Demographic Analysis and High School Graduation Projections

for George Mason University

May 15, 2020

Report produced by

The University of Virginia
Weldon Cooper Center
for Public Service

The Demographic Analysis and High School Graduation Projections report was produced by the University of Virginia Weldon Cooper Center in support of George Mason University's master plan and under contract with DumontJanks.

May 15, 2020

DISCLAIMER

In this analysis, we used the most credible population and K-12 enrollment data to develop Northern Virginia high school graduation projections. The short- and long-term impacts of the ongoing COVID-19 pandemic on the economy, and rates of birth and migration are not and cannot be incorporated. However, since the majority of high school graduates in the next two decades have already been born, the effect of the pandemic on future Northern Virginia high school graduation projections is expected to be minimal. The results presented in this analysis are largely unaffected.

As is true with all projections, those produced in this report should be read as suggestive, not determinative. The recent global pandemic demonstrates well that the future is inherently uncertain, making projections of any sort not fully reliable. This report includes projections reported to the single digit, which suggests a high level of precision in predicting the future. Actually, these numbers are the result solely of computation of trends, not by the data producer's ability to project to such detail.

EXECUTIVE SUMMARY

OVERVIEW

Nearly three-quarters of George Mason University students who received a bachelors degree in 2018 called Northern Virginia home, making regional demographic trends a significant factor in student enrollment. In light of this, our analysis focused on Northern Virginia's population trends and their effects on George Mason's current and future enrollment. We aimed to answer these two questions:

1. What demographic factors have facilitated Mason's enrollment growth?
2. Will the recent growth trajectory continue over the next 20 years, considering current trends in births and migration?

IN SUMMARY

The last decade's rapid growth at Mason may continue into the mid-2020s (although the impact of the coronavirus is unknown at this point), but the number of high school graduates in Northern Virginia is expected to decline when the last children born before the late 2000s recession complete high school. These factors create a smaller pool of traditional college-age students in the region who might seek enrollment at Mason.

MAJOR FINDINGS

Population growth in Northern Virginia has fueled rapid enrollment growth at George Mason in the last two decades:

- Seventy-two percent of Mason students who received a bachelor's degree in 2018 were from Northern Virginia, many of them entering as transfer students from local community colleges.
- Northern Virginia is home to almost 40 percent of Virginia's children. Between 2005 and 2019, public school enrollment in the region increased by 27 percent while declining in the rest of the state.
- The number of high school graduates in Northern Virginia has grown rapidly in recent decades. Since 2005, the number of high school graduates in Northern Virginia has risen by 39 percent, compared to 11 percent in the rest of Virginia. The increase in high school graduates in Northern Virginia has been mirrored in Mason's freshman in-state student body.

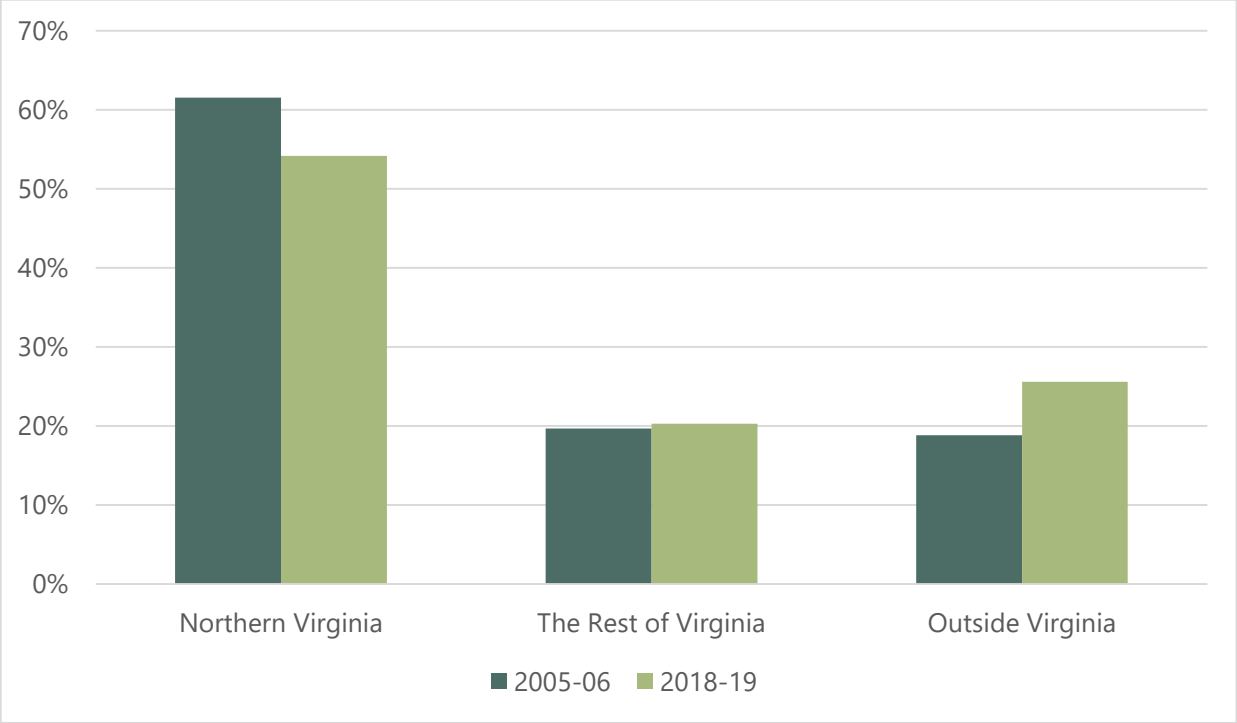
Two new trends in Northern Virginia will impact Mason's future enrollment in the next 20 years:

- **Fewer Births:** Birth rates have declined both nationally and in Virginia since the recession of the last decade. While Northern Virginia birth rates held steady longer than in the rest of the commonwealth, they have declined in the last few years. As a result, the slowing of Northern Virginia's historic growth rate in the 2010s is expected to continue.
- **Decline in net-migration:** Fewer people are moving to Northern Virginia than in previous decades due to slower economic growth in the Washington DC metropolitan area. This in turn reduces the region's number of births and slows the growth in the school age population.

