VIRGINIA:

BEFORE THE COMMISSION ON LOCAL GOVERNMENT

In the matter of the Notice by the TOWN OF LEESBURG, VIRGINIA, a municipal corporation of the Commonwealth of Virginia, of its intention to petition for the annexation of territory within THE COUNTY OF LOUDON, a political subdivision of the Commonwealth of Virginia, pursuant to Chapter 32 of Title 15.2 of the Code of Virginia (1950), as amended.

CONSULTANT REPORTS SUPPORTING TOWN REPLY

Town Manager

Kaj H. Dentler

Town Council of Leesburg

Kelly Burk, Mayor
Neil Steinberg, Vice Mayor
Ara Bagdasarian
Zach Cummings
Kari Nacy
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Dated: October 13, 2023

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Appendix A

BAE Urban Economics

October 9, 2023

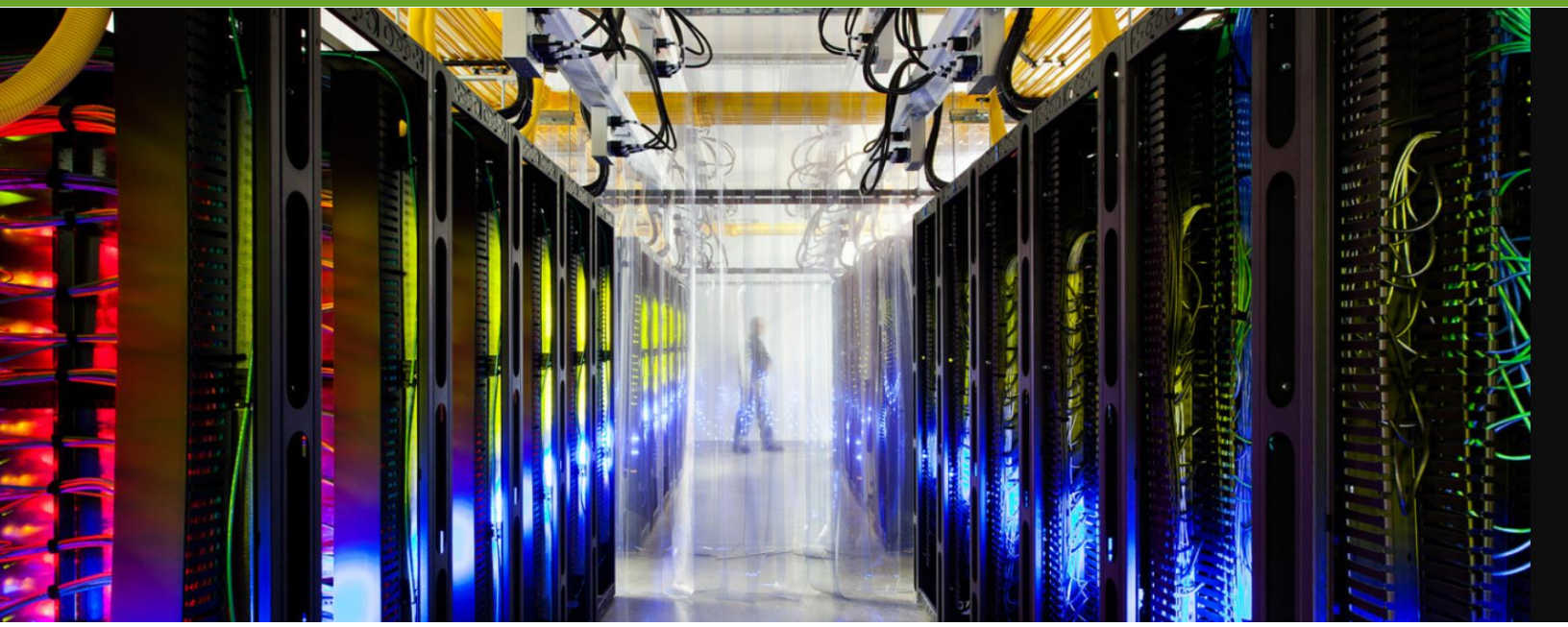
Data Center Market Study

bae urban economics

Data Center Market Study

Prepared for the Town of Leesburg, VA

October 9, 2023



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EXECUTIVE SUMMARY

BAE Urban Economics prepared this market study of the data center industry for the Town of Leesburg Virginia. The purpose of the study is two-fold: 1) to address the position taken by Loudoun County that the Town's annexation of part of the Compass Creek area will have an adverse effect on data center development in Compass Creek and elsewhere; and 2) to assess market demand, current and future, for data centers globally and nationally, with a focus on Northern Virginia. To prepare this study BAE used information gathered from commercial real estate brokers specializing in data centers, industry sources, local government officials, and others.

Key findings of this market study are listed in the final chapter of the of this report but the primary findings that are most germane to the stated purpose of the study are described below.

1. **There is unprecedented demand for data center sites in Northern Virginia**. Northern Virginia was not only the market with the largest data center inventory in 2022, but also the leading market in new data center capacities under construction. Rates of absorption versus vacancy in the market documents this growth. In 2022, 436.9 megawatts (MW) of data center capacity were absorbed versus a vacancy rate of 0.98 percent, and in the first half of 2023, 192.8 MW were absorbed and the vacancy rate fell to 0.94 percent. These are the lowest vacancy rates for data centers in any market in North America[1].

   Further, recent data center site sales illustrate the level of competition for land. Of 12 Northern Virginia site sales for data centers in the second half of 2022, eight brought in more $2 million per acre.[2] A similar list in the second half of 2021 included just one property that sold for more than $2 million per acre.[3]

2. **There is significant interest in possible data center sites in Leesburg.** Given the strong market demand for data centers, Town of Leesburg is attractive to data center developers. Data center developers and operators are already focused on the town with five potential sites in Leesburg with data center interest. This increased interest

[1] CBRE "North America Data Trends H1 2023: Northern Virginia: Retrieved from https://www.cbre.com/insights/local-response/north-america-data-center-trends-h1-2023-northern-virginia

[2] Cushman & Wakefield, "Data Center Update Americas H2 2022: United States and Canada." (2023). Retrieved from http://www.cushmanwakefield.com/en/insights/americas-data-center-update

[3] Cushman & Wakefield, "Data Center Update Americas: United States and Canada." (2021).

results from strong demand for data centers in the region and/or facing community opposition to data center expansion in other areas.

3. **The annexation of the remaining area of Compass Creek is not likely to have any adverse effect on data center development in Compass Creek or anywhere else.** There was already interest in Leesburg for data centers prior to Microsoft announcing an expansion on its Compass Creek campus. This interest is likely to continue because Leesburg is a good location for data centers, particularly as viable options in other parts of Loudoun County and Northern Virginia dwindle.

4. **Additional town taxes will not deter data centers from being interested in sites in Leesburg.** The additional taxes a data center would be responsible for paying to the Town of Leesburg if the located within the Town limits, above what they pay in Loudoun County, is not stopping data centers from wanting to locate in Leesburg. The locational advantages of the Town's sites outweigh this additional cost.

INTRODUCTION

BAE Urban Economics was engaged by the Town of Leesburg to prepare a market study of the data center industry. This study addresses the position taken by Loudoun County that the annexation of part of the Compass Creek area may have an adverse effect on data center development in Compass Creek and elsewhere. This study includes a review of the state of the data center industry and emerging trends, globally and nationally, but focused on Northern Virginia. The study also includes an assessment of market demand in Northern Virginia and the broader region that incorporates information available from commercial real estate brokers who specialize in data centers, as well as local government offices.[4]

BACKGROUND

In the last several years, the Town of Leesburg has been approached by data center operators interested in developing and/or expanding data centers within and immediately adjacent to the Town. This interest is coming from companies that own and operate enterprise data center facilities, such as Microsoft, as well as colocation data centers that rent out rack space and related infrastructure services to third parties for their servers or other network equipment. Companies that operate colocation data centers in Northern Virginia include

[4] The investigation, data collection, analysis, and conclusions in this report build on the BAE report Data Center Market Study Prepared for Prince William County, Virginia, October 2021.

STACK, Equinix, and Iron Mountain. Colocation data centers are typically used by businesses that do not maintain their own data centers but need the services provided by data centers.[5]

One area that is attracting interest from data center operators is Compass Creek. Compass Creek is a development area on the Loudoun County side of the south end of the Town of Leesburg. The Microsoft Corporation purchased approximately 333 acres in the southern portion of the Compass Creek development in 2018. Microsoft has built two data centers on the northern portion of its property and plans to build additional data centers on the property. Though these data centers are outside the Town of Leesburg boundary in Loudoun County, the Town provides water (required for cooling operations) and sewer service (required for the elimination of wastewater) to the Microsoft facilities. The Microsoft facilities are accessed primarily via Town streets.

In September 2022 the Town of Leesburg sent a notice to the Commission on Local Government that it intended to petition for annexation of the remaining parcels in Compass Creek that are not already located in the Town of Leesburg. The approximately 402.8 acres Leesburg is petitioning to annex from Loudoun County includes the Microsoft campus area.

There is an additional data center development at Compass Creek in the development process. The developer of Compass Creek filed an application with Loudoun County to rezone part of the remaining vacant parcel of the Planned Development-Industrial Park to allow data center use.[6] Loudoun County approved this application. The planned development will include two colocation data centers.[7] These are to be developed by the Petersen Companies, one of the largest privately held real estate developers in the Washington region.

There are five sites with data center interest in the Town of Leesburg. Three of these potential data centers are currently in the legislative rezoning process. The first of these is a 33-acre site that is part of the Village at Leesburg mixed-use development. Only 11 acres of this site is developable. If the rezoning is approved there will be at least another year or more for more detailed site plan and construction review.

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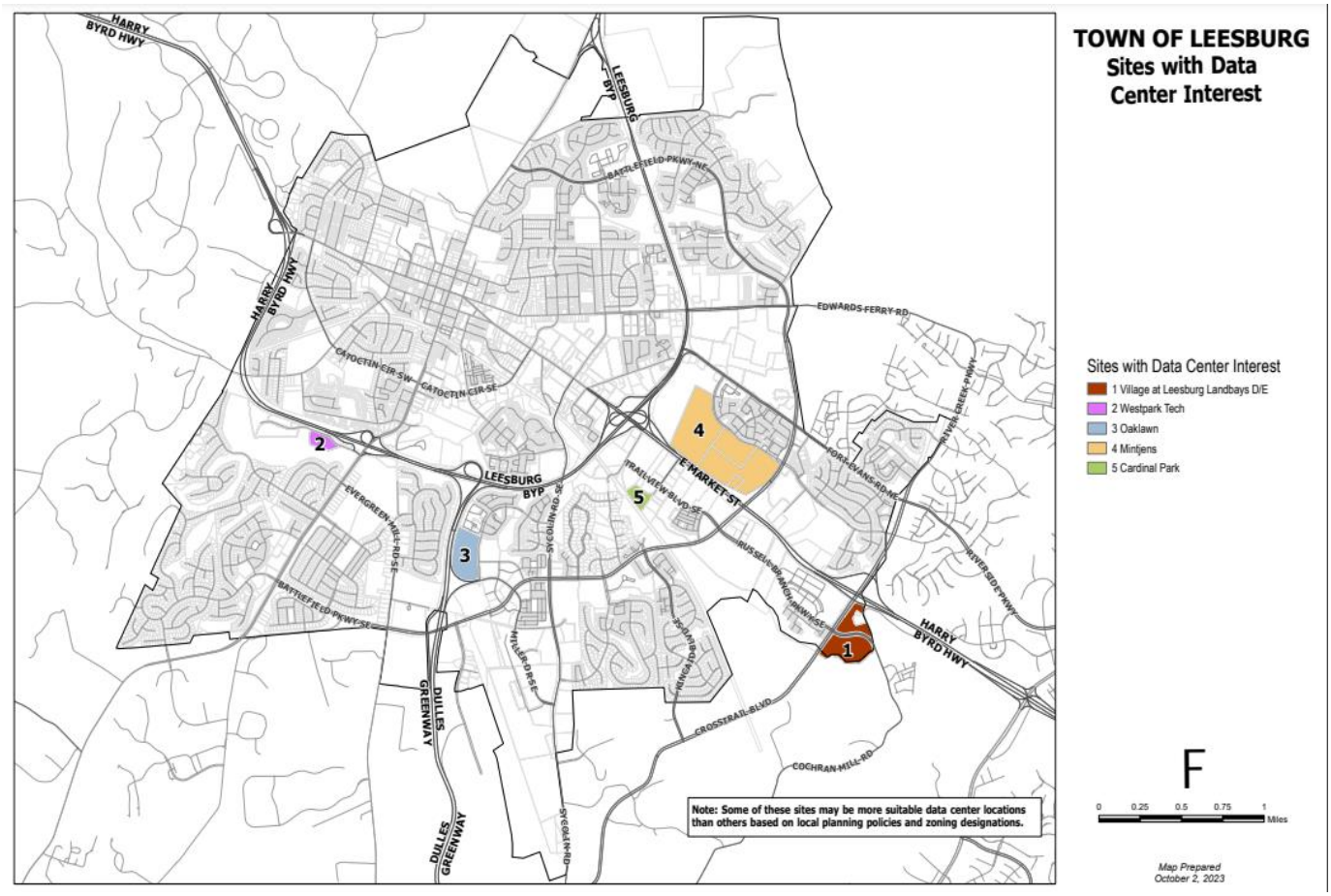
[5] https://www.racksolutions.com/news/data-center-trends/what-is-a-colocation-data-center/.

[6] Loudoun County Application Number: ZMAP-2021-0012.

[7] July 27, 2022, developer presentation to Town of Leesburg concerning data centers on Leesburg Commercial parcel.

Figure 1: Sites with Data Center Interest



Source: Town of Leesburg

Another potential data center or flex industrial development in the legislative rezoning process is Westpark Tech. This is located in a PEC zoning district on a 7.58 acre site that was once used as the clubhouse area for a golf course. Westpark Tech is now on its third submission to the Department of Community Development, but because the site is small it may not be developed as a data center. Also, there is no operator designated for the potential data center there.

Another potential data center that is in the legislative rezoning process is known as Oaklawn Land Bay A. This is a 26-acre site near the Dulles Greenway.

There is also data center interest on two other sites, the "Mintjens" property on Route 7 and another on Cardinal Park Drive, but both of these are conceptual as of this writing. Though the developer of the Mintjens property has had a pre-application meeting, neither proposal is in the legislative rezoning process.

STATE OF THE INDUSTRY: EMERGING TRENDS

Global/National Trends

In 2023 the data center market continues to experience robust growth and transformation globally. The growth of data generated by businesses, cloud computing, Internet of Things (IoT) devices, and online services is driving the need for expanded data center infrastructure. This demand has been accelerating in recent years by emerging technologies such as 5G, edge computing, and artificial intelligence (AI). Additionally, cloud service providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud have been expanding their data center footprints to meet the rising demand for cloud services. These factors have led to substantial investment in new data center construction and existing facility expansion.

There has been substantial growth in all three primary types of data centers: hyperscale, colocation, and enterprise centers. Hyperscale data centers are extra-large facilities that power the cloud and web and host millions of servers and applications.[8] Colocation data centers allow businesses to rent out space for their own hardware including servers, cables, networking devices, and other computing equipment.[9] Companies such as STACK, Equinix and Iron Mountain operate colocation data centers. Enterprise data centers are large data centers that have been built by and owned and operated by a business for its own use.[10] Examples of enterprise data centers include those owned and operated by Amazon, Google, Meta, and Microsoft.

According to a McKinsey analysis, between 2023 and 2030, measured by power consumption (gigawatts), data center demand in the U.S. is expected to grow by approximately 10 percent a year until 2030. As shown in Figure 2 all three of the primary types of data centers—hyperscale, colocation, and enterprise centers—will contribute to this projected growth.[11]

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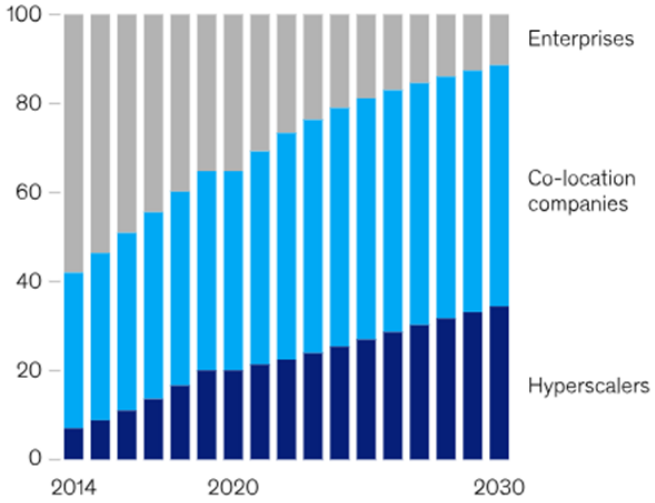
[8] www.fortinet.com/resources/cyberglossary/hyperscale.

[9] www.fortinet.com/resources/cyberglossary/hyperscale.

[10] Ibid.

11 Bangalore, S. et al. (2023, January). *Investing in the rising data center economy*. www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights.

Figure 2: Data Center Power Consumption, By Providers/Enterprises, % Share



The exponential increase of digital communication and services, demand for storing, managing, and distributing large amounts of data and information is reflected in the growth of the U.S. data center market. The number of internet users and applications has been rising dramatically for decades. Commercial users, such as retail and eCommerce companies, increasingly rely on the internet to provide their services and to store data. Traditional services provided by brick-and-mortar businesses are going online. Non-commercial users access the internet for emailing, texting, streaming videos and music, gaming, and social networking.

Data centers are a key resource for digital communications and services. They are centralized repositories of computer servers that provide these electronic services. Consequently, more data centers are built to meet the demand of the rising amount of data that is created and stored. The U.S. Data Center Market value is estimated at $18.1 billion in 2023, and it is projected to reach $28.46 billion by 2028, with a compound annual growth rate (CAGR) of 9.47% percent during the forecast period (2023-2028).[12]

According to a report by CBRE Research, the research arm of CBRE, a major international commercial real estate brokerage, total supply in primary markets[13] in North America (largely U.S) grew by 491.5 Megawatts (MW) (12 percent) in H1 2023 compared to H2 2022 and by 738.2 MW (19.2 percent) year-over-year.[14] Through the first half of 2023 there was a record

[12] United States Data Center Market Size & Share Analysis – Growth Trends & Forecasts Up to 2029. Retrieved from: https://www.mordorintelligence.com/industry-reports/united-states-data-center-market

[13] Primary markets include Northern Virginia, Dallas-Fort Worth, Silicon Valley, Chicago, Phoenix, Atlanta, Hillsboro (Portland OR metro), and New York Tri-State.

[14] Note: Growth in the data center real estate sector is measured in power, not square footage.

high amount of construction activity in primary markets, 2,287.6 MW, a 25 percent year-over-year increase.[15]

The following tables provide a snapshot of the fundamentals of the data center real estate for the primary and secondary markets in the U.S., which includes year-to-year change for the various key factors.[16]

Table 1: H1 2023 Wholesale Primary Market Fundamentals

Market	Inventory (MW)	Y-o-Y Change (MW)	Available MW/Vacancy Rate	Y-o-Y Change* (bps)	H1 2023 Net Absorption (MW)	Y-o-Y Change (MW)	Rental Rates (kW/mo)**
Northern Virginia	2,254.1	▲ 346.0	21.3 / 0.94%	▼ -93	192.8	▼ -76.5	$110-$150
Dallas-Ft. Worth	499.4	▲ 123.6	20.4 / 4.1%	▼ -280	110.6	▲ 84.7	$125-$165
Silicon Valley	410.7	▲ 41.1	25.9 / 6.3%	▲ 500	13.8	▼ -42.4	$155-$250
Chicago	367.5	▲ 61.5	20.3 / 5.5%	▼ -200	26.0	▲ 16.3	$115-$125
Phoenix	360.0	▲ 35.5	19.2 / 5.3%	▼ -250	43.8	▼ -2.5	$170-$200
Atlanta	271.0	▲ 21.5	20.1 / 7.4%	▲ 380	7.5	▼ -22.5	$110-$125
Hillsboro	248.4	▲ 109.0	8.1 / 3.3%	▼ -370	77.7	▲ 46.3	$125-$150
New York Tri-State	177.5	▲ 0	17.3 / 9.8%	▲ 80	-3.4	▼ -19.4	$130-$140

[15] CBRE Research, "North America Data Center Trends H1 2023." Retrieved from https://www.cbre.com/insights/reports/north-america-data-center-trends-h1-2023

[16] Ibid.

Table 2: H1 2023 Wholesale Secondary Market Fundamentals

Market	Inventory (MW)	Y-o-Y Change (MW)	Available MW/Vacancy Rate	Y-o-Y Change* (bps)	H1 2023 Net Absorption (MW)	Y-o-Y Change (MW)	Rental Rates (kW/mo)**
Central Washington	176.4	▲ 30.4	5.4 / 3.0%	▼ -500	5.9	▲ 1.6	$115-$130
Austin/ San Antonio	162.2	▲ 8.6	2.8 / 1.7%	▲ 40	6.7	▲ 1.8	$135-$150
Southern California	148.9	▲ 9.8	26.6 / 17.9%	▼ -100	3.2	▼ -4.7	$135-$160
Seattle	137.9	▼ 2.2	13.9 / 10.1%	▼ -500	5.7	▲ 1.7	$120-$150
Houston	134.1	▲ 0.6	32.2 / 24.0%	▼ -440	13.5	▲ 13.5	$125-$145
Denver	88.6	▲ 2.3	15.4 / 17.4%	▼ -80	5.3	▲ 4.3	$135-$145
Minneapolis	59.6	▲ 1.0	14.7 / 24.7%	▼ -20	-3.2	▼ -5.1	$115-$170
Charlotte/ Raleigh	52.1	▼ 6.4	11.2 / 21.6%	▲ 210	1.2	▼ -0.4	$115-$130

*Vacancy Y-o-Y changes are calculated by comparing the difference between H1 2023 and H1 2022.
**Rental rates are quoted asking rates for 250 – 500 kW at N+1/Tier III requirements.

Source: CBRE Research, CBRE Data Center Solutions, H1 2023.

Other notable national trends from CBRE's market report include the following: [17]

- Strong demand and developer interest continues to drive new construction across the U.S., but a lack of readily available power and extended lead times for components of electrical infrastructure are delaying construction.

- Primary market absorption was strong in H1 2023 "despite supply-side challenges." In H1 2023 468.8 MW was absorbed, compared to 484.8 MW in H1 2022.

- Preleasing activity in primary markets is strong with 1,673.1 MW (73.1%) of the 2,287.6 MW under construction pre-leased.

- The overall vacancy rate for primary markets in the U.S. remains near a record low, at 3.3 percent. Northern Virginia's vacancy rate is 0.94 percent, the lowest of all U.S. markets.

- Artificial Intelligence (AI) is driving demand across major markets. Some AI start-ups have large requirements between 5 to 25 MW.

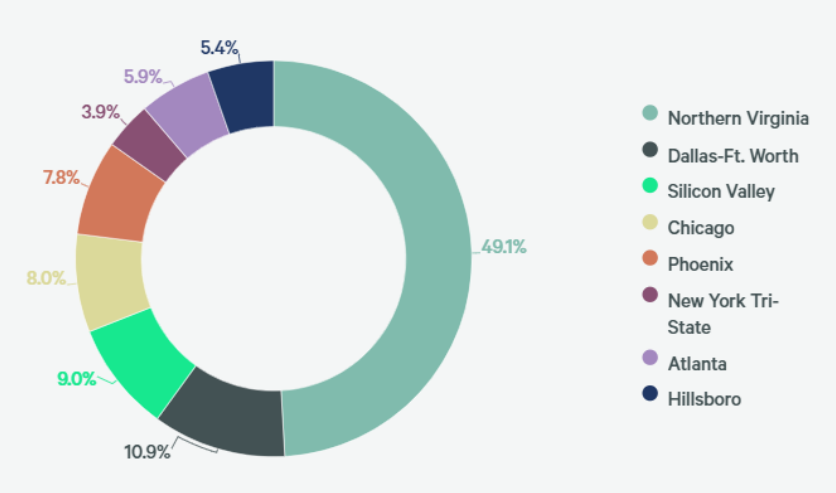
[17] CBRE Research.

- Most major markets in the U.S. are dealing with power constraints. Accordingly, many data center operators are prioritizing power availability, rather than selecting markets based on location, connectivity, water, and the price of land.

Northern Virginia Emerging Trends

Northern Virginia continues to be the largest data center market in the United States. As shown in Figure 2 below, data centers in Northern Virginia make up 49.1 percent of the primary market inventory of data centers in the United States. The next largest market for data centers in the United States is Dallas/Ft. Worth which has 10.9 percent of the primary market inventory. According to CBRE, historical supply growth of data centers, including what is under construction, pre-leased, or newly delivered, remained high through H1 2023. Overall demand outpaced new supply, keeping the vacancy rate less than one percent.[18]

Figure 3: % of Total Primary Market Inventory



Source: CBRE Data Center Solutions, H1 2023.

Altogether, according to Jones Lang LaSalle (JLL), another international commercial real estate brokerage, the Northern Virginia data center market added 163 MW of multi-tenant inventory and 203 MW of single tenant inventory in H1 2023. The Northern Virginia market had 184 MW of net absorption in H1 2023 with cloud providers accounting for 85 percent of the industry demand.[19]

[18] CBRE Research.

[19] JLL, "H1 2023 North America Data Center Report." Retrieved from https://www.us.jll.com/content/dam/jll-com/documents/pdf/research/americas/us/jll-north-america-data-center-report-updated.pdf.

All of the major real estate research brokerages predict continued market strength for the Northern Virginia data center market in 2023. In its H1 2023 data center market report, CBRE noted that "Preleasing activity is very high, as companies are securing space while waiting for power delivery." Additionally, CBRE reported the continued trend of land acquisition for expanding existing data centers, citing notable transactions such as acquisition of 57 acres in Loudoun County by CyrusOne to expand its Northern Virginia presence, and NTT filing plans to build over 2 million square feet on its newly acquired site in Prince William County.[20]

Rental rates in the Northern Virginia market remain competitive compared to other markets. However, rental rates are increasing. [21]

Average power rates in Northern Virginia have been increasing in the last two years, from 5.2 cents per KWh in 2021 to 7.0 cents in 2023. This rate is still lower than power rates in many of the data center locations in the U.S. including Austin/San Antonio, Boston, Houston, Los Angeles, New Jersey, New York, and Northern and Southern California but greater than in Chicago, Denver, Dallas-Fort Worth, Northwest (Hillsboro OR), and Phoenix.[22] In 2021 Northern Virginia's average power rates were lower than they were in some of the competitive markets including Chicago, Denver, and Phoenix where average rates now range between 6.8 and 9.9 cents per KWh. Since power makes up approximately 40 percent of the operating costs of a typical data center, data center developers are watching those rates.[23]

JLL offers the following market outlook for data center users in Northern Virginia:

- Few available options for data centers over 1MW;
- Rental rates are increasing; and
- Enterprise tenants risk being "bumped" out of current spaces by hyperscalers.[24]

For data center providers in Northern Virginia, JLL's market outlook is as follows:

- Tremendous demand for availabilities of scale;
- Achievable rental rates have increased; and
- There is "fierce" competition for land sites in Loudoun and Prince William. [25]

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[20] CBRE, "North America Data Center Trends H1 2023: Northern Virginia." Retrieved from https://www.cbre.com/insights/local-response/north-america-data-center-trends-h1-2023-northern-virginia.

[21] JLL.

[22] JLL.

[23] Ibid.

[24] Ibid.

[25] JLL.

Major site sales in Northern Virginia for data centers illustrate the level of competition for land. The most recent site sales that real estate firm Cushman & Wakefield lists in its United States Data Center Update for H2 2022, included in Table 3 below, document the increasing price per acre that is the result of dwindling land inventory for data centers. The price per acre for eight of the twelve transactions listed topped $2 million.[26] The same list from Cushman & Wakefield's H2 2021 report only included one property that sold for more than $2 million per acre.[27]

Table 3: Northern Virginia Recent Site Sales

PROPERTY	SIZE (Acres)	SALE DATE	SALE PRICE	PRICE/ACRE	BUYER
NEC Belmont Ridge Rd, Broadlands	58	Dec-22	$119,834,208	$2.1M	CyrusOne
Pacific Blvd & Moran Rd, Sterling	10	Sep-22	$27,000,000	$2.7M	Vantage Data Centers
9530 & 9650 Hornbaker Rd, Manassas	63	Sep-22	$51,569,919	$0.8M	STACK Infrastructure
14521 McDevitt Dr, Culpeper	100	Sep-22	$12,000,000	$0.1M	CloudHQ
14210 John Marshall Hwy, Gainesville	5	Jun-22	$13,015,080	$2.6M	NTT
14300 John Marshall Hwy, Gainesville	97	Jun-22	$257,369,580	$2.6M	NTT
45965 Nokes Blvd, Sterling	4	Jun-22	$10,000,000	$2.4M	Amazon
45969 Nokes Blvd, Sterling	4	Jun-22	$9.000.000	$2.1M	Amazon
45975 Nokes Blvd, Sterling	6	Jun-22	$11,700,000	$2.0M	Amazon
7816 Bethlehem Rd, Manassas	23	Apr-22	$21,000,000	$0.9M	PRP
19509 Belmont Ridge Rd, Ashburn	134	Mar-22	$180,000,000	$1.3M	Vantage Data Centers
21660 Ridgetop Cir, Sterling	12	Jan-22	$26,439,000	$2.2M	Amazon

Source: Cushman & Wakefield

A significant market challenge for Northern Virginia going forward is the lack of available development sites. Ashburn, which is home to about 80 percent of the data centers in Northern Virginia, no longer has any available land sites, short of some limited redevelopment options. Given those limits, data center providers have been focusing on the next best option,

[26] Cushman & Wakefield, "Data Center Update Americas H2 2022: United States and Canada." (2023). Retrieved from http://www.cushmanwakefield.com/en/insights/americas-data-center-update

[27] Cushman & Wakefield, "Data Center Update Americas: United States and Canada." (2021).

which is Manassas in Prince William County. At this juncture however, there are actually few land sites left in Manassas.[28]

Another challenge that surfaced in 2022 is that Dominion Energy, the largest electric utility in Northern Virginia, may not be able to support new data center developments in the area due to limitations on their ability to distribute power to substations. As of 2023, Dominion is making strides in upgrading transmission and infrastructure but pipeline or new projects that had not already secured agreements with Dominion for power may be delayed.

Finally, Maryland's recent movement in encouraging the development of data centers may be preparation for Northern Virginia reaching data center capacity limits. First, in 2020 the Maryland General Assembly established an exemption from Maryland sales and use tax on the purchase of qualified data center personal property for up to 20 years. Then, in June 2021, Quantum Loophole, a data center developer, and TPG Real Estate Partners announced the purchase of a 2,100-acre property in Frederick County, Maryland for data centers. The site, which is located approximately 26 miles from Ashburn across the Potomac River, is a former manufacturing site for Alcoa. The CEO of Quantum Loophole, Josh Snowhorn, indicates that that the reclaimed site has "the entitlement, power, water and proximity to Northern Virginia that the Internet industry needs for success." With land costs at less than $50,000 per acre compared to $400,000+ per acre in Northern Virginia, the Frederick County site has the potential to offer a lower cost alternative for data center providers and users.[29]

Recent Trends in Site Selection

While Northern Virginia will likely remain the largest data center hub in the nation for the foreseeable future, it is facing competition from other attractive, nearby locations with similar land use policies and economic incentives, where land supply is less limited. In so doing, we highlight both that Northern Virginia has become a dominant player in the market and why other nearby areas may also be attractive locations for future data centers.

Data centers tend to prioritize key factors when selecting new sites for development: availability of land, fiber connectivity, environment, access to electrical power, access to water, a skilled workforce, ease of development, and policy incentives. For many years, the most critical is access to high-bandwidth connectivity, such as fiber. (It is worth noting that some companies are seeking to diversify the location of their data for added reliability and security,[30]

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[28] This information is provided by data center real estate specialists.

[29] Massive Maryland property sells for $100M. bizjournals.com. (2021, June 28). Retrieved from: https://www.bizjournals.com/baltimore/news/2021/06/28/alcoa-sells-maryland-property.html.

[30] "Virginia's land dilemma," Data Center Dynamics (2020, January 6). Retrieved from: https://www.datacenterdynamics.com/en/analysis/virginias-land-dilemma/

although this is a nascent trend.) The growth of the data center industry in Northern Virginia's "Data Center Alley" in Ashburn has been driven by the density of fiber networks.

Northern Virginia's history with fiber began in Ashburn in the 1990s with the development of some of the first-ever internet exchanges and data centers by companies like AOL and Equinix.[31] These networks attracted other businesses which led to high interconnectivity of the network, allowing for a speedy and efficient exchange of information for any company connected to the network. This history has helped the region evolve into the largest peering point, where Internet networks come together to exchange traffic between their networks in North America.[32] Even as land prices throughout Northern Virginia, increase to over $1 million per acre, the upfront cost of land is becoming an increasingly small part of the total development cost, particularly in comparison to the market value of connectivity to the network. The data and information establish that high-bandwidth network interconnectivity is the main asset for the industry in Northern Virginia.

Since the Town of Leesburg is located in Loudoun County it provides companies and data center operators convenient access to the most interconnected network in the world. The stable growth in demand for data centers underscores this feature. Accordingly, site selection factors that affect the price of data center development and operations like tax breaks and other subsidies, will have less impact on the decision of data centers to locate there. Loudoun County has a higher tax rate for business and personal property than other counties in Northern Virginia and the state at large and remains the epicenter of the industry and continues to draw demand for new development. The additional taxes that a data center would be responsible for paying to the Town of Leesburg if located within Town limits, above what they would pay to be in Loudoun County alone, is not stopping data centers for wanting to locate in Leesburg. The locational advantages of the potential sites in the Town outweigh this additional cost.

