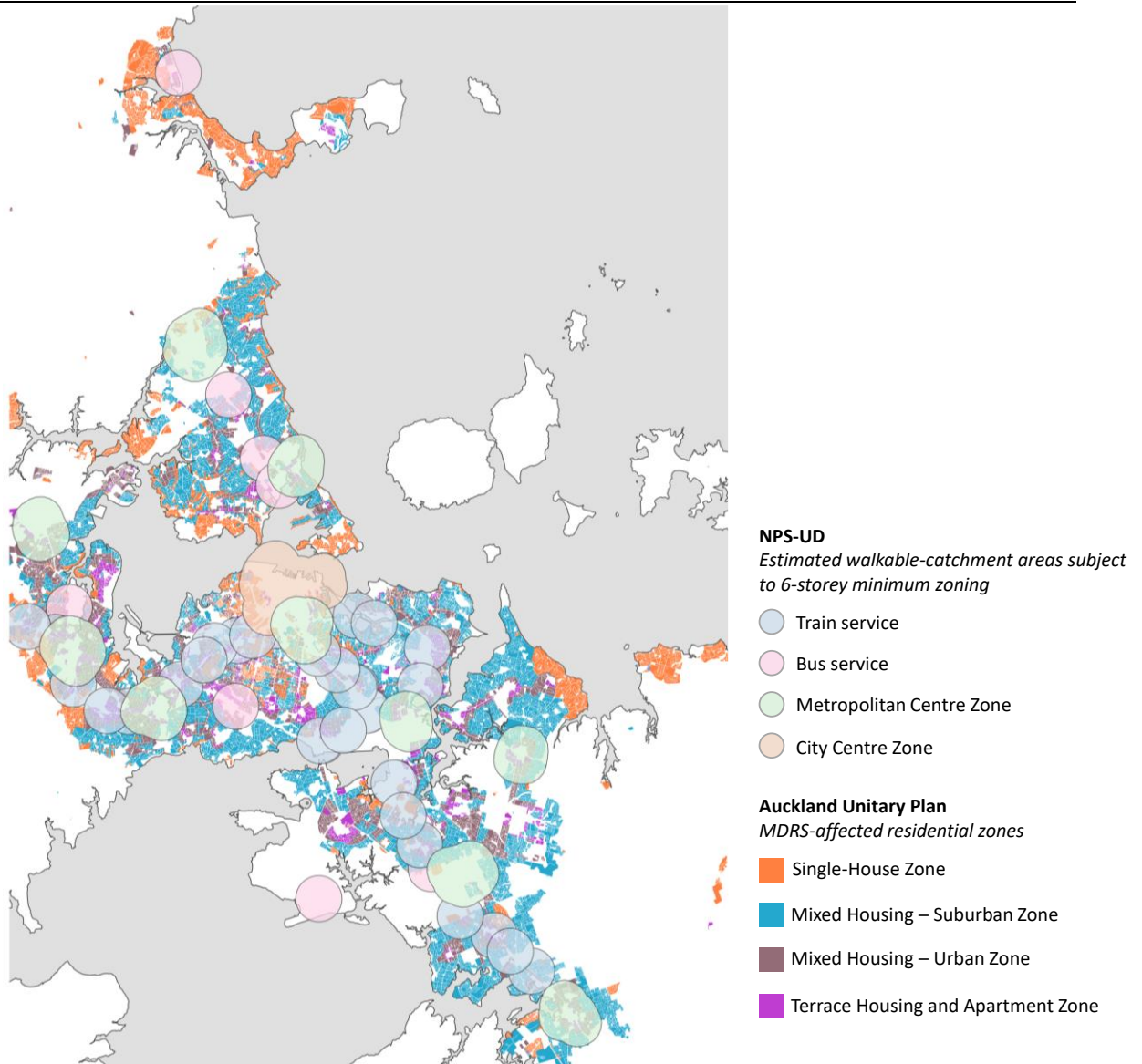
Beyond the AUP, our without-policy forecasts must incorporate another recent and significant departure from past trends—the impact of the NPS-UD. The NPS-UD aims to remove some of the barriers to urban intensification and attempts this using several instruments.

One of these instruments is to mandate a minimum enabled development intensity of 6-storeys within a walkable catchment of rapid transit stops and City Centre and Metropolitan Centre Zones. Figure 1 shows these NPS-UD affected zones, as well as the AUP residential zones for Auckland's core urban area.

The walkable catchment areas shown in Figure 1 are excluded from our estimates of the MDRS impact on housing supply. This is to avoid double-counting effects in those areas that were estimated as part of the benefits of the NPS-UD in the CBA for that policy. However, MDRS rules still apply in these areas. While the MDRS allows for a lower minimum intensity than required by the NPS-UD, it also allows development up to that lower level to proceed 'as of right', without a resource consent (building consents are still required). In this sense, the MDRS may have additional impact inside these NPS-UD catchment areas. These impacts are not included in our modelling.

Of the policy-affected area of 33,600 hectares, we estimate about 12,300 hectares will fall into the walkable catchment areas required to be up-zoned to at least 6-storeys by the NPS-UD. This impact assessment focuses on housing supply effects in the residential land outside of those catchments, where the MDRS represents the greatest departure from the zoning rules that would otherwise prevail. For Auckland, this is an area of 21,300 hectares, or 56 percent of the four major residential zones.

Figure 1: Areas affected by the MDRS policy



Source: HUD data, Auckland Council, authors' analysis.

Note: Walkable catchments are authors' estimates based on Auckland Council Planning Committee proceedings (July 2021).

2.2 Utilising the AUP as a natural experiment

Our model approach and estimates are built on a common theoretical foundation to those used for the CBAs of the NPS-UD and the National Policy Statement on Urban Development Capacity (NPS-UDC), but differ in important ways:

- The CBA for the NPS-UD assessed the benefits of the policy under the assumption that it achieves its stated intent of increasing the responsiveness of housing supply to price increases. To do this, the authors chose to model the implied costs and benefits of a deliberately conservative supply impact, to avoid optimism bias in their estimates.
- The chosen and assessed impact was small enough that it was within the range of observed historical variation in supply response to price increases in each of the six urban areas assessed. In other words, it was assumed to be much lower than the market-transforming

levels to which the policy aspired, as data constraints and the policy's complexity prevented a more robust estimate. As the authors of the CBA for the NPS-UD note:

“...our assumed policy impacts are well within the scope of historical variation in elasticity for New Zealand cities as a starting point...an impact of this magnitude would be unremarkable if it happened by mere chance. Our high and low estimates...do not represent the extremes of possibility, but two unremarkable outcomes within a much larger range. We intend this conservative choice for potential benefits to guard against undue optimism and ultimately to emphasise the mismatch in orders of magnitude between the potential benefits and costs of the policy.”⁴

- Now, with the benefit of five years of building consent data since the enactment of the finalised AUP and a more tightly scoped policy to assess, we have what we need for a higher-quality forecast of actual supply and price responses to a relaxation of zoning constraints in these cities.

Our method builds on the NPS-UD models for calculation of benefits but replaces the assumption of a modest supply response with this forecast. As we will show below, the evidence suggests that:

- the actual impact of the NPS-UD may be significantly greater than assumed for that policy's CBA
- the AUP shows a responsive market, but also a bias toward development at the urban fringe compared to theoretical expectations.

Our model is based on the theoretical framework provided by the Alonso-Muth-Mills model of urban spatial equilibrium (Alonso 1964, Muth 1969, Mills 1967), with parameters fitted to empirical data taken from the up-zoning under the AUP as a natural experiment.

2.2.1 Theoretical framework

Historical data – AUP as a natural experiment

The AUP guides Auckland's natural and physical resources, including land development. It determines what can be built, where, and how much of it. The AUP is both simpler and more permissive than the fragmented plans it replaced, and it has allowed thousands more property owners across Auckland to develop their land through zoning changes (up-zoning), increasing the potential number of dwellings. However, not all land parcels were up-zoned, and constraints in some areas were relaxed less than in others. This forms a natural experiment as there are natural control and treatment groups.⁵

We can look at historical data on how land values changed after the enactment of the AUP to determine how the up-zoning affected land values, and on how zone changes predict building consents to estimate the likelihood and quantity of residential development.

However, there are important ways with what happened under the AUP that are different from what we expect to happen under the MDRS. The AUP favoured development at the urban fringe over intensification near the city centre and left in place other constraints to development beyond zoning rules, such as around 17,000 residential properties under 'special character overlays'—areas

⁴ PwC 2020, pages 32-33.

⁵ Ideally the assignment of parcels into these groups would be random. In areas where very similar properties were allocated to different zones, say on either side of the same street, we can consider the allocation to be 'pseudo-random'. However, we expect a significant portion of the allocation of zones in older areas of the city to have aligned loosely with the levels of development that were already present under the 90-odd zones that existed before the AUP. This would bias our results toward underestimating the policy's effect in terms of the general level of response to up-zoning.

subject to much stricter conditions for redevelopment. The post-AUP period also has yet to reveal the results of the NPS-UD, which introduced large-scale changes to all Tier 1 urban areas. The NPS-UD was enacted in August 2020, and originally planned to take full effect by 2024, so the data to date does not capture the significant changes in underlying trends it will likely create.

Both the MDRS and the NPS-UD are designed with an intention to reverse the bias toward urban-fringe development observed under the AUP. To inform our assumptions about how future development might occur both with and without the MDRS, we need a theoretical framework for how market forces act on urban spatial arrangements in both the presence and absence of policy constraints. For this, we rely on the Alonso-Muth-Mills (AMM) model, introduced in the next section. Box A describes the key insights from the AUP that inform our forecasts.

Box A: Key insights from the AUP inform our forecasts

Properties up-zoned under the AUP increased in value in subsequent years more than properties that remained at pre-AUP constraint levels. The more permissive the new zone, the more the value increased, all else equal. This observation aligns with the theoretical expectation for high-demand areas—more permissive development implies greater potential revenue from built floor area, which is capitalised into land values. Measurements of these patterns allow us to simulate land value shocks following the MDRS.⁶

The land value and improvement value characteristics of residential properties before the AUP show a strong relationship to how zoning affected the probability of adding at least one dwelling after the AUP. We find:

- for properties in the AUP zone most similar to the MDRS (the MHU zone), there was a 20% probability of houses adding at least one dwelling if they have high relative land value and low opportunity cost of development,
- this probability drops to below 10% for properties with average relative land value and average opportunity cost of development.

Zoning changes strongly predicted the amount of floor area increase for properties that added at least one dwelling. The more permissive the new zone, the more floor area a property added on average (for those that added at least one dwelling), in ratio to land area. This implies that, on average, zoning rules worked as intended, leading to more intense development in the more permissive zones.

Since we have data on land and improvement values at the individual property level, we can analyse development likelihood based on these results with high granularity. However, the AUP released constraints by much more on the outskirts of the city than in the high-demand areas. Following the AUP, adding dwellings was statistically more likely the further away a parcel is from the city centre after controlling for land and improvement values, zone, and special character status.

This does not align with the demand patterns predicted by theoretical frameworks for urban spatial equilibrium. Further analysis reveals that while the zones themselves are distributed widely across distances, areas where the zones increased the permissible development capacity beyond the existing improvements by enough to add at least one dwelling were much less common as we approach the centre. In other words, the AUP effectively dispersed development to the city fringes.

When we adjust the model to neutralise the AUP bias toward urban fringe development, allowing demand and opportunity cost characteristics (linked with low value of existing improvements) to drive the response to up-zoning instead, we find the most intensive development moving much closer to the city centre.

Where the unadjusted AUP-based scenario shows the hubs of development projected in Flat Bush, Howick, Half-Moon Bay, Warkworth, Omaha, Algies Bay, and Whangaparāoa, our base-case scenario shows development closely hugging the NPS-UD walkable catchments around public transport and metropolitan centre areas. This bodes well for the NPS-UD intensification policies, suggesting that previous estimates of their impact may have been understated.

⁶ See Greenaway-McGrevy et al. 2020 on the impact of the AUP on intensification, land values and house prices.

The Alonso-Muth-Mills Model

The AMM model is a depiction of urban spatial structure that explains the economic substitutions associated with spatial choices that individuals make regarding where to live and work within the urban landscape. It is one of the most widely used spatial models in urban economics.

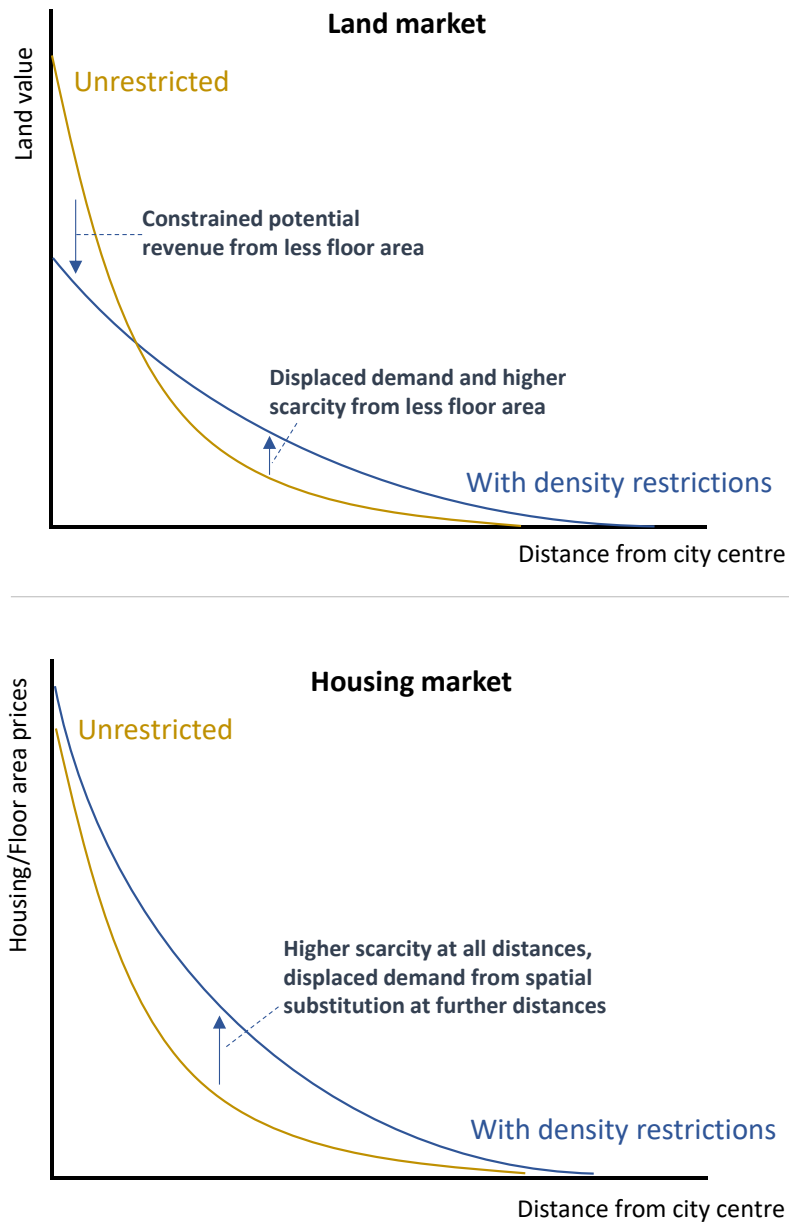
The AMM model is built on two key assumptions:

1. Cities exist to maximise access to opportunity and amenity
2. Access can be attained by either direct proximity, or by transport.

Since commuting and transport is costly in terms of money and time, households prefer to live closer to the centre of the city, all else equal. Land is less scarce further away from the city centre, but the cost of transport to the city centre is higher. Thus, households trade off the cost of housing with the cost of travel. In spatial equilibrium, the sum of all housing and commuting costs can be held constant or near-constant as distance changes, assuming households have similar preferences.

When zoning restrictions prevent development from reaching the density levels that would occur in an unrestricted market, land values react differently at different levels of existing demand, but housing prices rise throughout the city. This concept is illustrated in Figure 2 below.

Figure 2: The Alonso-Muth-Mills model – effects of density restrictions in the urban core



Source: The AMM model is developed in Alonso (1964), Muth (1969), and Mills (1967). This figure is adapted by the authors.

Up-zoning relaxes restrictions on density. Accordingly, we expect the MDRS to allow the urban landscape to move closer to the unconstrained spatial equilibrium that the AMM model would predict, reversing the arrow directions in both diagrams in Figure 2. The top diagram of the figure shows that land values react differently to zoning restrictions depending on the strength of demand at each location and at constrained locations nearby. The bottom diagram of Figure 2 shows that house-price effects of zoning restrictions move in the same direction at all distances from the centre regardless of what happens to land values at each distance. Our model design is informed by this theoretical framework, as we describe further below.

2.2.2 Model Approach

To estimate the effects of MDRS on housing supply, we use a parcel-level⁷ spatial econometric model to simulate how a change in zoning rules would affect the number of dwellings added over time based on observations of what happened in Auckland following the enactment of the AUP.

We use the historical data from the AUP as a natural experiment, to fit our model for forecasting the effect of an up-zoning on the number of dwellings added.

There are three steps to the model:

Step 1: Simulate the land-value shock that accompanies a relaxation of zoning constraints

Since the AUP and MDRS policies relax zoning restrictions, this increases the potential revenue of a parcel of land (if demand is sufficient) because more floor area can be added. This in turn increases the land value, which captures the present value of greater potential future cash flows.

We simulate this change in land value for each parcel caused by the change in zone. This phenomenon is described in the literature as the “up-zoning premium” (see Greenaway-McGrevy 2020 for a recent estimate of this premium based on post-AUP property sales).

We can quantify the actual land-value shocks following the AUP using a difference-in-difference estimate for Auckland (see Appendix C.2 for a description of this method). This is a robust method for estimating the effects of a treatment, such as up-zoning, on a subset of a population, such as residential parcels. The method requires data measured from both a control and a treatment group at different times, which we have for Auckland before and after the AUP.

For other cities, we have no natural experiment in the recent past, so we estimate the land-value shock using a regression discontinuity approach. This method uses the observed differences in land value across zones for otherwise similar properties to estimate the effect of zoning on land value.

We use these simulated land-value shocks as inputs into steps 2 and 3 of our model, informing both the probability of development for an observed parcel and the amount of added floor area for parcels that do develop.

Step 2: Find the probability that a parcel added at least one dwelling, based on each parcel’s post-shock land value, zone status, and existing level of development

The purpose of step two is to simulate a set of locations where added dwellings might be built under each forecast scenario, whether with or without the MDRS. This allows us to examine how differences in model assumptions influence the spatial distribution of development.

In any medium-term period, only a small fraction of homeowners will consider further developments on their property at all, regardless of the development viability their property may have. Many factors contributing to a homeowner’s decision to redevelop will not be affected by zoning rules, but others will. The major factors affected by zoning rules are:

- The permissible dimensions of development, which affect the potential revenue or benefits of redevelopment, as described in Step 1.

⁷ By ‘parcel-level’, we mean that individual rateable units of property are aggregated to the level of LINZ primary parcels. For cases where multiple parcels are associated with the same set of rateable units, we cluster the parcels and treat the resulting cluster as a single large observation. Single-parcel observations make up most of the sample for all urban areas in the study.

- The costs in money, time, and effort to obtain legal clearance to develop. Both the AUP and the MDRS involve an element of intended reduction in this cost factor.

Other factors contributing to the homeowner’s decision but not influenced by zoning rules include:

- The opportunity costs of any demolition of existing buildings required for redevelopment.
- The level of market demand for dwellings at or near a parcel’s location.

There are many other potential factors, but our data is limited, so our model only accounts for those listed above.

We use our observations of how land values, opportunity costs, zoning, and distance from the city centre were statistically associated with whether a parcel added at least one dwelling (thus excluding floor area expansions that added to an existing house) during the 2016 to 2021 period to arrive at an implied probability of development for each of the 218,000-plus parcels in our study area, based on updated data for those characteristics. This updated data includes the most recent available (as opposed to pre-AUP) data points for each parcel as well as any adjustments, such as for land-value shocks. We use these estimated probabilities in two ways:

- We sum them to arrive at our estimate for the total number of development events across the study area.
- We choose our hypothetical development locations using a random weighted probability, where the weights are the estimated probabilities. These hypothetical development locations are chosen without replacement⁸.

Step 3: Find the increase in the floor-area ratio if at least one dwelling was added

The amount of floor-area ratio (FAR) increase is determined by the cost-benefit considerations of the developer or homeowner. A homeowner/developer will consider the opportunity costs, the construction and consultation costs, and intangible costs such as the nuisance of construction or the stress of managing the process, as well as the potential revenue increase from adding more floor area. The higher the potential revenue, the more floor area will be added, all else equal. The higher the opportunity costs of development, the less floor area will be added, all else equal.

For each development event simulated in Step 1, we can quantify the statistical relationship between the actual FAR increase observed since the AUP and the pre-AUP levels of demand, zoning restrictions, simulated land-value changes, and opportunity cost of development for each parcel.

We can then use these quantified, or ‘fitted’ relationships to forecast the likely increase in FAR for each parcel, after updating what we know about changes in demand, opportunity cost, and zone since the pre-AUP date used for fitting. We calculate the number of dwellings added based on this estimate of FAR increase, the land area of each parcel, and the updated regulatory limits of each zone.

To find the number of dwellings added that can be attributed to the MDRS, we forecast and compare the number of dwellings added in both a with-policy (applying less restrictive zone assumptions and simulating a land-value shock), and a without-policy counterfactual case (keeping zones as they are and using actual current land values).

⁸ When a parcel is selected, we do not replace it back into the set of all parcels before selecting another parcel. This ensures that we do not select a parcel twice.

2.2.3 Application to other Tier 1 Urban Areas

The next part of the analysis applies this model to other Tier 1 urban areas: Hamilton, Tauranga, Wellington, and Christchurch. Both demand and constraint conditions differ in each city, and Auckland is an outlier particularly in terms of demand. To apply our fitted model to non-Auckland cities, we need to adjust each of the three model steps:

- For Step 1, the land value shock from up-zoning, we use regression estimates on data from each city to measure the difference by zone in the relationship between land value and distance from the city centre. This is a proxy for the level of constraint in land values from zone restrictions. Using the theoretical framework of the AMM model, these regression results also inform our assumptions below about how the level of constraint influences the estimated increase in FAR from relaxing zone restrictions.
- For Step 2, the estimate of likelihood to add at least one dwelling, we use the AUP-based relationships between development demand, opportunity cost, and zone constraints to predict likelihood to develop based on property-level equivalence across cities⁹.
- For Step 3, the estimate of added dwellings given that a property adds at least one, we adjust the expected change from up-zoning (for example, from Wellington’s Outer Residential zone to the new MDRS) to the difference in predicted FAR increase between two relevant zones from the Auckland case (the ‘zone gap’). We choose the zone gap in Auckland (taken from available combinations of the four measured AUP zones) that showed the most similar degree of relaxation in constraints to what we expect in that city. These expectations are informed by consideration of the differences in allowable development between existing zones and the MDRS in each city, which AUP zones they align most closely to in terms of defined building constraints, and the observed land value discontinuities between zones in each city as described above. Full zone alignment tables are provided in Appendix B.

2.2.4 Data

The available data for our model necessitates the use of proxies for the following driving factors:

- As a combined proxy for the level of demand adjusted for opportunity cost of development at the individual parcel level, we use the Quality of Capacity metric (“quality score”) developed for HUD as part of the Wider Costs and Benefits of Urban Growth Methodology (PwC 2020). The quality score is described further in the following subsection.
- The development limits under the MDRS have no exact equivalent in the residential zones of any Tier 1 urban area’s operative district plans, and zones in non-Auckland cities do not perfectly correspond to AUP zones. To complete our forecast, we must associate our observed zone effects with the modelled zone changes by matching each zone and simulated zone change with its closest available proxy in the data. Details of these associations are provided in Appendix B.

The quality score

The quality score is a useful metric to efficiently proxy demand-side development potential at the parcel level. It is a combination of two proxies—one for demand relative to other areas of each city, the other for opportunity cost of development. The first component uses land value per square metre (m²) to proxy the level of demand for built floor area in that location.

