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Causes and Consequences of Zoning Reform in Auckland

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Abstract

In 2016, the city of Auckland, New Zealand, upzoned approximately three-quarters of residential land to support medium- and high-density housing. This article describes the antecedents to this widespread zoning reform, details the extent of the reform, and presents evidence of its subsequent impacts on the city's housing market. The amalgamation of municipal governments into a single jurisdiction was an important precursor to the reform. Subsequent increases in housing starts indicate that the upzoning had a substantial impact on housing construction, while changes in rents suggest that it significantly decelerated increases in housing costs.

Introduction

Housing has become increasingly unaffordable in many cities around the world, leading a growing chorus of researchers to call for widespread zoning reform as a means to redress housing shortages and relieve upward pressure on housing costs (Glaeser and Gyourko, 2003; Freeman and Schuetz, 2017; Been et al., 2019; Manville et al., 2020). Proponents argue that binding land use regulations constrain supply in areas of high demand, pushing housing costs up and people out. The corollary is that relaxing those restrictions will allow housing supply to meet demand, thereby alleviating cost pressures and allowing more households to access the opportunities available in prosperous cities.

Scant empirical examples complement these theoretical arguments, however, because up until very recently, few cities have pursued widespread zoning reform (Schill, 2005; Freeman and Schuetz, 2017; Freemark, 2019).¹ However, in 2016, the city of Auckland, New Zealand, upzoned approximately three-quarters of its residential-zoned land to varying degrees (Greenaway-McGrevy and Jones, 2023). The city therefore provides a unique case study for policymakers seeking to redress housing shortages and tackle unaffordable housing in other parts of the world. This article describes the events preceding the reform, details the extent of the reform, and presents evidence of its subsequent impacts on housing outcomes.²

The amalgamation of several municipal authorities into a single jurisdiction for the entire metropolitan region was an important antecedent to the reform, particularly when viewed through the lens of canonical theories of urban political economy. Development has concentrated costs and diffuse benefits that lead homeowners to oppose local development (Fischel, 2001), encouraging low-density sprawl in metropolitan regions with fractured governance structures (Fischel, 2008). Centralization of planning decisions to the metropolitan level ensures that the relevant negative and positive externalities of development are internalized.

Housing market outcomes after the reform are consistent with upzoning increasing the supply and reducing the cost of housing. As anticipated by proponents of upzoning, housing construction has boomed subsequent to the reform, and rental price increases have decelerated, growing by substantially less in Auckland than in other cities in New Zealand. Studies by the author and collaborators that apply modern econometric policy evaluation methods suggest that these effects are causal, meaning that they can be attributed to the reform rather than some concurrent confounding event or policy change.

The remainder of the article is organized as follows. The next section describes the institutional background leading up to the reforms, showing that centralization of decisionmaking featured prominently in the institutional changes that preceded the reform. The third section summarizes the scale and extent of the reform, and the fourth section describes changes in various housing outcomes before and after the reform. The fifth section concludes.

Institutional Background and Antecedents to Zoning Reform

Auckland

Auckland is the largest metropolitan area in New Zealand, with an estimated resident population of 1.7 million as of June 2023. Centered on a long isthmus between two harbors, the city accounts for 38 percent of gross domestic product (GDP) and about one-third of the total population of the country.³

¹ Houston is an exception, having implemented widespread reform in 1998 (Gray, 2022).

² This article draws on various published and working papers by the author and his colleagues, including Greenaway-McGrevy and Phillips (2023), Greenaway-McGrevy and Jones (2023), Greenaway-McGrevy (2023), and Greenaway-McGrevy and So (2024).

³ See <https://www.stats.govt.nz/information-releases/regional-gross-domestic-product-year-ended-march-2022/>.

Like much of New Zealand, Auckland experienced rapid population growth in the years preceding the reform. Between the 2006 and 2018 national censuses, the usually resident population of the region increased by 20.4 percent. However, housing supply failed to keep up with demand. Occupied dwellings increased by only 13.7 percent over the same period,⁴ representing a shortfall of almost 7 percent, and the average number of people per dwelling increased from 2.98 to 3.15. The median age increased from 33 to 34.7 years, suggesting that the increase in people per dwelling was not driven by demographic or compositional shifts toward larger or more families.⁵

Amalgamation Into a Single Jurisdiction

Prior to 2010, the Auckland region consisted of seven district and city councils, each responsible for designing and implementing zoning regulations within its jurisdiction, and one regional council.⁶ These councils were amalgamated in November 2010 into a single authority, the Auckland Council, by an Act of Parliament.⁷ Reasons for amalgamation included the need for a cohesive strategic direction for the region and, later, cost efficiencies from the centralization of local government services and administration. Asquith, McNeill, and Stockley (2020) provide a comprehensive discussion of the rationale and processes underpinning amalgamation.⁸

The newly formed Auckland Council was statutorily required to produce a strategic spatial plan for the region and to produce a consistent set of land use regulations. The “Auckland Plan” was released in 2012.⁹ Motivated in part by sustainable development, this strategic plan called for a transition toward a more compact form of urban growth, directing the majority of population growth to be housed within the existing urban area. The plan set a specific target of 60 to 70 percent of new dwellings to be built within the existing “metropolitan urban limit” that delineated residential from rural areas.¹⁰ The spatial plan was followed by the draft version of the Auckland Unitary Plan (AUP), which included widespread relaxation of land use regulations to achieve the strategic target.

⁴ Source: Author’s calculations based on data from Table 2 and Table 13 here: <https://www.stats.govt.nz/assets/Uploads/2018-Census-population-and-dwelling-counts/Download-data/2018-census-population-and-dwelling-counts-amended-5-3-2020.xlsx>.

⁵ Sources: <https://statsnz.contentdm.oclc.org/digital/collection/p20045coll20/id/75/> and <https://www.stats.govt.nz/tools/2018-census-place-summaries/auckland-region>.

⁶ An earlier consolidation had combined 29 local authorities into the seven councils in 1989.

⁷ The Local Government (Auckland Council) Act 2009. <https://www.legislation.govt.nz/act/public/2009/0032/latest/DLM2044909.html>.

⁸ The 2011 Rugby World Cup, hosted by New Zealand, was an important catalyst. The government established a Royal Commission on Auckland Governance after the Minister for the Rugby World Cup failed to attain agreement among the various councils on a new and largely central government-funded stadium (Asquith, McNeill, and Stockley, 2020). The commission recommended amalgamation.

⁹ <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/Documents/auckland-plan-2012-full-document.pdf>.

¹⁰ The Auckland Plan 2012, paragraph 88, pp. 36–37, and p.48, paragraphs 124–129.

The Auckland Unitary Plan

The draft version of the plan was publicly released in March 2013 and was followed by 11 weeks of public consultation and feedback. Auckland Council then released the Proposed Auckland Unitary Plan (PAUP) in September.

However, prior to public notification of the PAUP, Auckland Council proposed that the central government appoint an Independent Hearings Panel (IHP) to take public submissions and recommend changes to the PAUP. The additional front-end community engagement would substitute for limited rights of appeal to IHP recommendations, thereby accelerating implementation by avoiding lengthy litigation (Blakeley, 2015). The central government agreed to the request and amended the facilitating legislation.¹¹

The IHP held hearings between April 2014 and May 2016 before releasing recommended changes to the PAUP on July 22, 2016. The IHP recommendations included further relaxation of restrictions to enable medium- and high-density housing, such as the abolition of minimum lot and dwelling sizes.

Auckland Council then voted on IHP recommendations over the next 20 working days, maintaining the abolition of minimum lot sizes but voting down the recommended removal of minimum dwelling sizes. The Council subsequently released the “decisions” version of the AUP in August. This release was followed by a 20-day period for the public to lodge appeals in the Environment Court. Appeals to the High Court were only permitted if based on points of law. The AUP then became operative in part on November 15, 2016.¹²

Each step in the process was highly transparent. Spatial plans for each version of the AUP could be viewed online by the public, along with the new regulations that would potentially change restrictions on permissible site development. This transparency meant that any interested member of the public could assess how zoning might affect what could be built on any given parcel under the proposed zoning changes.

