



How Big Upzonings Affect Housing Supply

An Examination of Recent Regulatory Reforms on Construction and Permitting in New York City and Philadelphia

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RESEARCH REPORT

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How Big Upzonings Affect Housing Supply

Despite a growing population in the United States, fewer new housing units were completed in the 2010s than during any of the previous four decades.¹ As building has slowed, housing has become more expensive.² Proponents of upzoning—the process of reforming land-use rules to increase the scale of potential new construction—argue that cities should change their policies to enable higher levels of housing density; they argue this will result in more development, which in turn will help to make homes more affordable. In response to this argument, dozens of cities have upzoned neighborhoods to encourage more supply, often in the interest of reducing housing costs.³ In this report, we explore how housing investment in New York City and Philadelphia changed over the past 15 years after the introduction of major zoning changes.

The New York and Philadelphia upzonings were designed to substantially increase allowed residential development. These upzonings were likely some of the largest undertaken in the United States during this period because of the added allowed construction density in each city. We investigate whether these reforms translated into permitted or completed housing, depending on the city, and examine how changes occurred over time. We identify which areas were upzoned and use propensity score matching (PSM) to identify comparable areas that were not upzoned; we then use event study regression techniques to compare how housing permitting and the housing supply changed in the years that followed.

Our major findings include the following:

- **The upzonings we studied enabled more housing development.** In New York, we estimate that seven neighborhood-scale upzonings collectively resulted in more than 4,000 additional housing units within four years compared with the number of units on similar parcels that were not upzoned. More supply growth is likely in the upzoned areas in future years. Upzoning's effects were particularly notable in the Gowanus, Brooklyn, neighborhood, where the transformation of a formerly industrial neighborhood made way for many market-rate homes and a large number of units specifically for households with low and moderate incomes. This outcome illustrates how large-scale upzoning in an area with significant market demand—a neighborhood where rents were already high and rising at a rapid pace—can quickly generate many new units. In Philadelphia, the reform contributed to a meaningful increase in permitting citywide, especially during the period from 2019 to 2021. We estimate that upzoning helped

generate a maximum of 4,000 additional housing unit permits per year citywide compared with non-upzoned areas, though there was substantial fluctuation over time.

- **The Philadelphia upzonings concentrated development in larger projects.** Although the Philadelphia upzonings increased the number of permitted units, they did not substantially increase the number of permitted projects. The upzonings likely increased the average number of units per development, especially in areas that were experiencing development pre-upzoning.
- **Upzoning did not increase permitting or housing supply in some areas, likely because of preexisting, weaker housing markets.** We find that upzoning had significant effects on housing supply in many but not all of the upzoned New York City neighborhoods. The Jerome Avenue (Bronx) corridor showed slightly negative, though not statistically significant, housing supply change. This area may have struggled to attract development because of its relatively weaker housing market (it had the slowest pre-upzoning increase in rents of any of the upzoned neighborhoods). Similarly, despite the citywide nature of Philadelphia’s upzoning, we do not find evidence that the changes shifted where developers applied for permits; neighborhoods that had little demand before the rezoning did not attract a substantial share of new projects after rezoning.
- **The timing of upzoning-induced construction varied.** Upzoned neighborhoods in New York City experienced statistically significant increased housing production within a few years after upzoning, with effects often growing over time. This may reflect the city’s consistently strong appeal over our study period. In contrast, the Philadelphia upzoning did not have a statistically significant effect on permitting until six years after the reform. This delay may have resulted from the city’s years-long process of converting the reform into zoning map changes, combined with the planned expiration of a ten-year property tax abatement program that induced a permitting boom. This suggests that the upzoning provided the capacity to absorb additional housing unit permitting when regulatory details were sorted out and the financial feasibility of development improved.

Across both cities, our findings suggest that upzoning can make way for denser development, but its effects depend on local market conditions and complementary policies. Our results deserve further analysis given potential underlying, unmeasured trends that may be causing housing supply growth for reasons other than the upzoning, such as the transition in Gowanus from industrial to residential uses. Additional research is needed to assess whether upzoning’s effects were primarily substitutive—meaning they encouraged a greater share of housing development in some places rather than others— or meaningfully contributed to regional increases in housing supply. Moreover, more work is needed to understand the effects of these changes on housing affordability and displacement.

Evaluating the Impacts of Upzoning

Upzoning is the process of changing land-use policies to increase the scale of allowed buildings that can be constructed on parcels or in neighborhoods, known as the “zoning envelope.” This can translate into added space for housing units; additional units are associated with increased affordability (Been, Ellen, and O’Regan 2019). There is no single approach to undertake an upzoning; cities can change any number of regulations, such as parking requirements, height limits, unit maximums, setbacks, and floor area ratios (FARs). Some policymakers hope that upzoning can help them make progress toward their goals of increasing housing affordability, encouraging economic development, and improving access to opportunities. Many also believe upzoning is necessary to alter policies that were first introduced to encourage racial and class segregation (Lens 2022). Upzonings have become increasingly common in some of the most affluent, expensive metropolitan areas (Pendall, Lo, and Wegmann 2022). New York City, for example, conducted a series of upzonings in the 2000s that added roughly 100 million square feet of additional residential space to the city’s zoning envelope (Armstrong et al. 2010).

Because of the variety of motivations and strategies for upzoning, it is difficult to compare one upzoning with another. It is also challenging to study the impacts of zoning changes because cities often make zoning changes reactively in response to requests from developers. In many cases, such rezonings are associated with negotiations in which city governments seek to capture benefits from developers, such as public open space or right-of-way improvements, in exchange for upzoning (Kim 2020). In such cases, we cannot be sure that housing development outcomes result from the zoning change or from some other confounding factor that affects the likelihood of development, such as the local economy and the purchasing power of prospective residents (Freemark, Lo, and Su 2025). For example, if there is inadequate market demand for new housing, upzoning is unlikely to have any substantive effect on housing development even if it eases land-use restrictions.

Nevertheless, a growing number of scholars have sought to explore how upzonings affect the communities in which they are introduced (Freemark 2023). Some of these scholars have studied New York City (Davis 2021; Liao 2026) and others have described development conditions in Philadelphia (Balzarini and Boyd 2024). We provide an overview of the current evidence on upzoning’s impacts in Appendix A. Additional scholarship is needed to explore what impacts upzonings have on housing supply and, importantly, how the impacts occur over time. We seek to fill that gap here.

The Case Studies: Upzonings in New York City and Philadelphia

We focus this report on recent zoning reforms in two major US cities, New York City and Philadelphia. These municipalities offer us the opportunity to explore how upzoning might affect outcomes in metropolitan areas with large real estate markets. We use the same general analytical approach for each city: comparing trends in the number of housing units (New York City) or permitting (Philadelphia) in upzoned areas with those of similar, non-upzoned areas, which generally maintained their zoning capacity during the study period. In each case, we define upzoned areas as those where legal reforms increased zoning envelopes. This creates “zoning capacity” for more construction.

For each upzoned parcel in New York City or block face in Philadelphia, we identify similar, non-upzoned parcels or block faces through PSM.⁴ PSM allows us to match areas based on their underlying characteristics, including pre-upzoning trends, and enables us to create our treated group (the upzoned areas) and our control group (the matched, non-upzoned areas). Next, we use event study regressions to compare outcomes both before and after the upzonings. When the upzoned areas and non-upzoned areas had similar housing trajectories pre-upzoning but diverge post-upzoning, this signals that the upzonings may have contributed to the difference. Our ultimate goal is to estimate how many housing units were completed or housing permits filed as a result of the upzonings, accounting for units that would have been built even without the zoning changes.

We adjust our methods to account for differing data availability in each city. In New York City, annual tax parcel data allow us to track completed housing units, while in Philadelphia, the absence of such data leads us to rely on building permit records. This difference provides complementary perspectives: New York City’s data capture realized housing production, while Philadelphia’s permit data reveal development intent and response to zoning changes. Because New York City’s data describe completed units, our study likely understates the long-term impacts of rezonings. For additional details on our data sources and analytic approaches, refer to Appendix B.

New York City’s Upzonings

During the administration of Mayor Bill de Blasio (2014–21), the New York City council undertook nine city government-initiated, neighborhood-scale rezonings.⁵ These may be some of the largest rezonings in terms of increases in allowed development per parcel in the United States over the past few decades. We focus on major upzonings that occurred in or along Downtown Far Rockaway (Queens, 2017), East Harlem (Manhattan, 2017), East New York (Brooklyn, 2016), Gowanus (Brooklyn, 2021), Inwood

(Manhattan, 2018), Jerome Avenue (Bronx, 2018), and SoHo/NoHo (Manhattan, 2021). The 2016–18 rezonings emphasized the production of affordable housing units on city-owned land, whereas the Gowanus and SoHo/NoHo rezonings, where less city-owned land was available, emphasized mixed-income investments. Other rezonings were undertaken along Bay Street on Staten Island and in East Midtown in Manhattan, but we do not examine these. During the administration of Mayor Eric Adams that followed (2022–25), New York City pursued five additional large-scale neighborhood upzonings, such as in Long Island City, as well as a citywide zoning text amendment referred to as “City of Yes for Housing Opportunity,” but we do not study these here because of the recency of the reforms, making an analysis of their impacts challenging.⁶

The rezonings affected neighborhoods with varying pre-upzoning economic conditions, with divergence in terms of median rents and recent changes in rent levels (table 1). The Gowanus rezoning was the most substantial upzoning, affecting a large area and dramatically increasing allowed residential densities, especially since the site is aligned along a formerly industrial canal that was subject to a years-long cleanup process.⁷ The Gowanus neighborhood (including the area a few blocks away from the canal) had high pre-upzoning real-estate demand, as demonstrated by its high rate of rent growth in the period between 2010 and 2015, and the fact that its pre-upzoning rent levels were the second highest of all upzoned neighborhoods, behind SoHo/NoHo. It is also surrounded by high-cost, high-income neighborhoods.

TABLE 1

Variations in Housing Markets Across New York City’s Upzoned Neighborhoods

Median household rents for upzoned neighborhoods, adjusted to 2024 dollars

Neighborhood and rezoning year	Median household rent in the year before upzoning	Median household rent, percentage change, 2010–15
East New York (2016)	\$1,457	8
Downtown Far Rockaway (2017)	\$1,595	13
East Harlem (2017)	\$1,046	16
Inwood (2018)	\$1,490	11
Jerome Avenue (2018)	\$1,402	6
Gowanus (2021)	\$2,248	18
SoHo/NoHo (2021)	\$2,971	13

Sources: Authors’ analysis of American Community Survey five-year data at the tract level.

Notes: All dollar values are inflation-adjusted to 2024 dollars. Median household rent data were calculated by using data for the five-year period before the upzoning; for example, if the upzoning occurred in 2016, we use rent data for the 2011–15 period and adjust it to 2024 dollars. Neighborhood-level values reflect areally interpolated values derived from intersecting tracts; for example, median household rent is the weighted mean of median household rent for all tracts intersecting with a given neighborhood, where the weight is the share of the tract in the neighborhood.

