



BARABOO, WI HOUSING STUDY

City of Baraboo
June 2022



REDEVELOPMENT
RESOURCES

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Executive Summary

The City of Baraboo is a vibrant, growing community. Commercial and residential growth has been responsive to changes in the economy, and at the present time is responding positively to post-pandemic enthusiasm. This is demonstrated by interest from developers for single-family, townhome/condo, and multi-family residential development. In order to quantify the community's ability to support a number of new developments now and over the next five years, the market was studied to understand its ability to absorb new units by type, number, size, and price point.

Demographics

Baraboo's population has grown among residents ages 15-24 and 25-34 more significantly than the surrounding region. Household growth is steady and projected to grow more over the next four years than the previous decade. Employment has rebounded post-pandemic. According to a report published by the Wisconsin Department of Workforce Development, the unemployment rate in November of 2021 was 3.0%, and the low unemployment rate before 2020 was 2.6% in 2018.

The Baraboo metro-area sees the largest percentage of population employed in Services, at 47.1%. In comparison to the region, Baraboo has the strongest manufacturing concentration within a 60-mile radius.

Housing Landscape

Vacancy rates among units for rent and for sale have been extremely low since 2016, hovering at 2% for owner-occupied units and between 2%-4.5% for renter-occupied units. The very low vacancy rates among both owner-occupied and renter-occupied housing suggests that there is a significant amount of pent-up demand for housing in Baraboo.

Construction of new residential units in Baraboo has not kept pace with historical trends since 2009. Just keeping pace with previous development trends would have seen an additional 500+ units constructed over the past 13 years. This has contributed to the shortage of housing in the market.

The City has commitments from developers and contractors for over 1,000 units of housing as of June, 2022. These developments are planned or already in progress. The demand projections call for a total of 1,275 new single family detached homes over the next five years, along with 135 townhome/condominiums (for sale) and 902 apartment units (for rent). The demand forecast already includes the 1,000 units of housing planned for the City of Baraboo. Additionally, an area of focus for the City needs to be creating transitional housing for residents coming out of homelessness. This study recommends the City work with providers of service to homeless individuals and families to create options for housing for these members of the community.

Introduction

In order to evaluate the current state of the Baraboo housing market, we evaluated a number of factors including existing single-family home sales, existing townhome/condominium home sales, as well as new single-family and townhome/condo homes currently available for sale. We also examined a selection of larger-scale rental apartment communities located in Sauk County.

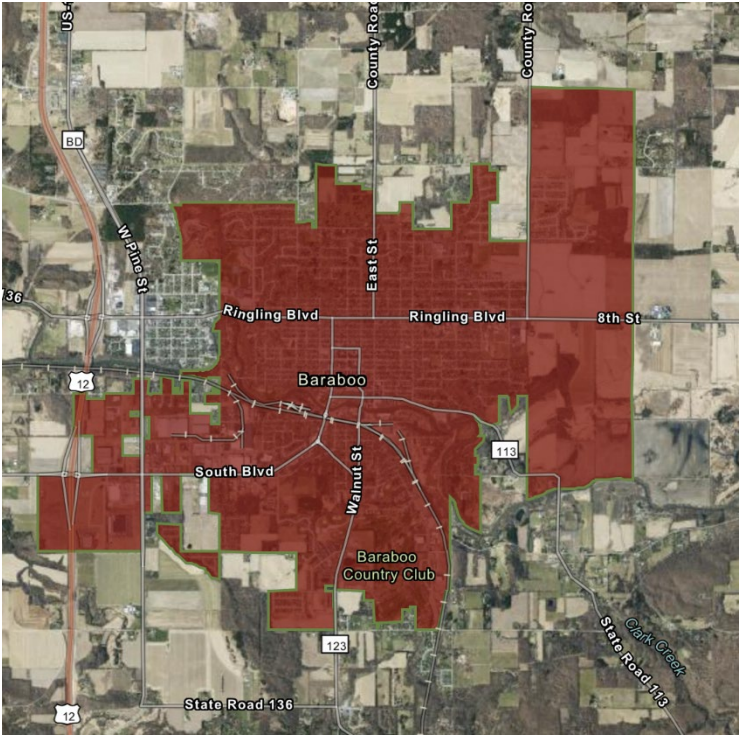
Given the demand for housing as evidenced through interviews with employers, realtors and bankers, we understand there is opportunity in Baraboo. Understanding historical and projected demographic factors and housing preferences of today's residents we can make solid predictions on the future needs in the Baraboo market.

This report serves as a five-year outlook for what the City, developers, bankers and the real estate community can expect to occur in the housing market for the City of Baraboo.

Economic and Demographic Factors

Household growth, employment and income drive housing demand. The following sections outline our study area, explore the trends within each of these drivers, and suggest related implications of those trends.

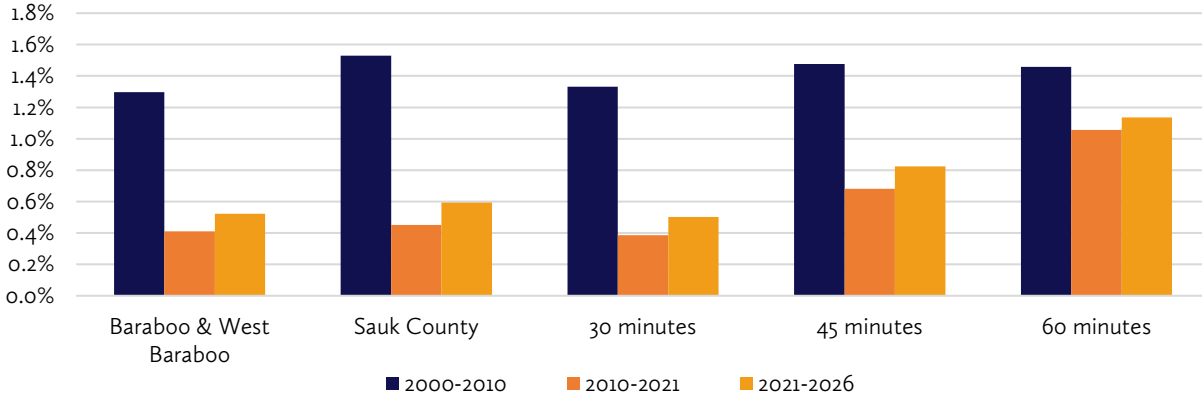
Market Area Definition



This study is for the City of Baraboo, and addresses the housing needs primarily within the city limits. However, some of the data was only available at the county level, so where noted, County level data was used.

Household & Population Trends

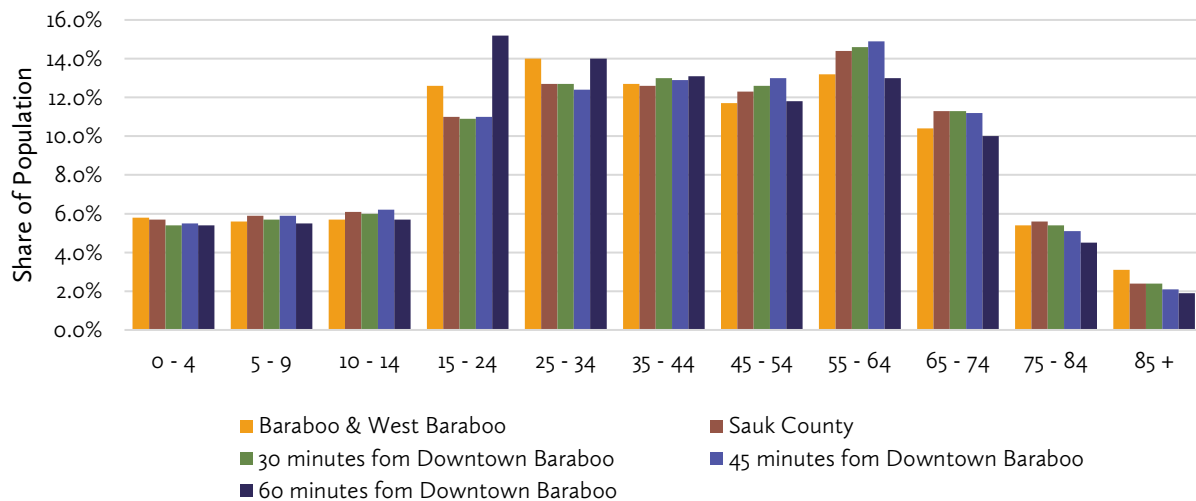
Estimated Annual Percentage Household Growth Rate by Geography



Data Source: ESRI Community Profile, Redevelopment Resources.

The chart above shows the community and region are continuously growing. Although growth after 2010 is not as robust as the previous decade, expected growth in the next five years is strong for Baraboo and the surrounding area.

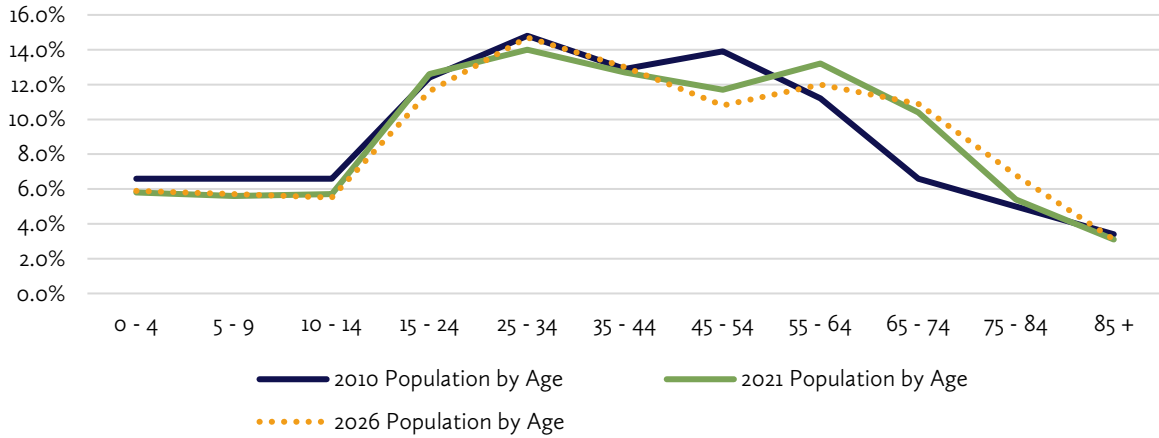
2021 Population by Age and Geography



Data Source: ESRI Community Profile.