Northern Virginia also satisfies the other main criteria for data center site selection, with its relatively mild climate, lack of seismic activity, access to one of the most highly educated workforces in the country, and electrical power supply from utility providers accustomed to serving data centers and their special needs. Though data center demand has strained the availability of electricity for new data centers, Dominion Energy is working on upgrading transmission and distribution infrastructure. It is notable that access to cheap electrical power is itself not the main concern for data centers. Rather, it is that data centers have insisted on obtaining renewable energy, accelerating their shift towards more renewable energy for its grid.

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[31] "Ashburn's Fiber-Fueled Data Center Boom." Data Center Knowledge (2018, March 14). Retrieved from: https://www.datacenterknowledge.com/data-center-world/ashburn-s-fiber-fueled-data-center-boom

[32] "Creating the Digital Infrastructure Capital of the World" Equinix. (2020, November 10). Retrieved from: https://blog.equinix.com/blog/2020/11/10/creating-the-digital-infrastructure-capital-of-the-world/

However, Leesburg is not the only jurisdiction located near the heart of the data center industry in Ashburn. As available sites in Loudoun County and Prince William County, where most of the area's data centers are located, are sold, and if land is unavailable, there are other areas that could seize the demand for proximity to the hub in Ashburn, both within Virginia and other states, particularly in neighboring Maryland. Fairfax County, for example, is well-positioned to attract data centers, which it already does and will likely continue to do. Jurisdictions in Maryland, such as Frederick County, divided from Loudoun County only by the Potomac River, could attract data centers while offering many of the same assets. As noted above, Quantum Loophole recently agreed to develop data centers on a 2,100-acre property in Frederick County, with the intention of building a fiber ring to connect to the hub across the river.[33] Though this a longer term possibility, the Frederick County site may be more cost competitive than most Northern Virginia sites because the land prices are so much lower.

If most of the environmental and electrical power supply needs can be satisfied by other jurisdictions near Loudoun County, and other areas offer their own connectivity capabilities, the main factor that will determine where data centers are developed will come down to the availability of land. Accordingly, the availability of land and sites that can developed by right or with minimal zoning adjustments will be the primary factor determining site selection in the near future. The importance of finding sites that work in prime locations, including in Loudoun County is key. This includes the Town of Leesburg, which has several land sites potentially available for data centers.

Site Selection Beyond Northern Virginia

Other areas in Virginia have attracted data centers, especially those where operators are less concerned about being located in Loudoun County or Northern Virginia. Some of these areas have other important network assets. One example is Henrico County, home to the only network access point (NAP) in the country, which connects a variety of land-based data centers, such as those in Northern Virginia, to two high-speed underwater data cables to Spain and Brazil[34]. These cables include the MAREA cable, which connects to Spain through Virginia Beach and is the fastest subsea cable in the world. The NAP serves as a hub for land-based data centers to connect to the subsea cables, positioning Henrico to attract significant attention from data centers seeking access to the NAP. In August 2020, Meta (formerly Facebook) completed the first phase of a $1.75 billion, 2.3 million square foot data center project in Henrico County. In addition, as discussed further in the next section, Henrico County

[33] "Quantum Loophole buys 2,100-acre property in Frederick County, Maryland for gigawatt data center campus" Data Center Dynamics. (2021, June 28). Retrieved from: https://www.datacenterdynamics.com/en/news/quantum-loophole-buys-2100-acre-property-in-frederick-county-maryland-for-gigawatt-data-center-campus/

[34] "Henrico poised to become global internet hub." Henrico Citizen. (2019, May 17). Retrieved from: https://www.henricocitizen.com/articles/henrico-poised-to-become-global-internet-hub/

is seeking to attract data centers by implementing low personal property tax rates for data centers in Virginia, at $0.40 per $100 in assessed value. Henrico County is poised to build on the presence of the NAP to attract data centers as a destination itself, but also may be a prime candidate to absorb demand from Northern Virginia as available land for data center development runs out. Henrico County also has a talented workforce, with regional organizations and institutions, including Virginia Commonwealth University, which are fostering talent specifically to work in a growing local IT economy.

Another example of a community outside Northern Virginia that has built a substantial data center complex is Mecklenburg County in Southern Virginia. Microsoft has invested heavily in the area, starting with a $500 million modular data center in Boydtown that created 50 new jobs. Since that first investment Microsoft has expanded data center operations in Mecklenburg County five different times, adding new data center buildings, increasing MW of power and other measures. In 2022, Microsoft filed for two more campuses in the county; a 132-acre site in another part of Mecklenburg that would feature three buildings, and a 259-acre parcel located at the Lakeside Commerce Park again housing three buildings. Altogether, not including the most recent expansion plans, Microsoft has invested nearly $2 billion in Mecklenburg County, adding 250 new jobs.

Summary

In terms of site selection factors, Northern Virginia continues to satisfy a key criterion for data centers: connection to a high-speed, fiber network infrastructure that serves the Eastern seaboard as well as the large institutional customers like the government and defense companies in DC-Maryland-Virginia region. In terms of access to such a network, Northern Virginia, centered around Ashburn, provides the highest density of fiber in the country, leading to a level of growth in the industry unmatched by any other market. However, regions immediately adjacent to Northern Virginia are transforming into viable alternatives given that they also satisfy site selection criteria and offer similar proximity to the network in Ashburn, including Prince William County, which recently expanded its Data Center Overlay Zone. That change made in 2022, though controversial with Prince William County residents, has resulted in several new data center proposals. It is clear that there are two factors that are becoming increasingly important to the site selection process for data centers: the availability of land, and ease of development in places with available land.

The availability of electricity is a potentially limiting factor for new data center development in Northern Virginia. In 2022 Dominion Energy, the primary electric utility provider in Northern Virginia, announced that they were facing capacity limitations for new data centers. While Dominion is in the process of upgrading its transmission and distribution infrastructure, new data centers that have not been able to work out an agreement for adequate power with the utility may face delays in starting up operations. Russell Seymour, Leesburg's Director of Economic Development, reports that the potential data center developers contacting his office

have not stated any concerns about available power for the potential data center sites within the Town of Leesburg.

The literature and interviews with data center real estate specialists make it clear that cost is less of a factor for data center site selection than it might normally be for other types of real estate. Site selection factors that affect the cost of data center development and operations like tax breaks and other subsidies, have little impact on the decision of data centers to locate in Northern Virginia. Accordingly, the additional taxes that a data center would be responsible for paying to the Town of Leesburg if located within Town limits, above what they would pay to be in Loudoun County alone, is not stopping data centers for wanting to locate in Leesburg. The locational advantages of the Town's potential sites outweigh this additional cost.

On the whole, however, data center investment in the Mid-Atlantic is more likely in the longer-term outside of Northern Virginia and the Washington region. Momentum may slowly build once development opportunities dry up in Northern Virginia. In any case, these other areas will need to have both good fiber and electric power access to be able to attract data center investment.

MARKET DEMAND ANALYSIS

The market demand analysis includes a review of the current supply of data centers in Loudoun County and a review of the demand. Also included here is an analysis of data from industry reports and interviews on the market provided by two large commercial real estate brokerages with special expertise in data centers, Jones Lang LaSalle and CBRE, a colocation data center operator, as well as Town officials. Accordingly, sources for this study includes Industry reports and publications; government and regulatory agencies; data center operators and providers; real estate firms and brokers; local news sources; and especially interviews with industry experts and key stakeholders.

Factors for determining market segmentation are based on size, capacity, location, and customer type (e.g., enterprise, cloud providers, etc.). Market sizing and analysis involves estimating the current size of the data center market in Northern Virginia in terms of square footage, power capacity, and revenue, with consideration of historical growth trends to forecast future market growth.

Supply and demand analysis require the evaluation of the supply of data center facilities in Northern Virginia, including both existing and planned developments. Demand drivers, including customer demand for data center services and industry trends, as well as factors like vacancy rates and utilization rates should be accounted for in a comprehensive market demand analysis. BAE provides most of the information about existing data centers at the aggregate level to show a general picture of the current supply.

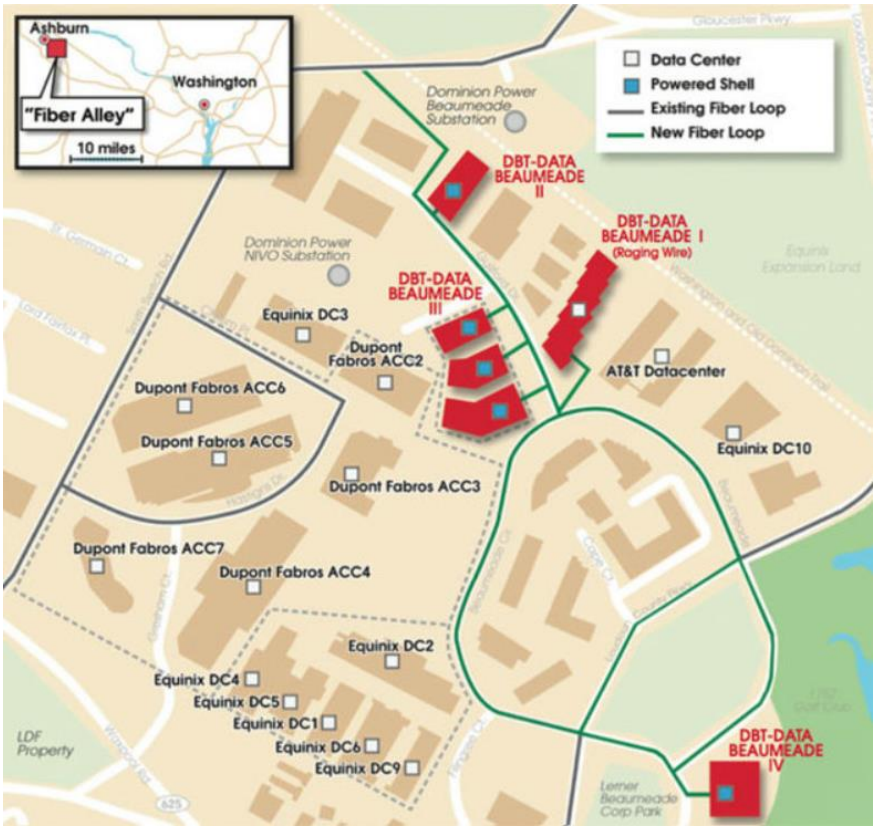
Data Centers in Northern Virginia

According to the data center information clearinghouse Baxtel as of this writing, there are 238 data centers located in 25,645,872 square feet and 3,031 megawatts in Northern Virginia. The data centers are operated by 50 providers with many of them located in Loudoun County. Specifically, the largest concentration of data centers is in an area known as "Data Center Alley" along the Dulles Greenway (VA 267) which includes the areas of Ashburn, Sterling, and Leesburg.[35] In 2023 Northern Virginia remains the largest data center market in the world. [36] By far the largest concentration of data centers in Data Center Alley is in Ashburn, in the area surrounding the Equinix campus and Beaumeade Circle, as shown in Figure 3.

[35] Baxtel, "Northern Virginia Data Center Market." Retrieved from https://baxtel.com/data-center/northern-virginia.

[36] CBRE, "Global Data Center Trends 2023." Retrieved from https://www.cbre.com/insights/reports/global-data-center-trends-2023.

Figure 4: Ashburn Data Center



The Major players in the industry have data centers in Loudoun County including Amazon Web Services, Google, Microsoft Corp., CyrusOne, Digital Realty Trust, and Equinix. As shown in Table 4, all five of the largest data centers in Northern Virginia are located in Loudoun County.

Table 4: Largest Data Centers in Northern Virginia [37]

Company	County	Site Name	Total Building SqFt	Power (MWs)
Aligned	Loudoun	Aligned IAD02	513,000	NA
CloudHQ	Loudoun	CloudHQ LC2	531,700	NA
Digital Realty Trust	Loudoun	44274 Round Table (Bldg L)	1,057,000	The first phase of Building L includes six data halls, each of which supports 6 megawatts of capacity, and can range in size from 36,000 to 45,000 square feet. That's a change from the 1.2 MW data hall that for many years served as the standard form factor for Digital Realty's Turn-Key Data Center wholesale product.
Digital Realty Trust	Loudoun	Digital Realty Loudoun Ashburn Campus	1,700,000	critical load between 1.125 and 2.25 MWs
Digital Realty Trust	Loudoun	44751 Round Table (Bldg P)	791,223	NA

Source: Baxtel, BAE, 2023

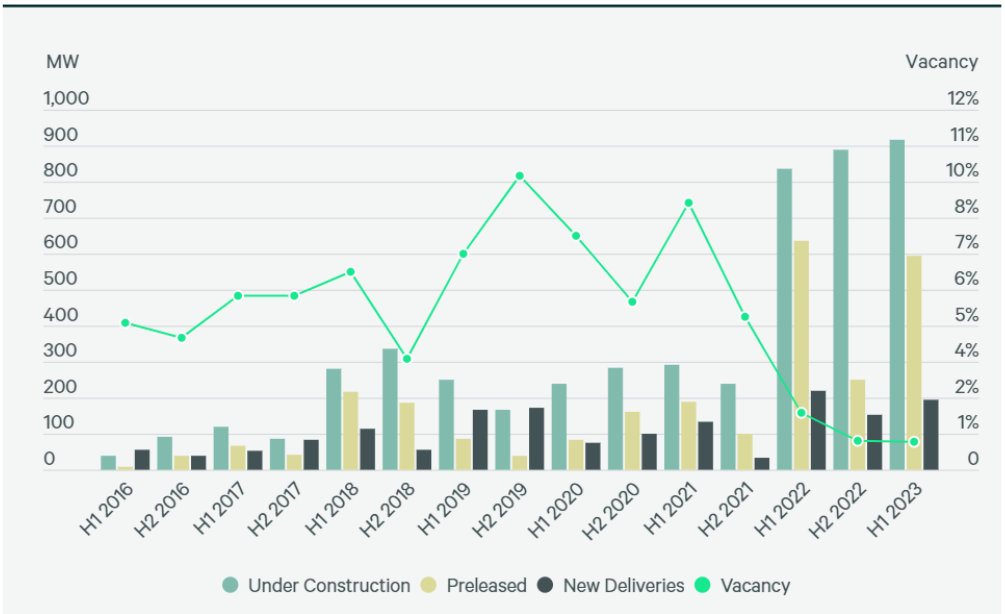
Note: Where NA is noted, this information was not available. Typically, data center size is measured in megawatts.

While land options are becoming more limited, there is a sustained pipeline of data center construction in Loudoun County or in the planning stage. Construction and vacancy data in following chart clearly shows the unprecedented demand for data centers since 2022. In H2 2021 there was only 239.0 MW under construction. But the H1 2022 metric of 837.0 MW is 3.5 times H2 2021. This increase was sustained through H2 2022 (889.0 MW) and H1 2023 (918.0 MW). At the same time, vacancy rate dropped from 5.1% in H2 2021 to 1.9% in H1 2022 to 0.98% in H2 2022 and to 0.94% in H1 2023 as shown in Figure 5.[38]

[37] Baxtel, "Northern Virginia Data Center Market." Retrieved from https://baxtel.com/data-center/northern-virginia.

[38] CBRE "North America Data Center Trends H1 2023: Northern Virginia." Retrieved from https://www.cbre.com/insights/local-response/north-america-data-center-trends-h1-2023-northern-virginia

Figure 5: Historical Market Information from H1 2016 – H1 2023 [39]



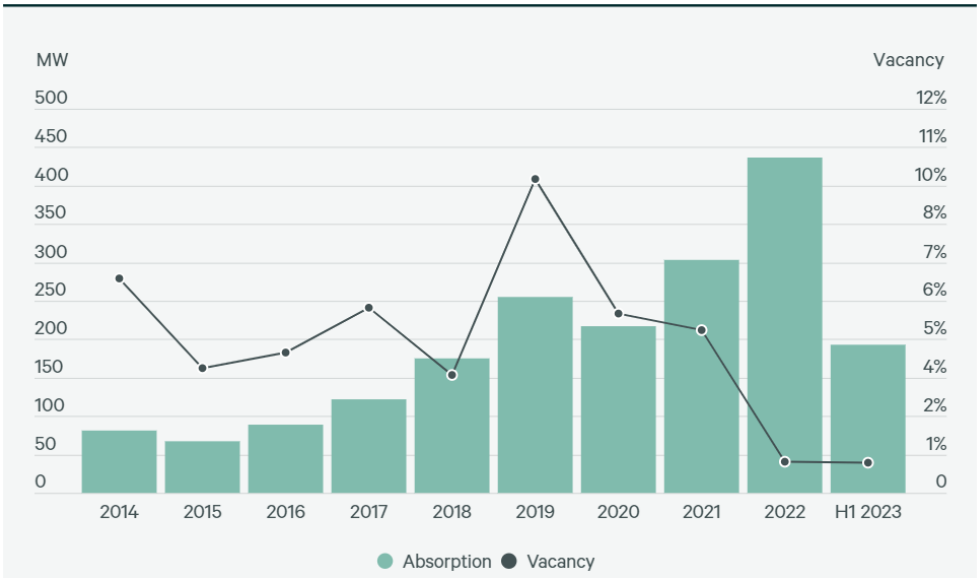
Source: CBRE Data Center Solutions, H1 2023.

Demand in the form of absorption reflects the construction/deliveries data in the above chart. Absorption is the capacity that was rented minus the capacity that became available during the period. Northern Virginia was not only the market with the largest data center inventory in 2022, but also the leading market in new data center capacities under construction. The following figure shows the demand growth with:

- 2021: 303.3 MW absorption against vacancy rate of 5.1%;
- 2022: 436.9 MW absorption against vacancy rate of 0.98%; and
- 2023 H1: 192.8 MW absorption against vacancy rate of 0.94%.

[39] CBRE.

Figure 6: Historical Supply and Demand from 2014 – H1 2023 [40]



Source: CBRE Data Center Solutions, H1 2023.

Leesburg in the Data Center Marketplace

Given the strong market demand for data centers in Northern Virginia the Town of Leesburg is attractive to data center developers. Data center developers and operators are already focused on the Town, with five potential sites in Leesburg with data center interest. This increased interest results from increasing demand for data centers in the region and other areas running out of space and/or facing community opposition to data center expansion. Leesburg has taken stock of assets in place (i.e., water and sewer capacity, etc.). Leesburg has evaluated what policy changes are appropriate to respond to and address data center development interest.

The Town provided water and sewer service and street access through the Town street system to Compass Creek which enabled the establishment of Compass Creek as a commercial and industrial center, including the Microsoft data center operations. Public water and sewer service is essential for data center operation, as these facilities require a large amount of water to function. As noted in the annexation petition, joint planning by the Town and County of Compass Creek as commercial and industrial development designated the area "for the Town's future expansion, specifically for commercial and industrial development."

In support of the proposed annexation bringing the Microsoft data center operation into the Town of Leesburg, as well as potentially allowing other data center development, the Town has

[40] CBRE

taken measures through policy and legislative changes to accommodate data center operations. Descriptions of these measures and associated processes, along with the Town's existing assets to support the data center use are included below.

- The Town of Leesburg provides water and sewer service to all of the Compass Creek area, including the existing Microsoft data centers. According to the Town of Leesburg's Director of Public Works Amy Wyks, the Town has adequate water and sewer capacity to also serve Microsoft's planned data center expansion in Compass Creek (A. Wyks, September 8, 2023).

- The Town approved Microsoft as a water and sewer customer in 2019 and 2020. [41]

- The Town of Leesburg also has adequate water and sewer capacity to accommodate the data center proposed for Compass Creek annexation area by the Petersen Companies for STACK, a colocation data center operator.

- The Town approved the Peterson parcel as a water and sewer customer on March 14, 2023. This is proposed as a "closed loop" data center, requiring less water than the Microsoft facilities

- The Town of Leesburg has adequate water and sewer capacity to accommodate the possible Village at Leesburg data center (also proposed as a closed loop data center).

- The Town also expects to have adequate water and sewer to serve the other possible data centers but it is too soon in the development review process for those to make that determination (A. Wyks, September 8, 2023).

- The Town has built out streets to connect Compass Creek into the Town's street system and maintains those roads to preserve good access into Leesburg and highways connecting the area to the broader region.

- Data center operators have reached out to the Town with interest in developing data centers in Leesburg. Town staff proposed two study efforts, one to reevaluate the zoning districts where data centers are allowed and another to develop standards that could potentially allow data centers to operate in the Town of Leesburg with minimal impact on residents and other businesses (J. David, October 2, 2023).

- In order to understand data center needs as the Department of Community Development evaluated possible standards for height, size, bulk, screening, and

[41] Town Council Resolutions, November 26, 2019, May 26, 2020, and August 11, 2020.

buffers, the staff contacted the Data Center Coalition to participate in discussions on what changes to current zoning could help accommodate data center operations without adverse impacts on residents and others. The coalition brought together data center developers, operators, and land use attorneys to work through standards. The input from the Data Center Coalition led to preparation of zoning ordinance amendments that would continue allowing data centers in I-1 (Industrial Research) and PEC (Planned Employment Center) zoning districts with appropriate standards (J. David, October 2, 2023).

- On August 8, 2023, the Town Council adopted the zoning ordinance amendments that established standards for data centers in the two zoning districts where they are allowed, I-1 and PEC. This included standards for building placement and orientation, building mass and articulation, screening (of both service areas and mechanical/electric equipment), noise, green building techniques, lighting, setbacks, landscaping/buffering/screening, power lines, data center electric utility substations, and parking. According to Mr. David, the standards establish more certainty to the development review process for data centers. (J. David, October 2, 2023).

Current Market Demand for Data Centers

BAE's investigation and data collection establishes that strong demand for data centers persists in Northern Virginia. Loudoun County has long been the focus of most of that demand. Prince William County is now seeing more demand for data centers due to the expansion of the County's Data Center Overlay Zone approved by the Board of Supervisors in 2022. Leesburg has also been contacted by data center operators and developers interested in developing data centers on sites located in the Town. Everyone contacted for this study indicated the growth potential for data centers in Leesburg is quite strong. BAE notes several points with respect to the demand for data center sites in the Town, Loudoun County, and the region:

1) Land prices for proposed data centers will continue to rise to unprecedented levels – Land sales for data center sites in Loudoun and Prince William counties between January and December 2022 ranged from $800,000 - $2.7 million per acre. In June 2022, ITT purchased 97 acres in Gainesville for $257,369,580 or $2.6 million per acre. In September 2022, Vantage Data Centers purchased 10 acres in Sterling for $27 million or $2.7 million per acre.[42]

[42] Cushman & Wakefield, "Data Center Update Americas H2 2022: United States and Canada." (2023). Retrieved from http://www.cushmanwakefield.com/en/insights/americas-data-center-update

2) The primary drivers for data center real estate site selection are availability of power and identification of sites suitable for data centers – Access to reliable power and sites that are readily suitable for data center use are the primary drivers for data center real estate site selection. Access to adequate power became particularly critical in 2022 when Dominion Energy, the primary power source for data centers in Northern Virginia, announced they may not be able to support new data center developments in some areas due to limitations on their ability to distribute power to substations. CBRE reported in its H1 2023 data center market report the following about the Northern Virginia market: "Preleasing activity is very high, as companies are securing space while waiting for power delivery."[43]

3) Data center operators are seeking properties in: Loudoun County, Prince William County and Leesburg. Most developers looking for data center sites want to be in Northern Virginia. And while they often put Ashburn in Loudoun at the top of the list, when they realize there are almost no opportunities there, they are looking at Prince William County, and Leesburg. Sites in these alternative places are "close enough" to the epicenter of data centers.

4) Local personal property tax rates are a factor but are not likely to be a primary consideration for data center site selection – Different localities in Virginia charge different personal property tax rates for data center personal property. In the more populated parts of the state, these range from $0.40 per $100 of assessed value in Henrico County to $4.57 per $100 of assessed value in Fairfax County. If a data center located in Leesburg, the center would be required to pay the Loudoun County personal property tax plus the Town of Leesburg's personal property tax. Both of the data center real estate specialists contacted for this study indicated that personal property taxes at whatever rate they are charged are not a deterrent in the current market with minimal supply of suitable data center sites in Northern Virginia.[44]

5) Other serious competitors to Northern Virginia for data center investments are starting to emerge in the market – Though demand for data centers in Northern Virginia remains quite strong, a few other areas in the broader region are offering both sites and/or improved incentives that may sway some data center interests in the longer-term including Henrico County, Culpeper, and much farther south, Mecklenburg County. Henrico County attracted a Meta (formerly Facebook) data center that is located in five buildings in the White Oak Technology Park in Sandston, VA. It should be complete by the end of 2023. Culpeper, located on the edge of what would be

[43] CBRE, "North America Data Center Trends H1 2023: Northern Virginia." Retrieved from https://www.cbre.com/insights/local-response/north-america-data-center-trends-h1-2023-northern-virginia

[44] This conclusion is consistent with BAE's data and conclusions in the Data Center Market Study Prepared for Prince William County, Virginia, October 2021, pp. 6 (Observation 4), 33 (Observation 4).

considered Northern Virginia, has four Equinix data centers and one data center property (CloudHQ) on the recent list of Northern Virginia data center site sales. Mecklenburg County is now home to a $2 billion Microsoft data center complex, with nine different data center buildings on one campus in Boydton and two more data centers planned in other parts of the County.

6) Data centers, particularly colocation centers, prefer to locate where there are other data centers – Data center operators achieve better efficiencies if they locate new data centers where they already have investments. The centers do not need to be immediately adjacent to achieve this efficiency; a short drive away (e.g., Sterling to Leesburg) would be sufficient. This is part of the reason why many data center operators remained focused on Northern Virginia.

7) Data centers are starting to be more vertical now which allows them to be sited on smaller properties – There is a trend for data centers to be more vertical—as much as 100-110 feet height—which allows them to be built on smaller properties. This may create more data center development in urban areas.

8) The demand for data centers, particularly in Northern Virginia, is strong and will likely remain so for many years. The data and information collected suggest there is unlimited demand for data centers in Northern Virginia. Construction and vacancy data in Figure 4 in this study illustrate that demand. The vacancy rate for data centers in Northern Virginia reported in CBRE's H1 2023 report is 0.94 percent, the lowest among all the primary and secondary data center markets.

KEY FINDINGS

Below are the key findings of the Leesburg Data Center Market Study.

Data Center Proposals in Leesburg and the Surrounding Area

- There is significant market interest in data center development in the Town of Leesburg.
- In the last several years, the Town of Leesburg has been approached by multiple data center operators interested in developing and/or expanding data centers within and immediately adjacent to the Town. This interest is coming from companies that operate enterprise data center facilities (i.e., Microsoft) as well as colocation data centers that rent out rack space to third parties (e.g., STACK, Iron Mountain, etc.).

- The first major data center investment in the Leesburg area was led by Microsoft when in 2018 it purchased 333 acres in the Compass Creek development, located in Loudoun County just outside the Town's boundary. The Town of Leesburg extended water and sewer to the entire Compass Creek area. Town streets access Compass Creek.

- The Compass Creek area will include another data center development to be developed by the Petersen Companies and it will include a colocation data center.

- There are three potential data centers in the legislative rezoning process in the Town of Leesburg. The first is the Village of Leesburg Land Bays D and E that is part of the Village of Leesburg mixed-use development. The proposed data center there would be a colocation center, operated by STACK. This site has 11 acres that can be developed.

- There are two other applications pending with the Town. One, called Westpark Tech, requests zoning changes to allow either a data center or flex industrial, proposed for the 7.58 acre site. The other is Oak Lawn Land Bay A, a 26 acres site near the Dulles Greenway. These applications request zoning changes to allow data centers to be developed on these properties.

- There are two other potential data center sites, the Mintjens property on Route 7 and another on Cardinal Park Drive. Both of these are conceptual at this juncture, though the Mintjens property developer has had a pre-application meeting.

- The annexation of Compass Creek by the Town of Leesburg is unlikely to have any adverse effect on data center development in Compass Creek or anywhere else in Loudoun County.

State of the Industry: Emerging Trends

Global/U.S.

- In 2023, the data center market continues to experience robust growth and transformation globally. There has been substantial growth in all three types of data centers: hyperscale, colocation, and enterprise centers.

- Data center demand in the U.S. measured by power consumption (gigawatts) is expected to grow by approximately 10 percent per year between 2023 and 2030. (McKinsey)

- Strong demand and developer interest continues to drive new construction across the U.S., but a lack of readily available power and extended lead times for components of electrical infrastructure are delaying construction. (CBRE Research)

- The overall vacancy rate in H1 2023 for primary markets in the U.S. remains near a record low, at 3.3 percent. The Northern Virginia vacancy rate is 0.94 percent, the lowest of all U.S. markets. (CBRE Research)

- Most major markets in the U.S. are dealing with power constraints. Accordingly, many data center operators are prioritizing power availability, over location, connectivity, water, and the price of land. (CBRE Research)

Northern Virginia

- Northern Virginia continues to be the largest data center market in the U.S. Data centers in Northern Virginia make up 49.1 percent of the primary market inventory in the U.S. The next largest market is Dallas/Fort Worth which has 10.9 percent of the primary market. (CBRE Research)

- Overall, in Northern Virginia demand has outpaced supply, hence a vacancy rate of less than one percent. (CBRE Research)

- All of the major real estate research brokerages predict continued market strength for the Northern Virginia data center market in 2023. In its H1 2023 data center market report, CBRE noted that "Preleasing activity is very high, as companies are securing space while waiting for power delivery." (CBRE Research)

- For data center providers JLL's market outlook is as follows: 1) tremendous demand for availabilities of scale; 2) achievable rental rates have increased; and 3) There is "fierce" competition for land sites in both Loudoun and Prince William. (JLL)

- The price per acre for data center sites continues to increase as a result of dwindling land inventory for data centers. The price per acre for eight of the 12 transactions on Cushman & Wakefield's list of site sales between January and December 2022 topped $2 million. On the same list for 2021, only one property sold for more than $2 million per acre. (Cushman & Wakefield)

- A significant market challenge for Northern Virginia going forward is the lack of available development sites. Ashburn no longer has any available sites, short of

some limited redevelopment options. The next best option, Prince William County, has few sites left.

- Another challenge that surfaced in 2022 is that Dominion Energy, the largest electric utility in Northern Virginia, may not be able to support new data center developments in all parts of Northern Virginia due to limitations on their ability to distribute power to substations.

Recent Trends in Site Selection

- Historically, data centers have prioritized six key factors when selecting new sites for development: fiber connectivity, environment, access to electrical power, access to water, a skilled workforce, and policy incentives. Today, it is clear that access to electrical power and identification of suitable sites are the key factors, particularly in a market as tight as Northern Virginia's.

- Even as land prices throughout Northern Virginia increase to well over $1 million per acre, the upfront cost of land is becoming an increasingly small part of the total development cost, particularly in comparison to the market value of connectivity to the network.

- The additional taxes that a data center would be responsible for paying to the Town of Leesburg if they located within the Town limits, above what they would pay in Loudoun County, is not stopping data centers from wanting to locate in Leesburg. The locational advantages of the Town's sites outweigh this additional cost.

- The availability of land and sites that can be developed by right or with minimal zoning adjustments will be the primary factor determining site selection in the near future.

Market Demand Analysis – Data Centers in Northern Virginia

- While land options are becoming more limited, there is a sustained pipeline of data center construction underway or in the planning stage in Loudoun County. (CBRE Research)

- Northern Virginia was not only the market with the largest data center inventory in 2022, but also is the leading market in new data center capacities under construction. No other primary market in the U.S. is even close. (CBRE Research)

Leesburg in the Data Center Marketplace

- Given the strong market demand for data centers in Northern Virginia, the Town of Leesburg is attractive to data center developers. Data center developers and operators are already focused on the Town, with at least five sites in Leesburg with data center interest.

Appendix B

Stantec Consulting Services, Inc.

October 10, 2023

An Analysis of Land Markets and Utility Capacity in Leesburg and Compass Creek

Stantec

An Analysis of Land Markets and Utility Capacity in Leesburg and Compass Creek

Prepared for: Town of Leesburg, Virginia

Prepared by: Stantec Consulting Services, Inc.

John K. Bachmann, Senior Principal
Practice Leader, Community Development, Mid-Atlantic Region
October 10, 2023

Executive Summary

1. In its "Responsive Pleading of the County of Loudoun and Supporting Narrative, Information, Citations, and Materials" dated July 7, 2023, Loudoun County claims that the Town of Leesburg does not need additional land for industrial and commercial development. This argument is built on the Technical Memorandum prepared by RKG Associates, attached as Appendix B.1 to the County's response. The essence of the County's argument is that: (i) the demand for industrial and commercial land in the Town is low; and (ii) the Town's existing supply of land zoned for industrial and commercial use is sufficient to accommodate projected demand over the next few decades.

2. The County's analysis of the demand for industrial and commercial land in Leesburg is inaccurate. The analysis is based on an incorrect definition of the market area for industrial and commercial land in Leesburg. The analysis also fails to acknowledge the historical context for development in Leesburg, which has been growing rapidly since the mid-1980s.

3. The County's analysis does not recognize the long-established planning process for urban expansion in Leesburg. This joint planning process is stated in the Town's and the County's comprehensive plans since the mid-1980s and early 1990s, namely, that the Town was the presumed provider of water and sewer service to areas undergoing expansion and that upon extension of these utilities, the areas served would be incorporated into the Town's corporate limits.[1] The Town and the County have applied this process in Compass Creek, where one boundary line adjustment property was completed in April 2020[2] and another was approved by County Board of Supervisors in April 2022.[3]

4. The County's analysis does not acknowledge the significant infrastructure investments made by the Town since 2008 to promote and facilitate the development of Compass Creek. Without these Town infrastructure investments, Compass Creek could not have been developed for intensive commercial and industrial uses. The road construction projects, water system extensions, and wastewater system expansions undertaken by the Town made it possible for industrial and commercial establishments to build and operate facilities in Compass Creek. All of Compass Creek requires the use of Town infrastructure, including street access, water and sewer facilities, and stormwater management.

