Arlington Duplexes and the *Missing Middle*

Summary

In order to develop housing options for households earning close to the area median income (AMI)—about $117,000—Housing Arlington has embarked on the Missing Middle Housing Study. One of the goals of the study is to determine the effects of zoning changes that will allow duplexes and other higher density development in areas currently zoned for detached single-family houses (SFH). In this analysis, we estimate the minimum economically viable price—the minimum price possible that could attract developers to build—for one type of *missing middle* housing: a single unit of a duplex.[1] Below this price, there is very little chance that a profit-minded developer will elect to build a duplex instead of another type of housing. In each civic association, we determine whether the minimum economically viable price for a duplex is affordable for an AMI household, which we assume can afford a residence at a sale price up to $525,000. We find that:

- Existing duplexes are and will continue to be a substantial part of *missing middle* housing stock—however, they are not representative of what to expect from new construction.
- The minimum economically viable price for a new duplex will exceed $525,000 in all but six associations (Arlington View, Claremont, Columbia Forest, Fairlington, Green Valley, and Shirlington).[2]
- Although we compute the minimum economically viable prices for new duplexes, evidence indicates that sale prices for these new duplexes may be significantly higher than these minimums.
- The high price of both land and competing housing alternatives—SFHs with five or more bedrooms—are the primary obstacles to making newly constructed duplexes affordable.

[1] We use the term duplex to refer to a single unit of a property classified as either a duplex or a side by side. Both properties have similar impacts on residential density, however, the ownership structure differs between these two types of properties.
[2] Almost all of the residential properties in Fairlington and Shirlington and roughly half of the properties in Green Valley are already zoned for higher density residential development. See the section on New Duplex Development for more details and analysis.

Background: Missing Middle Housing

Recently, discourse around affordable housing in Arlington has focused on developing *missing middle* housing such as duplexes, triplexes, and townhouses. In March 2019, the Arlington County Board passed its "Housing Arlington" resolution. In 2020, Housing Arlington began developing the framework for the Missing Middle Housing Study. The proposed study will examine how "Arlington's current land use policy and Zoning Ordinance limit opportunities to build *missing middle* housing types, such as duplexes and triplexes…*[m]issing middle* housing types could provide more affordable options than what is currently being produced."

Concurrently, during the 2020 Virginia Legislative Session, Delegate Ibraheem Samirah (D-Fairfax) introduced Virginia House Bill (HB) 152 in the Virginia House of Delegates to require all localities to allow development of middle housing—two-family residential units, including duplexes, townhouses, cottages, and any similar structure—on lots zoned for SFH.

Advocates for more middle housing typically point to the many environmental and economic benefits of increased density. Most importantly, perhaps, they see legalizing middle housing as "the simplest and most elegant approach to beginning to reverse the wrongs wrought by the institution of single-family zoning" such as the affordability crisis in American housing and resulting racial segregation. Delegate Samirah recently wrote:

> *Across the country, there is a shortage of affordable units that is putting a squeeze on working families and contributing to rises in rents for existing units. Unfortunately, the kind of dense "middle housing" that could be built to alleviate the shortage is banned on most lots.*
>
> *Because middle housing is what's most affordable for low-income people and people of color, banning that housing in well-off neighborhoods chalks up to modern-day redlining, locking folks out of areas with better access to schools, jobs, transit, and other services and amenities.*

According to Arlington County's Affordable Housing Master Housing Plan, between 2010 and 2040 Arlington will become home to about 13,000 new households at or below the AMI, currently about $117,000.[3] In most cases, households earning at the AMI are limited to houses selling for less than $525,000.[4] We evaluate the potential for duplexes to fill the role of providing housing options priced at or below $525,000.

Existing Duplexes

According to Arlington County's Open Data, the county has 2,268 properties classified as duplexes or side by side units.[5] The median assessment for these properties is $446,100.[6] The existing duplexes are clearly an important segment of the housing market that is currently affordable to community members earning around $120,000 per year. Moreover, in many cases, two sellers will have to coordinate to facilitate redevelopment. This process provides an additional obstacle to redevelopment to housing that costs more than an AMI household can afford.

[3] The U.S. Census Bureau reports the area median income for Arlington county is about $117,000 from 2014 to 2018. Household growth projections are generated by the Metropolitan Washington Council of Governments and are reported on page 13 of the 2015 Affordable Housing Master Plan.

[4] The Affordable Housing Master Plan claims that a household earning $100,000 per year can afford a house priced at about $450,000. We apply the same ratio to a household with the AMI, currently about $117,000, to determine affordability at this level of income.

[5] We considered all properties that are classified as 514 (side-by-side) or 515 (duplex) in county records for the purposes of the analysis in this section.

