Population and School Enrollment Projections

for the City of Harrisonburg



April 30, 2025

University of Virginia

Weldon Cooper Center for Public Service

Table of Contents

Executive Summary 1

Demographic Trends 2

- Total Population 2
- Migration 3
- Age & Births 3

Housing Trends 6

- Households & Housing Stock 6
- Housing Development 8
- JMU Student Housing 9

Enrollment Trends 11

- Public K-12 Enrollment 11
- Private & Homeschool K-12 Enrollment 13

Student Generation 14

- K-12 Student Housing 14
- Yields by Housing Type 15

Enrollment Projections 17

- Projection 1 17
- Projection 2 20
- Projection 3 23

Conclusion 25

Appendices 26

- Appendix A: Customized Population Projection for Harrisonburg City 26
- Appendix B: Housing 27
- Appendix C: Student Generation 30
- Appendix D: Enrollment Projections 33

Executive Summary

This study, commissioned by the City of Harrisonburg, examines the relationship between Harrisonburg's demographic, housing, and K-12 public school enrollment trends and, through three 10-year projection scenarios, illustrates how these factors will shape the city's future enrollment. Key findings include:

- Harrisonburg experienced considerable growth during the 2010s. The city's population increased by 12% from 2010 to 2019 and Harrisonburg City Public Schools (HCPS) ranked among the fastest growing school divisions in the state.
- The city's population and public K-12 enrollment fell in 2020, largely due to the pandemic. It is important to note, however, that population and enrollment growth started to slow in 2018. Growth resumed in 2021, but at a notably slower pace.
- Housing development has not kept pace with population and enrollment growth. Despite the steady growth observed from 2010-2019, 60% fewer residential units were built during this period compared to the preceding decade.
- The city's existing housing has played a prominent role in accommodating enrollment growth. The number of K-12 students living in housing units built prior to 2010 increased by 11% (561 students) from 2015 to 2024, while housing built during the same period generated 263 students.
- Based solely on post-pandemic (2021-2024) enrollment trends, the first projection series included in this report expects that enrollment will grow by 4% over the next ten years.
- The second and third projection series incorporate a housing development scenario where 1,332 units are built over the next decade—greater than the 859 units built from 2014-2023. The second series expects 6% enrollment growth based on a combination of post-pandemic enrollment trends and this housing scenario. Alternatively, 3% enrollment decline is expected in the third series, where enrollment is projected based solely on births and the housing scenario. Both series point to the limited impact of housing development and the dominance of non-housing factors—namely, migration.

Our analysis shows that increased K-12 enrollment was driven by demographic factors, not by housing development. Additionally, older housing played a more prominent role in accommodating the city's growing student body. This report suggests that demographic factors will continue to drive enrollment growth. Meanwhile, housing development will likely play a secondary role, especially if families continue to live in the city's older housing stock.

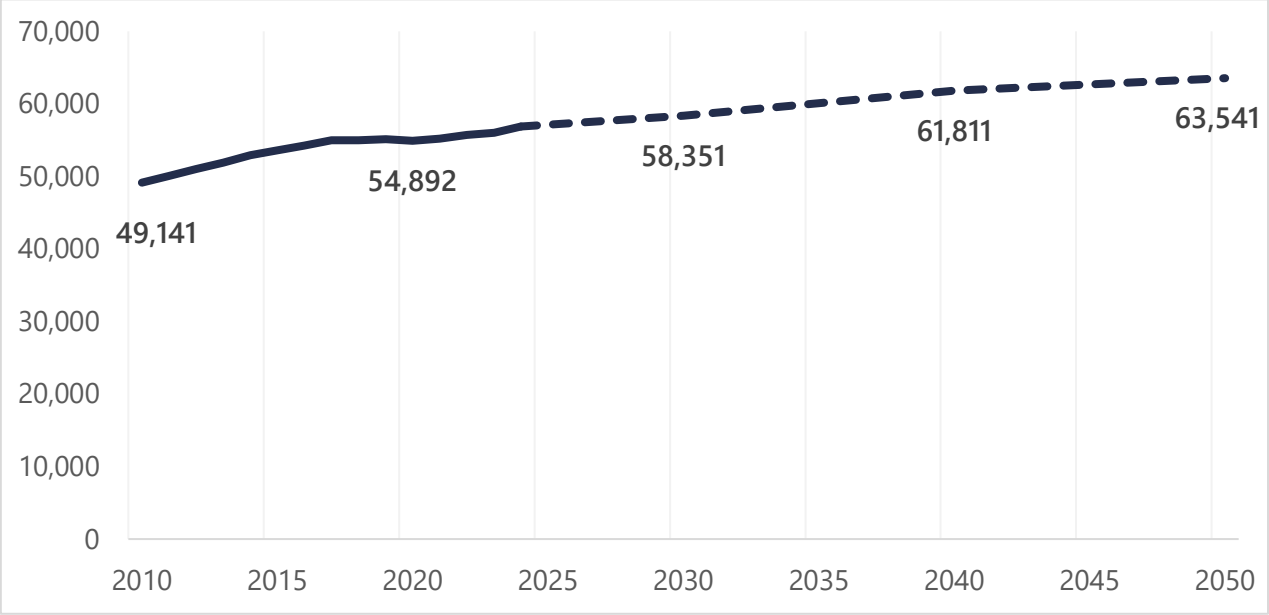
Demographic Trends

This section includes an analysis of the demographic trends in Harrisonburg City over the past decade, using the latest U.S. Census Bureau American Community Survey (ACS) 5-year estimates, Virginia Department of Health birth records, Weldon Cooper Center population estimates, and customized population projections.

Total Population

As shown in Figure 1, Harrisonburg City's population has grown consistently. The latest 2024 estimate reflects a 16% increase since 2010, with an average annual growth rate of 1.1%. While most of this growth occurred between 2010 and 2017, the pace has slowed since 2018, averaging 0.5% annually. Despite this slowdown, population growth is expected to continue over the next three decades. By 2030, the total population is projected to increase by 6.3% compared to 2020, followed by 5.9% growth from 2030 to 2040 and 2.8% from 2040 to 2050.

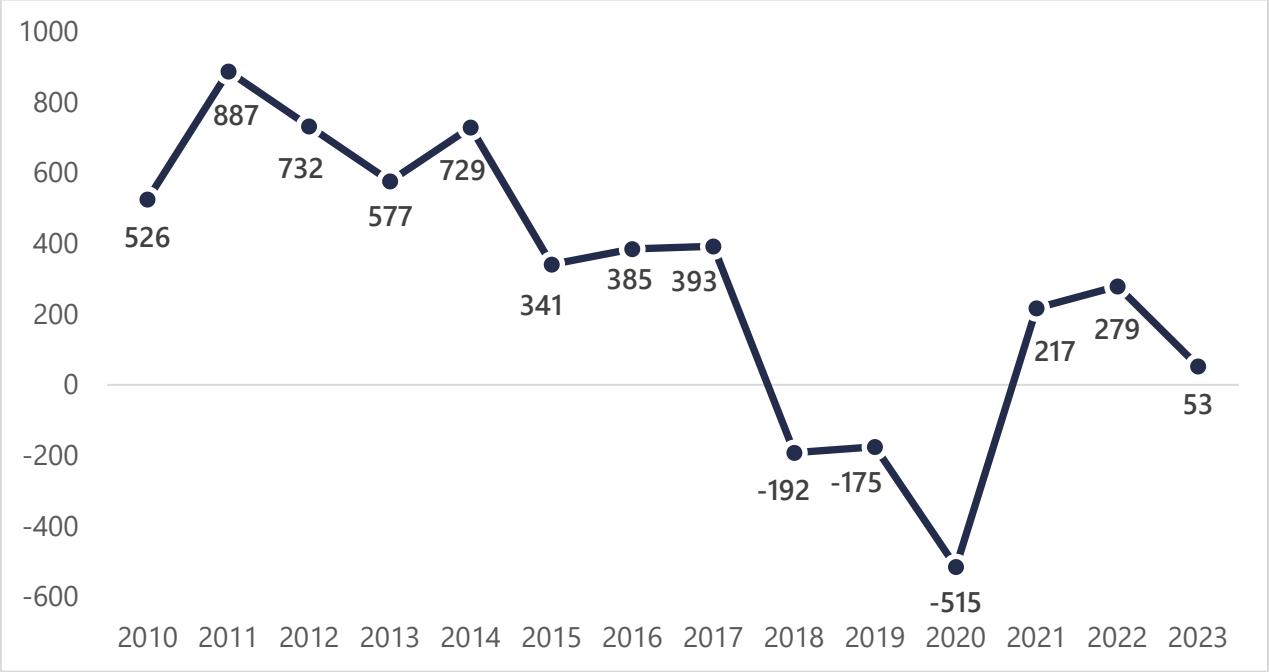
Figure 1: Population Estimates & Projections, 2010–2050



Migration

Over the past two decades, net migration in Harrisonburg City has generally been positive (with the exception of 2018-2020) and has significantly contributed to the city's population growth.

Figure 2: Net Migration, 2010–2023



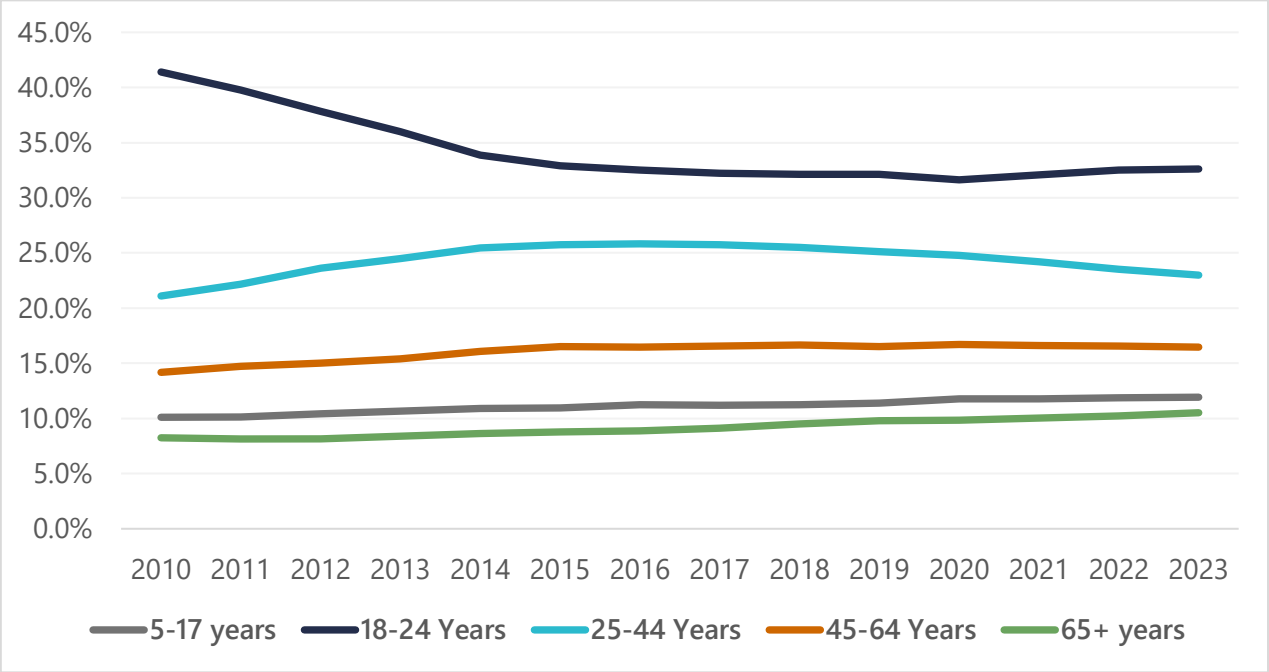
Immigration, which is a component of migration, has played an important role in the city's migration trends, with the share of the foreign-born population increasing from 14.7% in 2013 to 17.3% in 2023.

