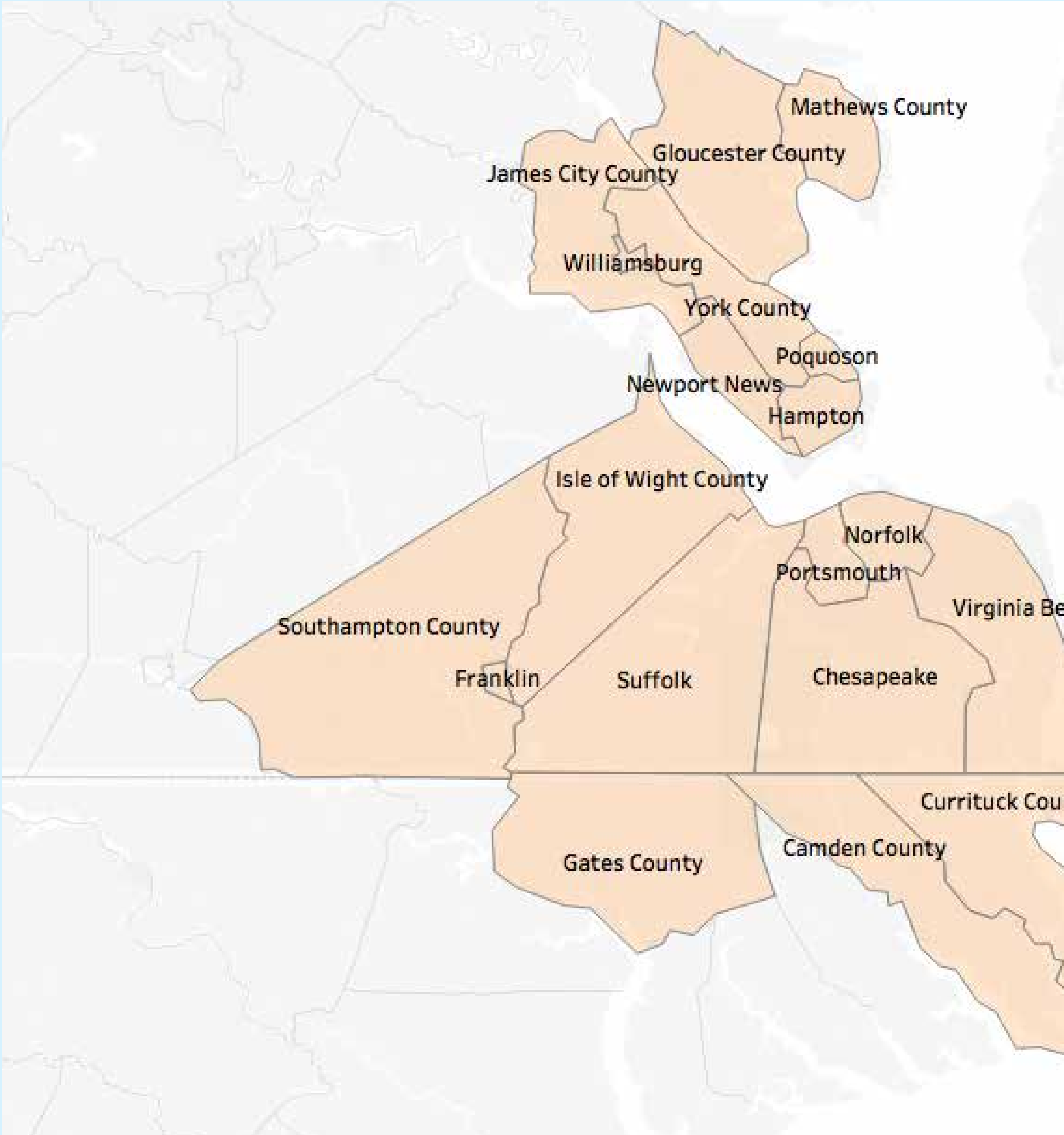
The State of the Region

HAMPTON ROADS 2019

DRAGAS CENTER FOR ECONOMIC ANALYSIS AND POLICY | STROME COLLEGE OF BUSINESS | OLD DOMINION UNIVERSITY



Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area

October 2019

Dear Reader:

This is Old Dominion University's 20th annual State of the Region Report. While it represents the work of many people connected in various ways to the university, the report does not constitute an official viewpoint of Old Dominion, its president, John R. Broderick, the Board of Visitors, the Strome College of Business or the generous donors who support the activities of the Dragas Center for Economic Analysis and Policy.

While the enthusiasm we have for our work remains high, it has been dampened by the recent passing of George Dragas, the individual most responsible for perceiving the region's need for the report and procuring the financial support to sustain it. George was a very successful businessman, who simultaneously exhibited marvelous foresight and a keen sense of civic duty. Without George and his family, there would be no State of the Region Report and no Dragas Center for Economic Analysis and Policy. We and the Hampton Roads community are indebted to him.

The 2019 State of the Region Report is divided into six parts:

Full Speed Ahead: The Regional Economy Continues to Improve
For the first time in a decade, the Hampton Roads economy is poised to grow for the third straight year. Unemployment has declined, incomes have increased and output has risen. Increases in defense spending, tourism, and education and health services have fueled our recent growth. Yet, there are storm clouds on the horizon. How long can the good times last?

420 in the 757: Marijuana and Hampton Roads
More than 30 states permit the personal use of marijuana for medical purposes and 11 states have legalized the possession of small amounts of marijuana for personal use. Over 50 percent of Americans have used marijuana in their lifetimes and young adults in Hampton Roads use it at a higher rate than their peers in all other regions of the Commonwealth. We take a look at how a change in the status of marijuana could affect Hampton Roads.

Mind the Gap: Women's Leadership in Hampton Roads
We examine whether there is a leadership gap between women and men in Hampton Roads. While a gap in earnings can be explained partly by occupational choice, part-time versus full-time employment and the risks of certain occupations, there remains the challenge of women being able to ascend to the higher levels of their chosen profession. We explore the extent of the leadership gap in our region and discuss what can be done to narrow it.

The State of Soccer in Hampton Roads
The "beautiful game" is thriving in Hampton Roads. Two new professional soccer teams now play in the region and thousands of children, teenagers and young adults play on pitches from Williamsburg to Virginia Beach. We look at the demographics of soccer, how the model of youth sports has changed in America and the prospects for growth in the coming years.

Can Defense Save Us?
Sequestration is blamed for many of our region's problems. In this chapter, we assess what would have happened to the Hampton Roads economy if sequestration had never occurred. We compare the impact of sequestration with the drawdown from the Cold War. We ask whether it is time to prepare for the next downturn in defense spending.

The Economic Impact of a Hurricane on Hampton Roads
In 1821, a Category 3 hurricane made landfall in Hampton Roads, flooding Norfolk before moving on to New York City. What would be the impact of a similar hurricane today on the region's economy? We find that a major hurricane would cause almost $20 billion in property damage, create more than 2 million tons of debris and reduce economic output by over $20 billion in the first year following landfall.

Hampton Roads is an increasingly diverse community that simultaneously plays a significant role in national security, is home to a busy deep-water port, hosts over 90,000 college students and is home to world-class tourism opportunities. There are challenges, of course, but, as the adage goes, challenge and opportunity are two sides of the same coin. To adapt, improve and overcome, we must understand where we are and where we want to go. Our work seeks to contribute to this conversation.

The Strome College of Business and Old Dominion University continue to provide support for the State of the Region Report. However, it would not appear without the vital backing of the private donors whose names appear below. They believe in Hampton Roads and the power of rational discussion to improve our circumstances, but are not responsible for the views expressed in the report.

Richard F. Barry III
The Aimee and Frank Batten Jr. Foundation
Jane Batten
R. Bruce Bradley
Ramon W. Breeden Jr.
Chartway Federal Credit Union
Arthur A. Diamonstein
Dragas Family Foundation
George Dragas Jr. (in memoriam)
Helen Dragas
David and Susan Goode
Edward L. Hamm Jr.
Hampton Roads Chamber of Commerce
Thomas Lyons
Patricia and J. Douglas Perry
Dr. Jitendra Swarup

The following individuals were instrumental in the writing, editing, design and dissemination of the report:

Vinod Agarwal
Barbara Blake
Ethan Crouson
Steve Daniel
Addie Gregory
William Heffelfinger
Saloni Jain
Elizabeth Janik
Nikki Johnson
Kiran Karande
James V. Koch
Tim Komarek
Feng Lian
Sharon Lomax
George McLeod
Janet Molinaro
Brendan O'Hallarn
Bailey Park
Emily Steinhilber
Jay Walker
Hannah White

Previous State of the Region Reports are available at www.ceapodu.com. Individual copies of the 2019 report may be purchased for $25 each. If you have comments or suggestions, please email us at rmcnab@odu.edu.

Sincerely,

Robert M. McNab

Director, Dragas Center for Economic Analysis and Policy
Professor of Economics, Department of Economics
Strome College of Business
Old Dominion University

Table of Contents

Full Speed Ahead: The Regional Economy Continues to Improve . . . 3

420 in the 757: Marijuana and Hampton Roads . . . 53

Mind the Gap: Women's Leadership in Hampton Roads . . . 83

The State of Soccer in Hampton Roads . . . 99

Can Defense Save Us? . . . 117

The Economic Impact of a Hurricane on Hampton Roads . . . 145

Full Speed Ahead: The Regional Economy Continues To Improve

FULL SPEED AHEAD: THE REGIONAL ECONOMY CONTINUES TO IMPROVE

Failure is simply the opportunity to begin again, this time more intelligently.
– Henry Ford

Every challenge is also an opportunity for change. An optimist will see a glass as half full, a pessimist will see it as half empty and a pragmatist will ask why no one is filling up the glass. Patience is its own reward. The road less traveled has made all the difference. The tortoise will eventually beat the hare. The proverbial check is in the mail.

Over the last decade, numerous clichés have been uttered to illustrate the performance (or lack thereof) of the Hampton Roads economy. While other regions in the country have prospered, Hampton Roads has had to wait outside the promised land, looking toward Washington, D.C., or Richmond to provide the needed economic spark. After a lost decade, however, the regional economy is not only growing, it is accelerating and appears to be poised for continued growth in 2020.

By now, the causes of our region's anemic economic performance from 2007 to 2016 are well documented and ingrained in our collective consciousness. Hampton Roads' dependence on federal spending, normally a strength in economic downturns, became a vulnerability with the passage of discretionary spending caps (commonly referred to as sequestration) in 2011. The lingering impact of the Great Recession and the slowdown in federal spending in the region reverberated through the housing market, depressing prices and increasing the number of distressed properties. The large number of distressed properties delayed the recovery of the housing sector.

Consequently, private-sector job creation in Hampton Roads lagged the state and the nation. Domestic outmigration increased as residents sought their economic fortunes elsewhere. Throughout these trying times, a lack of regional cooperation hindered efforts to leverage our strengths and allowed competitors to amplify our weaknesses. We watched as other regions sprang ahead in terms of economic growth.

Yet, like a fighter who picks himself up off the mat, the story does not end in 2016. Economic data illustrate that the Hampton Roads economy has recovered from the twin blows of the Great Recession and defense sequestration. The number of residents in the labor force is higher now than any point this century. Unemployment is nearing 3% and the number of jobs continues to rise. Manufacturing, once seen as a sector that had fallen on hard times, is rapidly expanding and adding jobs. Housing prices continue to increase as distressed properties approach prerecession lows and inventories continue to shrink. This year's inaugural Something in the Water festival in Virginia Beach, April 26-28, not only highlighted the importance of the region's travel and tourism industry but also, for the first time perhaps in a long time, made Hampton Roads the place to be.

Most of the economic news is positive but we would be remiss if we did not point out that challenges remain. Private-sector job creation here lags that of peer metropolitan areas in the United States. Business growth continues to lag in many parts of our region, highlighting the concentration of economic activity in the "Seven Cities." Population growth has slowed dramatically this decade and younger residents are seeking their fortunes elsewhere. While potentially disheartening, these challenges present opportunities for us to work together to make the region an even better place to live and work.

The peaks and valleys of the economic data represent the economic map of our region. We need to understand where we stand before beginning the journey to where we want to be. The purpose of this chapter is to review the economic data to help us determine whether the economy is moving full steam ahead into smooth waters or whether storm clouds are gathering on the horizon.

The Office of Management and Budget (OMB) defines a core-based statistical area (CBSA) as a geographical region anchored by an urban center of at least 10,000 residents plus adjacent counties that have socioeconomically integrated with the urban center through commuting ties.[1] The OMB has two categories of CBSAs: metropolitan statistical areas and micropolitan statistical areas. Metropolitan statistical areas (MSAs) have at least one urbanized area with a population of 50,000 or more residents. Virginia Beach-Norfolk-Newport News is one of 384 MSAs in the continental United States. In September 2018, the OMB updated the cities and counties that comprise the Virginia Beach-Norfolk-Newport News MSA (also known as the Hampton Roads MSA) to include Camden County in North Carolina and Southampton County and the city of Franklin in Virginia.[2] The Hampton Roads MSA now consists of the cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach and Williamsburg. The counties in the MSA are Camden, Currituck and Gates in North Carolina, and Gloucester, Isle of Wight, James City, Mathews, Southampton and York in Virginia. Where possible, we will present data reflecting the new definition of the Hampton Roads MSA; however, some agencies and departments, including the Bureau of Labor Statistics (BLS) and Bureau of Economic Analysis (BEA), continue to use older definitions of the MSA in the presentation of socioeconomic data.

1 https://www.govinfo.gov/content/pkg/FR-2010-06-28/pdf/2010-15605.pdf.
2 https://www.whitehouse.gov/wp-content/uploads/2018/09/Bulletin-18-04.pdf.

Improving Growth Following A Lost Decade

We estimate that real (inflation-adjusted) economic activity in Hampton Roads grew 2.2% from 2017 to 2018, more than doubling the previous year's rate of growth (Table 1).[3] Our current forecast is that growth will accelerate to 2.4% in 2019. Increases in federal spending, continued growth in the hotel and tourism industry and increased traffic through the Port of Virginia have contributed to the recovery in economic performance, following a lost decade of anemic growth.

Compared to Virginia and the United States, however, Hampton Roads' economic performance left much to be desired over the last decade. Graph 1 illustrates that, after a relatively slow start at the beginning of the century, regional economic growth outpaced that of the U.S. between 2001 and 2006 and, briefly, the Commonwealth in 2007. While the region fared better in the Great Recession than the nation, the tables turned with the nation accelerating and passing Hampton Roads in 2010. We forecast that by the end of 2019, the Hampton Roads economy will be almost 23% larger than in 2001. However, the national economy will be almost 44% larger over the same period.

TABLE 1

NOMINAL AND REAL (INFLATION-ADJUSTED) GROSS DOMESTIC PRODUCT (IN THOUSANDS OF DOLLARS): HAMPTON ROADS, 2001-2019*

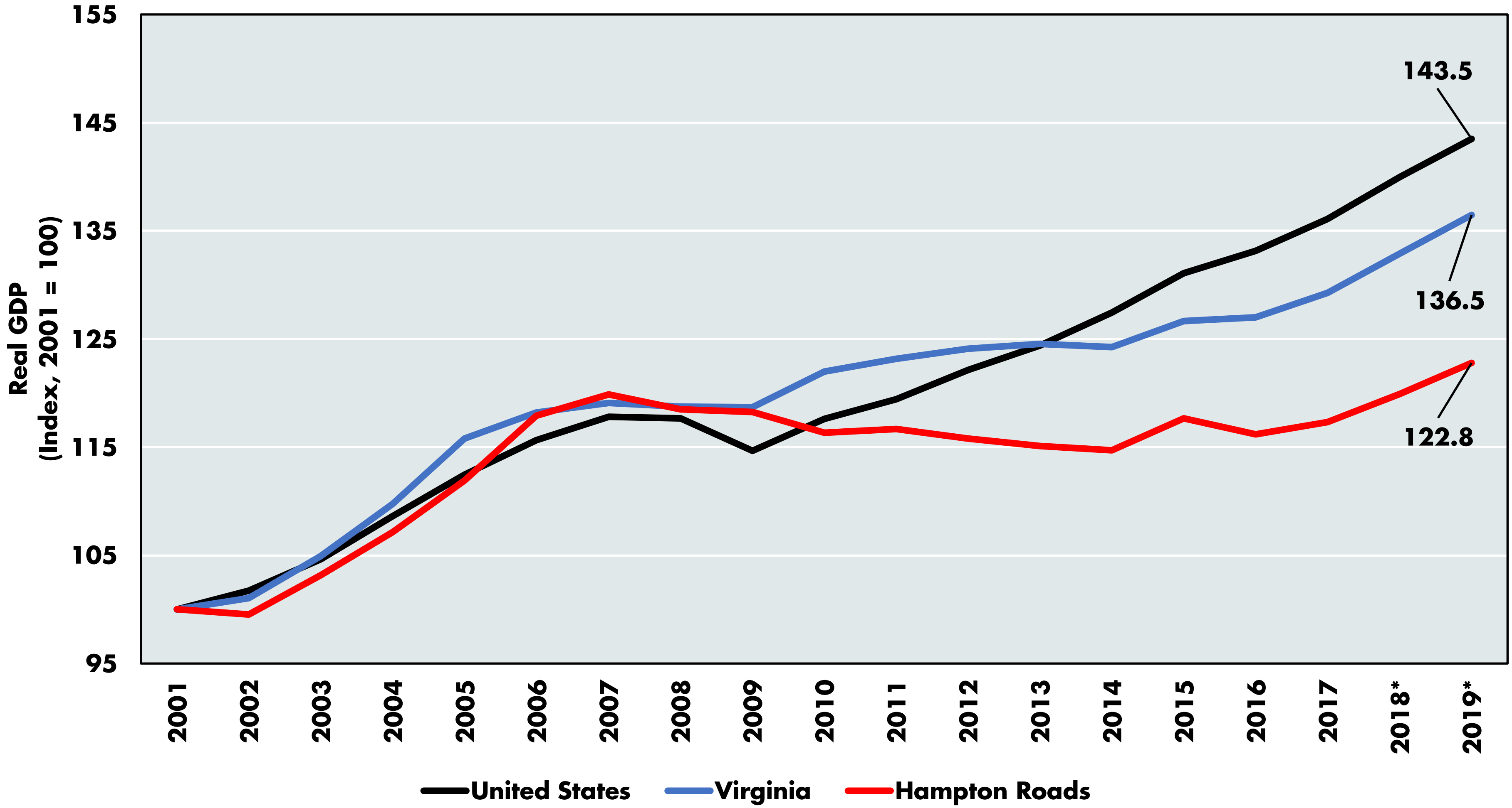
	Nominal GDP	Real GDP (Base Year – 2009)	Year-Over-Year Change in Real GDP
2001	$56,158	$69,736	--
2002	$57,558	$69,410	-0.5%
2003	$61,481	$71,944	+3.7%
2004	$65,638	$74,715	+3.9%
2005	$70,889	$78,036	+4.4%
2006	$77,003	$82,209	+5.3%
2007	$81,041	$83,585	+1.7%
2008	$81,146	$82,623	-1.2%
2009	$82,470	$82,470	-0.2%
2010	$82,107	$81,132	-1.6%
2011	$83,355	$81,363	+0.3%
2012	$84,485	$80,740	-0.8%
2013	$85,414	$80,263	-0.6%
2014	$87,088	$79,998	-0.3%
2015	$91,725	$82,058	+2.6%
2016	$92,321	$81,022	-1.3%
2017	$94,855	$81,821	+1.0%
2018*	$99,219	$83,621	+2.2%
2019*	$103,783	$85,628	+2.4%

Sources: Bureau of Economic Analysis and the Dragas Center for Economic Analysis and Policy, Old Dominion University. *2018 represents our estimate while 2019 represents our forecast. Base year of real GDP is 2009.

3 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, as the advance estimates for 2018 will only be released in December 2019. The estimates are also frequently subject to significant revision.

GRAPH 1

INDEX OF REAL GROSS DOMESTIC PRODUCT: UNITED STATES, VIRGINIA AND HAMPTON ROADS, 2001-2019*



Sources: Bureau of Economic Analysis. Real GDP in 2009 chained dollars. (For more information on chained indices, see: https://www.bea.gov/resources/methodologies/chained-dollar-indexes.) *2018 estimate and 2019 forecast provided by the Dragas Center for Economic Analysis and Policy, Old Dominion University. Base year of the index is 2001.

In Table 2, we present the annual average growth in real GDP for the U.S., Virginia and selected metropolitan areas since the turn of the century. Between 2001 and 2009, average economic growth in Hampton Roads exceeded that of the nation and several peers. During the current decade, however, among the selected metro areas, only the Memphis region performed worse than Hampton Roads. The sliver of good news is that the improved performance of the regional economy in 2018 and 2019 should reflect favorably on Hampton Roads when the GDP data become available in the coming years.

TABLE 2

AVERAGE ANNUAL GROWTH IN REAL GROSS DOMESTIC PRODUCT, UNITED STATES, VIRGINIA AND SELECTED METROPOLITAN STATISTICAL AREAS

Metropolitan Statistical Area	Average Growth 2001-2009	Average Growth 2010-2017
United States	+1.7%	+2.1%
Virginia	+2.2%	+0.8%
Charlotte-Concord-Gastonia, NC-SC	+2.7%	+3.4%
Cincinnati, OH-KY-IN	+0.7%	+1.7%
Cleveland-Elyria, OH	-0.1%	+2.1%
Fresno, CA	+3.0%	+2.0%
Jacksonville, FL	+1.5%	+2.4%
Memphis, TN-MS-AR	+0.2%	+0.0%
Nashville-Davidson-Murfreesboro-Franklin, TN	+2.0%	+5.0%
Raleigh, NC	+2.6%	+3.5%
Richmond, VA	+0.5%	+1.9%
San Diego-Carlsbad, CA	+2.2%	+2.2%
Virginia Beach-Norfolk-Newport News	+2.1%	+0.1%

Sources: Bureau of Economic Analysis and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Real GDP in 2009 chained dollars. Annual growth rate is the compound annual growth rate.

Economic Performance At The City And County Level

Measuring economic performance at the local level typically is a difficult undertaking because of the many factors specific to the time period and region in question. The inflows and outflows of military personnel and ships that distinguish Hampton Roads are but one example. Nevertheless, in 2018 the BEA released prototype estimates of GDP for counties in the United States for 2012 through 2015.[4] Though significantly lagged, these estimates provide comparable measures of economic activity across counties in the United States. While by no means perfect, these estimates provide insight into economic activity at the local level in Hampton Roads.[5]

Table 3 illustrates that, in real (inflation-adjusted) terms, the cities and counties of the Hampton Roads MSA generated about $93.5 billion in output in 2015. Of the metropolitan areas in the Commonwealth, only Northern Virginia produced a higher share of economic activity. Three metro regions – Hampton Roads, Northern Virginia and Richmond – accounted for almost three-quarters of Virginia's real GDP in 2015.

Within Hampton Roads, Virginia Beach accounted for over a quarter of the value of economic activity in 2015, followed by Norfolk (22.9%), Newport News (12.4%) and Chesapeake (10.6%). Adding Hampton (6.9%), Portsmouth (5.6%) and Suffolk (4.7%) to this list yields the overall contribution of the Seven Cities. These cities generated almost 90 cents of every $1 of economic activity in Hampton Roads in 2015.

4 Bureau of Economic Analysis, Prototype Estimates of County Level GDP, 2018, https://www.bea.gov/data/gdp/gdp-county.
5 We must caveat our discussion with two points. First, these estimates (as with the metro-level estimates) are likely to be revised annually. Second, the county-level and metro estimates are not directly comparable; that is, the county estimates do not sum to the metro estimates. For a discussion of the methodology and comparison of the county and MSA GDP estimates, see https://apps.bea.gov/scb/2019/03-march/0319-county-level-gdp.htm.

TABLE 3

REAL GROSS DOMESTIC PRODUCT (IN THOUSANDS OF 2012 DOLLARS): CITIES AND COUNTIES OF HAMPTON ROADS, 2012 AND 2015

Location	2012 Real GDP	2015 Real GDP	Annual Growth in Real GDP	Percentage of Hampton Roads 2015 Real GDP
Camden	$162,714	$160,211	-0.4%	+0.2%
Chesapeake	$9,320,962	$9,886,452	+1.5%	+10.6%
Currituck	$692,994	$633,004	-2.2%	+0.7%
Gates	$117,702	$129,803	+2.5%	+0.1%
Gloucester	$702,155	$711,559	+0.3%	+0.8%
Hampton	$6,326,584	$6,425,656	+0.4%	+6.9%
Isle of Wight	$1,326,816	$1,362,260	+0.7%	+1.5%
James City & Williamsburg	$3,991,029	$3,716,340	-1.8%	+4.0%
Mathews	$112,178	$106,717	-1.2%	+0.1%
Newport News	$11,568,021	$11,572,706	+0.0%	+12.4%
Norfolk	$20,659,234	$21,373,985	+0.9%	+22.9%
Portsmouth	$4,988,844	$5,259,462	+1.3%	+5.6%
Southampton & Franklin	$545,672	$532,240	-0.6%	+0.6%
Suffolk	$3,926,925	$4,425,996	+3.0%	+4.7%
Virginia Beach	$24,158,365	$25,043,602	+0.9%	+26.8%
York & Poquoson	$2,000,619	$2,160,947	+1.9%	+2.3%
Hampton Roads	$90,600,814	$93,500,940	+0.8%	--

Sources: Bureau of Economic Analysis, Prototype Estimates of County Level GDP, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Real GDP in 2012 chained dollars. Percentages may not sum to 100 percent due to rounding. When necessary, the BEA combines localities to produce GDP estimates. Estimated annual growth is the compound annual growth rate. September 2018 definition of the Virginia Beach-Norfolk-Newport News MSA.

Per Capita Personal Income

People earn personal income from wages, their own businesses, dividends, interest, rents and government benefits. Rising personal income is typically a signal of improving economic conditions and a predictor of rising consumer spending. Examining longer-term trends in personal income can help us determine whether a region is picking up the pace or slowing down.

Graph 2 illustrates how per capita personal income in Hampton Roads changed little from 2008 to 2014 and then started to increase in 2015. In 2017, personal income in Hampton Roads was about 91% of the national average and 86% of the Commonwealth average. While this might seem to be bad news, real per capita personal income in Hampton Roads increased by 8.5% from 2008 to 2017, 1.7 percentage points higher than the 5.8% increase for the Commonwealth for the same period. In 2017, real per capita personal income in Hampton Roads grew by 2.1%, exceeding the rate of growth for the U.S. (1.8%) and Virginia (1.8%).

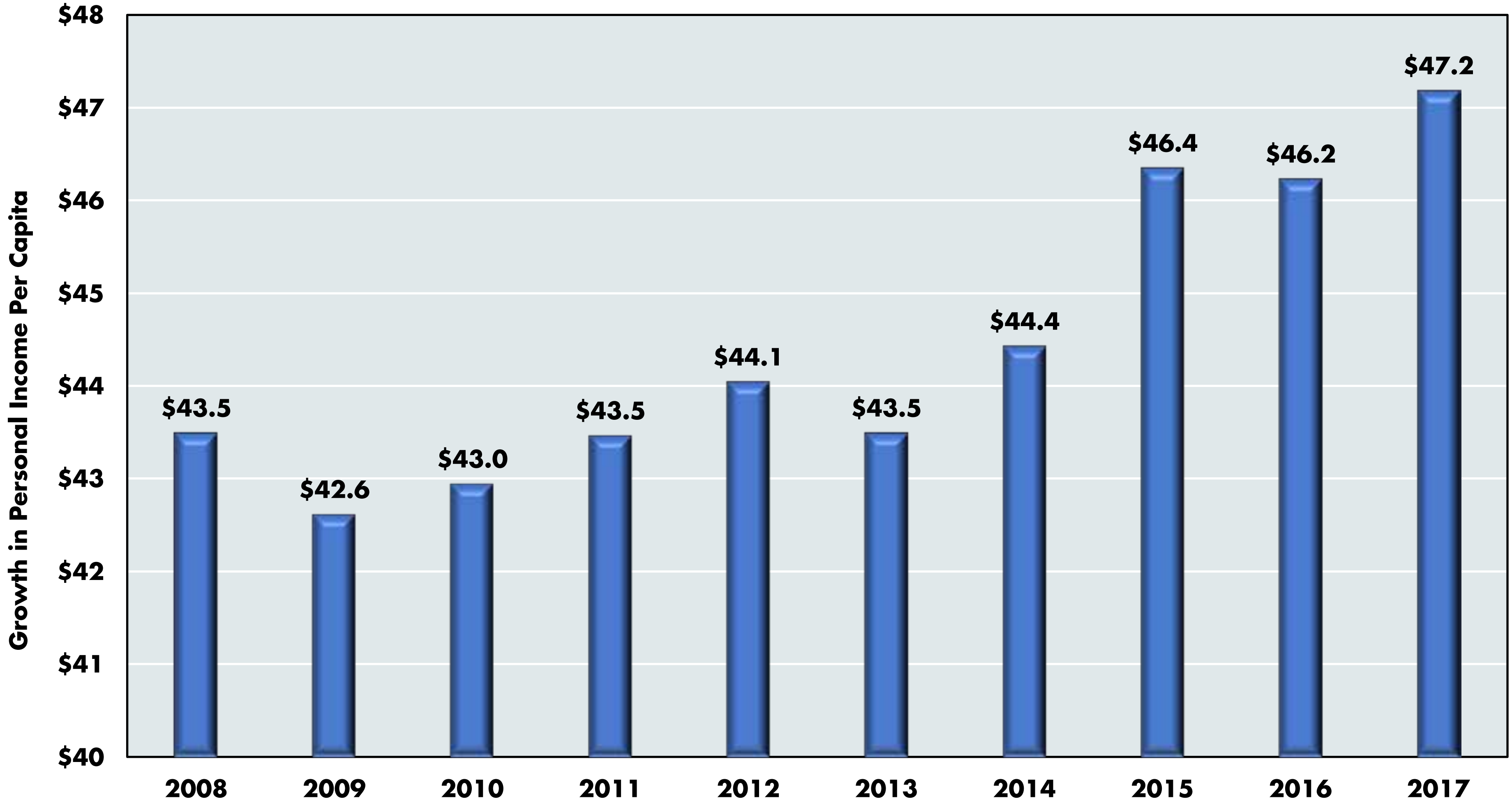
One potential caveat to this good news is the relatively slow rate of population growth in Hampton Roads. Faster-growing regions observe increases in personal income and population and thus may have slower rates of per capita personal income growth. The region's performance has improved when compared to earlier this decade, but there is also room for improvement.

We compare the performance of Hampton Roads to peer and aspirational metropolitan areas in the United States in Graph 3.[6] For most of the decade, our region lagged its peers, but there may be a change underway. In 2017, Hampton Roads outperformed many of its peers in the growth of personal income. With the upticks in defense spending, activity at the Port and tourism, it is likely that the increases in personal income were sustained into 2018 and 2019. If so, the region could finally start to close the gap created by the anemic growth in the early part of the decade.

6 The metropolitan area estimates are only available from 2008 to 2017, while the county-level estimates are available from 1969 to 2017.

GRAPH 2

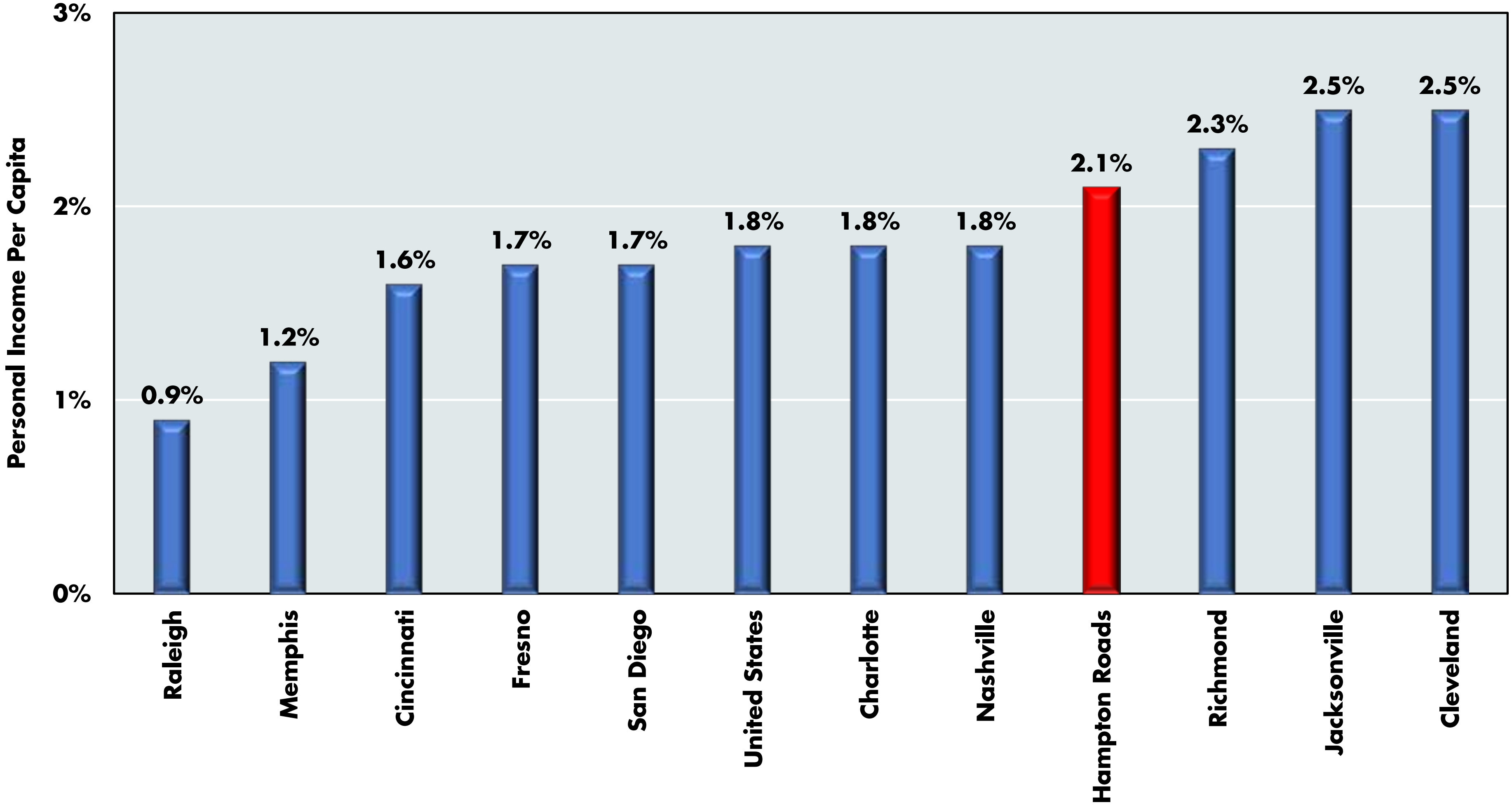
REAL PER CAPITA PERSONAL INCOME (IN THOUSANDS OF DOLLARS): HAMPTON ROADS, 2008-2017



Sources: Bureau of Economic Analysis, Personal Income Per Capita by Metropolitan Area, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Base year is 2012.

GRAPH 3

ANNUAL GROWTH IN PER CAPITA PERSONAL INCOME: UNITED STATES AND SELECTED METROPOLITAN AREAS, 2016-2017



Sources: Bureau of Economic Analysis, Personal Income Per Capita by Metropolitan Area, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Base year is 2012.

Employment Growth Improves But Lags The State And Nation

In 2018, more people were in the labor force working or looking for work in Hampton Roads than at any other point in history. 2018 also set records for the highest number of jobs on record and approached the record for the lowest observed unemployment rate. Let's look at the details.

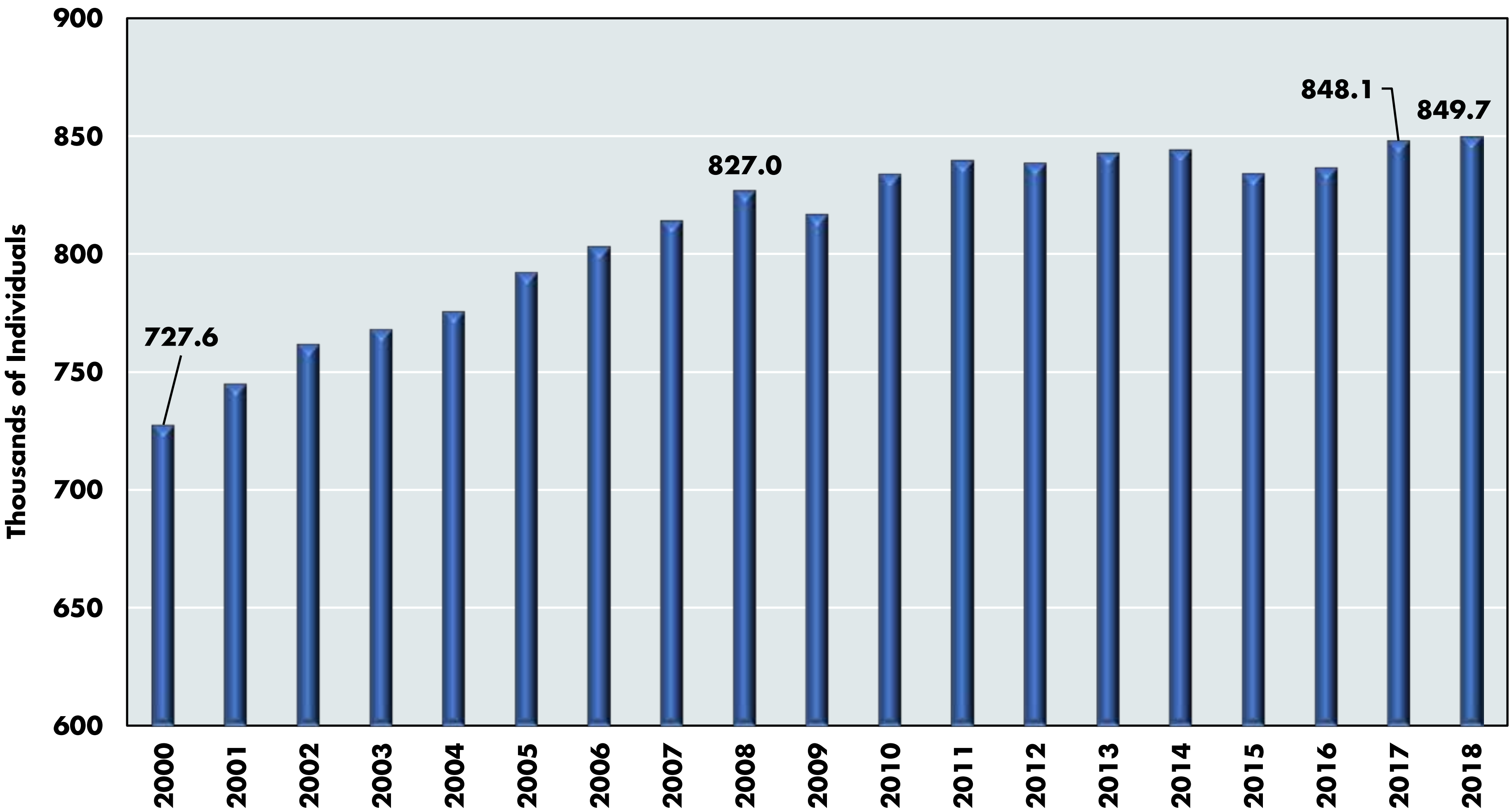
Graph 4 illustrates the number of individuals who were either working or actively looking for work in Hampton Roads from 2000 to 2018. While the number of people in the labor force hit a record in 2018, year-over-year labor force growth was fewer than 2,000 individuals for a metropolitan area with more than 1.7 million residents.

Graph 5 displays how individual employment changed in the region from 2000 to 2018. From 2008 to 2009, employment in Hampton Roads declined by more than 30,000 people and the recovery was painfully slow. Only in 2014 did individual employment exceed prerecession levels, and with sustained growth in recent years, the number of individuals employed averaged 822,000 in 2018.

While the labor force has grown over time, the number of people who were employed grew faster than the labor force, thus the number of unemployed in Hampton Roads has continued to fall over the decade. Graph 6 reveals that the average annual unemployment rate in Hampton Roads peaked at 7.6% in 2010. Since then, the average unemployment rate has steadily declined, reaching 3.3% in 2018. In mid-summer of 2019, the regional unemployment rate neared 3% and approached the record low observed in 2000.

GRAPH 4

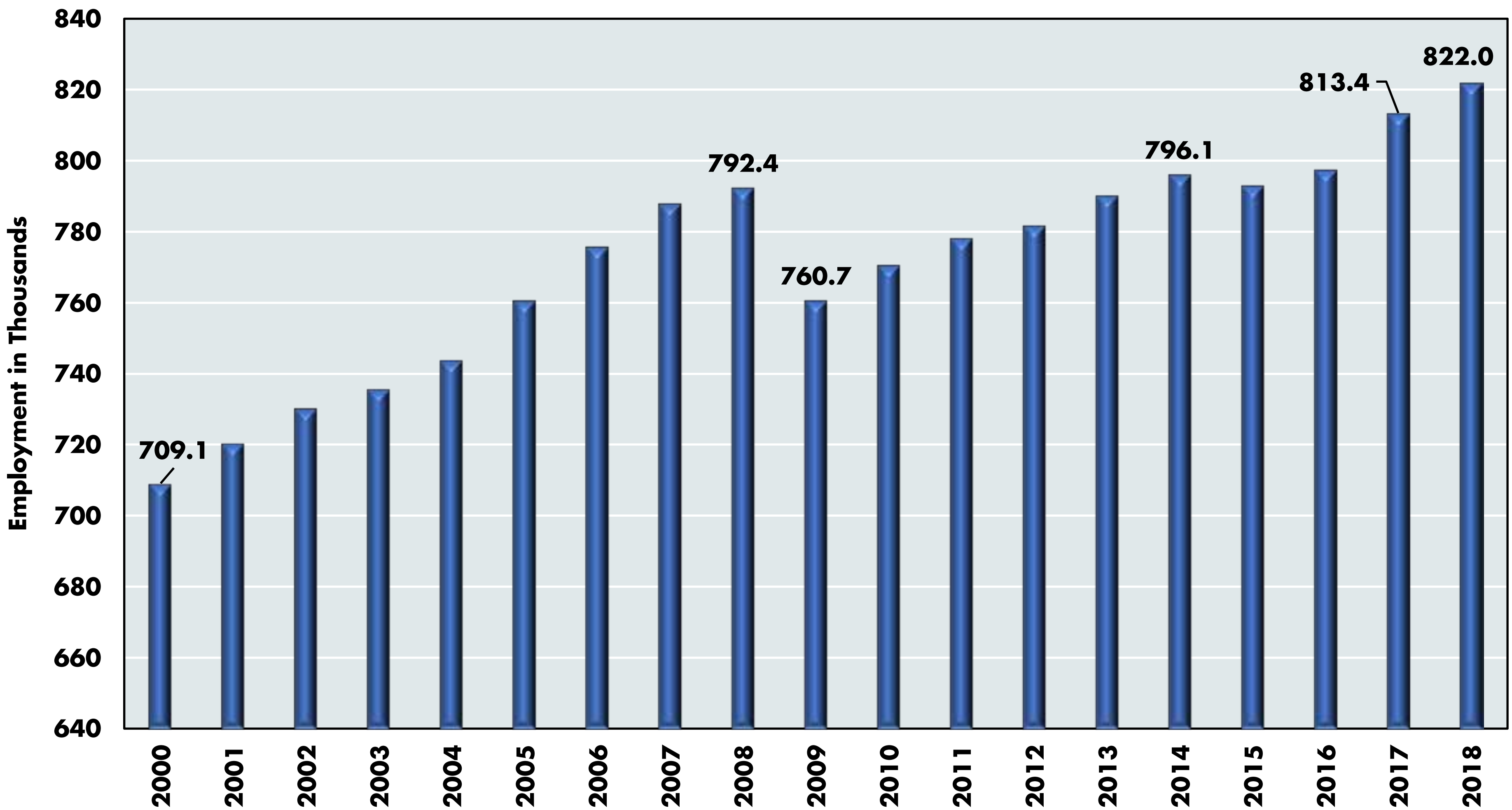
CIVILIAN LABOR FORCE IN HAMPTON ROADS, 2000-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual averages of non-seasonally adjusted data.