Each of the neighborhood rezonings occurred in association with a broader neighborhood comprehensive planning effort. Each was supported by city-led and other initiatives focused on affordable housing development and preservation, renovation and creation of parks and other open spaces, revitalization of community resources such as schools and health care facilities, transportation and public infrastructure enhancements, and strategies targeted toward economic and workforce development. Each rezoning was also linked with New York City's Mandatory Inclusionary Housing policy, adopted in March 2016, which required that substantially upzoned areas include a large share of housing affordable for households with low and moderate incomes.⁸ For example, the Gowanus rezoning mandated that about 35 percent of future units were to be reserved for households with low and moderate incomes.⁹

The New York zoning changes we study primarily operated by increasing parcels' maximum allowed FARs, maximum heights, and their lot coverage maximums (the share of a parcel that can be built on), although the scale of these changes varied across upzonings. (New York City does not regulate the maximum number of housing units in multifamily apartment buildings, other than through minimum floor area, so FAR increases, in essence, are increases in allowed unit count.) Not all parcels in each rezoned neighborhood were upzoned—some had no zoning change, and others were downzoned (we do not include downzoned parcels in either treated or control groups in this analysis). Notably, the rezoning in East Harlem upzoned many parcels while simultaneously downzoning more than 200 parcels. Other rezonings we evaluated did not include many or any downzoned parcels, though across all rezonings, some parcels experienced no FAR-based zoning change; this was the case for the majority of parcels in East New York.

The upzonings in New York City occurred against a backdrop of relative stability in housing construction over the period (though there were large boosts in permitting that occurred in 2015 and 2022 in the context of changes in tax abatement policies).¹⁰ New York City's boroughs experienced fairly constant but moderate growth in their total housing stocks during our study period. This suggests that citywide policy changes and other market factors that might affect the outcomes of neighborhood upzonings did not occur in the context of major changes to the overall housing stock.

In Appendix B, table B1 provides an overview of key characteristics for each neighborhood where upzonings occurred, the area in acres that was affected, and the number of individual parcels that were affected. This table shows that we estimate the Gowanus upzoning was larger than the others in terms of its estimated increase in allowed housing construction; we project that the upzoning made it possible to build more than 6,000 additional units compared with baseline. In figure 1, we map the upzonings in the city during the de Blasio administration.

FIGURE 1
City-Initiated Upzonings in New York City, 2016–21



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Source: The authors, adapted from New York City’s Rezoning Commitments Tracker, accessed February 9, 2026, <https://airtable.com/appHu65vJkMc71N8p/shrKOOhVpRyk9fBvf?ncmBo=rec8ocvtFJeavchyqhttps://arcg.is/0SLXC8>.

Note: In this report, we do not study the Bay Street rezoning, as we do not track data for Staten Island, or the Greater East Midtown rezoning, which was focused on commercial, not residential, uses.

Philadelphia's Upzonings

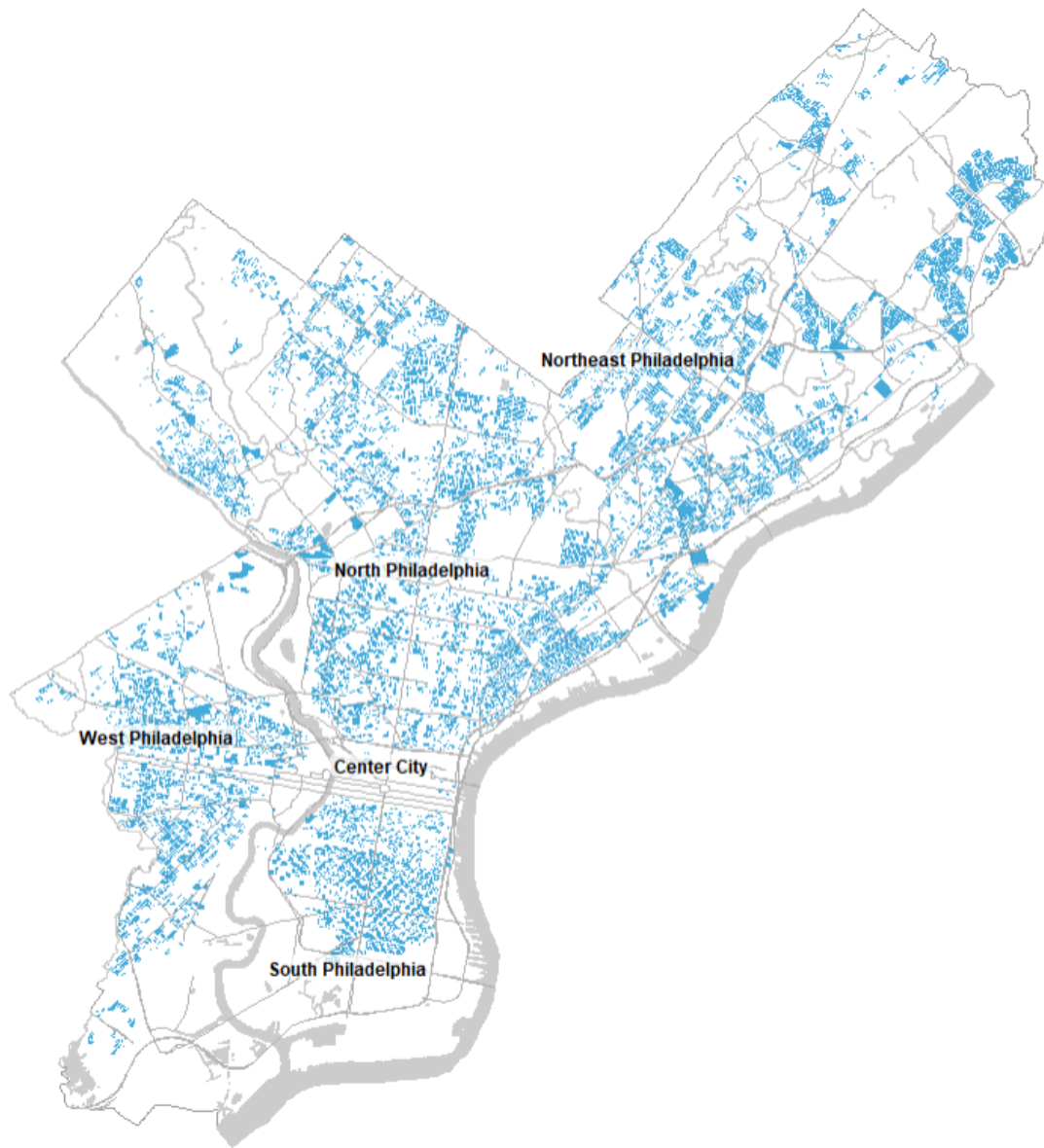
In 2012, Philadelphia's zoning code had its first comprehensive overhaul in over 50 years (the city council signed the relevant ordinance in December 2011, and it went into effect in August 2012). Philadelphia's reform included a complete rewrite of the regulatory framework governing land use across the city. The reform reduced the number of zoning district types by more than a third—from more than 30 categories to less than 20—and simplified development regulations that had accumulated decades of complexity. Overall, the rewrite resulted in capacity increases across many areas in the city, as parcels transitioned from old to new zoning designations.

To identify upzoned areas, we calculated the estimated residential development capacity for parcels under the pre-2012 and post-2012 zoning codes. This calculation incorporated key zoning parameters that govern building bulk and density, including FAR, maximum building height, lot coverage requirements, setback regulations, and parking minimums. (As in New York City, the number of units per potential apartment building in Philadelphia is largely determined by FAR.) We then aggregate parcels into “block faces,” or groups of adjacent parcels along the same city block that share similar characteristics and spatial proximity. We classify block faces as upzoned if the estimated capacity increased following the 2012 reform.

Philadelphia's upzoning was not immediately associated with zoning district remapping, which required additional work by city staff and votes by the council. By 2017, 56 percent of acres to be remapped had not yet undergone this process (City of Philadelphia 2017); this was a consequence of city councilors having a considerable role in managing the rollout of these changes through councilmanic prerogative.¹¹ In addition, the council refined several of the zoning code changes in 2016.¹² Finally, substantial shifts in housing permitting affected Philadelphia's real estate environment during the period after the upzoning. Likely because of the confluence of these regulatory and economic factors, upzoned areas in Philadelphia did not experience a major boost in permitting until 2019.

In figure 2, we document which Philadelphia block faces experienced increases in zoning capacity as result of the rezoning. In Philadelphia, we study outcomes citywide rather than at the neighborhood level, because of citywide nature of Philadelphia's 2012 zoning code overhaul.

FIGURE 2
City-Initiated Upzonings in Philadelphia, 2012



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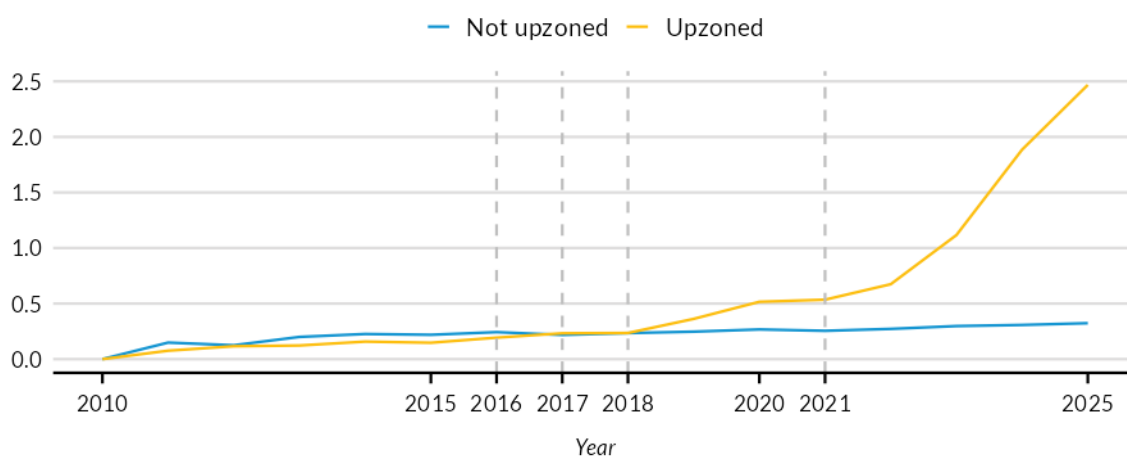
Source: Author calculation of change in maximum zoning capacity based on zoning ordinances.

Note: Blue areas signify block faces with upzoned capacity. Upzoning is identified based on changes in estimated zoning capacity calculated from zoning code parameters including height limits, floor area ratio (FAR), and setback requirements before and after the 2012 reform.