The second component captures the opportunity costs of development. When landowners or developers consider whether to build more floor area on a specific property, one of the key factors is

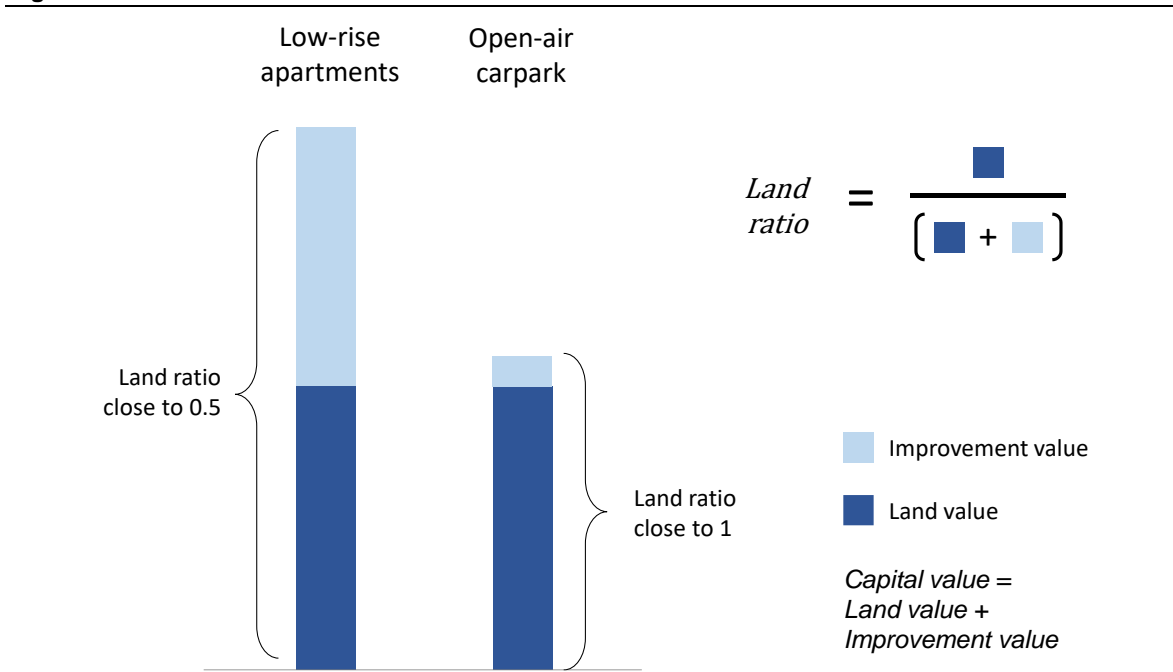
⁹ We also adjust the assumed base level of likelihood in each city to align the number of forecast development events in the without-policy case to each city’s observed level of development over the same historical period covered by the AUP data.

the opportunity cost of giving up the value of whatever is already built on the required land. Two properties with the same land value in the same neighbourhood will still have different levels of development appeal if the existing improvements are different.

Figure 3 compares two such hypothetical properties. We expect that adding dwellings is more likely for the open-air carpark than for the low-rise apartments due to the high opportunity cost of tearing down an apartment building and foregoing the revenue it could earn without adding dwellings.

Our data separates land value from improvement value at the parcel level. This allows us to incorporate the opportunity cost of redevelopment into our regression analysis using the land ratio (the land value of a property divided by the total capital value of the property). This is written as LV/CV and illustrated in Figure 3. Typically, the higher the land ratio, the greater the potential for development.

Figure 3: The role of the land ratio



Source: Authors' illustration.

A high land ratio represents a lower cost of development as the improvement value is relatively low compared to the land value. Thus, the higher the land ratio, the higher the quality score. The same applies for the land value per m² component.

The two components of the quality score are combined as a geometric average, by raising both to a power between 0 and 1 before multiplying them together. This has the effect of favouring balanced combinations of the two components over extreme values in one or the other. Both component values are numbers between 0 and 1, as is the final score. The full equation is as follows:

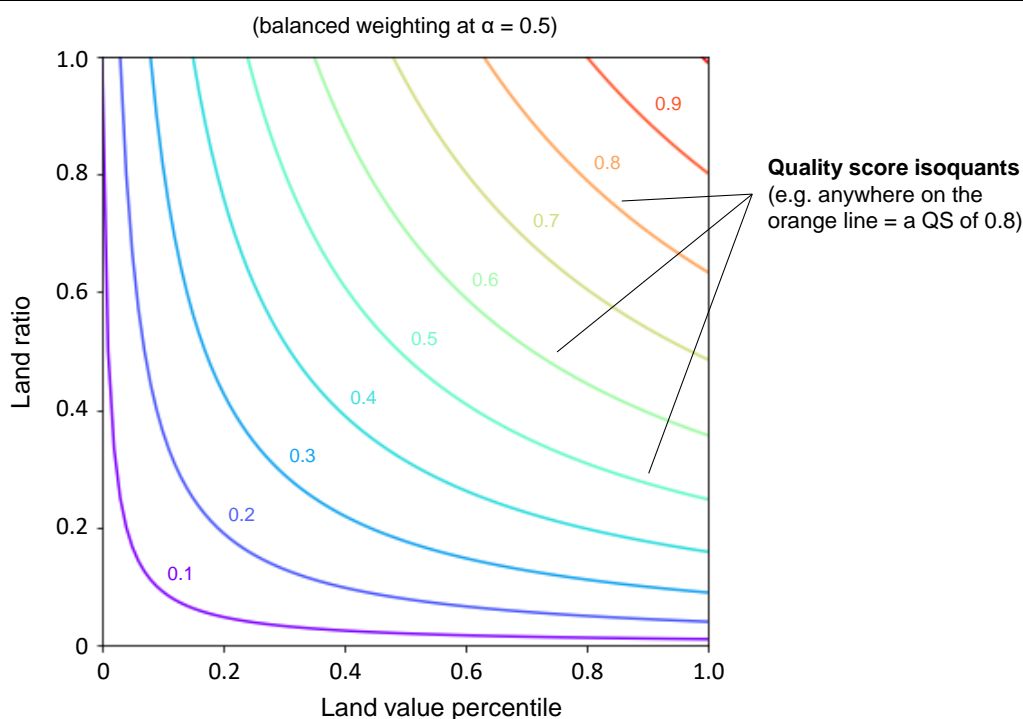
$$Quality\ Score = (LV/CV)^{\alpha} LVrank^{\beta}$$

Where:

- CV is the capital value or likely price a parcel or property would sell for at the time of valuation

- *LV* is the likely price a parcel's land would sell for at the time of valuation without any buildings or improvements
- *LVrank* is the percentile rank of a parcel's land value per m² among all parcels in the urban area
- α and β are weightings between 0 and 1 (that sum to 1) for the geometric weighted average. These are used to emphasise the effects of one component or the other according to the analytical question at hand. In this analysis, both are set to 0.5, so equal weight is given to each component.

Figure 4: Quality score by component inputs



Source: PwC 2021.

Advantages of the quality score include:

- It accounts for both site-specific opportunity cost and location potential relative to other sites.
- It does these two things in a way that is easily calculated, applicable in any city, and uses a dataset that is readily available historically and at a granular level to councils and ministries.
- It does not rely on actual sales, but on ratings valuation estimates, so it is available for all rateable units in a city.
- Its components, such as land value, can be modified to reflect expected shocks arising from policy changes based on a well-developed body of empirical analysis. In other words, we can observe today's actual quality scores, but also simulate what they would be if land values changed.

- The land value component is an effective general proxy for a broad range of factors contributing to desirability from a development perspective, including access to opportunity and proximity to amenities.

Disadvantages of the quality score include:

- It does not capture much about the willingness of a landowner to participate in the market for development.
- It relies on a dataset that is difficult for the public to access in bulk (data for individual properties is publicly available), making replication difficult for non-government researchers.

Zones

There are four primary residential zones under the AUP that will also be subject to the MDRS. These are:

- **Single House Zone (SHZ):** Allows for a single primary dwelling or conversion of existing (2013 or older) dwellings into a maximum of two dwellings. Maximum building site coverage is 35%, maximum height is 8 metres.
- **Mixed Housing Suburban Zone (MHS):** Allows for up to three dwellings and two storeys. Maximum building coverage is 40%, maximum height is 8 metres.
- **Mixed Housing Urban Zone (MHU):** Allows for up to three dwellings and three storeys. Maximum building coverage is 45%, maximum height is 11 metres.
- **Terrace Housing and Apartment Zone (THAB):** Enables apartment buildings of up to 5-7 storeys depending on proximity to centres. No explicit limit on dwellings. Maximum building coverage is 50%, maximum height is 16 metres.

A map of these zones is shown in Figure 1 above.

The SHZ provides a control group for our observations of the effect of up-zoning under the AUP, since these areas did not experience a significant change of zoning rules under that policy. The other three zones provide different levels of ‘treatment’ with which we can align our future zone change to say, “if the MDRS in City X has a similar effect to Zone Y under the AUP, the impact is likely to be Z given a similar time-frame...”. That we have three different levels of constraint release (ie the three up-zoned zones in the AUP) allows us to adjust for differing levels of baseline constraint in different cities.

The zone with rules most like the MDRS in terms of allowable floor area is the MHU. Both the MHU and MDRS allow 3 dwellings and 3 storeys, but the MDRS allows slightly more site coverage, more permissive height in relation to boundary (HIRB), and easier consenting.

As such, while we use the MHU as our proxy for the MDRS in our Auckland forecast, we believe these differences in zoning rules will bias results toward a conservative estimate. Full descriptions of alignment of zones for the other Tier 1 urban areas and their constituent TAs are provided in Appendix B.

Box B: Key model features, assumptions, and limitations

The unit of analysis for this study is the individual land parcel, allowing the model to take advantage of a rich dataset covering the full set of residential parcels in all five Tier 1 urban areas. The key purpose of the analysis is to understand the effects of zoning rules on development, especially following a change in those rules. Our model incorporates, at the parcel level:

- differences in demand for new dwellings both between cities and within each city, and how these vary by zone
- the opportunity cost of redeveloping existing improvements
- the effect of special character protections
- the maximum permissible building dimensions and floor area for each plot.

Our design prioritises the closest possible simulation of future policy effects rather than a fine-tuned depiction of causal relationships in the post-AUP data.

The interaction between zone and demand characteristics as summarised in a custom metric called the *quality score* is the common thread to a three-step forecast method for additional dwellings. This model incorporates the willingness (in terms of probability) of property owners to enter the market as developers and add a least one dwelling to supply following a relaxation of zoning constraints.

We assume that the average rate of participation in the development market among homeowners, including participation by selling to developers (holding our model variables constant), is similar over time and between cities. In other words, most homeowners will not build more dwellings on their property regardless of the potential revenue, but some will no matter what, and others will only if the economics improve.

The variables that we can model are limited to the data available at the land parcel level, and much of the variation in development is not explained by these variables. This means our modelled scenarios for the distribution of development locations across an urban area will have a wide margin of error.

For our base-case estimates, we assume the MDRS works as intended, unlocking development where demand is highest, and the opportunity cost is lowest. Our model explicitly nullifies the observed statistical effect of special character zones, which historically reduce the likelihood of development. This is because empirical results from the AUP data show that special character areas are much less likely to see development holding quality scores constant and this effect is stronger the higher the quality score. Section 4.8 discusses the treatment of other qualifying matters.

In our forecast, development likelihood is driven instead by the economic quality of the property as a development opportunity given the expected changes to zoning limits. In Auckland's case, most of the properties under special character protections sit within the NPS-UD walkable catchments, so are excluded from the forecasts of MDRS impact.

Areas required to be zoned for a minimum of 6-storeys under the NPS-UD are not included in the analysis, as the primary impact in those areas over the study period is expected to be driven by that policy. While the MDRS does apply to these areas, it is outside the scope of the present analysis to differentiate the effects of the MDRS in these areas from those of the NPS-UD (which have been estimated elsewhere).

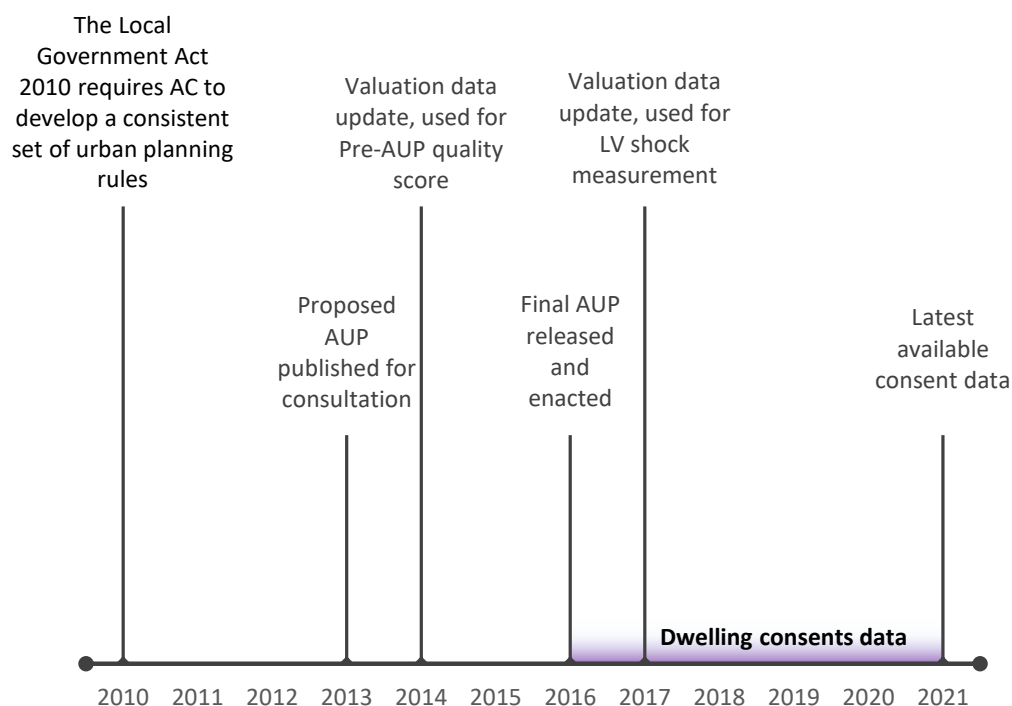
2.2.5 Model specifications

2.2.5.1 Step 1: Estimate the land value shock from a change in zoning constraints

To simulate the land value shock resulting from the MDRS policy, we first measure the actual shock that took place following the AUP, then apply the observed difference between zones according to the planned zone change under the new policy.

In Auckland, our data allows a robust estimate of the effects of up-zoning on land values. We fit Step 1 of our forecast model using a simple regression estimate that tests the relationship between zone interacted with distance from Britomart as predictor variables, and the percentage change in land value observed from 2014 (the most recent valuation update before the release and enactment of the final AUP) and 2017 (the first valuation update following full enactment of the final AUP) as the response variable. The timing of these valuation updates with the AUP policy development and enactment is summarised in Figure 5 below.

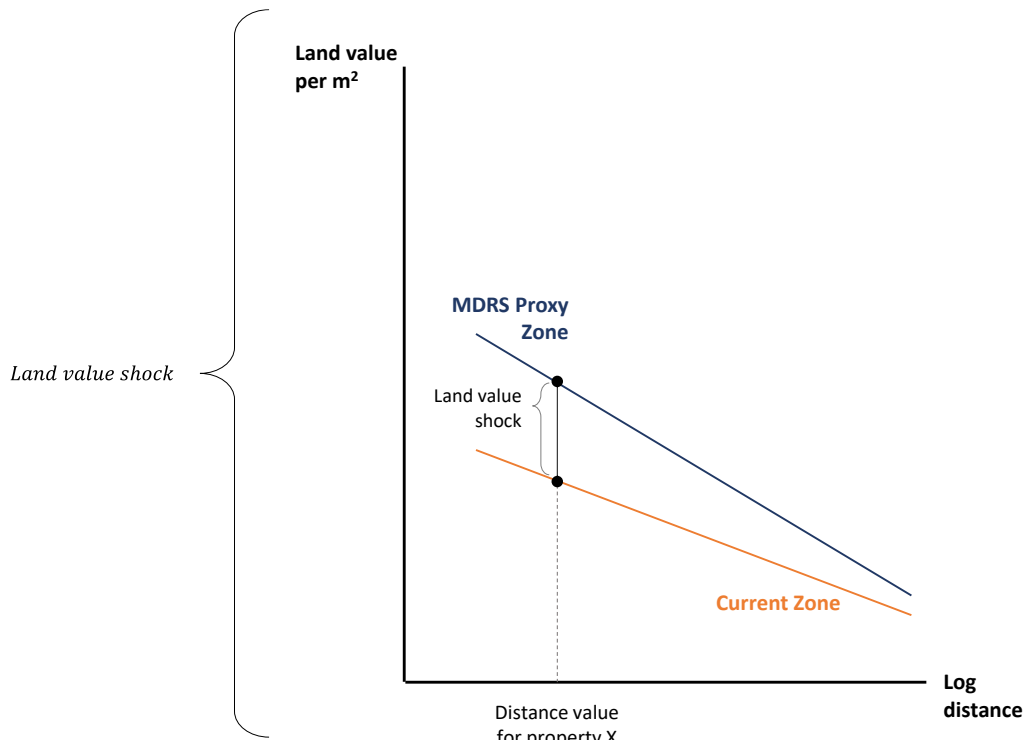
Figure 5: Timeline of the AUP and relevant data sources



Source: Greenaway-McGrevy et al 2020; Auckland Council, HUD data.

In Figure 6 below, the estimated land-value shock for a single property is the difference in the y-axis value (given that particular property's distance from the city centre) between the predicted land value for the property's current zone and the predicted land value for the MDRS proxy zone (eg MHU).

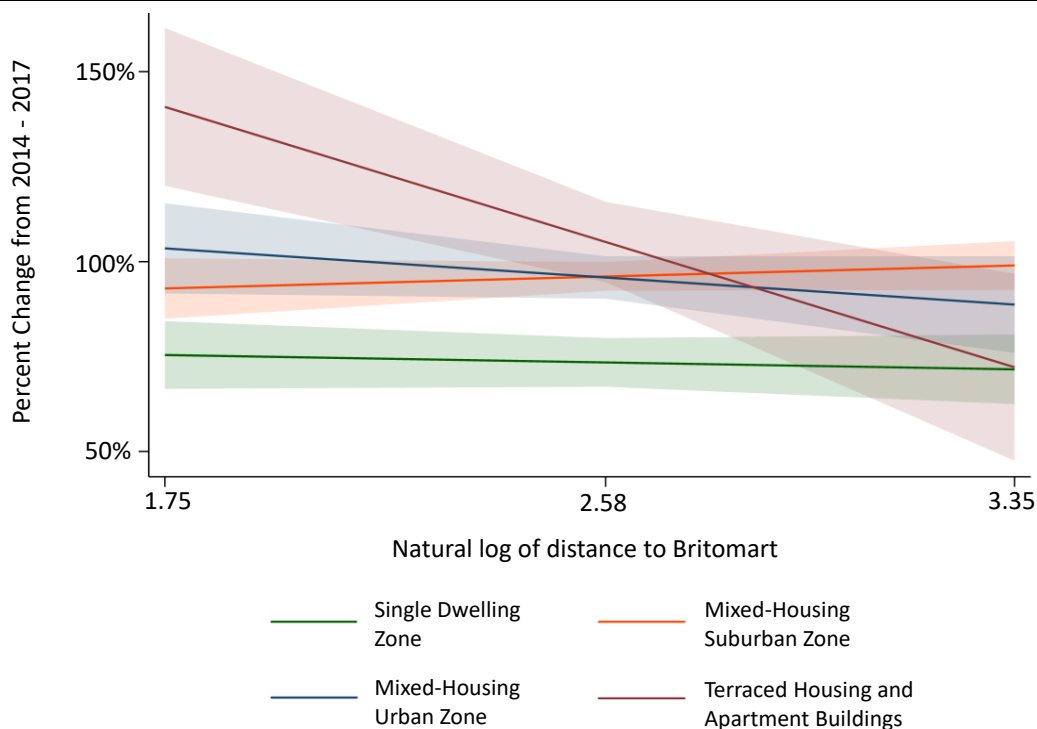
Figure 6: Land value shock simulation for model Step 1



Source: Authors' illustration.

Results for Auckland land-value shocks post-AUP are shown in Figure 7 below. The SHZ shows nearly no variation in relative LV appreciation according to distance from Britomart. In other words, single-house plots across the city increased in nominal value by about 75 percent on average, whether they were in Pukekohe, Herne Bay, or anywhere else.

Figure 7: Change in land value following AUP enactment



Source: HUD data, authors' analysis.

Note: Shaded bands represent 95% confidence intervals. Regression includes control for land ratio. Margins plotted here hold land ratio constant at the mean.

In the MHS, the increase was slightly less the closer a parcel was to Britomart, but not statistically different from a slope of zero (a flat line), like the SHZ. However, the MHS effect independent of interaction with distance (the intercept) was significantly different from both SHZ and zero. This means that parcels in the MHS zone reliably increased in value by more than parcels in the SHZ zone did, but that the difference between the two was not significantly affected by distance from the city centre.

In the MHU, the increase in land value was greater than the SHZ, and the increase was greater the closer a parcel was to Britomart. In the THAB, distance to Britomart had by far the largest effect on the land value increase, moving from about the same as the SHZ on the outskirts to nearly double the increase nearer to the centre.

We use the difference between the way land parcel values reacted to the AUP in different zones at different distances to simulate the way land parcel values will react to the MDRS in the future. To do this for Auckland, we use the marginal change from each parcel's current zone to the level of change expected at the new zone at that parcel's distance from the city centre. Forecast results are presented in Section 4.

2.2.5.2 Step 2: Estimate the likelihood of adding at least one dwelling

Using data up to 2021, we estimate the probability of properties in our control and treatment zones to have at least added one dwelling since the AUP enactment. We use the quality score (interacted with zone status) of each property as our primary predictor, and control for the pre-NPS-UD special character status and distance to Britomart of each property.

We then use these estimates (coefficients) to project the probability of adding at least one dwelling in the medium term. The fitted model is applied to an updated dataset, using quality scores

updated to include land value shocks from step 1, zone coefficients using the MHU as a proxy for the MDRS (so up-zoned parcels apply the MHU coefficient), and neutralising the effect of special character status. Model equations are shown below.

Estimation using historical data (post AUP): logit with continuous-categorical interaction

$$\begin{aligned} \text{AddedDwelling}_i = & \beta_0 + \beta_1 QS_{pre_i} + \beta_2 Zone_i + \beta_3 QS_{pre_i} * Zone_i + \beta_4 \ln(Distance_i) \\ & + \beta_5 SpecialCharacter_i + \varepsilon_i \end{aligned}$$

Forecast for post-MDRS

Without MDRS

$$\begin{aligned} P(\text{AddDwelling}) = & \hat{\beta}_0 + \hat{\beta}_1 QS_{post_i} + \hat{\beta}_2 Zone_i + \hat{\beta}_3 QS_{post_i} * Zone_i + \hat{\beta}_4 \ln(AdjustedDistance_i) \\ & + \hat{\beta}_5 NewSpecialCharacter_i \end{aligned}$$

With MDRS

$$\begin{aligned} P(\text{AddDwelling}) = & \hat{\beta}_0 + \hat{\beta}_1 QS_{shocked_i} + \hat{\beta}_2 NewZone_i + \hat{\beta}_3 QS_{shocked_i} * NewZone_i + \hat{\beta}_4 \ln(AdjustedDistance_i) + \\ & \hat{\beta}_5 NewSpecialCharacter_i \end{aligned}$$

Where:

AddedDwelling_i	is a dummy indicating whether a property added at least one dwelling from 2016 to 2021.
$P(\text{AddDwelling})$	is the predicted probability ¹⁰ that a property adds at least one dwelling in the medium term.
β_{0-5}	are the coefficients to be estimated using historical post-AUP data.
$\hat{\beta}_{0-5}$	are the fitted coefficients from the estimation using historical data.
QS_{pre_i}	is the pre-AUP quality score calculated using 2014 land values and land ratios for each parcel.
QS_{post_i}	is the latest available quality score for each parcel (ranges from 2017 to 2021, depending on valuation updates).
$QS_{shocked_i}$	is QS_{post_i} adjusted for land value shocks from Step 1.
$Zone_i$	is the AUP zone for each parcel.
$NewZone_i$	is the zone category for the ‘treatment’ zone, ie the zone chosen as a proxy for the MDRS. The fitted coefficient for the proxy zone replaces the original zone coefficient in this equation.

¹⁰ Our forecast equations here use notation for probability for ease of interpretation. Estimated logit coefficients predict odds ratios, not probability, and must be converted to probabilities, resulting in the non-linear relationship between dependent and independent variables observed in Figures 12 and 13.

$\ln(\text{Distance}_i)$ is the natural log of distance in kilometres from a selected point in the city centre.

$\ln(\text{AdjustedDistance}_i)$ is a scalar replacing the distance covariant for all observations. This collapses the distance effect to a constant.

$\text{SpecialCharacter}_i$ is a dummy for whether a property is located in a special character overlay area.