GRAPH 5

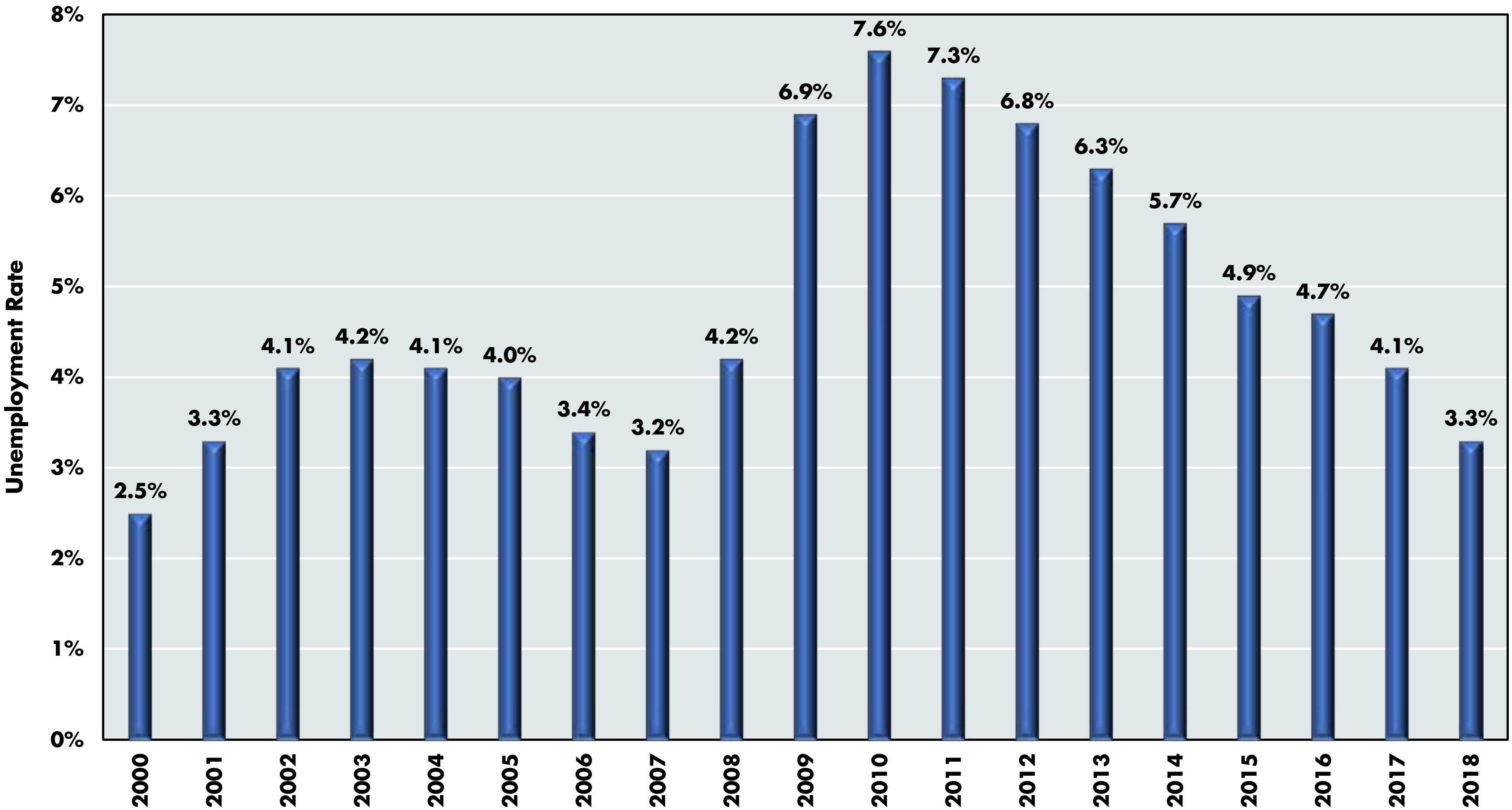
AVERAGE INDIVIDUAL EMPLOYMENT IN HAMPTON ROADS, 2000-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual averages of non-seasonally adjusted data.

GRAPH 6

AVERAGE UNEMPLOYMENT RATE: HAMPTON ROADS, 2000-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual averages of non-seasonally adjusted data.

More Jobs Is Good News

There is a subtle but important difference between employment data and jobs data. Individuals are the source of employment data while employers are the source of jobs data. Regardless of how many or what kinds of jobs I may have, I can only be counted as employed once. On the other hand, if I have two jobs with two different employers, these jobs are reported and counted separately. Our expectation is that the number of jobs will be greater than the number of people employed, although the rise of the "gig economy" has blurred the lines as to whether an individual is an employee, a contractor or in some other type of arrangement.

It should be no surprise that as the number of people employed has increased, the number of jobs in Hampton Roads has risen as well. While it took five years for individual employment to recover to levels seen prior to the Great Recession, it was almost a decade before Hampton Roads recovered all the jobs lost due to the recession and sequestration (Graph 7). The recovery proceeded slowly, in fits and starts. Only recently could the recovery in jobs be labeled as an expansion, and there are promising signs that job growth has continued in 2019.

While the number of jobs has grown every year since 2010, the pace of job growth has lagged that of the nation and the state (Graph 8). To put this in perspective, for every job added in Hampton Roads over the last decade, Virginia added almost three jobs and the nation added more than four jobs. Recent changes in federal spending, however, may help Hampton Roads close the gap in the coming years.

Graph 9 illustrates that education and health services, federal civilian employment, leisure and hospitality, and professional and business services jobs have led the way over the past decade. The growth of local institutions of higher education, EVMS and Sentara has, in part, driven these job gains. The largest losses have come in local government, information, financial activities, and trade, transport and utilities. The job losses in the information industry and the trade, transport and utilities industries are concerning, given the regional goal of becoming a hub for cybersecurity and information technology. Investments in the workforce in these areas will need to be closely monitored to see if there is a return over the coming years.

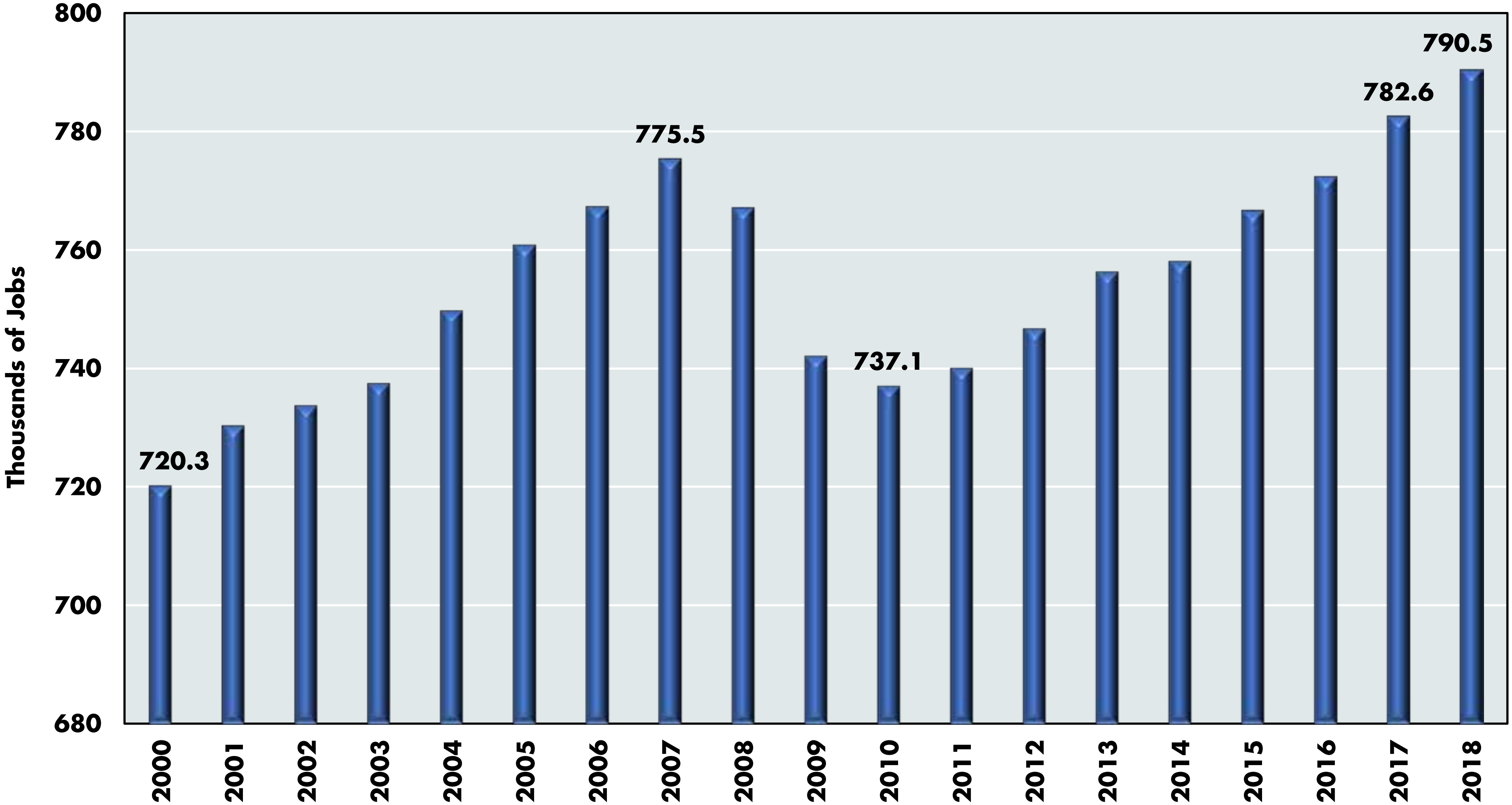
If we look at more recent data, we find a remarkable turnaround story with regard to manufacturing. Earlier in the decade, thousands of manufacturing jobs were lost in Hampton Roads. As illustrated in Graph 10, the manufacturing sector added more than 4,000 jobs in 2018. In fact, manufacturing was the fastest-growing employment sector in Hampton Roads in 2018, followed by professional and business services, and education and health services. **With continued hiring in 2019, it is likely that the manufacturing industry will not only finally recover all the jobs lost as a result of the Great Recession and sequestration, but also set new highs for employment. This is good economic news as the average annual pay for manufacturing jobs in 2018 was $63,296, almost $16,000 more than the average annual pay for all jobs in Hampton Roads in 2017.**[7]

No pun intended, the good news concerning jobs must be tempered with the realization that we still have work to do. Most new jobs created in Virginia this decade have not come from Hampton Roads but from Northern Virginia, Richmond and other metropolitan areas. Job growth in our region is near the bottom of the list when compared to peer and aspirational metro areas. To put this into perspective, since the recession, Charlotte has added about 10 jobs on average for every job created in Hampton Roads. Slower job growth reduces the attractiveness of a region and creates a stronger incentive for residents to seek their economic fortunes elsewhere. Now is not the time to rest on our proverbial laurels, it's time to find ways to improve economic resiliency, diversity and the capacity of the workforce.

7 The average annual pay for covered employment in Hampton Roads in 2018 was $47,474. (Most employers are required to make payments into unemployment insurance programs. Work for these employers is considered "covered employment.")

GRAPH 7

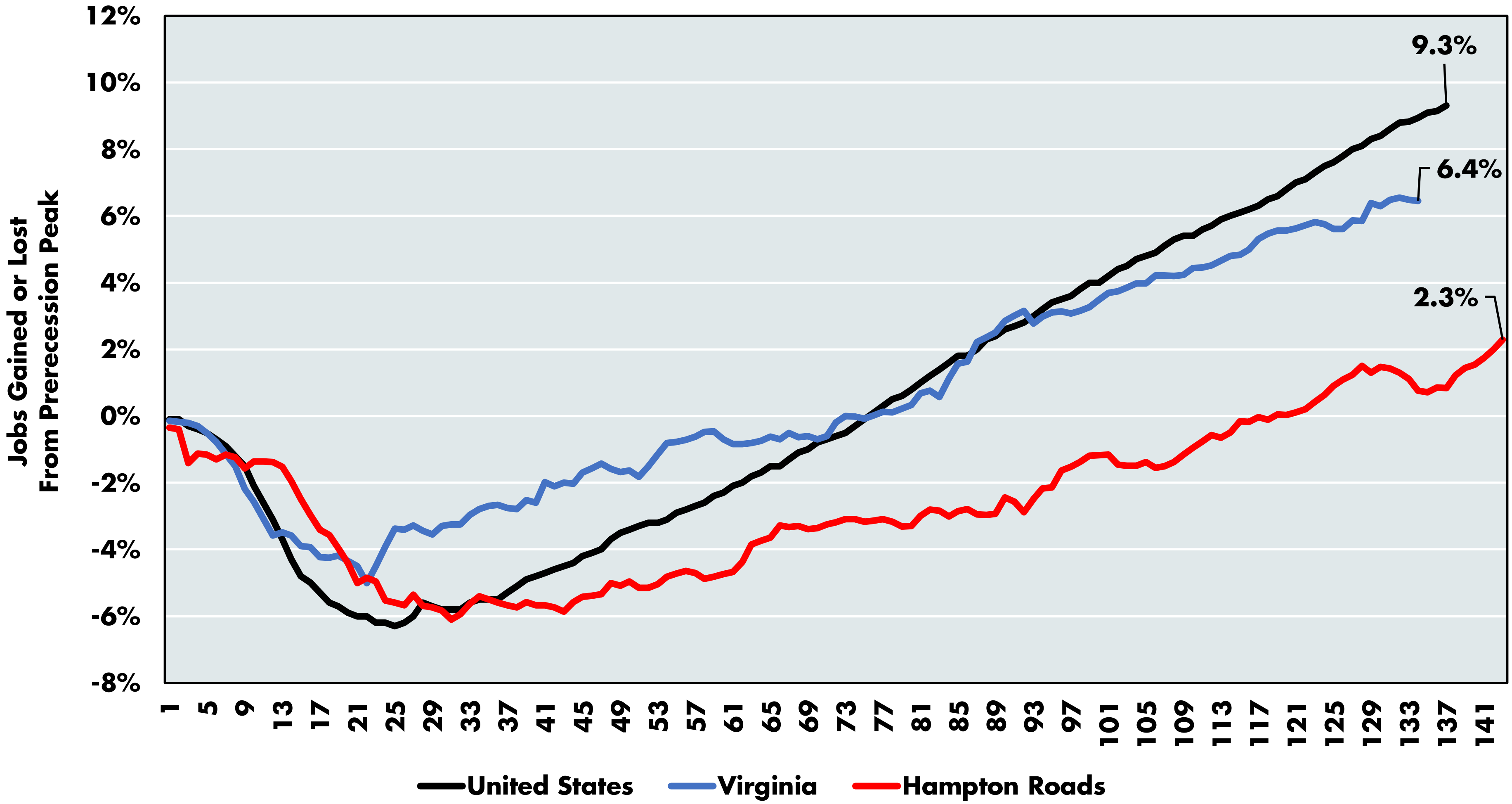
AVERAGE NONFARM PAYROLLS: HAMPTON ROADS, 2000-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual averages of non-seasonally adjusted data.

GRAPH 8

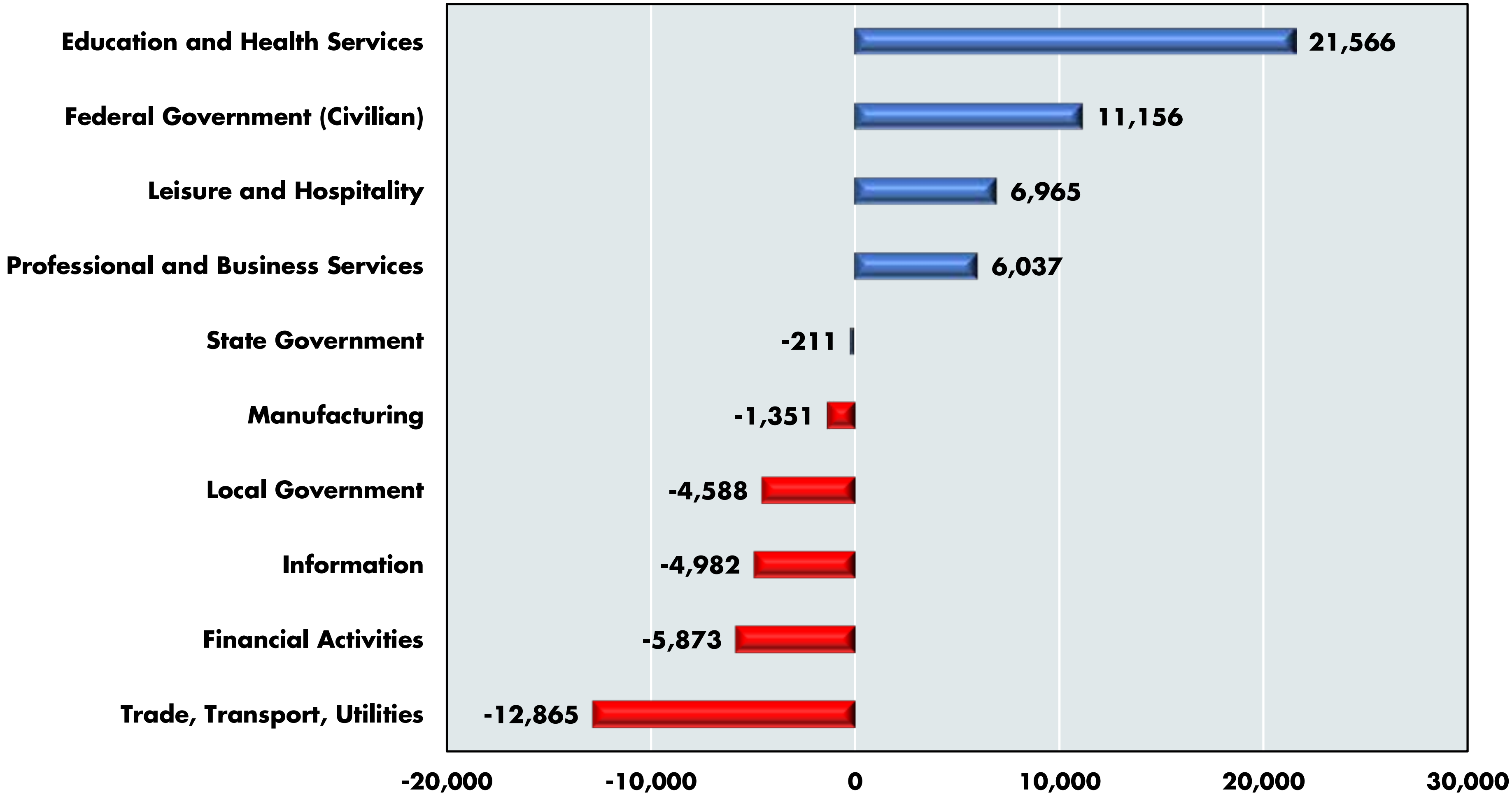
PERCENTAGE CHANGE IN NONFARM PAYROLLS COMPARED TO PRERECESSION PEAK: UNITED STATES, VIRGINIA AND HAMPTON ROADS, 2008-2019*



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Peak prerecession dates are January 2008 (United States), April 2008 (Virginia) and July 2007 (Hampton Roads). Data for U.S. through June 2019, Virginia and Hampton Roads through June 2019. U.S. data are preliminary for the last two months. Virginia and Hampton Roads data are preliminary for the last month. Seasonally adjusted data.

GRAPH 9

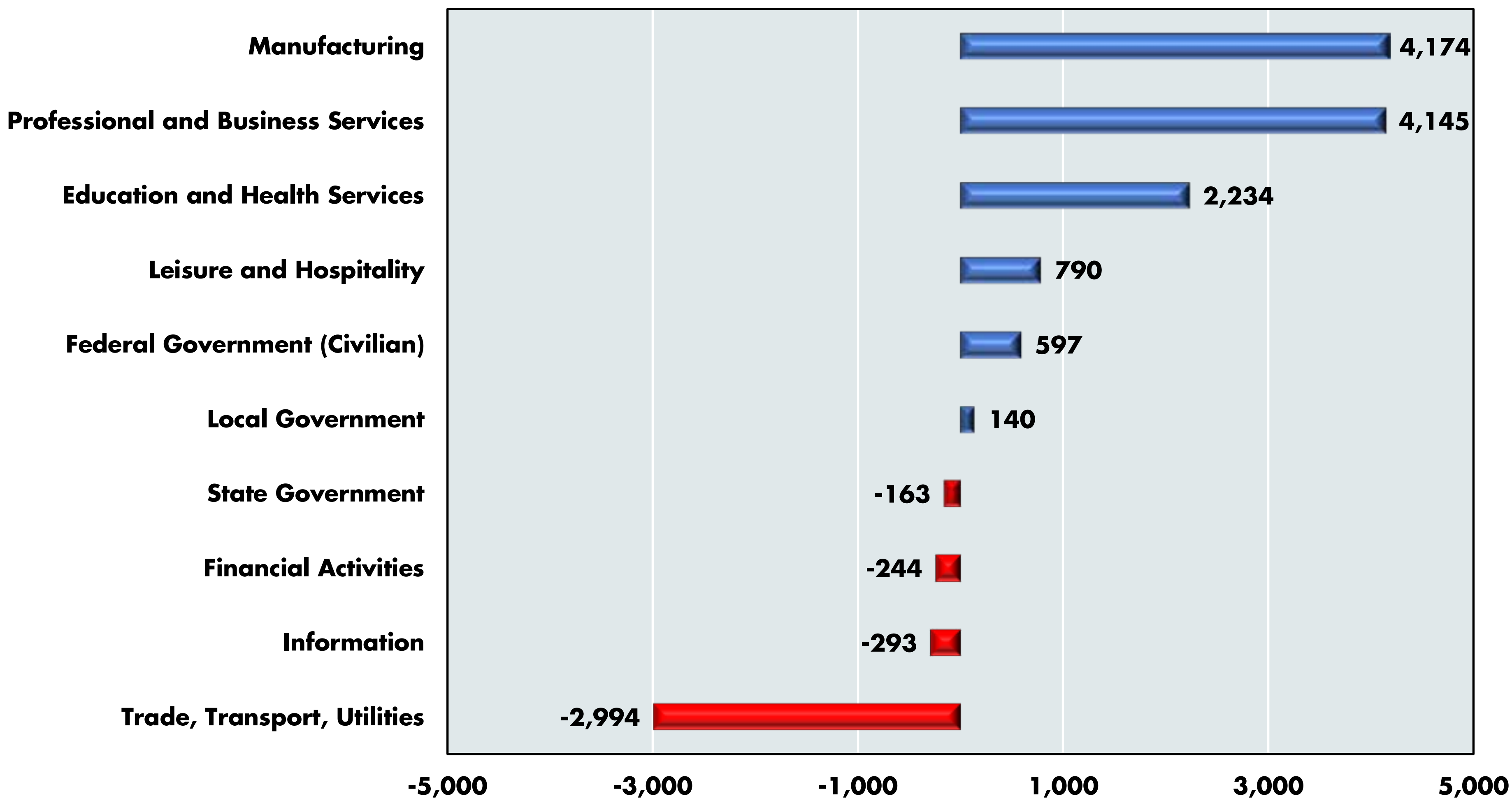
CHANGE IN ANNUAL COVERED EMPLOYMENT (JOBS) IN SELECTED SECTORS: HAMPTON ROADS, 2007-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual data are from the Quarterly Census of Employment and Wages. Fourth quarter 2018 data are preliminary. Due to nondisclosure requirements, we use third quarter 2018 data for financial activities. Data are based on classification of industrial activity defined by the North American Industry Classification System (NAICS). NAICS classifies industries into sectors, which are reported in this graph.

GRAPH 10

CHANGE IN ANNUAL COVERED EMPLOYMENT (JOBS) IN SELECTED SECTORS: HAMPTON ROADS, 2017-2018



Sources: Bureau of Labor Statistics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual data are from the Quarterly Census of Employment and Wages. Fourth quarter 2018 data are preliminary. Due to nondisclosure requirements, we use third quarter 2018 data for financial activities. Data are based on classification of industrial activity defined by the North American Industry Classification System (NAICS). NAICS classifies industries into sectors, which are reported in this graph.

Federal Spending And Employment

The primary driver of the regional economy is federal and, more specifically, Department of Defense (DOD) spending. From the construction of ships and submarines in Newport News to the operation of naval air squadrons in Virginia Beach, the DOD plays a significant role in the regional economy. Graph 11 illustrates estimated direct DOD spending in Hampton Roads. From 2000 to 2012, this spending almost doubled, from $10 billion to $19.8 billion. The passage of the Budget Control Act of 2011 (BCA 2011) and the imposition of discretionary spending caps, however, resulted in an approximate $1 billion decline in direct DOD spending in FY 2013. It took four years for direct spending to recover to FY 2012 levels. Direct spending is forecast to increase to $22.1 billion in FY 2019, fueling economic growth in the region.

On Aug. 2, 2019, President Trump signed the Bipartisan Budget Act of 2019 (BBA 2019) into law. Much like prior BBAs, it is a two-year agreement that raises defense and nondefense discretionary spending caps for FY 2020 and FY 2021. For national defense, BBA 2019 increased the spending caps by $90.3 billion and $81.3 billion for FY 2020 and FY 2021, respectively. Under current law, there are no caps on defense and nondefense discretionary spending for FY 2022 and beyond. Sequestration, essentially, is dead. [8]

With the national defense spending caps increasing to an estimated $738 billion in FY 2020 and $740 billion in FY 2021, DOD expenditures on maintenance, operations, personnel and procurement should continue to rise in Hampton Roads in the near term. These additional federal dollars will fuel faster economic growth in the region in 2020 and, barring unforeseen circumstances, into 2021.

The outcome of the 2020 presidential election and whether the current economic expansion continues past 2020 will likely determine if there will be a retrenchment of defense spending in the early 2020s. We only have to look at the decline and subsequent stagnation of defense spending earlier this decade to understand how a future drawdown would impact regional economic growth.

One component of federal spending is the employment of federal civilian employees and military personnel. Graph 12 presents the composition and federal employment in Hampton Roads from 2001 to 2017. First, as a share of total federal employment, the number of military personnel employed in the region has declined from a peak of approximately 110,000 in 2003 to slightly over 81,000 in 2017. Over the same period, federal civilian employment increased by about 11,000. Hampton Roads had the largest number of military personnel and the second-largest number of federal civilian employees among Virginia's metros in 2017. The slow decline in military personnel, however, is concerning given that military personnel are supported by civilian employees and contractors and indirectly create numerous jobs in the regional economy. Technological advances (which reduce the number of personnel needed to operate ships and airplanes), changes in national security strategy, the increasing cost of military personnel and weapons systems, and the impact of climate change on military infrastructure in Hampton Roads all pose threats to the level of military personnel in the future.

Graph 13 illustrates that the total compensation of federal civilian employees and military personnel (wages, salaries, benefits) reached $14.2 billion in 2017. The average annual compensation for a federal civilian employee in Hampton Roads in 2017 was $113,908, 2.7 times greater than the average compensation of $42,660 for private nonfarm employees locally. Average compensation for military personnel in 2017 was $93,988, about 2.2 times greater than the average private compensation for the region.

For every lost military job, the private sector would need to create more than two jobs on average to replace the lost compensation. If federal civilian employment were to decline, the private sector would need to create almost three jobs on average to replace the lost compensation. The military personnel and federal civilian employees are "economic gold" for our region, providing not only high skills and abilities, but also earning higher than average compensation.

8 The DOD base budget is at least 90% of national defense (budget function 050) expenditures. Overseas contingency operations are not subject to the discretionary spending caps.

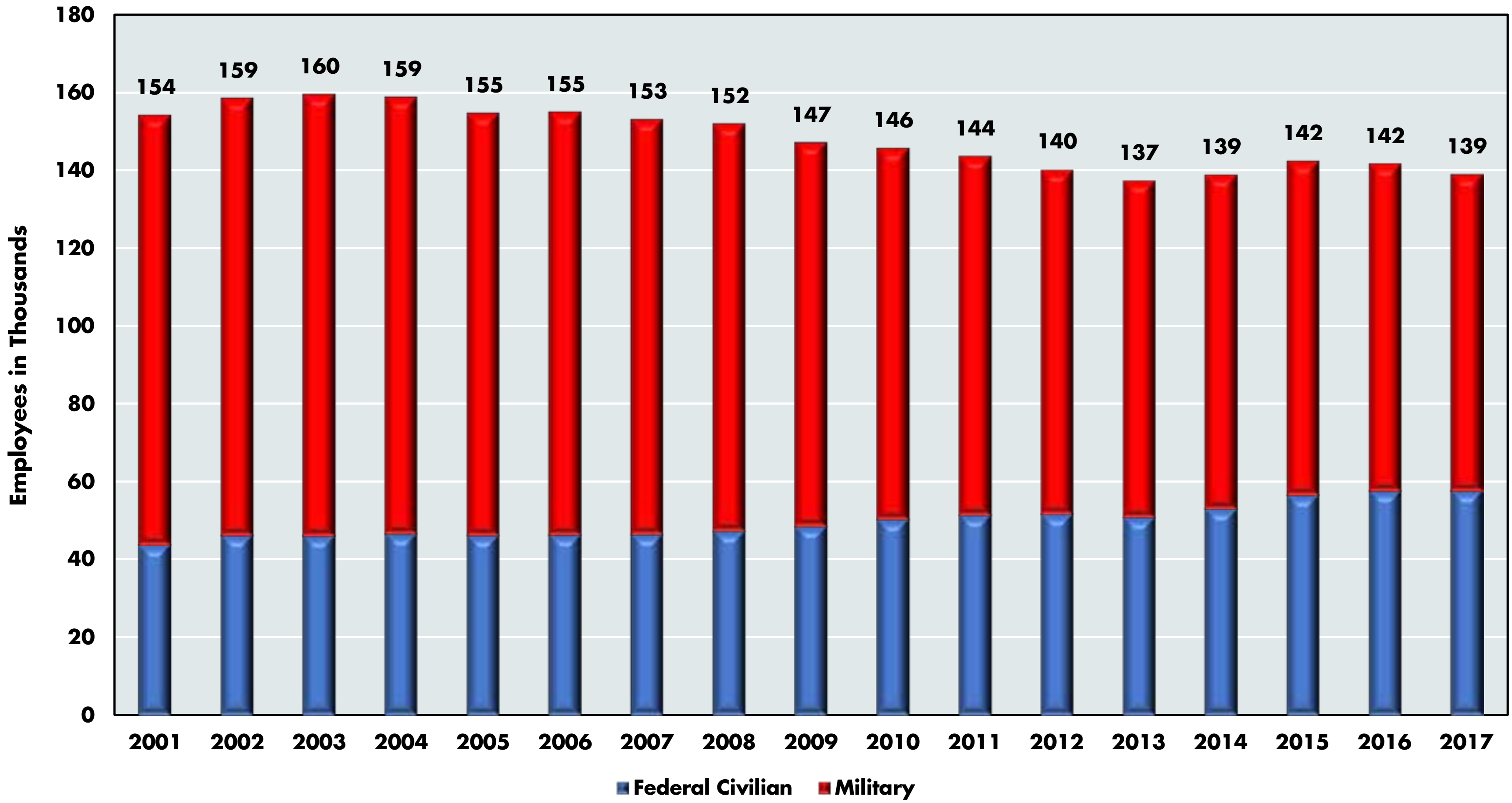
GRAPH 11

ESTIMATED DIRECT DEPARTMENT OF DEFENSE SPENDING: HAMPTON ROADS, 2000-2019

Sources: Department of Defense and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 12

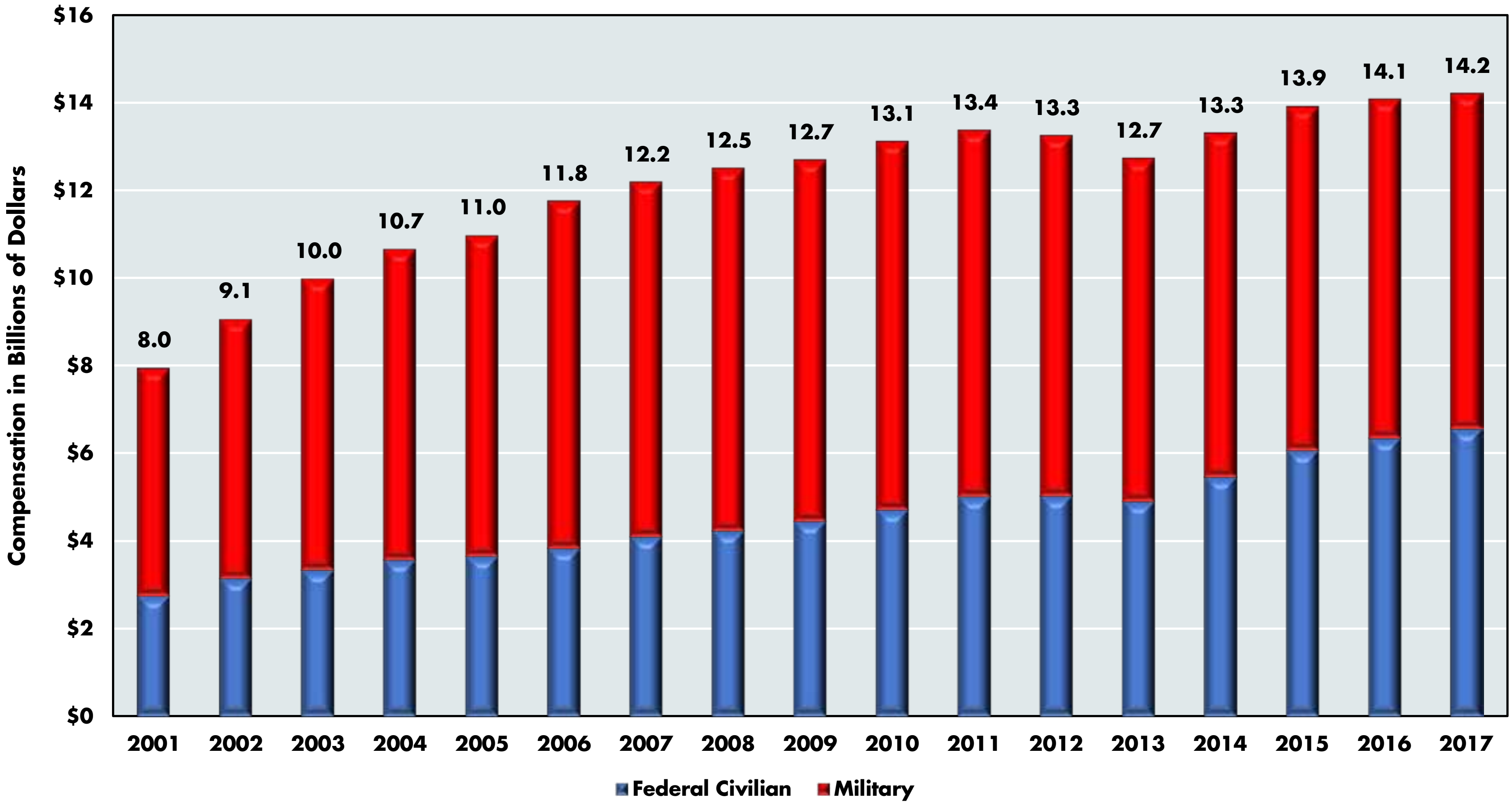
MILITARY AND FEDERAL CIVILIAN EMPLOYMENT: HAMPTON ROADS, 2001-2017



Sources: Bureau of Economic Analysis, CAEMP25N, Total Full-Time and Part-Time Employment by NAICS Industry, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Employment obtained by county and summed to the September 2018 metropolitan area definition.

GRAPH 13

MILITARY AND FEDERAL CIVILIAN TOTAL COMPENSATION (IN BILLIONS OF NOMINAL DOLLARS): HAMPTON ROADS, 2001-2017



Sources: Bureau of Economic Analysis, CAEMP25N, Total Full-Time and Part-Time Employment by NAICS Industry, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Compensation includes wages, salaries, employer-provided benefits and employer contributions to social insurance programs. Compensation obtained by county and summed to the September 2018 metropolitan area definition.

Troubling Signs In Establishment Data

An establishment is the single physical location where business is conducted or where services or industrial operations are performed. A region's economic activity is not only reflected in the value of output and the number of people employed by businesses, but also in whether the number of establishments is growing over time. Regions displaying robust economic growth will display gains in output, employment and establishments. Regions that are performing relatively poorly will display slow growth or declines in output, employment and establishments.

At the start of the century, establishment growth in Hampton Roads reflected the region's improving economic performance with the number of establishments peaking at slightly more than 40,000 in 2007 (Graph 14). As one might expect, the number of establishments declined during the Great Recession but there still hasn't been a complete recovery. At the end of 2016 (the most recent data), there were still about 2,220 fewer establishments than prior to the Great Recession.

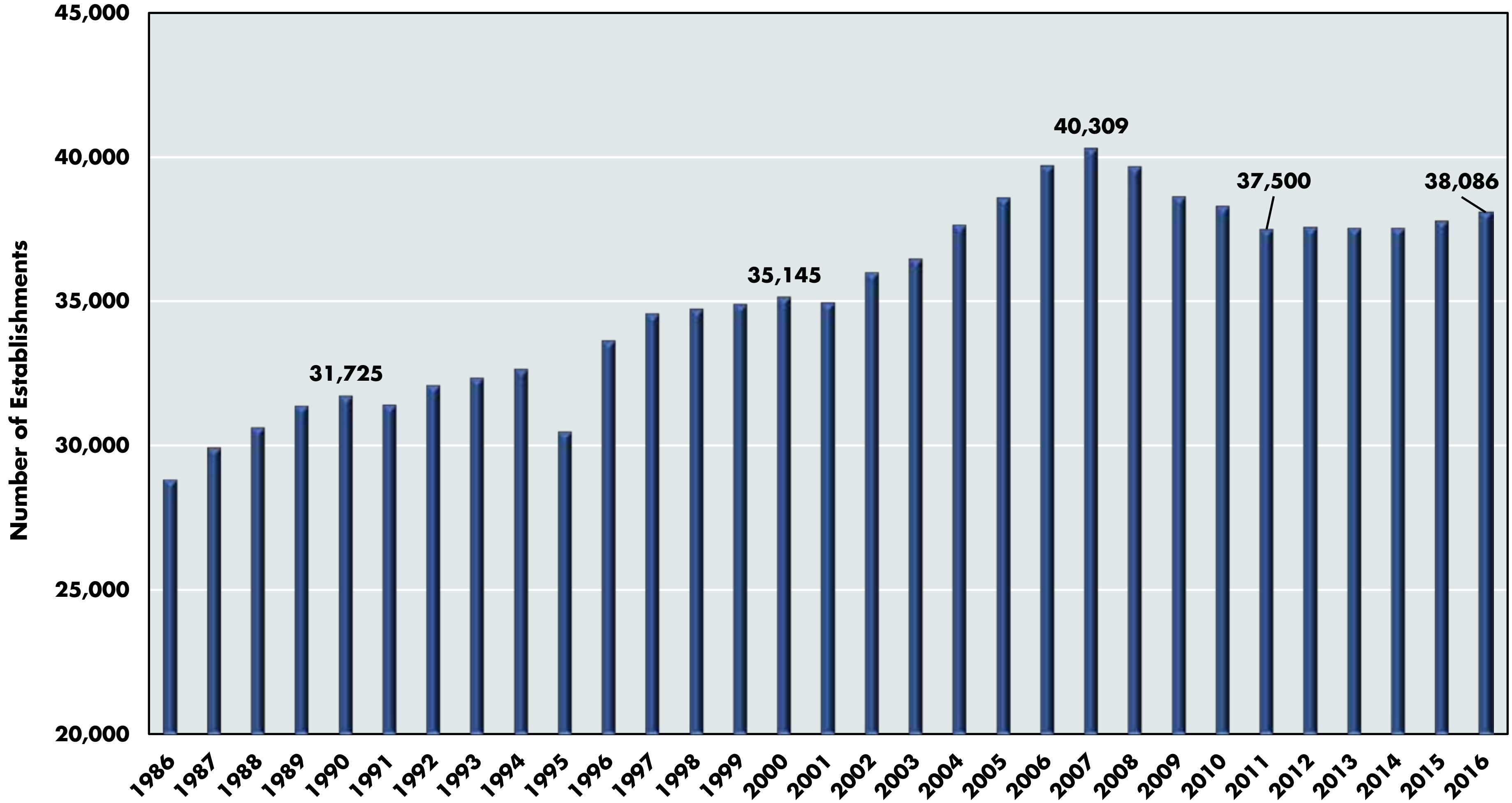
A downturn in establishment growth is not only occurring in our region, but also in Virginia and the United States. Table 4 displays the annual average growth in establishments for the nation, state and jurisdictions in the Hampton Roads metropolitan area. While our region outperformed the nation in the first decade of the century, neither Virginia nor Hampton Roads performed as well as the nation in the first six years of the current decade. Given the recent upticks in economic activity in the Commonwealth and the region, however, it may turn out that the number of establishments surged in the state and Hampton Roads in 2017 and 2018.

Focusing on the current decade, only Currituck County, Suffolk and Williamsburg had establishment growth rates in excess of the national average. Williamsburg's establishment growth rate of 2.1% from 2010 to 2016 was over three times greater than the state average and over twice the national average. However, this is a recovery from a severe contraction in the previous two decades rather than an expansion from previous growth.

