

THREE ESSAYS ON LAND USE REGULATIONS AND URBAN OUTCOMES

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ABSTRACT

THREE ESSAYS ON LAND USE REGULATIONS AND URBAN OUTCOMES

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Local zoning and other land use regulations restrict the quantity of housing that can be built in the United States and the type and location of real estate development that is permitted. Land use regulations particularly limit relatively low-cost, multifamily development, leading to inflated housing costs and reduced population density and walkability. This dissertation explores the effect of land use regulations on housing market outcomes. I use both empirical and case study approaches to study housing markets and the effects of land use regulations.

This dissertation consists of three chapters. Chapter 1, coauthored with Eli Dourado, builds on the existing literature on the relationship between walkability and house prices. We demonstrate a positive relationship between home prices and walkability using zip code-level data in the first nationwide study of walkability. We find that a one-point increase in Walk Score commands a 0.14 percent price premium. In other words, a zip code with a Walk Score of 100 could be expected to

command a 14 percent premium relative to an otherwise comparable zip code with a Walk Score of 0. Our findings indicate that land use regulations that prevent walkable development—such as zoning, parking requirements, and density restrictions—make consumers worse off by restricting choice and the supply of walkable neighborhoods that consumers are willing to pay a premium for.

Chapter 2 examines the effects of inclusionary zoning, a popular tool designed to increase the availability of affordable housing for households making less than their region's median income, on housing supply and median house prices. When inclusionary zoning requires private developers to subsidize below-market-rate units, it may act as a tax on housing, leading to reduced supply and higher prices than cities would experience without the policy. Few empirical studies have attempted to measure how inclusionary zoning affects housing supply and prices. In this chapter, I use a new dataset on inclusionary zoning in the Baltimore-Washington region to estimate its effects on market-rate house prices and building permits in a difference-in-difference study. I find some evidence that inclusionary zoning increases market-rate house prices, but none that it reduces new housing supply. Additionally, I find that most optional programs that offer developers increased development rights if they choose to provide below-market-rate housing units have been unsuccessful in producing affordable units. Alexandria, Virginia, and Falls Church, Virginia, are exceptions, where density bonuses are very valuable owing to traditional zoning's restrictions on new housing construction.

Chapter 3 examines how policymakers in one suburban jurisdiction changed zoning policy to allow new multifamily housing construction. Following the allocation of funds for a new line on the Washington Metropolitan Area Transit Authority's Metrorail system, the Board of Supervisors in Fairfax County, VA undertook redevelopment planning for its Tysons area. The redevelopment plan was the first of its kind. The Board adopted a comprehensive plan that established the objective of transforming Tysons from highway-oriented suburban office park development into a walkable, mixed-use area. The redevelopment effort has received extensive attention for its goal to turn a highly car-oriented area into walkable, transit-oriented development. But what's perhaps more notable about the Tysons redevelopment planning effort is its objective to allow extensive multifamily housing construction in a wealthy suburban community. So far, more progress has been made toward the goal of housing construction than walkability.

CHAPTER 1: THE PREMIUM FOR WALKABLE DEVELOPMENT UNDER LAND USE REGULATIONS

Section 1: Introduction

Critics of urban planning practices like Smart Growth and New Urbanism often argue that regulations are forcing higher population densities than those a free market would produce. Smart Growth and New Urbanism are planning platforms that espouse urban infill development to accommodate growing populations in lieu of new greenfield development on city fringes. Joel Kotkin typifies this view when he writes that, “planners and powerful urban land interests continue to force ever higher-density development down the throats of urban dwellers.”¹ Kotkin is correct that some Smart Growth advocates do promote regulations that require higher population density than an unregulated market might support. As an example, the Environmental Protection Agency claims that density’s benefits range from improved air and water quality to greater economic development.²

However, Kotkin’s argument ignores that while relatively new land use practices such as binding urban growth boundaries and minimum density rules require greater population density than the free market counterfactual, most land use

¹ Joel Kotkin. “City Leaders are in Love with Density, but Most City Dwellers Disagree.” *New Geography*. September 16, 2013. <http://www.newgeography.com/content/003938-city-leaders-are-love-with-density-most-city-dwellers-disagree>.

² United States Environmental Protection Agency. Smart Growth. <http://www2.epa.gov/smartgrowth>.

regulations work in the opposite direction, limiting building and population density. Minimum lot size requirements, maximum residential density limits, parking requirements, and other traditional zoning regulations all lead to less dense development than the free market would produce.

Policy analyst Randall O'Toole shares Kotkin's view and argues that based on survey data, consumers prefer less dense development in the form of detached single family homes.³ O'Toole cites surveys finding that, all else equal, most Americans prefer single family homes with private yards to multifamily housing. He says that Smart Growth policies such as upzoning—liberalizing current regulations that restrict residential density—make consumers worse off because Americans prefer low-density housing. However, survey data is not always a good indicator of the tradeoffs that consumers face in the marketplace. While in the abstract people may prefer a single-family house on a large lot to an apartment, this isolated preference fails to take into account the many attributes of housing, including size, location, and access to amenities that consumers must weigh when choosing where to live. For example, consumers have demonstrated their willingness to pay above-median rents for micro-apartments in new buildings in prime locations.⁴

Suppliers in the housing market are not free to build cities that reflect the demands of both walking people and car people in proportion to their numbers, and as

³ Randal O'Toole. "How Urban Planners Caused the Housing Bubble." Cato Policy Analysis No. 646. October 1, 2009. <http://www.cato.org/publications/policy-analysis/how-urban-planners-caused-housing-bubble>.

⁴ Laura Kusito, "Builders Bet Tiny Apartments Will Lure Renters." *Wall Street Journal*. April 15, 2017. <https://www.wsj.com/articles/builders-bet-tiny-apartments-will-lure-renters-1492254007?tesla=y>.

a result consumers don't face the housing choices that would be available to them in a free market. We can't look at consumer decisions in a heavily-regulated market as clear evidence of their revealed preferences.

Urban planning professor Jonatahn Levine addresses the difficulty of gleaning information about consumer preferences in markets where land-use regulations restrict allowable types of development and may prevent developers from building the type of housing that their customers prefer. He designed a study to compare variation in consumer preferences with development variation across Boston – a city with a relatively flat distribution of neighborhood types from central city walkable neighborhoods, to auto-oriented exurbs – and Atlanta – a city where over 60 percent of homes are in exurban neighborhoods.⁵ Levine surveyed residents of each city about their preferences for tradeoffs in housing choices, for example whether they would choose to live in a neighborhood with only single-family homes if this meant that they would not have access to good public transportation. He found that in Boston, people in the top decile for preferences of transit and pedestrian access had an 83 percent chance of living in an urban neighborhood or an inner suburb. In Atlanta, the people in the highest decile of stated preferences for walkable urban neighborhoods had a 52 percent chance of living in an outer suburb or an exurb.⁶ He explains, “Relative lack of choice in Atlanta rendered one's neighborhood selections much less sensitive to one's preferences than in Boston.”⁷

⁵ Jonathan Levine. *Zoned Out: Regulation, Markets, and Choices in Transportation and Metropolitan Land-Use*. New York: Resources for the Future, 2006: 153.

⁶ Ibid. 161.

⁷ Ibid. 165.

It is true that some Smart Growth planners might like to require people to live in dense apartment buildings and to forego driving cars,⁸ but it is also true that today every city of significant size in the United States enforces zoning rules that restrict urban density, including minimum parking requirements, benefiting drivers at the expense of walkers and limiting development density.⁹ While Smart Growth regulations like maximum parking limits and minimum density limits are beginning to emerge in select cities, traditional zoning rules that restrict development density remain much more common.¹⁰

Because a complicated web of regulations currently governs development in U.S. cities and some of these regulations act at cross-purposes, determining whether or not urban planning policies ultimately result in more or less density than the free market would provide is an empirical question. One could reasonably hypothesize that the net effect of regulations is to shape cities that are either more urban (dense, mixed-use, walkable) or suburban (less dense, single use, driveable).

A key tradeoff between more and less dense development is ease of various types of transportation. In less dense, suburban development, parking is often available at zero-price, facilitating ease and cost of driving between destinations. However, the development patterns that result in ease of driving typically reduce walkability. Surface parking lots increase the distance between destinations, creating

⁸ For example, Portland has some neighborhoods with minimum density requirements. See Michael Lewyn and Kristoffer Jackson. "How Often Do Cities Mandate Smart Growth or Green Building?" Mercatus Working Paper. Mercatus Center at George Mason University, Arlington, VA. October 2014. <http://mercatus.org/sites/default/files/Lewyn-Mandating-SmartGrowth.pdf>.

⁹ See Donald Shoup. *The High Cost of Free Parking* Chicago: American Planning Association. 2005. for a detailed study of the costs of parking requirements.

¹⁰ Lewyn and Jackson. "How Often Do Cities Mandate Smart Growth or Green Building?"

an environment in which pedestrians have longer and less pleasant paths to traverse in order to walk, rather than drive. Wide streets that facilitate more cars traveling at higher speeds make conditions less pleasant and more dangerous for pedestrians.

Given that many American cities may have an undersupply of walkable neighborhoods relative to consumer preferences, we must look to the prices people pay to live in various types of neighborhoods to determine whether land use regulations make cities more or less dense and walkable than they would be absent regulations. These revealed preferences are a more reliable indicator of consumers' preferences than survey data that participants provide without having to live with their decisions.

In this paper we estimate the relationship between walkability and home prices to determine whether land use regulations that limit walkability are making consumers better or worse off. First we review the existing literature on walkability and house prices. Second, we discuss our estimate of the walkability premium, finding that consumers are willing to pay a statistically significant premium to live in more walkable neighborhoods. Third, we discuss the policy implications of our empirical findings.

Section 2: Literature Review

Real estate economics has a long history of empirical study, including efforts to quantify the contributions of both location and housing quality to real estate prices. For a review of some of the large body of work on housing price determinants, see

Nguyen-Hoang and Yinger.¹¹ Since the 1980s, researchers have also pursued empirical studies on the relationship between housing prices and urban form.

Early studies in this line of research tested whether or not Euclidean zoning, separating housing from other land uses, made consumers better or worse off as revealed through consumers housing choices. Grether and Mieszkowski start with the research question, “Do zoning regulations achieve their stated intent of protecting the value of single family homes from the externalities of other land uses?”¹² They find that commercial and multifamily uses have no impact on the prices of nearby single family homes in New Haven while heavy industrial uses and public housing do reduce the price of single family homes relative to other comparable homes. In a similar study of land use mixing, Van Cao and Cory emphasize that mixed-use development has both positive and negative externalities for residential development.¹³ However, in their study of Tucson, Arizona, they found that commercial and industrial real estate tend to increase the value of single family homes, indicating that zoning holds mixed land uses below the optimal level.

More recent empirical studies of land use regulations have the advantage of Geographic Information Systems that allow for more precise and broader spatial econometric studies that can attempt to measure the value of neighborhood walkability. Song and Knaap have conducted multiple studies of walkability in

¹¹ Phuong Nguyen-Hoang and John Yinger. “The capitalization of school quality into house values: A review.” *The Journal of Housing Economics* 20: 1 (2011).

¹² D.M. Grether and Peter Mieszkowski. “Determinants of Real Estate Value. *Journal of Urban Economics* 1:2 (1974).

¹³ Than Van Cao and Dennis Cory. “Mixed Land Uses, Land-Use Externalities, and Residential Property Values: A Reevaluation. *The Annals of Regional Science* 16:1 (1982).

Portland.¹⁴ Like Van Cao and Cory, they find that proximity to non-residential amenities increases the value of single-family homes. They find that while multifamily housing and industrial uses may lower home values, service-oriented businesses and parks increase home values.

Outside of zoning rules, the work of urban planners and civil engineers has a complex impact on home values. Infrastructure can be designed to facilitate pedestrian activity, making a neighborhood more walkable, or it can be designed to facilitate easier driving transport. Either has the potential to increase home values, depending on consumers' preferences. Leinberger and Alfonzo at the Brookings Institution undertook a study of walkability in Washington, DC in 2012.¹⁵ They determine that housing in highly walkable neighborhoods in the DC area is more expensive on average than that in less walkable neighborhoods. Their findings indicate a revealed preference for mixed-use neighborhoods in which residents can walk from their homes to a variety of amenities over suburban-style development in which driving is easier. They explain:

The apparent supply-demand mismatch for walkable places may be contributing significantly to the price premium these places demand. To the extent that this is the case, the short and medium-term shortage of walkable

¹⁴ Y. Song and G. Knapp. "New urbanism and housing values: a disaggregate assessment." *Journal of Urban Economics* 54: 2. 2003; and Y. Song and G. Knapp. "Measuring the effects of mixed land uses on housing values." *Regional Science and Urban Economics* 34. 2004.

¹⁵ Christopher B. Leinberger and Mariela Alfonzo. "Walk this Way: The Economic Promise of Walkable Places in Metropolitan Washington, D.C." The Brookings Institute. (2012). <http://www.brookings.edu/~media/Research/Files/Papers/2012/5/25%20walkable%20places%20leinberger/25%20walkable%20places%20leinberger.pdf>.

places makes them inaccessible (unaffordable) to many people who desire to live in such places.

Leinberger and Alfonso conducted their study by gathering data on the walkability of 201 neighborhoods in the DC area. While this approach has advantages, it is costly and can only be conducted in a relatively small number of neighborhoods at a time. In contrast, Walk Score provides an index that approximates walkability by city, neighborhoods, zip code, and address. Founded in 2007, the company Walk Score ranks locations according to the average distance to amenities from residential origins. The ranking is designed to demonstrate how easy it is for a resident to run errands, go to restaurants, and enjoy entertainment without a car. The Walk Score algorithm uses several characteristics of neighborhoods to determine how friendly they are to pedestrians, including residential distance to amenities and street connectivity and provides locations with a fixed score from 0 to 100. This measurement relies on the theories that Jane Jacobs developed in her classic book on pedestrian life in *The Death and Life of Great American Cities*.¹⁶ Walk Score provides scores for cities by calculating walkability at different points and weighting these measurements by population densities. The Walk Score algorithm builds on the progress of GIS to make walkability research across cities cheaper and potentially more accurate.

Despite its advantages, some researchers have criticized Walk Score's methods for not including all of the variables thought to influence walkability. For

¹⁶ Jane Jacobs. *The Death and Life of Great American Cities*. 1963.

example, Walk Score rankings do not take sidewalk width, topography, crime or weather into account, all of which may influence how much people choose to walk in a given neighborhood and how much they rely on cars. A key failing of the original Walk Score metric is that it measured distances as the crow flies rather than as a pedestrian would actually be able to walk. This will lead to significant inaccuracy in Walk Score's correlation to walkability in cases such as a residential area separated from a shopping center by a highway. The creators of Walk Score have developed a new metric called Street Smart Walk Score that determines access to amenities based on the actual routes available to pedestrians. In our research, however, we use data collected in 2012, before the Street Smart Walk Score was available.

In spite of Walk Score's limitations discussed above, several researchers have validated Walk Score as a good indicator of how much a neighborhood's residents actually do walk in daily life. Carr, Dunsiger, and Marcus followed Walk Score's methodology to manually calculate scores for 379 Rhode Island addresses using GIS to test whether or not the original Walk Score algorithm accurately reflected opportunities to walk to destinations from a given starting point. They find a high degree of accuracy for Walk Score's algorithm, concluding, "Walk Score [is] a reliable and valid measure of estimating access to walkable amenities. Walk Score may be a convenient and inexpensive option for researchers interested in exploring the relationship between access to walkable amenities and health behaviors such as physical activity."¹⁷ In a Masters of Public Health thesis, Lindsey Jones tests the

¹⁷ LJ Carr, SI Dunsiger, and BH Marcus. "Walk Score as a global estimate of neighborhood walkability." *American Journal of Preventive Medicine*. 39(5) November 2010.

relationship between Walk Score and physical activity.¹⁸ Jones finds no significant relationship between Walk Score and physical activity, but in the same study she determines that Walk Score is correlated with GIS-derived indices of Walk Score using the most accepted formula in walkability literature, which defines walkability as a function of intersection density, residential density, and the mix of building uses. In contrast, Duncan et. al. find some limitations to Walk Score's correlation with GIS-derived walkability measures:

The correlations between Walk Score and cul de sac count overall were moderate and significant at the 1600-meter buffer level, which ... underscores that Walk Score is not a useful proxy for overall neighborhood walkability. We also found significant moderate correlations between Walk Scores and average speed limit as well as Walk Scores and highway density overall, which may also hinder one's ability to walk in their neighborhood. Therefore, our findings indicate that Walk Score is a useful proxy for only certain neighborhood walkability indicators (e.g., retail destinations, intersection density, residential density).¹⁹

In spite of these limitations, Walk Score provides an important research tool by providing an inexpensive and simple measure of walkability relative to on-the-ground estimations that are difficult and time consuming to construct. The

¹⁸ Lindsey Jones. "Investigating Neighborhood Walkability and its Association with Physical Activity Levels and Body Composition of a Sample of Maryland Adolescent Girls. UMD Theses and Dissertations. University of Maryland. 2010. <http://drum.lib.umd.edu/handle/1903/10472>.

¹⁹ Dustin T. Duncan, Jared Aldstadt, John Whalen, Steven J. Melly and Steven L. Gortmaker, "Validation of Walk Score® for Estimating Neighborhood Walkability: An Analysis of Four US Metropolitan Areas," *Int. J. Environ. Res. Public Health* 2011, 8.

introduction of Walk Score has facilitated more research on walkability as both an independent and a control variable in recent years. Several past studies have used Walk Score data to study consumer preferences for walkability.²⁰ El-Geneidy and Manaugh provide an overview of research that used Walk Score to date. For example, Price and Greene looked at the causal effect of Walk Score, crime, year sold, home type, neighborhood, acreage, and square footage on home sale prices in Gresham, Oregon.²¹ Their findings refuted their hypothesis that Walk Score and house prices would be positively correlated; instead, they found a negative correlation between Walk Score and home values. This result contrasts with Song's and Knapp's results from neighboring Washington County.

Rauterkus and Miller use Walk Score to conduct a study of prices in Jefferson County, Alabama.²² They study land prices, more directly measuring the value of walkability than as it is reflected in house prices, as walkability does not, of course, contribute to house values outside of location of the land the house sits on. They determine that neighborhoods with higher Walk Scores have higher home values and that this effect is larger in neighborhoods that are more walkable. While the study focuses on land values, the authors find that this result is mirrored in home prices. In a study of 15 metropolitan areas, Cortright finds that homebuyers place a significant

²⁰ Kevin Manaugh and Ahmed El-Geneidy. "Validating walkability indices: How do different households respond to the walkability of the neighborhood?" *Transportation Research Part D: Transport and Environment* 16:4 (2011).

²¹ Price Armstrong and Jessica Greene. "Sustainability Focused Data Analysis: To what extent do walkability, crime, and neighborhood predict housing prices?" Sustainability Cities Initiative, University of Oregon. (2009).
https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/10386/SustDataAnalysis_ReportOpt.pdf?sequence=1.

²² Stephanie Yates Rauterkus and Norman Miller. "Residential Land Values and Walkability." *Journal of Sustainable Real Estate* 3: 1. (2011).

premium on neighborhoods with above-average walkability in a hedonic regression.²³ He finds that an additional point in Walk Score can be expected to raise home values by \$700 to \$3,000.

In *Zillow Talk: Rewriting the Rules of Real Estate*, Rascoff and Humphries estimate the price premium for a 15-point increase in Walk Score across 15 cities. They find that this increase in walkability accounts for an average increase in home prices of 12 percent, with a range of four to 24 percent across the markets they studied.²⁴ They found that the value of additional walkability is greater in more walkable cities.

Boyle, Barrilleaux, and Scheller critique some of the above-mentioned studies as identifying a spurious correlation between Walk Score and home prices.²⁵ They argue that past research on walkability, such as Cortright's study, ignores neighborhood effects; "controlling for neighborhood is important because it separates the effect of walkability from the effect of living in a better neighborhood."²⁶ In their study of the relationship between Walk Score and assessed home values in Miami, they find a positive correlation using OLS regression but no relationship after adding neighborhood-level fixed effects.

Most studies relating Walk Score to home prices focus on small geographical areas or a small sample of cities. This offers the advantage of being able to control for

²³ Joe Cortright. *Walking the Walk: How Walkability Raises Home Values in U.S. Cities*. CEOs for Cities. (2009). <http://www.reconnectingamerica.org/.../2009WalkingTheWalkCEOsforCities.pdf>.

²⁴ Spencer Rascoff and Stan Humphries. *Zillow Talk: The New Rules of Real Estate*. New York: Grand Central, 2015.

²⁵ Austin Boyle, Charles Barrilleaux, and Daniel Scheller. Does Walkability Influence Housing Prices? *Social Science Quarterly* 95: 3, September 2014.

²⁶ Ibid.

property attributes that would be prohibitively costly to control for in a nationwide study, such as crime, property taxes, and public services. Similarly, the neighborhood-level fixed-effects that Boyle, Barrilleaux, and Scheller employ would be difficult to replicate in a national sample of cities. However, studying the importance of Walk Score in select cities also carries the risk that the findings in one city are not generalizable to other real estate markets. For example, if the walkable neighborhoods in Gresham, Oregon happen to all be located in parts of the city that are located far from job centers, this could explain why residents are not willing to pay more for houses located in walkable neighborhoods and may explain the varying results between studies of Washington County and Gresham despite their proximity. Additionally, existing studies of walkability demonstrate a trend toward studying relatively walkable cities like Washington, DC with a Walk Score of 74 (defined as Very Walkable) and Portland with a Walk Score of 63 (defined as Somewhat Walkable)²⁷. Walk Score does not publicly provide a weighted Walk Score of Jefferson County, AL, but Rauterkus and Miller describe it as one of the most walkable areas in the state.²⁸

Localized studies offer some advantages that are not possible on a larger scale. For example, researchers can develop their own metrics for walkability, which may be more inclusive and accurate than Walk Score. Additionally, data collection at the municipal level may not be consistent across municipalities. For example, some cities notoriously underreport crime, an important factor in home prices. If this

²⁷ These were the Walk Scores of Washington and Portland as of October 12, 2015. <https://www.walkscore.com/>.

²⁸ Rauterkus and Miller. "Residential Land Values."

problem is consistent among neighborhoods within a city, it may not result in biased estimates of the value of walkability. However, when using multiple cities as data points, this will lead to biased estimates of walkability.

Despite the challenges of studying the value of walkability on a nationwide level, this research remains critical to informing the land use policies that determine what developers can build for their consumers. Portland is one of the most heavily studied cities with regard to walkability, but its urban growth boundary means that results from Portland may not be generalizable to other cities. Additionally, many of the other cities studied are relatively walkable for their geographic areas. A much broader study of the country's diverse cities will help to determine if this relationship holds up over cities of broader ranges of walkability.

One study of walkability in the United States has approached the walkability issue at a national level. Pivo and Fisher study a representative sample of commercial buildings in the United States.²⁹ Their sample includes retail, office, apartment, and industrial buildings. They determine that walkability results in higher values for all of these types of assets except for industrial properties, which typically reflect accessibility for trucks. They control for variables including building age and size, occupancy rate, population density, crime, transit accessibility, and commute time.

In 2013 Emily Washington used Walk Score data to publish the first nationwide study of the relationship between walkability and home values.³⁰ She

²⁹ Gary Pivo and Jeffrey Fisher. "The Walkability Premium in Commercial Real Estate Investments." *Real Estate Economics* 39:2, Summer 2011.

³⁰ Emily Washington (now Hamilton). "The Role of Walkability in Driving Home Values." *Leadership and Management in Engineering* 13:3. July 2013.
[http://ascelibrary.org/doi/full/10.1061/\(ASCE\)LM.1943-5630.0000222](http://ascelibrary.org/doi/full/10.1061/(ASCE)LM.1943-5630.0000222).

found that a one-point increase in Walk Score correlates with a 0.5% increase in house prices, indicating that consumers are willing to pay a premium to live in more walkable neighborhoods, even though these neighborhoods may come with the drawback of being less convenient for driving and parking. These findings indicate that land use regulations that restrict the supply of walkable housing may be making consumers worse off.

Section 3: Data

Our independent variable of interest is zip-code level Walk Score. We used a web scraping tool to gather Walk Score data for all of the zip codes in Core Based Statistical Areas (CBSAs) in 2012. The Census designation CBSA includes all of the zip codes in Micropolitan or Metropolitan Statistical Areas, or in other words, all of the zip codes that are not rural. We selected zip codes as our unit of analysis because of its availability through Walk Score and the feasibility of gathering a national sample. One potential limitation of using Walk Score to measure walkability is that in addition to capturing pedestrian access to commercial destinations, it's also capturing proximity to these amenities. Our estimates on the coefficient of Walk Score may reflect a preference for close access to amenities by any mode of transportation rather than walkability per se.

Walk Score provides the zip code score by calculating the score at the zip code's geographic center. For a single zip code, this score at the geographic center may differ significantly from what the zip code's weighted score would be. Over our

large sample, we expect that our observed zip-code centroid Walk Score is highly correlated with each zip code's unobserved weighted score. A key limitation of our dataset is that we're working with zip code averages for our independent and dependent variables. While this approach gives us the ability to collect a nationwide dataset, it also eliminates important variation in walkability, house prices, and our control variables such as number of variables and commute time. We make the tradeoff of accepting this limitation for the potential of a nationwide dataset. Using zip code averages introduces attenuation bias into our regressions, which would make our estimated coefficient tend toward zero and our results insignificant. Because the results in our key regression are significant, we do not attempt to correct for this possible attenuation.

Aside from Walk Score, our independent variables include number of rooms, age of housing, average commute time, zip code distance from the nearest central business district, average income, vacancy rate, and population density. These zip codes are spread across 539 CBSAs, a Census designation including both metropolitan and micropolitan statistical areas, and 738 counties. Our control variables for population density, average rooms, average age of buildings, average commute times, average income, and vacancy rate come from the Zip Code Tabulation Area data in the American Community Survey.³¹ We also control for zip

³¹ The American Community Survey data is presented as percentages of households in various ranges. For example, the lowest household income range is from 0 to \$10,000, and the highest is \$200,000 or higher. In order to use the data, we created weighted averages using the median of each band where possible (\$5,000 in the case of the lowest income band), and \$200,000 in the case of the highest band where it's not possible to use a median income for the range. For many zip codes, this method of estimation is downwardly biased for average rooms, average commute, average income, and average age of homes. While these estimates may be problematic for a study of these characteristics of zip

codes' distance to Central Business Districts using a tool developed by Matthew Holian and Matthew Kahn.³²

The dependent variable in our primary model is average per square foot house sale price from 2012, gathered from Zillow. For robustness, we also include a model with per square foot rental rates. These are also gathered from Zillow and reflect 2012 data. While Zillow provides the best available nationwide data set of average housing values at the zip code level, for our 2012 sample only 3,221 data points are available for home prices, and 5,956 data points are available for rental rates. Thus, the data for our dependent variable constrains our sample size.

Hedonic regressions of home prices often include variables on public amenities and disamenities such as public school quality and crime. Unfortunately nationwide data on these control variables isn't available at the zip code level. Our key regressions include county-level fixed effects that control for these variables at the level of this jurisdiction. An alternative would be to use core based statistical area-level (CBSA) fixed effects. CBSAs include metropolitan and micropolitan statistical areas, regions defined by the Office of Management and Budget based on regional economic ties. We rely on county-level fixed effects rather than CBSA-level fixed effects because of the ability to better control for policy variables at the county level while still accounting for the labor market control that the CBSA-level control

codes, we do not think that relatively minor downward bias in these measurements affects our general finding of a positive relationship between median house prices and Walk Score.

³² Holian, Matthew J., and Matthew E. Kahn. "Household carbon emissions from driving and center city quality of life." *Ecological Economics* 116 (2015): 362-368.

would provide. We do include a CBSA-level fixed effects specification as a robustness check.

We have a cross-sectional sample of data, all from 2012. The mean Walk Score is 17.2, and the mean estimated Zillow price per square foot is \$166.99. See Table 1 for all of our summary statistics.