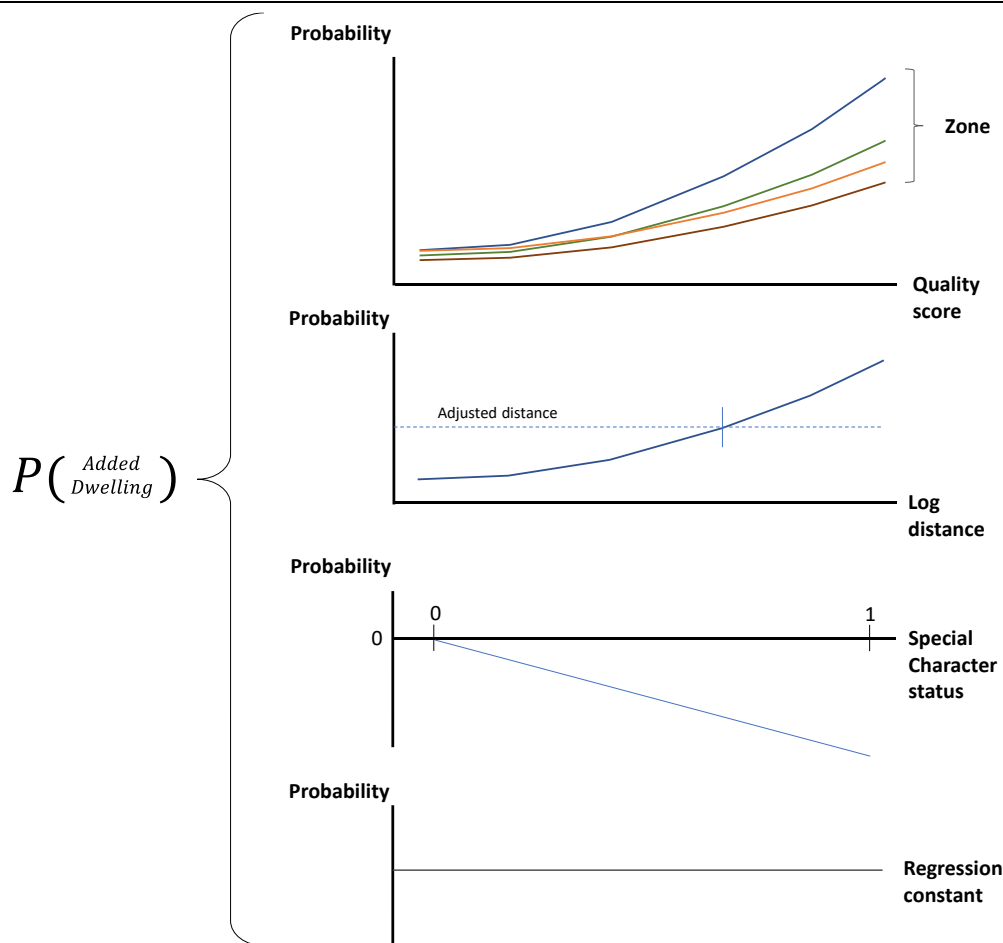
$\text{NewSpecialCharacter}_i$ is set to zero for base case estimates both with and without the policy, as the special character effect is assumed to have been nullified by the NPS-UD. We test variations to this in our sensitivity analysis.

ε_i is the error term.

Step 2 visual summary

Figure 8 illustrates how the parts of the forecast equations above are combined to arrive at a final probability estimate for each parcel. The coefficients determine the slope and direction of each line, and the final probability of adding at least one dwelling is the sum of the y-axis value from each set of axes in the figure.

Figure 8: Probability of adding at least one dwelling, by model component

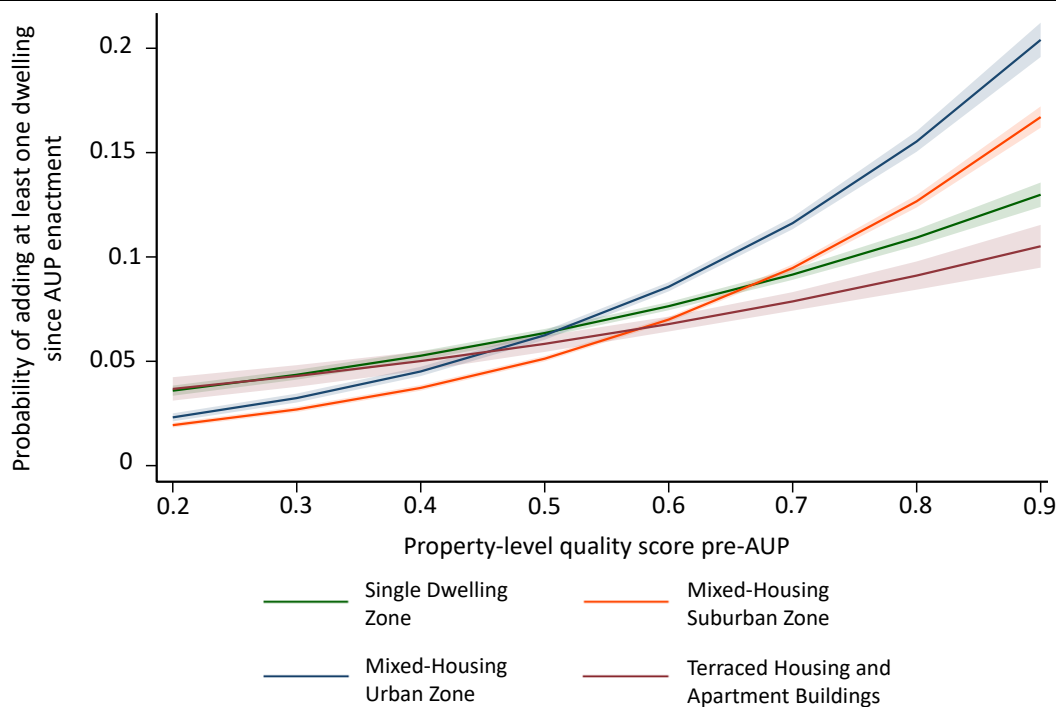


Source: Authors' illustration.

Fitted model results

Figure 9 summarises the coefficient results from the first regression as a logit margin plot. It shows the probability of adding at least one dwelling post-AUP at different pre-AUP quality scores for each zone, with special character status at zero and distance from Britomart at the median. Full regression outputs are provided in Appendix C.

Figure 9: Probability of development as predicted by quality score and zone



Source: Auckland Council and HUD data, authors' analysis.

These results show that as quality score increases, there is an increase in the probability of adding at least one dwelling for every zone as would be expected. For zones that are less constraining for the intensity of development, the relationship between quality score and probability of development is more pronounced at higher quality scores (eg >0.6).

The results for MHS and MHU compared to SHZ are evidence that zoning restrictions continue to constrain Auckland's housing supply and exacerbate affordability issues. This is also evidence that wider up-zoning across Auckland is likely to lead to more residential development than would otherwise take place.

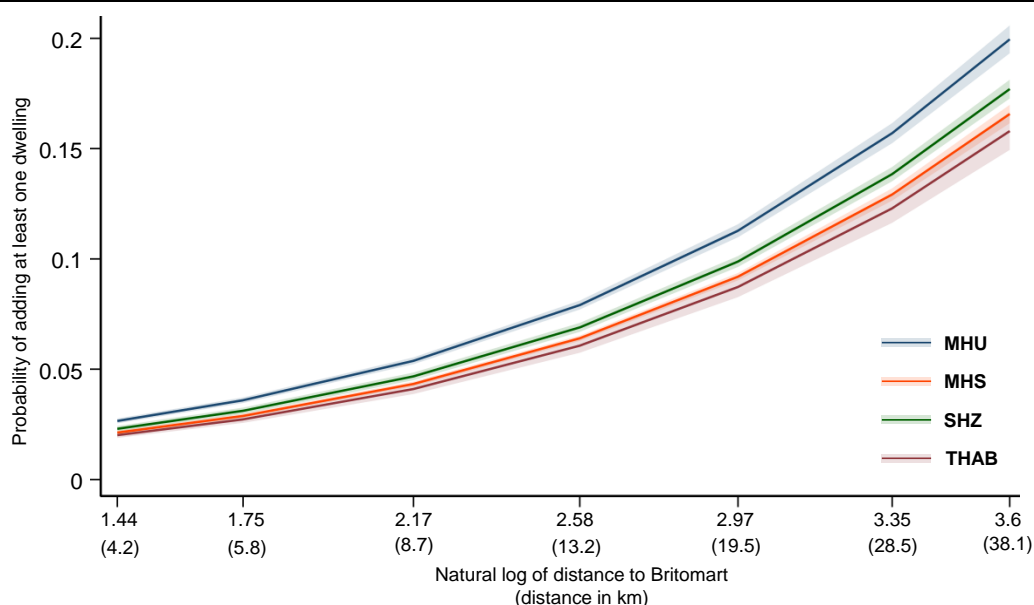
The exception is for the THAB, which shows a weaker likelihood response to higher quality scores than even the SHZ. This may be due to the higher risk and more complex preparation required for mid-rise and larger developments resulting in slower uptake. One THAB development also represents more dwellings on average than developments in the other zones, as our Step 3 analysis shows, so on the level of individual dwellings the development probability for THAB zones will be understated compared to the others.

The conclusion of Step 2 is to take the sum of calculated probabilities across all residential parcels in the policy-affected area. We do this for each tested scenario. This total becomes the estimate for that scenario of the total count of parcels that will add at least one dwelling in the medium term. We then rank all parcels from highest to lowest estimated probability and select the top n most likely parcels, where n is the sum of probabilities for the scenario.

Breaking the pattern of the AUP – adjustments to the distance effect

Our analysis reveals a counterintuitive insight about the pattern of development that took place following the AUP. Adding dwellings was statistically *more likely* the *further away* a parcel is from the city centre, after controlling for quality score, zone, and special character status. This does not align with the demand patterns predicted by the AMM model. Further analysis reveals that while the zones themselves are distributed widely across distances, areas where the zones increased the permissible development capacity beyond the existing improvements by enough to add at least one dwelling were much less common as we approach the centre. In other words, the zoning changes released constraints by much more on the outskirts of the city than in the high-demand areas. Figure 10 shows the fitted relationship between distance and probability of adding at least one dwelling for each zone at the median quality score.

Figure 10: Development likelihood by distance and zone at the median quality score



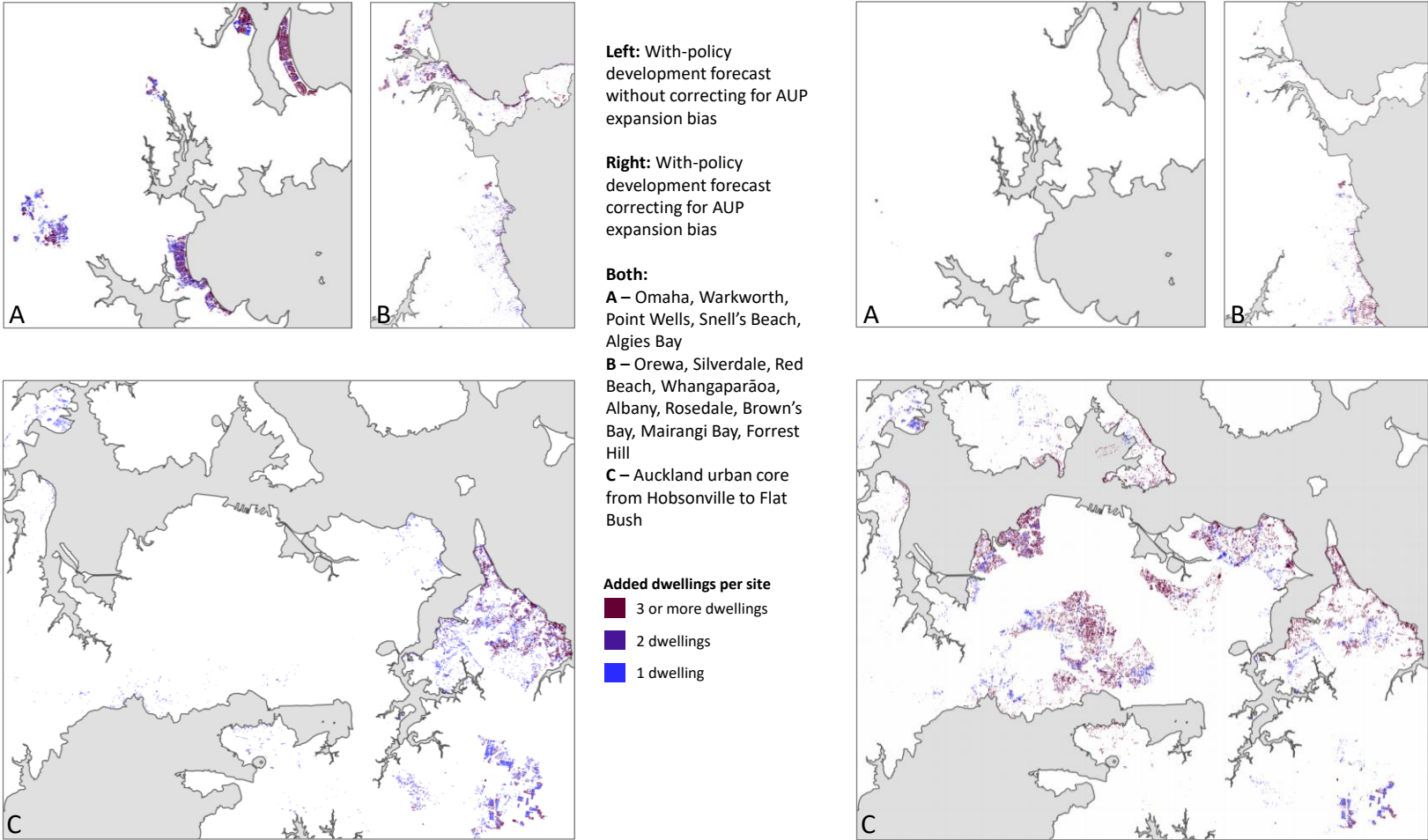
Source: Authors' analysis.

The presence of a recent natural experiment such as the AUP makes our approach one of the most analytically robust methods available for quantifying the actual results of relaxing zoning restrictions. However, the NPS-UD and the MDRS are intended to alter fundamental patterns about where and how much housing development takes place. Fitting any model to historical data will tend to replicate some of those historical patterns in our forecasts in ways that may not hold if the policy succeeds as intended.

The distance parameter in our model provides a way for us to neutralise this effect in our forecasts, to simulate how development might take place if the MDRS and NPS-UD are successful in unlocking development where demand is strongest.

The maps in Figure 11 on the following page show the difference in spatial development patterns generated by our model both with and without a correction for the bias toward city-fringe development observed in the AUP data. Note that the total policy impact in both cases is approximately equal, and that the NPS-UD walkable catchments are not included in the forecast.

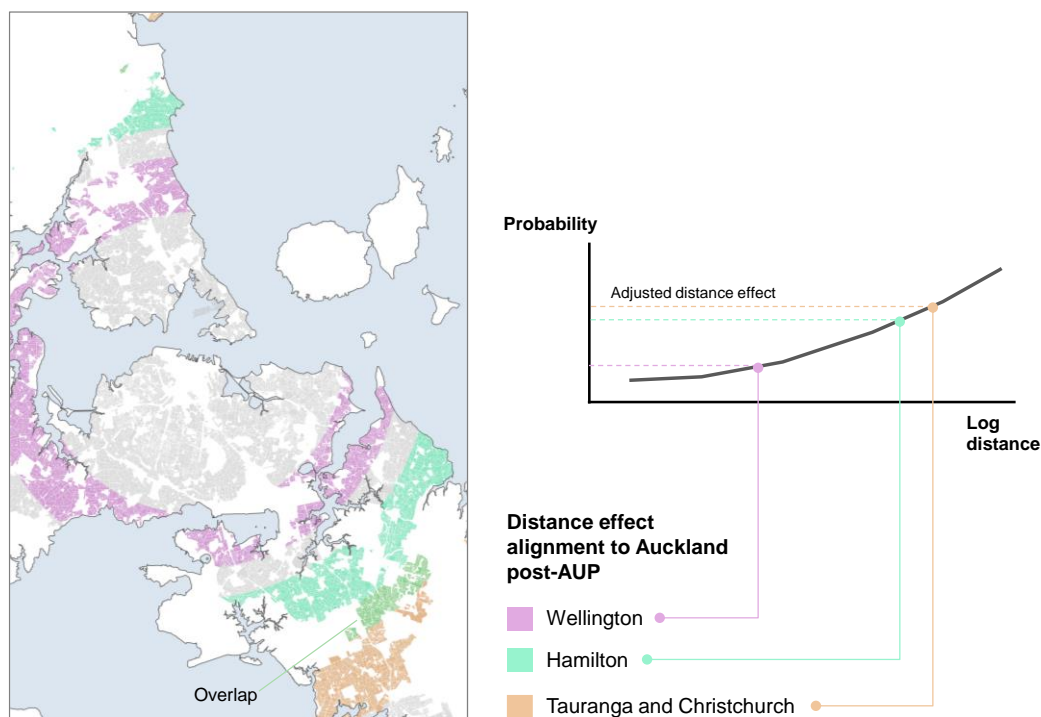
Figure 11: Modelled spatial distribution of highest likelihood development with and without correcting for the AUP urban fringe expansion bias



Source: Authors’ analysis

This adjustment to the distance parameter for modelled parcels is also useful when we come to applying the fitted model to non-Auckland urban areas, where the coefficient for distance from Britomart in Auckland has little relevance. We use the distance parameter instead to adjust the base-level modelled constant to align the without-policy forecast with historical consent trends in each city (Figure 12).

Figure 12: Aligning without-policy forecasts to historical consents for non-Auckland cities



Source: Authors' analysis.

Figure 12 above shows the results of this alignment as well as the range of distance tested in our sensitivity tests for each city. As we discuss further in the sensitivity analysis, Wellington's unusually low levels of consents cause it to align at a much lower distance parameter than the other cities.

2.2.5.3 Step 3: Estimate the expected increase in FAR conditional on adding at least one dwelling on historical data

For each parcel that passes the probability threshold for adding at least one dwelling, we estimate the expected FAR increase in the five-to-eight years following enactment of the MDRS. We then derive dwelling counts from this expected FAR increase based on the average 2019 dwelling size in each zone and TA, subject to the regulatory limits on building dimensions and total dwellings for each parcel's simulated zone. Model equations for FAR estimates are shown below.

2.2.5.4 Estimation using historical data (post-AUP)

$$(FAR\ increase|AddedDwelling) = \beta_0 + \beta_1 QS_{pre_i} + \beta_2 Zone_i + \beta_3 QS_{pre_i} * Zone_i + \beta_4 LandArea_i + \varepsilon_i$$

Forecast for post-MDRS
Without MDRS

$$(Est.\ FAR\ increase|AddDwelling) = \hat{\beta}_0 + \hat{\beta}_1 QS_{post_i} + \hat{\beta}_2 Zone_i + \hat{\beta}_3 QS_{post_i} * Zone_i + \hat{\beta}_4 LandArea_i$$

With MDRS

$$(Est. FAR\ increase|AddedDwelling) = \hat{\beta}_0 + \hat{\beta}_1 QS_{post_i} + \hat{\beta}_2 NewZone_i + \hat{\beta}_3 QS_{post_i} * NewZone_i + \hat{\beta}_4 LandArea_i$$

Where:

$(FAR\ increase|AddedDwelling)$ is the observed floor area ratio added in the post-AUP data for each parcel, conditional on that parcel having added at least one dwelling.

$(Est. FAR\ increase|AddedDwelling)$ is the expected floor area ratio added for each parcel, conditional on that parcel adding at least one dwelling.

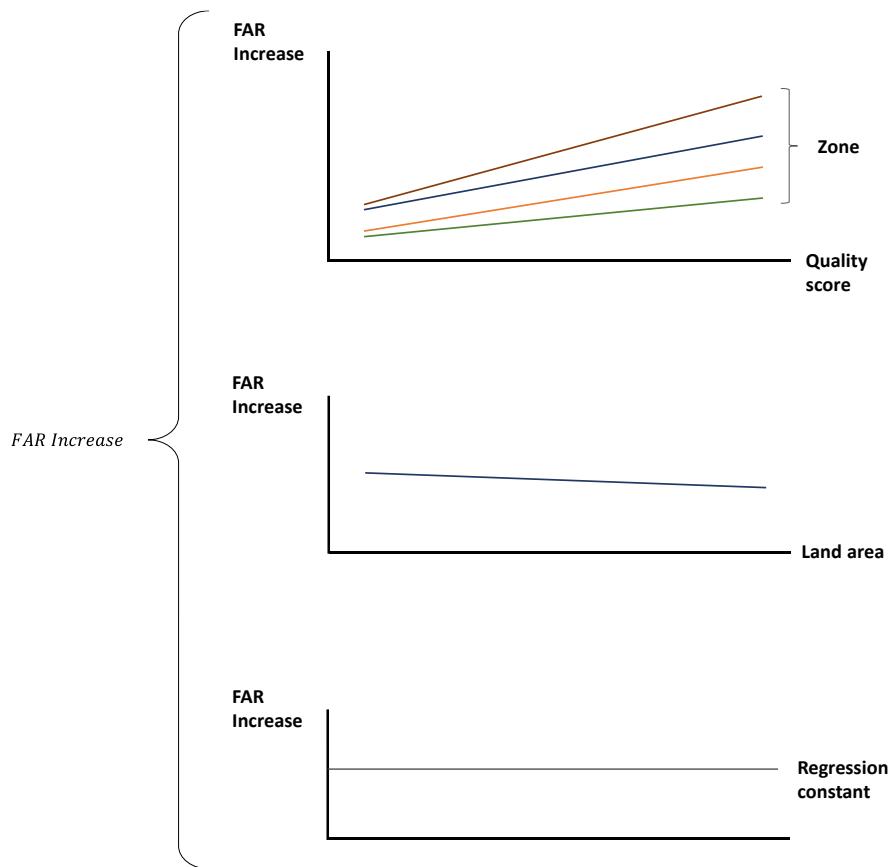
$LandArea_i$ is the land area in metres squared for each parcel.

**All other variables are as defined in Step 2 above.*

Step 3 visual summary

Figure 13 illustrates how the parts of the forecast equations above are combined to arrive at a final FAR increase estimate for each parcel. The coefficients determine the slope and direction of each line, and the final estimated increase in FAR is the sum of the y-axis value from each set of axes in the figure.

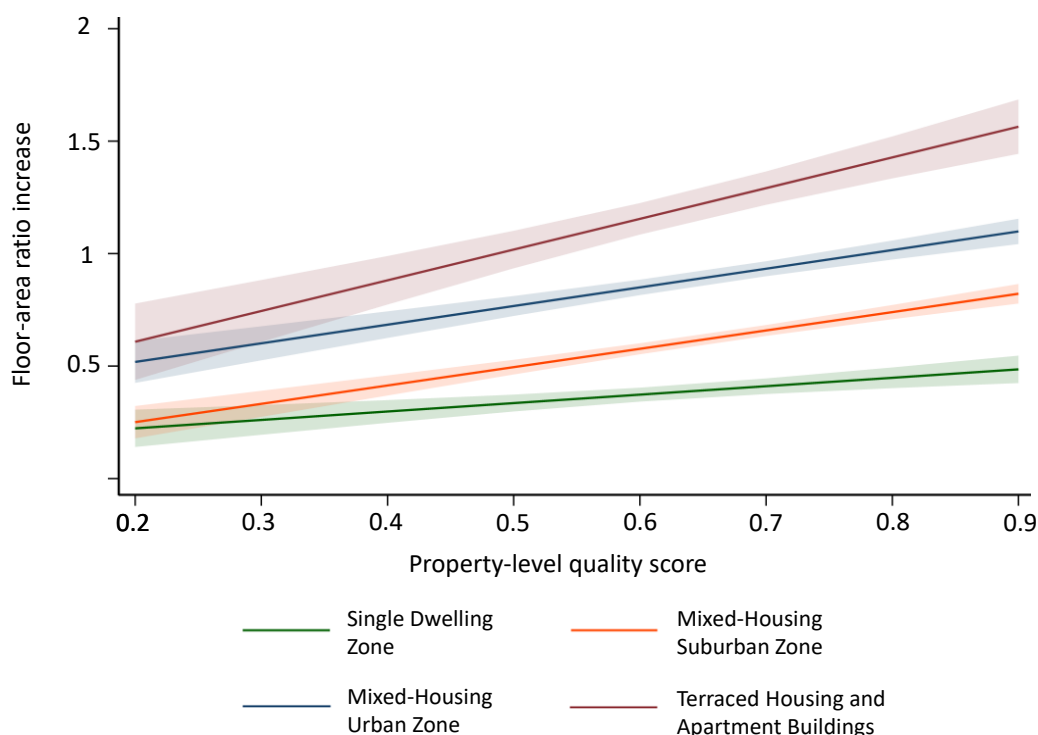
Figure 13: Estimate FAR increase



Source: Authors' illustration.

