

**PHYSICAL AND ECONOMIC FEASIBILITY ANALYSIS  
SINGLE-FAMILY ZONING INITIATIVE**

Prepared For:  
City of Alexandria, VA

Prepared By:  
W-ZHA, LLC

October 18, 2023

## **INTRODUCTION**

### Study Purpose

Zoning for Housing is the City of Alexandria’s proposal to expand housing production and affordability in the City and mitigate past and current barriers to equitable housing access. Several initiatives are being considered that modify existing zoning regulations to achieve housing goals. W-ZHA was retained to test the economic feasibility of certain Zoning for Housing initiatives.

This report evaluates the Single-Family Zoning Initiative. The Single-Family Zoning Initiative proposes to allow multi-family housing in Alexandria’s single-family zones. This analysis evaluates the physical and economic feasibility of a single-family parcel being redeveloped into 2-family/duplex units, a building containing four units (a “4-plex”), and a building containing six units (a “6-plex”). This analysis also forecasts how many non-single-family units will be developed in the City’s single-family zones over 10 years if the Single-Family Zoning Initiative is implemented.

There are five single-family zones in the City of Alexandria: R-2-5, R-5, R-8, R-12, and R-20. Each zone is different in terms of minimum lot area, maximum floor area, yard setbacks, and height.

Six parcels were chosen in each zone and test-fits were completed to understand whether each housing product-type could feasibly be developed on the site given the zoning requirements. For each zone, two parcels were chosen that were smaller than the zone’s minimum lot size, two were consistent with the minimum lot size, and two were larger than the minimum lot size. Appendix A provides an example of the methodology.

The economic feasibility of redevelopment was tested for each of the parcels and each product-type. A for-sale project was considered feasible if a developer could purchase the property, redevelop it, and sell it for a price that affords a 13% profit on development cost. A rental project was considered feasible if it produced a yield-on-cost of at least 5.5%. The yield-on-cost is the project’s net operating income divided by its total development cost.

### Report Structure

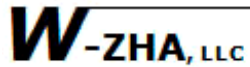
This report begins with a summary of developer interview findings. The experience of other cities that have changed single-family zoning to allow multi-family is summarized in the following section. Key findings from the analysis are then highlighted. The remainder of the report details the feasibility analyses for each zone and the housing unit forecast.

All property value and sale price data is from the City of Alexandria’s Department of Real Estate.

## **DEVELOPER INTERVIEW FINDINGS**

Developers and those familiar with infill development were interviewed to gain insight into development economics and development issues. A summary of key observations is provided below:

- City of Alexandria property is very expensive. If considering redevelopment, developers will look to purchase lower valued sites. This reduces their risk and allows them to deliver products at a



lower price point. They will also choose locations where they perceive there will be less neighborhood resistance to redevelopment.

- Because properties are so valuable in Alexandria, any redevelopment project will include state-of-the-art finishes and appliances.
- The 2-family and duplex product is familiar to Alexandria developers. There are many of these units in the Alexandria market today and developers have experience developing this product. For this reason, 2-family and duplexes are considered less risky than 4-plex and 6-plex properties where there is far less market precedent.
- Rental property is more price elastic than for-sale property. A rental duplex or 4-plex or 6-plex will compete with other rental communities in the City, many of which offer a host of amenities. Because for-sale housing is a long-term investment, buyers are often willing to pay more to get into the market.
- Rental 4-plex and 6-plex projects are challenging from a property management perspective. There are no economies of scale in terms of operations (for instance, management and maintenance). These products may not be a feasible option for larger development companies.
- The more urban areas of the City are the most likely locations for the 4-plex and 6-plex product-types. The market is more likely to be responsive here and developers perceive there will likely be less neighborhood resistance.
- A high percentage of properties in the single-family zones are non-conforming in terms of parcel size. If the single-family regulations are changed and non-conforming parcels require conditional approval to redevelop, redevelopment will likely not happen. Developers indicate that the time and expense associated with gaining approval would offset the benefit of redevelopment. If single-family zoning is to be changed, the products allowed should be as-of-right.
- Due to the lack of affordable housing supply in Alexandria, potential purchasers are more concerned with the overall price of the unit than the price per square foot.

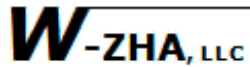
## LITERATURE REVIEW EXPERIENCE IN OTHER CITIES

The following paragraphs highlight how single-family zoning initiatives have impacted housing production and value in other cities.

- *Disaggregate Connecticut* conducted a study which collected zoning codes from every municipality in Connecticut. The purpose of the study was to identify public policy barriers to achieving housing equity and diversity in the state. The study found that over 98% of projects of four or more units required a public hearing for approval. For single-family homes a public hearing was required approximately one-third of the time. The study's author concludes: "public hearing requirements are an important target for regulatory reform, because they are far more widespread in constraining multi-family housing than I suspect even well-versed researchers might have guessed."<sup>1</sup>

---

<sup>1</sup> Governing Magazine, "Ending Single-Family Zoning Is Not a Stand-Alone Solution", January 21, 2022.



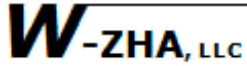
The study found that other factors including minimum parking requirements, maximum building height requirement and prescriptions regarding lot size, lot coverage and floor area ratio can constrain multi-family development.

- In 2018, Minneapolis passed a comprehensive plan to allow duplex and triplex projects in neighborhoods zoned single-family. According to an article by Bloomberg<sup>2</sup>, the number of units produced has been modest. Between 2018 and 2021, permits for small apartment buildings doubled, but totaled only 81 units, a small share of the City's housing supply. Minneapolis has 2.5 times the number of households as the City of Alexandria.
- It is noted in many articles that Minneapolis only changed the type of unit allowed, it did not increase the underlying density in the single-family zone. Research suggests that also changing height and density regulations in single-family zones increases housing production. As part of Minneapolis' legislation, minimum parking requirements were eliminated, which the article notes has been valuable.
- Daniel Kuhlmann has measured the early effects of the Minneapolis initiative. Kuhlmann measured residential prices both before and after the city council approved the initiative. His findings are presented in an article published in the *Journal of the American Planning Associates* (Vol. 87, No.3) titled "Upzoning and Single-Family Housing Prices: A (Very) Early Analysis of the Minneapolis 2040 Plan". Kuhlmann found that property sale values increased by three to five percent since the comprehensive plan's approval. He hypothesizes that property values increased because single-family properties now have higher development potential. Thus, rather than reduce single-family values, the initiative increased the value of existing properties.
- In the summer of 2020, Portland passed its Residential Infill Project which permitted duplexes, triplexes, and 4-plexes in most single-family zones. It also permitted accessory dwelling units. According to an article in *Reason*, the Portland Bureau of Planning and Sustainability data indicate that from August 2021 to February 2022, 127 permits were made possible by the Residential Infill Project. Ninety-one of these units were duplexes, triplexes and 4-plexes, and the rest were accessory dwelling units. Portland is 3.75 times larger than Alexandria.

Many single-family zoning initiatives are quite recent. Not enough time has passed to fully understand their impact on the housing supply. Notwithstanding, it is clear from the Minneapolis and Portland experiences that allowing higher density housing products in single-family zones does not result in widespread redevelopment. Instead, impacts on housing production have been relatively modest.

---

<sup>2</sup> Bloomberg, "Effective Zoning Reform Isn't as Simple as It Seems", May 24, 2022



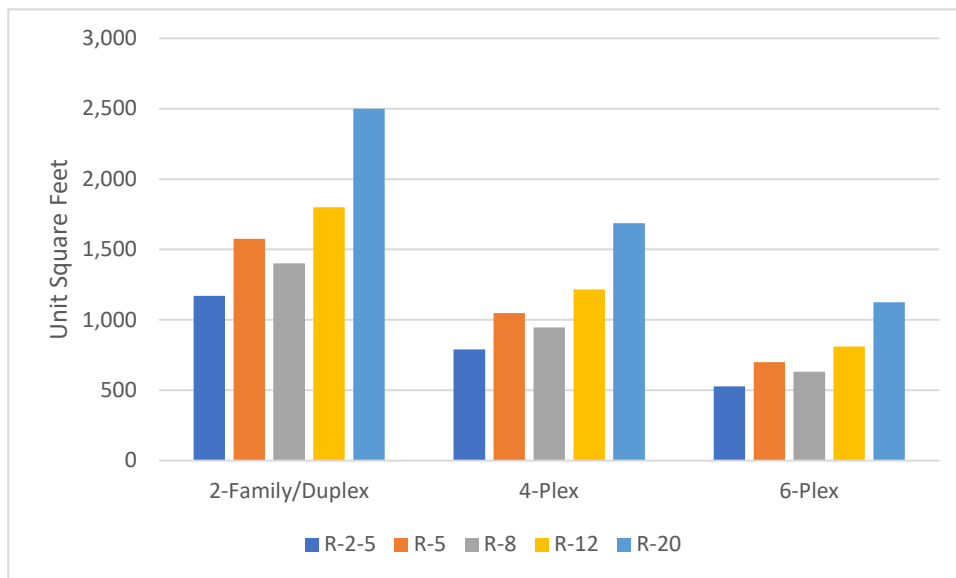
## SUMMARY OF FINDINGS

### Physical Development Feasibility

Six sample properties were analyzed for each zone. The properties were chosen by their size to test whether redevelopment to a higher density product is physically feasible given existing single-family zoning requirements. In the sample, two sites are smaller than the minimum lot size for the zone, two are consistent with the minimum lot size and two are significantly larger than the minimum lot size. The analysis determined the maximum building size feasible on the site and the maximum unit sizes by product-type.

Figure 1

Maximum Unit Size Allowed by Zoning by Product-Type and Zone

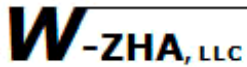


Source: City of Alexandria Department of Planning and Zoning; W-ZHA

Figure 1 illustrates maximum unit sizes by product-type and single-family zone. The parcel size in each case is consistent with the minimum lot size in the zone. In all zones a 2-family, semi-detached or duplex unit would average over 1,000 square feet in size. Larger projects can be developed in the larger lot zones (R-12 and R-20). Whether a developer would build to the maximum size allowed is not known.

In the R-2-5 and R-5 zones, lots are smaller. Six-plex projects may only be able to offer studio- and 1-bedroom units in these zones. While small, the unit sizes are feasible.

The test-fit analysis concludes that generally redevelopment to multi-family is physically feasible given single-family regulations regarding floor area, height, yards, and parking. There was one case on a small site where a two-family, semi-detached project was not feasible. The yard requirements made the building too narrow to be feasible.



### Economic Feasibility

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. The feasibility of redevelopment was tested for each of the parcels and each product-type. A project was considered feasible if a developer could purchase the property, redevelop it, and sell it for a price that affords a 13% profit on development cost. For for-sale products, redevelopment was considered feasible if the threshold sale price was within the range of recent sale prices in the zone.

Figure 2

Minimum Sale Price by Product-Type and Zone



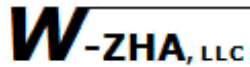
Source: W-ZHA

Figure 2 illustrates the economic findings for properties that approximate the minimum lot size in the zone. The threshold sales prices are generally at or below recent sales prices in the zone. In some cases, the sale price is higher due to large units. The 4-plex and 6-plex products introduce much more affordable sale prices in each zone.

For rental properties, a product was considered feasible if the required rent per square foot was less than \$4.00 for a unit under 1,000 square feet and \$3.00 for a unit over 1,000 square feet. For units over 2,500 square feet a rental was considered feasible if the rent was less than \$2.50 per square foot. Rarely was rental feasible.

### Housing Unit 10-Year Forecast

The analysis forecasts how changes to single-family zoning will likely impact housing production over the next 10 years in the City. The forecast assumes that redevelopment will occur on lower priced



properties for sale in the market. A proportion of these lower-priced properties sold in the market are assumed to be redeveloped to multi-family units.

The redevelopment percentage is a “best guess” informed by the relatively modest housing production experienced by cities with similar single-family zoning initiatives. The analysis assumes that 5% of those parcels that are selling for lower prices will be redeveloped in the R-8, R-12, and R-20 zones. For the R-2-5 and R-5 zones where land is very valuable and sites are more urban in character, a 10% redevelopment rate was assumed.

Table 1 on the following page summarizes the 10-year forecast for each zone given three scenarios. In Scenario 1, single-family zoning in R-2-5 is changed to allow 4-plex units. Scenario 1 also assumes that zoning is modified in the other single-family zones to allow 2-family/duplexes. This scenario results in 150 non-single-family units over the next 10 years.

Scenario 2 assumes that all single-family zones are modified to allow both 2-family/duplex and 4-plex projects. This scenario results in 178 non-single-family units over the next 10 years.

Scenario 3 assumes that all single-family zones are modified to allow 2-family/duplex projects, 4-plex and 6-plex projects. This scenario results in 204 non-single-family units over the next 10 years.