Findings: New York City

Beginning in 2019, upzoned parcels in New York City experienced substantially greater growth in residential units compared with non-upzoned parcels (figure 3). Before 2019, upzoned and non-upzoned parcels had similar rates of supply growth. Although these descriptive data suggest that upzonings may have influenced residential unit production, figure 3 does not account for confounding factors that may have contributed to upzoned parcels' greater unit growth. For example, upzoned parcels may have been upzoned because they were in areas with high housing demand, and it may have been underlying market dynamics in these areas, not the upzonings, that drove housing production.

FIGURE 3
Descriptive Data Show Upzoned Parcels in New York City Experienced Substantial Growth in Residential Units After Upzonings
Cumulative average change in residential units since 2010



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Source: Authors' analysis of parcel data from New York City.

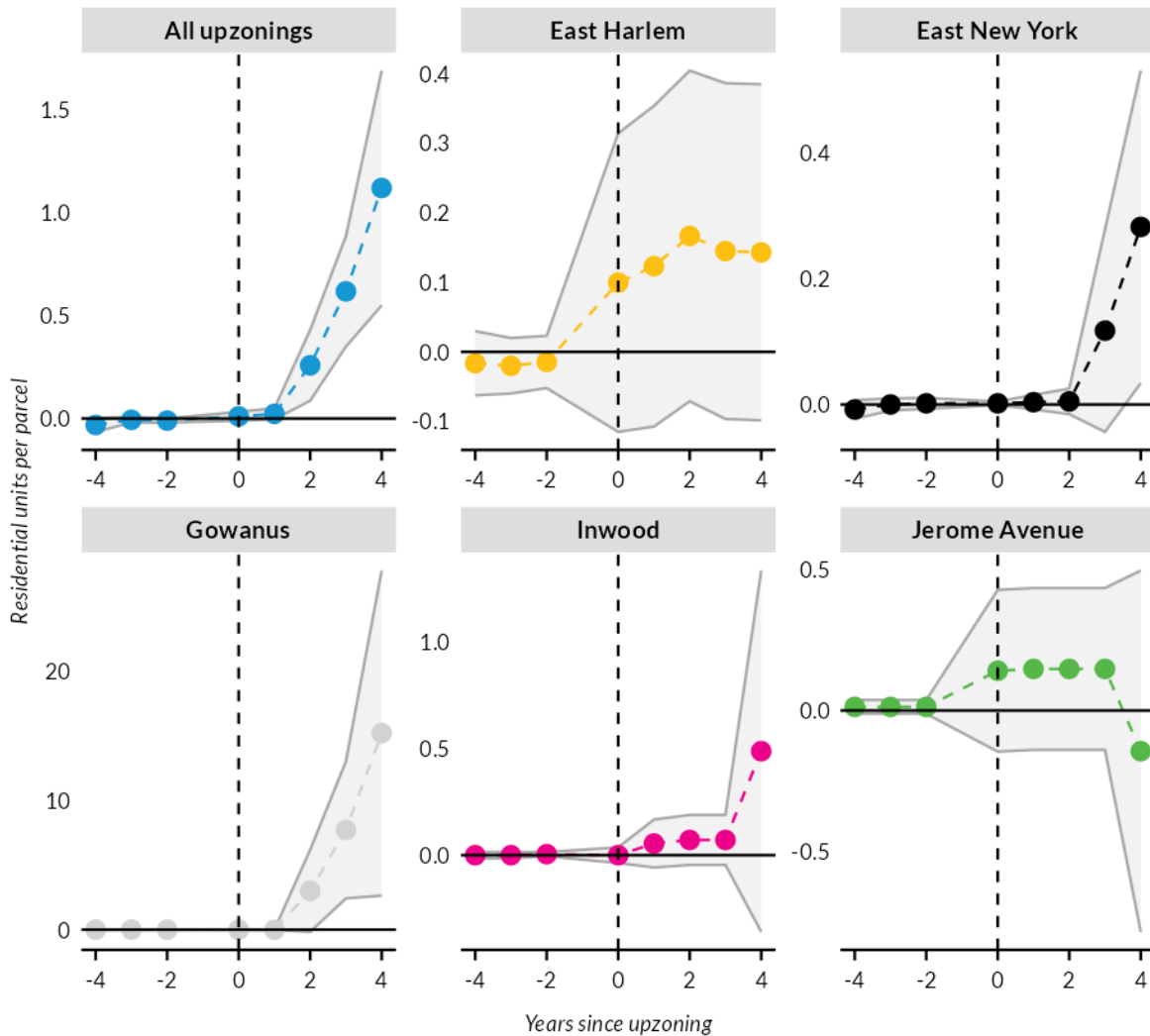
Note: "Not upzoned" includes all parcels in the Brooklyn, Manhattan, Queens, and the Bronx that were not in one of the seven upzoned neighborhoods: East New York, upzoned in 2016; Downtown Far Rockaway and East Harlem, upzoned in 2017; Inwood and Jerome Avenue, upzoned in 2018; and Gowanus and SoHo/NoHo, upzoned in 2021. "Upzoned" includes all parcels in any of the upzoned neighborhoods with a FAR increase of 0.25 or more. Dashed lines reflect years when upzonings occurred.

To control for these potential confounding variables, we implemented event study regressions for each study neighborhood, as well as a combined event study for all of the upzoned neighborhoods. Figure 4 illustrates our estimates of the parcel-level effects of upzoning contrasted with comparison parcels that were not upzoned, both citywide and among five of the upzoned neighborhoods (we do not include a separate graph for the Downtown Far Rockaway or SoHo/NoHo upzonings because of their small parcel counts and limited regression power).

FIGURE 4

Neighborhood-Scale Upzonings Increased Housing Unit Production in Many New York City Neighborhoods

Change in residential units pre- and post-upzoning, per upzoned parcel, compared with non-upzoned parcels; note that y-axis scales differ



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Source: Authors' analysis of parcel data from New York City.

Notes: The "All upzonings" plot includes upzoned parcels from each of the visualized neighborhoods plus upzoned parcels from Downtown Far Rockaway and SoHo/NoHo, which were also sites of neighborhood rezonings during the study period. Light gray fills represent the 95 percent confidence interval around each point estimate. The year at -1, or one year pre-upzoning, is the reference year for the regressions, and so no coefficient is calculated for this time period nor visualized here.

Figure 4 shows that before upzonings occurred, upzoned and equivalent non-upzoned parcels had similar rates of housing supply growth (as symbolized by their position at or near 0 on the y-axis, with no statistically significant difference in housing supply between treated and control parcels in the four

years before upzoning). Supply growth is demonstrated by the jumps in each panel's line at or after year 0, when the upzoning occurred. Across all upzonings collectively, and for the neighborhood-level upzonings in East New York and Gowanus, we find positive and statistically significant effects on housing supply by four years after upzoning. In Inwood and East Harlem, housing supply change is positive at four years post-upzoning but not statistically significant. The magnitude of housing development increases varied significantly across neighborhoods. Notably, the Gowanus upzoning was associated with a much larger effect than the other rezonings.

The method used in the development of figure 4 accounts for underlying trends at both the parcel and citywide levels, helping to isolate the specific contribution of increased zoning capacity and enabling comparisons between upzoned and non-upzoned areas. Across all upzonings, the average upzoned parcel had roughly 1.1 more residential units four years after upzoning compared with similar non-upzoned parcels (this figure increased steadily in the years after upzoning; note that development projects often encompass multiple parcels). In sum, across the approximately 3,600 upzoned parcels in the seven study neighborhoods, we estimate that the policy change generated nearly 4,100 additional units four years after upzoning compared with similar parcels that were not upzoned. Gowanus accounted for the bulk of this change, adding roughly 15 units per parcel four years after upzoning compared with equivalent areas that were not rezoned—much more than all other neighborhoods.¹³ A substantial share of these units were reserved for households with low and moderate incomes.

The size of the effects we observe in Gowanus is an outlier compared with the other upzonings we evaluate, but the context in Gowanus differed from that in the other neighborhoods. The Gowanus upzoning was more substantial in terms of increased allowed housing units (see Appendix B, table B1). Unlike the other upzoned areas, the neighborhood was primarily industrial before the rezoning and canal cleanup, meaning it offered substantial potential to be transformed. In addition, among upzoned neighborhoods, as noted, Gowanus experienced the fastest rise in rents between 2010 and 2015 and had some of the highest rents before upzoning (table 1). This large effect in Gowanus suggests that large-scale upzoning, associated with substantial market demand, can quickly produce a large number of completed housing units. That figure may grow in the coming years, since residential development takes time; some projects in Gowanus, for example, only revealed their designs or began construction in the last few months.¹⁴ Conversely, the experiences from the upzonings in Downtown Far Rockaway, East Harlem, East New York, Inwood, and Jerome Avenue—all of which had much lower housing costs pre-upzoning than Gowanus—suggest that upzoning effects in the context of weaker housing markets are much more modest, at least during the relatively short post-upzoning period that we observe.

The timing of effects on housing development is also notable, with those upzonings leading to statistically significant housing supply growth not showing effects until two or more years after upzoning, with the effects growing in the period after that. Previous research suggests that there is typically an uptake period post-upzoning, during which developers become familiar with the changes and make plans to respond to it (Stacy et al. 2023). Given the timelines for housing development—especially for larger multifamily buildings—a two-or-more-year lag between an upzoning and associated housing development is not unexpected. Indeed, the effects of some of the evaluated upzonings—such as those in Inwood, where housing supply growth is trending upward but remained not statistically significant at four years post-upzoning—may fall outside our observation window.

The upzoning along Jerome Avenue in the Bronx is notable in that in no year post-upzoning were there significant changes in the area’s housing supply, and at four years housing supply change was trending negative compared with controls. Two interrelated factors may explain this story. For one, upzoning is dependent on a housing market that demands new construction. A housing market with relatively slow rent growth and low real estate values in and around the corridor may have contributed to relatively constrained development post-upzoning along Jerome Avenue (table 1). Similarly, upzoning is only likely to stimulate construction if pre-upzoning policies limit what is allowable to build below what the market will support. It may be that lower housing demand meant that, even before the change, zoning was not a constraint on housing construction along Jerome Avenue.