Table 1: Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Walk Score	25,399	17.21	24.27	0	100
Total units	25,385	4,870.10	5,973.71	0	47,418
Vacant units	25,385	569.21	898.72	0	27,236
Population	25,385	11,618.49	14,839.33	0	115,538
Area (square miles)	24,044	69.41	154.0032	0.003	5,496.192
Population density (residents per square mile)	24,044	1,600.46	6,005.40	0	405,750
Price per square foot	3,221	166.99	135.8	16.57	1,921.62
Rent per square foot	5,956	1.15	1.42	0.078	75
Average rooms	25,053	5.75	0.78	1	9
Average commute	25,050	27.84	7.53	0	90
Average income	25,000	56,954.3	14,140.14	200	174,999.5
Average age	25,053	41.17	11.50	7	73
Average vacancy rate	25,053	0.15	0.15	0	1

Section 4: Model

In this paper we improve on the estimate of the walkability premium found in Washington's 2013 paper.³³ We use a fixed-effects model to test our hypothesis that consumers pay a premium to live in walkable neighborhoods. Like Pivo and Fisher, Cortright, and others we use Walk Score data as a proxy for walkability. Unlike the studies cited in our literature review, our unit of observation is zip codes. Our dependent variable is the median per-square-foot home sale price at the zip-code level.

Based on the widespread use of land use regulations that restrict the supply of walkable development, we hypothesize that consumers pay a premium to live in walkable zip codes. We use both an ordinary least squares and a fixed-effects model to test the relationship between walkability and housing prices. We begin with a simple OLS model testing the relationship between Walk Score and housing prices at the zip code level. In our first specification, with a sample of 2,995 zip codes we use:

$$\ln P_i = \beta_0 + \beta_1 W_i + \beta_2 D_i + \beta_3 N_i + \beta_4 C_i + \beta_5 T_i + \beta_6 I_i + \beta_7 A_i + \beta_8 V_i + \epsilon_i$$

where P is per-square-foot sale price, W is Walk Score, D is population density, N is average number of rooms, C is the zip code centroid's distance to the center point of it's nearest Central Business District, T is average commute time, I is average

³³ Ibid.

income, A is the average age of houses, and V is the vacancy rate. In this regression, we find a statistically insignificant relationship between Walk Score and home prices. The coefficients on density and average income are significant in the expected directions. The coefficients on distance from the CBD, average commute, and vacancy rate are insignificant. The coefficient on average age is positive and significant while we would expect consumers to pay more for newer homes than older homes, all else equal. Our full regression results are reported in Table 2.

Table 2: Ordinary Least Squares Regression Results

Log Zillow Price Per Square Foot	Coefficient	Robust Standard Error	<i>t</i>	<i>P</i> > <i>t</i>	[95% Confidence Interval]	
Walk Score	0.00036	0.00055	0.7	0.49	-0.0007	0.0015
Density	0.000017	2.20E-06	7.64	0	0.000013	0.000022
Average rooms	-0.33	0.047	-7.08	0	-0.42	-0.24
Distance (kilometers)	0.00016	0.0011	0.14	0.89	-0.002	0.0023
Average commute	0.0037	0.0042	0.88	0.38	-0.0045	0.012
Average income	0.00004	0.0000023	17.11	0	0.000035	0.000045
Average age	0.015	0.0024	6.36	0	0.01	0.02
Vacancy rate	0.46	0.26	1.78	0.076	-0.047	0.96
Constant	3.54	0.22	16.18	0	3.11	3.97

Note: Number of observations = 2,995; $F(8, 374) = 109.1$; Probability > $F = 0$; R -squared = 0.51; Root MSE = 0.41; Standard error adjusted for 375 clusters in county.

This specification has the obvious problem of not controlling for job market opportunities and other location-specific amenities and disamenities that are capitalized into the median home prices of zip codes, including labor market opportunities, cost of living, geography, public policy, etc. We believe that because

some of the country's most walkable cities are also some of the most productive cities³⁴ and they offer some of the most desirable consumption amenities³⁵, this estimate results in a downward bias on the coefficient for Walk Score. A fixed-effects model is the appropriate way to deal with the observable and unobservable factors that affect housing prices based on the jurisdiction that the house is located in. Starting with the same specification in the OLS model above, we add a fixed-effects model with 375 counties:

$$\ln P_{ij} = \beta_0 + \beta_1 W_{ij} + \beta_2 D_{ij} + \beta_3 N_{ij} + \beta_4 C_{ij} + \beta_5 T_{ij} + \beta_6 I_{ij} + \beta_7 A_{ij} + \beta_8 V_{ij} + \epsilon_i$$

As anticipated, here Walk Score's coefficient is positive at 0.11% and highly statistically significant. The R-squared here is 0.83, indicating that with the addition of the county-level fixed effects, our model explains the majority of the variation in housing prices. We don't have a strong hypothesis about whether or not average rooms should be positively correlated with price (people may prefer more rooms or more open floorplans), but our other coefficients have the expected sign with the exception of vacancy rate and average age, which both have unexpected positive signs. In the case of vacancy rate, this may be because some zip codes with very high vacancy rates also tend to be zip codes where a large percent of housing is vacation homes. Again, we find a positive, statistically significant estimate of the relationship

³⁴ Chang Tai-Hsieh and Enrico Moretti. "Housing Constraints and Spatial Misallocation." Berkely Working Paper. Forthcoming. <http://eml.berkeley.edu/~moretti/growth.pdf>.

³⁵ Edward Glaeser, *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier* (New York: Penguin, 2011), 242.

between the average age of housing and average per-square-foot prices. All else equal, we would expect people to be willing to pay more for newer housing. Our finding of the opposite relationship may be a result of desirable characteristics of older neighborhoods that are not fully captured by Walk Score. The full results of this fixed-effects specification are reported in Table 3.

Table 3: Fixed Effects Regression Results

Log Zillow Price Per Square Foot	Coefficient	Robust Standard Error	<i>t</i>	<i>P</i> > <i>t</i>	[95% Confidence Interval]	
Walk Score	0.0011	0.00036	2.92	0.004	0.00034	0.0018
Density	0.0000037	0.0000036	1.03	0.3	-0.0000034	0.000011
Average rooms	0.02	0.027	0.76	0.45	-0.032	0.073
Distance (kilometers)	-0.0035	0.0012	-2.97	0.003	-0.0059	-0.0012
Average commute	-0.029	0.0033	-8.8	0	-0.036	-0.023
Average income	0.000018	0.0000019	9.31	0	0.000014	0.000022
Average age	0.004	0.00095	4.19	0	0.0021	0.0058
Vacancy rate	1.22	0.31	3.93	0	0.61	1.83
Constant	4.3	0.17	25.46	0	3.97	4.63

Note: County absorbed (375 categories). Number of observations = 2,995; $F(8, 374) = 47.20$; Probability > $F = 0.0000$; R -squared = 0.85; Adjusted R -squared = 0.83; Root MSE = 0.25; Standard error adjusted for 375 clusters in county.

Following Rascoff and Humphries, we believe that the relationship between Walk Score and home prices may be non-linear; an additional point of walkability may be worth more in relatively walkable neighborhoods than in neighborhoods where most trips need to be made by car. To test for this non-linearity, we use the fixed-effects specification above using only the observations in our sample that have

a Walk Score of 70 or higher, or what Walk Score defines as Very Walkable. For this sample, we estimate that an additional point of Walk Score corresponds with a 0.56% increase in per square foot home prices. Our full regression results are reported in Table 4. The results in Table 3 understate the effect of Walk Score on price in Very Walkable neighborhoods but overstate it in neighborhoods with lower walkability.

Table 4: Fixed Effects Regression Results for Observations with Walk Score of 70 or Higher

Robust Log Zillow Price Per Square Foot	Coefficient	Robust Standard Error	<i>t</i>	<i>P</i> > <i>t</i>	[95% Confidence Interval]	
Walk Score	0.0056	0.0031	1.79	0.076	-0.00059	0.012
Density	0.000002	0.0000025	0.8	0.426	-0.0000029	0.0000068
Average rooms	-0.12	0.069	-1.81	0.073	-0.261	0.012
Distance (kilometers)	-0.041	0.0077	-5.37	0	-0.056	-0.026
Average income	0.00002	0.0000056	3.6	0.001	0.0000091	0.000031
Average age	0.0044	0.0032	1.34	0.182	-0.0021	0.011
Vacancy rate	0.82	0.5	1.67	0.099	-0.16	1.81
Constant	5.46	0.47	11.64	0	4.53	6.39

Note: County absorbed (98 categories). Number of observations = 380; $F(8, 374) = 23.04$; Probability > $F = 0.0000$; R -squared = 0.9; Adjusted R -squared = 0.86; Root MSE = 0.26; Standard error adjusted for 375 clusters in county.

We include two models to test our results for robustness. First, we use rental rates as a dependent variable rather than sale prices. Using rental rates, we find an even larger coefficient on Walk Score – that a one-point increase in the zip code’s average walkability corresponds with a 0.093% increase in rental rates, statistically significant at the 99% level. Finally, we use core based statistical areas as fixed effects rather than counties. We think that county fixed effects are appropriate because they provide a degree of control for public-policy driven amenities such as

public school quality and crime, factors with established effects on home prices. However, core based statistical areas have the benefit of being defined by organic labor markets rather than counties that tend to be larger in the West and smaller in the East. Using 178 Core Based Statistical Areas as the fixed effect rather than counties, we find that a one-point increase in Walk Score corresponds with a 0.061% increase in home prices. We report the full results of these robustness checks in Tables 5 and 6.

Table 5: Fixed Effects Regression Results for Walk Score on Rental Rates

Log Rent	Coefficient	Robust Standard Error	<i>t</i>	<i>P</i> > <i>t</i>	[95% Confidence Interval]	
Walk Score	0.00097	0.0001	4.92	0	0.00058	0.0014
Density	0.0000012	0.00000057	2.09	0.037	0.000000071	0.0000023
Average rooms	-0.047	0.018	-2.54	0.011	-0.083	-0.01
Distance (kilometers)	-0.00054	0.00075	-0.73	0.47	-0.002	0.00092
Average commute	-0.024	0.0021	-11.3	0	-0.028	-0.02
Average income	0.0000075	0.0000009	8.37	0	0.0000058	0.0000093
Average age	-0.0016	0.0007	-2.28	0.023	-0.003	-0.00022
Vacancy rate	1.24	0.31	3.96	0	0.62	1.85
Constant	0.37	0.098	3.8	0	0.18	0.57

Note: County absorbed (623 categories). Number of observations = 5,512; $F(8, 622) = 53.65$; Probability > $F = 0$; R -squared = 0.82; Adjusted R -squared = 0.79; Root MSE = 0.2; Standard error adjusted for 623 clusters in county.

Table 6: Regression Results Using CBSA Fixed Effects

Log Price Per Square Foot	Coefficient	Robust Standard Error	<i>t</i>	<i>P</i> > <i>t</i>	[95% Confidence Interval]	
Walk Score	0.00061	0.00035	1.77	0.078	-0.00007	0.0013
Density	0.000014	0.0000031	4.51	0	0.000008	0.00002
Average rooms	0.00084	0.032	0.03	0.98	-0.063	0.065
Distance (kilometers)	-0.0039	0.00091	-4.29	0	-0.0057	-0.0021
Average commute	-0.028	0.0035	-8.15	0	-0.035	-0.021
Average income	0.000019	0.0000025	7.79	0	0.000014	0.000024
Average age	0.004	0.0015	2.63	0.009	0.001	0.007
Vacancy rate	1.25	0.36	3.48	0.001	0.54	1.96
Constant	4.27	0.2	21.14	0	3.87	4.67

Note: CBSA absorbed (178 categories). Number of observations = 2,995; $F(8, 177) = 49.59$; Probability > $F = 0$; R -squared = 0.1; Adjusted R -squared = 0.79; Root MSE = 0.27; Standard error adjusted for 178 clusters in CBSA.

Our findings stand in contrast to Boyle, Barrilleaux, and Scheller's study of Miami, Florida, and Price and Greene's study of Gresham, Oregon. Boyle et al. argue that past work that has failed to control for neighborhood effects has identified a spurious correlation between home prices and Walk Score because people with high incomes both tend to purchase relatively expensive homes and tend to prefer to live in amenity-rich neighborhoods that happen to have high Walk Scores. In our study, the unit of observation is the neighborhood, as defined by zip codes, so we do not run the risk of erroneously attributing house price differences to Walk Score rather than to neighborhood characteristics. After controlling for hedonic factors that affect median home prices across zip codes, we find that consumers place a premium on zip codes that are more walkable in a fixed-effects model. Our findings provide reason to question whether or not results on the price effect of walkability in a single city are

generalizable. We find evidence that across a national sample, homebuyers are willing to pay more for houses with higher Walk Scores.

Conclusion

Our results indicate that, contrary to the narrative that Smart Growth regulations force people to live in denser, less drivable neighborhoods than they would prefer, in fact consumers are willing to pay a premium for walkability under the current regulatory environment. If city or state governments took steps to deregulate or set limits on the proliferation of land use regulation, developers would find opportunities to profit from building more walkable development, benefitting consumers by allowing more people to live in the type of walkable development they prefer at a lower price premium.

The relatively recent policy tools of urban growth boundaries, parking maximums, and minimum density requirements require developers to build more walkable development than they otherwise might. While critics of these Smart Growth policies correctly argue that policies requiring walkable development have the potential to distort the market and harm consumers, our study demonstrates that traditional zoning currently has a larger effect in restricting the supply of available walkable development. Because density restrictions, parking requirements, and setback requirements limit the availability of housing in walkable neighborhoods, consumers who prefer walkable development have to pay a premium for it. Walkable development is not without tradeoffs. Typically, walkable neighborhoods come at the

expense of conveniences such as readily available parking, ample private yards, and peace and quiet. In spite of these downsides of walkable neighborhoods, consumers are willing to pay a premium to live in more walkable places.

This paper builds on Cortright, Song and Knapp, Leinberger and Alfonzo, and Washington, providing further evidence that consumers value walkability and that in a free market, we would see a larger supply of walkable development. Of this past research, ours is most similar to Cortright's study that tests the relationship between home prices and Walk Score in 15 cities, finding that in 13 of these cities consumers pay a premium for walkability. Cortright finds that consumers pay \$4,000 to \$34,000 more for a home in a neighborhood of above average walkability, relative to homes in locations of average walkability. His findings are in line with our findings of the nationwide walkability premium, where we find that a one-point increase in Walk Score commands a .14% price premium. In other words, a zip code with a Walk Score of 100 could be expected to command a 14% premium relative to an otherwise comparable zip code with a Walk Score of 0.

The walkability premium indicates that, on net, consumers would be better off with fewer regulations restricting the supply of walkable development, including parking requirements, setback requirements, and density restrictions. Because the current regulatory environment restricts the quantity of walkable development that home builders are allowed to provide, consumers pay a premium for this housing attribute that they value. Without these restrictions in place, home builders would face an opportunity to profit by increasing the supply of walkable development. This higher quantity of walkable housing would increase the number of people who are

able to live in walkable neighborhoods and lower the premium that they would have to pay for the privilege.

CHAPTER 2: INCLUSIONARY ZONING AND HOUSING MARKET OUTCOMES

Section 1: Introduction

Inclusionary zoning (IZ) is a policy under which local governments require or incentivize real estate developers to provide some below-market rate housing units in new housing developments. IZ proponents promote it as a tool to address the important public policy concern of access to housing at prices that are affordable to households of diverse income levels. Its name indicates that its creators view IZ as an antidote to exclusionary zoning policies. Exclusionary zoning rules include minimum lot size requirements, multifamily housing bans, and other rules that limit the supply of housing in a jurisdiction, thereby driving up housing prices.³⁶

While IZ may be intended to address the serious consequences of other land-use regulations that limit housing supply and drive up prices, economic theory predicts that IZ could actually exacerbate regulatory constraints on housing supply. As legal scholar Robert Ellickson explains, IZ is a tax on the construction of new housing units and a price ceiling on the units that must be set aside at below-market

³⁶ Sanford Ikeda and Emily Washington (now Hamilton). “How Land-Use Regulation Undermines Affordable Housing.” (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington VA, November 2015).

rates.³⁷ Both of these factors can be expected to reduce the quantity of housing supplied, resulting in higher prices for units that are available at market rates.

IZ programs vary widely in design. Many jurisdictions offer developers density bonuses in exchange for the provision of set-aside units. This allows more market-rate units to be built than would otherwise be permitted, offsetting some or all of the cost of providing below-market-rate units. These density bonuses will be more valuable where market-rate prices are higher and where other land use regulations are more binding. If the value of these density bonuses outweighs the cost of providing below-market-rate units, the real-world effects of IZ could be the opposite of Ellickson's predictions.

As a further complication, in some cases, IZ units are required to serve households making up to 120 percent of their region's median income, and little rent reduction may be required relative to market rents. In these cases, IZ may have little effect on development outcomes. In other cases when IZ units are required to serve very-low-income households, they may be a large tax on development.

While Ellickson describes mandatory IZ programs that require developers to set aside affordable units as a condition of building new housing, some jurisdictions have optional IZ programs under which developers may provide affordable units in exchange for a density bonus. Some past empirical work on the effect of IZ on housing markets has not distinguished between the effects of mandatory and optional IZ programs, but theory says they should have different effects. Mandatory IZ may be

³⁷ Robert Ellickson. "The Irony of Inclusionary Zoning." Yale Law School Legal Scholarship Repository. January 1981.

a tax on new housing if the cost of providing below-market rate units exceeds the benefit to developers of density bonuses or other offsets. Optional IZ, however, allows developers to participate in the program if they the value of the density bonuses exceeds the cost of providing subsidized units. The introduction of optional IZ should either subsidize housing relative to a jurisdiction's status quo or have no effect if developers elect not to participate in the program.

In this paper, I review the empirical and theoretical evidence of the effects of IZ on housing market outcomes and contribute a new analysis of the effects of IZ on house prices and new housing supply in the Baltimore-Washington region. The following section will review the literature on the effects that IZ has on house prices and the supply of new housing. The next section describes the history and growth of IZ in the Baltimore-Washington region. The next section explores how economic theory predicts IZ programs of various designs can be expected to affect house prices and new housing supply. The following section explains my dataset and data gathering process. In the following section I explain the results of my empirical model, in which I use a difference-in-difference study design to estimate the effects of IZ in the Baltimore-Washington region on house prices and new housing supply. Building on past empirical work on IZ, I distinguish between mandatory and optional programs, which have different expected effects on market outcomes, and I use a spatial model to account for IZ's potential cross-border effects. I find some evidence that IZ raises prices, but none that it decreases housing supply. The final section concludes.

Section 2: Literature Review

While IZ programs continue to proliferate³⁸, their effect on housing market outcomes remains in debate. IZ advocates often promote two key goals for these programs: 1) promoting mixed-income buildings as a tool to reduce socioeconomic segregation, and 2) serving a population that may struggle to afford market-rate rents in their neighborhood or jurisdiction of choice (particularly new-construction housing), but who are not recipients of other public assistance for housing that is typically targeted toward a lower-income population. In her testimony on New York City's IZ program, legal scholar Deputy Mayor of Housing and Economic Development for New York City Vicki Been explains the program will "stretch our public dollars so that we can devote more public funds to the most critical needs, will enhance neighborhood economic diversity, and allow mobility among our neighborhoods, thereby reducing inequality."³⁹

On the other hand, critics of IZ suggest that Ellickson's analysis of its effects on the housing market are correct; IZ comes with the cost of taxing new development, reducing supply, and increasing market-rate house prices. IZ undoubtedly benefits the households that receive below-market-rate units, but if these benefits to a small percent of generally middle-income households come at the cost of increased housing

³⁸ One study identifies 547 programs in the United States, most of which were adopted in the 2000s. See Brian Stromberg and Lisa Sturtevant, "What Makes Inclusionary Zoning Happen?" National Housing Conference, May 2016, http://media.wix.com/ugd/19cfbe_2b02286eba264acd872fd2edb3d0cb8f.pdf.

³⁹ Vicki Been. "Testimony of Vicki Been, Commissioner of the Department of Housing Preservation and Development City Planning Commission." December 16, 2015. <https://www1.nyc.gov/assets/hpd/downloads/pdf/community/vicki-been-testimony-cpc.pdf>.

scarcity and higher prices for everyone not receiving IZ units, the programs likely exacerbate the problems they are trying to help.

Only four studies have used causal inference methods to measure the effect of IZ on broader housing market outcomes. This literature is likely small because of the difficulty of gathering data on IZ policy across permitting jurisdictions. Three of the four studies examine the effects of IZ across California localities, and one uses data from the Bay Area and the Boston region.

Bento et al. use a two-way fixed effects model to measure the effects of IZ on housing starts, the percentage of housing starts that are single-family versus multifamily, the prices of new homes, and the size of new homes.⁴⁰ They find that IZ causes prices to increase 2 to 3 percent faster relative to jurisdictions without the policy, but that IZ did not decrease housing starts. They find that IZ reduced the size of new single-family homes, and led to a larger portion of new construction being multifamily rather than single family. The authors characterize their findings: “The results are fully consistent with economic theory and demonstrate that inclusionary zoning policies do not come without costs.”⁴¹

Ann Hollingshead also studied IZ in California, looking at the effect of a state court ruling that found that IZ programs without density bonuses or other offsets violated a state prohibition on local rent control. This ruling reduced the tax effect of IZ by leading some jurisdictions to increase their density bonuses and to transition

⁴⁰ Antonio Bento, Scott Lowe, Gerrit-Jan Knaap, & Arnab Chakraborty, “Housing Market Effects of Inclusionary Zoning,” 11(2) Cityscape 7 (2009).

⁴¹ Ibid.

from mandatory to optional programs.⁴² Hollingshead does not find that reducing the burden of IZ programs led to a reduction in house prices.

Schuetz et al. study of the effects of IZ in the Boston area and the Bay Area on the single-family home market.⁴³ They use a model with jurisdiction fixed effects, time trends, and a control for whether or not house prices were appreciating during a given year. In the Boston area, they find that the implementation of IZ rules has corresponded with higher housing prices and reduced construction rates during times of regional house price appreciation, but not during soft markets. In the Bay Area, Schuetz et al. find that as in Boston, IZ corresponds with more rapidly rising house prices during periods of market appreciation, but that it decreases prices during soft markets.⁴⁴ They find no evidence of a relationship between IZ and housing supply in the Bay Area.⁴⁵

Tom Means and Edward Stringham use a first difference model to estimate the effect of IZ on California housing markets, controlling for the number of years that each jurisdiction has had an IZ program in place.⁴⁶ They find significant and large effects of IZ increasing house prices and reducing new housing supply, and they

⁴²Ann Hollingshead, *When and How Should Cities Implement Inclusionary Housing Policies?* (Berkeley, CA: Cornerstone Partnership, 2015), <http://www.monroecountyem.com/DocumentCenter/View/9447/Implement-Inclusionary-2015-APA2?bidId=>.

⁴³ Jenny Schuetz, Rachel Meltzer, & Vicki Been, *Silver Bullet or Trojan Horse? The Effects of Inclusionary Zoning on Local Housing Markets in the United States*, 48 *Urb. Stud.* 297 (2011).

⁴⁴ *Ibid.*

⁴⁵ *Ibid.*

⁴⁶ Tom Means and Edward P. Stringham, “Unintended or Intended Consequences? The Effect of Below-Market Housing Mandates on Housing Markets in California” *Journal of Public Finance and Public Choice*, 30(1-3): 39-64.

find that IZ's effect on house prices has increased over time. Their work builds on Benjamin Powell and Stringham's case study work on IZ in California.⁴⁷

Section 3: History of Inclusionary Zoning in the Baltimore-Washington Region

In 1971, Fairfax County, VA adopted the country's first ordinance that required developers to build below-market-rate housing as a condition of building market-rate housing. The program did not offer a density bonus or other regulatory reduction to offset the cost of providing subsidized units.⁴⁸ Following the rule's implementation, the development company DeGroff Enterprises, Inc. sued the county for takings without just compensation. Their case reached the Virginia Supreme Court in 1973. The Court overturned the county's IZ ordinance, finding that IZ was not a power granted to local governments under the state's zoning enabling act and that the requirement was a regulatory taking without compensation.⁴⁹

Following this decision, the Virginia General Assembly passed two new sections to the Code of Virginia that enabled localities to implement IZ programs. The first, Va. Code Ann. §15.2-2304, applies specifically to Albermarle, Arlington, Fairfax, and Loudoun counties, and Alexandria and Fairfax cities.⁵⁰ These

⁴⁷ Benjamin Powell and Edward Stringham. "Housing Supply and Affordability: Do Affordable Housing Mandates Work?" Reason Policy Study 318, (2004).

⁴⁸ Housing Virginia, "Welcome to the Neighborhood: A Practitioner's Guide to Inclusionary Housing," September 2017, http://www.housingvirginia.org/wp-content/uploads/2018/07/HV_Inclusionary_Guidebook.pdf.

⁴⁹ Ibid.

⁵⁰ Code of Virginia, Title 15.2. Counties, Cities and Towns, Subtitle II. Powers of Local Government, Chapter 22. Planning, Subdivision of Land and Zoning, Article 7. Zoning, § 15.2-2304. Affordable dwelling unit ordinances in certain localities, , <https://law.lis.virginia.gov/vacode/title15.2/chapter22/section15.2-2304/>.

jurisdictions are permitted to implement IZ programs that include density bonuses in exchange for below-market-rate units or other incentives to compensate developers for at least some of the cost of the affordable units.⁵¹ The second, Va. Code Ann. §15.2-2305 enables all of the state’s municipalities to implement IZ programs for projects that receive a rezoning or otherwise don’t comply with their jurisdiction’s by-right development. Programs allowed by §15.2-2305 must have affordability set-asides that are not more than 57 percent of the density bonus they offer (in other words, if a project requires 57 income-restricted units, the density bonus would have to allow the developer to build at least 100 additional units than they would be allowed under the baseline zoning). Additionally, the number of IZ units required may not exceed 17 percent of the total units in a new development.

In addition to the IZ programs specifically enabled by Va. Code Ann. §15.2-2304 and §15.2-2305, any Virginia municipality may enact optional IZ programs. Under these programs, developers are not required to build below-market-rate housing as a condition of building market-rate housing even under a rezoning; however, jurisdictions may offer incentives such as density bonuses to developers that choose to provide below-market-rate housing.

Shortly after Fairfax County’s original IZ program was found to violate the Virginia constitution, Montgomery County implemented its Moderately Price Dwelling Unit (MPDU) program in 1974.⁵² It’s now the longest-running IZ program

⁵¹ Housing Virginia, “Welcome to the Neighborhood.”

⁵² Jurisdictions use various terms to refer to requirements or incentives for developers to provide below-market-rate housing. Aside from MPDU programs, other terms include bonuses for Affordable Dwelling Units or Workforce Dwelling Units. I refer to all of these programs as IZ throughout.

in the region and the country. Montgomery County's program has been held up as an example of successful IZ frequently.⁵³

In 2004 Montgomery County policymakers made a few changes to the MPDU program.⁵⁴ They increased the affordability period for IZ units from 20 to 99 years for rental units and from 10 to 30 years for owner-occupied units. At the same time, the County reduced the project size that triggers MPDU requirements from 35 to 20 units and adopted a 20 percent density bonus for projects that include MPDUs. The reform also began allowing the affordable units to be provided off site in some cases.

Most of the permitting in the Baltimore-Washington region is done at the county level, but some cities and towns are also permitting jurisdictions. Today, among the 26 permitting jurisdictions in Maryland within the Baltimore-Washington region, 14 have IZ programs, five of which are optional programs. Of the 28 Virginia permitting jurisdictions that are part of the Baltimore-Washington region, eight have adopted IZ programs, four of which are optional. The District of Columbia adopted a mandatory IZ policy in 2009. The map below shows mandatory and optional IZ programs across the region as of 2017.

⁵³ Diane K. Levy et. al, "Expanding Housing Opportunities Through Inclusionary Zoning: Lessons From Two Counties," December 2012, https://www.huduser.gov/portal/Publications/pdf/HUD-496_new.pdf.