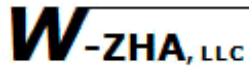
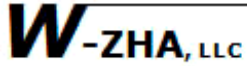


Table 1

Housing Unit 10-Year Forecasts Single-Family Zoning Initiative									
	Scenario 1			Scenario 2			Scenario 3		
	% of Redev. Parcels	Units	% of Scenario Total	% of Redev. Parcels	Units	% of Scenario Total	% of Redev. Parcels	Units	% of Scenario Total
<b>R-2-5</b>									
<b>Parcels 18</b>									
2-Family/Duplex	50%	18		50%	18		50%	18	
4-Plex	50%	36		50%	36		25%	18	
6-Plex	0%	0		0%	0		25%	27	
<b>Sub-Total</b>	<b>100%</b>	<b>54</b>	<b>36%</b>	<b>100%</b>	<b>54</b>	<b>30%</b>	<b>100%</b>	<b>63</b>	<b>31%</b>
<b>R-5</b>									
<b>Parcels 13</b>									
2-Family/Duplex	100%	26		50%	13		50%	13	
4-Plex	0%	0		50%	26		25%	13	
6-Plex	0%	0		0%	0		25%	20	
<b>Sub-Total</b>	<b>100%</b>	<b>26</b>	<b>17%</b>	<b>100%</b>	<b>39</b>	<b>22%</b>	<b>100%</b>	<b>46</b>	<b>23%</b>
<b>R-8</b>									
<b>Parcels 28</b>									
2-Family/Duplex	100%	56		80%	45		80%	45	
4-Plex	0%	0		20%	22		10%	11	
6-Plex	0%	0		0%	0		10%	17	
<b>Sub-Total</b>	<b>100%</b>	<b>56</b>	<b>37%</b>	<b>100%</b>	<b>67</b>	<b>38%</b>	<b>100%</b>	<b>73</b>	<b>36%</b>
<b>R-12<sup>1</sup></b>									
<b>Parcels 5</b>									
2-Family/Duplex	100%	10		80%	8		80%	8	
4-Plex	0%	0		20%	4		10%	0	
6-Plex	0%	0		0%	0		10%	6	
<b>Sub-Total</b>	<b>100%</b>	<b>10</b>	<b>7%</b>	<b>100%</b>	<b>12</b>	<b>7%</b>	<b>100%</b>	<b>14</b>	<b>7%</b>
<b>R-20<sup>1</sup></b>									
<b>Parcels 2</b>									
2-Family/Duplex	100%	4		80%	2		80%	2	
4-Plex	0%	0		20%	4		10%	0	
6-Plex	0%	0		0%	0		10%	6	
<b>Sub-Total</b>	<b>100%</b>	<b>4</b>	<b>3%</b>	<b>100%</b>	<b>6</b>	<b>3%</b>	<b>100%</b>	<b>8</b>	<b>4%</b>
<b>TOTAL</b>									
<b>Parcels 66</b>									
2-Family/Duplex	76%	114		48%	86		42%	86	
4-Plex	24%	36		52%	92		21%	42	
6-Plex	0%	0		0%	0		37%	76	
<b>Total</b>	<b>100%</b>	<b>150</b>	<b>100%</b>	<b>100%</b>	<b>178</b>	<b>100%</b>	<b>100%</b>	<b>204</b>	<b>100%</b>

1. Because there are only few redevelopment parcels allocated units to the product introduced in the scenario.





## ANALYSIS ASSUMPTIONS

The following assumptions are applied in each case study.

### Property Acquisition Cost

The property acquisition cost was assumed to be the existing assessed property's existing assessed value. The existing assessed value includes the property value and the improvement value.

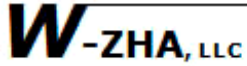
### Development Cost

Table 2

<b>Development Cost Assumptions Single-Family Zoning Initiative</b>	
<b>All Properties</b>	
Site Cost	\$20,000 /Unit Plus \$10,000
Demolition Allowance	\$5 /Existing SF
Hard Cost <sup>/1</sup>	\$180 /GSF Single-Family Detached \$185 /GSF Two-Family/Duplex \$190 /GSF 4-Plex & 6-Plex
Soft Cost	\$200,000 /Project
Garage	\$35,000 /Garage Sp
Appliance Allowance	\$18,000 /Unit Ownership \$13,000 /Unit Rental
Contingency	5.0% on Site, Demo, HC, Garage, SC
Financing	8.5% Construction Loan
<b>For-Sale Only</b>	
Broker Fees for For-Sale	5.0%
Developer Profit	13.0%
<b>Rental Property Only</b>	
Vacancy Rate	5.0% Gross Potential Rent
Operating Expenses & Prop Taxes	37.0% Rental Revenue
Developer Req Yield	5.5% Net Operating Income Divided by Cost

Source: Developer Interviews; W-ZHA

Table 2 summarizes development cost assumptions. Detailed construction cost estimates were not undertaken as part of this analysis. Costs are order-of-magnitude based on developer interviews, Marshall & Swift cost estimating software and W-ZHA's economic analysis experience for the City of Alexandria.



Feasibility

For for-sale products, redevelopment was considered feasible if the threshold sale price was within the range of recent sale prices in the zone. For rental properties, a product was considered feasible if the rent per square foot was less than \$4.00 for a unit under 1,000 square feet and \$3.00 for a unit over 1,000 square feet. For units over 2,500 square feet a rental was considered feasible if the rent was less than \$2.50 per square foot.

**SINGLE-FAMILY ZONING INITIATIVE FEASIBILITY**

**ZONE R-2-5**

Zoning

Table 3

Zoning Regulations Zone R-2-5	
Minimum Lot Size	5,000
Floor Area Ratio	0.45
Side-Yard Setback	1:3 7' Min.
Rear-Yard Setback	1:1 7' Min.
Maximum Height	30'
Parking Spaces	2

Source: City of Alexandria Zoning Code; W-ZHA

R-2-5 is the only single-family zone that allows both single-family and two-family homes. The minimum lot size in this zone is 5,000 square feet, unless it is a corner lot where the minimum lot size is 6,500 square feet. The maximum permitted floor area ratio is 0.45.

*R-2-5 Single-family Housing Characteristics*

Most of the properties zoned R-2-5 are on the east side of the City along the Route 1 corridor. R-2-5 parcels are close to Metro and goods and services. There are approximately 1,525 properties zoned R-2-5.

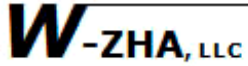
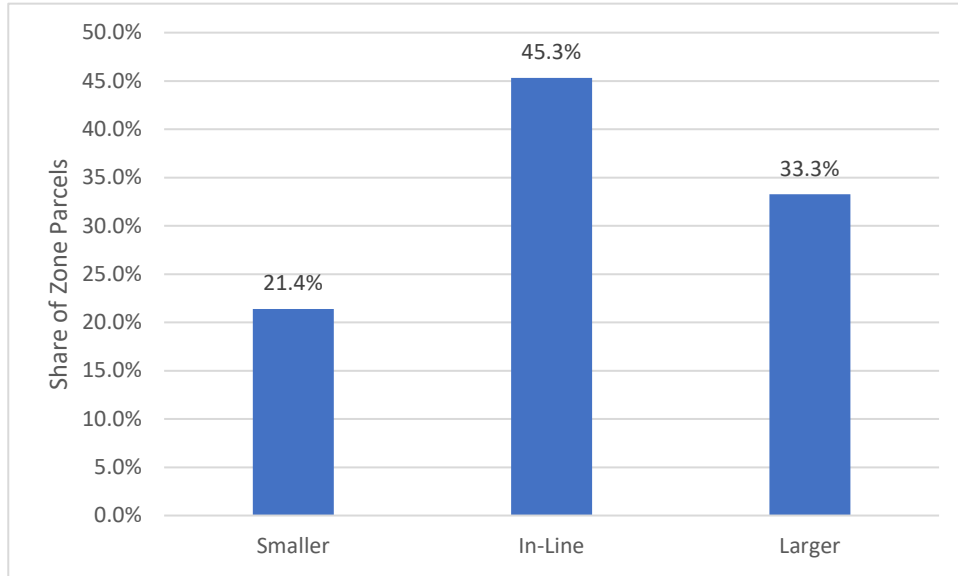


Figure 3

Parcel Sizes in the R-2-5 Zone

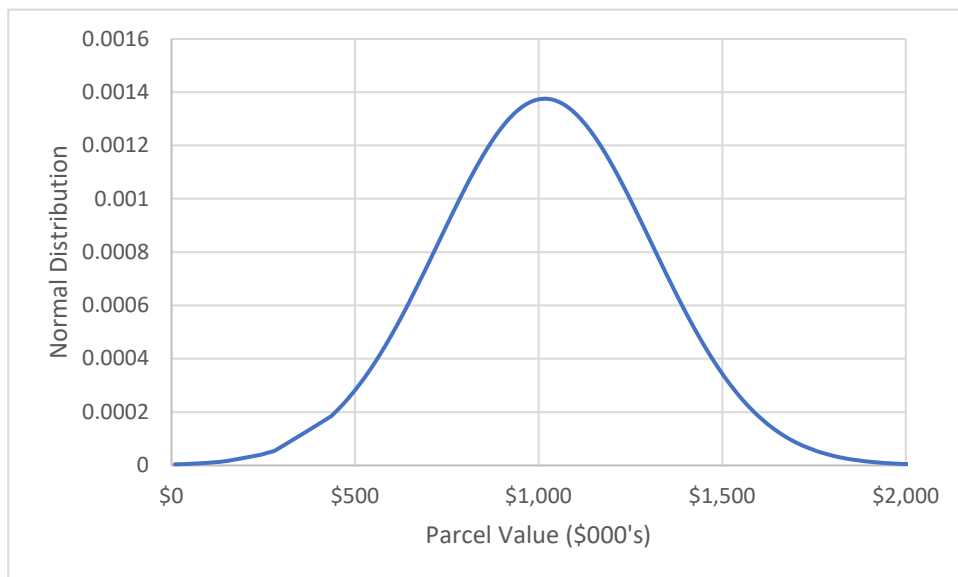


Source: City of Alexandria Department of Real Estate; W-ZHA

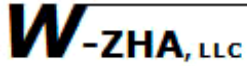
Approximately half of R-2-5 properties are close to the minimum lot size (5,000 – 5,750 square feet). One-third of the parcels are larger. Twenty-one percent of the parcels in the R-2-5 zone are smaller than the minimum lot size of 5,000 square feet.

Figure 4

Distribution of Property Values in the R-2-5 Zone



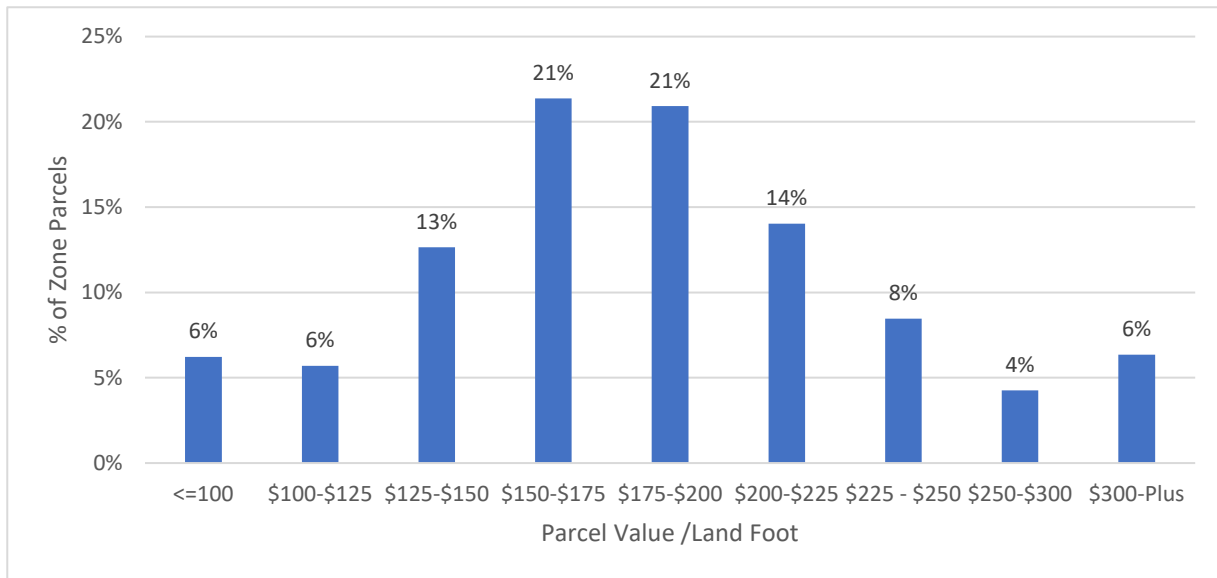
Source: City of Alexandria Department of Real Estate; W-ZHA



The median value of an R-2-5 property is \$989,000 and the average value is \$1.01 million. The top five properties in terms of value are between \$2.0 and \$2.05 million.

Figure 5

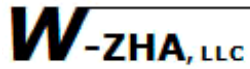
Existing Property Values by Square Foot of Land



Source: City of Alexandria Department of Real Estate; W-ZHA

Figure 5 illustrates property values by land square foot. To get value by land square foot, the property's total value (land and improvement) is divided by the parcel's size. A developer interested in redevelopment will seek out parcels that have a low value per land square foot.