Notable on the chart above, Baraboo's population has grown among residents ages 15-24 and 25-34 more significantly than the surrounding region. Retaining this youth should be a goal for the community.

Baraboo & West Baraboo Population Age Trends Over Time

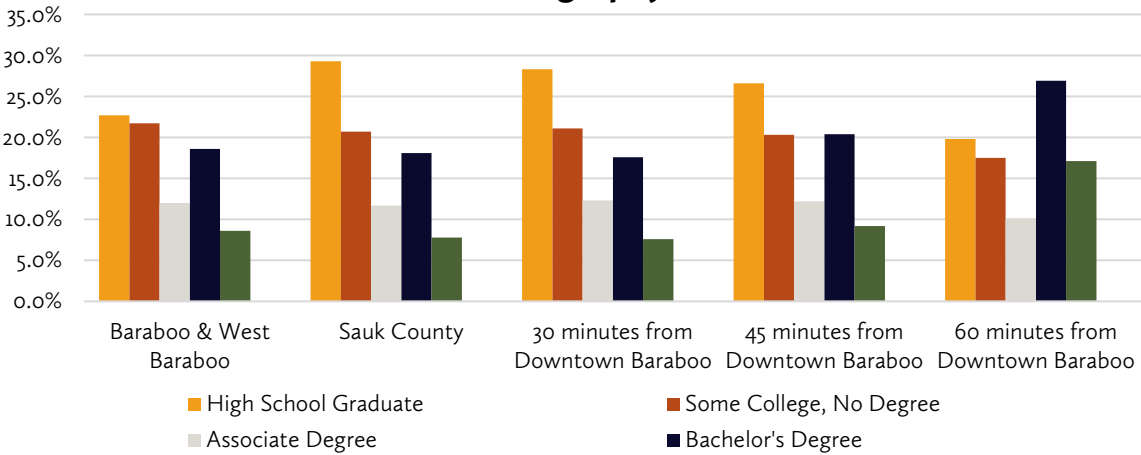


Data Source: ESRI Community Profile.

Although the chart above shows a decline in population as residents age, there is opportunity to capture those residents through supplying adequate housing choices for all ages and types.

Educational Achievement

Population Over Age 25 by Educational Attainment by Geography

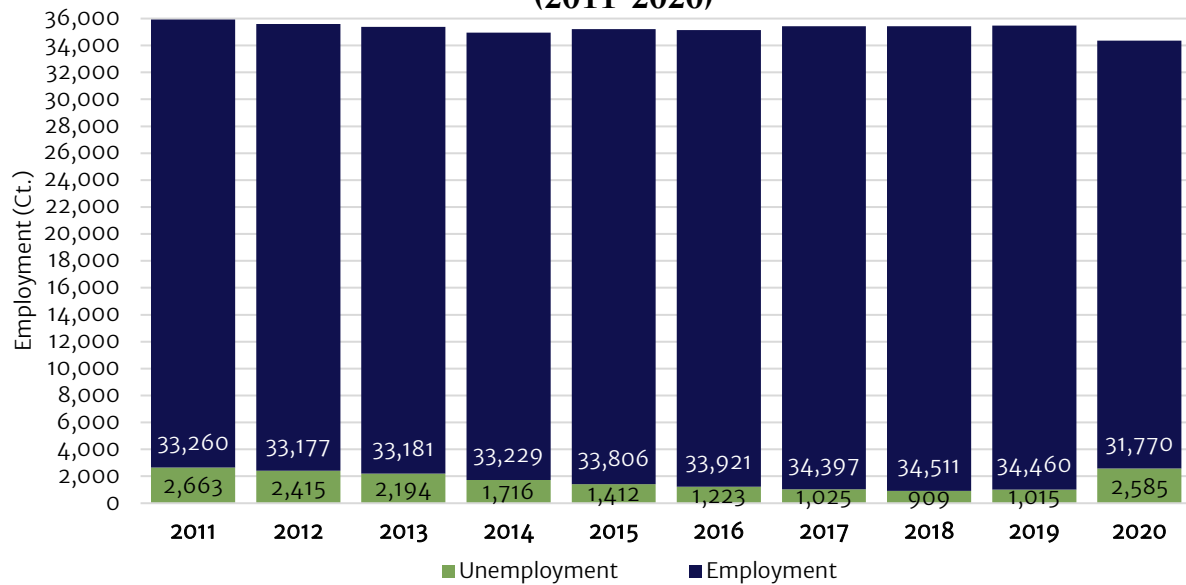


Data Source: ESRI Community Profile.

Education levels within the City of Baraboo outpace the County and near-region. As the distance from downtown exceeds 45 minutes, the effect from Madison shows a higher level of education exceeding some college.

Employment Trends

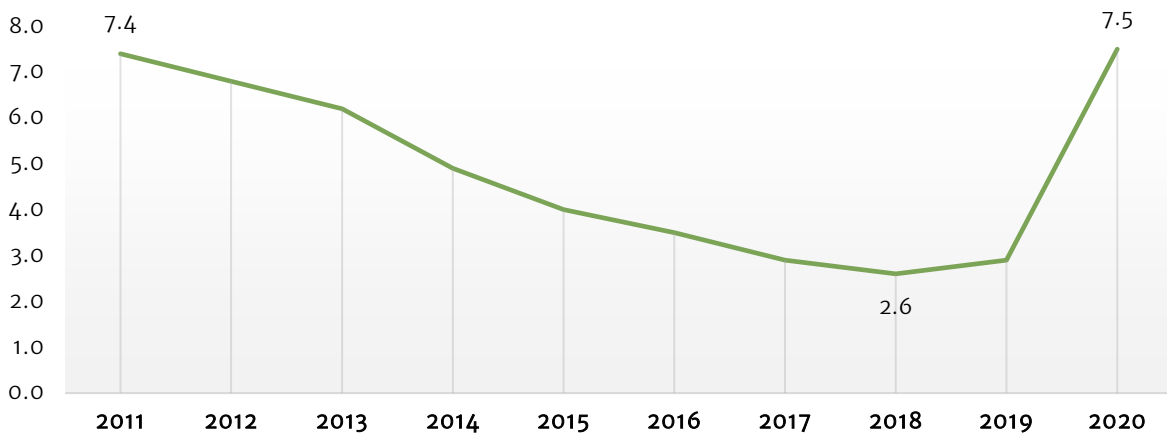
Sauk County Employment & Unemployment (2011–2020)



Data Source: US Bureau of Labor Statistics

While employment growth has been slow, we do note that since peaking at 7.4% in 2011, the unemployment rate has declined steadily and significantly to a 2018 level of only 2.6% as indicated in the table below. According to a report published by the Wisconsin Department of Workforce Development, the unemployment rate in November of 2021 was 3.0%.

Sauk County Annual Unemployment Rate (2011–2020)

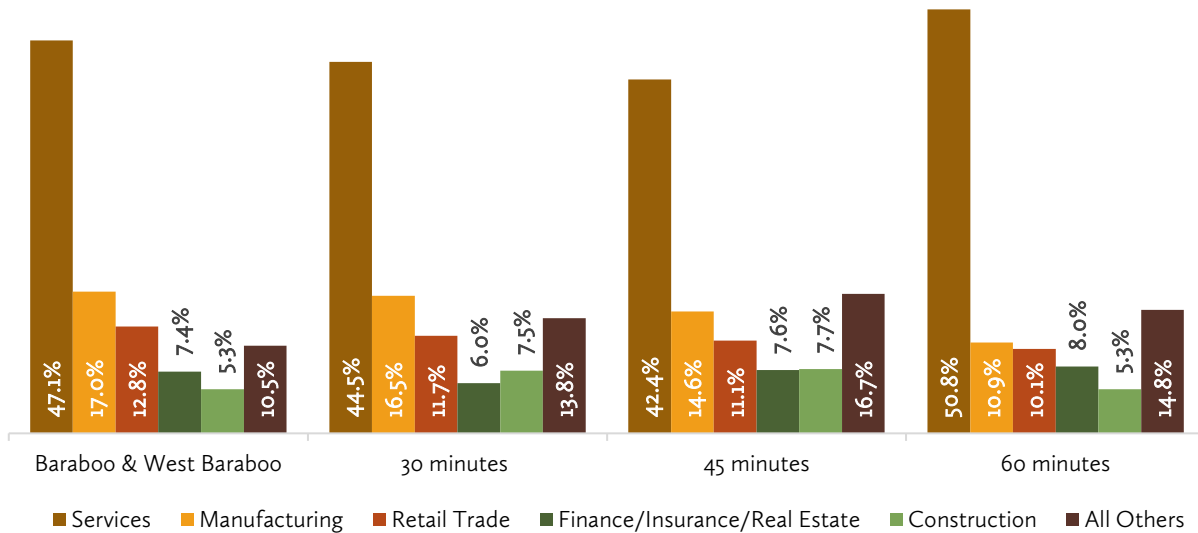


Data Source: US Bureau of Labor Statistics

Employment in Sauk County is strong, and although unemployment rose in 2020, this is an effect of the pandemic. Most labor markets have rebounded to pre-COVID-19 levels.