The Auckland Housing Accord

Although the AUP became operative in November 2016, an interim agreement between Auckland Council and the central government allowed developers to access the relaxed land use regulations of the PAUP soon after its notification.

In September 2013, the central government passed inclusionary housing legislation that offered developers an accelerated building approval process in return for the provision of affordable housing within the development.¹³ These developments were called Special Housing Areas (SHAs).

¹¹ Local Government (Auckland Transitional Provisions) Amendment Act 2013. <https://www.legislation.govt.nz/act/public/2013/0064/latest/DLM5464006.html>.

¹² Only two elements were not operative at this time: (a) any parts that remained subject to the Environment Court and High Court; and (b) the regional coastal plan of the Proposed AUP that required Minister of Conservation approval.

¹³ The “Housing Accords and Special Housing Areas Act 2013” (HASHAA). See <https://www.legislation.govt.nz/act/public/2013/0072/latest/DLM5369001.html>.

To qualify for the program, developers were required to allocate 10 percent of dwellings to affordable housing.¹⁴

At the same time, Auckland Council and the central government also entered into the Auckland Housing Accord (AHA), an agreement that allowed SHA developments in Auckland to be built according to the more relaxed regulations of the PAUP.¹⁵ The Accord stipulated that the program would expire once the AUP became operative. By the time the program ended, more than 150 SHAs had been approved in Auckland.¹⁶

The total number of dwellings generated under the program was comparatively small.¹⁷ Nonetheless, the policy likely had an impact on state-developed housing, which began to increase substantially from 2013 onward. Fernandez et al. (2021) present evidence that the SHA program in Auckland largely failed to meet affordable housing requirements, partly because of a lack of enforcement mechanisms.

Antecedents to Reform

The amalgamation of the seven city and district councils in 2010 was likely a critical antecedent to the widespread zoning reform that would follow. Political theories of urban development, such as Fischel's "homevoter hypothesis," posit that urban development has concentrated costs but diffused benefits, leading homeowners to oppose nearby development (Fischel, 2001) and causing regions with more fractured governance structures to have tighter restrictions on housing supply (Fischel, 2008). Amalgamation into a single authority for an entire metropolitan area presents a potential solution to optimally balance the externalities of development because it centralizes planning decisions to the level where the relevant costs and benefits are internalized. Empirical evidence from other contexts supports this reasoning. For example, Tricaud (2021) finds that fractured regions in France that were forced to integrate subsequently experienced increases in housing construction.

Centralization of planning decisions also features prominently in the implementation of Auckland's zoning reform through Auckland Council asking the central government to appoint the Independent Hearings Panel. Although motivated by a desire for streamlined implementation, this further removed planning decisions from the policymakers adjacent to local politics.

However, although amalgamation may have proven a sufficient antecedent to reform, sufficiency does not imply necessity. Alternative options exist.

¹⁴ *Affordable housing* was defined as housing meeting at least one of two criteria. First, the dwelling price did not exceed 75 percent of the Auckland region median house price. Second, the dwelling was (a) sold or rented to a household earning up to 120 percent of the median household income for Auckland and (b) sold or rented at or below a price at which the household spent no more than 30 percent of its gross household income on rent or mortgage payments. In addition, purchasers were also asked to occupy the affordable house exclusively as their residence for no less than 3 years and to be a first-time homebuyer. Developments had to have a minimum of 14 units to qualify. See Fernandez et al. (2021).

¹⁵ https://www.beehive.govt.nz/sites/default/files/Auckland_Housing_Accord.pdf.

¹⁶ An exhaustive list of SHAs is available at https://infocouncil.aucklandcouncil.govt.nz/Open/2017/10/PLA_20171010_AGN_6726_AT_files/PLA_20171010_AGN_6726_AT_Attachment_55947_1.PDF.

¹⁷ Monitoring reports subsequently kept track of the number of new dwelling permits issued. The *Auckland Housing Accord Third Quarterly Report for Third Accord Year* estimated that 2,208 permits had been issued in SHAs between October 2013 and June 2016. See <https://www.beehive.govt.nz/sites/default/files/Auckland%20Housing%20Accord%20Monitoring%20Report.pdf>.

Upzoning may be more politically acceptable if neighborhoods are allowed to collectively opt out, which occurred in Houston (Martin, 2023). Direct monetary incentives from a central or state government to construct dwellings could help overcome municipal opposition (Ehrlich, Hilber, and Schöni, 2018). Reforming land use institutions to facilitate bargaining between developers and neighborhoods would enable residents to be compensated for bearing the negative externalities of development (Foster and Warren, 2022). Finally, adopting a more active and representative community consultation process may help redress self-selection biases inherent to voluntary community consultation. Lower Hutt, a municipal government within the Wellington metropolitan region of New Zealand, features consultation with a representative citizens' panel in its decision-making process. Two-thirds of panel members supported medium-density reforms (Maltman and Greenaway-McGrevy, 2024).

Zoning Changes

The Auckland Unitary Plan introduced four new zones for residential areas.¹⁸ Listed in decreasing order of permissible site development, these zones are Terrace Housing and Apartment Buildings (THA), Mixed Housing Urban (MHU), Mixed Housing Suburban (MHS), and Single House (SH). Exhibit A-1 in the appendix summarizes the various regulations for each zone, including site coverage ratios, height restrictions, setbacks, and recession planes. Five to seven stories and a maximum site coverage ratio of 50 percent are allowed in THA, three stories and a coverage ratio of 45 percent are allowed in MHU, and two stories and a coverage ratio of 40 percent are allowed in MHS. Up to three dwellings per parcel are allowed in MHS and MHU, with no restriction applying to THA. Meanwhile, the Single House zone is reserved for conventional low-density detached housing, allowing one dwelling per parcel, two stories, and a maximum site coverage ratio of 35 percent. The THA, MHU, and MHS zones cover 7.3, 22.6, and 45.1 percent of residential parcels, respectively, with the remaining 25 percent allocated to SH.¹⁹

Prior to the zoning reform, approximately 95 percent of residential-zoned land had restrictions similar to that of the Single House zone.²⁰ Changes in floor-area ratios implied by height and site coverage restrictions indicate that approximately three-quarters of residential land was upzoned (Greenaway-McGrevy and Jones, 2023).

Exhibit 1 depicts the geographic distribution of upzoned residential areas by zone. The plan allowed more intensive development around access points to public and private transit networks. Many of the inner suburbs immediately surrounding the central business district were zoned Single House and were protected by special character “overlays” that prevent teardown and replacement of the houses. These suburbs largely consist of houses constructed in the late 19th and early 20th centuries.