⁵⁴ Montgomery County, Montgomery County Code, Chapter 25A. Housing, Moderately Priced, [http://library.amlegal.com/nxt/gateway.dll/Maryland/montgom/partiilocallawsordinancesresolutionsetc/chapter25ahousingmoderatelypricednote?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:montgomeryco_md_mc\\$anc=JD_Chapter25A](http://library.amlegal.com/nxt/gateway.dll/Maryland/montgom/partiilocallawsordinancesresolutionsetc/chapter25ahousingmoderatelypricednote?f=templates$fn=default.htm$3.0$vid=amlegal:montgomeryco_md_mc$anc=JD_Chapter25A).

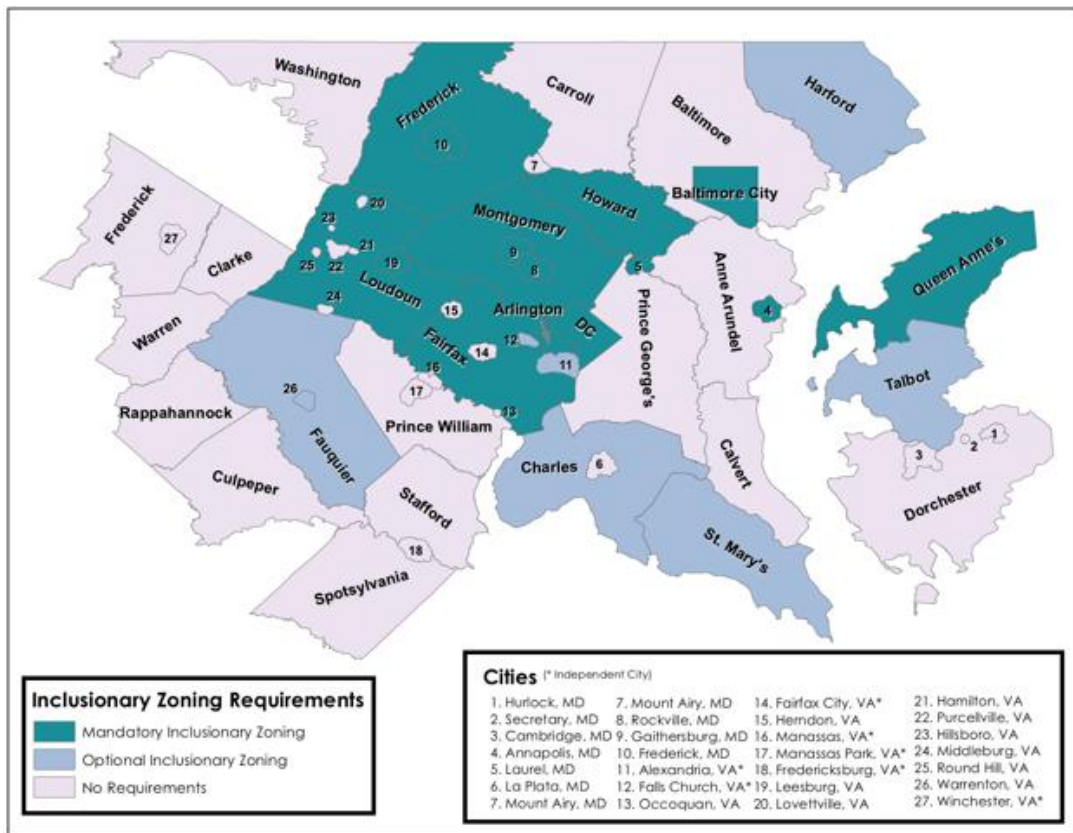


Figure 155: Jurisdictions with Mandatory and Optional Inclusionary Zoning Programs, 2017

Aside from the court ruling that ended Fairfax County’s first IZ program, Prince George’s County, Maryland is the only locality in the region that implemented and then abolished an IZ program. In 1991 the county adopted an IZ program that applied to portions of the jurisdiction. County policymakers repealed the program in 1996 because, as a Brookings Institution report describes, county officials “believed that Prince George’s County had more than its fair share of the region’s affordable

⁵⁵ Figure by Nolan Gray.

housing.”⁵⁶ With this exception, the prevalence of regional IZ programs has increased steadily over time. The chart below shows the number of IZ policies in the region over time.

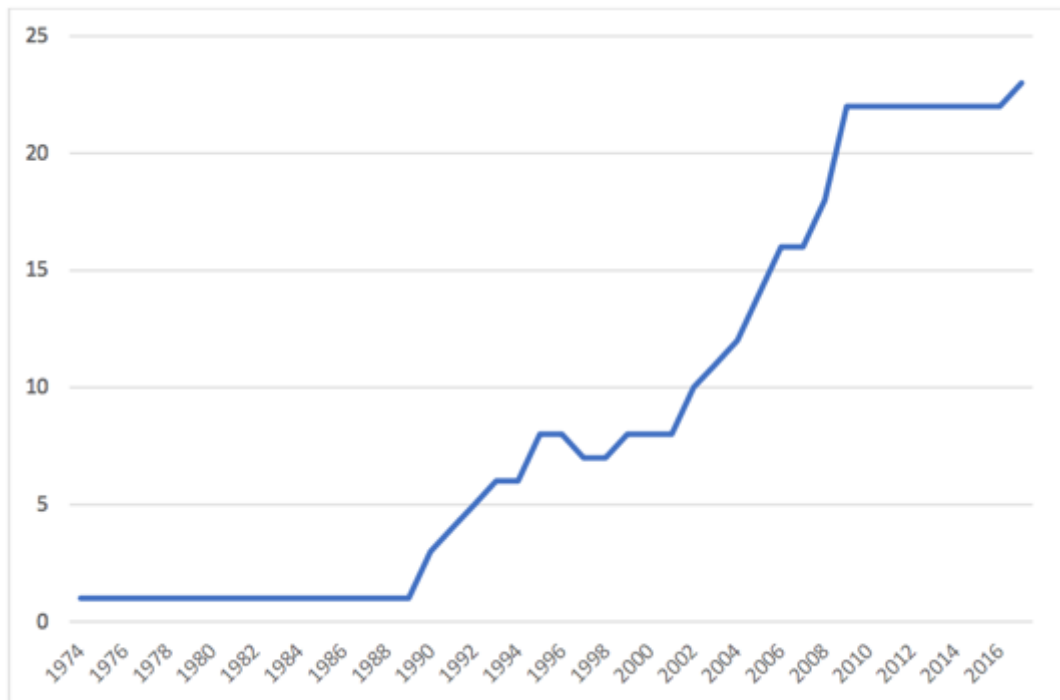


Figure 2: Number of Jurisdictions with Inclusionary Zoning in the Baltimore-Washington Region, 1974–2017. Source: Data are gathered from the zoning ordinances of the permitting jurisdictions in the Baltimore-Washington region.

⁵⁶ Karen Destorel Brown, “Expanding Affordable Housing through Inclusionary Zoning: Lessons from the Washington Metropolitan Area,,” The Brookings Institution center on Urban and Metropolitan Policy, October 2001. <https://www.brookings.edu/wp-content/uploads/2016/06/inclusionary.pdf>.

Localities in the region have indicated awareness and concern about how their IZ programs affect market outcomes. In 2015, five years after Washington, DC adopted a mandatory IZ program, local organizations, the Coalition for Smarter Growth and the DC Fiscal Policy Institute, proposed amendments to the program that would require a larger percentage of IZ units and would target rental IZ units to households earning 60% of AMI rather than 80%.⁵⁷ They pointed out that housing affordable to residents earning 80% of AMI is available on the private market, whereas households earning 60% of AMI struggle to find housing that is affordable to them. They also demonstrated that following the adoption of IZ in the District, new housing supply continued its recovery following the 2008 financial crisis, providing evidence that the original program wasn't a tax on development, or at least not such a tax that it choked off new construction drastically. In response to their proposal, the Office of Planning revised its IZ program to require rental IZ units to be affordable to households earning 60% of AMI, but kept the number of units required at eight to ten percent of new units in projects covered by IZ requirements.

The recommendation to reduce the income limits for IZ units in DC was based on a model showing the expected value of bonus density more than offset the cost of providing set-aside units under the original IZ program.⁵⁸ In adopting changes to increase the cost of subsidized units relative to bonus density, DC policymakers seemed to be seeking an IZ policy that produced as much income-restricted housing

⁵⁷ Claire Zippel and Cheryl Cort, "Petitioner Statement in Support for Zoning Case No. 04-33G," <https://www.smartergrowth.net/wp-content/uploads/2016/03/2016.3.3-Petitioner-statement-for-ZC-No-04-33G-IZ.pdf>

⁵⁸ Ibid.

as possible while maintaining roughly the same amount of development that was permitted under its zoning regime prior to the adoption of IZ.

Aside from the distinction between mandatory and optional IZ program, IZ policy varies widely across regional jurisdictions. Most of the regional jurisdictions with IZ programs offer density bonuses for affordable units, with the exception of Howard County, Maryland and Gaithersburg, Maryland. The density bonuses that developers receive as a condition of providing affordable housing range from 10 to 100 percent of density that would be permitted without IZ. In suburban jurisdictions, these density bonuses generally mean a reduction in minimum lot size requirements.

Following others in the IZ literature, I define IZ units that must be affordable to households making 50 percent or less of the area median income (AMI) as applying to low-income households and those that must be affordable to households making less than 30 percent of the AMI as applying to very-low-income households. Until 1990, no IZ programs in the region included requirements to serve low- or very-low income households, but the number of IZ programs requiring set-asides for lower-income households has increased steadily since then. Figure 3 shows this trend over time.

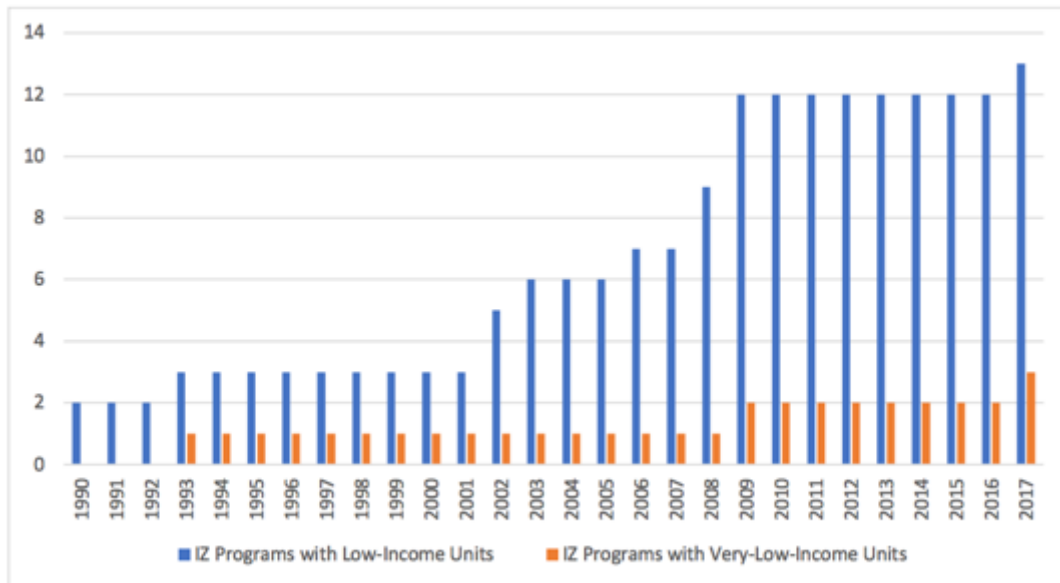


Figure 3: Number of Inclusionary Zoning Programs that Require Units Affordable to Low- and Very-Low-Income Households, 1990–2017. Source: Data are gathered from the zoning ordinances of the permitting jurisdictions in the Baltimore-Washington region.

Table 7 provides additional detail on some of the key details on the IZ programs in place in the region as of 2017. I gathered all of the data on IZ mandates and the details of programs from county land-use ordinances and special reports from counties on IZ and affordable housing. In some cases where these sources were ambiguous or incomplete, I contacted planning offices for clarification via phone or email.

Table 7: IZ Policies in the Baltimore-Washington Region

Jurisdiction	Years IZ in place as of 2017	Mandatory IZ	Number of units that triggers IZ program	IZ units required	Applies to households earning 50% or less of AMI	Applies to households earning 30% or less of AMI	Payment to jurisdiction allowed in lieu of IZ units	IZ units may be provided off-site	Maximum density bonus
Alexandria County, VA	23	No	5	9.0%	No	No	Yes	Yes	30%
Annapolis, MD	14	Yes	10	6.0%	No	No	Yes	No	15%
Arlington County, VA	13	Yes	50	5.0%	No	No	Yes	Yes	25%
Baltimore, MD	9	Yes	30	10.0%	Yes	Yes	Yes	Yes	20%
Charles County, MD	26	No	50	12.0%	No	No	No	No	100%
Fairfax County, VA	28	Yes	50	12.0%	Yes	No	Yes	Yes	20%
Falls Church, VA	16	No	0	6.0%	Yes	No	Yes	No	20%
Fauquier County, VA	23	No	2	20.0%	No	No	No	No	100%
Frederick County, MD	15	Yes	25	12.0%	Yes	No	Yes	Yes	22%
Frederick, MD	9	Yes	25	12.5%	No	No	No	No	22%
Gaithersburg, MD	12	Yes	20	15.0%	Yes	No	Yes	No	0%
Harford County, MD	9	No	0	10.0%	Yes	No	No	No	20%
Howard County, MD	19	Yes	0	10.0%	No	No	Yes	Yes	0%
Laurel, MD	10	Yes	50	6.0%	Yes	No	No	No	6%

(continued on next page)

Table 7: IZ Policies in the Baltimore-Washington Region (Continued)

Jurisdiction	Years IZ in place as of 2017	Mandatory IZ	Number of units that triggers IZ program	IZ units required	Applies to households earning 50% or less of AMI	Applies to households earning 30% or less of AMI	Payment to jurisdiction allowed in lieu of IZ units	IZ units may be provided offsite	Maximum density bonus
Leesburg, VA	10	Yes	24	6.3%	Yes	No	Yes	No	20%
Loudoun County, VA	25	Yes	50	6.3%	Yes	Yes	Yes	No	20%
Montgomery County, MD	44	Yes	20	12.5%	No	No	Yes	Yes	20%
Queen Anne's County, MD	13	Yes	20	10.0%	No	No	Yes	Yes	10%
Rockville, MD	29	Yes	50	12.5%	Yes	No	No	Yes	22%
St. Mary's County, MD	16	No	0	12.0%	Yes	No	No	No	10%
Talbot County, MD	12	No	0	50.0%	No	No	No	No	100%
Warrenton, VA	1	No	2	0.0%	Yes	Yes	No	No	100%
Washington, DC	9	Yes	10	8.0%	Yes	No	No	No	20%

IZ programs in the region have varied widely in the number of income-restricted units they have produced. Among the jurisdictions with optional IZ programs, only Alexandria, Virginia, and Falls Church, Virginia, have produced any units. In addition to offering density bonuses in exchange for subsidized units, the Alexandria rule gives planners discretion to reduce parking requirements.⁵⁹ In jurisdictions where land is expensive, complying with parking requirements presents a large cost to developers, so this may be a particularly valuable offset.⁶⁰ Falls Church offers a reduction of development fees in addition to density bonuses in exchange for affordable units.

Relative to other jurisdictions with optional IZ programs, Alexandria and Falls Church have high house prices. Among my full sample, the median per square foot house price in 2017 is \$206. Among those with IZ, it's \$239. Among the jurisdictions with mandatory versus optional programs, the medians are \$247 and \$210, respectively. The median price in Alexandria is \$361 per square foot and in Falls Church it is \$417, both well above the typical jurisdiction with an optional IZ program. These high prices are owing in large part to the jurisdictions' otherwise exclusionary zoning. Large parts of both municipalities permit only single family, detached development.

Alexandria's and Falls Church's limitations on the rights to build housing give their density bonuses value. Because they permit much less housing than what developers

⁵⁹ Alexandria, VA, Zoning Ordinance, City of Alexandria, VA, Zoning, Article VII: Supplemental Zone Regulations, Sec. 7-700 - Allowance for increases in floor area ratio, density and height and reductions in required off-street parking as incentive for provision of low- and moderate-income housing.

https://library.municode.com/va/alexandria/codes/zoning?nodeId=ARTVIIISUZORE_S7-700ALINFLARRADEHEREREOREPAINPRLODCOHO

⁶⁰ Donald C. Shoup, "The High Cost of Free Parking," *Journal of Planning Education and Research* 17 (1997): 3–20

would provide absent land use regulations, developers are willing to provide affordable housing in exchange for the right to build very valuable market-rate housing. In other jurisdictions with optional programs, typical land use regulations are likely less binding, so density bonuses are less of an incentive for providing subsidized units. In these jurisdictions the value of the density bonuses may not outweigh the cost of providing below-market-rate units.

On the whole, the ratio of density bonuses relative to below-market-rate units that optional IZ programs would require is much larger than under mandatory programs. Alexandria and Falls Church have larger density bonuses and require fewer IZ units than the typical mandatory IZ program. This provides some evidence that density bonuses under the region's mandatory programs are not large enough to offset the cost of providing IZ units, particularly considering that Alexandria's program, with high density bonuses relative to the typical mandatory program, has delivered only 17 IZ units per year on average, and Falls Church has delivered fewer than 5 units per year on average. However, this evidence is also consistent with density bonuses in the jurisdictions with optional programs offering little value because their existing zoning does not constrain housing supply significantly. Figure 4 shows average IZ unit requirements and density bonuses for all optional programs, mandatory programs, and optional programs that have produced IZ units.

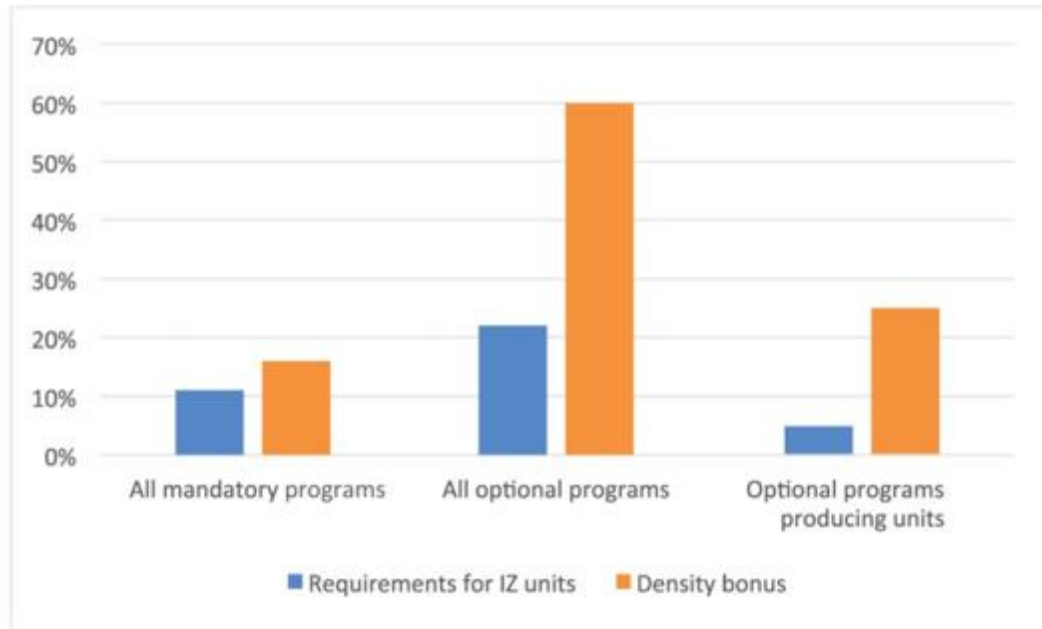


Figure 4: Mean Inclusionary Zoning Requirements and Density Bonuses across Program Types. Source: Author's calculations, based on data gathered from the zoning ordinances of the permitting jurisdictions in the Baltimore-Washington region.

Over half of the IZ units in the entire region have been built in Montgomery County (15,660 out of 26,733 units). This is partly a result of the program's long history, but Montgomery County's program is also the most productive on an annual basis. Figure 5 below shows the production of IZ units by jurisdiction, per year the IZ program has been in place.

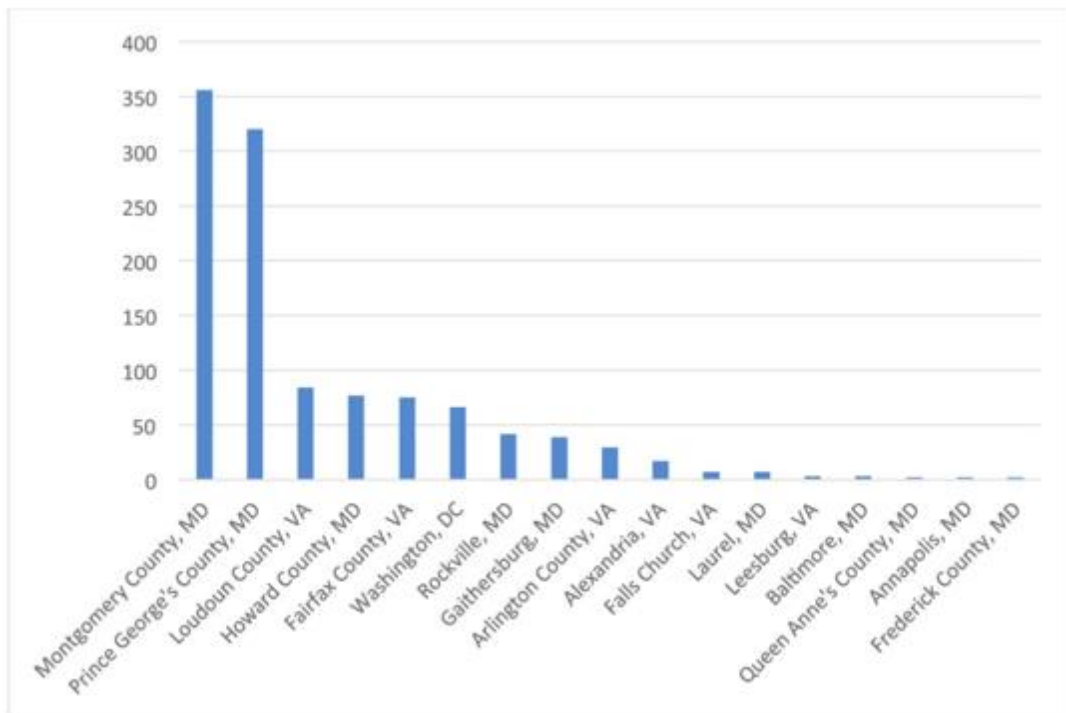


Figure 5: Inclusionary Zoning Units Produced under the Baltimore-Washington Region's IZ Programs per Year of Program, 1974–2017. Source: Data are gathered from permitting jurisdictions' reports on their IZ programs, supplemented with conversations with planning staff where necessary.

One complicating factor in studying the effect of IZ on overall housing supply and prices is that many jurisdictions' IZ programs give city planners wide discretion to determine requirements on a site-by-site basis. For example, many of the large multifamily buildings permitted since Washington, DC adopted IZ have received approval through the city's Planned Unit Development (PUD) process that allows projects to be built that deviate from the city's by-right zoning. When developers receive approvals through the PUD process, they are required to provide a benefits and amenities package to the project's neighborhood. Often these packages include more affordable

housing units, and units that are affordable to lower-income households, than would otherwise be required under the city's IZ ordinance. The requirement to provide additional affordable units as a result of negotiations between the developer, the city's Zoning Board of Adjustments, and other vested interests, are not reflected in the *de jure* ordinances.

Additionally, local policymakers have often granted themselves discretion to waive IZ requirements on a project-by-project basis. Baltimore city's IZ program has produced only 27 units since it went into effect in 2009. The city's IZ ordinance provides for a 20 percent density bonus, but if developers are able to show that this bonus does not compensate them for the cost of providing the IZ units, they can receive waivers from complying with the requirement.⁶¹ As a result of these waivers, the IZ units produced have fallen far short of what the ordinance would seem to require, and the program is having less of an effect on the city's housing market as a whole.⁶²

Thirteen jurisdictions allow developers to pay fees rather than providing affordable units in a mixed-income building. In some cases, the revenue raised by these programs has become unmoored from the narrow goals that are typically associated with IZ. Arlington County, VA has collected more fees-in-lieu of IZ units than any other in the region. The fees collected from developers go into the county's Affordable Housing Trust Fund. These funds are used to build homeless shelters and projects that consist of entirely

⁶¹ Baltimore City Department of Legislative Reference, Article 13 Housing and Urban Renewal (As Last Amended by Ord. 16-503). <http://legislativereference.baltimorecity.gov/sites/default/files/Art%2013%20-%20Housing.pdf>.

⁶² Natalie Sherman. "Despite rule, few affordable units created in new developments," *The Baltimore Sun*, December 27, 2014. <https://www.baltimoresun.com/news/maryland/sun-investigates/bs-bz-inclusionary-housing-20141227-story.html>.

subsidized housing. In these cases, fees collected don't meet typical IZ objectives of supporting mixed-income housing, but they are in line with the County's stated goal of directing subsidies for its least-well-off individuals.⁶³

Finally, in some cases, the complex array of an IZ program's taxes and subsidies have little effect on ultimate rent prices for IZ units relative to market-rate units. For example, one Washington, DC project built in 2016 includes units affordable to households earning 30 percent, 60 percent, 100 percent, and 120 percent of AMI. In many cases, the units affordable to households earning 100 percent to 120 percent of AMI receive only a slight subsidy of less than \$100 per month relative to market rents.⁶⁴ The discrepancy between real-world IZ implementation and stated policies presents a challenge to measuring their effects empirically.

Section 4: The Economic Theory of Inclusionary Zoning

Given that IZ programs vary widely in their implementation, economic reasoning will predict different effects from different specific programs on housing market outcomes. Table 8 describes how common aspects of IZ programs can be expected to affect new housing supply and in turn prices. An explanation of how each aspect of IZ programs can be expected to affect housing markets follows.

⁶³ Arlington County. "Annual Affordable Housing Targets Report for 2015." <https://housing.arlingtonva.us/wp-content/uploads/sites/15/2016/02/Annual-Affordable-Housing-Targets-Report-FY-2015.pdf>.

⁶⁴ Gordon Chaffin, "The Wharf Development Raises the Question: How Affordable Is Affordable?" Greater Greater Washington, January 12, 2018. <https://ggwash.org/view/66186/the-wharf-development-raises-the-question-how-affordable-is-affordable>.

Table 8: Inclusionary Zoning Components' Expected Effects on New Housing Supply and Prices

Policy	Expected effect on new building permits	Expected effect on market rate house prices
Density bonus	↑	↓
Percent of new units required to be income restricted	↓	↑
Income-restricted units for lower-income residents	↓	↑
Years IZ units are income restricted	↓	↑
Developer allowed to make a payment to the jurisdiction in lieu of building IZ units	↑	↓
IZ units allowed to be built off-site	↑	↓
Applies to both multifamily and single family development	↓	↑
IZ program applies to entire jurisdiction	↓	↑
Minimum project size IZ program applies to	↓	↑
Participation in IZ program is optional	↑ or no effect	↓ or no effect
Participation in IZ program is mandatory	↑, ↓, or no effect	↑, ↓, or no effect

Components of typical IZ programs contribute to the “IZ tax” while others are an “IZ subsidy.” The typical IZ subsidy to development is the density bonus that developers receive when they are required to provide IZ units under mandatory IZ programs or incentivized to provide them under optional programs. Allowing for more potential units under current zoning is the key way IZ programs may increase new housing supply, and in turn potentially lower market rate prices in addition to producing new subsidized units.

The IZ tax consists of the cost of providing IZ units, which includes several components. The percentage of total new units required to be subsidized, requiring IZ units to be affordable to lower-income residents, and the length of time that the IZ units must remain subsidized all contribute to the cost of complying with the program.