Leesburg Needs More Industrial and Commercial Land

5. The County's analysis of demand for industrial and commercial land inaccurately limits Leesburg's market area for industrial and commercial land to the Town's corporate limits. The more appropriate market area includes the Town and the surrounding Joint Land Management Area (JLMA). The development of land in the Leesburg area is driven by demand, proximity to the Town, and the availability of Town services. Thus, the market area is regional; it extends beyond the existing limits of the Town of Leesburg.

6. The demand for industrial and commercial land in Leesburg has spilled over into Compass Creek in recent years because there was not enough land in the Town that was available and suitable for development.

[1] This policy is made explicit in Loudoun County's 1991 General Plan, p. 52: "Urban Growth Areas around towns are served by town utilities and are expected to be annexed into the town as public utilities are extended."
[2] Loudoun County Circuit Court, Civil Action No. CL20-2343.
[3] Loudoun County, Minutes of Board of Supervisors Meeting, April 13, 2020.

An accurate analysis of demand for industrial and commercial land should take into account not only recent development projects in the Town, but also recent development project near the Town, including in the JLMA. The same dynamics that create and sustain demand for new development are present in both the existing Town and in the JLMA.

7. In the absence of available land within the Town boundary, commercial and industrial development has occurred at Compass Creek. Over the period 2018-2021, 101 acres of land was developed at Compass Creek, including the Walmart store, At Home store, Crosstrail (now, Compass Creek) commercial center, and Microsoft data center campus.

Leesburg's Remaining Industrial and Commercial Land Supply Is Inadequate to Meet Demand

8. Leesburg has 52 vacant land parcels zoned for industrial and commercial development. Not all of these parcels are appropriate for industrial and commercial development. First, industrial and commercial submarkets have different land requirements. Second, no two land parcels are alike—some parcels are not suitable or attractive for commercial or industrial development because of size, configuration, topography, or other limiting factors.

9. After filtering out vacant parcels unsuitable for industrial and commercial development, the total area of the remaining parcels is 262 acres. Many of these parcels are too small for development as data centers or industrial flex. Only nine of these parcels are larger than 10 acres in area. The total area of these ten parcels is approximately 159 acres. These ten parcels are likely to be developed in coming years. The other small and/or constrained parcels will be developed at a slower pace; many are likely to be developed after a period of years, if ever. In the meantime, the industrial and commercial land deficit will continue to hinder Leesburg's regional economy.

There Is Strong Historical Precedent for Annexation of Compass Creek

10. The County's analysis fails to acknowledge the historical context for development in Leesburg, which has been growing rapidly since the mid-1980s. Since the 18th century, Leesburg has expanded its boundaries in response to population growth and economic expansion. There have been 12 land grants, annexations, and boundary line adjustments since 1759. For example, 1,722 acres were added in 1958 (a 6.7-fold increase on the previous land area), and 5,193 acres were annexed into the Town in 1984 (a 3.6-fold increase).[4] Since 2000, Loudoun County and the Town of Leesburg have cooperated on seven more boundary line adjustments.

11. The County's analysis does not recognize the long-established planning process for urban expansion in Leesburg. This joint planning process is stated in the Town's and the County's comprehensive plans since the mid-1980s and early 1990s — namely, that the Town was the presumed provider of water and sewer service to areas undergoing expansion and that upon extension of these utilities, the areas served would be incorporated into the Town's corporate limits.

12. The Town and the County have applied these joint planning and annexation policies to properties in Compass Creek. Beginning in 2018, the Town and County collaborated on a boundary line adjustment that

[4] This translates to 8.11 square miles. The Commission on Local Government records 7.17 as the area of the annexation in the 1983 report.

resulted in the incorporation in 2020 of 119.0143 acres of land in and near Compass Creek into the Town boundaries.[5] This boundary adjustment area included four parcels in Compass Creek covering 21.5538 acres. In April 2022 the County Board of Supervisors approved an additional boundary line adjustment that applied to three more properties in Compass Creek: the Walmart, At Home and CC Outparcel properties. This boundary line adjustment has not been completed. The three properties in Compass Creek that were the subject of the April 2022 Board of Supervisors approval are included in the annexation area.

13. The history of annexations and boundary line adjustments in Leesburg demonstrates that the County and the Town have worked together for years, in accordance with established joint planning and annexation policies, to expand the Town boundaries in response to development needs and service needs.

The Town of Leesburg Made the Development of Compass Creek Possible

14. The County's analysis does not acknowledge that Compass Creek would not have developed without the Town of Leesburg's planning framework, legislative actions, and infrastructure investments.

15. The Town and the County collaborated on the planning framework for joint development at the urban periphery of Leesburg: the JLMA. The planning framework identified the Town as the primary provider of infrastructure for greenfield development in the JLMA.[6]

16. Over the period 2008–2021, Town of Leesburg delivered the infrastructure that made the development of Compass Creek possible. The Town extended water supply and wastewater collection and treatment services to the Lower Sycolin service area in an incremental fashion over a 30-year period. The Town undertook and managed the extension of water and sewer service to Compass Creek as part of the Lower Sycolin area. The Town also undertook and managed the extension of Battlefield Parkway — which connected Compass Creek to Sycolin Road, Route 7, and finally Route 15 — over the period 2006–2018. The deliberate efforts of the Town over a four-decade period laid the groundwork for the construction of commercial and industrial facilities at Compass Creek.

Leesburg Has Enough Water Capacity to Serve Compass Creek

17. The County's claim that Leesburg's Water Treatment Plant lacks sufficient water capacity to serve current and future data center development in Compass Creek is based on an outdated December 2019 analysis that is inconsistent with events since 2019.

18. Additional, more accurate, data are now available. Following the December 2019 analysis, the Town's Department of Utilities continually updated and refined its water capacity analysis over the next two years, and presented additional analyses to Town Council on February 24, 2020, August 10, 2020, February 22, 2021, March 7, 2022, and September 12, 2022.[7]

19. This Report reviews the Town's September 12, 2022 utility capacity analysis and analyzes with greater accuracy the amount of water that will be used by approved development, including the Microsoft and other data centers at Compass Creek, as well as other anticipated future development elsewhere in the

[5] Loudoun County Circuit Court, Civil Action No. CL20-2343.
[6] Loudoun County General Plan 1991, p. 52.
[7] Town of Leesburg, "Informational Memo: Capacity of Utility Plants – Semi Annual Report," August 10, 2020; February 22, 2021; March 7, 2022; and September 12, 2022 (presentation to Council).

Town. Based on this analysis, Stantec has concluded that the Town has enough water to serve all of its current commitments, including existing customers in Town and in the JLMA and approved development in Town and in the JLMA. Under all scenarios, the Town has enough water to serve all development in Compass Creek.

Table of Contents

I. Introduction

20. This memorandum addresses certain arguments made by Loudoun County on the subjects of industrial and commercial land markets and utility capacity in the Town of Leesburg in the July 7, 2023 document entitled "Responsive Pleading of the County of Loudoun and Supporting Narrative, Information, Citations, and Materials," as well as in the supporting Technical Memorandum prepared by the County's consultant, RKG Associates.

21. The County's analysis and conclusions have the following shortcomings: (i) the analysis of demand for industrial and commercial land is inaccurate; (ii) the analysis ignores the established policy framework for development of the Joint Land Management Area (JLMA); (iii) the County makes comparisons among incorporated cities and towns in Northern Virginia that are not germane to the analysis of the Town of Leesburg's need for more land for industrial and commercial development; and (iv) the County uses outdated information to draw its conclusion that the Town lacks sufficient water to supply Compass Creek.

22. The County's analysis does not recognize the established process for urban expansion in Leesburg, which is set forth in the Town's and the County's comprehensive plans, namely, that the Town provides water and sewer service to areas undergoing expansion and that after the development is complete, those areas are incorporated within the boundary of the Town. The County Board of Supervisors recognized in its June 3, 2008 resolution acknowledging that this arrangement applies to Compass Creek. The Town had previously confirmed with the County that it would serve all of Compass Creek, and desired to annex this area into the Town's corporate limits.[8]

II. Leesburg Needs More Industrial and Commercial Land

23. The County's analysis of demand for industrial and commercial land is inaccurate. The analysis is based on an incorrect definition of the market area for industrial and commercial land in Leesburg. The correct market area includes the Town and its JLMA.[9] The development of land in the Leesburg area is driven by demand, proximity to the Town, and the availability of Town services. The market area is regional; it extends beyond the existing limits of the Town of Leesburg.[10] The dynamics that create and sustain demand for new development are present in both the existing Town and in the JLMA.

24. The demand for industrial and commercial land spilled over into the Leesburg JLMA in recent years because there was not enough land available for development in the Town. This is reflected by development in Compass Creek, which is part of JLMA. From 2018-2021, approximately 101 acres of land in Compass Creek was developed, including the Walmart store, At Home store, Crosstrail (Compass Creek) commercial center, and Microsoft data centers (see Table 1 below).[11] The retail and industrial properties at Compass Creek reflect effective demand for industrial and commercial land in Leesburg.

[8] July 11, 2006. Town letter to County.
[9] On page 8 of the Legacy Leesburg Town Plan, the Town identifies the Town boundary *and* the JLMA as the appropriate planning area for Leesburg, a direct reflection of the extent of the market area.
[10] Pirounakis, Nicholas G. Real Estate Economics: A Point-to-Point Handbook, Chapter 6.2.1. London: Routledge, 2013.
[11] December 19, 2019, Revised Plat Showing Boundary Line Adjustment to the Corporate Limits for the Town of Leesburg.

Table 1. Industrial and Commercial Land Development in Compass Creek, 2018–2021

Project	Land Area (acre)
ION International Training Center	14.9
Crosstrail (Compass Creek) Commercial Center	8.4
Walmart	20.5
At Home	10.4
Microsoft Data Centers	47.0
Total	101.2

Source: Google Earth Pro; Loudoun County GIS; Stantec 2023.

25. The County's calculation of industrial and commercial land demand is based on average annual absorption rates of 2.9 acres and 12.0 acres for industrial and commercial land, respectively.[12] While the basis for this calculation was not disclosed, it appears that the County performed a straight average of its determination of the land area of industrial or commercial development divided by the period 2010-2021. Based on these averages, the County estimated that it would take 22.8 years (at 2.9 acres per year) to absorb the remaining vacant developable industrial land in the Town and 12.8 years (at 12.0 acres per year) to absorb the remaining vacant developable commercial land. The County, therefore, concluded that the Town's remaining supply of vacant land are adequate to meet projected demand.

26. The County's land absorption rate calculation is inaccurate for several reasons, including that the County's averages ignore the realities of industrial development needs and do not accurately reflect the Leesburg market area.

27. In practice, industrial land is not developed three acres at a time. While smaller, 1- to 3-acre parcels may be developed for uses that fall under an "industrial" zoning classification (e.g., self-storage), most industrial development requires parcels that are much larger than 2.9 acres in area. This is reflected by the fact that most industrial parcels are larger than 3 acres; most of the vacant parcels of industrial land in the Town are between 8 and 24 acres, as discussed below. These larger industrial parcels are not developed in piecemeal 2.9-acre segments, but rather the entire parcel is developed at once as part of a single industrial use. These facts highlight broader conceptual flaws in the County's vacant land consumption argument.

28. Moreover, an accurate assessment of recent demand trends for industrial and commercial land must take into account not only development projects in the Town's corporate limits, but also development projects in the Leesburg JLMA, the area designated for the Town's expansion. Actual industrial and commercial land development since 2019 in the Leesburg market includes the properties in the Leesburg JLMA, including Compass Creek, as listed in Tables 2 and 3, below.

[12] RKG Associates, Technical Memorandum: Town of Leesburg Annexation Need Analysis, June 2023.

Table 2. Industrial Development in Leesburg and the JLMA, 2019–2023

Project	Location	Zoning District	Land Area (acre)
RightAway Storage	Town of Leesburg	I-1	2.5
EPL Archives, Building 2	Town of Leesburg	I-1	11.7
Leesburg Tech Park	Town of Leesburg	I-1	17.5
Oaklawn Flex Space	Town of Leesburg	PEC	6.3
Compass Creek Self Storage	Town of Leesburg	I-1	2.3
Microsoft Data Centers	JLMA	PD-IP	47.0
Total			87.3

Source: Town of Leesburg GIS; Loudoun County GIS; Stantec 2023.

Table 3. Commercial Development in Leesburg and the JLMA, 2019–2023

Project	Location	Zoning District	Land Area (acre)
Floor and Décor	Town of Leesburg	B-3	11.5
Potomac Station Marketplace Sheetz	Town of Leesburg	PRN	1.2
Oaklawn Land Bay D (Chick-fil-A)	Town of Leesburg	PEC	2.2
Shops at Russell Branch projects	Town of Leesburg	B-3	17.0
Fort Evans Square	Town of Leesburg	B-3	5.2
Meadowbrook Neighborhood Center	Town of Leesburg	R-1	23.8
Lidl at Tuscarora Village	Town of Leesburg	PRC	5.8
Home 2 Suite	Town of Leesburg	B-3	5.2
Sonic (Oaklawn)	Town of Leesburg	PEC	1.3
Church & Market	Town of Leesburg	B-1	1.6
Leesburg Plaza Café (Starbucks)	Town of Leesburg	CDD	0.6
ION International Training Center	Town of Leesburg/JLMA	PD-IP & I-1	14.9
Crosstrail Commercial	JLMA	PD-IP	8.4
Walmart	JLMA	PD-CC-SC	20.5
AtHome	JLMA	PD-CC-SC	10.4
Segra Field	JLMA	PDSA	54.0
Total			183.6

Source: Town of Leesburg GIS; Loudoun County GIS; Stantec 2023.

29. A realistic assessment of the industrial and commercial development in the Leesburg market shows that the County's land absorption calculation is inaccurate, and significantly underestimates the pace of industrial and commercial development in the Town. While the County and RKG suggest that only 31.9 acres of industrial land were developed in the Town from 2010 to 2021 (2.9 acres per year for 11 years), there were actually 87.3 acres of industrial development over the past 4 years, 2019 to 2023.[13] Similarly, the County and RKG suggest that only 132 acres of commercial land in the Town were developed from 2010 to 2021 (12.0 acres for 11 years), but there were actually 183.6 acres of commercial development over the past 4 years.[14]

[13] While there are faults in using a straight average to calculate land absorption rates, as discussed herein, an accurate quantification of the amount of industrial development in the Town results in an average of 21.825 acres of industrial development per year—nearly ten times the absorption rate suggested by RKG and the County.

[14] Similarly, this results in a straight average commercial land absorption rate of 45.9 acres per year—over four times the absorption rate suggested by RKG and the County.

30. The County argues that "The Town's total acres and square footage of (commercial and industrial) development compare very favorably to these other high-performing localities (namely, Purcellville, Herndon, Manassas and Vienna) […] this comparison confirms for the Commission that Leesburg is generally on par with or exceeding its peers in the region."[15] A static snapshot of the amount of industrial and commercial land and built area in the Town as compared to other incorporated areas is irrelevant. Analyzing the supply side in isolation across different geographic areas does not reflect industrial and commercial market performance. The relevant indicator is supply/demand equilibrium. And the relevant question is: Does the Town have enough land to satisfy effective demand? The answer is, No, not for long. The analysis in the following section supports this conclusion.

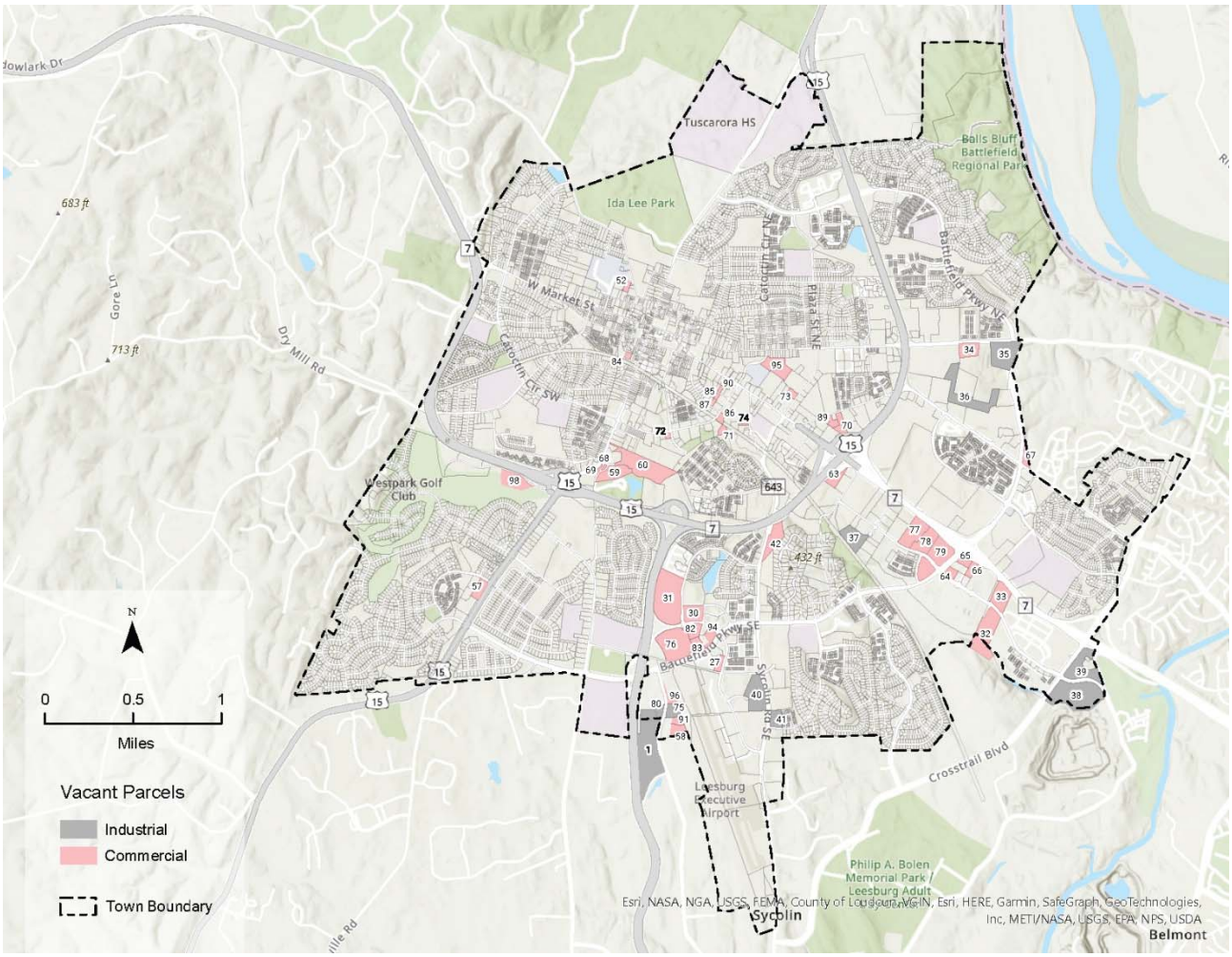
III. Leesburg's Remaining Industrial and Commercial Land Supply Is Inadequate to Meet Demand

A. Vacant Land in Town

31. Leesburg has 52 parcels of land, with a gross land area of approximately 305 acres, potentially available for future industrial and commercial development (see Figure 1 and Table 5 below). However, not all of these parcels are appropriate for industrial and commercial development for several reasons. First, industrial and commercial submarkets have different land requirements. Second, no two land parcels are alike. All land parcels have their own area, shape, topography, soils, access, and flood risk characteristics. It is inaccurate to divide a given total vacant land area by recent annual average land absorption (used as a surrogate for demand) in order to conclude that Leesburg has enough land for a certain number of years to come. This is not how land markets function in practice.

[15] County Response, at p. 108.

Figure 1. Location Map for Vacant Industrial and Commercial Land Parcels

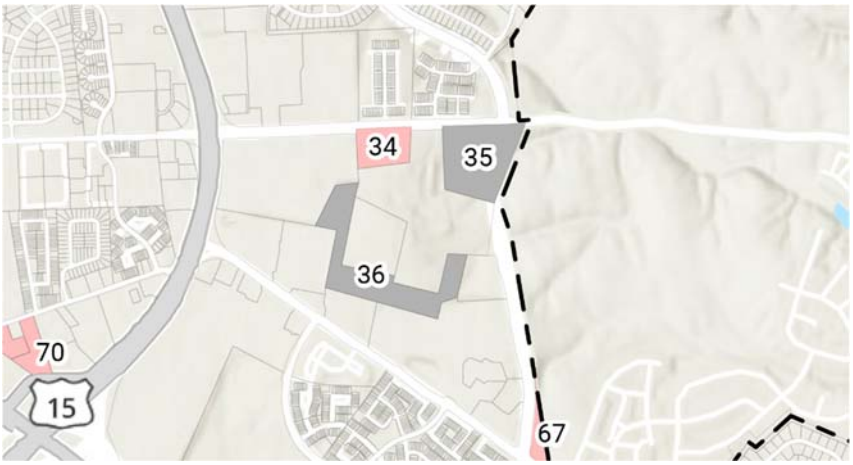


Source: Stantec, 2023.

32. A more detailed analysis of the characteristics of each of the remaining 52 industrial and commercial land parcels better informs and refines the land supply analysis.

33. First, some of the parcels are crossed by infrastructure easements, while others have irregular shapes or limited road access that make development impractical. Consider the parcel having PIN 147156270, shown as Parcel ID 36 in Figure 2. This 15.32-acre parcel is vacant and zoned B-3 (Community Retail/Commercial District) and, therefore, technically contributes to commercial land supply. However, in practice, this parcel is not developable for several reasons. This parcel (along with nearby Parcel ID 35) is owned by the adjoining property owner to the north and is encompassed by gated fencing for the Dewberry and REHAU Americas office complex. Parcel 36 is inefficiently "U"-shaped and only 373 feet at its widest point. Finally, this parcel has no public road frontage and is only accessible if road access was secured through parking lots or service roads on adjoining private property.

Figure 2. Example of Undevelopable Land Parcel (Parcel 36)



Source: Town of Leesburg GIS; Stantec 2023.

34. As shown on Table 4 below, Parcel ID numbers 35, 36, 42, and 69, with a total combined area of 35.83 acres, have these shape and/or topography challenges, which make them incapable of satisfying future demand for industrial and commercial land. Parcel ID 35, which is also visible in Figure 2, has an area of steep slopes running east-west through the middle of it. These four parcels cannot be considered as having economic development value equal to that of other vacant parcels without such encumbrances.

35. Second, three parcels, with a total combined area of 6.5 acres, are located in flood-prone areas, specifically the 100-year flood plain. These include Parcel ID 70 (PIN 188179105000, 4.91 acres); Parcel ID 73 (PIN 188165193000, 1.28 acres); and Parcel ID 74 (PIN 189451369000, 0.31 acres). Parcels in the flood plain are not capable of fully meeting future demand for land because Town zoning prohibits industrial and commercial development in the floodway.[16] Table 4 shows the remaining parcels, after exclusion of the parcels in the 100-year flood plain.

36. Additionally, some parcels that are classified by the County GIS system as "vacant" are in fact partially developed and in use. For example, Parcel ID 41 (3.92 acres), part of which is already under use by the owner, Dominion Power, as a parking lot; Parcel ID 57 (owned by adjoiner, 3.65 acres) has a driveway running through it.

37. Some of the parcels identified by the County as vacant are already developed and in use, such as the Sonic parcel at Oaklawn (PIN 233299325).

38. After filtering out the parcels unsuitable for industrial and commercial development, the total area of vacant and suitable commercially zoned parcels is approximately 193 acres, while the total area of industrially zoned parcels is approximately 70 acres. As described in see Section B below, however, many of these parcels are subject to development applications submitted to the Town and/or owners who have expressed intent to develop their parcels.

[16] Town of Leesburg, Zoning Ordinance § 7.11, Floodplain Overlay District, Subsection 7.11.7.

Table 4. Vacant Commercial and Industrial Land Parcels in Town of Leesburg, 2023

ID	PIN	Parcel Area (acre)	Developable Area (acre)	Zoning	Status/Notes
27	233203672000	2.00	2.00	PEC	Proffered to Town for Fire and Rescue Dedication site.
30	233396106000	6.26	6.26	PEC	Proposed for development as industrial flex.
31	233388942000	26.42	26.42	PEC	Owner intends to seek rezoning for data center development.
32	149263544000	16.05	16.05	B-3	Town has purchased for expansion of public works facility.
33	149368055000	7.73	7.73	B-3	Pending application for hotel development.
34	147271333000	5.27	5.27	B-3	
36	147156270000	15.32	-	B-3	Irregular parcel; difficult to develop.
42	189160666000	6.97	-	O-1 General Office	Steep slopes; difficult to develop.
52	230176511000	1.21	1.21	MC Medical Hospital Center	Proposed 19 age-restricted condos.
57	273492205000	3.68	3.68	B-1 Community Downtown	
58	234391457000	3.01	3.01	B-3	Pending application for self-storage facility.
59	232375627000	7.53	7.53	CDD Crescent District: Commercial	Rezoned for commercial and other uses, but not developed.
60	232377166000	19.66	19.66	CDD Crescent District: Mixed Use Optional	Rezoned for commercial and other uses, but not developed.
63	189378431000	2.86	2.86	B-3	
64	149453326000	1.95	1.95	B-3	
65	149457258000	1.79	1.79	B-3	
66	149459235000	1.79	1.79	B-3	Active rezoning application for proposed drive-through restaurant.
67	148475479000	2.28	2.28	B-3	Awkward shape, but still developable.
68	232369443000	0.29	0.29	CDD: Commercial	Small but developable.
69	232368037000	0.30	-	CDD: Commercial	Difficult to develop because of infrastructure easements.
70	188179105000	4.91	-	CDD: Commercial	In the 100-year floodplain.
71	232404981000	1.84	-	CDD: Commercial	In the 100-year floodplain.
72	234488765000	0.60	-	CDD: Commercial Corridor	In the 100-year floodplain.
73	188165193000	1.28	1.28	CDD: M-U Residential	
74	189451369000	0.31	0.31	CDD: M-U Optional	Partially in the 100-year floodplain, yet developable.
76	233290512000	18.11	18.11	PEC	In flight path; difficult to develop.
77	189103080000	9.85	9.85	B-4, PRC	Rezoned for commercial use, but not developed.
78	189106250000	7.70	7.70	B-4, PRC	Rezoned for commercial use, but not developed.
79	148151619000	14.39	14.39	B-4, PRC	Rezoned for commercial use. A supermarket is proposed.
82	233296254000	3.75	3.75	PEC	
83	233296822000	1.52	1.52	PEC	
84	231278080000	0.74	0.74	B-1	
85	231103583000	0.45	0.45	CDD: Commercial/Commericial Corridor	Currently used for car storage.
86	231104723000	1.09	1.09	CDD: Commercial	Currently used for car storage.
87	231102364000	0.56	0.56	CDD: Residential High/Commercial Corridor	
89	188177578000	1.52	1.52	CDD: Commercial	
90	231204604000	0.47	0.47	CDD: Commercial	
91	234491584000	1.77	1.77	B-3	Approved site plan with proposed 8,000 sq ft restaurant.
94	233201036000	2.41	2.41	PEC	Proposed car wash.
95	188261371000	8.07	8.07	Planned Residential Neighborhood District	Proposed 59 townhomes.
96	234489448000	1.16	1.16	B-3	Active rezoning application for proposed automotive service bldg.
98	272302501000	7.58	7.58	B-3	Active rezoning application for an industrial building.
Subtotal Commercial		222.44	192.50		
1	234382596000	3.06	3.06	I-1	Approved for development as a data center.
35	147368209000	13.24	-	I-1	Steep slopes; difficult to develop.
37	189184259000	8.23	8.23	I-1	Owner has expressed interest in developing as a data center.
38	150490155000	24.71	24.71	I-1	Owner intends to develop as a data center.
39	149192542000	12.01	12.01	I-1	Owner intends to develop as substation.
41	191460526000	3.92	3.92	I-1	Only partially vacant: Dominion Power has a parking lot here.
75	234488819000	1.69	1.69	I-1	
80	234486117000	1.19	1.19	I-1	
40	190155301000	11.71	11.71	I-1	Future EPL expansion site.
100	234382603002	3.06	3.06	I-1	
Subtotal Industrial		82.81	69.57		
TOTAL		305.25	262.07		
Land use:					
	= Commercial				
	= Industrial				

B. Available Vacant Commercial Land in Town

39. A number of vacant, commercially zoned parcels in Leesburg are the subject of current development applications. Parcel ID 33 (7.73 acres) is proposed for development by Leesburg FairTowne Inn and Suites LLC as a hotel with two other commercial buildings.[17] A Lidl grocery store was approved by Town Council in September 2023 for development on Parcel ID 79.[18] Parcel ID 31 is the subject of a rezoning application for development of a data center.[19] Parcel ID 66 is the subject of a rezoning application for a drive-through restaurant.[20] Parcel ID 91 has an approved site plan with a proposed 8,000 square foot restaurant. While these parcels are still listed in Table 4 because they are vacant, commercially zoned and suitable for development, their ability to meet future demand for commercial land is limited since they have been earmarked for development projects.

40. The owners of other vacant, commercially zoned parcels have expressed intent in their communications with Town officials to develop their parcels in the near future. The owner of Parcel ID 30 intends to develop it as industrial flex. Parcel ID 32 has been purchased by Town of Leesburg, which intends to develop as a facilities yard. While these parcels are listed in Table 4 because they are vacant, commercially zoned and suitable for development, their ability to meet future demand for commercial land is limited since they have been earmarked for development projects.

41. The small vacant parcels (less than two acres in area) are not capable meeting the demand for large commercial projects. While small-scale commercial projects are still developable on small sites, developers generally require parcels greater than two acres in area to implement significant commercial real estate development projects, especially given the requirement to include surface parking in retail and office projects in a suburban location such as Leesburg.

C. Available Vacant Industrial Land in Town

42. There are only ten parcels, comprising 82.81 acres, of vacant industrial land that are available for development in The Town. These parcels fall into two size categories: parcels less than four acres in area, and parcels more than eight acres in area.

43. Of the ten remaining industrially zoned parcels, five are under four acres in area. These parcels are too small for appreciable industrial development, such as data centers. Many of the permitted uses under the Industrial (I-1) district suitable for parcels of this size are commercial in nature (for example, child care center, doggy day care, eating establishment, hotel/motel, outdoor storage). While these are I-1 permitted uses, they overlap with the permitted uses of commercially-zoned districts such as B-1, B-2, B-3, and B-4. These smaller parcels will be developed at a slower pace; many are likely to be developed after a period of years, if ever.

44. There are four developable parcels in the Town that are suitably sized to respond to current and future demand for industrial development. Data center developers, for example, prefer large parcels —

[17] TLZM-2022-0004.
[18] Town of Leesburg, Resolution 2023-O-019, September 12, 2023.
[19] TLREZN-2023-0001.
[20] TLZM-2021-0012.

generally in excess of ten acres in area — in order to achieve economies of scale in development and operation. These five parcels, totaling 47.89 acres, are:

- PIN 234382596000 (3.06 acres in Town, 27.98 acres in County, total of 31.04 acres see Parcel ID 1)
- PIN 150490155000 (24.71 acres, see Parcel ID 38 on Figure 1)
- PIN 149192542000 (12.01 acres, see Parcel ID 39 on Figure 1)
- PIN 190155301000 (11.71 acres, see Parcel ID 40 on Figure 1)

45. These parcels are likely to be developed in coming years, as reflected by ongoing development activity on each of these parcels.

D. Competition from Other Uses

46. The shortage of land available for industrial and commercial uses is exacerbated by competition from residential developers and other uses. The proposed rezonings in recent years of commercially zoned land to residential uses reflects this competition. In addition, since 2003 the County has developed 593 acres for County facilities and parks in the Lower Sycolin area near the Leesburg Executive Airport (see Table 5 below).[21] The development of these parcels was made possible by expansion of the Town water and sewer systems. With their development into institutional uses, these parcels are no longer capable of responding to regional demand for commercial or industrial land.

Table 5. Loudoun County Public Facilities and Parks Constructed in the Lower Sycolin Area, 2004–2022

Improvement Name	Address	Year Built	Gross Floor Area (square feet)
Adult Detention Center	42035 Loudoun Center Place	2004	213,429
Fire and Rescue High Bay Build	16615 Courage Court	2008	19,875
Philip A. Bolen Memorial Park (405-acre regional park)	42405 Claudia Drive	2010	--
Philip A Bolen Memorial Park (Maintenance Storage Building)	42214 Greenfield Mill Drive	2011	3,210
Fire and Rescue Burn Building	16451 Meadowview Court	2008	6,630
Transit Maintenance Building	42031 Loudoun Center Place	2014	19,385
Transit Administration Building	42075 Loudoun Center Place	2014	6,350
Leesburg Park and Ride	19730 Sycolin Road	2013	--
Animal Shelter	42152 Claudia Drive	2021	21,439
Juvenile Detention Center	19788 Horserun Drive	2022	35,700

Source: Loudoun County tax assessment records; Loudoun County Parks, Recreation and Community Services website.

E. Data Center Development in Town

47. The Town is currently experiencing significant development activity from data centers. Most of the large industrial and commercial parcels in the Town and Compass Creek are currently in various stages of development application for data center uses. These active data center applications show that the County's

[21] Source: Loudoun County tax assessment records; Loudoun County Parks, Recreation and Community Services website; Stantec 2022.

estimate of the industrial land absorption of 2.9 acres per year is inaccurate and underestimates the rate of development in the Town. The data center developments also substantially reduce the amount of vacant land available for future development in the Town.