THE IMPACT OF LOCATION

Over the past two decades, George Mason University's undergraduate enrollment has grown more quickly both numerically and by rate than any other public university in Virginia. Mason is distinct among Virginia higher education institutions in the percentage of its students from Northern Virginia[1], the largest and fastest growing region of the Commonwealth.

Figure 1: George Mason Freshmen by Place of Origin

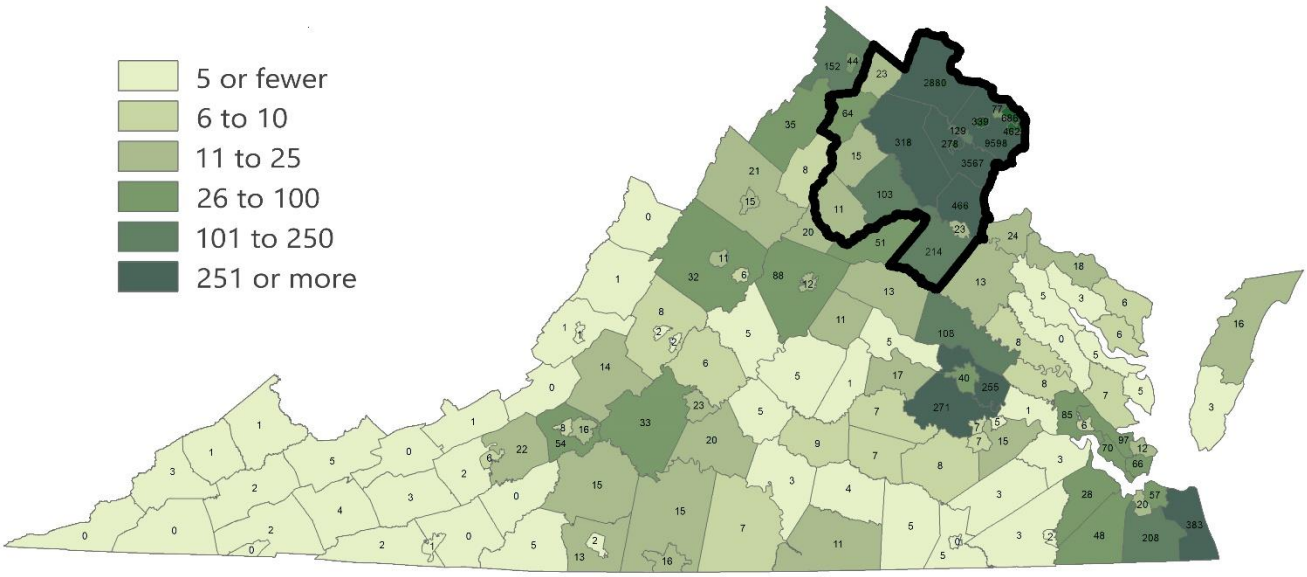


Source: State Council of Higher Education for Virginia

George Mason's total undergraduate enrollment is predominantly from Northern Virginia. More than half of Mason's freshmen students hail from Northern Virginia, although this percentage has gradually declined from 62 percent in 2005 to 54 percent in 2018. Many students from community colleges in the region transfer to Mason. In 2018 (the most recent year transfer data is available), over 3,500 students transferred to Mason from Virginia's community colleges, with 96 percent coming from the three community colleges serving Northern Virginia: Germanna, Lord Fairfax, and Northern Virginia. As a result, Mason's graduating classes are predominantly from the region–72 percent in 2018.