Of particular concern is the contraction in the number of establishments in a majority of localities in Hampton Roads. The loss of establishments in these jurisdictions is another sign of lagging economic activity and, in many cases, corresponds to slow (or declining) population and employment growth. When individuals do not start new businesses, the outlook for future economic growth is cloudy.

GRAPH 14

NUMBER OF BUSINESS ESTABLISHMENTS: HAMPTON ROADS, 1986-2016



Sources: U.S. Census Bureau, County Business Patterns, and the Dragas Center for Economic Analysis and Policy, Old Dominion University

TABLE 4

ANNUAL AVERAGE BUSINESS ESTABLISHMENT GROWTH, UNITED STATES, VIRGINIA AND HAMPTON ROADS

	Annual Business Establishment Growth, 1990-1999	Annual Business Establishment Growth, 2000-2009	Annual Business Establishment Growth, 2010-2016
United States	+1.4%	+0.6%	+0.8%
Virginia	+1.7%	+1.1%	+0.6%
Hampton Roads	+1.1%	+1.1%	-0.1%
Camden County	+3.9%	+2.0%	+0.3%
Currituck County	+6.2%	+3.1%	+1.3%
Gates County	+0.3%	+0.0%	-1.2%
Gloucester County	+2.3%	+1.2%	-0.8%
Isle of Wight County	+1.6%	+2.2%	-0.1%
James City County	+12.8%	+5.4%	+0.7%
Mathews County	+0.5%	-1.2%	-0.5%
Southampton County	+2.8%	-1.6%	-1.1%
York County	+5.5%	+2.4%	-0.6%
Chesapeake	+3.4%	+2.0%	+0.0%
Franklin	-2.4%	+2.5%	-1.7%
Hampton	+0.0%	-0.2%	-0.3%
Newport News	+0.4%	+0.3%	+0.1%
Norfolk	-1.2%	+0.8%	-1.5%
Poquoson	+0.5%	+2.5%	-1.8%
Portsmouth	-0.6%	+0.9%	-1.0%
Suffolk	+0.7%	+2.9%	+1.0%
Virginia Beach	+1.7%	+0.7%	+0.5%
Williamsburg	-4.7%	-5.5%	+2.1%

Sources: U.S. Census Bureau, County Business Patterns, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Annual growth rate is the compound annual growth rate.

The Port Of Virginia: Increasing Profits, Troubled Waters?

At the beginning of the decade, the Port was spending more money on operations than it was receiving in revenue. Quite simply, it was losing money. General cargo tonnage and 20-foot equivalent container unit (TEU) traffic had fallen due to the Great Recession. More troubling, the Port was losing market share to its major competitors on the East Coast, including the ports of New York-New Jersey and Savannah, Georgia. Staying the course was not a remedy for what ailed the Port.

However, the Port of Virginia has undergone a financial transformation. Operating revenue has more than doubled from approximately $209 million in 2010 to $537 million in 2018 (Graph 15).[9] The net position of the Virginia Port Authority, which is the broadest measure of assets and liabilities, also exceeded $620 million at the end of FY 2018, well above any level this decade. Recent data for FY 2019 suggest that total TEUs increased by 3.9% and loaded import TEUs were up by 5.2%, but loaded export TEUs were down 4%.[10] While the increase in loaded TEU imports is good news, the decline in loaded TEU exports may be a signal of the economic impact of the trade conflicts with Virginia's major trading partners.

Unlike other parts of the regional economy, which are closely tied to decisions on defense spending in Washington, D.C., the Port is highly integrated into the global economy. While the regional economy was limping along in the early years of the decade, the global economy rebounded sharply from the financial crisis and continued global growth has led to sustained increases this decade in cargo traffic (Graph 16).

However, cargo tonnage did not grow from 2017 to 2018 due to capacity constraints at the Port and the ongoing trade conflicts with China and other major trading partners. Even if the ongoing trade conflicts abate by the end of 2019, it may take years to recover from the loss of market share to foreign competitors.

The Port of Virginia also faces well-funded competition from other ports on the Eastern Seaboard. While total trade volumes have increased over the last decade, these gains have not been evenly distributed among the Port of Virginia and its competitors. Savannah has gained market share this decade while New York-New Jersey has lost market share (Graph 17). Charleston, South Carolina, has seen a slight increase in the percentage of TEU traffic over the same period. The Port of Virginia, on the other hand, saw market share rise to a high of 18.3% in 2013 before falling back to 16.6% in May of 2019. While a decline of approximately 1.6 percentage points may not sound like much, when there are millions of TEUs loaded every year on the East Coast, the decline in market share represents a significant loss of potential traffic.

Wisely, the Port of Virginia has not been standing still as change has buffeted the shipping industry. Recently, the Port installed four new 170-foot-tall ship-to-shore cranes to speed the offloading and loading of container ships. **From 2011 to mid-2019, the average number of TEUs per container vessel increased by a staggering 85% at the Port (Graph 18). Ships are getting larger and ports that invest in processing larger ships will, over time, be rewarded with more cargo traffic. The Port and the Commonwealth must continue to make investments to accommodate larger ships.**

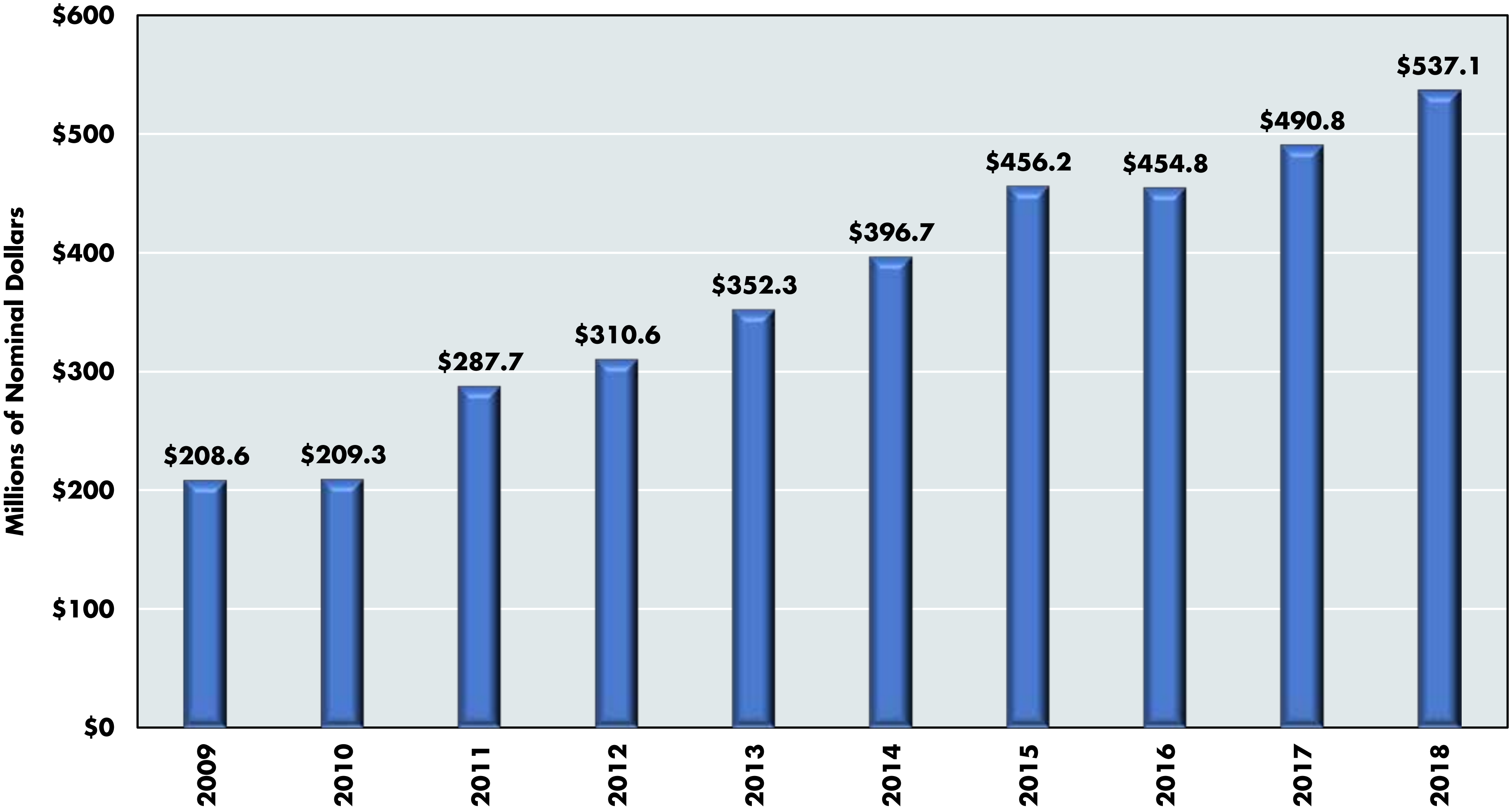
We cannot forecast fair winds and following seas for the Port of Virginia in the near term. While a resolution to the ongoing and threatened trade conflicts would bring a sense of relief, how exports and imports would recover over time is unknown. Would foreign businesses that have found suppliers in other nations readily return to buying goods and services from American farmers and businesses? We do know that tariffs are paid for by American importers and then either absorbed (lowering profits), passed along to consumers (increasing prices) or both. At some point, the increased inefficiencies from tariffs will act as a drag on the U.S. economy.

9 We recognize that financial statements may be revised in the light of new leases and accounting standards, and refer readers to the latest reports available on the Virginia Port Authority's website.

10 Port of Virginia, June 23, 2019, "FY 2019 Yield Cargo Record, Completion of Construction at VIG, Progress on Multiple Projects."

GRAPH 15

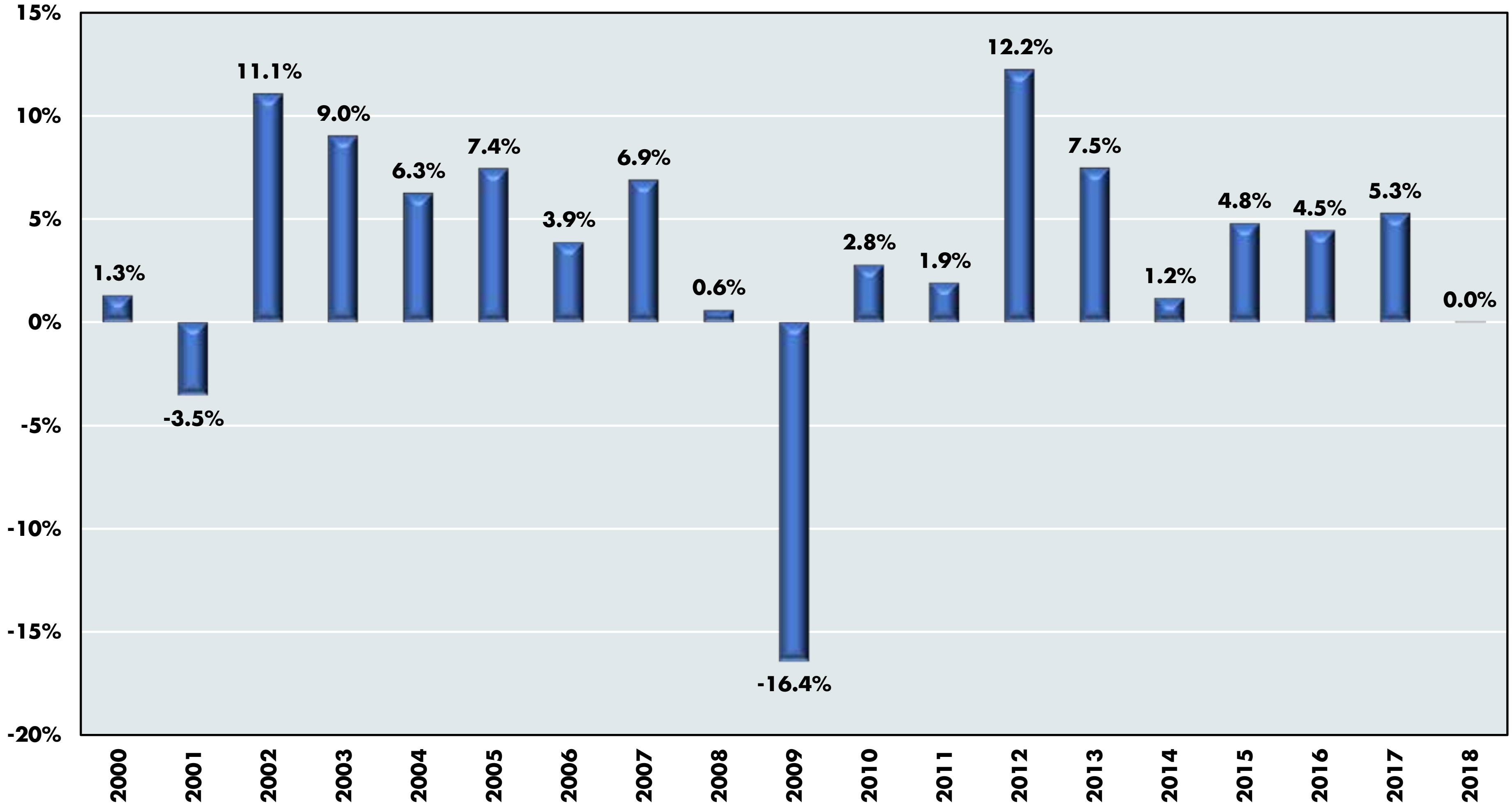
TOTAL OPERATING REVENUES: VIRGINIA PORT AUTHORITY, FY 2009-FY 2018



Source: Virginia Port Authority, 2018 Comprehensive Annual Financial Report

GRAPH 16

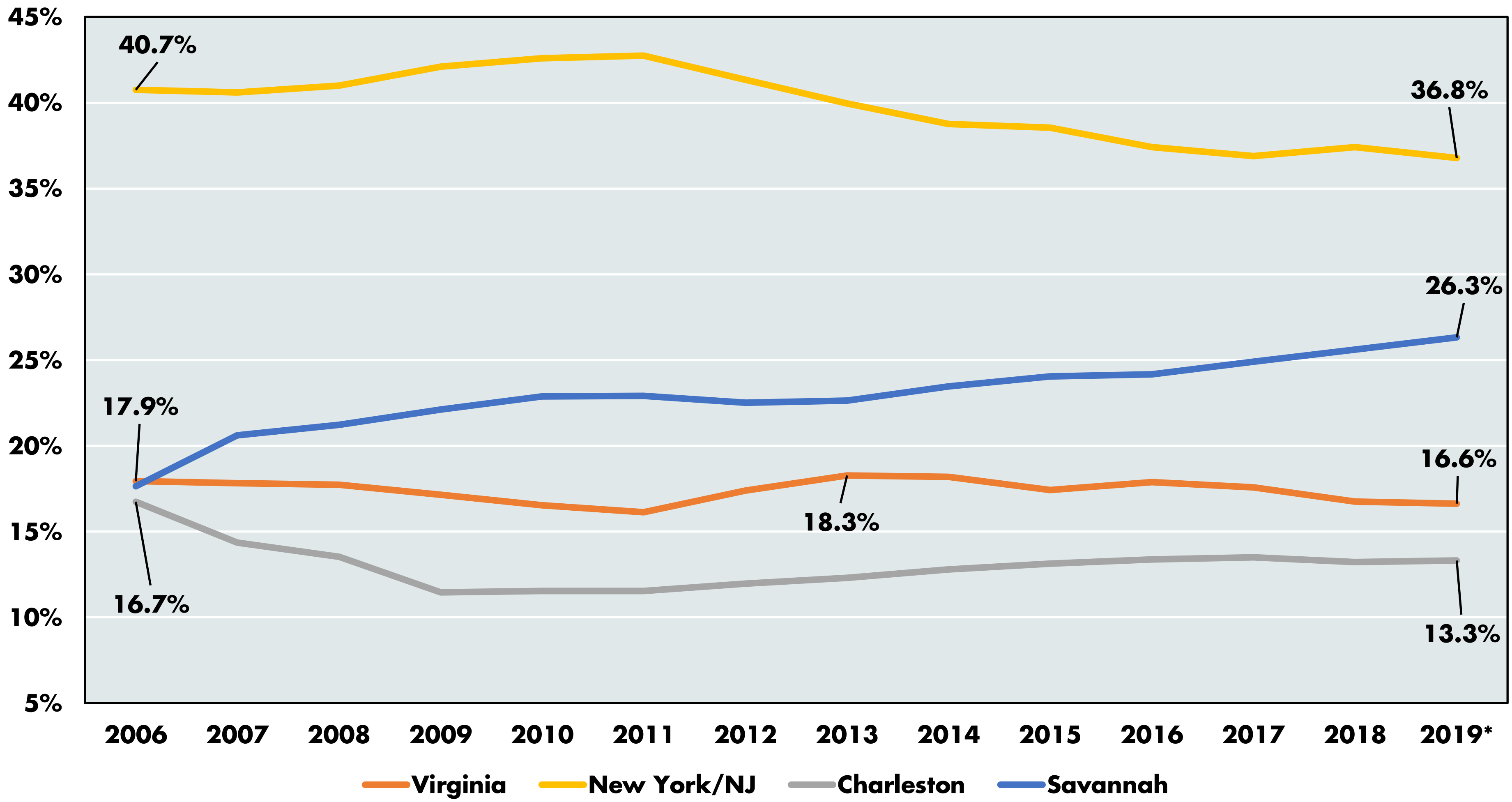
ANNUAL CHANGE IN GENERAL CARGO TONNAGE: PORT OF VIRGINIA, 2000-2018



Source: Virginia Port Authority, Comprehensive Finance Reports, various years

GRAPH 17

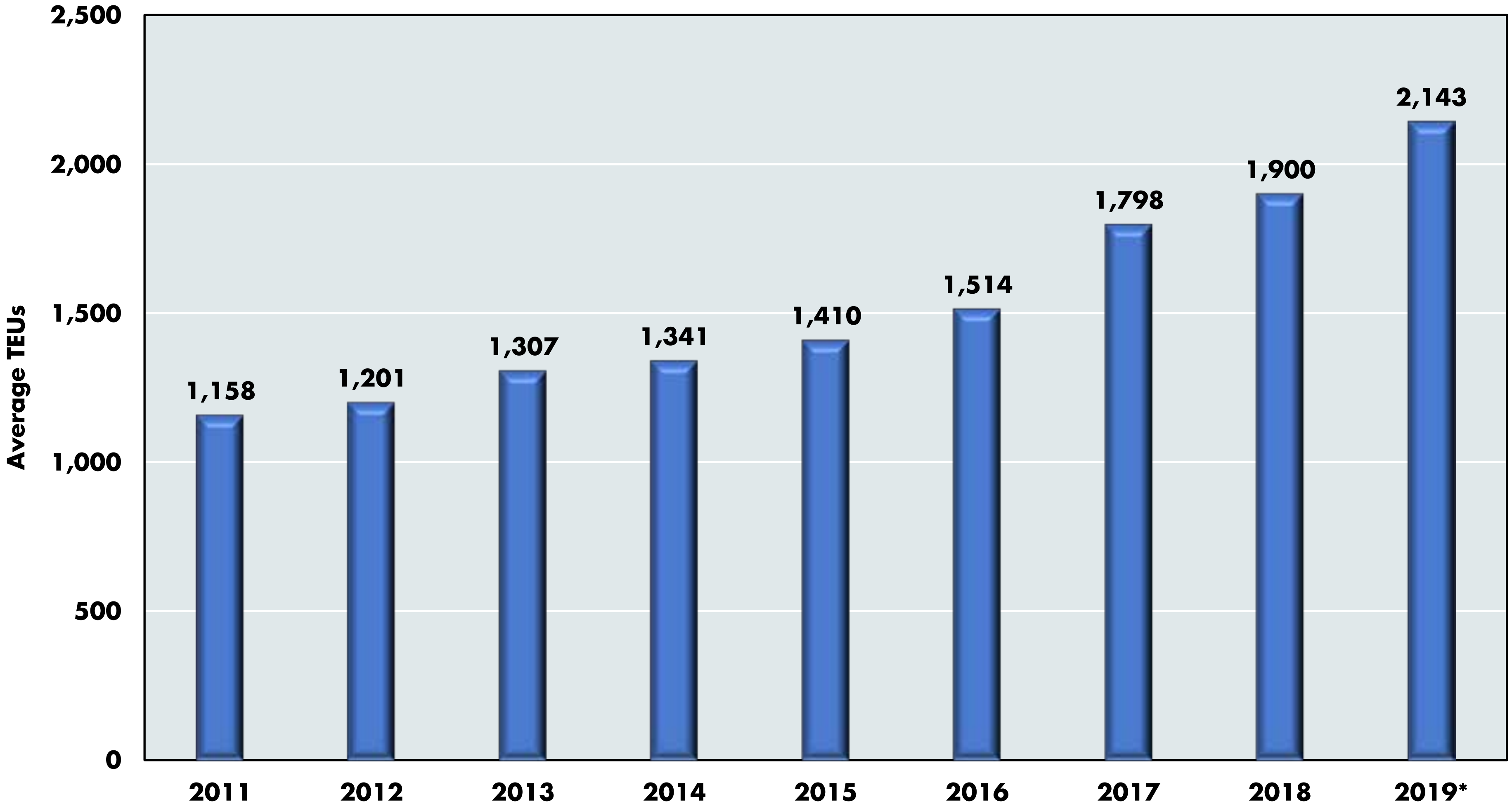
SHARES OF LOADED 20-FOOT EQUIVALENT CONTAINER UNITS (TEUS): SELECTED PORTS ON THE EAST COAST, 2006-2019



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. *For 2019, data are through May 2019.

GRAPH 18

AVERAGE TEUS PER CONTAINER VESSEL CALL: PORT OF VIRGINIA, 2011-2019*



Sources: Virginia Port Authority and the Dragas Center for Economic Analysis and Policy, Old Dominion University. *For 2019, data are through May 2019.

For now, however, we can say that the costs of tariffs have been unevenly spread across the country. Compared to states that are heavily engaged in agriculture or automobile production, Virginia has not been heavily damaged.

The Port also must contend with slowing global economic growth. Not only has Europe slowed, but China and many other Asian countries also are experiencing downturns in the rate of growth. As growth slows in a country, its demand for imported goods nearly always declines, and hence, trade, slacks off. The challenge for the Port and, by extension, the Commonwealth, is to continue to make investments in increasing capacity, improving efficiency and dredging the shipping channel. These investments would strengthen a key pillar of the Hampton Roads economy.

Housing: It's A Seller's Market

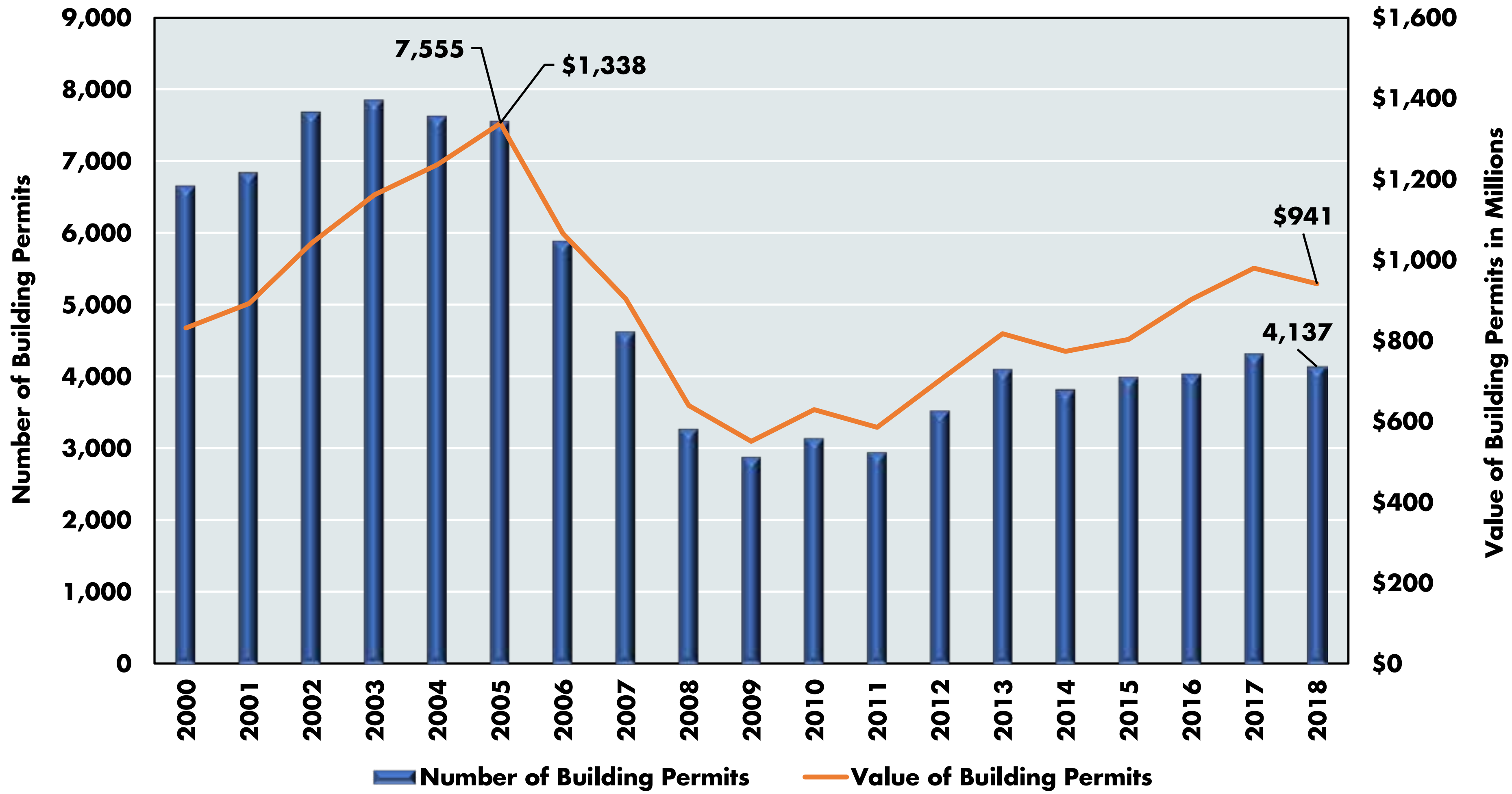
In many ways, Hampton Roads is distinctive. From the region's relationship to the military to coping with sea level rise, Hampton Roads is different from many other large metropolitan areas in the United States. The real estate market provides an example. It was slow to recover from the Great Recession but now is experiencing surges in sales and median sales prices. Let's take a closer look at what's happening to residential housing in Hampton Roads.

Like many other markets in the U.S., the construction of single-family residential housing has undergone a structural change since the Great Recession. The number of single-family building permits started falling in 2005 and continued to decline through 2009. Unlike previous declines in residential construction, there has not been a rebound in residential construction activity this decade (Graph 19). The total number of single-family building permits in Hampton Roads was 45% lower in 2018 than in 2005 and the value of the permits was 30% lower over the same period.

With a relatively stagnant regional economy in the first part of the decade, single-family home sales recovered, but slowly. Sales of existing homes dominated the market this decade, easily outpacing the growth in new-construction sales (Graph 20). Without a marked increase in supply, the market for existing homes slowly cleared over time. The median sales price of existing homes peaked at $223,000 in 2007. At its nadir, the median sales price of existing homes was $180,000 in 2011. It took another seven years for the price of existing homes to eclipse the prerecession peak. In 2018, the median sales price was $225,000 and more recent data in 2019 suggest that prices have continued to increase.

GRAPH 19

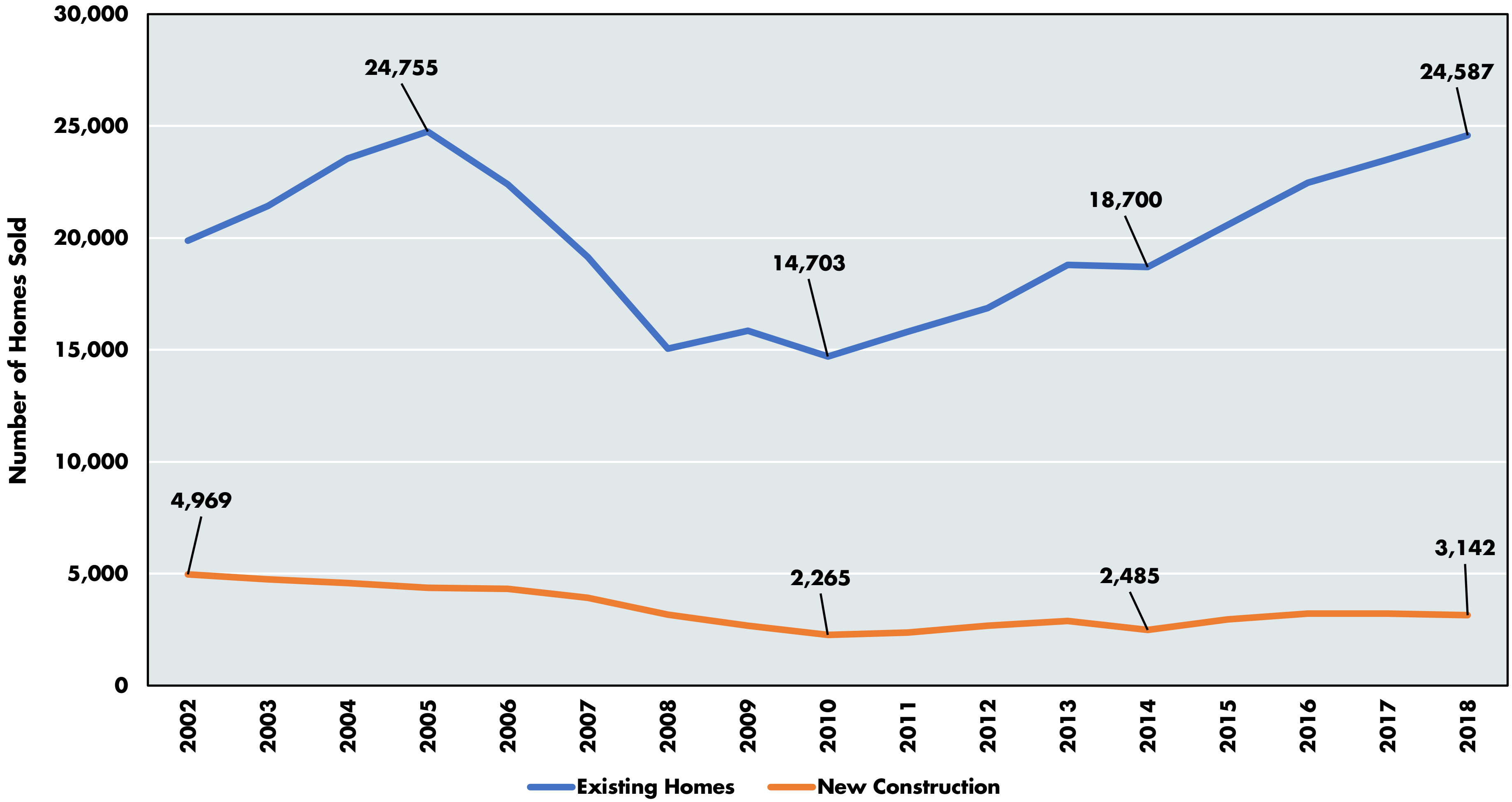
NUMBER AND VALUE OF ONE-UNIT SINGLE-FAMILY RESIDENTIAL BUILDING PERMITS: HAMPTON ROADS, 2000-2018



Source: U.S. Census Bureau, Building Permits Survey by Metropolitan Area (2019)

GRAPH 20

SALES OF EXISTING AND NEW-CONSTRUCTION SINGLE-FAMILY HOMES: HAMPTON ROADS, 2002-2018



Sources: Real Estate Information Network (REIN) and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Figures reported here represent only those properties that are listed through REIN by REIN members and may not represent all new construction activity in our region.

Table 5 shows that the median sales price of existing homes in 2018 finally exceeded the prices observed prior to the Great Recession. The increase is nothing to crow about – only 1% in nominal terms – but is welcome news for homeowners (albeit not so welcome news for home buyers). Within Hampton Roads, the recovery in housing prices has been uneven. Some jurisdictions (Chesapeake, Virginia Beach and Williamsburg, for example) are seeing strong growth in sales and prices. Other localities continue to struggle. Invariably, economic activity and population growth are tightly correlated with housing demand. Jurisdictions that are increasing in population and business activity are more likely to have higher housing demand and sales prices.

With so many other regions experiencing annual double-digit growth in the median sales prices of existing homes, why has it taken so long for Hampton Roads to recover? First, about one-third of home sales in our region are financed with a Veterans Administration loan. These loans typically require a smaller down payment and thus buyers have less "skin" in the game. Second, with slower economic and population growth, demand for housing has not increased as fast as in other regions, so it has taken the market longer to clear out distressed properties. Short sales and bank-owned properties sell at a substantial discount and depress market prices.

While the number of residential foreclosure filings was at its lowest point in a decade in 2018, it still was twice the level observed in 2007 and almost seven times higher than 2006 (Graph 21). Foreclosure filings are still well above prerecession levels and may be a signal of the financial weakness of homeowners in the region and their vulnerability to a significant economic downturn.

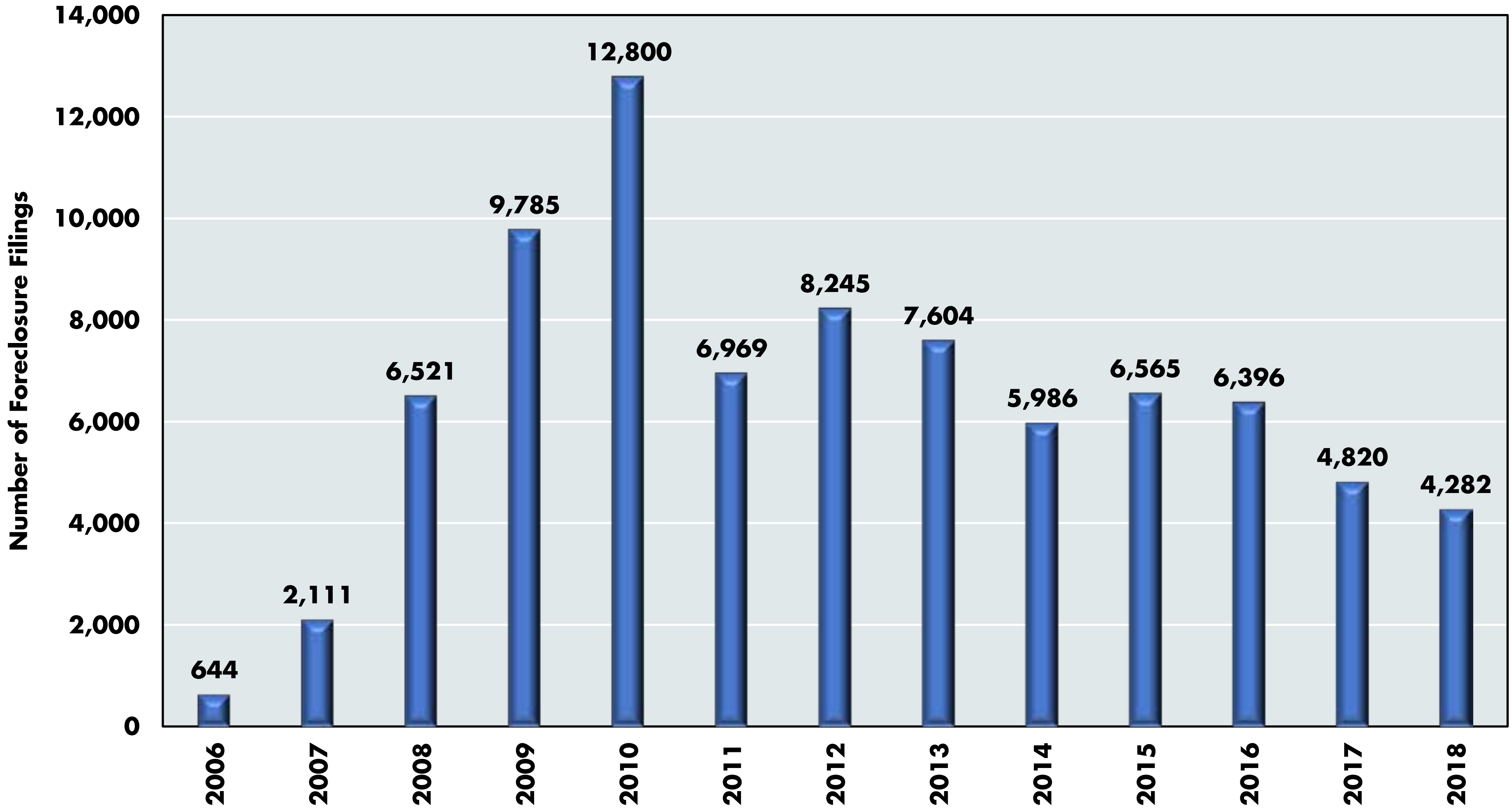
TABLE 5
MEDIAN SALES PRICE OF EXISTING RESIDENTIAL HOUSING: SELECTED CITIES IN HAMPTON ROADS, 2007 AND 2018

	Median Sales Price 2007	Median Sales Price 2018	Percent Change in Median Sales Price
Chesapeake	$250,100	$254,900	+1.9%
Norfolk	$195,000	$192,000	-1.5%
Portsmouth	$165,500	$149,900	-9.4%
Suffolk*	$257,500	$243,000	-5.6%
Virginia Beach	$245,000	$254,900	+4.0%
Hampton	$180,000	$165,900	-7.8%
Newport News	$199,250	$179,000	-10.2%
Williamsburg**	$284,450	$291,500	+2.5%
Hampton Roads	$223,000	$225,000	+0.9%

Sources: Real Estate Information Network and the Dragas Center for Economic Analysis and Policy, Old Dominion University. *Median price in Suffolk peaked in 2006 at $263,950. **Williamsburg represents Poquoson, Williamsburg, James City County, York County and Gloucester County.

GRAPH 21

NUMBER OF RESIDENTIAL FORECLOSURE FILINGS: HAMPTON ROADS, 2006-2018



Sources: Attom Data Solutions (formerly known as RealtyTrac) and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Filings include Notice of Trustee Sale and Real Estate Owned (owned by the lender).

Is The Cost Of Housing "Reasonable" In Hampton Roads?

Hampton Roads often sells itself as an affordable place to live with a high quality of life. Undoubtedly, if one has commuted in Washington, D.C., Los Angeles or a number of other major metropolitan areas, our traffic seems almost bearable. And horror stories abound of expensive housing costs in many large cities, such as San Francisco, where the cost of renting a one-bedroom can exceed $4,000 a month.[11] The 2019 Home Affordability Report by Unison provides data to compare how long it would take an individual earning the median level of income to save for a down payment on a residence.[12] In the 2019 report, the most expensive metro area in the U.S. was the Santa Cruz-Watsonville MSA, with a median home value of $728,336 and median income of $69,525. Assuming that an individual earning the median income in the Santa Cruz-Watsonville MSA could save 5% annually for a down payment, it would take 42 years for this person to save enough for a 20% down payment. Even with a 20% down payment, the mortgage payment for principal and interest would be over $3,500 a month.

Clearly, owning a home in Hampton Roads is not nearly as challenging as it is in the Santa Cruz-Watsonville MSA. But just how affordable is a residence in our region? Graph 22 compares Hampton Roads with peer and aspirational metropolitan areas. An individual earning the median annual income in our region and saving 5% of his or her income would need approximately 16 years to save enough for a 20% down payment. In 2018, the median housing value in Hampton Roads was the second highest among the peer metros, while median income was fourth highest.

However, Hampton Roads was not the most expensive metropolitan area in Virginia. By far, the costliest was the Washington, D.C., metro area, where the median housing value was almost $430,000. Median household income was nearly $100,000 for this metro area, so the median-income earner would need 17 years to accumulate enough for a 20% down payment. The Charlottesville MSA was also reported to have a 17 years to save index value, while Harrisonburg had a 16-year value. Among Virginia's metro regions, Martinsville had the lowest value (10 years) due to a median housing value of almost $93,000 and a median household income of around $37,000.

If owning a home is more expensive, then perhaps renting is the affordable alternative. In the 2018 State of the Region Report, we examined the expansion of multifamily housing in Hampton Roads and the increase in the quality of multifamily housing. Nationally, and in our region, multifamily housing vacancies have declined recently and are projected to decline in the coming years. Baby boomers are retiring and downsizing, in many cases from single-family to multifamily housing. At the same time, homeownership rates for younger generations are lower, in part due to increasing housing prices and increasing levels of student debt. **According to the U.S. Census Bureau, the rental vacancy rate for Hampton Roads fell from 8.2% in 2017 to 7.1% in 2018.[13] Lower vacancies coupled with higher demand have increased median rents in the region and the nation.**

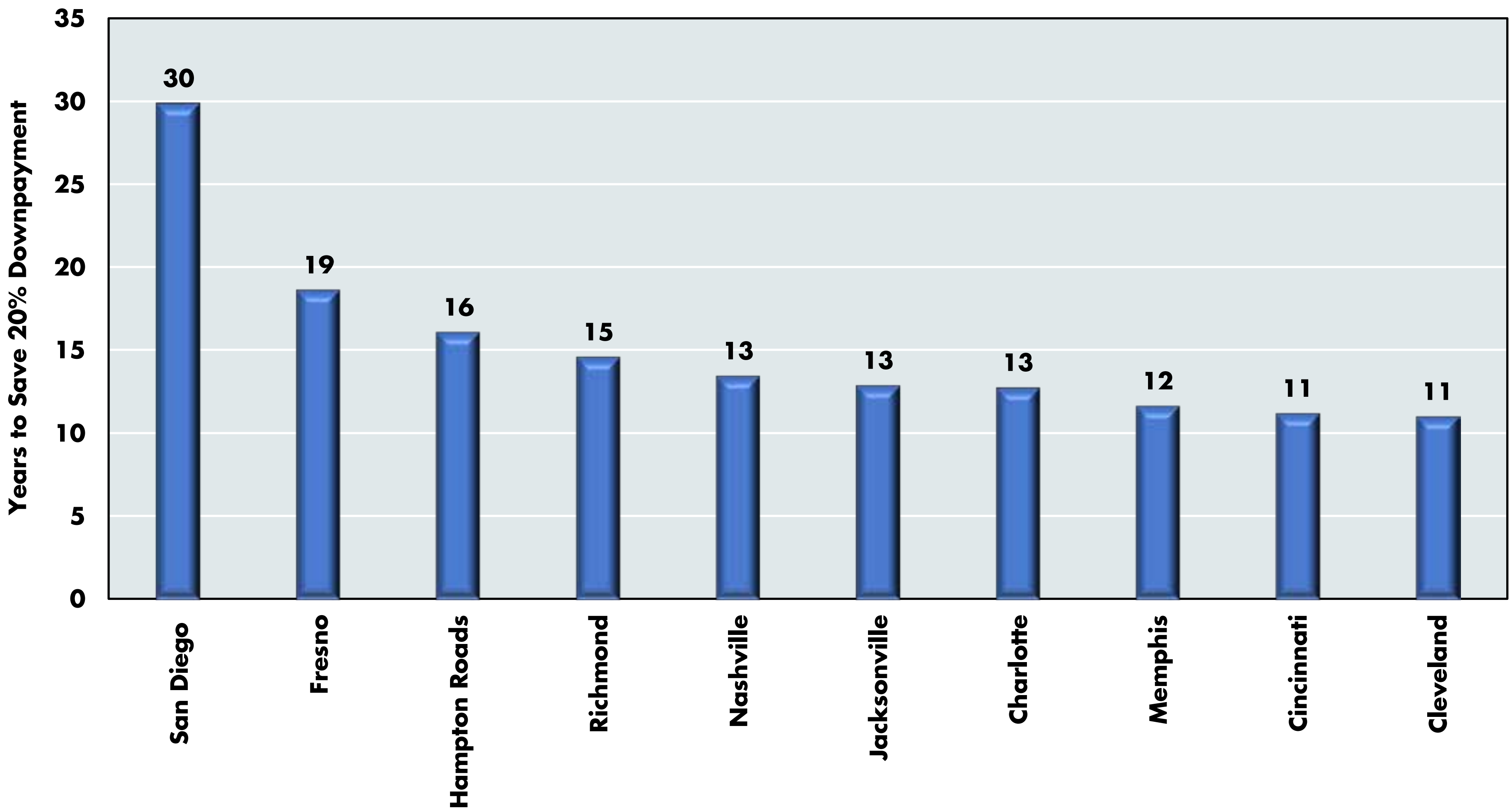
Graph 23 compares the real (inflation-adjusted) median rent and the housing payment for a three-bedroom home in Hampton Roads. When housing prices were increasing rapidly prior to the Great Recession, renting was relatively cheaper than owning. The steep decline and slow recovery of housing values after the recession meant that it became, on average, cheaper to own than rent. Even with the recent growth in median sales prices, the monthly cost of homeownership is still below monthly rent. Yet, while surveys suggest that many renters aspire to homeownership, their lack of savings and the time it takes to accumulate savings remain. For many, this has been an insurmountable barrier.