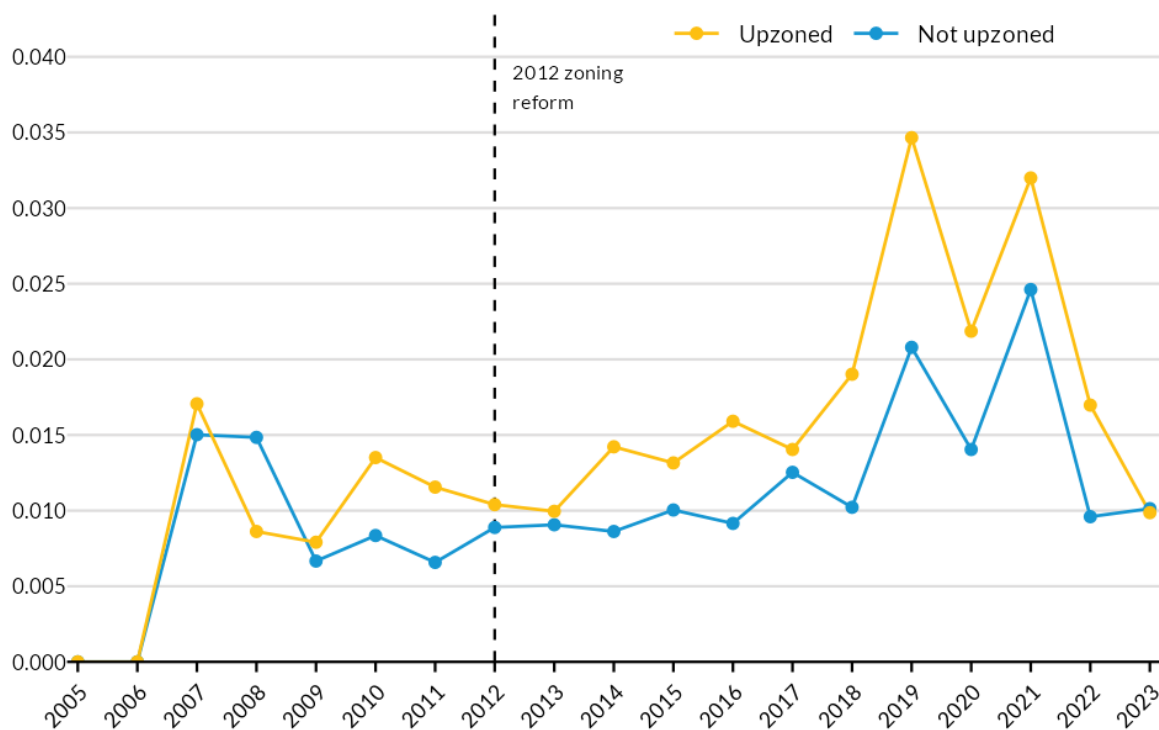
We also evaluated an upzoning in SoHo/NoHo, for which we do not present neighborhood-specific results in figure 4 because there were very few parcels that met our criteria for upzoning (we do include this upzoning in our “all upzonings” analysis). Here, we find that in spite of the neighborhood’s strong housing market, the rezoning did not produce significant increases in supply, which is in line with what others have found.¹⁵ This may be because the rezoning overlapped with historic preservation districts, which limit developers’ ability to build. Or it may be that neighborhood’s rezoning simply requires more time to have an impact; as of early 2026, the city recorded 580 in-process housing units in the neighborhood, but these are not captured in our data.¹⁶

We also evaluated an upzoning in Downtown Far Rockaway. Although we found statistically significant increases in housing supply after the upzoning, we do not present those results in figure 4, owing to the small sample size of upzoned parcels ($n = 104$) and the large associated standard errors around the regression estimates, likely because much of the growth was from a small number of relatively large new projects. Although these results align in direction and timing with those from the other New York City upzonings, those other upzonings have larger sample sizes and thus are more robust to the effects of a few large, outlier developments in the post-upzoning period.

Findings: Philadelphia

In Philadelphia, we leveraged 7 years of pre-reform data to establish baseline trends and 12 years of post-reform data to track the reform’s effects (as noted, certain reform elements took several years to manifest through zoning map changes). We first compare the trend in new permits and their associated units between block faces that experienced an increase in zoning capacity and those that were similar in other characteristics but experienced no increase in capacity (figure 5).

FIGURE 5
No Major Differences in Housing Project Permits in Upzoned Areas in Philadelphia
Average residential units permitted per block face



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Source: Authors’ analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

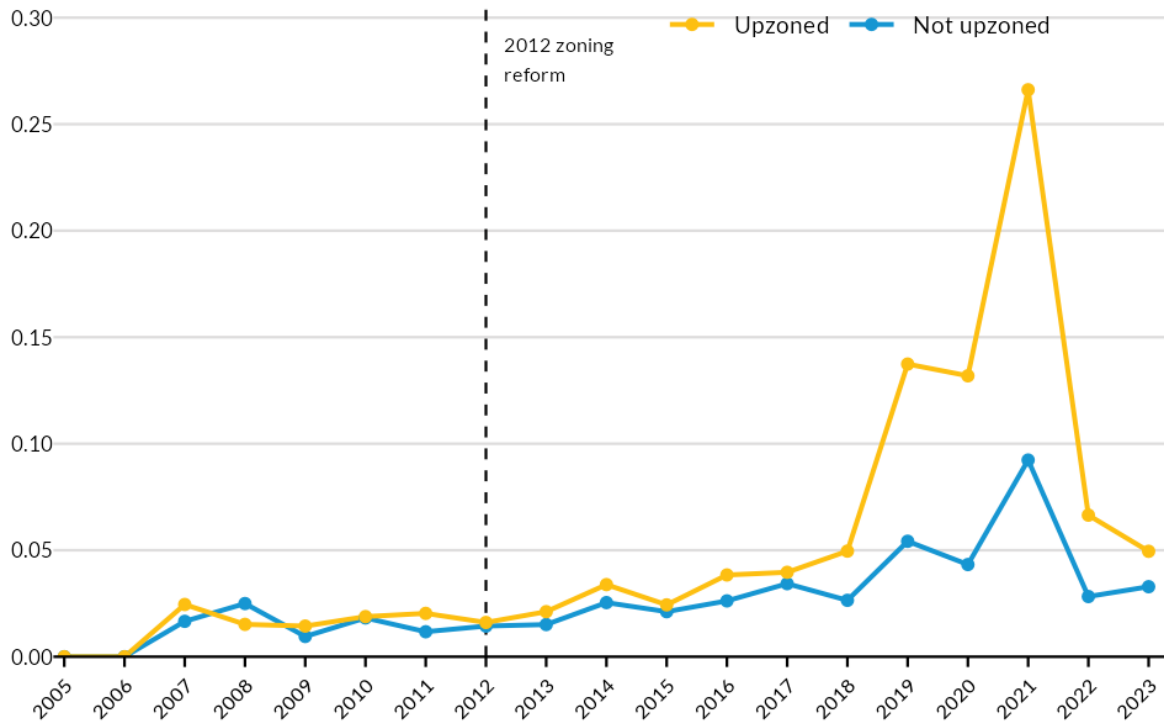
Notes: Upzoned = block faces where Philadelphia’s 2012 zoning change resulted in an increase in the zoning envelope; not upzoned in capacity = block faces where there was no increase in the envelope.

Figure 5 reveals a striking pattern: upzoned block faces with zoning capacity increases from the 2012 reform and matched control block faces that were not upzoned experienced nearly identical trends in the number of project permit applications filed throughout the study period. Although, on average, the block faces that experienced capacity increases had slightly higher average permits per

parcel throughout the period, both groups saw rising permit activity from the mid-2010s, spikes in 2019 and 2021, and a more recent decline.

When we examine the number of housing *units* proposed in those applications, however, a different story emerges (figure 6). Here, we show that upzoned block faces consistently attracted proposed developments with substantially more units, particularly during the citywide permitting boom that occurred between 2019 and 2021. This divergence suggests that the zoning reform’s primary effect may not be to increase the number of individual projects being planned, but rather to enable more intensive development: projects with more housing units.

FIGURE 6
In Philadelphia, More Housing Units Were Permitted in Upzoned Areas
Average residential units permitted per block face



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Source: Authors’ analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

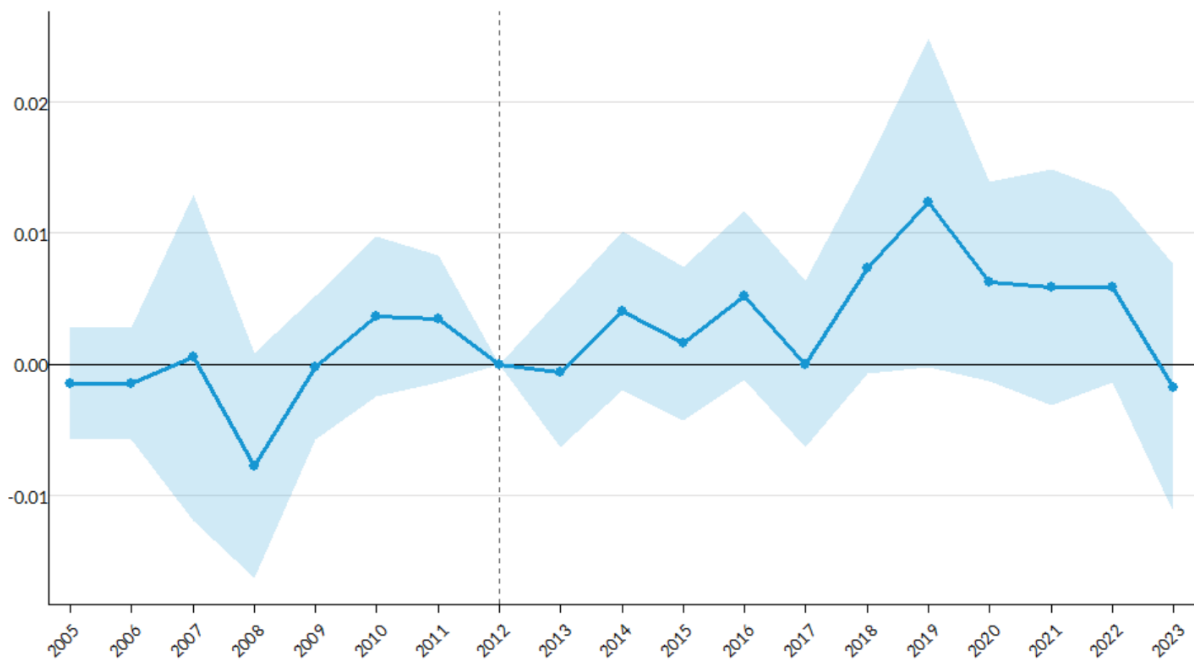
Notes: Upzoned = block faces where Philadelphia’s 2012 zoning change resulted in an increase in the zoning envelope; not upzoned in capacity = block faces where there was no increase in the envelope.

To further evaluate the block face-level effects of zoning change in relationship to the timing of the Philadelphia zoning rewrite, as in New York City, we use an event study regression to isolate the effect

of the zoning reform year by year, enabling us to control for underlying characteristics of the upzoned versus non-upzoned areas. Through this approach, we confirm figure 5 by finding no consistent, statistically significant difference in the number of *individual permits* filed in upzoned versus non-upzoned areas in any year before or after the reform (figure 7). Our estimates fluctuate around zero additional permitted units in upzoned versus non-upzoned areas throughout the study period, and confidence intervals consistently include zero, with the exception of two years, indicating no statistically significant effect. This reaffirms that the reform likely did not increase the frequency of development *projects* in upzoned areas in most years after the reform.

FIGURE 7
No Significant Difference in Number of Housing Project Permits Over Time in Philadelphia

Change in residential project permit applications before and after 2012 zoning rewrite, per block face, compared with block faces that were not rezoned



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Source: Authors' analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

Note: Light blue fill reflects the 95 percent confidence interval around each point estimate.