Employment Characteristics

2021 Employed Population 16+ by Industry

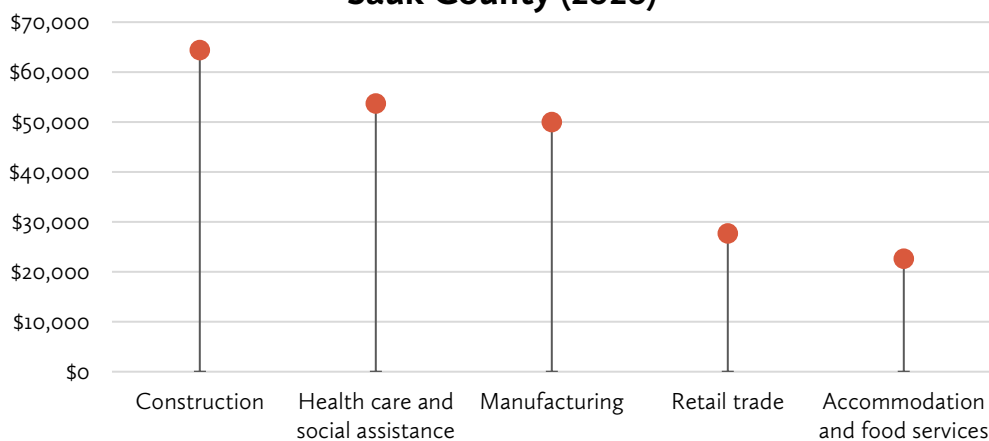


Data Source: ESRI Community Profile. NOTE: All Others includes Agriculture/Mining, Wholesale Trade, Transportation/Utilities, Information, and Public Administration)

The Baraboo metro-area sees the largest percentage of population employed in Services, at 47.1%. In comparison to the region, Baraboo has the strongest manufacturing concentration within a 60-mile radius.

Income

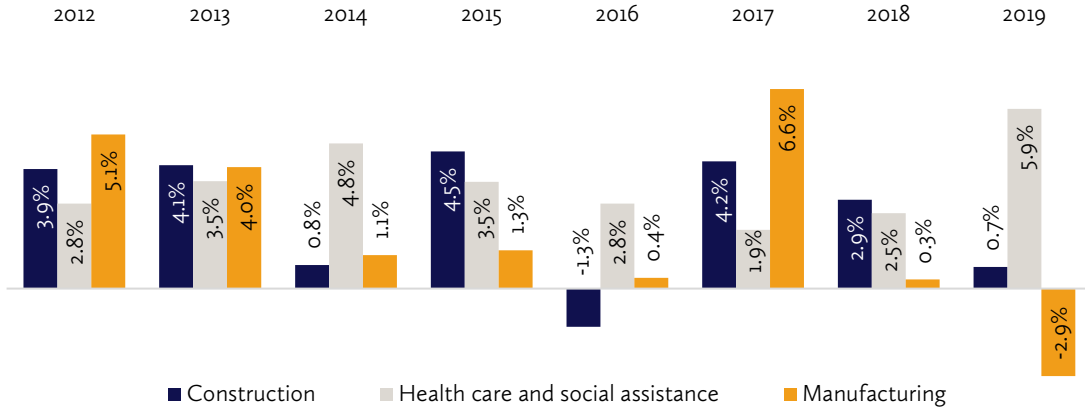
Average Annual Pay by Industry Sauk County (2020)



Data Source: US Bureau of Labor Statistics

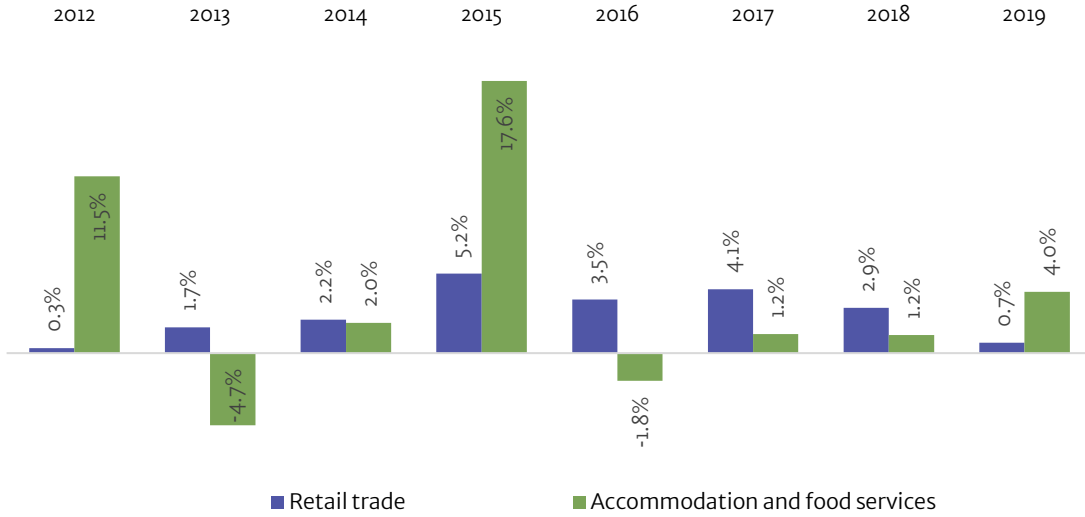
The chart to the left highlights annual pay for the top five industries in Baraboo.

Year-Over-Year Percentage Change in Average Annual Pay (2011-2020)



Data Source: US Bureau of Labor Statistics, Redevelopment Resources.

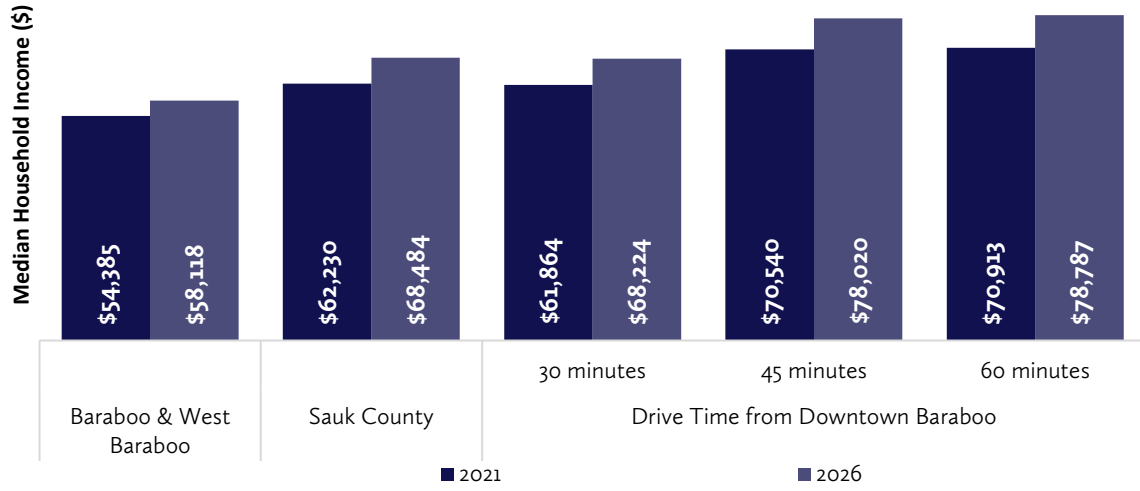
Year-Over-Year Percentage Change in Average Annual Pay (2011-2020)



Data Source: US Bureau of Labor Statistics, Redevelopment Resources.

In light of the very tight labor market, we expect wages and salaries to be higher than reported in 2020.

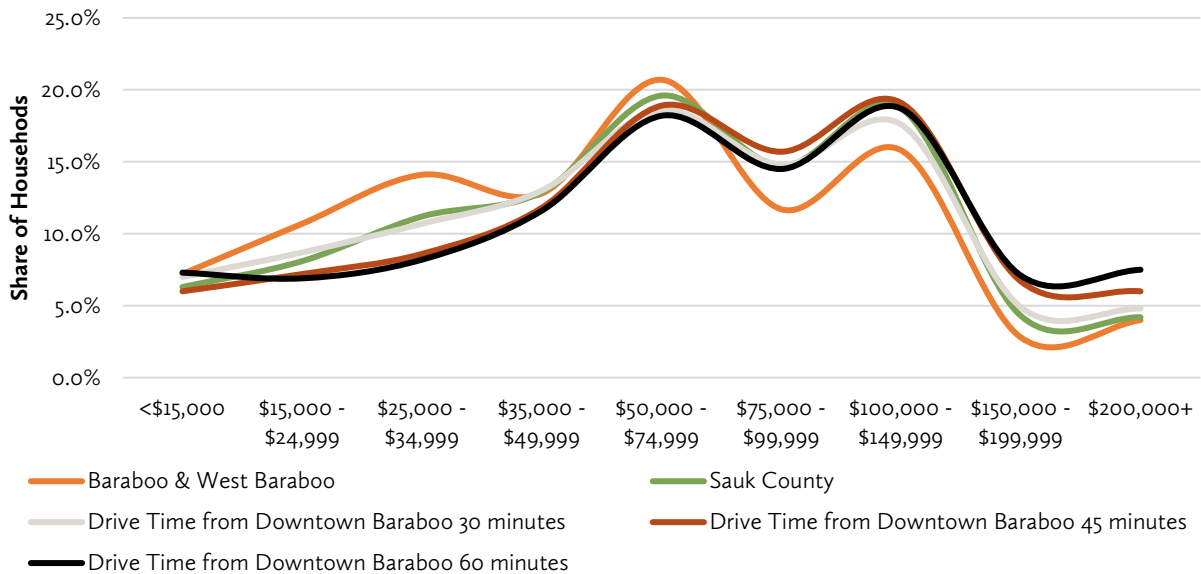
Median Household Income by Geography (2021-2026)



Data Source: ESRI Community Profile.