Figure 14 below summarises results from the first (historical estimation) regression. It shows that the increase in FAR becomes greater as quality score increases, regardless of zone, and that this relationship becomes stronger the more permissive the new zone is. The subset of data used here is those that added at least one dwelling, but we do not have data on whether any floor area was demolished in the process. For our model forecasts, we make the conservative assumption that one average-sized dwelling's worth of floor area is removed for each up-zoned parcel that adds at least one dwelling.

Figure 14: FAR increase per development event



Source: Auckland Council and HUD data. Authors' analysis.

In the figure, a FAR increase of 0.5 on the y-axis for a property with a building coverage of 50% implies an increase of one storey. We use this relationship along with a control for land parcel area to predict the increase in FAR for each parcel that adds at least one dwelling in each simulated scenario.

2.2.5.5 Applying the model in non-Auckland cities

Different cities have different levels of demand and different constraints. As described above, we make adjustments in each of the three model steps to adjust our forecasts to the local conditions of each city.

For the land-value shock from up-zoning, we can get an estimate of the impact of zoning on a parcel's land value by comparing parcels that are similar in most relevant respects (such as general demand in the area), but different in their zone status. As we only have a natural experiment for up-zoning in Auckland, we use this alternative approach with local data from each non-Auckland city.

The results are not as robust as a difference-in-difference design using a natural experiment because we do not know what other factors contributing to land value may differ by zone in a non-random way. However, the estimates we observe are consistent with our expectations informed by

the AMM model in all cities, and the resulting shocks to quality scores are small compared to the distribution of quality scores in each city.

3 A spatial forecast of the development impact of the MDRS

3.1 Overview

In the original CBA, we estimated probabilities in two ways:

- We sum them to arrive at our estimate for the total number of development events across the study area. The simple sum is equal to the total count of expected development sites.
- We rank properties by probability, then choose our hypothetical development locations from the most likely properties.

This process aggregates probabilities across all parcels and so our estimates are also aggregated for city-wide estimates. However, this approach does not tell us about the distribution of development sites in the city. For example, we can select a large number of equally probable outcomes that each allocate development differently between the sub-geographies of a city.

In other words, our original approach does not tell us anything about where these development sites might be located. We generalise the initial CBA by allowing for variation in which parcels will redevelop. We achieve this by randomly selecting parcels to redevelop based on their existing parcel-level probabilities. This allows us to see the distribution of redevelopment in the sub-geographies of a city. To account for variance in our estimates, we simulate thousands of specific probable outcomes.

We then provide an average expected development for each sub-geography. We do this at both the SA2 and TA levels.

3.2 Methodology

We estimate the total number of developments in the city by summing the existing parcel-level probability estimates. This gives us the total count of expected development sites. We shall denote the total number of development sites as n .

Then we randomly choose a parcel to redevelop. We choose which parcel to redevelop using a random weighted probability, where the weights are the existing parcel-level probabilities. This process is repeated n times without replacement¹¹. The result is a set of n parcels that are assumed to redevelop.

For each of the selected parcels, we estimate the number of dwellings added using the initial CBA methodology described in Section 2.2.2. The result of this simulation is the number of dwellings added for each parcel, where the parcels were selected randomly based on the existing parcel-level probabilities.

¹¹ When a parcel is selected, we do not replace it back into the set of all parcels before selecting another parcel. This ensures that we do not select a parcel twice.

We repeat this simulation 1,000 times for each urban area. Finally, we report the mean, and median number of dwellings added, as well as the 25th and 75th percentiles at the SA2 and TA levels.

4 Results and discussion

4.1 Results relative to the original CBA

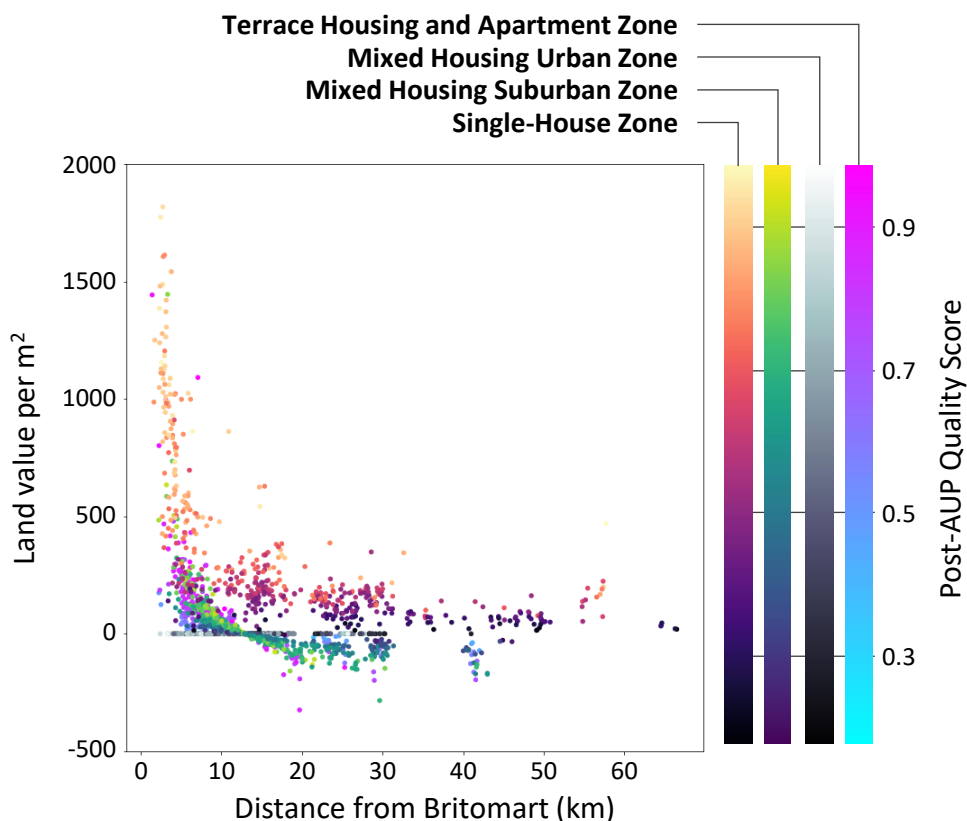
The forecasted total number of dwellings added for each TA or urban area, when summed from the SA2 level, may not be exactly the same as the aggregate forecasts in the original CBA. The TA-level totals represent the summed mean, median, and inter-quartile ranges of each constituent SA2. In an actual outcome, we would expect a variety of results – some SA2s will have more development than their probabilities imply, others will have less. Summing the mean or median estimate for each SA2 gives a different result than assessing the aggregate probability across the urban area as we did in the original CBA (although they fall within the same range of uncertainty). The results presented in this section are not intended to replace or as a revision to the original CBA estimates, which were determined using a different methodology designed for aggregate regional estimates. Rather, they represent our best estimate for the range of likely outcomes for each individual SA2.

4.2 Auckland

4.2.1 Step 1: Estimate the change in land value post-MDRS

Based on the land value shocks by zone following the AUP, and their relationship to distance from Britomart, we forecast a similar shock following the MDRS. The simulated changes in land value per m² post-MDRS in Auckland are shown in Figure 15 below.

Figure 15: Simulated post-MDRS land value shock in Auckland by zone and quality score



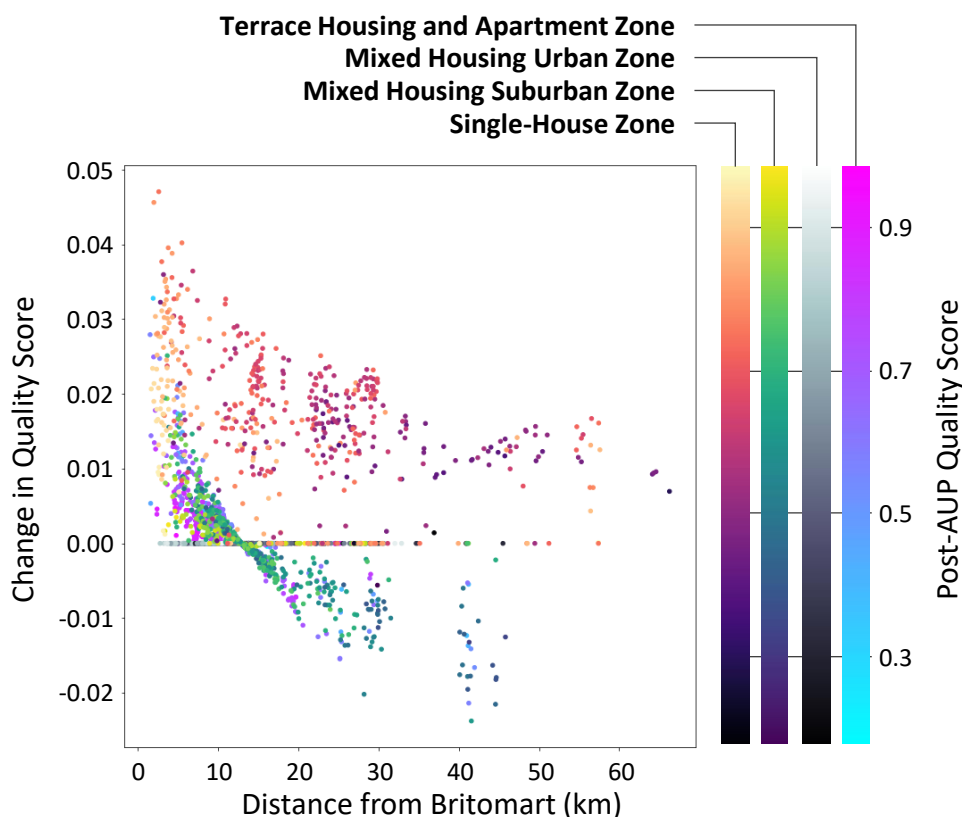
Source: Authors' analysis.

Note: The chart shows a random sample of 500 plots from each zone.

The four colour ramps in the figure represent the post-AUP quality scores for the four AUP zones in our data. In the scatter plot, notice that the grey colour ramp shows no land-value shock at any distance from Britomart. This is because the MHU is our proxy zone for the MDRS, so no simulated up-zoning takes place for those parcels. For the other zones, the change in land value is driven by the same regression results shown in Figure 7. In that figure, wherever the blue line for the MHU shows a higher or lower land-value than a parcel's current zone, our simulated shock is the difference in land-value change between the two lines. This means that at some distances from the city centre, we forecast a decrease in land values as a result of the up-zoning. This is consistent with the AMM model framework described in Section 2.2.1.

The simulated land value changes are applied to the post-AUP quality score calculations to reflect the impact of the zone change on demand for each property. The resulting changes in quality score for Auckland are shown in Figure 16.

Figure 16: Simulated post-MDRS quality score shocks in Auckland by zone and pre-shock quality score



Source: Authors' analysis.

Note: The chart shows a random sample of 500 plots from each zone.

The simulated quality score shocks in Auckland and in the other Tier 1 urban areas are consistently small compared to each observation's pre-shock scores. This implies that the land-value shock from the policy (Step 1) will have only a minor influence on a property's likelihood of development compared to that property's existing development demand conditions (Steps 2 and 3).

4.2.2 Step 2: Probability of adding at least one dwelling

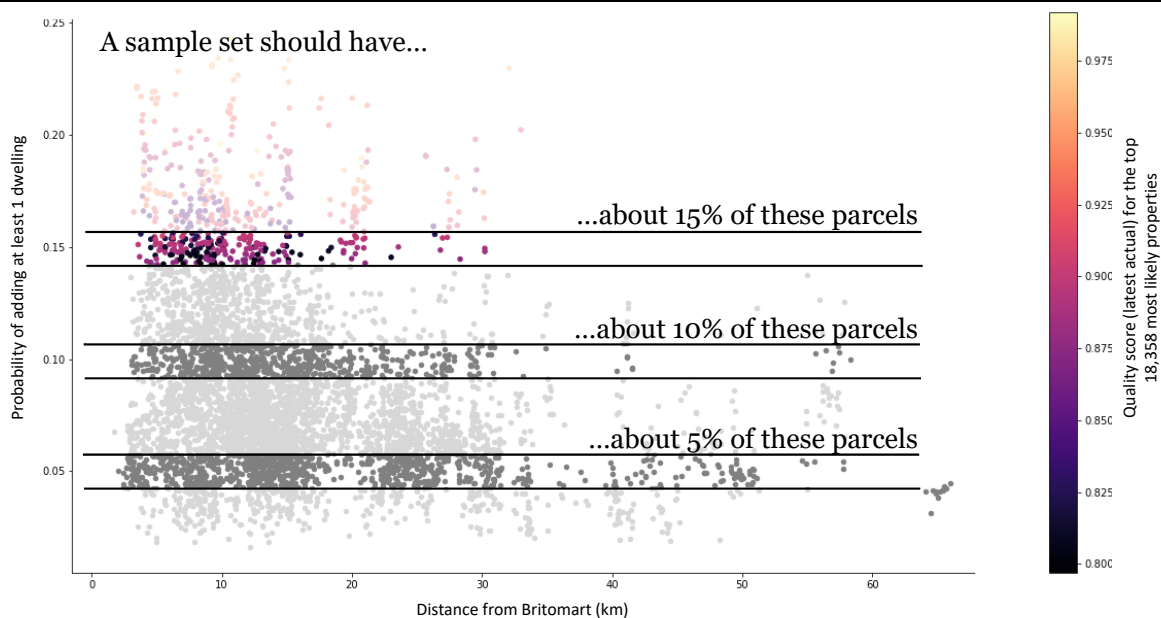
As the property-level quality score increases, the probability of adding at least one dwelling also increases. This is true for all zones. However, this is most prominent for the MHU and MHS zones. Our model uses the fitted coefficients for each zone, pre-AUP quality score, special character status, and distance from Britomart, and applies them using updated zone and special character status and updated quality scores, including the simulated shock from Step 1.

Each property is assigned a probability of adding at least one dwelling based on the fitted coefficients and updated model variables. This is done once without the policy effects (quality score shock, special character effects, and zone change) and once with the policy effects.

To simulate the selection of parcels that add at least one dwelling following the new policy, we first sum the predicted probabilities for all policy-eligible residential parcels (the four zones, less any parcels within the NPS-UD 6-storey catchment areas). We use this sum of probabilities as our estimate for the total count of development events for the forecast scenario.

To select properties for further estimations of dwelling counts, building dimensions, costs, and benefits, we simulate possible scenarios using a random weighted probability, where the weights are the existing parcel-level probabilities. We repeat this process n times without replacement,¹² where n is the total count of development events described above. Figure 17 shows how a single possible scenario might distribute development events across the population of parcels.

Figure 17: Plot selection based on probability predictions – Auckland



Source: Authors' analysis.

To account for variance in our estimates, we simulate 1,000 specific probable outcomes like the one shown above.

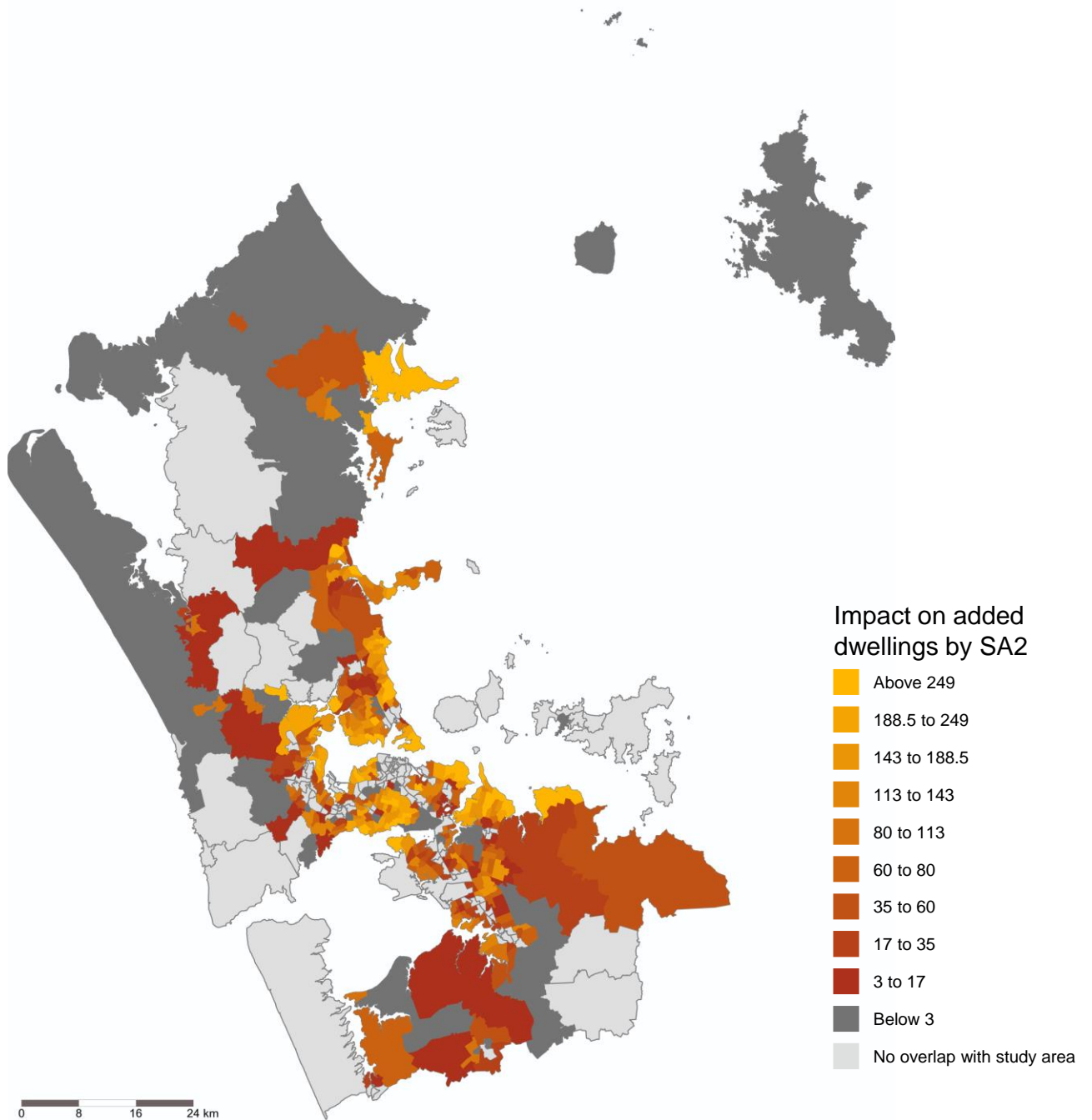
4.2.3 Step 3: Floor area ratio increase conditional on adding at least one dwelling

For each property selected in the previous step using ranked probabilities, we estimate the increase in FAR expected based on the property's quality score, zone, and land area. To do this, we apply the fitted coefficients from the AUP data, which generate a prediction like the one shown in Figure 14 above but adjusted for the simulated shocks to quality score and zone, as in Step 2.

In our original CBA, our results were not intended as a spatial prediction for where Auckland's future development will take place, but rather as a set of illustrative hypothetical scenarios for how the predicted quantities of dwellings would be arranged under each scenario's assumptions. By randomly selecting parcels to redevelop based on their existing parcel-level probabilities, our new results allow us to see the probable distribution of redevelopment in the sub-geographies of a city. Figure 18 below shows the median impact on added dwellings in Auckland as a result of the MDRS at the SA2 level. Appendix A provides a detailed breakdown of developments at the SA2 level.

¹² When a parcel is selected, we do not replace it back into the set of all parcels before selecting another parcel. This ensures that we do not select a parcel twice.

Figure 18: Median impact on added dwellings in Auckland



Source: Author's analysis

4.2.4 Dwelling impact results for Auckland

- Without the MDRS, we forecast a 35,522 increase in the number of dwellings in policy-affected areas.
- With the MDRS, we forecast an 81,361 increase in the number of dwellings in policy-affected areas.
- Policy impact is an additional 45,839 dwellings in policy-affected areas.

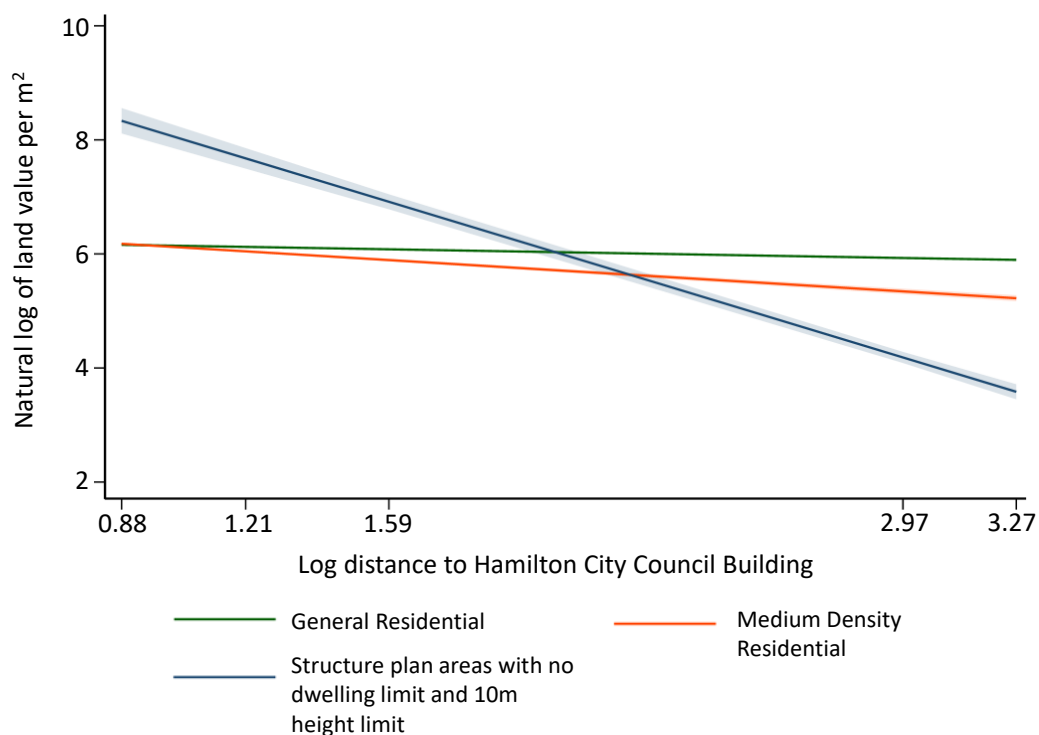
4.3 Other Tier 1 urban areas

Since we do not have a natural experiment in other Tier 1 urban areas, we adjust the model to align with local demand and constraints as described in the approach section above. The following subsections present model outputs for the four non-Auckland Tier 1 urban areas.

4.4 Hamilton

In Hamilton, land values show less variation by distance to the centre than in other urban areas. Most of the residential areas are in the General Residential and Medium Density Residential zones. To simulate the land-value shock from the MDRS, we use a subset of zones with characteristics closer to the new policy than to Auckland’s SHZ. This subset comprises the structure plan areas on the edges of Hamilton and in outlying towns that have no listed dwelling limit and a height limit of 10 metres. Figure 19 shows the discontinuity in land values by zone grouping.

Figure 19: Land value by zone and distance to city centre - Hamilton

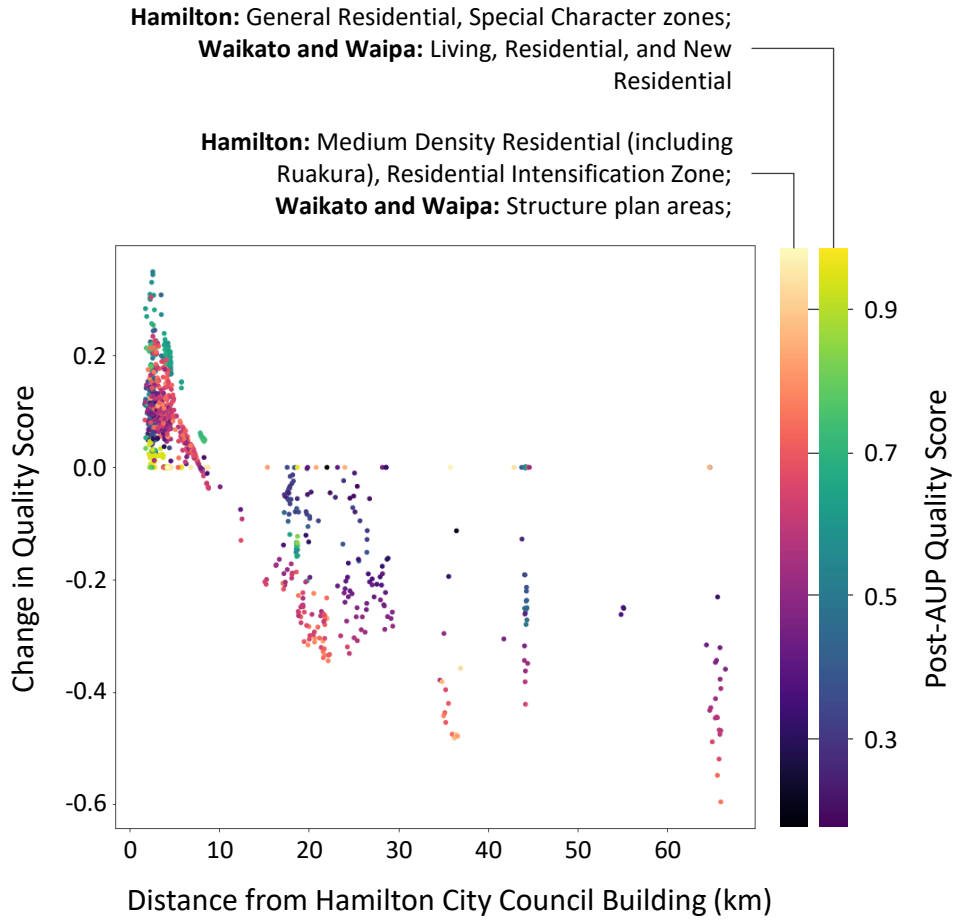


Source: Authors’ analysis.

