

Inflation, Drones, and the Economy of Hampton Roads



INFLATION, DRONES, AND THE ECONOMY OF HAMPTON ROADS

“A powerful Navy we have always regarded as our proper and natural means of defense; and it has always been of defense that we have thought, never of aggression or of conquest. But who shall tell us now what sort of Navy to build? ... When will the experts tell us just what kind we should construct – and when will they be right for ten years together?”

President Woodrow Wilson, December 8, 1914

The relationship between the United States Navy and Hampton Roads has deep roots, tracing all the way back to the founding of the nation. The USS Chesapeake, one of the six original frigates of the U.S. Navy, was built in Portsmouth. Over time, the Navy’s presence in the region expanded, building upon the deepwater port at Norfolk and the growing defense-industrial base at the shipyards in Norfolk, Portsmouth, and Newport News.

Today, Hampton Roads is not only home to five of the nation’s aircraft carriers, it is the place where these and other ships are built and maintained. Tens of thousands of the region’s residents are employed directly or indirectly through the billions of defense spending dollars that flow into Hampton Roads on an annual basis. In many ways, the U.S. Navy and other armed services are part of the foundation upon which the regional economy has been built.

Yet, as we look back over the past 12 months, we must ask whether we have arrived at an inflection point, not only in military affairs but also how the region’s economy may change in the future. Russia’s invasion of Ukraine in February of this year shocked global commodity markets and contributed to a global surge in energy prices, fueling inflation in the United States and other nations. While many experts doubted Ukraine’s ability to withstand the onslaught of Russian forces¹, the truism that no plan survives contact with the enemy was borne out by events on the ground. Ukraine’s decisions to invest in the professionalization of its armed forces and to procure modern unmanned aerial vehicles (UAVs or drones) proved prescient. Ukrainian UAVs have

destroyed tanks, infantry fighting vehicles, transport vehicles, and Russian patrol and supply ships.² The use of UAVs on the modern battlefield is not new, but it is now clear that these systems offer an asymmetric cost advantage. Drones, whether home-built or military-grade, are relatively inexpensive, can be produced quickly, and have demonstrated the ability to wreak havoc on more expensive legacy weapons systems. Many of the weapon systems built, maintained, and based in Hampton Roads are threatened by this revolution in military affairs, a revolution that will likely shake the foundations of the regional economy in the coming decades.

The economic shocks of the COVID-19 pandemic also continue to reverberate through the region. While the policy responses to the COVID-19 pandemic-related economic shock in the spring of 2020 likely staved off a deep, prolonged recession, the same policy responses rapidly expanded liquidity, most obviously in the form of dramatic increases in the size of the money supply by the Federal Reserve System. Increasing demand as the U.S. and other economies recovered resulted in price pressures as supply-chain shocks

¹ <https://www.reuters.com/business/aerospace-defense/how-ukraines-armed-forces-shape-up-against-russias-2022-02-01/>

² <https://www.aviacionline.com/2022/05/first-successful-anti-ship-mission-of-bayraktar-tb2-drone-in-ukraine/>

continued to roil the flow of goods and services. As prices surged at the pump and grocery store, consumer sentiments soured and inflationary expectations hardened, leading the Federal Reserve to shift its policy stance aggressively from promoting employment to combatting inflation, even if it meant increasing the risk of recession. Inflation not only has caused pain for consumers and businesses, but it also reduced the buying power of the Department of Defense (DoD) by tens of billions of dollars. Department of Defense spending in Hampton Roads may increase in nominal terms in 2022 and into 2023, but once we account for the impact of inflation, real (inflation-adjusted) DoD spending will likely decline in the region in the coming years.

Hampton Roads again finds itself looking wistfully at the economic performance of its peers. Many of the jobs we lost in 2020 have come back; however, our recovery is, at best, incomplete. While the headline unemployment rate approached 3% in the summer of 2022, these gains were driven, in part, by the relatively tepid recovery in the region's civilian labor force. There were almost 45,000 fewer residents working or looking for work in May 2022 when compared to February 2020, a decline of almost 5%. The outmigration of residents, especially in the prime working years, is another signal of declining economic competitiveness as people are voting with their feet about economic conditions in the region.

Not all the news is dire. Nominal defense spending is likely to increase in the region in 2023, although the Navy's plans to downsize its existing fleet may threaten these increases in future years. The Port of Virginia is on track for another record year. The hotel industry continues to outperform the Commonwealth and the nation. Ongoing discussions about closer collaboration between Eastern Virginia Medical School (EVMS) and Old Dominion University (ODU) (something we have recommended in the past) are likely to bear fruit in the coming years.

Regionalism does not mean that cities and counties will lose their distinctive character, but that together, we can build a better future for Hampton Roads. These bright spots illustrate the potential of Hampton Roads, while simultaneously highlighting the need for the region's localities to work together to lift economic development. To paraphrase Abraham Lincoln, a region divided against itself cannot stand.

In this chapter, we examine Hampton Roads' economic fortunes in 2022 and how the economy may fare in 2023. We ask how far labor markets have rebounded and how the region fares compared to its peers. We discuss opportunities for growth even as developments threaten parts of the defense-industrial base in the region. The challenge is before us; the question is whether we can all work together at the task at hand?

The Pandemic: In the Background but not Forgotten

Looking across Hampton Roads in the summer of 2022, one might reach the conclusion that the COVID-19 pandemic had receded into a distant memory for most residents. While masks were occasionally seen in the spring of 2022 (largely in health care settings), restaurants, bars, clubs, and sporting events went on as they did prior to the onset of the pandemic. The raging debates concerning whether one should get vaccinated have, to some extent, been relegated to the edges of social media as consumers have been more focused on prices at the gas station and grocery store. Yet, infections, hospitalizations, and sadly, deaths from COVID-19 continued to shape life in Hampton Roads, Virginia, and the nation.

From June 15, 2020, to June 17, 2022, there were more than 350,000 reported cases of COVID-19 in Hampton Roads, resulting in over 11,000

hospitalizations.³ According to the Virginia Department of Health (VDH), there were almost 3,800 COVID-19-related deaths in Hampton Roads over this period. Graph 1 presents the proportions of COVID-19 deaths by race relative to their share of population over this period. Black residents of the region were 30.7% of the population in 2019 but accounted for 48.0% and 41.3% of COVID-19-related hospitalizations and deaths, respectively. White residents, who made up 58.6% of the Hampton Roads population in 2019, accounted for approximately 41.0% and 51.7% of the region's hospitalizations and deaths, respectively, from COVID-19.

Vaccinations remain a significant defense against hospitalization and mortality associated with COVID-19. A study of hospitalizations between December 2021 and March 2022 found that three mRNA doses reduced the likelihood of hospital admission due to COVID-19 by approximately 90%.⁴ A 2022 study found that receiving two or three doses of an mRNA COVID-19 vaccine reduced the risk of COVID-19 invasive mechanical ventilation or death by 90%.⁵ Another study, examining adolescents, found the risk of hospitalization was 92% and 94% lower for 12- to 15- year-olds and 16- to 17- year-olds, respectively.⁶ Even in the face of new variants and subvariants, the evidence continues to show that vaccines are broadly effective at reducing the risk of hospitalization, intubation, and death.

Graph 2 displays the percentage of the population fully vaccinated by selected age groups and cities in Hampton Roads. As one might expect, vaccination rates are higher for older than younger residents of the region. Part of this can be explained by the effort to vaccinate those who are, on average, at higher risk from COVID-19. A recent survey of the literature found that younger individuals had lower intentions to vaccinate.⁷ Why these intentions are lower remains a matter of debate, with some suggesting that education and wealth influence the decision and others arguing there is a strong negative correlation with social media consumption.⁸

Graph 3 displays vaccinations by race in Hampton Roads and Virginia through June 21, 2022. In the summer of 2021, Black residents of Virginia were less likely to be fully vaccinated than white residents. Over the last 12 months, the story has changed. The latest data available show that a higher proportion of Black residents (60.3%) were fully vaccinated than white residents of the Commonwealth (57.0%). A matter of concern, however, is that Hampton Roads lags the Commonwealth. The disparity in vaccination rates was the highest for Latino residents, with only 46.5% of the Latino population considered fully vaccinated in the region, about 25 percentage points less than the Commonwealth average.

According to a recent report from the Kaiser Family Foundation, differences in vaccination rates for Black, Hispanic, and white people have narrowed over the course of the vaccine rollout. Nationally, for example, the gap in vaccination rates between white and Black people fell from 14 percentage points to 6 percentage points from April 2021 to April 2022. The narrowing gap likely reflects the impact of concerted efforts to address disparities in vaccination rates. The Kaiser Family Foundation also notes that data paint an incomplete picture of vaccination rates, with race and ethnicity unknown in approximately one-quarter of vaccinations nationally. The data we do have suggest that Hampton Roads lags behind the Commonwealth in vaccination rates and that continued outreach and education are necessary to lower the risk of severe disease for a number of residents of the region.

While inflation, supply-chain shocks, and geopolitical crises have dominated the news in 2022, COVID-19 remains a concern for the public health of Hampton Roads. Even as the virus diminishes from public discourse (as one can easily see on social media feeds), it retains the ability to dramatically alter lives. Working to improve vaccination rates is a battle worth fighting.

³ We recognize that COVID-19 infections are likely underreported, especially with the increasing use of at-home tests. We thus focus on hospitalizations and deaths from COVID-19.

⁴ https://www.cdc.gov/mmwr/volumes/71/wr/mm7113e2.htm?s_cid=mm7113e2_w

⁵ https://www.cdc.gov/mmwr/volumes/71/wr/mm7112e1.htm?s_cid=mm7112e1_w

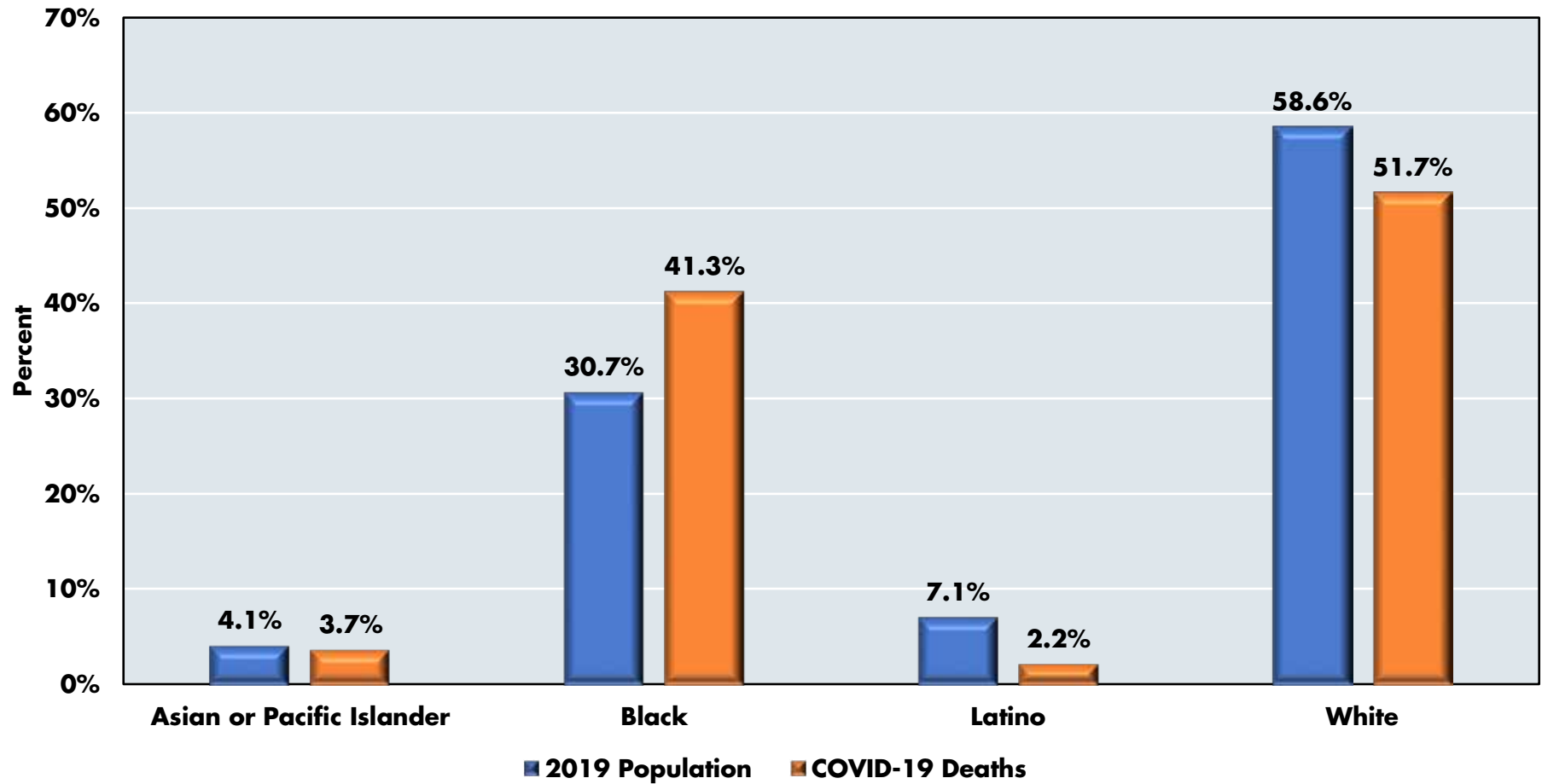
⁶ https://www.cdc.gov/mmwr/volumes/71/wr/mm7109e3.htm?s_cid=mm7109e3_w