The chart above shows median household income by the residents in each geography. These geographies are nested – meaning that everyone in the 60 minute drive-time radius of downtown Baraboo includes everyone in the 45 minute drive-time radius. The 60 minute drive-time radius includes residents of parts of Madison – potential visitors to the Baraboo area as well as potential future residents as they retire or are able to work from home.

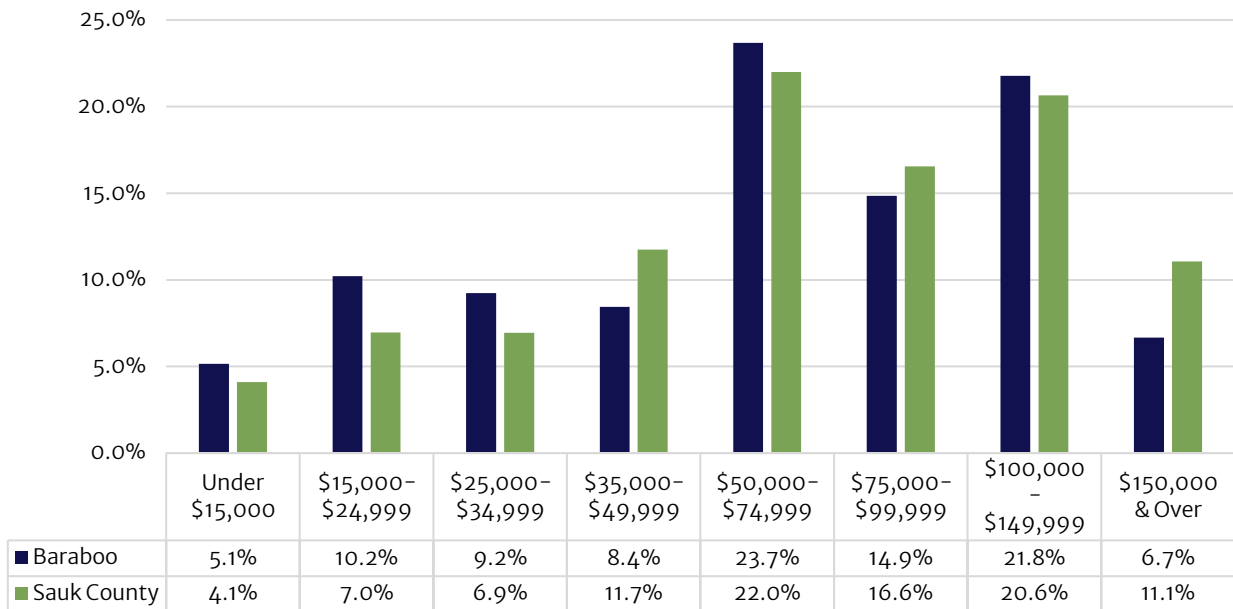
2021 Income Distribution by Geography



Data Source: ESRI Community Profile.

The largest percent of Baraboo residents earn between \$50,000–\$74,999, which is also the largest percent of earners in that income bracket regionally. At the higher income levels, residents of Baraboo lag earners

Baraboo & Sauk County 2020 Owner-Occupied Households by Income



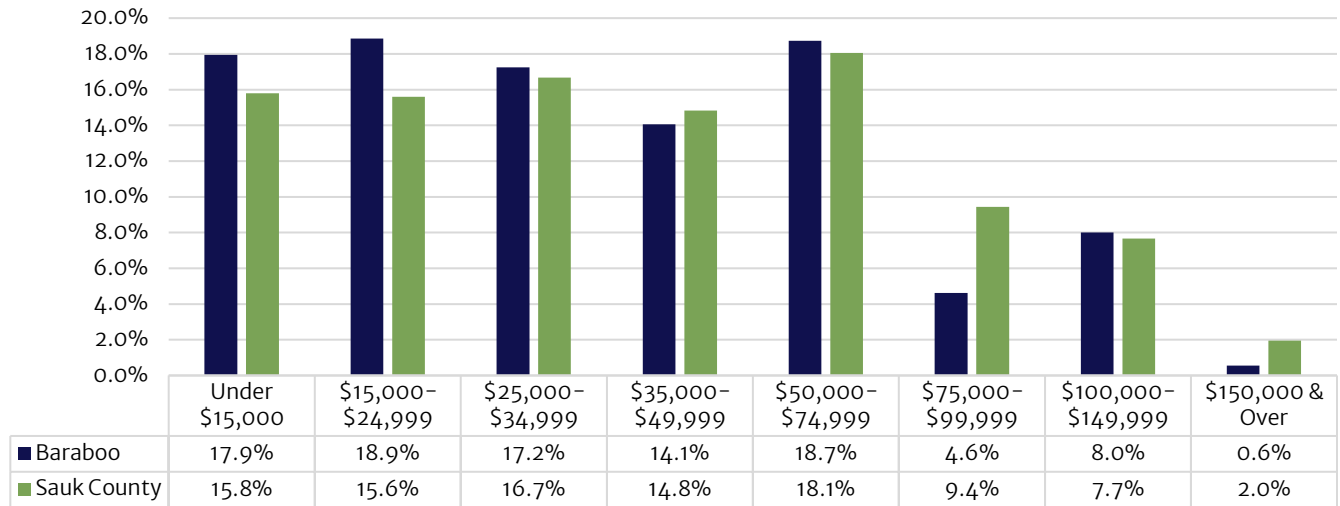
Data Source: www.data.census.gov

regionally.

In the City of Baraboo, we find median income among owner-occupied households stands at \$67,551 per year with 60.4% of all households earning between \$50,000 and \$149,999 annually. Incomes in Sauk County as a whole are slightly higher, with a current median \$72,776 per year and 59.2% of households earning between \$50,000 and \$149,999 yearly as detailed in the following table.

As a point of comparison, the median annual income for owner-occupied households in the State of Wisconsin stands at \$79,463, with both Baraboo and Sauk County falling slightly below that figure.

Baraboo & Sauk County, WI 2020 Renter Households by Income



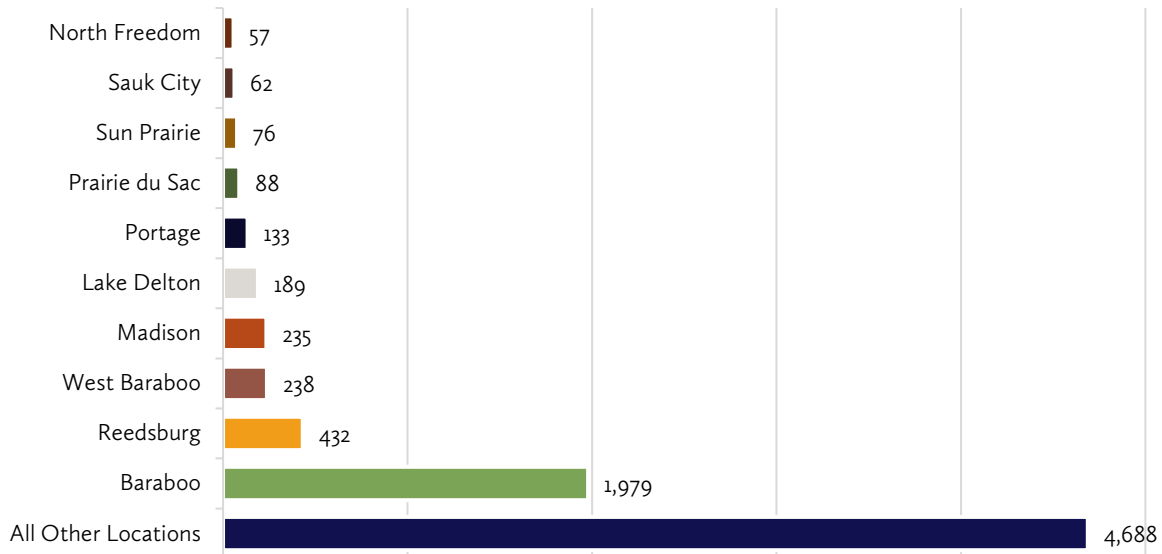
Data Source: www.data.census.gov

The median annual renter household income within the City of Baraboo stands at \$32,673 per year. Within the \$35,000 to \$74,999 annual income category (from within which most of the future renters will emanate), we find a representation rate of 32.8%, equating to 709 households.

In Sauk County, renter household incomes are slightly higher with a median figure of \$37,050 per year. For this area, 32.9% (2,640 households) of all renter households earn between \$35,000 and \$74,999 as detailed in the following table. Comparatively, the median income for a renter household in the State of Wisconsin stands at \$38,287.