Finally, some programs include flexibility for developers to comply in ways that reduce their cost. In the case of mandatory IZ programs that as a whole tax new housing construction, introducing flexibility will reduce the IZ tax, holding other aspects of the program constant. In some jurisdictions, developers are permitted to contribute to an affordable housing fund in lieu of providing units. If the required contribution is less than the cost of providing subsidized units over the required affordability period, this option will reduce the program's tax. Similarly, some programs allow developers to provide affordable units at a site other than where the new market-rate units are built. This may reduce the cost of the IZ units if, for example, they are built in a mid-rise building with lower per-unit construction costs than new market-rate units in a high-rise building. In some cases, IZ programs apply to only multifamily development or only single-family development. If the IZ program as a whole is a tax on development, but only applies to new multifamily construction, new supply can move to single-family rather than multifamily, reducing the decline in new construction and increase in market-rate prices than the program would have caused otherwise. Similarly, when IZ requirements apply to only a portion of the jurisdiction, they may move construction to the exempted portions rather than reducing it overall. IZ programs vary in the size of new development that they apply to. Projects that only apply to large new developments may allow new construction to continue apace if developers are able to avoid the IZ tax by building more, smaller new housing projects.

Ideally studies of IZ would take into account the nuances of each IZ program to determine the effects of each program aspect on housing market outcomes. Bento et al.

comes closest by controlling for IZ programs that apply to projects with 10 or fewer housing units and programs that apply to low-income households.⁶⁵ In my study, my sample size is unfortunately too small to include IZ program characteristics beyond distinguishing between optional and mandatory programs.

In addition to the disparate effects from each aspect of an IZ program, the programs will have different effects over time. On the supply side, IZ programs that are a tax on development can be expected to reduce new housing supply as soon as the program goes into effect. They may lead to a spike in permits before their implementation if developers know that an IZ tax will affect development in the future and advanced notice of the coming IZ requirement gives them an opportunity to secure building permits before the program takes effect. On the price side, the effects of IZ can be expected to increase the longer the program is in place. Whether as a whole an IZ program is a tax or a subsidy, its effects on price will increase the longer the program affects a city's new housing supply, and in turn its total housing stock.

Because housing in one jurisdiction is a substitute for housing in nearby jurisdictions, IZ programs may affect market outcomes in not only the jurisdiction that implements them, but in their neighbors as well. If an IZ program is a tax on development, it can be expected to reduce new housing supply in the jurisdiction that implements it while increasing supply in nearby localities where development can be expected to become relatively more profitable. On the price side, an IZ program that

⁶⁵ Antonio Bento, Scott Lowe, Gerrit-Jan Knaap, & Arnab Chakraborty, "Housing Market Effects of Inclusionary Zoning," 11(2) Cityscape 7 (2009).

taxes development can be expected to raise prices in the jurisdiction that implements the program and also to cause a smaller price increase in nearby jurisdictions.

De jure and *de facto* IZ programs often differ significantly, creating challenges for estimating the effects of an IZ program on market outcomes. In many jurisdictions, the permitting process for each major project is a negotiation between a developer and city officials. This process may result in actual IZ requirements being greater or less than the policy would seem to require. In my empirical work, I use the number of IZ units produced relative to a jurisdiction's population as a proxy for the program's expected effect on house prices and new housing supply. The following section explains the data on IZ in the Baltimore-Washington region that I use to test the effects of IZ on house prices and new building permits.

Section 5: Data

The data I use in my analysis includes the 56 permitting jurisdictions in the Baltimore-Washington Combined Statistical Region that are in Maryland, Virginia, and the District of Columbia. These are 28 counties, five independent cities, 22 cities and towns that are within counties, and the District of Columbia. I exclude the region's jurisdictions in West Virginia, Pennsylvania, and Delaware. None of these jurisdictions have IZ programs. Twenty-four jurisdictions in my sample have IZ programs, 16 mandatory and eight optional. Within the time period for which I have data on new

housing supply, twenty jurisdictions adopted IZ and Prince George's County repealed it. Within the time period for which I have data on house prices, 16 jurisdictions adopted IZ.

In coding each jurisdiction's IZ ordinance, I use some discretion in determining how to categorize specific features of each program. Arlington County, VA's program is ambiguous in whether it is mandatory or optional. The county does not require developers to provide affordable units in any projects that are permitted by-right. However, the County does require IZ units for any projects that require a site plan review. The median project size that triggers IZ requirements in the region is 20 units. Any project of 20 units or more in Arlington will very likely go through the site plan review process, so I classify this program as mandatory.

The most difficult data to gather, and potentially the least accurate data in my dataset, is the number of units that have been built in each jurisdiction and the fees they have collected in-lieu of affordable units. This data is in disperse places if jurisdictions report it at all. Montgomery County, Washington, DC, Arlington, VA, and Alexandria, VA provide excellent reports on their IZ programs, including detailed information on the number of units produced and fees collected, where applicable. For other jurisdictions, I piece together information from their websites, conversations with planning staff, news reports, and reports from other researchers to develop the most accurate dataset I could. In some cases, I obtained data on the total number of IZ units produced, but not the year in which each unit was delivered. In these cases, I reported the average number of units produced for each year of the program's existence. If my data on the number of units produced and fees collected aren't accurate, I think they are likely biased toward zero

because planning staff in jurisdictions with IZ programs that produce few units may not know about a small number of units produced in the past. My data reflect the total number of IZ units produced, to the best of my knowledge, but not all of these units are still in existence. For example, some of the units produced throughout Montgomery County's IZ program are now market-rate units.

In order to isolate the effect of IZ on housing supply and house prices, ideally a model would control for the effect of a jurisdiction's other land use regulations on these outcome variables. However, simply controlling for the land use regulations in place across jurisdictions will not be an effective control because the effect of the same regulations on house prices and new housing supply will vary across jurisdictions. The effect of, say, a minimum lot size regulation on housing supply and prices will be heterogeneous across jurisdictions. For example, a 10,000 square-foot minimum lot size requirement in a jurisdiction where the market would otherwise provide multifamily housing will have a much larger effect on housing supply and prices relative to the effect the same regulation would have in a jurisdiction where the market would provide single family homes on 5,000 square-foot lots.

Rather than attempting to control for the effects of land use regulations on my dependent variables of interest, I restrict my analysis to those jurisdictions where IZ was introduced at a distinct time from other land use regulations. The majority of the jurisdictions in my sample introduced IZ with a standalone IZ ordinance rather than including IZ as a component of a larger zoning rewrite. The exceptions are Loudoun County, Virginia, which adopted IZ and a new zoning ordinance in 1993, Annapolis,

Maryland, in 2004, and Harford County, Maryland in 2008. I exclude these three jurisdictions from my regressions since I'm unable to isolate the effect of IZ relative to other changes in land use policies that were introduced at the same time. After this I'm left with a sample of 56 jurisdictions, seven with optional IZ programs and 13 with mandatory IZ programs.

To measure the effect of IZ on house prices, I use Zillow data on median per square foot house prices.⁶⁶ Zillow researchers provide an index that mimics the price of a constant set of homes in each jurisdiction over time, using both actual sales data and data on the hedonic factors that affect house value, even among houses that aren't sold during the period. Zillow uses its Zestimate value for each home in a jurisdiction to identify an estimate of the median home in that jurisdiction.⁶⁷ Zillow has found its Zestimates to be unbiased.⁶⁸ Relative to repeat sales indices, Zillow's methodology better reflects the effect of new construction homes on median prices as well as any type of housing that is relatively unlikely to be sold during the period of interest.

Permitting jurisdictions in the Baltimore-Washington region include counties, independent cities, and incorporated cities and towns that do their own permitting. Zillow provides price data at the county level, which includes any towns and cities within those counties, and at the city level. Counties with incorporated towns or cities that issue building permits require an adjustment to isolate the prices for homes in the county,

⁶⁶ Since Zillow has made its estimates available, economists have been using them in real estate research. See, for example, Laurie S. Goodman and Christopher Mayer, "Homeownership and the American Dream," *Journal of Economic Perspectives*, 32:1, 2018.

⁶⁷ Zillow Research. "Zillow Home Value Index: Methodology." Jan. 3, 2014 <https://www.zillow.com/research/zhvi-methodology-6032/>.

⁶⁸ Ibid.

outside of other permitting jurisdictions. I use the number of households in each jurisdiction from Decennial Censuses and the American Community Survey to take a weighted average of the prices of incorporated jurisdictions relative to county prices to isolate the median price at the county level.

For measuring the effect of IZ on new housing supply, I use jurisdictions' total permitted housing units as well as multifamily housing permits from the Census and Department of Housing and Urban Development's Building Permit Survey. This is not a perfect data source for new housing supply because it reflects gross new housing permits rather than permits net of demolitions. Additionally, not all permitted housing ends up being built, and the rate of building to permits may vary across jurisdictions. In spite of these problems, the BPS is used widely as a supply variable in the housing literature, including in some work on the effects of IZ on housing supply.⁶⁹

I use demographic control variables from the American Community Survey and from the Decennial Census at the county level and place level in the years in which it's available. I use linear interpolation to fill in these control variables in the years for which they're not available. These years include non-Census years prior to the start of the ACS in 2005 and the years for which not all demographic controls are available for places in the ACS. Weden et. al provide support for using linear interpolation for Census demographic controls in longitudinal studies at the county level.⁷⁰ Table 9 provides

⁶⁹ For example, Schuetz et al. use it in their research on the effects of IZ on housing supply.

⁷⁰ Weden et. al, "Evaluating Linearly Interpolated Intercensal Estimates of Demographic and Socioeconomic Characteristics of U.S. Counties and Census Tracts 2001–2009," *Popul Res Policy Rev.* 2015 Aug; 34(4): 541–559.

summary statistics for my data on house prices, housing permits, demographic data, and mandatory and optional IZ.

Table 9: Summary Statistics for Data Included in Regressions

Variable	Observations	Mean	Std. dev.	Min.	Max.
Price per square foot	864	163.70	75.46	43	495
Residential unit building permits	1,320	756.40	1,172.21	0	7898
Inclusionary zoning	2,645	0.12	0.33	0	1
Mandatory IZ	2,645	0.09	0.28	0	1
Optional IZ	2,645	0.04	0.19	0	1
Inclusionary units built	2,645	9.16	60.43	0	1,224
Population	1,483	148,397	252,472	54	1,142,234
Population density	1,445	1,909.71	2,142.59	24.8	10,154.7
Median household income	1,367	63,632.28	21,767.46	20,185	148,750
Mean commute time	1,378	31.49	5.62	16.6	63
Percentage over age 25 with bachelor's degree or higher	1,371	28.48	14.93	2.5	80.9
Percentage of white non-Hispanic householders	1,366	75.14	16.79	16.1	100

The observations I'm able to use in my regression analysis range from 561 to 1054, depending on the specification. My spatial regressions require strongly balanced panels, causing them to have fewer observations than the standard cross-sectional regressions.

Section 6: Model

I use a difference-in-difference study design and a two-way fixed effects model to estimate the effect of IZ on new housing supply and prices by comparing the change in these outcome variables after jurisdictions adopt IZ to jurisdictions that haven't.

Endogeneity is a potential identification problem in this research – if IZ corresponds with higher market-rate housing prices, this could either be because of an IZ tax that reduces new housing supply and drives up house prices or because localities adopt IZ programs in response to high and rising prices. To test for this endogeneity, I use a two-way fixed effects model to test whether or not the years prior to a jurisdiction adopting an IZ program correspond with price increases. Equation 1 shows this model:

$$1) P_{jt} = \beta_0 + \beta_1 I_{jt-1} + \beta_2 I_{jt-2} + \beta_3 I_{jt-3} + u_j + v_t + \varepsilon_{jt}$$

Here P_{jt} is the log of median per square foot house price at the level of permitting jurisdiction j at time t . I_{jt-1} is a dummy variable indicating whether or not a permitting jurisdiction adopted a mandatory or optional IZ program in the following year, I_{jt-2} indicates whether the jurisdiction adopted IZ two years later, and I_{jt-3} three years later. Table 10 shows the result of this basic model in column 1. In column 2 I add demographic controls.

Table 10: House Prices in the Years Preceding Inclusionary Zoning Implementation

Variables	1 ln(price per sq. ft.)	2 ln(price per sq. ft.)
One year before IZ	-0.013 (0.018)	-0.0072 (0.017)
Two years before IZ	-0.016 (0.016)	-0.0056 (0.015)
Three years before IZ	-0.021 (0.020)	-0.0086 (0.019)
ln(median household income)		0.090 (0.14)
Population density		0.00015*** (0.000029)
Mean commute time		-0.0066 (0.0041)
Percentage over age 25 with bachelor's degree or higher		-0.0023** (0.00090)
Percentage of white non-Hispanic householders		0.0055** (0.0021)
Constant	4.442*** (0.018)	3.041* (1.54)
Jurisdiction fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	864	818
R ²	0.940	(0.952)
Number of Jurisdictions	41	41

Notes: Robust standard errors clustered by jurisdiction in parentheses. *** represents $p < 0.01$, ** represents $p < 0.05$, * represents $p < 0.1$.

In both models, the coefficients on the IZ leads are small, negative, and insignificant, providing evidence that IZ is not adopted in response to rising prices. Among the demographic controls, population density, and the percent of householders who are white alone have small, positive coefficients, and the percent of residents over age 25 with a bachelor's degree or higher has a surprising small, negative coefficient.

Next, I test the effect of IZ programs on median per square foot prices at the permitting jurisdiction level. I take advantage of the difference between mandatory and optional programs in my sample to distinguish between programs that are likely to have an effect on housing markets versus those that aren't. Because jurisdictions with optional programs have adopted these affordability policies, we know they share some characteristics with the jurisdictions that have mandatory programs, including policymakers who express concern for affordability and a willingness to provide density bonuses in exchange for below-market-rate units. However, because the optional programs, with the exception of Alexandria and Falls Church, have not produced IZ units, the adoption of these programs should not have an effect on house prices and housing supply within the jurisdiction. To use a randomized control trial analogy, it's as if the jurisdictions with optional IZ programs that are not producing units are receiving a placebo rather than the treatment.

I first test the effect of mandatory IZ programs on house prices and supply, using jurisdictions with no IZ program as the control group. Then I separately test the effect of optional IZ programs, dropping Alexandria and Falls Church, with jurisdictions with no IZ program as the control group. My dependent variable is P_{jt} , again the log of median per square foot house prices in jurisdiction j at time t :

$$2) P_{jt} = \beta_0 + \beta_1 Y_{jt} + u_j + v_t + \varepsilon_{jt}$$

Because IZ can be expected to affect prices over time, with little or no effect on prices before its effect on new housing supply has had cumulative effects on the

jurisdiction's total housing stock, my variable of interest is Y_{jt} , the number of years a mandatory IZ program has been in effect. Table 11 shows the results of this model.

Table 11: Effect of Length of Mandatory Inclusionary Zoning Programs on House Prices

Variables	1 ln(price per sq. ft.)	2 ln(price per sq. ft.)	3 ln(price per sq. ft.)
Number of years of mandatory IZ	0.011*** (0.0026)	0.0081*** (0.0018)	0.011* (0.0061)
ln(median household income)		0.0026 (0.13)	1.6*** (0.087)
Population density		0.00012 (0.000029)	0.000031 (0.000039)
Mean commute time		-0.0057044 (0.0038)	-0.0019 (0.0053)
Percentage over age 25 with bachelor's degree or higher		-0.0019 (0.00081)	-0.0026 (0.0016)
Percentage of white non-Hispanic householders		0.0074 (0.0028)	-0.0031 (0.0028)
Constant	4.420*** (0.020)	3.830*** (1.332)	
Jurisdiction fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	
Spatial autoregression			Yes
Number of years of mandatory IZ \times year			Yes
Spatial autocorrelation λ			3.50 (2.21)
Observations	734	690	561
R^2	0.947	0.955	
Pseudo R^2			0.113
Number of jurisdictions	35	35	33

Notes: Robust standard errors clustered by jurisdiction in parentheses. *** represents $p < 0.01$, ** represents $p < 0.05$, * represents $p < 0.1$. In the maximum likelihood estimation, the pseudo R^2 is $\{corr(y, \hat{y})\}^2$.

Column 1 shows the results of this basic specification. I find that each year of a mandatory IZ program can be expected to increase per square foot house prices by 1.1%, significant at the 1% level. In column 2, I add demographic controls, which reduces the coefficient of interest to 0.81%. The demographic controls are all small and insignificant.

In the model in column 3, I move to a spatial model. The “IZ tax” that increases prices in the jurisdiction that adopts it can also be expected to increase prices in nearby jurisdictions, since real estate markets are competitive across borders. To account for this, I use a model with spatial lags. I create a weighting matrix, W , of the inverse distance between the centroid of each jurisdiction relative to the other jurisdictions in the region, weighted by the jurisdiction’s share of the region’s total population. I use the maximum likelihood estimation method Lung-fei Lee and Jihai Yu developed to estimate the effect of Y_{jt} on P_{jt} with a spatial lag on price.⁷¹ Because this model does not allow for year fixed effects with my sample size, I instead use an interaction term of year and the number of years the jurisdiction’s IZ program has been in place:

$$3) P_{jt} = \lambda W_j P_{jt} + \beta_0 Y_{jt} + \beta_1 (Y_{jt} \times T_j) + u_j + \varepsilon_{jt}$$

$$\varepsilon_{jt} = \rho W \varepsilon_{jt} + v_{jt},$$

Where ε_{jt} is a spatially autoregressive error term. In this specification, I find that one additional year of a mandatory IZ program can be expected to increase per square foot home prices by 1.1%, indicating model 2 may understate the effect of mandatory IZ on price. The spatial autocorrelation coefficient λ is not quite significant at the 10% level. In

⁷¹ Lung-fei Lee and Jihai Yu, “Estimation of spatial autoregressive panel data models with fixed effects,” *Journal of Econometrics* 154:2, February, 2010.

this specification, all of the demographic controls are small and insignificant, except for the natural log of median income, which is large, positive, and significant at the 5% level.

I turn next to testing the effects of optional IZ requirements on price after dropping Alexandria and Falls Church. Because these programs have not produced IZ units, I expect them to have no effect on price. The results from these models are reported in Table 12.

Table 12: Effect of Length of Optional Inclusionary Zoning Programs on House Prices

	1	2
	ln(price per sq. ft.)	ln(price per sq. ft.)
Variables		
Number of years of optional IZ	0.00086 (0.0022)	0.0018 (0.0016)
ln(median household income)		-0.028 (0.11)
Population density		0.000073*** (0.000023)
Mean commute time		-0.0026 (0.0030)
Percentage over age 25 with bachelor's degree or higher		-0.0017 (0.0012)
Percentage of white non-Hispanic householders		0.0019 (0.0014)
Constant	4.37*** (0.0234)	4.57*** (1.21)
Jurisdiction fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Observations	560	5243
R ²	0.957	0.955
Number of jurisdictions	27	27

Notes: Robust standard errors clustered by jurisdiction in parentheses. *** represents $p < 0.01$, ** represents $p < 0.05$, * represents $p < 0.1$.

As expected, the coefficient on the number of years an optional program has been in place is small and insignificant in column 1. Including the demographic controls in column 2 does not change the coefficient of interest, and it remains insignificant. Population density is the only significant demographic control, and it's positive and small.

Turning now to the effects of IZ on new housing supply, I use the same two-way fixed effects approach to estimate the effect of mandatory IZ programs on total new residential units permitted:

$$4) T_{jt} = \beta_0 + \beta_1 U_{jt} + u_j + v_t + \varepsilon_{jt}$$

On the supply side, my dependent variable is total residential units permitted, T_{jt} . My independent variable of interest, U_{jt} , is the number of IZ units delivered under mandatory IZ program in jurisdiction j in year t per 10,000 residents. I use this variable as a proxy for the size of the IZ program's effect on its jurisdiction's housing market. Mandatory IZ requirements that are commonly waived, such as in Baltimore, will produce few units and in turn will have little effect on housing market outcomes. Similarly, IZ programs that are enforced will have little effect on the jurisdiction's housing market if they only apply to large projects and developers can avoid them if they are a tax on development. The results from this regression model are reported in Table 13.

Table 13: Effect of Inclusionary Zoning Unit Production under Mandatory Programs on New Building Permits

Variables	1 log(total permits)	2 log(total permits)	3 log(total permits)
IZ units per 10,000 people	0.021 (0.022)	0.036 (0.027)	-0.19 (.78)
ln(median household income)		0.45 (1.2)	-1.03*** (0.36)
Population density		-7.2 (0.00040)	-0.00017 (0.00012)
Mean commute time		-0.010 (0.045)	0.0025 (0.027)
Percentage over age 25 with bachelor's degree or higher		-0.0095 (0.012)	-0.0025 (0.0083)
Percentage of white non-Hispanic householders		0.029 (0.037)	0.082*** (0.011)
Jurisdiction fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	
Spatial autoregression			Yes
IZ units per 10,000 people × year			Yes
Constant	5.47*** (0.14)	-1.02 (12.65)	
Spatial autocorrelation λ			-2.31 (4.08)
Observations	1054	1005	900
R^2	0.82	0.81	
Pseudo R^2			0.0010
Number of jurisdictions	46	45	36

Notes: Robust standard errors clustered by jurisdiction in parentheses. *** represents $p < 0.01$, ** represents $p < 0.05$, * represents $p < 0.1$. In the maximum likelihood estimation, the pseudo R^2 is $\{corr(y, \hat{y})\}^2$.

Here, I find no evidence of mandatory IZ programs having an effect on new housing supply in the results of the cross-sectional models reported in columns 1 and 2. Column 3 uses the same spatial autoregression approach described in equation 3 above for new housing supply rather than price. As in the cross-sectional models, I find no

evidence that mandatory IZ reduces new building permits. Finally, I test the effect of IZ units delivered per 10,000 residents in jurisdiction j in year t on house price. The results are reported in Table 14.

Table 14: Effect of Inclusionary Zoning Unit Production under Mandatory Programs on New Building Permits

Variables	1 ln(price per sq. ft.)	2 ln(price per sq. ft.)	3 ln(price per sq. ft.)
IZ units per 10,000 people	0.0040 (0.0030)	0.00074 (0.0018)	-0.00036 (0.012)
ln(median income)		0.0068 (0.15)	1.7*** 0.087
Population density		0.00015 (0.000031)	0.000052 (0.000037)
Mean commute time		-0.0059 (0.0043)	-0.0014 (0.0053)
Percentage over age 25 with bachelor's degree or higher		-0.0027 (0.00093)	-0.0029 (0.0016)
Percentage of white non-Hispanic householders		0.0067 (0.0027)	-0.0029 (0.0029)
Jurisdiction fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	
Spatial autoregression			Yes
IZ units per 10,000 people \times year			Yes
Constant	4.43*** (0.02)	3.82** (1.54)	
Spatial autocorrelation λ			1.17 (1.92)
Observations	732	690	561
R^2	0.941	0.957	
Pseudo R^2			0.275
Number of jurisdictions	35	35	33

Notes: Robust standard errors clustered by jurisdiction in parentheses. *** represents $p < 0.01$, ** represents $p < 0.05$, * represents $p < 0.1$. In the maximum likelihood estimation, the pseudo R^2 is $\{corr(y, \hat{y})\}^2$.

The results of the cross-sectional models in columns 1 and 2 and the spatial model in column 3 indicate that, using this dependent variable as a proxy for a mandatory IZ program's effect on market rate prices, mandatory IZ does not have an effect on price.

The specification in equation 2, with the number of years a mandatory IZ program has been in place as the dependent variable of interest, (results in Table 5) provides some support for Ellickson's description of mandatory IZ as a tax on development. If mandatory IZ programs tax construction and result in reduced new housing construction, their effect will increase over time as reduced housing construction year after year reduces a jurisdiction's total housing supply relative to what it would have had without the IZ program. The results in Table 4 provide evidence that IZ is not adopted in response to rising prices, indicating that its effect on price is exogenous. Further, optional IZ programs (results in Table 6) that do not produce units have no effect on prices, indicating that these jurisdictions do not experience the same price increase as jurisdictions where IZ may tax new construction. My empirical finding that the typical mandatory IZ program in the Baltimore-Washington region taxes market rate housing is supported by the lack of uptake of optional IZ programs with higher density bonuses than those offered under the region's mandatory programs.

However, the supply model in Table 7 provides evidence that IZ programs proxied by the number of units they produce relative to their jurisdiction's size, have no effect on new housing permits. A potential explanation for mandatory IZ increasing price while not decreasing supply is that IZ increases the cost of building new housing without reducing the quantity of construction. For example, IZ may lead developers to pursue

more, smaller projects.⁷² Smaller projects may allow them to avoid IZ requirements by staying below a unit threshold for each project. It may be less efficient to build smaller numbers of units in each project, resulting in higher prices without a reduction in total new supply. Alternatively, IZ may lead developers to shift to higher-end housing that has the profit margins to cross-subsidize IZ units where lower-end new construction may be unfeasible under IZ requirements.

As reported in Table 8, I find that using a jurisdiction's number of IZ units produced relative to its population as the independent variable of interest indicates that IZ programs do not affect market prices. While I think that the number of years an IZ program has been in place is the more theoretically sound model for how IZ programs can be expected to affect prices, this finding indicates that the results reported in Table 5 are sensitive to specification.

Section 7: Conclusion

While IZ's prevalence is rapidly increasing, relatively little work has been done to study its effects on housing markets. My results contribute to the small literature on this question and provide new data on the types of IZ programs in the Baltimore-Washington region.

⁷² Following Portland, OR's adoption of an IZ program that applies to new housing developments with 20 or more units, it has seen an uptick for permits for projects between 12 and 19 units. See Noel Johnson and Mike Kingsella, "The Cautionary Tale of Portland's Inclusionary Housing Policy," Up for Growth, April 25, 2019, <https://www.upforgrowth.org/news/cautionary-tale-portlands-inclusionary-housing-policy>.

Measuring the effects of IZ on housing market outcomes is difficult because each program is unique, and the sample size of jurisdictions in a housing market is relatively small. Actual requirements for income-subsidized units may deviate from a locality's stated policy, so data on IZ policies are noisy.

These measurement challenges provide reasons to be cautious about making strong claims about IZ's effect on housing markets based on empirical studies, but the body of research attempting to measure the causal effect of IZ on average house prices and new housing construction provides some evidence that IZ increases house prices and reduces housing supply.

In my analysis of IZ's effects in the Baltimore-Washington region, I find evidence that mandatory IZ programs increase house prices, but not that they reduce new housing construction. Measuring the effect of optional programs separately from that of mandatory programs allows me to distinguish between programs that Ellickson's theory would predict to act as a tax on development versus those that it wouldn't. As expected, I find that optional programs that are not producing IZ units have no effect on house prices.

As IZ continues to gain prevalence as a tool to attempt to increase access to affordable housing, more empirical work on its effects on housing markets is needed to evaluate whether it's possible for IZ to achieve affordable housing goals without exacerbating affordability problems for those who do not receive IZ units. Additionally, case study work on specific IZ programs can provide important insights. For example, the general lack of IZ production under optional programs indicates that even large density bonuses may not offset the cost of providing below-market-rate units.

Optional IZ programs with density bonuses large enough to result in production present a way for policymakers to incentivize affordable housing construction without the risk of introducing a new tax on market-rate development. However, optional programs rely on exclusionary zoning to work as the case of Alexandria shows. They do not solve an underlying problem of exclusionary zoning.

CHAPTER 3: THE POLITICS OF REDEVELOPMENT PLANNING IN TYSONS AND OUTCOMES 10 YEARS LATER

Section 1: Introduction

Tysons, Virginia, an unincorporated area in Fairfax County, is surrounded and bisected by major highways--the Washington, D.C. region's 495 beltway, State Route 123, the Dulles Airport toll road, and State Route 7. Tysons is the prototypical edge city--a suburban job center dominated by auto infrastructure that's designed to get car commuters from their homes to offices and shopping malls in Tysons as quickly and easily as possible.⁷³

Due to its location at the intersection of major highways and arterial roads, and its role as a center of office and retail destinations, Tysons is well-known for traffic congestion and for being hostile to anyone traveling outside of a car. But in 2004, the Federal Transit Administration (FTA), in collaboration with state and local policymakers, finalized plans for a new Washington Metropolitan Area Transit Administration (WMATA) Metrorail (Metro) line that would include five new stations in the county, four in Tysons. In 2010, the Fairfax County Board of Supervisors finalized a new Comprehensive Plan and zoning ordinance for Tysons in anticipation of the new Silver

⁷³ For a study on edge city development, see the book where the term was coined, Joel Garreau, *Edge City: Life on the New Frontier*, New York: Doubleday (1991). In *A Field Guide to Sprawl*, Dolores Hayden and Jim Wark criticizes the term "edge city," arguing that edge node is a more appropriate term since they are dotted around pre-existing metropolitan areas. See Hayden and Ward, *A Field Guide to Sprawl*, New York: W.W. Norton (2006).