Age & Births

Due to its large college student population, Harrisonburg has consistently maintained a younger median age (about 25 years) compared to the state (38 years).

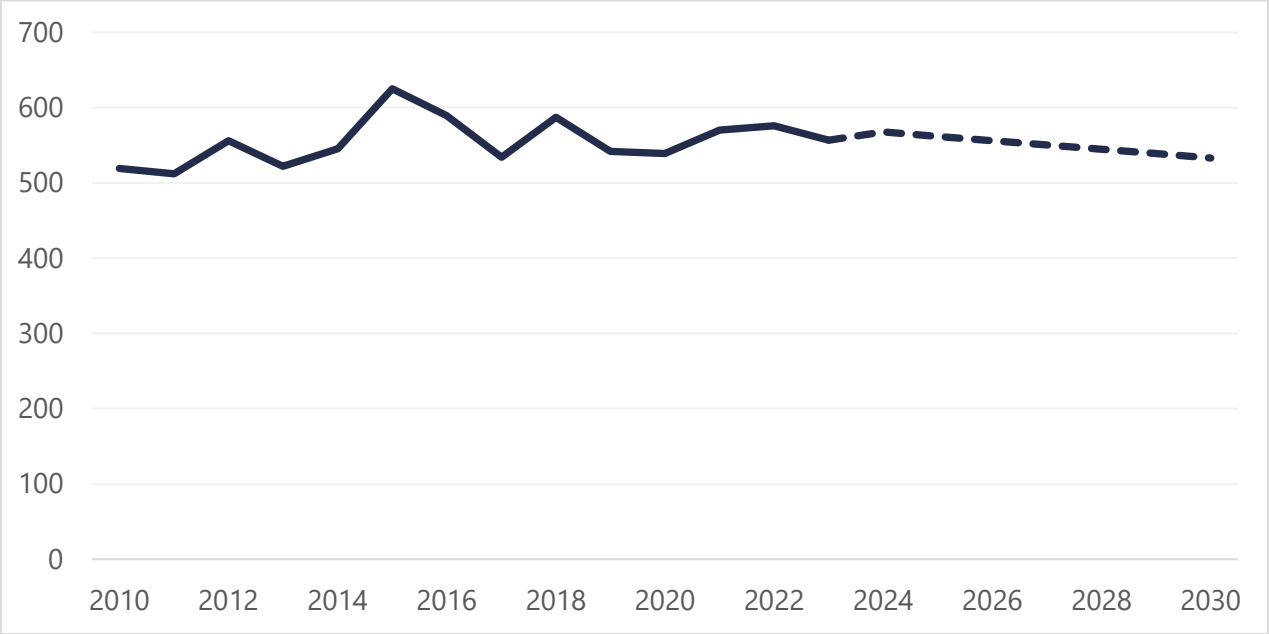
Between 2010 and 2023, the composition of age groups in Harrisonburg City shifted (see Figure 3). The share of the college-aged population (18–24 years) steadily declined into 2016 and has since plateaued at around 32%. Meanwhile, the populations of older adults (65+ years) and school-aged children (5–17 years) have steadily increased, with each group now representing about 10% of the total population. The working-age population (25-64 years) peaked at 42% between 2015 and 2017 and then gradually declined to 39% in 2023.

Figure 3: Population Share by Age Group, 2010–2023



The number of children born in Harrisonburg trended upward during the first half of the past decade and has remained largely stable in recent years (see Figure 4). In contrast, births at the state level have mostly declined since 2008. The city's birth rate fell from 2010 to 2023, as the number of women in childbearing age grew and the number of births remained relatively stable. This aligns with state and national trends, where birth rates have declined for the better part of the past two decades. We expect that the number of births in Harrisonburg will gently decline into 2030 as this trend persists.

Figure 4: Births, 2010–2030



Housing Trends

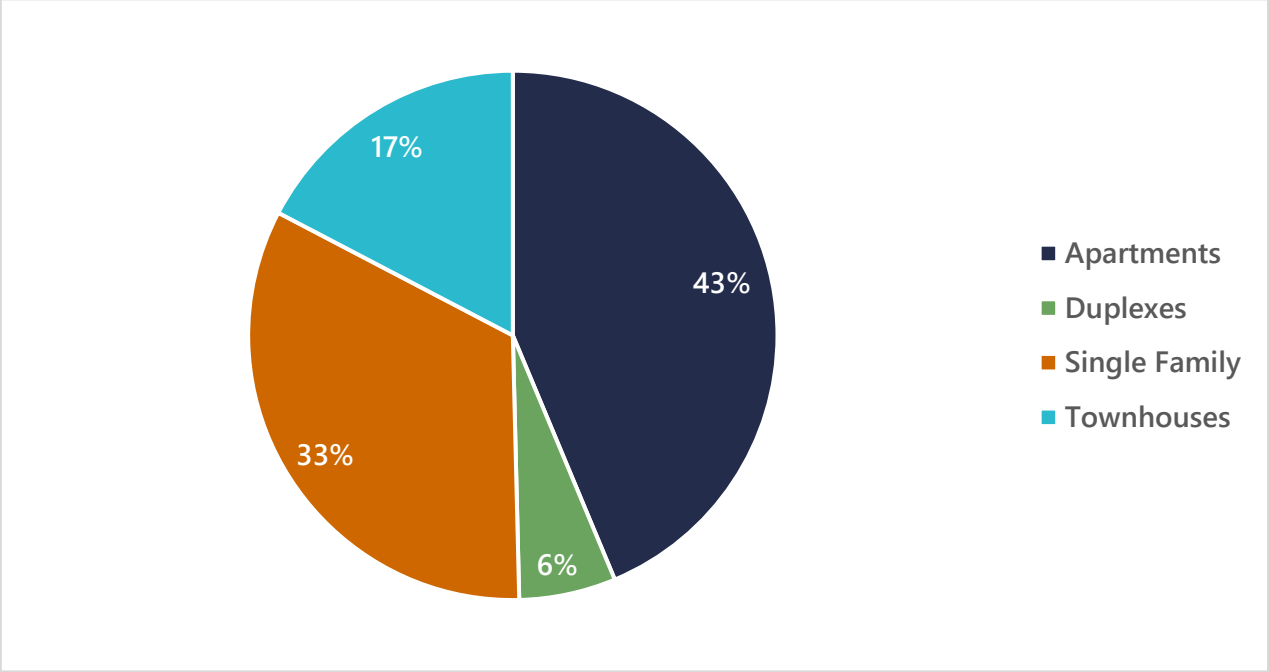
This section details the characteristics of Harrisonburg's households and changes in the city's housing stock. We used the city's real estate data to analyze housing trends and the 2023 ACS 5-year estimates to analyze household composition and state-level housing trends.

Households & Housing Stock

Harrisonburg counted 17,331 households in 2023. Due to its large college student population, Harrisonburg contained a smaller share (52%) of family households compared to the state (65%). Despite this, a slightly greater share of Harrisonburg households (29%) contained one or more people under the age of 18 compared to the state (27%).

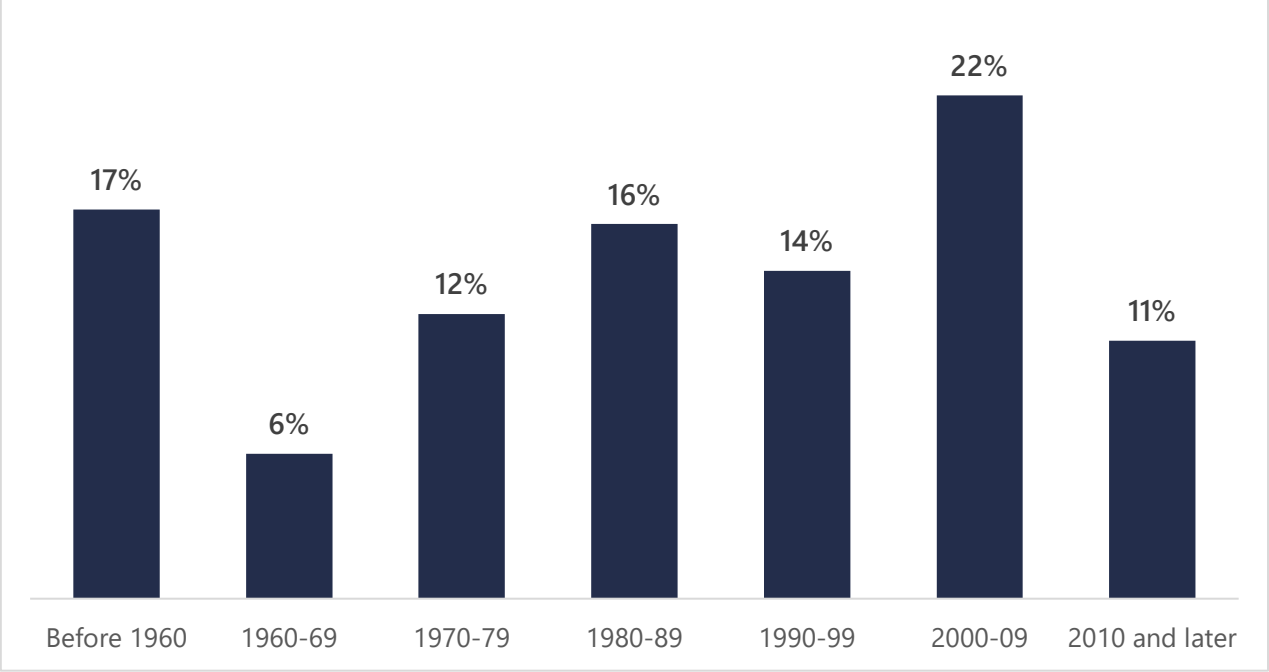
Figure 5 shows the distribution of housing units by five broad housing categories. Apartments accounted for the greatest share (43%) of the city's housing stock, followed by single-family homes, and townhouses.