48. Parcel ID 1 — the Leesburg Commercial parcel in Compass Creek — is currently under development as two data centers. This development depends on the Town's provision of water and sewer service, which the Town approved on March 14, 2023.[22] The developer has submitted site plans, which are currently undergoing final review and approval.[23]

49. Additionally, on November 21, 2022, the Town received a zoning application for the Village at Leesburg Land Bays D and E (Parcel IDs 38 and 39) to allow for data center uses. These parcels have a gross land area of approximately 35 acres and are zoned for industrial uses. The owner of the property reported that of these 35 acres, only 11 acres are developable because of (i) the parcels' irregular shape, (ii) the presence of a powerline easement across the property, and (iii) the fact that these parcels are bisected by Russell Branch Parkway. Given these constraints, these parcels have remained vacant. The owner is now seeking to modify applicable zoning to allow development for data center uses. Land Bay E, south of Russell Branch Parkway, is the only area of sufficient size to accommodate a data center. Land Bay D, north of Russell Branch Parkway, is proposed for development as an electrical substation to support the data center across the street.[24]

50. A number of other land owners are in the earlier stages of possible data center development projects within the Town that will remove additional parcels from the residual vacant land supply. These include:

- Leesburg Gateway LLC submitted a pre-application statement and exhibit, with possible site plan, to develop the Leesburg Innovation Village. This development would contain four data centers and industrial flex space on a 99.16-acre assemblage of parcels along Route 7 (East Market Street) and the intersection with Battlefield Parkway.[25] The project area is currently zoned residential (R-1, R-16) and commercial (B-3). While a rezoning would be required, this project reflects strong demand for industrial and commercial land in the Town.
- Oaklawn LLC filed a zoning application to amend certain proffers for Land Bay A (Parcel ID 31, Parcel PIN 233388942, 26.42 acres) in order to develop a data center and industrial flex project.[26]
- Clubhouse Dr, LLC submitted a rezoning application for the site of the former Westpark Golf Club clubhouse (Parcel ID 98, PIN 272302501000, 7.58 acres). This application proposes to develop this parcel as Westpark Tech and construct an industrial flex or data center building.
- RCKF Cardinal Park LLC has expressed interest in developing a data center along Trailview Boulevard in the Eastern Gateway district (Parcel ID 37, PIN 189184259, 8.23 acres). No rezoning would be required.

51. These projects demonstrate several important points, including: (i) there is ongoing robust demand for potential data center sites in the area of Leesburg; (ii) this demand is driving data center developers to

[22] Leesburg Town Council, Resolution No. 2023-046, March 14, 2023.
[23] STPL-2023-0004
[24] TLZM 2022-0010. Statement of Justification, November 21, 2022.
[25] August 11, 2023 Pre-App Statement, TLZM: 2023-xxxx.
[26] TLREZN-2023-0001

seek rezoning of residential land and explore smaller parcels that are not traditionally suitable for data center facilities; and (iii) this development activity may decrease the supply of vacant land in Leesburg.

IV. There Is Strong Historical Precedent for Annexation of Compass Creek

52. The County's analysis fails to acknowledge the historical context for development in Leesburg. Since the 18th century, Leesburg has expanded its boundaries in response to population growth and economic expansion. There have been 12 land grants, annexations, and boundary line adjustments since 1759.[27] 1,772 acres were added in 1958 (a 6.7-fold increase on the previous land area), and 5,193 acres were annexed in 1984 (a 3.6-fold increase).[28] Leesburg has continued to grow rapidly since the 1984 annexation.

53. Throughout the 1990s and 2000s, the Town and the County collaborated on the planning framework for joint development at the urban periphery of Leesburg: the Joint Land Management Area (JLMA), formerly known as the Urban Growth Area (UGA). The planning framework identified the Town as the presumed provider of infrastructure (water and sewer service) for greenfield development in the JLMA. Chapter 3, Countywide Strategic Management, of the County's 1991 General Plan states clearly the fundamental understanding between the two jurisdictions: "Urban Growth Areas around towns are served by town utilities and are expected to be annexed into the town as public utilities are extended."[29]

54. Leesburg's 1997 Town Plan stated the Town's policy on water and sewer system expansion in the UGA (later JLMA): "Development within Leesburg's Urban Growth Area will be served by public sewer and water provided by the Town of Leesburg at the town's option." The Plan goes on to state that "Extension of sewer and water service by the Town of Leesburg to areas outside the town limits will be grounds for the annexation of those areas." The Town reiterated these policies in its 2005 Town Plan. The 2012 Town Plan also addresses these policies. The 2012 Plan states that: "The JLMA will serve as an area for town growth and it will gradually and ultimately be annexed into the corporate limits. As property owners request central utility service, and the Town agrees to extend central utilities to such properties in the JLMA, the Town will anticipate that these properties will be incorporated into the Town."

55. Since 2000, Loudoun County and the Town of Leesburg have cooperated on seven more boundary line adjustments. Most recently, in April 2020, the Town and the County entered into a boundary line adjustment that incorporated into the Town approximately 119 acres in Compass Creek.[30] This included a portion of the ION International Training Center and the Compass Creek commercial center, all of which received Town water and sewer service prior to incorporation.

56. In April 2022, the Board of Supervisors approved a second boundary line adjustment for three properties in Compass Creek: the Walmart, At Home, and CC Outparcel properties. All of these properties receive, or are approved for, Town water and sewer service. This boundary line adjustment has not been

[27] Town of Leesburg.
[28] This translates to 8.11 square miles. The Commission on Local Government records 7.17 as the area of the annexation in the 1983 report.
[29] Loudoun County General Plan 1991, p. 52.
[30] Town of Leesburg and County of Loudoun, Boundary Line Agreement, April 13, 2020.

completed. The three properties in Compass Creek that were the subject of the April 2022 Board of Supervisors approval are included in the annexation area.

57. The history of annexations and boundary line adjustments in Leesburg demonstrates that the County and the Town have worked together for years to expand the Town boundaries in response to development needs and service needs. There is no substantive difference between the land in Compass Creek that the County has approved for transfer to the Town and the subject properties.

V. The Town of Leesburg Made the Development of Compass Creek Possible

58. The County's analysis does not acknowledge that Compass Creek could not have been developed without the Town of Leesburg's planning framework, legislative actions and infrastructure improvements. The Town of Leesburg enabled the commercial and industrial development at Compass Creek by providing road access, water supply services, and sewer services to properties in the area. The Town extended water supply and wastewater collection and treatment services to the Lower Sycolin service area in an incremental fashion over a 30-year period. The Town undertook and managed the extension of water and wastewater service to Compass Creek as part of the Lower Sycolin area. The Town also undertook and managed the extension of Battlefield Parkway — which connected Compass Creek to Sycolin Road, Route 7, and finally Route 15 — over the period 2006-2018. The deliberate efforts of the Town over a four-decade period laid the groundwork for the construction of commercial and industrial facilities at Compass Creek. A detailed timeline of the Town's policy, legislative, and capital infrastructure actions in support of the development of Compass Creek is attached as Appendix A and discussed further below.

A. The Town's Extension of Water and Sewer Infrastructure to Compass Creek

59. With respect to water supply, the Town constructed a new water line along Sycolin Road in the 1980s. During that same period, the Town's Water and Sewer Master Plan of 1987 called for the construction of an elevated water storage tank within the Sycolin Pressure Zone in order to expand the capacity of the water system and accommodate additional development in the JLMA. The capital cost was estimated by the Department of Utilities to be $3.5 million. In November 2005, the Town Council adopted Resolution No. 2005-172, which established pro-rata fees for the water tank.[31] The construction of the water storage tank was completed in 2007.

60. Concerning sewer service, the Town carried out "Lower Sycolin Creek Sewershed Study" in 2002 to study options for expanding centralized sewage collection and treatment services to the Lower Sycolin Creek area, including the JLMA. In 2008, the Town updated the Lower Sycolin Creek Sewershed Study to refine demand projections and capital investment cost estimates.

61. In June 2008, the County rezoned the Compass Creek property (then named Crosstrail) from low density designations to PD-IP, an industrial use designation.[32] The Board of Supervisors' resolution initiating the rezoning noted that the Town would provide water and sewer services to the property and noted the expectation that the property would be annexed.

[31] Town of Leesburg, Council Resolution No. 2019-180, November 26, 2019.
[32] June 3, 2008 Board of Supervisors Resolution; Initiation of Zoning Map Amendment for the Crosstrail Property.

62. The Town undertook construction of the sewer system serving Lower Sycolin Creek and eventually Compass Creek in the 2010s. This was to take place in two phases. Phase I of the Lower Sycolin Sanitary Sewer Conveyance System included a gravity sewer main, pump station, and force main that connected the Lower Sycolin Road service area to the wastewater treatment plant at Tuscarora Creek. Phase II included a conveyance system to collect and transfer wastewater from future development at Compass Creek to the Lower Sycolin Sanitary Sewer.[33]

63. The Town completed construction of Phase I in 2014, at a cost of $5.3 million. This new trunk infrastructure provided sewerage services to the County facilities located on 92-acres of land immediately adjoining the Town boundary, in the JLMA.

64. In 2012, the Town began to acquire land for easements for Phase II of the Lower Sycolin Sanitary Sewer. The Town's Capital Improvement Plan called for the Town's construction of Phase II at a cost of $5.2 million. In fall 2013, the Town entered into discussions with Peterson Companies, the real estate developer of Compass Creek, regarding the extension of Town utilities to this area. This would expedite the construction of Phase II at a decreased cost to Town taxpayers — the Town would pay a fixed price of $4 million for construction services.

65. On March 24, 2015, Town Council approved a resolution authorizing the Town to enter into an agreement with The Peterson Companies for the construction of Phase II Lower Sycolin Sanitary Sewer Main.[47] The Council concluded the Agreement for Construction of the Phase II Lower Sycolin Gravity Main with the developer on April 9, 2015.[48] The agreement provided that the Town would reimburse the developer for the $4 million construction cost. The pro-rata fees for the future users of the sewer main were established under resolution 2015-039, dated March 24, 2015; this resolution also amended the pro-rata fees for the Phase I Lower Sycolin Sanitary Sewer works.[49]

66. The Peterson Companies completed the construction of in 2017, extending the Town sewer infrastructure from the middle of Compass Creek along the Northern Branch of Sycolin Creek and terminates at the pump station constructed during Phase I (see Figure 3 below).

[33] March 24, 2015. Agreement to Construction Lower Sycolin Phase II Sewer Gravity Main, recitals.

Figure 3. Alignment of Phase II Lower Sycolin Gravity Main

Source: Google Earth, Stantec 2023.

67. With this infrastructure in place, Town Council approved the extension of Town water and sewer service to all properties in Compass Creek. These approvals came as specific development projects requested service, including: Compass Creek commercial center in 2015; Walmart in 2018; Microsoft Phase I in 2019; Microsoft Phase II in 2020; and Leesburg Commercial in 2023.

B. The Town's Extension of Road Access to Compass Creek

68. The Town of Leesburg also enabled the development of Compass Creek by providing road access via Battlefield Parkway. The Town's role in the development of Battlefield Parkway included planning the road extension, acquiring easements, contracting out road design, identifying and securing construction financing (including the Town's own-source financing), and negotiating and procuring construction services.

69. The development of Battlefield Parkway was carried out in five segments over a 12-year period ending in 2018. The Town provided access to the Compass Creek area (then known as Crosstrail) in 2008 when the construction of Battlefield Parkway from Sycolin Rd. to the Dulles Toll Road was completed. Construction was administered by Oaklawn Development Partners, LLC under a proffer to Town of Leesburg associated with the Oaklawn at Stratford project immediately north of Compass Creek.[34] Town of Leesburg undertook and managed the construction of the segment of Battlefield Parkway from Kincaid Blvd. to Route 7. This project was included in the Town's FY2008, FY2009, and FY2010 Capital Improvement Programs.[35] Finally, Town of Leesburg organized and managed the construction of the segment of Battlefield Parkway between Route 15 South and the Dulles Greenway in 2018. The construction of the

[35] Town of Leesburg, FY2008 Capital Improvement Program (CIP); FY2009 Capital Improvement Program; FY2010 Capital Improvement Program; 2007, 2008 and 2009.

segments connecting Compass Creek eastward to East Market Street and westward to Route 15 increased access to Compass Creek and enhanced the viability of developing commercial property there.

C. Town Infrastructure Enabled Compass Creek's Development

70. The County argues that "…annexation of the APA will not alleviate the lack of alleged 'vacant' land claimed by the Town because nearly the entirety of the APA is approved for or undergoing development."[36] This argument disregards the fact that at the beginning of the development process from 2008 to 2014, the entire Compass Creek area was vacant land.

71. Town infrastructure was integral to the development of Compass Creek. The water, wastewater and transportation improvements, described above, enabled the commercial and industrial development in Compass Creek. The first project to be constructed was the ION International Training Center, an ice skating and training facility completed in 2018. In 2019, Walmart closed its Leesburg store, and constructed a new Walmart Supercenter. The At Home store was constructed in 2020. Microsoft data centers 1A and 1B were completed in 2020, and data centers 2 and 3 are currently under construction.[37] Absent Town infrastructure, none of this development would have been possible since Loudoun Water's infrastructure is still in the design phase and will not be available for several years.

VI. Leesburg Has Enough Water to Serve Compass Creek

72. Stantec has analyzed the ability of Town of Leesburg's water treatment facility to meet the demand of existing and potential future customers, including data centers, within the Town boundary and in the JLMA. Building on a series of similar analyses that the Town of Leesburg had undertaken over the period 2020-2022, Stantec's analysis updates the Town's water capacity projection to reflect new, more accurate data on (i) water consumption and (ii) the distribution of potential future customers in the JLMA between Town of Leesburg and Loudoun Water.

73. Stantec has concluded that the Town has enough water capacity to serve all existing and approved water customers in Town and all customers in Compass Creek.

A. Background and Purpose of the Analysis

1. Town's December 2019 Water Capacity Analysis

74. In 2019, the Town of Leesburg's Department of Utilities analyzed whether its water treatment facility had sufficient capacity to meet the demand of possible future data center customers. Town Council approved Microsoft as an out-of-town water customer for Phase I of its data center development at Compass Creek on November 26, 2019, subject to certain conditions.[38] Town Council was considering Microsoft's request for out-of-town water service for Phase II of its data center development at Compass Creek. Town Council was also evaluating possible future water service requests for proposed data centers at Tuscarora Crossing and Twin Creek, both in the JLMA.

[36] (pp. 96-97)
[37] Google Earth Pro; Stantec 2023.
[38] Town of Leesburg, Council Resolution No. 2019-180, November 26, 2019.

75. The Town Department of Utilities projected total water demand under six different scenarios, starting with the addition of Microsoft Phase I alone and including five other combinations of the proposed data centers.[39] This analysis focused on the possible marginal impact on water capacity due to various combinations of future data center development.

76. The Town's December 2019 analysis was based on two assumptions. The first assumption was Microsoft's water demand, which was "based on numbers provided by their engineer." The water demand for Microsoft Phase I was not broken out as a separate line item. The marginal increase in water demand for Microsoft Phase II was projected at 610,000 gallons per day (GPD).

77. The analysis estimated water demand for the Tuscarora Crossing and Twin Creek data centers. This was based on Loudoun Water's standard of 1.0 GPD per square foot of built space. The size of the Tuscarora Crossing data center was estimated to be 1.4 million square feet, and the size of the Twin Creek data center was estimated to be 810,000 square feet.

78. Based on these assumptions, the Town's December 2019 analysis showed that its water treatment plant capacity was sufficient to serve Microsoft Phase I, but insufficient to serve all of the other proposed data centers.

79. The Town and Microsoft entered into a Water and Wastewater Service Agreement in July 2020. This agreement provided that the water consumption for Phase II of the Microsoft development was 452,000 MGD.

80. Other data center cooling technologies require less water. Water-cooled chillers that do not employ cooling towers consume less water than systems that do use cooling towers, such as the Microsoft data centers at Compass Creek. Water-cooled chillers that operate in a closed loop consume almost no water. Air-cooled chillers consume no water. These other data center cooling technologies are commonly employed in new data centers today. Applying a standard of 1.0 GPD per square foot of data grossly overstates the amount of water that future data centers will consume.

2. Town's Subsequent Water Capacity Analyses

81. From February 2020 through September 2022, Town of Leesburg conducted a series of five additional analyses of its water treatment plant capacity. These analyses looked not only at the impact of data center water consumption, but comprehensively examined the possible water demand of different categories of development throughout the Town and JLMA, including: Approved Flows, Projected Flows, Town Plan, JLMA Likely, JLMA Potential, and JLMA Data Centers. These analyses were reported to Town Council on February 24, 2020; August 10, 2020; February 22, 2021; March 7, 2022; and September 12, 2022.

82. The Town's September 12, 2022 utility capacity analysis concluded that the Town had enough water to serve all current development, approved projects, projected development in the Town and JLMA, as well as "likely" development in the JLMA that may be served by Town water. The total maximum day water demand was projected to be 12.372 MGD, which is below the 12.884 MGD permitted capacity of the Town's water treatment plant.

[39] Town of Leesburg, Town Council Work Session Meeting Minutes, December 9, 2019.

B. Water Treatment Plant Load and Capacity

83. Stantec has updated the Town's water treatment capacity analysis. This analysis addresses the anticipated future water consumption from existing users, approved and proposed projects in the Town, additional development projects foreseen by the Legacy Leesburg comprehensive plan, and approved and proposed projects in Compass Creek.

84. The Town's Kenneth B. Rollins Water Treatment Plant (WTP) has a permitted capacity of 12.884 MGD from May 1 through October 31, and a permitted capacity of 10.784 MGD from November 1 through April 30.

85. For calendar year 2022 and the first six months of 2023, the average day base demand and maximum day base demand were 4.117 MGD and 5.741 MGD, respectively. The maximum day demand during that period represents 44.5% of the WTP's permitted capacity.

86. The daily demand for water during this period did not surpass at any point a level of 80% of the plant's permitted capacity (10.3 MGD), the ceiling that under Commonwealth of Virginia regulation triggers a requirement for preparation of a capital plan to expand capacity, under certain conditions.[40] The Town of Leesburg monitors the daily demands closely for trending and planning purposes.

C. Water Demand from Data Centers in Compass Creek

1. Microsoft Data Centers at Compass Creek

87. Microsoft is developing a data center campus at Compass Creek in two phases. Phase I includes one data center which is split between two buildings. The first two buildings are in service. Phase II includes four additional data centers. The second and third data centers are currently under construction.

88. As part of the water requests, Microsoft calculated the water demand in their data center cooling equipment. The data centers are designed with water-cooled chillers with cooling towers, a water-intensive cooling technology. Microsoft's engineers provided initial water usage estimates. Microsoft reduced its water requirements prior to entering into a "Water and Wastewater Service Agreement" with the Town in July 2020. Microsoft's final agreed water demand requirements are included in Section 3.1 and Exhibit 5 of the agreement and are presented in Table 6 below.[41]

[40] Section 12VAC5-590-520 of the Virginia Department of Health Waterworks Regulations. The expansion plan is required when and if water production reaches 80% of the rated capacity of the facility for three consecutive months *and* the cause of the production increase is not "unusual transient conditions."
[41] Town/Microsoft Water and Wastewater Service Agreement, July 14, 2020.

Table 6. Microsoft Phase I and Phase II Maximum and Peak Water Flows

Phase	Maximum water demand (gallons per day)	Peak instantaneous water demand (gallons per minute)
Phase I	139,100	315
Phase II	452,400	1,040
Total	591,500	1,355

Source: Town/Microsoft Water and Wastewater Services Agreement, July 14, 2020.

2. Leesburg Commercial Parcel at Compass Creek

89. The Peterson Companies and STACK Infrastructure are developing the Leesburg Commercial parcel at Compass Creek for data center uses. On January 30, 2023, Leesburg Commercial LLC submitted a water and sewer extension request to the Town for two data center buildings. The proposed cooling technology is an Air-Cooled Chiller Plant ("ACCP"), a closed-loop cooling system technology.[42]

90. In Building 1, the ACCP incorporates four independent piping loops. Each loop carries approximately 33,000 gallons of liquid. The system will be flushed with a combination of water and chemical cleaning agents, followed by a clean water flush prior to final fill. The Peterson Companies stated in its letter dated January 30, 2023 that the detergent and clean water flushes will require 167,000 gallons of water per flush per loop, for a total of 668,000 gallons of water. The final fill of the ACCP system will consist of 96% water and 4% chemicals (inhibitor and biocide) and 128,000 gallons of water.

91. In Building 2, the ACCP incorporates two independent piping loops. Each loop carries approximately 33,000 gallons of liquid. The system will be flushed and filled in the same manner as Building 1 and will require a total of 334,000 gallons of water. The final fill of the ACCP system will consist of the same water, inhibitor, and biocide mixture, and 68,000 gallons of water.

92. In the January 30, 2023 request, the Peterson Companies proposed to connect the Building 1 and Building 2 to a metered fire hydrant for the detergent, flush, and final fills of ACCP systems related to construction activities only. Leesburg Commercial stated that the discharge from the detergent and flushes of these systems will be contained in ten 20,000-gallon frack tanks and then pumped and hauled to an approved treatment facility. The Peterson companies proposed that the ACCP systems not be connected to the Town's water or sewer systems for any data center cooling operations.

93. The proposed method for disposing of liquids discharged from the ACCP systems is in accordance with the product information and material data safety sheets for the chemicals to be used. The five chemicals used in the ACCP are manufactured and distributed by ChemTreat, Inc. of Glen Allen, VA.[43] The disposal of these chemicals into municipal domestic wastewater treatment facilities is prohibited. For this reason, Leesburg Commercial proposed to arrange for proper disposal of the wastewater from the ACCP system commissioning and did not request that the Town receive said effluent in the Town's wastewater collection

[42] The Peterson Companies letter to Town of Leesburg, "Water Request for Compass Creek: PIN 234-38-2596-001, PIN 234-38-2596-002, PIN 234-48-8819, PIN 244-48-3058-001, PIN 244-48-3058-002." January 30, 2023.
[43] ChemTreat, Inc., Safety Data Sheets for products ChemTreatCL2250, ChemTreatCN5600, ChemTreatCL6034, ChemTreatCL241, and ChemTreatBL1240, 2017-2019.

and disposal system. This arrangement is codified in the Town resolution granting out-of-town water/sewer customer status to Leesburg Commercial LLC.[44]

94. The Town Council approved the extension of water and sanitary sewer service to the Leesburg Commercial data centers by Resolution dated March 14, 2023. Town Council adopted the water demand requirements (1,008,000 gallons for commissioning and 196,000 gallons of water mixing the final cooling liquid) and discharge limitations proposed in the Peterson Companies' January 30, 2023 extension request. This water will be billed as construction water through a rented fire hydrant meter. The Town agreed to provide water and sewer service for non-cooling, standard building operations not to exceed 1,600 GPD water and 1,500 GPD sewer service.

D. Water Demand Projection Scenarios

95. Stantec has analyzed the capacity of the Town's WTP to meet the needs of current and future water customers in three categories:

- Approved Development;
- Anticipated Development; and
- Future Town Plan Development.

The Town's WTP has sufficient capacity to provide water service to all of this future development, as described below.

1. Approved Development

96. Projects in the "Approved Development" category are either under construction or have received all necessary approvals for construction. As the Town has approved the extension of water and sewer service to all parcels in Compass Creek, this category includes the Compass Creek commercial center, Walmart Store, AtHome store, and data centers on both the Microsoft and Leesburg Commercial parcels.

97. Stantec determined the water demand from these projected uses based on the most recent information available from the project owners or development applications, as well as Town estimates of water demand for projects in this category. As discussed above, the Microsoft data centers at Compass Creek have an existing maximum day water demand of 591,500 GPD, which equates to an average day water demand of 338,000 GPD. The Leesburg Commercial data centers will use an ACCP closed-loop system, which will consume very little water and does not require water for ordinary cooling operations. Water usage will be limited to non-cooling, standard building operations, and require average day water demand of 1,600 GPD.

98. Total average water demand from "Approved Development" category is estimated at 1,276,510 GPD. Including the Town's baseline flows, the cumulative average day and maximum day demands from the WTP are estimated 5.394 MGD and 7.974 MGD, respectively, as presented in Table 7.

[44] Town Resolution 2023-046, Article 1.e., March 14, 2023.

2. Anticipated Development

99. Projects in the "Anticipated Development" category reflect anticipated individual development projects within the Town's corporate limits and the JLMA that are expected to receive new water service or expanded water service in the future. The classification of water users in this category is based on communication between property owners and Town of Leesburg. Some of the properties have been the subject of development applications previously submitted to the Town, while others have not. There are no data centers in this category.

100. Total average water demand from the "Anticipated Development" category is estimated to be 736,655 GPD, as presented in Table 7.

3. Future Town Plan Development

101. The category includes future development consistent with the Town's most recent comprehensive plan, Legacy Leesburg. Water demand projections in this category are not linked to individual proposed development projects, but rather to the scale of (re)development — including intensification projects with higher Floor Area Ratios — that could be undertaken and are considered likely under the Town Plan and associated regulations. Some of the future development is anticipated to take place in the Crescent District. There are no data center projects included in this category.

102. Total average water demand from the "Future Town Plan Development" category is estimated to be 764,997 GPD, as presented in Table 7.

4. Water Treatment Plant Capacity Projections

103. Under all scenarios, the Town's WTP has enough capacity to serve all existing customers, all approved development, anticipated development, and future (re)development in accordance with the Town Plan. The maximum day water demand from all of this development is 10.603 MGD, which is less than the WTP's permitted capacity of 12.884 MGD over the May 1 – October 31 period. The Town has enough water to serve all customers in Compass Creek.

Table 7. Summary of Evaluation of Water Treatment Plant Capacity

Scenario	Additional Demand (MGD)	Cumulative Average Day Demand (MGD)	Cumulative Max Day Demand (MGD)
Base Water Demand	N/A	4.117	5.741
Approved Development	1.277	5.394	7.974
Anticipated Development	0.737	6.130	9.264
Town Plan	0.765	6,895	10.603

Source: Stantec, 2023. Numbers may not add up due to rounding.

E. Potential Data Center Projects Served by the Town

104. The Town has received rezoning applications or pre-application statements concerning the development of four parcels for data center uses within the Town's corporate limits. These projects include: Village at Leesburg Land Bays D & E; Leesburg Innovation Village; Oaklawn Land Bay A; and Westpark Tech. The Town has not acted on or approved these applications, and it is unclear to Stantec whether these applications will be approved or, if approved, whether this possible development will go forward.

1. Village at Leesburg Land Bays D & E

105. On November 21, 2022, the Town received a rezoning application for the Village at Leesburg Land Bays D and E.[45] This application proposed to amend proffers to include a variety of industrial uses, including data centers.

106. STACK infrastructure is partnering in the development of this proposed data center facility. The Town understands, from discussions with STACK, that it intends to use the same cooling technology — an ACCP closed-loop system — as at the data centers on the Leesburg Commercial parcel at Compass Creek.[46] As discussed above, this cooling technology does not consume water on a daily basis; rather, it requires water to fill the system. The only daily water demand would be for non-cooling functions (e.g., sanitary) and would require only approximately 1,600 GPD, as estimated by the developer.[47]

2. Oaklawn Land Bay A

107. On May 22, 2023, the Town received a rezoning application for Oaklawn Land Bay A.[48] This application proposed to amend the previously-approved concept plan and proffers to allow for up to 700,000 square feet of flex industrial and/or data center uses.

108. The developer of this proposed data center has not specified the planned cooling technology for any data center(s) on this parcel or provided estimated water demand to the Department of Utilities for evaluation.

3. Leesburg Innovation Village

109. On August 11, 2023, the Town received a pre-application statement concerning the development of a large parcel located near Route and the Battlefield Parkway interchange. The property is currently zoned R-1, R-16 and B-3, but the developer stated it will seek to rezone this property to Planned Employment Center (PEC) to allow for data center and flex industrial uses. The developer also provided a pre-application exhibit showing the possible location of four data center buildings.

110. The developer is partnering with STACK infrastructure for the development of these data centers. STACK provided potential maximum day water consumption estimates of 156,076 GPD per data center building. This equates to total estimated maximum day water consumption of 624,304 GPD.[49] The Town will have to evaluate this request, if and when finalized, based on its existing capacity when the request is made.

4. Westpark Tech

111. On November 17, 2022, the Town received an application to rezone the 7.58-acre parcel of the former Westpark Golf Club clubhouse. The applicant has not provided an estimate of water demand to the Department of Utilities.

[45] TLZM-2022-0010.
[46] Amy Wyks, Town of Leesburg.
[47] The Peterson Companies, Letter to Town Department of Utilities, January 30, 2023.
[48] TLREZN-2023-0001.
[49] Amy Wyks, Town of Leesburg.

5. Additional Water Service Request by Microsoft at Compass Creek

112. The Town also received a request from Microsoft on October 4, 2023 proposing to increase Microsoft's maximum water capacity allocation to 1,230,000 gallons per day. This represents a net increase of 638,500 gallons per day. The Town has begun its evaluation of this request.

F. Conclusion

113. The Town WTP has sufficient capacity to serve all its current commitments, including existing and approved customers in Town and in the JLMA. The Town has enough water to serve all customers in Compass Creek.

114. Net of the Approved Development, Anticipated Development, and Future Town Plan Development flows, the Town WTP has 2.281 MGD of remaining permitted capacity, at least during the period May 1 – October 31, when permitted capacity is 12.884 MGD. The total maximum day demand of the Microsoft request and the two potential data center projects for which we have water demand information (Village at Leesburg Land Bays D & E and Leesburg Innovation Village) is 1.266 MGD. Therefore, the Town has sufficient capacity to meet Microsoft's additional water request as well as some requests for water service by other possible future data center projects. As total water demand approaches the permitted capacity of the Town's WTP, the Town will need to carefully evaluate new requests to ensure its ability to continue meeting the needs of existing customers.

Appendix A
Timeline for Development of Compass Creek

Year	Type of Action	Description
1958	Legislative/Regulatory	Town of Leesburg annexed 1,772 acres (a 6.7-fold increase on the previous land area).
1984	Legislative/Regulatory	Town of Leesburg annexed 5,193 acres (a 3.6-fold increase).
1985	Legislative/Regulatory	Town of Leesburg and Loudoun County cost-sharing Agreement for Rte. 643 waterline development to serve the County's 92-acre greenfield site.
1986	Legislative/Regulatory	Two cost-sharing agreements for a new waterline to extend down Sycolin Road (Rte. 643) specifying additional financing arrangements for the waterline, including pro-rata fees.
1986	Legislative/Regulatory	1986 Town Plan a. Route 643 improvements (pp. 117, 127).
1987	Infrastructure Development	Town of Leesburg constructs a 16" waterline on Rte. 643 to serve County's 92-acre greenfield site. The waterline starts at Rte. 7 and runs south towards Loudoun Center Place.
1988	Legislative/Regulatory	Leesburg Town Council amends pro-rata fees for connections to Rte. 643 waterline.
1988	Infrastructure Development	Cattail Branch Sewer project. Pro-rata project.
1990	Legislative/Regulatory	32-acre boundary line adjustment for the creation of Edwards Landing Park along the Potomac.
1990	Infrastructure Development	Route 773 Waterline project. Pro-rata project.
1991	Legislative/Regulatory (Loudoun County)	Loudoun County General Plan a. Chapter 2. General Plan Strategy, Part 5(d) (Policy Areas/JLMA). b. Chapter 9. Town's Growth Management Policies/Leesburg JLMA Policies. No. 8. c. Chapter 11. County/Town Annexation Agreements/Corporate Boundary Line Adjustment Guidelines. Nos. 1,3, 5.
1992	Legislative/Regulatory	Council amends pro-rata fees for connections to Rte. 643 waterline. $800,000 for Rte. 643 waterline and $1.1M for construction of booster station. 20% of the cost was attributed to public benefit and 80% to benefit of landowners adjacent to these facilities.
1993	Infrastructure Development	East Leesburg Water project. Pro-rata project.
1993	Infrastructure Development	Cattail Branch project. Pro-rata project.
1995	Infrastructure Development	Middle Tuscarora Creek Sewer Project. Pro-rata project.
1997	Legislative/Regulatory	1997 Town Plan a. Urban Growth Area. (p. 1-2) b. Utilities (p. 1-40) c. Transportation (Routes 653 and 643) (pp. 1-4 and 1-5; 1-7; 8-3; 8-7; 8-20 through 8-24). d. Implementation Program. Utilities. No. 4. Extension of the Town water and sewer as grounds for annexation (p. 1-6).
2000	Legislative/Regulatory	78-acre boundary line adjustment for two public schools and a park.