Line. The plan's objective was to increase residential development in Tysons and to create mixed-use, walkable neighborhoods around each new station.⁷⁴ By appointing a Task Force that included membership with diverse interests, the Tysons redevelopment plan was a politically feasible mechanism for permitting multifamily construction, a rarity in high-income coastal suburban jurisdictions. However, little progress has been made toward the Comprehensive Plan's walkability goals to date.

When the Washington region's Metro system was originally planned in 1968, the designers envisioned a rail line to Dulles Airport in Loudoun County, Virginia, 26 miles west of downtown Washington, D.C. The West Falls Church station in Fairfax County was originally built to accommodate a new line going northwest to the airport via Tysons.⁷⁵

⁷⁴ In 2010 I published a study on the Tysons redevelopment planning process. This paper builds on that political economy of the passage of the 2010 Comprehensive Plan. See Emily Washington (now Hamilton), "Stifling the Market Process with Land-Use Regulation: An Analysis of Modern Trends in Land-Use Regulation Applied to Redevelopment in Tysons Corner, Virginia," Mercatus Center Graduate Policy Essay, No. 06 Summer 2010, https://asp.mercatus.org/system/files/Washington_GPE.pdf.

⁷⁵ Metropolitan Washington Airports Authority, "Dulles Metrorail History," 2006, <https://web.archive.org/web/20060513064531/http://www.dullesmetro.com/about/history.cfm>.



Figure 6: Tysons in the Washington Region

However, earnest planning for the Silver Line didn't begin until 2000, when federal and local agencies began completing required Analyses of Alternatives, comparing various rail options to a no-build alternative and to a bus rapid transit line.⁷⁶ In 2004 the FTA completed its final environmental impact statement in favor of building the

⁷⁶ Federal Transit Administration, "Final Impact Statement and Section 4(F) Evaluation," Chapter 2, December 2004, http://www.dullesmetro.com/silverline/assets/File/project_docs/FEIS_I/FTA_FEIS_Chapter_2.pdf.

Silver Line to Dulles in two phases, with the first phase ending at the Wiehle Reston station, one station west of the Tysons area.⁷⁷

The Comprehensive Plan and resulting zoning amendments for Tysons include provisions to allow both denser development generally and to encourage an increase in residential construction relative to office construction. Within one-eighth of a mile of Metro stations, where the densest development is permitted, these rules include:

- 400-foot height limit;
- 2.5 floor area ratio (FAR)⁷⁸ for office development, plus potential bonus density;
- Unlimited FAR for development other than offices (designed to encourage non-office development);
- No parking minima for office or hotel development and one parking spot required per unit in multifamily buildings.⁷⁹

Moving away from one eighth of a mile away from metro stations, the allowable density decreases and the required parking increases. The Comprehensive Plan includes the freedom for policymakers to allow for increased density and height for projects that advance the plan's objectives.⁸⁰ Transforming Tysons to a mixed-use, high-density area is in line with a vision for urban development known as Smart Growth. Smart Growth

⁷⁷ Federal Transit Administration, "Executive Summary," Final Impact Statement and Section 4(F) Evaluation, December 2004, http://www.dullesmetro.com/silverline/assets/File/project_docs/FEIS_I/FTA_FEIS_ES_vol1_final.pdf.

⁷⁸ FAR is a restriction on building density that limits the amount of floor area a building can include relative to its lot size. For example, a parcel zoned for a FAR of 2.0 could include a two-story building that covers its entire lot or a four-story building that covers half of its lot.

⁷⁹ Fairfax County, "Fairfax County Zoning Ordinance," Article 6, Part 5, PTC Planned Tysons Corner Urban District, December 19, 2019, <https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/zoning/art06.pdf>.

⁸⁰ Fairfax County, "Fairfax County Zoning Ordinance," 51.

emerged in the 1970s as a reaction to traditional land use regulations.⁸¹ Whereas traditional zoning rules limit density and support car-oriented development, Smart Growth adherents advocate for walkable, bikeable transit-oriented development (TOD).

Today, wide streets that carry fast-moving cars cut through the Tysons area, and it has few relatively narrow streets that are comfortable to people on foot or bike. Large setbacks and seas of surface parking lots on yet-to-be-redeveloped lots increase the distance non-drivers must walk or bike to reach their destinations. Its redevelopment plan relies on the unusual, possibly unprecedented, step of building a new grid of narrow, pedestrian-friendly streets as part of the redevelopment of its suburban office parks, car dealerships, and big-box shopping centers.⁸² In spite of the increasing adoption of Smart Growth theory among city planners, actually rezoning built-out areas to permit denser, more walkable redevelopment has been relatively rare since the advent of zoning in the early 20th century.⁸³

Politically, homeowners are the greatest obstacle to allowing denser redevelopment in built out urban areas. Economist William Fischel calls homeowners “homevoters” in his

⁸¹ Sanford Ikeda and Emily Washington (now Hamilton), “How Land-Use Regulation Undermines Affordable Housing” (Mercatus Research, Mercatus Center at George Mason University, Arlington VA, November 2015), 15-8.

⁸² The current comprehensive plan for Tysons emphasizes the creation of a grid of narrow streets as one of the most important redevelopment priorities. Fairfax County, “Fairfax County Comprehensive Plan 2017 edition.”

⁸³ Until recently, Houston, TX, the U.S. city with the most liberal land use regulations, was perhaps the only city where replacing existing single-family houses with denser development was feasible. In 2019, Minneapolis policymakers reformed its zoning ordinance to permit triplexes on lots that were previously zoned for exclusively single-family development. Also in 2019, Oregon policymakers adopted a state law that requires many localities across the state to permit duplexes and in some cases fourplexes on lots zoned for single-family exclusively. Allowing denser development in areas zoned for commercial use, as in the Tysons case, has been somewhat more common. Section 2 covers some examples of where commercial redevelopment has been permitted in the Washington region.

political analysis of zoning because of their outsized influence in local politics and land use policy.⁸⁴ Local policymakers use zoning and other land use restrictions to limit housing construction in their jurisdictions. While Smart Growth policies have not been widely adopted within cities, in no small part due to homevoter opposition to infill development, Smart Growth policies designed to limit “sprawl” outside of developed areas have been popular with municipal and state governments. Greenbelts, growth boundaries, and growth caps can be found in many states and localities across the country.⁸⁵

By allowing new, multifamily development in Tysons, Fairfax policymakers have bucked national trends.⁸⁶ In many parts of the country, particularly in wealthy suburbs like Fairfax County, local land use regulations stand in the way of new housing construction, if not banning it entirely.⁸⁷ Homeowners in other parts of Fairfax County

⁸⁴ William A. Fischel, *The Homevoter Hypothesis: How Home Values Influence Local Government Taxation, School Finance, and Land-Use Policies* (Cambridge, MA: Harvard University Press, 2005).

⁸⁵ The Portland, OR region had the country’s most well-known and binding urban growth boundary that was established by state policymakers in 1973. For decades, prices in the Portland region rose in line with national trends as the growth boundary was expanded gradually over time and localities permitted growth within the boundary. However, since 2000, Portland house prices have more than doubled after accounting for inflation. Today the median house in the Portland region is worth \$462,000 compared to \$247,000 nationally Zillow Research, ZHVI Single-Family Homes Time Series (\$) (dataset), accessed March 28, 2020, <https://www.zillow.com/research/data/>. Other notable growth boundaries in the U.S. include local growth boundaries in Lexington and state growth management laws in Florida and Hawaii.

⁸⁶ Salim Furth et al., “HUD Can Use Housing Market Data to Inform Fair Housing Accountability,” (Public Interest Comment, Mercatus Center at George Mason University, Arlington, VA, March 12, 2020).

⁸⁷ Kevin Erdmann terms expensive regions that have strong labor markets, expensive housing, and low rates of housing permitting “closed access cities” because they use land use regulations to block new housing construction. He points out that even cities that are losing population due to economic distress, like Detroit, MI and St. Louis, MO are permitting housing at a higher rate than wealthy regions many people would like to move to, including San Francisco, Los Angeles, Boston, and New York City. Kevin Erdmann, *Shut Out: How a Housing Shortage Caused the Great Recession and Crippled Our Economy*, Lanham, MD: Rowman and Littlefield, 2019, 16. Erdmann identifies Washington, DC and Seattle as regions that share characteristics with closed access cities but that are not experiencing the same levels of outmigration due to high housing costs. Erdmann, *Shut Out*, 122-4.

did present some opposition to allowing increased development in Tysons. However, support for redevelopment from commercial landowners who stood to benefit from increased rights to develop their land and increased property values, along with local activists who supported a Smart Growth vision for Tysons for environmental and quality of life reasons, ultimately overcame homevoter opposition with the passage of the 2010 Comprehensive Plan for Tysons. The Comprehensive Plan established a goal of increasing the number of residents in Tysons from about 20,000 to 100,000 and the number of jobs from 100,000 to 200,000.⁸⁸

This case study analyzes the planning process and outcomes in Tysons' redevelopment. Section 2 examines the politics of redevelopment in general and in Tysons specifically. Section 3 covers Tysons' history of redevelopment planning. Because the plan for Tysons included goals from many different interest groups, some of its goals are incompatible; Section 4 identifies these contradictions. Section 5 evaluates progress toward the goals the comprehensive plan established for the Tysons area 10 years after it was adopted. Section 6 concludes and identifies potential lessons that Tysons can offer to policymakers in other edge cities.

⁸⁸ Fairfax County, "Fairfax County Comprehensive Plan 2017 edition," 6.

Section 2: The Political Economy of Redevelopment Planning in Tysons

The groups that supported redevelopment for Tysons -- landowners and Smart Growth advocates -- fit economist Bruce Yandle's bootleggers and Baptists dynamic. He explains:

Bootleggers, you will remember, support Sunday closing laws that shut down all the local bars and liquor stores. Baptists support the same laws and lobby vigorously for them. Both parties gain, while the regulators are content because the law is easy to administer.⁸⁹

Yandle shows that interest groups with divergent principles can form a successful coalition behind policy change.⁹⁰ While bootleggers support policy change for financial gain, Baptists support the same policy because they view it as socially beneficial.

The bootleggers and Baptists monikers are not normative. Bootleggers stand to profit from policy change while Baptists frame the change as socially beneficial. This does not mean that the bootleggers or Baptists are necessarily "bad" or "good." In Yandle's scenario, consumers of alcohol bear the brunt of Sunday closing laws. However, it is possible that the bootlegger and Baptist dynamic can lead to policies that benefit consumers in some cases.

⁸⁹ Bruce Yandle, "Bootleggers and Baptists: The education of a regulatory economist," *Regulation* 7(3), 1983, <https://www.cato.org/sites/cato.org/files/serials/files/regulation/1983/5/v7n3-3.pdf>.

⁹⁰ Ibid.

Land-use regulations that limit the supply of housing in America's leading cities hurt consumers, particularly low-income renters, by making housing more expensive.⁹¹ To the extent that bootleggers and Baptists in Tysons made it politically feasible for policymakers to permit more residential development, consumers could benefit from lower housing prices.

In the Tysons case, the bootleggers were largely real estate interests who benefited both from the opening of the Silver Line, a major transit investment serving their properties, and from upzoning that increased their rights to build, which in turn increased the value of their land,⁹² while Baptists supported construction around the new Metro stations to promote walkability, environmental sustainability, and/or housing affordability. Because the Task Force crafted a plan for redevelopment in Tysons that limited impact on single-family neighborhoods, bootlegger and Baptist support for redevelopment was politically sufficient to overcome potential homevoter opposition, making it possible for the Board of Supervisors to implement the 2010 Comprehensive Plan and zoning amendments.

The planning process for redevelopment in Tysons cemented the alliance between bootleggers and Baptists. At the start of the redevelopment planning effort, the County Board of Supervisors appointed a Task Force to develop planning recommendations. Task Force membership included bootleggers, Baptists, and Fairfax homeowners,

⁹¹ Sanford Ikeda and Emily Washington (now Hamilton), “How Land-Use Regulation Undermines Affordable Housing.”

⁹² For an example of how upzoning near transit stations has increased property values, see Yonah Freemark, “Upzoning Chicago: Impacts of a Zoning Reform on Property Values and Housing Construction,” *Urban Affairs Review*, January 29, 2019.

including representatives of neighborhood organizations. The plan they developed reflected all of these constituencies' interests. As Section 3 will show, the Comprehensive Plan and zoning amendments that govern development in Tysons closely reflect the recommendations the Task Force developed.

As a result of redevelopment planning supported by diverse political interests, Tysons has seen substantial redevelopment, particularly high-rise multifamily development. Permitting new housing in Tysons was framed as a means to the end of walkability. Without more residents living in Tysons, the type of 24-hour activity and pedestrianism that the Comprehensive Plan calls for wouldn't be achievable.

Allowing the type of development that the Comprehensive Plan calls for in Tysons is typically politically difficult. For many homeowners, their house is their largest financial asset. They are therefore highly motivated to oppose policies that could increase volatility in home prices or cause home values to fall.⁹³ They tend to be particularly opposed to the construction of comparatively low-cost, multifamily housing.⁹⁴ Fischel identifies the rise of the environmentalist movement in the 1970s as a turning point in housing policy.⁹⁵ Blocking the construction of low-cost housing, or housing generally, for personal economic gain is not generally a sympathetic cause. But environmental concerns, such as the loss of open space or pollution caused by increased traffic, have

⁹³ William Fischel, *The Homevoter Hypothesis: How Home Values Influence Local Government Taxation, School Finance, and Land-Use Policies*, Cambridge, MA: Cambridge University Press, (2001), pages 9-10.

⁹⁴ William Fischel, "Fiscal Zoning and Economists' Views of the Property Tax," Lincoln Institute of Land Policy Working Paper, 2013, https://www.lincolnst.edu/sites/default/files/pubfiles/2355_1695_Fischel_WP14WF1.pdf, 4.

⁹⁵ William Fischel, "The Rise of Homevoters: How the Growth Machine Was Subverted by OPEC and Earth Day," *Evidence and Innovation in Housing Law and Policy*, Lee Anne Fennell and Benjamin J. Keys eds., Cambridge: Cambridge University Press (2017).

provided homevoters with a reason to oppose development that is framed as a public-spirited objective.

Fischel demonstrates that local elected officials face incentives to implement policy that restricts housing development in accordance with homevoters' preferences. Homeowners are more likely to vote relative to renters, and they are more likely to stay in the same jurisdiction over time.⁹⁶ These factors make them more influential constituents for local politicians relative to renters who could live in new multifamily housing. Local politicians tend to fare better when they keep homevoters happy by blocking policies that allow newcomers to move into their jurisdictions.

In their book *Neighborhood Defenders*, Katherine Levine Einstein, David M. Glick, and Maxwell Palmer offer an alternative to Fischel's homevoter hypothesis with their concept of "neighborhood defenders."⁹⁷ Neighborhood defenders are residents who oppose change near their residences and show up to planning commission meetings to voice their opposition. Based on their findings from gathering data on planning meetings in Massachusetts, they find evidence that neighborhood defenders tend to oppose any projects that would bring change to their neighborhoods even if the change would likely increase their property values, such as converting a vacant warehouse into residences.⁹⁸ They describe the neighborhood defenders who attend planning meetings in Massachusetts:

⁹⁶ Jonathan Levine, *Zoned Out: Regulation, Markets, and Choices in Transportation and Metropolitan Land Use* (Washington, DC: RFF Press, 2005), 70.

⁹⁷ Katherine Levine Epstein et al., *Neighborhood Defenders: Participatory Politics and America's Housing Crisis*, (Cambridge, UK: Cambridge University Press: 2020).

⁹⁸ *Ibid.*, 95.

We find that the individuals who participate in community meetings on new housing developments differ starkly from the broader population. They are older, whiter, longtime residents, and more likely to be homeowners. They overwhelmingly oppose the development of new housing, with only 15 percent of meeting attendees showing up to support proposed housing projects. In concert, the meeting minutes reveal that these forums are dominated by an unrepresentative group of neighborhood defenders.⁹⁹

Einstein and Glick provide empirical support for Fischel's theory that environmental concerns play a large role in the publicly-stated rationale that homevoters or neighborhood defenders present when they oppose new housing construction. They find that meeting attendees who speak in opposition to new housing proposals cite environmental concerns more often than any other reason besides traffic.¹⁰⁰

In *Urban Land Use Planning*, Philip Berke et al. identify three interest groups that shape land use policy: neighbors who organize to oppose growth, real estate professionals who support growth, and minority and low-income tenant advocates who support subsidized housing and tenant protections, but who tend to oppose new market-rate construction.¹⁰¹ Berke et al. explain that these political dynamics tend to result in little infill construction. However, they developed this theory a social-advocacy coalition that supports dense, infill housing development has emerged. In the Tysons planning process, this pro-housing coalition included environmentalists who support transit use,

⁹⁹ Ibid., 97.

¹⁰⁰ Ibid., 117.

¹⁰¹ Philip Berke et al., *Urban Land Use Planning*, 5th ed., (University of Illinois Press: 2006), 22.

walkability, and bikeability to reduce carbon emissions relative to car travel, urbanists who prefer dense, walkable development aesthetically, and housing affordability advocates. More recently, similar groups supporting these goals have adopted the YIMBY (Yes In My Back Yard) moniker.¹⁰² The Tysons redevelopment planning took place before U.S. YIMBY groups emerged, but this fourth coalition member, which could retroactively be described as having YIMBY tendencies, played a key role in developing the Task Force report and ultimately in the adoption of the Comprehensive Plan.

While Fischel, Einstein and Glick, and Berke et al. emphasize how homevoter- or neighborhood-defender-driven policy has limited opportunities for people to live in their preferred locations and contributed to high housing costs, sociologist Harvey Molotch characterizes local obstructions to development as something to strive for.¹⁰³ He argues that landowners and civic boosters work together to promote continual population growth and real estate development. He describes this “strategic coalition” as a vested interest in favor of development, which benefits local elites at the expense of cities’ other residents and local environmental quality.¹⁰⁴

Molotch expressed optimism that anti-growth environmentalists could bring an end to the “growth machine” that supported new development in cities.¹⁰⁵ His analysis was prescient; Molotch pointed to policymakers in localities including Boulder, Colorado

¹⁰² For an overview of YIMBY organizations and their work, see Conor Dougherty, *Golden Gates: Fighting for Housing in America*, (New York: Penguin), 2020.

¹⁰³ Harvey Molotch, “The City as a Growth Machine: Toward a Political Economy of Place,” *American Journal of Sociology* 82(2), September 1976

¹⁰⁴ Ibid., 318

¹⁰⁵ Ibid., 311.

and Beverly Hills, California as providing forward-thinking models of policy to limit housing development and local population growth.¹⁰⁶ Today, Boulder, Beverly Hills, and other communities where no-growth environmentalists are influential have strictly limited housing construction and population growth as a result.¹⁰⁷

No- or low-growth policies may improve some aspects of local environmental quality, but, Molotch fails to account for the negative environmental consequences they have more broadly.¹⁰⁸ Localities may be able to stop housing development within their own jurisdiction's borders, but they cannot reduce regional demand for housing. One consequence of no-growth policies is that new homes to accommodate new residents must be built in outlying locations where homeowner opposition is lower than in developed areas.¹⁰⁹ When all new development in high-demand regions must occur on greenfields, at the outskirts of existing development, building new housing requires

¹⁰⁶ Ibid., 327.

¹⁰⁷ In Boulder, for example, population grew rapidly between 1950 and 1970, more than tripling from 20,000 residents to nearly 67,000. Since then, Boulder's population has grown at less than 10% per decade, and it's about 107,000 today. U.S. Census Bureau, Decennial Census and American Community Survey. The median house price in Boulder is now nearly \$800,000. Zillow Research, ZHVI Single-Family Homes Time Series (\$) (dataset), accessed March 28, 2020, <https://www.zillow.com/research/data/>. Boulder has accommodated more population growth than Arlington since Arlington County planners upzoned for Metro. But while Arlington's growth has been accommodated entirely through infill development, the Boulder area has extensive greenfield sites available.

¹⁰⁸ When a locality in a growing region obstructs housing development within its borders, regional population will likely continue, but housing for new residents will have to be built in a further flung location. The pattern leads to more farmland or wild land being developed, resulting in habitat loss. It also results in more people with longer driving commutes than would otherwise result. One study estimates that if people who work in Boulder, CO, were able to find and afford housing there, vehicle miles travelled could be reduced by 245 million annually. Abigail Bradford et al., "Growing Greener: The Environmental Benefits of a Compact and Connected Boulder," Frontier Institute et al., <https://copirg.org/sites/pirg/files/reports/FINAL%20-%20Boulder%20Growing%20Greener.pdf>, page 10.

¹⁰⁹ Molotch argued that allowing real estate development would benefit a locality's elites at the expense of low-income residents and racial minorities. However anti-growth policies have in fact resulted in the displacement of low-income, disproportionately minority residents from anti-growth localities. For a history on the racist history of U.S. local government regulations, including zoning restrictions, and federal housing policy, see Richard Rothstein, *The Color of Law: A Forgotten History of How Our Government Segregated America*, New York: Liveright, 2017.

harming wildlife habitat, building new infrastructure, and also causes residents to commute farther to job centers relative to what would be possible if infill construction were allowed in places closer to employment centers.

In response to environmental problems caused by decades of the anti-growth activism that Molotch supported, some influential environmental activists have adopted stances supporting infill development. For example, the Sierra Club now has an urban infill platform that supports allowing dense development, particularly in locations served by transit.¹¹⁰ Not all environmental organizations support infill development today, however. Even within the Sierra Club, some local chapters are much less supportive of infill development--and trend toward the no-growth advocacy position--relative to the national organization.¹¹¹

The no-growth environmental movement has historically had a presence in Fairfax County. Former Fairfax County Supervisor Audrey Moore built her political career by supporting large lot zoning and the preservation of local open space in order to improve local water quality and limit traffic.¹¹² She served on the County Board for 20 years, including four as Board Chair.¹¹³ In an interview explaining how she developed her views on development, Moore cited her commute to Manhattan as a student, “I would

¹¹⁰ Sierra Club, “Urban Infill,” Urban and Land-Use Policies, Sierra Club, (accessed February 10, 2019), https://www.sierraclub.org/sites/www.sierraclub.org/files/Infill%20Policy_5.18.2019.pdf.

¹¹¹ Sasha Perigo, “Why does the Sierra Club Oppose Affordable Housing?” *Curbed*, February 6, 2020, <https://sf.curbed.com/2020/2/6/21122825/affordable-housing-homes-sierra-club-moss-beach>.

¹¹² Antonio Olivo, “Audrey Moore, Fairfax County supervisor and environmentalist, dies at 89,” *The Washington Post*, December 19, 2018, https://www.washingtonpost.com/local/obituaries/audrey-moore-fairfax-county-supervisor-and-environmentalist-dies-at-89/2018/12/19/5301a4ca-02e5-11e9-9122-82e98f91ee6f_story.html.

¹¹³ Ibid.

sit on that train and look out at the apartments on West 125th Street and think that was terrible.”¹¹⁴

Today, environmentalists widely recognize that, relative to many parts of the U.S., Manhattan is an environmentally friendly place to live. It has among the country’s lowest greenhouse gas emissions per capita due to a low rate of trips in single occupancy vehicles and nearly ubiquitous multifamily housing that is efficient to heat and cool relative to detached single-family homes.¹¹⁵ The Tysons Task Force report demonstrates that the environmentalists on the Task Force recognized the benefits of allowing infill development relative to a slow- or no-growth approach within Fairfax County.¹¹⁶ The Tysons plan that the County ultimately adopted looks like the growth machine – a coalition of real estate interests and boosters of local growth – at work in part because environmentalists who believe no-growth policies are actually environmentally detrimental were members of the Task Force.

During the Tysons redevelopment planning process, officials and residents repeatedly cited neighboring Arlington County’s Rosslyn-Ballston corridor as their model for success.¹¹⁷ Arlington sits about eight miles to the east of Tysons, across the

¹¹⁴ Ibid.

¹¹⁵ David Owen, *Green Metropolis*, New York: Penguin (2009), Chapter 1.

¹¹⁶ The Task Force included John Jennison, Stella Koch, George Lamb, and Wade Smith who all indicated that they worked for environmentalist organizations either professionally or in a volunteer capacity. CouncilPB Placemaking for Tysons Task Force, “Transforming Tysons: Vision and Area Wide Recommendations,” September 15, 2008, <http://www.cdctyson.com/images/TransformingTysons.pdf>, Appendix A.

¹¹⁷ Ibid., 57; In addition to the Task Force report citing the Rosslyn-Ballston corridor as a model, the bicycle infrastructure plan for Tysons does as well. See Fairfax County Department of Transportation, “Fairfax County Bicycle Master Plan Phase 1: Tysons Corner Area,” April 2011, <https://www.fairfaxcounty.gov/transportation/sites/transportation/files/assets/documents/pdf/transportation%20projects,%20studies%20and%20plans/countywide%20bicycle%20master%20plan/tysonsbikemasterplan/chapters.pdf>.

Potomac River from Washington, DC. Consisting of plantations and small farms until the Civil War, Arlington saw extensive development in the early 20th century as a streetcar suburb of Washington, DC.¹¹⁸ While the majority of the county was developed as detached, single-family home neighborhoods, it sits on a dense network of relatively narrow streets as all development did prior to widespread car use. Unlike Tysons, walkable development was able to proceed in Arlington without building a new street grid.

The Rosslyn-Ballston corridor is served by five stations on WMATA's Orange Line, built in the 1970s. Ahead of the arrival of the Orange Line, Arlington County underwent a redevelopment plan with goals similar to the Tysons redevelopment plan. Arlington policymakers adopted a zoning code that accommodates dense, mixed-use development on the land adjacent to its Metro stations. In part as a result of this zoning reform, the county's population has grown by more than one-third since 1970. Between 2000 and 2010, more than 90 percent of the county's population growth was accommodated in new multifamily housing units, mostly centered around Metro stations.¹¹⁹ The American Planning Association has said of Arlington's planning:

Arlington has experienced a remarkable transformation from a suburban, auto centric collection of neighborhoods to one of this country's most recognized

¹¹⁸ John E. Merriken, *Old Dominion trolley too: A history of the Mount Vernon Line*, L.O. King, Jr, 1987.

¹¹⁹ Arlington County, "Arlington Community Facilities Study," March 19, 2015, Chapter 2, Page 9, https://commissions.arlingtonva.us/wp-content/uploads/sites/5/2015/11/CFS_FinalReportCompanion-Part2web.pdf.

examples of the benefits of smart growth, sustainability, walkability and transit oriented development.¹²⁰

Arlington has shown Fairfax residents and policymakers that it's possible for growth not to be accompanied with increased traffic congestion. Traffic in the county has actually declined since the 1990s, in part because 40% of residents now take transit to work.¹²¹

As a whole, the Washington region has been more open to new housing construction, and specifically transit-oriented development, than many other coastal regions in the country. The reason for this regional relative openness to transit-oriented development is beyond the scope of this paper. However, in addition to TOD in Arlington, other, smaller scale areas of transit-oriented redevelopment in the region include Silver Spring and White Flint in Montgomery County, MD and the Mosaic District at the Dunn Loring Metro in Fairfax. In a survey of walkable areas within urban areas across the country, Christopher Leinberger identifies the Washington-Arlington-Alexandria metropolitan area as having the highest percent of residents who live in a walkable urban place.¹²² Redevelopment planning for Tysons stands out even within the DC region for its size and scope.

¹²⁰ American Planning Association, "Arlington County's Smart Growth Journey, Rosslyn – Ballston Corridor – Implementing the General Land Use Plan," 2017, <http://www.pgplanning.org/DocumentCenter/View/9199/Article-on-Arlington-County-SGJRB-Corridor-9-18>, page 1.

