# Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

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# Abstract

Across the U.S., rising housing costs have increased the political pressure on local elected officials to encourage more housing production. Local and state governments are experimenting with changes to land use regulations that could allow more housing to be built through infill development. Between 2000 and 2020, Washington, DC engaged in substantial infill development, increasing the housing stock by about 15 percent. In this paper, we examine whether areas in the city with particularly high growth saw large zoning changes. We find that most housing development occurred where underused commercial or industrial land was repurposed into high-density residential uses. Some high-growth neighborhoods experienced rezonings, while others saw conversions of existing structures with little zoning changes. Notably, high-growth areas initially had very little land zoned for single-family homes.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

**2**

# Introduction

Since the Great Recession, the U.S. has failed to build enough homes to keep up with the demand growth driven by population and job increases.[1] Housing costs have risen faster than household incomes, creating more financial pressure on low-to-middle income households, especially renter households. This in turn has raised the political salience of housing affordability among elected officials, who are seeking ways to encourage more housing production.[2]

As part of this response, local and state governments across the U.S. are beginning to experiment with zoning reforms. These include attempts to legalize "gentle density," such as accessory dwelling units and duplexes, to statewide requirements to allow more dense housing ("upzone") around transit stations.[3] To guide future policy decisions, it is important to understand which types of reforms have the most potential to expand housing production, where, and under what market conditions. However, most of these reforms are still too recent to have yielded measurable results in housing outcomes.

To provide insights into the relationship between housing production and land use policies, we apply a different lens: looking retrospectively at two decades of rapid housing growth in Washington, DC, what can we infer from the neighborhoods that saw the greatest increases in housing? Did high-growth neighborhoods enact notable changes in zoning or other land use policies? What was their initial zoning status?

We care about the answers to these questions because while regulatory constraints are one—potentially very important—determinant of housing production, they are certainly not the sole determinant. Housing development also depends heavily on market factors, such as land values, the cost of construction labor and materials, and the expected prices or rents of newly built homes. Overly restrictive zoning can limit housing growth, but permissive

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

3

1. Jared Bernstein et al., "Alleviating Supply Constraints in the Housing Market," The White House, November 30, 2021, https://www.whitehouse.gov/cea/written-materials/2021/09/01/alleviating-supply-constraints-in-the-housing-market/; Up For Growth, "2022 Housing Underproduction in the U.S. - Up For Growth," October 14, 2022, https://upforgrowth.org/apply-the-vision/housing-underproduction/.

2. Jenny Schuetz, *Fixer-Upper: How to Repair America's Broken Housing Systems* (Brookings Institution Press, 2022).

3. Jon Chesto, "Housing Choice Brings the Biggest Changes to Massachusetts Zoning Laws in Decades," *Boston Globe*, February 9, 2021, https://www.bostonglobe.com/2021/02/09/business/housing-choice-brings-biggest-changes-massachusetts-zoning-laws-decades/; Henry Grabar, "Minneapolis Just Passed the Most Important Housing Reform in America," *Slate Magazine*, December 7, 2018, https://slate.com/business/2018/12/minneapolis-single-family-zoning-housing-racism.html; Manuela Tobias, "Duplex Housing Law Met with Fierce Resistance by California Cities," *CalMatters*, April 11, 2022, https://calmatters.org/housing/2022/04/duplex-housing-resistance/.

zoning will not produce growth if market factors are not favorable. Additionally, zoning is not the only possible regulatory constraint on housing growth; current residents and elected officials have a variety of political and legal channels to deter unwanted development.

Washington, DC provides an intriguing empirical setting to look at the relationship between redevelopment and zoning, because it has benefitted from a strong labor market and increased housing demand over the past two decades. However, aside from parks, the city has almost no undeveloped land. Virtually all land was developed by the 1950s, or designated as protected open space. Therefore, nearly all housing growth occurs through infill development, redeveloping parcels currently occupied by other uses.[4] The District's elected leaders have been actively engaged in discussing how changes to zoning and housing approvals could facilitate more infill housing production.[5] (Like most older cities in the Northeast and Midwest, the District's boundaries are fixed. It is surrounded by independent political jurisdictions, and cannot grow in land area by annexing unincorporated areas.)

As Figure 1 shows, Washington DC grew from just over 570,000 residents in 2000 to about 700,000 residents in 2020. This 21 percent increase reversed more than two decades of population decline.  While population can grow without new housing, Washington saw increases in both population and housing units over this period. This growth occurred in the absence of any wholesale upzoning to allow multi-family zoning in single-family neighborhoods; such single-family neighborhoods account for most of the city's land. Thus, Washington, DC provides insights into where housing production takes place in the absence of large-scale changes to land use regulation.

**Figure 1: Washington, DC population declines through 2000 and then grows**
Washington, DC population by decade
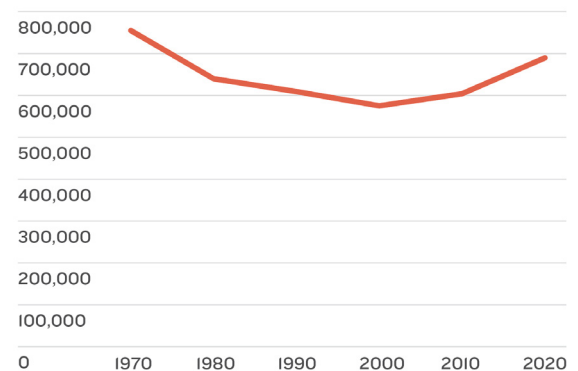


Source: Decennial Census 1970-2000, American Community Survey 2010 and 2020

4. Leah Brooks, Genevieve Denoeux, and Jenny Schuetz, "The Washington, DC Region Needs More Housing, and Satellite Data Can Tell Us Where to Build," Brookings, March 9, 2022, https://www.brookings.edu/blog/the-avenue/2020/06/03/the-washington-dc-region-needs-more-housing-and-satellite-data-can-tell-us-where-to-build/.