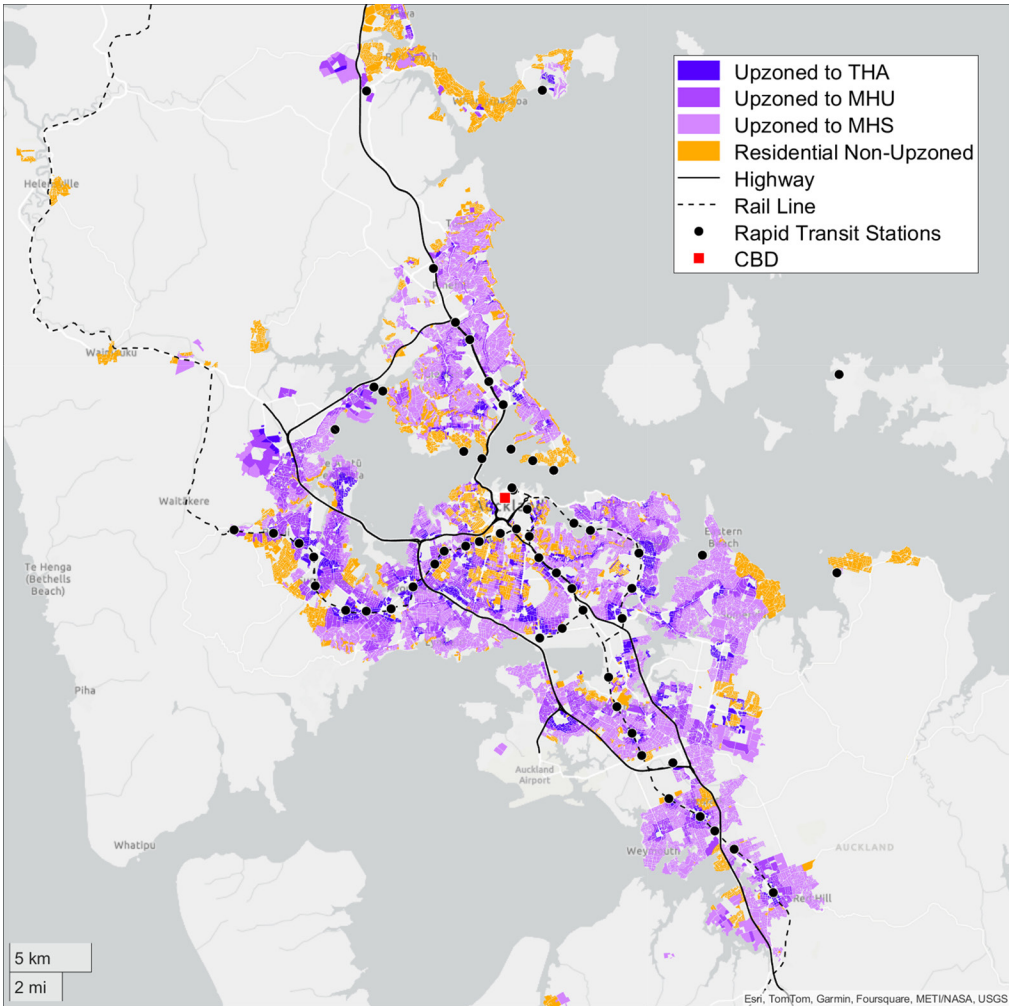
¹⁸ The AUP also includes two additional zones that were described as “residential” that were applied to peri-urban areas or small settlements distant to the CBD: “Large Lot” and “Rural and Coastal Settlement.” Regulations in these zones restrict development to a very low intensity, and connection to water and sewerage infrastructure is frequently lacking.

¹⁹ Source: Author's calculations based on Table 1 of Greenaway-McGrevy and Jones (2023).

²⁰ Prior to the AUP, there were more than 100 different residential zones across the seven city and district councils. Medium- and high-density housing in residential areas was restricted to small pockets. See Table 1 in Greenaway-McGrevy and Jones (2023).

Exhibit 1

Upzoned and Non-Upzoned Residential Areas of Auckland



Notes: CBD = central business district. MHS = Mixed Housing Suburban. MHU = Mixed Housing Urban. THA = Terrace Housing and Apartment Buildings. Rapid Transit stations include heavy rail stations, dedicated busway stations, and ferry terminals. The CBD marker is centered on the iconic "Sky Tower" skyscraper in the central business district. Water is shown in gray. Residential areas upzoned to business and rural areas upzoned to residential or business are excluded for visual clarity. See Greenaway-McGrevy and Jones (2023) for tabulations of land conversion between zones.

Source: Greenaway-McGrevy and Jones, 2023

Policy Effects

Subsequent changes in housing construction and housing costs indicate that the zoning reform had a substantial effect on the quantity and price of housing in the region.

Housing Construction

In New Zealand, the building process begins with an application for a building consent—similar to a building permit in the United States or a building approval in Australia. Consent is the primary measure of construction activity used in the country. Historically, between 90 and 95 percent of all issued consents result in finished dwellings.²¹ Hereafter, this article will use the North American term, *permit*.

Since the reform became operative in late 2016, Auckland has issued permits for approximately 112,000 new dwellings over the subsequent 7 years (2017 through 2023). To put that figure in context, Statistics New Zealand estimates that Auckland's housing stock totaled 530,000 dwellings by the end of 2016. Thus, within 7 years, Auckland issued permits equivalent to more than one-fifth (21 percent) of its existing housing stock.²²

Exhibit 2 shows annual permits issued for new dwellings in the Auckland region between 1991, when the available data begin, and 2023. Dwelling permits reached record highs subsequent to the reform in both absolute and per capita terms.

Prior to notification of the Proposed AUP in 2013, annual permits peaked in 2002 at 12,200 dwellings, or 9.7 permits per thousand residents. This early 2000s boom was driven in part by construction of apartment buildings in the central business district (Productivity Commission, 2015). The abrupt end of the boom in 2005 coincided with a downzoning that imposed minimum dwelling sizes on apartments.

Construction activity continued to decrease through the period spanning the global financial crisis (GFC) and the associated global recession. Permits per thousand residents reached a low of 2.5 in 2009, thereafter recovering slightly.

Permits increased each year from 2013 through to 2022, first reaching a new record of 12,800 units in 2019, just 3 years after the reform became operative. In per capita terms, a new record of 9.7 permits per thousand residents was also attained in 2019, followed by further increases in 2021 and 2022, when it reached a record high of 12.6.

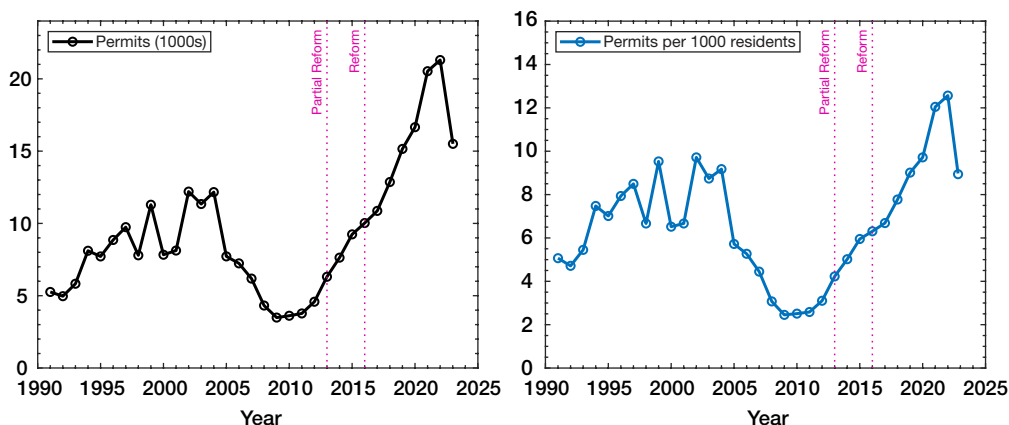
²¹ “Code of compliance certification” (CCC) is commonly used as a measure of building completions in New Zealand. CCCs indicate that the building works have been satisfactorily inspected by the local council to certify that the work has been completed to the required local and national building codes and regulations. Experimental estimates of completion rates for New Zealand as a whole produced by Statistics New Zealand (SNZ) exceed 90 percent. For example, using CCC issuance as completion results in a 91.2 percent completion rate for permits issued over the 10 years to December 2018. However, dwellings can be inhabited without a CCC. Final inspection provides another measure of completion because it occurs after the dwelling is completed to a habitable standard, with the interior wall linings, plumbing, and fixtures in place. Using final building inspection results in a completion rate of 92.9 percent over the 10 years to December 2018. For further information on SNZ experimental estimates, see <https://www.stats.govt.nz/experimental/experimental-building-indicators-march-2022-quarter>.