Figure 5: Housing Mix



About two-thirds (67%) of the city's residential units were built before 2000. Of the remainder, 22% were built between 2000-2009 and 11% were built during or after 2010. Harrisonburg's housing stock is slightly newer compared to the state, where 72% of housing units were built prior to 2000.

Figure 6: Percent of Housing Stock by Year Built



Housing Development

The number of residential units in Harrisonburg increased by 49% from 2000 to 2023, outpacing the 34% growth at the state level. The bulk (70%) of the nearly 6,000 units added during this period were built between 2000-2010. Development noticeably cooled thereafter, which tracks with state and national trends.

Figure 7: Housing Units by Year of Construction, 2000-2023

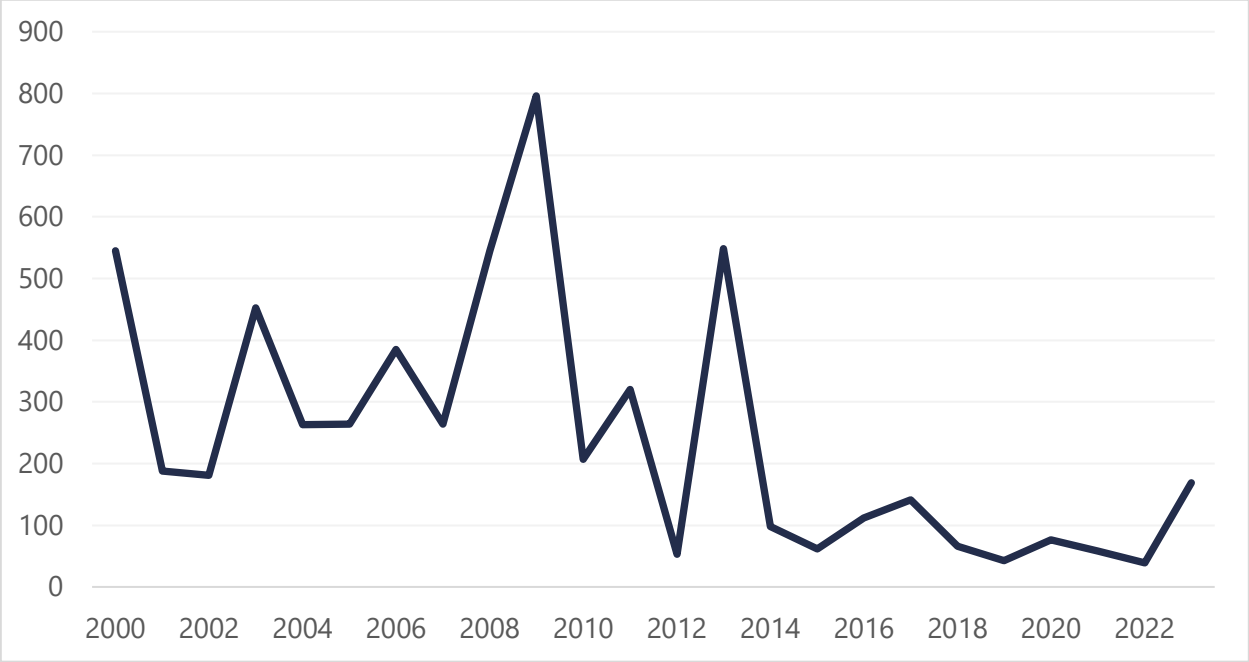


Table 1 details the change in housing units by housing type from 1999 to 2023. Apartments accounted for the greatest share of units built during this period. The city also saw its count of townhouse units more than double. Growth was comparatively milder for single-family homes, which grew by 16%.

Table 1: Change in Housing Units by Housing Type

Housing Type	1999	2023	Change	% Change
Apartments	4,923	7,756	2,833	58%
Duplexes	673	1,046	373	55%
Single-Family	5,044	5,860	816	16%
Townhouses	1,223	3,076	1,853	152%
Total	**12,073**	**17,738**	**5,875**	**49%**

The Stone Spring elementary zone contained nearly half (44%) of all housing units built since 2000 (primarily apartments and townhouses), while Bluestone contained the greatest share of duplexes (74%) and single-family homes (38%).

Table 2: Units Built 2000-2023 by Housing Type and Elementary School Zone

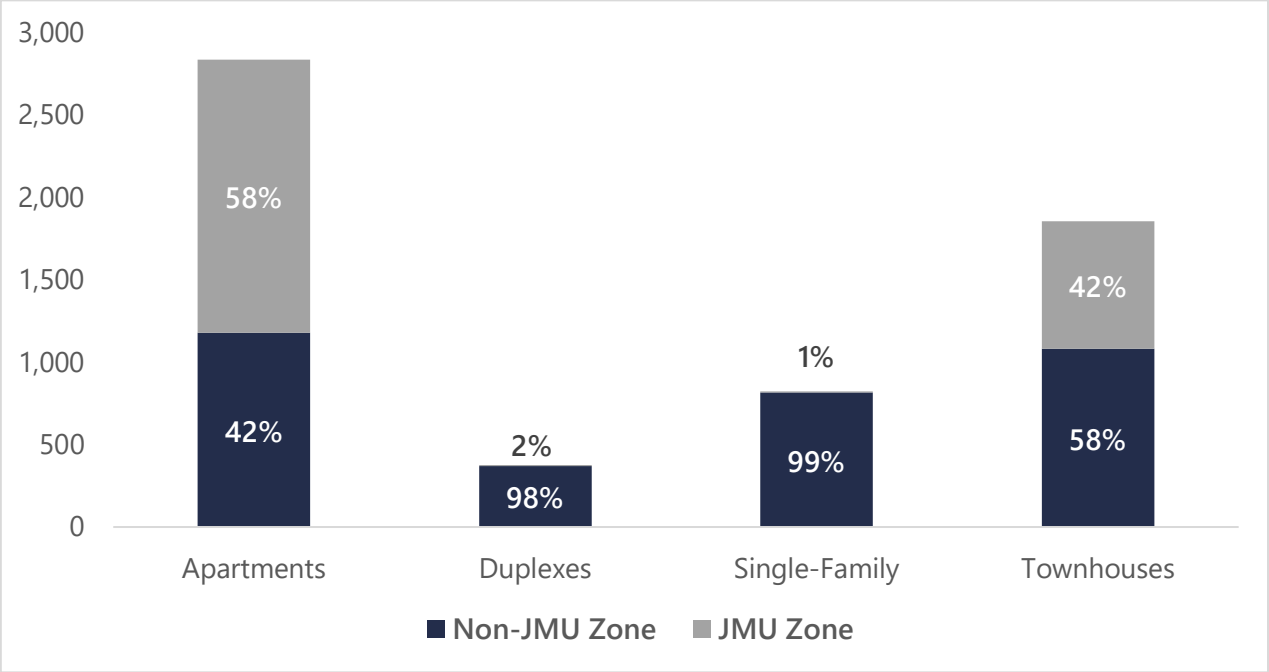
Category	Bluestone	Keister	Smithland	Spotswood	Stone Spring	Waterman
Apartments	312	69	313	367	1,654	118
Duplexes	276	10	10	62	11	4
Single-Family	314	111	213	61	57	60
Townhouses	311	114	365	103	696	264
Total	**1,213**	**304**	**901**	**593**	**2,418**	**446**

JMU Student Housing

James Madison University's (JMU) enrollment grew by 53% from 2000 to 2023, which played a significant role in driving housing development.

We used a combination of data to identify three areas that contain significant densities of JMU student housing (called "JMU zones" hereafter). Two of these zones are located in Stone Spring, while a smaller zone is located in Keister. JMU zones contained 42% of all housing units built in Harrisonburg since 2000. More specifically, JMU zones accounted for 58% of apartments and 32% of townhouses built during this period (see Figure 8). In contrast, nearly all single-family and duplex construction occurred outside of these areas.

Figure 8: Units Built 2000-2024 by JMU Zone



Enrollment Trends

This section details changes in public, private, and homeschool K-12 enrollment over the past two decades. We used fall count data and student records provided by city schools to analyze public school enrollment trends. We used data from the Virginia Department of Education and the 2023 ACS 5-year estimates to analyze private and homeschool trends.

Public K-12 Enrollment

Harrisonburg City Public Schools (HCPS) experienced a 15% (854 students) increase in public K-12 enrollment from 2015 to 2024. The most significant enrollment growth (11%) occurred from 2015 to 2019, with HCPS ranking as the state's third fastest growing division. Similar to most of Virginia's school divisions, HCPS experienced a decline in enrollment after the onset of the pandemic in 2020. Growth resumed in 2021, albeit at a slower pace.

Figure 9: Public K-12 Enrollment, 2015-2024

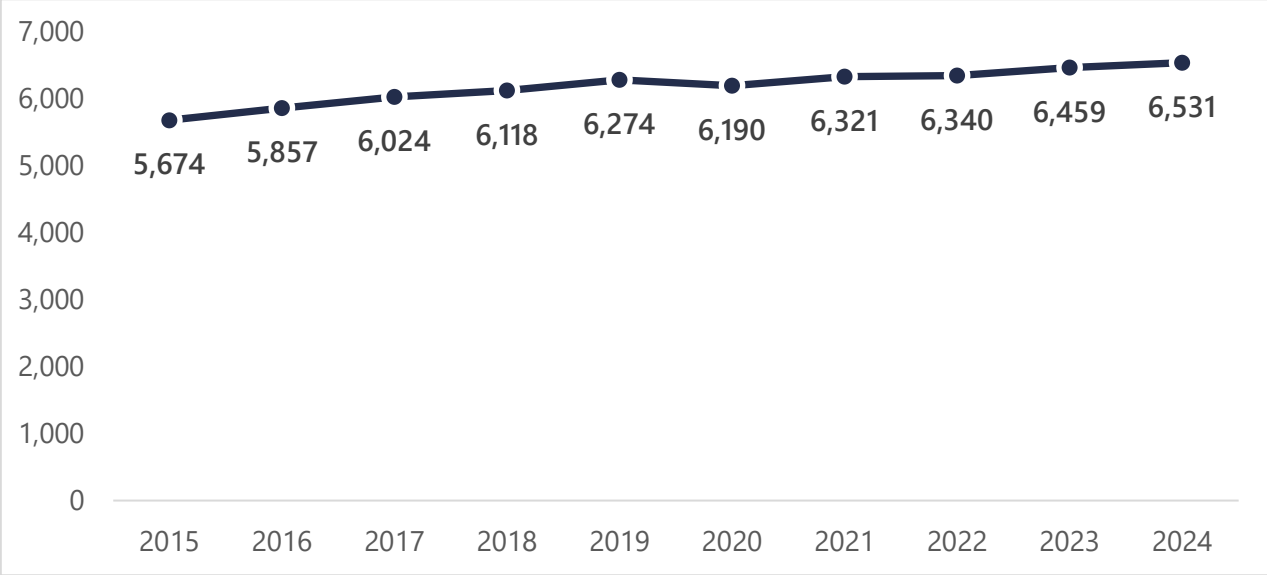


Table 3 details changes in the number of students by elementary zone during this period. Waterman led the city in growth, adding 245 students, but Stone Spring, Smithland, and Bluestone also experienced an increase in enrollment.