⁷ <https://onlinelibrary.wiley.com/doi/full/10.1111/jocn.15951>

⁸ <https://www.mdpi.com/2076-393X/10/4/559>

GRAPH 1

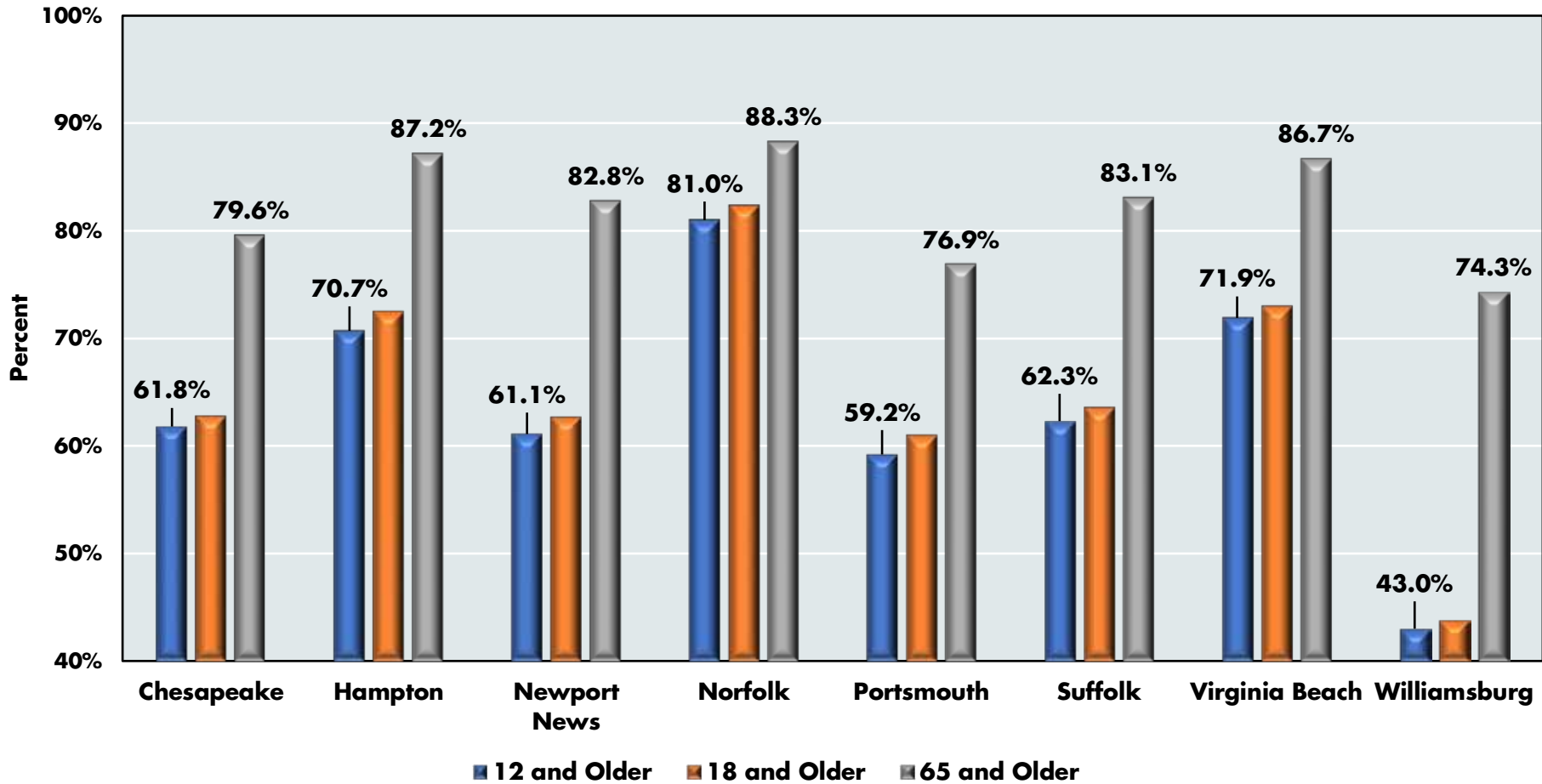
**DISTRIBUTION OF POPULATION AND COVID-19 DEATHS
HAMPTON ROADS*
JUNE 15, 2020–JUNE 17, 2022**



Sources: Virginia Department of Health and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Population data are from the 2019 American Community Survey 1-year estimates. COVID-19 data, from the Virginia Department of Health, cover the health districts of Chesapeake, Hampton, Norfolk, the Peninsula, Portsmouth, Virginia Beach, and Western Tidewater. *Data at the city and county level are not available prior to June 15, 2020.

GRAPH 2

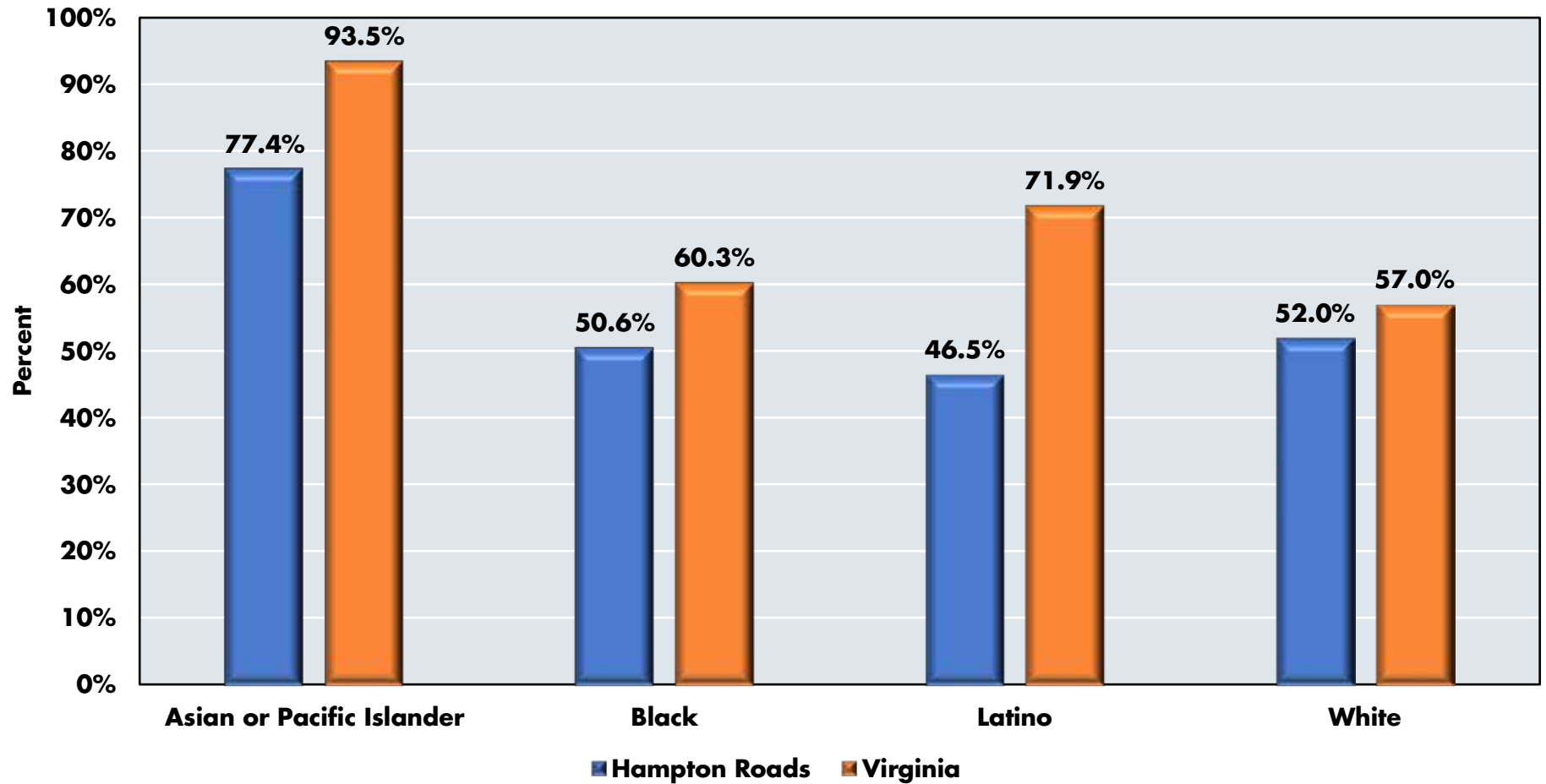
**PERCENTAGE OF THE POPULATION FULLY VACCINATED:
SELECTED CITIES AND AGE GROUPS IN HAMPTON ROADS
AS OF JUNE 17, 2022**



Sources: Centers for Disease Control and Prevention, County Level Vaccination Data, COVID-19 Integrated County View. Data as of June 17, 2022. Individuals are considered fully vaccinated two weeks after their second dose in a two-dose series or after a single-dose of the J&J/Janssen vaccine. See <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/faq.html> for more information.

GRAPH 3

**VACCINATIONS BY RACE:
HAMPTON ROADS AND VIRGINIA
AS OF JUNE 21, 2022**



Sources: Virginia Department of Health and the Dragas Center for Economic Analysis and Policy, Old Dominion University. The data do not include doses administered by federal agencies.

Growth Returns: Will It Continue?

We estimate that real (inflation-adjusted) economic activity in Hampton Roads grew by 3.0% from 2020 to 2021, a rebound from the 3.9% contraction in 2020 due to the COVID-19 economic shock (Table 1).⁹ We project that annual real GDP growth will moderate to 2.4% in 2022, even in the face of inflation and global uncertainty. Increases in federal spending, continued growth in traffic through the Port of Virginia, and increases in the hotel and tourism sector will fuel the ongoing recovery in the region. However, our forecast must be tempered by the rise in petroleum prices, continued increases in interest rates, and the possibility of another unforeseen economic shock that leads to a more significant contraction in equities and real estate markets.

The economic recovery in Hampton Roads is good news but must be tempered by comparison with the Commonwealth and nation. Graph 4 illustrates that the region's economic performance left much to be desired prior to the pandemic, with the regional economy growing by only 16.1% from 2001 to 2019, compared to 35.1% and 43.5% for the state and nation over the same period, respectively. Real GDP in Hampton Roads, the Commonwealth, and the nation all contracted in 2020, but the recovery from 2020 has been more rapid at the state and national level. At the end of 2021, real GDP in the United States and Virginia was higher than 2019, the last full year prior to the COVID-19 pandemic. Even though we estimate the Hampton Roads economy grew by 3.0% in 2021, it was insufficient to make up for the losses of 2020. We project that regional economic activity will regain most (if not all) the lost ground in 2022; however, increasing recessionary risk threatens these gains in 2023.

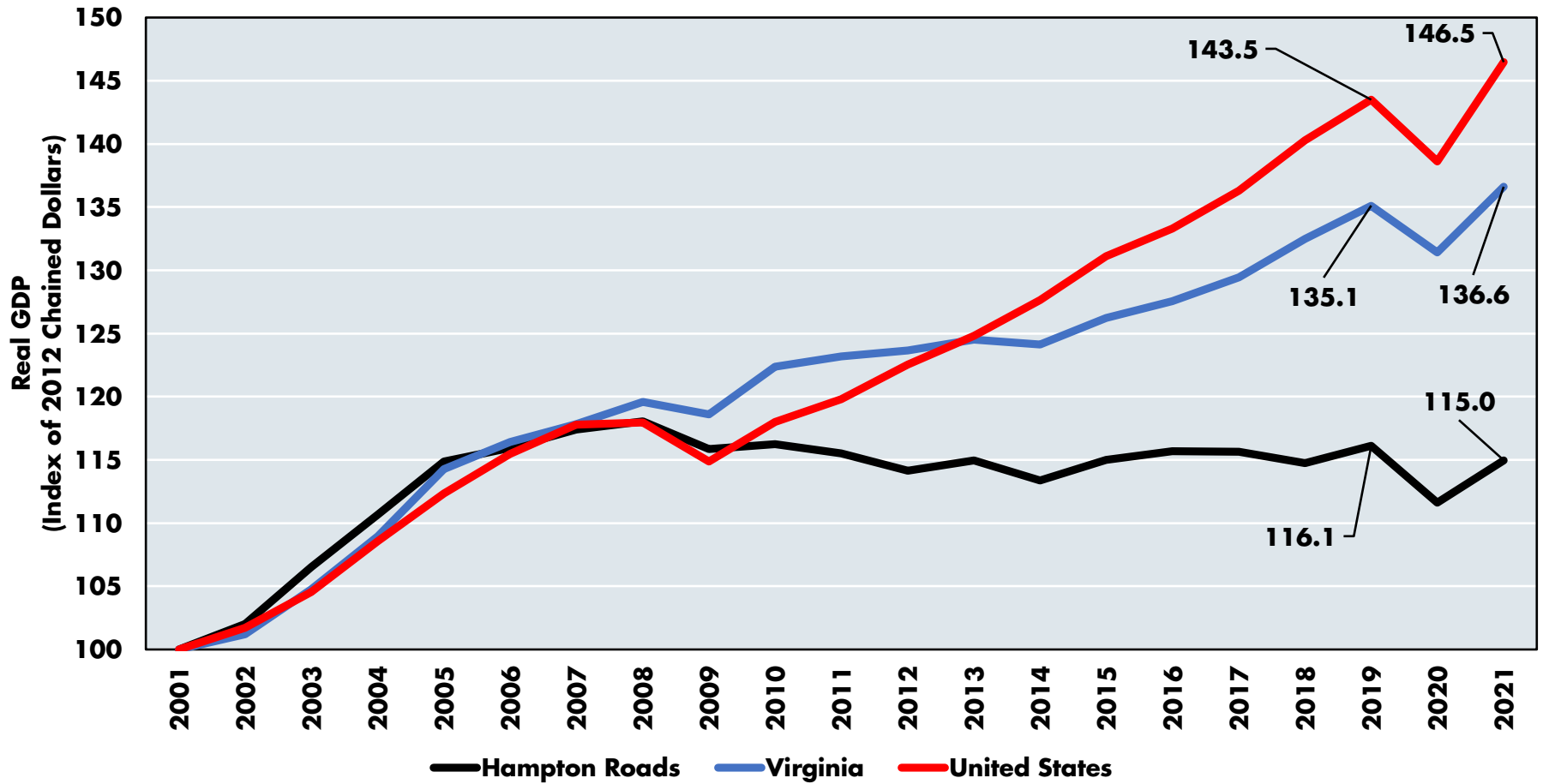
⁹ As we have noted in previous reports, the regional GDP estimates of the Bureau of Economic Analysis (BEA) should be viewed with caution. The BEA estimates are significantly lagged; the advance estimates for 2021 will only be released in December 2022. The estimates are also frequently subject to significant revision.

	Nominal GDP	Real GDP (Base Year – 2012)	Year-over-Year Change in Real GDP
2001	\$56,929	\$73,393	---
2002	\$59,704	\$74,864	2.0%
2003	\$63,921	\$78,165	4.4%
2004	\$68,089	\$81,228	3.9%
2005	\$72,734	\$84,303	3.8%
2006	\$75,630	\$85,081	0.9%
2007	\$78,859	\$86,173	1.3%
2008	\$80,833	\$86,640	0.5%
2009	\$81,382	\$85,019	-1.9%
2010	\$82,540	\$85,326	0.4%
2011	\$83,077	\$84,794	-0.6%
2012	\$83,770	\$83,770	-1.2%
2013	\$85,988	\$84,359	0.7%
2014	\$86,702	\$83,221	-1.3%
2015	\$90,208	\$84,393	1.4%
2016	\$92,190	\$84,916	0.6%
2017	\$93,505	\$84,890	0.0%
2018	\$94,642	\$84,210	-0.8%
2019	\$98,050	\$85,214	1.2%
2020	\$96,337	\$81,926	-3.9%
2021*	\$101,154	\$84,384	3.0%
2022*	\$107,223	\$86,409	2.4%

Source: U.S. Bureau of Economic Analysis and the Dragas Center for Economic Analysis and Policy, Old Dominion University. *2021 represents our estimate while 2022 represents our forecast. Base year of real GDP is 2012.

GRAPH 4

**INDEX OF REAL GROSS DOMESTIC PRODUCT
UNITED STATES, VIRGINIA, HAMPTON ROADS
2001-2021***



Source: U.S. Bureau of Economic Analysis. Real GDP in 2012 chained dollars. *2021 forecast for Hampton Roads. Base year of the index is 2001.

A Limited Recovery in Labor Markets

By now, the story is familiar. Prior to the onset of the pandemic, the civilian labor force (the number of people working or actively looking for work) in Hampton Roads reached a record 877,229 people in December 2019. Individual employment peaked in February 2020, with 854,032 individuals reporting to the Bureau of Labor Statistics (BLS) that they were gainfully employed (Graph 5).¹⁰ By April 2020, with social distancing measures in place, the civilian labor force and individual employment had dropped to 855,913 and 747,661 individuals, respectively. If we compare April 2020 to February 2020, there were 21,059 fewer individuals in the civilian labor force, and 106,371 people reported that they were no longer gainfully employed. To say the decline in employment in two months was historic continues to understate the magnitude of the shock to labor markets.