²² This number is not the net increase in the housing stock, due to teardowns and uncompleted dwellings; it nonetheless serves to illustrate the size of the supply response.

Permits then fell between 2022 and 2023, following an unprecedented rise in interest rates and a technical recession.²³ Despite the unfavorable macroeconomic conditions, over 15,000 permits were issued in 2023, far exceeding the peak of the previous cycle in 2002.

Exhibit 2

New Dwelling Permits in Auckland, 1991 through 2023



Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016.

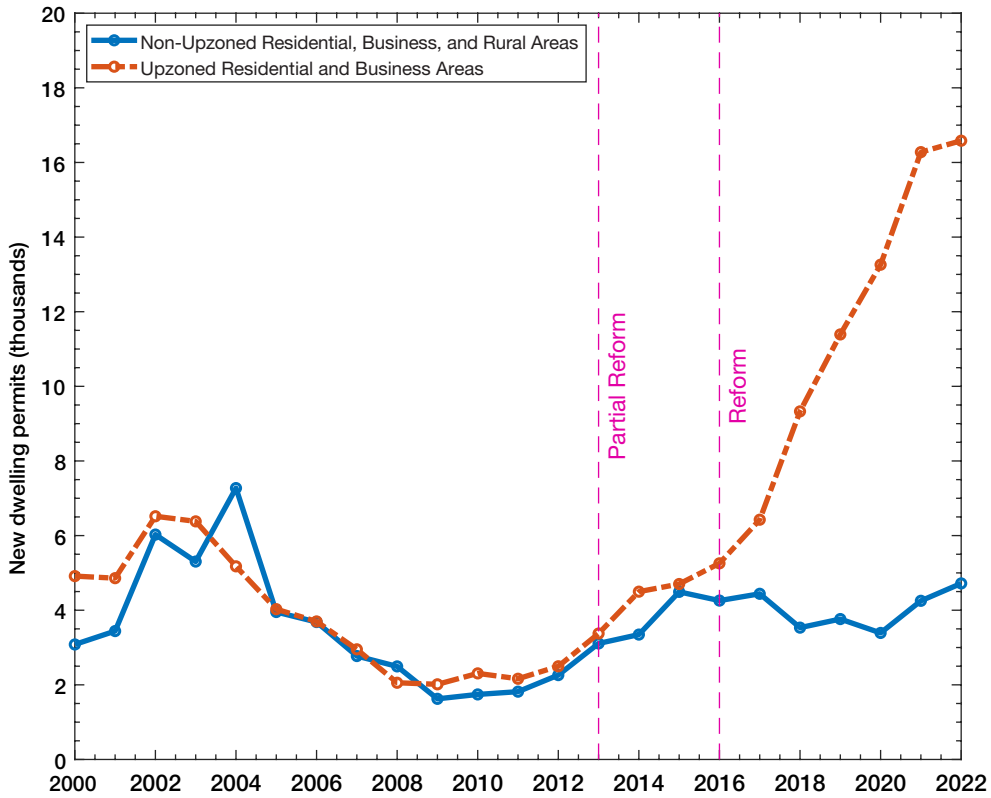
Source: Statistics New Zealand

If the observed increases in permits subsequent to the reform were driven by upzoning, housing construction should have occurred in upzoned areas of the city. Individual permit data maintained by Auckland Council are geocoded so that they can be mapped to upzoned and non-upzoned areas. Exhibit 3 demonstrates that the increase in housing starts from about 2015 onward is driven exclusively by permits issued in upzoned areas, whereas permits in non-upzoned areas are relatively stable from 2015 through 2022.

²³ The Research Bank of New Zealand (the country's central bank) increased the official cash rate from 0.25 percent in September 2021 to 5.5 percent by May 2023. Meanwhile, national GDP growth was negative in the December 2022, March 2023, and September 2023 quarters. At the time of writing, GDP growth for the December 2023 quarter had not been released.

Exhibit 3

Permits by Upzoned and Non-Upzoned Areas of Auckland, 2000 through 2022



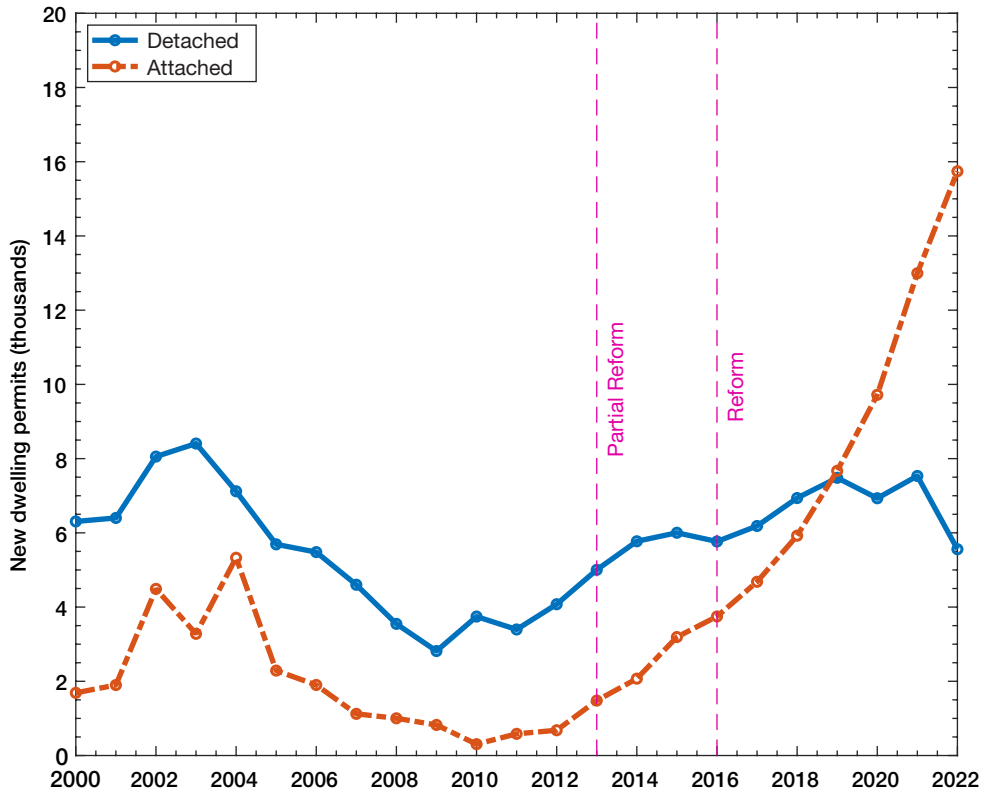
Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016.

Source: Greenaway-McGrevy, 2023

Meanwhile, housing construction has shifted away from predominantly detached housing to attached housing that medium- and high-density zones encourage. Exhibit 4 shows that, from 2019 on, more permits were issued for attached housing than for detached housing in the Auckland region.

Exhibit 4

Permits by Attached and Detached Housing, 2000 through 2022



Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016. Attached housing includes apartments, rowhouses, and plexes.