¹²¹ Luke Mullins, "The Audacious Plan to Turn a Sprawling DC Suburb into a Big City," *Washingtonian*, March 29, 2015, <https://www.washingtonian.com/2015/03/29/the-audacious-plan-to-turn-a-sprawling-dc-suburb-into-a-big-city/>.

¹²² Christopher Leinberger, "Footloose and Fancy Free: A Field Survey of Walkable Urban Places in the Top 30 U.S. Metropolitan Areas," Brookings Institution, 2016, https://www.brookings.edu/wp-content/uploads/2016/06/1128_walkableurbanism_leinberger.pdf

In addition to the potential transportation benefits of building housing near transit, fiscal realities likely led Fairfax residents to favor the Arlington model.¹²³ In general, local policymakers tend to support office and retail development and shun residential development, particularly relatively low-cost, multifamily development. This practice is known as “fiscal zoning,”¹²⁴ referring to local policymakers pursuing zoning policies that increase their tax revenues relative to their obligations.

Commercial development provides localities with increased property and sales tax revenues and requires few government services in return. Compared to commercial development, residential development requires more government services relative to the taxes new residents will pay. This effect is greatest for multifamily construction that is home to children who will attend public schools and generates lower per-unit property tax revenues than new single-family construction.

Dating to at least 1976, when a special commission formed to identify opportunities to fill revenue shortfalls for Fairfax County, Tysons, with its extensive office and retail development, has been viewed as key to the county’s fiscal health.¹²⁵ Typical fiscal zoning patterns have started to falter in Tysons, however. Since the peak of Tysons’ office market in the late 1990s, when vacancy rates were below two percent, Tysons has been losing office tenants to Washington, DC and Arlington, where they are

¹²³ The Task Force pointed to fiscal concerns as a guiding planning principle in their report: “Move Tysons forward within its existing boundaries as the employment and commercial economic engine of the region and an expanding contributor to the tax base of Fairfax County.” PB Placemaking for Tysons Task Force, “Transforming Tysons,” Page x.

¹²⁴ J. M. Pogodzinski, “The Effects of Fiscal and Exclusionary Zoning on Household Location: A Critical Review,” *Journal of Housing Research* 2(2), 1991.

¹²⁵ Nicholas A. Phelps, “The Growth Machine Stops? Urban Politics and the Making and Remaking of an Edge City.” *Urban Affairs Review* 48:5 (2012).

willing to pay higher rents to locate in more urban, walkable neighborhoods.¹²⁶ This is part of a national trend; many suburban office parks across the country have been deemed obsolete by real estate industry analysts, as companies have been leaving aging office parks in favor of urban locations that are more appealing to their workforce.¹²⁷

In addition to the fiscal realities that helped make redevelopment in Tysons appealing to Fairfax residents, the redevelopment plan likely passed in part because of its buffered effect on homeowners. The plan allows for TOD in the four areas closest to the new Metro stations while identifying four surrounding neighborhoods within the Tysons planning area that are not zoned for TOD. No single-family homes are located in the TOD areas. Within the four non-TOD neighborhoods, there are very few detached single-family houses and some townhouses. The remaining lots are primarily low-density commercial usages such as strip malls and car dealerships. The plan doesn't upzone any of these residences.¹²⁸

¹²⁶ Mullins, "The Audacious Plan to Turn a Sprawling DC Suburb into a Big City."

¹²⁷ Newmark Grubb Knight Frank, "Suburban Office Obsolescence: Quantifying Challenges and Opportunities," September 2015, page 5, <http://ngkf.com/Uploads/FileManager/Suburban-Office-Obsolescence.pdf>.

¹²⁸ A small number of single-family homes within the West Side planning area, which makes up the non-TOD zone to the west of both the Greensboro and Spring Hill TOD planning areas. In its work planning for a new development at the Spring Hill metro, in 2012 the Georgelas Group sought to purchase these two homes to use their land as required park space for the new development. The Comprehensive Plan calls for the County to use eminent domain to purchase private land for the plan's called-for park space if buyers can't come to an agreement with owners for purchase. Under eminent domain the property owner would be compensated for the property's assessed value, so that's what the Georgelas Group offered. However at least one property owner didn't want to sell at that price because she had been offered a higher price for her home from another potential buyer. See Dave Webster, "Fairfax County's Improper Land Grab," *Patch*, June 24, 2013, https://patch.com/virginia/vienna/fairfax-countys-improper-land-grab_0c618503. Ultimately, the County purchased other homes on Raglan Road to create new park space with funds proffered from the Spring Hill development. See Fairfax County Park Authority, "Park Authority Adds Acre to Raglan Road Park in Vienna," June 19, 2019, <https://www.fairfaxcounty.gov/parks/park-news/2019/z-ir097> (accessed March 30, 2020).

Tysons' history of large landowners has led to a particularly intertwined relationship between concentrated real estate interests and local policymakers that gives real estate interests special political influence.¹²⁹ In 1962, Gerlad Halpin, Tom Nicholson, Rudolph Seeley and Charlie Ewing founded WestGroup, first with one office park in Tysons and eventually owning more than 100 buildings.¹³⁰ It's possible that the presence of large, powerful real estate interests in Tysons and in the region as a whole has contributed to the DC region's relative permissiveness toward housing development relative to other high-income, coastal regions.

At the time of redevelopment planning, WestGroup owned 142 acres of land in Tysons, or nearly 7 percent of the entire area. The firm was closely involved in the redevelopment planning process.¹³¹ After purchasing WestGroup's portfolio in 2010, DLJ became a major area landowner.¹³² The sales price was less than initially expected,

¹²⁹ In his analysis of Tysons as an edge city, Joel Garreau calls the networks of landowners and other real estate interests, civic associations, and these groups' networks with county officials "shadow governments" in Tysons. See Garreau, *Edge City*, 187. Garreau explains that during the 1940s through the 1970s, when Tysons took shape as an edge city, lawyer and developer John Tilghman "Til" Hazel Jr. played a key role in condemning land for where I-495 would be built. Hazel advocated for development in Fairfax County (including George Mason University), and ultimately developed housing and commercial real estate in Northern Virginia. In the 1960s, Theodore Lerner entered the Tysons market, purchasing a large parcel of farmland that had previously belonged to William Tyson, for whom the area is named and where the Tysons Corner metro station now sits. Lerner went on to develop the two large shopping malls that Tysons is well-known for along with surrounding hotels and retail.

¹³⁰ Jon Banister, "Titan Of Tysons: Visionary Developer Gerald Halpin Dies At 94," August 16, 2017, <https://www.forbes.com/sites/bisnow/2017/08/16/titan-of-tysons-visionary-developer-gerald-halpin-dies-at-94/#1c6375ea2062>.

¹³¹ Tierney Plumb, "Deal of the Year: WestGroup Tysons Corner Portfolio," *Washington Business Journal*, April 29, 2011, <https://www.bizjournals.com/washington/print-edition/2011/04/29/bred-story-1.html>.

¹³² Jon Banister, "Titan Of Tysons: Visionary Developer Gerald Halpin Dies At 94," *Forbes*, August 16, 2017, <https://www.forbes.com/sites/bisnow/2017/08/16/titan-of-tysons-visionary-developer-gerald-halpin-dies-at-94/#1c6375ea2062>.

likely because the zoning amendment for Tysons ended up allowing less dense office development than the Task Force report recommended.¹³³

Tysons is an illustration of growth machine Molotch describes, a symbiotic relationship between policymakers and real estate interests, at work. As is common in local politics, individuals and firms in the real estate industry are an important source of campaign contributions for candidates running for seats on the Fairfax County Board of Supervisors. In the six elections since Tysons redevelopment planning began, real estate industry contributions have totaled 18.2 percent of all donations to Fairfax County supervisor campaigns.¹³⁴ The redevelopment planning period for Tysons, 2004 through 2010, corresponded with an increase in real estate industry campaign contributions as a percentage of total donations, from 14.3 percent in 2003 to nearly 20 percent in the three following elections.¹³⁵ Figure 7 shows real estate industry campaign contributions as a percentage of total campaign contributions and as a percent of winning candidates' campaign contributions from 1999 through 2019, the period for which campaign finance data is available.

¹³³ Sarah Krouse, "Details of WestGroup's sale to DLJ Real Estate Capital Partners," *Washington Business Journal*, August 2, 2010, https://www.bizjournals.com/washington/blog/2010/08/details_of_west-groups_sale_to_dlj_real_estate_capital_partners.html.

¹³⁴ The Virginia Public Access Project provides data on donors to Fairfax County candidates for local office by industry. Author's calculations. See "Donors," Fairfax County, 1999-2019, (accessed November 2019), <https://www.vpap.org/localities/fairfax-county-va/donors/>.

¹³⁵ Ibid.

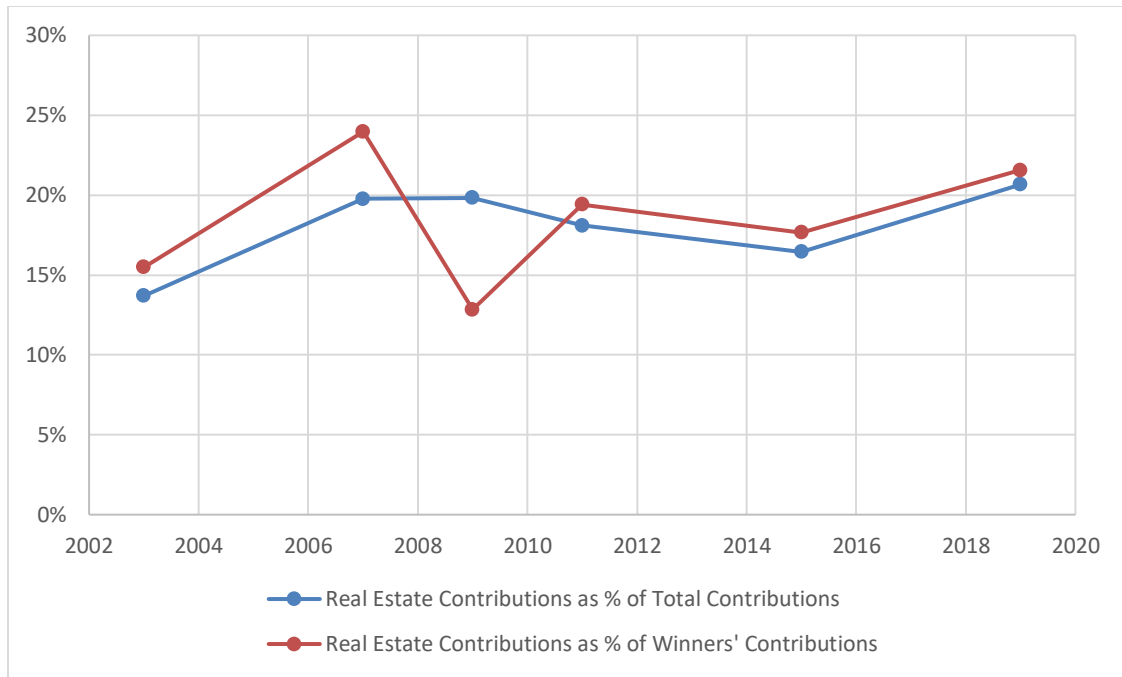


Figure 7: Fairfax County Campaign Contributions from the Real Estate Industry.¹³⁶

Fairfax County held a special election in 2009 after Board Chair Democrat Gerry Connolly was elected to the United States Congress. In this special election, Chair and one other board seat were open. In all other elections for which campaign spending and contribution data is available, real estate industry contributions disproportionately went to winning candidates. In the special election, however, real estate industry money disproportionately went to losing candidates, driven by contributions to Republican Pat Herrity, candidate for At Large Supervisor and Chairman.

Herrity lost narrowly to Democrat Sharon Bulova, who served as Chair until she retired in 2020. Both candidates were current supervisors and campaigned on growth and

¹³⁶ Ibid., Author's Calculations.

redevelopment in Tysons. However, Herrity supported reducing requirements for developers to provide income-restricted housing for middle-income households relative to what the Task Force recommended. He supported spending increased property tax revenue from development on transportation infrastructure instead.¹³⁷

No members of the County Board have lost re-election campaigns following the adoption of the comprehensive plan for Tysons in 2010. The Board composition has been the same since 2009 with the exception of Michael Frey and Gerald Hyland, who retired along with Bulova.

The real estate interests who supported redevelopment planning in Tysons through campaign contributions, their work on the Task Force, and other activism were rewarded with increased development opportunities as a result of the 2010 Comprehensive Plan and zoning amendments. The parcels of land immediately surrounding Metro stations in Tysons, zoned for the highest intensity in the area, are worth far more than similar parcels slightly further away. Figure 8 shows the land areas that are $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 mile away from the Tysons metro stations mapped onto Fairfax County's census tracts. In 2018, an acre of land between one-half mile and one mile away from any of the four Tysons metro stations (shown in blue in Figure 8) is worth on average 1.4 million dollars per acre.¹³⁸ Parcels sold for redevelopment in the land within

¹³⁷ Aubrey Whelan, "Fairfax board clashes over Tysons Corner housing," *Washington Examiner*, June 7, 2012,

https://www.washingtonexaminer.com/fairfax-board-clashes-over-tysons-corner-housing?_amp=true.

¹³⁸ Land price data for land between one-half mile and one mile from the Tysons area metro stations is from William Larson et al., "The Price of Residential Land for Counties, ZIP codes, and Census Tracts in the United States," Federal Housing Finance Agency Working Paper 19-01, January 2, 2019, <https://www.fhfa.gov/PolicyProgramsResearch/Research/Pages/wp1901.aspx>. I used their data on land prices at the census tract level and created a weighted average of the Census tracts that make up the the

1/8 mile of the metro stations are selling for multiples of this value, for as much as \$5 to \$10 million per acre.¹³⁹ Land prices in Tysons would be much higher were it not for Tysons-specific property taxes and development fees that are capitalized into land prices, covered in Section 3.

land between 1/2 and 1 mile from the four Tysons metro stations. Their methodology relies on single-family home sales to estimate land value. They provide data at the Census tract level covering 97% of the land between 1/2 and 1 mile from the four Tysons metro stations. Because there are few single-family home in the bands closer to the metro stations, I'm not able to use their data to estimate land prices in the bands closer to the metro stations, so I rely on news reports for some examples of land price sale within 1/8 mile of the metro stations, the land that has been upzoned the most and benefits most from proximity to the metro stations.

¹³⁹ Keith Loria, "Tysons Parcel Primed for Redevelopment Commands \$60.2M," *Commercial Observer*, November 19, 2019, <https://commercialobserver.com/2019/11/tysons-parcel-primed-for-redevelopment-commands-60-2m/>; the County Board recently purchased 1.8 acres from a developer for \$16.6 million. See Daniel J. Sernovitz, "Fairfax County acquires former Tysons Container Store," *Washington Business Journal*, October 9, 2019.

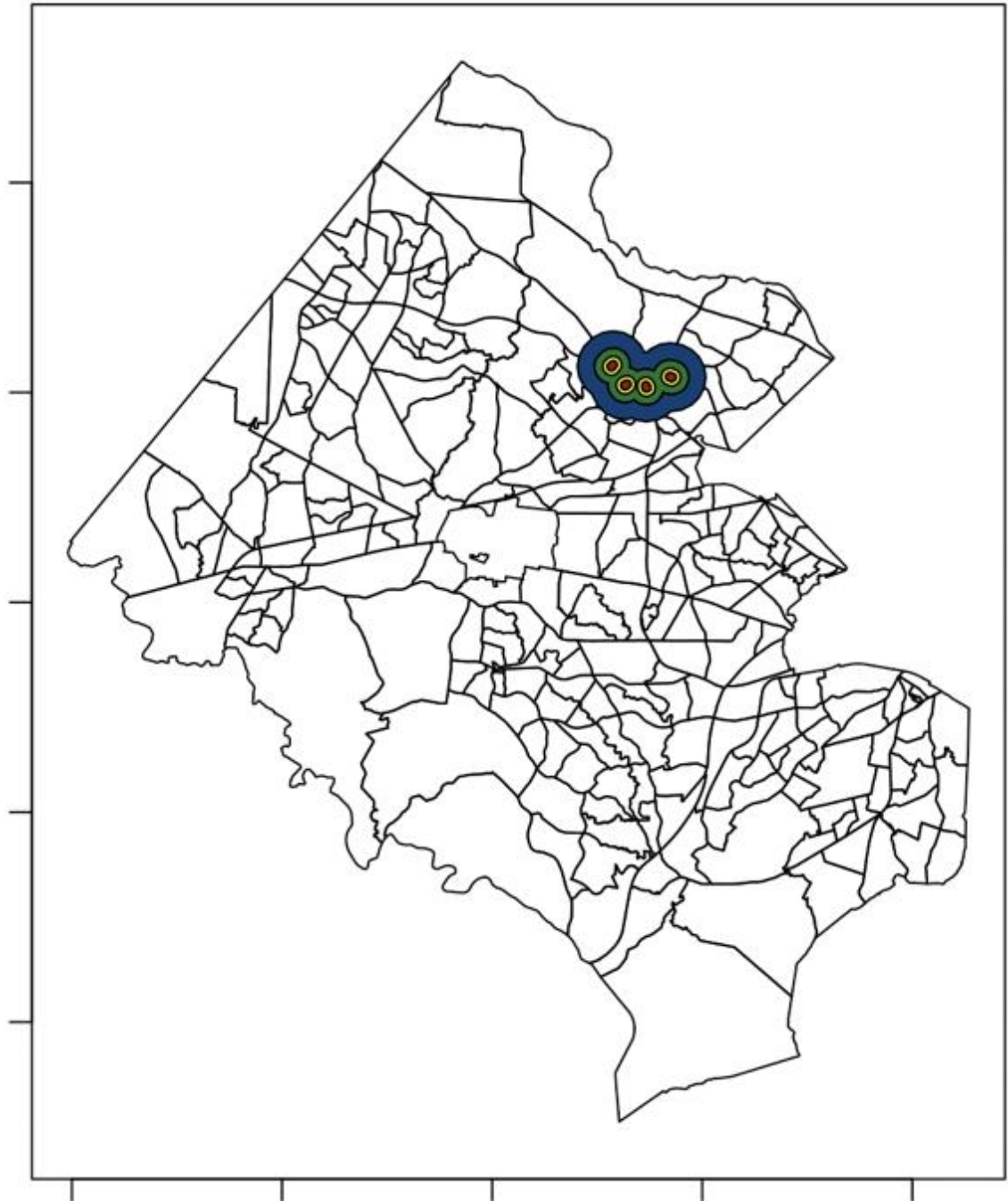


Figure 8: Planning radii surrounding the Tysons Metro stations. Image by Robert Orr.

While landowners and developers stood to profit from Tysons redevelopment planning, support from public-spirited activists, who supported redevelopment for environmental or affordability reasons, was just as important to the Plan's adoption. Of the 36 members on the Task Force, 6 included environmental professional or volunteer work in their bios. The Comprehensive Plan reflects many of the policies that the Task Force recommended to mitigate the environmental impact of building in Tysons, including requirements for 20 athletic fields along with other greenspace, and a mandate that all redevelopment projects meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program standards for LEED Silver standards or better.¹⁴⁰

The goals of the real estate and environmentalist coalitions align well in Tysons. Urban planning professors Jonathan Levine and Aseem Inam explain that land use regulations are likely responsible for the prevalence of greenfield development, which causes more environmental damage and longer, more car-intensive commutes relative to infill construction. In many cases new subdivisions on the edges of urban development are the only type of new housing that land use regulations permit. In a nationwide survey of developers published in 2004, Levine and Inam find that most developers perceived an inadequate supply of housing in dense, walkable neighborhoods relative to demand.¹⁴¹ Developers who were surveyed attributed the mismatch to zoning regulations.

¹⁴⁰ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," 37.

¹⁴¹ Jonathan Levine and Aseem Inam, "The Market for Transportation-Land Use Integration: Do Developers Want Smarter Growth than Regulations Allow?" *Transportation* 31:4, November 2004, 409-427.

Besides supporting increased building density through zoning reforms, environmental activists on the Task Force supported extensive new park space and open space in Tysons. They cited goals both of providing active and civic space¹⁴² as well as reducing stormwater runoff.¹⁴³

The Task Force also included affordable housing advocates. Extensive research has shown that restricting housing construction, particularly multifamily construction, increases house prices.¹⁴⁴ In turn, housing supply constraints particularly harm low-income renters. In cases where new housing construction replaces existing, relatively low-cost housing, the effect of housing construction on prices may be ambiguous.¹⁴⁵ Because redevelopment in Tysons permitted housing construction where car dealerships, big box stores, and office parks stood, this wasn't a concern for Fairfax housing affordability advocates.

The next section will show that the planning process reinforced the alignment of these groups by creating specific benefits for activists with each new development project. Combined with the county's relatively low level of homeowner opposition, increased residential density in Tysons is proceeding according to the Task Force's plan.

¹⁴² CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons," page v.

¹⁴³ CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons," 61.

¹⁴⁴ For a review of the economic literature on the relationship between land use regulations and housing supply, see Joseph Gyourko and Raven Molloy, "Regulation and Housing Supply" (NBER Working Paper No. 20536, National Bureau of Economic Research, Cambridge, MA, October 2014).

¹⁴⁵ Vicki Been et al., "Supply Skepticism: Housing Supply and Affordability," *Housing Policy Debate* 29:1, May 2018.

Section 3: The Planning Process in Tysons

Prior to appointing the Task Force to design a plan for TOD in Tysons, Fairfax County policymakers had already considered land use planning for Tysons that anticipated rail to Dulles. In 1994, the County Board adopted a comprehensive plan amendment for Tysons reflecting locations for three potential Metro stations. The 1994 plan shared the current plan's goal of transforming Tysons into a more urban area and continuing its role as the county's "downtown."¹⁴⁶ Unlike the 2010 plan, the 1994 plan remained merely a vision document and was not reflected in zoning changes or denser development in Tysons.¹⁴⁷

While policymakers had discussed rail to Dulles and TOD planning in Tysons for decades, serious steps toward planning for the Silver Line began in 2005 when the Fairfax County Board appointed 36 members to the Tysons Task Force. The Task Force's role was to hold meetings with homeowners, real estate firms, and other businesses to craft suggestions for redevelopment planning that reflected all stakeholders' interests. Members of the Task Force held over 100 meetings and workshops to gather public feedback.¹⁴⁸ The Task Force developed a plan supporting TOD in Tysons with the goal of facilitating population and economic growth without worsening the area's

¹⁴⁶ Fairfax County, "Adopted Text for Plan Amendment 2007-23 (Tysons Corner Urban Center) for Fairfax County, Va." Adopted June 22, 2010, page 1,

<https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/zoning/2007-23.pdf>.

¹⁴⁷ Avery Bowron, "Visions of the Future as Spaces of Engagement: The Political Economy of Transit-Oriented Redevelopment in Tysons Corner, VA," *Cities in the 21st Century* 2(1), Summer 2010, page 16, <http://digitalcommons.macalester.edu/cgi/viewcontent.cgi?article=1010&context=cities>.

¹⁴⁸ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," 4.

notorious traffic.¹⁴⁹ The Task Force played an important role in shaping the planning objectives and ultimately the zoning and transportation reforms that were reflected in the Tysons comprehensive plan and zoning reforms.

The Task Force included members representing the three key political groups that were needed to implement the plan – real estate professionals, public advocates, and representatives of homeowner organizations.¹⁵⁰ All three groups’ key concerns were reflected in the Task Force report and ultimately in the Comprehensive plan and zoning amendments.

In 2008, the Task Force worked with a team of consultants and county officials to publish a document called “Transforming Tysons: Vision and Area Wide Recommendations” to present to the Board of Supervisors.¹⁵¹ In addition to real estate professionals, businesses interests represented on the Task Force included business owners and several members of Chambers of Commerce chapters and employees of major Tysons real estate interests -- the Georgelas Group, a major area developer, and WestGroup, the largest landowner.¹⁵² Public-oriented activists included representatives for several causes including environmentalists, parks supporters, pedestrian and cyclist advocates, and supporters of affordable housing.¹⁵³

¹⁴⁹ For an overview of transit-oriented design and implementation in the U.S., see Hank Dittmar and Gloria Ohland (eds.), *The New Transit Town: Best Practices In Transit-Oriented Development*, Washington: Island Press, (2004).

¹⁵⁰ Appendix A of the Task Force’s report includes biographies of all of the members. Their affiliation information shows that homevoters, bootleggers, and Baptists were all well-represented. CouncilPB Placemaking for Tysons Task Force, “Transforming Tysons.”

¹⁵¹ Ibid.

¹⁵² Ibid.

¹⁵³ Ibid.

Homeowners and representatives of neighborhood organizations also served on the Task Force, including Chairman Clark Tyler, a former board member of the McLean Citizens Association, an influential homeowner organization. Many of the members of the Task Force were long-time Fairfax County homeowners, and 10, nearly a third, represented homeowner organizations. If advocates of Molotchian no-growth policies were on the task force, their views were not reflected in the Task Force's report, which provided enthusiastic support for TOD and population growth in the area immediately around the new metro stations.

The Task Force report aggregated the goals of its memberships' diverse interests by promoting zoning reforms that would allow for significantly increased development exclusively around the new transit stations, maintaining the status quo for single-family neighborhoods and creating buffer zones around the transit stops to transition from high-rise to low-density development.

Further, the Plan requires developer-funded infrastructure and public service requirements to be in place prior to permitting new development in order to prevent new residents in Tysons from causing increased traffic congestion or crowding in public spaces in other parts of the County. The plan reads:

Incremental redevelopment must be balanced by having infrastructure in place when needed, such as the Circulator System, the new grid of streets, parks and recreational facilities, schools and fire stations to successfully support an increased population in Tysons. Each step of redevelopment in Tysons needs to

move in the direction of achieving the vision laid out in the Plan. The phasing of development is essential to assure the provision of public facilities.

[...]

Development approved in later phases should be triggered by achievement of trip reduction objectives and the provision of the infrastructure and other transportation improvements set forth . . . in the Transportation section.¹⁵⁴

The Task Force developed a plan for growth that would minimize impact on single-family neighborhoods. Since redevelopment began, homeowners have been particularly concerned that roads had not been widened sufficiently to maintain current levels of traffic flow as population and jobs have grown. They have also held county policymakers to achieving the goal of permitting primarily residential rather than office development, which they argued would cause more traffic.¹⁵⁵ In a comment on the 2017 update to the Comprehensive Plan for Tysons, the McClean Citizens Association characterized County policymakers' promises to Fairfax residents outside of the Tysons area:

First, to ensure that public infrastructure construction in Tysons proceeds in tandem with and is in place prior to development that yields major increases in

¹⁵⁴ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," 31.

¹⁵⁵ McLean Citizens Association, "Resolution on Tysons Implementation Plan Amendment (S13-II-TY1)," March 10, 2017, https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/comprehensive_plan/mca_resolution_on_tysons_imp_plan_amendment.pdf, page 1.

intensity; Second, to ensure that Tysons is a place where people can live, work, and play; and Third, to ensure that negative impacts on the surrounding communities are mitigated and that Tysons growth does not come at the expense of the quality of life in these communities.¹⁵⁶

While the Task Force members reached a consensus in the report they published, there has been some opposition to redevelopment post-publication that's typical of Fischel's homevoter. In addition to Tyler, other members of the McLean Citizens Association served on the Task Force. Following the Task Force's report publication, some members of the Association have been critics of the Comprehensive Plan and ongoing redevelopment in Tysons. They've argued that the comprehensive plan requires the county and developers to provide the infrastructure to accommodate growth before permitting new office and residential buildings because they're concerned new buildings will increase traffic.

However, maintaining current speeds for an increasing number of drivers in Tysons is directly at odds with the area becoming more walkable. If Tysons successfully follows the Arlington model, as has been the county's objective since the Task Force report, new road infrastructure would not be needed in order to maintain or improve upon current levels of traffic congestion and delay. But in fact, the median travel time to work for Fairfax residents has increased slightly from 31.3 minutes in 2010 to 32.1 minutes in

¹⁵⁶ Sally K. Horn, "Planning Commission Oral Testimony," McLean Citizens Association, February 8, 2017, https://www.fairfaxcounty.gov/tysons/sites/tysons/files/Assets/Documents/PDF/Comprehensive_Plan/mca_-_tysons_oral_testimony_02-08-17.pdf.