Commuting Patterns

Where Employees in Baraboo and West Baraboo Live



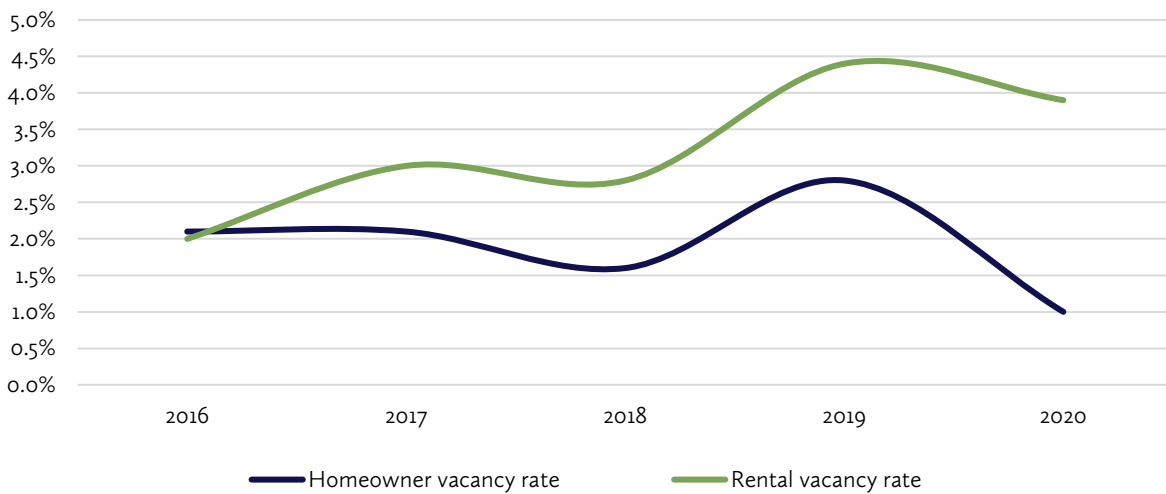
Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2019).

Of the 8,177 jobs in Baraboo and West Baraboo according to the U.S. Census Bureau 2019 OnTheMap data, only approximately 25% of employees live in Baraboo or West Baraboo. More than 57% of employees live outside of Sauk and Dane County.

Housing Landscape

Occupancy and Vacancy

Vacancy Rates Over Time by Type

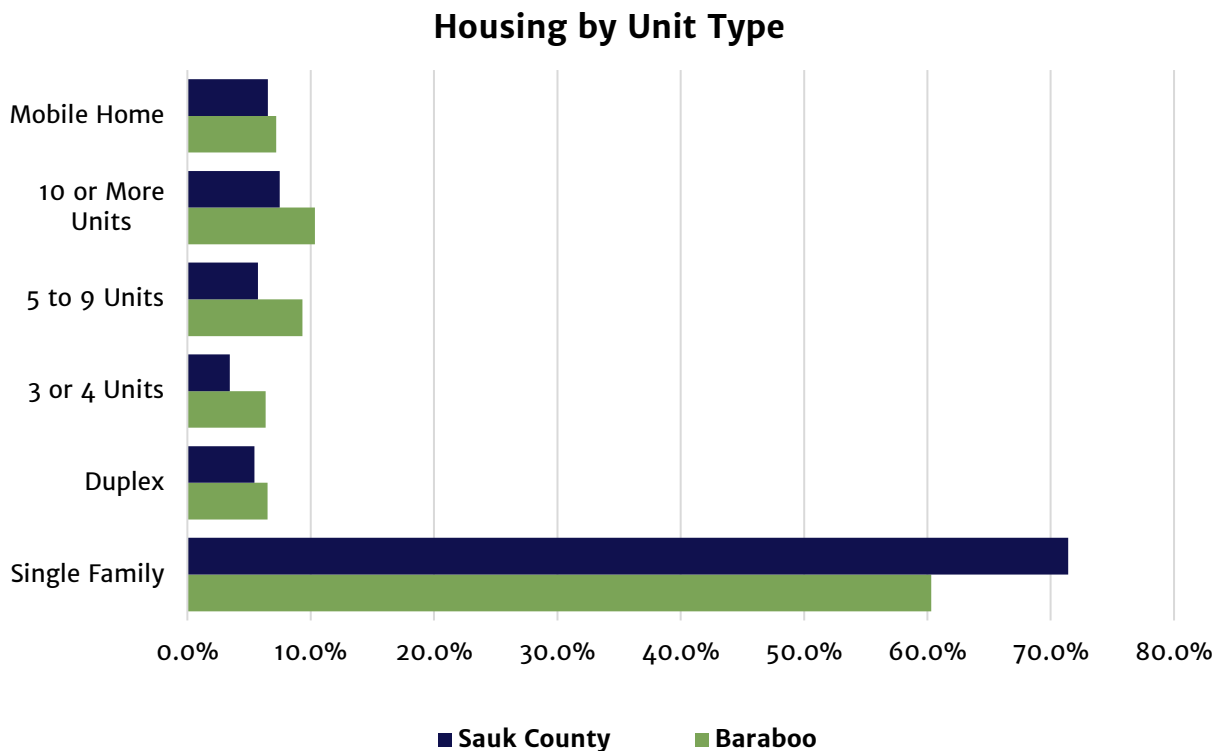


Source: Selected Housing Characteristics, American Community Survey 5-Year Estimates 2016-2020

According to the graph above, homeowner vacancy has been less than 2% between 2016–2020, with the exception of 2019, when it rose to 2.75%. Rental vacancy has ranged from between 2% to nearly 4.5% between 2016 and 2020. A healthy vacancy rate in owner-occupied housing would be 6–9 percent, while a healthy vacancy rate for renter-occupied housing is 5–7 percent. (Nelson, 2004). The very low vacancy rates among both owner-occupied and renter-occupied housing suggests that there is a significant amount of pent-up demand for housing in Baraboo.

On June 9, 2022, during a simple search of the internet for units to rent, only four units were found in multi-family buildings and three single-family homes were listed for rent, (apartments.com and trulia.com). This demonstrates the tight rental market. According to local realtors, inventory of for-sale single-family units is down, and choice is slim.

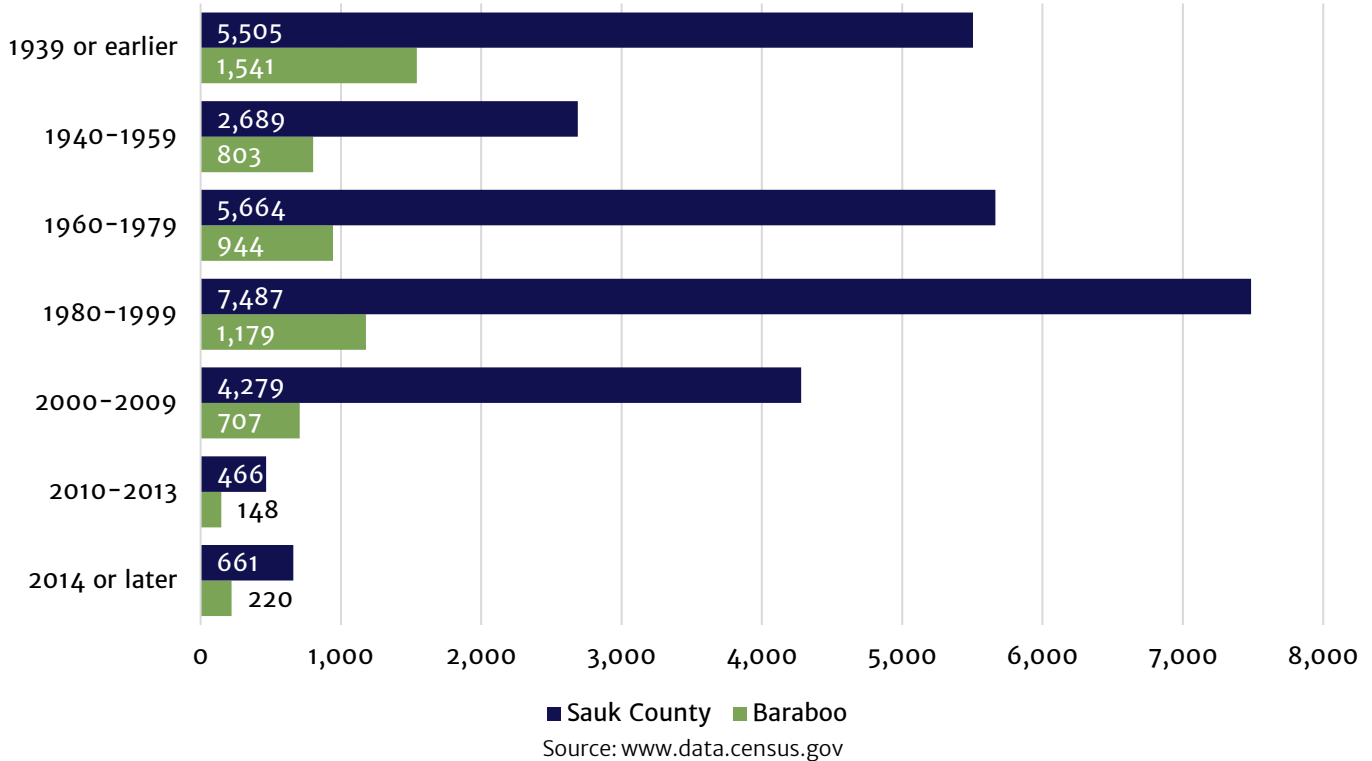
Unit Types and Age



Note: Total units in Baraboo is 5,542. Total units in Sauk County is 26,751. Source: www.data.census.gov

Single-family homes in Baraboo make up the largest portion of the residential market at approximately 60%. No other category comprises significantly more than 10% of the residential mix.