Source: Greenaway-McGrevy and Jones, 2023

Since the reform was implemented, housing construction in Auckland has also outperformed that of other large cities in New Zealand. Exhibit 5 plots permits per thousand residents (or the "permitting rate") in Auckland against other urban areas of the country that are large enough to be classified as "metropolitan" by Statistics New Zealand.²⁴

Auckland exhibited a comparatively low permitting rate in the aftermath of the global financial crisis (GFC), from 2008 to 2010, when permits per thousand residents bottomed out at 2.5 in 2009. A significant increase occurred between 2012 and 2013, when the partial upzoning under the Auckland Housing Accord took place, followed by further increases every year thereafter

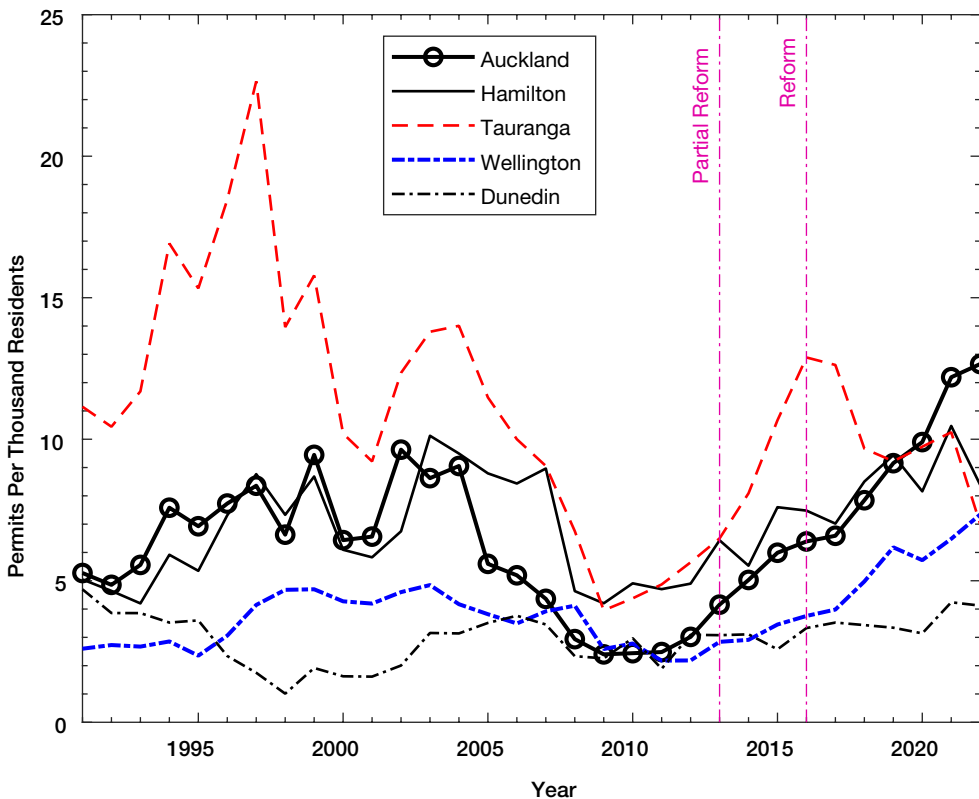
²⁴ This article uses "functional urban areas" (FUAs) as the geographic unit of analysis to facilitate comparisons between different cities, because administrative boundaries do not encompass metropolitan areas in cities other than Auckland. FUAs are defined by Statistics New Zealand (SNZ) based on commuting patterns and are equivalent to commuting zones as defined by the OECD. The metropolitan area of Christchurch is omitted as a relevant comparator because it experienced a large and destructive earthquake in 2011 that had a significant impact on subsequent housing construction due to the need to replace the loss in the housing stock.

through 2022, when the permitting rate reached the record high of 12.6 permits per thousand residents. Auckland's permitting rate surpassed that of Tauranga in 2019, which had previously exhibited the highest permitting rate among the five metropolitan areas.

Auckland continues to outperform the Wellington urban area despite one of the constituent municipalities within the metropolitan area, Lower Hutt, implementing a sequence of widespread zoning reforms in the late 2010s. Beginning in 2016, Lower Hutt enacted a series of zoning changes to enable medium-density housing. However, Maltman and Greenaway-McGrevy (2024) show that these zoning changes increased permits per capita in Lower Hutt to levels comparable to those in Auckland.

Exhibit 5

Auckland's Permits per 1,000 Residents Versus Other Cities in New Zealand, 1991 through 2022



Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016.

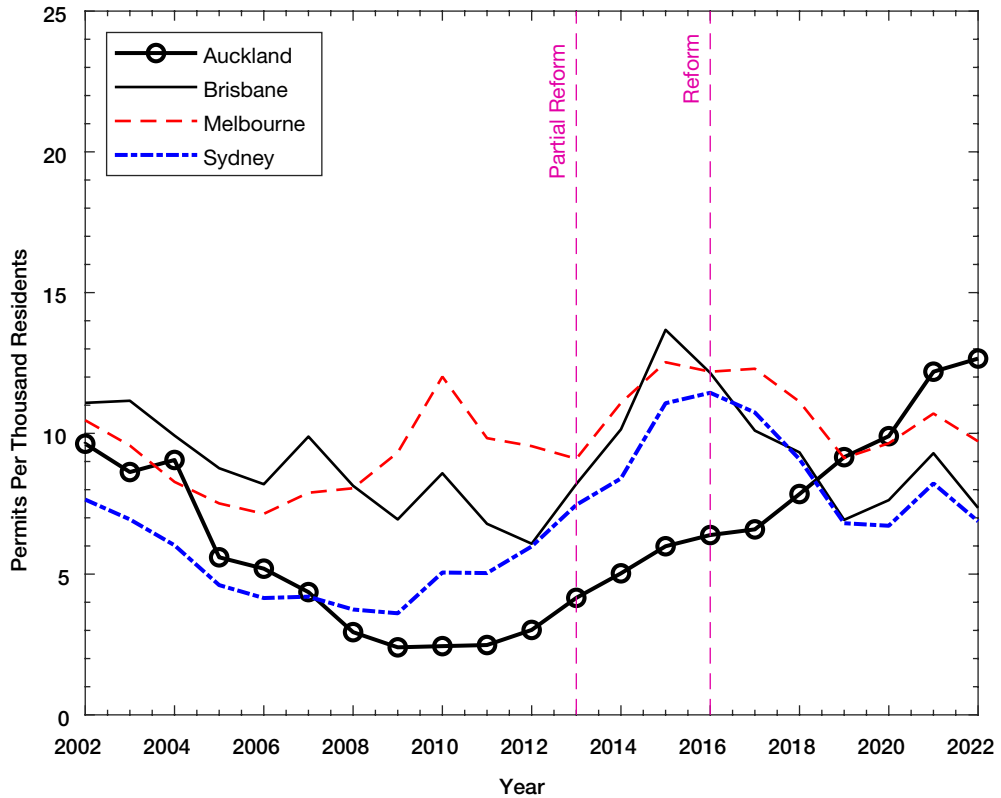
Source: Greenaway-McGrevy, 2023

By 2021, the number of permits per capita in Auckland also surpassed that of large Australian cities. Exhibit 6 compares Auckland's permitting rate to that of Sydney, Melbourne, and Brisbane. These three Australian cities exhibited far higher construction rates than Auckland after the latter's

2005 downzoning and the GFC. By 2019, Auckland's permitting rate exceeded that of Sydney and Brisbane. By 2021, it surpassed that of Melbourne.

Exhibit 6

Auckland's Permits per 1,000 Residents Versus Large Cities in Australia, 2002 through 2022



Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016.

Source: Greenaway-McGrevy, 2023

Causal Effects

The evidence presented in exhibits 2 through 5 appears consistent with widespread upzoning having a large and significant impact on housing starts. Since passing the reform in late 2016—

1. Approximately 112,000 new dwelling permits have been issued over the subsequent 7 years (2017 through 2023), equivalent to 21 percent of the prereform housing stock.
2. Dwelling permits issued per year have reached record highs in both absolute and per capita terms.
3. The increase in permits has been located exclusively in upzoned areas of the city.

4. Attached housing accounts for the majority of new dwelling permits.
5. The number of permits per capita in Auckland has exceeded that of comparable cities elsewhere in New Zealand and Australia.