2017.¹⁵⁷ So far, Tysons is accommodating growth in part by widening major thoroughfares, with the view that growth in Tysons will be accompanied by an increase in traffic.¹⁵⁸ Accommodating growth by maintaining the level of service for drivers on Tysons' roads is at odds with the goal of Tysons becoming more walkable and safe for pedestrians.¹⁵⁹

After the Task Force submitted its report to the county board, five members worked with County planning staff and sought community engagement to create the first Comprehensive Plan for Tysons. Members of the Task Force were in a privileged position to advance their private interests in the Comprehensive Plan and related zoning amendments for Tysons that the County Board ultimately adopted. The plan reflected several priorities identified in the Task Force's report, including planning for high-density TOD around the metro stations, with less-dense development in the surrounding areas; requiring new developments to provide below-market-rate housing or contribute to an affordable housing fund; creating new pedestrian-scale streets; a focus on decreasing the jobs to housing ratio in Tysons; prioritizing parks and arts space; and implementing a circulator bus to complement the Silver Line.¹⁶⁰ The Task Force developed a land use map that closely resembles the county's current zoning map for Tysons.¹⁶¹

¹⁵⁷ U.S. Census Bureau, *Commuting Characteristics by Sex, 2013-2017*, American Community Survey 5-Year Estimates, 2017.

¹⁵⁸ Fairfax County, "Tysons 2018-2019 Progress Report on the Implementation of the Comprehensive Plan," Page 20-22, https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/annual_reports/tysons%20annual%20report%202019%20final%20for%20web.pdf.

¹⁵⁹ Jonathan Levine et al., *From Mobility to Accessibility: Transforming Urban Transportation and Land-Use Planning*, Cornell: Cornell University Press, 142-3.

¹⁶⁰ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," 6.

¹⁶¹ CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons," v.

The Task Force recommended allowing denser office development in the TOD planning areas than the Tysons zoning amendments permit. The Task Force recommended allowing up to 6.0 FAR for all development within ¼ mile of a metro station with potential bonus density for meeting environmental standards and for providing income-restricted housing in residential developments.¹⁶² The actually implemented zoning ordinance restricts office development to 2.5 FAR, with no FAR restrictions on other types of development, in an effort to encourage residential, retail, and hotel development rather than office.

Following the adoption of the Tysons Comprehensive Plan in 2010, the Task Force's work was complete. In 2012 a new organization, the Tysons Partnership, was established as a successor stakeholder organization. The Partnership is a non-profit with the mission to "ensure that the overarching goals and objectives of the Comprehensive Plan for Tysons are achieved."¹⁶³ Like the Task Force, the Tysons Partnership is a platform for interest groups to influence public policy. Unlike the Task Force, the Tysons Partnership membership is made up primarily of real estate interests without representation of environmental or housing activists or homeowners' organizations. The County also serves a role in the Tysons Partnership with an *ex-officio* membership.

Since the County Board adopted the first Comprehensive Plan for Tysons in 2010, an amendment was adopted in 2013 that created more flexibility for standards for public facilities and infrastructure. In 2017 the county adopted a revised Comprehensive Plan to

¹⁶² Ibid., 39.

¹⁶³ Tysons Partnership, "Mission," <https://www.tysonspartnership.org/about-us/mission/>, accessed February 13, 2020.

reflect new details on funding for infrastructure and public services with the establishment of various funds and development fees.

Public comments submitted in response to the 2013 revisions shows that tensions began emerging between bootleggers and homevoters about how development should proceed and the level of public benefits that developers should be required to provide. The high-level of influence that the Comprehensive Plan has on Tysons development allows organizations like the Tysons Partnership to be particularly influential on development approvals because policymakers have extensive leeway to subjectively approve or deny projects, or require changes to development proposals.

In addition to the Comprehensive Plan and zoning amendments, county departments have published additional guidance documents for development. These include design standards for buildings and infrastructure,¹⁶⁴ a parks plan,¹⁶⁵ and a bicycle infrastructure plan.¹⁶⁶

In some cases, comprehensive plans are little more than box checking exercises, which states require municipalities to complete as part of implementing zoning

¹⁶⁴ Fairfax County Office of Community Revitalization, “Tysons Urban Design Guidelines,” February 24, 2017, https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/urban%20design/tysons_udg.pdf.

¹⁶⁵ Fairfax County Park Authority, “Tysons Park System Concept Plan,” October 22, 2014, https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/tysonsparksystem_cp_102214.pdf.

¹⁶⁶ Fairfax County Department of Transportation, “Fairfax County Bicycle Master Plan.” Phase 1: Tysons Corner Area,” April 2011, https://www.fairfaxcounty.gov/transportation/sites/transportation/files/assets/documents/pdf/transportation%20projects,%20studies%20and%20plans/countywide%20bicycle%20master%20plan/tysonsbikemasterplan_chapters.pdf.

ordinances and other land use regulations that actually govern development.¹⁶⁷ This is not the case in Tysons. The zoning ordinance specifically defers to County planners and elected officials to interpret the Comprehensive Plan and determine whether or not a development proposal furthers the Plan's goals:

The [Planned Tysons Corner] PTC District is established for the Tysons Corner Urban Center as defined in the adopted comprehensive plan to implement the mix of uses, densities and intensities under the redevelopment option set forth in the adopted comprehensive plan. The PTC District regulations are designed to provide the necessary flexibility to transform the designated Tysons Corner Urban Center area from a suburban office park and activity center into an urban, mixed-use, transit, bicycle and pedestrian oriented community to promote high standards in urban design, layout and construction and to otherwise implement the stated purpose and intent of this Ordinance.¹⁶⁸

Local policymakers have the discretion to award substantial density beyond what zoning permits if they determine the project is furthering the objectives in the Comprehensive Plan.¹⁶⁹ The plan encouraged large parcels of at least 20 acres to make it feasible for developers to provide public benefits, such as a new street grid, which helped

¹⁶⁷ Della Rucker, "Why Comprehensive Plans Gather Dust," Planners Web Article #540, August 2, 2011, <http://plannersweb.com/2011/08/why-comprehensive-plans-gather-dust/> (accessed February 17, 2020).

¹⁶⁸ Fairfax County, "Fairfax County Zoning Ordinance," 51.

¹⁶⁹ County policymakers have used this discretion in approving a new development at the Spring Hill metro station called The View. The project will be 600 feet tall, exceeding the height limit in the Tysons zoning ordinance by 50 percent. However because county policymakers determined that the project advanced the Comprehensive Plan objectives, it has received approval. Alex Koma, "Fairfax County approves Tysons project featuring what would be region's tallest building," *Washington Business Journal*, October 16, 2019, <https://www.bizjournals.com/washington/news/2019/10/16/fairfax-county-approves-tysons-project-featuring.html>.

to build environmentalist and housing affordability activist support for redevelopment.¹⁷⁰ However, this approach sharply reduces the opportunities for small developers or homebuilders to compete in the Tysons market. The requirement for developers to provide public services and the authority for policymakers to use their discretion to determine how these services will be provided further intertwines the relationship between Tysons' real estate interests and policymakers. Economists Meg Tuszynski and Richard Wagner call this relationship "entangled political economy."¹⁷¹ As policymakers are shaping developers' opportunities to build, developers are also shaping policymakers abilities to meet their constituents' demands.

Developers in Tysons are paying extraordinarily high taxes for transportation improvements. Developers must pay \$3,261 per residential unit or \$18.12 per square foot in non-residential buildings for transportation alone.¹⁷² In addition to these fees, in 2013 the County board passed a new property tax in 2013 on that covers land surrounding the four Tysons area Silver Line metro stations as well as the land around Wiehle-Reston station, the last stop on the first phase of the Silver Line extension. The tax rate for these areas is 0.005% plus the standard Fairfax County property tax.¹⁷³ The average price of a residential unit in Tysons is \$510,000, so the transportation taxes combined with the

¹⁷⁰ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," pages 133, 136, 142, 145, 163, and 166.

¹⁷¹ Meg Tuszynski and Richard Wagner, "From Mixed Economy to Entangled Political Economy: A Paretian Social-Theoretic Orientation," *Public Choice* 164(2), 2015.

¹⁷² Fairfax County, "Tysons 2018-2019 Progress Report," 21-23, author's calculations.

¹⁷³ Fairfax County, "Tax Rates from the FY 2020 (Tax Year 2019) Adopted Budget," <https://www.fairfaxcounty.gov/taxes/real-estate/tax-rates>.

Tysons-specific property tax amount to a little over 1.1% for each new residential unit.

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Residential developers in Tysons are required to set aside 20% of new units as below-market-rate.¹⁷⁵ The requirement is designed to facilitate residents of diverse incomes living in Tysons.¹⁷⁶ Non-residential projects must pay either a one-time \$3.00 per square foot tax to the Tysons Housing Trust Fund or an annual \$0.25 per square foot tax for 16 years. So far the fund has received \$5,222,283.¹⁷⁷

Protests to development in Tysons are notable for their focus on park space and support for policies designed to keep new Tysons residents from using publicly provided goods in other parts of the County. The McLean Citizens Association and Mayor of Vienna both gave testimony at Planning Commission meetings emphasizing their desire for full-size athletic fields to be built in the Tysons planning area.¹⁷⁸ So far, three fields out of the goal of 20 have been built, and developers have promised to build an additional

¹⁷⁴ Redfin, “Tysons Corner Housing Market,” <https://www.redfin.com/city/26538/VA/Tysons-Corner/housing-market>, (accessed March 28, 2020).

¹⁷⁵ Fairfax County, “Fairfax County Comprehensive Plan 2017 Edition,” 34.

¹⁷⁶ In other research on the effects of inclusionary zoning programs across the Baltimore-Washington region, I find that these programs tax new housing construction. While they provide a large benefit to those households who get to live in the subsidized units, this may increase housing costs for the vast majority of Tysons and Fairfax County residents who do not, including for those who earn less than the targets for the subsidized units. However, in the case of the Tysons set-asides for workforce housing likely have little effect on market outcomes since they are price close to market-rate prices. See Emily Hamilton, “Inclusionary Zoning in the Baltimore-Washington Region,” (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington VA, September 2019).

¹⁷⁷ Fairfax County, “Tysons 2018-2019 Progress Report,” 18.

¹⁷⁸ McLean Citizens Association, “Comments on Draft Tysons Implementation Plan Amendment, S13-II-TY1, Dated January 25, 2016,”

https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/comprehensive_plan/mca_comments_draft_tysons_impn_plan_final.pdf; Laurie A. DiRocco Mayor, Town of Vienna, “Proposed Tysons Implementation Plan Amendment,”

https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/comprehensive_plan/tovlettertofcp_re-tysonsplanamend.pdf.

seven.¹⁷⁹ The provision of the 10 fields that are currently legally promised will put the County halfway to its goal of 20 fields by 2050.

To appease these homeowners' concerns, the Tysons Park System Concept Plan relies on developers to provide 154 acres of new parks. For every 4.5 million square feet of new development, developers must provide one new athletic field, or come to an agreement with the county or other developers to meet the requirement at another location in the county.¹⁸⁰ The plan relies on developers to take advantage of the large site plans they will be creating to provide rights of way for utilities as well as space and/or facilities for public services such as schools and fire stations.¹⁸¹

The Plan also includes vague requirements for developers to provide small parks, and what actually gets built has been a result of negotiations between developers and county planners on a project by project basis.¹⁸² The plan calls for some small parks along with civic and art space to be provided near metro stations, where dedicating land to parks or plazas may represent an opportunity cost of millions of dollars to the property owner.

The Task Force recommended that developers should be eligible to receive density bonuses exclusively for meeting LEED building standards and for contributing to the subsidized housing fund.¹⁸³ However, the final zoning ordinance allowed the county to offer up additional density in exchange for any community benefits:

¹⁷⁹ Fairfax County, "Tysons 2018-2019 Progress Report," 56.

¹⁸⁰ *Ibid.*, 36.

¹⁸¹ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," 15.

¹⁸² Fairfax County Park Authority, "Tysons Park System Concept Plan," 36.

¹⁸³ CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons," 37.

For office uses: 2.5 FAR, exclusive of any bonus intensity obtained for proffered public facilities and/or public infrastructure, as set forth in the adopted comprehensive plan; however, an increase in FAR may be permitted by the Board.¹⁸⁴

The Task Force included real estate interests, who signed on to all of these requirements for developers to provide services that would otherwise be provided by local governments. The extensive fees that redevelopment in Tysons requires along with the Tysons special property tax district has met the homevoter demand that increased density in the area has largely paid for its own infrastructure needs.¹⁸⁵

The Task Force proved to be a mechanism for gaining support for redevelopment in Tysons from diverse interests. However, the consensus plan that they developed includes some contradictory objectives. The following section explores the internal inconsistencies in the Tysons redevelopment goals.

¹⁸⁴ Fairfax County, “Fairfax County Zoning Ordinance,” Article 6, Part 5, PTC Planned Tysons Corner Urban District, December 19, 2019,

<https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/zoning/art06.pdf>.

¹⁸⁵ Kali Schumitz, “Tysons Corner tax district draws mixed reviews,” *The Washington Post*, October 24, 2012, https://www.washingtonpost.com/local/tysons-corner-tax-district-draws-mixed-reviews/2012/10/24/ce0c2566-1d39-11e2-b647-bb1668e64058_story.html.

Section 4: Contradictions in the Tysons Redevelopment Plan

Before its Metro stations opened, Arlington had adapted to car transportation, with some wide arterial roads, surface parking lots, and a mall called Parkington.¹⁸⁶ The Arlington experience shows that it's possible for some neighborhoods to evolve from car-dependent to TOD. TOD in Arlington has involved some traffic-calming measures,¹⁸⁷ but unlike Tysons, it has not involved the creation of a new street grid on top of a built out area, and none of the streets adjacent to Arlington's metro stations were ever as hostile to pedestrians as Route 123 and Route 7 in Tysons. Figures 9 and 10 show the difference in street density between Arlington and Fairfax at the same scale.

¹⁸⁶ Arlington Historical Society, "A Parkington Christmas," November 24, 2017, <https://arlingtonhistoricalsociety.org/2017/11/a-parkington-christmas/>.

¹⁸⁷ Arlington, "Neighborhood Complete Streets Background," <https://projects.arlingtonva.us/programs/neighborhood-complete-streets/background/>.

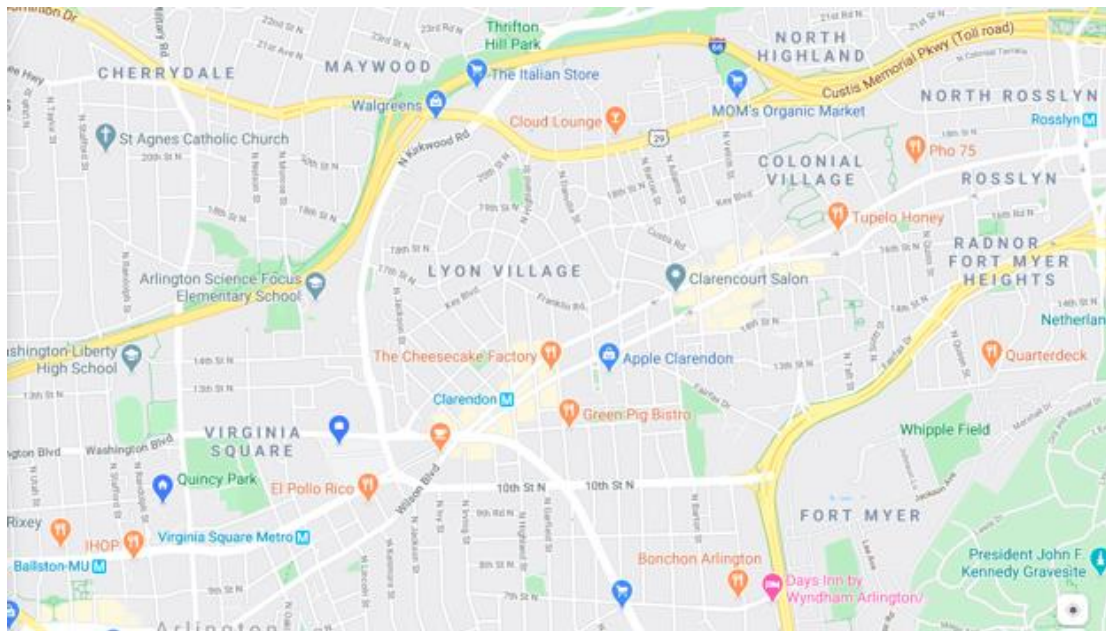


Figure 9: Arlington Street Grid.

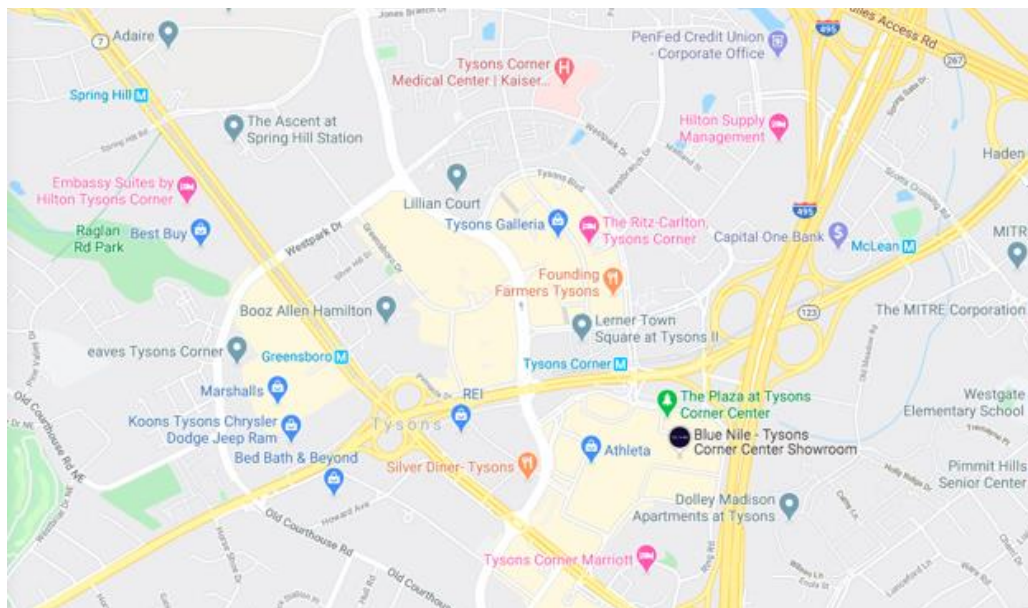


Figure 10: Tysons Street Grid.

In addition to Arlington's benefit of a grid of streets relative to Tysons' highways and roads, walkability in the Rosslyn-Ballston corridor benefits from underground Metro stations. In early 2007, the County Board passed a motion for the Silver Line in Tysons to be built underground.¹⁸⁸ In 2007, republican Gary H. Baise campaigned for the Chair of the County Board on a platform of an underground Silver Line, but lost to the democratic incumbent Gerald E. Connolly.¹⁸⁹ Task Force member Scott Monett also founded an organization called Tysons Tunnel that fought to have the line underground.¹⁹⁰ While local officials supported underground rail in Tysons, both the FTA and the Virginia Governor Tim Kaine and republican leaders in the Virginia statehouse supported above-ground rail because an underground line would have been much more expensive.¹⁹¹ The more fiscally feasible above-ground plan won out, resulting in the Silver Line being built in the center of Route 123 and Route 7, with pedestrian-hostile elevated tracks and stations connected by long pedestrian bridges.¹⁹²

¹⁸⁸ Brian Trompeter, "Supervisors Press for Tunnel Under Tysons," *Inside Nova*, January 9, 2007, https://www.insidenova.com/news/fairfax/supervisors-press-for-tunnel-under-tysons/article_ccd9b682-1bc5-55df-a63a-f6dafa790e07.html.

¹⁸⁹ Amy Gardner, Baise Still Fighting Tysons Tunnel -- For a Fee, *The Washington Post*, December 3, 2007.

http://voices.washingtonpost.com/virginiapolitics/2007/12/baise_still_fighting_the_tunne.html.

¹⁹⁰ Monett's professional work is unrelated to real estate or urban planning; he advocated for an underground Silver Line through Tunnel.org, a coalition of the McLean Chamber of Commerce. CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons: Vision and Area Wide Recommendations," September 15, 2008, <http://www.cdctysons.com/images/TransformingTysons.pdf>, Appendix A, 6.

¹⁹¹ William Flook, "FTA rejects underground rail route," *The Washington Examiner*, June 1, 2007, <https://www.washingtonexaminer.com/fta-rejects-underground-rail-route>.

¹⁹² Rail infrastructure, particularly tunneling, costs much more to build in the U.S. relative to other developed countries. The Silver Line cost more than double per mile what European countries spend on new above-ground rail lines. See Alon Levy, "Why It's So Expensive to Build Urban Rail in the U.S.," *City Lab*, January 26, 2018, <https://www.citylab.com/transportation/2018/01/why-its-so-expensive-to-build-urban-rail-in-the-us/551408/>.

The placement of Tysons' four Metro stops exacerbates challenges to developing walkability around the stations. In order to make the stations safely accessible, WMATA built massive skybridges, crossing highway-width roads and connecting to the stations to both sides of the thoroughfares they cross. This station design is at odds with Fairfax County's Tysons Design Guidelines, which states:

Above-grade skybridges or below-grade pedestrian tunnels are strongly discouraged as they detract from the vibrancy of the streetscape. Further, skybridges and tunnels can pose challenges for security and public access.¹⁹³

The Metro station design demonstrates the challenge of creating a walkable urban environment on top of an edge city. It may be impossible to develop pleasant pedestrian environments while leaving intact the highways and arterial roads that run through Tysons. Given the challenging placement of the stations, WMATA planners arguably made the stations as safe and accessible as possible with skybridges. Figure 11 shows Tysons' McLean Station on top of Route 123.

¹⁹³ Fairfax County Office of Community Revitalization, "Tysons Urban Design Guidelines," 33.



Figure 11: McLean Metro Station.

As described in Section 3, the Plan relies on developers to assemble very large parcels in order to contribute to a new grid of narrow streets in their projects; however, very large-scale developments tend not to produce the type of fine-grained urban space that the comprehensive plan calls for. City planner Jeff Speck writes in his book

Walkable City: How Downtown Can Save America, One Step at a Time:

However delicate and lovely a building facade, there is little to entice a walker past five hundred feet of it. As urban theorist Jane Jacobs noted, “Almost nobody travels willingly from sameness to sameness and repetition to repetition, even if the physical effort required is trivial.” Getting the scale of the detail right is only half the battle; what matters even more is getting the scale of the buildings right, so that each block contains as many different buildings as reasonably possible.

Only in this way will the pedestrian be rewarded with the continuously unfolding panorama that comes from many hands at work.¹⁹⁴

The Design Guidelines for Tysons includes images depicting the type of development that Speck and Jacobs promote -- narrow buildings with uneven lot lines. But by choosing to require development projects so large that it's feasible for them to include new streets and parks, the county closed off opportunities for the type of incremental urbanism that supports pedestrianism that they say they are trying to encourage.

¹⁹⁴ Speck, *Walkable City*.



Figure 12: Michigan Avenue in Chicago, Illinois. The Tysons Design Guidelines include images of Michigan Avenue in Chicago, shown here, as the type of development they are trying to encourage. However, Michigan Avenue was generally developed as small parcels, incrementally for different purposes over time. This type of variety in styles and materials is expensive and generally infeasible to create as part of a large redevelopment project that the comprehensive plan requires.

In *Retrofitting Suburbia*, Ellen Dunham-Jones and June Williamson discuss the challenges of replicating incremental urbanism in edge cities, which have been intentionally built to accommodate car traffic to the exclusion of pedestrians. Rather than Chicago, built with wide streets and around rail travel, they point to Santa Fe's 17th century walkable urbanism as the model to strive for. They argue:

The quality of place in Santa Fe is not a consequence of any single building. Rather, it is the result of the collective shaping of spatial and tactile experiences by multiple buildings in concert with the public realm. This kind of placemaking across multiple parcels necessitates public leadership and public-private partnerships – a return to exactly the kind of coordinated master planning,

establishment of design codes, and infrastructure for walkability and interconnectivity that is anathema to the ad hoc, market-driven processes that gave rise to edge cities in the first place.¹⁹⁵

Parts of Santa Fe's urban landscape were of course publicly planned, including the Santa Fe Plaza, which was originally built as a fort, and the small grid of narrow streets around it. But the buildings that made Santa Fe an architectural landmark were not originally the result of design codes, public-private partnerships, or master planning. Rather Santa Fe's urban development was incremental, built in a variety of emergent architectural styles over time. That decentralized development that provides interest at the pedestrian scale will be difficult or impossible to create on Tysons' 20-acre parcels.

¹⁹⁵ Ellen Dunham-Jones and June Williamson, *Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs*, Updated Edition, (Hoboken, NJ: John Wiley & Sons): 177.



Figure 13: Incremental Development in Santa Fe.

The Comprehensive Plan envisions developers providing 20 full-size athletic fields in the Tysons planning area. Such large expanses of green space that will be unused nearly all of the time would create long, boring stretches in between destinations. These fields would be what Jacobs called “border vacuums,” obstacles created by boring, dead space that pedestrians are reluctant to cross on foot when they stand between the pedestrian and a potential destination.¹⁹⁶

In mandating that developers provide parks and civic space, the Tysons comprehensive plan is following in the footsteps of New York City. In 1958 the Seagram Building opened in Manhattan, featuring a public plaza that quickly became a favorite

¹⁹⁶ Ibid., Chapter 14.

spot for workers in Midtown to eat lunch or spend time outside. Based on the plaza's success, the city began offering property owners density bonuses that allowed them to build larger buildings than they would otherwise be permitted to build in exchange for "privately owned public space."¹⁹⁷ However, because the new public spaces were built to meet the requirements for bonus density rather than to improve buildings' value, they have not proved as appealing or as well-used as the Seagram Building's plaza.¹⁹⁸ Tysons may find that its privately owned public spaces, built to meet county requirements, are not well-used by residents, workers, visitors and shoppers.

Urban design that is comfortable for pedestrians creates a sense of enclosure, with buildings that are at least as tall as the width between building fronts across the street from each other.¹⁹⁹ The most walkable neighborhoods feature buildings that abut each other and the sidewalk. Zoning in Tysons allows this type of development for all types of development other than office, but it's 2.5 FAR limit for offices does not.

Capital One Tower at the McLean metro station demonstrates the type of office development that the plan unwittingly encourages. The primary tower was approved for a height of 467 feet height due in part to its provision of rooftop park space and new street infrastructure. However, the street and sidewalk design maintains characteristics of a suburban office park, with landscaping between buildings and the public right of way wider than is warranted given the heights of adjacent buildings.

¹⁹⁷ Bertaud, *Order without Design: How Markets Shape Cities*, Danbury, CT: Westchester Publishing Services. 322-31.

¹⁹⁸ Ibid.

¹⁹⁹ Jeff Speck, *Walkable City: How Downtown Can Save America, One Step at a Time*, New York: Farrar, Straus, and Giroux (2012) 213-5.

VDOT determines road design standards in Fairfax County, and they continue to rely on road manuals that are not intended for walkable urban areas and are instead intended to maximize speed and safety of drivers alone.²⁰⁰ Figures 14 and 15 show the Capital One development.