The median value in the R-2-5 zone is \$180 per land square foot. The average value per land square foot is \$183. Of all single-family zones, R-2-5 properties have the highest value per land square foot.



Sample Parcels

Table 4

<b>Sample Properties R-2-5 Zone</b>			
<b>Site Size <sup>/1</sup></b>	<b>Site Size</b>	<b>Current Value</b>	<b>Value /Land SF</b>
Lower	4,600	\$530,000	\$115
Lower	4,000	\$975,000	\$244
In-Line	5,206	\$780,000	\$150
In-Line	5,240	\$1,250,000	\$239
Higher	8,625	\$842,000	\$98
Higher	7,508	\$864,000	\$115

1. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; City Property Records; W-ZHA

The sample properties were chosen based on their size to test whether redevelopment to a higher density product is physically feasible. In the sample, two sites are smaller than the minimum lot size for the zone, two are consistent with the minimum lot size and two are significantly larger than the minimum lot size.

The median value of a property in the R-2-5 zone is \$180 per land square foot. Two of the six sample sites have land per square foot values above the median for the zone.

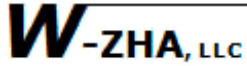


Table 5

Test-Fit Analysis Findings <sup>/1</sup>				
R-2-5 Zone				
Site Size <sup>/2</sup>	Duplex	2 Family Semi-Detached	4-Plex	6-Plex
	Unit SF	Unit SF	Unit SF	Unit SF
Smaller	1,035	NA	699	466
Smaller	900	900	608	405
In-Line	1,171	1,171	790	527
In-Line	1,179	1,179	796	531
Larger	1,941	2,910	1,310	873
Larger	1,689	1,689	1,140	760

1. Duplex and 2 family/semi-detached unit sizes are derived by taking the maximum floor area allowed by the FAR and dividing by two. 4-plex and 6-plex buildings include livable basement area which is not included in the FAR.

2. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

Table 5 summarizes each housing product’s average unit size given floor area ratio, height, and yard requirements. The unit size represents the livable area.

The duplex, 4-plex and 6-plex product are feasible on each lot size. A 6-plex building on a small site in the R-2-5 zone would consist of studio units.

On one of the smaller sites, the test-fit analysis determined that a two-family, semi-detached product was infeasible. Because of the lot’s width, the side yard requirements made the buildings too narrow and infeasible.

Economic Analysis

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. A product was considered feasible if the required sale price fell within recent sale prices in the R-2-5 zone.

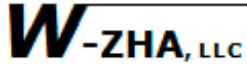


Figure 6  
2022 Sale Prices



Source: City of Alexandria Department of Real Estate; W-ZHA

For the sixty homes sold in the R-2-5 zone in 2022, sale prices ranged from \$580,000 to \$2.02 million. The average sale price was \$1.17 million or \$662 per square foot of the home. The median sale price was \$1.1 million or \$652 per square foot of the home.

The analysis assumes that a developer purchases the property for its current value, demolishes the existing unit, and redevelops the property. The required sales price and rent (or “threshold price and rent”) are a function of the acquisition, demolition, and development cost plus the developer’s required profit.

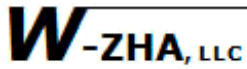
*Duplex and Two-Family*

Table 6

Duplex and 2 Family Semi-Detached Minimum Sale Price and Rent R-2-5 Zone											
Site Size <sup>1</sup>	Acq. Price /Unit	Duplex				2 Family Semi-Detached				Rental	
		Unit SF	Price	Price/SF	Multiplier	Unit SF	Price	Price/SF	Multiplier	Rent	/SF
Smaller	\$265,000	1,035	\$821,328	\$797	3.1	NA	NA	NA	NA	\$5,116	\$4.94
Smaller	\$487,500	900	\$1,080,361	\$1,206	2.2	900	\$1,080,361	\$1,206	2.2	\$6,743	\$7.49
In-Line	\$390,000	1,171	\$1,021,958	\$877	2.6	1,171	\$1,021,958	\$877	2.6	\$6,376	\$5.44
In-Line	\$625,000	1,179	\$1,335,529	\$1,138	2.1	1,179	\$1,335,529	\$1,138	2.1	\$8,345	\$7.08
Larger	\$421,000	1,941	\$1,257,524	\$651	3.0	1,941	\$1,257,524	\$651	3.0	\$7,855	\$4.05
Larger	\$432,000	1,689	\$1,208,865	\$719	2.8	1,689	\$1,208,865	\$719	2.8	\$7,550	\$4.47

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA



The threshold price for a duplex and a two-family, semi-detached unit is within the range of recent sales values in the zone. The smaller sites have sale prices below the average for the zone. Larger sites have higher than average sale prices.

The required rental rates are very high and not feasible in the market today.

*4-Plex*

A 4-plex will require halls and stairs to access the units. The analysis assumes that 90% of a 4-plex building is sellable or rentable.

Table 7

4-Plex Minimum Sale Price and Rent R-2-5 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	4-Plex				Rental	
		Unit SF	Price	Price/SF	Multiplier	Rent	Rent /SF
Smaller	\$132,500	699	\$508,364	\$728	3.8	\$3,151	\$4.51
Smaller	\$243,750	608	\$628,502	\$1,035	2.6	\$3,905	\$6.43
In-Line	\$195,000	790	\$618,126	\$782	3.2	\$3,840	\$4.86
In-Line	\$312,500	796	\$775,467	\$974	2.5	\$4,828	\$6.07
Larger	\$210,500	1,310	\$789,264	\$603	3.7	\$4,915	\$3.75
Larger	\$216,000	1,140	\$747,584	\$656	3.5	\$4,653	\$4.08

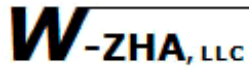
1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

A 4-plex for-sale product is feasible in the zone. Sales prices for 4-plex units are below the average sales price in the zone, although higher on a per square foot basis. Developers indicate that potential purchasers are more concerned with the overall price than the sales per square foot.

As a rental product, 4-plex units are not feasible because they will require above-market rental rates to provide an adequate return to a developer.





6-Plex

Table 8

6-Plex Minimum Sale Price and Rent R-2-5 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	6-Plex				Rental	
		Unit SF	Price	Price/SF	Multiplier	Rent	Rent /SF
Smaller	\$88,333	466	\$357,751	\$768	4.1	\$2,195	\$4.71
Smaller	\$162,500	405	\$438,213	\$1,082	2.7	\$2,698	\$6.66
In-Line	\$130,000	527	\$431,263	\$818	3.3	\$2,654	\$5.04
In-Line	\$208,333	531	\$536,641	\$1,011	2.6	\$3,313	\$6.24
Larger	\$140,333	873	\$545,882	\$625	3.9	\$3,371	\$3.86
Larger	\$144,000	760	\$517,967	\$681	3.6	\$3,196	\$4.20

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

As a for-sale product, the 6-plex is financially feasible. On small- and average-sized parcels a 6-plex building would consist of studio or 1-bedroom units. The sales price threshold is high per square foot, but the total price is affordable to many more City households.

As a rental project, the 6-plex is not financially feasible due to above-market threshold rents.

**ZONE R-5**

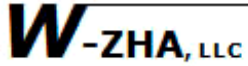
Zoning

Table 9

**Zoning Regulations  
Zone R-5**

Minimum Lot Size	5,000
Floor Area Ratio	0.45
Side-Yard Setback	1:3 7' Min.
Rear-Yard Setback	1:1 7' Min.
Maximum Height	30'
Parking Spaces	2

Source: City of Alexandria Zoning Code; W-ZHA



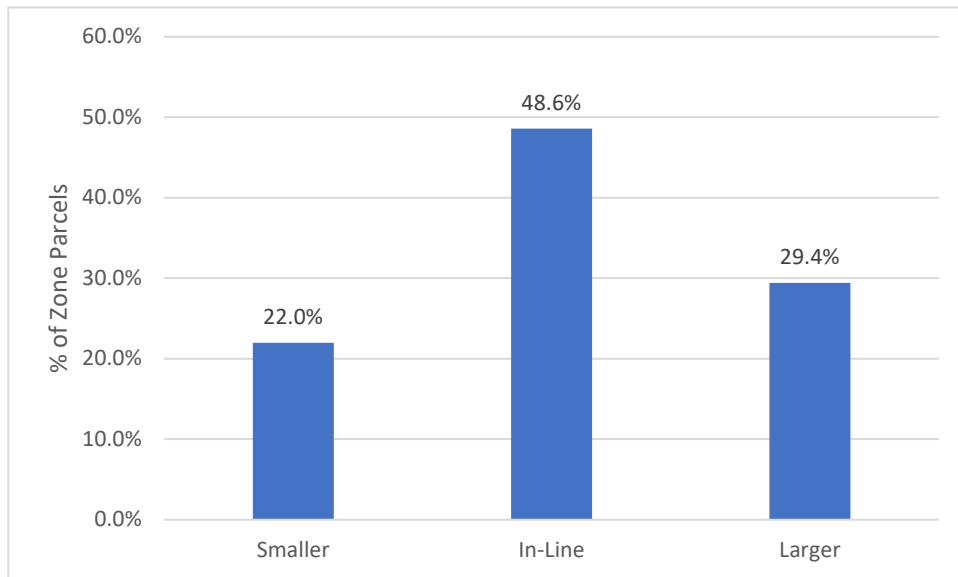
The minimum lot size in the R-5 zone is 5,000 square feet, unless it is a corner lot where the minimum lot size is 6,500 square feet. Like the R-2-5 zone, the maximum permitted floor area ratio is 0.45 in the R-5 zone.

#### R-5 Single-family Housing Characteristics

Most of the properties zoned R-5 are on the east side of the City near Metro and goods and services. There are 1,196 properties zoned R-5.

Figure 7

#### Parcel Sizes in the R-5 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

Most of the parcels in the R-5 zone are between 5,000 and 7,000 square feet. The average lot size in the R-5 zone is 6,900 square feet.

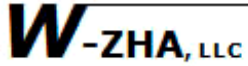
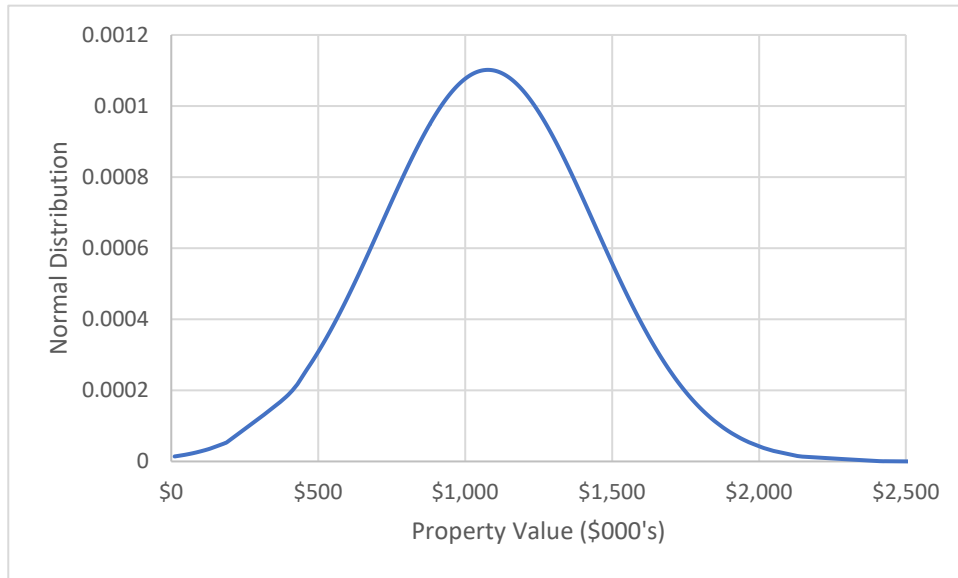


Figure 8

Distribution of Property Values in the R-5 Zone

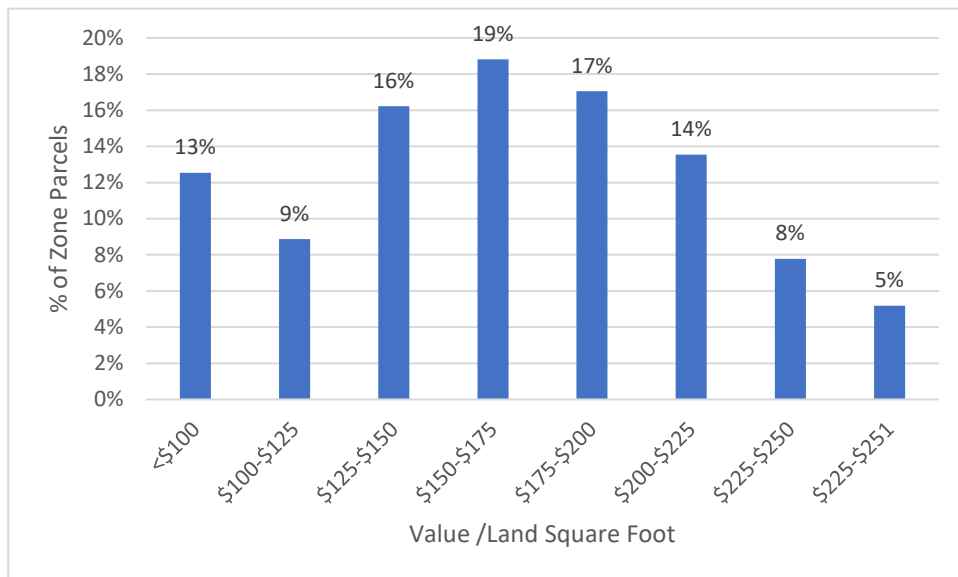


Source: City of Alexandria Department of Real Estate; W-ZHA

The median value of an R-5 property is \$1.05 million, and the average value is \$1.08 million. The top five properties are valued between \$2.5 and \$4.0 million.