5. Alex Baca, "Mayor Bowser Sent Amendments to DC's Comp Plan to the Council. Here's What You Need to Know.," Greater Greater Washington, 2020, https://ggwash.org/view/77268/dc-releases-its-amendments-on-the-comp-plan; Robert McCartney, "D.C. Mayor Muriel Bowser Wants More Low-Cost Housing in Affluent City Neighborhoods," *Washington Post*, October 15, 2019, https://www.washingtonpost.com/local/dc-politics/dc-mayor-muriel-bowser-wants-more-low-cost-housing-in-affluent-neighborhoods/2019/10/14/7b2a5a6e-ee9e-11e9-89eb-ec56cd414732_story.html.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

4

In the remaining sections, we provide descriptive statistics on where housing growth occurred—and did not occur—in Washington, DC. We examine how growth correlates with initial zoning status and zoning changes at the neighborhood level.[6] To better understand the mechanisms at work, we conduct qualitative case studies of two neighborhoods that added unusually large amounts of housing over this period. The analysis relies primarily on data from the 2000 Census and 2020 American Community Survey; details on data sources and empirical methods are provided in the technical appendix.

During the 2000–2020 period, the District revised its zoning laws, with new zoning districts and rules taking effect in 2016. While this was a major legislative effort, the fundamental components of zoning–what size structures and what uses are allowed by right–changed on only a modest share of land in most neighborhoods.[7] Notably, virtually all of the land previously zoned for single-family homes remained zoned as single-family. Almost 15 percent of land previously zoned for multifamily housing was downzoned—re-zoned to allow less intensive use—to allow only single-family. The neighborhoods with the largest share of downzoned land are located in historically Black Wards 7 and 8, east of the Anacostia River. The majority of zoning changes that added capacity for new housing occurred by rezoning land from non-residential districts (specifically a catch-all "Other" category) into single-family, multifamily, and mixed-use districts.

Examining the patterns of housing growth, we find that most growth is concentrated where previously industrial or commercial land—often underused—was repurposed into housing. Relatedly, growth is also concentrated in areas with the least land zoned for single-family housing. Growth was not, however, tied to large-scale neighborhood rezonings.

The District's experience suggests that, in many cities, targeted land use interventions can accommodate substantial amounts of new housing. In the District's case, the city reallocated very small amounts of land from non-residential to high-density residential uses. Our analysis does not shed light onto the potential effects of upzoning existing residential areas, because the District did not undertake this type of rezoning. Instead, it points to the conditions under which infill development can take place in the absence of such upzonings.

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6. Throughout, we use block groups as our neighborhood unit. A census block group is a small neighborhood, designated by the Census for statistical purposes, designed to contain between 600 and 3,000 residents (see Census documentation).

7. Neil Flanagan, "Get to Know DC's New Zoning with This Map," Greater Greater Washington, July 27, 2016, https://ggwash.org/view/42304/get-to-know-dcs-new-zoning-with-this-map.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

5

# Which Washington, DC neighborhoods saw the most housing growth?

As expected of a city whose population expanded by more than 20 percent, most District neighborhoods—measured in this analysis as Census block groups—saw increases in population density between 2000 and 2020.[8] Figure 2 shows a scatterplot of housing unit density (thousands of housing units per square mile) in these two years. Dots in the shaded triangle represent neighborhoods that increased in housing unit density, while dots outside of the shaded area represent block groups that lost housing density. Were a dot to lie on the diagonal of the triangle, it would have the same housing density in 2020 as in 2000. Over 60 percent of the District's 433 block groups gained population during this time, although most saw only modest increases. However, a few neighborhoods account for a strikingly large share of the District's housing growth: block groups in red are the five with the greatest change in the total number of housing units; block groups in yellow are the neighborhoods with the next five greatest increase in total housing units.[9] Later, we analyze these fast-growing neighborhoods in greater detail.

**Figure 2: Most District neighborhoods saw modest increases in housing unit density from 2000—2020**

Thousands of housing units per square mile by census block group, 2000 and 2020

■ Top 5 neighborhoods ■ Next 5 neighborhoods
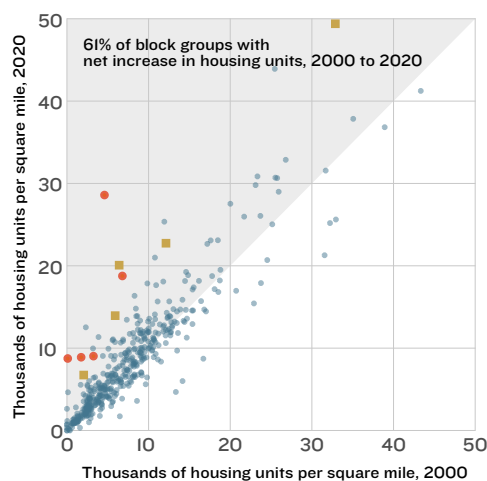


Source/notes: Housing density calculated as housing units/square mile, using data from 2000 decennial Census and 2020 American Community Survey. Red circles represent the block groups with the largest increase in the total number of housing units; yellow squares represent the block groups with the next five largest increase in total housing units. All remaining block groups are smaller circles shown in light blue. Some blue dots lie above the red and yellow dots because we call out the highest growth neighborhoods by growth in total units, rather than by population density.