Year	Type of Action	Description
2001	Legislative/Regulatory (County)	Loudoun County General Plan (Amending 1991 General Plan).
2002	Legislative/Regulatory	68-acre boundary line adjustment for a public school.
2002	Infrastructure Development	Xerox/Potomac Station Sanitary Sewer Outfall project. Pro-rata project.
2004	Parcel Development	Loudoun County develops detention center in the Joint Land Management Area.
2005	Legislative/Regulatory	Council Resolution establishing pro-rata fee for Phase I Lower Sycolin Sanitary Sewer Conveyance System.
2005 (6/14/05)	Legislative/Regulatory	Town Council approves Bolen Park as an out-of-town water/sewer customer
2005 (11/8/05)	Legislative/Regulatory	Town Council Resolution establishing pro-rata fees for Sycolin Pressure Zone – Rte. 643 water storage tank. Estimated engineering and construction cost was $3.5M.
2005	Legislative/Regulatory	Town Plan. a. Introduction, Urban Growth Area and Joint Land Management Area. Joint planning and annexation. (pp. 4-5). b. Community Design. (i) Objective 4(a) (p. 32). (ii) Objective 7(b) (annexation of areas served by Town water and sewer p. 4). c. Land Use. (i) Limited vacant land (p. 34). (ii) Battlefield Parkway (p. 45). d. Transportation. Major Arterial Corridors. Battlefield Parkway. (pp. 76-79).
2006	Legislative/Regulatory	105-acre boundary line adjustment for a residential subdivision.
2007	Infrastructure Development	Town of Leesburg constructs the Rte. 643 water storage tank and associated pipelines.
2008 (6/3/08)	Legislative/Regulatory (County)	Loudoun County initiates rezoning of Crosstrail (Compass Creek) property to PD-IP. Board resolution references Town water and sewer service and future annexation.
2008	Infrastructure Development	Battlefield Parkway constructed to serve Compass Creek area.
2008	Legislative/Regulatory	141-acre boundary line adjustment for a public school.
2008	Legislative/Regulatory	139-acre boundary line adjustment for a public park.
2008	Legislative/Regulatory	ZMAP 2008-2009 (now “Compass Creek”) rezoned to Planning Development Industrial Park (PD-IP)
2003-2008	Parcel Development	92-acre site along Lower Sycolin Road developed as Loudoun County Support Facilities.
2009	Legislative/Regulatory	Tuscarora High School approved as out-of-town water/sewer customer
2010	Infrastructure Development	Sycolin Water Tank (located near the County’s Park & Ride lot on Sycolin Road) constructed. Approximate construction cost - $3.4M.
2010	Parcel Development	Philip A. Bolen Memorial Park in the Joint Land Management Area (405-acre regional park with sports fields, recreational areas, and natural areas) developed by Loudoun County.
2010	Parcel Development	Kettler develops Village at Leesburg land bay B.
2012	Infrastructure Development	Town begins acquiring land for easements for Phase II Lower Sycolin Sanitary Sewer.
2012	Legislative/Regulatory	A portion of Compass Creek property (ZMAP 2008-2009) dedicated to Loudoun County to be used as a fire station.

Year	Type of Action	Description
2012 (6/26/12)	Legislative/Regulatory	2012 Town Plan. a. Chapter 1. Introduction. Joint Land Management Area (p. 1-6). b. Chapter 6. Land Use. (i) Limited vacant land (p.6-2) (ii) Objective 10. (p. 6-8). c. Chapter 8. Economic Development. Objective 3(c). (p. 8-4). d. Chapter 9. Transportation. Transportation Corridor Objectives. Major Arterial Corridors. Battlefield Parkway. (pp. 9-13 through 9-16). e. Chapter 10. Community Facilities and Services; Objective 7(b). (p. 10-4). f. Land Use Action Program; No. 1 (p. A-7). g. Land Use Action Program; No. 2 (p. A-11).
2013	Legislative/Regulatory (County)	Crosstrail Commercial Center (now "Compass Creek") approved by the Loudoun County Board of Supervisors as ZMAP 2012-0021 to change zoning of 52-acre area from Planned Development – Industrial Park (PD-IP) to Planned Development – Commercial Center – Small Regional Center (PD-CC-SC).
2014	Infrastructure Development	Pump station, force main and gravity sewer main under Phase I Lower Sycolin Sanitary Sewer Conveyance System completed by Town of Leesburg. Phase I project cost - $5.3M (including design costs for Phase II).
2015 (3/24/15)	Infrastructure Development	Town enters into Agreement with Peterson Companies for the construction of Phase II Lower Sycolin Gravity Sewer.
2015 (3/24/15)	Legislative/Regulatory	Town Council Resolution authorizing Agreement for construction of Phase II Lower Sycolin Sanitary Sewer Main. The construction cost was $4M.
2015 (3/24/15)	Infrastructure Development	Town enters into Agreement with Peterson Companies to construct Lower Sycolin Phase II Gravity Sewer improvements. $4M construction cost.
2015 (6/23/15)	Legislative/Regulatory	Town Council approves Compass Creek Phase I as an out-of-town water/sewer customer.
2016 (7/26/16)	Legislative/Regulatory	Town Council approves Goose Creek Club project as out-of-town water/sewer customer.
2017	Infrastructure Development	Peterson Companies constructs Phase II Lower Sycolin Gravity Sewer.
2017	Legislative/Regulatory	Village at Leesburg pump station project (located south of Rt. 653-Russell Branch Parkway); engineering and construction cost $3.8M. Pro-rata project.
2017	Legislative/Regulatory	Town Council Resolution establishing pro-rata fees for Rte. 643 water storage tank.
2017	Infrastructure Development	Compass Creek Parkway constructed. Northern segment.
2017	Infrastructure Development	Town manages the extension of Lower Sycolin water/sewer improvements to serve Compass Creek.
2017	Infrastructure Development	Construction of Compass Creek off-ramp from Dulles Greenway.
2017 (6/13/17)	Legislative/Regulatory	Town Council approves Loudoun County Detention Center as cut-of-town water/sewer customer.
2017 (8/8/17)	Legislative/Regulatory	Town Council approved Loudoun County Animal Shelter Project as out-of-town water/sewer project.
2018	Legislative/Regulatory	Council initiates Compass Creek Boundary Line Adjustment (BLA).
2006-2018	Infrastructure Development	Town manages development of Battlefield Parkway connecting Compass Creek Parkway to Sycolin Road, Route 7, and Route 15.

Year	Type of Action	Description
2018 (5/29/18)	Legislative/Regulatory	Town Council approves DC United Stadium and Training Facility as out-of-town water/sewer customer.
2018	Parcel Development	ION International Center was developed.
2018	Infrastructure Development	Village at Leesburg pump station constructed.
2018	Parcel Development	Van Metre (formerly Arcadia) develops housing at Village Leesburg, Land Bay C as The Lofts at Village Walk condos.
2019 (1/8/19)	Legislative/Regulatory	Town Council approves Loudoun Soccer Indoor Facility as out-of-town water/sewer customer.
2019 (11/26/19)	Legislative/Regulatory	Council approves Microsoft Phase I as a water/sewer customer.
2019	Parcel Development	Walmart store developed.
2019 (6/19/19)	Legislative/Regulatory (County)	2019 Loudoun County General Plan. a. Towns and JLMAs/Policies, Strategies, and Actions. Strategy 1.2; Action D (p. 2-118). b. County/Town Annexation Agreement/Corporate Boundary Line Adjustment Guidelines; No. 3, 5 (p. 2-132).
2019 (11/26/19)	Legislative/Regulatory	Town Council adopts Zoning Ordinance amendments applicable to Compass Creek area establishing PD-IP and PD-CC-SC zoning districts.
2020	Legislative/Regulatory	Leesburg Town Council approves boundary line adjustment for Area 1A parcels which included land zoned as follows: 100.25 acres for Airport use, 10.28 acres for industrial use, and 10.04 acres for commercial use (Compass Creek). The "Final Order Approving the Boundary Line Adjustment" was issued by the Loudoun County Circuit Court on April 28, 2020.
2020	Legislative/Regulatory (5/26/20 and 8/11/20)	Council approves Microsoft Ph. II as out-of-town water/sewer customer.
2020 (7/19/20)		Town enters into Water and Wastewater Service Agreement with Microsoft.
2020	Parcel Development	At Home store was developed.
2020	Parcel Development	Microsoft data center 1-1A was developed.
2020	Parcel Development	Microsoft data center 1-1B was developed.
2020 (5/26/20)	Legislative/Regulatory	Town Council approves Tuscarora Crossing Land Buy 2 as out-of-town water/sewer customer.
2021 (4/27/21)	Legislative/Regulatory	Town Council approves Cattail Run as out-of-town water/sewer customer.
2021	Parcel Development	Loudoun County Animal Shelter constructed in the Joint Land Management Area
2021	Legislative/Regulatory (County)	Leesburg Commercial applies to County to rezone a 10.03-acre area in Compass Creek from PD-CC-SC to PD-IP to allow data center use.
2021	Infrastructure Development	Town of Leesburg assumes responsibility for the maintenance of Compass Creek Parkway (southern segment).
2022	Parcel Development	Microsoft data center 2-1B under construction.
2022	Parcel Development	Loudoun County Detention Center constructed in the Joint Land Management Area.
2022	Parcel Development	Leesburg Commercial LC development is under construction.
2022 (3/22/22)	Legislative/Regulatory	2022 Legacy Leesburg Plan. Compass Creek area identified as priority area for incorporation into the Town. (pp. 70,202)
2022 (4/13/22)	Legislative/Regulatory	Board of Supervisors approves boundary line adjustment for Walmart parcel, At Home parcel, and 1.5-acre Leesburg Commercial parcel and Compass Creek Parkway right-of-way.

Year	Type of Action	Description
2023 (3/14/2023)	Legislative/Regulatory	Town Council approves Leesburg Commercial data center as out-of-town water/sewer customer. (Leesburg Town Council, Resolution No. 2023-046, March 14, 2023)

Appendix C

Ann Harrity Shawver, CPA, PLLC

October 3, 2023

Compass Creek Project Financial Analysis

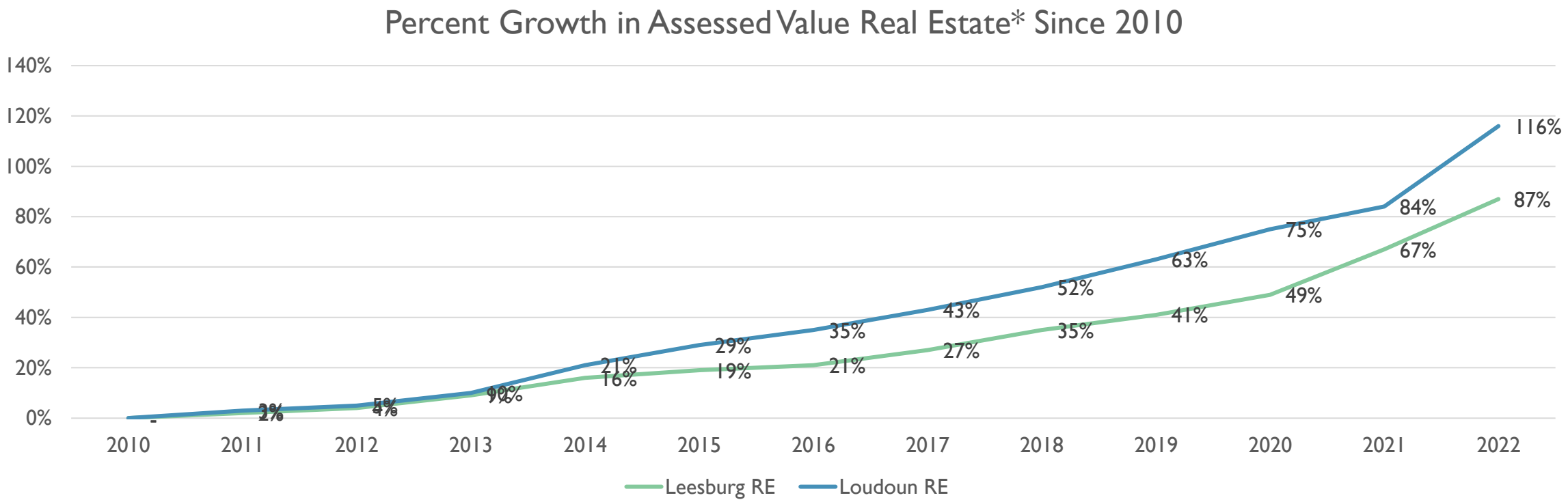
TOWN OF LEESBURG, VIRGINIA

COMPASS CREEK PROJECT FINANCIAL ANALYSIS

OCTOBER 3, 2023

TAXABLE ASSESSED VALUE

STRONGER GROWTH IN ASSESSED VALUE REAL ESTATE IN LOUDOUN COUNTY

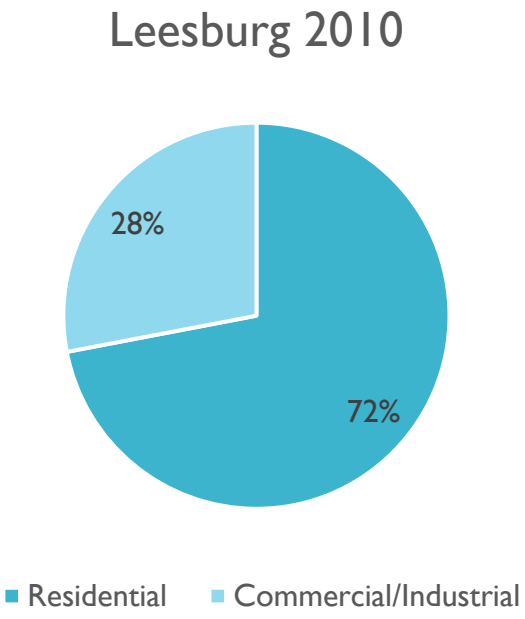


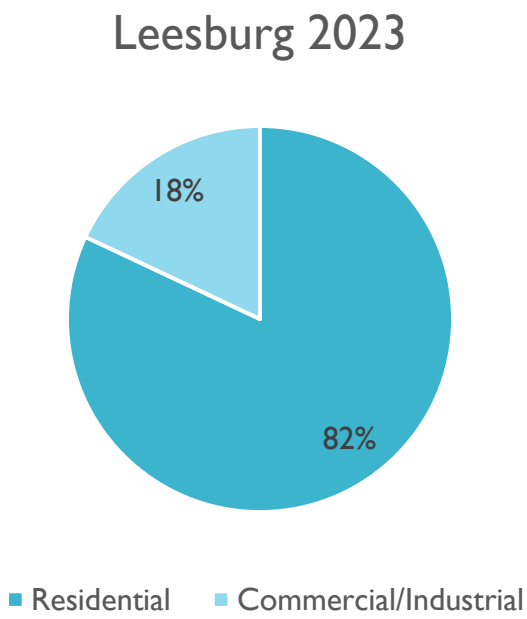
Leesburg assessed value in FY 2022 increased 87% since FY 2010 while Loudoun's increased 116%.

* Includes public service corporation real estate

Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Leesburg Table 9, Loudoun Table F

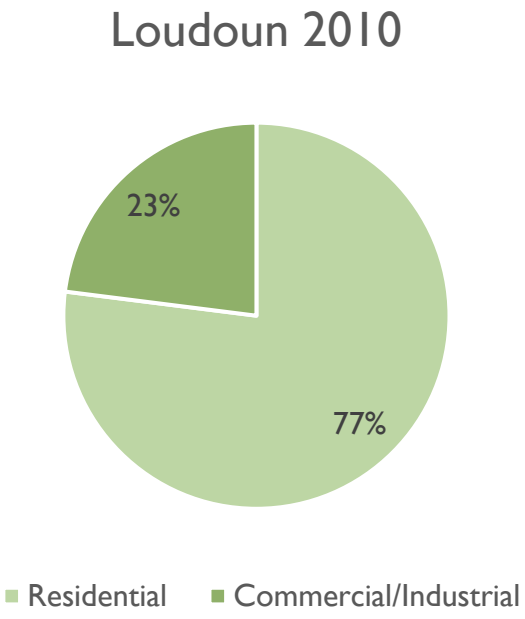
LEESBURG MORE RELIANT ON RESIDENTIAL REAL ESTATE , INCREASING FROM 72% TO 82% FROM 2010 TO 2023

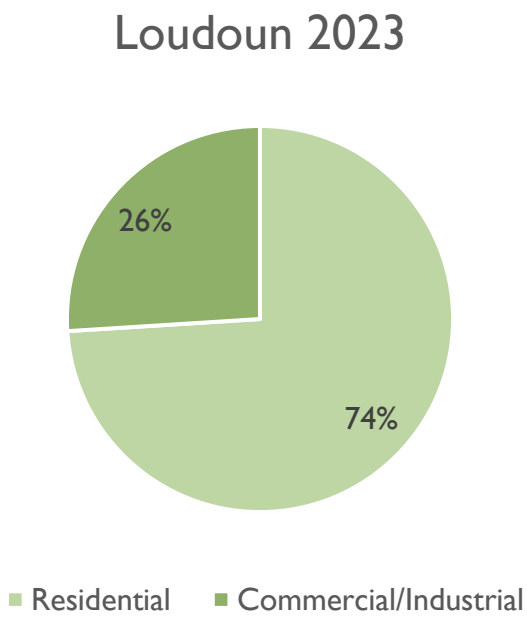




Source: Loudoun County Assessment Summaries sourced from Loudoun County Commissioner of the Revenue Real Estate folder at the Loudoun County Document Center: https://www.loudoun.gov/DocumentCenter
Data excludes public service corporation personal property. Residential is the total of all Classes 1 and 2. Commercial/industrial is Class 4. Multi-family, Agricultural and exempt property are not portrayed (Classes 3, 5, 6, and 7)

LOUDOUN LESS RELIANT ON RESIDENTIAL REAL ESTATE, DECREASING FROM 77% TO 74% FROM 2010 TO 2023





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Data excludes public service corporation personal property. Residential is the total of all Classes 1 and 2. Commercial/industrial is Class 4. Multi-family, Agricultural and exempt property are not portrayed (Classes 3, 5, 6, and 7)

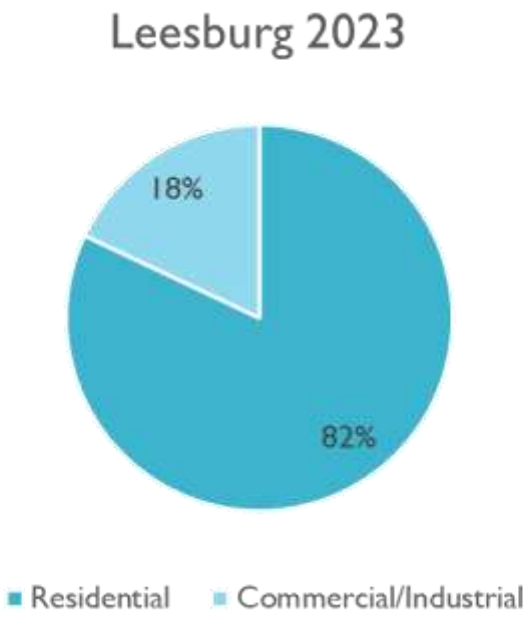
LOUDOUN RECEIVES A SIGNIFICANTLY LARGER PERCENTAGE OF REAL ESTATE REVENUE FROM COMMERCIAL/INDUSTRIAL PROPERTY THAN LEESBURG

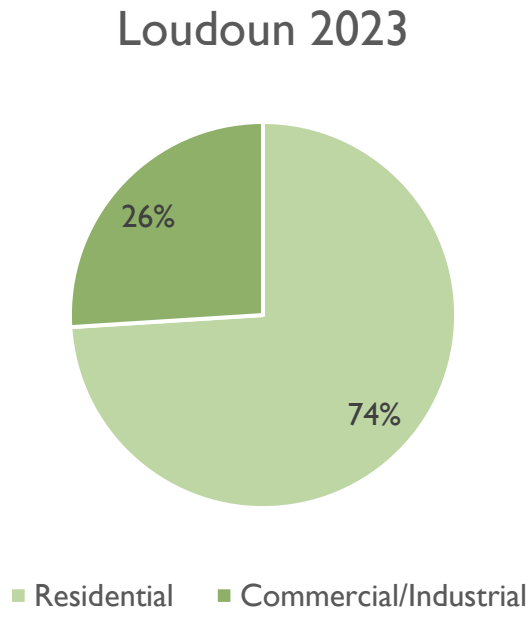
FY23 Tax Revenues Based on Assessed Value Commercial/Industrial Property		
Leesburg	$	3,225,864
Loudoun	$	277,811,986

Loudoun County generates more than 86 times the amount of tax revenue from commercial/ industrial property than Leesburg.

FY10 Tax Revenues Based on Assessed Value Commercial/Industrial Property		
Leesburg	$	2,841,642
Loudoun	$	142,843,799

Loudoun County generated more than 50 times the amount of tax revenue from commercial/ industrial property than Leesburg.





Source: Loudoun County Assessment Summaries sourced from Loudoun County Commissioner of the Revenue Real Estate folder at the Loudoun County Document Center: https://www.loudoun.gov/DocumentCenter
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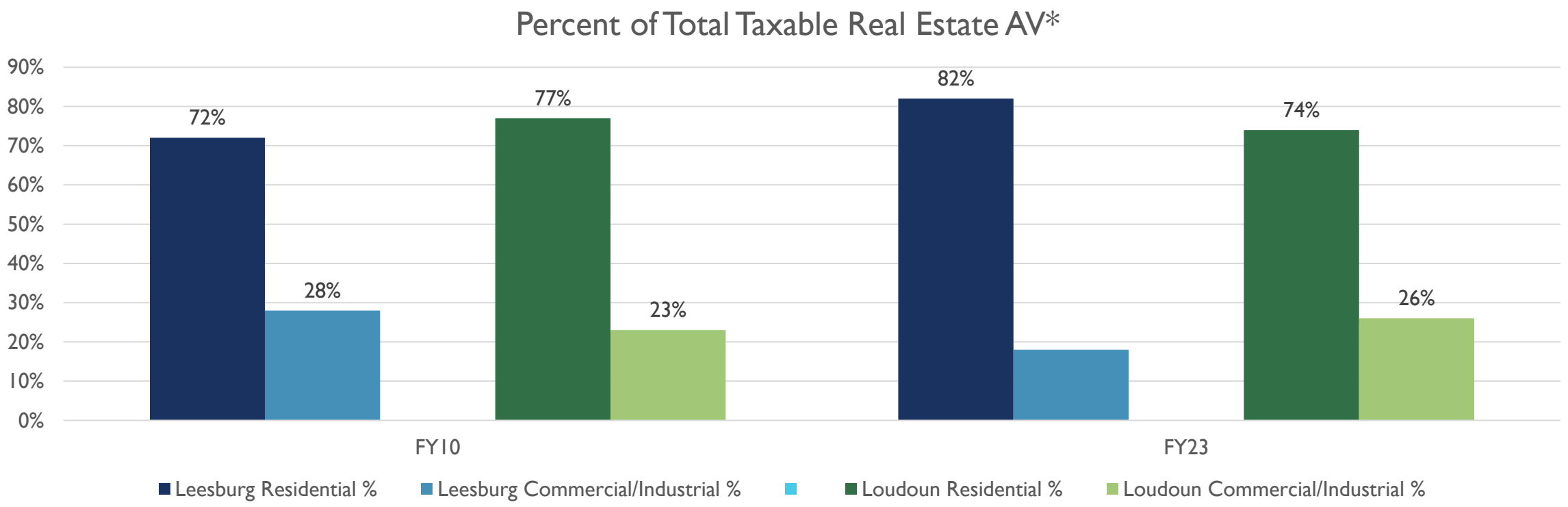
LEESBURG MORE RELIANT ON RESIDENTIAL REAL ESTATE



Source: Loudoun County Assessment Summaries sourced from Loudoun County Commissioner of the Revenue Real Estate folder at the Loudoun County Document Center: https://www.loudoun.gov/DocumentCenter
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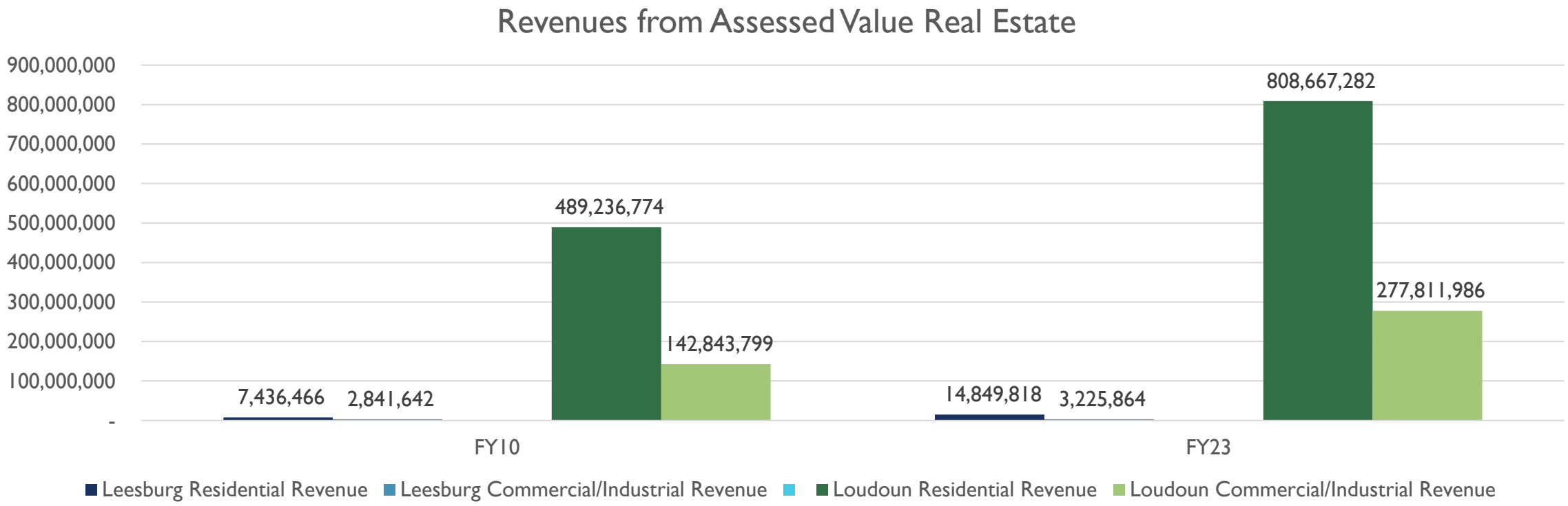
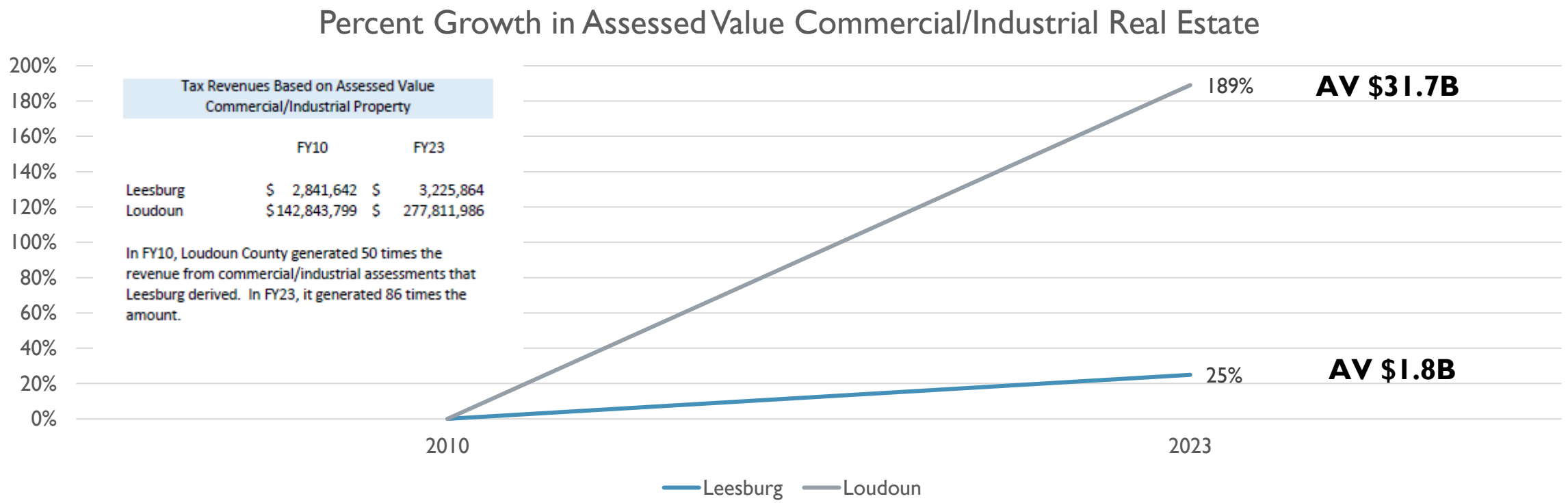
LEESBURG MORE RELIANT ON RESIDENTIAL REAL ESTATE



Source: Loudoun County Assessment Summaries from Loudoun County website. 2023 tax rates from Town of Leesburg and Loudoun County websites. 2010 tax rates from Town of Leesburg and Loudoun County ACFRs. Data excludes public service corporation personal property

LOUDOUN'S GROWTH IN COMMERCIAL/INDUSTRIAL REAL PROPERTY ASSESSED VALUE OF 189% SIGNIFICANTLY OUTPACES LEESBURG'S OF 25%



Source: Loudoun County Assessment Summaries sourced from Loudoun County Commissioner of the Revenue Real Estate folder at the Loudoun County Document Center: https://www.loudoun.gov/DocumentCenter
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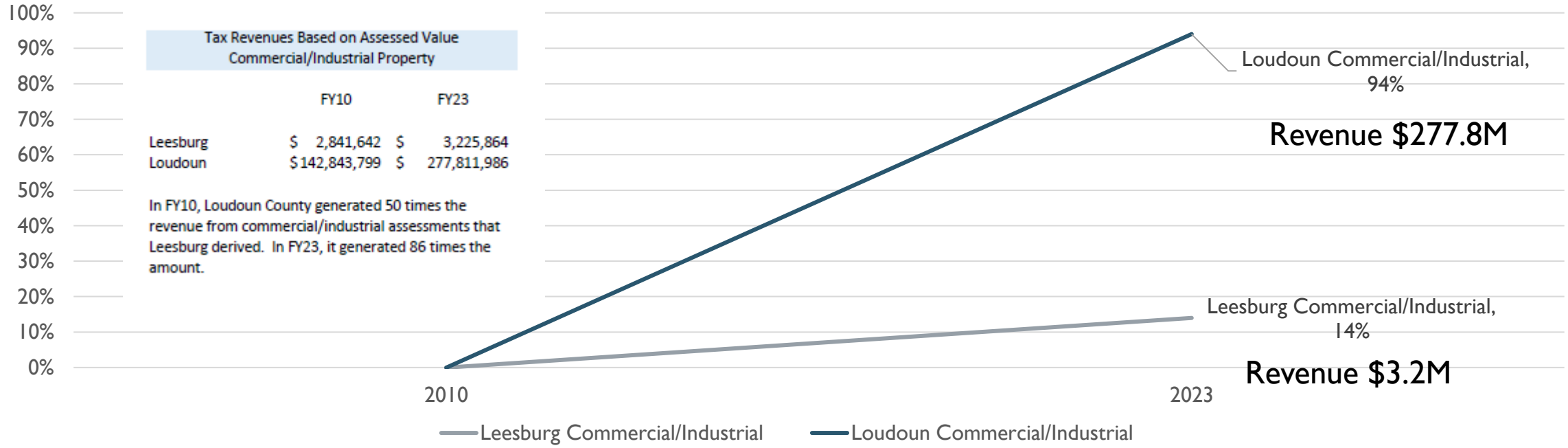
LOUDOUN REVENUE GROWTH FROM COMMERCIAL/INDUSTRIAL ASSESSMENTS SIGNIFICANTLY HIGHER THAN LEESBURG

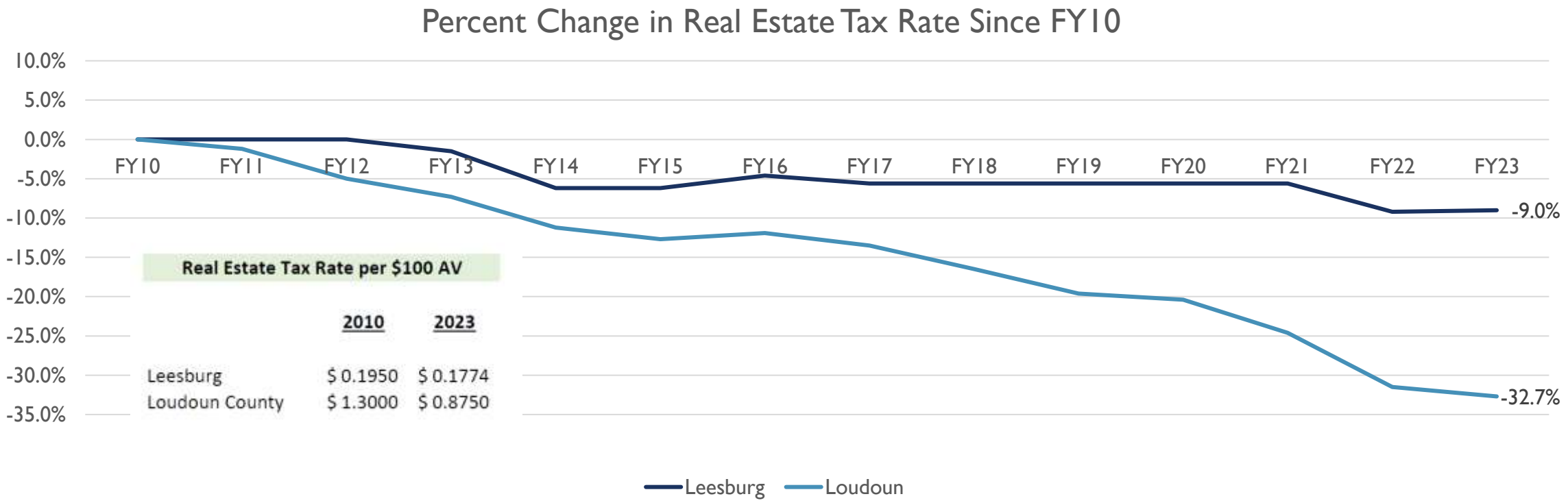
The Loudoun real estate tax rate of 2023 is 33% lower than that of 2010. Leesburg's is 9% lower.