Table 3: Change in Public K-12 Enrollment by Elementary Zone

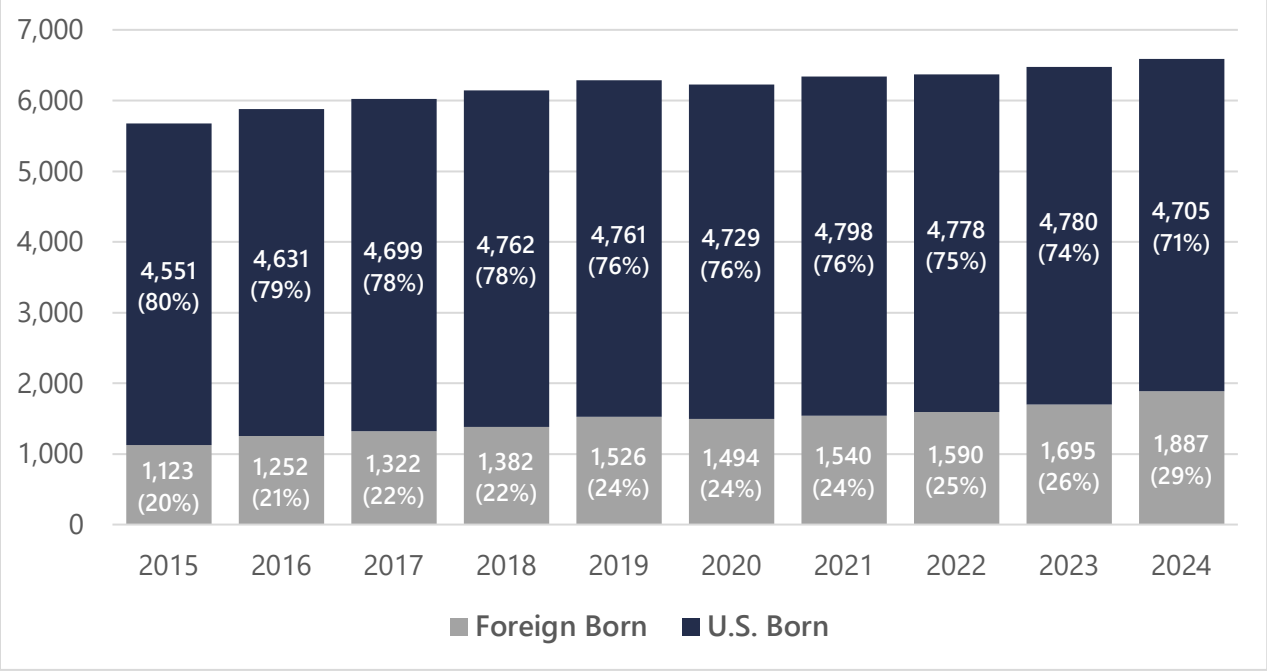
Elementary Zone	2015	2024	Change	% Change
Bluestone	962	1,107	145	15%
Keister	958	1,019	61	6%
Smithland	867	1,059	192	22%
Spotswood	940	929	-11	-1%
Stone Spring	927	1,145	218	24%
Waterman	871	1,116	245	28%

Note: these figures exclude HCPS students living in Rockingham County.

Growth during this period shifted the distribution of students in Harrisonburg. In 2015, Bluestone (17.4%) and Keister (17.3%) had the first and second greatest shares of K-12 students, but in 2024, Stone Spring (18%) and Waterman (17.5%) ranked first and second.

Growth in Harrisonburg's foreign-born population is reflected in the city's public K-12 enrollment. From 2015 to 2024, the number of foreign-born students increased by 68% (764 students) compared to a 3.3% (154 students) increase in U.S.-born students. Overall, the share of foreign-born students grew from 20% in 2015 to 29% in 2024.

Figure 10: Public K-12 Enrollment, Foreign-born & U.S.-born Students, 2015-2024



Private & Homeschool K-12 Enrollment

In contrast to declining public school enrollment during the pandemic, the city's private and homeschool enrollment more than doubled from 306 students in 2018 to 677 students in 2023. Data suggest that much of this growth occurred from 2020 to 2021, with enrollment stabilizing in recent years.

Student Generation

Student generation rates (called "yields" hereafter) demonstrate the number of public K-12 students generated per 100 housing units and are a key variable in assessing the impact of new housing on school enrollment. Yields were calculated with 2015 and 2024 enrollment data to determine how these figures shifted over the past decade.

K-12 Student Housing

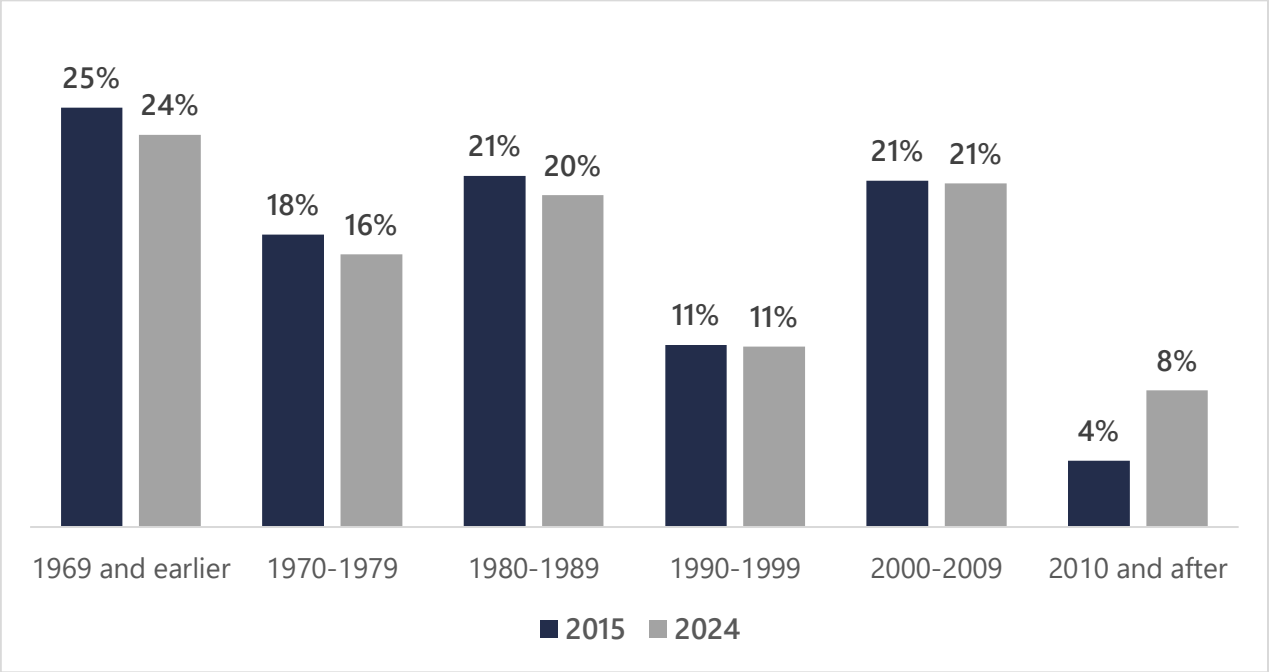
Table 4 details the change in the number of K-12 students by housing type from 2015 to 2024. Townhouses absorbed the greatest share of enrollment growth during this period, with the number of students living in this housing increasing by nearly 50%. Single-family homes and, to a lesser extent, duplexes played a secondary but nevertheless important role in absorbing growth. The number of students living in apartments remained relatively unchanged.

Table 4: Change in K-12 Enrollment by Housing Type

Housing Type	2015	2024	Change	% Change
Apartments	1,726	1,744	18	1%
Duplexes	369	447	78	21%
Single-Family	2,204	2,478	274	12%
Townhouses	993	1,486	493	49.6%

It is important to note that overall enrollment growth during this period far outpaced housing development. Figure 11 compares the distribution of students by the year in which their homes were built. While the share of students living in houses built in 2010 and after doubled over the past decade, this category accounted for a comparatively small portion of 2024 K-12 enrollment. In addition, there was little to no change in the distribution of students across housing built prior to 2010, indicating that older housing played a larger role in absorbing growth.

Figure 11: Percent of Public K-12 Enrollment by Year Built



Yields by Housing Type

Table 5 details citywide student generation rates by housing type. Note that two rates are presented for each year. One rate includes all K-12 students and all housing. The other excludes K-12 students and housing units in the three JMU housing zones. This was done to account for distortion caused by large concentrations of college student apartments and townhouses, in which few, if any, K-12 students live.