However, evaluating the impact of the reform requires a counterfactual scenario that tells us what would have happened if the policy had not been implemented. Quasi-experimental methods are commonly employed to specify a counterfactual and measure policy effects. In the zoning literature, quasi-experimental methods have been applied to study the effects of zoning changes in Chicago (Freemark, 2019), Portland (Dong, 2021), and Minneapolis.²⁵

Synthetic controls provide one such quasi-experimental method. Under this approach, the counterfactual is constructed from a weighted average of outcomes from comparable cities; the weights are selected via a statistical algorithm to ensure that the weighted average (or synthetic unit) has outcomes that resemble those of the treated unit prior to the policy change or intervention. The synthetic unit then provides the policy counterfactual to the unit that received the treatment. The synthetic control method has been applied to evaluate numerous policies and was recently described by Susan Athey and Nobel Memorial Laureate Guido Imbens as “arguably the most important innovation in the policy evaluation literature in the last 15 years” (Athey and Imbens, 2017). The Minneapolis Federal Reserve Bank uses the method to assess the effects of the Minneapolis 2040 Plan, which relaxed regulations to allow up to three dwellings per parcel.²⁶ See Abadie (2021) for a comprehensive description of the method.

Greenaway-McGrevy (2023) applies the synthetic control method to the Auckland zoning reform, finding that it roughly doubled the permitting rate within 5 years of the reform becoming operative and generated an approximate 80-percent increase in permits issued over the following 6 years.

Another commonly used quasi-experimental policy evaluation method is difference-in-differences. In this approach, changes in outcomes in treated units after a policy intervention are compared with changes in outcomes in units that did not receive the treatment. Untreated units are a “control” that serves as the policy counterfactual for the treated group. Freemark (2019) uses this method to evaluate transit-oriented upzoning in Chicago, comparing housing outcomes between upzoned and non-upzoned areas of the city.

Greenaway-McGrevy and Phillips (2023) use difference-in-differences to examine the effects of the Auckland upzoning, comparing permits issued in upzoned residential areas of the city to permits in non-upzoned residential areas. However, one potential problem of applying the difference-in-differences approach is that housing construction in upzoned areas may have displaced construction that would have otherwise occurred in non-upzoned areas of the city under the policy counterfactual. Permits in non-upzoned areas of the city would be biased downward as a policy counterfactual, which then generates an upward bias in any estimated policy effects.

²⁵ The Minneapolis Federal Reserve Bank tracks the impacts of the Minneapolis 2040 plan. See <https://minneapolisfed.shinyapps.io/Minneapolis-Indicators/>.

²⁶ See <https://minneapolisfed.shinyapps.io/Minneapolis-Indicators/> and <https://www.minneapolisfed.org/~media/assets/articles/2021/new-fed-tool-will-measure-zoning-reforms-impacts-on-housing-affordability-in-minneapolis/minneapolis-housing-indicators-technical-appendix.pdf>.

The authors address this problem by using pre-policy intervention trends in permits in non-upzoned areas to specify a *set* of counterfactual scenarios. Their approach repurposes the method proposed by Rambachan and Roth (2023) to address another problem commonly encountered in applications of difference-in-differences.²⁷ Under this approach, exact estimates of policy effects cannot be obtained because observed outcomes in treated areas are compared to a set of counterfactual outcomes. Nonetheless, the statistical significance of policy impacts can still be tested conditional on the set of counterfactual outcomes.

Greenaway-McGrevy and Phillips (2023) find that, had Auckland not upzoned, the trend rate of housing construction in non-upzoned areas of the city would have had to increase four-fold for policy impacts to be statistically insignificant. They argue that no feasible concurrent policy change could have generated such a significant increase in housing construction.²⁸

Changes in the Housing Stock

Although housing starts are indicative of how the housing stock is changing over time, they do not directly translate into increases in the housing stock, for two reasons.

First, not every permit results in a completed dwelling. Although accurate data for Auckland over the complete pre- and post-reform periods are lacking, the available data suggest that between 90 and 95 percent of permits result in a completion, depending on how a completion is defined.²⁹

Second, many housing developments tear down and replace existing dwellings. Unfortunately, direct estimates of the gross reduction in the housing stock from teardowns are not available.³⁰

Motivated by this issue, Jones, Greenaway-McGrevy, and Crow (2024) estimate the net change in Auckland's housing stock based on district valuation rolls. These administrative records are kept by local governments throughout New Zealand for the purpose of levying property taxes. Through to February 2024, their estimates show that the housing stock had increased by approximately 80,000 dwellings, or 15 percent, since the AUP became operative.³¹

²⁷ Namely, violation of the parallel trends assumption.

²⁸ Greenaway-McGrevy and Phillips (2023) also produce estimates of policy effects by restricting the counterfactual sets to a linear trend, resulting in an estimate of 21,808 additional permits between 2017 and 2021. However, they warn that such a restriction is subject to strict specification assumptions.

²⁹ "Code of compliance certification" (CCC) is commonly used as a measure of completion, although dwellings can be inhabited without a CCC. Greenaway-McGrevy and Jones (2023) explain that matching CCCs to building permits in Auckland only became feasible from July 2017 onward because this is when a unique identifier was applied to permits and subsequent building inspections in the administrative records. Over 91 percent of permits have a CCC issued within 4 years, while over 93 percent have a final inspection. In addition, more than 95 percent of permits have a first inspection within 2 years, indicating that construction has commenced. Permits expire after 1 year, but developers can apply for a 1-year extension.

³⁰ Demolitions for dwellings of fewer than three stories do not require a permit in Auckland.

³¹ Many of these net additions were likely to have been permitted before the AUP became operative but after it began to have an effect through the partial upzoning under the Auckland Housing Accord program. It is difficult to ascertain how many gross additions were originally consented under the new regulations due to the lack of a unique identifier matching permits to dwellings in the district valuation roll.

Government-Developed Housing

Like many countries, New Zealand has long had government-run or -controlled organizations that construct housing. The nation's primary government developer, Kāinga Ora, builds houses for a variety of purposes, including tenanted housing for low-income households, affordable housing, and market-priced housing.

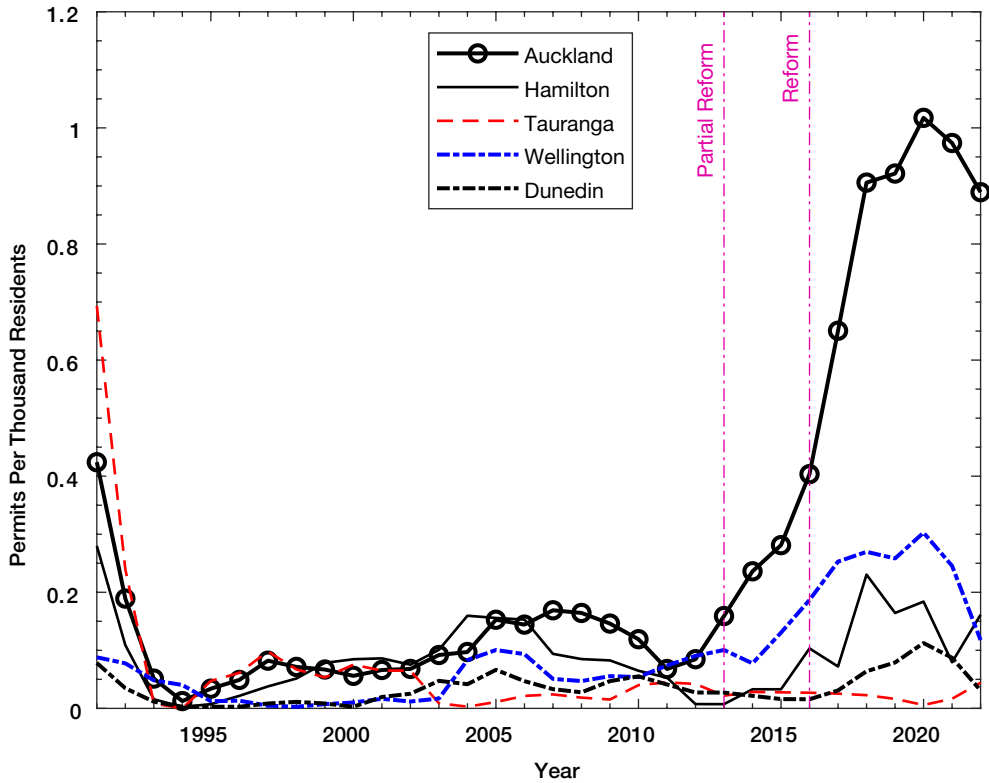
Upzoning helps government developers build more housing because it allows them to fit more housing onto the land they own or must otherwise acquire. Public developers in New Zealand have consequently been highly supportive of zoning reform. Kāinga Ora has made multiple submissions to local governments in New Zealand in support of widespread upzoning (Greenaway-McGrevy, 2024). Housing New Zealand (a predecessor to Kāinga Ora) credits the AUP with enabling it to meet housing demand in Auckland, stating that the additional capacity of its land holdings increased from 3,000 homes to close to 30,000.³²