8. See footnote 1 for definition of neighborhoods.

9. An alternative classification is to examine the ten neighborhoods with the greatest percentage increase in housing units. Of the 10 neighborhoods with the greatest increase in absolute number of units, five are in the top 10 when ranked by percentage change in units, and seven are in the top thirteen by percentage change in units.

This housing growth was not spread evenly across the District's neighborhoods: the five greatest growth block groups account for nearly 30 percent of additional housing created from 2000 to 2020, and the next five block groups account for roughly 10 percent of additional housing (Figure 3). For context, these 10 block groups account for well under five percent of land in the District. The remaining 432 block groups make up over 95 percent of land, but only 60 percent of new housing.

**Figure 3: Housing growth was highly concentrated in a handful of neighborhoods**
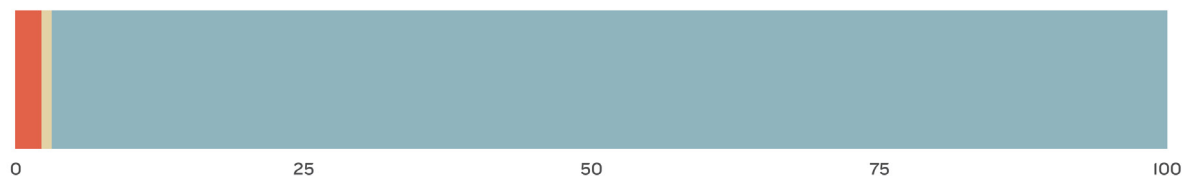
Percent of new housing units, 2000 to 2020, and percent of total land area, 2020

■ Five Block Groups with Most Housing Growth   ■ Next Five   ■ Remaining 423 Block Groups

**PERCENT OF NEW HOUSING UNITS, 2000 TO 2020**



0          25          50          75          100
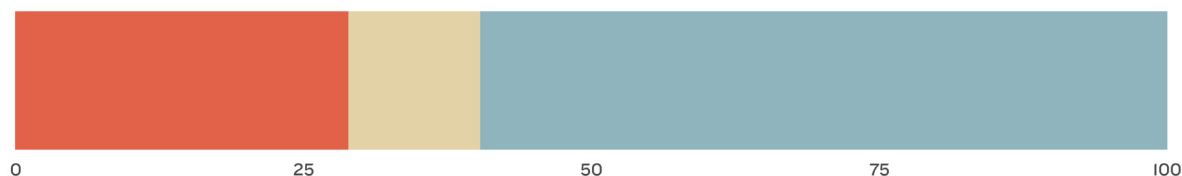
**PERCENT OF TOTAL LAND AREA, 2020**



0          25          50          75          100

Source/notes: Housing unit counts and land area from 2000 decennial census and 2020 American Community Survey. The top row shows the share of new housing units in the five block groups with the greatest increase in number of housing units; the share of new housing units in the next five block groups with the greatest increase in housing units; and the remaining 423 block groups. The bottom row shows the share of land area in each of those three categories using the same color scheme.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?
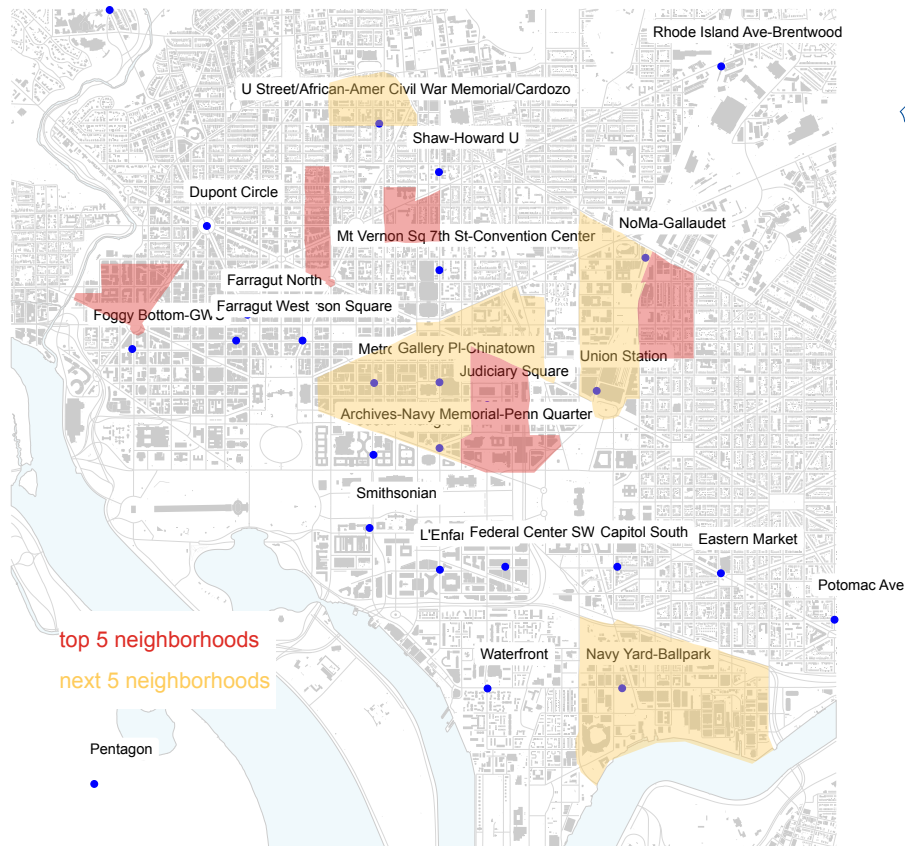
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# Which neighborhoods saw the greatest increase in housing?