11 https://sf.curbed.com/2019/7/2/20678607/san-francisco-rent-comparisons-curbed-bayview-glen-park
12 https://contentimages.o-prod.unison.com/images/downloads/Unison_Affordability-Report_2019.pdf

13 U.S. Census Bureau, Housing Vacancies and Homeownership (2019), Table 6, Rental Vacancy Rates for the 75 Largest Metropolitan Areas in the United States.

GRAPH 22

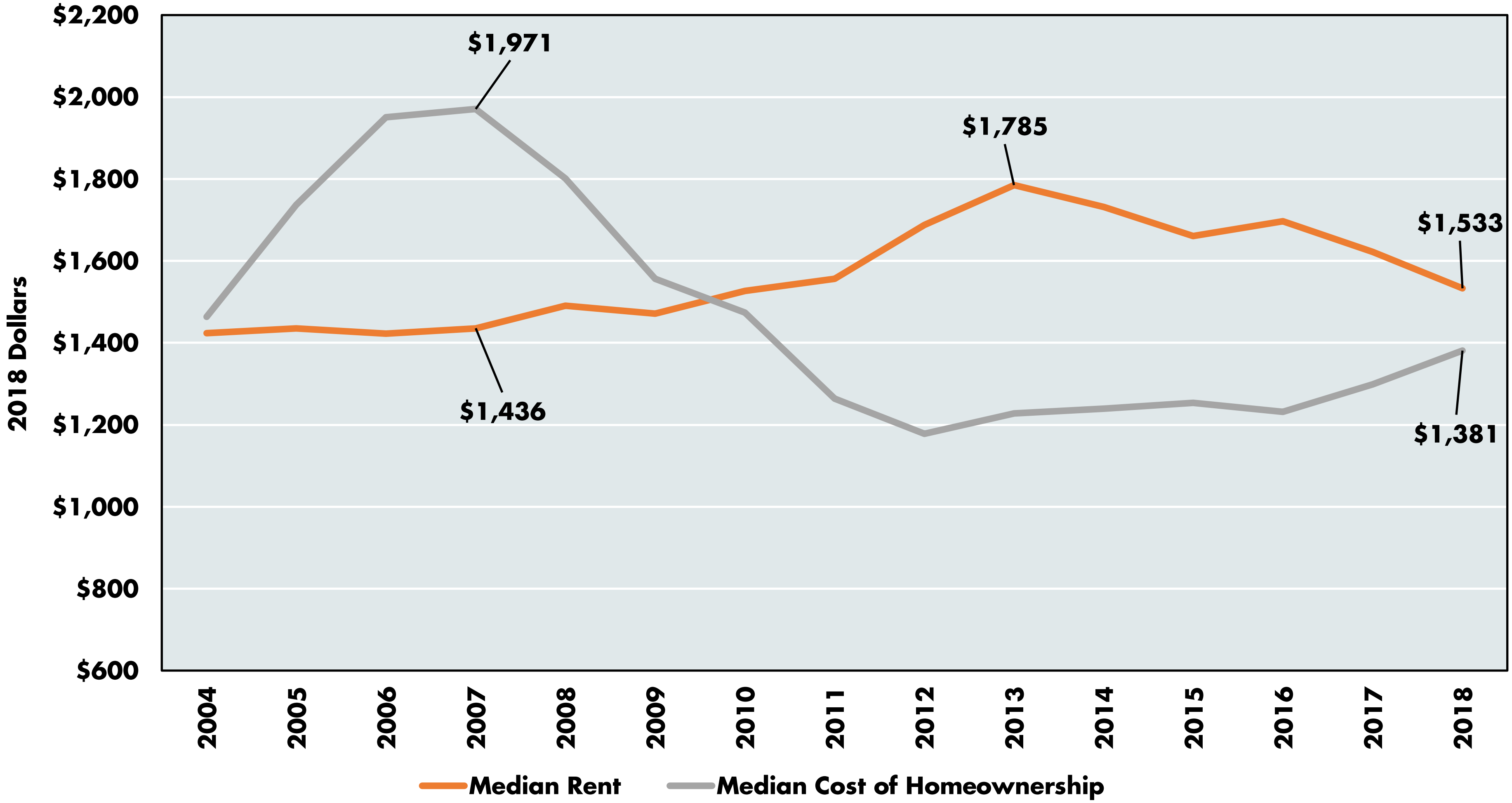
YEARS TO SAVE A 20% DOWN PAYMENT FOR A MEDIAN-INCOME EARNER: SELECTED METROPOLITAN AREAS, 2018



Source: Unison 2019 Home Affordability Report

GRAPH 23

MEDIAN RENT AND MEDIAN COST OF HOMEOWNERSHIP IN 2018 DOLLARS: THREE-BEDROOM HOUSE IN HAMPTON ROADS, 2004-2018



Sources: U.S. Department of Housing and Urban Development and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Rent estimates are for the 50th percentile. It is assumed that the real estate tax rate is 1% and the tax reduction received by homeowners would compensate for homeowner's insurance and maintenance expenditures. Prevailing 30-year-average mortgage rate is used for each year. Consumer Price Index for Housing obtained from the Bureau of Labor Statistics.

The Hotel Sector Sets A Record Or Two

2018 was a good year for the hospitality and tourism industry in Hampton Roads and that was before the Something in the Water festival in 2019. As reported in Graph 24, the number of hotel rooms in the region increased by about 200 from 2017 to 2018, yet remained about 2,500 rooms below the peak of 2010. More importantly, the hotel occupancy rate continued to rise in 2018. Average occupancy rose to 63% in 2018, almost 10 percentage points higher than the low in 2013. As occupancy has risen steadily since 2014, it should be no surprise that hotel revenues have increased as well.

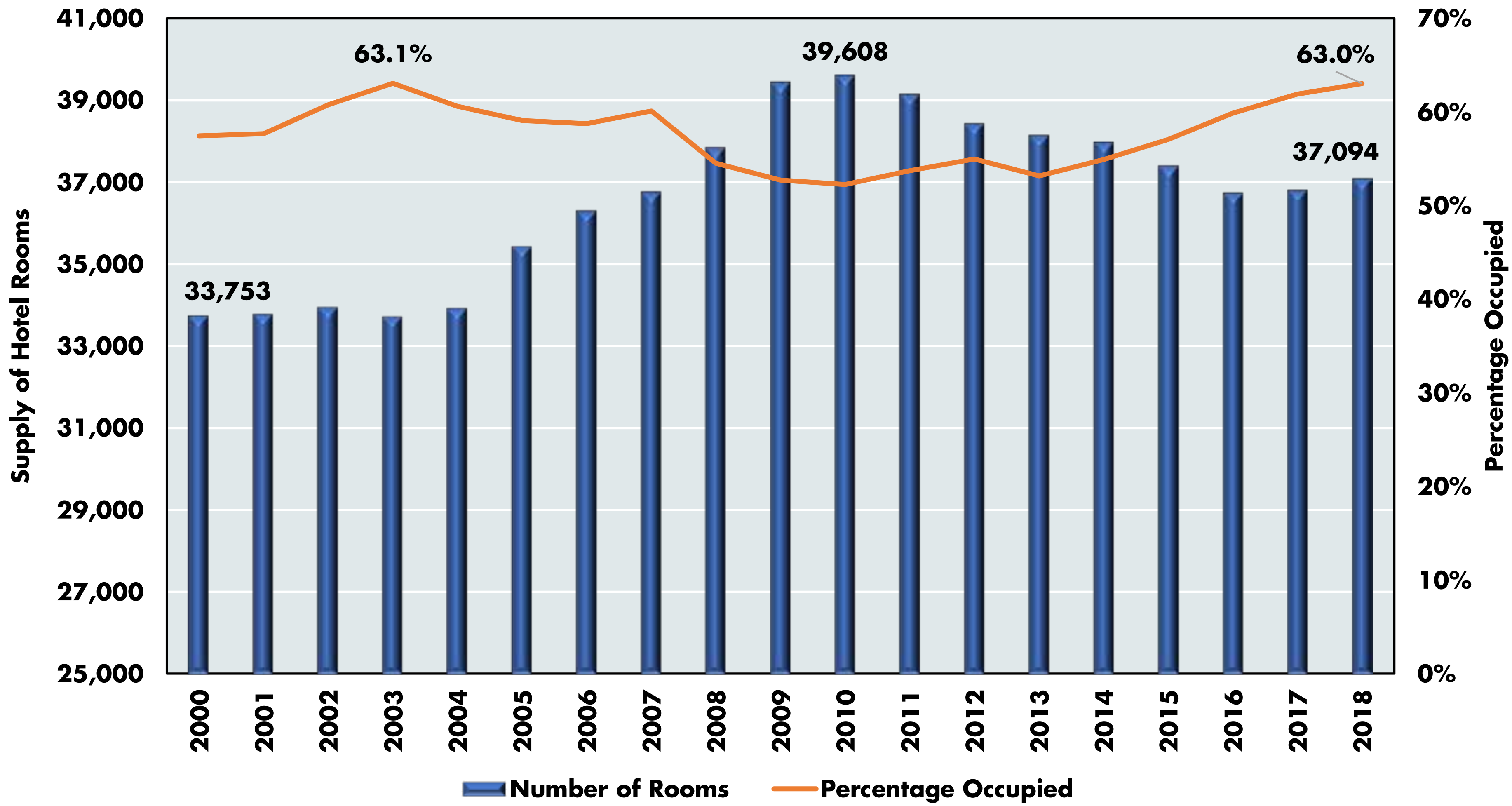
Accelerating economic growth in Virginia and the continuation of the economic expansion in the U.S. has led to an increasing number of tourists in Hampton Roads. Greater demand, reduced supply and, in many cases, higher room quality have meant that hotel revenues increased to record levels in 2018. As displayed in Graph 25, nominal (before inflation) hotel revenues exceeded $880 million in 2018. **Real (inflation-adjusted) hotel revenues were about $728 million in 2007 dollars, almost $20 million higher than the prerecession peak. 2018 was the fifth consecutive year of real hotel revenue growth, though we must express a note of caution that real revenue growth slowed to 2% in 2018.**

To examine whether the hotel sector has been improving or declining, we need a measure that captures revenue and the supply of rooms. The industry standard in this regard is Revenue per Available Room (RevPAR). If revenue increases but the supply of rooms does not, RevPAR increases as each available room is generating more revenue. On the other hand, if revenue increases but the supply of rooms increases at a greater rate, then RevPAR falls, as each available room is earning less money. RevPAR is a valuable metric because it incorporates demand and supply influences.

Graph 26 displays the year-over-year change in RevPAR for selected markets in Hampton Roads for 2018. The relatively slow growth in RevPAR in Virginia Beach, the region's largest city and tourist destination, suggests that the pricing power of hotels in this city may be under pressure. On the other hand, the Newport News-Hampton, Chesapeake-Suffolk and Norfolk-Portsmouth markets all demonstrated robust growth in RevPAR. The competition brought about by the introduction of The Main in downtown Norfolk has led other hotels to modernize their rooms. Higher-quality rooms command higher prices and, when coupled with higher occupancy, this leads to increases in RevPAR.

GRAPH 24

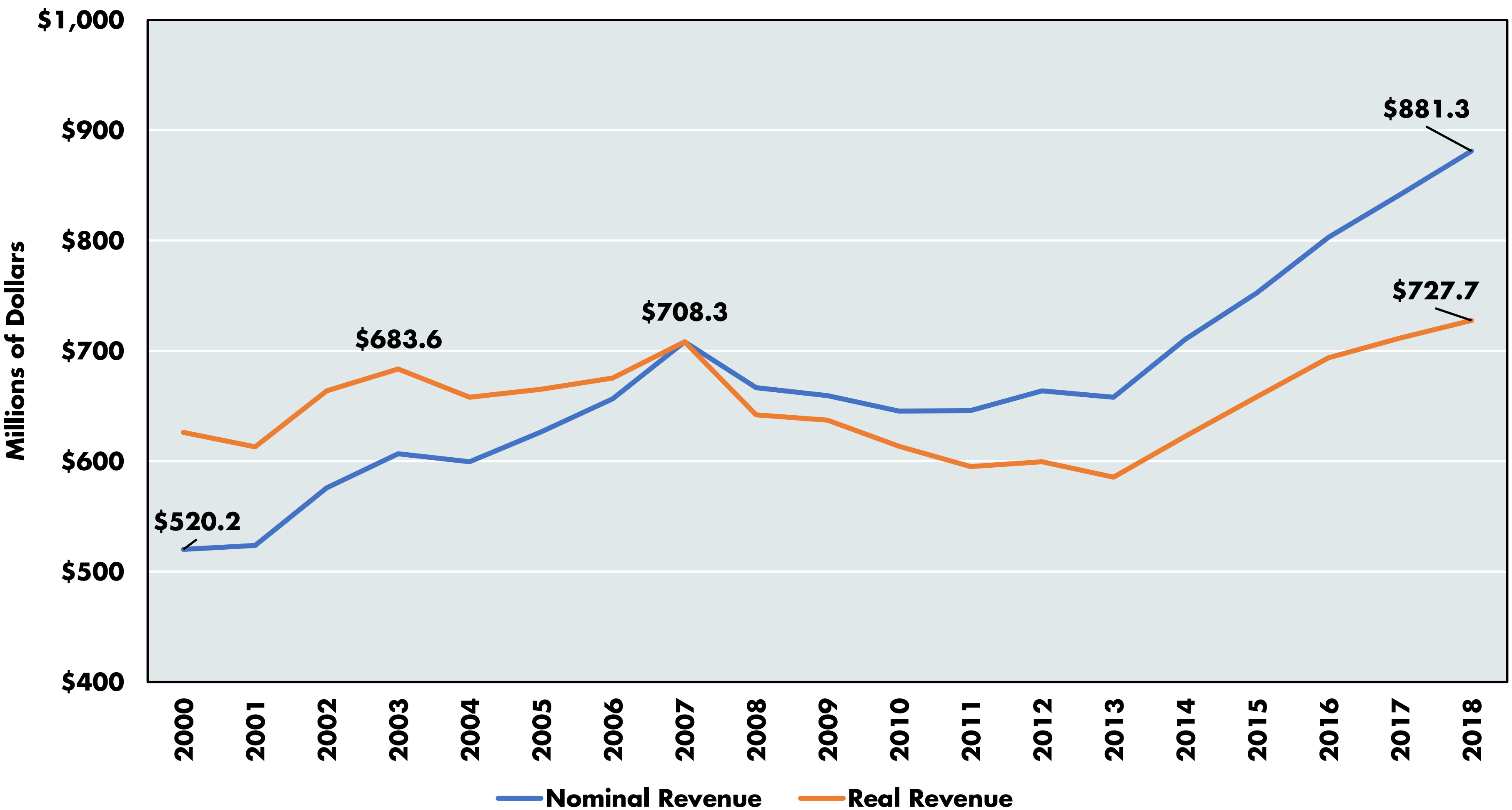
SUPPLY OF HOTEL ROOMS AND OCCUPANCY OF HOTEL ROOMS: HAMPTON ROADS, 2000-2018



Source: STR Trend Report, January 2019

GRAPH 25

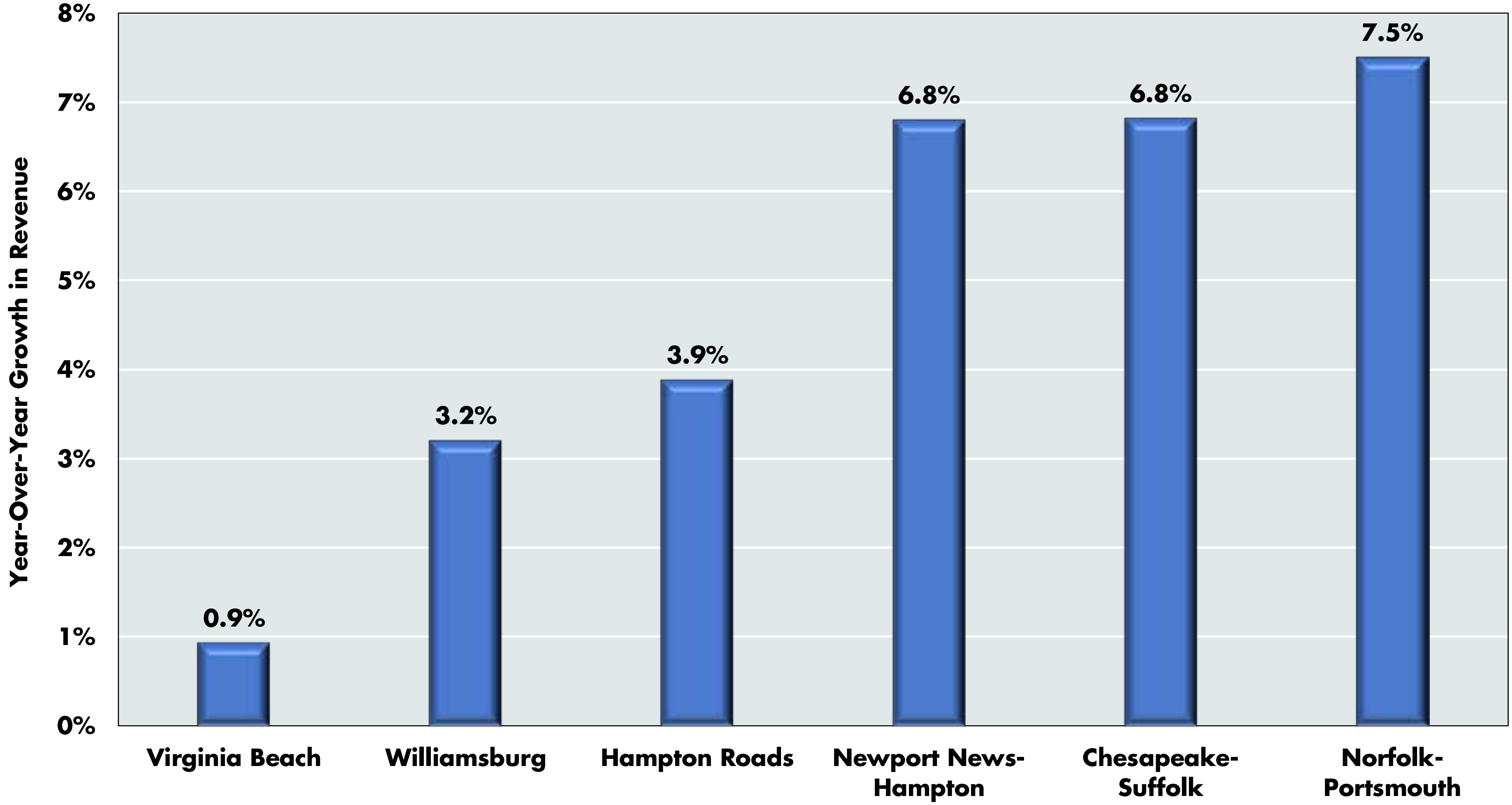
NOMINAL AND REAL HOTEL REVENUE: HAMPTON ROADS, 2000-2018



Sources: STR Trend Report, January 2019, Bureau of Economic Analysis, Consumer Price Index for all Urban Consumers (base year = 2007), and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 26

YEAR-OVER-YEAR CHANGE IN REVENUE PER AVAILABLE ROOM: SELECTED MARKETS AND HAMPTON ROADS, 2018



Sources: STR Trend Report, January 2019, and the Dragas Center for Economic Analysis and Policy, Old Dominion University

There May Be Something In The Water

The Something in the Water music festival was, by all accounts, a resounding success. There now exists an opportunity for the region to capitalize on this success by examining how other regions have turned local arts and music festivals into "must attend" events. Coachella (Indio, California), South by Southwest (Austin, Texas) and other festivals have put these locales "on the map" and Something in the Water is the best chance for Hampton Roads to join this select group.

One obvious impact of the 2019 Virginia Beach festival was the increase in demand for hotel rooms. What may come as a surprise is that demand increased not only in the resort city, but also across the region (Graph 27). Comparing the last weekends of April in 2018 and 2019, occupancy increased by double digits in the Newport News-Hampton, Williamsburg and Virginia Beach markets. The large change in occupancy is almost certainly due to Something in the Water, given that there were no other significant new events during this period.

Any increase in occupancy for the last weekend in April would, by itself, have been welcome news for hoteliers. However, not only did occupancy increase dramatically, but each market in Hampton Roads observed double-digit increases in revenues (Graph 28). Since hotel supply did not change much from year to year, this meant that RevPAR increased remarkably during the last weekend of April 2019 (Graph 29).

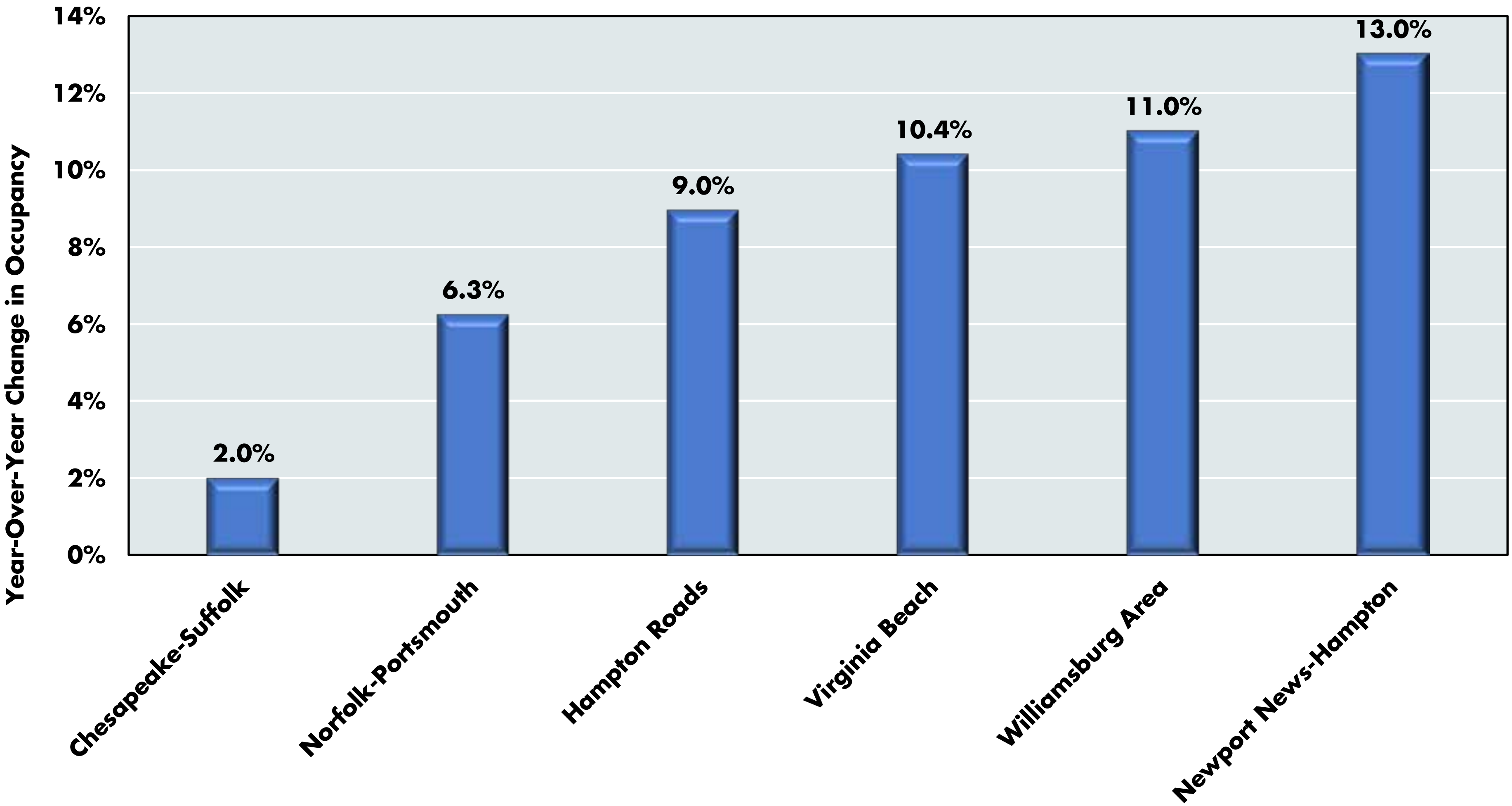
Something in the Water was more than music, it was big business. In contrast to many regional events that, economically speaking, do little more than recirculate money inside Hampton Roads, Something in the Water attracted a significant number of attendees from outside our region. These visitors bought tickets, stayed in hotels, ate at restaurants and spent other money locally. This injection of "new money" increased the overall economic impact of Something in the Water and bodes well for the future.

With the prospect of Something in the Water returning to Virginia Beach in 2020, the economic benefits to the region are unmistakable, and there is a strong economic incentive to work together to increase the visibility, hospitality and impact of the 2020 event. One only needs to examine how South by Southwest grew from about 700 attendees in the 1980s to tens of thousands in 2019 to understand the economic potential of Something in the Water. Not only do estimates suggest that South by Southwest's economic impact is in the hundreds of millions of dollars, but the benefits accrue to the entire Austin region.

One must, of course, take account of costs as well as benefits. It is fair to say that the costs of Something in the Water were not uniformly distributed across the region. With many of the events located at the Oceanfront, the costs of policing, emergency services and other services were borne primarily by Virginia Beach in 2019. But, because the benefits associated with the festival accrued to cities across the region, this represented an indirect subsidy by Virginia Beach taxpayers of residents in other Hampton Roads jurisdictions. Analyzing, understanding and mitigating these costs is a regional challenge that will not only foster future cooperation, but also increase the likelihood of the success of future events like Something in the Water.

GRAPH 27

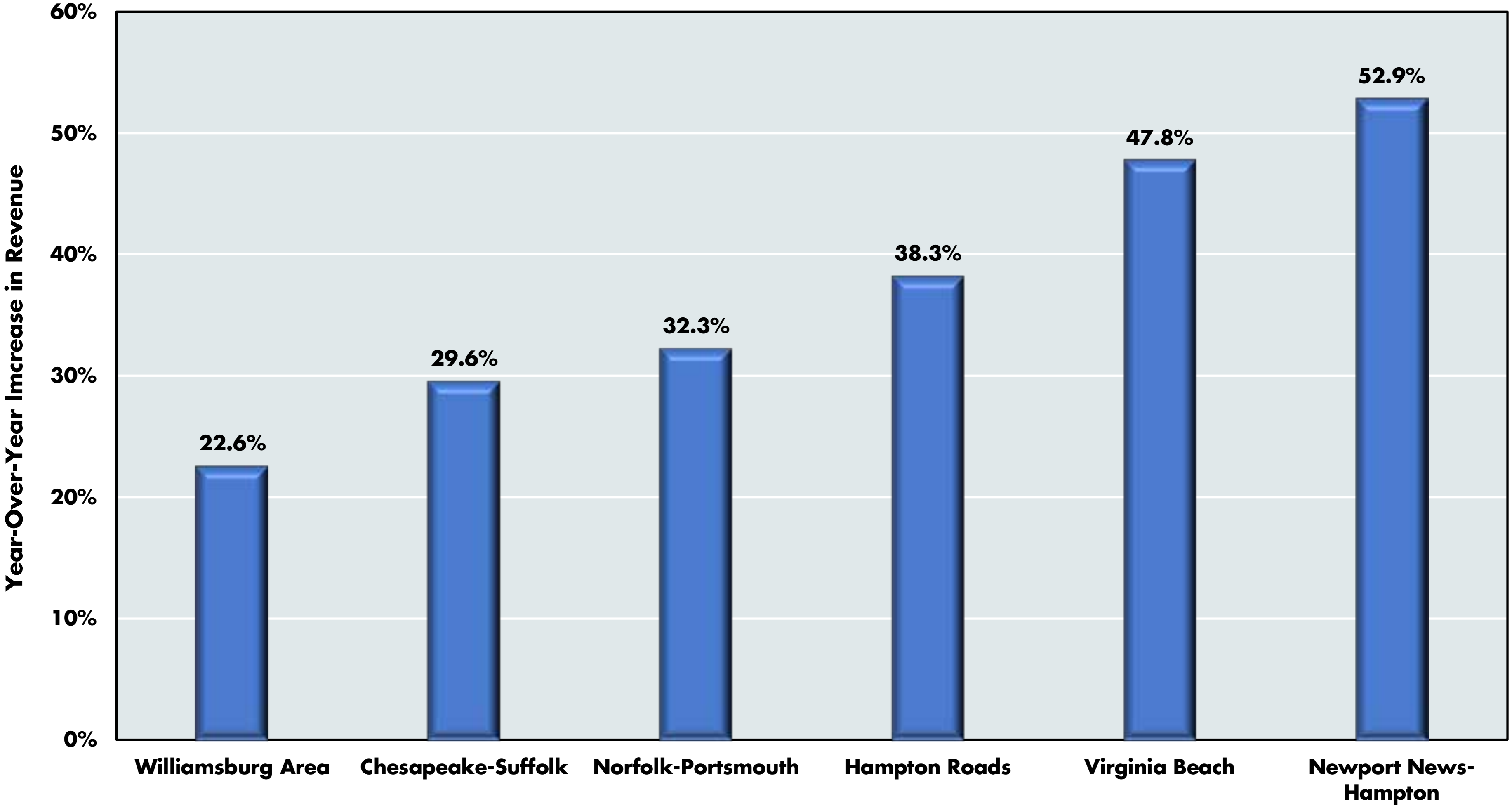
PERCENTAGE CHANGE IN HOTEL OCCUPANCY: LAST WEEKEND IN APRIL 2018 VERSUS LAST WEEKEND IN APRIL 2019, SELECTED MARKETS AND HAMPTON ROADS



Sources: STR Daily Trend Reports, May 2019, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data reported for weekends represent averages for Thursday through Monday of each year.

GRAPH 28

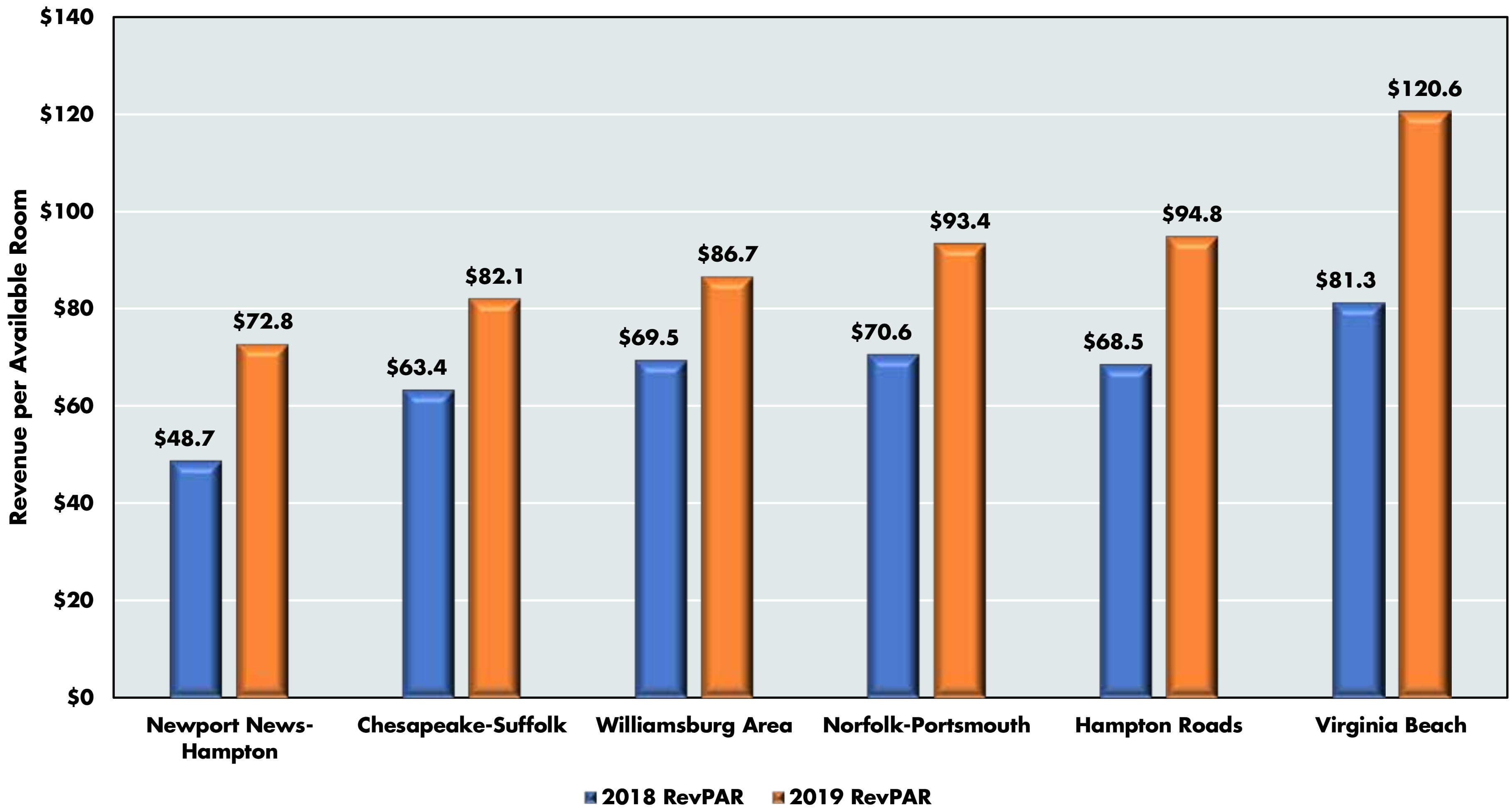
PERCENTAGE CHANGE IN HOTEL REVENUE: LAST WEEKEND IN APRIL 2018 VERSUS LAST WEEKEND IN APRIL 2019, SELECTED MARKETS AND HAMPTON ROADS



Sources: STR Daily Trend Reports, May 2019, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data reported for weekends represent averages for Thursday through Monday of each year.

GRAPH 29

REVENUE PER AVAILABLE ROOM: LAST WEEKEND IN APRIL 2018 VERSUS LAST WEEKEND IN APRIL 2019, SELECTED MARKETS AND HAMPTON ROADS



Sources: STR Daily Trend Reports, May 2019, and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data reported for weekends represent averages for Thursday through Monday of each year.

Final Thoughts

2018 was a year to remember for Hampton Roads. Most of the economic indicators moved in the right direction and there are numerous signals that 2019 will improve upon the performance of 2018. Projected increases in defense spending, continuing growth in the travel and tourism industry and increasing revenues at the Port of Virginia have given a green light for the regional economy to grow into 2020.

Not all the news is record setting, however, and we do not lack for challenges. Job creation here continues to lag other metropolitan areas and the pace of the region in establishing new businesses has not recovered to prerecession levels. The interdependence of Hampton Roads with the DOD is a source of economic strength but also vulnerability. We should leverage our unique role in procurement and operations while also seeking opportunities to foster private-sector growth. We must continue to work on improving our economic resiliency, especially in the face of sea level rise. Each challenge represents an opportunity to work together to make Hampton Roads an even better place to live and do business.

If there are sources of uncertainty, these come from outside the region. Defense policy, for now, favors Hampton Roads. An emerging conflict in the Middle East or Asia, however, could see ships and personnel move out of the area for extended periods of time, or permanently. Continued trade conflicts could undermine gains by the Port of Virginia and weigh on the current economic expansion. The federal deficit is, for the lack of a better phrase, out of control and federal debt now exceeds $22 trillion. Yet, the U.S. economy has shown remarkable resiliency in the face of these and other challenges. While growth may slow at the national level in 2020, Hampton Roads is picking up speed and moving forward at a pace not seen for a decade. For now, the economic outlook is rosy.

420 In The 757: Marijuana And Hampton Roads

420 IN THE 757: MARIJUANA AND HAMPTON ROADS

It is time for us to recognize this growing national consensus that criminalizing marijuana is unnecessary, discriminatory and gratuitously punitive. It is also time for us to cease saddling our fellow Virginians with criminal records for marijuana possession that is legal in ever-larger swaths of the country.
– Gregory Underwood, Commonwealth's Attorney, City of Norfolk

On June 26, 2019, Gov. J.B. Pritzker of Illinois signed legislation making the state the 11th to legalize possession of 30 grams or less (1.05 ounces) of marijuana for personal use. In the same month, Virginia Attorney General Mark Herring argued in an opinion piece published throughout the Commonwealth that legislators should remove criminal penalties for marijuana possession as a first step on the path toward legalization for personal use. While not in complete agreement, Senate Majority Leader Tommy Norment of James City County echoed the sentiment. Given the conversations taking place in Hampton Roads and throughout Virginia about marijuana, it is time to consider what a change in its legal status might look like, whom it might affect and how it might impact the cities and counties of our region.

Even though a majority of adult Americans have used marijuana in their lifetime and over a third of young adults in Virginia used it in the previous year, marijuana possession is almost always unlawful in the Commonwealth of Virginia.[1] The Code of Virginia Section 18.2-250.1 states: "It is unlawful for any person knowingly or intentionally to possess marijuana unless the substance was obtained directly from, or pursuant to, a valid prescription or order of a practitioner while acting in the course of his professional practice, or except as otherwise authorized by the Drug Control Act." A conviction of the violation of this section for the first offense can result in confinement of no more than 30 days, a fine of up to $500, or both. A second or subsequent conviction results in a Class 1 misdemeanor, which may result in maximum confinement of 12 months, a maximum fine of $2,500, or both.

Madison Davis is a young resident of Hampton and has undergone 10 brain surgeries for cancer. Her family obtained a Virginia prescription for medical cannabis oil and must carry the prescription and state registration with them in the event they are stopped by law enforcement; otherwise, they could be arrested for marijuana possession. One of the priorities of Madison's mother, Melanie, is the legalization of medical marijuana. "If we are willing to give her radiation, if we are willing to give her chemo that we know is going to make her lose her hair, we know it's going to make her vomit, then why would we not try something you can grow in your backyard that people have been using since 8,000 BC?"[2]

Virginia has a limited qualification for the possession and personal use of marijuana. As a result of HB 1251 (2018) and SB 1B 1557 (2019), doctors, physician's assistants and licensed nurse practitioners can issue a written certification for oils that contain tetrahydrocannabinol (THC) or cannabidiol. Each dispensed dose cannot exceed 10 milligrams of THC. Virginia's law also only provides for an "affirmative defense." The certification may not prevent an arrest for marijuana possession and can only be raised during a criminal prosecution.[3]

1 National Survey of Drug Use and Health, 2017 Estimates and 2014-2016 Sub-State Estimates. Substance Abuse and Mental Health Data Archive. Responses are for Virginia - Region 5, which includes the Eastern Shore and excludes counties in North Carolina.

2 https://www.wavy.com/news/pitch-for-pot-mother-of-child-with-cancer-local-delegate-want-marijuana-reform-in-va/.

3 https://www.mpp.org/states/virginia/.

A number of Hampton Roads residents use marijuana and, if marijuana sales were legal here, it would be a popular business. In the 2014-2016 National Survey of Drug Use and Health, 7.6% of residents 18 and older in Hampton Roads reported using marijuana in the past month, a higher percentage than for Virginia (6.7%) but lower than for the United States (8.7%). Hampton Roads adults were more likely to have used marijuana in the past year (14.1%) than residents of the Commonwealth (11.5%) and the United States (13.7%). Not surprisingly, marijuana use was the highest among adults ages 18 to 25. Over 20% of adults ages 18 to 25 in Hampton Roads used marijuana in the past month and over a third in the past year. Hampton Roads young adults can lay claim to the dubious distinction of having the highest (no pun intended) marijuana use among young adults in the Commonwealth.

While more than 50% of Virginians in recent surveys supported legalization of the personal use of small amounts of marijuana, the Code of Virginia is quite clear: possession of marijuana is illegal in almost every circumstance. A first offense for marijuana possession can result in an arrest that is resolved by either a court summons or transport to confinement. From 2010 to 2018, there were nearly 200,000 marijuana possession arrests in Virginia, of which almost 39,000 were in Hampton Roads. Over 80% of marijuana possession arrests in Virginia were for a single offense; that is, no other offense was charged at the time of arrest. In the Virginia portion of Hampton Roads in 2018, there were 114.3 marijuana possession arrests per 100,000 white residents and 621.0 arrests per 100,000 black or African American residents in 2018.[4]

While some argue that decriminalization could reduce these inequities, evidence from decriminalized states suggests that these disparities may persist. Legalization, on the other hand, has dramatically reduced the number of possession arrests in several states but also has resulted in increases in the number of traffic accidents and emergency department visits. Of particular concern for Hampton Roads is how decriminalization or legalization would affect the large number of military service members and federal employees who, in many cases, are regularly tested for drug use.

In this chapter, we will look at how perceptions about marijuana have changed over time and who uses it. We'll consider who is arrested for possession, discuss the differences between decriminalization and legalization, and provide an estimate of the financial impact of marijuana legalization. It's not just smoke; there are real issues to examine.