The recovery to date can be best characterized as incomplete and, at worst, troubling. The civilian labor force in Hampton Roads rebounded slightly in June and July of 2020 and then proceeded to decline through August 2021. Over 32,000 people left the labor force in the region from June 2020 to August 2021. While there have been some small gains since August 2021, there were approximately 45,000 fewer people willing to work in Hampton Roads in May 2022 when compared to the pre-pandemic peak. Individual employment has recovered somewhat more quickly than the labor force, gaining over 57,000 jobs from the trough of April 2020. However, employment in May 2022 remained almost 50,000 individuals below the pre-pandemic peak. There is certainly more road to travel before we can characterize the labor market recovery complete in Hampton Roads.

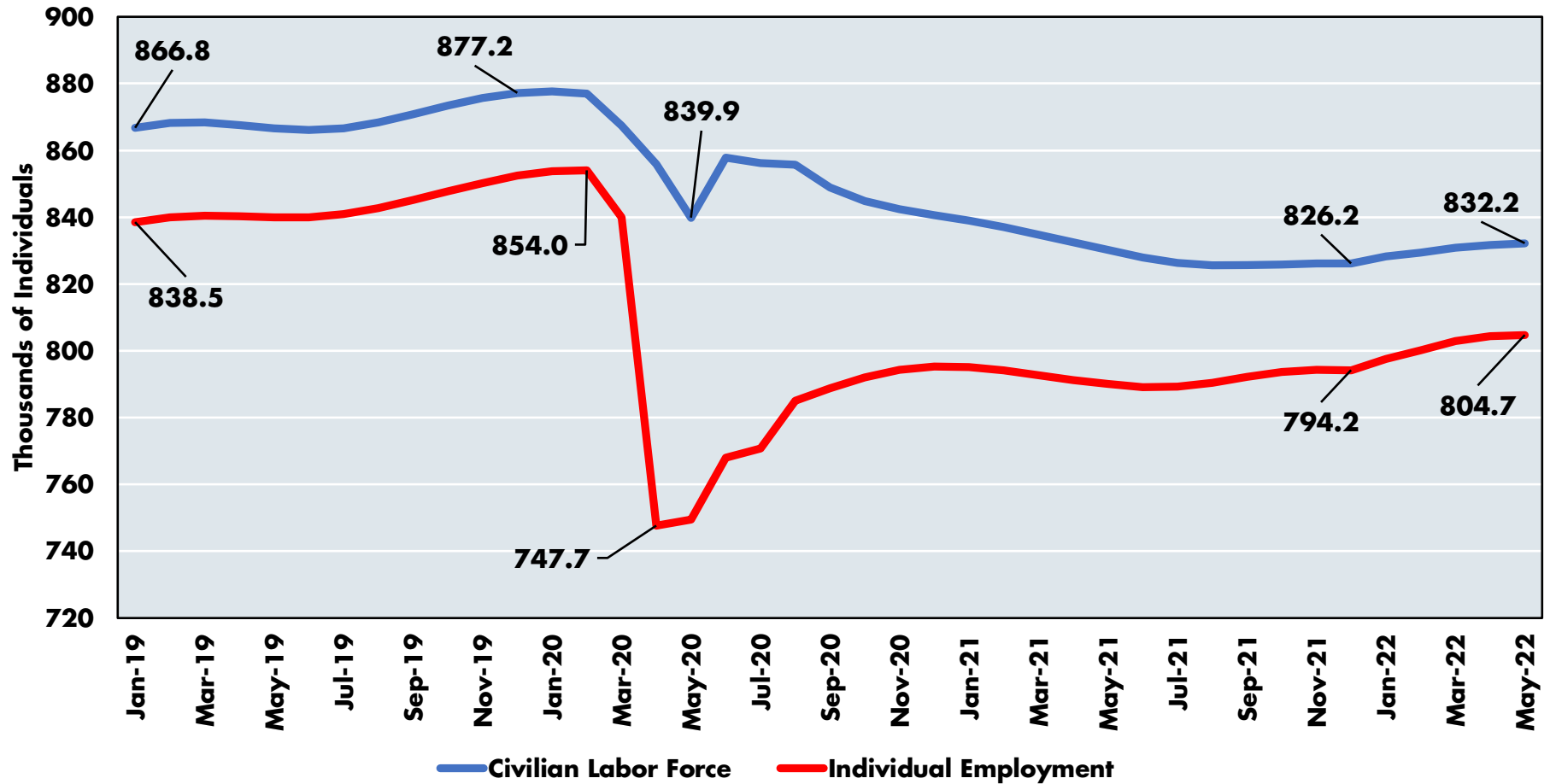
The headline unemployment rate is equal to the ratio of the number of unemployed people in the labor force to the overall labor force. After peaking at 12.6% in April 2020, the unemployment rate declined to 3.3% in May 2022 (Graph 6). The unemployment rate fell for two reasons: one good (fewer unemployed residents) and one concerning (fewer residents in the labor force). While there were fewer unemployed people over the period in question, the numerator of the unemployment rate (the civilian labor force) was smaller, biasing the unemployment rate downward.

We conduct a simple thought experiment to illustrate how departures from the labor force affect the headline unemployment rate in Hampton Roads. In Graph 6, we construct an alternative measure of the unemployment rate by treating exits from the labor force as unemployed individuals. In May 2022, for example, there were 45,425 fewer individuals in the labor force than January 2020. Adding these individuals to the 27,491 unemployed in May 2022 yields an unemployment rate estimate of 8.3%, more than 2.5 times the reported unemployment rate. If there is a modicum of good news, it is that the civilian labor force and individual employment both increased in the spring of 2022; however, it is an open question whether these gains can be sustained in the face of increasing economic uncertainty.

¹⁰ According to the BLS, individuals are classified as employed if, during the survey reference week, they meet one of the following criteria: (1) worked at least one hour as a paid employee, (2) worked at least one hour in their own business, profession, trade, or farm, (3) were temporarily absent from the job, business, or farm, regardless of whether they were paid or not, or (4) worked without pay for a minimum of 15 hours in a business or farm owned by a member of their family.

GRAPH 5

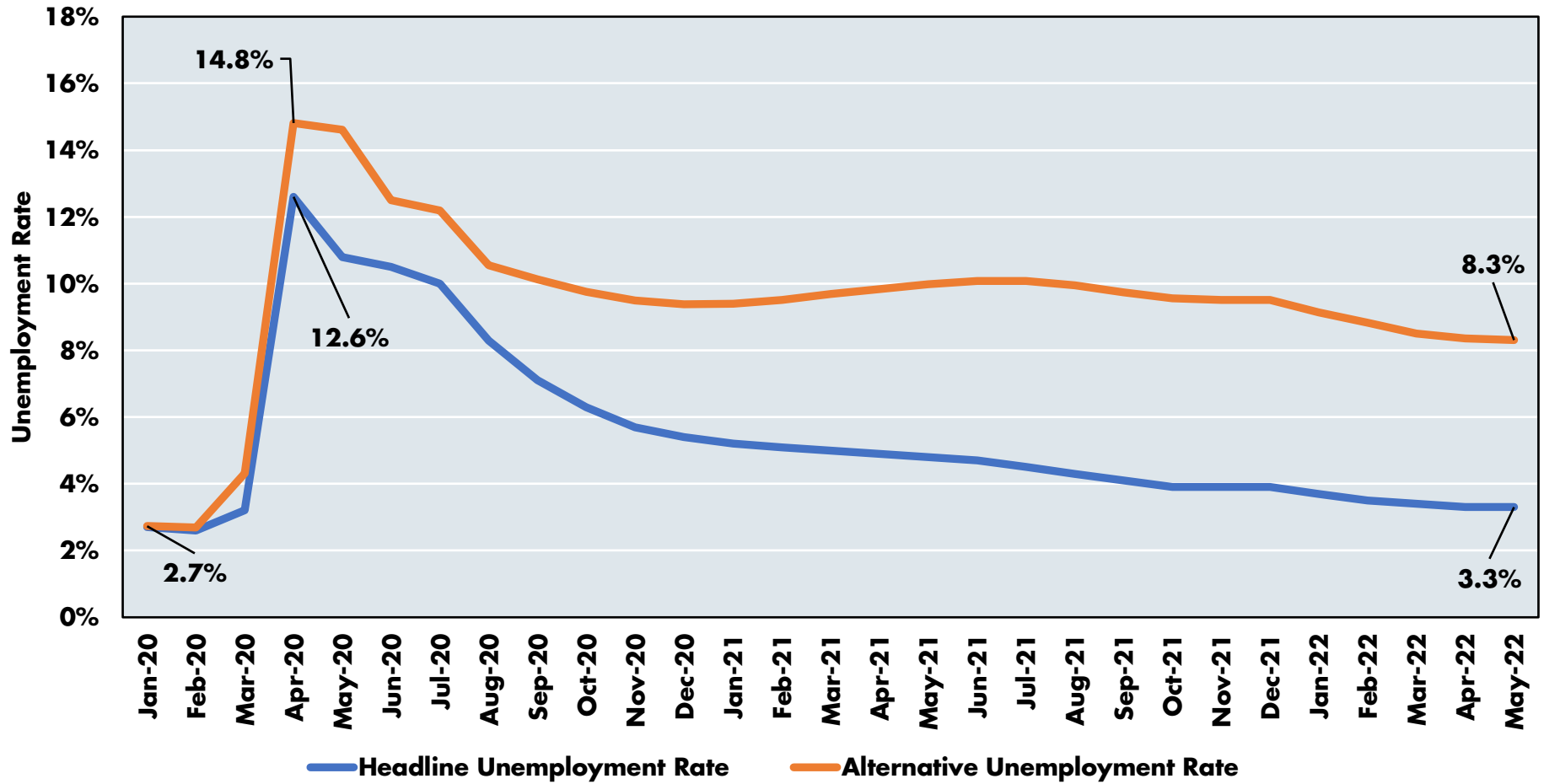
CIVILIAN LABOR FORCE AND INDIVIDUAL EMPLOYMENT:
HAMPTON ROADS, JANUARY 2019-MAY 2022



Sources: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are seasonally adjusted.

GRAPH 6

HEADLINE UNEMPLOYMENT RATE AND ALTERNATIVE UNEMPLOYMENT RATE
HAMPTON ROADS, JANUARY 2020-MAY 2022



Sources: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are seasonally adjusted.

Unemployment Claims In Hampton Roads

When discussing unemployment claims, it is important to make the distinction between initial and continued claims. Initial claims represent the number of people who have filed a request for unemployment benefits after separation from an employer. Continued claims, or what is known as insured unemployment, reflect those who have already filed their initial claim, had the claim accepted by the government and continue to file claims to receive benefits for the current week of unemployment. In other words, continued claims represent the number of insured unemployed people, while initial claims reflect the number of initial requests for unemployment benefits in a given week.¹¹

In 2007, before the full impact of the Great Recession was felt in Hampton Roads, an average of 2,733 initial unemployment claims were filed monthly (Graph 7). Even though the recession was officially over in 2009, average monthly initial unemployment claims continued to rise in the region, peaking at 8,257 a month in 2010. Initial claims declined and fell below the 2007 average in 2017, bottoming out at an average of 2,174 a month in 2019. The impact of the pandemic is clearly visible, with average monthly claims jumping 10-fold in 2020 to an average of 28,656 a month before falling to 13,672 in 2021 (which would have been, by itself, a historic level for average initial claims).

Graph 8 shows the rapid rise in monthly initial unemployment claims in Hampton Roads and the subsequent recovery. In February 2020, 1,961 initial claims were filed in the region. By April, 76,723 claims were filed in Hampton Roads, more in one month than in many of the previous years. As infections surged in December and January 2021, initial claims jumped, then rapidly declined into the early fall before increasing again as the summer travel season

¹¹ In the spring of 2020, Congress passed, and President Trump signed into law, the Pandemic Unemployment Assistance (PUA) and Pandemic Emergency Unemployment Compensation (PEUC) programs. The PUA program provided up to 79 weeks of unemployment benefits for the self-employed, freelancers and independent contractors who would not typically qualify for regular state unemployment benefits. The PEUC program provided an additional 13 weeks of unemployment benefits for those who exhausted their benefits. Authorization for these programs lapsed in September 2021. Data for these programs were only available at the federal and state level.

was over, and infections again increased in the region. In 2022, we have observed a continued decline in initial claims, reflecting an increasing demand for labor and a smaller pool from which employers can hire. Initial claims were essentially at pre-pandemic levels by the spring of 2022.

As the flow of newly unemployed into the unemployment system declined in 2022, it should be no surprise that the levels of continued claims declined as well. An individual receiving continued unemployed benefits remains in the labor force and must actively search for employment each week.¹² Continued unemployment claims data only became available in the spring of 2020 but provide a picture into the trajectory of the labor market in Hampton Roads.

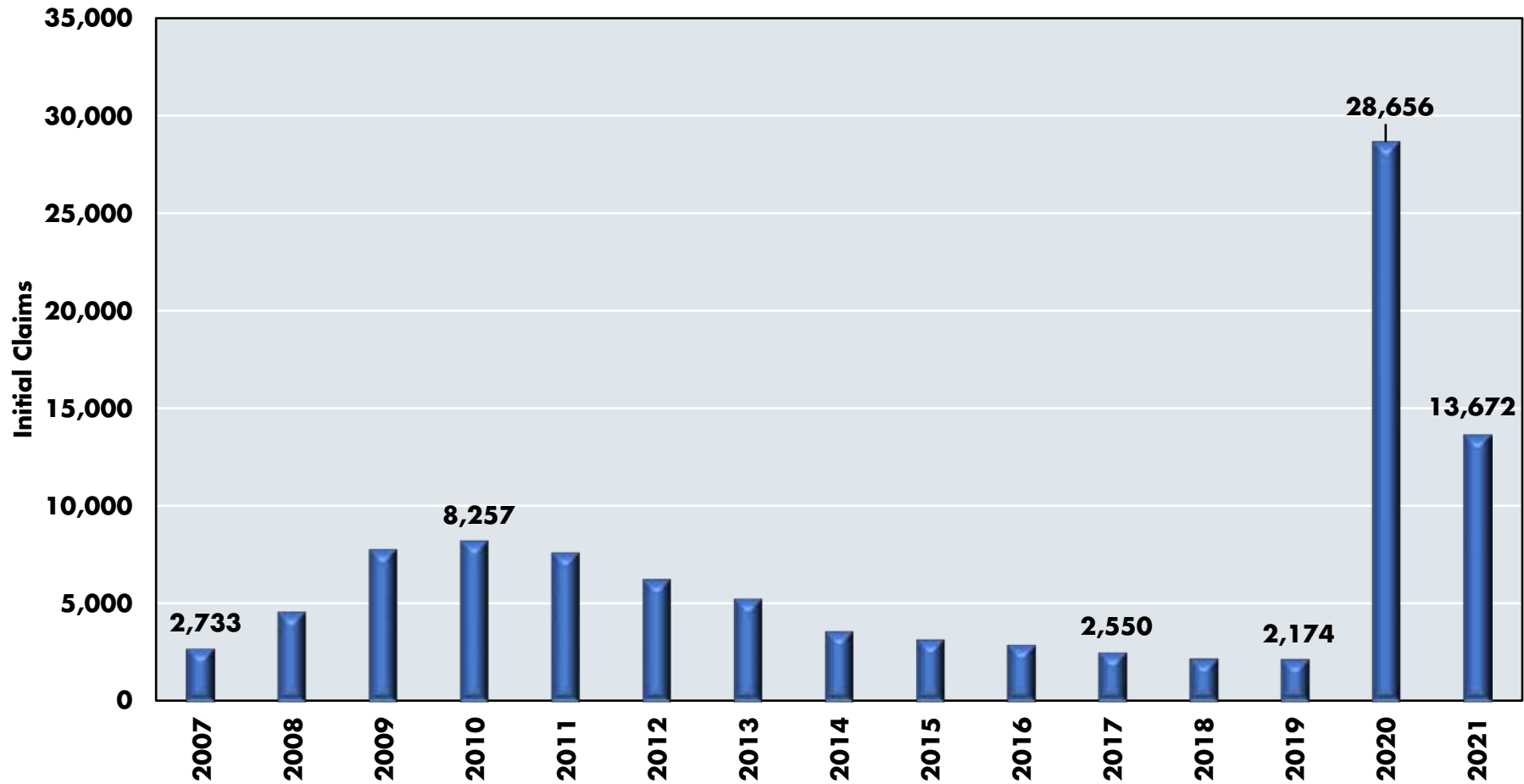
Graph 9 highlights the jump in continued claims from 4,315 for the week ending March 14, 2020, to 88,436 for the week ending May 16, 2020. At the peak, more than 1 in 10 workers in the region received unemployment benefits. As individuals returned to work, continued claims declined to 13,754 for the first week of January 2021. Claims continued to fall through most of 2021. In the first week of January 2022, there were 2,611 continued claims and less than 2,000 claims in the most recent data.