Housing Stock by Year Built



The housing stock in Baraboo has been steadily developed over time, with fairly consistent development by decade until 2010. The average number of units built per year in Baraboo until 2009 was 104. Since 2009, however, approximately 28 units were constructed per year. This significant decrease in housing production is a circumstance that has occurred across most housing markets. Banks and contractors were extremely cautious after the Great Recession, and it has caused stress in the market a decade later. While the market was able to absorb over 100 homes per year for several decades prior to 2010, the significant decrease in production is now causing a serious shortage in new residential options. Based on the housing production since 1940 alone, an average of 908 homes were built each decade. In the decade from 2010 to 2020, to remain on par with that average, an additional 540 single-family homes should have been constructed in the City of Baraboo alone. County-wide, the shortage is much more pronounced.

Housing Start Trends

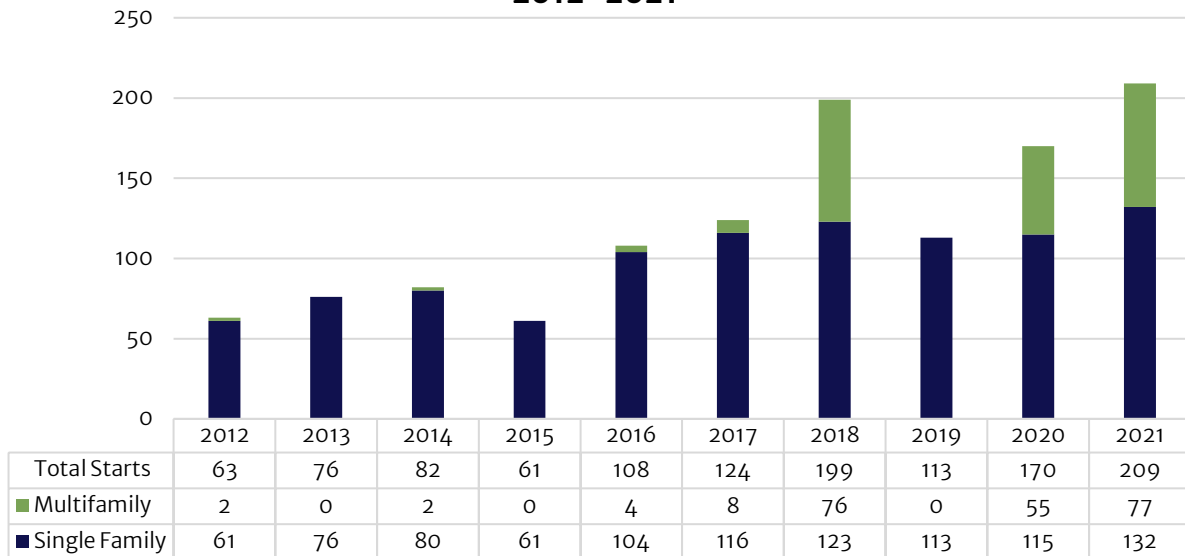
Housing starts, as evidenced by building permits, show that annual residential construction activity in the **Sauk County** area has been modest over the past ten years. Specifically, between 2012 and 2021, authorizations for 1,205 new units were granted, averaging 121 per year.

Focusing upon multifamily alternatives (which include both rental apartments and townhome/condominium units), we see that the number of housing starts has increased significantly over the past four years with an average of 52 new units authorized annually. Over the previous six years, multifamily construction activity averaged less than three units per year.

In the single-family sector, we find that annual housing start totals have been increasing consistently over the

past ten years. Specifically, between 2012 and 2016, single-family starts averaged 76 per year, increasing to an average of 120 annually from 2017 through 2021. The figure which follows provides additional details.

Sauk County, WI Annual Housing Starts 2012 - 2021



Source: U.S. Census Bureau, C40 Reports

Single-Family Home Sale Trends

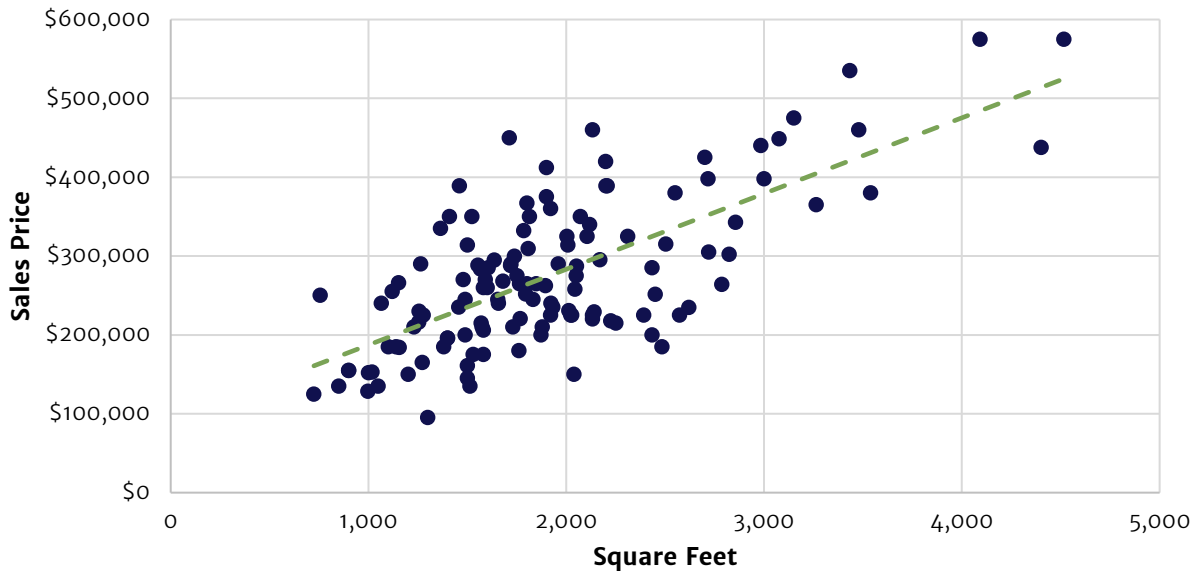
By community, we find that the highest *relative* single-family home prices were found in Lone Rock, LaValle and Sauk City. Conversely, Hill Point, Loganville and Freedom offer the best price per square foot value. In Baraboo, there have been a total of 40 single-family sales in 2022. Among all sales, we note an average price of \$251,900 for a home with 1,795 square feet, or \$140.34 per square foot. The average single-family home sold in Baraboo was positioned \$12,139 below the overall Sauk County market, as detailed on the following page.

**Sauk County, WI
2022 Single-family Sales**

City/Town	Sales	Bedrooms	Baths	Square Feet	Sales Price	Price/Sq. Foot	"Market" Price	Variance
Lone Rock	1	4.0	3.5	2,700	\$425,000	\$157.41	\$350,014	\$74,986
LaValle	9	2.9	1.9	1,553	\$288,500	\$185.74	\$241,049	\$47,451
Sauk City	10	3.1	1.6	1,807	\$309,450	\$171.29	\$265,179	\$44,271
Prairie du Sac	11	3.5	1.9	2,105	\$324,991	\$154.38	\$293,489	\$31,502
Merrimac	3	3.3	2.2	2,310	\$324,967	\$140.70	\$312,964	\$12,003
Plain	3	3.3	2.3	2,170	\$295,200	\$136.06	\$293,084	\$2,116
Wisconsin Dells	8	3.4	2.2	1,961	\$278,375	\$141.96	\$279,809	(\$1,434)
Reedsburg	30	3.2	2.2	1,895	\$262,333	\$138.41	\$273,539	(\$11,206)
Baraboo	40	3.2	2.0	1,795	\$251,900	\$140.34	\$264,039	(\$12,139)
Spring Green	2	4.0	1.8	2,013	\$230,800	\$114.68	\$284,749	(\$53,949)
Hill Point	1	4.0	2.0	4,400	\$437,500	\$99.43	\$511,514	(\$74,014)
Loganville	1	3.0	2	1,760	\$180,000	\$102.27	\$260,714	(\$80,714)
Freedom	2	3.5	2.5	2,225	\$217,550	\$97.78	\$304,889	(\$87,339)
Total/Average	121	3.2	2.0	1,906	\$274,584	\$144.06	\$274,584	\$0

Source: The Windward Group, Inc.