Not only was housing growth concentrated in a few block groups, these block groups are quite spatially clustered (Figure 4). The first part of Figure 4 shows the ten neighborhoods with the greatest housing growth, as measured by the increase in the absolute number of units. The second part of the figure locates those neighborhoods within the city at large. Though the District is 10 miles square, this city map shows that all of the high development neighborhoods are all reasonably close to the central business district, in an area roughly two by four miles.

One large cluster of high-growth block groups appears adjacent to downtown near the Archives-Penn Quarter-Convention Center area in near Northwest. Another includes the near Northeast area just north of Union Station, near the NoMa metro (which opened for service in 2004) and Union Market. Other areas of high growth include the Navy Yards area in Southeast, near the Nationals baseball park; the Shaw and U Street corridors in Northwest; and just north of the Foggy Bottom area in Northwest.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

8

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

9

**Figure 4: Fastest-growing neighborhoods were adjacent to downtown, near Union Station and Navy Yards**

Top ten block groups by housing growth, 2000-2020



Woodley Park-Zoo/Adams Morgan

Rhode Island Ave-Brentwood

U Street/African-Amer Civil War Memorial/Cardozo

Shaw-Howard U

Dupont Circle

NoMa-Gallaudet

Mt Vernon Sq 7th St-Convention Center

Farragut North

Farragut West   son Square

Foggy Bottom-GW

Metr  Gallery Pl-Chinatown

Union Station

Judiciary Square

Archives-Navy Memorial-Penn Quarter

Smithsonian

L'Enfa  Federal Center SW  Capitol South  Eastern Market

Potomac Ave

top 5 neighborhoods

next 5 neighborhoods

Waterfront   Navy Yard-Ballpark

Pentagon

Source/notes: Map shows ten block groups with largest increase in total housing units, determined by 2000 decennial census and 2020 American Community Survey. Dark blue dots are Metro stations. See data appendix for details on other map sources.

# How did zoning change in Washington, DC between 2000 and 2020?

Cities promulgate zoning regulations to define allowed land uses, building dimensions and density. Planners assign a zone to each piece of land in a city; in the District, planners currently have 164 zones from which to choose. For example, the R-1-A zone limits a piece of land to single-family homes, and further limits the total square footage of the building on the lot, requires a set number of parking spaces, and sets a minimum lot size. Originally, zoning was intended to separate commercial and industrial uses from residential areas, to protect homes from noise and pollution, and to preserve light and air by limiting building height and bulk.[10] Many critics of zoning argue that it goes much farther, reinforcing economic and racial segregation and limiting access to high-opportunity communities.[11]

The share of land allocated to each zone varies considerably across the District's neighborhoods. Downtown and commercial corridors are zoned to allow offices, retail spaces, and various other types of commercial land uses, in most cases also allowing new residential development. Much of the District's land outside downtown is reserved for residential uses, with some small-scale neighborhood-serving commercial activity permitted.

Our analysis focuses on the revisions to Washington, DC zoning that took effect in 2016. In most cases, these revisions were only technical and left in place the basics of zoning: what structures and uses are allowed by right. For purposes of our analysis, we aggregate the District's 164 zones into five broad categories: single-family, multifamily, mixed-use, commercial-industrial, and other. This necessarily limits the precision of our analysis, but leaves us with a tractable and comprehensible set of categories. The left-hand side of Figure 5 shows the share of District land allocated to each of these five categories under the prior zoning rules (in 2003). The right-hand side shows how much land originally zoned for each category stayed the same or was reallocated to a different broad category.

10. Sonia A. Hirt, Zoned in the USA: The Origins and Implications of American Land-Use Regulation (Cornell University Press, 2015).

11. Chang-Tai Hsieh and Enrico Moretti, "Housing Constraints and Spatial Misallocation," *American Economic Journal: Macroeconomics* 11, no. 2 (April 1, 2019): 1–39, https://doi.org/10.1257/mac.20170388; Richard Rothstein, *The Color of Law: A Forgotten History of How Our Government Segregated America* (Liveright Publishing, 2017); Allison Shertzer, Tate Twinam, and Randall Walsh, "Zoning and Segregation in Urban Economic History," *Regional Science and Urban Economics*, January 1, 2021, https://doi.org/10.3386/w28351; Jessica Trounstine, "The Geography of Inequality: How Land Use Regulation Produces Segregation," *American Political Science Review* 114, no. 2 (May 1, 2020): 443–55, https://doi.org/10.1017/S0003055419000844.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

10

In 2003, about 36 percent of the District's land was zoned exclusively for single-family residential uses, while about 16 percent was zoned as multifamily residential.[12] The "Other" category was the largest non-residential category, accounting for roughly 35 percent of District land. The largest component of this land is parks, including the very large Rock Creek Park and the National Mall; this category also includes land used for federal and local government buildings, and other uses. About 12 percent of land was zoned as commercial-industrial, with a very small amount designated as non-residential mixed use.[13]

Notably, virtually all of the land initially zoned for single-family housing was still zoned exclusively for single-family homes as of 2016. (Land zoned initially as mixed-use or commercial-industrial was also left in the same broad categories). Single-family exclusive zoning, particularly when paired with large minimum lot sizes, has been identified as one of the greatest barriers to increasing housing in already developed neighborhoods, where adding housing would require replacing existing single-family homes with multi-family, multi-story buildings.[14]

One limitation of our broad-brush zoning categories is that we are not able to observe more nuanced changes to zoning rules, such as revisions to dimensional requirements or procedural rules, that could alter the effective housing capacity within zoning categories. In theory, keeping land zoned for single-family but cutting the minimum lot size in half might allow property owners to subdivide parcels and build an additional home on the new lots. In practice, DC's rezoning made at most modest changes to dimensional requirements that did not substantially alter housing capacity in residential areas.[15]