In our land value regressions, the special character zones to the East of Hamilton’s city centre are grouped with the General Residential zone, along with the Living, Residential, and New Residential zones from Waikato and Waipā. The Medium Density Residential group includes Hamilton’s Medium Density Residential zone including Ruakura and the Residential Intensification Zone, as well as some structure plan areas in Waikato and Waipā.

The observed discontinuity pattern means that most of the properties forecast to see a positive land value shock from up-zoning are in Hamilton City rather than the neighbouring districts. This is consistent with the AMM model to the extent that nearby towns are a substitute for living in Hamilton City—relaxing constraints in the centre leads to a decrease in land value for substitute locations farther away. This is clear in Figure 20, where positive quality score shocks are exclusively in the distance range below 10 km from Hamilton City Council.

Figure 20: Simulated quality score shock from MDRS – Hamilton

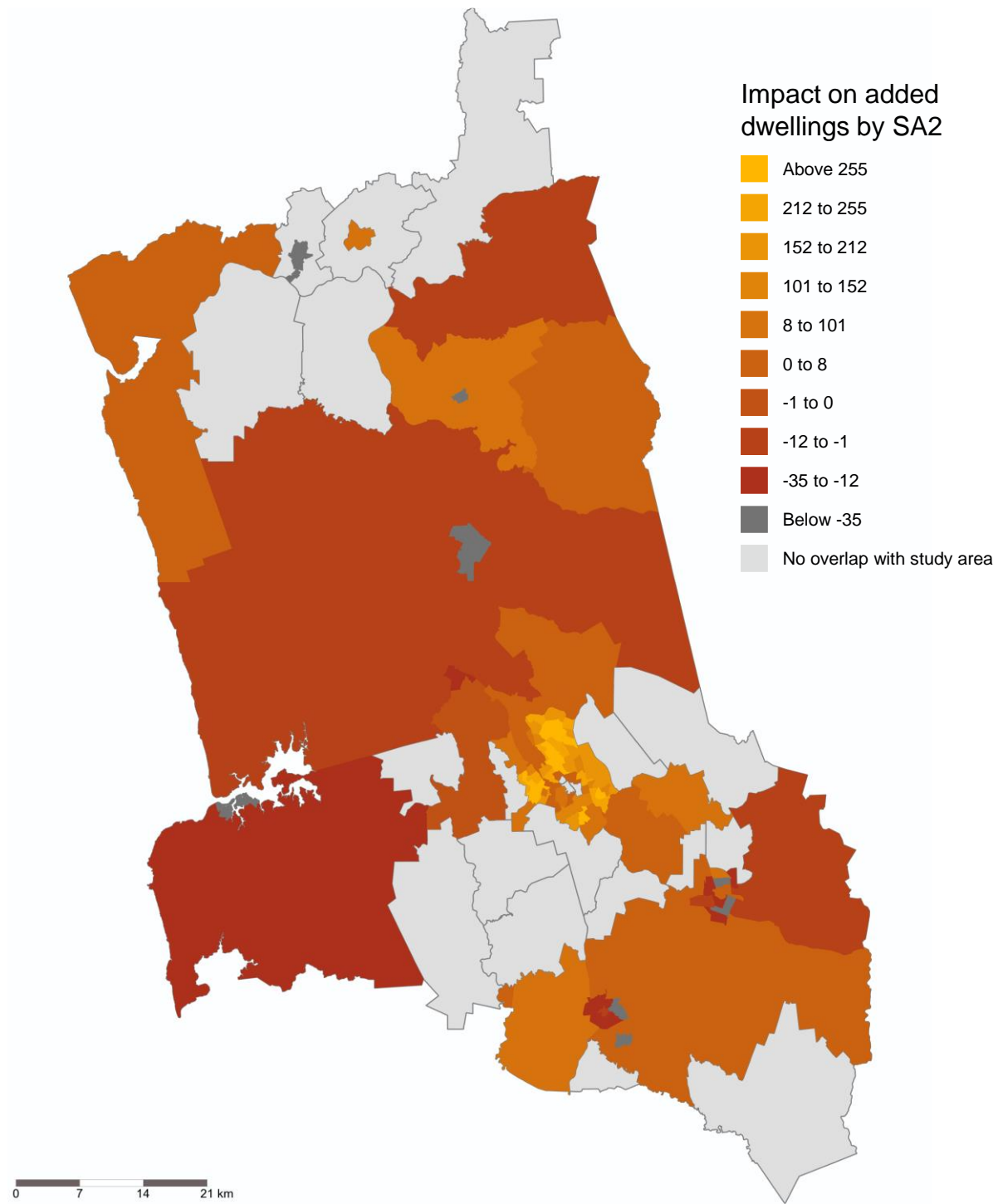


Source: Authors' analysis.

We use these adjusted quality scores as inputs to steps 2 and 3 of our model, which forecast the location and quantity of likely development of new dwellings in Hamilton over the five-to-eight years following the enactment of the MDRS.

Figure 21 below shows the median impact on added dwellings in Hamilton as a result of the MDRS at the SA2 level. Appendix A provides a detailed breakdown of developments at the SA2 level.

Figure 21: Median impact on added dwellings in Hamilton



Source: Author's analysis

4.4.1 Dwelling impact results for Hamilton

Table 3: Mean dwelling impact results for Hamilton

	Without policy	With policy	Policy impact
Waikato District	1,556	1,131	-425
Hamilton City	5,615	15,781	10,166
Waipā District	1,524	1,079	-445

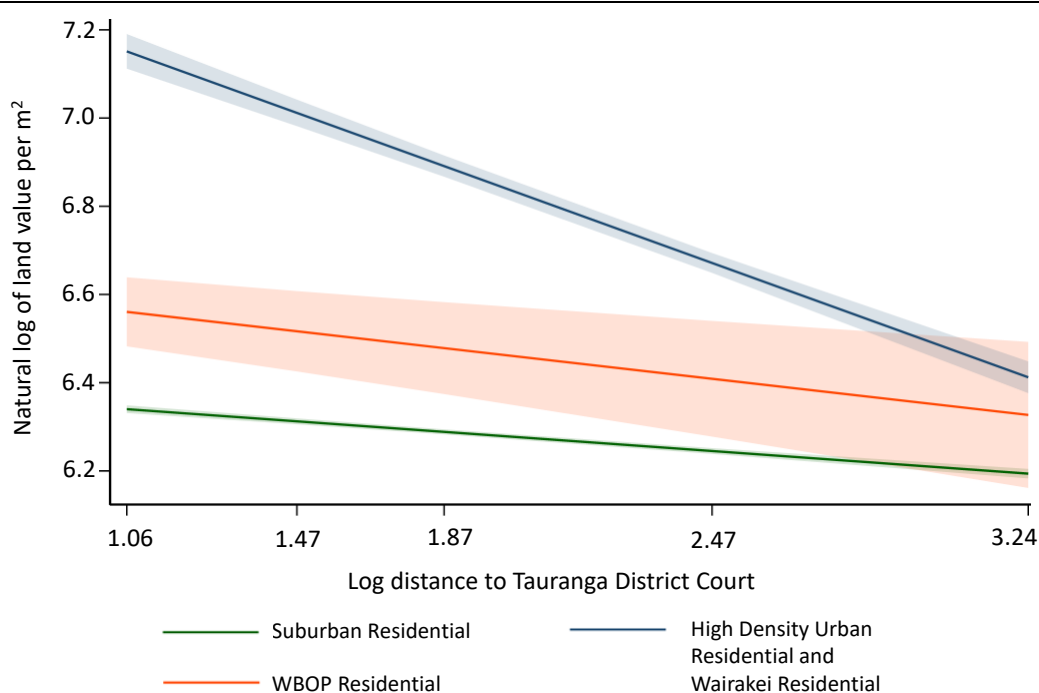
Source: Author's analysis

We forecast that the MDRS will decrease the number of added dwellings in Waikato District and Waipā District, while more development is attracted to Hamilton City.

4.5 Tauranga

Land values in Tauranga show a clear and significant statistical difference by zone at all distances to the city centre. This suggests that much of the city may face constraints to development. Figure 22 shows the discontinuities in land values in Tauranga post-MDRS by zone. The wide shaded band around the linear estimate for Western Bay of Plenty residential areas indicates a smaller sample size and lower statistical confidence for the estimated relationship for that group.

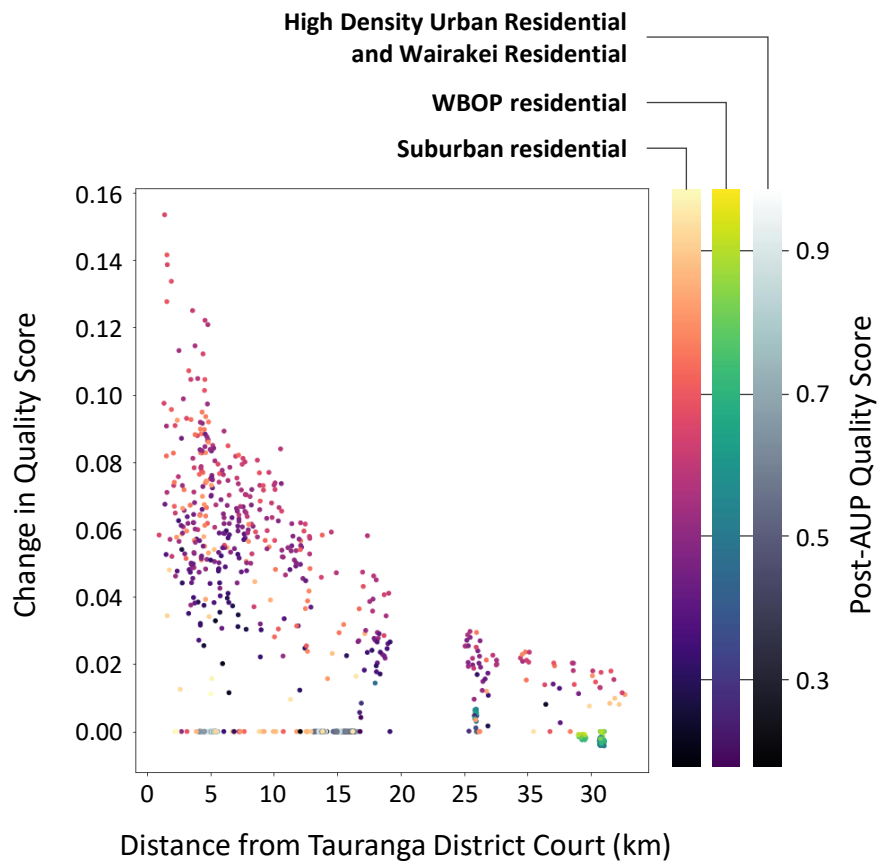
Figure 22: Land value by zone and distance to city centre - Tauranga



Source: Authors' analysis.

Unlike in Hamilton, Tauranga's simulated land value and quality score shocks are positive at nearly all distances from the centre. These are shown for a sample of parcels in Figure 23 below.

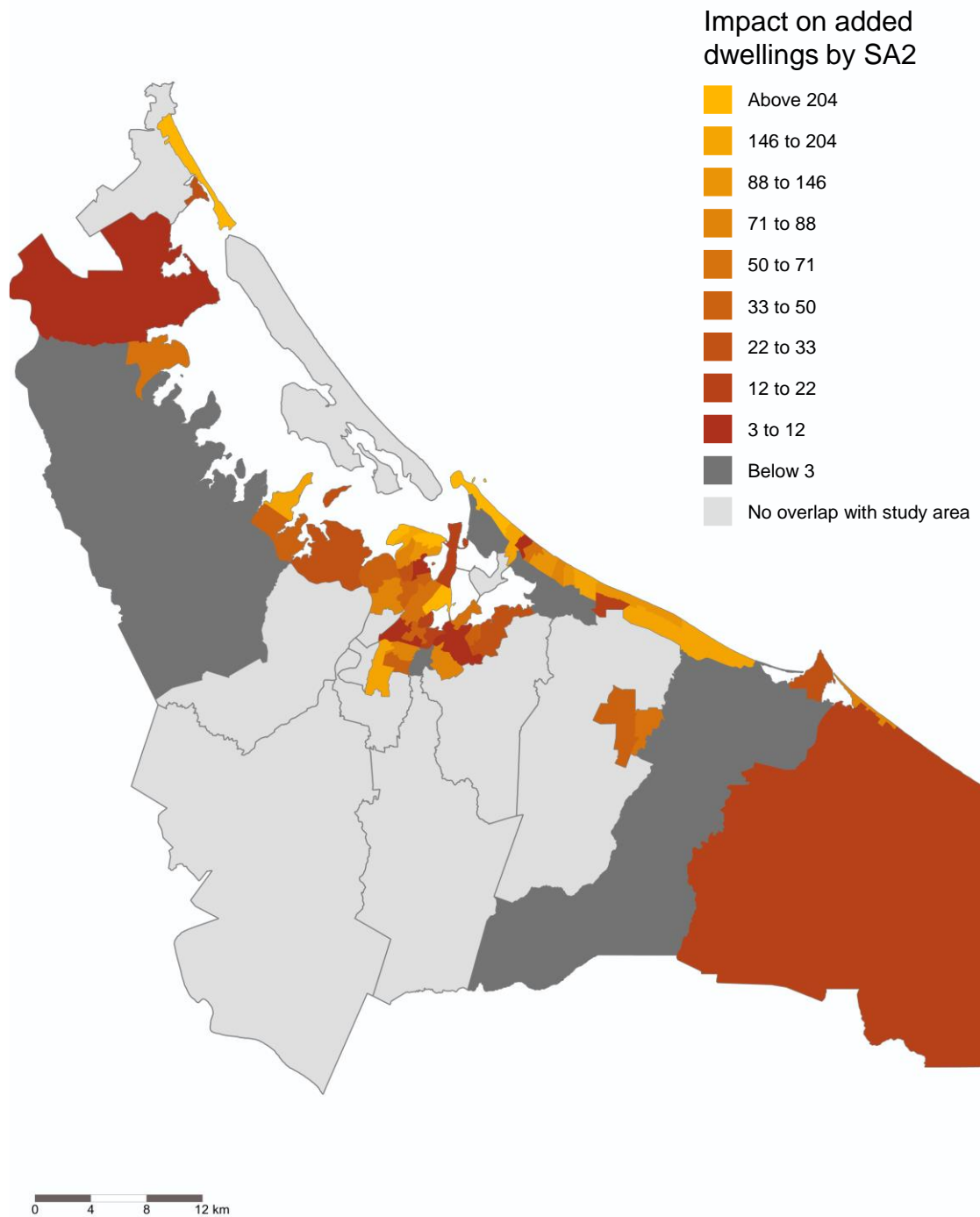
Figure 23: Simulated quality score shock from MDRS – Tauranga



Source: Authors' analysis.

As in the other urban areas, we use the shocked quality scores to estimate likelihood, location and quantity of development with and without the policy. Figure 24 below shows the median impact on added dwellings in Tauranga as a result of the MDRS at the SA2 level. Appendix A provides a detailed breakdown of developments at the SA2 level.

Figure 24: Median impact on added dwellings in Tauranga



Source: Author's analysis

4.5.1 Dwelling impact results for Tauranga

Table 4: Mean dwelling impact results for Tauranga

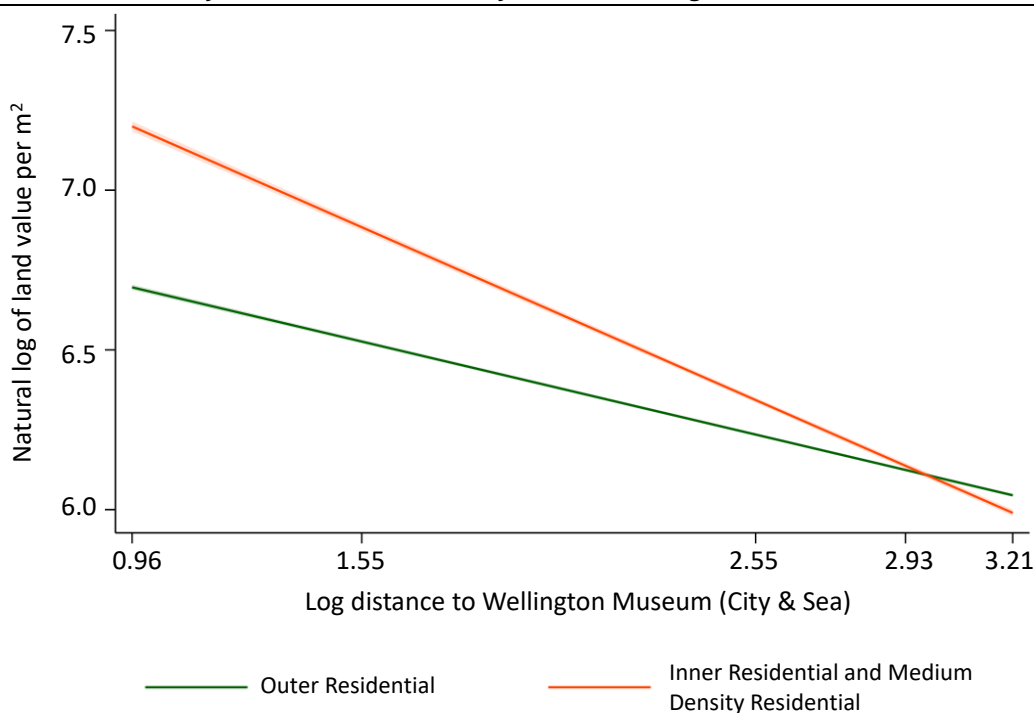
	Without policy	With policy	Policy impact
Western Bay of Plenty District	922	1,808	886
Tauranga City	3,010	6,941	3,931

Source: Author's analysis

4.6 Wellington

In Wellington, the Inner Residential zone and Medium Density Residential zone show very similar land value patterns. While their names imply that the latter might be more permissive, both permit one dwelling and up to 50% building coverage. The Inner Residential zone also has special character protections in many neighbourhoods. These two zones have been grouped together, along with the Medium Density Residential Activity Area in Lower Hutt and the Suburban Zone in Porirua, each of which are more permissive than the Wellington City zones. Figure 25 shows the discontinuity in land values in Wellington post-MDRS by zone.

Figure 25: Land value by zone and distance to city centre – Wellington

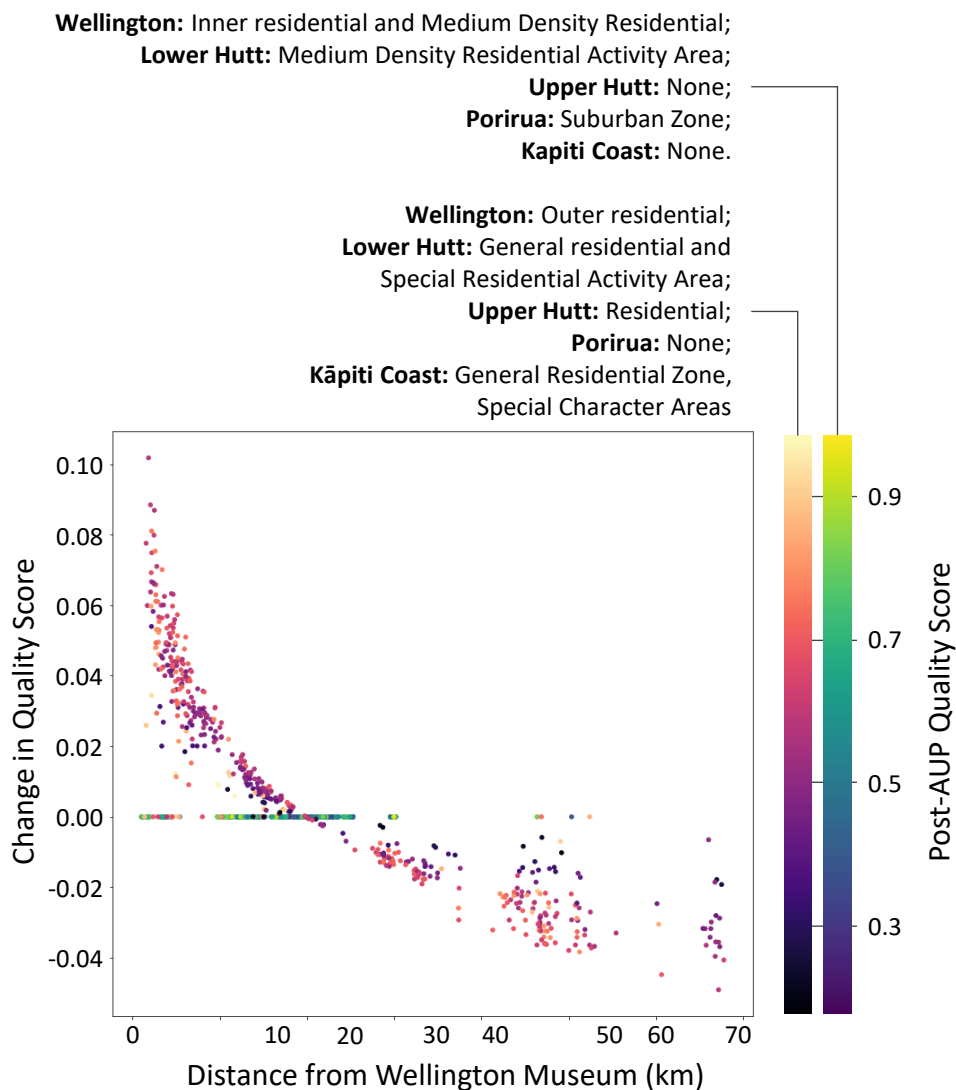


Source: Authors' analysis.

The Outer Residential zone in Wellington has been grouped with the General Residential and Special Residential Activity Area zones in Lower Hutt, the Residential zone in Upper Hutt, and the General Residential zone and Special Character Areas in Kāpiti Coast. The land value discontinuity patterns imply that a broad release of development capacity may lead to rising land values in Wellington City but falling land values in the more distant residential zones.

This pattern is simulated in our modelled quality score shocks, a sample of which are shown in Figure 26 below.