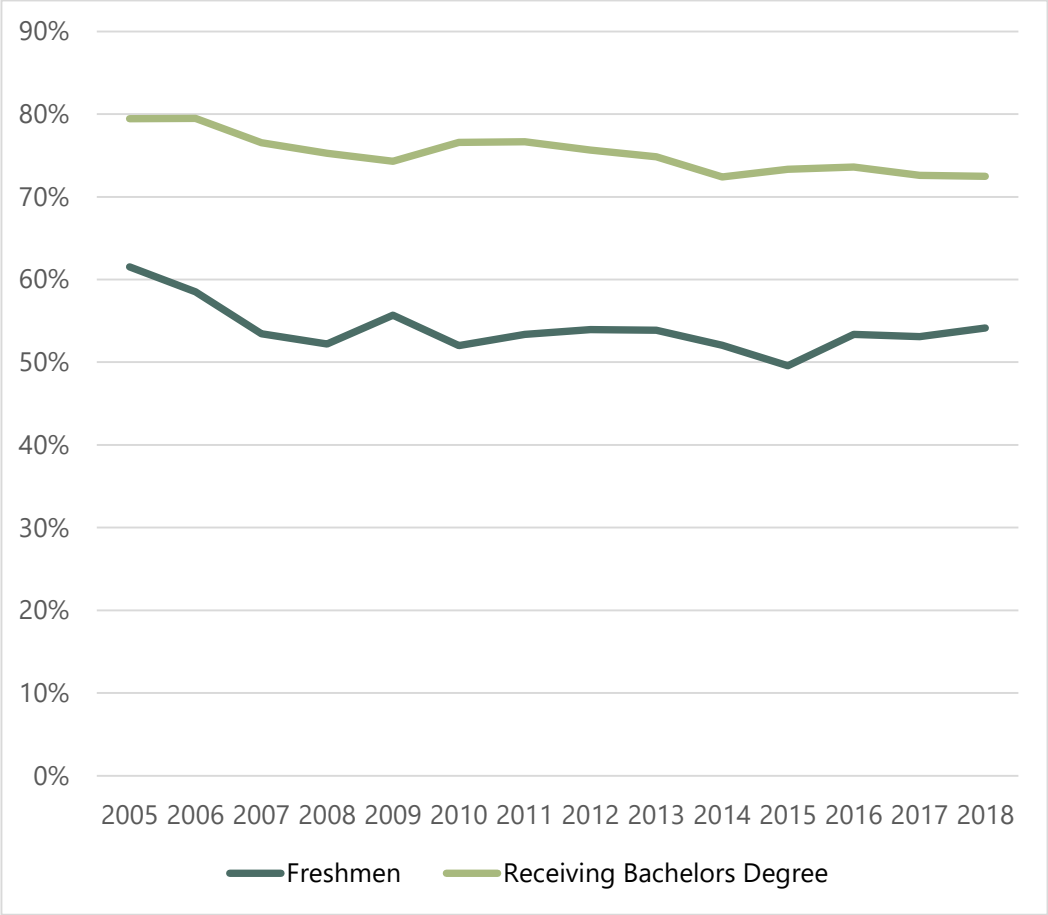
[1] Northern Virginia is defined as the Virginia counties and cities within the Washington, DC Metropolitan Area according to the Office of Management and Budget in March, 2020. It includes Arlington County, Clarke County, Culpeper County, Fairfax County, Fauquier County, Loudoun County, Madison County, Prince William County, Rappahannock County, Spotsylvania County, Stafford County, Warren County, Alexandria City, Fairfax City, Falls Church City, Fredericksburg City, Manassas City, Manassas Park City.

Figure 2: Place of Origin for in-state George Mason Undergraduate Students in 2019



Source: State Council of Higher Education for Virginia

Figure 3: Percent of George Mason Students from Northern Virginia

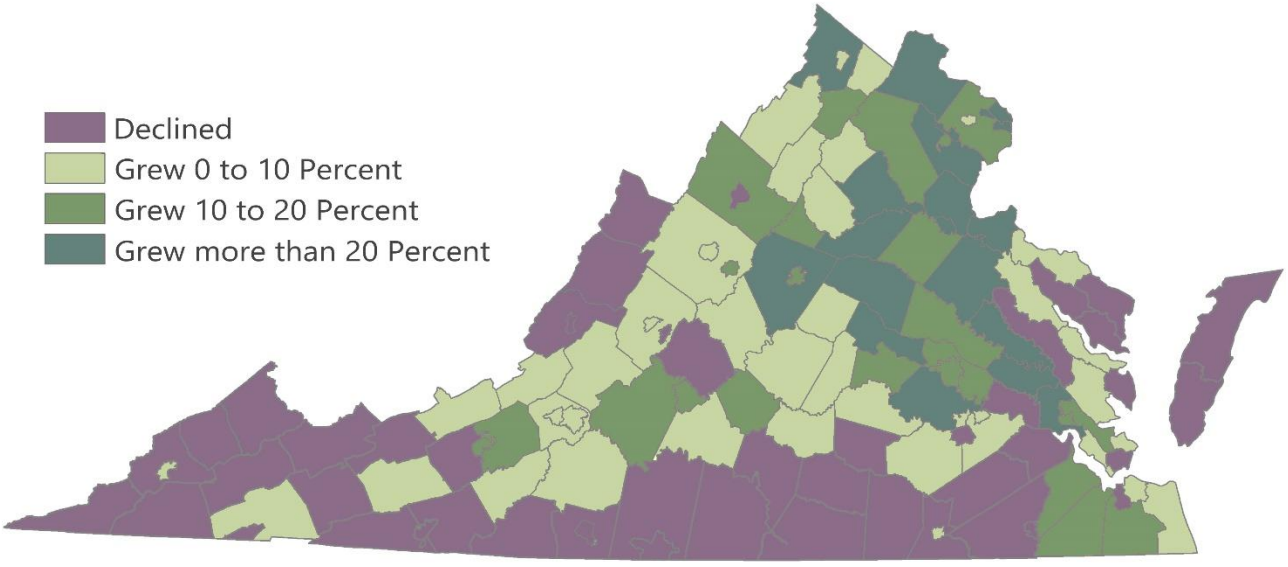


Source: State Council of Higher Education for Virginia

GROWTH OF NORTHERN VIRGINIA POPULATION, K-12 ENROLLMENT, AND HIGH SCHOOL GRADUATES

With a population of over three million, Northern Virginia is home to more than a third of Virginians and has accounted for the majority of Virginia's growth in the last four decades. The region's rapid growth began after World War II when increased federal spending resulted in more jobs, which attracted more people to the DC area. Between 2005 and 2019, Northern Virginia's total population grew by 22 percent, compared to only 7.5 percent in the rest of Virginia and 11 percent nationally. Since 2010, Northern Virginia accounted for nearly two-thirds of the total population growth in the Commonwealth.