The levels of initial and continued unemployment claims suggest there is not much 'slack' in the Hampton Roads labor market among those willing and able to work. Transitional unemployment, that is, individuals moving from job to job, likely dominates the pool of available unemployed labor. Unless there is a surge of new residents into Hampton Roads, future increases in employment must be drawn from individuals currently outside the labor force. In other words, if there is 'slack' in labor markets, it exists in the form of individuals who are not participating in the labor force rather than individuals who are actively working or seeking employment. Even if labor force participation returns to pre-pandemic levels, the longer-term declines in labor force participation remain an issue of concern. In the meantime, employers will continue to compete to attract and retain talent among the existing pool of workers.

¹² In March 2020, Virginia Gov. Ralph Northam temporarily waived the requirement that unemployed individuals must actively search for work. This requirement came back into force on June 1, 2021. Virginians receiving unemployment benefits must apply for two or more jobs a week and report the details to the Virginia Employment Commission.

GRAPH 7

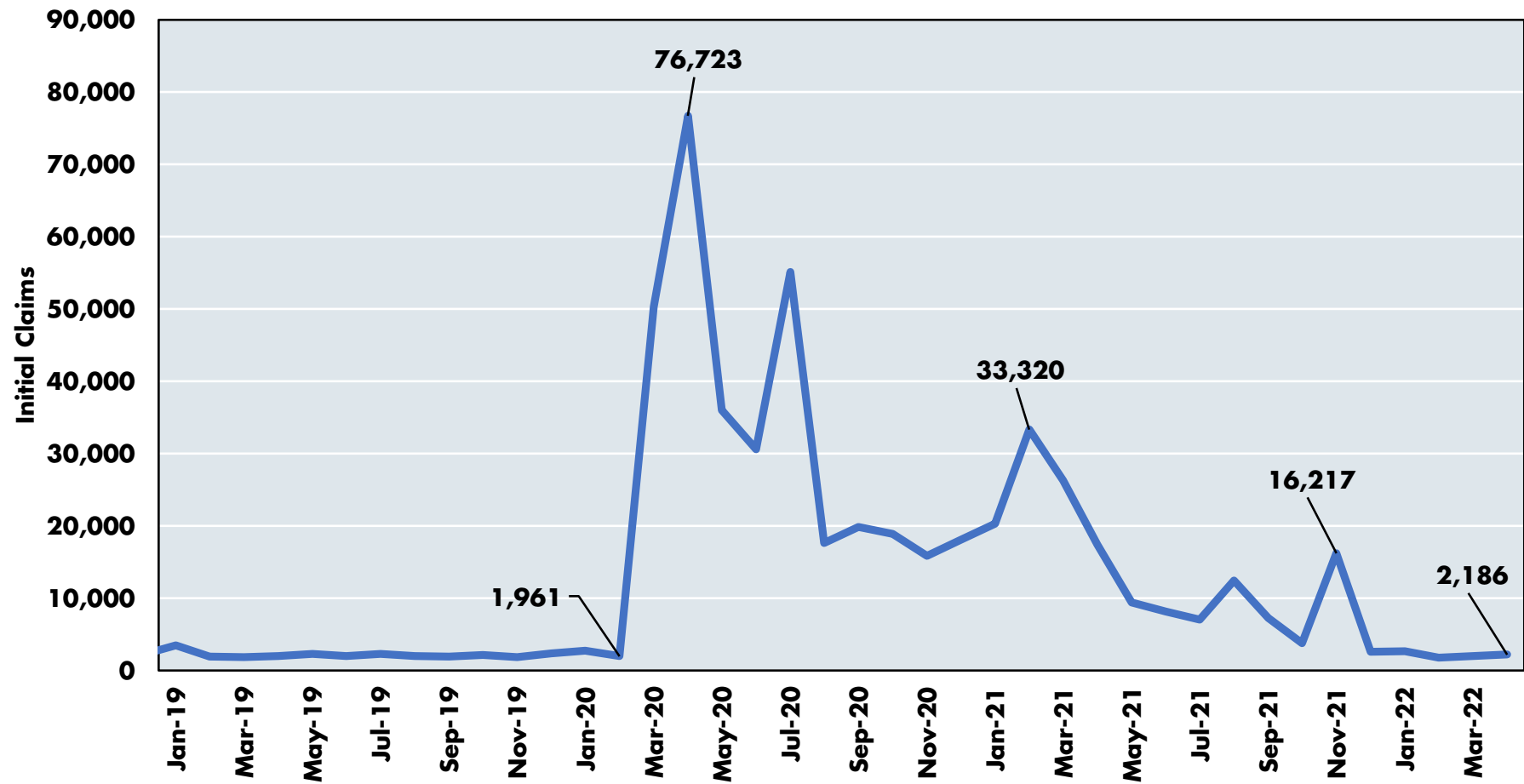
**AVERAGE MONTHLY INITIAL UNEMPLOYMENT CLAIMS:
HAMPTON ROADS, 2007-2021**



Sources: Virginia Employment Commission and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are not seasonally adjusted and do not include PUA and PEUC claims.

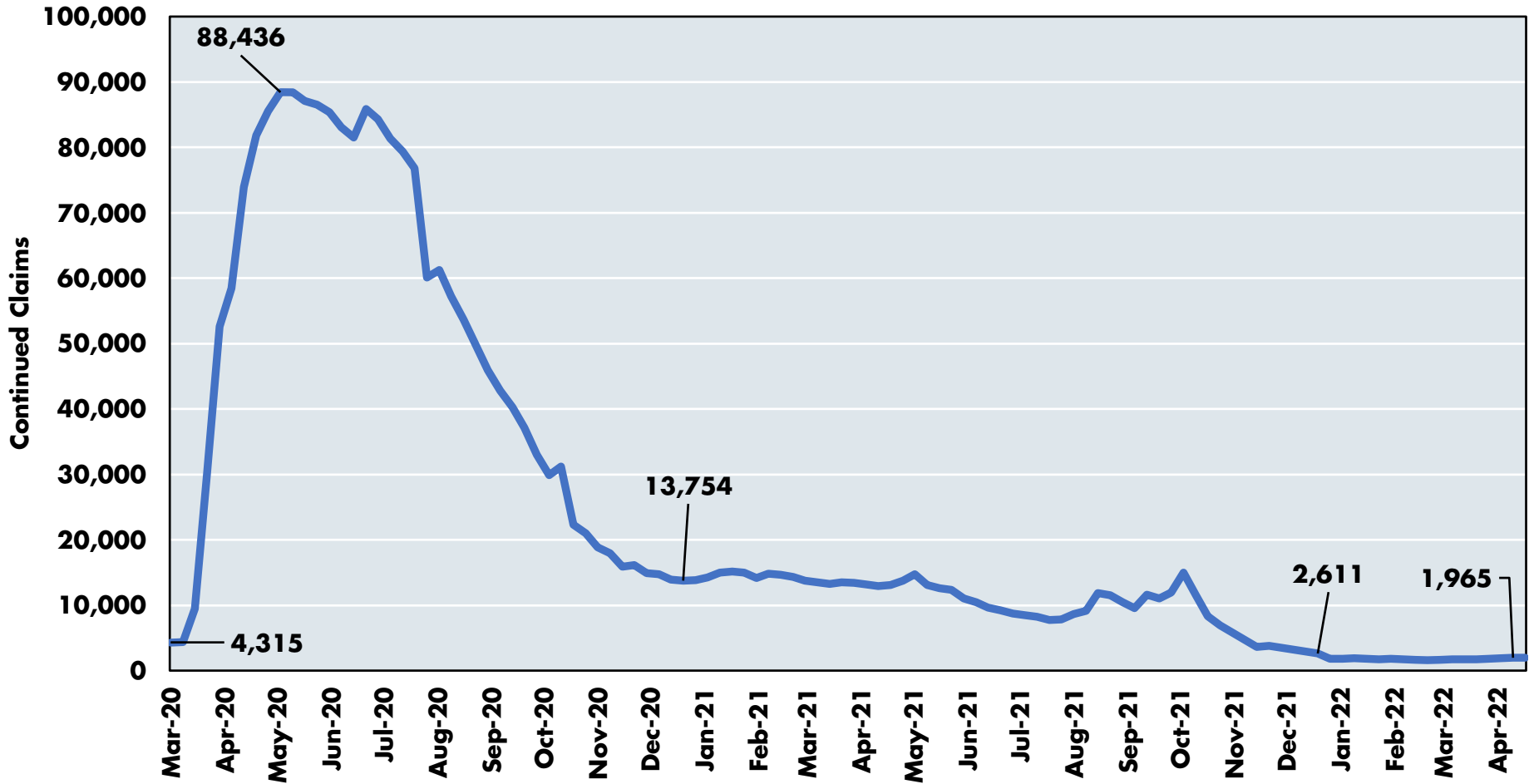
GRAPH 8

**MONTHLY INITIAL UNEMPLOYMENT CLAIMS:
HAMPTON ROADS, JANUARY 2019-APRIL 2022**



Sources: Virginia Employment Commission and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are not seasonally adjusted and do not include PUA and PEUC claims.

GRAPH 9
CONTINUED UNEMPLOYMENT CLAIMS:
HAMPTON ROADS,
WEEK ENDING MARCH 14, 2020-APRIL 30, 2022



Sources: Virginia Employment Commission and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are not seasonally adjusted and do not include PUA and PEUC claims.

Jobs in Hampton Roads

Prior to the onset of the pandemic, Hampton Roads lagged the Commonwealth and nation in job growth. From the trough in nonfarm payrolls (jobs) in February 2010 to February 2020, the number of jobs in Hampton Roads grew by 9.4% (Graph 10). Across Virginia, the number of jobs over the same period increased by 13.7% while there were 17.6% more jobs nationally. Proportionately, for every job created in Hampton Roads, almost two jobs were created nationally in the decade prior to the pandemic.

Even though job growth lagged in Hampton Roads, there were a record 803,300 jobs in the region in February 2020 (Graph 11). In the space of two months, however, not only did the 63,000 jobs gained over the previous decade disappear, another 38,500 were swept away in the pandemic shock. The scale of the decline in nonfarm payrolls was truly staggering. In about eight weeks, employers shed 1 out of every 8 jobs in Hampton Roads.

Fortunately, many of these job losses were short-lived, with 50,000 jobs returning by the summer of 2020. By the end of 2020, Hampton Roads remained 40,200 jobs below the pre-pandemic peak. There was modest job growth through 2021 so that by December 2021, the region had 29,800 fewer jobs than February 2020. The modest gains in jobs continued in the first half of 2022, but the recovery was not complete. By the summer of 2022, there were almost 25,000 fewer jobs in the region than prior to the onset of COVID-19.

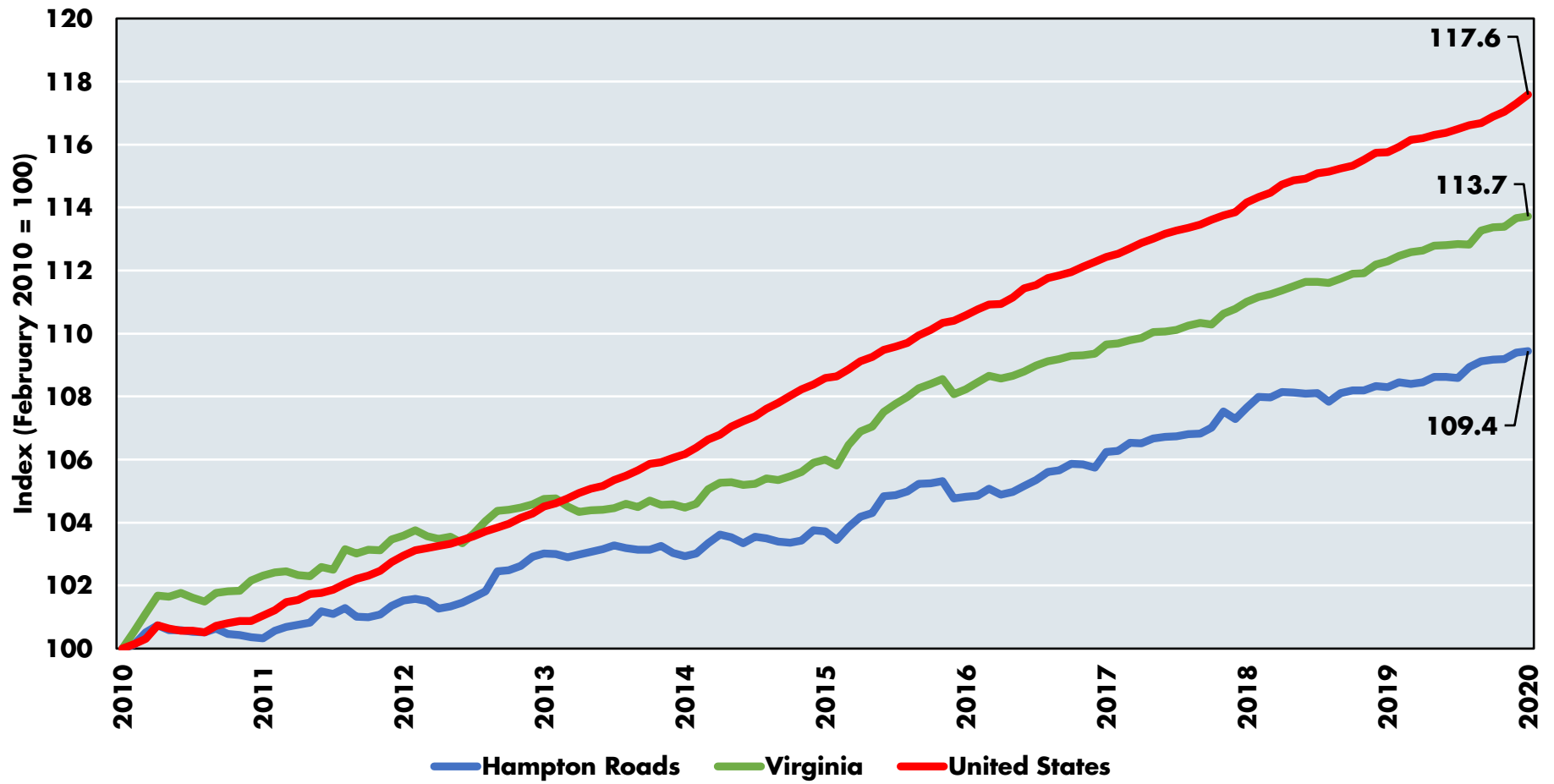
Graph 12 highlights the recovery in jobs from the depths of the economic shock from April 2020 to May 2022. In the first six months of the recovery, jobs grew in Hampton Roads at almost the same pace as the United States. Hampton Roads actually regained jobs faster than Virginia through the summer of 2021, at which point job growth continued to slow in the region. By the end of Spring 2022, the nation had almost fully recovered the jobs lost during the pandemic while Virginia was on track to completely recover by

the fall of 2022. At Hampton Roads' current pace of job growth, it may take another 18 to 24 months to recover all the lost jobs. If the job growth slows due to inflation, supply-chain shocks, or another unexpected geopolitical event, then it may be years before Hampton Roads revisits the pre-pandemic peak in nonfarm payrolls.