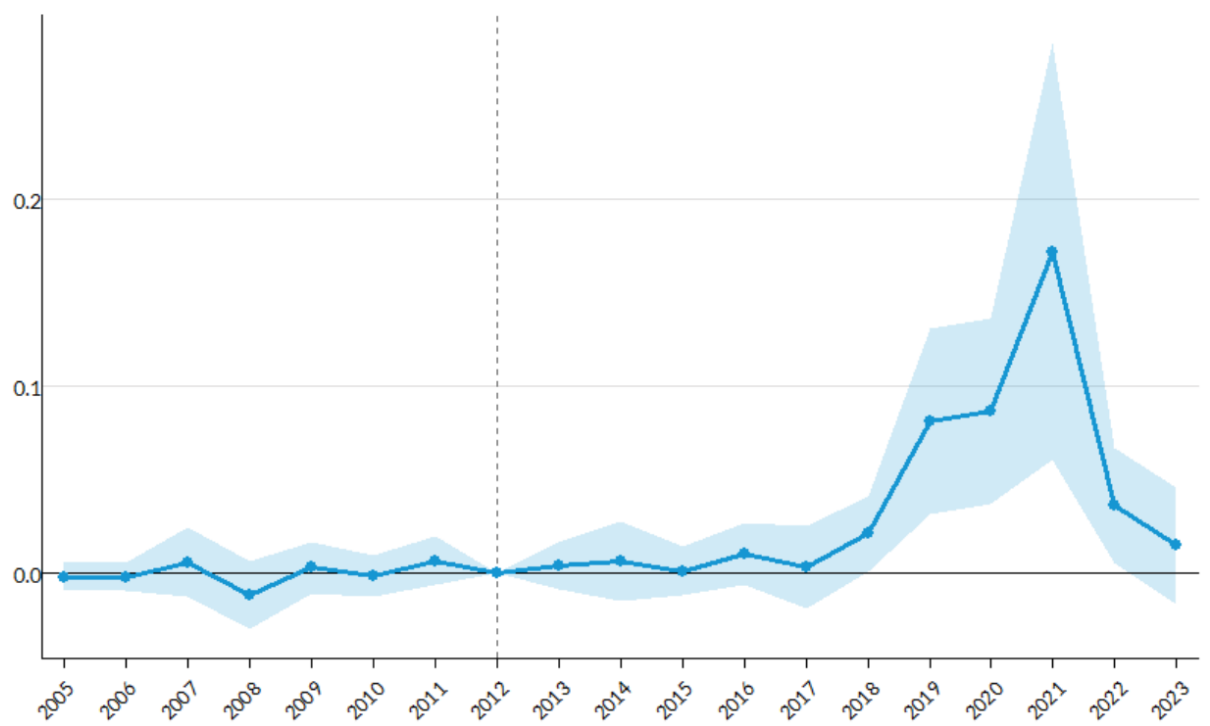
In contrast, our event study for housing units permitted reveals a clearer pattern (as in figure 6), but also a delayed impact of the reform over time (figure 8). Before 2012, upzoned and non-upzoned block faces experienced no meaningful differences in housing units permitted, again confirming they were on

similar trajectories before the reform. For the first five years after the reform was enacted (2013 to 2017), differences remained small and statistically insignificant.

The reform’s effects on housing unit permitting became more apparent starting in 2018, six years after implementation, but only two years after the aforementioned 2016 changes and after a significant share of the city’s zoning map had been redrawn to apply the 2012 rules. By 2021, upzoned block faces attracted approximately 0.17 additional housing units per block face per year in permit applications, compared with non-upzoned areas. Given that 24,056 block faces (almost 40 percent of the city’s residential block faces) experienced capacity increases, this translates to a maximum of 4,000 additional housing unit permits per year citywide, compared with conditions on non-upzoned block faces (in 2021). In other years, the effect was smaller or nil.

FIGURE 8
Upzoned Block Faces Saw Significant Increases in Housing Unit Permits in Philadelphia

Change in housing unit permit applications before and after 2012 zoning rewrite, per block face, compared with block faces that were not rezoned



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Source: Authors’ analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

Note: Light blue fill reflects the 95 percent confidence interval around each point estimate.

The Role of the Tax Abatement and Market Timing

The timing and magnitude of Philadelphia’s post-reform development surge—which, as we have shown, occurred several years after the initial rezoning—cannot be understood without considering the broader policy and economic context. Overall, the city experienced a construction boom in the latter half of the 2010s.¹⁷ The volume of new construction permits citywide grew nearly sixfold from early 2016 to early 2020, with permits for new construction reaching their highest share of total permitting activity (which also includes renovation and other similar changes) in 2020.

Much of this burst of activity was driven by Philadelphia’s 10-year tax abatement program, which exempted new construction from property tax increases for a decade. The abatement was originally scheduled to expire on July 1, 2020 (later extended to January 1, 2021, because of COVID-19), creating intense pressure on developers to secure permits before the deadline. The dramatic spike visible in our data in 2020 and 2021 likely reflects this rush to “beat the clock.”

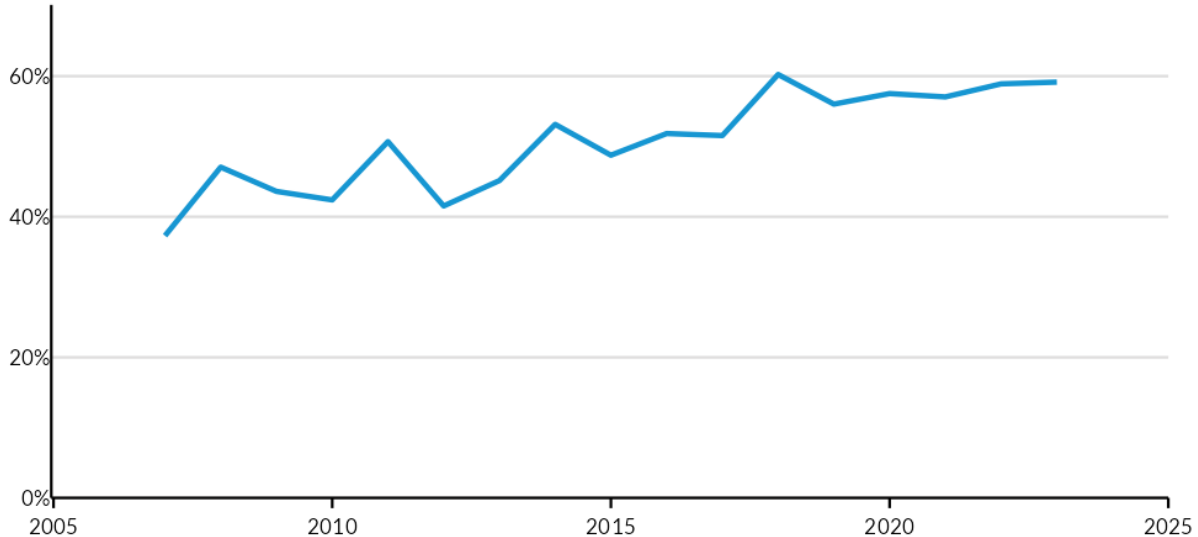
The zoning reform, which passed in 2012 but was not fully implemented until several years later because of the need for council-approved zoning map changes, likely played a critical enabling role. The tax abatement provided a financial incentive for development broadly, but the zoning reform determined how much housing could be built on any given site. Our findings show that upzoned block faces disproportionately captured the housing units created during this surge—not because more projects occurred there, but because each project could include more units.

Figure 9 illustrates this shift in where housing units were permitted across the city. In the years immediately before and after the 2012 reform, upzoned block faces accounted for approximately 40 to 50 percent of new housing units permitted annually. This share increased steadily over time, rising to around 60 percent by 2018, and remaining at that level through 2024. This pattern suggests that as the real estate market responded to the expanded zoning capacity, an increasingly large proportion of the city’s new housing permitting concentrated in areas where the zoning reform had expanded capacity for construction.

FIGURE 9

A Growing Share of New Housing Units Were Permitted in Upzoned Areas in Philadelphia

Share of citywide housing unit permits in upzoned areas



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Source: Authors' analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

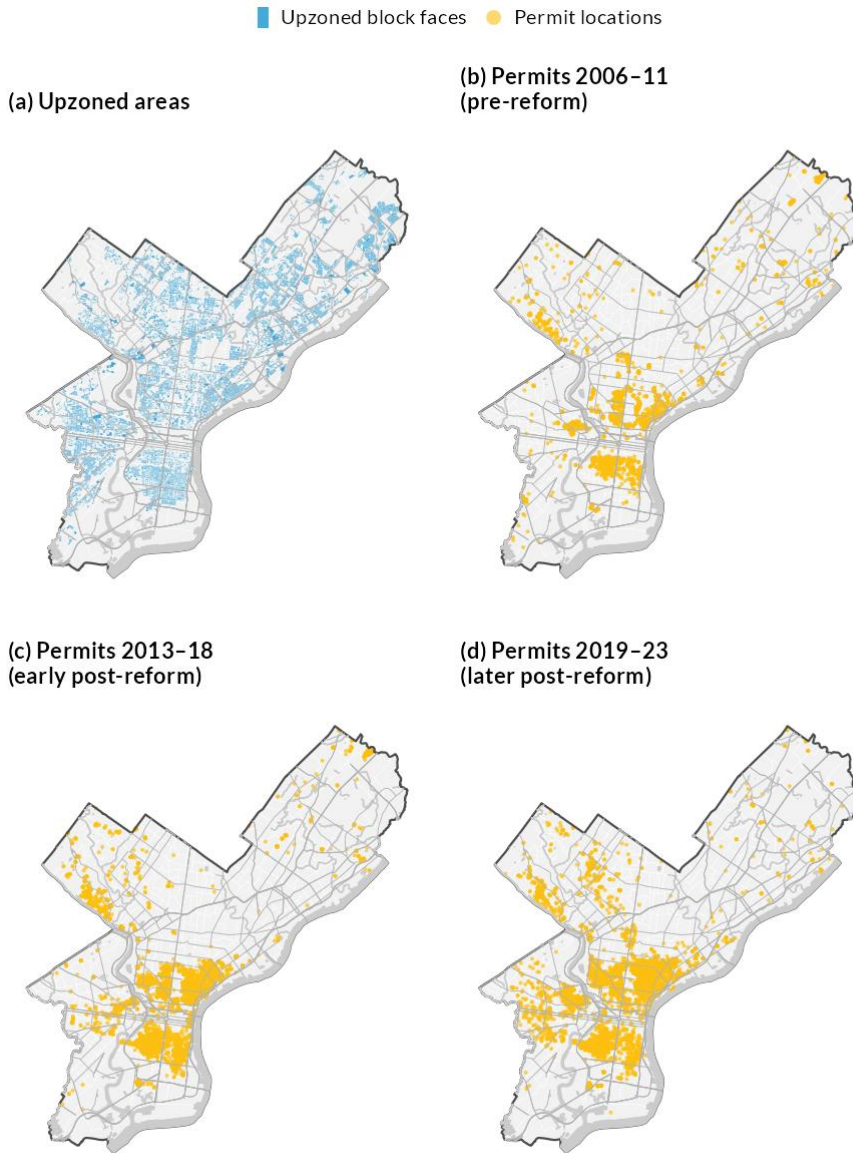
Notably, this 60 percent share of units being permitted on upzoned block faces significantly exceeds the 39.7 percent of residential block faces that were subject to capacity increases, indicating that developers in upzoned areas permitted units at a disproportionate rate relative to those areas' geographic footprint, including after the abatement's conclusion. This sustained concentration of permitting in upzoned areas suggests that the zoning reform created durable changes in development feasibility that outlasted the temporary fiscal incentive.