Percent Growth in Resulting Tax Revenues at Prevailing Tax Rate



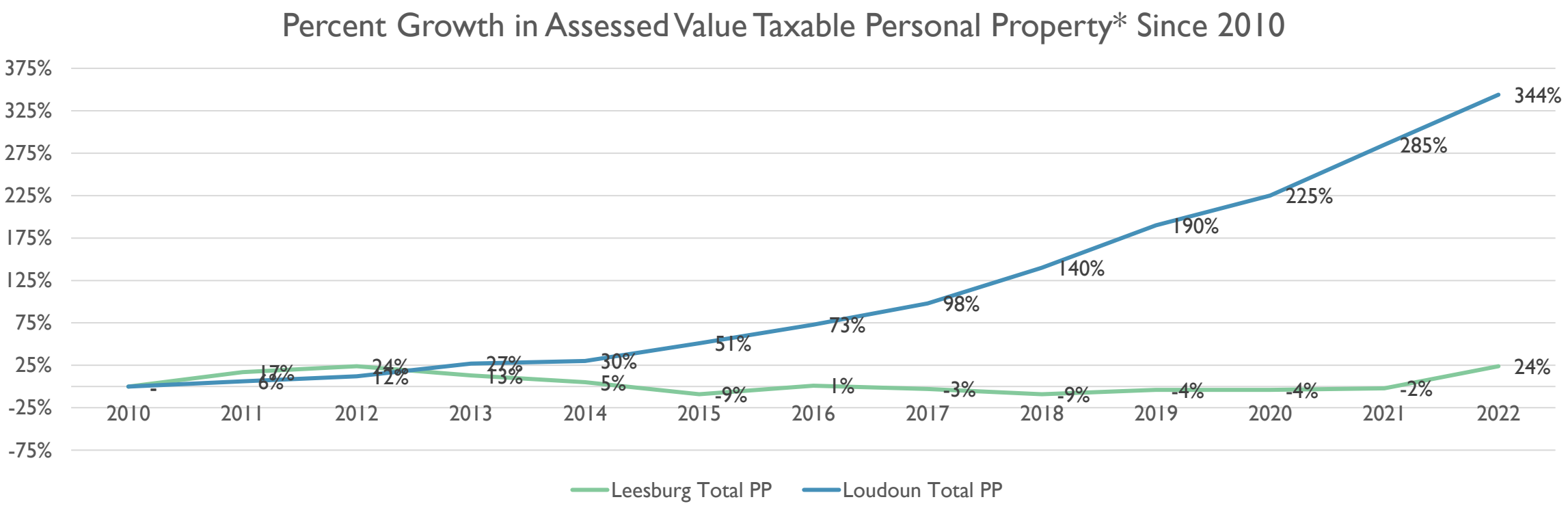
Source: Loudoun County Assessment Summaries from Loudoun County website. 2023 tax rates from Town of Leesburg and Loudoun County websites. 2010 tax rates from Town of Leesburg and Loudoun County ACFRs. Data excludes public service corporation personal property. Revenue a factor of assessed value and applicable tax rates with no allowance for delinquent nor uncollectible amounts.

LEESBURG'S REAL ESTATE TAX RATE DECLINED 9% WHILE LOUDOUN COUNTY'S DECLINED 33% FROM FY10 TO FY23



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 10 Leesburg, Table G Loudoun
The rate shown for Loudoun County is the General Fund real estate tax rate (FY10 to FY22)
Locality websites for FY23 https://www.leesburgva.gov/departments/finance/taxes-fees/tax-rates-and-fees and https://www.loudoun.gov/1922/Property-Tax-Rates

LOUDOUN GROWTH IN ASSESSED VALUE TAXABLE PERSONAL PROPERTY SIGNIFICANTLY OUTPACING LEESBURG

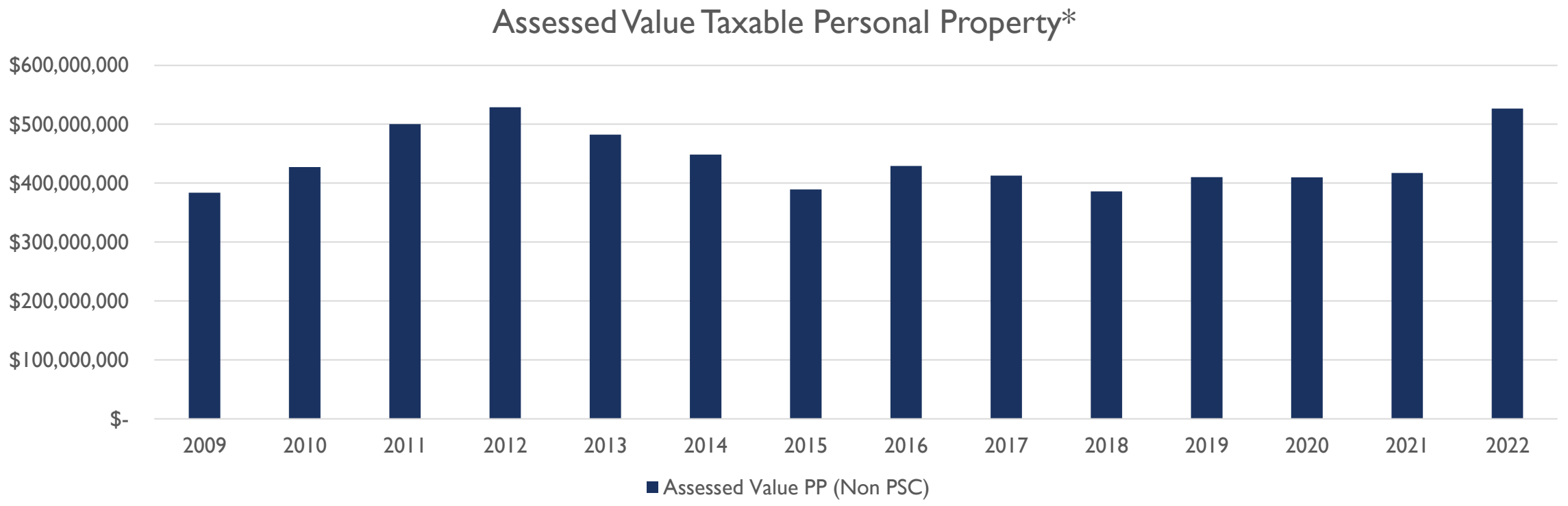


From FY 2010 to FY 2022, Loudoun County's total personal property assessments grew by **344%** while Leesburg's grew by 24%.

* Excludes public service corporation personal property

Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Leesburg Table 8, Loudoun Table F

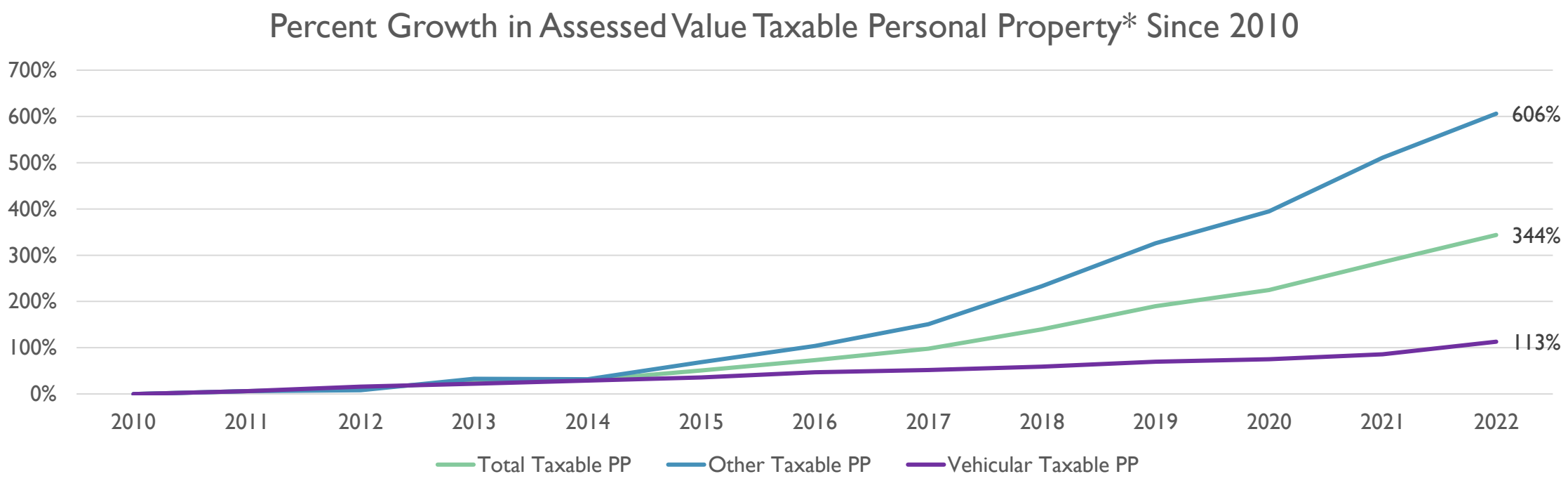
TOWN OF LEESBURG ASSESSED VALUE TAXABLE PERSONAL PROPERTY DEMONSTRATES PEAKS AND VALLEYS



* Excludes public service corporation personal property

Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Leesburg Table 8

LOUDOUN INCREASE IN ASSESSED VALUE PERSONAL PROPERTY TAX IS DRIVEN BY GROWTH IN OTHER TAXABLE PERSONAL PROPERTY

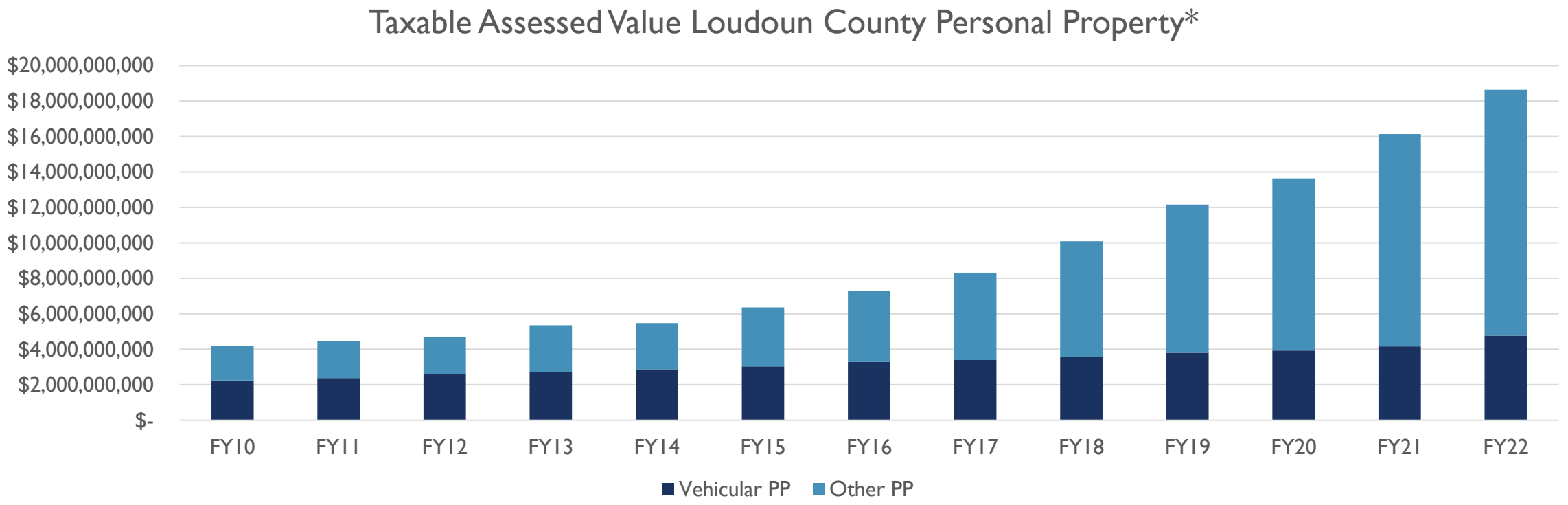


From FY 2010 to FY 2022, Loudoun County's total personal property assessments increased 344%. This was led by growth in its "other" personal property category which increased by more than 600%. Vehicular property increased 113%

* Excludes public service corporation personal property

Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table F

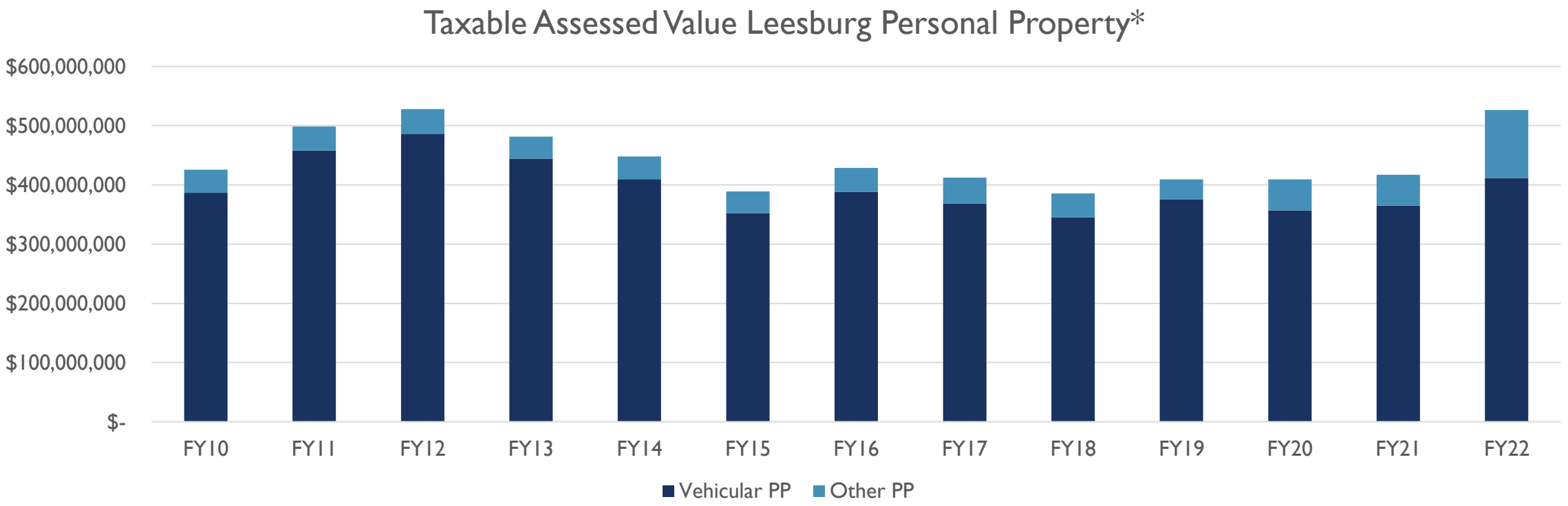
GROWTH IN ASSESSED VALUE LOUDOUN COUNTY TAXABLE PERSONAL PROPERTY HAS BEEN DRIVEN BY INCREASED **OTHER PERSONAL PROPERTY**



* Excludes public service corporation personal property

Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table F

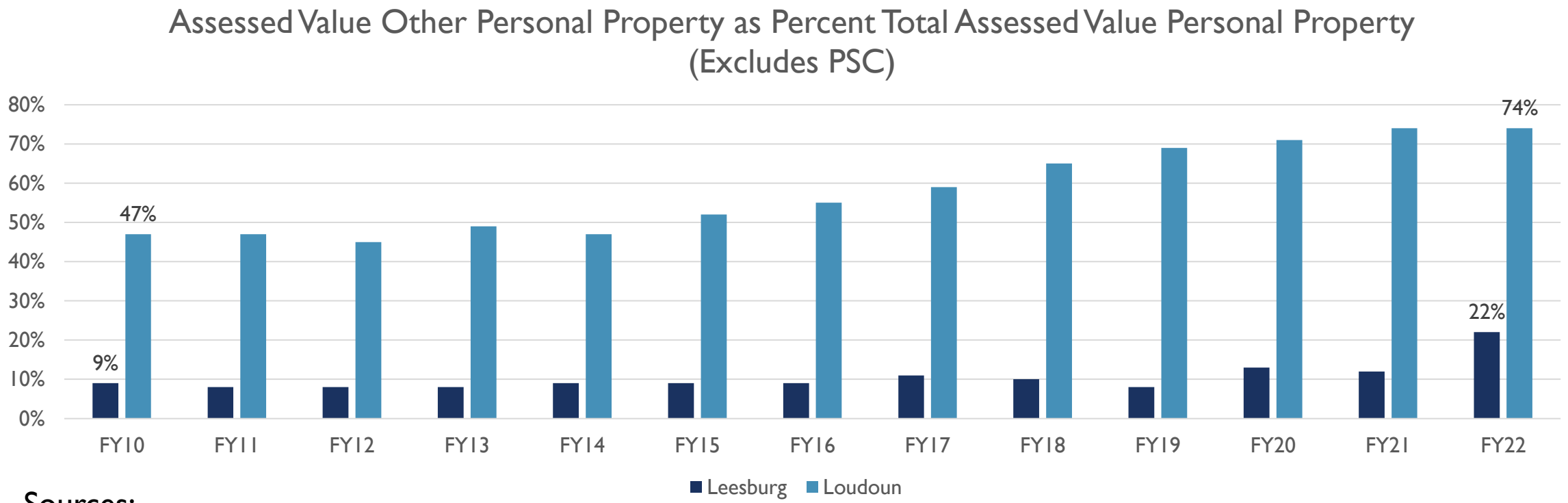
LEESBURG OTHER PERSONAL PROPERTY A SMALL PORTION OF TOTAL TAXABLE PERSONAL PROPERTY



* Excludes public service corporation personal property

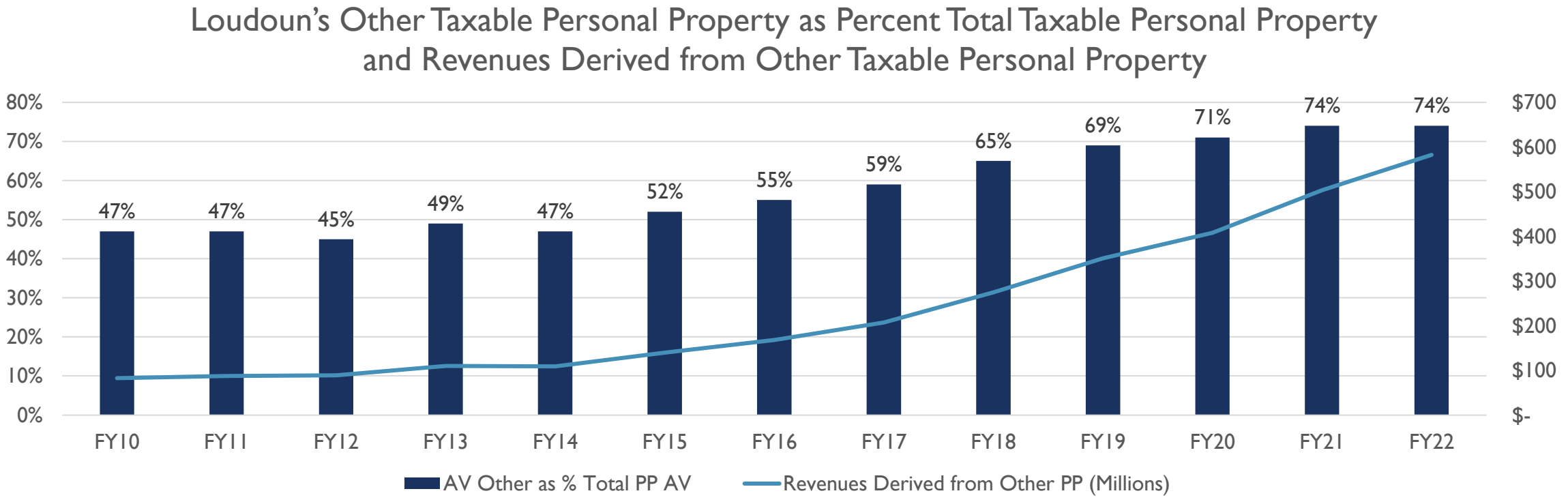
Sources: Details regarding Vehicular and Other Personal Property for Leesburg furnished by Town of Leesburg
Reconciled to total taxable personal property in FY19 and FY22 Annual Comprehensive Financial Reports – Table 8

LOUDOUN'S **OTHER** WAS 74% OF FY22 TOTAL ASSESSED VALUE PERSONAL PROPERTY WHILE LEESBURG'S WAS 22%



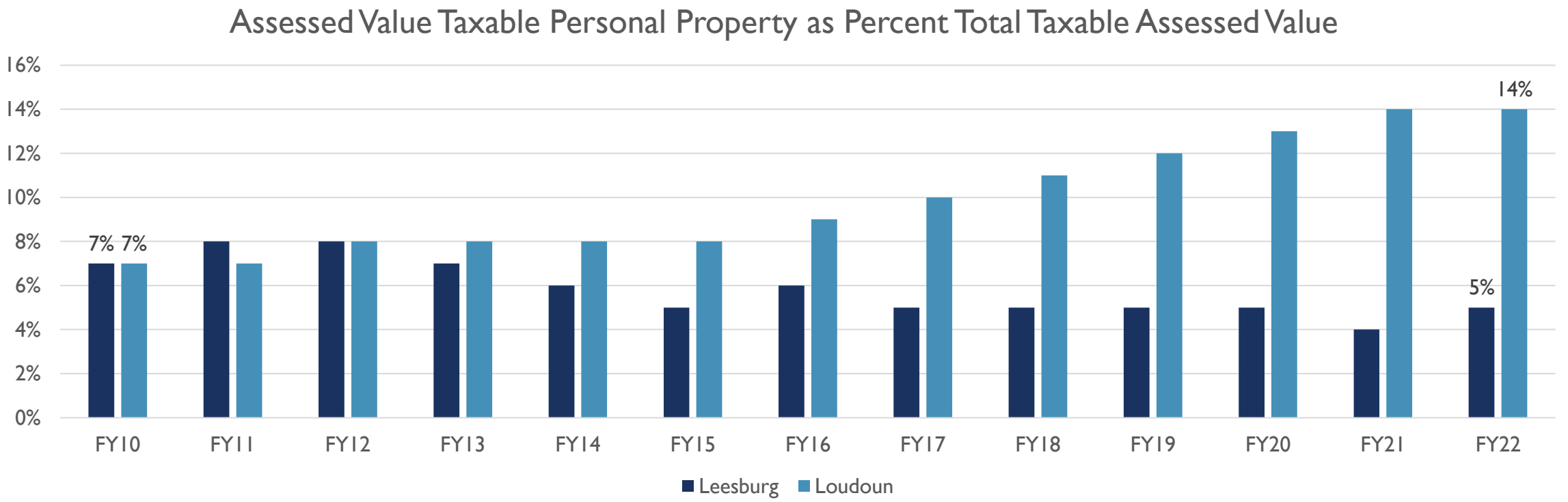
Sources:
FY19 and FY22 Annual Comprehensive Financial Reports – Table 8 Leesburg, Table F Loudoun
Details regarding Other Personal Property for Leesburg furnished by Town of Leesburg

LOUDOUN COUNTY ASSESSED VALUE OF **OTHER TAXABLE PERSONAL PROPERTY** GREW FROM 47% TO 74% OF TOTAL ASSESSED VALUE TAXABLE PERSONAL PROPERTY FY10 TO FY22



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table F
Revenues determined using assessed value and tax rate of $4.20/$100 assessed value per ACFR Table G

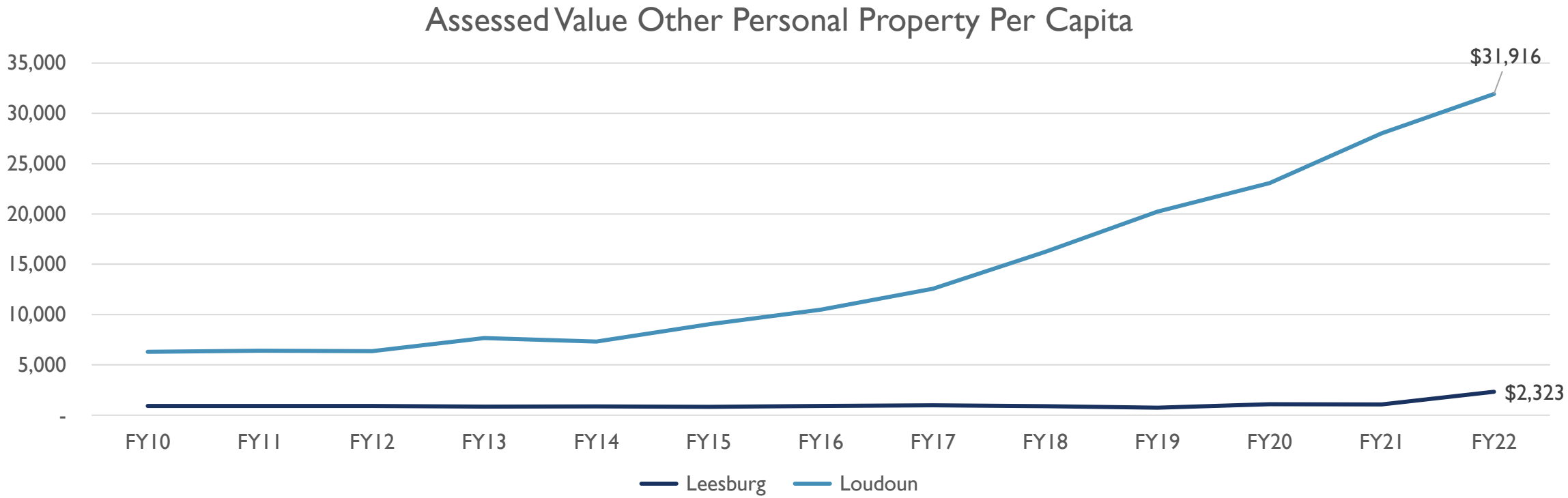
TAXABLE PERSONAL PROPERTY IS NOW 14% OF LOUDOUN'S TOTAL TAXABLE ASSESSED VALUE (INCLUDING REAL PROPERTY) - TWICE THE PROPORTION OF FY10



Sources:
FY19 and FY22 Annual Comprehensive Financial Reports – Table 8 Leesburg, Table F Loudoun

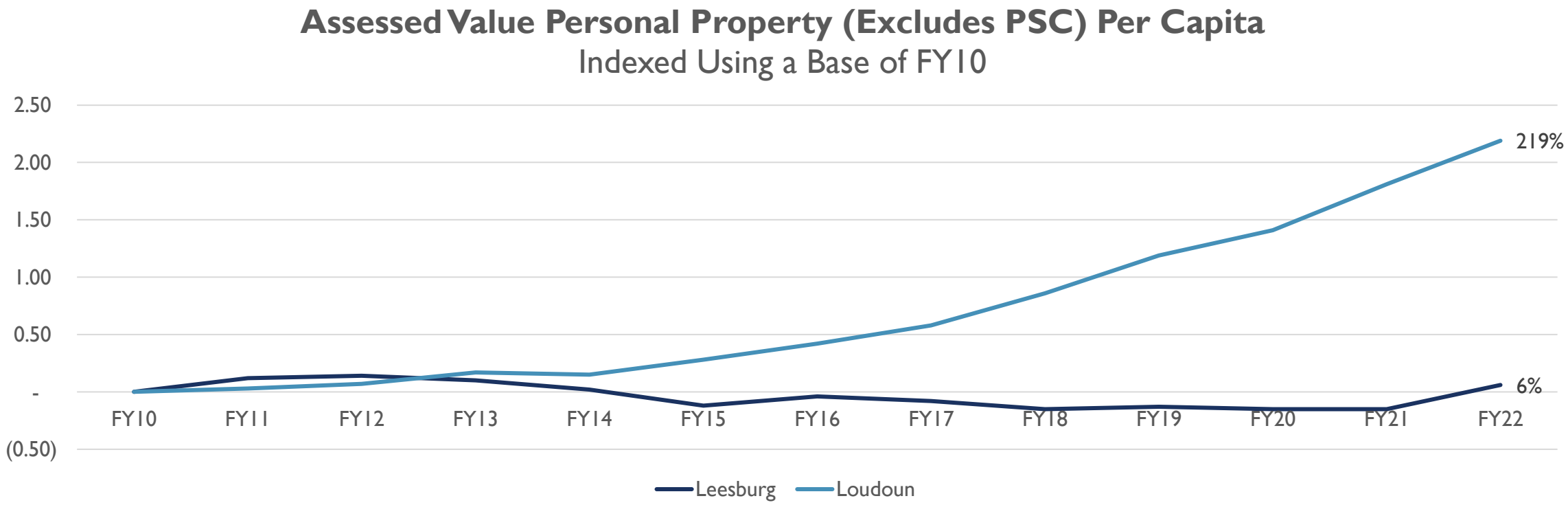
PER CAPITA
TAXABLE ASSESSED VALUE

LOUDOUN ASSESSED VALUE PER CAPITA **OTHER** PERSONAL PROPERTY WAS NEARLY $32,000 IN FY22 WHILE LEESBURG'S WAS UNDER $2,500



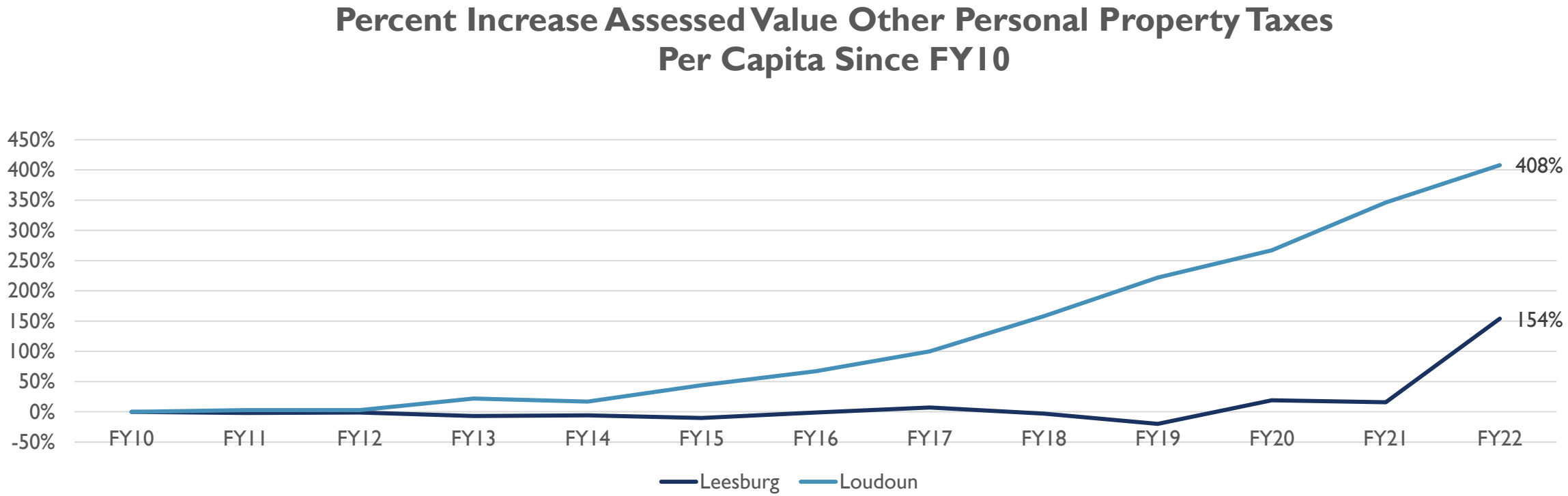
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 8 Leesburg, Table F Loudoun with additional details regarding other personal property furnished by Town of Leesburg. Population data from ACFR Table 17 Leesburg, Table M/N Loudoun.

LOUDOUN'S PER CAPITA ASSESSED VALUE PERSONAL PROPERTY GREW 219% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 6%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 8 Leesburg, Table F Loudoun for assessed value and Table 17 Leesburg, Table M/N Loudoun for population

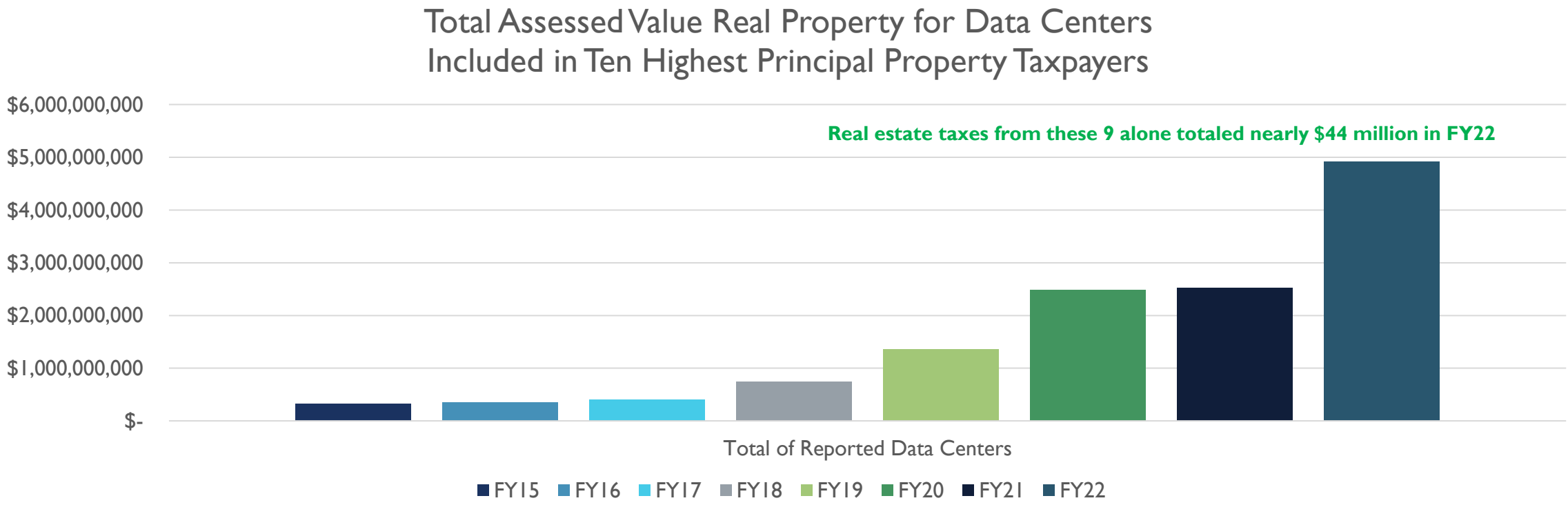
LOUDOUN'S ASSESSED VALUE PER CAPITA **OTHER** PERSONAL PROPERTY INCREASED MORE THAN 400% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 154%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 8 Leesburg, Table F Loudoun with additional details regarding other personal property furnished by Town of Leesburg. Population data from ACFR Table 17 Leesburg, Table M/N Loudoun.