**Sauk County, WI
2022 Single Family Sales**



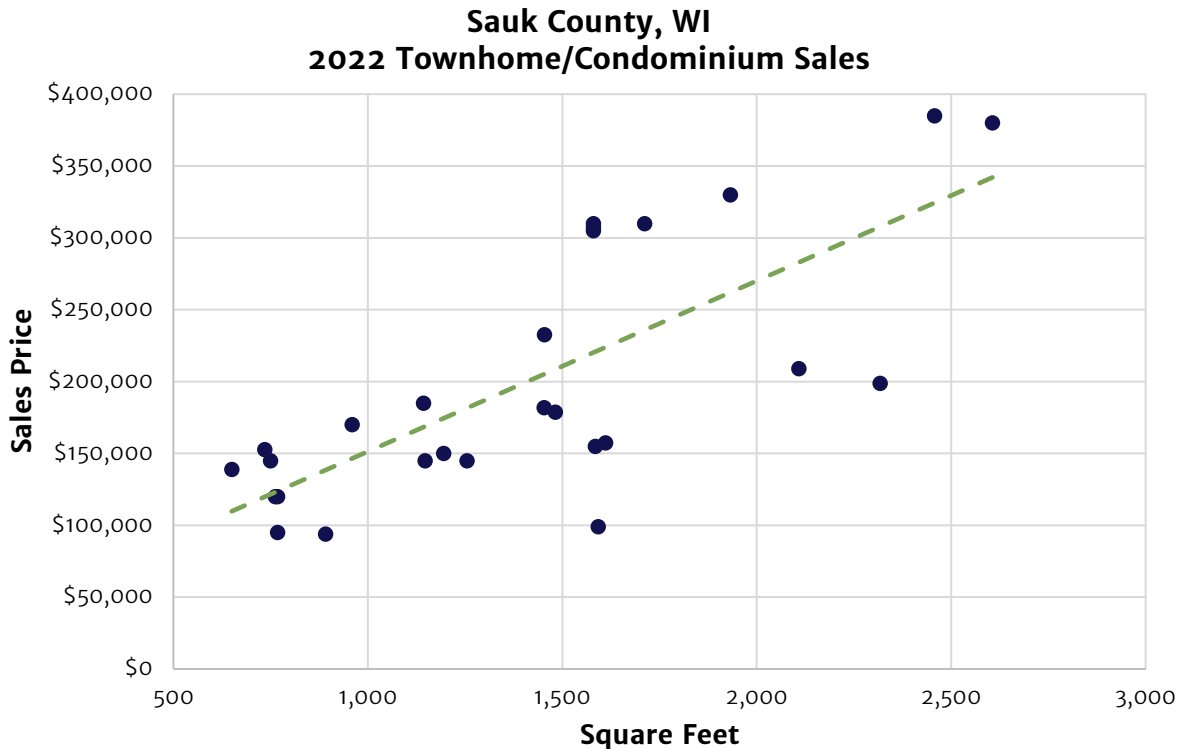
Source: The Windward Group, Inc.

As a point of comparison, we examined single-family home sales in Sauk County for the same time period in 2021. During this period, there were a total of 216 single-family sales, with 2022 reflecting an increase of 4.3% over 2021 totals. Additionally, in 2021, the average sales price of a single-family home sold stood at \$254,608, a figure 7.9% lower than the average noted in 2022. While the average single-family home price has increased, we note that the average unit size for a home sold in 2021 is only 1,537 square feet, equating to a value ratio of \$165.28 per square foot, a figure exceeding the 2022 figure of \$144.06 per square foot by 12.8%.

Townhome/Condominium Sales

There has been a total of 27 sales among townhome/condominium units in Sauk County thus far in 2022. Among all sales, the average home included 2.0 bedrooms, 1.7 bathrooms and contained 1,410 square feet of living space. The \$200,019 average sales price equates to a value ratio of \$141.85 per square foot, a figure almost identical to the single-family market discussed earlier.

When presented graphically as seen below, we find that townhome/condo sales have been fairly evenly scattered throughout the market, with no significant concentrations as was found within the single-family sector.



Source: The Windward Group, Inc.

Within the Sauk County townhome/condominium sector, linear regression analysis reveals that “market” pricing ranges from \$103,629 for a unit with 600 square feet, up to \$317,829 for a 2,400 square foot unit.

In Sauk County, we identified a total of 13 new-construction single-family homes and townhome/condominiums that are presently listed for sale through the Multiple Listing Service.

All homes currently offer three bedrooms, and also contain an average of 2.2 bathrooms within 1,613 square feet of living space. Asking prices extend from \$295,000 up to \$459,000, with an average list price of \$377,677. This yields a value ratio of \$234.08 per square foot, a figure well over the ratio noted for sales of existing inventory discussed earlier.

Multi-Family Rental

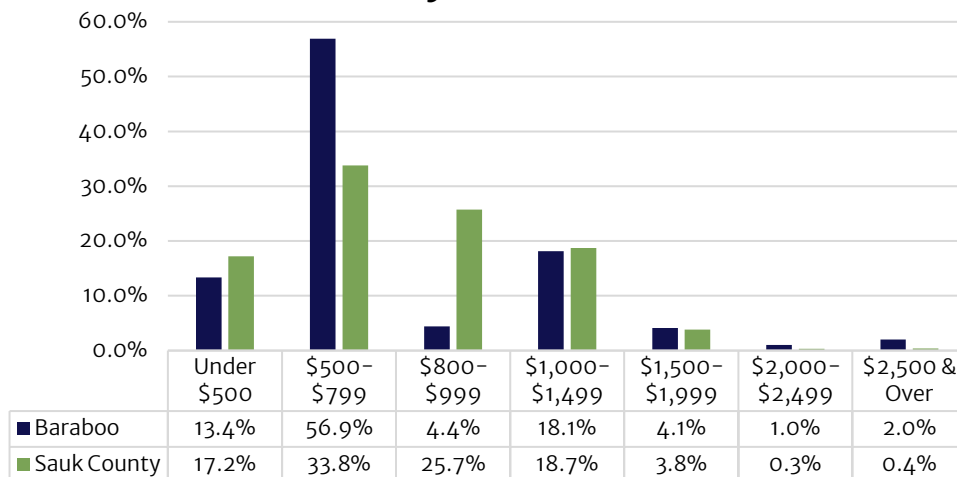
County-wide, a breakdown of square footage and rental rates is listed below.

Sauk County, Wisconsin Market Rent by Unit Size		
Unit Size (Sq. Feet)	"Market" Rent	Rent/ Sq. Foot
500	\$679	\$1.36
600	\$791	\$1.32
700	\$903	\$1.29
800	\$1,015	\$1.27
900	\$1,127	\$1.25
1,000	\$1,239	\$1.24
1,100	\$1,351	\$1.23
1,200	\$1,463	\$1.22
1,300	\$1,575	\$1.21
1,400	\$1,687	\$1.21
1,500	\$1,799	\$1.20
1,600	\$1,911	\$1.19
1,700	\$2,023	\$1.19
1,800	\$2,135	\$1.19

Source: The Windward Group, Inc.

From a macro perspective, we see that the median rent for an apartment in the City of Baraboo stands at a relatively modest \$692 per month, with 56.9% of renters paying between \$500 and \$799 per month. Rents are slightly higher in Sauk County, which supports a median rent of \$790 per month, and 33.8% of all renters paying between \$500 and \$799 monthly as detailed in the following table.

2020 Monthly Rent Distribution



Data Source: www.data.census.gov

Affordability

By annual income, within the City of Baraboo, we find that among owner-occupied households, only 22.0% are paying 30% or more of their annual income for housing. Conversely, 57.5% are currently contributing less than 20.0% of their income to housing costs.

For Sauk County, we find that only 20.2% of owner-occupied households are paying 30% or more of their income for housing, with 58.5% paying less than 20%. This bodes well for future potentials within Baraboo and Sauk County as there is currently a significant number of owners who can theoretically pay higher monthly housing costs, and still not be contributing more than 30.0% of their income for housing. The table which follows provides further details.

2020 Owner Occupied Housing Costs as a Percentage of Household Income

	Baraboo		Sauk County	
	Households	Percent	Households	Percent
Less than 20%	1,943	57.5%	10,910	58.5%
20.0% to 29.9%	692	20.5%	3,974	21.3%
30.0% or more	744	22.0%	3,774	20.2%
Total	3,379	100.0%	18,658	100.0%
Median Percentage		17.4%		17.1%

Source: www.data.census.gov

Among renter households, there is a significantly higher percentage of households whose budgets are being stretched by housing costs. In the City of Baraboo, we note that 44.2% of all renter households are paying 30% or more of their income for housing, with only 30.8% paying less than 20%. For Sauk County as a whole, 41.7% of renter households are paying in excess of 30% of their income in rent, with 34.0% paying 20% or less, as detailed in the following table.

2020 Rent as a Percentage of Household Income

	Baraboo		Sauk County	
	Households	Percent	Households	Percent
Less than 20%	666	30.8%	2,553	34.0%
20.0% to 29.9%	541	25.0%	1,828	24.3%
30.0% or more	956	44.2%	3,133	41.7%
Total	2,163	100.0%	7,514	100.0%
Median Percentage		27.6%		26.5%

Source: www.data.census.gov

While the data above indicates there are people paying more than 30% of their household income for housing, the community is meeting the needs of those who are cost burdened with the existing supply of lower-cost options. With the significant amount of development taking place at the current time (over 1,000 new units of housing, varied among type and size) providing space for those who can afford to move out and up to a new product, this activity will free up housing units (single family homes and apartments) and provide more options for those who may be cost-burdened at lower price points than the new construction.

One area of specific concern is entry level housing for those transitioning out of homelessness. The City of Baraboo should look at creating options for transitional housing specifically for the lowest income individuals

and families in the community. There is a need for this type of housing as was confirmed by those working most closely with the homeless and housing-challenged members of the community. To develop housing for those transitioning out of homelessness should be an area of focus for the City.

Housing Demand Forecast

Continuing recent trends, overall housing demand in Sauk County is expected to remain modest over the next five years barring the occurrence of a catalytic event such as a significant employer expansion or relocation into the area.

Specifically, we anticipate total demand in Baraboo will average 410 units per year over the 2022-2026 timeframe. By sector, for-sale alternatives (including both single-family homes and townhome/condominiums) are forecast at an average of 282 units per year, with rental apartment demand estimated at an average of 180 new units annually. The following table provides further details.

City of Baraboo , WI				
Organic Demand for Housing 2022-2026				
Year	Total Demand	Multifamily		Single Family
		For-Rent	For-Sale	
2022	375	160	20	230
2023	400	175	25	250
2024-2026 (Avg)	425	189	30	265
Total	2,050	902	135	1,275
Average	410	180	27	255

Source: The Windward Group, Inc., Redevelopment Resources

The numbers above include all known, proposed, and planned (over 1,000) units that the city is aware of. This five-year estimate is based on current demand and may change with economic challenges and timing of approvals, supply chain and financing challenges.