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

11

12. For our analysis, mixed residential-commercial zones were assigned to residential categories, according to which type of housing was allowed by right. The core downtown areas permit multifamily housing by right, so are counted as "multifamily" throughout the analysis.
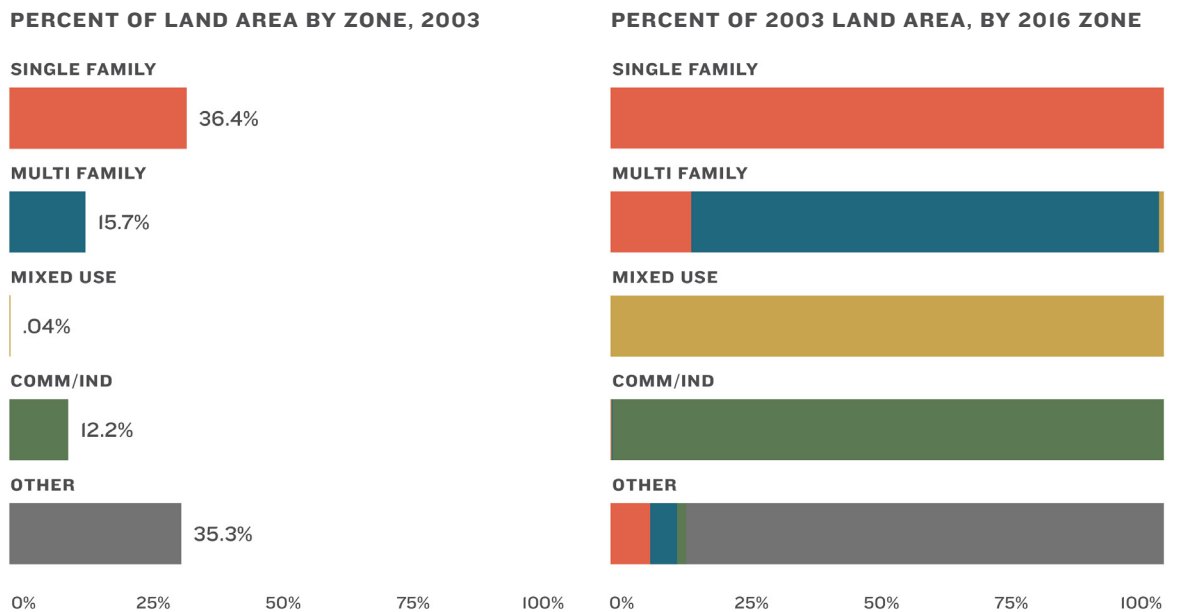
13. Commercial-industrial zones do not allow residential uses, with a few exceptions (on-site janitor, artist studios, and homes built before 1958).

14. Robert Ellickson, "The Zoning Straitjacket: The Freezing of American Neighborhoods of Single-Family Houses," *Indiana Law Journal* 96, no. 2 (2021); M. Nolan Gray and Salim Furth, "Do Minimum-Lot-Size Regulations Limit Housing Supply in Texas?," Mercatus Center Research, George Mason University, May 1, 2019, https://doi.org/10.2139/ssrn.3381173; Edward Glaeser, Jenny Schuetz, and Bryce Ward, "Regulation and the Rise of Housing Prices in Greater Boston," Rappaport Institute for Greater Boston, Harvard University, 2006, https://www.hks.harvard.edu/sites/default/files/centers/rappaport/files/regulation_housingprices_1.pdf.

15. Flanagan, "Get to Know DC's New Zoning with This Map."

**Figure 5: Zoning changes added housing capacity by reallocating non-residential land to residential uses**

Initial land by broad zoning category and subsequent allocation by initial zoning category

PERCENT OF LAND AREA BY ZONE, 2003

PERCENT OF 2003 LAND AREA, BY 2016 ZONE

SINGLE FAMILY — 36.4%

MULTI FAMILY — 15.7%

MIXED USE — .04%

COMM/IND — 12.2%

OTHER — 35.3%



Sources: Washington, DC 2003 and 2016 zoning shapefiles, full details in appendix.

Almost 15 percent of the land previously zoned for multifamily was downzoned to allow only single-family homes. The neighborhoods that experienced the largest amount of downzoning are located east of the Anacostia River in Wards 7 and 8; these historically Black neighborhoods are some of the least affluent parts of the District.

Most of the increased housing capacity that resulted from rezonings came from reallocating land previously in the "Other" category: 7 percent of this land was changed to single-family, 5 percent to multi-family, and roughly 1.5 percent to Commercial/Industrial. The "Other" category accounts for quite a lot of land, so in theory the District could keep adding housing capacity by rezoning parcels from this category to allow multifamily and mixed use development. But in practice, much of this land is occupied by local or federal government facilities, including parks owned by the National Park Service, and is unlikely ever to be converted.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

12

# How was housing growth correlated with initial zoning status and zoning changes?

In Figure 6, we evaluate whether any zoning change at all—to any category—is correlated with new construction. Specifically, we plot each block group's share of land with zoning change versus each block group's change in total housing units during this period. We use the color scheme as in Figures 3 and 4 to denote neighborhoods with largest housing growth. Between 2003 and 2016—the years for which we observe zoning designations—the median block group saw zoning changes to about 1.5 percent of its land. Among the top 10 block groups with the greatest increase in housing units, nine of these block groups saw zoning changes to less than seven percent of land area. Only one of the highest-growth block groups, located in Navy Yard, saw nearly 25 percent of its land rezoned.