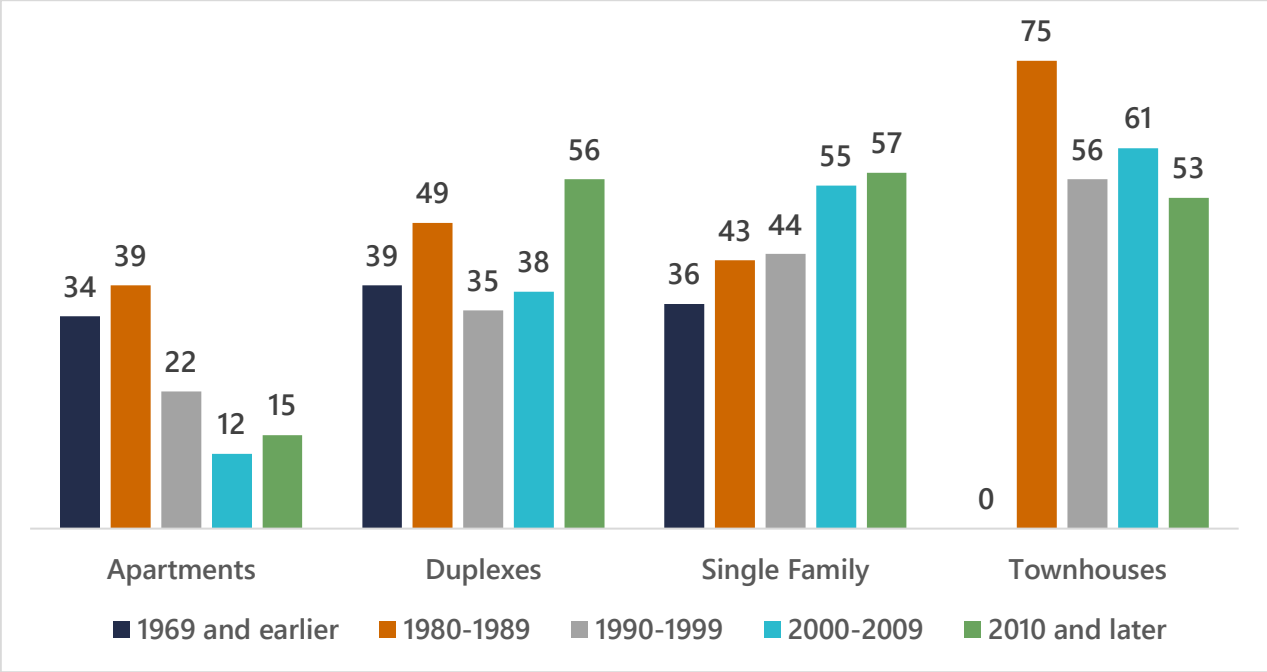
Table 5: Student Generation per 100 Housing Units by Housing Type

Category	2015 Generation Rates		2024 Generation Rates	
	Total	Excl. JMU Zone	Total	Excl. JMU Zone
Apartments	22	33	22	33
Duplexes	35	-	43	-
Single-Family	38	-	42	-
Townhouses	32	45	48	63

The city experienced a considerable jump in yields for townhouses, which reached 63 students per 100 units in 2024 (after controlling for JMU student housing). This is perhaps unsurprising given the nearly 50% increase in the number of students living in townhouses from 2015 to 2024. Yields also increased for duplexes and single-family homes, but to a lesser extent. Finally, the number of students living in apartments was stable, which flatted yields for this housing type.

Figure 12 shows how yields differed by the year in which housing was built (note that these figures are adjusted to account for JMU student housing). As mentioned above, housing built prior to 2010 played an important role in housing K-12 students. This is clearly seen in yields for apartments and townhouses. For instance, townhouses built in the 1980s yielded 75 students per 100 units—higher than the 53 students yielded by townhouses built in 2010 or later. The same trend is evident in apartments, where units built in the 1980s yielded nearly three times as many students as those built after 2000. Counter to this trend, yields for single-family homes increased as the age of housing decreased.

Figure 12: 2024 Student Generation Rates by Housing Type and Year Built



Older housing units are finite and, therefore, have a limited ability to absorb K-12 students. Data suggest, however, that the city's older stock has additional capacity. For example, about 31% of the 1,219 townhouse buildings built before 2000 contained at least one K-12 student. K-12 occupancy rates were similar (25-32%) for single-family homes and duplex buildings built during the same period. It is also important to consider that housing development can indirectly increase the city's overall housing supply, as older units become available when families relocate from existing homes to newly built homes.

Enrollment Projections

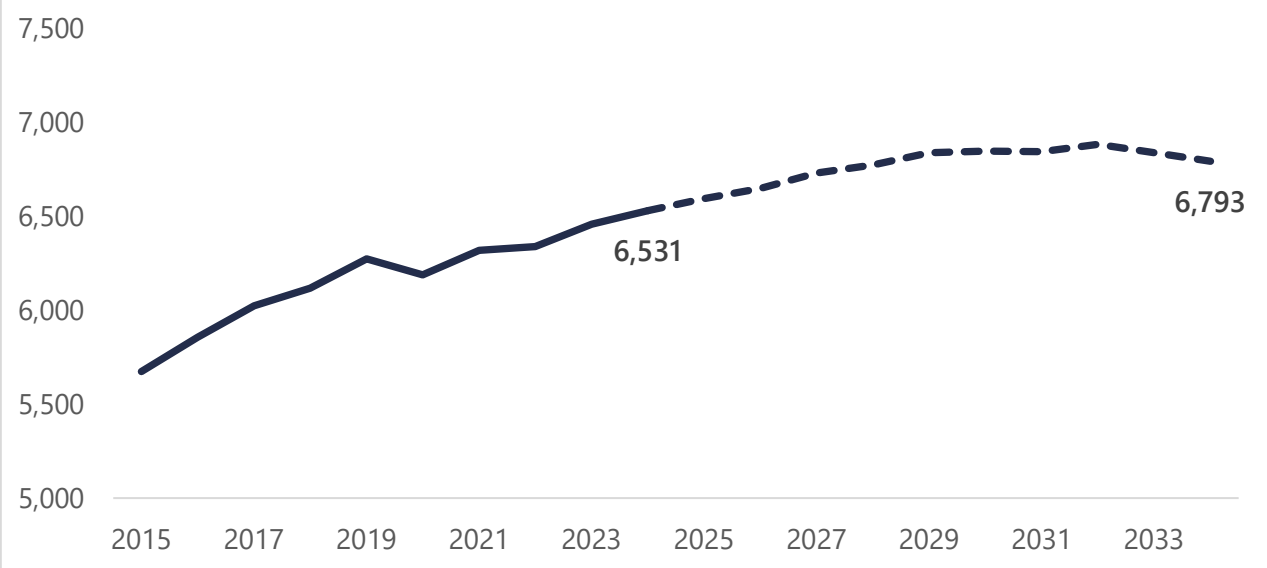
This section details three division-level public K-12 enrollment projections. The first series—which uses the standard methodology—projects enrollment based exclusively on recent enrollment trends. Alternatively, the second and third series demonstrate how anticipated housing development could influence citywide public K-12 enrollment.

Projection 1

The first projection series uses the grade progression ratio (GPR) methodology, which is perhaps the most commonly used approach in projecting school enrollment. GPR methodology implicitly accounts for a host of factors that cause enrollment change, including births, migration, school transfers, and occasional deaths. Relevant to this analysis, the migration component of GPRs captures the impact of past housing development.

The first projection series extrapolates post-pandemic (2021-2024) enrollment trends and anticipates 4% (262 students) K-12 enrollment growth over the next 10-year period. This series expects that recent growth will continue at a year-over-year rate of about 1% to a total of 6,839 K-12 students in 2029. Enrollment remains stable into 2030, with a mild decline beginning in 2031 and mostly continuing through 2034.

Figure 13: Projection 1, Total K-12 Enrollment, 2015-2034



Projected growth is largely due to two factors. First, the supply of kindergarten-aged students gently increases during the first half of the projection period. This increases the size of anticipated kindergarten cohorts, which, in turn, grows the pool of students available to progress into subsequent grades. Note that the full effect of this trend is dampened by the lower-than-expected rate at which kindergarten-eligible children enrolled in division schools from 2021-2024. Due to the

city's declining birth rate, smaller kindergarten cohorts are expected to enter division schools during the second half of the projection period. This begins to erode elementary grade enrollment thereafter.

Second—and perhaps most notably—largely favorable grade progression trends observed after the pandemic caused the projection model to grow cohorts as they progress from one grade to the next. Enrollment steadily increases during the first half of the projection period as larger existing and anticipated cohorts grow. Continued growth for cohorts that entered division schools prior to 2030 swells middle and high school grades during the second half of the projection period, which more than offsets the anticipated decline in elementary grades mentioned above.

Table 6 contains by-grade enrollment projections for this series.

Table 6: Projection 1, 2025-2034

Grade	2024-25 (Actual)	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	24-34 Change
Kindergarten	465	469	480	491	482	483	482	477	472	467	462	-3
Grade 1	501	485	490	498	511	503	503	502	497	492	487	-14
Grade 2	524	502	484	487	497	509	500	501	500	495	490	-34
Grade 3	527	527	508	489	491	502	515	506	506	505	500	-27
Grade 4	534	532	537	516	496	500	510	523	514	515	513	-21
Grade 5	462	528	526	527	509	489	492	503	515	506	507	45
Grade 6	511	461	534	536	531	515	496	497	509	521	512	1
Grade 7	516	512	462	537	538	534	518	498	500	511	524	8
Grade 8	482	529	525	477	552	553	550	533	512	514	526	44
Grade 9	568	565	633	629	567	660	660	655	636	611	613	45
Grade 10	509	529	526	585	585	527	612	613	608	590	567	58
Grade 11	488	466	482	482	535	534	482	559	560	556	539	51
Grade 12	444	490	462	477	479	531	530	478	555	556	552	108
Total K-12	**6,531**	**6,594**	**6,648**	**6,731**	**6,775**	**6,839**	**6,849**	**6,845**	**6,884**	**6,840**	**6,793**	**262**

Projection 2

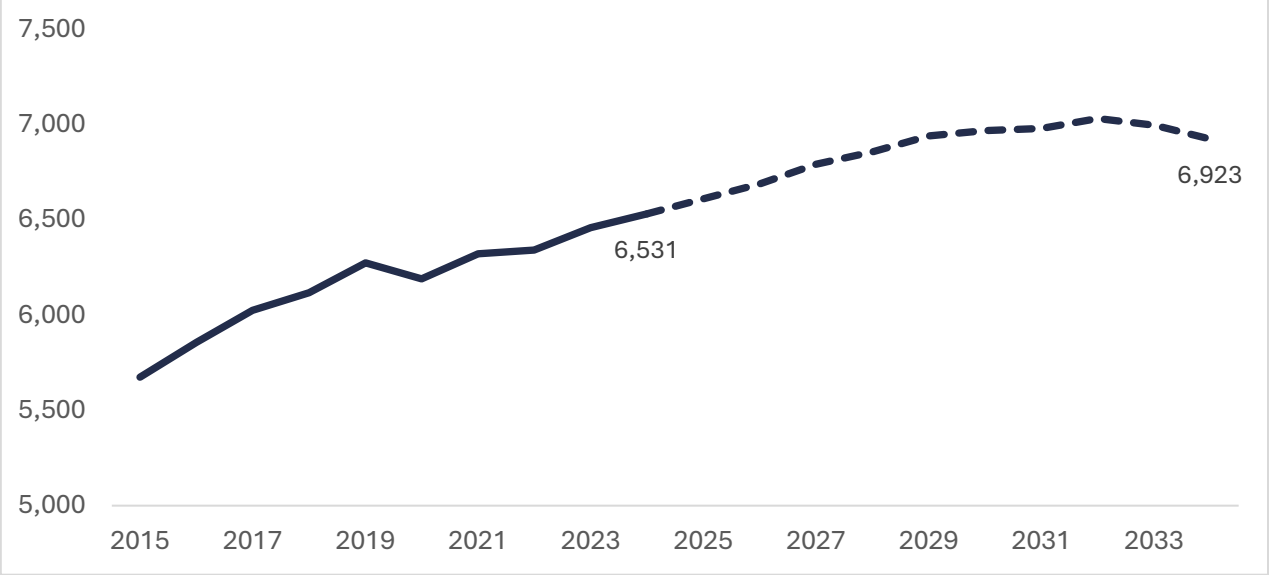
The second projection series involves a two-step process where:

1. Grade progression ratios were modified to project enrollment in the absence of any housing development.
2. Additional students generated from future construction were then added to projected enrollment.