Figure 4: Population Change 2005 to 2019



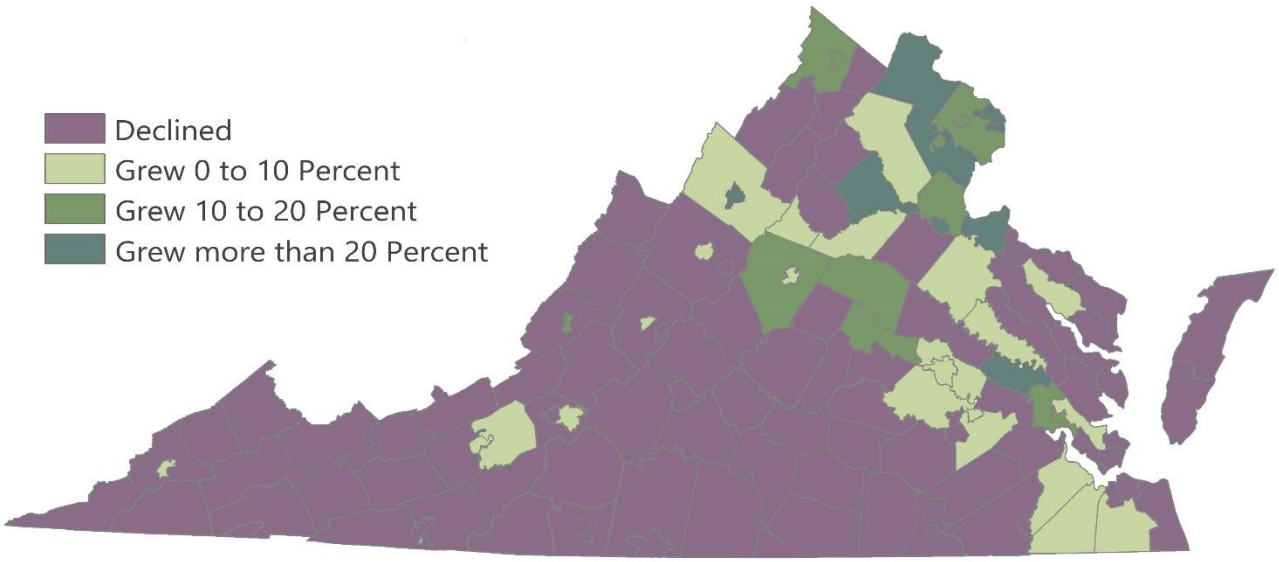
Source: University of Virginia, Weldon Cooper Center, Annual Population Estimates

Northern Virginia further distinguishes itself within Virginia through high concentrations of both school-age and prime-working-age residents. Northern Virginia has been home to:

- one-third of Virginia's population
- 38 percent of Virginia's births, and
- 40 percent of Virginia's population under age 18.

Between 2005 and 2019, public school enrollment in Northern Virginia grew quickly, increasing by 27 percent, compared to a decline of 5 percent in the rest of Virginia and a 3 percent increase nationally.