Figure 9

Existing Property Values by Square Foot of Land in R-5 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

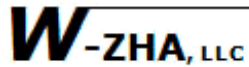


Figure 9 illustrates property values by land square foot. The average value per land square foot is \$164. The R-5 zone has the second highest value per land square foot among the single-family zones.

Sample Parcels

Table 10

Sample Property Existing Value R-5 Zone			
Site Size <sup>/1</sup>	Site Size	Current Value	Value /Land SF
Lower	4,752	\$721,300	\$152
Lower	5,060	\$730,000	\$144
In-Line	6,900	\$1,200,000	\$174
In-Line	6,500	\$1,055,000	\$162
Higher	8,400	\$885,000	\$105
Higher	8,466	\$1,300,800	\$154

1. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; City Property Records; W-ZHA

The sample parcels were chosen based on size to test whether redevelopment to a higher density product is physically feasible. The average value of a property in the R-5 zone is \$164 per land square foot. One sample site has a value above the median for the zone.

Test Fit Results

Table 11

Test-Fit Analysis Findings <sup>/1</sup> R-5 Zone			
Site Size <sup>/2</sup>	Duplex	4-Plex	6-Plex
	Unit SF	Unit SF	Unit SF
Smaller	1,069	722	481
Smaller	1,139	768	512
In-Line	1,575	1,048	699
In-Line	1,463	987	658
Larger	1,890	1,276	851
Larger	1,905	1,181	787

- Duplex and 2 family/semi-detached unit sizes are derived by taking the maximum floor area allowed by the FAR and dividing by two. 4-plex and 6-plex buildings include livable basement area which is not included in the FAR.
- Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

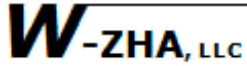


Table 11 summarizes a housing product’s maximum unit size given single-family zoning regulations. The duplex, 4-plex and 6-plex product are feasible on each lot size. A 6-plex building on a small site in the R-5 zone would consist of studio units.

### Economic Analysis

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. A product was considered feasible if the required sale price fell within recent sale prices in the R-5 zone.

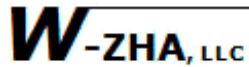
Figure 10

2022 Sale Prices in R-5 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

For the 48 homes sold in the R-5 zone in 2022, sale prices ranged from \$660,000 to \$1.9 million. The average sale price was \$1.2 million or \$613 per square foot of home. The median sale price was \$1.17 million or \$629 per square foot of home.



Duplex and Two-Family

Table 12

2-Family/Duplex Minimum Sale Price and Rent R-5 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	2-Family/Duplex				Rental	
		Unit SF	Price	Price/SF	Multiplier	Rent	/SF
Smaller	\$360,650	1,069	\$961,881	\$900	2.7	\$5,971	\$5.59
Smaller	\$365,000	1,139	\$983,076	\$863	2.7	\$6,103	\$5.36
In-Line	\$600,000	1,575	\$1,410,867	\$896	2.4	\$8,777	\$5.57
In-Line	\$527,500	1,463	\$1,284,194	\$878	2.4	\$7,986	\$5.46
Larger	\$442,500	1,890	\$1,282,243	\$678	2.9	\$7,973	\$4.22
Larger	\$650,400	1,905	\$1,612,997	\$847	2.5	\$9,736	\$5.11

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

Two-family, semi-detached, and duplex prices are within the range of 2022 sales prices. As a for-sale product, these product-types are feasible in today's market.

4-Plex

Table 13

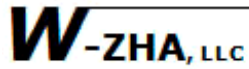
4-Plex Minimum Sale Prices and Rents R-5 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	4-Plex				Rental	
		Unit SF	Price	Price/SF	Multiplier	Rent	/SF
Smaller	\$180,325	722	\$581,463	\$806	3.2	\$3,593	\$4.98
Smaller	\$182,500	768	\$596,911	\$777	3.3	\$3,690	\$4.80
In-Line	\$300,000	1,048	\$836,760	\$799	2.8	\$5,189	\$4.95
In-Line	\$263,750	987	\$770,080	\$780	2.9	\$4,772	\$4.83
Larger	\$221,250	1,276	\$798,939	\$626	3.6	\$4,952	\$3.88
Larger	\$325,200	1,181	\$958,825	\$812	2.9	\$5,647	\$4.78

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

The 4-plex product offers a range of unit sizes and prices. Threshold prices per square foot are higher than the 2022 sales average, but overall prices are below the 2022 average.

The required rental rates are very high and likely not feasible in the market today.



6-Plex

Table 14

**6-Plex Minimum Sale Price and Rent  
R-5 Zone**

Site Size <sup>/1</sup>	Acq. Price /Unit	6-Plex				Rental	
		Unit SF	Price	Price/SF	Multiplier	Rent	/SF
Smaller	\$120,217	481	\$404,923	\$842	3.4	\$2,490	\$5.18
Smaller	\$121,667	512	\$415,221	\$810	3.4	\$2,554	\$4.98
In-Line	\$200,000	699	\$575,120	\$823	2.9	\$3,553	\$5.09
In-Line	\$175,833	658	\$530,667	\$806	3.0	\$3,276	\$4.98
Larger	\$147,500	851	\$549,906	\$647	3.7	\$3,396	\$3.99
Larger	\$216,800	787	\$672,781	\$855	<b>3.1</b>	\$3,859	\$4.90

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

Multipliers are highest on small parcels and parcels that can be acquired for less cost. The 6-plex units are small but offer a price point well below the average sales price in the R-5 zone.

**ZONE R-8**

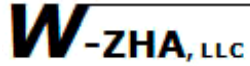
Zoning

Table 15

**Residential Regulations  
Zone R-8**

Minimum Lot Size	8,000
Floor Area Ratio	0.35
Side-Yard Setback	1:2 8' Min.
Rear-Yard Setback	1:1 8' Min.
Maximum Height	30'
Parking Spaces	2

Source: City of Alexandria Zoning Code; W-ZHA

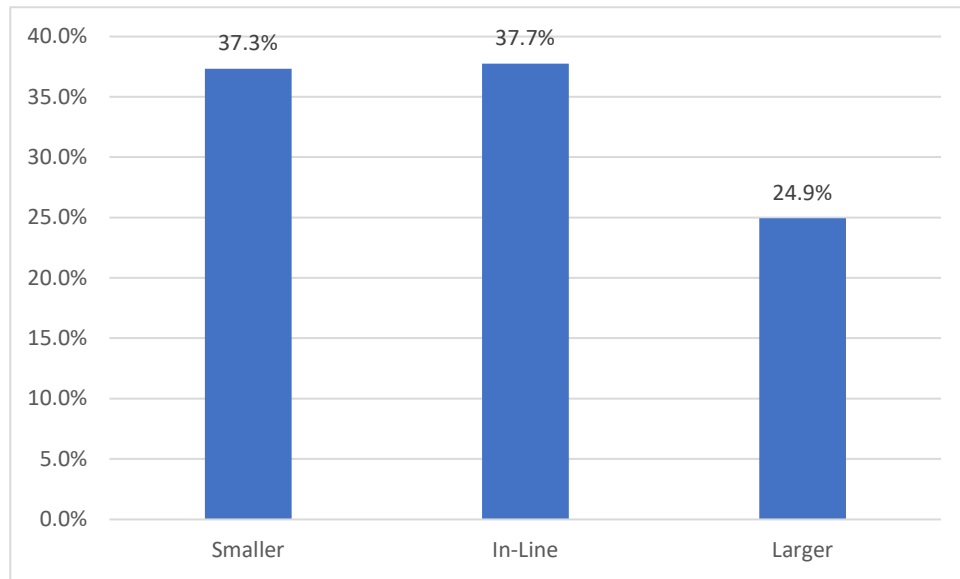


The minimum lot size in the R-5 zone is 8,000 square feet, unless it is a corner lot where the minimum lot size is 9,000 square feet. The maximum permitted floor area ratio is 0.35 in the R-8 zone.

R-8 Single-family Housing Characteristics

Figure 11

Parcel Sizes in the R-8 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

R-8 is the City's largest single-family zone with 4,386 parcels. Over one-third of the parcels in the R-8 zone are smaller than the zone's minimum lot size. Notwithstanding, the average parcel size in the R-8 zone is 9,270 square feet which is slightly larger than the minimum lot size of 8,000 square feet.



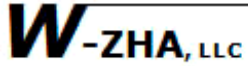
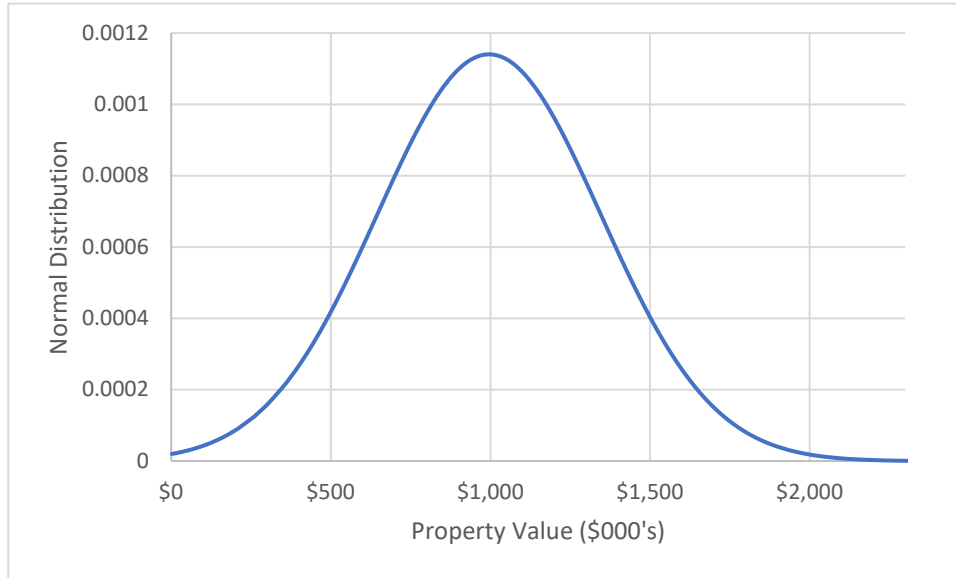


Figure 12

Distribution of Property Values in the R-8 Zone

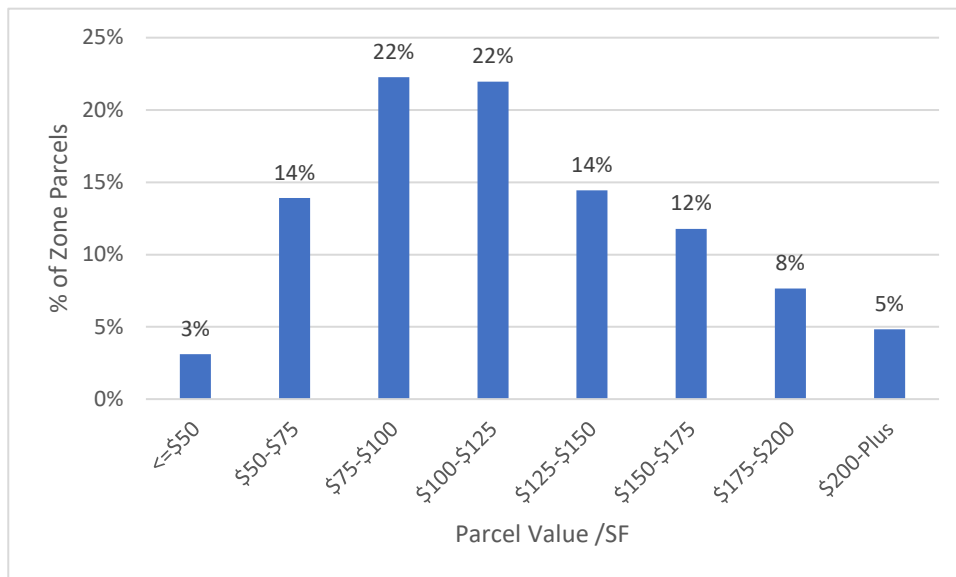


Source: City of Alexandria Department of Real Estate; W-ZHA

The median value of an R-8 property is \$954,000 and the average value is \$996,000 million. The top five properties are valued between \$3.4 and \$6.5 million.

Figure 13

Existing Property Values by Square Foot of Land in R-8 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

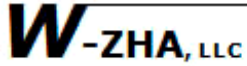


Figure 13 illustrates property values by land square foot. The median value is \$111 per land square foot. The average value per land square foot is \$118. Values per land square foot are lower in R-8 compared to R-25 and R-5 because the property values are slightly lower in R-8 and parcel sizes are larger.