In figure 10, we map the geographic distribution of upzoned areas, and new construction permit applications across Philadelphia from 2006 to 2011 (prereform), 2013 to 2018 (the first years after reform), and 2019 to 2023 (the peak years of the city's development boom). The pattern shows that permits clustered in neighborhoods in and surrounding Center City—including Brewerytown, Fishtown, Grays Ferry, Kensington, and Point Breeze—while vast swaths of North, Northeast, Southwest, and far West Philadelphia experienced minimal permitting activity despite the zoning reform, which upzoned many parcels in those areas.¹⁸ This uneven geography mirrors patterns observed in other cities experiencing rapid development: a concentration of growth in certain neighborhoods and not others.

FIGURE 10

Housing Permitting Continued to Concentrate in Neighborhoods Surrounding Center City, Even After the Citywide Upzoning

Upzoned areas and new construction building permits in Philadelphia



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Source: Authors' analysis of permit data from Philadelphia Department of Licenses and Inspections and zoning data from Philadelphia City Planning Commission.

Takeaways: What to Expect When Upzoning

We examine two major upzoning efforts in the United States: neighborhood-scale rezonings in New York City and a comprehensive citywide zoning code overhaul in Philadelphia. Although these reforms differed in scope and structure, our analysis yields insights for policymakers considering similar regulatory changes. In Philadelphia, a broad reform of the zoning code led to increases in housing unit permits, though the increases took several years to manifest. In New York City, neighborhood upzonings led to substantial increases in housing unit supply: more than 4,000 units were added on upzoned parcels within four years post-upzoning compared with housing supply on similar, non-upzoned parcels. New York City's upzonings also generated growth quickly, with impacts often beginning to occur within two years after reforms.

Taken together, these findings suggest several conclusions and recommendations:

- Upzonings can be an effective mechanism to spur additional housing construction. **Policymakers should proactively identify neighborhoods to rezone, enabling cities to grow by adding housing supply, rather than waiting for individual developers to apply for parcel-level rezonings.**
- New permitting and housing supply that follow upzoning are dependent on neighborhood dynamics and the scale of the upzoning. Upzoning may not generate additional housing in neighborhoods with weak real estate markets, or if the upzoning does not allow for development types that “pencil out” financially. **Policymakers and planning staff should assess whether zoning is a significant constraint on development and, if it is, upzone sufficiently to enable financially feasible new development. Nonzoning strategies may be more effective to achieve public goals when zoning is not a barrier to housing growth.**
- Upzoning may take several years to have an effect. Complementary regulations and investments must sometimes be implemented in parallel. And developers need time to purchase land, create and receive approval for building plans, and construct projects. **Policymakers should consider how coupling upzonings with policies such as rental assistance or rent stabilization can strengthen housing stability in the years before upzoning adds additional supply.**

Upzoning affected project intensity more than project frequency in Philadelphia. We found no significant difference in the number of permit applications between upzoned and non-upzoned areas, but significant differences in housing units per project. This suggests the reform enabled projects with more units rather than redirecting where development occurs. Upzoned block faces captured 60 percent of new-unit permits despite representing only 40 percent of residential block faces, indicating

that expanded capacity translated into denser projects where development occurred. In New York City, neighborhood-scale upzonings similarly resulted in increased housing unit supply on upzoned parcels.

The timing of development response varied. Philadelphia’s citywide reform took six years before clear effects on housing unit permitting became apparent, with impacts coinciding with other favorable policy conditions, particularly the expiration of the ten-year tax abatement program. The slow pace of Philadelphia’s zoning map changes likely also delayed the reform’s impact. Meanwhile, collectively, upzoned areas in New York City began to experience increased housing development within two years of upzoning.

These timing differences may be related to other local characteristics. The scales of zoning change in Philadelphia and the New York City neighborhoods included in this study are fundamentally different, with Philadelphia’s rezoning affecting the majority of the city and New York City’s upzonings encompassing only a small fraction of the city’s parcels. Underlying housing market dynamics—meaning what projects are feasible, when and where—are also an important potential factor. New York City’s consistently high housing prices may make new housing development financially feasible in more cases and lead to faster redevelopment in the face of upzoning than is likely to occur in a housing market with lower prices (like much of Philadelphia), where upzoned parcels may not be redeveloped until market dynamics shift. Gowanus’s large increase in housing investment reflected the strong demand for housing in the surrounding area, which had particularly high and growing rent levels.

As is reflected in New York City’s approach, where upzoning is routinely paired with other policy and investment tools to shape comprehensive neighborhood development goals, including the Mandatory Inclusionary Housing program, housing development outcomes can be influenced via many different policies. Indeed, understanding how multiple approaches intersect—for example, transportation investments, upzonings, affordable housing requirements, and rent stabilization—is critical to applying policy and financial mechanisms to achieve desired outcomes.

The concentration of development in particular neighborhoods, as we mapped in Philadelphia, may raise concerns about gentrification and displacement. Research on neighborhood-scale upzonings in New York City has documented associations between zoning changes and demographic shifts that align with gentrification patterns. Davis (2021), Kim and Lee (2025), and Liao (2026) all find evidence that upzonings were associated with aspects of gentrification. These findings have fueled concerns among housing advocates that upzoning, rather than promoting affordability and inclusion, may accelerate displacement pressures in vulnerable communities.

But our analysis suggests that regulatory permission alone does not generate development in the absence of market demand. Areas that did attract substantial development were likely already experiencing investment. Conversely, vast areas of Philadelphia—including much of North Philadelphia beyond the core and its gentrifying ring—experienced minimal additional residential permitting despite receiving zoning capacity increases through the 2012 reform. Similarly, the Jerome Avenue upzoning in New York City—in an area with low and slowly growing rents—had little effect.

For policymakers, these results raise considerations about the distributional effects of zoning reform. The combination of our findings with other research suggests that while comprehensive upzoning may be necessary to accommodate regional housing needs, it is insufficient to ensure that development—including its benefits and burdens—is distributed everywhere across a city. As scholars have argued, zoning reform must be coupled with complementary policies that directly address affordability and displacement (Davis 2021; Freemark 2023). These might include inclusionary zoning requirements, enhanced tenant protections, antispeculation measures, public land banking, and targeted investments in affordable housing production—particularly in neighborhoods that have historically been disinvested. Some cities like New York are already taking these steps. The Mandatory Inclusionary Housing program integrated into New York’s upzonings means that the rezonings we study will be associated with a substantial supply of affordable housing to complement the new supply of market-rate housing. Additional study is needed to assess the degree to which these initiatives improve housing affordability for residents in the neighborhoods.

Appendix A. Previous Scholarship on the Impacts of Upzoning

In a broad review of upzonings implemented in large metropolitan areas, Stacy and colleagues (2023) find that these reforms are associated with a small but statistically significant increase in housing supply. This increase took, on average, at least three years to manifest. Sullivan (2025), on the other hand, finds that altering one specific zoning instrument (the maximum allowed housing density) has not been associated with increased housing supply at the national level.

These national studies provide insight into what we might expect at the local level following an upzoning, but outcomes vary from place to place, depending on the local economy and regulations in effect. So far, researchers have published peer-reviewed research that investigates upzoning impacts on housing supply in, at minimum, Auckland, Chicago, Portland, and Zurich (Greenaway-McGrevy and Phillips 2023, Freemark 2020, Kuhlmann 2021, Hong 2024, and Büchler and Lutz 2024, respectively). Upzonings in New York City have been studied by others, in part responding to the effort by the administration of Mayor Michael Bloomberg (2002–13) to upzone neighborhoods ripe for redevelopment, such as the Brooklyn and Queens waterfronts (Goldberg 2015). The city focused these upzonings on industrial land that had relatively low land value but was within easy access of Manhattan (Wolf-Powers 2005).

Liao (2026) examined the Bloomberg-era rezonings, finding that they were associated with a small but significant increase in housing units. They find a 4 percent average unit increase per upzoned parcel compared with similar parcels in the seven years after upzoning, using a difference-in-differences regression that compared upzoned areas with adjacent areas. This effect grew over time, was more substantial when the upzoning created greater zoning capacity, and had a bigger influence on parcels where the existing zoning envelope had been “binding,” meaning nothing more could be built on them without a zoning change. These data provide some evidence for the effects of these reforms on housing supply, though they do not delve into the impacts of more recent changes or the impacts of the reforms on specific areas (the Bloomberg-era reforms applied across many neighborhoods).

Our research expands on this work by studying a later period of upzonings, those implemented during the de Blasio administration. These latter upzonings differed from those undertaken during the Bloomberg administration because several of them focused on less high-market neighborhoods (including upper Manhattan, the Bronx, and portions of outer Brooklyn and Queens), and because they

included additional affordability requirements. We also use a somewhat different analytical method than Liao (2026); while she compared upzoned areas to a buffered surrounding area, we compare upzoned areas to all comparable non-upzoned areas (using propensity scores) in each relevant borough (for New York City) or the city overall (in Philadelphia). In Philadelphia, our aggregation of parcels to the block face level provides an additional methodological advantage: it helps absorb potential unobserved spillover effects, as development on one parcel could influence adjacent parcels on the same block face. Our approach is intended to address one concern of using a buffer-based method, which is that the effects of upzoning could “spill over” geographically onto surrounding areas, potentially reducing or increasing construction therein.

Although we do not study the impacts of zoning reforms on neighborhood demographic composition in this report, several researchers have explored how New York City’s rezonings have influenced those outcomes. Davis (2021) shows that the city’s 2000-era upzonings were associated with neighborhoods increasing their shares of white residents. Kim and Lee (2025), too, show that upzoning was associated with indicators of gentrification, including neighborhood demographic composition becoming more white, more affluent, and more educated after upzoning. Finally, Liao (2026) finds that upzoning was associated with (a) incumbent residents being more likely to move out following the change and (b) new residents to upzoned neighborhoods being more likely to hail from higher-income neighborhoods. These findings suggest that upzoning might, sometimes at least, be associated with displacement.