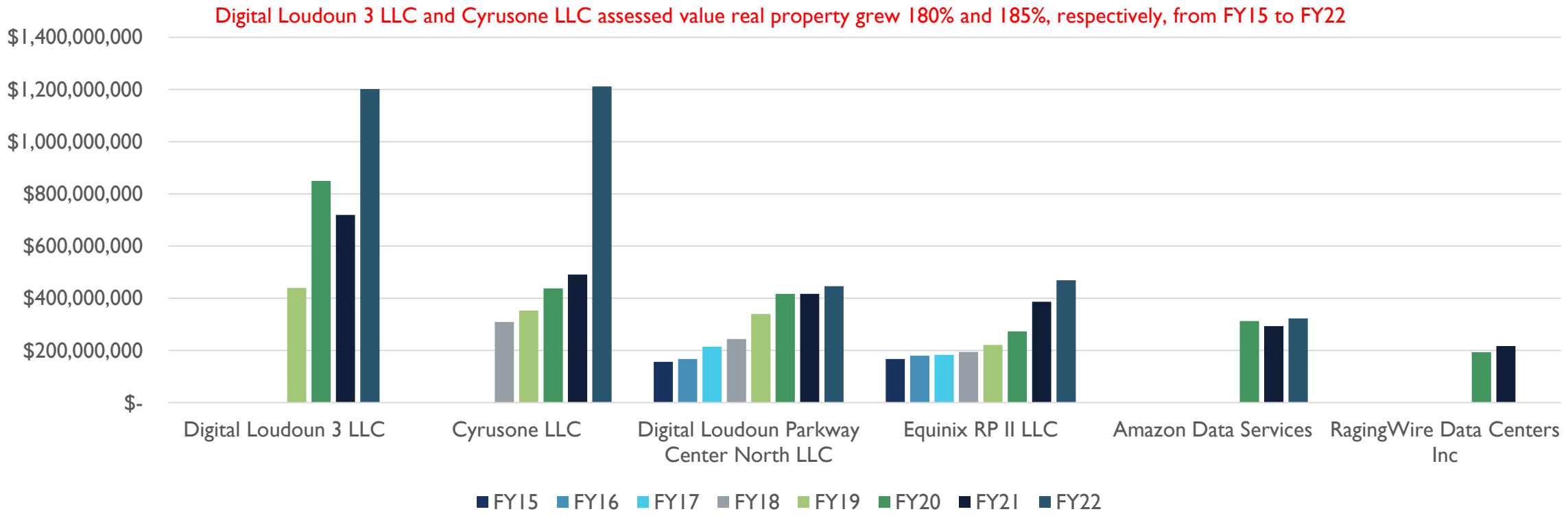
DATA CENTER IMPACT

IN FY22, 9 OF LOUDOUN COUNTY'S TOP 10 REAL PROPERTY TAXPAYERS WERE DATA CENTERS



Sources: Loudoun County Annual Comprehensive Financial Reports Table H (Principal Property Taxpayers) FY15 to FY22. Note that no data center was listed in the Principal Property Taxpayers Table prior to FY15

GROWTH IN ASSESSED VALUE REAL PROPERTY OF THOSE DATA CENTERS LISTED IN LOUDOUN ACFR TABLE H, PRINCIPAL PROPERTY TAXPAYERS



Sources: Loudoun County Annual Comprehensive Financial Reports Table H (Principal Property Taxpayers) FY15 to FY22. Note that no data center was listed in the Principal Property Taxpayers Table prior to FY15.

DATA CENTER INFORMATION IN LOUDOUN COUNTY'S FY24 BUDGET

- "The data center industry continued to expand with approximately 7.1 million of new data center square feet space permitted by the County in 2022." (Volume 1, E-19)
- This was for 7.6 million square feet of new data center space (Volume 1, R-44)
- "Revaluation across the commercial portfolio varied by property type with data centers seeing the largest increases year-over-year" (Volume 1, R-44)
- "Commercial property appreciated by 21.3 percent, primarily from new and expanded data centers in the County. New development added a record $4.4 billion to the real property portfolio in 2022, compared to $2.2 billion in 2021, and was led by the data center industry." (Volume 1, E-20)
- The FY24 adopted budget estimates revenue of nearly $561 million from data center computer equipment. (Volume 1, R-4). This represents 72% of the anticipated personal property tax revenues and 29% of the estimated general property tax revenues.

DATA CENTER INFORMATION FROM LOUDOUN COUNTY ECONOMIC DEVELOPMENT

- "More than 25 million square feet of data centers are currently operational with another 4 million in development"
- "Data centers and the data center ecosystem provide more than 12,000 jobs in Loudoun County."
- "Loudoun County's "Data Center Alley" is the world's largest concentration of data centers, with more than 25 million square feet currently in operation and millions more being planned or developed. Much of the world's internet traffic passes through Loudoun's digital infrastructure, making us a key player in the world's technology economy."

Source: https://biz.loudoun.gov/key-business-sectors/data-centers/ (accessed on October 3, 2023)

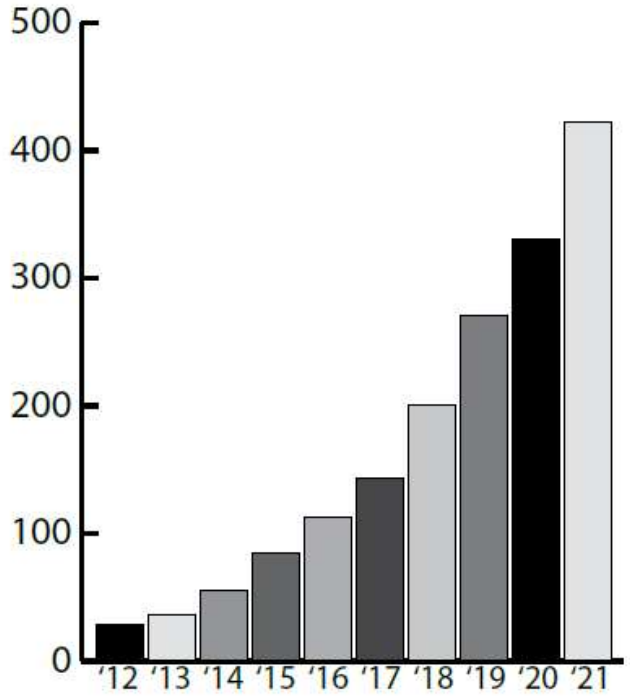
LOUDOUN COUNTY DATA CENTER IMPACT AS REPORTED BY THE MEDIA

- "Loudoun County alone takes in close to $600 million annually in tax revenue from data centers, enough to cover all the county's operating expenditures." (*The Data Center Capital of the World is in Virginia*, Governing, July 27, 2023) (https://www.governing.com/infrastructure/the-data-center-capital-of-the-world-is-in-virginia)

"IN FY22, DATA CENTERS ARE EXPECTED TO CONTRIBUTE MORE THAN $500 MILLION IN LOCAL TAX REVENUE"

~ *LOUDOUN DATA CENTER LAND STUDY*, FEBRUARY 2022 (BIZ.LOUDOUN.GOV)

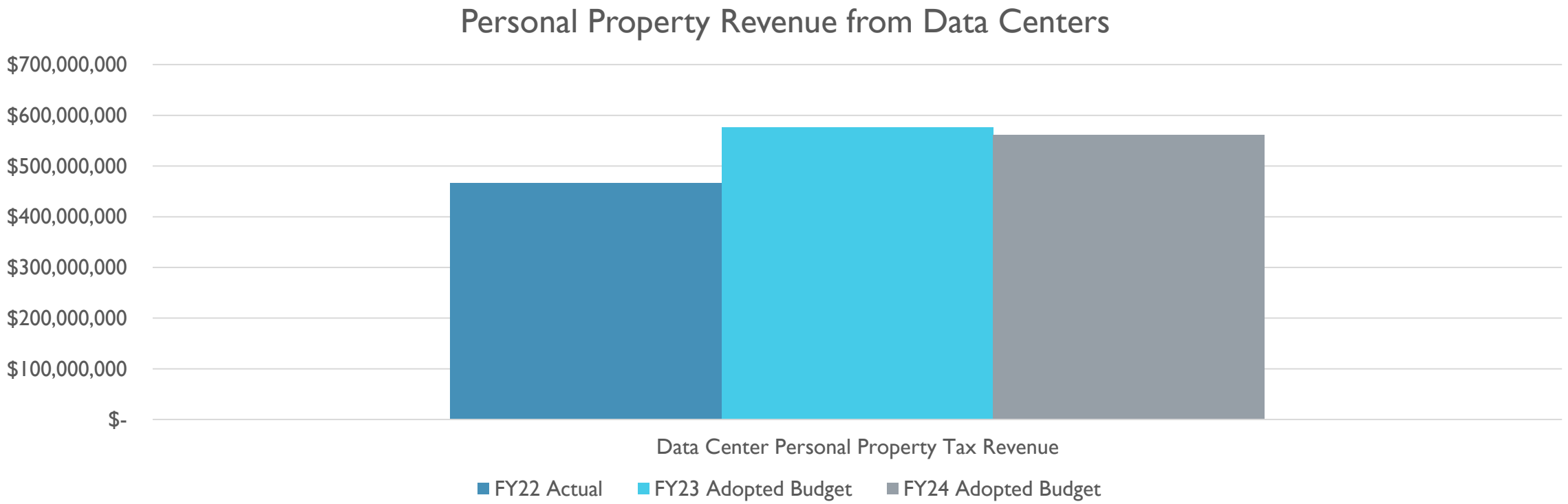
Estimated Equipment Tax Revenue from Data Centers



Estimated Total Tax Revenue from Data Centers

Tax Year	Total Revenue	% Change
2016	$148.23	
2017	187.01	26.2%
2018	255.59	36.7%
2019	345.80	35.3%
2020	431.92	24.9%

LOUDOUN COUNTY GENERATES SIGNIFICANT PERSONAL PROPERTY TAX REVENUES FROM DATA CENTERS

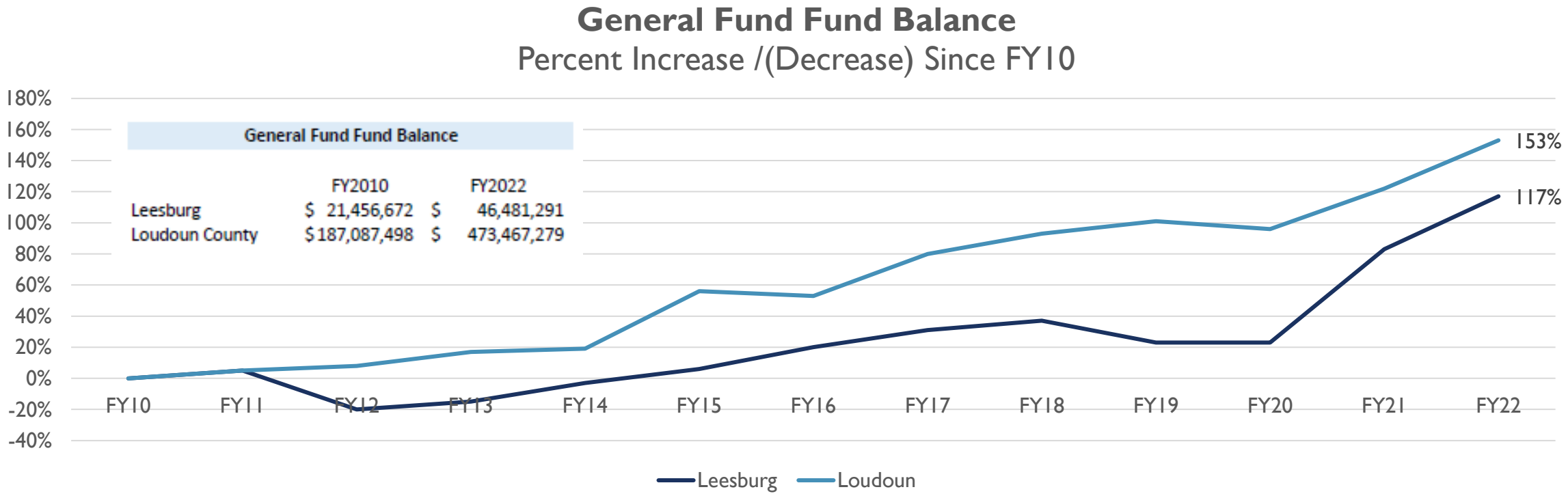


Source: Loudoun County FY24 Adopted Budget – Volume 1

FY22 was the first full fiscal year where data center personal property revenues were separately disclosed

FUND BALANCE

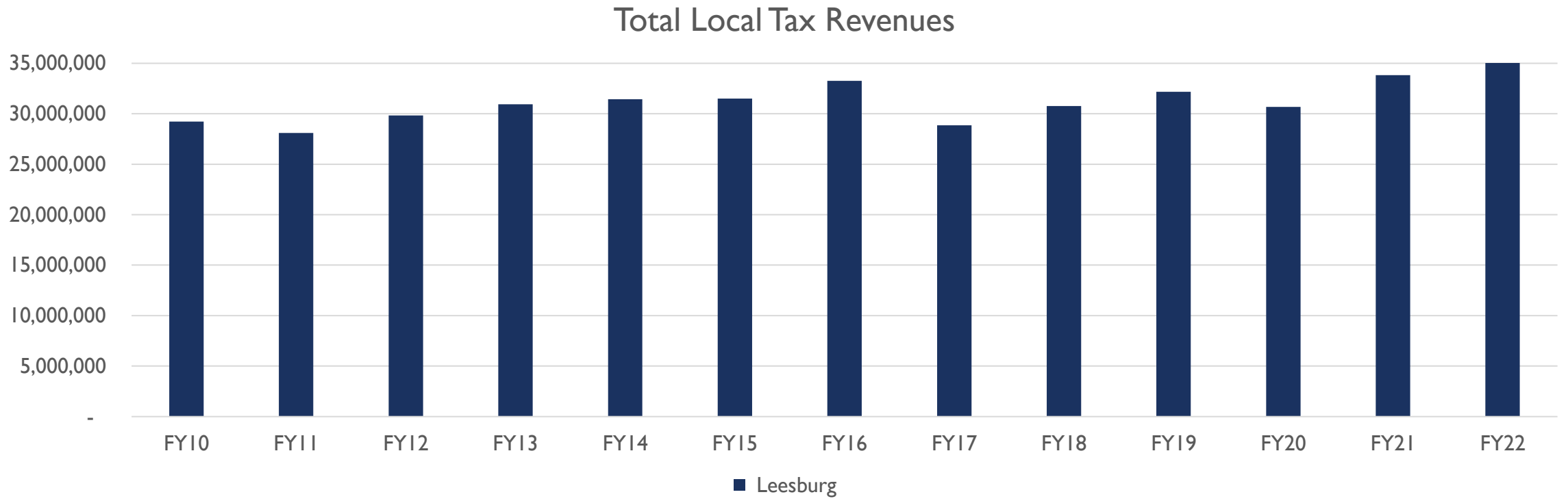
LOUDOUN'S GENERAL FUND FUND BALANCE INCREASED 153% FROM FY10 TO FY22 WHILE LEESBURG'S INCREASED 117%



Sources:
FY19 and FY22 Annual Comprehensive Financial Reports – Table 4 Leesburg, Table C Loudoun

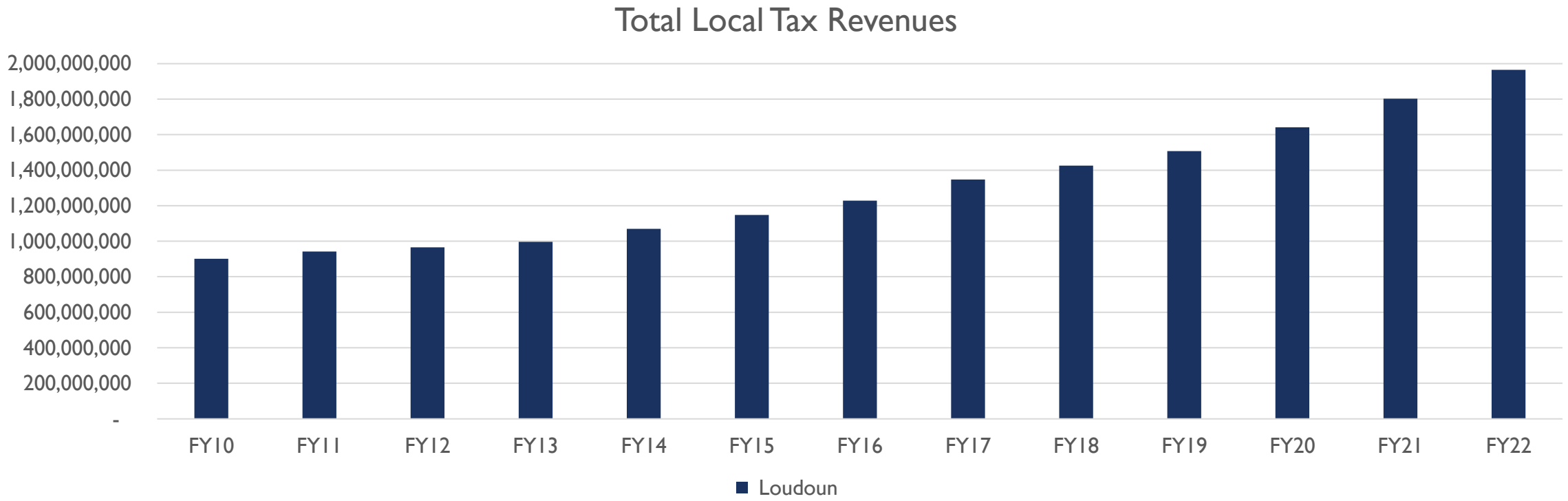
REVENUES

THE TOWN OF LEESBURG'S TOTAL LOCAL TAX REVENUES INCREASED BY 29% FROM FY10 TO FY22



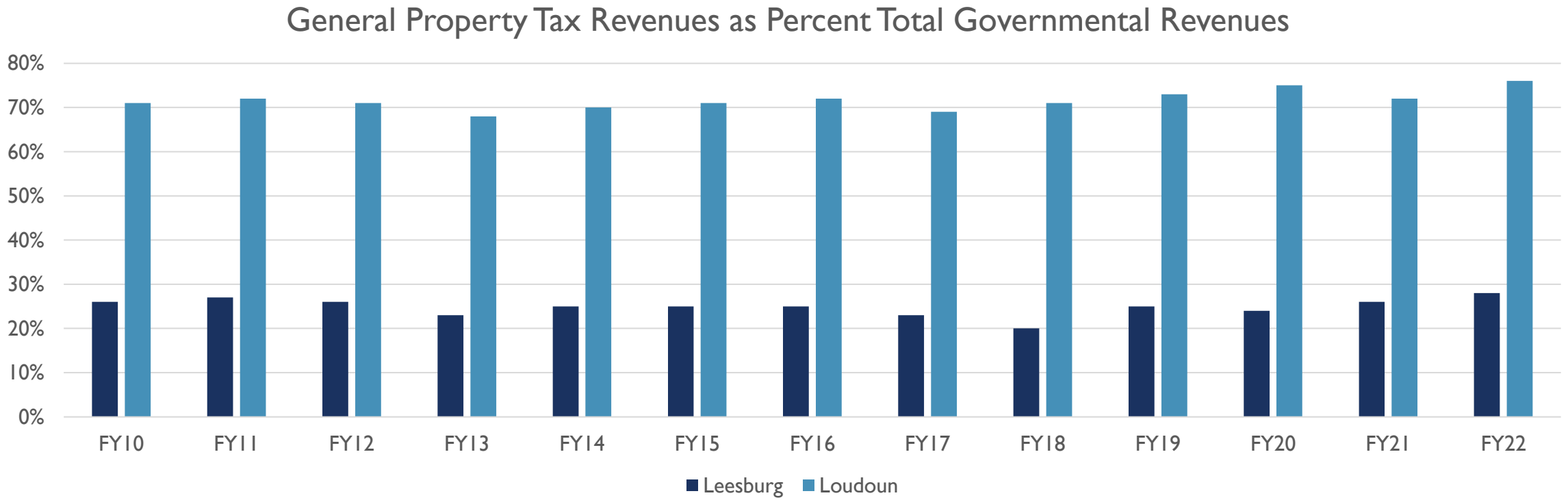
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5
Note: Presented using the modified accrual method of accounting
Total local taxes are the combination of general property taxes and other local taxes

LOUDOUN COUNTY'S TOTAL LOCAL TAX REVENUES DOUBLED FROM FY10 TO FY22



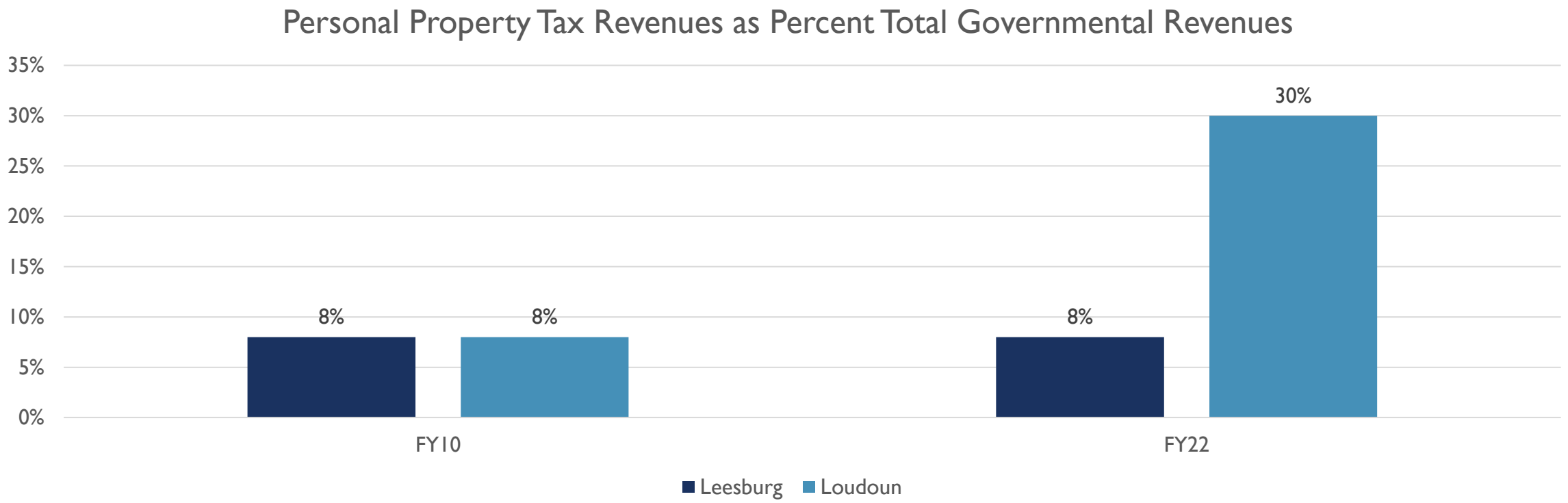
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table D
Note: Presented using the modified accrual method of accounting
Total local taxes are the combination of general property taxes and other local taxes

GENERAL PROPERTY TAX REVENUES AS PERCENT TOTAL GOVERNMENTAL REVENUES AVERAGED **25% FOR LEESBURG** AND **74% FOR LOUDOUN** FY18-22



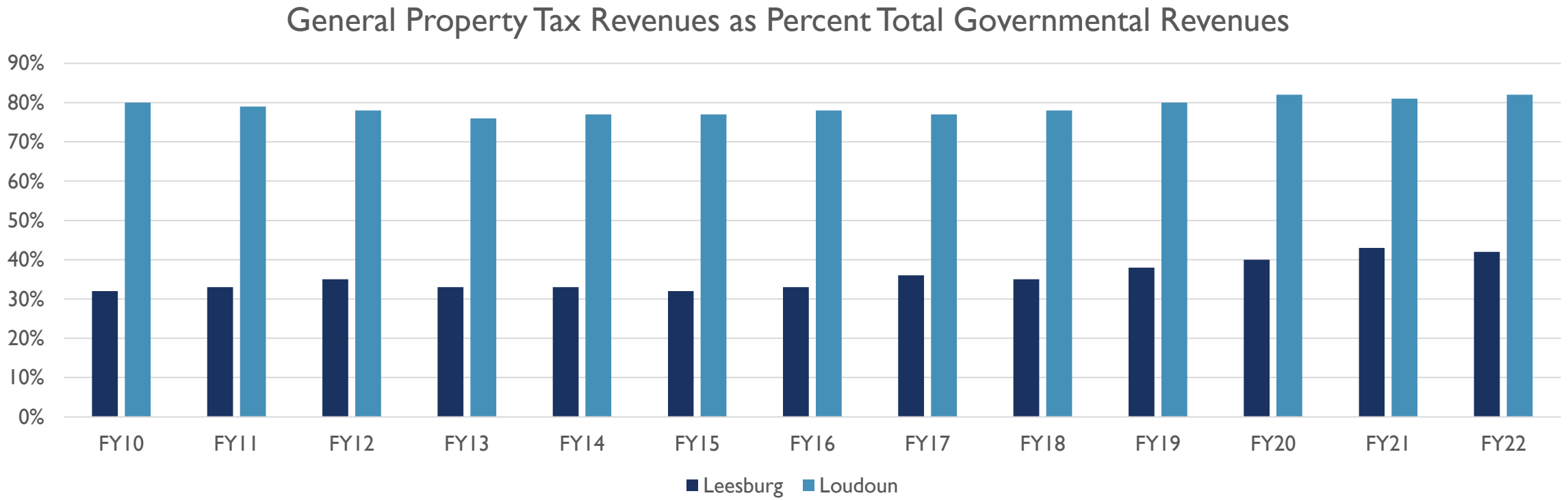
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun
FY22 Leesburg adjusted to exclude the $55M pass through funding related to the NVTA
Note: Presented using the modified accrual method of accounting

PERSONAL PROPERTY TAX REVENUES AS PERCENT TOTAL GOVERNMENTAL REVENUES 8% FOR LEESBURG IN BOTH FY10 AND FY22, 8% TO 30% FOR LOUDOUN



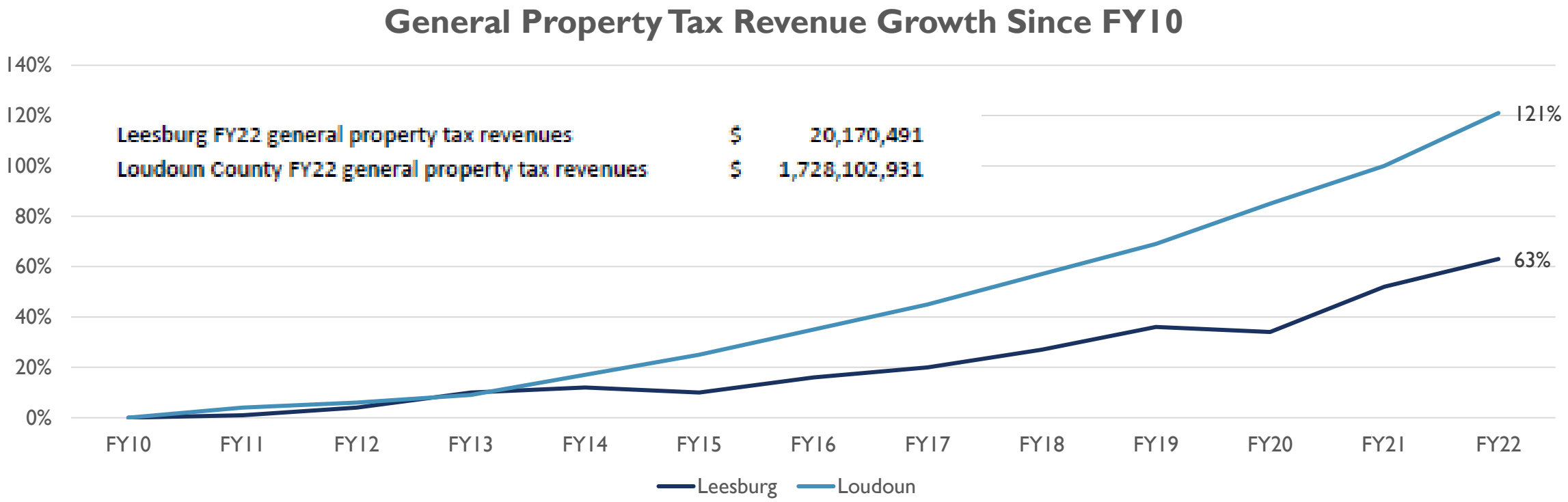
Sources: FY10 and FY22 Annual Comprehensive Financial Reports – Exhibit A-2 and Table 5 Leesburg, Schedule 1 and Table D Loudoun

GENERAL PROPERTY TAX REVENUES AS PERCENT TOTAL LOCAL REVENUES AVERAGED **40% FOR LEESBURG** AND **81% FOR LOUDOUN** FY18-22



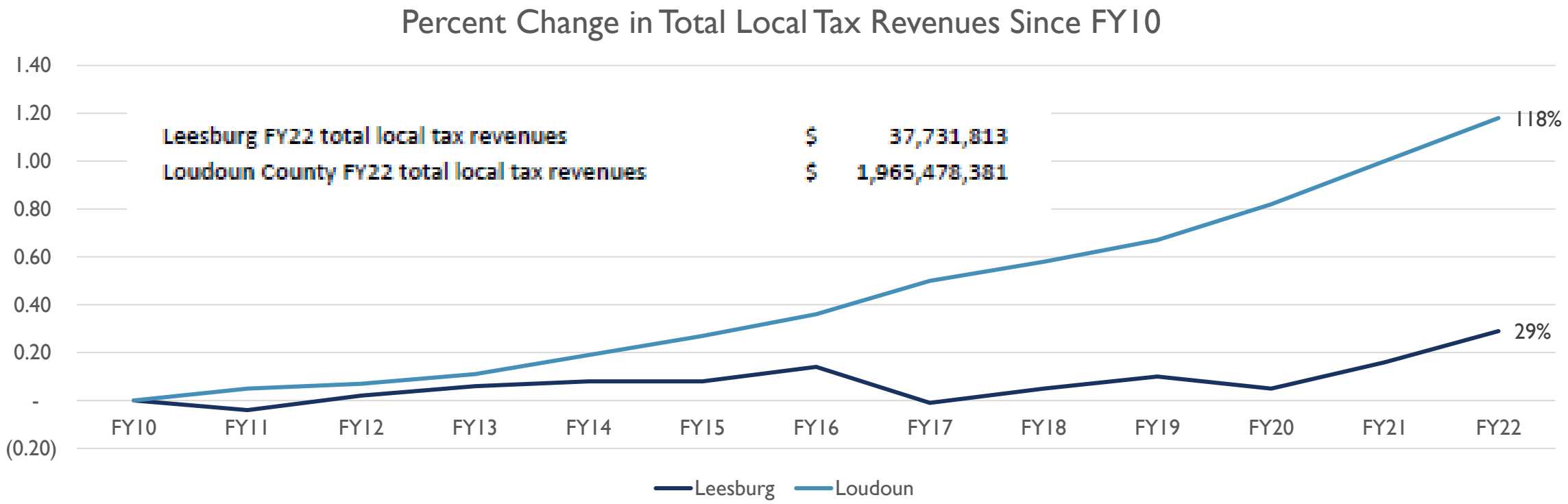
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun
FY22 Leesburg adjusted to exclude the $55M pass through funding related to the NVTA
Note: Presented using the modified accrual method of accounting

LOUDOUN'S GENERAL PROPERTY TAX REVENUES INCREASED 121% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 63%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun
Note: Presented using the modified accrual method of accounting

LOUDOUN'S TOTAL LOCAL TAX REVENUES INCREASED 118% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 29%

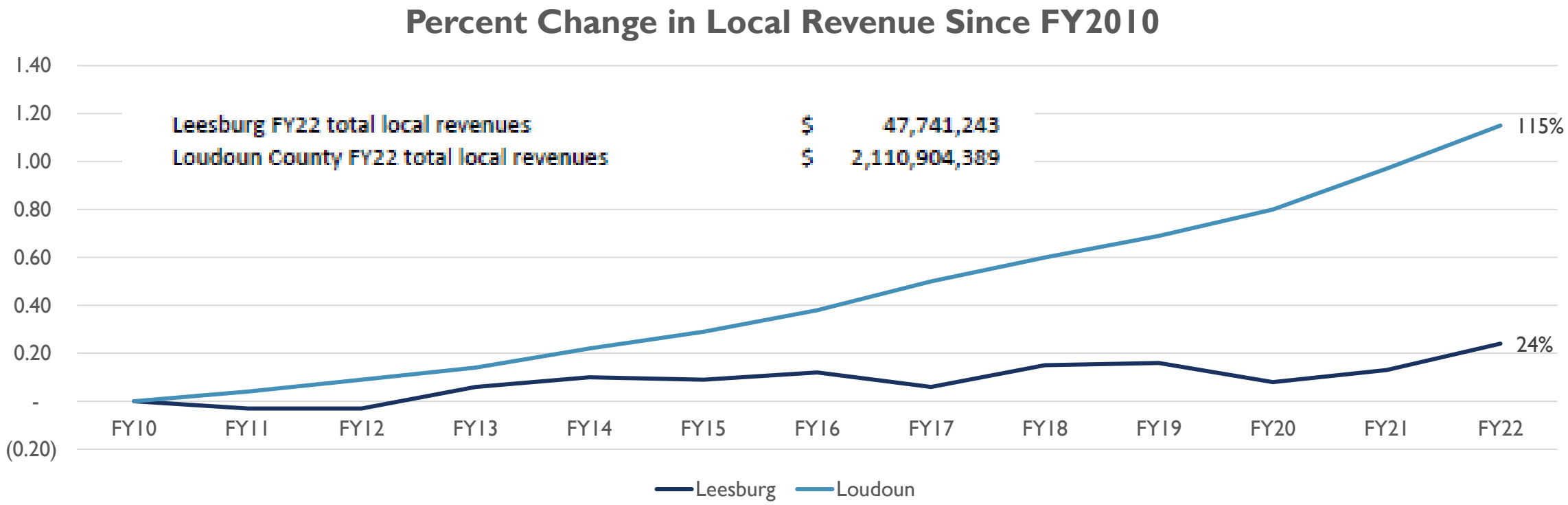


Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun

Note: Presented using the modified accrual method of accounting

Total local taxes are the combination of general property taxes and other local taxes