Sample Parcels

Table 16

Sample Property Existing Value R-8 Zone			
Site Size <sup>/1</sup>	Site Size	Current Value	Value /Land SF
Lower	6,251	\$765,000	\$122
Lower	6,250	\$775,000	\$124
In-Line	8,005	\$542,500	\$68
In-Line	8,142	\$775,000	\$95
Higher	16,564	\$665,000	\$40
Higher	13,703	\$795,000	\$58

1. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; City Property Records; W-ZHA

The sample parcels were chosen based on size to test whether redevelopment to a higher density product is physically feasible. The median value of a property in the R-8 zone is \$118 per land square foot. Two sample sites have values above the median and the others are well below the median.

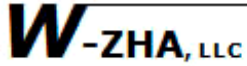
Test Fit Results

Table 17

Test-Fit Analysis Findings <sup>/1</sup> R-8 Zone			
Site Size <sup>/2</sup>	Duplex	4-Plex	6-Plex
	Unit SF	Unit SF	Unit SF
Smaller	1,094	738	492
Smaller	1,094	738	492
In-Line	1,401	945	630
In-Line	1,425	962	641
Larger	2,899	1,957	1,304
Larger	2,398	1,619	1,079

1. Duplex and 2 family/semi-detached unit sizes are derived by taking the maximum floor area allowed by the FAR and dividing by two. 4-plex and 6-plex buildings include livable basement area which is not included in the FAR.

2. Relationship to minimum lot size allowed by zone.



The two-family, semi-detached, duplex, 4-plex and 6-plex products are physically feasible on each site size. The large lots in the R-8 zone can accommodate much larger two-family/duplex, 4-plex and 6-plex units.

### Economic Analysis

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. A product was considered feasible if the required sale price fell within recent sale prices in the R-8 zone.

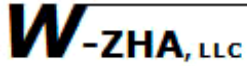
Figure 14

2022 Sale Prices in R-5 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

For the 207 properties that sold in the R-8 zone in 2022, sale prices ranged from \$400,000 to \$2.55 million. The average sale price was \$1.08 million and the median, \$980,000. The average price per square foot of the home was \$542.



Duplex and Two-Family

Table 18

**Two-Family/Duplex Minimum Sale Price  
R-8 Zone**

Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$382,500	1,094	\$992,385	\$908	2.6	\$6,190	\$5.66
Smaller	\$387,500	1,094	\$997,107	\$912	2.6	\$6,220	\$5.69
In-Line	\$271,250	1,401	\$921,533	\$658	3.4	\$5,745	\$4.10
In-Line	\$387,500	1,425	\$1,082,309	\$760	2.8	\$6,755	\$4.74
Larger	\$332,500	2,899	\$1,388,605	\$479	4.2	\$8,678	\$2.99
Larger	\$397,500	2,398	\$1,345,703	\$561	<b>3.4</b>	\$8,409	\$3.51

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

Two-family/duplex threshold prices are feasible and within the range of 2022 prices.

The required rental rates are high and likely not feasible in the market today.

4-Plex

Table 19

**4-Plex Minimum Sale Price  
R-8 Zone**

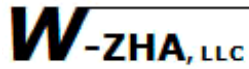
Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$191,250	738	\$597,989	\$810	3.1	\$3,714	\$5.03
Smaller	\$193,750	738	\$600,334	\$813	3.1	\$3,728	\$5.05
In-Line	\$135,625	945	\$583,889	\$618	4.3	\$3,625	\$3.83
In-Line	\$193,750	962	\$665,935	\$692	3.4	\$4,140	\$4.30
Larger	\$166,250	1,957	\$921,467	\$471	5.5	\$5,745	\$2.94
Larger	\$198,750	1,619	\$865,236	\$535	<b>4.4</b>	\$5,392	\$3.33

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

The 4-plex product offers a range of unit sizes and prices. Units on larger lots have lower prices per square foot than the zone's average in 2022 (\$542).

The required rental rates are high and likely not feasible in the market today.



6-Plex

Table 20

6-Plex Minimum Sale Price R-8 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$127,500	492	\$415,861	\$845	3.3	\$2,570	\$5.22
Smaller	\$129,167	492	\$417,424	\$848	3.2	\$2,580	\$5.24
In-Line	\$90,417	630	\$406,461	\$645	4.5	\$2,511	\$3.98
In-Line	\$129,167	641	\$461,158	\$719	3.6	\$2,854	\$4.45
Larger	\$110,833	1,304	\$631,513	\$484	5.7	\$3,924	\$3.01
Larger	\$132,500	1,079	\$594,025	\$550	<b>4.5</b>	\$3,689	\$3.42

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

The 6-plex product is financially feasible in the R-8 zone. The larger lots allow for larger units, which may be necessary from a market perspective. Larger lot redevelopment may also allow the product to be rented, but operating expenses may be a challenge with a 6-unit project.

**ZONE R-12**

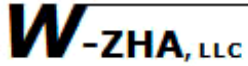
Existing Zoning

Table 21

Residential Regulations Zone R-12	
Minimum Lot Size	12,000
Floor Area Ratio	0.3
Side-Yard Setback	1:2 10' Min.
Rear-Yard Setback	1:1 10' Min.
Maximum Height	30'
Parking Spaces	2

Source: City of Alexandria Zoning Code; W-ZHA

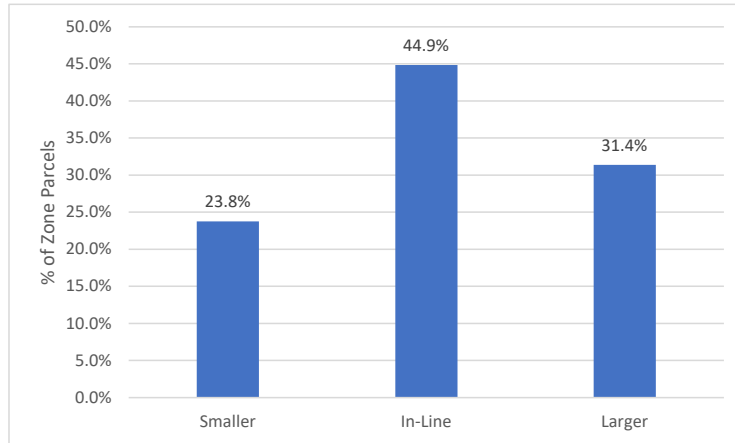
The minimum lot size in the R-5 zone is 12,000 square feet. The maximum permitted floor area ratio is 0.3.



R-12 Single-family Housing Characteristics

Figure 15

Parcel Sizes in the R-12 Zone

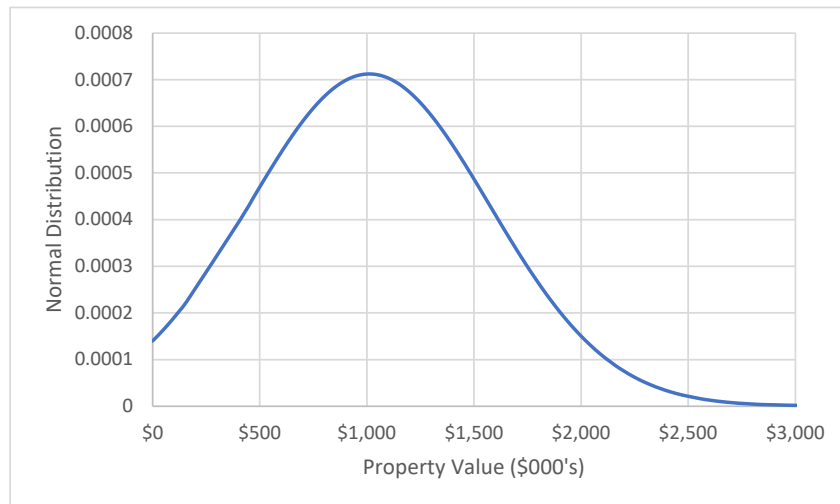


Source: City of Alexandria Department of Real Estate; W-ZHA

There are 787 properties zoned R-12 in the City. A little less than a quarter of the parcels in the R-12 zone are smaller than the minimum lot size. The average property size in the R-12 zone is 15,130 square feet.

Figure 16

Distribution of Property Values in the R-12 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

The average value of an R-12 property is 1.01 million. The top five properties are valued between \$3.3 and \$4.1 million.

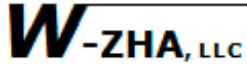
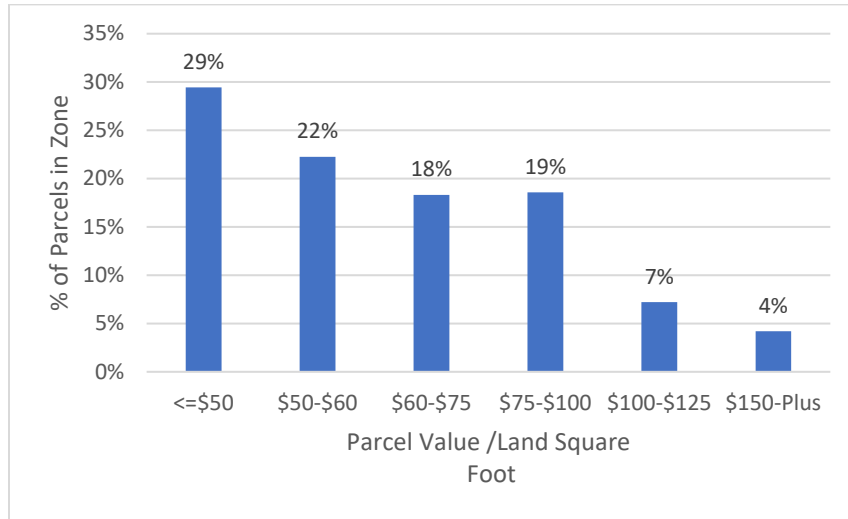


Figure 17

Existing Property Values by Square Foot of Land in R-12 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

Figure 17 illustrates property values by land square foot. Because lots are large, R-12 property values per square foot of land are lower. The median value is \$60 per land square foot. The average value per land square foot is \$69.

Sample Parcels

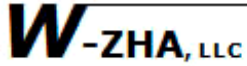
Table 16

Sample Property Existing Value R-12 Zone			
Site Size <sup>/1</sup>	Site Size	Current Value	Value /Land SF
Lower	10,779	\$455,000	\$42
Lower	10,483	\$785,000	\$75
In-Line	12,000	\$875,000	\$73
In-Line	12,000	\$950,000	\$79
Higher	19,000	\$547,000	\$29
Higher	26,676	\$930,000	\$35

1. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; City Property Records; W-ZHA

The sample parcels were chosen based on size to test whether redevelopment to a higher density product is physically feasible. The median value of a property in the R-12 zone is \$60 per land square foot. Three sample sites have property values per land foot above the median and the others are below the median.



Test Fit Results

Table 23

Test-Fit Analysis Findings <sup>/1</sup>			
R-12 Zone			
Site Size <sup>/2</sup>	Duplex	4-Plex	6-Plex
	Unit SF	Unit SF	Unit SF
Smaller	1,617	1,091	728
Smaller	1,835	1,238	825
In-Line	1,800	1,215	810
In-Line	2,100	1,316	878
Larger	2,850	1,924	1,283
Larger	4,668	3,150	2,100

1. Duplex and 2 family/semi-detached unit sizes are derived by taking the maximum floor area allowed by the FAR and dividing by two. 4-plex and 6-plex buildings include livable basement area which is not included in the FAR.
2. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

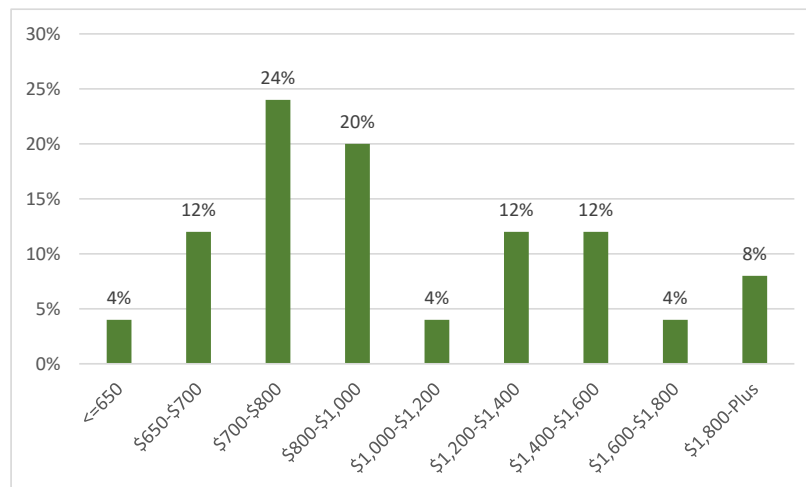
Table 23 summarizes the housing product’s maximum unit size given regulations pertaining to floor area ratio, height, and yards.

Economic Analysis

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. A product was considered feasible if the required sale price fell within recent sale prices in the R-12 zone.