Marijuana And Hemp: A Primer

There are two plants, hemp and marijuana (cannabis), that look alike to the untrained eye.[5] Hemp has many uses, including for clothing, rope and livestock feed. Marijuana, on the other hand, is primarily a recreational substance. Both marijuana and hemp contain tetrahydrocannabinol (THC). THC is the main psychoactive agent in marijuana; when consumed, it stimulates the parts of the brain that respond to pleasure, leading to the release of dopamine.[6] Hemp, however, must legally have a THC content of less than 0.3%, well below the 18.7% average THC level in marijuana sold for recreational purposes in Colorado.[7]

Hemp, unlike marijuana, can be produced legally, processed, distributed and sold throughout the United States as of Jan. 1, 2019.[8] The change in hemp's legal status has allowed hemp growers access to banking, water rights and crop insurance, among other institutional rights and protections.[9] Farmers can now grow hemp and sell to processors, potentially good news for a sector that has struggled recently in Virginia with the decline in the demand for tobacco

4 We utilize the Virginia State Police's publicly available Crime in Virginia dataset on individual arrests in Virginia to obtain these findings. We follow the U.S. Census Bureau's conventions with regard to race. Individuals choose to self-identify race and may self-identify more than one race. For more information, see: https://www.census.gov/topics/population/race/about.html.

5 For the purposes of the chapter, we refer to cannabis as marijuana.
6 https://www.webmd.com/mental-health/marijuana-use-and-its-effects#1.
7 https://www.nbcnews.com/storyline/legal-pot/legal-weed-surprisingly-strong-dirty-tests-find-n327811.
8 https://www.agriculture.senate.gov/2018-farm-bill.
9 https://www.vox.com/policy-and-politics/2018/12/12/18136408/hemp-marijuana-legalization-trump-congress-farm-bill.

products. Everything Diesel, a Colorado-based company, has applied for a hemp-processing license to open a facility in Chesapeake. If the license and use permits are approved, the company will extract oil from the plants for manufacturing purposes.

> Sam Grant, managing partner of the Virginia Hemp Company, recently made an appeal to farmers in Mount Jackson, Virginia, to consider growing hemp. "We need to buy 11,000 tons of hemp straw as it comes out of the field, which is about 2,500 acres at 4.5 tons to the acre. We found a building that is of suitable size here and with a commitment, we can build an environmentally responsible way to make cottonized hemp."[10]

While hemp is legal, marijuana remains a subject of tension between the federal government and many state and local governments. **As of July 2019, 34 states (plus the District of Columbia, Guam, Puerto Rico and the U.S. Virgin Islands) have legalized medical marijuana, 15 states have decriminalized marijuana possession for personal use and 11 states (plus the District of Columbia) have legalized marijuana for recreational purposes. There is not a common legal framework among the states.** In some states, such as Colorado and California, where recreational marijuana possession is legal for adults, the production and sale are taxed and regulated, and there are medical marijuana laws. In other states, such as New Mexico and North Dakota, possession does not result in confinement and medical marijuana is allowed under the law. In some states, including North Carolina, possessing small amounts of marijuana may result in an arrest or fine. Virginia allows the prescription of cannabis oil products but not medical marijuana. Lastly, in some states, such as Alabama, possession of marijuana in any form for almost any reason is illegal under state law. This, of course, can create confusion as individuals may purchase marijuana legally in one state and travel to another state only to find they are now in violation of state law as well as federal law.[11]

With all this in mind, we must remember that the federal government considers marijuana an illegal substance. The Drug Enforcement Agency (DEA) classifies marijuana as a Schedule I drug, with no currently accepted medical use and a high potential for abuse.[12] Marijuana is grouped together with heroin, lysergic acid diethylamide (LSD), 3,4-methylenedioxymethamphetamine (ecstasy), methaqualone (Quaaludes) and peyote. Marijuana's classification as a Schedule I drug also effectively outlaws most medical research on products with THC. Marijuana producers and dispensaries are also largely shut off from financial networks and, in many cases, must conduct business in cash.

We find marijuana's classification curious, since the Centers for Disease Control and Prevention (CDC) notes that a fatal overdose is "unlikely" but that an overdose can lead to adverse reactions, including confusion, anxiety and paranoia.[13] To place this into context, the CDC reported that there were 63,632 fatal overdoses in 2016 in the United States.[14] Fentanyl, which is a Schedule 2 drug, accounted for 28.8% of the overdose deaths. Heroin (Schedule 1), cocaine (Schedule 2) and methamphetamine (Schedule 2) accounted for 25.1%, 17.8% and 10.6% of deaths, respectively. There were no reported deaths from marijuana overdose in 2016.

We must be careful to note that these observations focus on overdose fatalities. Marijuana use can cause impaired driving and there is no field test for marijuana intoxication. Prolonged substance abuse is also possible with marijuana. Withdrawal symptoms may be exacerbated in individuals with a mental illness;[15] however, there continues to be fierce debate as to the impact of marijuana use on anxiety and depression. Many claims and counterclaims remain untested due to the classification of marijuana as a Schedule 1 substance.

10 https://www.lancasterfarming.com/farming/field_crops/virginia-hemp-company-seeks-growers/article_39ebb86c-4e44-523c-844b-805181c053bd.html.

11 For more information, see the National Conference of State Legislatures and the Marijuana Policy Project.
12 U.S. Drug Enforcement Agency. For more information, see https://www.dea.gov/drug-scheduling.
13 For more information, see https://www.cdc.gov/marijuana/faqs/overdose-bad-reaction.html.
14 Centers for Disease Control and Prevention (2018), "Drugs Most Frequently Involved in Drug Overdose Deaths: United States, 2011-2016."
15 Randi Melissa Schuster, Madeleine Fontaine, Emily Nip, Haiyue Zhang, Ailish Hanlya and A. Eden Evins, "Prolonged cannabis withdrawal in young adults with lifetime psychiatric illness," *Preventive Medicine* 104 (2017).

Cannabidiol (CBD)

Hemp and marijuana contain another active component that, unlike THC, has gained acceptance in recent years. Cannabidiol, or CBD, does not result in a "high" after ingesting or applying to the body. Claims that CBD can reduce anxiety and seizures, and provide pain relief, have sparked interest in and usage of CBD products.[16] CBD often comes in the form of an oil but can also be found in creams, or even gummies. With the 2018 Farm Bill's passage, if CBD products are derived from hemp under the THC guidelines contained in the law, these products can be consumed and are transportable nationwide. Any products derived from hemp or marijuana with THC levels greater than allowable limits remain illegal at the federal level.

In 2018 and prior to the passage of the 2018 Farm Bill, Virginia legalized the production and use of CBD oils and set explicit guidelines for the cultivation and production of CBD-related products. The Commonwealth also created a framework for legal prescriptions, although CBD products (absent of THC) were already widely available without prescription.[17] Virginia has since passed a law conforming state regulation of hemp to federal guidelines regarding oversight and the THC content of hemp. The absence of previous legal oversight of hemp led to large variation in quality and active ingredients for products that may perhaps share the same names or labels.[18]

Even though CBD is legal in Virginia, the production and distribution of CBD products is still in its infancy. The Virginia Board of Pharmacy selected five CBD distributors (one for each health service area) for the entire state. Columbia Care, a firm that already operates dispensaries in multiple states, produces products and services patients who are part of the medical marijuana program, was selected for Hampton Roads.[19,20] At the time of this writing, the expectation was that Columbia Care would open its facility in Portsmouth in late 2019.

16 https://www.health.harvard.edu/blog/cannabidiol-cbd-what-we-know-and-what-we-dont-2018082414476.
17 Virginia CBD law passed: https://law.lis.virginia.gov/vacode/54.1-3408.3/. Story regarding availability of CBD products: https://www.virginiamercury.com/2018/09/27/virginia-is-creating-strict-new-cbd-oil-regulations-why-are-health-food-stores-and-gas-stations-already-selling-it/.
18 https://www.consumerreports.org/cbd/how-to-shop-for-cbd/.
19 https://pilotonline.com/business/consumer/article_25145784-f8cb-11e8-9a54-2f04dc11ffda.html.
20 https://www.dailypress.com/news/southside/vp-bz-medical-marijuana-dispensaries-0111-20190112-story.html.

John Kelly is the chief executive officer at Everything Diesel, a company that extracts distillate and isolate from CBD and produces CBD-infused products. Everything Diesel is looking to expand its operations to a 30,000-square-foot facility in Chesapeake. The facility, which aims to extract CBD from Virginia-farmed hemp to produce products ranging from CBD oils and creams to CBD-infused pet food, would be ideally placed to take advantage of the temperate growing climate and access to the Port of Virginia. When we interviewed Kelly, he noted that Virginia used to be a leading tobacco producer and hemp represents an opportunity to reinvigorate this sector. "Virginia has an agricultural story. We have an ability to bring it back and make a high-quality product at the same time. We can work with small farmers to help them bring in additional revenue, add quality jobs and bring in tax revenue."

From Hippie Culture To Culturally Acceptable

I didn't inhale it, and never tried it again. – Bill Clinton

When I was a kid, I inhaled frequently. That was the point. – Barack Obama

Graph 1 illustrates how swiftly perceptions about marijuana have changed in the United States. In 1969, only 12% of those surveyed thought marijuana should be legalized. Even at the turn of the current century, only 31% of respondents were in favor of legalization. By 2013, a majority of respondents were in favor. In 2018, almost two-thirds of Americans reported they thought marijuana should be legalized. The most recent survey found broad support for legalization among millennials (74%), Gen Xers (63%) and baby boomers (54%).

Recent surveys of Virginians reflect the national data. Polls by Quinnipiac University in 2015 and 2017 found that a majority of Virginians supported adults being able to legally possess small amounts of marijuana. The 2017 Quinnipiac poll also found an overwhelming 92% of Virginians supported marijuana use for medical purposes with a doctor's prescription.[21] A March 2018 Christopher Newport University poll found that 76% of Virginians favored decriminalizing possession of small amounts of marijuana.[22]

Public perceptions of marijuana are changing because more Americans have used marijuana. The National Survey of Drug Use and Health (NSDUH) collects data at the national, state and substate level on drug use, abuse and mental health. The latest survey illustrates the rise in marijuana's popularity relative to other drugs. The percentage of respondents who reported using marijuana in their lifetimes increased from 42.7% in 2002 to 48.2% in 2017 (Graph 2). Across the same time period, reported use of crack cocaine and LSD declined while cocaine usage increased slightly.

It appears that marijuana has reached a tipping point, where a majority of the population has tried it, supports its legalization for personal use and overwhelmingly supports the use of marijuana for medical purposes.

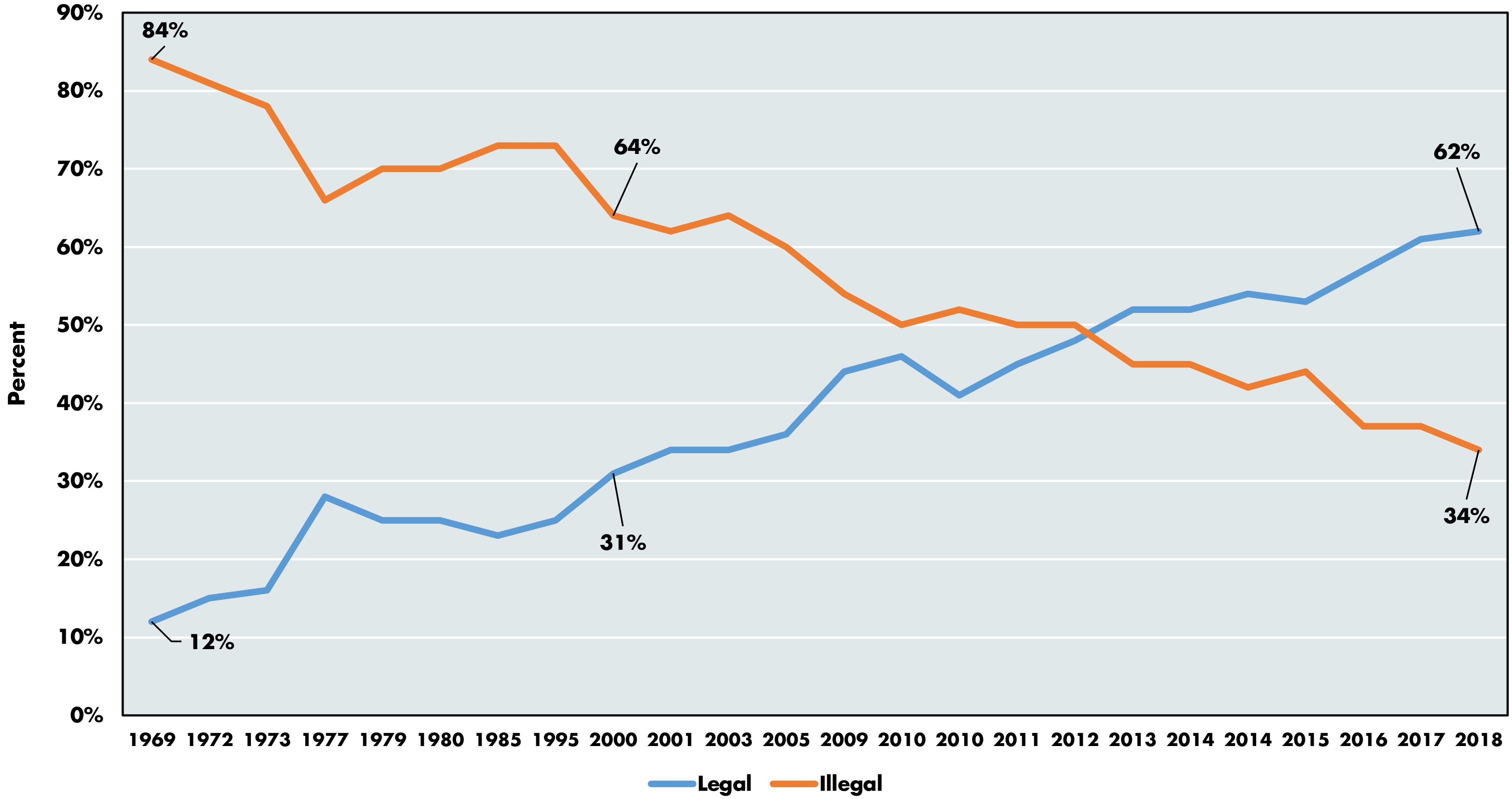
As marijuana use by adults has increased over time and the drug is now legalized or decriminalized in a number of states, we compare marijuana use in the previous month with two of the most popular legal substances: alcohol and cigarettes (Graph 3). Since 2002, while alcohol usage in the past month by Americans 18 and older has increased only at an average rate of 0.1% a year, cigarette use has declined at an annual rate of 2.3% a year.[23] Reported marijuana use grew at a 3.4% annual rate over the period. The increasing acceptance of marijuana coincides with the decline in the use of cigarettes and tobacco.

21 https://poll.qu.edu/virginia/release-detail?ReleaseID=2451 (2017 VA poll).
22 https://bloximages.newyork1.vip.townnews.com/pilotonline.com/content/tncms/assets/v3/editorial/c/77/c77f8ee9-f7c3-5208-810e-5a45e762a3ee/5a7b20dfb8755.pdf.pdf.

23 We estimate the compound annual growth rate (CAGR) to determine the average annual growth or decline in each substance over the period in question. CAGR is equal to (End Value/Start Value)^(1/Number of Periods) – 1.

GRAPH 1

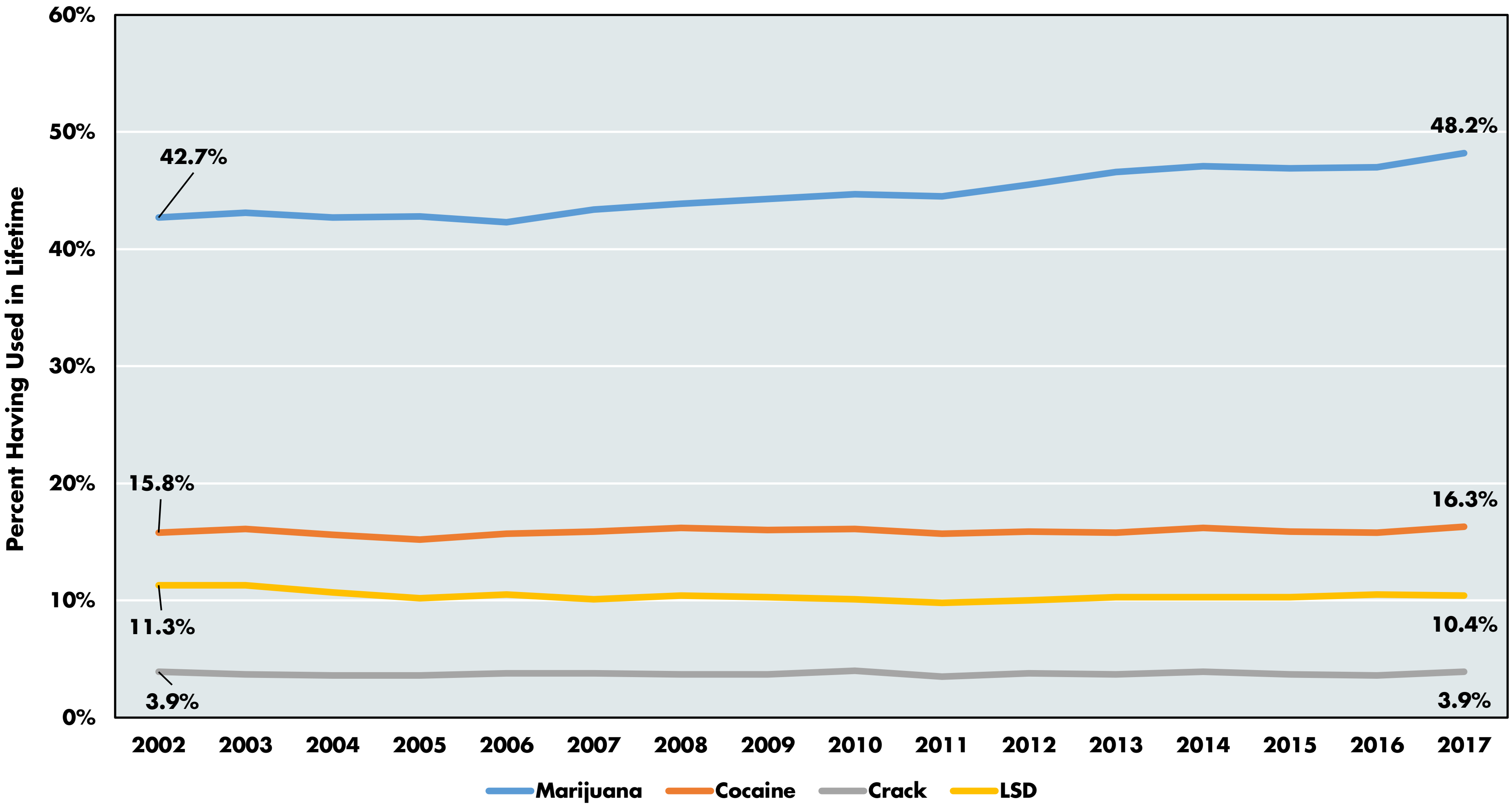
PEW RESEARCH POLL ON LEGALIZING MARIJUANA: UNITED STATES, 1969-2018



Source: Pew Research Center (2018). The Pew Research Center conducted surveys at various intervals over time, including multiple surveys in some years. Individual survey results are displayed in the graph instead of annual averages for those years with multiple surveys.

GRAPH 2

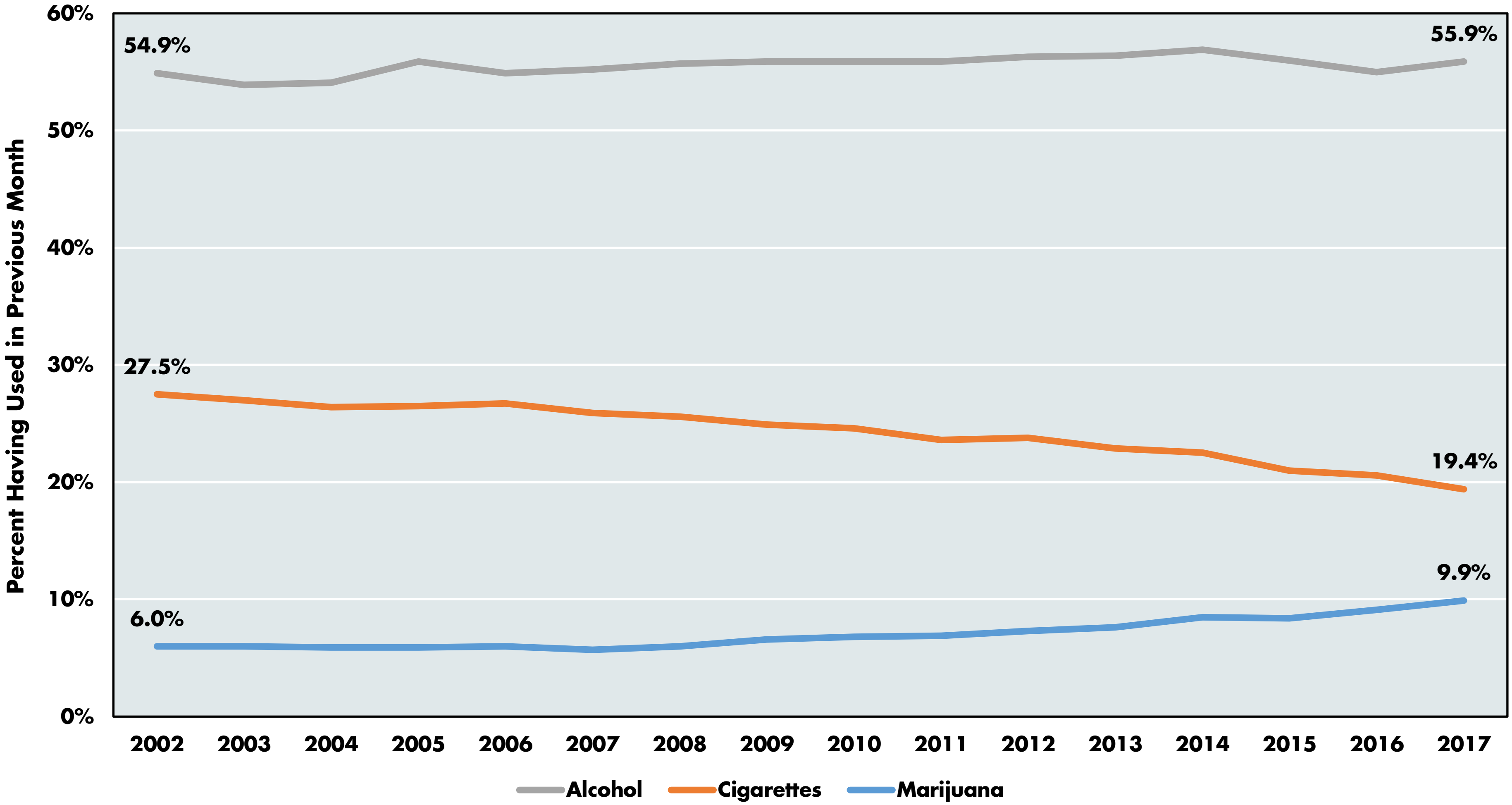
SELECTED TYPES OF ILLICIT DRUG USE IN LIFETIME AMONG PERSONS AGES 18 OR OLDER: UNITED STATES, 2002-2017



Source: Substance Abuse and Mental Health Services Administration, 2017 National Survey of Drug Use and Health, Table 7.7B

GRAPH 3

USE OF ALCOHOL, CIGARETTES AND MARIJUANA IN THE PREVIOUS MONTH: UNITED STATES, 2002-2017



Source: Substance Abuse and Mental Health Services Administration, 2017 National Survey of Drug Use and Health, Table 7.9B and 7.18B

Diving into the national data, over 53% of males and almost 44% of females reported having used marijuana at least once, with 18% of males and 12% of females reporting having used it in the past year. Examining respondents by race yields an interesting observation: Whites are more likely than African Americans or Hispanics to have used marijuana in their lifetimes. On the other hand, African Americans used marijuana in a slightly greater proportion in the past year and month than whites or Hispanics (Table 1).

TABLE 1

MARIJUANA USE BY RACE, AGES 18 AND OLDER: UNITED STATES, 2017

	Lifetime	Past Year	Past Month
White	**53.8%**	**15.8%**	**10.1%**
Black or African American	**45.5%**	**17.9%**	**12.2%**
American Indian	**63.8%**	**24.2%**	**15.6%**
Native Hawaiian	**45.9%**	**11.7%**	**9.7%**
Asian	**20.6%**	**7.2%**	**3.8%**
Two or More Races	**59.9%**	**24.1%**	**16.7%**
Hispanic or Latino	**36.0%**	**13.1%**	**8.5%**

Source: Substance Abuse and Mental Health Services Administration, 2017 National Survey of Drug Use and Health, Tables 1.32B, 1.33B, 1.34B

Marijuana use increases with education and falls with employment (Table 2). While some may believe marijuana is used predominantly by "slackers," the survey evidence suggests that usage is highest among those who have attended some college. College graduates and those who did not graduate from high school report the same usage over the previous year, although college graduates have the lowest usage rates in the previous month. On the other hand, marijuana usage rates are the highest among the unemployed. **It may be that continued marijuana use lowers employability, which, in turn, leads to increased use. However, 1 out of 10 full-time employed respondents reported using marijuana in the past month.**

TABLE 2

MARIJUANA USE BY EDUCATION AND EMPLOYMENT, AGES 18 AND OLDER: UNITED STATES, 2017

	Lifetime	Past Year	Past Month
Less than high school	**35.2%**	**13.3%**	**9.3%**
High school graduate	**45.2%**	**15.2%**	**10.7%**
Some college/ associate degree	**54.6%**	**18.3%**	**11.9%**
College graduate	**49.3%**	**13.3%**	**7.5%**
Full-time employment	**54.6%**	**16.6%**	**10.4%**
Part-time employment	**51.1%**	**19.7%**	**13.0%**
Unemployed	**53.3%**	**27.4%**	**17.6%**
Other	**36.7%**	**10.1%**	**6.8%**

Source: Substance Abuse and Mental Health Services Administration, 2017 National Survey of Drug Use and Health, Tables 1.32B, 1.33B, 1.34B

Is Marijuana A Gateway Drug?

As an increasing number of Americans use marijuana on a more frequent basis, the debate whether marijuana is a gateway drug continues to boil. A 2015 study examined the responses of 6,624 survey participants who used marijuana prior to any other drug.[24] Almost 45% of individuals with lifetime marijuana use progressed to other illegal substances at some time during their lives. Other potential indicators of substance abuse include being male, urban residence, never being married, being separated or divorced, having a psychiatric disorder or a family history of substance abuse, and the early use of marijuana.

These findings echoed previous studies that suggested that a significant (but not all) proportion of marijuana users used other illegal drugs at some point in their lives.[25] There are several arguments why this progression from marijuana to other drugs may occur. First, marijuana users (in states where it is illegal) are exposed to other illegal drugs because the supply channels overlap. Second, marijuana provides a pleasurable experience that may encourage experimentation with other illegal substances. Marijuana use may also "condition" the brain to be more sensitive to the pleasurable effects of other drugs. Finally, if one is under the influence of marijuana, there is a potential loss of self-control and increased likelihood of experimentation with other drugs.[26]

However, the National Institute on Drug Abuse also recently noted that the majority of people who use marijuana do not go on to use other substances.[27] While there is strong evidence that marijuana may act as a gateway drug for some users, the same may be also be said about two legal substances, alcohol and tobacco. Cigarette use, for example, may increase the risk of cocaine addiction.[28] A 2012 study of high school students found that alcohol, not marijuana, was the gateway drug. Alcohol use led to tobacco, marijuana and other substance use.[29]

An alternative to the gateway hypothesis is that individuals who are more likely to use drugs start with readily available substances (alcohol, marijuana, tobacco). A portion of these individuals then, whether through social interaction or "priming the brain," then transition to other substances. If marijuana was not available, individuals would start elsewhere, and some would eventually transition to "harder" drugs. From this perspective, marijuana, by itself, is not a gateway drug. Individual characteristics and social conditions determine whether there is a transition path to other substances, not the use of marijuana.

Regardless of whether one accepts or rejects the argument that marijuana is a gateway drug, there is a degree of commonality among these arguments. At some point, some individuals will use marijuana along the path toward using other drugs. Whether the starting point is alcohol, tobacco or marijuana, we need to recognize that awareness, intervention and treatment may be more effective earlier rather than later. For the majority of marijuana users, however, the evidence suggests that marijuana (for now) is not a door to harder drugs.

24 R. Secades-Villa, O. Garcia-Rodríguez, C.J. Jin, S. Wang and C. Blanco (2015), "Probability and predictors of the cannabis gateway effect: a national study, *The International Journal on Drug Policy*, 26(2), 135–142.

25 A. Agrawal, M.C. Neale, C.A. Prescott and K.S. Kendler, "A twin study of early cannabis use and subsequent use and abuse/dependence of other illicit drugs," *Psychological Medicine*, 2004;34(7):1227–1237, and K. Van Gundy and C.J. Rebellon, "A Life-course Perspective on the 'Gateway Hypothesis,'" *Journal of Health and Social Behavior*, 2010;51(3):244–259.

26 T.J. Dishion and L.D. Owen, "A longitudinal analysis of friendships and substance use: bidirectional influence from adolescence to adulthood, *Developmental Psychology*, 2002;38(4):480–491, and M. Ellgren, S.M. Spano and Y.L. Hurd, "Adolescent cannabis exposure alters opiate intake and opioid limbic neuronal populations in adult rats," *Neuropsychopharmacology*, 2007 Mar; 32(3):607-15.

27 https://www.drugabuse.gov/publications/research-reports/marijuana/marijuana-gateway-drug.

28 A. Levine, Y. Huang, B. Drisaldi, et al., "Molecular mechanism for a gateway drug: epigenetic changes initiated by nicotine prime gene expression by cocaine," *Science Translational Medicine*, 2011;3(107):107ra109. doi:10.1126/scitranslmed.3003062.

29 T. Kirby and A.E. Barry, (2012), "Alcohol as a Gateway Drug: A Study of US 12th Graders," *Journal of School Health*, 82: 371-379. doi:10.1111/j.1746-1561.2012.00712.

Who Uses Marijuana In Hampton Roads?

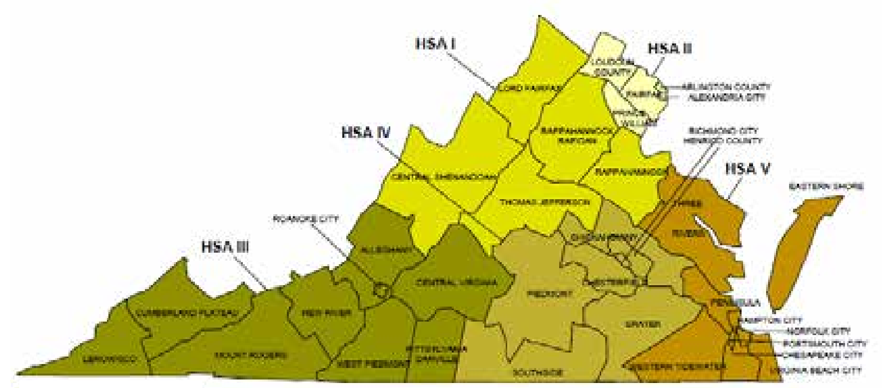
Given that the national survey data suggest that more than 50% of Americans have used marijuana in their lifetimes and almost 10% in the previous month, how many residents of Hampton Roads use marijuana?

We must first note that the available survey data for Virginia Health Services Area 5 (HSA 5) does not perfectly overlap the geography of the Hampton Roads MSA. HSA 5 includes the Virginia counties from the Hampton Roads MSA and adds the counties of the Eastern Shore (Figure 1).[30] The North Carolina counties Gates and Currituck are also not included in HSA 5. Since most of the Hampton Roads population is within HSA 5, we refer to HSA 5 as Hampton Roads. We ask the reader to keep this caveat in mind.

Graph 4 presents the responses to the sub-state National Survey of Drug Use and Health since the 2002-2004 survey. Marijuana use in Hampton Roads mirrors that of the nation. The percentage of adults who used marijuana in the previous year increased from 9.4% in the 2002-2004 survey to 14.1% in the 2014-2016 survey. Marijuana use in the previous month also increased from 5.6% in the earliest survey to 7.6% in the latest survey. With approximately 1.36 million adults living in Hampton Roads in 2017, according to the U.S. Census Bureau's American Community Survey, this means that more than 190,000 adults used marijuana in the previous year and almost 104,000 in the previous month. While marijuana use does not approach the levels reported in Wards 1 and 2 of the District of Columbia or Region 5 of Colorado (most of western Colorado), where over 30% of adults replied that they had used marijuana in the previous year, marijuana is clearly being used in Hampton Roads and is gaining in popularity over time.

FIGURE 1

HEALTH DISTRICTS AND HEALTH SERVICES AREAS OF VIRGINIA

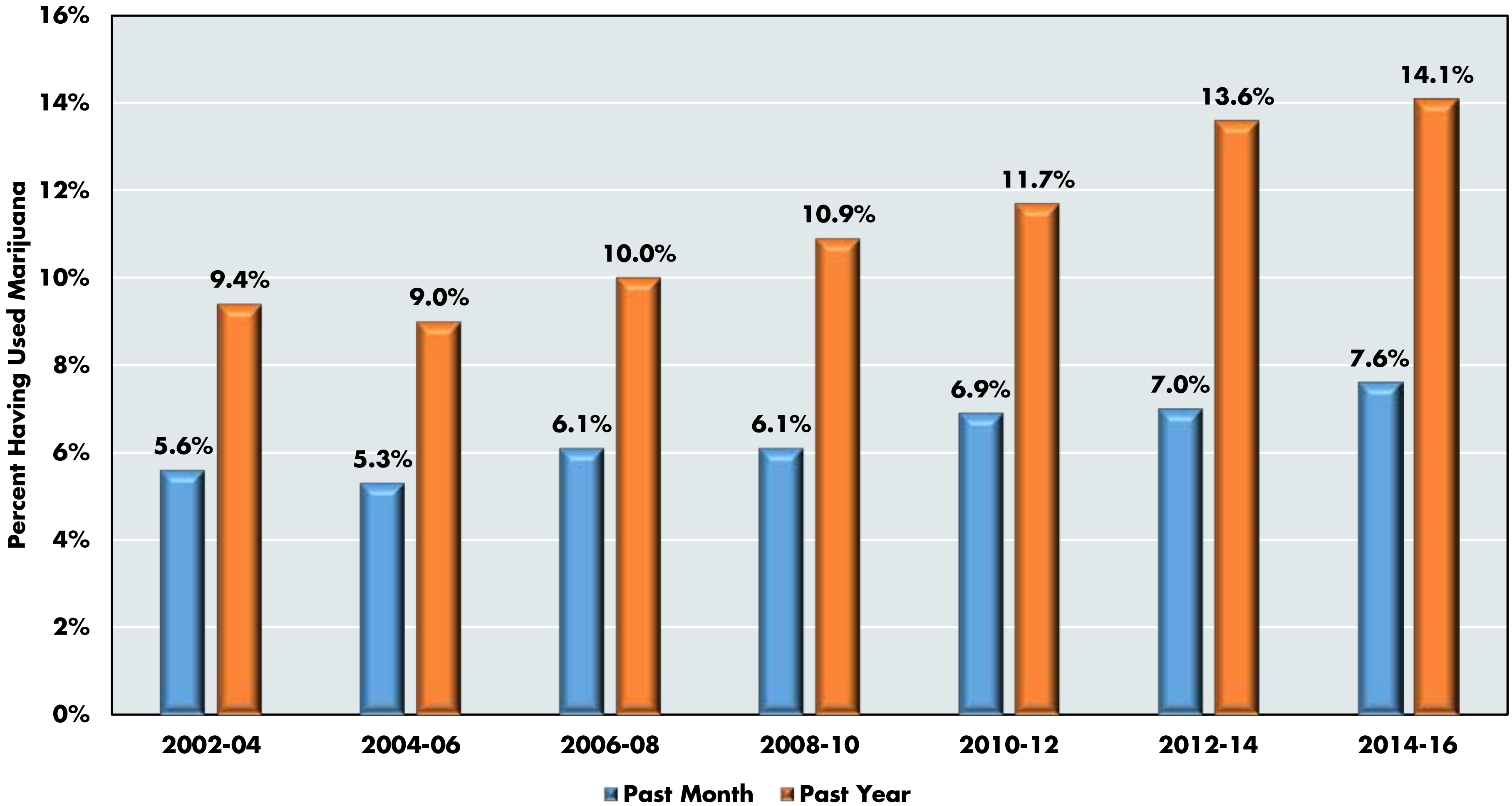


Source: Virginia Division of Health Statistics

30 Region 5 includes: Accomack, Chesapeake City, Essex, Franklin City, Gloucester, Hampton City, Isle of Wight, James City, King and Queen, King William, Lancaster, Mathews, Middlesex, Newport News City, Norfolk City, Northampton, Northumberland, Poquoson City, Portsmouth City, Richmond, Southampton, Suffolk City, Virginia Beach City, Westmoreland, Williamsburg City, and York (counties unless denoted "City"). For more information, visit the SAMHSA page: https://www.samhsa.gov/data/report/2014-2016-nsduh-substate-region-definitions.

GRAPH 4

USAGE OF MARIJUANA IN PREVIOUS YEAR AND PREVIOUS MONTH, AGES 18 OR OLDER: HAMPTON ROADS, 2002-2016



Source: National Survey of Drug Use and Health, Substate Surveys, various years. Hampton Roads is Virginia Region 5. Available at https://pdas.samhsa.gov/saes/substate.

We compare marijuana use in Hampton Roads with the other Virginia Health Service Areas and Virginia as a whole in Table 3. **Hampton Roads (Region 5) had the highest proportion of adults 18 and older who have used marijuana in the past year and was only slightly behind Region 4 (South Central Virginia) in terms of usage in the previous month.** Northern Virginia (Region 2) had the lowest reported usage of marijuana in the Commonwealth.

TABLE 3

MARIJUANA USE BY VIRGINIA HEALTH SERVICES REGIONS: 2017, 18 YEARS AND OLDER

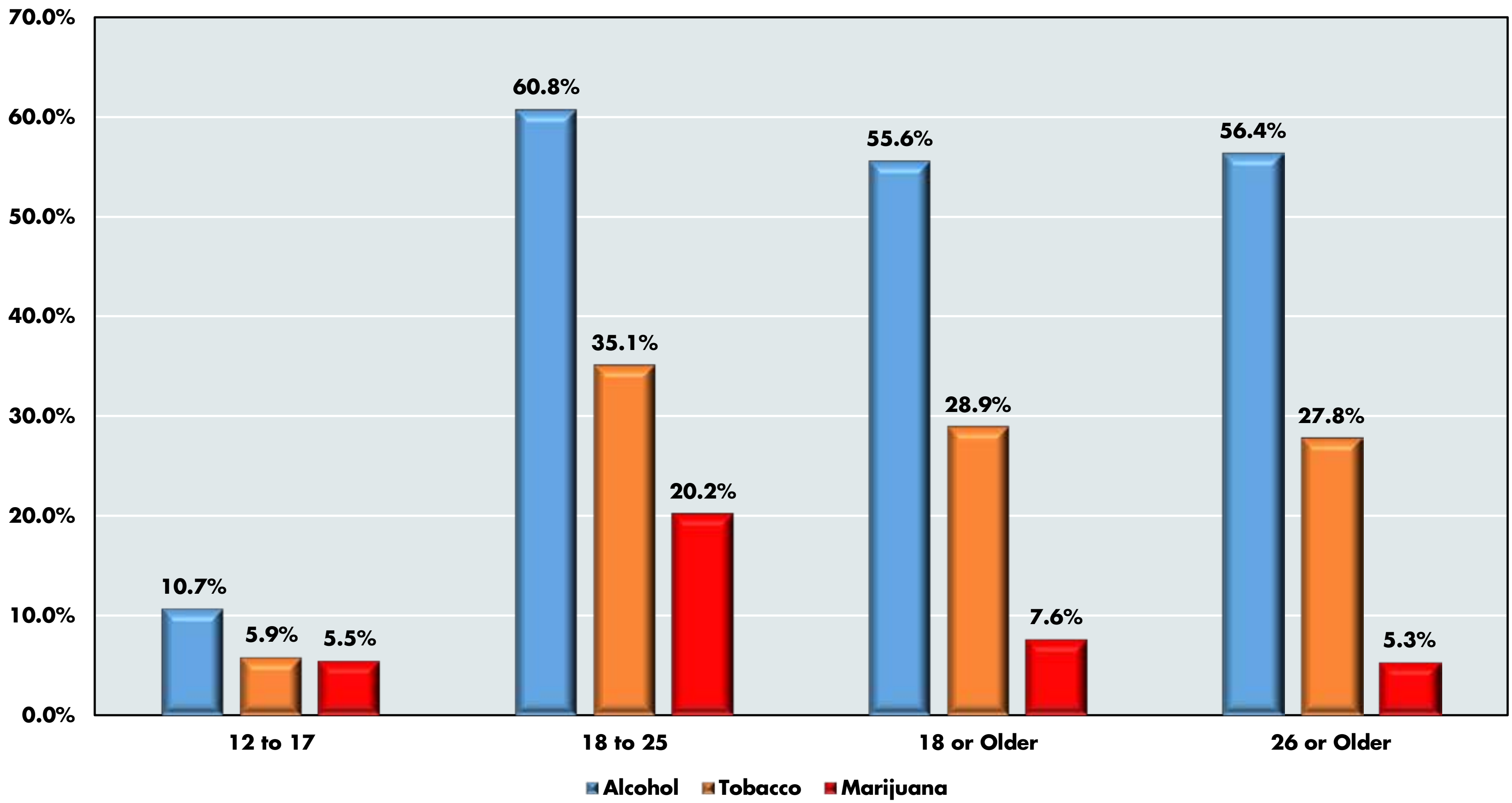
	Past Year	Past Month
Virginia	**11.5%**	**6.7%**
Region 1	**11.1%**	**6.8%**
Region 2	**8.9%**	**5.2%**
Region 3	**10.9%**	**7.0%**
Region 4	**13.3%**	**7.7%**
Region 5	**14.1%**	**7.6%**

Source: National Survey of Drug Use and Health, 2014-2016 Substate Survey. Available at https://pdas.samhsa.gov/saes/substate.