The data support this reasoning. The AUP precipitated significant increases in government-developed housing in Auckland. Exhibit 7 shows the number of permits issued to government-controlled institutions per 1,000 residents, illustrating that there has been a substantial increase in Auckland since 2013, when government developers took up the development opportunities enabled under the Auckland Housing Accord. Moreover, government housing development in Auckland far exceeds that in other metropolitan cities in New Zealand. These patterns suggest that zoning reform can enable governments to supply more housing, including affordable housing and subsidized public rentals.

³² See page 30 of its "Briefing for Incoming Minister Responsible for Housing New Zealand": <https://kaingaora.govt.nz/assets/Publications/Briefing-to-the-Incoming-Minister/briefing-for-the-incoming-minister-2016.pdf>.

Exhibit 7

State-Developed Housing in Auckland Versus Other Cities in New Zealand, 1991–2022



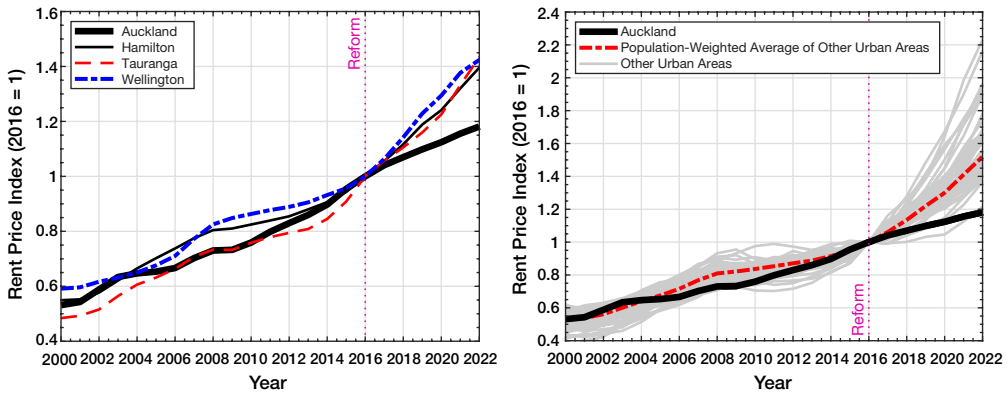
Notes: "Partial Reform" refers to the Auckland Housing Accord, which was enacted in October 2013 and allowed developers to build under the relaxed regulations of the Proposed Auckland Unitary Plan in exchange for a 10-percent affordable housing provision. "Reform" refers to when the Auckland Unitary Plan was made operative in November 2016.

Source: Greenaway-McGrevy, 2024

Rents

Proponents of upzoning suggest that it will not only redress housing shortages but will relieve pressure on housing costs. Exhibit 8 presents rental price indexes constructed from new tenancies in Auckland and comparable cities, showing that nominal rents in Auckland have increased at a substantially slower rate than almost every other urban area in the country.³³

³³ Inflation-adjusted rents in Auckland actually decreased between 2016 and 2022. The Consumer Price Index increased by 21 percent between Q4 2016 and Q4 2022. Source: <https://www.rbnz.govt.nz/monetary-policy/about-monetary-policy/inflation-calculator>.

Exhibit 8**Rental Price Indexes in Auckland and Other Urban Areas of New Zealand, 2000–2022**

Note: "Reform" refers to when the Auckland Unitary Plan was made operative in 2016.

Source: Greenaway-McGrevy and So, 2024

Rents provide a clearer picture of housing affordability than house prices because of the heterogeneous impacts of upzoning on the latter. Housing is a bundle of land and structure. Because upzoning can increase the price of upzoned land, its immediate impact can be to increase the value of land-intensive properties, such as small or dilapidated detached houses on large parcels.³⁴ Consistent with this outcome, Greenaway-McGrevy, Pacheco, and Sorensen (2021) showed that Auckland's upzoning increased the price of land-intensive properties relative to capital-intensive properties.

Greenaway-McGrevy and So (2024) apply the synthetic control method to rental price indexes, finding that rents would have been 28 percent higher 6 years after the reform if Auckland had not upzoned. Nonetheless, housing costs in the city remain highly unaffordable when measured by either the proportion of disposable income spent on housing or house prices relative to incomes. Auckland's zoning reform is therefore unlikely to be a panacea, and additional policy tools and further reforms may be required to bring the cost of housing to affordable levels.

Concluding Remarks

Widespread upzoning is increasingly advocated to redress housing shortages and alleviate rising housing costs in many cities around the world. Until recently, proponents have had few empirical case studies to complement the theoretical arguments underpinning this policy intervention because few cities had pursued widespread zoning reform.

Auckland demonstrates that these arguments are no longer theoretical. Subsequent to its 2016 reform, housing construction has boomed, while rental price increases have significantly decelerated.

³⁴ Note that this does not imply that upzoning erodes housing affordability. Upzoning encourages affordability by directly reducing the quantity of land required per dwelling—not the price of land. Land costs of development decrease if the reduction in quantity is proportionately greater than any increase in land price. Increases in land prices are smaller when upzoning is widespread because development opportunities are more abundant (Phillips, 2022).

Auckland is no longer unique in this regard, either globally or within New Zealand. Lower Hutt, a municipality within the Wellington metropolitan area in New Zealand, implemented a sequence of reforms in the late 2010s that have had a substantial impact on housing starts (Maltman and Greenaway-McGrevy, 2024). In North America, the cities of Arlington, Minneapolis, and Victoria have enacted widespread zoning changes, and the province of British Columbia and the states of California and Oregon have implemented regulatory changes to encourage intensification.

In many cases, it is too early to tell whether the policies have had a substantive impact. In others, construction booms do not seem to have followed reforms (Garcia and Alameldin, 2023). The results from New Zealand hold promise that zoning reform can help redress housing shortages and ease pressure on housing costs. Collectively, these case studies form an important evidence base that can inform the design of upzoning policies elsewhere to enhance housing supply. Understanding why zoning reform has such a significant impact under some circumstances but not others remains an important topic for future research.

Appendix

Exhibit A-1

Summary of Land Use Regulations by Residential Zone Under the Auckland Unitary Plan

Regulation	Terraced Housing and Apartments	Mixed Housing Urban	Mixed Housing Suburban	Single House
Maximum Height	16m (5–7 stories)	11–12m (3 stories)	8–9m (2 stories)	8–9m (2 stories)
Height in Relation to Boundary	3m + 45% recession plane	3m + 45% recession plane	2.5m + 45% recession plane	2.5m + 45% recession plane
Setback (side and rear)	0m	1m	1m	1m
Maximum Site Coverage	50%	45%	40%	35%
Maximum Impervious Area	70%	60%	60%	60%
Minimum Dwelling Size	45m ²	45m ²	45m ²	NA
Maximum Dwellings per Site	NA	3	3	1
Minimum Lot Size (subdivision)	1,200m ²	300m ²	400m ²	600m ²

NA = not applicable

Notes: Restrictions are "as of right." Number of stories (in parentheses) are obtained from the purpose of the height restriction as stated in the zoning regulations. Height in relation to boundary restrictions applies to side and rear boundaries. Less restrictive height in relation to boundary rules than those tabulated applies to side and rear boundaries within 20m of site frontage. Impervious surfaces include roofs, paved areas, and compacted metal roads. Maximum dwellings per site are permitted as of right. Minimum lot sizes do not apply to extant residential parcels. Tabulated restrictions are not exhaustive.