Many neighborhoods with very large changes in zoning had very small changes in housing units. However, this reflects the nature of the zoning changes in these locations. Of the 10 block groups with the greatest percentage changes in zoning, all are east of the Anacostia River and in all 10, the vast majority of the change was to downzone multifamily land to single-family, effectively reducing capacity.

**Figure 6: High-growth neighborhoods did not undergo large zoning changes**
Percent of block group land that changed zoning and change in housing units, 2000—2020
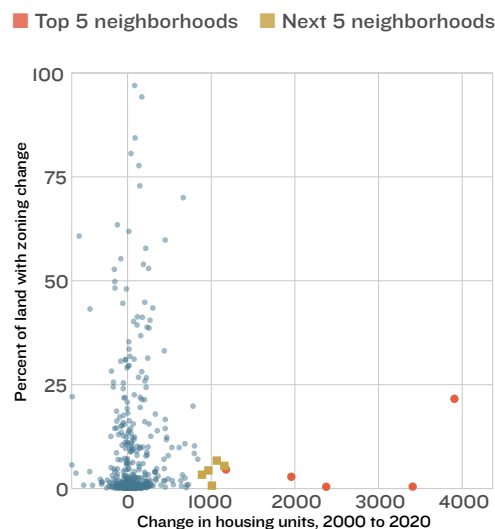
■ Top 5 neighborhoods  ■ Next 5 neighborhoods



Source/notes: Housing unit change calculated using block group data from the 2000 Decennial Census and the 2020 American Community Survey. Zoning change is defined as movement between one of the five broad zone codes we employ. Red circles are the five block groups with the greatest absolute increase in housing units, 2000 to 2020; yellow squares are the second five block groups with the greatest housing increase. More details on methodology in Appendix A.

Although high-housing growth neighbor-hoods did not experience large rezonings, they do share another zoning trait: rela-tively little land initially zoned exclusively for single-family homes (Figure 7). Across all District block groups, the median block group has almost 60 percent of land zoned exclusively for single-family homes. Among the ten top housing growth neighborhoods, eight block groups had less than 10 percent of land zoned for single-family homes. (The two outliers, with more than 50 percent of land zoned single-family in 2000, both had substantial vacant or extremely underused land. These neighborhoods are the area just west of Logan Circle and one now known as NoMa, just east of Union Station.)

**Figure 7: High-housing growth neighborhoods had relatively little single-family zoning in 2000**
Change in housing units, 2000 to 2020 versus percent of block group land zoned for single-family housing in 2003
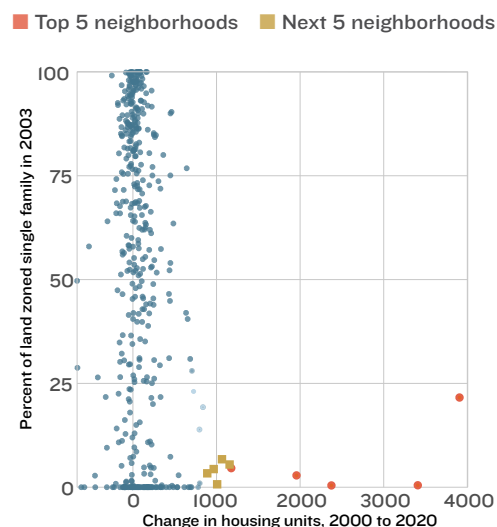
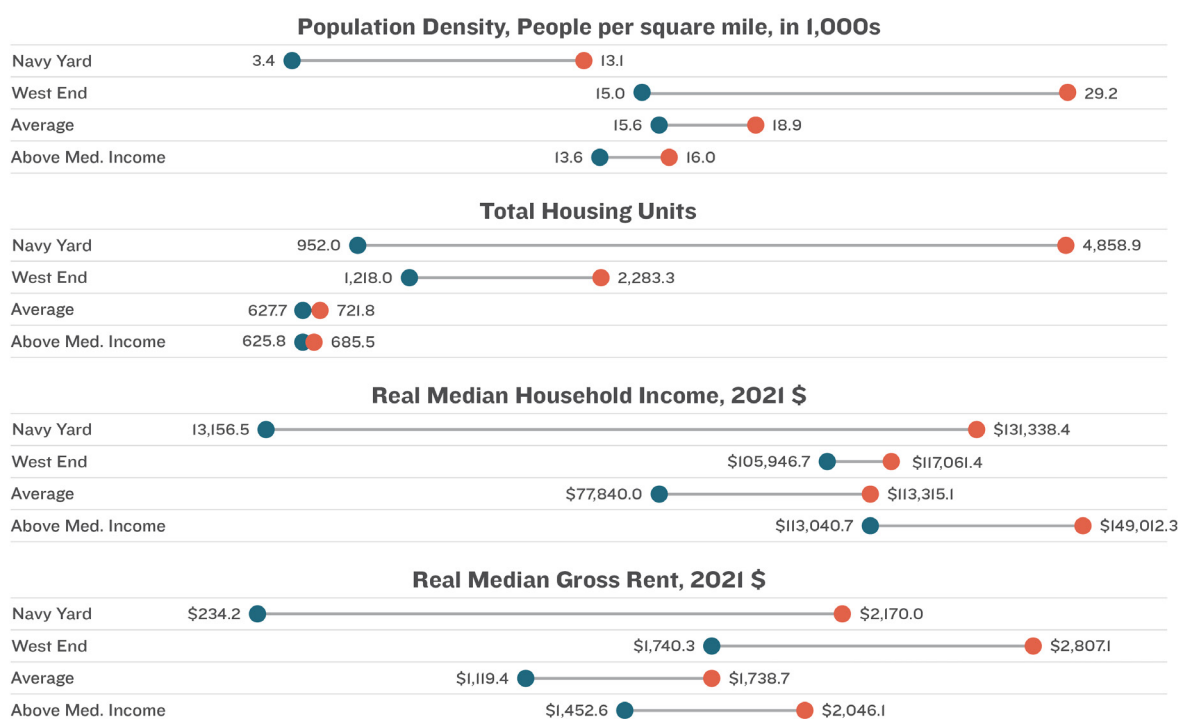■ Top 5 neighborhoods　■ Next 5 neighborhoods