Figure 5: K-12 Enrollment Change 2005 to 2019

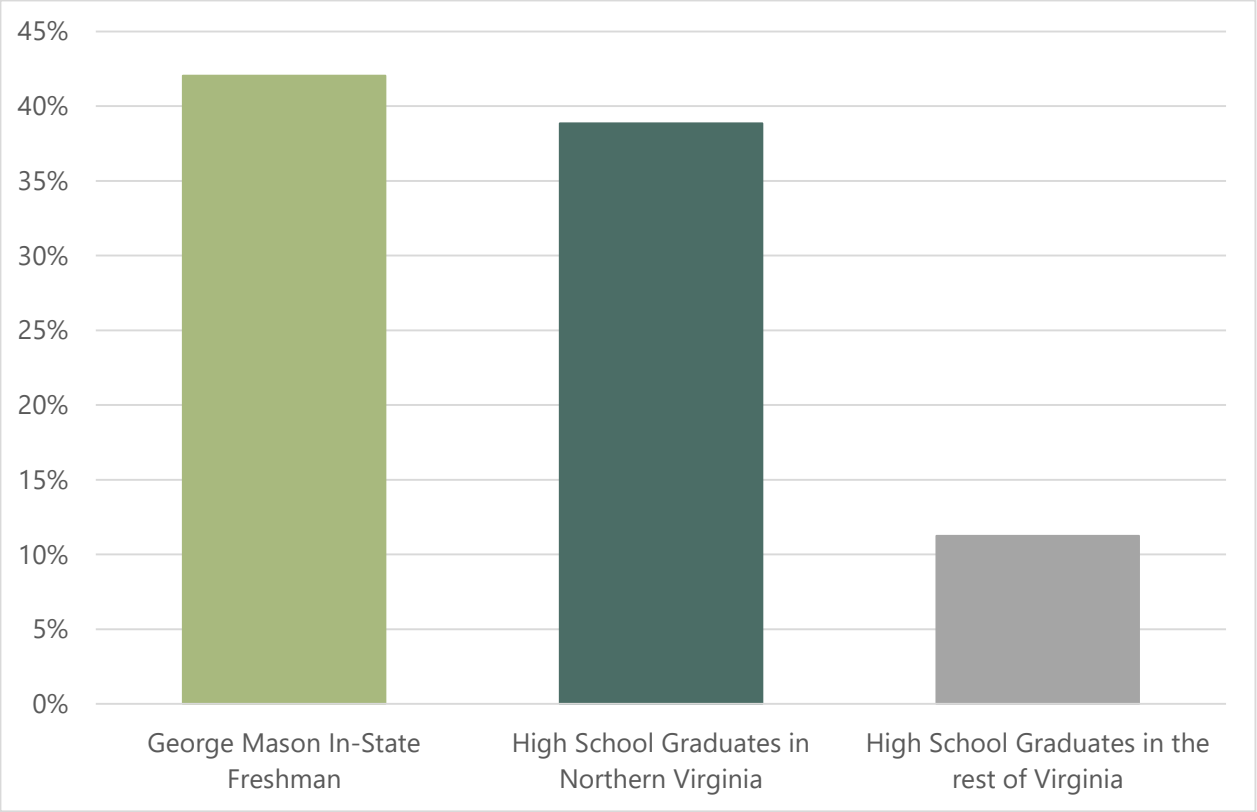


Source: Virginia Department of Education, Fall Membership

An additional demographic trend with potential impact for enrollment at George Mason is a growing high school graduation rate. The number of high school graduates in Virginia has grown more quickly than K-12 enrollments, in large part due to fewer dropouts and rising graduation rates. In 2019, Virginia's high school graduation rate had risen to 91.5 percent; and most school divisions in Northern Virginia had even higher rates than Virginia overall.

These demographic trends contributed to the rapid growth of George Mason's enrollment over the past two decades. Between 2005 and 2018, the number of high school graduates in Northern Virginia rose by 39 percent, effectively facilitating the 42 percent growth in Mason's in-state freshman class. Outside of Northern Virginia, the increase of high school graduates was much smaller, only 11 percent.

Figure 6: Percent Growth 2005 to 2018



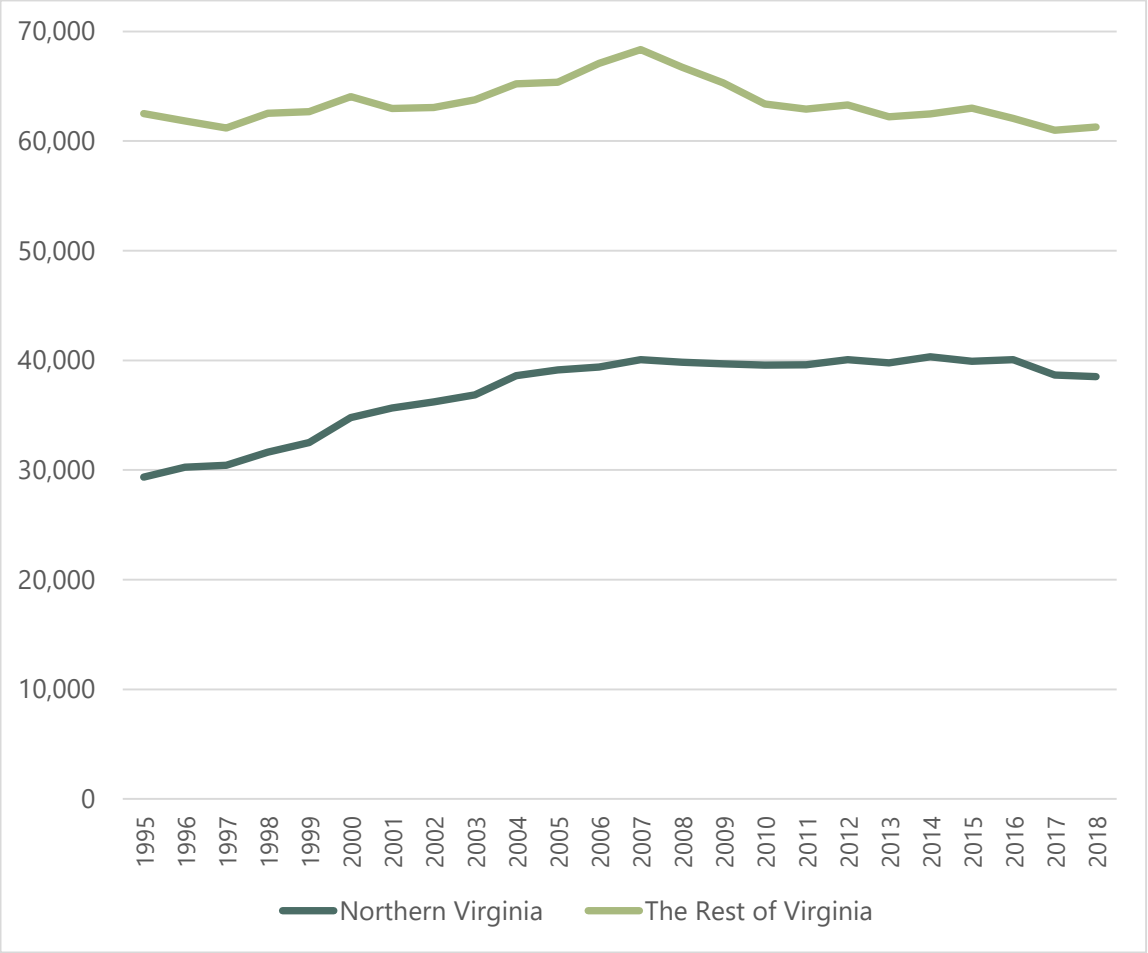
Source: State Council of Higher Education for Virginia

WILL GROWTH CONTINUE DURING THE NEXT 20 YEARS?