[6] Duplex assessments were divided in half and double-counted to compute this value.

Existing duplexes, while an essential component of any *missing middle* housing plan, are not representative of what will be built should opportunities for duplex development expand. Existing duplexes are older properties: 95 percent of the county's duplexes were built in 1963 or earlier. They bear little resemblance to the types of properties being developed today. Furthermore, the prices for new duplexes will need to compete with the very high prices SFHs command in order to make duplexes a viable choice for developers to build. If a developer can make more money building SFHs, that developer will build SFHs.

New Duplex Development

We estimate the minimum economically viable price for a new duplex—the absolute minimum price that could generate a similar profit for a developer compared to an SFH—in each of the county's citizens' and civic associations.[7] This price, however, is just a floor—except in very limited numbers, profit-minded developers are not going to sell duplexes below this price.

In order to determine the minimum economically viable price for a new duplex, we make four assumptions:

- Developers need to sell both units in the duplex so that the total price is comparable to what they would receive for a newly constructed SFH.
- The cost to build a duplex is the same as the cost to build an SFH.
- Each part comprising the two units of a duplex will be similarly priced.[8]
- The sale price of each part of the duplex will be equal to the county's property assessment.[9]

If any of these assumptions are broken, then the price for a new duplex will likely be higher than our estimate. If the cost to build a duplex is higher than the cost to build a SFH, or the individual units in total sell for more than a SFH, or if the sales price is higher than the county's property assessment, the actual prices for the duplex will exceed our minimum economically viable price.

For a developer, building a duplex excludes the possibility of building a detached SFH on the same lot. Therefore, developers need to sell both units in a duplex so that the total price is comparable at a minimum to what they would receive for brand new SFHs. Specifically, we estimate the assessments on detached single-family homes with five or more bedrooms (SFH5+). Table 1 shows that SFH5+ represent the vast majority of new houses built in Arlington in each year since 2015.

[7] Similar initiatives in other cities have resulted in existing properties being converted to duplexes. Arlington's Missing Middle Housing Survey, however, looks to achieve growth in the "production and preservation of family-sized (e.g. 3+ bedroom) moderately-priced ownership units." The number of SFH in Arlington with six or more bedrooms, which are needed to meet that goal, is about 1,150. Of those, slightly more than half have been built since 2000, a number of additional are probable recent renovations, and the majority are very expensive, which makes them unlikely to be good candidates for conversions into moderately-priced, higher density residences.
[8] Two housing units built on a single parcel where one is substantially more expensive than the other are going to be more closely related to accessory dwellings, regulations for which were updated in 2019.
[9] County assessed value is typically lower than the sold price. An analysis of real estate sales by zip code found that assessments were between six and 10 percent lower than settled prices, and a more recent analysis reported that the difference could be as high as 14 percent.

Table 1. New SFH Construction

	2015	2016	2017	2018	2019
# of SFH5+ built	148	185	159	180	118
Total # of houses built	171	217	190	223	143
% SFH5+	86.5	85.2	83.7	80.7	82.5

Source: Arlington County Open Data, 2020 Assessments.

We estimate the assessment values of newly-built SFH5+ for each civic association in the county. Because new construction is both new and reflects current tastes and trends, it tends to be more valuable than most of the similar existing houses. We estimate that a recently-built SFH5+ on average has an assessment greater than 90 percent of existing SFH5+ in its civic association neighborhood; details are provided in Appendix A.[10]

We use this 90 percent figure to estimate the assessments for brand new SFH5+ by association. We describe our methodology in Appendix B, and we report the results in Table 2. In only four civic associations are the estimated assessments of newly built SFH5+ less than $1.0 million. For every other association, a new SFH5+ would assess for $1.0–$3.6 million. The countywide average assessment for a new SFH5+ is about $1.6 million.

If all of those four assumptions listed above were true, a newly constructed duplex would sell for a price that is half of the assessment on a new SFH5+, also shown in Table 2 in Appendix B. The only neighborhoods where an AMI household could afford a duplex sold at this minimum economically viable price are Arlington View ($494K), Claremont ($498K), Columbia Forest ($455K), and Fairlington ($498K), Green Valley ($519K), and Shirlington ($506K). However, Fairlington and Shirlington would not be significantly impacted by a proposal affecting zoning for SFHs because their residential areas are zoned RA14-26, which already allows for higher density residential construction. Similarly, more than half of Green Valley is already zoned R2-7 or RA14-26, both of which permit higher density construction.