Quantitatively, for-sale housing demand will be concentrated at prices between \$250,000 and \$350,000. This price range will account for 48.0% of total demand or 128 units per year, on average, as indicated in the table which follows.

Distribution of Demand-For Sale Product 2022-2026		
Monthly Rent	Percent	Units
Under \$150,000	2.0%	28
\$150,000-\$199,999	8.0%	113
\$200,000-\$249,999	16.0%	226
\$250,000-\$299,999	22.0%	310
\$300,000-\$349,999	26.0%	367
\$350,000-\$399,999	15.0%	212
\$400,000-\$499,000	9.0%	127
\$500,000 & Above	3.0%	42
Total	101.0%	1,410
Median	\$303,846	

Source: The Windward Group, Inc., Redevelopment Resources

Among for-rent (Apartment) alternatives, we estimate that demand will be focused on rents between \$800 and \$1,250 per month. In this range, we expect that demand will average 117 units per year, accounting for 65.0% of total multifamily demand. Additional details are provided below.

Rental Apartment Distribution of Demand 2022-2026		
Monthly Rent	Percent	Rental Units
Under \$800	6.0%	54
\$800-\$899	20.0%	180
\$900-\$999	26.0%	235
\$1,000-\$1,249	19.0%	171
\$1,250-\$1,499	15.0%	135
\$1,500-\$1,999	8.0%	72
\$2,000 & Above	6.0%	54
Total	100.0%	902
Median	\$991	

Source: The Windward Group, Inc., Redevelopment Resources

Understanding construction costs are a significant contributing factor to rental rates, these numbers may adjust upward to account for the rising cost of construction.

Appendix A: Definitions

Affordable/Affordability & Cost-burdened

Housing that is affordable to a given household is a unit which costs the household less than 30% of their gross income per month. Therefore, “affordable” does not mean it is less expensive than all other housing or that it is only for low-income households – instead it is relative to the household’s income. As defined by the U.S. Department of Housing and Urban Development (HUD), those spending more than 30% on housing are considered “cost-burdened” and those spending more than 50% on housing are considered “extremely cost-burdened.”

Vacancy

The ACS includes people at the address where they are at the time of the survey if they have been there or will be there more than two months. A housing unit occupied at the time of interview entirely by people who will be there for 2 months or less is classified as “Vacant – Current Residence Elsewhere”. Such units are included in the estimated number of vacant units. ESRI defines a vacant housing unit as “no one living in the dwelling, unless its occupant or occupants are only temporarily absent—such as away on vacation, in the hospital for a short stay, or on a business trip—and will be returning.”

Income

The term "income" is defined at 42 U.S.C. Section 1437a(b)(4) as "income from all sources of each member of the household, as determined in accordance with criteria prescribed by the [HUD] Secretary, in consultation with the Secretary of Agriculture." Among items included in income are:

- earnings from employment, including overtime pay, tips, and bonuses;
- payments from Social Security, pensions, or other retirement benefits;
- disability income, including veterans disability benefits, death benefits, and insurance payments;
- unemployment compensation, disability compensation, and workers' compensation; Temporary Assistance for Needy Families (TANF) cash assistance (with exceptions);
- alimony and child support; and
- military pay.

Appendix B: Methodology

ESRI

“Esri's Updated Demographics data includes current-year estimates and five-year projections of U.S. demographic data. Esri develops the annual demographic datasets using a variety of sources, beginning with the latest base, and adding a mixture of administrative records and private sources to capture changes. Categories include the following:

- Population—Such as age, sex, race, Hispanic origin, labor force, educational attainment, marital status, life-stage and age dependency ratios, civilian labor force, and employment by industry and occupation
- Households—Such as total households, total family households, and average household size
- Income—Such as household income, per capita income, income by age, disposable income, net worth, percent of income for mortgage, and wealth index
- Daytime Population—Covers both workers (civilians employed at work and armed forces personnel) and daytime residents (population under 16 years of age, the unemployed, those not in the labor force, and the civilian employed temporarily absent from work)
- Housing—Such as home value, tenure (owner/renter), vacant units, and housing affordability index
- Historical Time Series—For population, households, and housing units”

“Forecasting change in the size and distribution of the household population begins at the county level with several sources of data. Esri incorporates a full-time series of intercensal and vintage-based county estimates from the U.S. Census Bureau. Because testing has revealed improvement in accuracy by using a variety of sources to track county population trends, Esri also employs a time series of county-to-county migration data from the Internal Revenue Service, building permits and housing starts, plus residential postal delivery counts. Finally, local data sources that tested well against Census 2010 are reviewed. The end result balances the measures of growth or decline from a variety of data series.

Measuring change in population or households at the county level is facilitated by the array of data reported for counties. Unfortunately, there is no current data reported specifically for block groups. Past trends can be calculated from previous census counts; the American Community Survey (ACS) provides five-year averages. However, these sources are not recent. To measure current population change by block group, Esri models the change in households from multiple sources: Experian; the U.S. Postal Service (USPS); Zonda (formerly Metrostudy), a Hanley Wood company; and RealPage (formerly Axiometrics), in addition to several ancillary sources.

The U.S. Postal Service publishes monthly counts of residential deliveries for every U.S. postal carrier route. This represents the most comprehensive and current information available for small, subcounty geographic areas. Carrier routes are a fluid geographic construct that is redefined continuously to incorporate real changes in the housing inventory and occupancy plus administrative changes in staffing and budgets of local post offices.

Converting delivery statistics from postal carrier routes to census block groups is a complex challenge. Carrier routes are defined to deliver the mail, while block groups are constructed to collect and report census data. Comparing two areas that are defined for wholly different purposes provides one significant conversion issue. Carrier routes commonly overlap multiple block groups. In many cases, a carrier route encompasses disjointed

areas that can be distant from each other, but block groups are rarely divided into multiple polygons. These overlaps require an effective method of allocating the postal delivery counts across multiple block groups.

Esri has developed a technique to link carrier routes to the correct block groups—using the actual locations of mail deliveries. Its proprietary Address Based Allocation (ABA) methodology was developed in 2005 to solve the complex challenge of converting delivery counts from carrier routes to block groups. This allocation method assigns carrier routes using household addresses that are geocoded at the block level to serve as the foundation for the conversion. The approach is unbounded by geographic borders or arbitrary assumptions about the distribution of households or postal deliveries. ABA results have been tested extensively against Census 2010 counts, including an independent evaluation that involved data from four other vendors. This test confirmed the accuracy of Esri's ABA allocation method.[1]

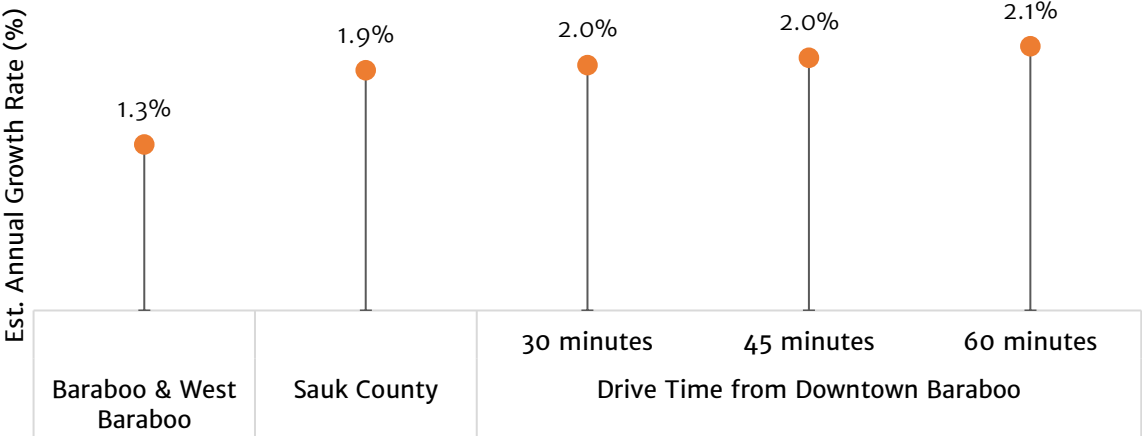
For over a decade, Esri has licensed data from Zonda to track new residential construction in the top U.S. housing markets. This database identifies the location and characteristics of individual construction projects, including total units planned, under construction, and closed by type of housing. This data is especially critical in tracking growth in previously unpopulated areas. Beginning with the 2016 updates, Esri has utilized an additional database from Zonda that more than doubles Esri's geographic coverage and the number of units planned and completed. The addition of this database gives the household and housing unit update a finer level of granularity and insight into smaller housing markets across the nation.

RealPage housing data is incorporated to capture the growing multifamily rental market. Like Zonda, which covers new residential-owned dwellings such as single-family homes and condominiums, RealPage collects and maintains data on planned, new, and existing rental properties of multifamily and student apartments, nationwide. This data source provides a wealth of property-level characteristics, such as the total number of units or beds, building type, number of stories, and occupancy, as well as asking rent. RealPage's inventory of rental properties expanded due to a corporate merger. This contributed to a near 30 percent increase in rental properties incorporated in Esri's models this year.

The best techniques are derived from a combination of models and data sources. Discrepant trends are checked extensively against independent sources and premium imagery data from Esri's ArcGIS Living Atlas of the World. Finally, totals for block groups are controlled to the county totals. Despite the appeal of microforecasting, there is simply more information available to track population change by county than by household. Ignoring the advantage of county-level data would be throwing away information.”

Appendix C: Additional Data

**Median Household Income Annual Growth Rate by
Geography (2021-2026)**



Data Source: ESRI Community Profile.