The decades-long growth in both public school enrollment and the number of high school graduates will likely slow or possibly shift to decline over the next twenty years. These trends, in turn, will affect Mason's in-state student enrollments, particularly from Northern Virginia.

The number of births has been declining in the state as a whole since peaking in 2007, before the last recession began. The most recent data show that Virginia's births in 2018 were 8 percent lower than in 2007, reaching the lowest point in decades. In Northern Virginia, birth rates have been stagnant and are not expected to increase.

Figure 7: Annual Births



Source: Virginia Department of Health, geocoded by the Weldon Cooper Center

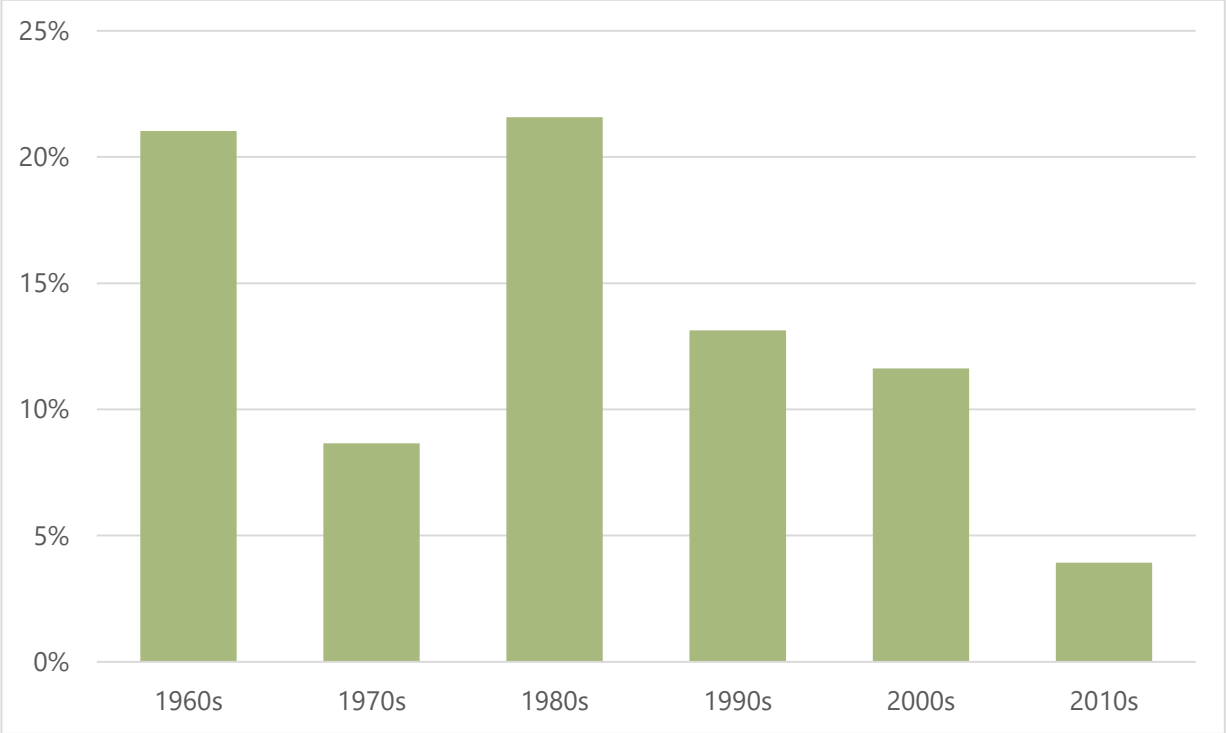
During the late 2000s and early 2010s, the large number of young families that continued to move to the region helped keep the number of births in Northern Virginia stable, while births declined in the rest of Virginia. In 2007, however, growth in the number of Northern Virginia births also stopped. More recently, the number of births in Northern Virginia declined by 4 percent between 2016 and 2018. This decline was likely associated with the second demographic factor in the region's population: a decline in net-migration.

More people have moved into Northern Virginia than moved out every decade since World War II. Since 2010[2], however, the economy of the Washington DC Metropolitan Area has grown more slowly than the U.S. overall and many other metropolitan areas, causing Northern Virginia to attract fewer people. As a result, net migration contributed much less to Northern Virginia population growth in the

[2] Bureau of Economic Analysis data shows that the United States economy grew by 19.4 percent between 2010 and 2018, compared to 12.8 percent in the Washington DC Metro Area. In comparison, between 2001 and 2010, BEA data shows the United States economy grew by 16 percent, compared to 30.2 percent in the Washington DC Metro Area.

2010s than in the previous decades. In addition to low birth rates, migration will likely further slow Northern Virginia's population and K-12 enrollment growth.

Figure 8: Population Growth in Northern Virginia from Migration by Decade



Source: University of Virginia, Weldon Cooper Center, Annual Population Estimates

In addition, Washington DC–like most cities across the U.S.–has experienced population growth in the 2010s, particularly of its young, educated population. After decades of population decline, the District of Columbia has added more residents since 2010 than any county in the Washington DC Metro Area. As more young people have moved to the District and more families remained rather than moving to its suburbs, the District's population under age 18 has grown by over 26,000 between 2010 and 2018. In comparison, the combined under 18 population in the counties of Arlington, Fairfax, and Prince William, which together are 3.5 times more than that of Washington DC, has grown by only 27,000 in that same period.