Source/notes: Housing unit change calculated using block group data from the 2000 Decennial Census and the 2020 American Community Survey. Single-family zoning is the share of land in a block group covered by a single family zoning designation and comes from 2003 zoning designations. Zoning data is measured in 2003 and 2016. Red circles are the five block groups with the greatest absolute increase in housing units, 2000 to 2020; yellow squares are the second five block groups with the greatest housing increase. More details on methodology and sources in Appendix A.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

14

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

15

# Deeper look: What happened in unusually high-growth neighborhoods?

To better understand what happened in high-growth neighborhoods, we provide context for these block groups' demographic, economic, and physical characteristics at the beginning and end of the period. We also narrow our focus to two block groups. One of these is located in the Navy Yard, and experienced the greatest absolute growth in housing units for all District neighborhoods. The other is in the West End, and ranks in the next five highest growth areas. We chose these two neighborhoods to illustrate somewhat different stories about where housing growth occurred (Figures 8 and 9).

**Figure 8: West End and Navy Yard saw more housing and population growth than the District average**

Change in population, housing units, median rent and median income for block groups in West End, Navy Yard, average of all District block groups, and average of above-median income (2000) block groups. ● 2000 ● 2020



**Population Density, People per square mile, in 1,000s**

| | 2000 | 2020 |
|---|---|---|
| Navy Yard | 3.4 | 13.1 |
| West End | 15.0 | 29.2 |
| Average | 15.6 | 18.9 |
| Above Med. Income | 13.6 | 16.0 |

**Total Housing Units**

| | 2000 | 2020 |
|---|---|---|
| Navy Yard | 952.0 | 4,858.9 |
| West End | 1,218.0 | 2,283.3 |
| Average | 627.7 | 721.8 |
| Above Med. Income | 625.8 | 685.5 |

**Real Median Household Income, 2021 $**

| | 2000 | 2020 |
|---|---|---|
| Navy Yard | 13,156.5 | $131,338.4 |
| West End | $105,946.7 | $117,061.4 |
| Average | $77,840.0 | $113,315.1 |
| Above Med. Income | $113,040.7 | $149,012.3 |

**Real Median Gross Rent, 2021 $**

| | 2000 | 2020 |
|---|---|---|
| Navy Yard | $234.2 | $2,170.0 |
| West End | $1,740.3 | $2,807.1 |
| Average | $1,119.4 | $1,738.7 |
| Above Med. Income | $1,452.6 | $2,046.1 |

Source/notes: Data from 2000 census and 2020 ACS. Income and rent are in 2021 dollars. "Average" reports the average value across all District neighborhoods. "Above Median Income" neighborhoods are those with median income above the citywide median (as calculated from block group data).

The West End block group illustrates how substantial amounts of housing can be added through converting existing structures, even without major zoning changes. The West End block group—bordered by Pennsylvania Ave. to the west/southwest, New Hampshire Ave in the east/northeast, and N St to the north—had a small but fairly affluent residential population as of 2000, and grew larger and richer over the subsequent decades.

The block group has seen substantial development of both apartment and condominium buildings, along with several high-end hotels, restaurants, and retail. It also saw at least two very large conversions of commercial property to residential uses: one large office building (located at 1255 25th St.) became residential rental and a hospital (the Columbia Hospital for Women) became condos.[16] Although the mixture of zoning as measured by land area has not changed much over this time period—roughly two-thirds mixed-use and one-third multifamily in 2003 and 2016—the total number of units is strikingly higher, and does not account for the large number of hotel rooms built in this area over the past two decades (Figure 9).

**Figure 9: Change in land use composition for West End, Navy Yards, and average block group**
Percentage of land by broad zoning designation in 2003 and 2016
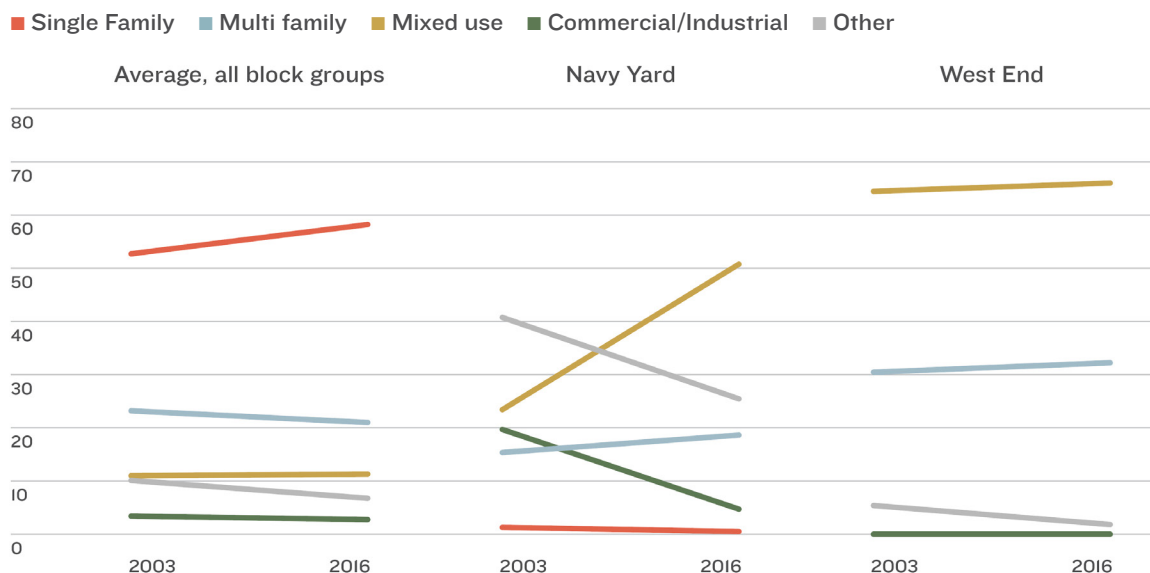