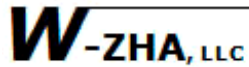
Figure 18

2022 Sale Prices in R-12 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA





For the 25 properties that sold in the R-12 zone in 2022, sale prices ranged from \$640,000 to \$2.58 million. The average sale price was \$1.1 million and the median \$910,000. The average home price per square foot was \$549. The highest sale price was \$689 per square foot.

*Duplex and Two-Family*

Table 24

2-Family/Duplex Minimum Price R-12 Zone							
Site Size <sup>/1</sup>	Value /Parcel SF	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$227,500	1,617	\$919,221	\$569	2.4	\$5,731	\$3.54
Smaller	\$392,500	1,835	\$1,244,061	\$678	3.2	\$7,771	\$4.24
In-Line	\$437,500	1,800	\$1,249,802	\$694	4.6	\$7,807	\$4.34
In-Line	\$475,000	2,100	\$1,422,692	\$677	3.7	\$8,892	\$4.23
Larger	\$273,500	2,850	\$1,297,448	\$455	3.9	\$8,106	\$2.84
Larger	\$465,000	4,668	\$2,069,350	\$443	<b>5.2</b>	\$12,953	\$2.77

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

Two-family/duplex prices are feasible and are close to 2022 average sale prices in the zone. Except for the large lots, sales prices per square foot are above the average for the zone.

The required rental rates are high and likely not feasible in the market today.

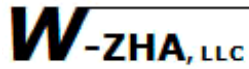
*4-Plex*

Table 25

4-Plex Minimum Sale Price R-12							
Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$113,750	1,091	\$597,729	\$548	5.3	\$3,712	\$3.40
Smaller	\$196,250	1,238	\$799,549	\$646	4.1	\$4,979	\$4.02
In-Line	\$218,750	1,215	\$775,742	\$638	3.5	\$4,830	\$3.98
In-Line	\$237,500	1,316	\$877,644	\$667	3.7	\$5,470	\$4.16
Larger	\$136,750	1,924	\$872,505	\$454	6.4	\$5,437	\$2.83
Larger	\$232,500	3,150	\$1,408,796	\$447	<b>6.1</b>	\$8,805	\$2.80

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA



Even with a lower floor area ratio the larger lots in R-12 allow buildings to be larger. The 4-plex product offers 2- to 3-bedroom unit sizes at prices below the average for the R-12 zone. Rental rates are high.

6-Plex

Table 26

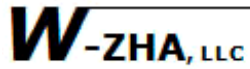
6-Plex Minimum Sale Price R-12 Zone							
Site Size <sup>1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$75,833	728	\$415,687	\$571	5.5	\$2,569	\$3.53
Smaller	\$130,833	825	\$566,443	\$686	4.3	\$3,515	\$4.26
In-Line	\$145,833	810	\$534,363	\$660	3.7	\$3,314	\$4.09
In-Line	\$158,333	878	\$618,506	\$705	3.9	\$3,842	\$4.38
Larger	\$91,167	1,283	\$598,871	\$467	6.6	\$3,719	\$2.90
Larger	\$155,000	2,100	\$972,607	\$463	<b>6.3</b>	\$6,066	\$2.89

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

A for-sale 6-plex project is financially feasible in the R-12 zone. The sales price per square foot is high, but the overall price is below the average for the zone.

Development on a small, low-cost site has a rent threshold of \$3.53, which is feasible in today's market. Larger lot redevelopment on a low-cost site, has a rent threshold of \$2.90 per square foot, which is also feasible in today's market. Otherwise, the costs require a rent threshold above what the market is willing to pay.



## ZONE R-20

### Existing Zoning

Table 27

Single Family Zoning Zone R-20	
Minimum Lot Size	20,000
Floor Area Ratio	0.25
Side-Yard Setback	1:2 12' Min.
Rear-Yard Setback	1:1 12' Min.
Maximum Height	30'
Parking Spaces	2

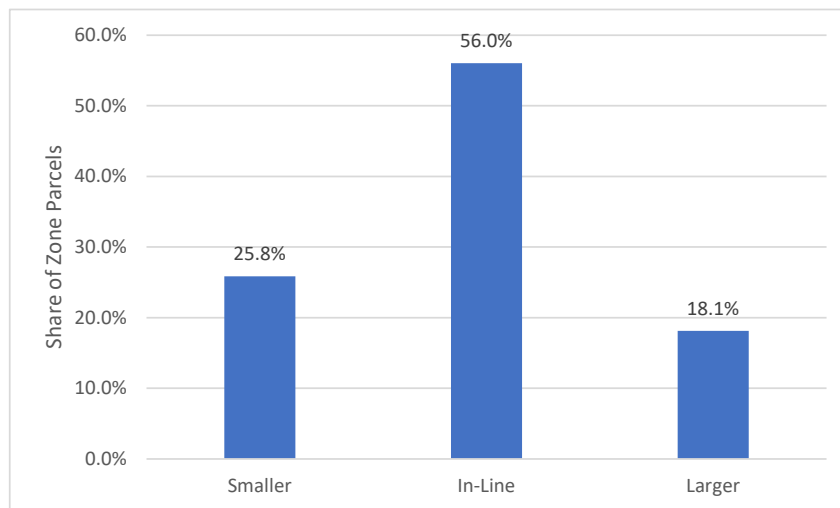
Source: City of Alexandria Zoning Code; W-ZHA

The minimum lot size in the R-20 zone is 20,000 square feet. The maximum permitted floor area ratio is 0.25.

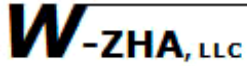
### R-20 Single-family Housing Characteristics

Figure 19

Parcel Sizes in the R-20 Zone



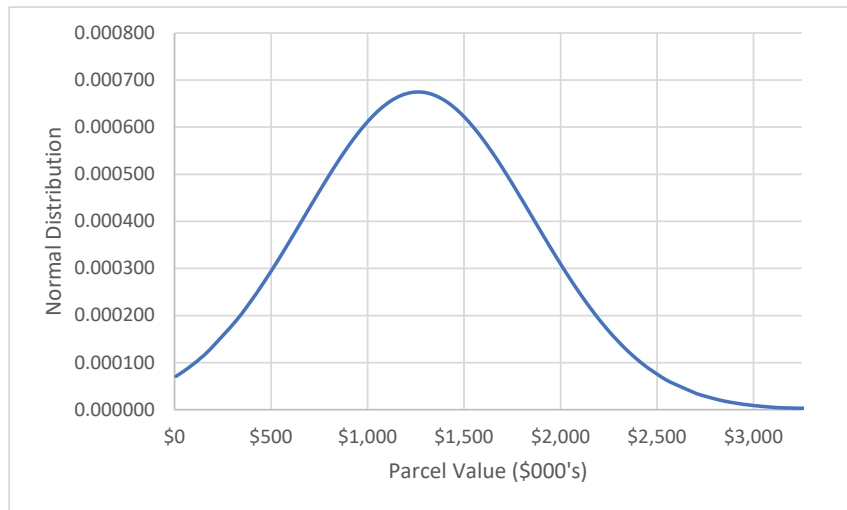
Source: City of Alexandria Department of Real Estate; W-ZHA



There are 624 properties zoned R-20. Approximately one-quarter of the parcels in the R-20 zone are smaller than the minimum lot size. The average property size in the R-20 zone is 23,800 square feet.

Figure 20

Distribution of Property Values in the R-20 Zone

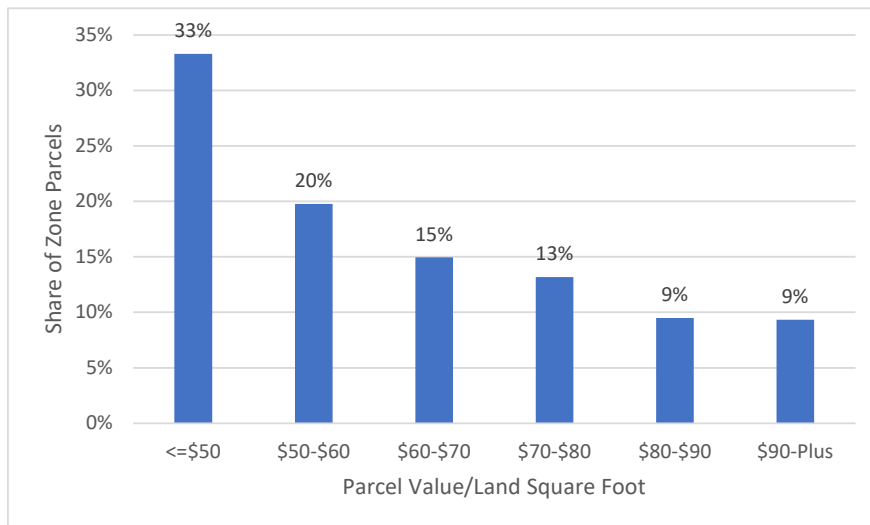


Source: City of Alexandria Department of Real Estate; W-ZHA

The average value of an R-20 property is \$1.26 million, the highest among all single-family zones. The top five properties are valued between \$3.6 and \$4.4 million.

Figure 21

Existing Property Values by Square Foot of Land in R-20 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

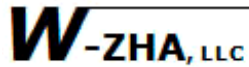


Figure 21 illustrates property values by land square foot in R-20. Because lots are large, the property values per square foot of land are lower. The median value is \$58 per land square foot and the average is \$61.

Sample Parcels

Table 28

Sample Property Existing Value R-20 Zone			
Site Size <sup>/1</sup>	Site Size	Current Value	Value /Land SF
Lower	8,169	\$440,000	\$54
Lower	8,123	\$580,000	\$71
In-Line	20,000	\$1,151,000	\$58
In-Line	20,014	\$675,000	\$34
Higher	36,481	\$1,425,000	\$39
Higher	43,560	\$1,225,000	\$28

1. Relationship to minimum lot size allowed by zone.

Property Records; W-ZHA

The median value of a property in the R-20 zone is \$58 per land square foot. Four sample sites have property values per land foot below the median.

Test Fit Results

Table 29

Test-Fit Analysis Findings <sup>/1</sup> R-20 Zone			
Site Size <sup>/2</sup>	Duplex	4-Plex	6-Plex
	Unit SF	Unit SF	Unit SF
Smaller	1,021	689	459
Smaller	1,015	685	457
In-Line	2,500	1,688	1,125
In-Line	2,500	1,688	1,125
Larger	4,560	3,078	2,052
Larger	5,445	3,675	2,450

1. Duplex and 2 family/semi-detached unit sizes are derived by taking the maximum floor area allowed by the FAR and dividing by two. 4-plex and 6-plex buildings include livable basement area which is not included in the FAR.

2. Relationship to minimum lot size allowed by zone.

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

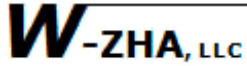


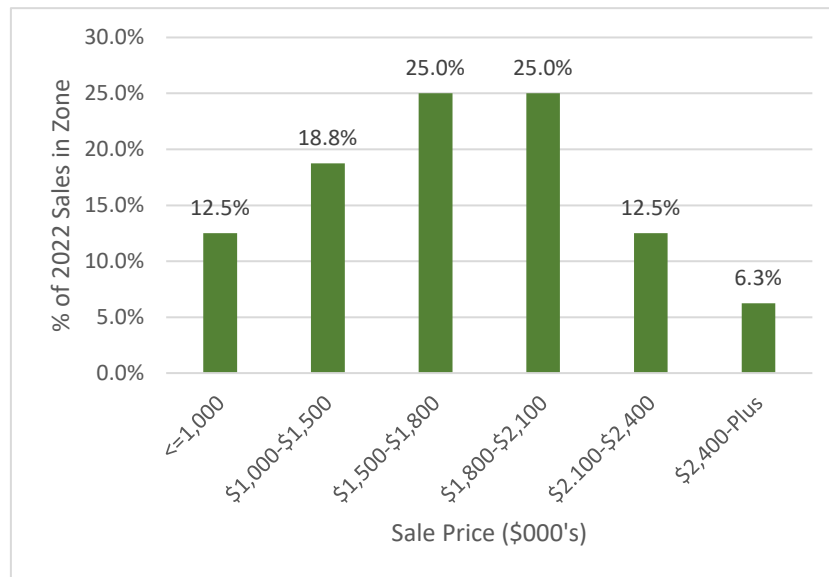
Table 29 summarizes the housing product’s maximum unit size given regulations pertaining to floor area ratio, height, and yards. Redevelopment is physically feasible for all product-types, although the 6-plex unit sizes on small sites are studio-sized.

### Economic Analysis

The economic analysis analyzed the redevelopment feasibility for each housing product on each of the sample sites. A product was considered feasible if the required sale price fell within recent sale prices in the R-20 zone.

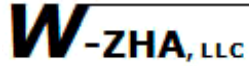
Figure 22

2022 Sale Prices in R-12 Zone



Source: City of Alexandria Department of Real Estate; W-ZHA

For the 16 properties that sold in the R-20 zone in 2022, sale prices ranged from \$690,000 to \$3.35 million. The average sale price was \$1.74 million and the median \$1.78 million. The average home price per square foot was \$460 of livable space. The highest sale price was \$696 per square foot of livable space.