When we compare Hampton Roads to its peer and aspirant metropolitan regions, the tale of regional economic underperformance becomes stark (Graph 13). From February 2020 to May 2022, Hampton Roads ranks last in terms of job growth among its peers. Several metro areas have not only recovered all the jobs lost in 2020, but they are also in the midst of a new economic expansion. The Raleigh metro area had almost 5% more jobs in May 2022 than in February 2020. The Durham-Chapel Hill and Nashville regions had 4% more jobs than the pre-pandemic peak while Charleston (1.0%), Charlotte (2.0%), and Jacksonville (3.6%) were all exhibiting signs of economic growth. The performance of Hampton Roads (-3.0%), Richmond (-2.5%), and Northern Virginia (-1.0%), the three metro areas that account for more than 7 in 10 jobs in Virginia, document Virginia's lagging economic performance in terms of job growth relative to that of neighboring states and the nation.

GRAPH 10

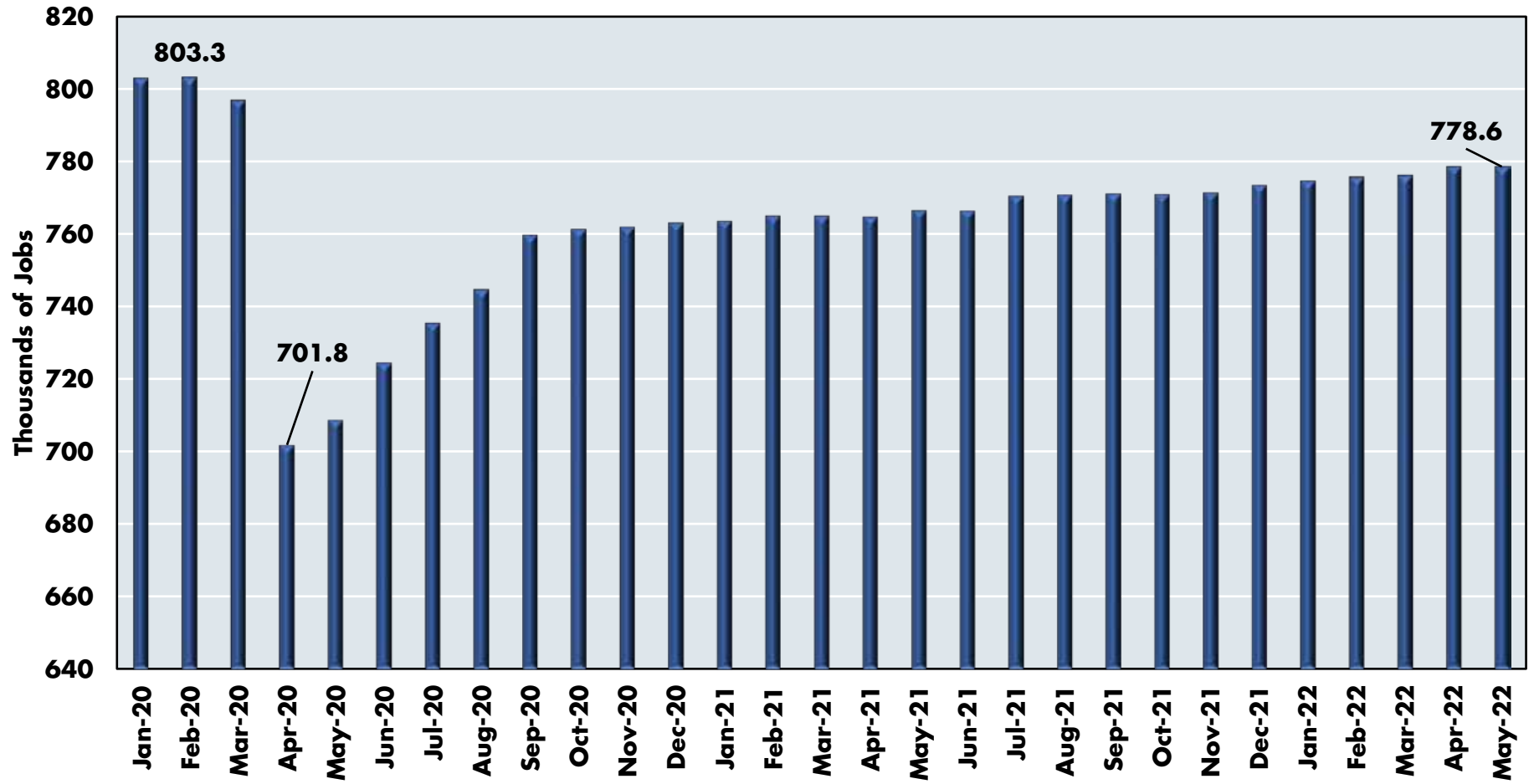
INDEX OF NONFARM PAYROLLS (JOBS)
UNITED STATES, VIRGINIA, HAMPTON ROADS,
FEBRUARY 2010–FEBRUARY 2020



Source: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. The index measures the change in nonfarm payrolls (jobs) relative to February 2010. An index value of 100 means that the number of jobs is equal to that observed in February 2010. Seasonally adjusted data.

GRAPH 11

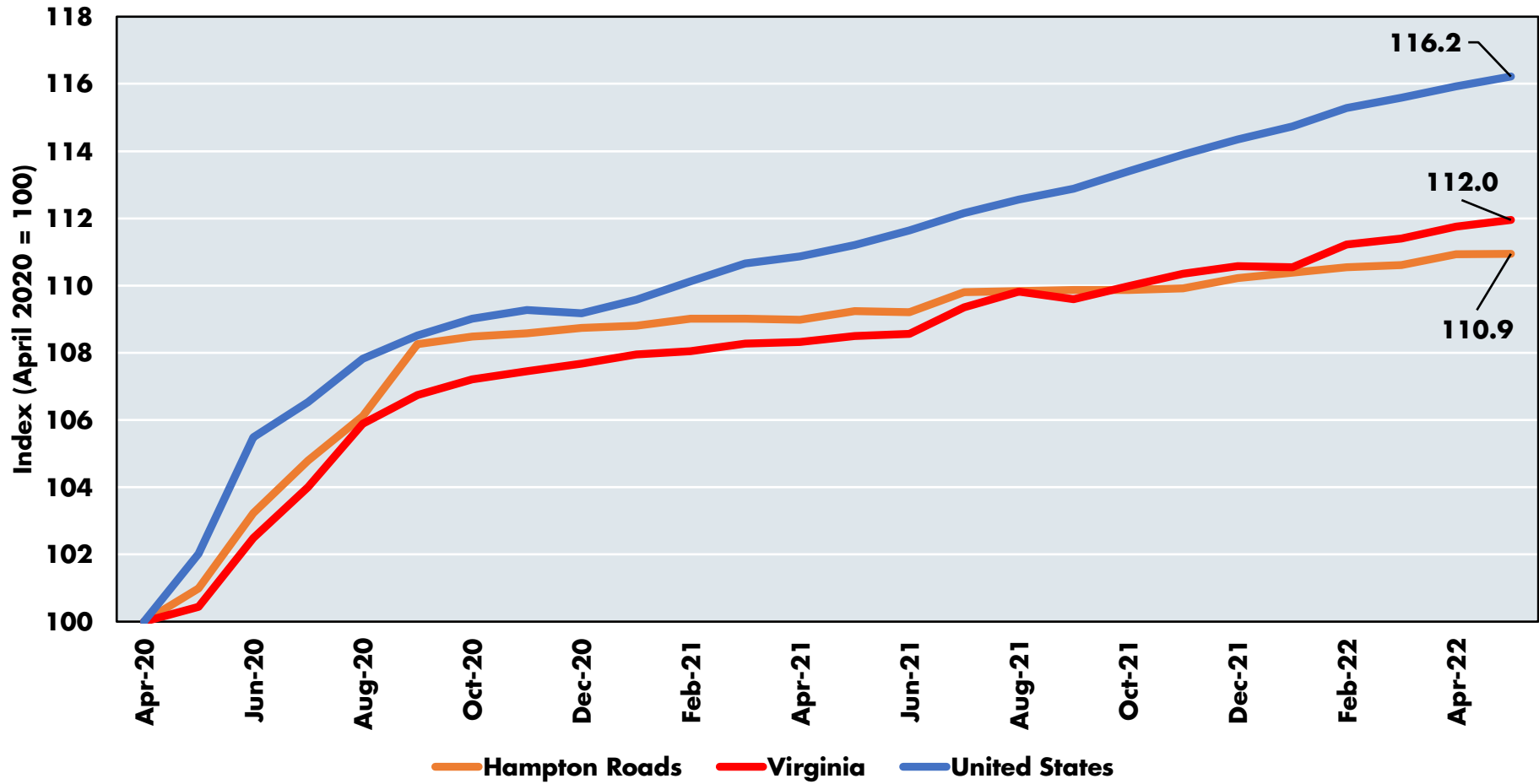
NONFARM PAYROLLS (JOBS) IN HAMPTON ROADS
JANUARY 2020-MAY 2022



Sources: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are seasonally adjusted.

GRAPH 12

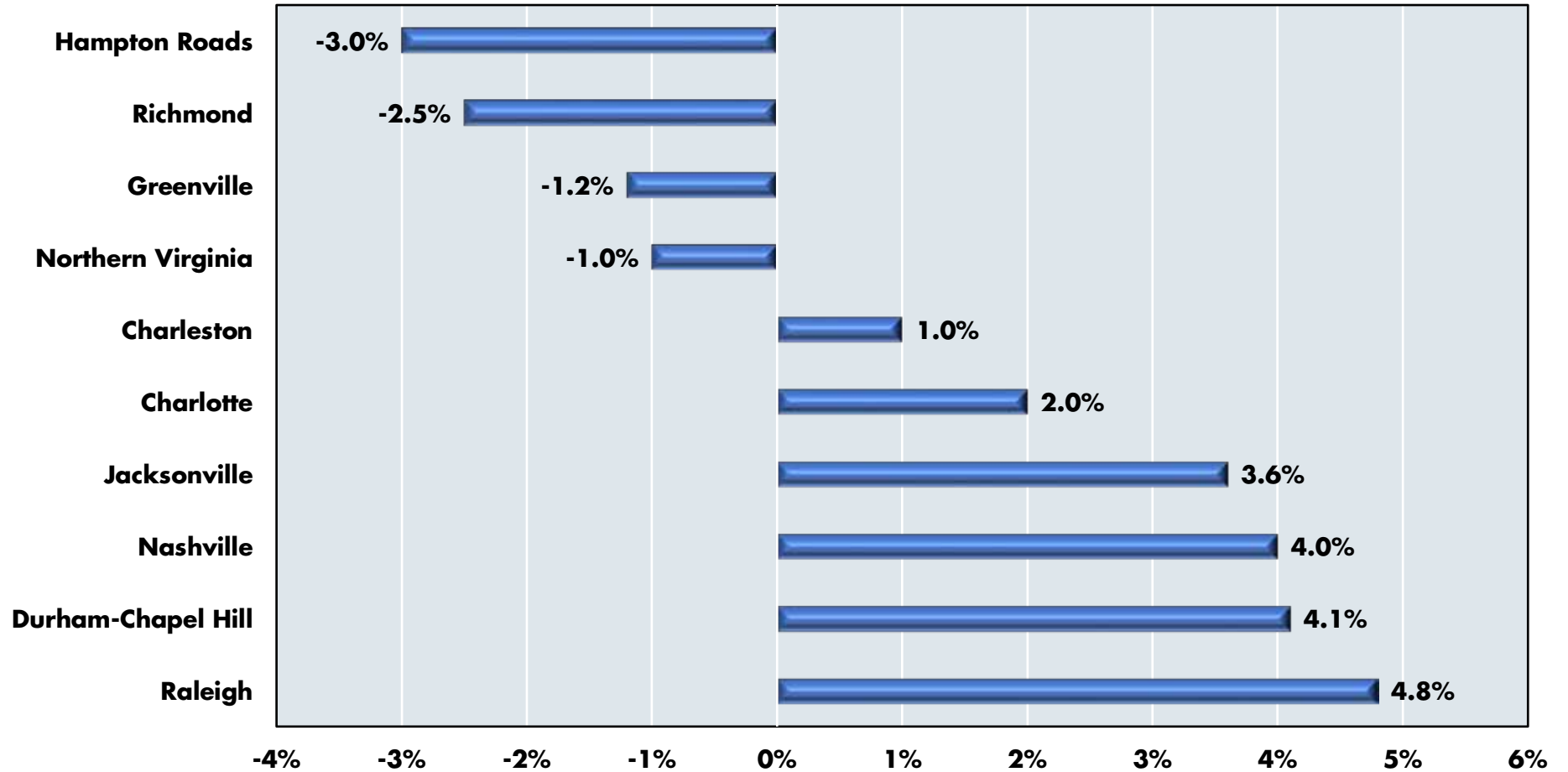
CUMULATIVE GROWTH IN NONFARM PAYROLLS (JOBS):
UNITED STATES, VIRGINIA, AND HAMPTON ROADS
APRIL 2020-MAY 2022



Sources: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. The index measures the change in nonfarm payrolls (jobs) relative to April 2020. An index value of 100 means that the number of jobs is equal to that observed in April 2020. Data are seasonally adjusted.

GRAPH 13

**CUMULATIVE GROWTH IN NONFARM PAYROLLS (JOBS):
SELECTED METROPOLITAN STATISTICAL AREAS, FEBRUARY 2020-MAY 2022**



Sources: U.S. Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are seasonally adjusted.

Where are the Job Gains and Losses in Hampton Roads?