This series considers a housing development scenario we created in conjunction with the city's planning office. This entails the construction of 1,332 housing units over the next ten years, including 67 single-family homes, 58 duplex units, 440 townhouse units, and 767 apartment units. Note that it is perhaps impossible to accurately forecast the number of units that will be built over the course of a decade. This scenario reflects a reasonable outlook based on existing, city council-approved projects that have made considerable progress in the pre-construction process.

Using a combination of post-pandemic enrollment trends, housing yield rates, and the housing scenario described above, the second projection series anticipates 6% (392 students) enrollment growth over the next ten years. Similar to the first series, the bulk of anticipated growth occurs in the first half of the projection period. Growth slows into 2030, with enrollment expected to peak at 7,031 students in 2032. A mild decline is expected thereafter.

Figure 14: Projection 2, Total K-12 Enrollment, 2015-2034



Considering the uncertain nature of housing development, we considered scenarios where 80% (1,065 units) and 120% (1,598 units) of the units in our housing outlook are built. These adjustments resulted in small changes to the extent of projected growth, as changes in the number of anticipated units result in slightly more or less generated students. The 120% scenario resulted

in 6.6% (428 students) enrollment growth over the next ten years; the 80% scenario resulted in 5.4% (354 students) growth.

We estimate that, annually, recent housing development added an average of 21 students to HCPS enrollment from 2021 to 2024. This suggests that other factors, namely migration, played a more prominent role in shaping post-pandemic enrollment trends. As such, more than half of the enrollment growth expected over this period is due to the persistence of these non-housing factors. The remainder of the growth is due to anticipated construction. In total, the housing scenario used in this projection expects that the rate of future construction will noticeably surpass that of recent years. As a result, housing development plays a more significant role in driving projected enrollment growth.

Table 7 contains by-grade enrollment projections for this series.

Table 7: Projection 2, 2025-2034

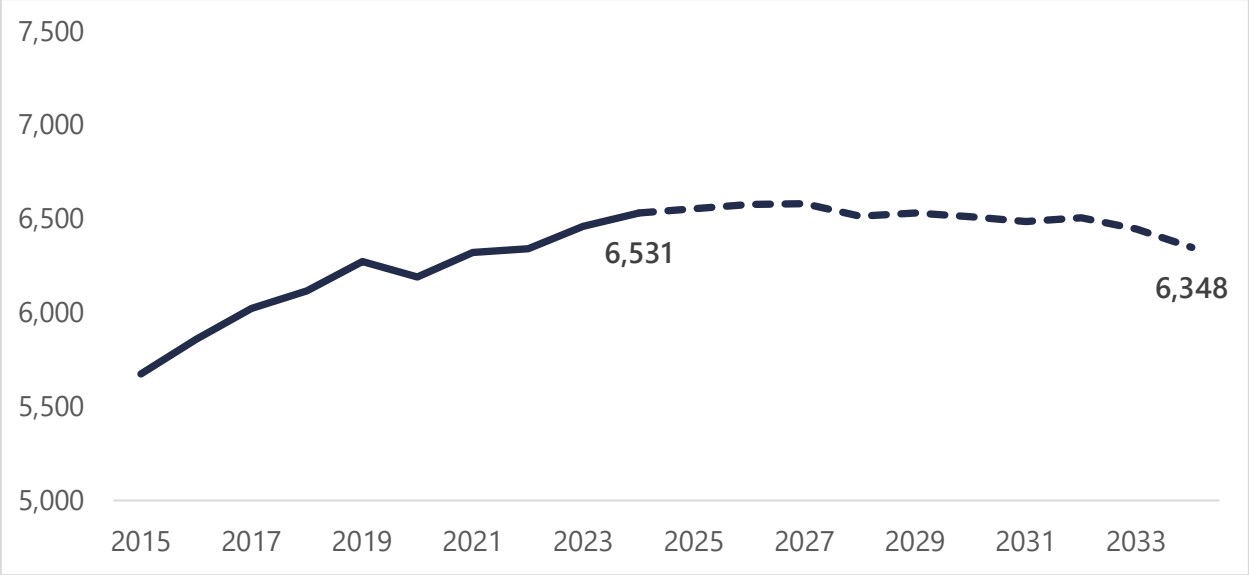
Grade	2024-25 (Actual)	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	24-34 Change
Kindergarten	465	469	481	491	483	484	483	478	473	468	461	-4
Grade 1	501	486	492	501	514	505	506	505	500	494	487	-14
Grade 2	524	503	487	490	502	514	505	506	505	500	492	-32
Grade 3	527	528	511	494	497	509	522	512	513	512	504	-23
Grade 4	534	534	540	521	504	507	519	532	522	523	520	-14
Grade 5	462	530	529	532	516	498	501	513	526	516	515	53
Grade 6	511	462	538	541	539	525	507	509	522	534	522	11
Grade 7	516	513	465	543	545	543	529	511	513	526	536	20
Grade 8	482	530	529	482	560	563	562	547	528	530	541	59
Grade 9	568	567	637	636	575	672	675	672	655	632	632	64
Grade 10	509	530	530	591	593	536	625	629	626	610	586	77
Grade 11	488	467	485	487	543	544	492	574	577	575	557	69
Grade 12	444	491	465	482	486	540	542	491	571	575	570	126
Total K-12	**6,531**	**6,610**	**6,689**	**6,791**	**6,857**	**6,940**	**6,968**	**6,979**	**7,031**	**6,995**	**6,923**	**392**

Projection 3

The third projection series provides an enrollment outlook driven solely by birth cohorts and new housing. Other factors, such as migration and school transfers, are not considered. This series uses the same housing scenario applied in the second series, where 1,332 units are built over the next decade.

This series expects nearly 3% (183 students) enrollment decline over the next ten-year period. Very little enrollment growth is expected during the first three years of the projection period, with total enrollment increasing by 50 students to a peak of 6,581 students in 2027. Enrollment decline begins in 2028 and mostly persists through 2034.

Figure 15: Projection 3, Total K-12 Enrollment, 2015-2034



We also considered scenarios where 80% and 120% of expected units are built, which resulted in small changes to expected K-12 enrollment. The 120% scenario projected a milder 2.3% (148 students) enrollment decline while the 80% scenario projected a 3.3% (218 students) decline.

Overall, this series underscores the relatively limited impact of new housing on enrollment trends and, by extension, each enrollment series. In isolation, the number of students generated by anticipated housing construction results in incremental growth for existing and anticipated cohorts. This particularly impacts smaller-than-average cohorts, as the slower rate of progression limits their ability to "catch up" with current and previous class sizes. This effect becomes particularly noticeable in the second half of the projection period, as anticipated kindergarten cohorts begin to shrink alongside the supply of eligible children.

Table 8 contains by-grade enrollment projections for this series.

Table 8: Projection 3, 2025-2034

Grade	2024-25 (Actual)	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	24-34 Change
Kindergarten	465	455	475	485	475	477	476	471	466	461	454	-11
Grade 1	501	466	457	478	488	477	480	478	473	469	461	-40
Grade 2	524	502	469	460	480	491	480	483	481	476	469	-55
Grade 3	527	525	505	471	462	483	493	482	485	484	476	-51
Grade 4	534	528	528	508	474	465	485	496	485	488	484	-50
Grade 5	462	535	531	531	510	476	467	488	499	488	488	26
Grade 6	511	463	538	534	534	513	479	470	490	501	488	-23
Grade 7	516	512	466	541	537	537	516	481	472	493	501	-15
Grade 8	482	517	515	468	544	540	540	519	484	475	493	11
Grade 9	568	483	520	518	471	547	543	542	521	487	475	-93
Grade 10	509	570	486	523	521	473	550	546	545	524	487	-22
Grade 11	488	510	573	488	526	523	476	553	548	548	524	36
Grade 12	444	489	513	576	491	528	526	478	556	551	548	104
Total K-12	**6,531**	**6,555**	**6,576**	**6,581**	**6,513**	**6,530**	**6,511**	**6,487**	**6,505**	**6,445**	**6,348**	**-183**

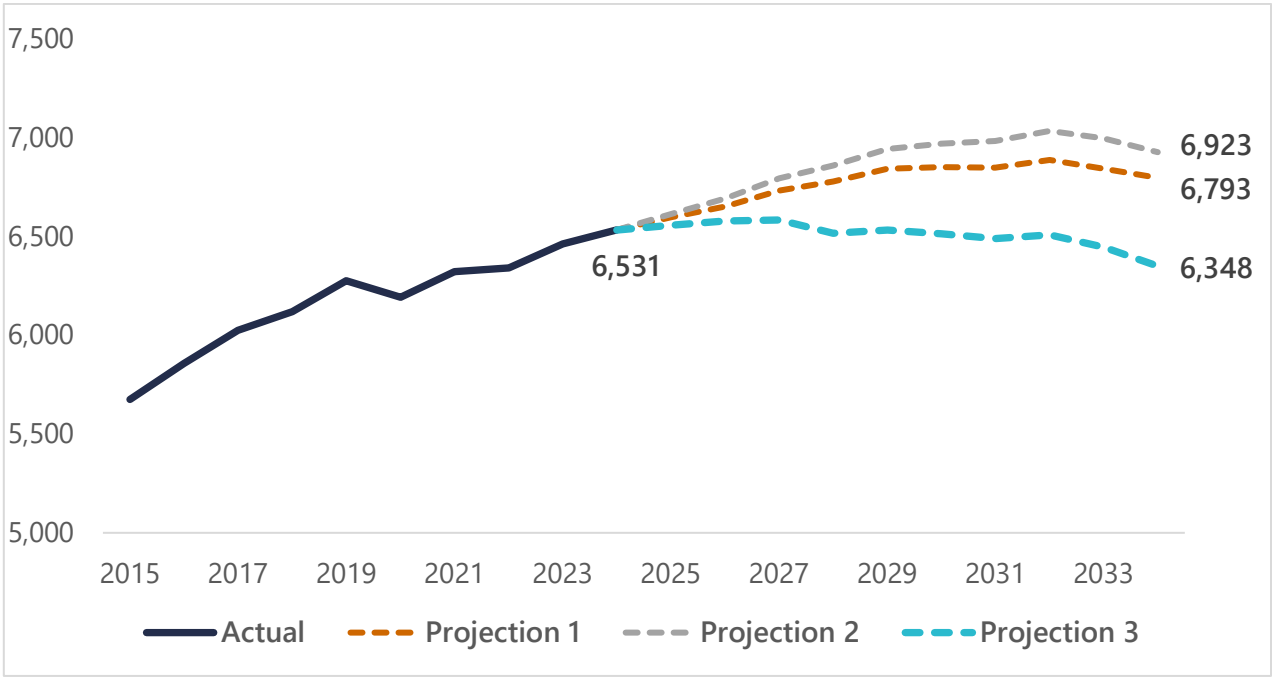
Conclusion

The three individual projection series presented in this report provide unique enrollment outlooks.