Duplex and Two-Family

Table 30

2-Family/Duplex Minimum Sale Price R-20 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$227,500	1,021	\$756,339	\$741	3.3	\$4,708	\$4.61
Smaller	\$392,500	1,015	\$847,925	\$835	2.2	\$5,283	\$5.20
In-Line	\$437,500	2,500	\$1,618,055	\$647	3.7	\$10,119	\$4.05
In-Line	\$475,000	2,500	\$1,293,405	\$517	2.7	\$8,081	\$3.23
Larger	\$273,500	4,560	\$2,329,540	\$511	8.5	\$14,587	\$3.20
Larger	\$465,000	5,445	\$2,420,727	\$445	5.2	\$15,160	\$2.78

1. Relationship to minimum lot size allowed by zone.

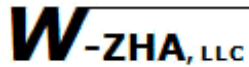
Source: W-ZHA

Two-family, semi-detached units and duplex development is financially feasible in the R-20 zone. On small sites, two-family/duplex redevelopment would offer a relatively affordable sale price. The home's price per square foot is very high, however. Depending on the property's acquisition price, two-family, semi-detached and duplex development on a small site may entail too much market risk in the R-20 zone.

On an average-sized site, two-family, semi-detached and duplex homes will require a sales price that approximates average single-family home prices. The units will be new, which is valuable.

On large lots a developer may choose not to build the largest building allowed by zoning. This would bring the overall price down for 2-family, semi-detached and duplex units on large lots.

The required rental rates are high and likely not feasible in the market today.



4-Plex

Table 31

4-Plex Minimum Sale Price R-20 Zone							
Site Size <sup>/1</sup>	Acq. Price /Unit	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$113,750	689	\$474,897	\$689	4.2	\$2,941	\$3.53
Smaller	\$196,250	685	\$520,299	\$759	2.7	\$3,226	\$4.26
In-Line	\$218,750	1,688	\$1,008,496	\$598	4.6	\$6,291	\$4.09
In-Line	\$237,500	1,688	\$846,170	\$501	3.6	\$5,272	\$4.38
Larger	\$136,750	3,078	\$1,507,348	\$490	11.0	\$9,424	\$2.90
Larger	\$232,500	3,675	\$1,614,410	\$439	6.9	\$10,096	\$2.89

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA

Four-plex projects in the R-20 zone introduce a wider range of sale prices. The 4-plex product is untested in the market, however. As unit sizes get larger on larger lots, prices approach existing single-family prices in the zone. While new construction will certainly command a premium, the market for such units at these prices is untested and from a developer’s perspective potentially risky.

The rental rate for a small unit on a small site satisfies the market rent criteria. It is unknown whether there is a demand for relatively small apartment units in the R-20 zone.

6-Plex

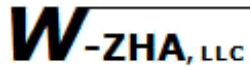
Table 32

6-Plex Minimum Sale Price R-20 Zone							
Site Size <sup>/1</sup>	Value /Parcel SF	For-Sale				Rent	
		Unit SF	Price	Price/SF	Multiplier	Monthly	/Sq Ft
Smaller	\$75,833	459	\$333,799	\$727	4.4	\$2,055	\$4.47
Smaller	\$130,833	457	\$364,067	\$797	2.8	\$2,245	\$4.91
In-Line	\$145,833	1,125	\$689,532	\$613	4.7	\$4,288	\$3.81
In-Line	\$158,333	1,125	\$581,315	\$517	3.7	\$3,609	\$3.21
Larger	\$91,167	2,052	\$1,022,100	\$498	11.2	\$6,377	\$3.11
Larger	\$155,000	2,450	\$1,093,475	\$446	7.1	\$6,825	\$2.79

1. Relationship to minimum lot size allowed by zone.

Source: W-ZHA





The 6-plex product is financially feasible in the R-20 zone. A broad range of price points is possible depending on the parcel's size. The larger lots allow for larger units, which may be necessary from a market perspective. Larger lot redevelopment may also allow the product to be rented, but operating expenses may be a challenge with a 6-unit project.

The required rental rates for a 6-plex are high and likely not feasible in the market today.

## **HOUSING FORECAST**

### Introduction

This section of the report forecasts how changes to single-family zoning will likely impact housing production over the next 10 years in the City. The following principles underly the forecast methodology:

- Developers will redevelop parcels that are valued at the lower end of a zone's value spectrum.
- A higher share of single-family properties will be redeveloped to higher density products in the City's higher intensity zones – R-2-5 and R-5. Here these products make more market sense.
- Because 2-family/duplex units are a proven and successful product in the City of Alexandria, most redevelopment will be 2-family/duplex homes.
- Developers will develop product-types that balance market risk and profitability.

The housing forecast employs the following methodology for each single-family zone.

### **Step 1: Define the Maximum Value for a Low-Cost Property in Each Zone.**

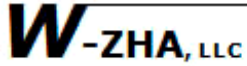
In interviews, developers were clear that lower cost parcels are what they look for when considering redevelopment or renovation. In this step, the analysis identifies what constitutes a low-cost parcel in a zone. A low-cost parcel is defined as a property whose value is up to 91% of the median value in the zone.

### **Step 2: Calculate the Average Annual Property Sale Rate.**

Property sales data were evaluated for the years 2018, 2019, 2020, 2021, and 2022 in each zone. The number of parcels sold is compared to the total number of properties in the zone to get the sales rate per year. The averages sale rate is applied to forecast annual sales in the future.

### **Step 3: Determine What Percentage of 2022 Sales in the Zone Were Low-Cost Properties.**

In this step, 2022 actual sales are analyzed to determine what share of the properties sold in the zone were sold at or below the low-cost price. These are properties that are most susceptible to redevelopment.



**Step 4: Apply a Reasonable Percentage to Those Properties Most Susceptible for Redevelopment to Identify the Number of Parcels Redeveloped as Multi-Family.**

The redevelopment percentage is a “best guess” informed by the relatively modest housing production experienced by cities with similar single-family zoning initiatives. The analysis assumes that 5% of those parcels that are selling for lower prices will be redeveloped in the R-8, R-12, and R-20 zones. For the R-2-5 and R-5 zones where land is very valuable and sites are more urban in character, a 10% redevelopment rate was assumed.

**Step 5: Quantify the Non-Single-Family Housing Units Produced from the Single-Family Zoning Initiative Given Three Product Mix Scenarios.**

Three product-mix scenarios were tested for each zone. The scenarios are as follows:

**Scenario 1:**

- Allow Two-Family/Duplex in Zones R-20, R-12, R-8, and R-5
- Allow 4-Plexes in R-2-5

**Scenario 2:**

- Allow 4-Plexes in All Single-Family Zones

**Scenario 3:**

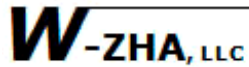
- Allow 6-Plexes in All Single-Family Zones

In the R-2-5 and R-5 zone, 2-family/duplex units are assumed to always account for at least 50% of redevelopment properties in the zone. In the R-8, R-12, and R-20 zones, 2-family/duplex is assumed to account for at least 80% of the redevelopment properties in the zone.

Table 33

<b>Housing Forecast Scenarios Single-Family Zone Initiative</b>					
<b>Scenario 1: 2-Fam/Duplex Max in R-5, R-8, R-12, and R-20; 4-Plex Max in R-2-5</b>					
	R-2-5	R-5	R-8	R-12	R-20
2-Family/Duplex	50%	100%	100%	100%	100%
4-Plex	50%	0%	0%	0%	0%
6-Plex	0%	0%	0%	0%	0%
<b>Scenario 2: Max 4-Plex in R-2-5, R-5, R-8, R-12, and R-20</b>					
	R-2-5	R-5	R-8	R-12	R-20
2-Family/Duplex	50%	50%	80%	80%	80%
4-Plex	50%	50%	20%	20%	20%
6-Plex	0%	0%	0%	0%	0%
<b>Scenario 3: Max 6-Plex in R-2-5, R-5, R-8, R-12, and R-20</b>					
	R-2-5	R-5	R-8	R-12	R-20
2-Family/Duplex	50%	50%	80%	80%	80%
4-Plex	25%	25%	10%	10%	10%
6-Plex	25%	25%	10%	10%	10%

Source: City of Alexandria Department of Planning and Zoning; W-ZHA



A summary of the scenario assumptions is provided in Table 33.

**R-2-5 ZONE**

Step 1: Identify the Maximum Value for a Low-Cost Property in Each Zone.

The median value of property in R-2-5 is just over \$180 per land square foot. A lower-value parcel is defined as up to 91% of the median value. This equates to a maximum sale price of \$163 per land square foot.

Step 2: Calculate the Average Annual Property Sales Rate.

Table 34

Sales Trends R-2-5 Zone						
Transaction Type	2018	2019	2020	2021	2022	Average
Arms Length	80	44	56	72	60	<b>62</b>
Multi-Lot	1	1	5	1	2	<b>2</b>
Renovation	1	4	1	0	0	<b>1</b>
Miscellaneous	15	17	20	17	6	<b>15</b>
Land	3	1	0	0	1	<b>1</b>
<b>Total</b>	<b>100</b>	<b>67</b>	<b>82</b>	<b>90</b>	<b>69</b>	<b>82</b>
% of All R-2-5 Parcels	6.6%	4.4%	5.4%	5.9%	4.5%	5.4%

Source: City of Alexandria Department of Real Estate, W-ZHA

Property sales by type are summarized in Table 34. An average of 82 properties sell in a year in the R-2-5 zone. This represents a sales rate of 5.4% per year.

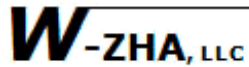
Step 3: Determine What Percentage of 2022 Sales in the Zone Were Low-Cost Properties.

In 2022, 21.7% of all properties that sold in R-2-5, sold for a price at or below \$163 per land square foot. Therefore, of the 82 properties that sell in a year, approximately 18 properties are assumed to be potential redevelopment sites.

Table 35

Lower-Price Parcels R-2-5 Zone		
	Annual	10-Years
Total Annual Sales	82	816
% Lower Priced	21.7%	
Lower Price Sales	17.7	177

Source: City of Alexandria Department of Real Estate; W-ZHA



Step 4: Apply a Reasonable Percentage to Those Properties Most Susceptible for Redevelopment to Identify the Number of Parcels Redeveloped as Multi-Family.

Table 36

<b>Parcels for Multi-Family Development R-2-5 Zone</b>		
	<b>Annual</b>	<b>10-Years</b>
Total Annual Sales	82	816
% Lower Priced	21.7%	
Lower Price Sales	17.7	177
% of Lower Cost Sales Redeveloped		10%
<b>Parcels for Multi-Family Development</b>		<b>18</b>

Source: City of Alexandria Department of Real Estate; W-ZHA

The R-2-5 zone is the highest density single-family zone in the City. The analysis assumes 10% of the lower-priced properties that sell will be redeveloped to multi-family. This results in 18 redevelopment properties over the next 10 years.

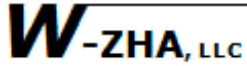
Step 5: Quantify the Non-Single-Family Units Produced from the Zoning Initiative Given Three Product Mix Scenarios.

Table 37

<b>Unit Forecast by Scenario R-2-5 Zone</b>			
Parcels 10 Years	18		
<b>Product</b>	<b>% of Parcels Developed For Product</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	50%	50%	50%
4-Plex	50%	50%	25%
6-Plex	0%	0%	25%
	<b>Units</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	18	18	18
4-Plex	36	36	18
6-Plex	0	0	27
<b>Total</b>	<b>54</b>	<b>54</b>	<b>63</b>

Source: W-ZHA

Over 10 years, between 54 and 63 multi-family units are forecast to be developed in the R-2-5 zone.



### R-5 ZONE

Step 1: Identify the Maximum Value for a Low-Cost Property in Each Zone.

The median value of property in R-5 is just over \$167 per land square foot. A lower-value parcel is defined as up to 91% of the median value or \$152 per land square foot,

Step 2: Calculate the Average Annual Property Sale Rate.

Table 38

Sales Trends R-5 Zone						
Transaction Type	2018	2019	2020	2021	2022	Average
Arms Length	41	52	48	42	48	<b>46</b>
Multi-Lot	0	0	2	0	0	<b>0</b>
Renovation	3	6	3	1	3	<b>3</b>
Miscellaneous	5	4	6	8	1	<b>5</b>
Land	3	0	1	0	0	<b>1</b>
<b>Total</b>	<b>52</b>	<b>62</b>	<b>60</b>	<b>51</b>	<b>52</b>	<b>55</b>
% of All R-5 Parcels	4.3%	5.2%	5.0%	4.3%	4.3%	<b>4.6%</b>

Source: City of Alexandria Department of Real Estate, W-ZHA

Property sales by type are summarized in Table \_\_. An average of 55 parcels sell in a year in the R-5 zone. This represents a sales rate of 4.6% per year.

Steps 3 and 4: Determine What Percentage of 2022 Sales in the Zone Were Lower Cost Properties and Apply a Reasonable Percentage of Properties Redeveloped as Multi-Family.

In 2022, 22.9% of all properties that sold, sold for a price at or below 91% of median property value. Therefore, of the 55 properties that sell in a year, approximately 13 properties are assumed to be potential redevelopment sites.