Lastly, we examine usage of alcohol, marijuana and tobacco for Hampton Roads in Graph 5. Alcohol is clearly the substance of choice, with over 55% of adults replying that they had used alcohol in the previous month. Almost 29% of adults 18 and older replied that they had used some form of tobacco in the previous month, a higher response rate than that of the nation and Virginia as a whole. With respect to marijuana usage in Hampton Roads, one in five individuals ages 18 to 25 replied that they had used marijuana in the previous month. Only 5.5% of teenagers replied that they had used marijuana in the previous month, about half of those who reported using alcohol. **The NSDUH data for Hampton Roads also reveal the need for substance abuse care, in that about 2% of teenagers and 12% of those ages 18 to 25 reported having an alcohol dependence disorder.**

GRAPH 5

USAGE OF ALCOHOL, TOBACCO AND MARIJUANA IN THE PREVIOUS MONTH: HAMPTON ROADS, 2016



Source: National Survey of Drug Use and Health, 2014-2016 Substate Survey. Hampton Roads is Virginia Region 5. Available at https://pdas.samhsa.gov/saes/substate.

Marijuana Possession And Arrests

Because marijuana possession is illegal in Virginia, enforcement of the law requires that individuals in possession of marijuana, in almost every circumstance, be subject to a law enforcement action. The Virginia State Police (VSP) collects and makes publicly available crime data from law enforcement agencies within the state. In general, two types of data are captured: incident data and arrest data. Since the VSP notes that arrest data are the primary measure of police activity as it relates to crime, we use arrest data in this section.[31]

This decade, law enforcement officers made almost 383,000 arrests for drug-related crimes in Virginia. Fifty-nine percent of all drug arrests from 2010 to 2018 in the Commonwealth were for marijuana-related crimes, and marijuana possession or concealment was the charge in a preponderance of these arrests. Graph 6 illustrates that for each year this decade, almost 52% of all drug arrests were for marijuana possession or concealment.

A potential critique is that an individual could be arrested for multiple offenses; that is, assault and marijuana possession or theft and marijuana possession. The marijuana offense would be incidental, overshadowed by the more egregious crime. To examine whether this critique is valid, we filtered the data to exclude arrests where the number of offenses was two or more or where the arrest type was not for a drug or narcotics offense. Of the 198,386 arrests for marijuana possession or concealment from 2010 to 2018 in Virginia, 84.3% were for a single drug or narcotics offense. Marijuana possession was the primary driver of total drug arrests in the Commonwealth.

Regardless of one's opinion about the legal status of marijuana in the Commonwealth, the data clearly illustrate that a majority of drug arrests in Virginia this decade were for the possession or concealment of marijuana. Furthermore, the Virginia State Crime Commission (VSCC) estimated that 84% of marijuana possession arrests from 2007 to 2016 were first-time arrests.[32] Even though it is rare for an offender to receive confinement for a first-time offense, the VSCC found that on one day in July 2017, 127 inmates were in jail solely for a marijuana charge. The estimated cost to taxpayers was over $10,000 a day to incarcerate these inmates. In a recent opinion piece, Virginia Attorney General Mark Herring stated that marijuana enforcement costs amounted to at least $81 million a year.[33] This figure does not include the "opportunity costs" of enforcement – that is, the effort and attention that could be redirected to other crimes.

We now turn our attention to arrests in the Virginia cities and counties within the Hampton Roads metropolitan area. In Graph 7, we present the arrests per 100,000 residents for possession or concealment by racial group in Virginia, Hampton Roads, and selected cities and counties in Hampton Roads. We divide the number of arrests by the population of each racial group to allow a direct comparison. We note that an individual could be arrested multiple times in a year for the same offense, so the arrests closely (but do not perfectly) correspond to the arrest rate for the population of each group.

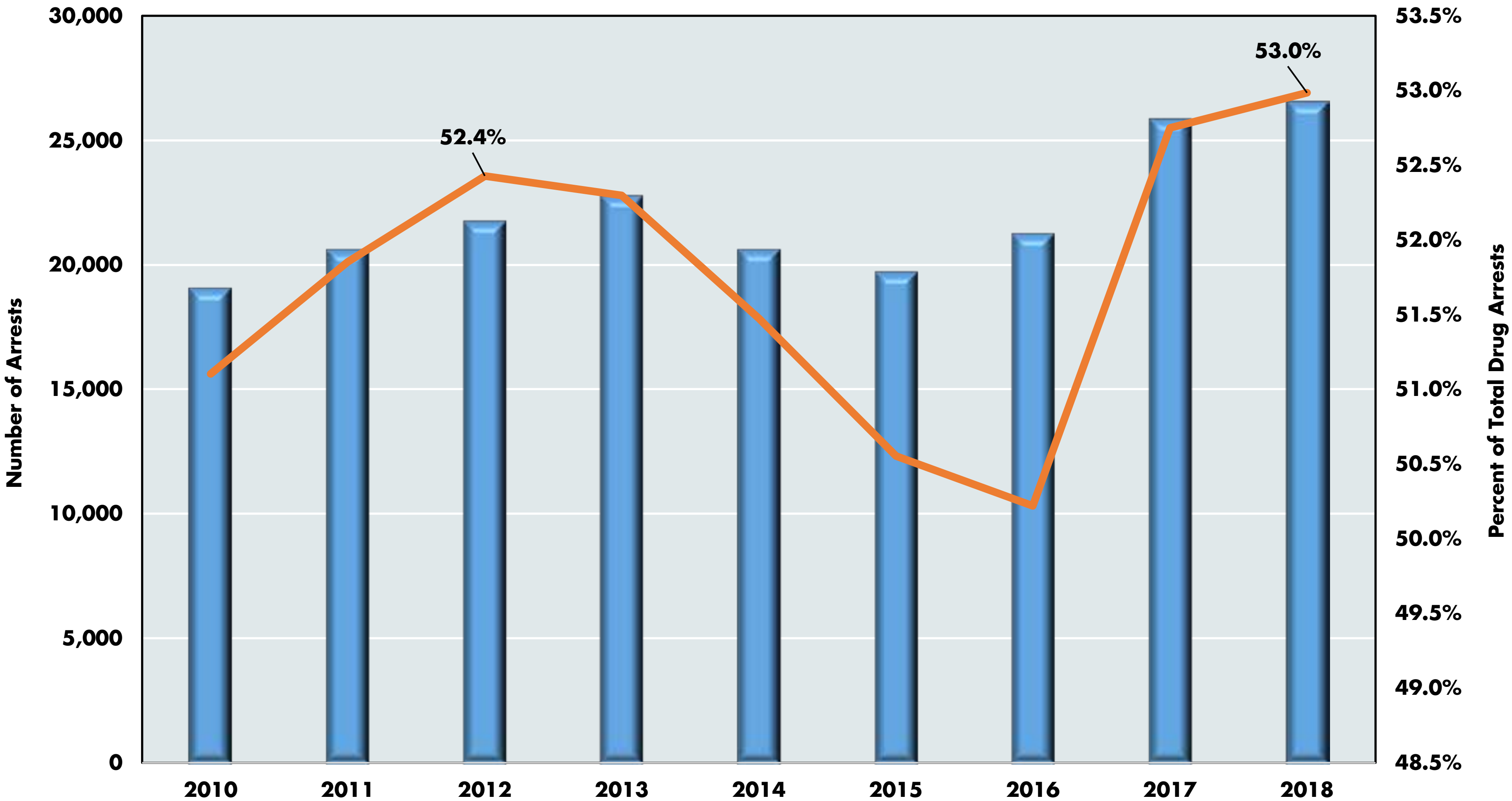
31 As noted by the Crime in Virginia Report (2018), "Although law enforcement arrest policies vary, particularly with respect to juveniles, agencies are instructed to count one arrest each time an individual is taken into custody for committing one or more offenses. A juvenile arrest is counted when an offense is committed and the circumstances are such that if the juvenile had been an adult, an arrest would have been made." The Crime in Virginia data are publicly available and located at: https://va.beyond2020.com/.

32 Virginia State Crime Commission (2017), http://vscc.virginia.gov/reports.asp. The data may overrepresent the percentage of first-time arrests and should be viewed as an upper bound on first-time arrests.

33 https://www.dailypress.com/news/opinion/local-voices/dp-edt-oped-herring-decriminalize-marijuana-0616-story.html.

GRAPH 6

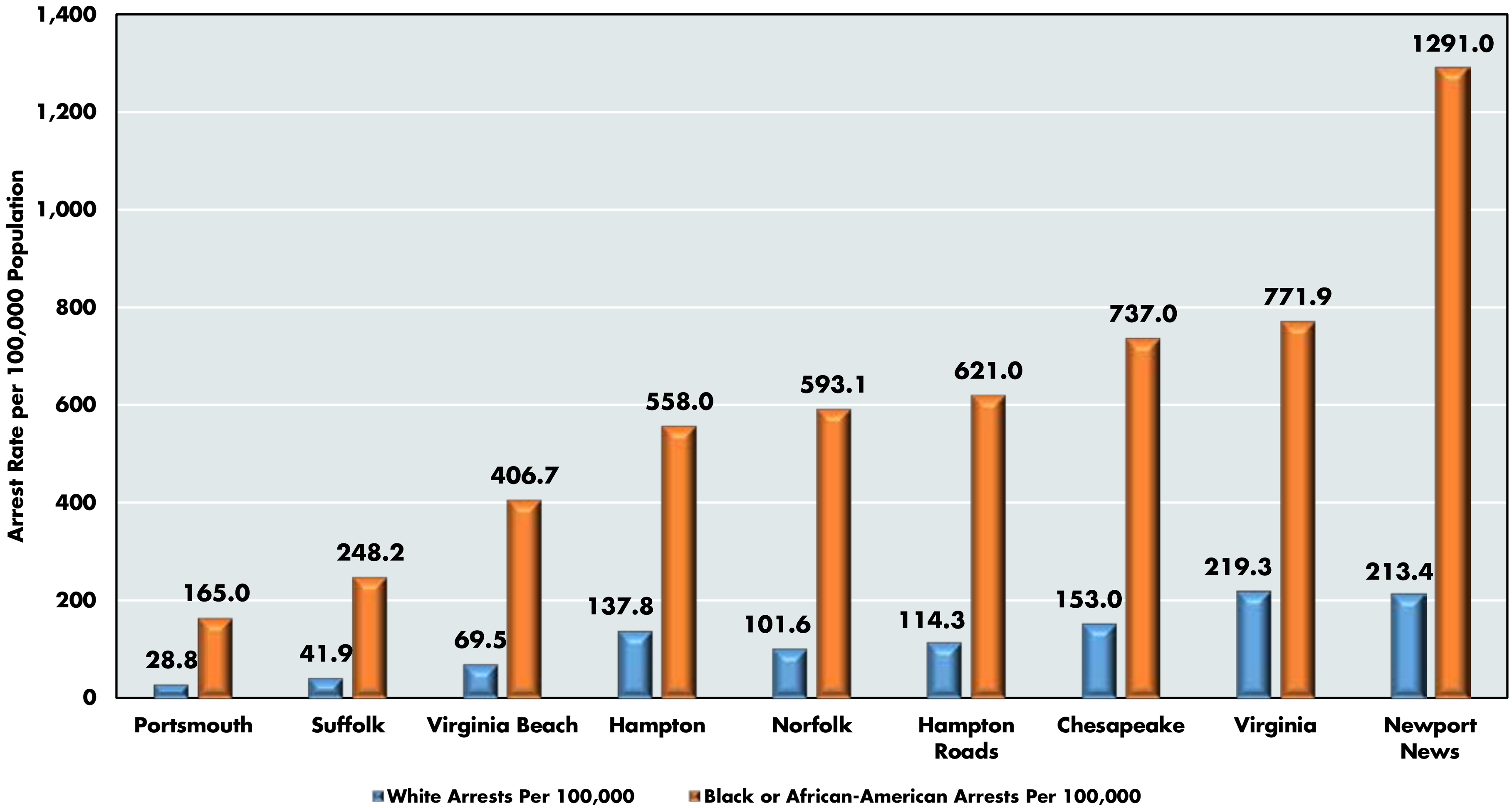
ARRESTS FOR MARIJUANA POSSESSION OR CONCEALMENT: TOTALS AND AS A PERCENTAGE OF ALL DRUG ARRESTS IN VIRGINIA, 2010-2018



Source: Virginia State Police, Virginia Crime Data: Arrest Drug Activity, various years; Marijuana Arrests for Possessing/Concealing and Totals for Arrest Drug Type for Records with Drug Identifier. Data obtained July 29, 2019.

GRAPH 7

ARRESTS FOR MARIJUANA POSSESSION OR CONCEALMENT PER 100,000 POPULATION: SELECTED CITIES IN HAMPTON ROADS, 2018



Sources: Virginia State Police (2019), Crime in Virginia Microdata; U.S. Census Bureau, American Community Survey 2013-2017 5-Year Estimates; and the Dragas Center for Economic Analysis and Policy, Old Dominion University. All possession and concealment arrests are included in the analysis. Small jurisdictions are not presented, as the small African American populations in these cities and counties may result in arrest rates that are potentially outliers. As an individual may be arrested multiple times for the same offense over a year, arrests are not necessarily equal to individuals.

We first remind the reader that national surveys do not show a stark difference in marijuana usage by race. For the most recent survey in 2017, whites were about 7 percentage points more likely than blacks or African Americans to have used marijuana in their lifetime. Blacks or African Americans, on the other hand, were about 2 percentage points more likely to have used marijuana in the previous year or month. In 2018, there were 219.3 arrests of individuals who identified as white per 100,000 white residents and 771.9 arrests of individuals who identified as black or African American per 100,000 black or African American residents of the Commonwealth. For the Virginia portion of Hampton Roads, arrests per 100,000 residents were 114.3 for whites and 621.0 for blacks or African Americans.

The disparity between white and African American arrests per 100,000 residents is apparent for every jurisdiction in Hampton Roads. Even though arrests per 100,000 residents in Portsmouth and Suffolk, for example, were well below the Virginia and regional averages in 2017, the disparity between white and African American arrests relative to the population of each group was still prevalent. Relative to the population of each race in Suffolk, for example, African American arrests per 100,000 were five times higher than white arrests per 100,000. In Virginia Beach, even though the arrests per 100,000 were below the regional average, African American arrests per 100,000 were 5.8 times higher than white arrests per 100,000. While the arrest rates may fluctuate from year to year, the disparities between the arrest rates of whites and African Americans are persistent over time.

There are several possible explanations for the disparities in arrests relative to the population of each racial group. First, the arrest data do not capture the residence of the offender. If a significant number of out-of-state offenders were being arrested in Virginia and, more specifically, in Hampton Roads, this possibly could bias the arrest data. However, the volume and persistence of the disparities across jurisdictions cast doubt on this argument. Second, explicit racial bias may occur, which would lead to a higher number of encounters for African Americans, and thus a higher number of arrests. However, the increasing prevalence of mobile phones, police body cameras and civil rights monitoring may cast doubt on this hypothesis. Third, unconscious racial bias may result in more frequent "chance" encounters that, in turn, lead to arrests. The argument, for example, that "driving while black" is a form of profiling continues to reverberate throughout popular culture and there is mounting empirical evidence that profiling occurs.[34] Fourth, policing decisions may lead to the concentration of scarce resources in areas overrepresented with minority populations. More police presence to deter crime creates more contacts with residents, which, in turn, leads to more arrests. Fifth, there is a possibility (however remote) that marijuana usage rates in Hampton Roads differ dramatically from the nation and thus the disparities in arrests reflect these differences in use. Finally, it is entirely possible that there is no single reason, and that the disparities are a result of many socioeconomic factors. While these debates are outside the scope of this chapter, we recognize these discussions are worth having to improve our region. We must also recognize that these disparities are, in part, driving the discussion of what to do about marijuana in Virginia.

Decriminalization Versus Legalization

With a growing number of legislators and government officials calling for action to change the consequences of marijuana possession or the legal status of marijuana possession for personal use in Virginia, we briefly review the differences between the two broad policy actions: decriminalization and legalization.[35] There are significant legal and policy differences between legalization and decriminalization, including the amount of marijuana in question, which may vary from an ounce (in most legalized states) or less (in most decriminalized states). Furthermore, either of these actions would occur in an environment where the federal government still classifies marijuana as a Schedule 1 substance.

34 https://www.economist.com/graphic-detail/2019/03/15/black-drivers-in-america-face-discrimination-by-the-police.

35 We do not include a discussion of removing the jail sentence for possession of marijuana. The Virginia State Crime Commission noted in 2017 that jail time is rarely imposed for many possession charges. Furthermore, removing the prospect of jail time would remove the right of indigent defendants to counsel.

Decriminalization: Dipping A Toe Into The Legalization Pool

Decriminalization reduces or eliminates the criminal penalties for possessing small amounts of marijuana for personal use. Marijuana possession is typically punished with a civil or criminal fine for the first offense. Subsequent offenses may result in the same fine, an increased fine or an increased fine and confinement. Subsequent offenses may remain civil (noncriminal) or may result in a criminal offense. As illustrated in Table 4, the penalties for a first offense of the possession of recreational amounts of marijuana vary from $50 in New Mexico to $300 in Minnesota and Nebraska. Among those states that have decriminalized possession of recreational amounts of marijuana, North Carolina's approach is considered among the most punitive, as the offender may be issued a summons or arrested. A recent investigation in Charlotte found that African Americans are more prone than whites to be arrested than cited for possession.[36]

What is common among the states that have decriminalized marijuana is that it remains illegal to consume it in public, to cultivate it for personal use, or to distribute or sell recreational amounts of marijuana. If one is in possession of more marijuana than allowed in the statute, penalties can range from a criminal misdemeanor to a felony. In Delaware, for example, possession of more than one ounce is punishable by up to three months in jail and a $575 fine. In Connecticut, possession of more than half an ounce is punishable by up to one year in jail and a $2,000 fine.

One motivation for decriminalization is that it (generally) removes the criminal penalty for first-offense marijuana possession for personal use. Lowering the penalty for possession should not only benefit the individual, but should also lower the number of arrests and thus the expenditure of resources for enforcing marijuana laws. Examining data collected by the Federal Bureau of Investigation, we compare arrest rates for marijuana possession per 100,000 residents for Virginia and selected decriminalized states for 2010 and 2017 (Graph 8).[37]

Among the states in Graph 8, Connecticut and Maryland recently changed the penalty for the first offense for marijuana possession for personal use. Since 2011, possession of a half-ounce or less in Connecticut is a civil violation. Arrests for possession fell from 8,322 in 2010 to 1,946 in 2017, a decline of 76%. Maryland decriminalized possession of 10 grams or less of marijuana in 2014. Arrests for possession declined from 23,390 in 2010 to 15,170 in 2017, a drop of 35%. It is worth noting that Maryland's arrest rate per 100,000 residents for marijuana possession in 2017 remains among the highest among decriminalized states. Decriminalization has reduced arrests but not as dramatically as proponents would argue.

Even if decriminalization reduced arrests by the same proportion as in Connecticut, two problems would remain: the disproportionate burden of the civil penalties relative to income and the lack of public defense for indigent offenders. Even if the civil fine is relatively low, there are additional court costs to consider (as anyone who has had to appear in court for a traffic ticket can attest). Failure to pay could lead to other fines and even jail time. **As a percentage of income, the civil penalties would be the greatest burden on those with the least means to pay them.**

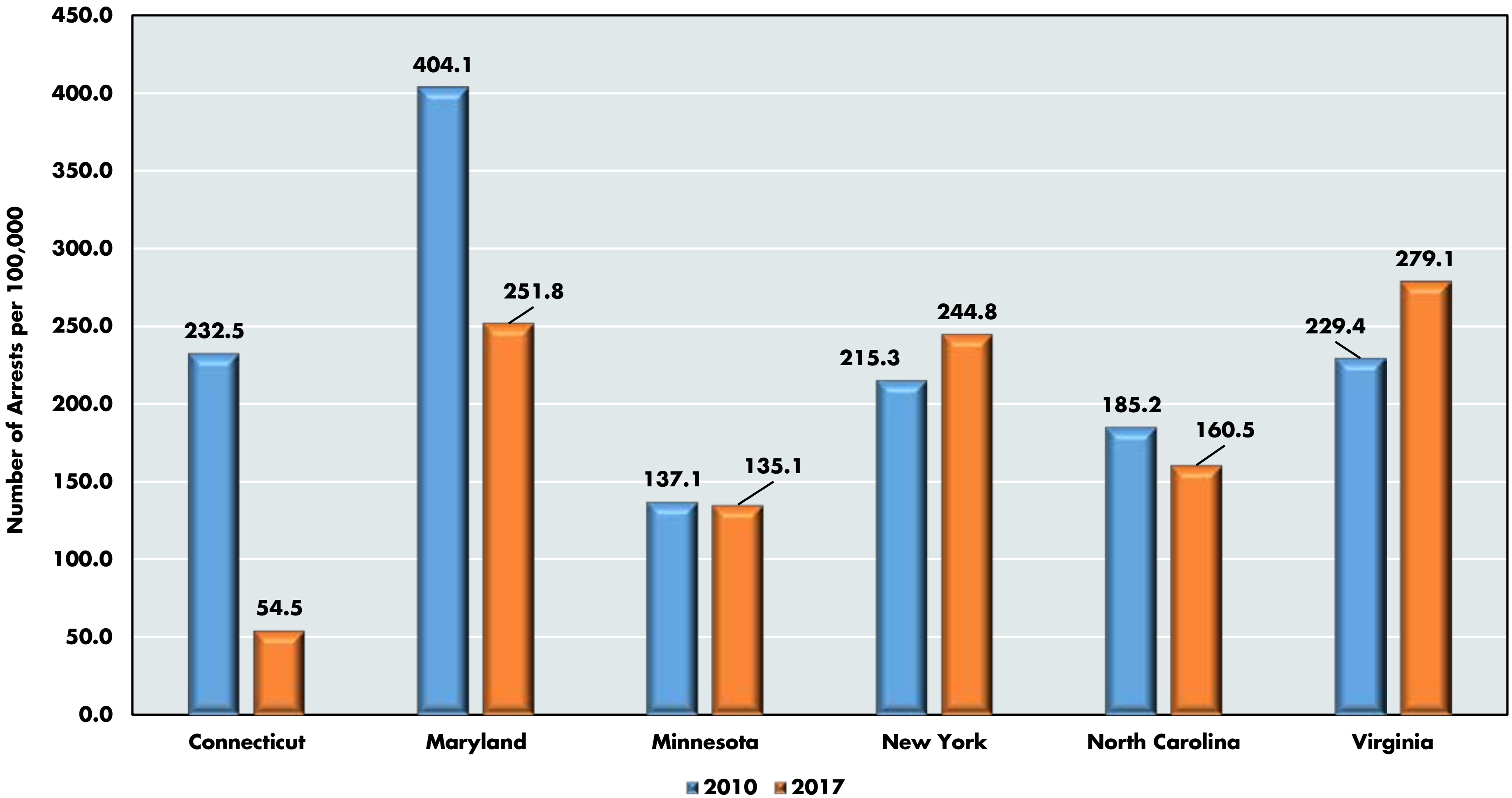
Another concern is that the shift from criminal to civil penalties removes the obligation for the state to provide counsel to defendants who could otherwise not afford a legal defense. We interviewed Gregory Underwood, commonwealth's attorney for the city of Norfolk, who directed his prosecutors to dismiss all marijuana-possession cases. He noted that "decriminalizing marijuana possession would strip the poor of the right to be appointed lawyers who could test the constitutional basis for their citations and the sufficiency of the evidence against them. In a decriminalized system, the wealthy could afford to hire lawyers to defend them. The poor would be on their own, and they would face an even higher comparative rate of conviction than they do now."

36 https://www.charlotteobserver.com/news/local/crime/article60170981.html.

37 As a person may be arrested multiple times a year, the arrest data do not show the number of individuals arrested but rather the number of times individuals are arrested.

GRAPH 8

NUMBER OF MARIJUANA POSSESSION ARRESTS PER 100,000 RESIDENTS: VIRGINIA AND SELECTED DECRIMINALIZED STATES, 2010 AND 2017



Sources: Federal Bureau of Investigation, National Incident-Based Reporting System, Marijuana Possession Arrests, and the U.S. Census Bureau, 2018 Population Estimates

TABLE 4 SUMMARY OF STATE DECRIMINALIZATION LAWS AS OF JUNE 2019				
State	Amount of Marijuana	Civil or Criminal First Offense	First Offense/Conviction	Second Offense/Conviction
Connecticut	0.5 ounce or less	Civil	$150 fine	$200 to $500 fine
Delaware	One ounce or less	Civil	$100 civil fine if 18 or older	Same as first offense for 21 and older, $100 criminal fine for ages 18-20
Hawaii	Up to 3 grams (0.105 oz)	Civil	Up to $130 fine	Same as first offense
Maine	2.5 ounces or less Six plants	Civil	No penalty for 21 and older Under 21: $350 to $1,000 fine	Same as first offense
Maryland	10 grams (0.35 oz.) or less	Civil	$100 fine	Second offense: $250 fine Subsequent: $500 fine
Minnesota	42.5 grams (1.5 oz.) or less	Criminal misdemeanor	$300 fine	Same as first offense
Mississippi	30 grams (1.06 oz.) or less	Civil	$100 to $250 fine	Within two years – $250 fine and 5 to 60 days in jail
Missouri	10 grams (0.35 oz.) or less	Criminal misdemeanor	$250 to $1,000 fine	Up to one year in jail and a fine up to $2,000
Nebraska	One ounce or less	Civil	$300 fine	Second offense: $400 fine, up to 5 days in jail Third offense: $500 fine, up to 7 days in jail
New Hampshire	0.75 ounce or less	Civil	Adults: $100 fine	Second offense: $100 fine Third offense: $300 fine Fourth offense within 3 years: up to $1,200 criminal fine
New Mexico	0.5 ounce or less	Civil	$50 fine	Same as first
New York	25 grams (0.88 oz.) or less	Civil	Fine up to $100	Second offense in 3 years: up to $200 fine Third offense in 3 years: $250 fine and/or 15 days or less in jail
North Carolina	0.5 ounce or less	Criminal misdemeanor	21 and older: $200 fine Possibility of arrest	Third infraction within a year may become Class B misdemeanor with 30 days in jail
Ohio	100 grams (3.5 oz.) or less	Civil	$150 fine	Same as first offense
Rhode Island	One ounce or less	Civil	18 or older: $150 fine	Third conviction within 18 months – misdemeanor punishable by $200 to $500 and/or six months in jail

Sources: Marijuana Policy Project (2019) and the Virginia State Crime Commission (2017), various state laws (2019). Information current as of June 2019. https://www.mpp.org/issues/decriminalization/state-laws-with-alternatives-to-incarceration-for-marijuana-possession/.

Legalization: Jumping In With Both Feet?

Table 5 lists the 11 states and the District of Columbia that have legalized the possession of marijuana for personal use. Legalization completely removes the civil and criminal penalties for marijuana possession for personal use in one's private residence. Legalization, however, typically does not entirely remove the penalties for public consumption. Possession of amounts that are greater than the legal limit may result in a fine, arrest, or both. The sale and distribution of marijuana is typically tightly regulated by the state and is only allowed in state-licensed dispensaries. Person-to-person private transactions are, in general, subject to a criminal charge, ranging from a misdemeanor to a felony, depending on the amount being sold. Contrary to popular belief, individuals can still be arrested for marijuana possession in legalized states, primarily for possession of more than the legal amount or consuming in a prohibited public space.

Proponents of legalization argue that it is more equitable than decriminalization, frees up more law enforcement and judicial resources and brings a shadow economy into the light. Legalization at the state level allows the state to regulate the production and sale of marijuana within its boundaries. Legalization also allows states and local governments to levy taxes on the production and sale of marijuana and marijuana-infused products. The Colorado Department of Revenue, for example, has recorded more than $6 billion in marijuana sales since January 2014 and has collected over $1 billion in revenue from taxes, licenses and fees since February 2014.[38]

Unlike decriminalization, where the supply side of the market remains illegal, legalization removes the risk for arrest from legal growers, processors and retailers. Transparency in supply and competition among suppliers increases, increasing the potency and decreasing the price of marijuana. According to the Colorado Department of Revenue, the average retail price of a pound of marijuana fell from $1,876 in January 2014 to $850 in July 2019, a decline of nearly 55%.[39] According to Beau Kilmer, the director of RAND's Drug Policy Research Center, the fall in prices in Washington and Colorado means that the cost of getting high by using marijuana is less than a couple of dollars, significantly less than the cost of the amount of alcohol to achieve the same effect.[40]

To provide an equal comparison with the decriminalized states, we examine the change in marijuana possession arrests from 2010 to 2017 for states that have legalized the possession of marijuana for personal use (Graph 9). To say that the declines in arrests have been dramatic might be an understatement. California, which reported 55,911 possession arrests in 2010, had only 3,741 arrests in 2017. Shaun Rundle, deputy director for the California Peace Officers' Association, argued that legalization might factor into police behavior. "If someone is going to be out of jail [in] six months and back on the streets – and six months is even unlikely these days – then the agencies need to divert their time and resources to the most dangerous and violent crime prevention."[41]

> "Marijuana legalization and regulation will ensure that all Virginians, no matter where in the Commonwealth they live, will no longer be subject to fines and jail for possessing marijuana. They will help lift the burden that marijuana enforcement imposes on the poor and on minority communities. They will bring business benefits to Virginia that many of our fellow states already enjoy. And they will ensure that a strong regulatory framework will exist so that legalization is consistent with public safety. Justice demands it."
> – Greg Underwood, Commonwealth's Attorney for the city of Norfolk

38 Colorado Marijuana Sales Data and Marijuana Tax Data (2019), available at https://www.colorado.gov/pacific/revenue/colorado-marijuana-tax-data.

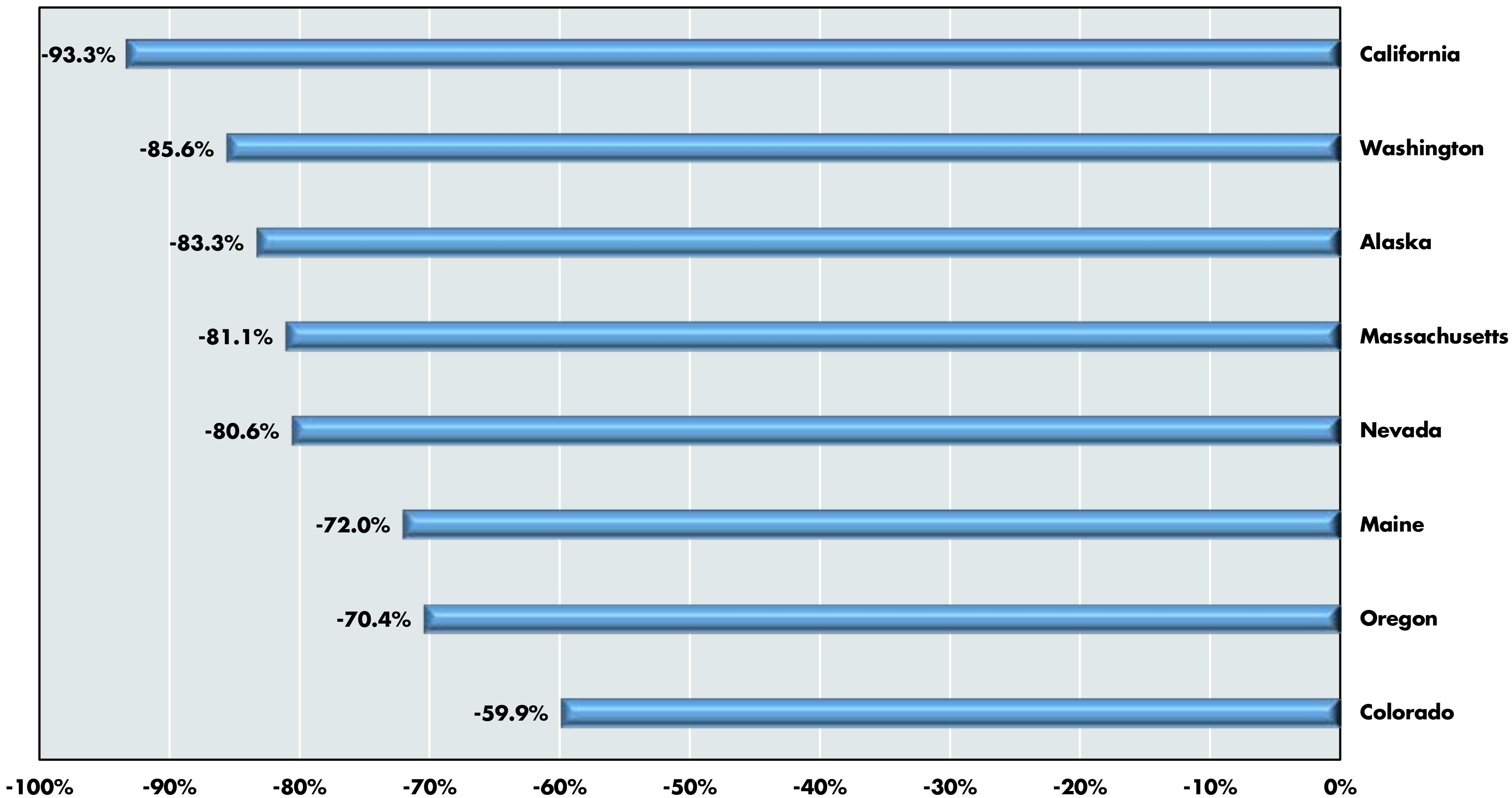
39 https://www.colorado.gov/pacific/sites/default/files/AMR_PriorRates_Oct2018Edit.pdf.

40 https://www.rand.org/blog/2018/12/navigating-cannabis-legalization-20.html.

41 https://www.mercurynews.com/2018/07/11/prop-64-didnt-legalize-every-cannabis-crime-but-arrests-are-falling-fast/.

GRAPH 9

PERCENT DECLINE IN MARIJUANA ARRESTS: SELECTED LEGALIZATION STATES, 2010-2017



Source: Federal Bureau of Investigation, National Incident-Based Reporting System, marijuana possession arrests. Michigan and Vermont legalized marijuana in 2018 and data are not yet available regarding the change in arrests.

TABLE 5 SUMMARY OF STATE LEGALIZATION LAWS AS OF JUNE 2019				
State	**Year of Legalization**	**Age**	**Legal Amount of Marijuana**	**Public Consumption**
Alaska	**2014**	**21 years or older**	**1 to 4 ounces, six plants in private**	**Civil violation, $100 fine**
California	**2016**	**21 years or older**	**Up to 1 ounce, six plants**	**Criminal misdemeanor to loiter in public with intent to commit marijuana offenses**
Colorado	**2012**	**21 years or older**	**Up to 1 ounce, six plants**	**Civil violation to display or use more than 2 ounces, $100 fine**
District of Columbia	**2014**	**21 years or older**	**Up to 2 ounces, six plants**	**Criminal misdemeanor, citation and release**
Illinois	**2019**	**21 years or older**	**10 grams (0.35 oz) or less**	**Civil violation, $200 fine**
Maine	**2016**	**21 years or older**	**Up to 2.5 ounces, three plants**	**Civil infraction, $100 fine**
Massachusetts	**2016**	**21 years or older**	**Up to 10 ounces in private, up to 1 ounce in public, six plants**	**Civil infraction, $100 fine**
Michigan	**2018**	**21 years or older**	**Up to 10 ounces in private, up to 2.5 ounces in public, less than 12 plants**	**Civil infraction, $100 fine**
Nevada	**2016**	**21 years or older**	**Up to 1 ounce, six plants**	**Criminal misdemeanor, $600 fine**
Oregon	**2014**	**21 years or older**	**Up to 1 ounce in public, up to 8 ounces in private, four plants**	**No fine or penalty for up to 1 ounce in public**
Vermont	**2018**	**21 years or older**	**Up to 1 ounce, six plants**	**Civil violation, $100 fine**
Washington	**2012**	**21 years or older**	**1 ounce or less for private consumption**	**Civil penalty, 1 ounce or less, $100 fine**

Sources: National Organization for the Reform of Marijuana Laws (2019), various state laws (2019). Information current as of June 2019, https://norml.org/legal/legalization. Vermont Marijuana Laws (2019), https://statelaws.findlaw.com/vermont-law/vermont-marijuana-laws.html. National Conference of State Legislatures (2019), Marijuana Overview (2019). Information current as of May 2019, http://www.ncsl.org/research/civil-and-criminal-justice/marijuana-overview.aspx. Illinois becomes effective 2020.

Would Legalization Be A Revenue Windfall For Virginia Cities And Counties?

If Virginia decided to legalize marijuana for personal use, cities and counties in Hampton Roads would likely be able to tax the production and sale of marijuana. Marijuana legalization would also likely reduce the number of arrests for possession; however, we would reasonably expect that law enforcement resources would be reallocated to deal with other crimes. Let's take a quick look at what the revenue impact might be from marijuana legalization.

We assume that adults in Hampton Roads would respond to legalization by consuming more marijuana. The question is how much? We use the response of adults in Colorado and Oregon to form our low and high estimates (Table 6). Legalization likely would result in approximately 10% to 12% of the adult population in Hampton Roads using marijuana on a monthly basis.

What might legalization in the Commonwealth look like? Virginia House Bill 2371, introduced earlier this year, proposed to legalize recreational marijuana. The proposed excise tax in Virginia would have been 9.7% at the state level (combined with the 5.3% normal sales tax levy, it would total 15%) with an additional 5% local excise tax option. Although the bill failed in committee, we use it as a framework to estimate the potential tax revenues for local governments.[42]

While we do not have data on how much Virginia residents currently spend on marijuana, we do have survey data on how much marijuana consumers in other states spend. Headset Inc., a Seattle-based cannabis market intelligence firm, recently estimated that the average marijuana consumer spends about $645 a year, or approximately $54 a month.[43] After legalization and assuming that residents of Hampton Roads respond like those in Colorado or Oregon, Table 7 estimates that marijuana sales could approach $80 million to $100 million a year, resulting in approximately $4 million to $5 million in excise tax revenues to local governments. Of course, our estimate does not include jobs that would be created to produce, distribute and sell marijuana for personal use. Our estimates also do not factor in the costs to society, to include the potential for increases in car accidents, hospitalizations or absenteeism. Our estimates suggest that marijuana legalization would generate a modicum of additional tax revenue but should not be viewed as means to improve financial stability of governments in the region.

42 https://lis.virginia.gov/cgi-bin/legp604.exe?191+sum+HB2371.
43 https://www.headset.io/blog/what-does-the-average-cannabis-consumer-look-like.

TABLE 6

ESTIMATED CHANGE IN MARIJUANA USE IN THE PAST MONTH FOR ADULTS 18 AND OLDER: COLORADO, OREGON AND HAMPTON ROADS

	Colorado	Oregon	Hampton Roads	
	Low Response	High Response	Low Response	High Response
Before legalization	**12.9%**	**12.6%**	**7.6%**	**7.6%**
After legalization	**16.6%**	**20.0%**	**9.8%**	**12.1%**
Percent Change	**28.7%**	**58.7%**	**28.7%**	**58.7%**

Source: National Survey of Drug Use and Health. Colorado liberalization went into effect in January 2014 and Oregon in July 2015. Comparison is between last full year with data available prior to change versus next full year post liberalization. Colorado is 2012-2013 and 2015-2016. Oregon is 2013-2014 and 2016-2017. Hampton Roads usage for preliberalization is from 2014-2016.

TABLE 7 EXCISE TAX REVENUE ESTIMATES FOR THE LEGALIZATION OF MARIJUANA, HAMPTON ROADS		
	Low Estimate	High Estimate
Population 18 and Older	1.3 million	1.3 million
Usage in the Previous Month	9.8%	12.1%
Monthly Marijuana Consumers	127,400	157,300
Average Monthly Spending	$54	$54
Estimated Monthly Spending	$6,879,600	$8,494,200
Estimated Annual Spending	$80,611,200	$101,930,400
Estimated Excise Tax Revenue	$4,030,560	$5,096,520

Final Thoughts

The decision of whether to maintain the status quo, decriminalize or legalize the personal possession of marijuana will reverberate throughout the Hampton Roads economy. Maintaining the status quo is a policy choice under increasing pressure at the state and local level. The attempts of the commonwealth's attorneys of Norfolk and Portsmouth to dismiss some (Portsmouth) or all (Norfolk) misdemeanor possession cases are a sign that the region is moving from conversation toward action on marijuana.

If, as evidenced by the increasing number of states decriminalizing and legalizing the personal use of marijuana, change does come to Virginia and Hampton Roads, what would it mean? **First, marijuana is not a cure for the ills of local governments**. While Colorado has generated $1 billion in marijuana taxes, fees and licenses, this was over almost five years. It's an additional revenue source, not a replacement for property taxes or other taxes at the local level.

Second, many of the claims about marijuana and CBD-infused products are unproven and research will take time to investigate them. CBD-infused products do appear to have some medicinal benefits for pain relief. Whether or not these products have benefits for anxiety, depression, gout, weight loss, weight gain and a host of other physical ailments remains to be seen. The rush of CBD-based products to markets appears to follow similar fads of the past. As for marijuana, the health benefits are also mixed, with some studies showing benefits, others not. Claims that marijuana use reduces opioid overdoses, for example, are promising and intriguing, but require further research to determine whether the relationship exists.

Third, marijuana decriminalization or legalization does not eliminate the black market for marijuana. When marijuana is decriminalized, there are still no legal outlets for consumers to purchase it, so the black market may grow as penalties for consumers decrease. When marijuana is legalized, the legal dispensaries are taxed and regulated, and the quality of marijuana increases relative to what is available on the black market.[44] Consumers are willing to pay more, but not too much more, and some consumers may find legal prices are too high when compared to the black market. Part of the problem is the federal classification of marijuana, which presents significant barriers to the operation of marijuana businesses. Another is that the black market is not taxed like the legal market, so it can offer cheaper (but riskier) prices. If the federal government were to change its position on marijuana, some of these barriers might go away. Increased competition within and among states would lower prices and reduce the size of the black market.

Fourth, Hampton Roads' interdependence with the federal government and the military means that many residents have a job that requires a drug test, security clearance, or both. Even if marijuana were completely legalized for personal use in the U.S., the military and individuals working for or with the federal government in sensitive positions would likely continue to face restrictions on the use of marijuana. Transportation industries, to include airlines, rail and trucking, would undoubtedly have restrictions on marijuana similar to the current restrictions on alcohol consumption. As over 60% of traffic through the Port of Virginia moves by truck and another 30% by rail, marijuana decriminalization or legalization could potentially have far-ranging impacts on the availability of truck drivers and public safety.

Fifth, while marijuana legalization does not appear to increase the rate of use by minors, there is strong evidence that marijuana potency increases with legalization. Emergency department and urgent care visits by minors for adverse reactions to marijuana increased almost three-fold in Colorado after legalization.[45] Even though minors may not legally consume marijuana, a resale market exists, creating the increased likelihood of an adverse reaction or prolonged substance abuse. Care must be taken to recognize that sales competition would likely lead to increased THC content. Illinois, which recently signed marijuana legalization into law, has a unique tax structure where the tax rate on marijuana is dependent upon THC content, perhaps attenuating future demand for high-THC marijuana.