WHAT DOES SLOWER POPULATION GROWTH MEAN FOR GEORGE MASON?

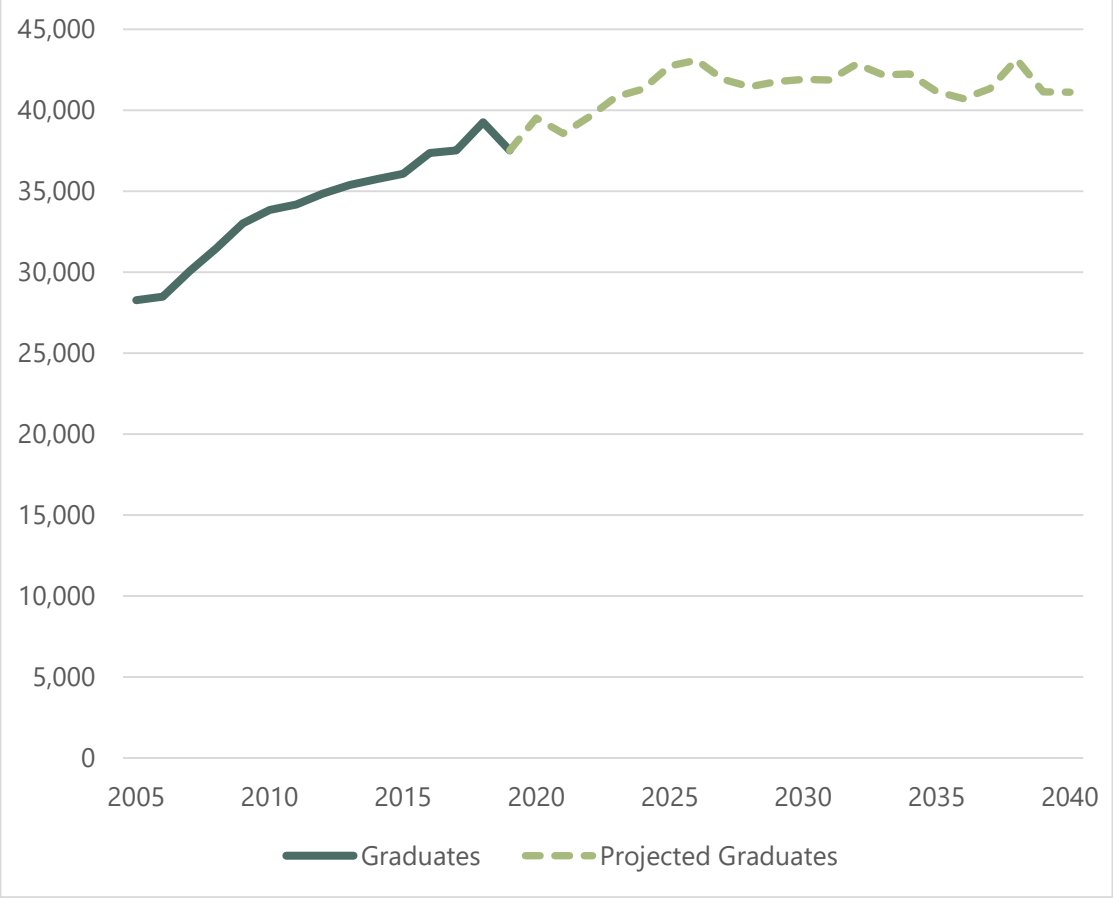
The Northern Virginia population is expected to continue to grow in the foreseeable future, but at a slower rate. Because the number of births in Northern Virginia has been stagnant since 2007 *(see figure 7)* and is likely to remain at a low level, the number of high school graduates in Northern Virginia is projected to begin to decline in the mid-2020s, when those born in 2007 and later graduate from high school.

We developed three sets of projections of Northern Virginia high school graduates based on enrollment trends observed in the last two years (short-term), in the last five years (medium-term) and the last ten years (long-term). The projection illustrated below *(see figure 9)* was the medium-term projection. Appendix I provides the detailed projected numbers and Appendix II explains the projections methodology.

In the first half of the 2020s, the number of high school graduates in Northern Virginia is projected to continue to grow at a similar rate as in recent years, peaking at 43,000 in 2026. Between 2026 and 2040, the number is projected to remain largely stable before declining to 41,000 graduates by 2040.

In the rest of Virginia, the total number of high school graduates already peaked in the late 2000s, and will likely continue to decline during the next two decades. The state as a whole is expected to see a small increase in high school graduates up to 2025, thanks to Northern Virginia's continued growth. After 2025, the number of high school graduates in Virginia overall is expected to decline moderately.

Figure 9: Number of High School Graduates in Northern Virginia



Source: Virginia Department of Education, Projections produced by the Weldon Cooper Center

To a great extent, the demographic and high school graduation trends described in this analysis will likely limit George Mason's long-term enrollment growth, both from Northern Virginia and from the rest of Virginia. While Mason has enrolled increasingly a growing number of out-of-state students, the

birth trends observed in Virginia apply to the U.S. and many states as well. Some higher education institutions have already experienced the demographic squeeze. More will soon have to compete fiercely for the available supply of high school graduates.

WILL COVID-19 AFFECT HIGH SCHOOL GRADUATION PROJECTIONS?

While it is certain that the COVID-19 pandemic will change the region's economy, and possibly the rates of both births and migration over the next twenty years, the number of Northern Virginia high school graduates is expected to be largely unaffected. The majority of future high school graduates have already been born (except for classes of 2038, 2039, and 2040), and the region's school enrollment is predominantly determined by births. For the next twenty years, the population of Northern Virginia high school graduates should remain sufficient for steady enrollment.