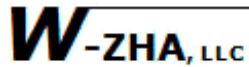


Table 39

Parcels for Multi-Family Development R-5 Zone		
	Annual	10-Years
Total Annual Sales	55	554
% Lower Priced	22.9%	
Lower Price Sales	12.7	127
% of Lower Cost Sales Redeveloped		10%
<b>Parcels for Multi-Family Development</b>		<b>13</b>

Source: City of Alexandria Department of Real Estate; W-ZHA

The R-5 zone is one of the highest density single-family zones in the City. The analysis assumes 10% of the lower-priced properties that sell will be redeveloped to multi-family. This results in 13 parcels over 10 years.

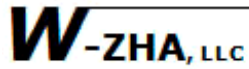
Step 5: Quantify the Non-Single-Family Units Produced from the Zoning Initiative Given Three Product Mix Scenarios.

Table 40

10 Year Unit Forecast by Scenario R-5 Zone			
Parcels 10 Years	13		
Product	% of Parcels Developed For Product		
	Scenario 1	Scenario 2	Scenario 3
2-Family/Duplex	100%	50%	50%
4-Plex	0%	50%	25%
6-Plex	0%	0%	25%
	Units		
	Scenario 1	Scenario 2	Scenario 3
2-Family/Duplex	26	13	13
4-Plex	0	26	13
6-Plex	0	0	20
<b>Total</b>	<b>26</b>	<b>39</b>	<b>46</b>

Source: W-ZHA

Over 10 years, between 26 and 46 units are forecast to be developed in the R-5 zone. The number of units depends on what housing products are allowed in the R-5 zone.



## R-8 ZONE

### Step 1: Identify the Maximum Value for a Low-Cost Property in Each Zone.

The median value of property in R-8 is \$111 per land square foot. A lower-value parcel is defined as up to 91% of the median value or \$101 per land square foot.

### Step 2: Calculate the Average Annual Property Sale Rate.

Table 41

Sales Trends R-8 Zone						
Transaction Type	2018	2019	2020	2021	2022	Average
Arms Length	213	183	190	232	186	<b>201</b>
Multi-Lot	2	0	2	0	2	<b>1</b>
Renovation	18	19	8	16	13	<b>15</b>
Miscellaneous	13	17	18	14	5	<b>13</b>
Land	1	1	0	0	1	<b>1</b>
<b>Total</b>	<b>247</b>	<b>220</b>	<b>218</b>	<b>262</b>	<b>207</b>	<b>231</b>
% of All R-8 Parcels	5.6%	5.0%	5.0%	6.0%	4.7%	5.3%

Source: City of Alexandria Department of Real Estate, W-ZHA

The R-8 zone contains almost 4,400 parcels. Property sales by type are summarized in Table 41. An average of 231 parcels sell in a year in the R-8 zone. This represents a sales rate of 5.3% per year.

### Steps 3 and 4: Determine What Percentage of 2022 Sales in the Zone Were Lower Cost Properties and Apply a Reasonable Percentage of Properties Redeveloped as Multi-Family.

In 2022, 24.2% of all properties that sold, sold for a price at or below \$101 per land square foot. Therefore, of the 231 properties that sell in a year, 56 properties are assumed to be potential redevelopment sites.

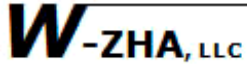


Table 42

<b>Parcels for Multi-Family Development R-8 Zone</b>		
	<b>Annual</b>	<b>10-Years</b>
Total Annual Sales	231	2,308
% Lower Priced	24.2%	
Lower Price Sales	55.8	558
% of Lower Cost Sales Redeveloped		5%
<b>Parcels for Multi-Family Development</b>		<b>28</b>

Source: City of Alexandria Department of Real Estate; W-ZHA

Largely due to the number of properties in the R-8 zone, the analysis assumes that 5% of the lower-priced properties that sell in the R-8 zone will be redeveloped to multi-family. This results in 28 properties over 10 years.

Step 5: Quantify the Non-Single-Family Units Produced from the Zoning Initiative Given Three Product Mix Scenarios.

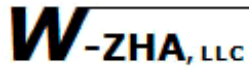
Table 43

<b>10 Year Unit Forecast by Scenario R-8 Zone</b>			
Parcels 10 Years	28		
<b>Product</b>	<b>% of Parcels Developed For Product</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	100%	80%	80%
4-Plex	0%	20%	10%
6-Plex	0%	0%	10%
<b>Product</b>	<b>Units</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	56	45	45
4-Plex	0	22	11
6-Plex	0	0	17
<b>Total</b>	<b>56</b>	<b>67</b>	<b>73</b>

Source: W-ZHA

Over 10 years, between 56 and 73 units are forecast to be developed in the R-8 zone. The number of units depends on what housing products are allowed in the R-8 zone.





**R-12 ZONE**

Step 1: Identify the Maximum Value for a Low-Cost Property in Each Zone.

The median value of property in R-12 is approximately \$60 per square foot of land. A lower-value parcel is defined as up to 91% of the median value or \$53.81 per land square foot.

Step 2: Calculate the Average Annual Property Sale Rate.

Table 44

Sales Trends R-12 Zone						
Transaction Type	2018	2019	2020	2021	2022	Average
Arms Length	33	26	45	34	25	<b>33</b>
Multi-Lot	1	0	1	0	0	<b>0</b>
Renovation	2	5	5	1	1	<b>3</b>
Miscellaneous	3	3	4	6	5	<b>4</b>
Land	2	0	0	1	0	<b>1</b>
<b>Total</b>	<b>41</b>	<b>34</b>	<b>55</b>	<b>42</b>	<b>31</b>	<b>41</b>
% of All R-12 Parcels	5.2%	4.3%	7.0%	5.3%	3.9%	5.2%

Source: City of Alexandria Department of Real Estate, W-ZHA

Property sales by type are summarized in Table 44. An average of 41 parcels sell in a year in the R-12 zone. This represents a sales rate of 5.2% per year.

Steps 3 and 4: Determine What Percentage of 2022 Sales in the Zone Were Lower Cost Properties and Apply a Reasonable Percentage of Properties Redeveloped as Multi-Family.

In 2022, 24% of all properties that sold, sold for a price at or below the median price threshold. Therefore, of the 41 properties that sell in a year, approximately 10 properties are assumed to be potential redevelopment sites.

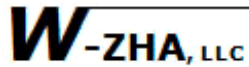


Table 45

Parcels for Multi-Family Development R-12 Zone		
	Annual	10-Years
Total Annual Sales	41	406
% Lower Priced	24.0%	
Lower Price Sales	9.7	97
% of Lower Cost Sales Redeveloped		5%
<b>Parcels for Multi-Family Development</b>		<b>5</b>

Source: City of Alexandria Department of Real Estate; W-ZHA

The analysis assumes that 5% of the lower-priced properties that sell in the R-12 zone will be redeveloped to multi-family. This results in 5 parcels over 10 years.

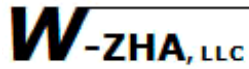
Step 5: Quantify the Non-Single-Family Units Produced from the Zoning Initiative Given Three Product Mix Scenarios.

Table 46

10 Year Unit Forecast by Scenario R-12 Zone			
Parcels 10 Years	5		
	% of Parcels Developed For Product		
Product	Scenario 1	Scenario 2	Scenario 3
2-Family/Duplex	100%	80%	80%
4-Plex	0%	20%	10%
6-Plex	0%	0%	10%
	Units		
Product	Scenario 1	Scenario 2	Scenario 3
2-Family/Duplex	10	8	8
4-Plex	0	4	0
6-Plex	0	0	6
Total	10	12	14

Source: W-ZHA

Over 10 years, between 10 and 14 multi-family units are forecast to be developed in the R-12 zone. The number of units depends on what housing products are allowed in the R-12 zone.



## R-20 ZONE

Step 1: Using Up To 91% of Median Value as the Definition, Identify the Maximum Value for a Low-Cost Property in Each Zone.

The median value of property in R-20 is approximately \$58 per land square foot. A lower-value parcel is defined as up to 91% of the median value or \$52.60 per land square foot.

Step 2: Calculate the Average Annual Property Sale Rate.

Table 47

Sales Trends R-20 Zone						
Transaction Type	2018	2019	2020	2021	2022	Average
Arms Length	30	26	29	26	16	<b>25</b>
Multi-Lot	1	0	3	0	0	<b>1</b>
Renovation	2	2	1	2	1	<b>2</b>
Miscellaneous	3	1	1	1	1	<b>1</b>
Land	0	0	0	0	1	<b>0</b>
Total	36	29	34	29	19	<b>29</b>
% of All R-20 Parcels	5.7%	4.6%	5.4%	4.6%	3.0%	4.7%

Source: City of Alexandria Department of Real Estate, W-ZHA

In R-20, an average of 29 parcels sell in a year. This represents 4.7% of all properties in the zone.

Steps 3 and 4: Determine What Percentage of 2022 Sales in the Zone Were Lower Cost Properties and Apply a Reasonable Percentage of Properties Redeveloped as Multi-Family.

In 2022, 12.5% of all properties that sold in the R-20 zone, sold for a price at or below the median price threshold. Relatively few parcels sell below the median value threshold in the R-20 zone. Of the 29 properties that sell in a year, approximately 4 properties are assumed to be potential redevelopment sites.

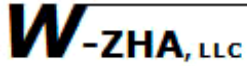


Table 48

<b>Parcels for Multi-Family Development R-20 Zone</b>		
	<b>Annual</b>	<b>10-Years</b>
Total Annual Sales	29	294
% Lower Priced	12.5%	
Lower Price Sales	3.7	37
% of Lower Cost Sales Redeveloped		5%
<b>Parcels for Multi-Family Development</b>		<b>2</b>

Source: City of Alexandria Department of Real Estate; W-ZHA

The analysis assumes that 5% of the lower-priced properties that sell in the R-20 zone will be redeveloped to multi-family. This results in 2 parcels over 10 years.

Step 5: Quantify the Non-Single-Family Units Produced from the Zoning Initiative Given Three Product Mix Scenarios.

Table 49

<b>10 Year Unit Forecast by Scenario R-20 Zone</b>			
Parcels 10 Years	2		
<b>Product</b>	<b>% of Parcels Developed For Product</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	100%	80%	80%
4-Plex	0%	20%	10%
6-Plex	0%	0%	10%
<b>Product</b>	<b>Units</b>		
	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
2-Family/Duplex	4	2	2
4-Plex	0	4	0
6-Plex	0	0	6
<b>Total</b>	<b>4</b>	<b>6</b>	<b>8</b>

Source: W-ZHA

Over 10 years, between 4 and 8 multi-family units are forecast to be developed in the R-12 zone. The number of units depends on what housing products are allowed in the R-20 zone.



## APPENDIX A

### Test-Fit and Unit Size Calculation Example

The test-fit methodology is summarized herein. The sample site is in the R-8 zone. The parcel size is 8,005 square feet, very close to the minimum size for the zone.

#### **Determine Whether a Building is Physically Feasible on the Site Given Single Family Regulations Regarding Side Yards, Rear Yards, and Height Limitations.**

This physical feasibility analysis was conducted on sample sites by the City of Alexandria’s Department of Planning and Zoning. Property plats showing the property boundaries as recorded in the deed were obtained for the sample property. Physical feasibility was analyzed given the size and dimensions of the sample property and regulatory requirements.

#### **For 2-Family/Duplex Units Applied the Maximum Floor Area Ratio to Determine Unit Size.**

The analysis applied the maximum floor area ratio to determine the unit sizes for 2-family and duplex units. In every zone, the unit sizes for 2-family and duplex were of sufficient size to make the basement optional. Because basement space is not included in the floor area ratio calculation, the 2-family and duplex units could have more livable area if a basement was included.

Table A-1

#### **2-Family/Duplex Unit Size Calculation R-8 Zone Example**

Site Size	8,005	Sq Ft
Maximum FAR <sup>/1</sup>	0.35	
Maximum Building Size	2,802	Sq Ft
Efficiency Factor	100%	
Livable Area	2,802	Sq Ft
Units	2	
Avg Unit Size	1,401	Sq Ft

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

The 2-Family/Duplex building was assumed to have no common area.

#### **For 4-Plex and 6-Plex Units Applied the Maximum Floor Area Ratio Plus Basement Space to Determine Maximum Building Area. Then, Applied a Building Efficiency Factor to Determine Unit Size**

For 4-plex and 6-plex units it was assumed that developers would leverage the basement area to increase unit size. The basement area is not included in the floor area ratio calculation.

Table A-2

4-Plex and 6-Plex Size Calculation R-8 Zone Example			
Site Size		8,005	Sq Ft
Maximum FAR <sup>/1</sup>		0.35	
Maximum Building Size		2,802	Sq Ft
Building Size w/ Basement		4,202	
Efficiency Factor		90%	
Livable Area		3,782	Sq Ft
	<b>4-plex</b>		<b>6-Plex</b>
Units	4		6
Avg Unit Size	945		630

Source: City of Alexandria Department of Planning and Zoning; W-ZHA

To account for common areas like stairways and halls, a 90% efficiency factor was applied. In other words, 90% of the building area was assumed to be livable area. The livable area was then divided by the number of units to determine the average unit size. A unit's livable area is what a household would purchase or rent.