There has been less study of the impacts of Philadelphia’s upzonings. That said, Balzarini and Boyd (2024) conducted a series of interviews with landlords and property managers in the city to assess their views about housing development there. These individuals argue that Philadelphia’s use of a ten-year tax abatement for new residential development encouraged additional construction. At the same time, small-scale landlords told the researchers that the general investment environment was weighted toward the needs of large-scale developers, prompting the first group to seek to “cash out,” meaning selling their properties rather than investing in small-scale projects on site.

Appendix B. Methodological Approach

Our event study specification for both cities follows the general form:

$$\text{outcome}_{it} = \sum_{k \neq 0} \beta_k \cdot (\text{treated}_i \times \mathbb{1}[\text{years_since_treatment} = k]) + \alpha_i + \gamma_t + \epsilon_{it}$$

Where i indexes parcels (for New York City) or block faces (for Philadelphia); t indexes years, α_i are parcel/block face fixed effects, γ_t are year fixed effects, and we cluster standard errors at the parcel/block face level. Our outcomes of interest are number of housing units (for New York City) and number of housing unit permits or housing project permits (for Philadelphia). In the New York City regressions, we add PSM variables to the regression as covariates for additional robustness. The coefficients capture the difference in outcomes between treated and control parcels/block faces in each year relative to the year of the upzoning (our reference year; 2012 for Philadelphia, 2016 through 2021, depending on the neighborhood in New York City).

Our methods for examining outcomes differed for New York and Philadelphia because of data availability in each city. We describe the data collected and how we explored each city's conditions below.

Evaluating Upzoning in New York City

We compare upzoned parcels to a set of matched parcels in the same borough that were not upzoned (or downzoned) and that share similar pre-upzoning characteristics, thereby isolating the effects of the upzonings on housing production trends from other potential drivers of housing production, such as pre-upzoning housing production, household income changes, and other related changes.

The upzonings in New York City took a variety of forms. All upzoned parcels experienced FAR increases, meaning increases in the size of new buildings that can be built. Many neighborhood-level rezonings also entailed other changes:

- In Downtown Far Rockaway, many parcels were upzoned from R5 (a relatively low-density residential district) and C4-2 (a lower-density mixed-use district) to R6, a medium density residential district typically comprising moderately sized apartment buildings.

- In East Harlem, many parcels were upzoned from R8A (medium-to-high density residential) to R9A (similar to R8A but allowing for higher-density buildings).
- In East New York, R5 parcels were rezoned to R5B (a residential district with slightly higher FAR maximums than apply in R5) and R7A (a medium-density district comprising mostly apartment buildings).
- In Gowanus, the rezoning enabled the construction of medium- to high-density housing, notably converting some manufacturing and commercial uses to M1-4/R7X, which allows for medium-density apartment buildings.
- In Inwood, R7A to R7-2 was the most common upzoning.
- Along Jerome Avenue, R8 to R8A was a common zoning change. These are similar character medium-density residential districts, but R8A has consistently higher FAR maxima.
- In SoHo/NoHo, the city expanded provisions for live-work opportunities through the creation of a special mixed-use district area.

To undertake our analysis of these changes, we collected parcel data from the City of New York’s PLUTO data series,¹⁹ which provides characteristics—zoning district, FAR, land value, parcel area, and number of residential units—about parcels by year from 2010 through 2023. To identify parcels that were treated—in other words, were upzoned—we evaluated parcels within the boundaries of one of seven areas that were part of a city-initiated rezoning and that had a recorded increase in their permitted FAR greater than 0.25. Not all parcels in each rezoned neighborhood were upzoned; some parcels experienced no FAR change, and others were downzoned (see table B1). We only considered upzoned parcels as treated units, and we excluded other parcels in rezoned neighborhoods from the pool of potential comparison parcels.

TABLE B1

Select Characteristics of Rezoned Neighborhoods, New York City

	All	Inwood	East Harlem	Jerome Ave	Far Rockaway	East New York	SoHo / NoHo	Gowanus
Acres								
Upzoned	519	118	41	74	28	142	48	68
Downzoned	507	33	21	42	25	197	88	100
No zoning change	244	29	15	23	21	130	2	24
Parcels								
Upzoned	4,244	450	609	341	138	1,781	542	383
Downzoned	3,500	87	279	184	120	1,500	825	505
No zoning change	2,721	58	111	121	32	2,097	20	282
Zoning change for upzoned parcels								
Mean increased FAR per parcel	2.87	1.26	2.27	3.67	1.75	2.43	5.95	3.1
Total estimated additional units (zoning envelope)	14,452	0	1,602	44	1,442	0	5,202	6,162
Mean increased zoning envelope per parcel	3.41	0	2.63	0.13	10.45	0	9.6	16.09

Source: Authors' analysis of New York City parcel data and rezoning boundaries.

Notes: Table reflects only parcels that are present in the data for each year of the study period (2010-2023). Counts of parcels and acres by zoning change are reflective of changes in maximum floor area ratio (FAR) that exceeded .25 ("upzoned") or were less than -.25 ("downzoned"); when FAR changes ranged from -.25 to .25, parcels were considered to have experienced no zoning change. Upzoning neighborhoods based on city definitions.

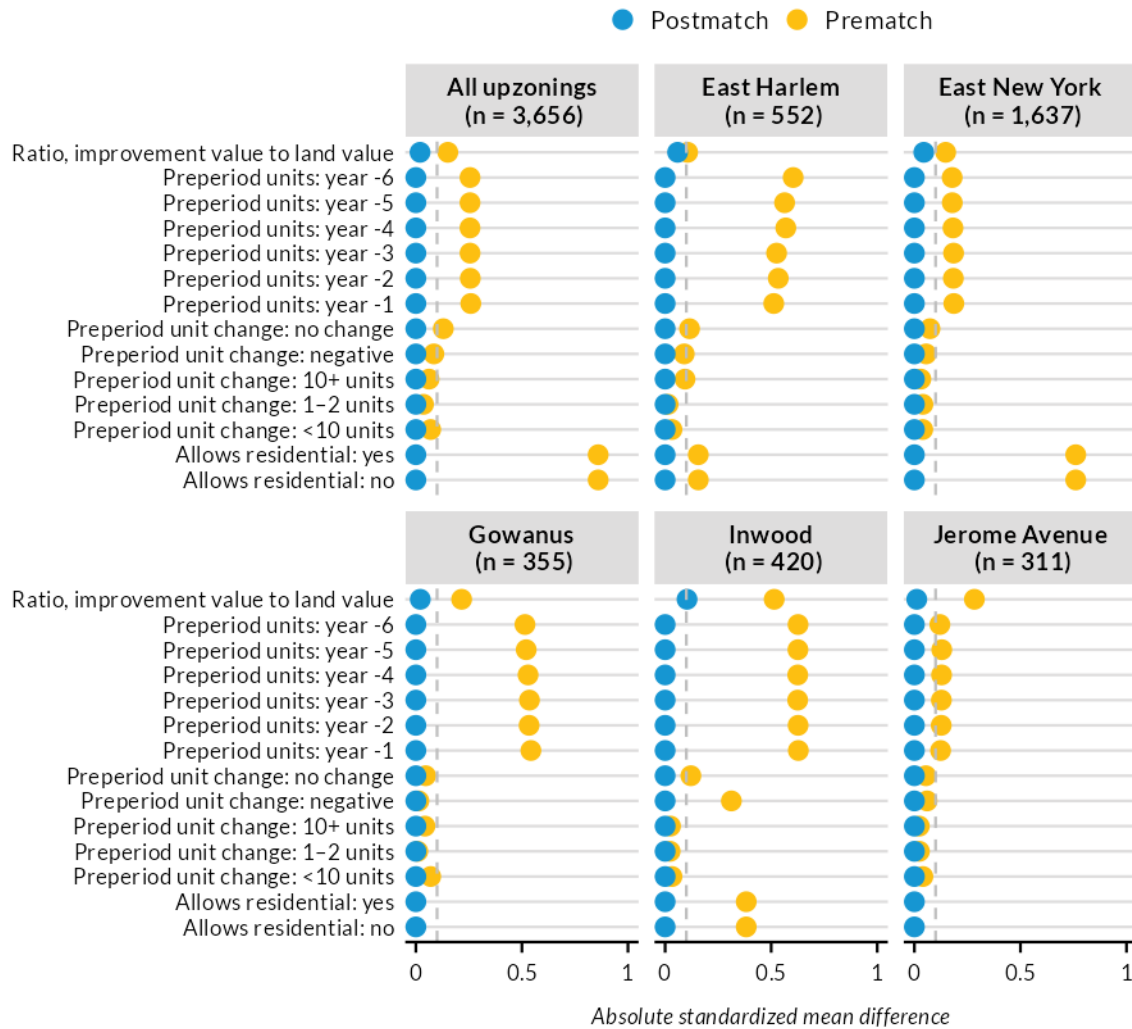
These parcel-level attributes allowed us to match our treated parcels to a set of comparison parcels in the same borough with very similar characteristics in the pre-upzoning period, but which did not receive an upzoning or downzoning during the study period. We implemented this matching process using a form of PSM called fast generalized full matching, or "quick" matching, from the *MatchIt* package in R (Ho et al. 2011).

We specified exact matching for a categorized measure of pretreatment residential unit change, counts of residential units in each of the six years preceding upzoning, and whether the parcel allowed residential development pre-upzoning; we matched on the ratio of improvement value to land value inexactly, but still achieved good balance—at or below the threshold of an absolute standardized mean difference of 0.1, which is a commonly used cut point for acceptable matching balance—across all measures for each of our regressions. We show how the differences between treatment and control parcels changed from pre- to post-match scenarios in figure B1.

FIGURE B1

Propensity Score Matching Achieved Good Balance for All Regressions

Pre- and postmatching standardized mean differences between treatment and control parcels, by regression, by matching variable



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Source: Authors' analysis of PLUTO data from New York City.

Notes: The vertical dashed gray line at 0.1 represents a commonly used threshold for good balance; in well-balanced models, all matching variables would have standardized mean differences at or below 0.1 after matching, as is the case here. Yellow points, which reflect prematching balance, highlight how different the upzoned parcels and non-upzoned parcels were prior to matching. Parenthetical n-values reflect the number of upzoned parcels that were successfully matched.

To understand the effects of each upzoning in isolation as well as the composite effects of multiple neighborhood upzonings, we implemented a series of event study regressions: one regression for each upzoned neighborhood along with one regression examining the effects across all upzoned

neighborhoods. Because this multineighborhood regression included staggered treatment years (2016 to 2021, depending on the upzoning), we applied the methods proposed by Sun and Abraham (2020) to account for possible shortcomings with traditional two-way fixed effects models and staggered treatments. Each regression predicts the change in housing units (the outcome variable) as a function of the years to treatment (upzoning), controlling for all the variables used in the PSM models along with fixed effects terms denoting the parcel and the treatment-comparison pairs. Because the PSM model matches each treated parcel to one or more comparison parcels, each comparison unit also receives a weight; we supplied these weights as regression weights.