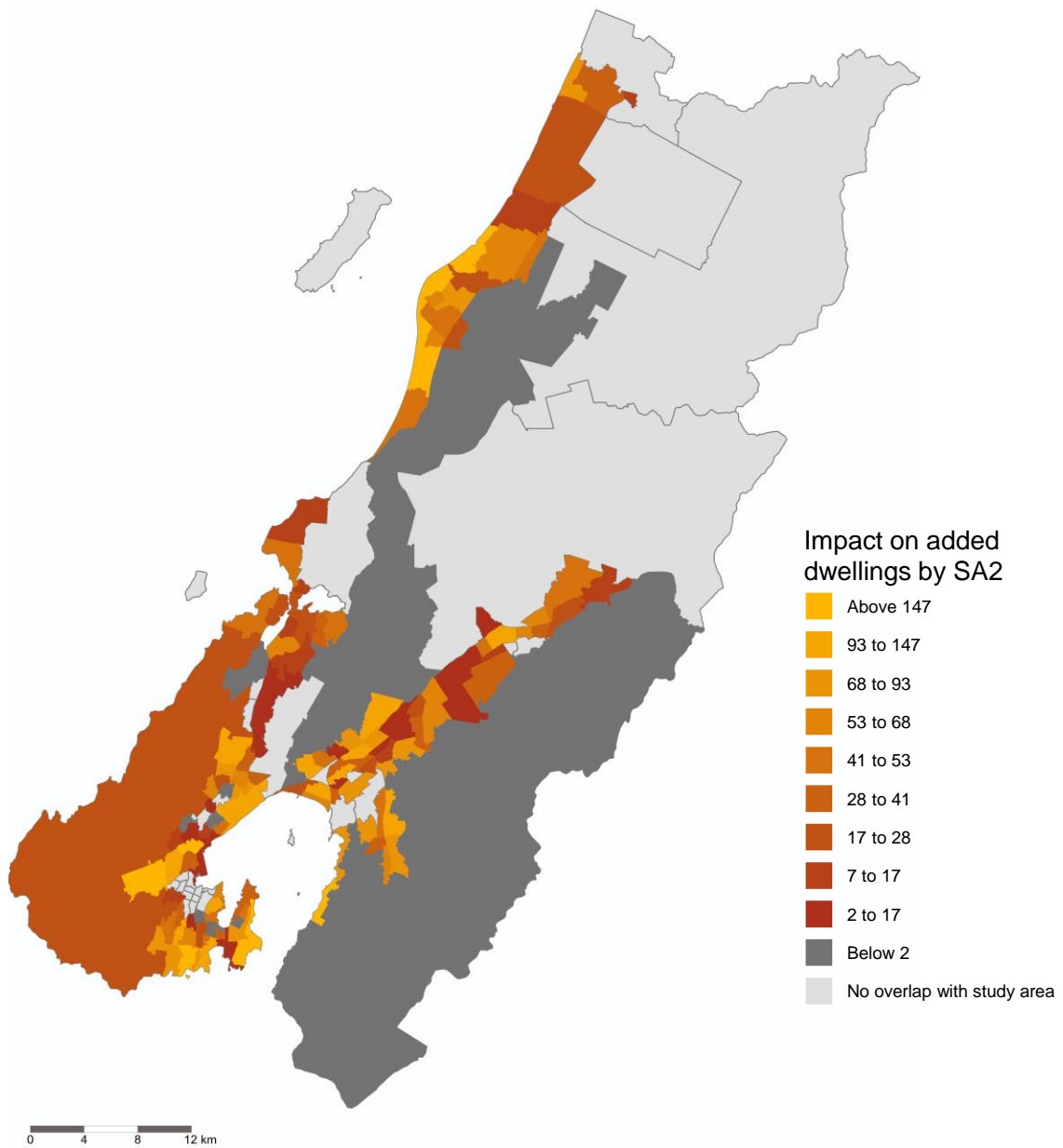
Figure 26: Simulated quality score shock from MDRS - Wellington



Source: Authors' analysis.

The forecast pattern of development is more dispersed in Wellington than in the other cities, reflecting that the NPS-UD catchment areas in Wellington cover much more of the urban core. Figure 27 below shows the median impact on added dwellings in Wellington as a result of the MDRS at the SA2 level. Appendix A provides a detailed breakdown of developments at the SA2 level.

Figure 27: Median impact on added dwellings in Wellington



Source: Author's analysis

4.6.1 Dwelling impact results for Wellington

Table 5: Mean dwelling impact results for Wellington

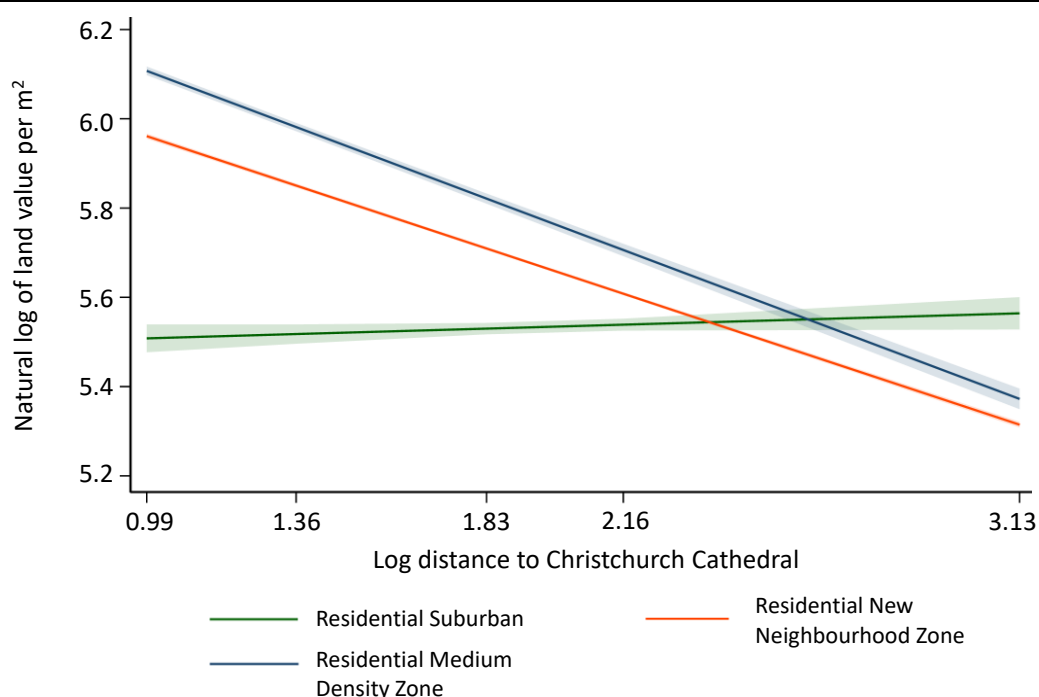
	Without policy	With policy	Policy impact
Kapiti Coast District	1,048	2,680	1,632
Porirua District	1,215	1,689	474
Upper Hutt City	479	1,068	589
Lower Hutt City	1,358	3,445	2,087
Wellington City	2,103	6,147	4,134

Source: Author's analysis

4.7 Christchurch

Christchurch shows a significant difference between zones in the relationship between distance from the city centre and land value. Our regression results for land value discontinuity between zones are shown in Figure 28 below.

Figure 28: Land value by zone and distance to city centre – Christchurch



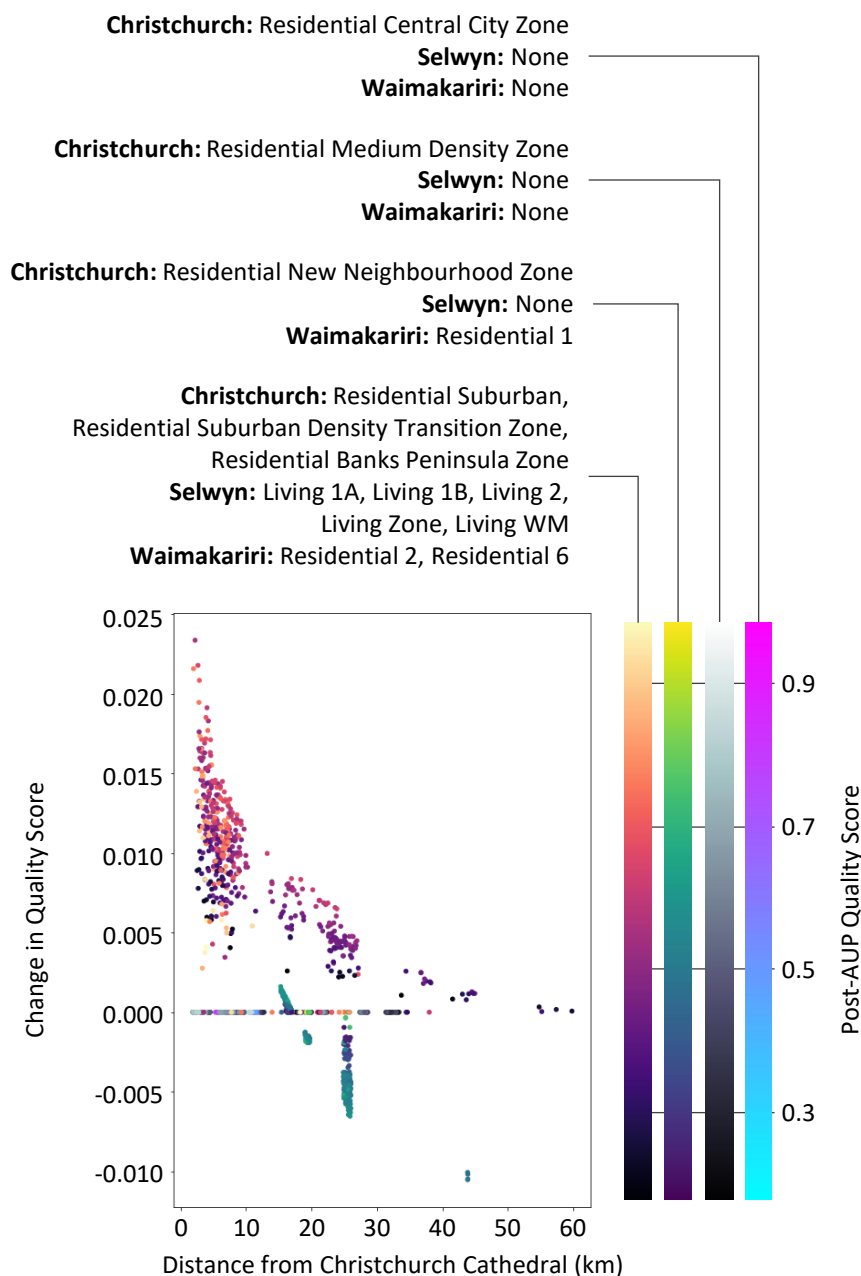
Source: Authors' analysis.

The zones shown in the figure represent groupings according to zone characteristics. The 'Residential Suburban' zone includes the Residential Suburban, Residential Suburban Density Transition, and Residential Banks Peninsula zones in Christchurch; the Living 1A, Living 1B, Living

2, Living Zone, and Living WM zones in Selwyn; and the Residential 2 and Residential 6 zones in Waimakariri.

Based on these observed discontinuities, our land value and quality score shocks are much more significant for parcels currently zoned as Residential Suburban or similar than for other zones. The quality score shocks are shown for a sample of parcels in Figure 29 below.

Figure 29: Simulated quality score shock from MDRS – Christchurch



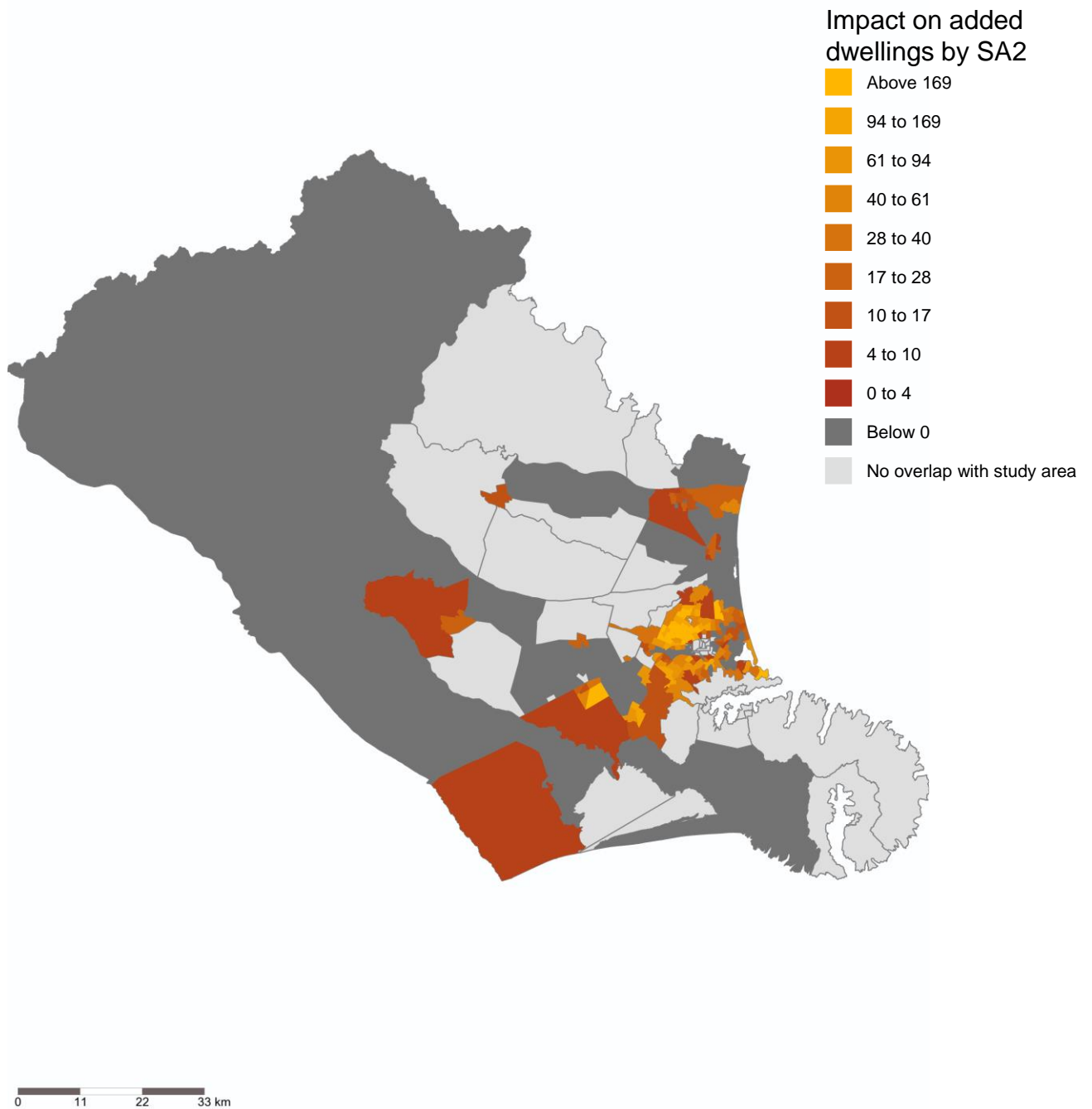
Source: Authors' analysis.

Note: Zone alignments for land-value shocks are chosen based on local land-value discontinuities and may differ slightly from the alignments used for floor area changes in Step 3.

We use these adjusted quality scores as inputs to steps 2 and 3 of our model, which forecast the location and quantity of likely development of new dwellings in Christchurch over the five-to-eight years following the enactment of the MDRS.

Figure 30 below shows the median impact on added dwellings in Christchurch as a result of the MDRS at the SA2 level. Appendix A provides a detailed breakdown of developments at the SA2 level.

Figure 30: Median impact on added dwellings in Christchurch



Source: Author's analysis

4.7.1 Dwelling impact results for Christchurch

Table 6: Mean dwelling impact results for Christchurch

	Without policy	With policy	Policy impact
Waimakariri District	1,172	1,441	269
Christchurch City	9,465	18,884	9,419
Selwyn District	1,440	2,109	669

Source: Author's analysis

In terms of our model, the impact in Christchurch is strong because historical consents have been strong and quality scores are high. Conceptually, Christchurch is unique among the Tier 1 urban areas in that its prices have been more stable over the last decades. No other Tier 1 urban area had a median house price as a multiple of median income that was no higher in April 2020 than it was in April 2014.¹³ This may be due to the unusual demand conditions created by the devastating 2011 Christchurch Earthquake, after which building consents spiked during reconstruction, but population growth slowed for several years and housing preferences appear to have shifted toward less densely developed areas.¹⁴

Since mid-2020 however, the price-income multiple has begun to climb. Population growth has also recovered to pre-earthquake levels after a period of decline from 2011 to 2013. Land values in the city centre have recovered well relative to improvement values, implying lower average opportunity cost of redevelopment compared to the other city centres. Together, these factors provide insight into the difference in data inputs that have led to a stronger modelled policy response in Christchurch.

In other words, the policy can be more effective than average in Christchurch because where other urban areas have a housing crisis to address, Christchurch is in the enviable position of having a housing crisis to prevent.

4.8 Note on treatment of qualifying matters

Both the NPS-UD and the MDRS include provisions that allow councils to exempt specific properties from minimum up-zoning requirements according to a list of “qualifying matters,” including consideration of the provisions of other National Policy Statements, potential interference with nationally significant infrastructure, and several others.¹⁵

To apply an exemption under one of the qualifying matters, councils must demonstrate their case based on site-specific analysis, including what characteristics of the site make the level of directed development inappropriate, why those characteristics justify limiting development in light of the national significance of the policy’s urban development objectives.

This is a stark departure from the status-quo for exemptions to allowable development before the NPS-UD, where typically the case had to be made *for* development rather than *against* it. Because the burden of demonstration for qualifying matters applies to specific sites and falls on councils in their planning process, our original CBA assumption is that only a few sites with clear cases for exemption will be put forward under qualifying matters. We model our base case forecasts under this assumption. One advantage of this approach for the purpose of the current work is that these

¹³ REINZ and Stats NZ data.

¹⁴ PwC 2020, Stats NZ.

¹⁵ See NPS-UD 2020, Section 3.32 and 3.33.

estimates can serve as a baseline development expectation against which to estimate the costs of providing exceptions to the MDRS in specific areas.

4.9 Robustness checks

As robustness checks for our spatial econometric model, we tested three alternate model specifications to examine their effects on the primary relationships that drive our forecast results. These are described in the subsections below.

4.9.1 Spatial autocorrelation

In plain language, we tested and found that the estimated relationships between quality score and both likelihood of development and quantity of development are not random in the way the errors (differences between fitted model expected values and actual observations) are spatially distributed. We conducted an alternate method of estimating these errors that is robust to this kind of spatial dependence to understand whether the spatial clustering or anti-clustering (dispersion) in the data harms the accuracy of our estimates of the key model relationships and concluded that it does not.

In more technical language, we conducted a Moran's I test for spatial autocorrelation in regression residuals for both the logit and Ordinary Least Squares (OLS) steps. We found that residuals are spatially correlated, with index values of 0.022 for the logit and 0.016 for the OLS. Moran's Index values near zero imply that we observe both non-random spatial clustering and non-random dispersion in the residuals.

To test whether the presence of spatial autocorrelation affects the statistical significance of our coefficient estimates, we use the Conley standard errors method (Conley 1999) to correct for spatial autocorrelation, finding no relevant effect on the significance of our coefficient estimates. Further technical details of these test results are provided in Appendix C.3.

4.9.2 Neighbourhood-level fixed effects

We tested both the logit and OLS models with neighbourhood-level fixed effects for Auckland and found that the general relationship between quality score and both the likelihood to develop and quantity of development were unchanged, including in terms of differences in slope between zones. That is, higher quality scores were still associated with higher likelihood and quantity of development, and this relationship was more pronounced for the MHS and MHU zones than for SHZ.

While the specific estimates of slopes and intercepts were altered by the presence of neighbourhood-level fixed effects, we decided to omit these from the final model to avoid overfitting our forecasts to observed neighbourhood-level patterns in the past, which the policy intends to alter.

4.9.3 Single-step approach to the dwellings-added estimate

We also tested a single-step model, directly estimating the average FAR increase across the city in each zone as predicted by the quality score. This provided similar results in terms of zone-quality score relationships and city-wide average FAR increases.

However, this method disperses modelled increases in floor area across all observations as predicted by their quality score, zone, land area, and distance from the city centre. Consequently, it does not provide insight into potential scenarios for how development might be spatially arranged throughout a city, as the two-step model does.

5 Restrictions

This report has been prepared for the Ministry for the Environment and the Ministry of Housing and Urban Development ('the Ministries') to set out our spatial estimates of the likely development impact of the Medium Density Residential Standards policy at the Statistical Area 2 level. This report has been prepared solely for this purpose and should not be relied upon for any other purpose. We accept no liability to any party should it be used for any purpose other than that for which it was prepared.

This report and accompanying data tables have been prepared solely for use by the Ministries and appointed peer reviewers, as well as for initial circulation among the local district and city councils whose territories are included in our modelled estimates. They may not be copied or distributed to third parties without our prior written consent.

To the fullest extent permitted by law, PwC accepts no duty of care to any third party in connection with the provision of this report and/or any related information or explanation (together, the "Information"). Accordingly, regardless of the form of action, whether in contract, tort (including without limitation, negligence) or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind to any third party and disclaims all responsibility for the consequences of any third party acting or refraining to act in reliance on the Information.

We have not independently verified the accuracy of information provided to us and have not conducted any form of audit in respect of the Ministry for the Environment or the Ministry of Housing and Urban Development. Accordingly, we express no opinion on the reliability, accuracy, or completeness of the information provided to us and upon which we have relied.

The statements and opinions expressed herein are based on information available as at the date of the report, have been made in good faith, and have been made on the basis that all information relied upon is true and accurate in all material respects and not misleading by reason of omission or otherwise. We reserve the right, but will be under no obligation, to review or amend our report, if any additional information, which was in existence on the date of this report, was not brought to our attention, or subsequently comes to light.

It is not possible to assess with certainty the implications of COVID-19 on the economy, both generally in terms of how long the current crisis may last and more specifically in terms of its impact on housing supply and demand. We note our advice is subject to significant caveats and caution at this time due to uncertainty that exists for residents and developers including (among other matters) the demand for products or services, access to capital, supply chain disruption, and the extent and duration of the measures implemented by various governments and authorities to contain or prevent spread of COVID-19.

This report is issued pursuant to the terms and conditions set out in our Consultancy Services Order dated 2 June 2022.

Appendix A. SA2 level development impacts

A.1 Auckland

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
110200	2	0	-1	4
110400	1	0	0	0
110500	48	47	34	61
110700	1	0	-1	3
110900	37	36	26	48
111100	83	82	66	98
111200	0	0	0	0
111300	142	141	123	161
111400	1	0	0	0
111500	514	513	480	548
111700	217	213	190	239
111800	0	0	0	0
111900	77	77	63	91
112100	14	13	5	21
112200	21	20	11	30
112300	16	13	8	19
112400	96	94	79	110
112500	0	0	0	0
112700	253	249	223	281
112800	81	81	66	95
112900	142	141	124	159
113000	21	21	7	34
113100	79	79	65	92
113200	1	0	0	2
113300	164	163	142	185
113400	74	72	57	88
113600	117	117	99	135
113800	4	4	-5	14
113900	176	176	153	198
114000	254	251	224	279
114100	34	33	24	43
114200	96	95	75	114
114400	117	117	100	134
114600	113	113	96	130
114700	5	4	0	8
114800	40	40	29	50
114900	107	105	84	131

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
115000	82	80	67	96
115100	114	112	97	131
115200	148	148	128	167
115300	0	0	0	0
115400	126	125	109	143
115500	0	0	0	0
115600	0	0	0	0
115700	60	58	45	72
115800	233	232	206	257
115900	284	283	255	312
116000	78	77	63	92
116100	1	0	0	0
116200	139	138	114	161
116400	9	6	0	17
116500	167	167	141	193
116700	17	16	7	25
116800	213	212	184	243
116900	70	70	56	83
117000	194	193	165	221
117200	302	300	269	335
117400	49	44	30	60
117500	162	162	136	187
117600	8	8	1	14
117700	165	166	138	193
117900	243	243	213	274
118000	0	0	0	0
118100	21	21	12	30
118200	165	165	141	190
118300	145	145	120	168
118400	82	81	66	95
118500	53	54	41	66
118600	5	5	1	10
118700	131	131	105	153
118900	356	353	323	387
119000	197	195	168	225
119100	105	103	84	124
119200	40	39	22	57
119400	26	25	16	34
119500	179	178	154	205
119700	22	22	13	30
119800	47	47	34	59
119900	97	97	77	116
120000	188	188	162	212

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
120100	22	21	13	31
120200	164	162	128	198
120300	215	214	185	242
120400	26	26	15	35
120500	141	142	114	167
120600	25	25	4	47
120700	134	133	109	160
120800	161	162	136	183
120900	20	20	5	35
121000	70	70	51	90
121100	0	0	0	0
121200	9	8	3	13
121300	37	37	22	51
121400	61	62	46	74
121500	34	33	23	42
121600	79	80	62	97
121700	34	33	17	49
121800	149	149	123	174
121900	134	134	104	164
122000	12	12	7	17
122100	83	81	64	102
122200	285	283	253	315
122300	128	127	101	152
122400	93	93	72	112
122500	46	46	25	67
122600	171	170	142	201
122700	151	151	120	181
122800	115	113	90	136
122900	99	99	76	123
123000	6	6	1	11
123100	72	70	52	93
123200	185	184	157	212
123300	108	107	88	127
123400	193	192	163	222
123500	1	0	0	0
123600	254	254	220	288
123700	477	478	437	518
123900	194	193	170	217
124000	162	160	132	193
124200	1	0	0	2
124300	7	6	-1	15
124400	127	127	106	148
124500	210	207	175	238