The first series projects enrollment based on post-pandemic trends. While it reflects the impact of housing development, it does not account for a specific number of expected housing units. This series indicates that migration and, to a lesser extent, new construction will drive growth into the next five years. Thereafter, enrollment briefly stabilizes and then begins to fall as smaller kindergarten cohorts enter division schools.

The second and third series more directly account for new construction. While their outlooks differ, these projections underscore the relatively limited role housing development is expected to have on HCPS' enrollment. Note that the housing scenario used in these series represents a higher rate of development compared to recent years. Despite this, new construction mildly elevates expected growth in the second series and—in the third series—is insufficient to sustain the city's current enrollment on its own.

Figure 16: Projections 1-3, Total K-12 Enrollment, 2015-2034



A projection is only as good as its assumptions. Many of the factors that shape these projections, such as the extent of future construction, yield rates for existing and new housing, births, and migration, can—and likely will—change. Nevertheless, these projections equip the city with an understanding of how recent demographic and housing trends stand to impact K-12 enrollment over the next decade.

Appendices

Appendix A: Customized Population Projection for Harrisonburg City

We used the latest annual Virginia population estimates from the University of Virginia's Weldon Cooper Center for Public Service (WCCPS). Specifically, we used the total population estimates of Harrisonburg City from 2020 and 2024. The 2020 estimate for Harrisonburg City was adjusted to account for an undercount of college towns in the 2020 Census.

Table 9: Total Population Estimates, 2020-2024

2020	2021	2022	2023	2024
54,892	55,220	55,700	55,990	56,879

Based on historical trends, we expect Harrisonburg's growth to slow in 2030 compared to previous decades (30.8% in the 1990s, 21.4% in the 2000s, and 11.7% in the 2010s). For 2030, we projected growth using the 2020 and 2024 estimates. For 2040, we applied the absolute population change from 2020 to 2030 to the 2030 projection. For 2050, we adjusted the growth rate to reflect continued slower growth.

Table 10: Population Projections, 2030-2050.

Year	2030 (April 1 Projection)	2040 (April 1 Projection)	2050 (April 1 Projection)
Total Population	58,351	61,811	63,541
Growth Rate (per decade)	6.3%	5.9%	2.8%

Appendix B: Housing

1. Residential Unit Counts

We used address point data to tabulate the number of residential units within Harrisonburg. Units were calculated by aggregating the number of individual addresses per multifamily building. This yielded a count of 17,957 units, which was within 4% of the 2023 ACS estimate of 18,654 units.

We also tabulated unit counts with utility billing data by aggregating the number of water meters per multifamily building. We elected to use the address points approach as it provided better coverage. Water meter-based unit counts and manual spot-checking were used to validate address point unit counts.

2. Broad Housing Categories

We grouped the various housing styles used in city real estate data into five broad housing categories:

1. Apartments, including high- and low-rise multifamily buildings, mixed-use buildings, and condos.
3. Duplexes
4. Single-family, including all housing styles that corresponded with standalone single-family homes.
5. Townhouses

Commercial properties, dormitories, group care facilities, and mobile homes were not included in this analysis.

3. Year Built Values

A portion of this report analyzes housing by the year of construction. As such, it is important to note that we could not determine the year of construction for about 2% of the housing units considered in this analysis. In several instances where buildings contained multiple year built values, the latest year was selected.

4. Housing Stock by Elementary Zone

Bluestone, Smithland, and Stone Spring favored attached and multifamily housing. Meanwhile, single-family homes accounted for the majority of housing in Keister, Spotswood, and Waterman.

Table 11: Housing Mix by Elementary School Zone

Category	Bluestone	Keister	Smithland	Spotswood	Stone Spring	Waterman
Apartments	41%	33%	27%	38%	63%	30%
Duplexes	12%	5%	4%	9%	2%	8%
Single-Family	33%	51%	27%	43%	14%	49%
Townhouses	12%	11%	36%	10%	21%	12%

Stone Spring, Bluestone, and Smithland favored more recent construction. This is especially the case for Stone Spring, where nearly half of its residential units were built in 2000 or later. Alternatively, Keister, Spotswood, and Waterman favored older housing.

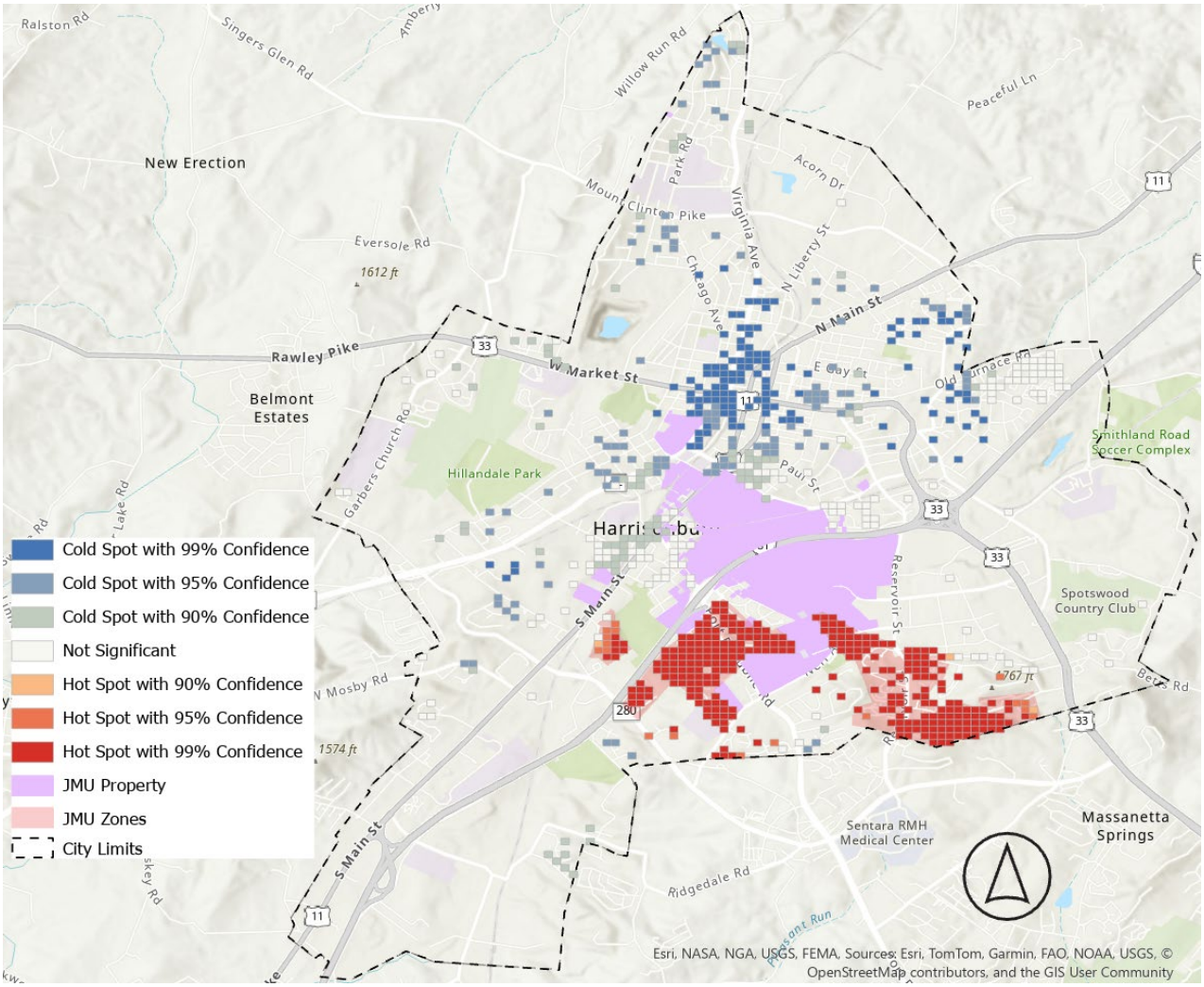
Table 12: % Housing Stock by Year Built and Elementary School Zone

Category	Bluestone	Keister	Smithland	Spotswood	Stone Spring	Waterman
Before 1940	2%	12%	0.5%	24%	0.2%	18%
1940-1959	6%	20%	4%	18%	2%	17%
1960-1979	19%	33%	16%	15%	12%	25%
1980-1999	32%	25%	42%	19%	39%	17%
2000 and later	41%	11%	38%	25%	47%	22%

5. Determination of JMU Student Housing Areas

James Madison University provided 22,988 addresses for current students. While many of them proved unusable, 11,627 addresses were matched to address points within city boundaries. We performed a "hot spot" analysis, which determines statistically significant clusters of observations within a given area, with these matched addresses. Figure 17 shows the results of this process. Note that a "fishnet" grid is overlaid on the city. Portions of this grid shaded in red, mostly to the south and southwest of the university, indicate the most significant clusters of JMU students. These clusters fall mostly within the Stone Spring elementary zone, which contained 70 percent of matched JMU students.

Figure 17: Hotspot Analysis of JMU Students



The identification of JMU zones was chiefly important to the calculation of student generation rates. This is because high densities of college student housing can deflate housing yields, especially for apartments and townhouses. Consider that 90% of Stone Spring's 3,478 apartment units were located inside JMU zones. In this case, the bulk of the housing considered in the unadjusted yield rate is not geared towards families and, therefore, contains very few K-12 students. This mismatch results in low yield rates. Excluding housing and students living inside JMU zones results in more realistic yield rates, as the housing considered in this adjusted calculation is more likely to cater to families.

Appendix C: Student Generation

1. Matching Public K-12 Student Records to City Real Estate Data

Student records for two academic years (2015 and 2024) were matched to city real estate data to calculate student generation rates. The match process was as follows:

- Records for students living in Rockingham County were screened by: 1) matching records to county real estate data and 2) removing records with zip codes outside of Harrisonburg and Rockingham County.
- The remaining records were then cleaned and matched to housing data. Several iterations of this match were performed to account for various inconsistencies.
- Unmatched records were matched to address point (AP) data. Researchers verified that real estate records were not available for these addresses.
- Finally, the small number of unmatched records were manually reviewed to ensure that they were unmatchable.