In actuality, we expect that new duplexes to sell for significantly more than the minimum economically viable price if construction and transaction costs are higher for duplexes, if the assessments continue to fall below actual sales prices, or if high demand drives up prices. For example, two duplexes in the John M. Langston Civic Association sold for $1.2 million each in December 2019 and January 2020, far above the $717,000 minimum economically viable price we estimate for this neighborhood.

While we do not account for the effect of increased housing supply on prices, this effect is likely to be small. Research in this area tends to focus on developments much larger than duplexes. For example, recent work found that new large apartment buildings lower adjacent rents by up to seven percent. A new apartment building, however, represents a much bigger change to housing supply than a new duplex. Additionally, other ongoing work finds sale prices and rents decrease only in the immediate area surrounding new large developments.

Similar Policies in Other Cities

Other cities such as Minneapolis have gone ahead with plans to allow landowners in a number of neighborhoods to develop higher density housing such as duplexes and triplexes. As part of the Minneapolis 2040 plan, the city intends to abolish SFH exclusive zoning to allow construction of duplexes and higher density housing. Seattle has

[10] If a civic association does not have a large enough sample of SFH5+ to make an informed estimate of the assessment for new construction, we incorporate SFH5+ from neighboring civic associations.

pursued similar—if less ambitious—plans to increase density within select neighborhoods. This plan, however, is aimed to encourage growth in accessory dwelling units.

A plan similar to the Minneapolis 2040 plan that enables duplex construction in Arlington is unlikely to find success in achieving its goals for more affordable housing, because property prices in Arlington are uniformly high.[11] At a minimum, the cost of a new development must cover the cost of procuring the land, demolition, construction, financing, marketing, taxes, transfer costs, and profit. The first step in developing a new duplex is acquiring the land, and in all parts of Arlington county, land is expensive.

Teardowns in some neighborhoods are being purchased for as much as a million dollars or more. That means that new duplexes in those neighborhoods are starting from a price of more than $500,000 before any of the other costs of development are considered. Although land isn't uniformly that expensive across the county, the high price of land will continue to be an impediment to housing affordability that doubling or even tripling the number of residences per SFH parcel is unlikely to solve. Other cities similar to Minneapolis have a greater diversity of land prices across neighborhoods, which improves the likelihood that rezoning will succeed in generating new affordable duplex development.

Conclusion

Existing duplexes are undoubtedly a crucial element for continuing to support *missing middle* housing in the future, however, newly constructed duplexes are unlikely to be affordable for AMI households. Arlington County is uniquely poorly situated to promote affordability through the development of new duplexes.

We show this by estimating the minimum economically viable price for new duplexes in each civic association. In nearly all of the county, this cost for a new duplex is going to exceed the means of an AMI household. Even in the few civic associations where these values are nearly affordable to an AMI household, the actual market price for new duplexes may end up being significantly higher. This will limit the effectiveness of allowing duplex development to address the shortage of *missing middle* housing.

Notes and Acknowledgments

Written by Kody Carmody and Jon Huntley, PhD. Thanks to the numerous reviewers for their helpful suggestions and comments. All findings, errors, and conclusions are the authors' own and do not represent those of their employers. Corresponding author's e-mail: jon.huntley@gmail.com. Last updated, July 2020.

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[11] Although assessments are not exact predictors of market price, the difference in median assessed values for SFHs between the two cities is enormous. The median assessment for a SFH in Arlington is about $860,100. The median value of a detached SFH in Minneapolis, according to Assessor's Parcel Data 2020 on Open Minneapolis, is $270,500.

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Appendix A

The first step in our analysis is to determine the typical assessed value for new construction in the last few years. Knowing this information will allow us to predict the assessed value for new construction, which will, in turn, be used to estimate the minimum economically viable price.

In order to determine the typical value of a new SFH5+, we use annual county assessment data from 2015 through 2020 combined with information about the properties.

Most properties, particularly recently constructed properties, have a "built" year attached to the property's record in Arlington's open data. We start with all of the approximately 450 properties with a built year from 2014 to 2016. This built date is typically between zero and two years from the date when the SFH5+ is fully constructed and occupied. We compute the percentile—the percentage of SFH5+ with the same or lower assessment within the same civic association—for the newly constructed SFH5+ zero, one, and two years after the built date in the record.

We use the largest of these three percentiles to estimate the assessment for the average new SFH5+ when it is finished. We find that an average brand new SFH5+ assesses for more than 88 percent of existing SFH5+ in the same civic association. Therefore, we round up slightly and assume that the typical new SFH5+ will have an assessment that is higher than 90 percent of existing SFH5+. Although our approach may overvalue new construction, we find that we typically overvalue the new construction in very high-price neighborhoods such as Arlingwood, Lyon Park, Lyon Village, Rock Spring, Williamsburg, and Yorktown. Using a different assumption on the price of new SFH5+ construction in these neighborhoods is going to have very little impact on our overall analysis of *missing middle* housing.