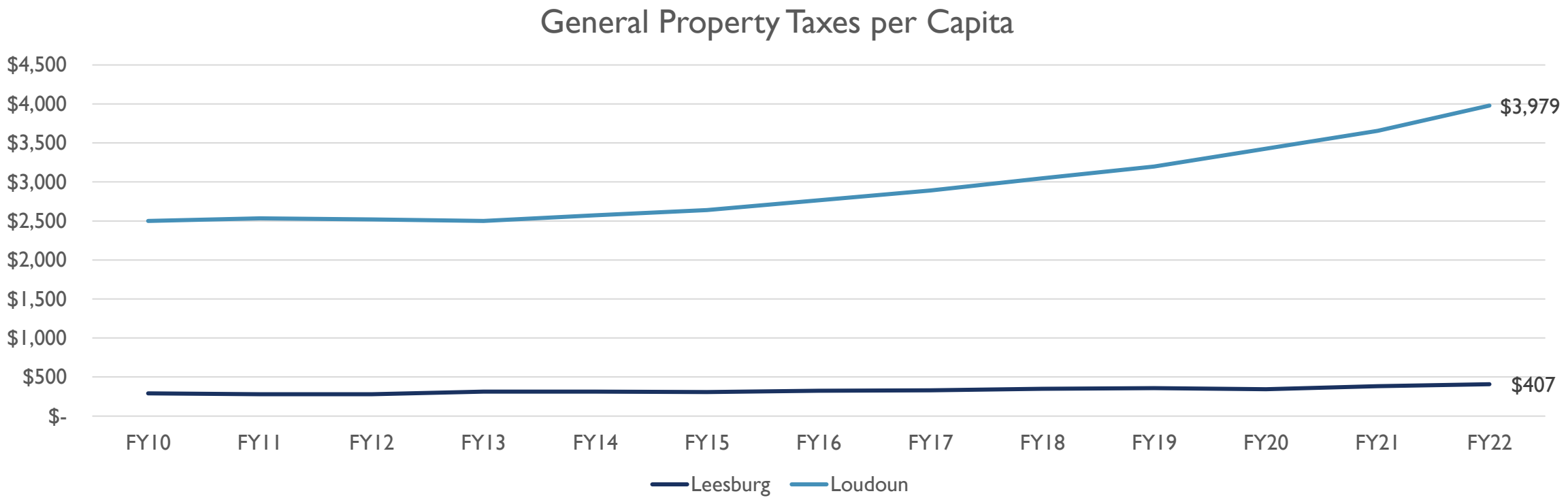
LOUDOUN'S LOCAL REVENUES INCREASED 115% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 24%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun
Note: Presented using the modified accrual method of accounting
Local revenues are total revenues less intergovernmental revenues and payments from component units

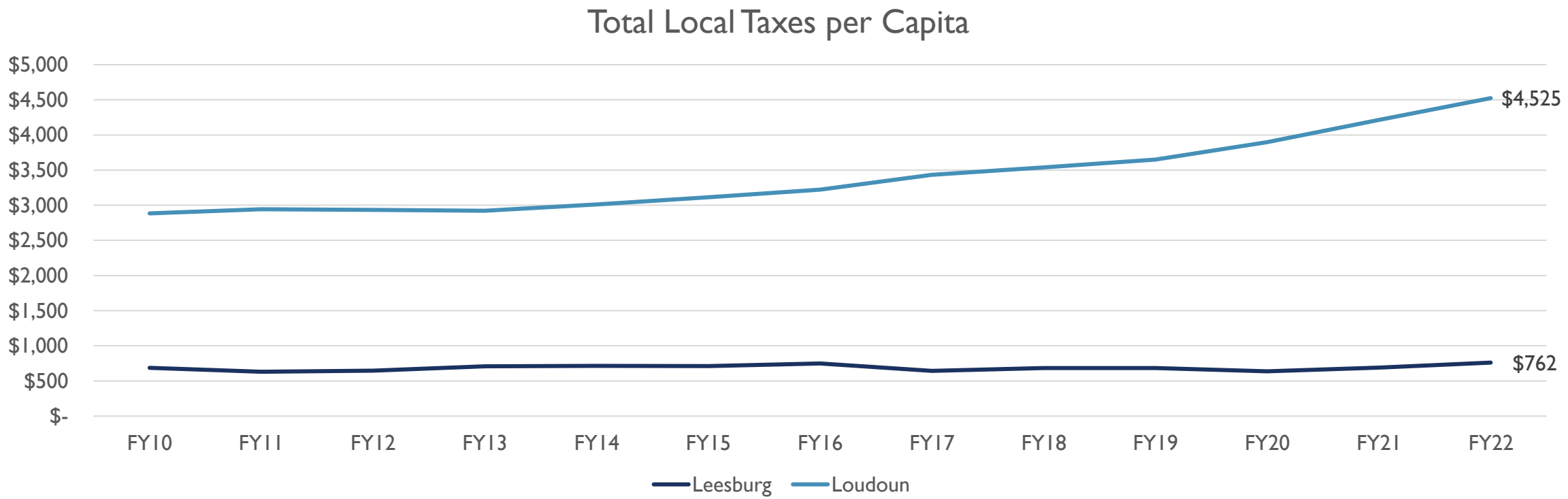
PER CAPITA REVENUES

LOUDOUN'S PER CAPITA **GENERAL PROPERTY TAXES** INCREASED 59% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 40%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun for General Property Tax revenues and Table 17 Leesburg , Table M/N Loudoun for population
Note: Presented using the modified accrual method of accounting

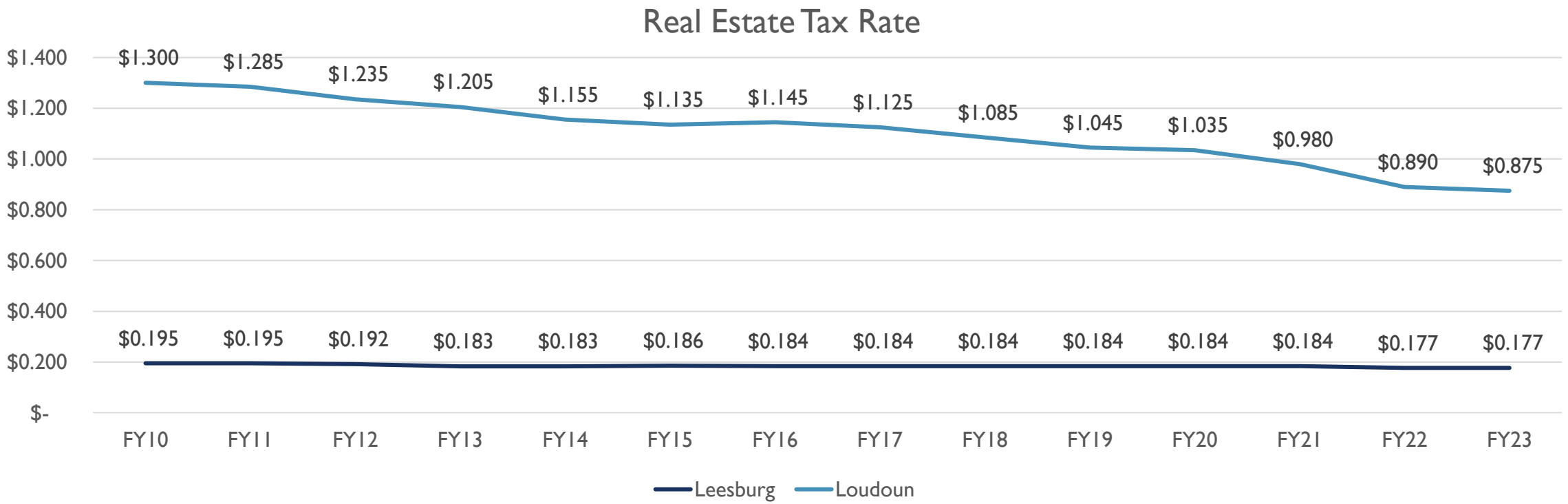
LOUDOUN'S PER CAPITA **TOTAL LOCAL TAXES** INCREASED 57% FROM FY10 TO FY22 WHILE LEESBURG'S GREW 11%



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 5 Leesburg, Table D Loudoun for tax revenues and Table 17 Leesburg , Table M/N Loudoun for population. Presented using the modified accrual method of accounting. Total local taxes are general property taxes and other local taxes.

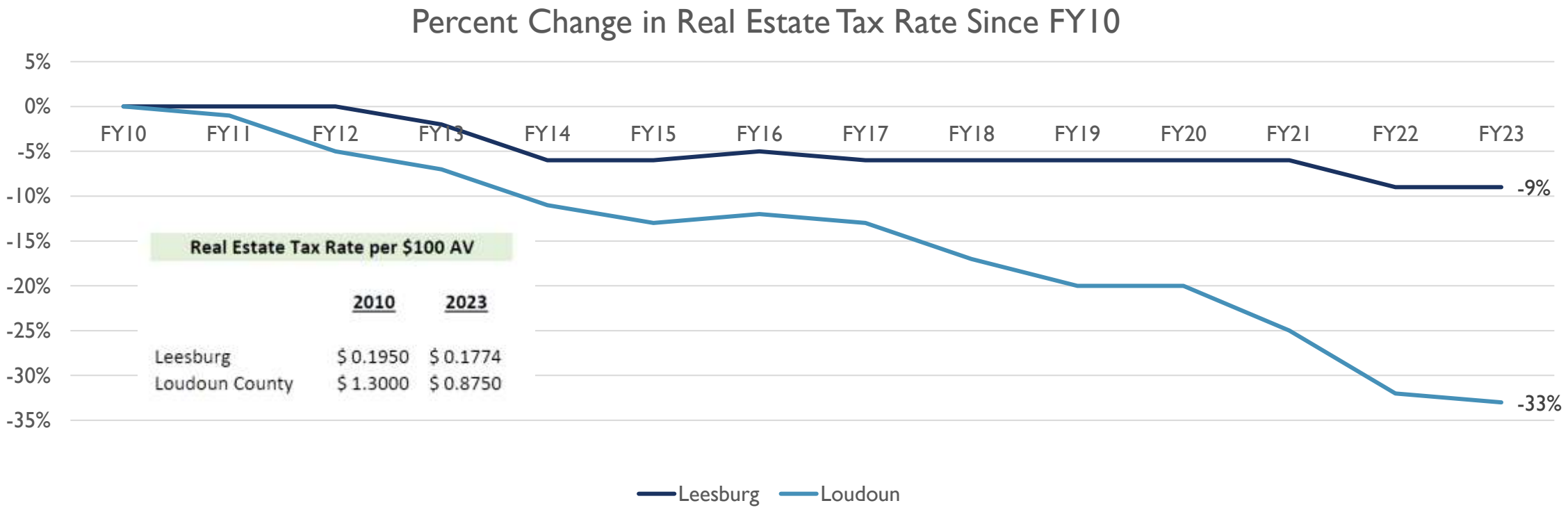
TAX RATES AND COST OF HOME OWNERSHIP

HISTORY OF REAL ESTATE TAX RATES LEESBURG AND LOUDOUN



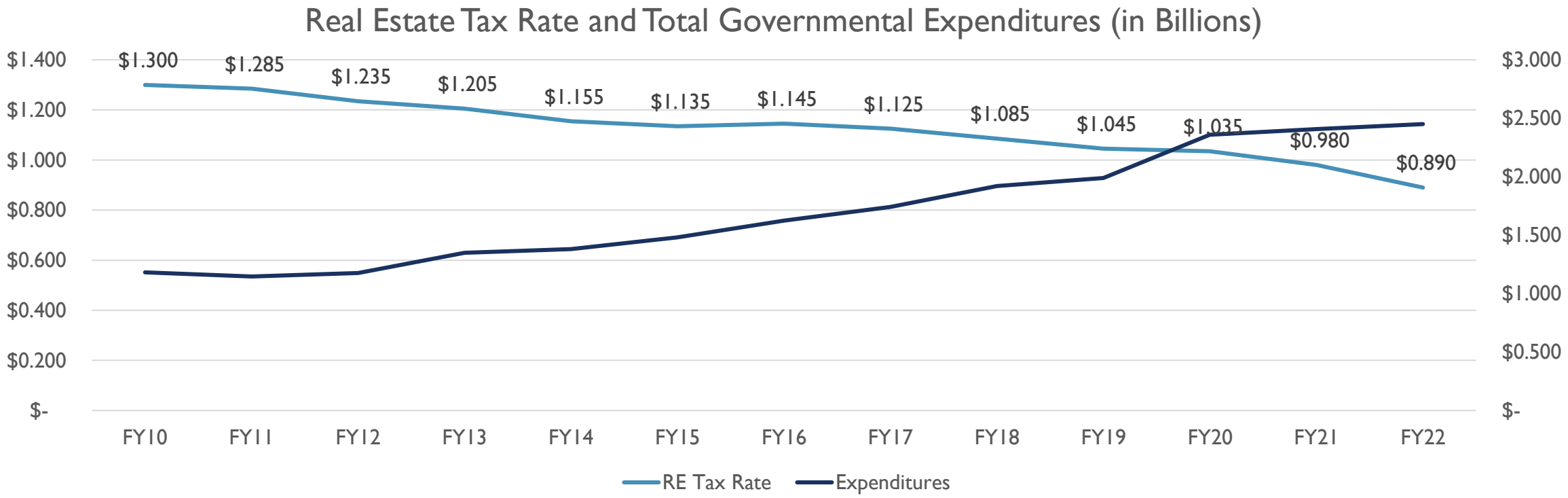
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 10 Leesburg, Table G Loudoun
The rate shown for Loudoun County is the General Fund real estate tax rate (FY10 to FY22)
Locality websites for FY23 https://www.leesburgva.gov/departments/finance/taxes-fees/tax-rates-and-fees and https://www.loudoun.gov/1922/Property-Tax-Rates

LEESBURG AND LOUDOUN REAL ESTATE TAX RATE CHANGES SINCE 2010



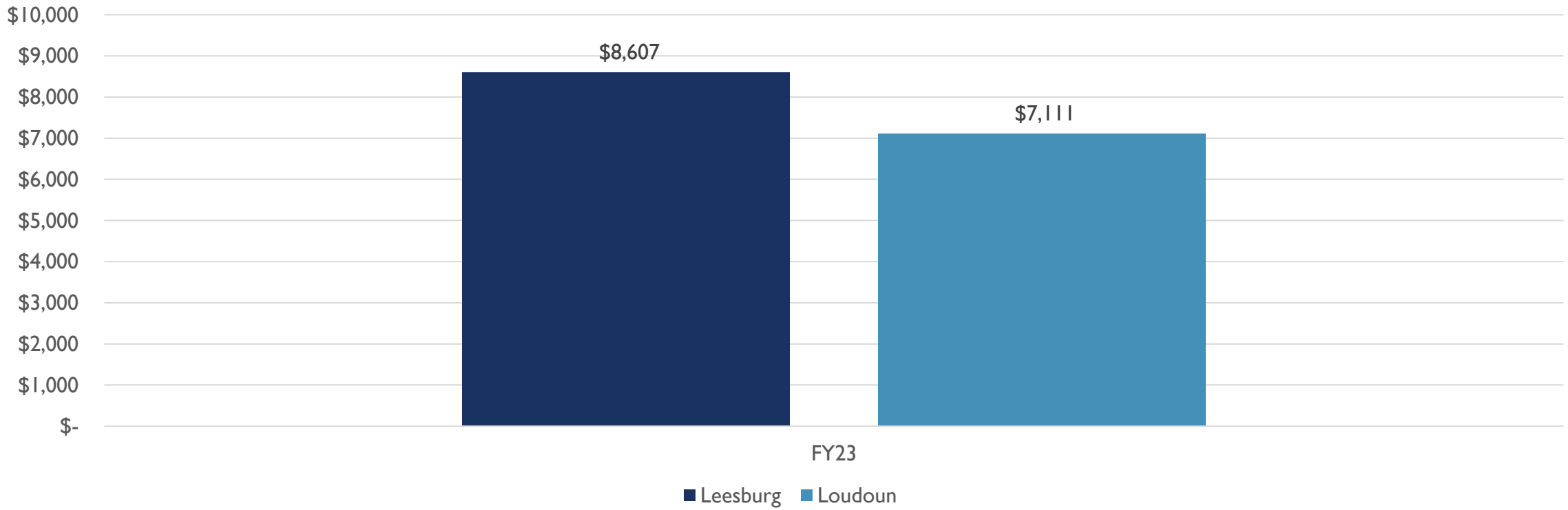
Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Table 10 Leesburg, Table G Loudoun
The rate shown for Loudoun County is the General Fund real estate tax rate (FY10 to FY22)
Locality websites for FY23 https://www.leesburgva.gov/departments/finance/taxes-fees/tax-rates-and-fees and https://www.loudoun.gov/1922/Property-Tax-Rates

LOUDOUN REAL ESTATE TAX RATE DECLINED WHILE EXPENDITURES INCREASED



Sources: FY19 and FY22 Annual Comprehensive Financial Reports – Tables D and G
The tax rate shown is the General Fund real estate tax rate

A LEESBURG HOMEOWNER PAYS 21% MORE IN PROPERTY TAXES THAN THE LOUDOUN COUNTY HOMEOWNER WITH EQUAL ASSESSED VALUES



Assumptions –homeowner with a home assessed at $563,000 and vehicles assessed at $50,000. Home assessment based on the average residential assessment in the Town of Leesburg as reported in the 2023 Loudoun County Assessment Summary. Vehicular assessment estimated.

COMMISSION ON LOCAL GOVERNMENT FISCAL STRESS AND HOUSEHOLD INCOME

LOUDOUN COUNTY LEADS VIRGINIA WITH LOW FISCAL STRESS AND HIGH MEDIAN INCOME

- Report on Comparative Revenue Capacity, Revenue Effort and Fiscal Stress of Virginia's Cities and Counties FY21
  - Loudoun County was 3rd lowest in overall fiscal stress among Virginia's 133 cities and counties
    - From 2010 to 2021 Loudoun ranked no lower than 6th among the total of 133 or 134 cities/counties in Virginia
  - Loudoun County had the highest median household income in the state at $153,716
    - Loudoun ranked first every year between 2010 and 2021 except 2012 when surpassed by Falls Church city which has been consistently second behind Loudoun County in other years

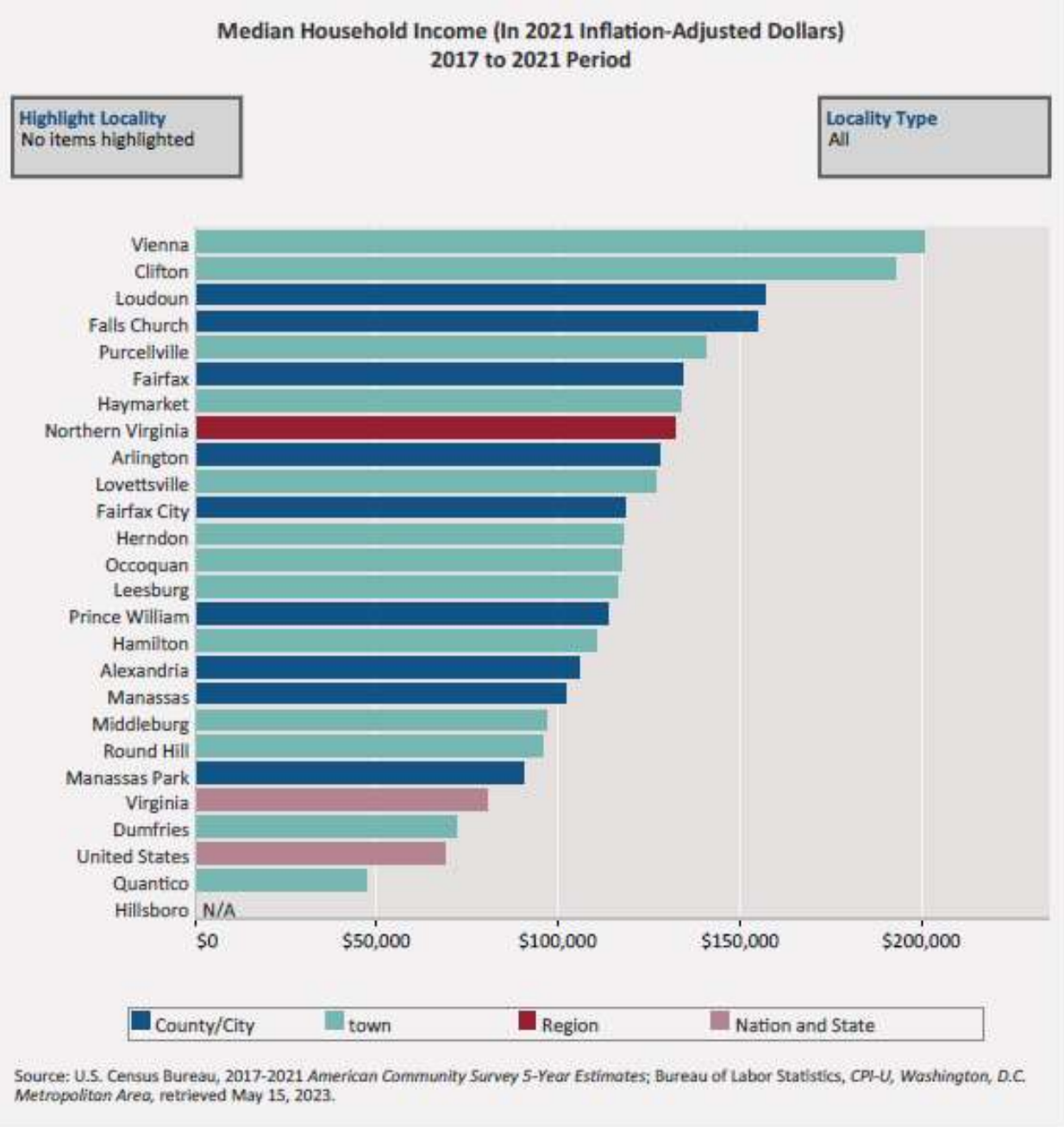
Source:
Virginia Department of Housing and Community Development Fiscal Stress Report
https://www.dhcd.virginia.gov/fiscal-stress

Leesburg Median Household Income is Well Below Loudoun County

Loudoun County $156,821*
Leesburg $116,350

* Loudoun ranked 1st among 3,143 cities and counties in the US

Loudoun County income is 119% the Northern Virginia level while Leesburg is 88%.

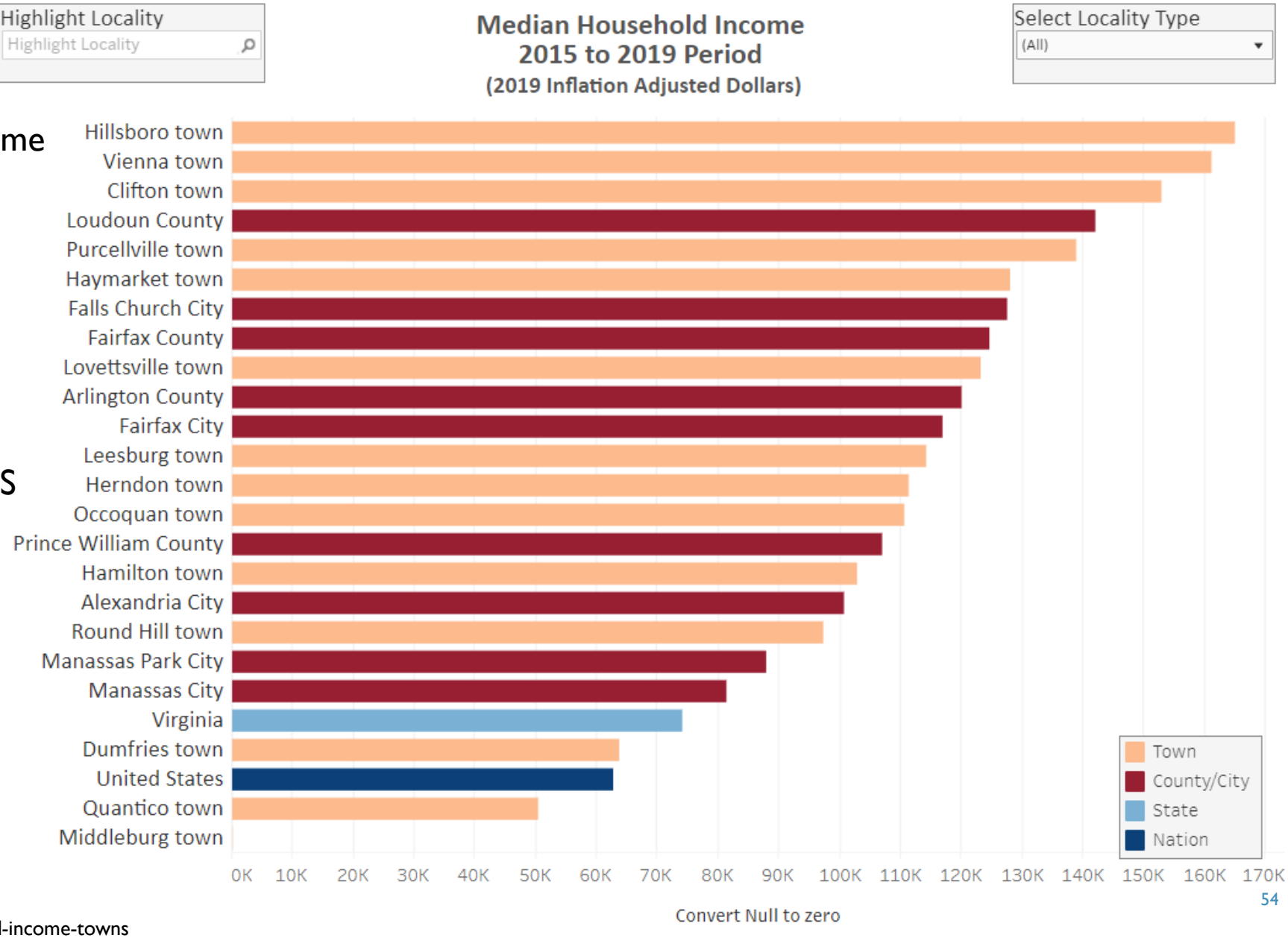


Source:
NOVA Regional Dashboard
https://www.novaregiondashboard.com/median-household-income-towns

Leesburg Median Household Income is Well Below Loudoun County

Loudoun County $142,299*
Leesburg $114,444

* Loudoun ranked 1st among 3,142 cities and counties in the US



Source:
NOVA Regional Dashboard
https://www.novaregiondashboard.com/median-household-income-towns

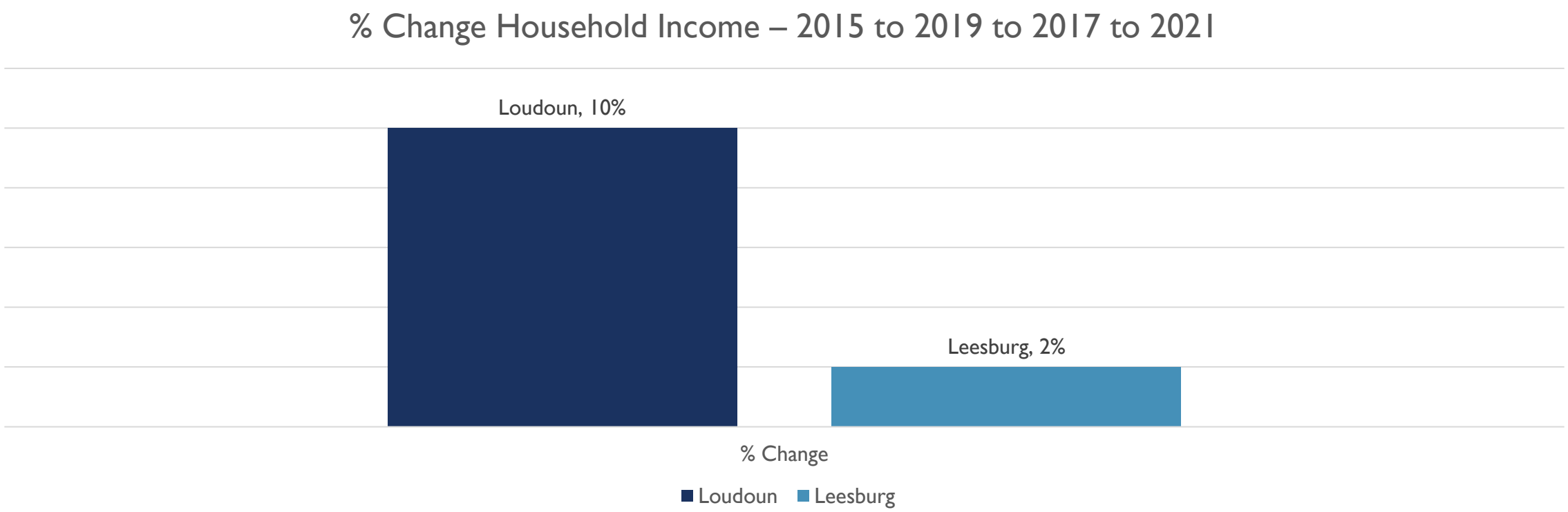
Source: U.S. Census Bureau, *2015-2019 American Community Survey 5-Year Estimates.*

LEESBURG HOUSEHOLD INCOME GROWTH SIGNIFICANTLY LAGS THAT OF LOUDOUN

	Median Household Income 2015 to 2019	$ Change	% Change	Median Household Income 2017 to 2021	% Northern Virginia Region
Loudoun	**142,299**	14,522	10%	**156,821**	119%
Leesburg	**114,444**	1,906	2%	**116,350**	88%

Source:
NOVA Regional Dashboard
https://www.novaregiondashboard.com/median-household-income-towns

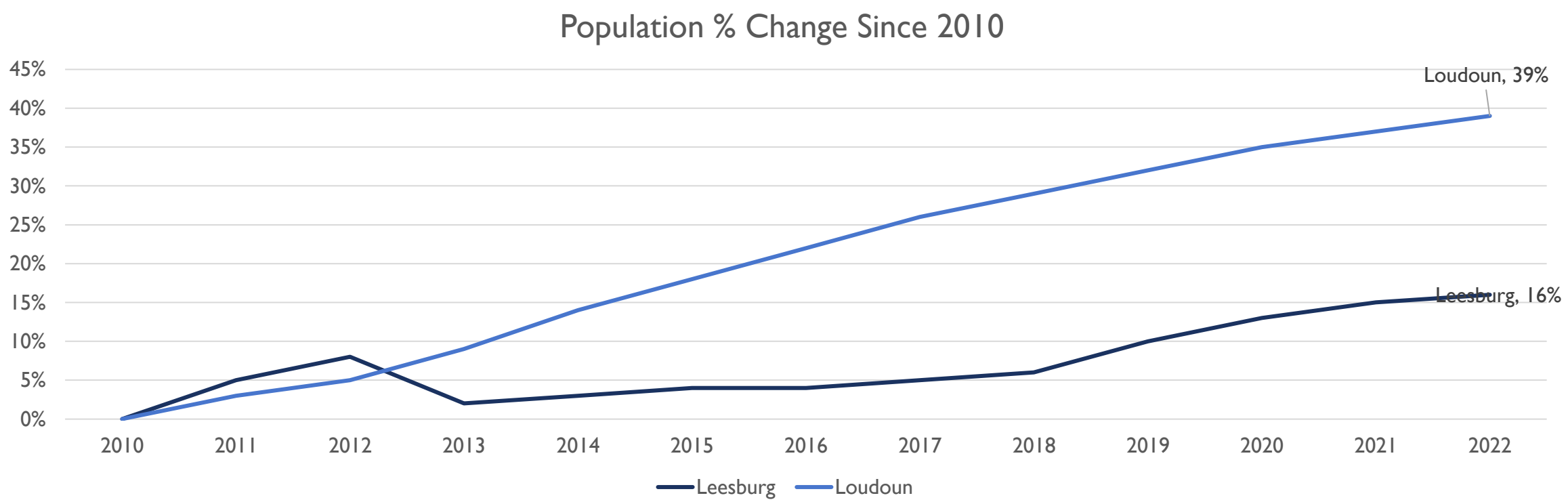
LEESBURG HOUSEHOLD INCOME GROWTH SIGNIFICANTLY LAGS LOUDOUN'S



Source:
NOVA Regional Dashboard
https://www.novaregiondashboard.com/median-household-income-towns

POPULATION

LOUDOUN COUNTY / LEESBURG POPULATION GROWTH



Source: US Census for 2010 and 2020 and FY22 and FY19 Annual Comprehensive Financial Reports for other years. Table 17 Leesburg , Table M/N Loudoun County.

Ann Harrity Shawver
CPA, PLLC

Public Finance Consulting
Roanoke, Virginia