Sixth, decriminalization or legalization will create new burdens on law enforcement. A 2018 study by the Insurance Institute for Highway Safety and the Highway Loss Data Institute found that car crashes increased by as much as 6% in Colorado, Nevada, Oregon and Washington after these states legalized marijuana for recreational use.[46] Adults 18 to 20 still can be cited in legalized states and the prevention of sales to minors is an obvious concern. New law enforcement training, procedures and equipment would be needed to adapt to a new normal. On the other hand, Virginia will likely benefit from not being an early adopter of either decriminalization or legalization, thus putting itself in a position to learn from best practices developed by other states.

Lastly, marijuana legalization is likely to be more efficient than decriminalization in addressing inequities in enforcement. The racial and socioeconomic disparities in arrests for marijuana possession in Virginia and Hampton Roads are troubling and worthy of discussion. Evidence from decriminalized states, however, suggests that these disparities persist even after decriminalization. Furthermore, because civil fines do not graduate with income, the burden of civil penalties is higher on those with lower incomes. Decriminalization removes the provision of a legal defense from those least able to afford one, which may increase disparities in judicial outcomes. Decriminalization should not equate "punishable by fine" with "legal for people with means."

Marijuana is coming (and it's already here). The exact date is unknown, but the momentum is clear. We should not shy away from discussing what may occur and keep in mind that challenge and opportunity are two sides of the same coin. In the words of Winston Churchill, "To improve is to change; to be perfect is to change often."

44 Michael Armlung, Derek Reed, Vanessa Morris, Elizabeth Aston, Jane Metrik and James MacKilop (2018), "Price elasticity of illegal versus legal cannabis: a behavioral economic substitutability analysis, *Addiction* 114 (1), 112-118.

45 https://www.ncbi.nlm.nih.gov/pubmed/29609916.

46 https://www.iihs.org/news/detail/crashes-rise-in-first-states-to-begin-legalized-retail-sales-of-recreational-marijuana.

Mind The Gap: Women's Leadership In Hampton Roads

MIND THE GAP: WOMEN'S LEADERSHIP IN HAMPTON ROADS

A truly equal world would be one where women ran half our countries and companies and men ran half our homes.
– Sheryl Sandberg, Chief Operating Officer, Facebook, and Founder of LeanIn.org

During June and July of 2018, the Pew Research Center surveyed Americans about their attitudes toward women and whether women would make effective leaders. The survey responses, while not entirely surprising, provided a stark contrast with the reality of women in leadership positions in the United States. Not only did a majority of respondents state that they would like to see more women in leadership positions, 59% indicated that there are too few women in high political office and in top executive business positions. More than two-thirds of respondents indicated that more women in leadership positions would improve the quality of life "some" or "a lot" for all Americans.

There was, of course, a lack of unanimity with this perspective across the political spectrum. While almost 80% of Democratic or Democratic-leaning respondents believed that there were too few women in high political office or top executive business positions, only about one-third of Republican or Republican-leaning respondents voiced similar opinions. Among the more conservative respondents, however, there were strikingly dissimilar responses by gender. While about one-quarter of Republican or Republican-leaning men thought there were too few women in high political office, this view was held by almost half of Republican or Republican-leaning women. The same split emerged with respect to top business positions. At the same time, nearly half of the men and two-thirds of the women who identified as Republican or Republican-leaning thought it was easier for men to get elected to high political office or be appointed to an executive business position.

Most participants in the Pew survey saw no difference between the skills of women and men in areas that are relevant to corporate and political leadership – from being persuasive and working well under pressure, to providing fair pay and mentoring employees (Table 1). A notable exception was when it came to being compassionate and empathetic; 61% felt women were better in this area. **The minority of respondents who did see a difference in the abilities of female and male leaders consistently ranked women's abilities higher.**

The relative advantage of women was most pronounced in "creating a safe and respectful workplace" and "serving as a role model for children." Men were given an edge only in "being willing to take risks" and "negotiating profitable deals." If women and men are viewed as having similar leadership qualities and many Americans believe that there are too few women in senior leadership positions, this raises the question: Why does this gap continue to persist?

TABLE 1 WOMEN AND LEADERSHIP SURVEY, 2018: VIEWS ON WOMEN'S AND MEN'S LEADERSHIP QUALITIES			
	Women are better	**Men are better**	**No difference**
Creating a safe and respectful workplace	**43%**	**5%**	**52%**
Valuing people from different backgrounds	**35%**	**3%**	**62%**
Considering the societal impact of business decisions	**33%**	**8%**	**58%**
Mentoring young employees	**33%**	**9%**	**56%**
Providing fair pay and good benefits	**28%**	**5%**	**66%**
Negotiating profitable deals	**9%**	**28%**	**61%**

Source: 2018 Women and Leadership Survey, Pew Research Center, September: http://www.pewsocialtrends.org/2018/09/20/women-and-leadership-2018/

According to the latest estimates from the U.S. Census Bureau for 2017, women comprised approximately 52% of the U.S. population ages 25 and over. On average, women were slightly more likely than men to hold a bachelor's degree or higher (31.2% vs. 30.6%), but there were marked differences across age cohorts. For those ages 25 to 34, 38.5% of women and 30.4% of men held a bachelor's degree or higher. For 31- to 35-year-olds, the percentages were 37.8% and 31.8% for women and men, respectively. Only when we examine the 65 and older population do we observe more men (31.5%) than women (21.5%) having completed a college or university degree.

In Hampton Roads, 31.8% of women ages 25 and over held a college or university degree in 2017, compared to 29.7% of men in the same age range – an achievement gap that is a bit broader than in the United States as whole. Yet these averages obscure significant variations in educational attainment by race and gender. As illustrated in Graph 1, black or African American, Hispanic and white women were more likely to have a bachelor's degree or higher than their male counterparts in 2017. If income is strongly influenced by education, one might reasonably conclude that women, on average, should earn more in Hampton Roads than men, but this is not the case.

At every level of educational attainment, women typically earned less than men in 2017. In Hampton Roads, median income for women with bachelor's degrees was $41,486 – 67.5% of the median income for men with the same level of education ($61,416). The earnings gap was even wider for women with a graduate education. Their median income was $53,551, which was just 61.6% of that for men with a graduate or professional degree ($86,984) – an annual disparity of $33,433.

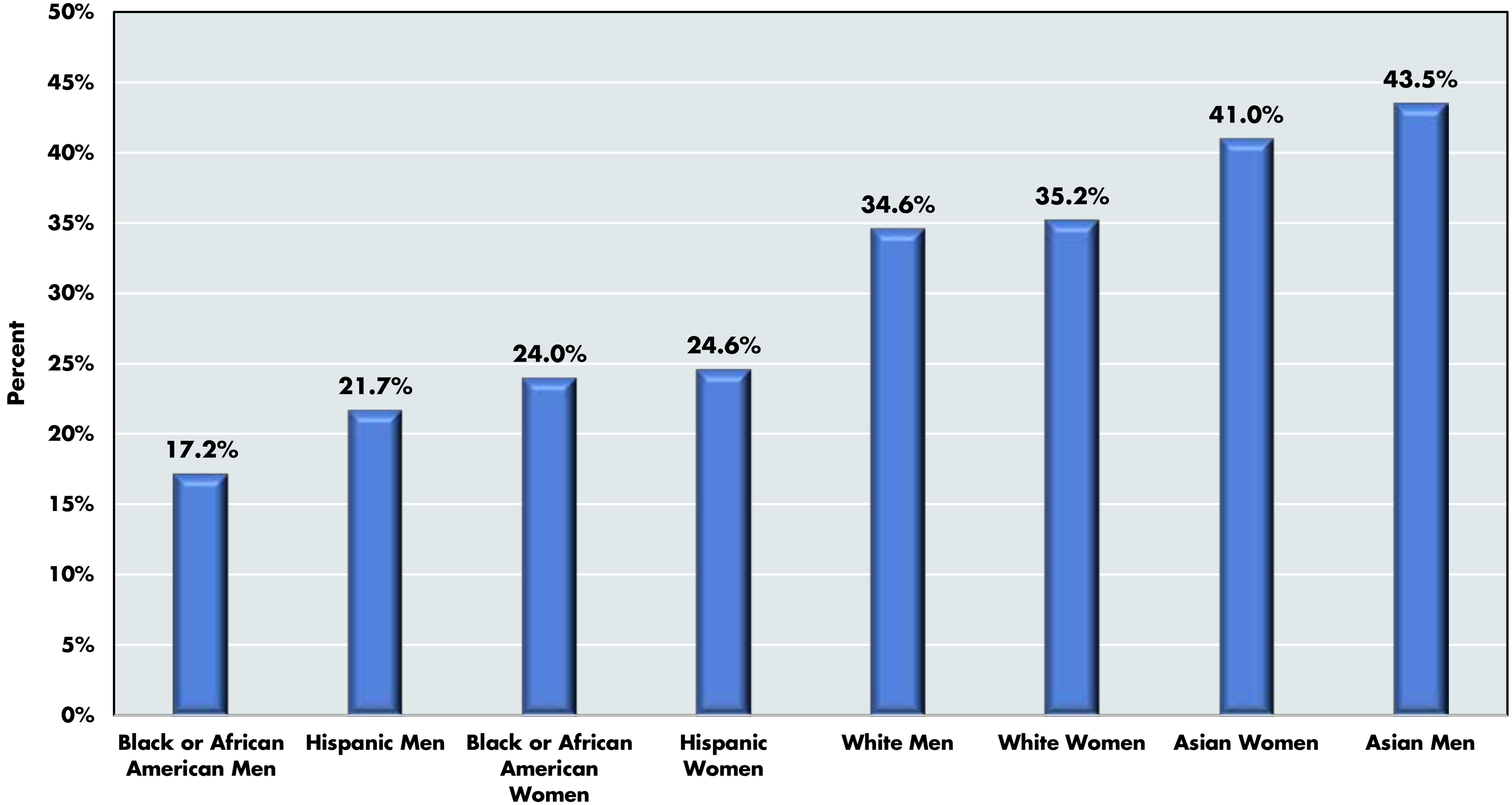
There are many different reasons for this gap in earnings – including a higher proportion of women who work part time and the fact that women may, on average, work more often in jobs (caregiving and education, for example) that have lower levels of compensation. Men's earnings may also be higher due to the tendency of males, on average, to work longer hours and in jobs that may be more physically demanding, dangerous or in harsher environmental conditions.[1] Women interrupt their careers for children more than men and there are well-documented penalties in terms of wages and income as a result. Recent evidence suggests that while the gender wage gap declined significantly from 1980 to 2010, these declines have been much slower at the top of the wage distribution.[2] This yields the somewhat ironic conclusion that the more successful women are, on average, the more they fall behind men's wages.

The disparity in earnings also reflects the women's leadership gap. In nearly all lines of work, the proportion of women at the highest levels of leadership is significantly lower than the proportion of women in mid- and lower-level positions. The relative absence of women has ripple effects on the talent pipeline, as women mentors are in relatively short supply.

1 http://www.aei.org/publication/details-in-bls-report-suggest-that-earnings-differentials-by-gender-can-be-explained-by-age-marital-status-children-hours-worked/.
2 Francine D. Blau and Lawrence M. Khan, 2017, "The Gender Wage Gap: Extent, Trends, and Explanations," *Journal of Economic Literature* 55 (3), 789-865.

GRAPH 1

HAMPTON ROADS, BACHELOR'S DEGREE OR HIGHER: RACE AND GENDER, 2017



Source: U.S. Census Bureau, American Community Survey 2013-2017, 5-Year Estimates

In Hampton Roads, the women's leadership gap is readily apparent. Although it has narrowed considerably over the past several decades, there are still far fewer women than men in positions of power. Women comprise less than one-quarter of the membership of the regional boards of directors for both the Peninsula and Hampton Roads Chambers of Commerce. The 2019 Inside Business Power List recognizes 70 men, and just 30 women, as "important to the future of Hampton Roads." The Inside Business emeritus list – reserved for those individuals whose "tenure in our community is not only implicit, it's a valuable ongoing contribution" – is even more lopsided; only 14 of its 83 names belong to women.[3]

TABLE 2

SELECTED HAMPTON ROADS BUSINESS LEADERS BY GENDER, 2019

	Men	Women	Percentage of Women
Hampton Roads Chamber of Commerce Board of Directors	**56**	**18**	**24.3%**
Virginia Peninsula Chamber of Commerce Board of Directors	**27**	**8**	**22.9%**
2019 Inside Business Power List	**70**	**30**	**30.0%**

Sources: Hampton Roads Chamber, board of directors (May 2019); Virginia Peninsula Chamber, board of directors (May 2019); and Inside Business, "The Power Issue" (May 2019)

This chapter seeks to investigate the extent of the women's leadership gap in Hampton Roads, its underlying causes and what can be done to narrow it. We focus on four key fields: politics, business, law and higher education, drawing upon publicly available data as well as our own conversations with some of Hampton Roads' women leaders.

3 "The 2019 Inside Business Power List" (May 17, 2019), https://pilotonline.com/inside-business/special-reports/power-issue/.

Politics: Gains In Representation, Though Challenges Remain

2018 was a milestone year for women in politics throughout the United States. A record number of women ran for elected office, at all levels of government, in the November elections. As illustrated in Table 3, more women than ever before are now serving in the U.S. Congress (127, or 23.7% of all members), including three newly elected representatives from Virginia – Abigail Spanberger (Virginia 7th), Jennifer Wexton (Virginia 10th) and Elaine Luria (Virginia 2nd, which covers parts of Hampton Roads and the Eastern Shore).

This accomplishment is all the more notable in that only four women have *ever* represented Virginia in the U.S. Congress, in all years previously – Barbara Comstock (2015–2019), Thelma Drake (2005–2009, also from the 2nd District), Jo Ann Davis (2001–2007, from the 1st District, including northern Hampton Roads) and Leslie Byrne (1993–1995). Women's gains in the Virginia General Assembly were also impressive. The proportion of seats held by women rose from 19.3% to 26.4% (37 of 140 seats).

TABLE 3

WOMEN IN ELECTED OFFICE: UNITED STATES AND VIRGINIA, 2019

	UNITED STATES			VIRGINIA		
	Total seats	Total held by women	Percent	Total seats	Total held by women	Percent
U.S. Congress	535	127	23.7%	13	3	23.1%
U.S. Senate	100	25	25.0%	2	0	0.0%
U.S. House	435	102	23.4%	11	3	27.3%
Statewide Executive	312	86	27.6%	3	0	0.0%
State Legislature	7,383	2,117	28.7%	140	37	26.4%
State Senate	1,972	504	25.6%	40	10	25.0%
State House	5,411	1,613	29.8%	100	27	27.0%
Mayors	1,365	297	21.8%	18	6	33.3%

Sources: Center for American Women and Politics and the Virginia Public Access Project, 2019. Mayors are for cities with populations of 30,000 or greater only.

Table 4 shows the proportion of Hampton Roads districts now represented by women is slightly higher, at 27.6% (8 of 29 seats). Our region's state senators are Mamie Locke (Hampton) and Louise Lucas (Portsmouth). Our delegates are Emily Brewer (Smithfield), Kelly Fowler (Virginia Beach), Cia Price (Newport News), Cheryl Turpin (Virginia Beach), Brenda Pogge (Norge) and Jeion Ward (Hampton). Notably, after a recount in the race for the 94th District, Shelly Simonds (Newport News) received exactly the same number of votes as David Yancey, losing the seat only after a random drawing broke the tie.

TABLE 4

WOMEN IN ELECTED OFFICE FROM HAMPTON ROADS, 2019

	HAMPTON ROADS		
	Total seats	Total held by women	Percent
U.S. Congress	6	1	16.7%
U.S. Senate	2	0	0.0%
U.S. House	4	1	25.0%
Statewide Executive	3	0	0.0%
State Legislature	29	8	27.6%
State Senate	9	2	22.2%
State House	20	6	30.0%
Mayors (Cities > 30,000)	7	1	14.3%

Sources: Center for American Women and Politics and the Virginia Public Access Project, 2019. Mayors are for cities with populations of 30,000 or greater only.

Virginia women have made great strides in representation at the state and national levels, although the proportion of female officeholders, in all categories, still lies well below the percentage of women in the Commonwealth. Hampton Roads' city council chambers are somewhat more equitably populated. Half, or four of the eight Norfolk City Council seats are held by women (Courtney Doyle, Angelia Williams Graves, Mamie Johnson and Andria McClellan), while women do in fact represent a majority on the Newport News City Council, holding four of seven seats (Vice Mayor Tina Vick, Saundra Nelson Cherry, Sharon Scott and Patricia Woodbury). Linda Johnson is the only woman now serving on the Suffolk City Council – but she is also the mayor, a position she has held since 2006. She follows in the footsteps of Virginia Beach's longest-serving mayor, Meyera Oberndorf (1988–2009); as well as Ann Kilgore (1963–1971 and 1974–1978), Mamie Locke (2000–2004) and Molly Ward (2008–2013) in Hampton; and Jessie Ratley (1986–1990) in Newport News.

Research shows that women win U.S. elections at about the same rate as men. Women, however, have traditionally been less likely to run for office, for a number of different reasons – including fundraising hurdles, insufficient support from power brokers and party insiders, and perhaps a self-confidence gap.[4] Organizations such as Emerge America, VoteRunLead, Higher Heights for America and She Should Run have coalesced to support and train women candidates within the past several years, contributing in no small way to these candidates' successes in the 2018 elections.

Suffolk Mayor Linda Johnson told us that city leaders first encouraged her husband, Jesse, and other men to run for an open City Council seat in 2000. After none of the men expressed interest in running, she decided to step up herself – although she had not previously considered a political career, and only two women to that point had ever served on the Suffolk City Council. Johnson has since won five elections, including three as Suffolk's first directly elected mayor, and she has presided over a remarkable phase of population growth and economic development in her city.

Daun Hester – who has run successful campaigns as a city councilwoman, General Assembly delegate and now city treasurer in Norfolk – reiterated the challenges that women politicians face breaking into the formal and informal circles of power that remain largely dominated by white men. She emphasized the importance of relationships in the political process, and thus the importance of women in positions of influence supporting each other. She cited the cooperation and collegiality she experienced among female members of both parties in the General Assembly as a positive example.

4 See "Research and Scholarship," Center for American Women and Politics, https://cawp.rutgers.edu/research; and Saskia Brechenmacher, "Tackling Women's Underrepresentation in U.S. Politics," Carnegie Endowment for International Peace (February 2018), https://carnegieendowment.org/files/CP_323_Brechenmacher_Gender_web.pdf.

The governments of Hampton Roads' seven cities can point to numerous women in leadership posts, including as city managers, deputy city managers and department heads. We found that women in Hampton Roads generally hold one-third to one-half of these key positions. Three of the seven cities' city managers are currently women – Mary Bunting in Hampton, Cynthia Rohlf in Newport News and Lydia Pettis Patton in Portsmouth. Bunting, who has served in Hampton's top administrative post since 2010, told us that the women's leadership gap in city government may be somewhat narrower than in other fields because of the profession's inherent emphasis on reflecting and serving the entire community. She remarked that becoming a city manager never seemed out of the ordinary to her, as she is literally following in the footsteps of her mother, Darlene Burcham, who served as director of social services in Hampton, deputy city manager in Norfolk and city manager in Roanoke. Even so, national survey data suggest that the gender gap among city managers remains quite wide, with women holding just 20 percent of chief executive positions in local government throughout the United States.[5]

5 "Will 2019 Be a Breakthrough Year for Women in Local Government Leadership?" ICMA (Jan. 23, 2019), https://icma.org/blog-posts/will-2019-be-breakthrough-year-women-local-government-leadership.

Business: Some Good News, Some Opportunities For Improvement

It's been more than 40 years since Rosabeth Moss Kanter published "Men and Women of the Corporation," a landmark study that identified the structural barriers that kept many working women in low-level managerial or secretarial posts. In The New York Times Magazine earlier this year, journalist Emily Bazelon noted the dramatic progress that women executives have made since then, "achieving higher positions, closing the gender wage gap and moving into male-dominated fields" – but also how this progress has largely stalled since the 1990s, especially at the highest ranks of leadership.[6]

National statistics and survey data throw Bazelon's observations into sharp relief. Since 2015, LeanIn.Org and McKinsey & Company have published a comprehensive annual study on the state of women in corporate America. (LeanIn.Org is a nonprofit organization dedicated "to offering women the ongoing inspiration and support to help them achieve their goals"; McKinsey & Company is a worldwide management consulting firm.) Each year, their depiction of the corporate pipeline has shown how women remain dramatically outnumbered in senior leadership. Women hold nearly half (48%) of all entry-level positions, but they represent just 38% of managers, 29% of vice presidents and 22% of top (or "C-Suite") executives. The leadership gap is wider still in Fortune 1000 companies, where women comprised just 18% of all C-Suite executives in 2016. Table 5 shows that most of these top female executives were either chief human resources officers or chief marketing officers – not chief executive officers, chief operating officers or chief financial officers. In 2015, there were four men named John, Robert, William or James for every woman chief executive (of any name) in an S&P 1500 firm.[7]

6 Emily Bazelon, "A Seat at the Head of the Table," The New York Times Magazine (Feb. 21, 2019), https://www.nytimes.com/interactive/2019/02/21/magazine/women-corporate-america.html.
7 Justin Wolfers, "Fewer Women Run Big Companies Than Men Named John," The New York Times (March 2, 2015), https://www.nytimes.com/2015/03/03/upshot/fewer-women-run-big-companies-than-men-named-john.html.

TABLE 5 PERCENTAGE OF WOMEN EXECUTIVES: FORTUNE 1000 COMPANIES, 2016	
TITLE	**U.S. (2016)**
Chairman of the Board	**6.7%**
Chief Executive Officer	**6.9%**
Chief Operating Officer	**7.2%**
Chief Financial Officer	**8.8%**
Chief Revenue Officer	**12.5%**
Chief Technology Officer	**12.9%**
Chief Strategy Officer	**20.0%**
Chief Information Officer	**20.7%**
Chief Legal Officer	**31.9%**
Chief Compliance Officer	**36.4%**
Chief Marketing Officer	**48.0%**
Chief Human Resources Officer	**62.2%**
All C-level executives	**18.0%**

Source: Fortune, "There Are Hardly Any Women Leading Fortune 1000 Companies," http://fortune.com/2016/09/06/fortune-1000-still-led-by-men/

We acknowledge that we are not able to provide a full portrait of the corporate pipelines of Hampton Roads' three Fortune 500 companies (Dollar Tree, Norfolk Southern and Huntington Ingalls) due to data limitations and confidentiality concerns. Publicly available data, however, allow us to examine the composition of these corporations' boards of directors. As illustrated in Table 6, one perspective is that women appear to be an unambiguous minority among the appointed members of these boards. Another perspective is that the proportional representation of women in two of the three companies in Table 6 is higher than the national average. Lastly, one could surmise that, in all cases, the representation of women on these boards, locally and nationally, is well below the percentage of women in the overall population. All three perspectives can simultaneously be true and a challenge to do better.

TABLE 6 MEN AND WOMEN APPOINTED TO BOARDS OF DIRECTORS: FORTUNE 500 COMPANIES IN HAMPTON ROADS, 2019			
	Men	**Women**	**Percent of Women**
Dollar Tree	**13**	**2**	**15.4%**
Norfolk Southern	**11**	**3**	**27.3%**
Huntington Ingalls	**11**	**3**	**27.3%**
U.S. Average	**--**	**--**	**22.5%**

Sources: Wall Street Journal Co. Profiles (2019), Bloomberg Co. Profiles (2019) and Alliance for Board Diversity, "Missing Pieces Report." Data as of May 29, 2019.

We spoke with Jennifer Boykin, president of Newport News Shipbuilding and executive vice president of Huntington Ingalls in Newport News, at her company's headquarters, where her portrait stands out as the newest, and the only female, face at the end of a long hallway showcasing the visages of men who led Newport News Shipbuilding for more than 130 years. The past 10 to 15 years in the company, Boykin said, have been distinguished by a renewed emphasis on diversity and inclusion. She told us that efforts to increase the hiring and promotion of women (and members of other diverse groups) have borne the most fruit since the company shifted from using primarily outcome-based measures to, more recently, making sure that initial pools of interviewees and hiring panels were also diverse.

The payoff, Boykin said, is a leadership team that incorporates multiple perspectives and is flexible and open to new ways of thinking. She observes that male leaders, too, may be more comfortable asking questions or proposing new ideas in a more diverse group; this has been particularly helpful as the company has tackled new challenges associated with its ongoing digital transformation. Boykin's observations correspond with research from McKinsey & Company, which has found that meaningful strategies of diversity and inclusion can be a source of competitive advantage. Specifically, McKinsey found that "companies in the top-quartile for gender diversity on their executive teams were 21% more likely to have above-average profitability than companies in the fourth quartile."[8]

Alongside Huntington Ingalls, the health care providers Sentara, Riverside, Bon Secours, Children's Hospital of The King's Daughters and Chesapeake Regional Healthcare are among our region's top employers. We found the health care systems' executive teams often included a higher proportion of women than those of other comparably sized companies. Sentara Healthcare has seven female vice presidents (and eight male vice presidents), and five of the 13 Sentara hospitals are headed by women. Amy Carrier has served as president of the Bon Secours Hampton Roads Health System since October 2018, and at CHKD, eight of 14 vice presidents are women. These numbers correspond with, or exceed, national statistics; women represented 34.5% of all U.S. hospital executives in 2018.[9]

Sentara Healthcare senior corporate vice president Mary Blunt notes that the health care field has traditionally employed a high proportion of women, in many different capacities. She herself began her career as a physical therapist. Moreover, nonprofit entities of all kinds have a high rate of female leadership, representing a significant exception to the women's leadership gap.[10] Blunt told us that the nature of large health care providers, which necessarily serve the entire public, has made them particularly cognizant of issues related to diversity, inclusion and unconscious bias. When we spoke last spring, Sentara was in the process of adding the new position of chief diversity officer to its executive team. And Blunt's own assessment that women leaders tend to be more intuitive and compassionate, while just as sharp analytically as their male counterparts, may help to explain the success of many women in this field.

8 McKinsey & Company, "Delivering through Diversity" (January 2018), 8, https://www.mckinsey.com/business-functions/organization/our-insights/delivering-through-diversity.
9 Halle Tecco and Michelle Huang, "What 600+ women told us about working in healthcare in 2018," https://rockhealth.com/reports/women-in-healthcare-2018/.
10 A recent survey of foundation boards shows that 73 percent are led by female executives. See "Foundation Board Leadership: A Closer Look at Foundation Board Responses to Leading with Intent 2017," p. 17, https://leadingwithintent.org/wp-content/uploads/2018/03/LWI2017-Foundations-Report.pdf.

Law: Concerns About Equity, Efforts To Improve

Last December, the prominent law firm Paul, Weiss, whose headquarters are in New York City, did not receive the warm response it had undoubtedly hoped for to a LinkedIn post congratulating its new partner class. The post displayed the portraits of 12 young, white attorneys, all but one of whom were male. Social media backlash was swift, and the firm eventually expressed regret for the "gender and racial imbalance" of its 2019 class. Paul, Weiss chairman Brad Karp did note that the class was something of an outlier, and that the firm's overall partner-level membership was more diverse than that of many of its peers. It's no secret, however, that white men continue to dominate the profession of law, and elite law firms in particular.[11]

About half of all law school graduates today are women, and a recent McKinsey & Company survey shows that women represent just under half of all law firm associates. But female associates are far less likely to reach the first level of partnership than their male counterparts. For every 100 women, 141 men are promoted to partner. Thus, only 19% of all equity partners are women, a dramatic narrowing of the professional pipeline.[12]

The pipeline may be even narrower in our region. At the end of May 2019, we examined the websites of Hampton Roads' six largest law firms (as identified by Virginia's Largest Law Firms 2018), and we found that women generally comprise more than half of all junior attorneys and associates. Yet the proportion of women partners, members or shareholders did not exceed 19% at any of the six firms. The Hampton Roads offices of Williams Mullen came closest (17.6%, or 6 female/28 male partners), followed by the Hampton Roads offices of Vandeventer Black (16.7%, or 5 female/25 male partners) and Kaufman & Canoles (15.1%, or 8 female/45 male members). The Virginia Beach office of Troutman Sanders has 11 male partners only. All six

11 Noam Scheiber and John Eligon, "Elite Law Firm's All-White Partner Class Stirs Debate on Diversity," *The New York Times* (Jan. 27, 2019), https://www.nytimes.com/2019/01/27/us/paul-weiss-partner-diversity-law-firm.html; Tracy Jan, "The Legal Profession is Diversifying. But not at the top," *The Washington Post* (Nov. 27, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/11/27/the-legal-profession-is-diversifying-but-not-at-the-top/.
12 McKinsey & Company, "Women in Law Firms," see https://www.mckinsey.com/~/media/mckinsey/featured%20insights/gender%20equality/women%20in%20law%20firms/women-in-law-firms-final-103017.ashx.

firms employ approximately the same proportion of women attorneys across all levels (between 22% and 31%). We recognize that there may be internal variation in employment data from the public-facing websites; however, the publicly available data suggest that women are underrepresented at senior levels in the legal profession.

For the past 19 years, Virginia Business, in collaboration with the Virginia Bar Association, has published a list of the Commonwealth's "legal elite." The 2018 list was based on a poll of more than 14,000 attorneys, who were asked to select "the best lawyers" in 18 different practice categories. Among the Hampton Roads attorneys who made the list, men dominated 14 categories – by especially high margins in lucrative fields such as business law, civil litigation and real estate/land use (see Table 7). Notably, the "young lawyers" category was evenly split between men and women.

We reached out to attorneys at all of the law firms and acknowledge the gracious reception of those who responded to our inquiries. At Willcox Savage, partners Lisa Murphy and Cher Wynkoop (who are both recognized as Virginia Business legal elites) underscored the great investment of time and energy that it takes to become a law firm partner, which can be difficult to manage while raising children or attending to other responsibilities outside of work. They agreed that a key challenge for law firms today is not so much recruiting, but rather retaining female talent, and that some associates can be unprepared for the degree of competition and social assertiveness that the profession demands. Murphy emphasized the importance of mentoring junior colleagues and Wynkoop noted that the presence of women partners in a firm tends to beget more women partners, in the sense of offering multiple role models and potential paths for success.

At Vandeventer Black, Michael Sterling, managing partner, and Deborah Casey, partner and executive board member, emphasized their firm's commitment to diversity and the proactive steps it takes to recruit and retain talent that reflects this ideal. Casey, who chairs the firm's diversity committee (and is also recognized as a Virginia Business legal elite), remarked that law firm life can be challenging to combine with family life – but also that Vandeventer Black offers flexible options (such as the option to "step back" from partner-level involvement for a limited period) to make this possible. Sterling noted that this kind of flexibility is increasingly sought by women and men alike – an indicator of generational change within the profession.

TABLE 7

HAMPTON ROADS' "LEGAL ELITE" BY GENDER, 2018

	Men	Women
Alternative dispute resolution	8	3
Appellate law	4	0
Bankruptcy/ Creditors' rights	17	4
Business law	25	3
Civil litigation	31	1
Construction law	12	3
Corporate counsel	11	5
Criminal law	14	0
Environmental law	10	2
Family law/ Domestic relations	8	10
Health law	6	8
Intellectual property	8	1
Labor/Employment law	18	8
Legal services/Pro bono	1	3
Legislative/Regulatory/ Administrative	9	2
Real estate/Land use	27	4
Taxes/Estates/ Trusts/Elder law	17	9
Young lawyers (under 40)	8	8

Source: Virginia Business, Nov. 30, 2018, http://www.virginiabusiness.com/reports/article/changing-rules#

We also spoke with several women who work, or who have worked, in multiple law firms in our region, and who asked that their names not be used for this report. They commented on the numerous obstacles that women face in achieving seniority at large firms, beginning with the long workdays and high expectations for collections and billable hours. We heard that our region's networks of power and influence remain challenging for women to penetrate, and that firm leaders too often give plum assignments to other attorneys "who look like them." We also heard, however, that the experiences of women at these firms has improved significantly, if slowly, over time. One female attorney recalled that, early in her career, it was not unusual for male colleagues to question her very presence at the firm. Another pointed out that technology – in particular, the ability to send email and to work extended hours from home – has introduced a certain flexibility to the work of high-powered attorneys (if also heightened expectations for availability) that wasn't possible in the past.

The women who spoke to us off the record generally agreed that our region's law firms would like to "do the right thing" and become more inclusive, although not all have arrived at a successful formula for doing so. At a bare minimum, firm websites tout policies that affirm their commitment to diversity and inclusion. Some firms advertise targeted fellowship programs, diversity or women's committees, or cooperation with relevant organizations, such as the Virginia Women Attorneys Association.

In the end, pressure from clients may be the most meaningful impetus for reform. A growing number of large clients have become reluctant to work with firms that are not diverse; it is increasingly common for RFPs (requests for proposals) to include specific expectations in this regard. One outcome of last year's Paul, Weiss controversy was an open letter to law firms from the general counsels and chief legal officers of more than 170 companies, including Lyft, Heineken USA and Booz Allen Hamilton. The letter reiterated that these companies would "direct our substantial outside counsel to those law firms that manifest results with respect to diversity and inclusion, in addition to providing the highest degree of quality representation."[13]

13 Christine Simmons, "170 GCs Pen Open Letter to Law Firms; Improve on Diversity or Lose Our Business," *The American Lawyer* (Jan. 27, 2019), https://www.law.com/americanlawyer/2019/01/27/170-gcs-pen-open-letter-to-law-firms-improve-on-diversity-or-lose-our-business/.

Higher Education: Uneven Gains

Hampton Roads is home to no fewer than 10 well-regarded institutions of higher education – two community college systems, seven public and private universities, and a graduate medical school. They are among our region's largest employers, educating thousands of students each year. A women's leadership gap is evident here, too, reflecting broader trends in the arena of higher education.

The higher education pipeline bears some resemblance to the pipeline of law firms discussed previously. Women now earn a majority of all U.S. graduate degrees granted each year, and they represent a majority of all university instructors and lecturers (non-tenure track, often part-time positions), and also assistant professors. Yet Table 8 shows the proportion of women among associate professors, who have earned tenure, slips to 44.8%, and the share of women among full professors falls further still, to just 31.7%. Some portion of this statistical gap – as with the gap between law firm associates and partners – may reflect change over time. Full professors may have served at their institutions for decades, while assistant professors have generally been hired within the past six years.

A declining proportion of women faculty at senior levels is apparent at nearly every institution of higher education in Hampton Roads, according to Data USA statistics. The outstanding exception is Thomas Nelson Community College, which also has one of the smallest faculties in the region; 11 of its 14 full professors are women. Regent University, Eastern Virginia Medical School and Old Dominion University have the lowest proportion of female full professors (between 19.6% and 21.4%), while the remaining institutions range between 29.2% and 38.9%.

TABLE 8

NUMBER OF ACADEMIC STAFF MEMBERS BY RANK AND GENDER, 2016

UNITED STATES

	Male	Female	Percentage Female
Professors	124,364	57,840	31.7%
Associate professors	87,317	70,842	44.8%
Assistant professors	84,762	88,269	51.0%
Instructors	42,936	56,350	56.8%
Lecturers	18,372	22,586	55.1%
Other faculty	81,038	72,716	47.3%

Sources: American Council on Education, "Pipelines, Pathways, and Institutional Leadership: An Update on the Status of Women in Higher Education," p. 19 (https://www.acenet.edu/news-room/Documents/HES-Pipelines-Pathways-and-Institutional-Leadership-2017.pdf), and Data USA, at https://datausa.io

It is also notable that a pay gap exists between the average salaries of male and female faculty members at nearly every level, according to 2016-17 salary figures from The Chronicle of Higher Education. The average female assistant professor is typically paid less than the average male assistant professor (and so forth) at all institutions, in Hampton Roads and elsewhere. A substantial part of this disparity may be explained by the preponderance of women faculty in lower-paying fields, such as the humanities or education, or by other measurable factors that may apply in some circumstances, such as lower academic productivity. Even controlling for these and other variables, studies frequently turn up some "unexplained variance" in the salaries of female and male faculty members.[14] This may (or may not) be evidence of discrimination because unobserved differences between genders (such as the number of hours devoted to work) could explain salary divergences. In any case, unexplained variance declines to insignificance at the assistant professor level.

Unsurprisingly, there is also a gap at the very top ranks of university leadership. In the United States, just three out of 10 college presidents were women in 2016. However, this proportion has grown steadily over the past three decades (in 1986, it was less than one in 10). According to the American College President Study, only 8% of all women presidents lead doctorate-granting institutions; the majority preside over institutions that do not offer graduate programs.[15]

Javaune Adams-Gaston, President, Norfolk State University, 2019

In Hampton Roads in 2019, two of 10 university presidents are women. Katherine Rowe became the first woman president in the 325-year history of William & Mary in 2018, and Javaune Adams-Gaston assumed the presidency of Norfolk State University early in 2019. They follow in the footsteps of Carolyn Winstead Meyers and Marie McDemmond (also at NSU), Roseann Runte (Old Dominion University), Shirley Robinson Pippins (Thomas Nelson Community College), and Deborah DiCroce and Edna Baehre-Kolovani (Tidewater Community College). Half of our region's women college presidents over time have been African American women – Pippins at TNCC and the three NSU presidents. If we expand our view to the ranks of vice presidents and provosts, we can see that women generally hold one-third to one-half of our regional institutions' top administrative posts. Noteworthy exceptions are Hampton University (all five of its vice presidents are women) and Virginia Wesleyan University (no women vice presidents).

14 Joshua Hatch, "Gender Pay Gap Persists across Faculty Ranks," *The Chronicle for Higher Education* (March 22, 2017), https://www.chronicle.com/article/Gender-Pay-Gap-Persists-Across/239553; John W. Curtis, "Faculty Salary Equity: Still a Gender Gap?" *On Campus with Women* (spring 2010), http://archive.aacu.org/ocww/volume39_1/feature.cfm?section=2.

15 American Council on Education, American College President Study 2017, Summary Profile, http://www.aceacps.org/summary-profile/; and Rick Seltzer, "The Slowly Diversifying Presidency," *Inside Higher Ed* (June 20, 2017), https://www.insidehighered.com/news/2017/06/20/college-presidents-diversifying-slowly-and-growing-older-study-finds.

Hampton Roads' colleges and universities do support a variety of means to promote diversity in leadership and in their student bodies – not only with respect to gender, but also race and other categories. This year, EVMS and ODU were nationally recognized for their efforts in this arena. EVMS received an institutional excellence award from the National Association of Diversity Officers in Higher Education, and Forbes magazine named ODU as one of America's 100 best employers for diversity.[16] These awards suggest that important progress is being made, although the women's leadership gap clearly persists.

W&M President Katherine Rowe emphasized to us that diversity is essential to institutions of higher education today; it accelerates innovation and creates an environment where talent can thrive. We discussed the university's diversity plans, a comprehensive personnel study that has helped to identify potential inequities, and efforts to encourage female students in computer science (women at W&M earn computer science degrees at rates well above the national average). Rowe also underscored the importance of celebrating women leaders from the university's past. Last year, two new plaques were added to the walls of the historic Christopher Wren Building – honoring the first 24 women who enrolled as students in 1918, and the first three African American students in residence (also women) who enrolled in 1967.

16 "EVMS receives national award for excellence in diversity," EVMS Pulse (March 13, 2019), https://www.evms.edu/pulse/archive/evmsreceivesnationalawardforexcellenceindiversity.php; and "ODU Named One of America's Top 100 Employers for Diversity," News @ ODU (Feb. 1, 2019), https://www.odu.edu/news/2019/2/odu_cited_by_forbes_.

Final Thoughts

Hampton Roads Community Foundation President and CEO Deborah DiCroce shared a telling story with us from the early 1990s, when she served as (the first woman) president of Piedmont Virginia Community College in Charlottesville. After she selected a new chief academic officer, the headline in the local newspaper read "DiCroce Hires Woman" – the implication being that not just one, but two women in top leadership positions at the institution was a newsworthy event. We have made considerable progress since then. Virtually all Hampton Roads colleges and universities, city administrations and other large workplaces can point to multiple women in positions of power. Yet, the distribution of women and men at the highest levels of influence is not proportional to the population.

In her 2015 book "Unfinished Business: Women Men Work Family," Anne-Marie Slaughter suggests that the most urgent problem for working women today is no longer the glass ceiling, but what she calls the "Great Stall" – the slow, and in some fields, "barely perceptible increase" of women in top leadership positions over the past generation. The stall is especially frustrating if one considers the impressive educational gains that young women have made in the meantime; they now outpace young men by many academic measures and earn more advanced degrees. **Slaughter identifies our society's devaluing of caregiving as a primary culprit, observing that "if a young female lawyer or banker on a promising career track decides to leave early every day to be home with her kids for dinner, work part-time, or take time out for a while to be a full-time caregiver, she is quickly knocked out of the game."[17] The same observation is true (and perhaps even more so) for a young male lawyer or banker – but women, who perform the majority of all unpaid caregiving, are disproportionately affected.**

Participants in the Pew Research Center survey pointed to a number of different reasons why comparatively few women hold high political offices or top executive positions. The top responses – echoed by several of the women

17 Anne-Marie Slaughter, "Unfinished Business" (New York: Random House, 2015), 81–84.

leaders we spoke with for this chapter – included "women have to do more to prove themselves than men," "women get less support from party leaders," "women in politics/business face gender discrimination," "many Americans aren't ready to elect a woman to higher office/many businesses are not ready to hire women for top positions," "family responsibilities make it harder for women to move up" and "women aren't encouraged to be leaders from an early age." Perhaps not surprisingly, a higher proportion of female than male respondents identified each one of these reasons as "major."[18]

Several women leaders – including panelists at the Hampton Roads Chamber's "Power of Women" event in April – emphasized to us that women must not hesitate to "lean in," take the initiative and create opportunities for themselves. Retired Rear Adm. Janet Donovan, U.S. Navy JAG Corps, urged women not to wait for someone else to open professional doors, but to proactively ask, "What would it take?" in order to advance or introduce workplace change. Lorraine Wagner, vice president of operations at Stihl Inc. in Virginia Beach, emphasized the importance of risk-taking, self-confidence and not placing limits on oneself – qualities that were key to her own upbringing and professional development.

An interesting question that emerged in some of our conversations is what closing the women's leadership gap might look like. How much diversity is enough? A common answer we heard is that institutional leadership should reflect the population it serves – whether voters, students or corporate clients. Another way to think about the closing of the leadership gap is in terms of pipelines for advancement. If 40% to 50% of entry-level positions within a particular workplace or sector are occupied by women, it does not seem misplaced to expect a similar proportion of women at the senior level as well.

We consistently heard that achieving greater gender equity does not happen on its own. Institutions that have made the most progress in closing the leadership gap have generally done so intentionally, through a variety of means. We heard about informal and formal mentoring initiatives for entry- and mid-level female workers, greater acceptance of flexible working hours, more transparency and inclusion in decision-making processes, the importance of proactively encouraging women applicants and the introduction of diversity officers to guide and monitor institutional progress. DiCroce noted that the Hampton Roads Community Foundation enhanced the diversity of its board by introducing term limits and increasing its size from nine to 17 members.