FAR is only one factor by which cities use zoning to control allowable development; myriad other factors, such as setbacks, height limits, unit maxima, parking requirements, and others combine to determine the “zoning envelope,” or the maximum amount of development that is legally allowed on a parcel. In New York City, FAR appears to be the primary mechanism through which the city regulates the size of residential buildings, but it is possible that our primary approach—in which we use FAR change to operationalize upzoning—is missing other important zoning features that might influence whether parcels experienced meaningful upzonings or not.

Accordingly, we ran a parallel series of regressions where we operationalized upzoning using zoning envelopes—modeled based on a more comprehensive set of zoning factors including those listed above—for each parcel and considered parcels with an increase of three or more additional allowed units to be upzoned. The results from these regressions for the Jerome Avenue rezoning were similar to those obtained using FAR to create our treatment indicator. Interestingly, for East New York and Inwood, our zoning envelope approach did not detect any upzoned parcels—FAR increases were offset by other changes that decreased the number of units that could be constructed, such as increases in required open space.

Even so, given the complexity of New York City’s zoning ordinance and the potential error associated with codifying it for this analysis—combined with the fact that parcel-level FAR values are reported directly by the city as part of its PLUTO parcel data series—we present FAR-based results as our primary findings. The alignment between our FAR- and zoning envelope-based regressions for Jerome Avenue suggests FAR was the primary mechanism at work in these rezonings. For Inwood and East New York, there are a few possible explanations for the differences we find between our FAR and zoning envelope approaches, taking into account that our FAR-based regressions detect statistically significant increases in housing production on upzoned parcels.

Most simply, our codification of other zoning attributes may have been incorrect or may have simplified factors that are important redevelopment considerations—for example, corner lots often allow denser development, but we generally codified zoning attributes based on noncorner lots; there are other optional development routes, such as optional Quality Housing standards and development of senior housing that we did not apply in our codification of zoning attributes. Alternately, our approach to estimating total zoning envelopes may have missed important factors that influence development feasibility. For example, a zoning change might lead to a smaller total zoning envelope, but the distribution of developable space might pencil out in a way it did not before (e.g., shorter buildings that occupy a greater share of a lot might be more financially feasible than taller buildings—even those that have more floor area and can accommodate more units—because shorter buildings are often cheaper per square foot of floor area [Eriksen and Orlando 2021]).

Evaluating Upzoning in Philadelphia

To evaluate the impact of Philadelphia’s citywide zoning rewrite on housing production, we analyze building permit applications—a forward-looking indicator that captures developer intent and investment decisions. Permit applications precede construction (and housing supply, such as we use for New York City) by months or years and indicate that a developer believes a project is financially feasible under current regulations. Permit applications provide a quicker signal of how zoning changes affect development decisions than completed construction, which can be delayed by financing, supply chain issues, or other factors unrelated to zoning. That said, we emphasize that one limitation of using permit data rather than completions data is that a substantial share of permitted housing units is never built.

The Philadelphia zoning code reform included a diversity of related elements:

- The city created new mixed-use districts (CMX, IRMX, RMX) to encourage residential development along commercial corridors and in former industrial areas.
- The city standardized FAR regulations and, in many cases, made them more permissive.
- The city converted many G-2 (medium-density industrial) parcels, particularly in neighborhoods like Callowhill, Fishtown, Northern Liberties, and the river wards, to mixed-use or residential zoning, opening previously off-limits land to housing development.
- The reform downzoned some neighborhoods, particularly where R-10 parcels (permitting multi-family development) were reclassified as RSA-5 (single-family only); in the process, the city reduced zoning capacity by 60 to 70 percent on those affected parcels.

We construct our analysis at the block-face level—defined as the parcels located along a single street, between two intersecting streets. Block faces thus form aggregated groups of adjacent parcels that represent cohesive units of development. By intersecting block face boundaries with pre-2012 and postreform zoning specifications, we calculate the change in allowable residential development capacity for each block face. Our treatment group consists of block faces that experienced increases in residential capacity due to the rezoning; our control group consists of block faces with similar characteristics that did not experience increases in capacity.

We retain most block faces with decreased capacity (unlike in New York City, where we exclude the downzoned parcels) for two methodological reasons. First, excluding all downzoned areas would reduce the control group by approximately half, substantially limiting statistical power and the representativeness of the matched comparison group. Second, the PSM process ensures treatment and control block faces share similar prereform neighborhood characteristics, mitigating concerns about systematic differences between stable and downzoned areas. We choose this approach because, even with decreased capacity included in the control group, our analysis provides meaningful insight: we are comparing areas where capacity *increased* against areas where it did not increase (whether stable or decreased). This comparison directly addresses the policy question of whether upzoning drives additional housing production relative to areas without expanded development rights. Additionally, as a sensitivity analysis, we excluded the top 10th percentile of block faces with the largest capacity decreases and found that results remained substantively unchanged, suggesting that our findings are robust to the composition of the control group.

To isolate the effect of increased development capacity from other factors that might drive housing production, we employ a PSM technique based on 2010 neighborhood characteristics (prior to the 2012 reform), similar to the version we used for New York City. Matching variables that we selected include median household income, median rent, racial composition, tree coverage, and prereform zoning capacity (other researchers have found that these indicators can each influence the probability of development), as well as pretreatment residential unit count and unit change. This ensures that treated and control block faces were similar on observable dimensions that might lead to developer interest *before* the reform, allowing us to attribute differences *after* the reform to the capacity changes. We examine two outcomes: the number of residential permit applications and the number of housing units proposed in those applications.

To undertake this work, we collected building permit application data from the Philadelphia Department of Licenses and Inspections covering 2005 to 2024 as the outcome variables, as well as neighborhood characteristics such as household incomes, housing tenure, rent, and other

sociodemographic variables from the Census Bureau’s Decennial Census and American Community Survey five-year estimates, as well as tree canopy coverage from the National Land Cover Database. Because the upzoning in Philadelphia included so many block faces—in contrast to New York City, where the neighborhood-scale upzonings we evaluate encompass relatively few upzoned parcels—we included a larger number of characteristics in our PSM model for Philadelphia than we could include for New York City.

Limitations

This report offers new evidence about how upzonings may change housing supply in communities affected by regulatory change. Our approach is limited by several factors we were unable to control. It is possible that areas that were not upzoned—either those adjacent to the upzoned areas or across the broader housing market—experienced reduced residential development, with the effect that upzoning did not increase total housing production in the city or region and instead changed the spatial distribution of new housing. Indeed, we find some evidence for this in Philadelphia.

In the case of New York City, neighborhood rezonings occurred in tandem with other affordable housing, transportation, and open space investments and policy changes, in line with the city’s long-standing approach of using rezonings as part of multipronged neighborhood policymaking and development efforts. Because of these accompanying efforts, we may have been unable to disentangle the specific effects of the rezonings on housing development. Moreover, it is possible that the Gowanus rezoning’s transformation of a formerly industrial area into a mixed-use zone fundamentally changed market dynamics in the neighborhood, beyond what was produced by the upzoning.

In the case of Philadelphia, data limitations meant that we were unable to measure year-by-year zoning changes. This is an important issue given that the neighborhoods affected by the reform were remapped over several years, not all in 2021. There were some additional changes that occurred in 2016 that we do not study. Instead, we relied on snapshots of zoning at two points in time: before and after the 2012 rewrite. Moreover, we were unable to distinguish the effects of the 2012 reforms from other zoning changes that occurred after 2012, such as parcel-specific rezonings, special permits, and smaller-scale zoning amendments. In addition, due to data availability, we examined building permit applications rather than completed new units, meaning our analysis captures development intent rather than realized housing units. Finally, our block face-level analysis may not capture parcel-specific characteristics or development constraints that influence whether and how individual properties are redeveloped.

Notes

- ¹ “New Privately-Owned Housing Units Completed: Total Units,” US Census Bureau and US Department of Housing and Urban Development via Federal Reserve Bank of St. Louis, updated January 26, 2026, <https://fred.stlouisfed.org/series/COMPUTSA#>.
- ² Signe-Mary McKernan, Catherine Harvey, and Gregory Acs, “The American Affordability Tracker: Data on Americans’ Finances and Everyday Costs,” Urban Institute, October 28, 2025, <https://www.urban.org/data-tools/american-affordability-tracker>.
- ³ Ipso Cantong, Stephen Menendian, and Samir Gambhir, “Zoning Reform Tracker,” Othering & Belonging Institute, April 18, 2025, <https://belonging.berkeley.edu/zoning-reform-tracker>.
- ⁴ We employ different units of analysis in Philadelphia and New York City because many New York City neighborhood rezonings included upzoned, downzoned, and no-zoning-change parcels within their boundaries, and we wanted to ensure we could distinguish treatment (zoning change) with appropriate nuance. In Philadelphia this was less of a concern.
- ⁵ “Rezoning Commitments Tracker,” New York City Mayor’s Office of Operations, 2025, <https://airtable.com/appHu65vJkMc71N8p/shrKOOhVpRyk9fBvf?ncmBo=reciDNuDjkKmRnRps>.
- ⁶ “City of Yes for Housing Opportunity,” New York City Department of City Planning, accessed March 14, 2026, <https://www.nyc.gov/content/planning/pages/our-work/plans/citywide/city-of-yes-housing-opportunity>.
- ⁷ David Brand, “NYC Council Approves de Blasio’s Massive Gowanus Rezoning,” *City Limits*, November 23, 2021, <https://citylimits.org/nyc-council-approves-de-blasios-massive-gowanus-rezoning/>.
- ⁸ Some affordable housing developed pursuant to the Mandatory Inclusionary Housing policy might have been financed with public subsidy, which in turn might have lengthened development timelines. However, the Mandatory Inclusionary Housing program does not include any guarantee of public subsidy; rather, developers can build to more lenient zoning requirements to help offset the costs of providing affordable units. “Inclusionary Housing Program,” New York City Department of Housing Preservation and Development, accessed February 9, 2026, <https://www.nyc.gov/site/hpd/services-and-information/inclusionary-housing.page>.
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- ¹³ When we ran the Gowanus rezoning in its own model, we estimated that it produced roughly 5,400 additional units compared with equivalent areas that were not rezoned. This figure is higher than the citywide total noted in the paper; this is a statistical consequence of whether we analyze the upzonings together or separately.
- ¹⁴ See Michael Young and Matt Pruznick, “Earthwork Begins At 450 Union Street In Gowanus, Brooklyn,” *New York YIMBY*, May 28, 2025, <https://newyorkyimby.com/2025/05/earthwork-begins-at-450-union-street-in-gowanus-brooklyn.html>; Michael Young and Matt Pruznick, “BIG’s Updated Design Revealed for 175 3rd Street in Gowanus, Brooklyn,” *New York YIMBY*, June 3, 2025, <https://newyorkyimby.com/2025/06/big-s-updated-design-revealed-for-175-3rd-street-in-gowanus-brooklyn.html>.

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