The pandemic has resulted in an immediate economic downturn and is likely to generate a recession. Recessions typically cause birth rates to decline. A pandemic-induced birth decline would in turn impact the sizes of entering classes in 2038-2040.

On the other hand, increased federal spending may benefit the Northern Virginia economy and employment opportunities, attracting more individuals and families to move into the region, thereby boosting the region's school-age population. This pattern was observed during the last recession.

A recession may also slow out-migration from Northern Virginia. As a result, over the next few years, the migration gains could potentially push the number of high school graduates in the region closer to that in the long-term projection. Unless federal spending remains at elevated levels—permanently boosting employment in the region—the projected number of high school graduates near 2040 may be closer to the short-term projection as a result of fewer births over the next few years.

APPENDICIES

APPENDIX I

High School Graduation Projections, Northern Virginia, 2020-2040

	Short-Term Trends	Medium-Term Trends*	Long-Term Trends
2020	38,815	39,520	40,101
2021	37,600	38,581	39,021
2022	39,209	39,628	40,512
2023	39,969	40,852	41,312
2024	40,738	41,310	42,029
2025	42,026	42,749	43,317
2026	42,412	43,090	43,938
2027	41,293	41,915	42,647
2028	40,798	41,464	42,098
2029	41,266	41,777	42,457
2030	41,383	41,907	42,645
2031	41,395	41,872	42,351
2032	42,165	42,858	43,572
2033	41,802	42,188	42,996
2034	41,905	42,240	43,052
2035	40,793	41,169	41,987
2036	40,326	40,720	41,445
2037	40,335	41,342	42,238
2038	40,331	43,151	42,518
2039	40,333	41,138	42,532
2040	40,332	41,129	42,528

**Projection series used in analysis.*

The short-term projection takes into account two recent factors: a shift to out-migration from Northern Virginia, and lower birth rates. As a result, among the three projection scenarios the short-term projection expects the least growth in the number of high school graduates, with the number of graduates peaking at 42,412 in 2026.

The medium-term projections balance recent out-migration and lower birth rates with more in-migration in the mid-2010s and higher birth rates. The medium-term projection expects the number of high school graduates to peak at 43,090 in 2026.

The long-term projection includes recent out-migration and lower birth rates, but is more heavily weighted towards earlier in the 2010s when in-migration rates were higher and the number of births near an all-time high. The long-term projection shows the number of high school graduates in Northern Virginia peaking at 43,938 in 2026.

All three projections show a similar trend: strong growth in high school graduates (which Northern Virginia has experienced in recent decades) should continue until 2026. After 2026, the number of high school graduates in Northern Virginia is projected to decline slightly in all three projections.

Though the medium-term projection was used for this analysis, the difference between the three projections is relatively small for a 20-year period (the greatest difference is only 5 percent, which occurs in 2039). The reason all three projections are quite close to each other is that, while migration in the past has helped boost the number of high school graduates in Northern Virginia, births in the region have accounted for the large majority of high school graduates. The three projections show fairly similar trends, in part, because nearly all the projected high school graduates in Northern Virginia have already been born.

APPENDIX II

High School Graduation Projection Methodology

In order to project the number of future high school graduates in Northern Virginia, it is necessary to analyze how students in Northern Virginia progress from elementary to middle and then high school, before graduating. This projection used the grade-progression ratio method which captures the school enrollment patterns of a cohort of children as they move forward in time and progress from grade to grade. Grade progression ratios provide detail of how many students advance into the next grade from the lower grade one year before, and are determined by dividing the number of students in a particular grade by the number of students from the previous grade in the previous school year. For example, the 2nd grade/1st grade-progression ratio is found by dividing the current number of 2nd grade students by last year's number of 1st grade students. A ratio larger than 1 means there are additional students coming in to the school who were not enrolled in the previous grade. A ratio smaller than 1 means students may be transferring to private school or home school, dropping out, or families with school children are moving away from the community, among other reasons.

In order to project the number of high school graduates, the number of graduates is treated as 13th grade. Since the share of 12th graders in Northern Virginia and Virginia overall who attend private and public school has remained stable over the past decade according to Census Bureau surveys, the projection assumes the share will remain at current rates.

Because grade-specific progression ratios can fluctuate considerably from one year to another, it is important to generate and evaluate multiple sets of grade-progression ratios. The Cooper Center does this by creating five-year and ten-year average ratios based on data from those most recent years, along with a two-year ratio. All three grade-progression ratios are applied to the current school enrollment data to obtain forecasts for the following year, which then become the basis for projecting enrollment the year after. The projections based on single- and multiple-year grade progression ratios are compared, and the middle series is selected as most probable.

The high school graduation projections require the use of birth data, fall membership counts, high school completion data and the share of students educated publicly and privately. Birth data are obtained from the Virginia Center for Health Statistics, reported by county. To ensure that the birth data have been assigned to the correct localities, Cooper Center demographers geocode the residence address of each birth mother and then assign each birth to the locality of residence. The second element of input data—historical and current fall membership counts—were obtained from the Virginia Department of Education. The third piece of data used in the projection was the number of high school graduates by school division in Virginia, which was obtained from the Virginia Department of Education. The last piece of data used in the projections was the number of 12th graders attending private and public schools, which was obtained from the Census Bureau's American Community Survey.