Job losses and gains have not been spread evenly across sectors in Hampton Roads. Graph 14 compares the change in jobs from May 2019 to May 2022; we observe a mild expansion in two sectors: transportation, warehousing, and utilities; and mining, logging, and construction. Given the increased levels of activity through the Port of Virginia and increased demand for housing, it should be no surprise that these sectors have outperformed over this period. Several other sectors appear to be on the cusp of an expansion, presenting the possibility that Hampton Roads may recover all its lost jobs over the next 18 to 24 months.

How the story of recovery has changed over the last 12 months is illuminating. In 2020, the largest job losses were concentrated in three sectors: leisure and hospitality, education and health services, and local government. Leisure and hospitality jobs were down due to the declines in travel, tourism, and business-related travel. Education and health service jobs were down due to the impact of COVID-19 on elective procedures in the health field and school closures. Local government jobs were cut in anticipation of a downturn in tax revenues and a decline in the demand for some services (public libraries and recreation services, for example) due to social distancing measures.

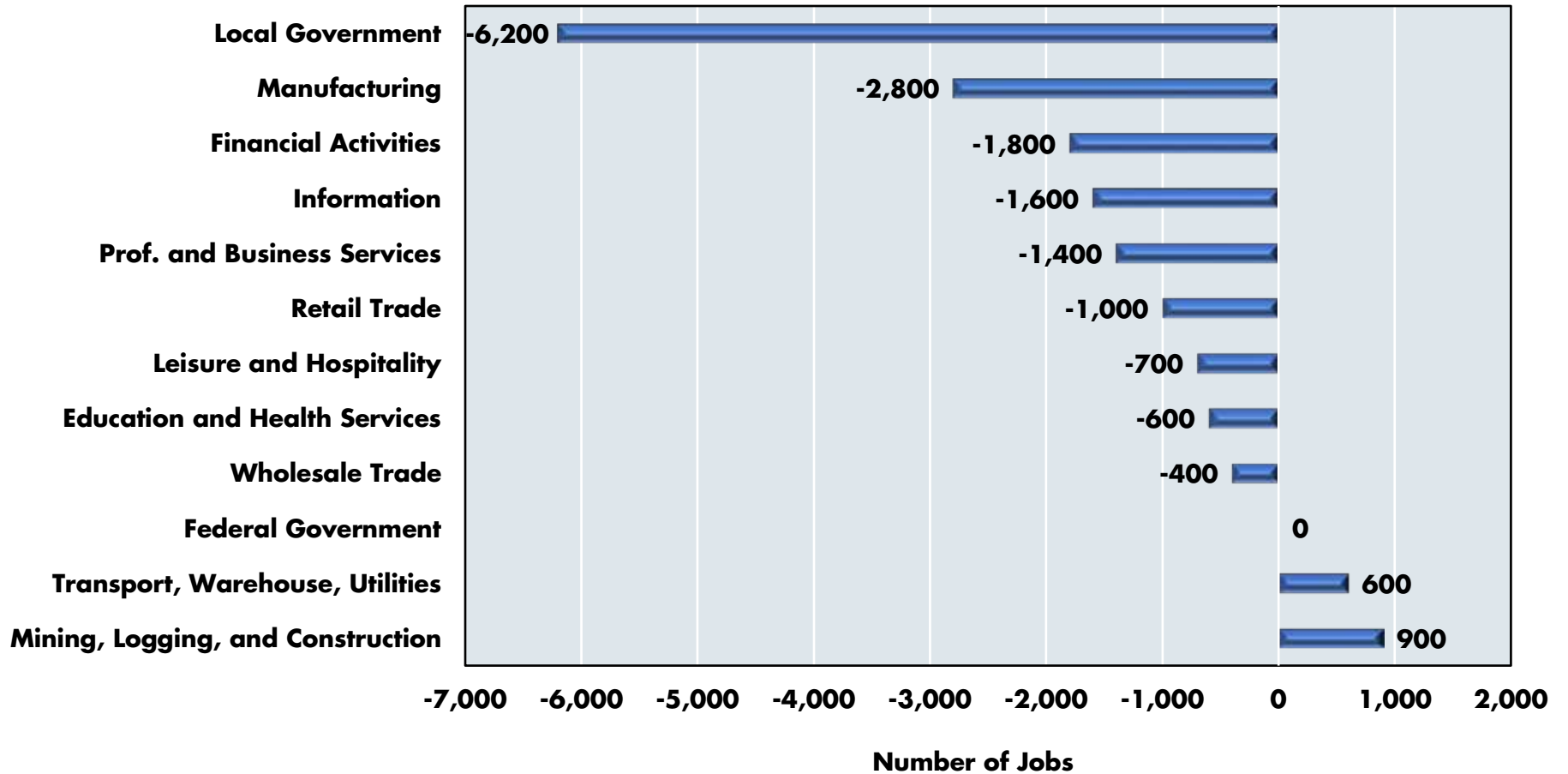
Times, as the saying goes, have changed for two of the three sectors. The hotel industry in Hampton Roads has outperformed the state and nation. The complete recovery of leisure and hospitality jobs was not due to a lack of demand but constrained supply. Job quits and a shrinking pool of available labor hampered employers' ability to fill open positions. The education and health services sector had also almost completely recovered by the spring of 2022, but the number of teachers quitting may limit the ability of this sector to expand in the fall of 2022.

Local governments in our region have yet to expand the number of jobs back to 2019 levels. The reductions in revenues failed to materialize at the state level, and increasing property valuations bolstered local property taxes in many cities. Local governments, however, have not been able to nimbly respond to inflation and its impact on wage demands. As with other employers, local governments are competing in a shrinking labor pool and several jobs were left unfulfilled. Until more residents return to the labor market, it is unlikely that a full recovery will occur for the local government sector.



GRAPH 14

**CHANGE IN NONFARM PAYROLLS: HAMPTON ROADS
MAY 2019–MAY 2022**



Sources: U.S. Bureau of Labor Statistics, Federal Reserve Bank of St. Louis, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Nonseasonally adjusted data.

The Port: Records Set (Again)

The Port of Virginia continues to be a harbor of good news for Hampton Roads amid economic turmoil. The port's turnaround over the last decade is well documented and demonstrates the continued wisdom of making targeted investments to increase its capacity and efficiency. While other ports struggled to move cargo traffic over the last 12 months, the Port of Virginia increased traffic without noticeable delays. Market share remains a concern, however, this may be a function of the lackluster performance of the regional economy rather than the port's lack of action.

Graph 15 displays the total number of twenty-foot equivalent units (TEUs) moved through the Port of Virginia from January 2019 to June 2022. Empty TEUs are represented by the distance between the total and loaded TEU lines. The number of loaded TEUs dipped to 159,829 in May 2020 but exceeded pre-pandemic levels by the fall of the same year. The number of total and loaded TEUs passing through the port continued to climb, setting and breaking records in the spring and fall of 2021. The good news continued in 2022, with record levels in May for total and loaded TEUs. The demand for TEUs worldwide was so strong that the port set a record for moving empty TEUs in the spring of 2022. Empty TEUs accumulate when imports are greater than exports and are moved to other ports only when a financial incentive exists to do so.

Graph 16 dives into the composition of loaded TEUs from January 2019 to June 2022 to ask what was driving their generous increases. Not surprisingly, the pandemic surge in consumer demand led to higher levels of imports nationally and through the Port of Virginia. TEUs carrying imports set records in late 2020, broke those records in 2021, and set a new bar in 2022. The story is different for exports. The level of TEUs carrying exports fell in early 2020 and only recovered in spring 2021 to pre-pandemic levels. However, these gains were short lived as the number of loaded exports TEUs fell in the summer of 2021.

Graph 17 displays the share of total loaded TEUs for four major East Coast ports from 2006 through the spring of 2022. Two phenomena are readily observable: the rise of the Port of Savannah and the relative decline of the Port of New York/New Jersey through 2020. The fortunes of the two ports appeared to change in 2021, with the Port of New York/New Jersey gaining market share at the expense of the Port of Savannah.

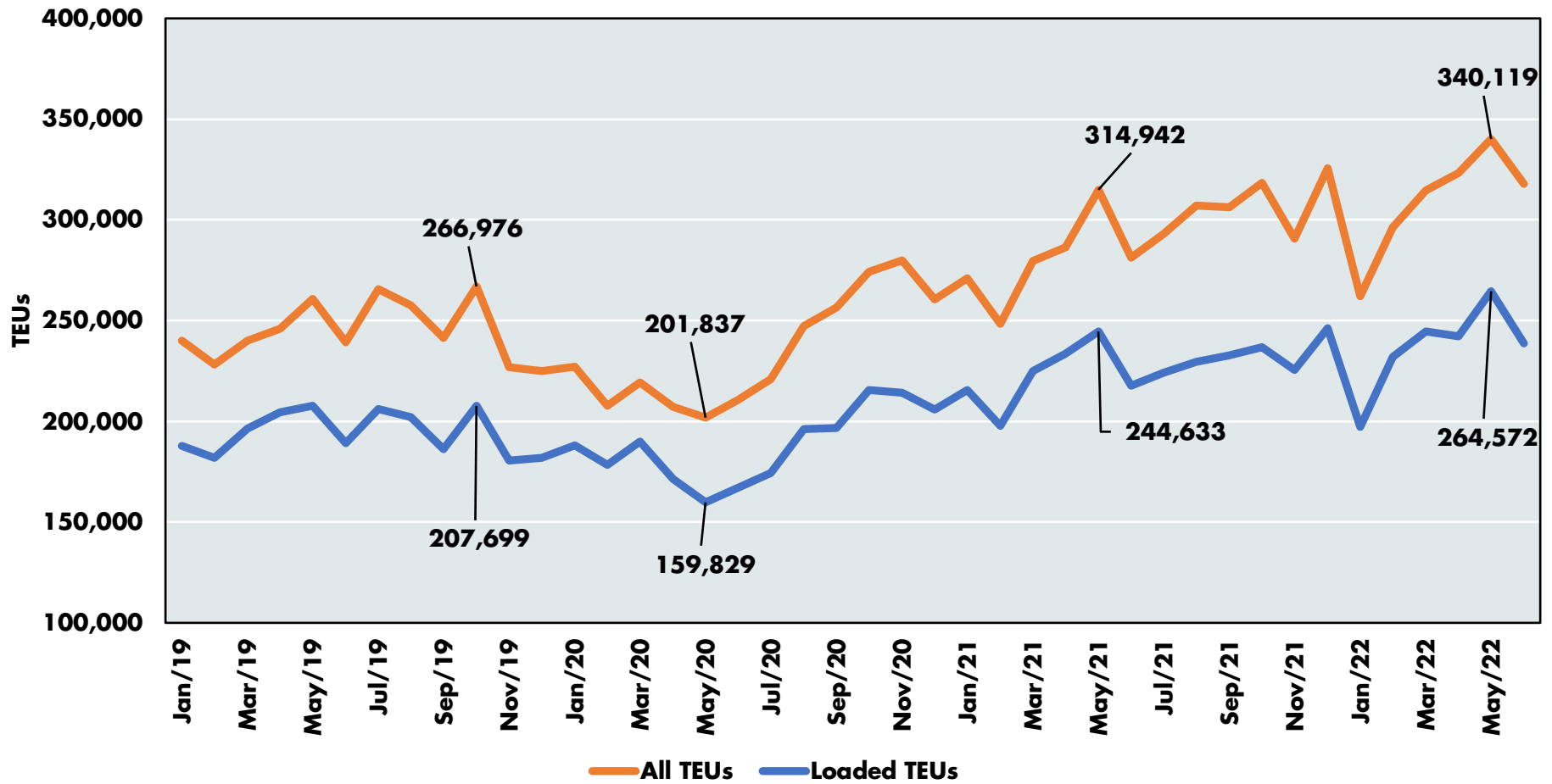
As for the Port of Virginia, its market share in 2022 is about the same as it has been for the past decade. At times, the port's market share has increased or decreased, but these gains and losses have not persisted over time. Yes, the total amount of cargo moving through the Port of Virginia has increased, especially in the last 24 months, but it has also increased through other ports as well. The continuing challenge for the Port of Virginia is to gain market share and, to its credit, it has continued to make improvements and argue the case for infrastructure investments. It should continue to do so in the coming years.

We would be remiss if we did not note that the Port of Virginia is part of a larger economic system. The Port of Virginia cannot control economic conditions in Hampton Roads, Virginia, or the neighboring states. Economic development in Hampton Roads, especially ready-made value-added manufacturing sites, is in the interest of the port. Import and re-export is a tried-and-true strategy, but the port needs action beyond its domain for this to come to fruition. We laud the port's gains but also caution that other ports and states are not standing still. Regional and state action is needed to shift more of the port's cargo from "pass through" goods to goods that are used in value-added manufacturing and then exported to other regions, states, and nations.



GRAPH 15

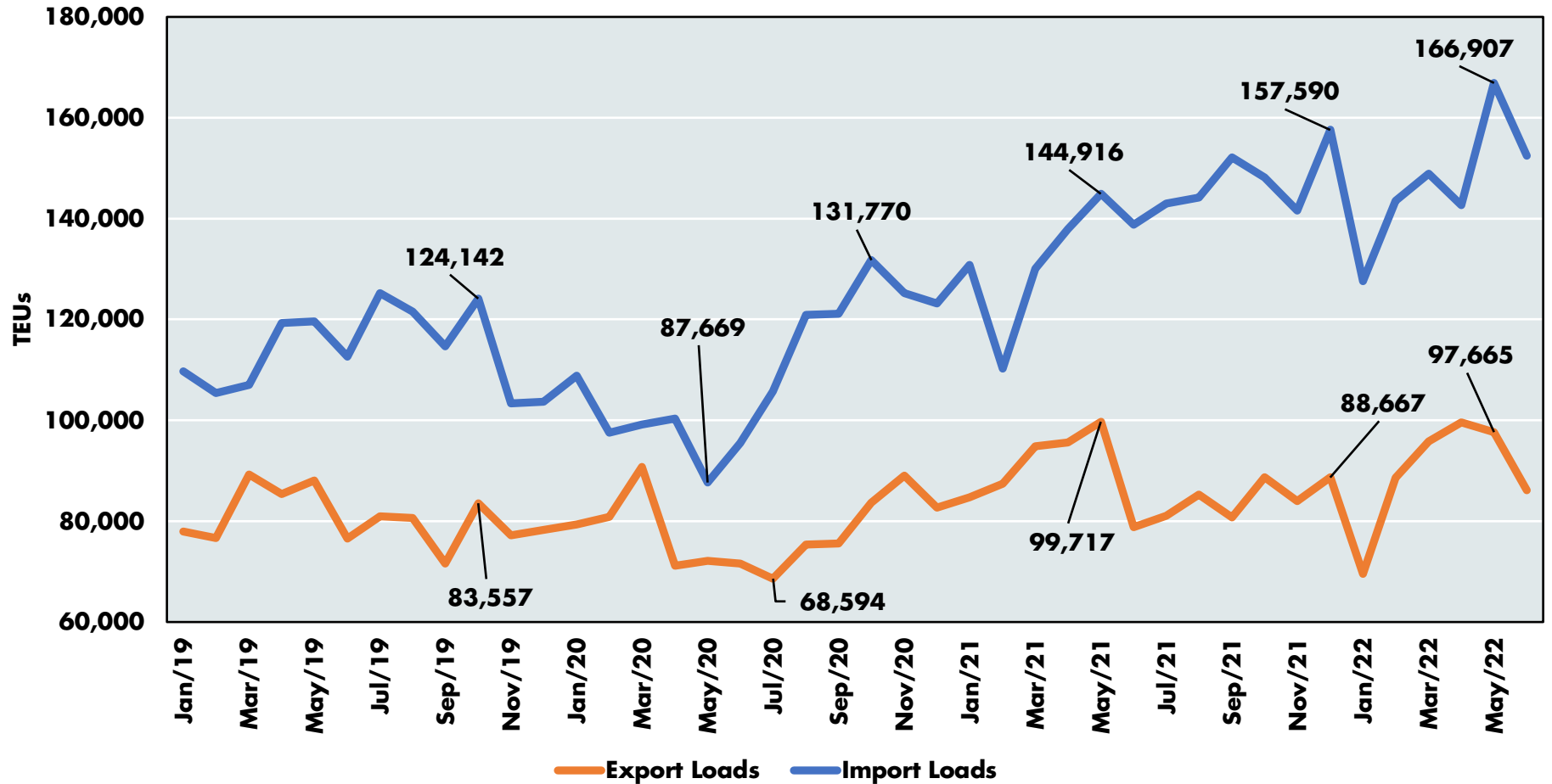
**TOTAL AND LOADED TWENTY-FOOT EQUIVALENT UNITS (TEUS):
PORT OF VIRGINIA, JANUARY 2019-JUNE 2022**



Sources: Virginia Port Authority and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are not seasonally adjusted.