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
124600	73	68	45	91
124700	1	0	0	0
124800	330	325	293	362
125200	158	157	132	180
125300	206	205	182	234
125400	149	149	122	177
125500	4	4	0	8
125600	74	73	56	91
125800	188	188	160	216
125900	77	77	58	96
126000	82	82	69	95
126200	271	272	240	301
126300	211	211	188	234
126400	27	26	12	41
126500	103	103	81	126
126900	80	78	64	92
127000	205	202	171	240
127100	140	138	118	161
127300	117	118	92	143
127400	279	278	254	305
127600	3	3	0	6
127700	42	40	28	55
127800	29	28	19	38
128100	103	102	82	122
128200	289	289	258	320
128300	38	38	28	47
128500	49	48	34	62
128600	11	10	4	16
128800	107	108	85	130
128900	129	129	105	152
129000	2	1	0	4
129200	239	240	203	276
129300	199	202	166	233
129400	235	233	197	272
129500	69	68	52	86
129600	125	124	108	142
129700	309	308	274	341
129800	146	143	117	173
129900	279	278	241	315
130100	134	132	112	155
130300	198	198	169	225
130400	143	142	121	166
130500	99	98	80	117

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
130600	212	213	182	243
130700	352	353	316	386
130900	61	60	43	78
131000	3	3	-4	9
131100	116	115	88	141
131200	1	0	0	2
131400	265	266	242	286
131500	10	9	4	15
131600	190	190	170	210
131700	20	20	6	33
132000	26	25	16	35
132100	59	59	38	80
132500	136	135	114	157
133000	377	378	350	404
134000	254	252	233	273
134200	1	1	-3	5
134600	0	0	0	0
134700	136	135	113	159
134900	2	0	0	4
135400	119	118	96	144
135500	72	72	57	86
135800	3	2	0	6
136300	2	2	-1	5
136500	35	32	15	50
136600	128	129	104	151
136700	4	4	0	8
136800	55	54	39	70
137000	70	70	50	91
137100	59	59	44	75
137200	2	2	-4	8
137300	73	72	50	93
137500	1	0	0	0
137600	78	77	55	103
137800	9	8	3	15
137900	167	168	140	192
138000	109	108	88	129
138100	131	131	114	149
138200	154	153	130	176
138300	194	193	164	222
138400	177	176	153	200
138600	126	125	102	149
138700	3	2	0	5
138900	247	246	213	279

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
139000	196	197	165	228
139300	229	227	206	252
139500	147	146	119	174
139600	169	167	139	201
139700	137	137	113	161
139800	57	56	42	72
139900	263	263	228	297
140000	86	86	68	104
140100	69	68	50	86
140200	191	192	163	220
140400	8	8	-2	19
140500	23	22	14	31
140600	206	203	179	233
140700	1	1	-3	5
140800	375	374	337	410
140900	321	320	286	354
141100	235	232	195	275
141200	107	103	85	126
141300	167	168	142	190
141500	225	226	197	253
141600	269	267	237	298
141700	193	191	163	223
141800	189	189	146	230
142000	181	180	149	216
142100	227	227	196	259
142300	217	216	188	245
142400	128	127	107	151
142500	155	149	119	184
142600	154	154	120	187
142700	277	277	239	315
142800	200	200	170	231
142900	160	159	133	184
143000	282	278	233	325
143100	133	132	106	161
143200	91	90	70	111
143400	219	217	189	249
143500	242	240	205	278
143600	261	260	231	291
143700	131	129	104	157
143800	25	25	15	34
143900	133	132	106	158
144000	424	421	381	467
144100	269	266	233	301

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
144300	299	297	266	331
144400	88	88	67	107
144700	3	3	-5	11
144900	36	35	25	47
145000	226	224	195	256
145100	256	253	216	299
145200	81	82	59	102
145300	64	55	35	82
145500	3	1	0	6
145600	133	134	101	163
145700	4	3	-1	8
145800	197	197	161	231
145900	0	0	0	0
146000	12	12	3	20
146100	341	339	306	374
146200	72	71	56	87
146300	79	77	57	98
146400	280	280	245	313
146500	5	5	0	10
146800	186	184	154	215
147000	63	62	47	78
147100	17	14	7	22
147200	4	4	0	6
147500	173	170	145	198
147600	0	0	0	0
147800	192	193	159	221
148000	178	177	151	204
148100	333	332	295	367
148200	61	59	44	76
148300	116	115	94	138
148400	291	290	256	325
148500	25	24	9	40
148600	68	67	52	82
148800	158	157	133	182
148900	31	31	10	52
149000	220	219	188	254
149100	81	80	65	96
149200	176	175	145	208
149300	178	179	151	204
149400	36	36	19	53
149500	59	58	46	74
149700	276	275	243	307
149800	206	204	172	238

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
150000	31	30	10	53
150100	1	0	0	3
150200	125	125	106	145
150300	58	58	40	77
150400	344	344	310	376
150500	185	185	156	212
150600	514	511	470	559
150700	183	182	155	210
150800	60	59	45	76
150900	88	87	67	107
151000	79	78	64	93
151200	51	48	27	72
151300	275	276	241	309
151500	199	198	171	229
151600	80	79	59	101
151800	26	25	13	39
151900	82	80	63	100
152000	114	115	80	146
152200	152	153	130	176
152300	0	0	0	0
152400	186	182	157	214
152500	62	61	47	76
152600	22	22	6	36
152800	83	82	65	100
152900	121	121	98	143
153000	42	41	30	53
153100	13	12	5	21
153200	35	34	24	46
153400	570	568	532	606
153500	78	77	60	97
153600	41	39	28	52
153700	111	111	91	131
153800	229	230	199	256
153900	7	7	2	12
154000	3	3	-1	7
154100	155	148	122	177
154200	41	40	27	52
154300	328	327	301	355
154400	46	45	30	61
154700	51	51	38	65
154900	24	24	12	36
155000	299	299	271	331
155100	56	55	38	74

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
155200	27	27	18	36
155600	140	138	114	161
155700	33	31	13	49
155800	43	44	17	65
155900	17	17	9	25
156000	1	0	0	0
156100	16	16	8	24
156200	90	88	70	109
156300	3	3	0	5
156400	360	359	332	388
156600	32	32	15	50
156800	41	41	29	54
156900	68	66	52	84
157100	21	17	6	31
157200	15	15	1	28
157300	81	80	67	94
157400	282	281	252	310
157500	36	35	14	58
157700	12	13	-6	29
157800	79	77	64	93
157900	8	8	3	13
158000	120	118	99	140
158100	77	76	56	97
158200	65	64	51	79
158300	101	101	80	121
158400	19	19	8	30
158500	88	86	71	104
158600	182	180	152	208
158700	72	72	55	89
158800	20	20	11	29
158900	8	6	0	14
159000	99	99	80	116
159100	6	6	-1	12
159300	178	178	152	201
159400	97	95	80	112
159500	66	66	50	82
159600	114	113	98	131
159700	21	20	3	37
159800	1	0	0	2
159900	17	16	-3	37
160000	39	39	25	52
160200	86	87	70	103
160400	68	67	50	83

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
160500	76	76	59	95
160600	19	18	5	30
160700	130	130	109	153
161000	69	68	51	82
161100	119	119	99	138
161200	26	26	15	37
161300	6	5	1	10
161400	18	15	8	25
161500	92	92	74	111
161600	3	3	0	6
161800	51	50	37	64
162100	68	68	55	81
162200	24	24	14	33
162300	0	0	0	0
162400	67	67	54	78
162500	127	125	106	146
162600	37	37	24	48
162700	41	41	31	52
162900	33	32	21	43
163300	123	123	103	143
163400	89	88	71	106
163500	57	57	43	71
163700	90	88	72	107
163800	0	0	0	0
163900	67	66	52	80
164000	20	19	12	28
164200	83	79	62	98
164300	40	36	19	56
164400	18	17	9	26
164500	13	13	6	20
164600	4	1	-2	5
165000	13	13	8	18
165100	13	12	-3	28
165300	42	41	29	52
165400	47	46	33	60
165500	96	89	72	108
165600	35	35	24	45
165700	1	0	0	0
165800	2	1	0	3
165900	92	91	75	110
166100	22	22	14	30
166200	28	25	14	37
166300	0	0	0	0

A.2 Waikato District

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
169700	0	0	0	0
170000	-84	-84	-94	-75
170300	-56	-55	-63	-48
170400	0	0	-1	0
170500	52	52	34	71
170700	-8	-8	-11	-4
170800	38	37	23	53
170900	-3	-3	-8	2
171100	-37	-37	-45	-28
171200	-6	-7	-12	-1
171300	0	0	0	0
171400	-38	-37	-45	-30
171500	-89	-88	-102	-76
171600	-143	-144	-165	-121
171700	-2	-2	-4	0
171800	-15	-16	-23	-8
171900	-6	-6	-14	3
172000	-12	-12	-22	-2
172100	-12	-12	-26	2
172200	-19	-19	-27	-10
172300	1	1	-2	5
172400	0	-1	-5	4
172600	2	1	-4	8
172700	0	0	0	0
172800	-1	-1	-5	2
173200	4	4	0	7
173300	8	8	2	14
173400	0	0	0	0

A.3 Hamilton City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
175200	0	0	0	0
175300	243	243	221	262
175400	36	36	27	46
175500	188	187	169	206
175600	153	152	134	171
175700	78	78	65	91
175800	323	322	295	349
175900	361	360	337	384
176000	149	149	131	166
176100	247	246	226	267
176200	383	383	357	409
176300	1	0	0	0
176400	226	226	203	250
176500	299	299	274	324
176600	250	250	227	272
176700	197	196	179	214
176800	111	111	93	129
176900	308	307	288	331
177000	229	226	211	247
177100	262	260	238	284
177200	213	212	189	237
177300	242	243	220	264
177400	202	202	183	222
177500	200	201	181	220
177600	291	291	267	314
177700	304	303	280	328
177800	181	182	162	200
177900	292	291	268	318
178000	242	242	222	264
178100	291	291	267	316
178200	183	182	162	203
178300	5	5	1	9
178400	103	103	88	119
178500	204	203	185	224
178600	12	12	5	19
178700	92	92	76	108
178800	159	158	139	180
178900	3	2	0	6
179100	101	101	85	117
179200	168	168	149	187
179300	5	5	2	8

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
179500	34	34	26	41
179600	219	220	199	240
179800	2	2	0	5
179900	132	132	114	151
180000	36	36	29	44
180100	125	125	108	142
180200	149	148	134	164
180300	149	148	130	168
180400	143	142	126	161
180500	134	134	115	151
180600	227	226	206	250
180700	256	255	232	279
180800	127	127	111	144
180900	175	176	154	195
181000	197	197	178	215
181100	282	282	260	305
181200	231	231	209	252
181300	9	8	0	17

A.4 Waipā District

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
181900	0	0	0	0
182100	14	13	8	20
182200	0	0	-1	0
182400	7	5	0	11
182500	-5	-5	-8	-1
182600	42	41	28	56
182700	-29	-29	-44	-15
182800	-55	-56	-68	-40
182900	-10	-10	-18	-3
183000	-24	-23	-31	-16
183100	0	0	0	0
183200	2	1	-6	9
183300	-15	-15	-21	-9
183400	-24	-25	-30	-18
183500	-25	-25	-34	-15
183600	-34	-35	-42	-27
183700	-25	-25	-34	-17
183800	-51	-52	-63	-39
183900	-40	-40	-52	-28
184000	-34	-35	-42	-27
184100	-6	-6	-10	-2
184200	-37	-37	-47	-28
184300	-29	-29	-36	-22
184400	-28	-28	-35	-20
184500	0	0	0	0
184600	3	3	0	6
184800	-40	-40	-52	-28
184900	0	0	0	0

A.5 Western Bay of Plenty District

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
190200	332	331	304	358
190300	8	7	2	13
190400	26	26	17	35
190500	0	0	0	0
190600	56	55	41	70
190900	0	0	0	0
191000	189	189	164	210
191100	39	39	28	50
191200	22	22	14	29
191900	46	45	33	59
192000	0	0	-1	0
192100	51	50	38	64
192300	28	28	18	38
192400	73	73	58	88
192500	15	15	6	23

A.6 Tauranga City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
192600	214	213	195	234
192800	204	204	182	225
192900	146	146	128	163
193000	38	37	27	47
193100	78	78	65	91
193200	248	246	227	270
193300	133	134	117	150
193400	24	23	16	31
193500	86	86	72	99
193600	3	3	0	6
193700	231	226	204	253
193800	13	12	7	17
193900	0	0	0	0
194000	46	46	35	56
194100	34	34	24	44
194300	214	212	191	236
194400	63	63	51	75
194600	68	68	55	80
194700	10	9	4	15
194800	237	234	209	261
194900	180	179	160	199
195100	181	179	162	201
195200	34	33	25	42
195300	11	12	6	17
195400	85	86	72	99
195500	3	3	0	6
195600	33	33	24	41
195700	20	20	13	27
195800	60	59	48	70
195900	58	58	47	71
196000	12	11	5	18
196100	0	0	-2	2
196200	119	119	103	134
196300	6	5	1	10
196400	72	71	58	86
196500	0	0	0	0
196600	38	37	27	48
196700	25	25	16	33
196800	83	83	69	96
196900	22	22	12	31
197000	88	88	76	101

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
197100	169	168	152	184
197200	95	95	81	109
197300	21	21	12	29
197400	102	102	88	117
197500	145	145	128	163
197600	180	179	159	198

A.7 Kapiti Coast District

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
236300	70	69	59	82
236500	31	31	20	41
236600	26	25	18	33
236700	13	12	6	19
236800	304	304	281	328
236900	16	16	9	21
237000	152	151	135	168
237100	155	154	137	172
237200	56	55	43	68
237300	60	60	49	72
237400	18	17	11	24
237500	68	68	55	82
237600	68	67	56	80
237800	52	51	40	64
237900	0	0	0	0
238000	161	160	142	178
238100	50	49	39	60
238300	61	60	48	74
238400	18	17	10	24
238500	201	200	181	220
238600	52	51	43	61

A.8 Porirua City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
238800	16	16	8	24
239000	40	41	26	54
239100	46	45	31	61
239200	47	46	31	63
239300	18	17	8	28
239400	0	0	0	0
239500	21	21	9	33
239600	9	8	2	15
239800	23	23	12	34
239900	1	0	0	3
240000	10	11	3	18
240100	55	55	39	71
240200	27	27	15	39
240300	19	18	7	32
240400	32	32	19	44
240500	7	7	0	14
240600	53	52	36	69
240700	9	9	1	17
240800	14	14	3	23
240900	6	6	0	12
241000	14	13	4	23
241100	5	5	-1	12

A.9 Upper Hutt City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
241300	5	5	-1	12
241400	2	2	0	4
241500	41	41	30	52
241600	101	101	87	115
241700	49	49	40	59
241800	5	5	1	9
241900	135	134	118	150
242000	16	15	9	22
242100	67	66	56	78
242200	28	28	21	35
242300	0	0	0	0
242400	64	64	53	75
242600	24	24	14	33
242700	9	8	2	14
242800	6	6	1	10
242900	37	36	27	45

A.10 Lower Hutt City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
243100	0	0	0	0
243200	111	109	95	127
243300	1	0	0	3
243400	102	101	86	116
243500	49	48	38	60
243600	69	68	56	80
243700	18	18	13	23
243800	3	2	0	5
243900	1	0	-1	2
244100	6	6	2	9
244200	124	124	105	142
244300	40	39	26	52
244400	79	78	66	92
244500	24	23	15	33
244600	2	2	0	3
244700	95	93	79	108
244800	98	98	78	116
244900	58	58	45	71
245000	66	66	48	84
245100	35	34	25	43
245200	4	3	0	7
245300	4	3	1	6
245400	15	14	9	21
245600	28	27	20	35
245800	39	38	28	48
245900	39	39	29	50
246000	81	80	68	94
246100	93	92	78	107
246200	81	80	66	95
246300	56	56	44	66
246400	81	80	67	93
246600	50	50	38	61
246800	0	0	0	0
246900	75	75	61	88
247000	100	100	86	114
247100	34	33	23	43
247200	201	201	180	222
247300	73	71	58	86
247400	54	53	42	65

A.11 Wellington City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
247500	23	23	17	29
247600	20	19	12	27
247800	23	22	15	31
248000	6	6	1	10
248100	137	137	120	152
248300	72	71	55	89
248400	56	56	42	68
248500	31	31	21	40
248600	26	25	17	33
248700	59	59	46	71
248800	1	0	0	2
248900	2	0	0	3
249000	5	4	1	9
249100	8	8	4	12
249400	177	176	156	197
249500	79	79	64	93
249600	6	5	2	9
249700	106	105	88	123
249800	30	28	18	40
249900	203	202	183	222
250000	2	1	0	3
250100	96	96	81	111
250200	7	7	4	11
250300	218	217	197	237
250400	216	215	193	237
250500	44	43	34	52
250600	192	191	172	213
250700	2	2	0	3
250800	103	101	85	117
250900	37	35	21	49
251200	15	14	10	20
251500	23	22	16	30
251900	35	34	26	43
252200	41	41	29	52
252600	64	62	50	74
252700	76	75	61	88
252800	127	124	107	144
252900	0	0	0	0
253000	5	4	0	9
253100	97	95	81	111

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
253200	46	45	35	55
253300	58	55	37	76
253400	54	52	43	63
253500	39	34	24	48
253600	25	24	14	36
253700	0	0	0	0
253800	173	170	153	192
253900	50	49	41	59
254000	168	166	148	188
254100	47	46	35	57
254200	33	32	25	40
254300	117	114	95	136
254400	0	0	0	0
254500	69	69	56	81
254600	148	147	129	165
254700	98	97	84	110
254800	86	86	72	99
254900	69	69	57	80
255000	4	4	2	7
255100	162	162	143	180
255200	213	212	192	233

A.12 Waimakariri District

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
313200	15	14	3	27
313300	-1	-2	-9	6
313700	-5	-5	-12	2
313800	7	7	3	12
313900	18	18	9	28
314000	16	16	5	26
314100	11	11	3	19
314200	13	12	4	21
314300	0	0	-6	5
314400	0	0	0	0
314500	8	8	0	17
314600	19	18	6	31
314700	16	17	-1	33
314800	0	0	-3	3
314900	14	14	4	24
315000	4	4	-2	9
315200	0	0	-4	3
315300	24	23	13	35
315400	50	51	36	64
315500	0	0	0	0
315600	-9	-9	-18	0
315700	19	17	7	30
315800	0	0	0	0
315900	5	4	-5	15
316000	10	10	3	18
316100	22	21	11	31
316200	8	6	-1	15
316300	4	0	-1	2

A.13 Christchurch City

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
316600	33	32	23	42
316800	9	9	2	14
316900	44	43	32	55
317000	51	50	40	61
317100	0	0	0	0
317200	0	0	0	0
317300	52	52	37	65
317400	52	51	41	63
317500	43	42	32	52
317600	105	105	91	119
317700	182	182	158	204
317800	210	209	184	237
317900	239	239	213	266
318000	109	108	86	131
318100	30	29	19	41
318200	13	12	4	21
318300	182	181	160	204
318400	12	9	4	16
318500	105	106	87	123
318600	93	93	76	109
318700	71	71	56	85
318800	71	71	56	87
318900	137	137	118	154
319000	109	107	86	131
319200	209	206	182	235
319300	36	36	23	49
319400	58	57	42	72
319500	198	199	177	221
319600	99	99	81	117
319700	240	239	211	267
319800	68	68	54	82
319900	182	181	157	205
320100	113	115	94	132
320200	293	293	263	323
320300	24	23	14	33
320400	2	1	-1	4
320500	51	51	38	63
320600	255	256	228	281
320700	216	216	193	241
320800	194	194	171	217
320900	50	48	37	61

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
321000	155	155	132	178
321100	71	72	54	88
321200	62	61	48	75
321300	168	169	149	187
321400	293	294	265	321
321500	231	231	205	257
321600	44	44	33	56
321700	71	71	55	86
321800	101	100	82	121
321900	32	32	21	42
322000	33	32	21	43
322100	147	147	125	167
322200	204	204	176	230
322300	4	3	-1	9
322400	189	187	164	211
322500	11	11	5	17
322600	282	280	254	309
322700	62	62	46	78
322800	14	14	6	21
322900	86	86	74	99
323000	147	146	117	178
323100	96	97	78	115
323200	10	9	0	19
323300	61	60	46	74
323400	50	50	38	63
323500	1	0	0	2
323600	18	18	11	25
323700	29	28	17	41
323800	33	33	23	43
323900	8	8	-1	16
324000	38	38	26	51
324100	13	13	7	19
324300	104	103	88	122
324400	1	0	-2	4
324500	13	13	-1	27
324600	33	33	23	43
324700	17	17	10	23
325000	53	52	37	66
325100	25	24	13	36
325200	1	0	-3	4
325300	10	10	4	16
325400	74	74	59	89
325500	1	0	0	0

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
325600	35	35	21	49
325900	3	3	-1	7
326000	27	28	18	36
326100	3	2	-1	6
326200	1	0	-2	3
326300	97	96	77	115
326500	18	18	9	27
326700	44	44	32	57
326900	102	100	81	121
327200	24	24	10	37
327300	76	75	62	88
327500	12	12	3	21
327600	7	6	2	11
327700	64	64	45	81
327800	25	24	14	35
327900	1	0	-1	2
328000	120	120	102	137
328200	21	21	12	30
328300	15	15	5	25
328400	31	30	18	43
328500	15	14	8	21
328600	14	13	3	26
328700	0	-2	-10	9
328900	3	2	0	6
329000	60	59	49	69
329100	68	68	51	83
329200	78	77	61	94
329300	7	7	0	13
329400	8	7	-5	20
329500	64	64	49	79
329700	29	28	8	50
329800	15	14	4	25
329900	8	7	1	15
330000	9	9	5	14
330100	39	40	26	54
330200	26	26	14	38
330300	41	39	26	52
330400	30	30	20	40
330500	45	44	31	58
330600	132	131	112	152
330700	0	0	0	1
330800	95	94	76	113
330900	43	43	31	54

SA2 ID	Mean impact	Median impact	25th percentile	75th percentile
331000	15	14	6	23
331100	30	29	17	43
331200	2	1	-1	4
331300	24	23	13	33
331400	51	50	36	63
331500	4	3	-1	7
331700	77	76	58	94
331800	1	1	-3	5
331900	32	31	21	42
332000	4	4	0	8
332100	78	77	63	93
332400	29	28	19	38
332700	181	180	156	205
333100	0	0	0	0

A.14 Selwyn District

SA2 ID	Mean impact	Median impact	25 th percentile	75 th percentile
333600	2	1	-3	6
333700	2	2	-4	8
333800	0	0	-4	3
333900	5	4	-4	13
334000	17	17	6	28
334100	2	2	-4	8
334200	0	-1	-4	3
334500	0	0	0	0
334600	21	21	10	31
334900	19	19	7	30
335000	5	5	-6	16
335100	17	16	6	26
335200	31	32	17	46
335300	43	43	29	58
335400	5	4	-4	12
335500	219	220	193	245
335600	0	0	0	0
335700	81	81	66	96
335800	0	0	-3	4
335900	13	13	8	18
336000	71	70	55	86
336100	106	105	88	124
336200	9	8	-2	18
336400	0	0	0	0

Appendix B. Zone alignment tables

Table 7: Zone alignment for housing supply impact – Hamilton, Waipā, and Waikato

Provisions	Medium Density Residential Standards	Hamilton							Waipā	Waikato	
		General Residential	Medium Density Residential	Ruakura Medium Density Residential	Residential Intensification Zone	Special character zones, near inner city	Outlying Residential Development Zones (other structure plans)	Peacocks Structure Plan Area	Residential Zone	Franklin Section Residential Zones	Waikato Section Living Zone
		Dwellings permitted	3	1	None	1	None	1	None	None	1
Building height	11m	10m	10m	10m	12.5m	7m	8m to 10m	10m to 12m	9m	8m	7.5m
Height in relation to boundary	6m + 60°	3m + 28° to 45°	3m + 28° to 45°	3m + 28° to 45°	3m + 28° to 45° (Where adjoining general residential or special character)	3m + 28° to 45°	3m + 28° to 45°	3m + 28° to 45°	2.7m + 28° to 45°	3m + shortest distance between building and site boundary	2.5m + 37°
Building coverage	50%	40%	50%	50%	50%	35%	Up to 40%	8% to 50%	40%	Up to 40%	40%
Treatment		Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ, Special Character Status	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ

Source: District Operative Plans, MfE, authors.

Table 8: Zone alignment for housing supply impact – Tauranga and Western Bay of Plenty

Provisions	Medium Density Residential Standards	Tauranga City				Western Bay of Plenty	
		Suburban Residential Zone	City Living Zone	High Density Residential Zone	Wairakei Residential Zone	Residential	Medium Density Residential
Dwellings permitted	3	1	2	1	1	1	1
Building height	11m	9m	9m	9m	9.5m	8m	9m 12m (Waihi)
Height in relation to boundary	6m + 60°	2.7m + 45° to 55°	2.7m + 45° to 55°	2.7m + 45° to 55°	2.7m + 45° to 55°	2m + 45°	2m + 45°
Building coverage	50%	45% - sites over 500m ² 55 % - sites less than 500m ²	45% - sites over 500m ² 55 % - sites less than 500m ²	No limit	No limit	40%	40%
Treatment		Align to AUP SHZ	Align to AUP SHZ	Align to AUP MHS	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ

Source: District Operative Plans, MfE, authors.