Table 13 details the results of the match process for 2015 and 2024 student records. In both cases, nearly all student records were matched.

Table 13: K-12 Student Record Match Results

Category	2015 Match		2024 Match	
	N	%	N	%
Total Addresses	**5,974**	**100%**	**6,869**	**100%**
Total Matched	**5,949**	**99.6%**	**6,865**	**99.9%**
To Rockingham (Excluded)	*144*	*2%*	*214*	*3%*
To housing records	*5,748*	*96%*	*6,602*	*96%*
To APs only	*57*	*1%*	*49*	*1%*
Unmatchable	*25*	*0.4%*	*4*	*0.1%*

2. Student Generation Rates by Elementary School Zone

This section details housing yields for each of the city's six elementary school zones. For comparability, generation rates are grouped by housing type. Additionally, JMU-adjusted yields were calculated for apartments and townhouses.

A. Apartments

Waterman apartment yields increased alongside a 22% growth in students living in this housing. Elsewhere, apartment yields were flattened due to little to no change in the number of students living in this housing. Note that adjusting for JMU student housing greatly increased generation rates for Stone Spring. Consider, however, that applying this filter greatly reduces the sample size as more than 90% of Stone Spring apartments are located within its two JMU zones.

Table 14: Student Generation per 100 Apartment Units by Elementary Zone

Category	2015 Generation Rates		2024 Generation Rates	
	Total	Excl. JMU Zone	Total	Excl. JMU Zone
Bluestone	29	-	31	-
Keister	32	36	31	33
Smithland	9	-	13	-
Spotswood	37	-	33	-
Stone Spring	13	84	12	63
Waterman	34	-	42	-

B. Duplexes

Duplexes accounted for a small share (6%) of the city's housing stock and were mostly located in Bluestone and Spotswood. Sample sizes were too small to reliably calculate duplex yields for Keister, Smithland, Stone Spring, and Waterman. Nevertheless, yields for Bluestone duplexes nearly doubled as the number of students living in this housing increased from 60 in 2015 to 113 in 2024. Spotswood's duplex generation rate remained stable during the same period due to an exceedingly marginal change in students living in this housing type.

Table 15: Student Generation per 100 Duplex Units by Elementary Zone

Elementary Zone	2015	2024
Bluestone	16	30
Keister	-	-
Smithland	-	-
Spotswood	56	54
Stone Spring	-	-
Waterman	-	-

C. Townhouses

As mentioned in the body of the report, Harrisonburg experienced considerable growth in the number of townhouses built since 2000 and the number of students living in this housing from 2015 to 2024. The number of students living in Stone Spring townhouses more than doubled from 2015 to 2024, with much of this growth occurring within its two JMU zones. Yields more than doubled as a result. Waterman (74%), Bluestone (66%), and Smithland (27%) also saw significant growth in the number of K-12 students residing in townhomes, which increased yields.

Table 16: Student Generation per 100 Townhouse Units by Elementary Zone

Category	2015 Generation Rates		2024 Generation Rates	
	Total	Excl. JMU Zone	Total	Excl. JMU Zone
Bluestone	27	-	45	-
Keister	19	32	26	47
Smithland	59	-	75	-
Spotswood	75	-	83	-
Stone Spring	13	18	31	51
Waterman	30	-	53	-

D. Single-Family

It is important to note that—at the city level—the greatest share of K-12 students lived in single-family homes; this was also the case for many elementary zones. High densities of students living in single-family homes make these yields less reactive overall. Moreover, yields were further moderated by milder growth in the number of students living in single-family homes from 2015-2024. Nevertheless, Waterman and Smithland saw the greatest increases in single-family yields during this period.

Table 17: Student Generation per 100 Single-Family Units by Elementary Zone

Elementary Zone	2015	2024
Bluestone	41	42
Keister	36	40
Smithland	31	39
Spotswood	39	39
Stone Spring	38	44
Waterman	39	48

Appendix D: Enrollment Projections

Projection Inputs

Each of the projection series shown in this report use fall membership counts and birth data. These data are obtained from the Virginia Department of Education and the Virginia Department of Health.

The second and third projection series directly account for past and anticipated housing development. We applied student generation rates to historical building permits data provided by the city planning department to determine the number of public K-12 students generated from past housing development. Single-family permits were staggered by one year and duplex, townhouse, and apartment permits were staggered by two years to account for completion and absorption. For example, the following approach was taken to determine the number of students generated by single-family housing in 2015:

$$Students\ Generated_{2015} = Yield\ Rate_{2015} \times Permitted\ Units_{2014}$$

We collaborated with the city planning department to create a housing development outlook for the next ten years. More specifically, we aggregated the number of units belonging to housing projects that had been accepted into the engineered comprehensive site plan ("ECSP") review phase of development. This included the construction of 1,332 housing units—67 single-family homes, 58 duplex units, 440 townhouse units, and 767 apartment units. Many approved housing projects in Harrisonburg City do not reach the construction phase. ECSP status indicates that a project has made considerable progress in the pre-construction process and, therefore, has a higher likelihood of completion.

Table 18: Individual Housing Projects included in Housing Scenario

Project Name	Single Family	Duplex	Townhouse	Apartments	Total
Lucy Drive Apartments (Formerly Simms Pointe)	0	0	0	108	**108**
Two41 Central	0	0	0	142	**142**
Pleasant Hill Townhomes	0	0	16	0	**16**
Cobbler's Valley	0	0	35	0	**35**
Vine Street Townhomes	0	0	29	0	**29**
Suter Street	0	18	3	0	**21**
Northside Village (Formerly Wilson Avenue)	0	0	58	34	**92**
1180 Virginia Avenue Mixed Use	0	0	0	12	**12**
NERD Apartments	0	0	0	15	**15**
Arez Subdivision (Formally known as 937 Vine Street)	0	10	0	0	**10**
Commerce Village II	0	0	0	16	**16**
Tuscan Village	0	2	57	54	**113**
Cobbler’s Valley Section 2	0	0	21	0	**21**
Zephyr Hill	0	0	41	0	**41**
Weston Park	26	28	74	0	**128**
439 & 445 Myrtle Street	2	0	0	0	**2**
723 North Liberty Street (Plat Variance)	1	0	0	0	**1**
Bluestone Town Center (Phase I)	38	0	106	145	**289**
The Shoppes at Peach Grove	0	0	0	122	**122**
The Vista at Forest Hills	0	0	0	119	**119**
Total	**67**	**58**	**440**	**767**	**1,332**

Next—using the process described above—we determined the number of students generated by future construction by applying 2024 yield rates to the approximately 133 units expected annually in our housing scenario.

Note that it is perhaps impossible to accurately predict the number of residential units that will be completed over a ten-year period. This approach reflects our best effort to create a realistic housing forecast that demonstrates how anticipated development could shape school enrollment.

Projection 1

Projection 1 represents a straightforward application of the grade progression ratio methodology, which uses past school enrollment trends to project school enrollment under the assumption that these trends are likely to continue into the near future.

Grade progression ratios (GPRs) capture enrollment trends by measuring the rate at which cohorts progress from one grade to the next. GPRs are determined by dividing the number of students enrolled in a particular grade by the number of students enrolled in the previous grade and school year. The kindergarten ratio represents the rate at which eligible children (typically at least 5-years-old) enrolled in kindergarten. This ratio is determined by dividing actual kindergarten enrollment by the number of children born within a school division's jurisdiction five years prior.

GPRs indirectly capture the impact of school transfers, migration, dropouts, deaths, and—especially as it relates to this project—past construction. GPRs greater than 1.0 mean that a given cohort grew as it progressed from one grade into the next. GPRs less than 1.0 indicate that a cohort shrank as it progressed from the previous grade. Year-to-year fluctuations in GPRs can obscure school enrollment trends. Therefore, multiple GPRs are combined into a single measure to "smooth" these fluctuations. In the case of this projection series, we combined ratios derived from 2021-2024 enrollment data.

GPRs were applied to 2024 enrollment counts to project 2025 enrollment for grades 1-12. Kindergarten enrollment was projected by applying the kindergarten ratio to the number of children born five years previously. This process repeats for the remainder of the 10-year projection period.

Projection 2

The second projection series uses a methodology that more directly accounts for the impact of past and anticipated housing development, in addition to the other factors captured in conventional GPR methodology. In that GPRs implicitly account for the impact of construction, ratios must be modified to avoid overstating the impact of anticipated housing development. This was accomplished using the following approach:

1. First, we determined the number of students generated from past construction using the process described in Section 1 of this appendix. In short, yield rates were applied to historical building permits data.
2. Next, students generated from past construction were removed from corresponding enrollment counts, effectively nullifying the influence of housing on enrollment trends.
3. GPRs were then calculated with adjusted grade counts for the 2021-2024 school years. The resulting GPRs exclude the impact of housing development, while retaining the other factors that shaped post-pandemic enrollment trends.

We then determined the number of students generated from anticipated construction by applying 2024 yield rates to the housing scenario described above.

The following approach was used to project 2025 enrollment:

1. For grades 1-12, modified GPRs were applied to 2024 enrollment counts to project 2025 enrollment based on non-housing enrollment trends. The 2025 kindergarten cohort was progressed into the model by applying the adjusted kindergarten ratio to the number of children born five years prior. At this point, 6,589 students were projected for 2025, in the absence of anticipated housing development.
2. Next, students generated from new construction were added to the projected counts, increasing 2025 K-12 enrollment to 6,610 students.

This process was repeated for the remainder of the 10-year projection period: first, enrollment was projected with modified GPRs; next, the number of students generated from future construction (about 27 annually from 2026-2034) were added to these counts.

Projection 3

The third projection series uses a methodology where existing and anticipated cohorts would remain the same size, except for the impact of anticipated housing development.

Prior to projecting enrollment, the number of students generated from future housing development was determined. We applied the same process used in the second projection series: 2024 yield rates were applied to the housing forecast we developed in conjunction with the city planning office.

We then used the following approach to project 2025 enrollment:

1. Similar to the first and second series, the 2025 kindergarten cohort was progressed into the model by applying the rate at which eligible children entered division schools to the number of children born five years prior. Grades 1-12 were projected by applying a GPR of 1.0 to 2024 enrollment counts. This held existing cohorts constant, thus, ignoring all factors otherwise captured in conventional GPRs. As a result, 6,541 students were projected for 2025.
2. Next, students generated from new construction were added to projected counts, increasing 2025 enrollment to 5,555 students.

This process was repeated for the remainder of the projection period. Existing cohorts from the previous projection were held constant as they progressed into the next grade; the kindergarten cohort was progressed into the model based on the supply of eligible children. The number of students generated by housing development in the corresponding year was then added to the projected count.