Source/notes: 2000 Census block groups and 2003 and 2016 zoning shapefiles. We report shares of land area by zoning category.

16. Frank Leone, "Funkstown No 7. The Columbia Hospital for Women and How Foggy Bottom Got Its Trader Joe's," *Foggybottomdc*, November 28, 2021, https://www.foggybottomassociation.org/post/funkstown-no-7-the-columbia-hospital-for-women-and-how-foggy-bottom-got-its-trader-joe-s; Pennsylvania State University, "West End 25 Senior Thesis," Capstone Project Electronic Portfolio, 2009, https://www.engr.psu.edu/ae/thesis/portfolios/2009/cmm5035/.

Although we do not see much change in land zoned by major category, it is not uncommon for large development (or conversion) projects to be facilitated by variances or other minor changes to zoning rules. These are not systematically recorded by the District government and so are difficult to measure.

Navy Yard presents a more intentional story of housing growth as part of a broader redevelopment plan. Over the course of two decades, joint efforts of the District local government, the federal government, private sector developers and a newly formed Business Improvement District have transformed a low-density, low-value commercial-industrial site into a high-density, high-value mixed residential-commercial area.[17] In the early 2000s, then-Mayor Anthony Williams led efforts to recruit a major-league baseball team—formerly the Montreal Expos, now the Washington Nationals—to the region, with the promise of a new ballpark. In addition to the ballpark (which opened in 2008), the neighborhood now has nearly 15,000 residents, extensive retail and entertainment corridors, hotels, as well as parks and recreation facilities along the Anacostia River. The newly-built residences include quite a diversity of housing types, including rental and owner-occupied homes; market-rate and subsidized properties, with at least one mixed-income subsidized property that replaced public housing.[18] Projects like Navy Yard demonstrate that rezoning even small amounts of land for high density multifamily can yield substantial amounts of new housing.

As of 2000, the West End, but not the Navy Yard, had income above the citywide average (Figure 8). Most neighborhoods with incomes above the citywide median likely had high demand, but had modest changes in population density and very small changes in housing units, combined with appreciable increases in rent.

17. Sarah Cassius, "Public Space for All? Examining the Role of Privatization, Visions of Redevelopment, and BID Governance in the Capitol Riverfront" (M.S. Thesis, George Washington University, 2021); Michael C. Stevens, "Redeveloping a Vibrant Riverfront in Washington, DC/ The Capitol Riverfront," *Journal of Urban Regeneration and Renewal* 5, no. 2 (2012): 132–45, https://hstalks.com/article/2403/redeveloping-a-vibrant-riverfront-in-washington-dc/.

18. Michele Lerner, "Public Housing Complex in D.C.'s Navy Yard Re-Emerges as a Mixed-Income, Mixed-Use Development," *Washington Post*, December 5, 2019, https://www.washingtonpost.com/business/2019/12/05/public-housing-complex-dc-navy-yard-re-emerges-mixed-income-mixed-use-development/.

# Conclusions and policy recommendations

As housing affordability becomes a politically contentious issue in more parts of the U.S., cities and states are experimenting with different policy levers to boost housing production. Targeted research is needed to fill in knowledge gaps about what types of policies are most effective in different housing market conditions. Our analysis focuses on the experience of Washington, DC, a city which has seen strong population growth and housing demand over the past 20 years, yet had little undeveloped land.

The District has built substantial amounts of new housing in recent decades, almost entirely through infill development converted from other uses. New housing is spatially concentrated in a handful of neighborhoods. While most high-growth neighborhoods did not see large zoning changes, they entered the period with very small amounts of land zoned exclusively for single-family homes. Case studies of two high-growth neighborhoods illustrate two different patterns: the West End added housing by converting a few large commercial and institutional buildings into housing, without a substantial change in zoning. By contrast, Navy Yard is an example of long-term planned redevelopment, with intentional partnerships between local government and private sector developers to transform underused land into high-density mixed-use housing, retail, and entertainment.

These results offer several insights into how policies may constrain or support greater housing production. First, growth is more likely to occur in neighborhoods that are predominantly non-residential or mixed residential-commercial. This likely reflects both the limits imposed by low-density residential zoning and the political process that guides development: having fewer neighbors to complain makes it easier for developers to build. This pattern may also reflect economies of scale in construction–especially with infill development in high-cost markets– that drive concentrated growth of large buildings in a few areas. Both soft costs of development (financing, design and engineering, and legal approvals) as well as materials and labor costs of vertical development contribute to economies of scale. Second, rezoning even small amounts of land can potentially yield large increases in housing supply–if the rezonings allow sufficiently high density and the rents are high enough to support construction.

Does Housing Growth in Washington, DC Reflect Land Use Policy Changes?

18