Table 9: Zone alignment for housing supply impact – Wellington and Lower Hutt

Provisions	Medium Density Residential Standards	Wellington			Lower Hutt		
		Outer Residential Area	Inner Residential Area	Medium Density Residential Area	General Residential Activity Area	Special Residential Activity Area	Medium Density Residential Activity Area
Dwellings permitted	3	2	1	1	2	1	No limit
Building height	11m	8m	10m	8m - Johnsonville 10m - Kilbirnie	8m	8m	10m
Height in relation to boundary	6m + 60°	2.5m + 45°	2.5m + 45° to 71°	2.5m + 56° to 63°	2.5m + 45°	2.5m + 45°	3.5m + 45°
Building coverage	50%	35%	50%	50%	40%	30%	60%
Treatment		Align to AUP SHZ	Align to AUP SHZ, special character status	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ, special character status	Align to AUP MHU

Source: District Operative Plans, MfE, authors.

Table 10: Zone alignment for housing supply impact – Upper Hutt, Porirua, and Kāpiti Coast

Provisions	Medium Density Residential Standards	Upper Hutt		Porirua	Kāpiti Coast	
		Residential	Residential (Centres Overlay)	Suburban Zone	General Residential Zone	General Residential Zone with Ōtaki Beach, Raumati, and Paekākāriki beach residential precincts
Dwellings permitted	3	1	1	3 (2 share a party wall and one detached)	1	1
Building height	11m	8m	8m	8m	8m	8m
Height in relation to boundary	6m + 60°	2.7m + 35° to 45°	2.7m + 35° to 45°	3m + 45°	2.1m + 45°	2.1m + 45°
Building coverage	50%	35%	45%	35%	40%	35%
Treatment		Align to AUP SHZ	Align to AUP SHZ	Align to AUP MHS	Align to AUP SHZ	Align to AUP SHZ with special character status

Source: District Operative Plans, MfE, authors.

Table 11: Zone alignment for housing supply impact – Christchurch

Provisions	Medium Density Residential Standards	Christchurch					
		Residential Suburban Zone	Residential Suburban Density Transition Zone	Residential Medium Density Zone	Residential Banks Peninsula Zone	Residential New Neighbourhood Zone	Residential Central City Zone
Dwellings permitted	3	1	1	No limit	1	No limit	No limit
Building height	11m	8m	8m	11m	7m	8m	8m to 30m
Height in relation to boundary	6m + 60°	2.3m + 55°	2.3m + 55°	2.3m + 55°	2m + 45°	2.3m + 55°	2.3m + 55°
Building coverage	50%	35%	35%	50%	35%	40% to 45%	No limit
Treatment		Align to AUP SHZ	Align to AUP SHZ	Align to AUP MHU	Align to AUP SHZ	Align to AUP MHS	Align to AUP THAB

Source: District Operative Plans, MfE, authors.

Table 12: Zone alignment for housing supply impact – Selwyn and Waimakariri

Provisions	Medium Density Residential Standards	Selwyn	Waimakariri			
		Living Zones	Residential 1 Zone	Residential 2, 3 and 6 Zones	Residential 6A Zone	Residential 7 Zone
Dwellings permitted	3	1	1	1	1	1
Building height	11m	8m	8m	8m	10m	8m 9m (Area A)
Height in relation to boundary	6m + 60°	2.5m + 30° to 55°	2.5m + 35° to 55°	2.5m + 35° to 55°	2.5m + 35° to 55°	2.5m + 35° to 55°
Building coverage	50%	40% approx average in most zones	50%	35%	24% to 38%	40% to 60%
Treatment		Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ	Align to AUP SHZ

Source: District Operative Plans, MfE, authors.

Appendix C. Supplementary technical material for housing supply estimates

C.1 Regression results

The following subsections show regression outputs for our three model steps for each Tier 1 urban area.

C.1.1 Auckland

To avoid multicollinearity among our categorical variables, we have dropped the Single Housing Zone (SHZ) dummy from the regression, making it our base category. The regression outputs for the percentage change in land value are given in Table 13 below.

Table 13: Regression output – percentage change in land value – Auckland

Source	SS	df	MS	Number of observations		217,523
Model	4537.36625	8	567.170782	F-statistic		14.01
Residual	8808296.03	217,514	40.4953062	Probability > F-statistic		0.0000
Total	8812833.4	217,522	40.5146762	R-squared		0.0005
				Adjusted r-squared		0.0005
				Root mean squared error		6.3636
Percentage change in land value	Coefficient	Standard error	t-statistic	p-value	95% confidence interval low	95% confidence interval high
Zone						
MHS	0.067799	0.150576	0.45	0.653	-0.22733	0.362925
MHU	0.401171	0.208059	1.93	0.054	-0.00662	0.808962
THAB	1.361599	0.340106	4.00	0.000	0.695	2.028199
Zone * Log distance						
Log distance (SHZ)	-0.02361	0.040687	-0.58	0.562	-0.10335	0.056135
MHS	0.061411	0.056219	1.09	0.275	-0.04878	0.171598
MHU	-0.06884	0.080836	-0.85	0.394	-0.22727	0.089599
THAB	-0.40484	0.135408	-2.99	0.003	-0.67023	-0.13944
2014 LV/CV	0.660997	0.097445	6.78	0.000	0.470007	0.851986
Constant	0.378911	0.127359	2.98	0.003	0.129291	0.628532

Source: Authors' analysis.

The coefficients for zone are the difference between the constant for the respective zone and the constant for the SHZ. The coefficients for zone * log distance are the differences between the slope for the respective zone and the slope for the SHZ

The coefficient on log distance is not statistically significant. This means that for the SHZ, when no up-zoning took place, we see a general appreciation in the land value (around a 75% increase in three years at the mean value for 2014 LV/CV), with little variation by distance from the city centre. Whereas, for more permissive zones, especially the Mixed-Housing Urban Zone and Terraced

Housing and Apartment Buildings, distance makes a difference. Thus, the up-zoning effect varied by distance, but the general effect did not.

The regression outputs for Step 2, estimating the probability of adding at least one dwelling, are given in Table 14 below.

Table 14: Regression output – likelihood of adding at least one dwelling

Logistic regression		Number of observations		331,105		
Log likelihood = -84767.412		Likelihood ratio chi-squared		9693.36		
		Probability > chi-squared		0.0000		
		Pseudo r-squared		0.0541		
Log odds of adding at least one dwelling	Coefficient	Standard error	z-score	p-value	95% confidence interval low	95% confidence interval high
Quality score (SHZ)	2.035176	0.081777	24.89	0.000	1.874897	2.195455
Zone						
MHS	-0.91135	0.066824	-13.64	0.000	-1.04232	-0.78037
MHU	-0.75265	0.080239	-9.38	0.000	-0.90991	-0.59538
THAB	0.102557	0.127476	0.8	0.421	-0.14729	0.352405
Zone * quality score						
MHS	1.356778	0.104068	13.04	0.000	1.152808	1.560749
MHU	1.468782	0.122659	11.97	0.000	1.228374	1.709189
THAB	-0.39025	0.197592	-1.98	0.048	-0.77752	-0.00298
Special character	-0.67466	0.060959	-11.07	0.000	-0.79413	-0.55518
Log distance	1.00538	0.013873	72.47	0.000	0.97819	1.032571
Constant	-6.4438	0.072636	-88.71	0.000	-6.58616	-6.30143

Source: Authors' analysis.

The coefficients for zone represent the difference between the intercept for the respective zone and the regression constant, which is the intercept for the SHZ. The coefficients for zone * quality score are the differences between the slope for the respective zone and the slope for the SHZ. For logit regressions, coefficient estimates indicate the fitted linear relationship between the modelled predictors and the log of the odds ratio of outcomes for that predictor. This makes it difficult to directly intuit the meaning of logit results in terms of probabilities. See the margin plot shown in Figure 9 for a graphic presentation of these results in terms of probabilities.

Regression outputs for Step 3, estimating the increase in FAR given that a parcel adds at least one dwelling, are shown in Table 15 below.

Table 15: Regression output – FAR increase conditional on adding at least one dwelling

Source	SS	df	MS	Number of observations		25,398
Model	1668.1713	8	208.522016	F-statistic		129.62
Residual	4084.3997	25,389	1.60874393	Probability > F-statistic		0.0000
Total	42512.5758	25,397	1.67392116	R-squared		0.0392
				Adjusted r-squared		0.0389
				Root mean squared error		1.2684
Floor area ratio increase	Coefficient	Standard error	t-statistic	p-value	95% confidence interval low	95% confidence interval high
Quality score (SHZ)	0.374482	0.094231	3.97	0.000	0.189783	0.559181
Zone						
MHS	-0.06089	0.078941	-0.77	0.441	-0.21562	0.093838
MHU	0.204171	0.089162	2.29	0.022	0.029408	0.378933
THAB	0.186872	0.135269	1.38	0.167	-0.07826	0.452007
Zone * quality score						
MHS	0.44122	0.121109	3.64	0.000	0.203839	0.678601
MHU	0.454595	0.135119	3.36	0.001	0.189754	0.719435
THAB	0.991064	0.20739	4.78	0.000	0.584567	1.397561
Land Area	-1.99E-06	8.00E-07	-2.49	0.013	-3.56E-06	-4.26E-07
Constant	0.150532	0.060163	2.5	0.012	0.03261	0.268454

Source: Authors' analysis.

The coefficients for zone are the difference between the constant for the respective zone and the constant for the SHZ. The coefficients for zone * quality score are the differences between the slope for the respective zone and the slope for the SHZ.

C.1.2 Christchurch

For Christchurch, we have dropped the dummy indicator for the Residential Suburban Zone (RSZ) from the regression, making it our base category. This means that the coefficient for the quality score is the coefficient for quality score interaction with RSZ and the coefficient for the constant represents the RSZ intercept.

The regression outputs for the percentage change in land value are given in Table 16 below.

Table 16: Christchurch land-value discontinuity regression

Source	SS	df	MS	Number of observations		132,190
Model	12291.7402	7	1755.96288	F-statistic	5357.04	
Residual	43327.3832	132,182	.327785805	Probability > F-statistic	0.0000	
Total	55619.1234	132,189	.420754551	R-squared	0.2210	
				Adjusted r-squared	0.2210	
				Root mean squared error	.57253	
Land value/m ²	Coefficient	Standard error	t-statistic	p-value	95% confidence interval low	95% confidence interval high
Log distance (RSZ)	-0.26935	0.002528	-106.53	0	-0.2743	-0.26439
Zone						
RNN	-0.1136	0.013457	-8.44	0	-0.13998	-0.08723
RMD	0.153457	0.010163	15.1	0	0.133538	0.173376
Zone * quality score						
RNN	0.056839	0.008691	6.54	0	0.039804	0.073873
RMD	-0.03729	0.00628	-5.94	0	-0.0496	-0.02498
Latest land ratio	0.649791	0.008707	74.63	0	0.632727	0.666856
Constant	5.898737	0.007288	809.42	0	5.884453	5.913021

Source: Authors' analysis.

Note: RNN is the Residential New Neighbourhood Zone group, RMD is the Residential Medium Density Zone group.

C.1.3 Hamilton

For Hamilton, we drop the dummy indicator for the General Residential Zone (GRZ) from the regression, making it our base category. This means that the coefficient for the quality score represents the coefficient for quality score interacted with the GRZ (ie, the GRZ slope), and the coefficient for the constant represents the intercept for the GRZ.

The regression outputs for the percentage change in land value are given in Table 17 below.

Table 17: Hamilton land-value discontinuity regression

Source	SS	df	MS	Number of observations		
Model	3946.56811	6	657.761351	F-statistic	68,139	
Residual	22242.1023	68,132	.326456031	Probability > F-statistic	2014.85	
Total	26188.6704	68,138	.384347506	R-squared	0.0000	
				Adjusted r-squared	0.1507	
				Root mean squared error	0.1506	
					.57136	
Land value/m ²	Coefficient	Standard error	t-statistic	p-value	95% Confidence interval low	95% Confidence interval high
Log distance (GRZ)	-0.13143	0.00226	-58.15	0	-0.13586	-0.127
Zone						
MDR	0.08104	0.016703	4.85	0	0.048303	0.113777
SP	3.939525	0.181074	21.76	0	3.584621	4.294429
Zone * quality score						
MDR	-0.22684	0.01171	-19.37	0	-0.24979	-0.20389
SP	-1.9066	0.073051	-26.1	0	-2.04978	-1.76342
Latest land ratio	-0.05837	0.015207	-3.84	0	-0.08818	-0.02857
Constant	6.340419	0.01114	569.18	0	6.318585	6.362252

Source: Authors' analysis.

Note: MDR is the Medium Density Residential group, SP is the subset of structure plan areas with no dwelling limit and height limits of 10 metres.

C.1.4 Tauranga

In Tauranga, the Suburban Residential Zone (SRZ) is our base category. This means that the coefficient for the quality score is the coefficient for quality score interaction with the SRZ and the coefficient for the constant represents the intercept for the SRZ.

The regression outputs for the percentage change in land value are given in Table 18 below.

Table 18: Tauranga land-value discontinuity regression

Source	SS	df	MS	Number of observations		54,111
Model	2589.36102	7	369.908717	F-statistic	844.65	
Residual	23694.0034	54,103	.437942507	Probability > F-statistic	0.0000	
Total	26283.3645	54,110	.485739502	R-squared	0.0985	
				Adjusted r-squared	0.0984	
				Root mean squared error	.66177	
Land value/m ²	Coefficient	Standard error	t-statistic	p-value	95% Confidence interval low	95% Confidence interval high
Log distance (SRZ)	-0.07626	0.003872	-19.69	0	-0.08385	-0.06867
Zone						
WBOP	0.242432	0.036885	6.57	0	0.170138	0.314726
HDU	1.064785	0.036535	29.14	0	0.993177	1.136394
Zone * quality score						
WBOP	-0.02912	0.027259	-1.07	0.285	-0.08255	0.024312
HDU	-0.26552	0.015691	-16.92	0	-0.29628	-0.23477
Latest land ratio	0.322454	0.016176	19.93	0	0.290749	0.354159
Total valuations post-2016	-0.03098	0.000575	-53.91	0	-0.03211	-0.02985
Constant	6.336463	0.012487	507.44	0	6.311988	6.360938

Source: Authors' analysis.

C.1.5 Wellington

In Wellington, we use the Outer Residential Area (ORA) as our base category. This means that the coefficient for the quality score represents the slope for the quality score interaction with the ORA and the coefficient for the constant represents the intercept for the ORA.

The regression outputs for the percentage change in land value are given in Table 19 below.

Table 19: Wellington land-value discontinuity regression

Source	SS	df	MS	Number of observations		130,063
Model	19012.0388	4	4753.0097	F-statistic	8970.10	
Residual	68914.1649	130,058	.529872556	Probability > F-statistic	0.0000	
Total	87926.2037	130,062	.676032997	R-squared	0.2162	
				Adjusted r-squared	0.2162	
				Root mean squared error	.72792	
Land value/m ²	Coefficient	Standard error	t-statistic	p-value	95% Confidence interval low	95% Confidence interval high
Log distance (ORA)	-0.2883	0.002295	-125.63	0	-0.2928	-0.2838
Zone						
MDR	0.740244	0.013393	55.27	0	0.713995	0.766493
Zone * quality score						
MDR	-0.24748	0.005046	-49.04	0	-0.25737	-0.23759
Latest land ratio	0.780849	0.01329	58.76	0	0.754802	0.806896
Constant	6.531676	0.009702	673.25	0	6.512661	6.550691

Source: Authors' analysis.

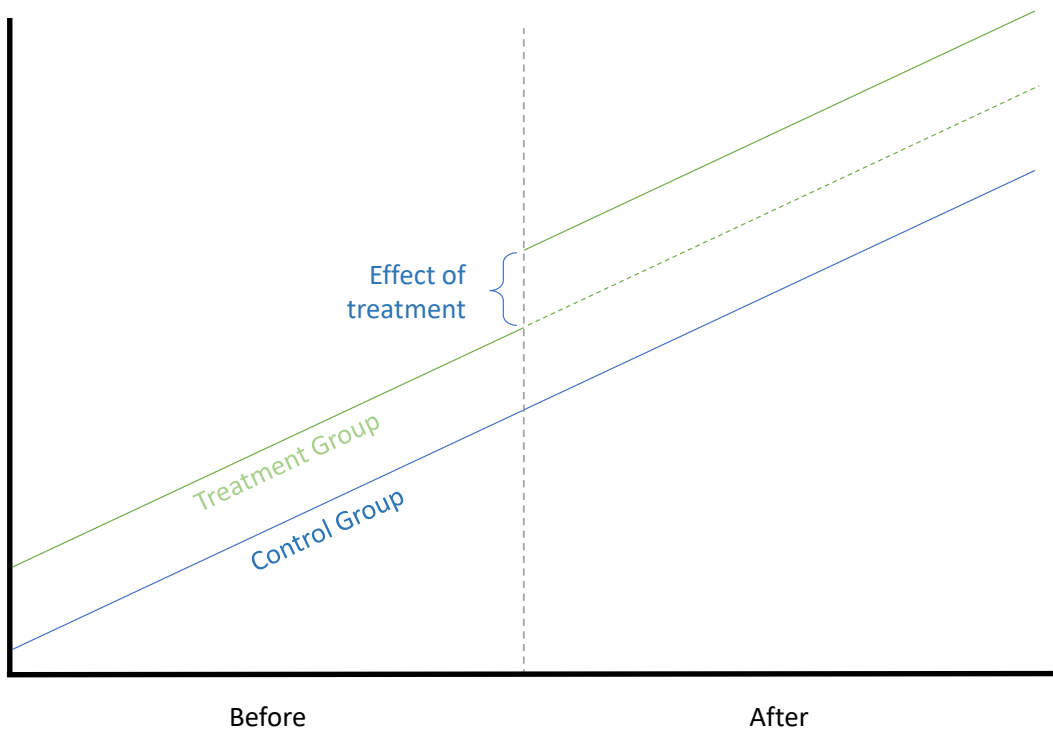
Note: MDR is the Medium Density Residential group.

C.2 Difference in Difference Estimation

Difference in Differences (DiD) is a statistical technique used in econometrics that attempts to measure the impact of a policy intervention or treatment using observational data. DiD analyses often exploit natural or quasi-natural experiments.

Difference in Difference estimation studies the differential effects of a treatment group versus a control group. This is done by comparing the average change of a treatment group, with the average change of a control group. The difference in these average changes gives a causal change due to the treatment.

Figure 31: Difference in Difference Estimation



Source: Authors' illustration.

In Figure 31 above, we have separate trends in a dataset for a treatment group and control group. A DiD estimation examines the difference between the average change in the treatment group and the average change in the control group from before the treatment to after the treatment.

To estimate the change in land value due to the AUP, we can compare the change in land value from parcels that were up-zoned (treatment group) with the parcels that were not up-zoned (control group). The average difference in the land value for parcels that were up-zoned and parcels that were not up-zoned (control group) gives a causal effect of the up-zoning (the treatment).

C.3 Spatial Autocorrelation

C.3.1 Moran's I test for spatial autocorrelation

We test for spatial autocorrelation in the residuals for our modelled estimates in Steps 2 and 3. Results are shown in Table 20 and Table 21 below.

Table 20: Moran's I results – Logit estimation of likelihood to add at least one dwelling

<i>Observed/Moran's I index</i>	0.02223574
<i>Expected index under null hypothesis</i>	-0.000050025
<i>Standard deviation of I under the null hypothesis</i>	0.0002226476
<i>P-value</i>	0.0000

Source: Authors' analysis.

Table 21: Moran's I results – OLS estimation of FAR increase

<i>Computed Moran's I index</i>	0.01640531
<i>Expected index under null hypothesis</i>	-4.29203e-05
<i>Sd</i>	0.0003470399
<i>P value</i>	0.0000

Source: Authors' analysis.

These estimates imply that spatial autocorrelation is present with a high degree of confidence. This is not a surprise, given the model specifications and the geographic distribution of the spatial data employed. Development tends to occur in clusters, especially in areas where land is less scarce, such as the outskirts of Auckland. As a result, the estimates of confidence intervals and significance of coefficients may not be accurately estimated, as the distribution of residuals is non-random or not independent of proximity. We correct the standard errors to account for this spatial dependence in the following section.

C.3.2 Conley standard errors to correct for spatial autocorrelation

In the presence of spatial autocorrelation, the spherical error variance assumption is violated, and so econometric theory would suggest that the estimates of the standard errors are not consistent. Consistency of an estimator means that as the sample sizes gets larger and larger, the value of the estimator gets closer and closer to the true value of the parameter. That is, an estimator is said to be consistent if an estimator converges in probability to the true parameter value. This is often a desirable property as we can assume in large samples that the estimator is approximately its true value.

Conley (1999) presents a method to obtain asymptotically consistent standard errors in the presence of spatial autocorrelation by accounting for spatial dependence. We follow the method described in Conley (1999) for our regression for the probability of adding at least one dwelling and the regression for FAR increase given a property adds at least one dwelling.

The calculation of distance between every possible pair of observations is so computationally intense that it is impractical to run on the full dataset of 331 thousand parcels. Instead, we run the test on a random sample of 40 thousand parcels to understand whether the adjusted standard errors would alter the level of significance for our coefficient estimates of the slopes and intercepts of our estimated relationships between quality score and probability of adding at least one dwelling by zone.

Table 22: Conley standard error estimates for the probability of adding at least one dwelling

Variable	Coefficient estimate	Standard SE	Spatial SE	Standard Z score	Spatial Z-score	Standard P-value	Spatial P-value	Signif. effect
Intercept (in log odds)								
SHZ	-6.807	0.332	0.523	-20.522	-13.024	0.000	0.000	None
MHS	0.340	0.325	0.292	1.047	1.165	0.295	0.244	None
MHU	-0.266	0.321	0.303	-0.827	-0.878	0.408	0.380	None
THAB	-0.334	0.337	0.300	-0.992	-1.115	0.321	0.265	None
Slope vs. Quality Score								
SHZ	1.837	0.503	0.459	3.650	4.001	0.000	0.000	None
MHS	-0.220	0.539	0.473	-0.408	-0.464	0.683	0.643	None
MHU	0.875	0.526	0.526	1.664	1.663	0.096	0.096	None
THAB	1.395	0.550	0.418	2.536	3.338	0.011	0.001	Higher
Controls								
Log Distance	1.129	0.042	0.111	27.113	10.140	0.000	0.000	None
Special character	-0.742	0.191	0.141	-3.875	-5.258	0.000	0.000	None

Note: Estimates for a random sub-sample of 40,000 observations out of 331,105 parcels and parcel-clusters (where valuations involve multiple parcels) subject to the policy in the four primary residential zones.

As Table 22 shows, the adjustment for spatial autocorrelation has no statistically relevant effect except in cases where it increases the significance of the estimate. Based on this result, we are satisfied to use the original logit model, with the full sample of 331 thousand observations, for our forecast estimates. For the OLS estimate of FAR increase conditional on a property adding at least one dwelling, we run the dependence-adjusted estimate for the full dataset of observations. Results are shown below.

Table 23: Conley standard error estimates for FAR increase given a property adds at least one dwelling

Variable	Coefficient estimate	Standard SE	Spatial SE	Standard t-score	Spatial t-score	P-value	Spatial P-value	Signif. effect
Intercept								
SHZ	0.088	0.116	0.171	0.764	0.515	0.445	0.607	None
MHS	0.112	0.124	0.172	0.91	0.655	0.363	0.512	None
MHU	0.019	0.123	0.174	0.154	0.108	0.878	0.914	None
THAB	0.162	0.128	0.191	1.264	0.851	0.206	0.395	None
Slope vs. Quality Score								
SHZ	1.848	0.185	0.37	9.988	5	0.000	0.000	None
MHS	-1.495	0.202	0.37	-7.418	-4.04	0.000	0.000	None
MHU	-0.982	0.197	0.375	-4.99	-2.621	0.000	0.009	None
THAB	-0.778	0.205	0.404	-3.791	-1.927	0.000	0.054	Lower
Controls								
Land area	0	0	0	-1.999	-1.577	0.046	0.115	Lower

Note: Estimates use the full sample of 25,398 properties that added at least one dwelling post-AUP.

As with the logit model above, the OLS standard errors show no change in statistical significance when adjusted to account for spatial autocorrelation, except in the case of the slope for the THAB zone and the land area control, which become less significant. As our key coefficient estimates for the slopes and intercepts of the control and treatment zones are unaffected, we conclude that our model results are robust to spatial dependence.