Appendix B

Having determined the typical assessed value for new construction historically, we use this information to predict the assessed value for new construction in each civic association. As described in Appendix A, we find that across the county, new SFH5+ are typically assessed at a level that is higher than about 90 percent of comparable houses in the same neighborhood.

We take all of the SFH5+ in each civic association and list their assessments.[12] For example, Lyon Village has 170 SFH5+. The property on this list with the lowest assessment is valued at $950,000—the property with the highest assessment is valued at $5.1 million. Of all of these houses in Lyon Village, 90 percent of them are worth less than about $2.29 million. Therefore, we estimate that the typical new SFH5+ in Lyon Village will assess for about $2.29 million. In fact, the new houses that are listed as "built" in 2019 and appear to be complete were assessed at $2.75, $2.67, $2.72, $2.10, and $2.2 million in 2020, roughly about or above our estimate of $2.29 million. We perform this calculation for every civic and citizens' association, and we list the results in Table 2.

[12] In the few neighborhoods in which there are not many SFH5+, we use additional "comps" from adjacent neighborhoods.

Table 2: Estimated Assessments for New Construction by Civic Association

Civic Association	Estimated Assessment for New SFH5+	Minimum Viable Price of New Duplex	Civic Association	Estimated Assessment for New SFH5+	Minimum Viable Price of New Duplex
Alcova Heights	$1,309,920	$654,960	Foxcroft Heights	$1,264,420	$632,210
Arlington - East Falls Church	$1,664,440	$832,220	Glebewood	$1,591,240	$795,620
Arlington Forest	$1,202,560	$601,280	Glencarlyn	$1,235,520	$617,760
Arlington Heights	$1,215,090	$607,545	Green Valley	$1,038,140	$519,070
Arlington Mill	$1,225,300	$612,650	Gulf Branch	$2,147,840	$1,073,920
Arlington Ridge	$1,970,460	$985,230	Highland Park - Overlee Knolls	$1,514,350	$757,175
Arlington View	$988,000	$494,000	John M Langston	$1,434,000	$717,000
Arlingwood	$3,631,750	$1,815,875	Leeway Overlee	$1,608,500	$804,250
Ashton Heights	$1,818,380	$909,190	Long Branch Creek	$1,728,900	$864,450
Aurora Highlands	$1,526,000	$763,000	Lyon Park	$1,800,500	$900,250
Ballston - Virginia Square	$1,813,600	$906,800	Lyon Village	$2,293,460	$1,146,730
Barcroft	$1,310,700	$655,350	Madison Manor	$1,271,500	$635,750
Bellevue Forest	$2,132,600	$1,066,300	Maywood	$1,468,020	$734,010
Bluemont	$1,498,260	$749,130	North Highlands	$2,267,400	$1,133,700
Boulevard Manor	$1,157,220	$578,610	North Rosslyn	$2,293,460	$1,146,730
Buckingham	$1,547,400	$773,700	Old Dominion	$1,763,670	$881,835
Chain Bridge Forest	$1,454,010	$727,005	Old Glebe	$2,153,520	$1,076,760
Cherry Valley Nature Area	$1,733,200	$866,600	Penrose	$1,304,900	$652,450
Cherrydale	$1,730,440	$865,220	Radnor/Ft.Myer Heights	$1,864,320	$932,160
Claremont	$995,420	$497,710	Rivercrest	$1,786,600	$893,300
Clarendon - Courthouse	$1,904,080	$952,040	Riverwood	$2,811,380	$1,405,690
Colonial Village	$2,267,700	$1,133,850	Rock Spring	$1,915,630	$957,815
Columbia Forest	$910,900	$455,450	Shirlington	$1,011,200	$505,600
Columbia Heights	$1,182,600	$591,300	Stafford-Albemarle-Glebe	$1,900,580	$950,290
Crystal City	$1,526,000	$763,000	Tara - Leeway Heights	$1,601,160	$800,580
Dominion Hills	$1,076,580	$538,290	Waverly Hills	$1,526,800	$763,400
Donaldson Run	$1,868,200	$934,100	Waycroft - Woodlawn	$1,620,780	$810,390
Douglas Park	$1,139,520	$569,760	Westover Village	$1,370,550	$685,275
Dover Crystal	$1,971,400	$985,700	Williamsburg	$1,781,120	$890,560
Fairlington	$995,420	$497,710	Woodmont	$2,050,930	$1,025,465
Forest Glen	$1,127,000	$563,500	Yorktown	$1,776,550	$888,275

Sources: Arlington-Analytics.com own calculations.