GRAPH 16

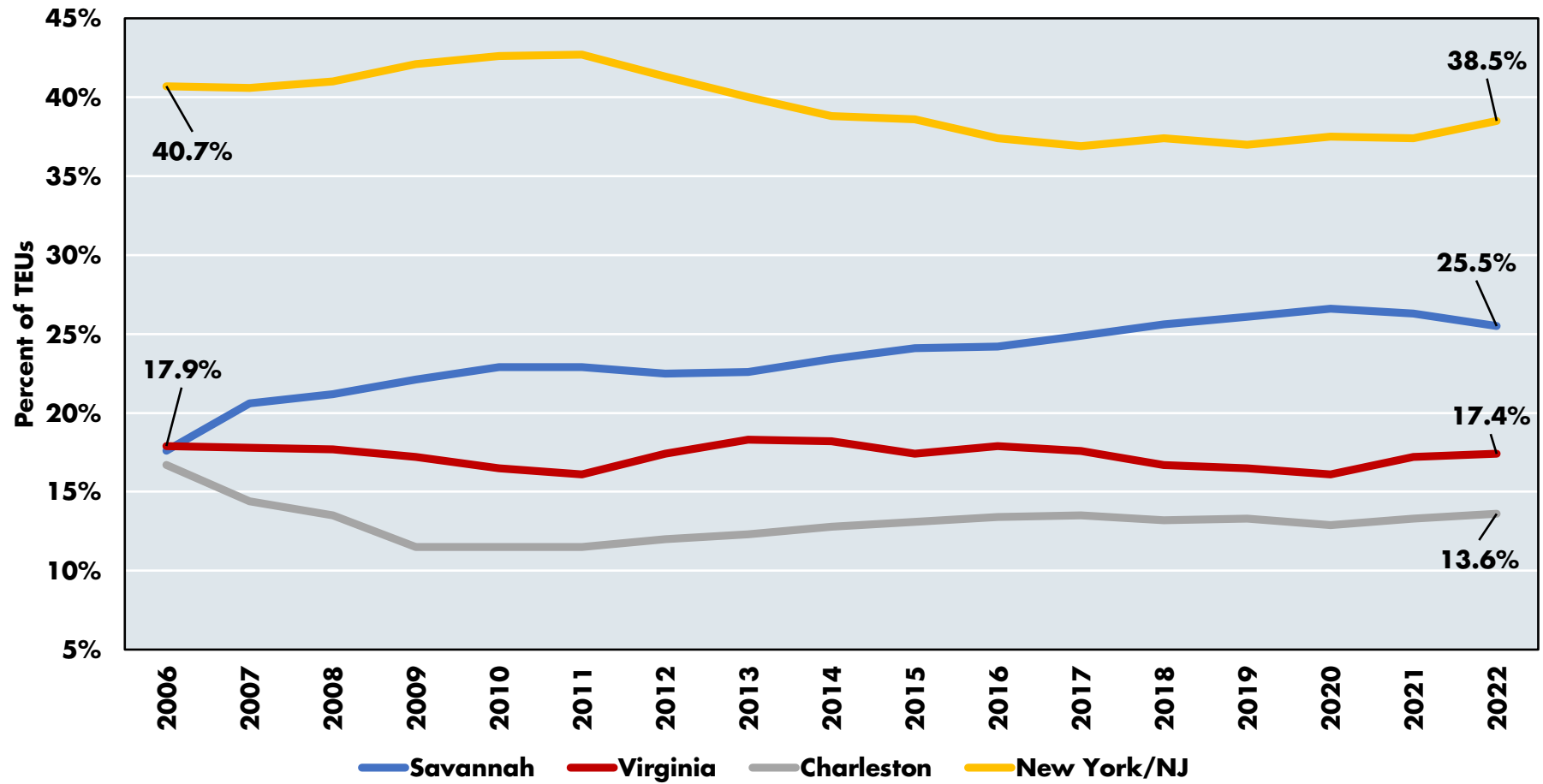
**EXPORT AND IMPORT LOADED TWENTY-FOOT EQUIVALENT UNITS (TEUS):
PORT OF VIRGINIA, JANUARY 2019-JUNE 2022**



Sources: Virginia Port Authority and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are not seasonally adjusted.

GRAPH 17

SHARE OF TOTAL LOADED TEUS FOR SELECTED EAST COAST PORTS,
2006-2022*



Sources: American Association of Port Authorities, port websites and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Market shares are based on TEUs for Baltimore, Boston, Charleston, Virginia, New York/ New Jersey and Savannah. *Data for 2022 are through May 2022.

Good News for Defense Spending: Can It Last?

To say that Department of Defense (DoD) spending is one of the pillars of the Hampton Roads economy is an understatement of the importance of DoD spending to the regional economy. Direct DoD spending in the region likely exceeded \$24 billion in 2021 and is projected to top \$25 billion in 2022 (Graph 18). When we account for the ripple effects of direct DoD spending on the regional economy, we estimate that 4 out of every 10 dollars of economic activity is the result of DoD spending in the region. DoD spending is the “long pole” in the tent around which other parts of the region revolve.

In the short term, we expect that DoD spending will continue to increase. In FY 2021, DoD’s base budget was \$703.7 billion, increasing to \$742.3 billion in FY 2022 (Graph 19). When one includes supplemental appropriations for Operation Allies Welcome (the DoD response to the Afghanistan government’s collapse and the subsequent withdrawal of U.S. forces) and assistance to Ukraine, the enacted DoD budget in FY 2022 was \$756.6 billion. For FY 2023, President Biden proposed to increase the DoD base budget to \$773 billion, a request that authorizers and appropriators in Congress have viewed as too low relative to the national security needs of the nation. In all likelihood, the DoD base budget will exceed \$800 billion in nominal dollars in FY 2023.

While the DoD base budget is increasing in nominal dollars, inflation will erode these gains by reducing the purchasing power of DoD dollars. In Graph 20, we compare the DoD base budget projections President Biden submitted to Congress with the same projections adjusted for the impact of inflation. In one scenario, we use the inflation estimates contained in the presidential budget submission. In the other scenario, we use more current data on inflation and assume that inflation will take time to moderate to pre-pandemic levels.

Our analysis reveals that, even if one uses the optimistic assumptions contained in the President’s budget, DoD base spending will decrease in real terms over the coming years. Using a more realistic set of assumptions on the rate of inflation yields the startling realization: Inflation will erode DoD purchasing power by billions of dollars by FY 2027. The impact of inflation on the DoD will be significant; it will not be able to sustain the current pace of operations, maintenance, and investments. Unless Congress increases the base budget at the rate of inflation, the DoD will have to cut personnel, weapons systems, and investments in future systems. As this happens, the flow of DoD funds into Hampton Roads will decline, first in real terms, and subsequently even in nominal dollars.

What is missing here is a discussion of the size of the U.S. Navy in terms of the number of ships. It continues to decline, and no projected budget would reverse this. This bodes badly both for ship construction and ship repair. Building numerous smaller ships would make strategic and economic sense, but it could devastate our region.

Even while the purchasing power of the DoD is being undermined by inflation, the federal government continues to spend more money than it brings in. The last federal government surplus in FY 2001 is a distant memory (Graph 21). Budget discipline has waned as Congress and successive presidents have vacillated between increasing expenditures and reducing tax rates. The structural imbalance between revenues and expenditures only increased after the passage of the Tax Cuts and Jobs Act of 2017 and the abandonment of discretionary spending cuts. The fiscal response to the COVID-19 pandemic pushed the annual deficit in FY 2020 to more than \$3 trillion and to \$2.75 trillion in FY 2021. While the federal deficit is projected to be “only” \$1.03 trillion in FY 2022, it would be malpractice not to recognize that this would be largest deficit in a non-recessionary period in the last 50-plus years. Even the President’s FY 2023 budget submission recognizes that deficits will only increase over the remainder of the decade.

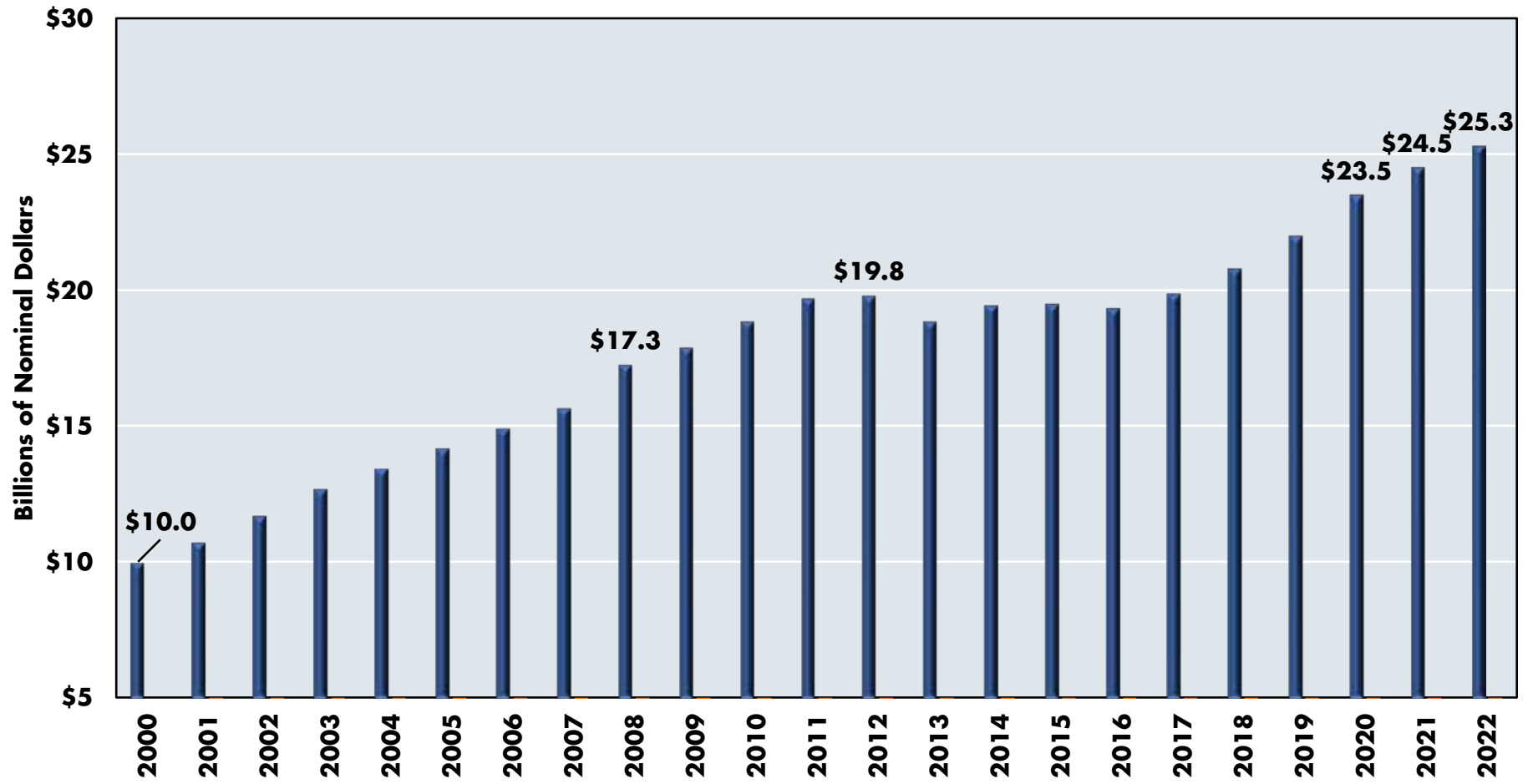
In 1946, in the aftermath of World War II, the public held \$2.7 trillion in FY 2021 dollars of federal debt or 106.1% of GDP. In 1980, the federal debt held by the public was \$2.0 trillion or 18.4% of GDP. Publicly held federal debt would steadily increase to \$17.5 trillion or 79.4% of GDP in FY 2019. In the aftermath of the fiscal response to the pandemic, federal debt is projected to reach \$23.9 trillion in FY 2023 and will likely top \$30.0 trillion in FY 2030. Simply put, the federal government's debt held by the public will continue to exceed annual economic activity in the nation for the foreseeable future. While some economists believed that we had moved past inflation and the federal government could merely print more money to fund the expansion of social programs, 2022 has (hopefully) put these appealing but fanciful theories to rest.

The future does not look bright for increases in real DoD spending. Inflation will continue to erode DoD's purchasing power. Interest costs are already the fastest-growing part of the federal budget, and interest rates increases will raise the cost of borrowing for the federal government. At some point, whether by choice or by financial crisis, Congress will have to raise taxes and restrain expenditures. When it does so, the DoD, as the largest discretionary program in the federal government, will be squarely in the crosshairs.



GRAPH 18

**ESTIMATED DIRECT DEPARTMENT OF DEFENSE SPENDING IN HAMPTON ROADS,
2000-2022**



Sources: Department of Defense and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Includes federal civilian and military personnel and procurement. Data for 2020, 2021, and 2022 are estimates. Last updated on Dec. 19, 2020. Procurement data updated on January 5, 2022.