Source: Greenaway-McGrevy and Jones, 2023

Acknowledgments

I thank the editor for feedback on a previous draft.

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References

- Abadie, Alberto. 2021. "Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects," *Journal of Economic Literature* 59 (2): 391–425.
- Asquith, Andy, Jeffrey McNeill, and Elizabeth Stockley. 2020. "Amalgamation and Auckland City: A New Zealand Success Story?" *Australian Journal of Public Administration* 80 (4): 977–986.
- Athey, Susan, and Guido W. Imbens. 2017. "The State of Applied Econometrics: Causality and Policy Evaluation," *Journal of Economic Perspectives* 31 (2): 3–32.
- Been, V., I.G. Ellen, and K. O'Regan. 2019. "Supply Skepticism: Housing Supply and Affordability," *Housing Policy Debate* 29 (1): 25–40. <https://doi.org/10.1080/10511482.2018.1476899>.
- Blakeley, Roger. 2015. "The Planning Framework for Auckland 'Super City': An Insider's View," *Policy Quarterly* 11 (4): 3–14. <http://dx.doi.org/10.26686/pqv11i4.4572>.
- Dong, Hongwei. 2021. "Exploring the Impacts of Zoning and Upzoning on Housing Development: A Quasi-Experimental Analysis at the Parcel Level," *Journal of Planning Education and Research* 44 (1): 403–415. <http://dx.doi.org/10.1177/0739456X21990728>.
- Ehrlich, Maximillian V., Christian A. Hilber, and Oliver Schöni. 2018. "Institutional Settings and Urban Sprawl: Evidence from Europe," *Journal of Housing Economics* 42: 4–18. <https://doi.org/10.1016/j.jhe.2017.12.002>.
- Fernandez, M.A., G.E. Sánchez, and S. Bucaram. 2021. "Price Effects of the Special Housing Areas in Auckland," *New Zealand Economic Papers* 55 (1): 141–154. <https://doi.org/10.1080/00779954.2019.1588916>.
- Fischel, William A. 2001. *The Homevoter Hypothesis: How Home Values Influence Local Government Taxation, School Finance, and Land-Use Policies*. Cambridge, MA: Harvard University Press. <https://www.hup.harvard.edu/books/9780674015951>.
- . 2008. "Political Structure and Exclusionary Zoning: Are Small Suburbs the Big Problem?" In *Fiscal Decentralization and Land Policies*, edited by Gregory K. Ingram and Yu-Hung Hong. Cambridge, MA: Lincoln Institute of Land Policy: 111–136.
- Foster, David, and Joseph Warren. 2022. "The NIMBY Problem," *Journal of Theoretical Politics* 34 (1): 145–172. <http://dx.doi.org/10.1177/09516298211044852>.
- Freeman, Lance, and Jenny Schuetz. 2017. "Producing Affordable Housing in Rising Markets: What Works?" *Cityscape* 19 (1): 217–236.
- Freemark, Yonah. 2019. "Upzoning Chicago: Impacts of a Zoning Reform on Property Values and Housing Construction," *Urban Affairs Review* 56 (3): 758–789.

Garcia, David, and Muhammad Alameldin. 2023. "California's HOME Act Turns One: Data and Insights From the First Year of Senate Bill 9." <https://ternercenter.berkeley.edu/research-and-policy/sb-9-turns-one-applications/>.

Glaeser, Edward L., and Joseph Gyourko. 2003. "The Impact of Building Restrictions on Housing Affordability," *Economic Policy Review* June: 21–39.

Gray, M. Nolan. 2022. *Arbitrary Lines: How Zoning Broke the American City and How to Fix It*. Washington, DC: Island Press.

Greenaway-McGrevy, Ryan. 2024. Zoning Reform and State-Developed Housing in Auckland. Working paper 019. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/our-research/docs/economic-policy-centre/EPC-WP-019-zoning-reform-and-state-developed-housing-in-auckland.pdf>.

———. 2023. Can Zoning Reform Increase Housing Construction? Evidence from Auckland. Working paper 017. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/our-research/docs/economic-policy-centre/Working%20paper%2017.pdf>.

Greenaway-McGrevy, Ryan, and James Allen Jones. 2023. Can Zoning Reform Change Urban Development Patterns? Evidence from Auckland. Working paper 012. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/012WP.pdf>.

Greenaway-McGrevy, Ryan, and Peter C.B. Phillips. 2023. "The Impact of Upzoning on Housing Construction in Auckland," *Journal of Urban Economics* 136: 103555. <https://doi.org/10.1016/j.jue.2023.103555>.

Greenaway-McGrevy, Ryan, and Yun So. 2024. Can Zoning Reform Reduce Housing Costs? Evidence From Rents in Auckland. Working paper 016. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/our-research/docs/economic-policy-centre/EPC-WP-016.pdf>.

Greenaway-McGrevy, Ryan, Gail Pacheco, and Kade Sorensen. 2021. "The Effect of Upzoning on House Prices and Redevelopment Premiums in Auckland, New Zealand," *Urban Studies* 58 (5): 959–976.

Jones, James Allen, Ryan Greenaway-McGrevy, and Chris Crow. 2024. *Using Council Valuation Records to Estimate Auckland's Housing Stock*. Urban and Spatial Economics Hub Policy Paper No. 002. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/our-research/docs/economic-policy-centre/urban-and-spatial-economics/Using%20Council%20Valuation%20Records%20to%20Estimate%20Auckland%27s%20Housing%20Stock.pdf>.

Maltman, Matthew, and Ryan Greenaway-McGrevy. 2024. Going It Alone: The Impact of Upzoning on Housing Construction in Lower Hutt. Working paper 018. Auckland, NZ: University of Auckland, Economic Policy Centre. <https://www.auckland.ac.nz/assets/business/our-research/docs/economic-policy-centre/EPC-WP-018-going-it-alone-the-impact-of-upzoning-on-housing-construction-in-lower-hutt.pdf>.

Manville, M., P. Monkkonen, and M. Lens. 2020. "It's Time to End Single-Family Zoning," *Journal of the American Planning Association* 86 (1): 106–112.

Martin, Anya. 2023. "Houston, We Have a Solution," *Works in Progress* 12, September 7. <https://worksinprogress.co/issue/houston-we-have-a-solution/>.

New Zealand Productivity Commission. 2015. *Using Land for Housing*. Wellington, NZ: New Zealand Productivity Commission. <https://www.productivity.govt.nz/assets/Documents/6a110935ad/using-land-for-housing-final-report.pdf>.

Phillips, Shane. 2022. *Building Up the "Zoning Buffer": Using Broad Upzones to Increase Housing Capacity Without Increasing Land Values*. UCLA Reports. <https://escholarship.org/uc/item/0r53h7pw>.

Rambachan, Ashesh, and Jonathan Roth. 2023. "A More Credible Approach to Parallel Trends," *The Review of Economic Studies* 90 (5): 2555–2591.

Schill, Michael H. 2005. "Regulations and Housing Development: What We Know." In *The Affordable Housing Reader*, edited by J. Rosie Tighe and Elizabeth J. Mueller. London: Routledge.

Tricaud, C. 2021. *Better Alone? Evidence on the Costs of Intermunicipal Cooperation*. CEPR Discussion Paper No. DP15999.