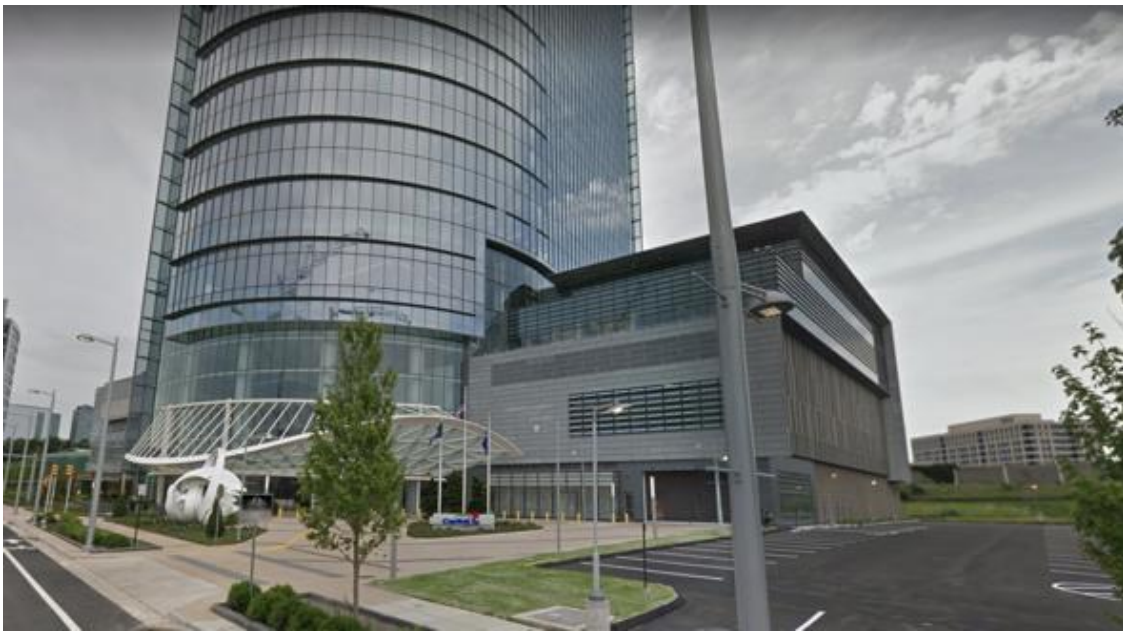


Figure 14: Buildings at Capital One Site. The Capital One development complies with the Tysons zoning amendments FAR limits by receiving bonus density for providing public infrastructure, proffers for public parks, and a public theater along with mixing tall buildings with low-rise buildings and setbacks.

²⁰⁰ Tanya Snyder, “Transforming Tysons Corner: A High-Stakes Suburban Retrofit,” *Streetsblog USA*, October 27, 2011, <https://usa.streetsblog.org/2011/10/27/transforming-tysons-corner-a-high-stakes-suburban-retrofit/>.



Figure 15: Infrastructure at Capital One Site. Where the Capital One site meets the McLean station parking garage, the new street fails to meet the urban street grid standards that the comprehensive plan calls for.

With some exceptions, the goals of the competing interests that developed the Task Force plan and shaped the Comprehensive Plan have been reconciled by limiting growth to the areas closest to the Silver Line stations. The windfall to landowners as a result of both upzoning and the opening of the Silver Line was so great that the desired redevelopment has proven to be feasible even after requiring developers to pay for new infrastructure and public services. However, the greatest tension in the Tysons planning process and redevelopment is the goal of creating a walkable area while maintaining the current level of service that drivers traveling through the area experience. The Tysons

Task Force did not make specific recommendations for improving pedestrian access on Tysons' unsafe roads, but they did support this objective:

The auto-oriented streets of Route 7 and Route 123 will be transformed to tree-lined boulevards designed to calm traffic through the most urban parts of Tysons while still moving traffic. People will be able to safely walk or bike along Route 7 and 123 to access nearby businesses.

[...]

Route 7 could be designed to carry less traffic and be more pedestrian- and bicycle-friendly, with more crossings, to create connectivity between Tysons 123 and Old Courthouse South.²⁰¹

The Comprehensive Plan echoes these objectives nearly verbatim.²⁰² So far, however, little has been done toward these goals. In fact, work is underway to widen multiple sections of both Route 123 and Route 7.²⁰³

Walkability goals notwithstanding, the Comprehensive Plan supports the contradictory idea of widening streets to increase capacity for car travel while also tying wide, fast roads to the grid of streets and adding pedestrian and cyclist infrastructure to roads that are currently hostile to pedestrians.²⁰⁴ The County has in fact made some

²⁰¹ CouncilPB Placemaking for Tysons Task Force, "Transforming Tysons," iv.

²⁰² Fairfax County, "An Amendment to the Comprehensive Plan for Fairfax County, Virginia, 2007 Edition," Adopted June 22, 2010,

<https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/zoning/2007-23.pdf>, 9.

²⁰³ Fairfax County, "Tysons 2018-2019 Progress Report on the Implementation of the Comprehensive Plan,"

https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/annual_reports/tysons%20annual%20report%202019%20final%20for%20web.pdf, 23.

²⁰⁴ Fairfax County, "Fairfax County Comprehensive Plan, 2017 Edition," 51.

improvements to some pedestrian infrastructure on both arterials, including new crosswalks, sidewalks, and pedestrian and cyclist routes that make it possible to cross highways.²⁰⁵ However, making 10-lane roads like Route 123 and Route 7 safe and pleasant for pedestrians would require drastic changes, including slowing traffic with tools like wider sidewalks, narrower traffic lanes, raised platform crosswalks, wide medians, eliminating several traffic lanes, and eliminating turn lanes. Making it physically possible for people outside of cars to cross 10-lane roads won't lead many people to do so.

In some cases, the Virginia Department of Transportation (VDOT) has stood in the way of Fairfax County improving pedestrian conditions near the Tysons area Metro stations. For example, county officials sought to add a crosswalk and remove a second right turn lane at the intersection of Route 123 and Tysons Boulevard, near Tysons Corner station.²⁰⁶ VDOT wouldn't allow a crosswalk at an intersection with a double right turn lane, nor would it allow the removal of one of the road's turn lanes because it would have reduced drivers' current level of service.²⁰⁷

In Arlington, road rights-of-way are under local control, giving County officials the authority to design infrastructure and restrict speed limits to create relatively safe conditions for pedestrians near Metro stations. In contrast, thoroughfares in Tysons largely have state or federal rights-of-way, giving Fairfax County limited authority to facilitate conditions that are safe for pedestrians.

²⁰⁵ Ibid.

²⁰⁶ David Alpert, "Why is Tysons walkability and bikeability so bad?" *Greater Greater Washington*, July 31, 2014.

²⁰⁷ Ibid.

The comprehensive plan includes measures to implement Transportation Demand Management (TDM) in Tysons. TDM is a set of tools used to discourage traffic congestion, either by discouraging car trips during peak times or encouraging people to use methods of transportation other than driving. The arrival of the Silver Line provided a major transportation alternative to driving. TDM tools also include making driving more expensive, either by intentionally slowing cars down or by implementing tolls. Neither of the latter is being advanced in Tysons, and, as a consequence, the area's major thoroughfares will continue to be dangerous and unpleasant for pedestrians and cyclists.

Before Arlington's Orange Line was built, WMATA proposed to build a surface line along Interstate 66. Placing stations in this limited-access freeway would have been even more hostile to pedestrians and cyclists than Tysons' state roads. Arlington planners fought for underground Metro stations located along pedestrian-accessible boulevards, and, unlike tunnel advocates in Tysons, they won.²⁰⁸ Since Arlington's Orange Line Metro stations were built, U.S. rail construction costs have risen steeply, leading to what would have been a very high cost for underground rail in Tysons.²⁰⁹ As a result, Tysons stations will never be the pedestrian-friendly sites that Arlington stations are.

²⁰⁸ Zachary Schrag, *The Great Society Subway: A History of the Washington Metro*. Baltimore, MD: Johns Hopkins University Press, (2006). 55.

²⁰⁹ The causes of high and rising infrastructure costs, particularly rail construction, are not well understood. For an overview of the issue, see Josh Barro, "Here's Why We've Failed to Figure Out Why Infrastructure Costs So Much," *New York Magazine*, July 24, 2019, <https://nymag.com/intelligencer/2019/07/why-we-cant-figure-out-why-infrastructure-is-so-expensive.html>.



Figure 16: Ballston Metro Station Underground in Arlington.



Figure 17: Spring Hill Metro Station in Tysons.

Achieving walkability in Tysons is important not only as an independent goal, but also for achieving the comprehensive plan's mode share goals. Without walkable neighborhoods on both ends of a transit trip, riders have an incentive to drive rather than walk to and from transit stations that are located in unsafe or unpleasant neighborhoods.²¹⁰

Section 5: Measuring Progress toward the Tysons Redevelopment Objectives

The Tysons Comprehensive Plan anticipates achieving its goals by 2050.²¹¹ However, ten years after the adoption of land use reforms provides a reasonable point to evaluate progress so far.

Population Growth and Residential Development

County policymakers established a goal of increasing Tysons' population from just under 20,000 residents in 2010 to 100,000 by 2050 while also increasing employment in the area from about 100,000 to 200,000. Progress toward these two goals has been strong. As of 2017 Census estimates, Tysons' population increased from 19,627 in 2010 to 23,236.²¹² In 2011, Tysons had 8,943 housing units.²¹³ As of August 2019, it has

²¹⁰ Speck, *Walkable City*, 155.

²¹¹ Fairfax County, "Fairfax County Comprehensive Plan, 2017 Edition," 19.

²¹² U.S. Census Bureau, Total Population, Universe, Total Population, 2013-2017, American Community Survey 5-Year Estimates, 2017.

²¹³ Fairfax County Planning Commission, "Report to the Board of Supervisors on Tysons Corner," October 2011,

12,991 with 952 units under construction, 24,514 approved, and 5,087 under review.²¹⁴ Not all of the units approved or under review will be delivered, but counting only the units delivered or under construction so far, the number of housing units in Tysons has increased by 56%. If the units approved and under review were to be delivered by 2050 and no other housing units were built, the housing stock relative to the baseline would increase by 487 percent, putting it close to achieving the fivefold population growth that the county set as its objective.

Under Tysons' below-market-rate housing requirement, 752 units have been delivered (18.6% of total new units) affordable to residents making between 50 and 120 percent of the county's median income. Because Fairfax is such a high-income county (the median household income is \$118,000 annually), many of the residents who qualify for income-restricted units are not low-income households and units that are targeted to their income level may not require subsidy. For example, at the Lumens building near the Greensboro station, market-rate two-bedroom apartments are available for as low as \$2,419 per month.²¹⁵ Some income-restricted two-bedroom units are available for \$2,527.²¹⁶

Most new housing units in Tysons are in high-rise apartment buildings. These buildings have largely replaced old office buildings, parking lots or low-density

https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/annual_reports/2011_annual_report.pdf.

²¹⁴ Fairfax County, "Tysons 2018-2019 Progress Report," Page 16.

²¹⁵ Apartments.com, Lumen, <https://www.apartments.com/lumen-tysons-va/ksvw318/>, (accessed February 17, 2020).

²¹⁶ Lumen, "Workforce Dwelling Unit Program," <https://lumentysons.com/wdu/>, (accessed February 17, 2020).

commercial buildings like car dealerships and big box stores. The average one-bedroom apartment in Tysons rents for \$2,388 compared to \$1,930 for Fairfax County as a whole.²¹⁷ However, over the past year rent in Tysons has increased by 4% nominally relative to 6% in the county as a whole.²¹⁸ Some evidence indicates that apartments in Tysons are becoming more affordable over time as new supply is delivered. For example, the lowest priced apartments at The Ascent, one of the earliest Tysons redevelopment projects near the Springhill Metro station, rented for \$1,753 per month in 2018.²¹⁹ Today, some studios at The Ascent rent for \$1,674 per month.²²⁰

Office Development

The jobs-to-residents ratio has fallen from 11.7:1 in 2010, to 6.8:1 in 2019, 42 percent of the way to the county's goal of 2:1.²²¹ While the ratio of jobs to residents in Tysons is shrinking as planned, office development is proceeding according to the comprehensive plan goals. About 2.7 million square feet of office space has been delivered in Tysons since 2010 and nearly one million square feet are under construction.²²² The average

²¹⁷ Rent Café, "Tysons Corner, VA Rental Market Trends," <https://www.rentcafe.com/average-rent-market-trends/us/va/tysons-corner/> (accessed March 28, 2020).

²¹⁸ Rent Café, "Tysons Corner," (accessed March 28, 2020).

²¹⁹ Vernon Miles, "Want to Live in Tysons? Here Are the Current and Future Options," *Tysons Reporter*, October 15, 2018, <https://www.tysonsreporter.com/2018/10/15/want-to-live-in-tysons-here-are-the-current-and-future-options/>.

²²⁰ Apartments.com, "The Ascent at Spring Hill Station," <https://www.apartments.com/the-ascent-at-spring-hill-station-mclean-va/kgr8yf9/>, (accessed March 28, 2020).

²²¹ Fairfax County, "Tysons 2018-2019 Progress Report," 10.

²²² Fairfax County, "Tysons 2018-2019 Progress Report," 14.

office worker in Tysons has about 300 square feet.²²³ The new office construction therefore represents about 12,000 new jobs in Tysons.

Silver Line Ridership

So far, Silver Line ridership has been below the numbers projected in its funding applications, as is common across rail projects.²²⁴ In 2004, the FTA estimated that the five new Silver Line stations would attract 24,600 weekday passengers in its first year of service, which was projected to occur in 2011.²²⁵ The first phase of the Silver Line, including the McLean, Tysons, Greensboro, Spring Hill, and Wiehle-Reston stations, actually opened in 2014. Actual ridership in 2015, the first full year of service, was an average of 14,950 weekday passengers. In 2019, the five stations saw 16,940 weekday passengers on average.²²⁶

Ridership rates below forecast may be due in part to declining ridership on the system as a whole. Outside the Silver Line, WMATA's weekday Metrorail ridership declined from 660,130 in 2015 to 615,350 in 2019.²²⁷ However, some of the Silver Line stations' riders switched from the Orange Line stations west of East Falls Church to the

²²³ Fairfax County, "Tysons 2018-2019 Progress Report," 17, author's calculations.

²²⁴ Bent Flyvbjerg, "How common and how large are cost overruns in transport infrastructure projects?" *Transport Reviews* 23(1), November 26, 2010.

²²⁵ Federal Transit Administration, "Executive Summary," Final Impact Statement and Section 4(F) Evaluation, December 2004, Chapter 6, page 9, http://www.dullesmetro.com/silverline/assets/File/project_docs/FEIS_I/FTA_FEIS_Chapter_6.pdf.

²²⁶ Washington Metropolitan Area Transit Authority, "Rail Ridership Data Viewer," Accessed February 9, 2020, <https://www.wmata.com/initiatives/ridership-portal/Rail-Data-Portal.cfm#main-content>.

²²⁷ Ibid.

Silver Line stations that are now more convenient for them. These Orange Line stations saw greater ridership losses than the system as a whole, down 11.4% compared to 2.3% for all stations excluding the new Silver Line stations.²²⁸

An unpublished Metro analysis that was reported in the press blames the low Silver Line ridership in part on poor pedestrian and bike infrastructure surrounding the stations.²²⁹ While this is a valid barrier to ridership, the FTA estimates did not assume that Fairfax County would make any new pedestrian or cyclist infrastructure investments near the stations or allow more residences and offices to be built relative to what 2004 zoning permitted.²³⁰ Additionally, above ground Silver Line stations that span arterial roads reduce ridership demand relative to a more pedestrian friendly design. Following the Arlington model of underground stations on more pedestrian-friendly streets would have reduced the challenge of creating a pedestrian- and bike-friendly environment around the stations.

Walkability

Private contributions to the grid of streets are in place or underway in several locations. About one mile of streets are now complete out of the stated goal of about 20

²²⁸ Ibid.

²²⁹ Martin Di Caro, “Silver Line Ridership in Tysons Well Below Metro Estimates,” WAMU, August 3, 2015, https://wamu.org/story/15/08/03/silver_line_ridership_in_tysons_well_below_metro_estimates/.

²³⁰ Federal Transit Administration, ““Final Impact Statement and Section 4(F) Evaluation,” Chapter 6, Page 38.http://www.dullesmetro.com/silverline/assets/File/project_docs/FEIS_I/FTA_FEIS_Chapter_6.pdf.

miles.²³¹ The first section of street grid developed in Tysons is located adjacent to an apartment building called The Ascent, near the Spring Hill Metro. The project includes one block length of one street, called Broad Street. So far Broad Street at the Ascent does little to improve walkability because it doesn't connect to other pedestrian-friendly streets, but Broad Street resumes in another development, called The Boro, one-quarter mile away. Fairfax County has purchased a vacant retail property located adjacent to The Ascent, with plans to build a street that will connect the sections of Broad Street.²³² So far the County has allocated \$18.1 million for the grid of streets, including the purchase of land and construction costs for one small stretch of street and funds to study the extension of another.²³³

The Boro project, located about one-third of a mile north of the Greensboro Metro station, includes the most well-developed street grid so far. The project will have multiple phases of construction, with the first consisting of three residential towers and an office building along with ground floor retail. The project includes the construction of two new streets, in addition to the Broad Street connection, each two blocks long. The streets are narrow and in a grid pattern with no setback between the buildings and the public right of

²³¹ The Comprehensive Plan includes a conceptual map of Tysons with a grid of local and service streets. This map includes about 240 blocks. Based on a standard urban block being one-twelfth of a mile, the map portrays Tysons having about 20 miles of small streets. See Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition."

²³² Keith Loria, "Tysons Parcel Primed for Redevelopment Commands \$60.2M," *Commercial Observer*, November 19, 2019, <https://commercialobserver.com/2019/11/tysons-parcel-primed-for-redevelopment-commands-60-2m/>; the County Board recently purchased 1.8 acres from a developer for \$16.6 million. See Daniel J. Sernovitz, "Fairfax County acquires former Tysons Container Store," *Washington Business Journal*, October 9, 2019.

²³³ Catherine Douglas Moran, "County Board OKs \$51 Million for Tysons-Area Road Work, New Streets," *Tysons Reporter*, June 4, 2019, <https://www.tysonsreporter.com/2019/06/04/county-board-oks-51-million-for-tysons-area-road-work-new-streets/>.

way. A portion of the new grid is car-free with no sidewalks. Figure 11 shows a new narrow street under construction between new buildings at the Boro. The street has since been completed.



Figure 18: Buildings and Streets Under Construction at The Boro.

While new developments are showing the potential for small areas of walkability in Tysons, little progress has been made toward making it possible for pedestrians to safely and pleasantly navigate between portions of the developing street grid. The Plaza at Tysons Corner Center shows that in places, only islands of walkability are feasible to

build given the elevated Metro stations and pedestrian-hostile roads that surround them. Tysons Corner Center built The Plaza, an elevated parking structure, to connect the Tysons Corner Metro station to the mall. Three new buildings -- a 431-unit apartment building called Vita, an office tower, and a hotel surround The Plaza. Pedestrians can access these buildings via the station's pedestrian bridge, but walking to them from anywhere other than the mall would require either traversing the mall's maze of parking garage access roads or crossing the hazardous Chain Bridge Road. From the east it's entirely inaccessible on foot due to Interstate 495.

Rental rates in Tysons show that consumers are willing to pay high prices to live there in spite of the limitations on walkability there so far. Small one-bedroom apartments in The Boro are available for about \$2,100 per month²³⁴ and for about \$1,700 at Vita.²³⁵ These prices are comparable with new construction buildings in Arlington. In Ballston, for example, a small one-bedroom at The Origin, a new apartment building near the Metro station is available for about \$2,000.²³⁶

²³⁴ The Boro Tysons, Floor Plans, <https://www.boldenrise.com/floor-plans>, (accessed March 28, 2020). Price is for a 650 square foot one-bedroom apartment.

²³⁵ Vita Tysons Corner Center, Floor Plans, <https://www.vitatyson.com/floor-plans/?bedrooms=1&floor=&min=&max=&availability=> Price is for a 542 square foot one-bedroom apartment.

²³⁶ Origin Ballston, Availabilities, <https://originballston.com/availability/>, (accessed March 28, 2020). Price is for a 525 square foot one-bedroom apartment.



Figure 19: The Plaza at Tysons Corner Center. The Plaza at Tysons Corner Center connects the mall to its south to the Tysons Corner metro station at the north side of Route 123. The Plaza makes it possible to walk from the mall to the station via a series of pedestrian bridges.

Transportation Mode Share

What remains to be seen is if small areas of walkability in Tysons can lead to the major shifts in transportation mode share the redevelopment plan calls for. Since 2011, that county has been tracking morning and evening single-occupancy vehicle (SOV) commutes into and out of Tysons. Since 2011, total morning and evening trips have increased by about 1.9 percent.²³⁷ However since 2017, SOV trips have been falling.²³⁸

²³⁷ Fairfax County, "Tysons 2018-2019 Progress Report," 27.

²³⁸ Ibid.

And as a share of total trips into and out of Tysons, SOV trips have fallen by 12.6 percent as all other mode shares have increased.²³⁹

To complement the new Metro stations, the Tysons plan calls for circulator buses to expand the locations that are accessible by transit.²⁴⁰ Initially, county transportation planners created a plan for four circulator routes, but began operation with just three routes, one of which covered destinations previously covered by two other bus routes.²⁴¹ All three loops stop at Tysons Corner Station.

Some riders have complained that taking the Tysons circulators can be slower than walking between destinations due to the buses' meandering routes and long headways.²⁴² As of 2016, the most recent year for which ridership for Fairfax County buses is broken down by route, two of the circulator routes were among the lowest 20 percent of riders per revenue mile in the county.²⁴³ The third, however, was in the top 20 percent.²⁴⁴ The routes offer a discounted fare of \$0.50 per ride compared to \$2.00 for other routes in Fairfax County.²⁴⁵ All three routes had a farebox recovery ratio of less than 10%.²⁴⁶ The average farebox recovery ratio in the county is 18%.²⁴⁷

²³⁹ Ibid.

²⁴⁰ Fairfax County, "Fairfax County Comprehensive Plan 2017 Edition," https://www.fairfaxcounty.gov/tysons/sites/tysons/files/assets/documents/pdf/comprehensive_plan/fc_com_p_plan2017ed_tysons_amended04_04_2017.pdf, 9.

²⁴¹ Tysons Partnership, "Public Transportation," <https://www.tysonspartnership.org/transportation/public-transportation/> (accessed February 12, 2020).

²⁴² Jenifer Joy Madden and Navid Roshan, "New Tysons Circulator bus routes get mixed reviews," *Greater Greater Washington*, September 10, 2014, <https://ggwash.org/view/35834/new-tysons-circulator-bus-routes-get-mixed-reviews>.

²⁴³ Fairfax County Department of Transportation, "Transit Development Plan Fiscal Year 2016 – Fiscal Year 2022," March 2016, <http://www.drpt.virginia.gov/media/1907/fairfax-county-tdp-2016.pdf>, Table 3-2.

²⁴⁴ Ibid.

²⁴⁵ Ibid., Table 1-4.

²⁴⁶ Ibid., Table 3-3.

²⁴⁷ Ibid.

In 2014, Fairfax County adopted a Bicycle Master Plan, including a conceptual map for bike infrastructure, depicting about 17 miles of bike lanes.²⁴⁸ So far, 7.7 miles of bike infrastructure have been created in Tysons, but this figure includes shared use markings (sharrows) in addition to painted bike lanes and protected bike lanes.²⁴⁹ Along Route 7, the road that runs along the Greensboro and Spring Hill metro stops, a shared pedestrian and bike path has been added in both directions as part of widening the road.²⁵⁰

As in its land use planning, the Tysons Bicycle Master Plan cites Arlington County as a model of cycling safety and education²⁵¹, even though fewer than two percent of Arlingtonians commute to work by bicycle.²⁵² Unlike Tysons, Arlington's TOD is not bisected by hazards to cyclists like arterial roads and interstate highways.²⁵³ The Bicycle Master Plan identifies dozens of sites where bicycle infrastructure needs to be improved in order to provide safe routes to and within Tysons.²⁵⁴ In 2019, fewer than one percent of trips in and out of Tysons were made on foot or by bike.²⁵⁵

In general, more progress has been made toward the land use goals for Tysons than the transportation goals. Even though new development in Tysons requires large

²⁴⁸ Fairfax County Department of Transportation, "Fairfax County Bicycle Master Plan."

²⁴⁹ Fairfax County, "Tysons 2018-2019 Progress Report," 35.

²⁵⁰ Fairfax County, "Tysons 2018-2019 Progress Report," 23.

²⁵¹ Fairfax County Department of Transportation, "Fairfax County Bicycle Master Plan."

²⁵² U.S. Census Bureau, "Sex of Workers by Means of Transportation to Work," Universe: Workers 16 years and over, Arlington County, 2013-2017, American Community Survey, 5-year Estimates, 2017.

²⁵³ Fairfax County Department of Transportation, "Fairfax County Bicycle Master Plan Phase 1: Tysons Corner Area," April 2011,

<https://www.fairfaxcounty.gov/transportation/sites/transportation/files/assets/documents/pdf/transportation%20projects,%20studies%20and%20plans/countywide%20bicycle%20master%20plan/tysonsbikemasterplan/chapters.pdf>, page 3-2.

²⁵⁴ Ibid., Appendix I.

²⁵⁵ Fairfax County, "Tysons 2018-2019 Progress Report," 182.

contributions to infrastructure and public services, the upzoning has made substantial new investments in multifamily and office developments worthwhile. Tysons has not yet shown that it is possible to turn an edge city into a place where a substantial number of people choose to get around by means other than driving. Whether or not Fairfax policymakers and developers succeed at achieving the walkability goals established for Tysons, the plan has proven to be a politically feasible way to allow more housing construction in a high-opportunity county, in locations close to jobs and transit.

Section 6: Policy Lessons from Tysons

In addition to the Silver Line Metro expansion, a key motivating factor for redevelopment planning in Tysons was that prices -- and tax revenues -- for office space was declining relative to offices in more walkable and transit-accessible neighborhoods in the region. The potential to increase the county's tax base (and avoid property tax rate increases for current homeowners) helped homevoters on the task force endorse the bootleggers' and Baptists' redevelopment objectives.

Other edge cities are now facing long-run fiscal challenges similar to what Tysons policymakers and residents foresaw. Suburban office parks across the country are experiencing vacancy rates double that of their respective regions, which will ultimately lead to lower property tax revenues for their jurisdictions.²⁵⁶ In suburban jurisdictions that shun new housing construction, one day this fiscal threat may reduce homeowner

²⁵⁶ Newmark Grubb Knight Frank, "Suburban Office Obsolescence," 5.

opposition to new development that can help maintain their current level of government services without increasing property tax rates.

The Task Force appointed at the beginning of the redevelopment planning process provided a platform for stakeholders with all sorts of objectives to have their interests represented in the ultimate plan. Because the Task Force was appointed to create a redevelopment plan, their task was to create guidelines for growth, not to determine whether or not growth would be permitted. This approach provides one model for overcoming typical impediments to new multifamily housing in high-income suburban localities.

While the Tysons experience shows that it's possible to overcome anti-development coalitions with pro-development interests, it has not yet shown that it's feasible to turn an edge city environment into a walkable neighborhood. Rather than taking space away from cars and making infrastructure choices that slow traffic down to make the area safe for pedestrians, redevelopment in Tysons has been paired with maintaining and even increasing the amount of real estate dedicated to major car thoroughfares. Christopher Leinberger, a real estate researcher and practitioner said this of the effort:

The redevelopment of Tysons is the most important urban redevelopment in the country, possibly in the world. If they do this right, it'll be the model. Just as it was the model of edge cities, it will be the model of the urbanization of the suburbs. It's that big.²⁵⁷

²⁵⁷ Mullins, "The Audacious Plan to Turn a Sprawling DC Suburb Into a Big City."

In seeking to please all interest groups -- those who supported athletic fields and walkability, maintaining car travel speeds on Tysons' highways and arterials and making these routes safe for pedestrians, some of the plan's objectives may prove mutually exclusive.

The Tysons experience shows that in growing, high-cost regions, zoning reform that allows for increased density can result in rapid development and corresponding higher tax revenues, even when developers are required to provide substantial proffers that may reduce homeowner opposition to development. Tysons shows one route for overcoming suburban anti-development tendencies. The new housing that has been built and that is in process under the plan will provide the opportunity for tens of thousands of new residents to live in a high-opportunity location.

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