GRAPH 19

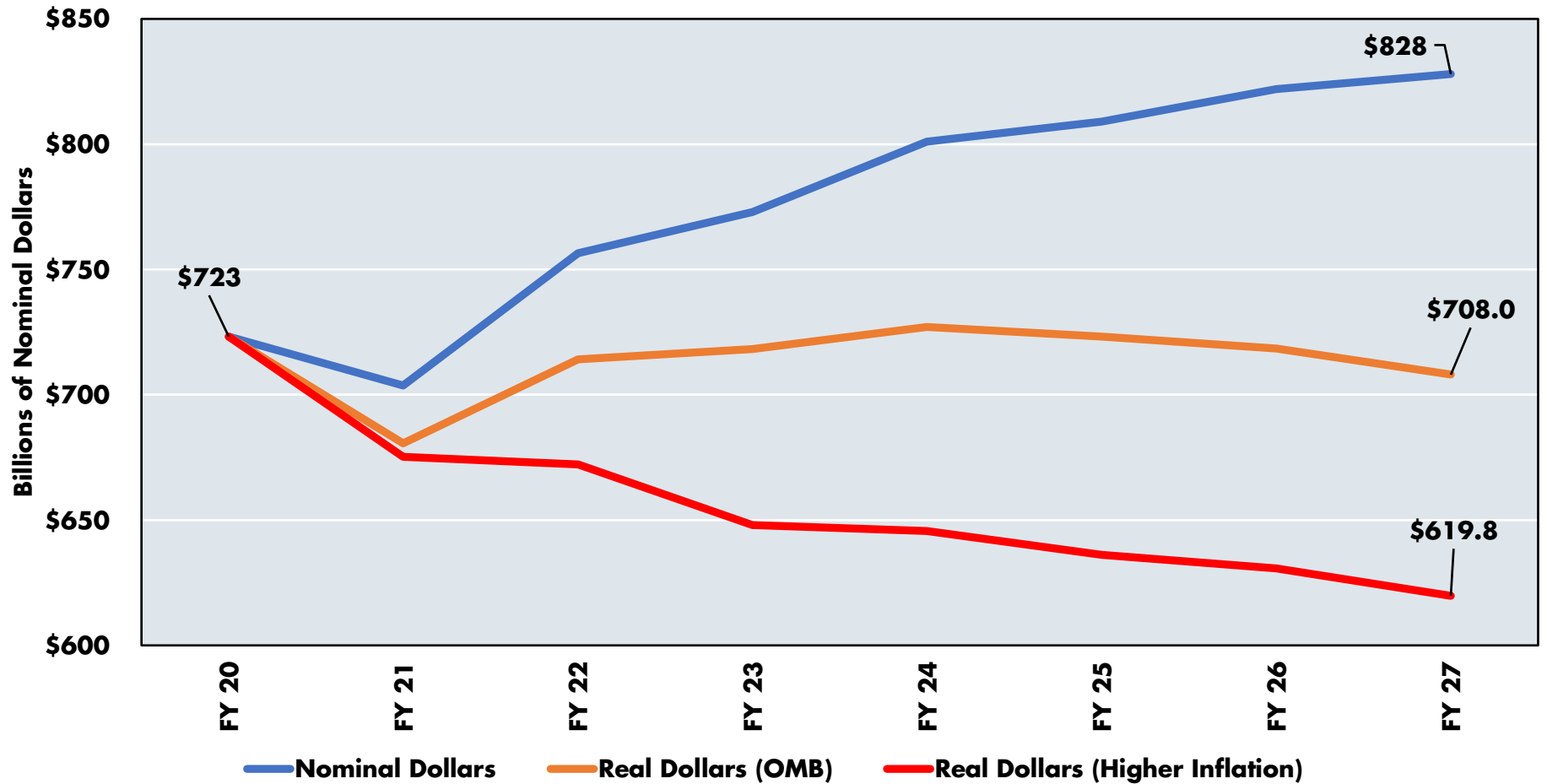
DEPARTMENT OF DEFENSE DISCRETIONARY BUDGET AUTHORITY,
FISCAL YEAR 2010-2027



Sources: Dragas Center for Economic Analysis and Policy, Old Dominion University; Office of the Secretary of Defense (Comptroller) Department of Defense National Defense Budget Estimations for FY 2022 and Defense Budget Materials – FY 2023. The FY 2022 budget presentation includes overseas contingency operations (OCO) in the DoD base budget. For backwards comparison, we present the DoD base as the sum of base funding and OCO funding. Includes emergency budget authority.

GRAPH 20

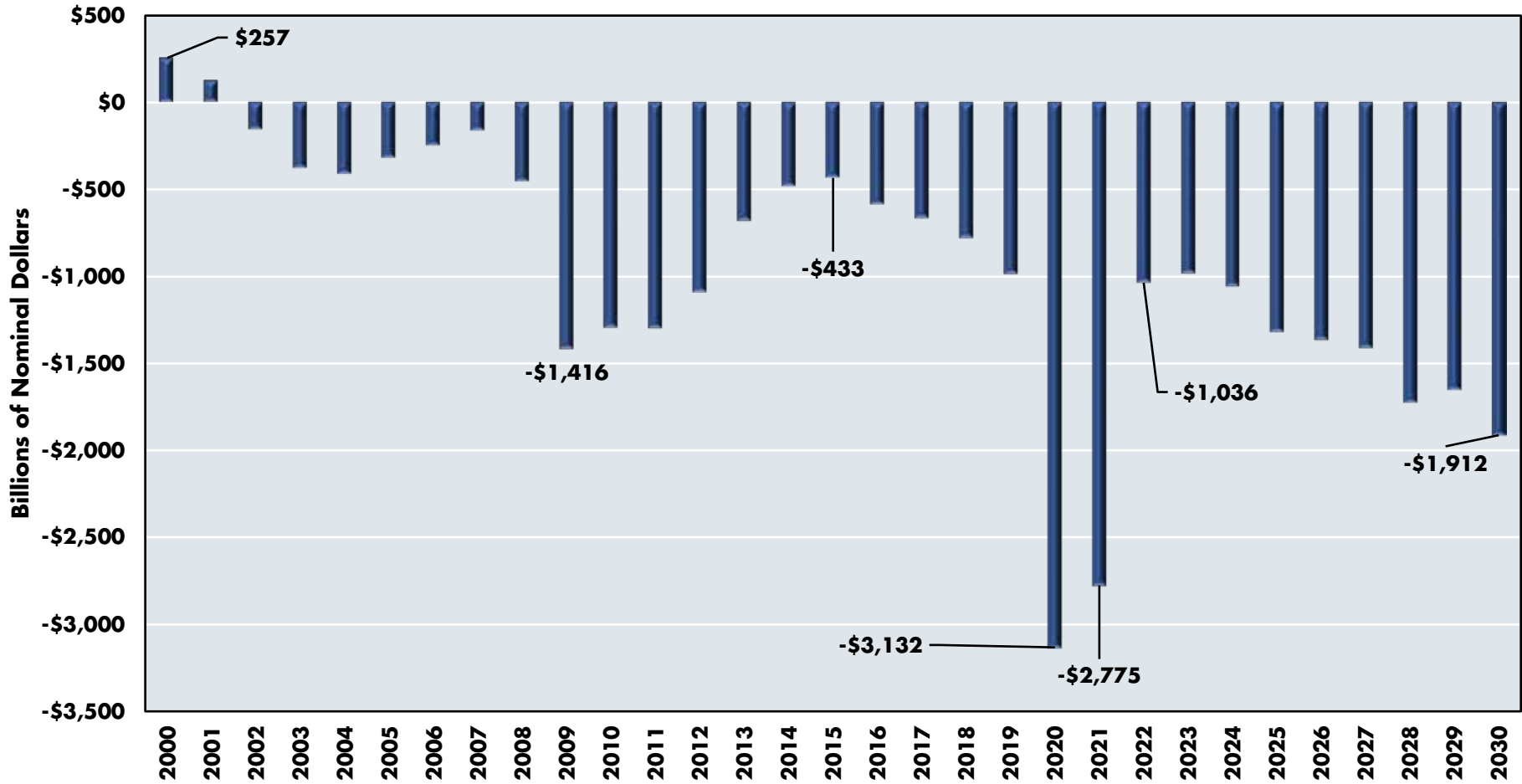
THE IMPACT OF INFLATION ON DEPARTMENT OF DEFENSE DISCRETIONARY BUDGET AUTHORITY,
FISCAL YEAR 2020–FISCAL YEAR 2027



Sources: Dragas Center for Economic Analysis and Policy, Old Dominion University; Office of the Secretary of Defense (Comptroller) Department of Defense National Defense Budget Estimations for FY 2022 and Defense Budget Materials – FY 2023. OMB inflation estimates from Table 2-1 Economic Assumptions in Economic and Budget Analyses for FY 2023 budget submission to Congress. Higher inflation scenario assumes 4.2% in FY 21, 8.0% in FY 22, 6.0% in FY 23, 4.0% in FY 24, and 2.5% in FY 25–27.

GRAPH 21

FEDERAL BUDGET SURPLUS OR DEFICIT IN BILLIONS OF NOMINAL DOLLARS,
FISCAL YEAR 2000-FISCAL YEAR 2030



Sources: Dragas Center for Economic Analysis and Policy, Old Dominion University, and Office of Management and Budget FY 2023 Presidential Budget (Table 1.1 – Summary of Receipts, Outlays, and Surpluses or Deficits: 1789–2026 and Congressional Budget Office May 2022 Budget and Economic Update, Table 1-1.

Is a Revolution Coming for Hampton Roads?

In his 1956 essay, "The Military Revolution, 1560-1660," Michael Roberts argued that military revolutions are defining points in history where what is possible in war changes, and those military organizations that grasp the potential of these shifts obtain advantages over less nimble counterparts. In 2001, MacGregor Knox and Williamson Murray in their book, "The Dynamics of Military Revolution, 1300-2050" argued that Robert's thesis can be broken into two parts: Military Revolutions (MR) and Revolutions in Military Affairs (RMA). While RMA focuses on the impact of technology on the character of war, MR is a broader concept, asking how technology has a sweeping impact on war and society. Knox and Williamson identified five revolutions in modern history: (1) the 17th century rise of the modern nation state, (2) the French Revolution, (3) the Industrial Revolution, (4) the First World War, and (5) the onset of the nuclear age.

Russia's invasion of Ukraine has increased the visibility of unmanned aerial vehicles (UAVs) on the modern battlefield but is only the latest instance of how UAVs can reshape tactics and, eventually, strategy. Ukraine has deployed UAVs ranging from off-the-shelf commercial drones that can be purchased online to more sophisticated platforms from Turkey and the United States. Russia has used UAVs as well but has found itself behind in the ability to integrate UAVs into combined arms operations (a byproduct of Russia's centralized command and control approach to warfare).

The increasing use of UAVs will, without adaption, undermine advantages long held by the United States on the battlefield. Tanks, for example, are increasingly vulnerable to UAVs (and anti-armor weapons such as the U.S. Javelin) and UAVs can range far behind the "front lines." The concentration of forces, long a dictum of military tactics, also results in a "target rich" environment for UAVs that can loiter on the battlefield for 24 hours or more. The Ukrainian defense forces have sunk Russian patrol ships using UAVs, forcing the Russian navy to move farther away from the coastline. While this may not seem like much of an advantage, it has forced the Russian navy

to shift toward more expensive and complex weapons systems as stand-off weapons. On the modern "come as you are" battlefield, forcing an adversary to deplete war stocks that cannot be readily replaced is one of the potential paths to victory.

UAVs will also exacerbate existing cost asymmetries. First, UAVs are relatively cheap, especially when compared to manned aircraft and ships. Second, the destruction of a UAV does not come at the cost of personnel. It is easier to place numerous UAVs at risk to gain a tactical advantage instead of manned assets. Nations that are slow to embrace this revolution will need to invest significant resources to defeat UAVs, further exacerbating the cost asymmetries. In the coming years, naval UAVs and ground combat UAVs will enter the battlespace, eroding other advantages held by the U.S. armed forces. Iran, for example, continues to heavily invest in UAVs to offset U.S. advantages in ships and aircraft.

As technological change increases the abilities of UAVs, the number of commercial applications for UAVs will also grow exponentially. Long-haul ground transportation will readily shift to ground-based drone vehicles while short-haul delivery will likely move toward UAVs over the coming decades. Walmart and Amazon are already piloting drone deliveries and while this promised tomorrow has not yet arrived, it is certainly a glimmer on the horizon.¹³ Consumers will benefit from cheaper transportation and more delivery options, but truck drivers are increasingly facing an uncertain future. When coupled with increasing automation, the future of many segments of the workforce is, at best, cloudy.

How will this play out for Hampton Roads? The region produces weapon systems that have grown increasingly complex and costly. As inflation erodes the purchasing power of the DoD, it will continue to seek to remove current ships, airplanes, and vehicles from its inventory to free up funds for future investments. Yet, these future investments are increasingly at risk on the modern battlefield. The open question is whether the armed forces will seek to transform their strategy and tactics by moving toward unmanned systems of all forms or whether change will be forced upon it.

¹³ <https://www.freightwaves.com/news/walmart-droneup-expanding-drone-delivery-to-six-us-states>

Change is difficult. Hampton Roads played a seminal role in the founding of the modern U.S. Navy. The Navy is not going away, but the Navy over the coming decades will be markedly different than it is today. Much like aircraft carriers replaced battleships as the focal point of naval strategy in the Pacific in World War II, unmanned ships and aircraft are likely to become dominant in the coming decades. These changes will likely lead to fewer military personnel in the region. A revolution is upon us; the question is whether we have the foresight to adapt to a changing world or whether we will continue to hope that the regional economic ship will remain on course, ignoring the looming storm on the horizon.

Final Thoughts

In December 1776, Thomas Paine eloquently wrote “These are the times that try men’s souls: the summer soldier and the sunshine patriot will, in this crisis, shrink from the service of his country...” Looking back over the last 24 months, one would be forgiven if they argued that Paine’s words were really about today rather than the American Revolution. We have lived through a historic economic contraction, restrictions on public and private life, school closures, and raging debates on the safety and efficacy of vaccines. Even as a recovery started, the echoes of the decisions made in 2020 continued to play out. Emergency department visits for mental health crises spiked, drug and alcohol abuse continued apace, and numerous parents reported that their children had fallen behind (and continued to remain behind) in school. We only now are starting to grasp how the COVID-19 pandemic has altered our definition of normal.

Yet, we would be remiss if we did not report there is good news to consider. Regional leaders are more closely collaborating with each other on the future of Hampton Roads. There is a growing recognition that doing business as usual will only result in the same sad economic story.

There is a discernible shift to focus economic development efforts on four industry clusters: (1) shipbuilding and ship repair, (2) renewable energy, (3) health care and biomedical research, and (4) data collection and analytics. As we have long argued, diversification of the regional economy is in the interest of the residents of Hampton Roads and the DoD. A robust regional economy provides jobs for residents and military spouses, family members, and veterans. Now is the time to push forward with these efforts.

Conversations about improved regional collaboration only need to look at Hampton Roads’ peers to see how working together pays off. This effort will need cities and counties to give up some authority to regional organizations. If a firm locates in one city in Hampton Roads, we know from U.S. Census data that, on average, more than 50% of its workers will reside in another city. The more we compete with each other, the easier it is for our competitors to point to our inability to get along as a reason for moving to their region instead of ours. We cannot continue to act like we have in the past and expect results to be any different.

We continue to argue that consolidating public services across the cities and counties of Hampton Roads will yield benefits to taxpayers and improve regional collaboration. How many library systems, fire departments, and police and sheriff departments are necessary for a region of 1.7 million people? Each local system requires an administrative support structure. As Parkinson’s law notes, “work expands so as to fill the time available for its completion,” and the numerous, duplicative administrative structures in our region are no exception. If a trip to the General Assembly is needed to obtain the appropriate legal authorities, taxpayers would surely be supportive of such an effort to lower costs and increase efficiency.

Change is coming. We cannot control every aspect of how the future will shape our lives in Hampton Roads. However, this also does not mean we do not have the ability to shape the future and determine better outcomes for the residents of Hampton Roads. The choice is ours: Will we get to work, or will we let our fate be determined by others?