Closing the women's leadership gap is important not only because it is the "nice" or politically correct thing to do. Greater gender equity may actually improve how our institutions function. In a recent study at Harvard University, researchers found that "beliefs about gender diversity create a self-fulfilling cycle. Countries and industries that view gender diversity as important capture benefits from it. Those that don't, don't."[19] Women leaders in Hampton Roads have already accomplished great things. To close the gap, we must first recognize that it exists. Only then can we take action – action that will improve the perception that Hampton Roads is a place where everyone can "do business."

18 Pew Research Center, "Women and Leadership 2018," 22 and 30, at http://www.pewsocialtrends.org/2018/09/20/women-and-leadership-2018/.

19 "An Institutional Approach to Gender Diversity and Firm Performance," Letian Zhang, Harvard Business School, 2019, http://www.hbs.edu/faculty/Publication%20Files/An%20Institutional%20Approach%20to%20Gender%20Diversity%20and%20Firm%20Performance_4c0479f3-9d13-4af8-82da-7f1713af940d.pdf.

The State Of Soccer In Hampton Roads

THE STATE OF SOCCER IN HAMPTON ROADS

Soccer isn't the same as Bach or Buddhism. But it is often more deeply felt than religion, and just as much a part of the community's fabric, a repository of traditions.
– Franklin Foer, "How Soccer Explains the World: An Unlikely Theory of Globalization"

It has been called "The Beautiful Game" (a nickname popularized by Pelé, the legendary Brazilian footballer) and "The World's Game." With apologies to soccer purists, the second name is probably more accurate. The scope and size of the sport of soccer – football to most of the world – are undeniably large. Soccer is played by the young and old, men and women, believers of different (or no) faiths, the poor and rich, from Afghanistan to Zimbabwe. It is becoming increasingly popular in the United States, ranking fourth among all sports in terms of popularity in a recent Gallup survey.[1] While American football dominated the list of favorite sports in the U.S., with 37 percent of respondents saying it was their favorite sport to watch, soccer, at 7 percent, was only 2 percentage points behind baseball (9 percent) and 4 percentage points behind basketball (11 percent) in terms of popularity.

To say that soccer has an avid global fan base would be an understatement. The 2018 World Cup in Russia drew an estimated 3.6 billion viewers, nearly half of the world's population.[2] The top professional soccer clubs are among the most valuable sports franchises in the world. In 2018, soccer clubs occupied three of the top five spots on Forbes' annual listing of the most valuable sports teams.[3] Manchester United ($4.12 billion), Real Madrid ($4.09 billion) and Barcelona ($4.06 billion) not only were the second, third and fourth most valuable teams, but each of these teams also posted double-digit gains in value from the previous year.

Soccer's popularity from a participation and fan perspective is unique in the United States. Millions of children play youth soccer, sharing orange slices and juice boxes, an experience in common with most of the world. The U.S. Women's National Team (with a far superior record of success compared to the U.S. Men's National Team) has been a contributing factor in the growth of the sport. The women's team has not only played in all eight Women's World Cups, it is also the most successful team, with eight top-four finishes and a record four championships, including the 2-0 victory over the Netherlands in the finals earlier this year. The 5-2 victory over Japan in the 2015 FIFA Women's World Cup final was the most-watched soccer match in U.S. history, with more than 25 million viewers.

Compared to the rest of the world, however, the United States is considered somewhat of a soccer backwater. According to a recent study by the Sports and Fitness Industry Association, from 2011 to 2017, the number of children in this country ages 6 to 12 participating in outdoor soccer dropped from 6.2 million to 4.4 million.[4] The increasing expense and competitiveness of youth soccer are often cited as reasons for the recent declines in participation. In interviews for this chapter, parents told us that their family's soccer costs were thousands of dollars a year per player. Lower-income families are literally priced out of the "beautiful game," in stark contrast to the ideal where soccer requires only a ball and an open space in which to play.

1 https://news.gallup.com/poll/224864/football-americans-favorite-sport-watch.aspx.
2 FIFA Activity Report 2019, available at https://img.fifa.com/image/upload/yjibhdqzfwwz5onqszo0.pdf.
3 Kurt Badenhausen, *Forbes* (2018), "Full List: The World's 50 Most Valuable Sports Teams of 2018."
4 https://medium.com/@sfia/soccer-participation-in-the-united-states-92f8393f6469.

Not all the news, however, suggests a sport in decline. Participation in high school soccer was at its highest recorded level in the 2017-18 academic year. Major League Soccer (MLS), the highest tier of professional soccer in North America, also recently experienced its most successful year. In 2018, the league's total attendance was 9.05 million, up from 8.72 million the year before. Ticket revenue per game rose by 10 percent to the highest level in the league's 23-year history. The average attendance of 20,000 per game ranked MLS third among U.S. professional sports leagues. Viewership for the league championship, the MLS Cup, was the highest since 1997. Steve Jolley, who is a broadcaster for the New York Red Bulls, and a Virginia Beach native, noted this growth in a recent interview: "The MLS is the fastest-growing sporting enterprise in the history of the United States."

Jolley has been involved in soccer his whole life, and in the MLS for almost his entire adult life. A graduate of Kempsville High School in Virginia Beach, Jolley was a scholarship soccer player at William & Mary, and the ninth pick in the 1996 MLS draft. After his playing career ended, and following a brief stint on Wall Street, Jolley was hired by MLS to help grow its business and media presence. Jolley said that these efforts are now bearing fruit. "People aren't aware of just how much money is pouring into soccer in this country. You have multibillionaires lining up to build stadiums and bid on MLS franchises."

This chapter explores the state of soccer in Hampton Roads. We will look at the unexpected developments that have spurred the growth of the game and spotlight examples of our region's soccer successes. We highlight some of the numerous leagues, organizations and individuals connected to the sport and estimate the contribution of the organizations to the regional economy. Finally, in light of the fact that Hampton Roads is one of the largest metropolitan statistical areas in the country that is not home to a major league sports franchise, we ask whether it is time for our region to get in the match and compete for an MLS franchise.

Soccer In The United States And Virginia

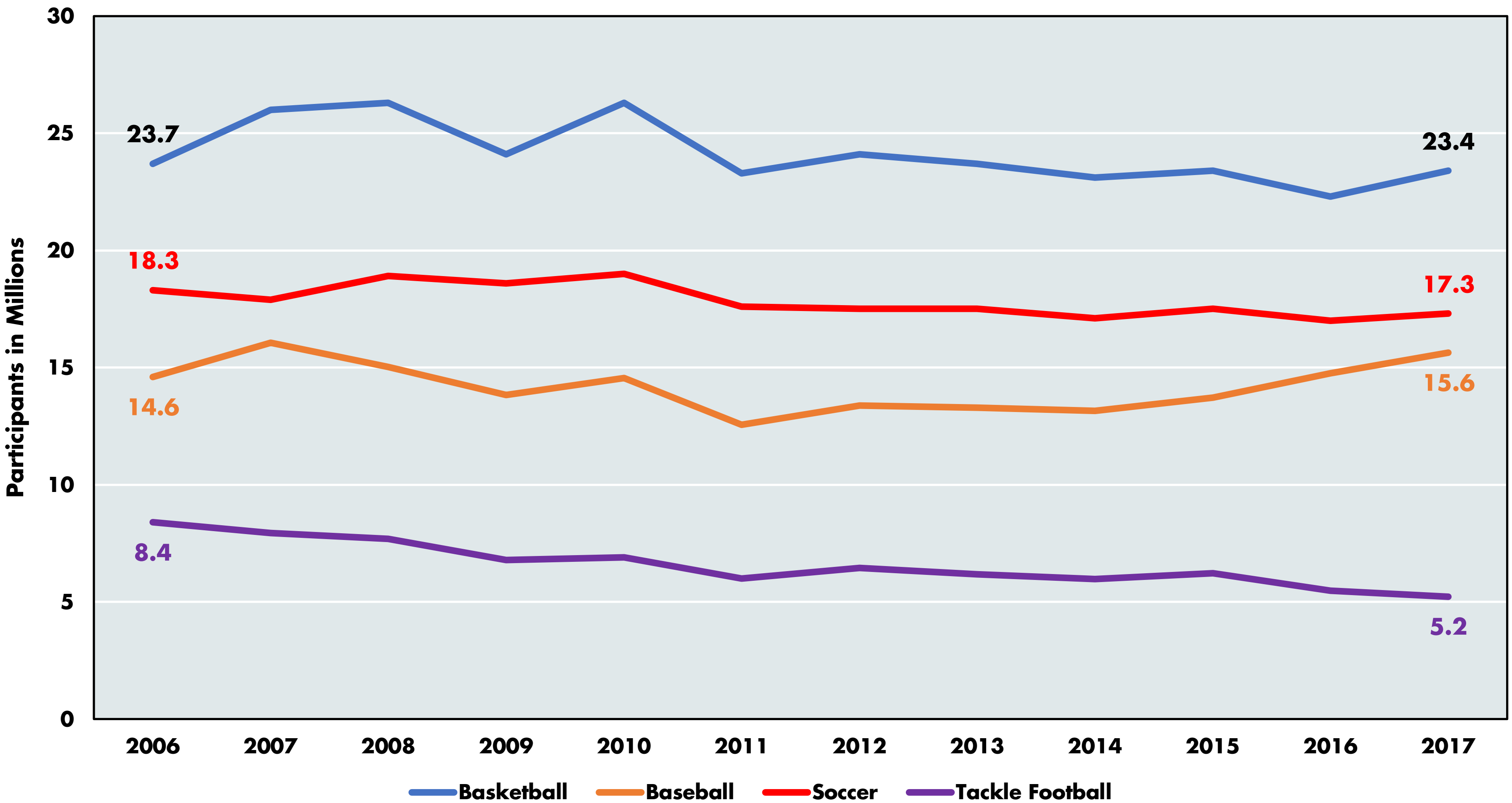
Football remains the most popular sport at the professional level in the United States; however, the number of youngsters actually playing tackle football has declined over the last decade, in part due to increased fears of concussions and other injuries. While tackle football is a cultural touchstone for many, especially on Saturdays and Sundays in the fall, more Americans have played or play basketball, baseball and soccer (Graph 1). Even though more Americans have run up and down a soccer pitch than a football field, this fact has not yet translated into ratings for soccer games, contracts for players and valuations for teams that approach those of professional basketball, baseball and football.

Perceptions that soccer is only accessible to those with high incomes also continue to plague the sport. In a 2018 report on soccer participation in the United States, the Sports & Fitness Industry Association estimated that 53 percent of households with an outdoor soccer player had incomes greater than $75,000 and more than one-third of households had incomes greater than $100,000 (Graph 2). Hope Solo, the former goalkeeper for the U.S. Women's National Team, linked the high cost of youth soccer to the poor performance of the U.S. Men's National Team. "You have to look at why have our U.S. men not qualified for the World Cup? And it goes back to our youth system. And it's because we are alienating so much talent in the youth system, and it breaks my heart because these kids are passionate about the game and they are filled with great skill, yet they're being told if you don't have the money, you can't represent your country."[5]

5 https://www.usatoday.com/story/sports/soccer/2018/06/28/hope-solo-youth-soccer-united-states-cost/741378002.

GRAPH 1

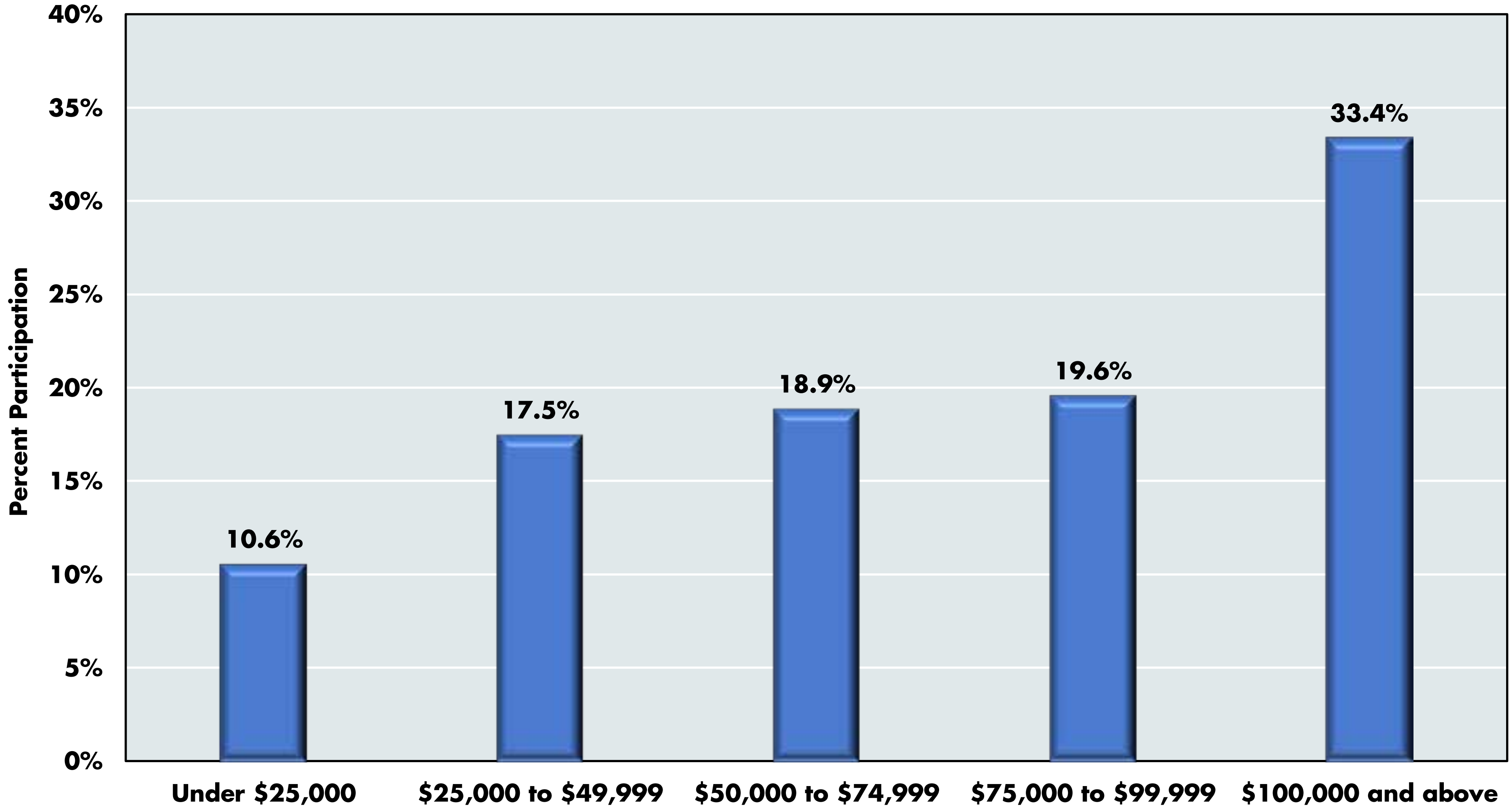
PARTICIPATION IN BASEBALL, BASKETBALL, SOCCER AND TACKLE FOOTBALL: UNITED STATES, 2006-2017



Sources: Outdoor Foundation and statista.com, age 6 or older. Soccer includes participants in outdoor and indoor soccer.

GRAPH 2

OUTDOOR SOCCER PARTICIPATION BY HOUSEHOLD INCOME



Source: Sports & Fitness Industry Association, "Soccer Participation in the United States, 2018"

While national-level data on who plays soccer by race are not readily available, the National Collegiate Athletic Association (NCAA) gathers data on student-athletes by sport. In Table 1 we compare the distribution of athletes by race and selected sport for 2010 and 2018. Compared to other major sports and the U.S. population, African Americans are underrepresented in NCAA soccer. While the number of black players grew from 1,487 in 2010 to 2,067 in 2018 for men's soccer, for example, the number of Hispanic/Latino players jumped more dramatically, from 1,616 to 3,514. There appears to be some weight to the argument that costs at the youth level affect participation, which, in turn, reduces the talent pipeline flowing into colleges and universities.

In Virginia, soccer has increased in popularity at the high school level over the last two decades (Graph 3). Soccer was the third most popular sport for boys and the second most popular for girls in the 2017-18 school year. According to the most recent survey data from the National Federation of State High School Associations (NFHS), tackle football remained the dominant high school sport in Virginia, with 23,108 participants in 2017-18. The number of boys participating in tackle football exceeded that of the next two most popular sports, outdoor track and field (11,217 participants) and soccer (10,400 participants). For girls, outdoor track and field was the most popular sport, with 9,000 participants in the 2017-18 school year. Girls' soccer, with 8,913 participants, was a close second. In high school, soccer appears to be on stable ground.

Soccer is in a curious place in the United States. The Women's National Team is ranked first in the world, according to FIFA (the Fédération Internationale de Football Association, French for International Federation of Association Football, an international governing body of association football).[6] The college player base is increasingly diverse and reflective of the popularity of the sport among the Hispanic population. The MLS recently concluded one of its most profitable seasons. Yet, there are winds blowing over the pitch that may derail future growth. Increasing equipment, club, travel and other costs may price more and more families out of the sport. Declines in youth participation, if sustained, may erode future competitiveness of the national teams and, to a lesser extent, the MLS. Finally, soccer, with its low scores and tie games, may just not be that appealing to the average American spectator. How the sport answers these challenges will, in large part, define its future.

TABLE 1

STUDENT-ATHLETE DEMOGRAPHICS BY SELECTED SPORT: 2010 AND 2018, NATIONAL COLLEGIATE ATHLETIC ASSOCIATION

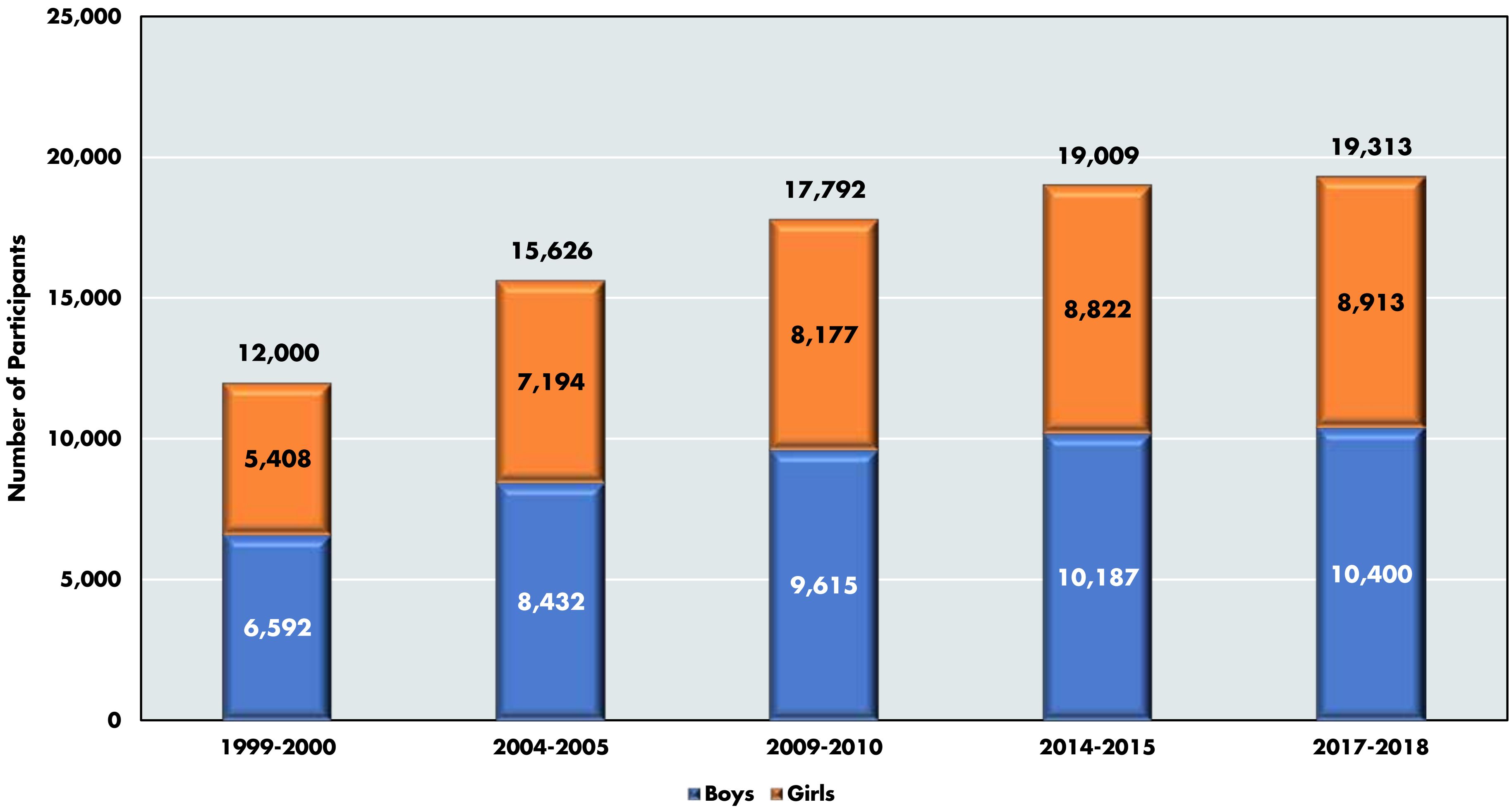
Sport	2010	2018	2010	2018
	Black or African American	Black or African American	White	White
Men's Basketball	45.5%	44.9%	46.7%	39.3%
Men's Football	34.4%	39.4%	57.5%	46.8%
Men's Soccer	7.9%	8.4%	74.7%	57.1%
Women's Basketball	32.7%	31.2%	58.9%	51.7%
Women's Soccer	3.4%	4.6%	84.8%	74.7%
Women's Softball	5.6%	5.1%	83.5%	76.7%
U.S. Population*	12.5%	12.7%	74.0%	73.0%

Sources: National Collegiate Athletic Association (2019) and the U.S. Census Bureau, 2013-2017 American Community Survey. *U.S population data are for 2017. NCAA data are available at: http://www.ncaa.org/about/resources/research/ncaa-demographics-database.

6 https://www.fifa.com/fifa-world-ranking/ranking-table/women.

GRAPH 3

PARTICIPANTS IN HIGH SCHOOL SOCCER BY GENDER: VIRGINIA, SELECTED SCHOOL YEARS



Source: National Federation of High Schools, High School Athletics Participation Survey, various years

Soccer In Hampton Roads

To assess the state of soccer in Hampton Roads, we interviewed more than a dozen leading figures in the local soccer community. These decision-makers and thought leaders shared their candid assessments of the state of soccer. Not surprisingly, what emerged was a story of a sport that is popular, competitive and possibly ready for the next step. Jon Hall, athletic director of Norfolk Collegiate, noted that the level of play has steadily improved over time. "If you were to put a good travel team from 1994 up against a good travel team from today, it would not be close."

Virginia Beach-based Beach FC, one of the two largest club soccer teams in the region – along with Virginia Rush – has seen its roster of players swell to more than 3,500. To help meet demand, the club opened the Beach FC Futsal Center, a 23,000-square-foot facility that houses the club offices, as well as two fields dedicated to futsal, a smaller, faster version of indoor soccer. Executive director Steve Danbusky moved to Hampton Roads in 2003 to play for the Virginia Beach Mariners, the professional team that started out as the Hampton Roads Hurricanes in 1993. The club folded in 2006 after Danbusky had played for three different owners in four years. He said working in youth soccer coaching and leadership has provided the stability for many in the community that professional soccer ultimately did not. "I would say anybody who is involved in youth soccer in the area is doing their best to tell the story. Those of us that are passionate about the sport, that are former players, and now leaders in youth soccer, we want to pass on that love of the sport."

There are also challenges associated with soccer today, many of which are not confined to Hampton Roads. Soccer has been heralded as an equal opportunity sport in much of the world, requiring only a ball and an open space to play. In the U.S., however, the rise of the travel, or competitive, soccer model means that participation is no longer solely determined by a player's skill. A family's financial means or lack thereof may ultimately decide whether a youth player can move from recreational soccer to more competitive leagues. The shift toward travel soccer has also generally led to a decline in volunteers, which, in turn, has prompted local clubs to merge. A nationwide shortage of referees compounds the issue.

Chuck Shockley of the Tidewater Soccer Referee Association, which provides soccer referees for most competitive games in the area, recently discussed this challenge. "I have somewhere in the neighborhood of 250 to 300 referees and could use twice that many."

There has also been significant upheaval for every youth soccer club since U.S. Soccer changed its development model for players in 2007. To make American soccer teams more competitive globally, U.S. Soccer created the Development Academy. The result has been a tiering of soccer clubs across the United States, forcing clubs to make tough decisions about what opportunities to provide to young players and what additional costs to pass on to parents. Unlike Steve Jolley, who played high school soccer in Virginia Beach, college soccer at William & Mary and professionally in the MLS, some promising local players have left Hampton Roads in search of development opportunities. Jack De Vries of Virginia Beach, for example, moved at age 14 to play for the Philadelphia Union, one of the top development clubs on the East Coast, and was recently called onto the U.S. under-17 men's national soccer team.[7]

These challenges have led to an unexpected by-product: real cooperation among rival soccer groups in the past decade. Given the somewhat parochial nature of communities in Hampton Roads, this increasing cooperation among soccer clubs in the region may bode well for other sports and activities. Steve Danbusky reflected on the shift in attitudes. "I would think it has evolved to be less toxic here. We're all fighting the same fight, whereas a decade ago, it was probably more difficult to get on the same page." The whole, not surprisingly, has turned out to be greater than the sum of its parts. Let's take a look at some of the developments in soccer in Hampton Roads.

7 https://www.ussoccer.com/us-under17-mens-national-team#tab-1.

The "Hub"

In 1994, the southern end of Princess Anne Road in Virginia Beach featured just a few planned developments and a lot of swampy green space. Twenty-five years later, one square mile of that portion of Virginia Beach acts as a hub for soccer for much of the region. Within that space are the Hampton Roads Sportsplex (built in 1997), the Hampton Roads Soccer Complex (opened in 1997), the Virginia Beach Field House (opened in 2010) and headquarters of the two largest soccer clubs in Hampton Roads – Virginia Rush and Beach FC. Adjoining these facilities is the Princess Anne Athletic Complex, a multisport facility that often hosts soccer matches.

The Sportsplex was the first soccer-specific stadium built in the United States. It played host to the Virginia Beach Mariners professional team until the franchise folded in 2006. Since 2009, Hometown Sports Management has managed the facility and the regional training center for U.S. Field Hockey. Managing partner Chuck Thornton said efforts to promote the facility and host different events have raised its annual attendance to more than 500,000 spectators per year.

Right across the parking lot from the Sportsplex is the largest indoor soccer facility in Hampton Roads, the Virginia Beach Field House. The 175,000-square-foot facility opened in 2010 and caters to adult indoor soccer leagues. General manager Chuck Stollery observed how much indoor soccer has changed in recent years: "We had nothing like this when I grew up here. Indoor was played on a hard surface – a school gym or a church gym – with a soft ball, if you could even find a league that was running."

The Hampton Roads Soccer Complex (HRSC), which opened the same year as the Sportsplex, currently consists of 22 grass and two turf soccer fields. Affiliates of the HRSC include Beach FC, Southeastern Virginia Women's Soccer Association, the Over-30 Soccer League and Virginia Rush. HRSC executive director Lauren Bland highlighted the competition for resources and how cooperation improves the bottom line. "There is competition for everybody. I hate saying this, but every player is a dollar amount to the bottom line. But I think they all realize that everybody has to come together, especially here at the Soccer Complex. If one club uses fewer hours or rents fewer fields here, it affects the other clubs."

After moving to Newport News six years ago, Mike Vest, co-founder of Lionsbridge FC, found a great neighborhood feel and connection, in part through soccer. When he witnessed his kids' passion for the sport, however, he and his future business partners noticed something was missing.

Hampton Roads Soccer Complex


Lionsbridge FC

"What we realized was they were playing soccer in leagues. They were watching the Premier League on television. They were playing it on the Xbox. They were making YouTube videos in the backyard. But we weren't going to soccer games and watching them as spectators."

Finding no such experience in the Hampton Roads market, Vest and his business partners decided to create one, modeling the experience of semi-pro soccer around the family-friendly experience offered at minor league baseball games. "We wanted to have fireworks. We wanted to have bounce houses. We wanted to have food trucks. We wanted to have a beer garden. That kind of creative approach to appealing to the widest possible audience, which minor league baseball has done really well, has not happened in soccer to a large degree. But you're seeing it pop up in pockets of the country, and it's not going to take long for that to be imitated."

The result of this effort was Lionsbridge FC, which began play in 2018 at Christopher Newport University. Lionsbridge FC plays in USL League Two, the fourth tier of professional soccer behind MLS, USL Championship and USL League One. In its inaugural season, the club averaged 1,340 fans per home game and, at the time of this writing, was in the midst of its second season.

Ivan Militar, a former four-year scholarship player at Old Dominion University who is now director of coaching with Beach FC, also plays for Lionsbridge FC. Militar said mimicking minor league baseball was the perfect approach for the league. "Now I'm bringing my beach chair, here's my vodka and soda in a coffee mug that I'm pretending is coffee, I forget what the score is and then I go home. Lionsbridge is hitting that spot. We spend more time signing autographs for little kids than we do anything else, because so many families are coming out."

2019 saw a new team emerge as a local rival to Lionsbridge, Virginia Beach United. Virginia Beach United is co-owned by local clubs Beach FC and Virginia Rush and plays in USL League Two. As with Lionsbridge FC, the goal is to spark interest in professional soccer by creating a family-friendly environment at reasonable prices. Adult season tickets, which include entry to all seven home games, are only $56. The question now is whether there is enough appetite for soccer in Hampton Roads to sustain two professional teams.

The North American Sand Soccer Championships

When the idea of a big soccer tournament on the sand at the Virginia Beach Oceanfront was first suggested, the local soccer community thought it was bizarre. It wasn't what you would call a runaway success initially. Twenty-six years later, however, the idea of combining soccer and the Virginia Beach Oceanfront seems visionary. The North American Sand Soccer Championships (NASSC) feature more than 900 soccer teams, 300 teams for other sports, 200,000 participants and 30 blocks of sand along the oceanfront. Held the second weekend in June, the NASSC is the largest sand soccer tournament in the world.

Unknown to many, the tournament started as a suggestion to raise funds for local soccer club Beach FC. In 1994, Beach FC president Dick Whalen had an idea for a soccer tournament on sand. Matt Whalen, the current director of operations for the NASSC and Dick Whalen's son, has played in all 26 tournaments. He has seen the tournament grow from 26 teams playing in a torrential downpour during the first tournament to nearly 1,000 teams in 2018. "When I first played in the event in 1994, I was just a 17-year-old high school junior looking to have a good time with my club team playing this new game. Within a few years, it was apparent that we had something special."

The NASSC now includes a U.S. Open professional division, as well as "sidekick" sports like flag football, beach field hockey and kickball. Matt Whalen played some professional beach soccer in his career but is honored now to help run the event his dad started. "There is no other tournament in the world that does what we do. And that is a testament to all of our staff, volunteers and soccer families. *They* have created this event."

North American Sand Soccer Championships, youth play

Lauren Bland, executive director of the HRSC, recently said the NASSC has appeal across the entire local soccer community. Sixty percent of the teams that participate come from within an hour's drive of Virginia Beach. There is extra motivation for the Virginia Beach clubs to participate, promote and volunteer in the event – it's the largest single fundraiser in support of the HRSC. Without the revenue from the NASSC, Bland estimated in a recent interview that field fees for clubs in Hampton Roads would likely double. Sand soccer is not just an excuse to gather at the oceanfront, it's serious business that lowers the cost of playing soccer in Hampton Roads.

Dick Whalen, who was instrumental in founding the NASSC, died in August 2019. He played a significant role in the building of the HRSC complex and was a respected figure in the Hampton Roads soccer community. Like many parents, he become involved in the local soccer community by watching his sons play for high school teams. Kevin Denson, a soccer coach at Norfolk Academy, aptly summed up the passing of Whalen: "He's going to be sorely missed by the soccer community."[8]

8 https://www.pilotonline.com/sports/article_c1efd49c-be97-11e9-8e91-ffbdc19c73c0.html.

Soccer In Hampton Roads: One Family's Experience

Kaiden Scanlon of Virginia Beach, a recent high school graduate, is now a freshman at Mary Baldwin University in Staunton, Virginia, where she is playing soccer this fall. Scanlon played eight years of travel soccer in Hampton Roads for Virginia Rush, as well as two years for Green Run Collegiate. Misty Scanlon said her daughter loved the sport from the time she came to her brother's recreational soccer practices and took to the competitiveness of travel soccer right away. "Kaiden loved being part of a team. She really loved the close friendships that she made with her teammates. She also loved the 'win' and loved the celebrating with teammates when they got the wins."

Playing travel soccer involved a commitment of time and money. In Table 2 Misty Scanlon shares an annual breakdown of the costs for Kaiden to play travel soccer, noting that many teams provide financial support through fundraising and scholarships. We observe that these costs are not atypical, in that more than 60 percent of American families spend between $1,200 and $6,000 annually per child on youth sports. Twenty percent of families spend more than $12,000 a year per child in support of their children's sports dreams.[9]

Misty Scanlon stresses that, for her family, the expense of travel soccer was a worthy investment. But she cautions that parents need to know what to expect. "Kaiden has made memories that will be with her for a lifetime – memories she never would have had, had she not played travel soccer. The money and time are a lot, but the benefits and rewards are priceless."

TABLE 2

KAIDEN SCANLON'S ESTIMATED TRAVEL SOCCER COSTS

Type	Average Expense
Club Dues	$1,600
Team Budget Dues	$1,600
Uniform Costs	$250
Fitness Events/Training	$2,000
Travel for Soccer Tournaments	$1,000
Miscellaneous Expenses	$1,200
Total	$7,650

Source: Misty Scanlon (2019)

Kaiden Scanlon

9 https://www.chicagotribune.com/business/yourmoney/sns-201807051901--tms--kidmoneyctnsr-a20180706-20180706-story.html.

The Soccer Economy In Hampton Roads

A report on soccer in this region would be incomplete without some attempt to assess the economic impact of the sport. Such a tally is difficult, because soccer has so many tentacles across the region. The estimates discussed in this chapter are illustrative; that is, we want to provide the reader a sense of the size of soccer activity rather than the more typical estimates of economic impact. Data from several key areas of soccer spending, including soccer at the high school level (because it is rolled into school budgets), are not readily available. We also exclude spending of Hampton Roads parents on travel to tournaments and league games outside the region, because that is money leaving the local economy.

To examine the impact of soccer in Hampton Roads, we rely on data from the Internal Revenue Service (IRS). Every organization in the U.S. that has received tax-exempt status from the IRS must file a Form 990 annually, unless an organization falls below certain income thresholds. A Form 990 (for larger organizations) or Form 990-EZ (for organizations with less than $200,000 in revenue and less than $500,000 in assets) requires information on revenues, expenses, assets and liabilities.[10] Nonprofit organizations that earn less than $50,000 annually are not required to file with the IRS, which means that booster clubs for schools and travel teams are not included in the data. The data also do not capture the thousands of volunteers who make recreational soccer at all levels possible in the region. While not a complete picture of direct spending on soccer in the region, the IRS data provide a lower bound with which we can estimate the sport's local economic impact.

Table 3 provides Form 990 data for selected soccer organizations in Hampton Roads. Three organizations (Beach FC, Virginia Rush and Williamsburg Soccer Club) had revenues greater than $1 million in the latest available filing year. Beach FC generated most of its revenue through membership dues, while the Williamsburg Soccer Club earned revenue from fees, sponsorships, concession sales and other activities related to running soccer events. On the other hand, the Hampton Roads Soccer Council's revenue stream depended slightly more on fundraising than providing services. There is no common model for soccer organizations in Hampton Roads: some focus on member services while others focus on the infrastructure required for soccer play to occur. **In 2018 dollars, the soccer organizations in Hampton Roads listed in Table 3 generated almost $7.7 million in revenue, spent $7.4 million and had more than $4.1 million in net assets.**

To estimate the economic impact of soccer in Hampton Roads, we must explore the direct economic impact and, from that, the indirect and induced economic impacts. One can think of these impacts as an economic chain, where a jolt in one part of the chain is transmitted to each link in the chain. Let's say, for example, soccer organizations in Hampton Roads decide to spend more on balls, uniforms and referees due to an increase in the number of players. The direct spending on soccer balls, uniforms and referees, however, does not occur in a vacuum. Suppliers of soccer equipment will see an uptick in business activity. This is what is known as the indirect economic impact. Finally, those directly and indirectly affected by the increase in soccer spending start to spend more money in the local economy. This third-order effect is known as the induced impact. In summary, we estimate that for every dollar of direct expenditure on soccer in Hampton Roads, another $0.35 is generated in indirect spending and an additional $0.24 in induced spending. In other words, $1 of direct spending leads a $1.59 increase in economic activity.[11]

10 An organization that earns less than $50,000 is not required to file a Form 990-EZ but must still inform the IRS that the organization remains active via a Form 990-N.

11 We employ JobsEQ from Chmura Economics to estimate the overall economic impact. We focus our analysis of the annual impact on "Performing Arts, Spectator Sports, and Related Industries" (a Bureau of Labor Statistics subsector).

TABLE 3

IRS FORM 990 DATA FOR SELECTED SOCCER ORGANIZATIONS IN HAMPTON ROADS

	Fiscal Year Ending	Contributions and Grants	Program Service Revenue	Total Revenue	Total Expenses	Net Income	Total Assets	Total Liabilities	Net Assets
Beach FC	2016	$1,825,057	$133,794	$2,188,584	$1,994,469	$194,115	$1,242,597	$7,120	$1,235,477
Chesapeake Soccer Club	2018	$551	$87,481	$88,118	$88,288	-$170	$87,878	$0	$87,878
Chesapeake United Soccer Club	2018	$7,600	$272,907	$293,485	$243,817	$49,668	$114,504	$70,374	$44,130
Churchland Soccer League	2017	$1,190	$151,837	$152,041	$134,723	$17,318	$260,988	$0	$260,988
Hampton Roads Soccer Council	2017	$49,505	$377,272	$809,131	$720,409	$88,722	$2,466,107	$677,007	$1,789,100
Neptune Soccer Classic	2017	$0	$56,088	$56,088	$55,455	$633	$30,186	$0	$30,186
Norfolk Youth Soccer League	2015	$22,357	$313,317	$335,679	$435,618	-$99,939	$56,291	$2,107	$54,184
Old Dominion Soccer Club	2018	$0	$157,592	$161,261	$152,373	$8,888	$72,531	$0	$72,531
Portsmouth Soccer Club	2017	$4,330	$62,845	$69,541	$67,520	$2,021	$31,415	$0	$31,415
Tidewater Advanced Soccer League	2015	$0	$183,121	$183,121	$119,934	$63,187	$128,007	$0	$128,007
Virginia Rush Soccer	2017	$0	$1,762,513	$1,872,279	$1,764,196	$108,083	$503,922	$696,819	-$192,897
Western Branch Soccer Club	2017	$1,768	$95,115	$96,933	$100,243	-$3,310	$9,252	$0	$9,252
Williamsburg Soccer Club	2016	$33,161	$1,247,986	$1,281,634	$1,297,266	-$15,632	$278,313	$2,433	$275,880
Williamsburg Soccer Foundation	2017	$83,600	$0	$100,673	$33,166	$67,507	$348,013	$0	$348,013

Sources: Propublica.org Nonprofit Explorer and the Internal Revenue Service. Most recent filing year available as of June 2019.

TABLE 4 ESTIMATED ECONOMIC IMPACT OF SELECTED SOCCER ORGANIZATIONS IN HAMPTON ROADS, MILLIONS OF 2018 DOLLARS				
	Direct	Indirect	Induced	Total
Employment	37	18	12	67
Output (Millions)	$7.4	$2.6	$1.8	$11.8
Compensation (Millions)	$2.1	$0.8	$0.6	$3.5

Sources: JobsEQ, Chmura Economics and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data as of 2018 Q4. Estimates for the selected soccer organizations in Table 3. Direct expenditures for filing year obtained from IRS Form 990 and converted to 2018 dollars using Consumer Price Index for All Urban Consumers.

We estimate that the largest soccer organizations in Hampton Roads added almost $12 million in additional economic activity in 2018. About $3.5 million of the increase in economy activity was personal compensation; that is, increased incomes for Hampton Roads residents. Our estimate is conservative, as it does not account for the thousands of volunteer hours and spending by booster organizations and public and private educational organizations. Soccer is not just orange slices and juice boxes for young players on a weekend; it's real business.

Is The MLS Coming To Hampton Roads?

Lionsbridge FC and Virginia Beach United are not the first professional soccer clubs to play in Hampton Roads. The Virginia Beach Mariners played in the USL First Division (the second tier of professional soccer in the U.S.) from 1994 to 2006. Ownership turmoil characterized the life of the club, with six ownership changes in 12 seasons. Do Lionsbridge FC and Virginia Beach United represent the first steps toward an MLS franchise or will our region be left behind?

Hampton Roads, by population, is one of the largest metropolitan areas in the U.S. without a major professional sport franchise in basketball, baseball, football, hockey or soccer. While some would lay part of the blame on the small number of Fortune 500 headquarters, other metro areas with only a few Fortune 500 headquarters have or will have professional teams (Austin, Texas, for example, has two Fortune 500 headquarters). Others will point to a transient population because of the military, yet Jacksonville, Florida, which is actually smaller in population than Hampton Roads, is home to the Jacksonville Jaguars. San Diego, which is larger than our region, is home to the San Diego Padres, but also saw the San Diego Chargers depart for Los Angeles in 2017. As for bridges and tunnels, one only need drive around Boston, Los Angeles or Washington, D.C., during rush hour to understand that Hampton Roads' traffic is not as bad as we often think it is. The culprit may be what many in the region consider a four-letter word: collaboration.

To capitalize on the re-emergence of professional soccer in Hampton Roads will require collaboration among cities and counties that are often incentivized to look out for their own interests. Over the past decade, city and regional leaders have bemoaned the lack of a major sporting arena in Hampton Roads and there have been unsuccessful attempts to fill this gap. Whether the proposal was located at Scope, Military Circle, Town Center or the oceanfront, there were competing interests that ultimately led to each proposal's failure. These proposals failed, in some part, due to the problem of concentrated costs. If Virginia Beach built an arena, the taxpayers of Virginia Beach would subsidize the entertainment of residents from Chesapeake, Norfolk and other cities. To solve this problem, Chesapeake, Norfolk, Virginia Beach and other interested cities could establish a special district that would have the ability to levy taxes, collect revenues and administer a new stadium. There are many special districts in Virginia (the Chesapeake Bay Bridge and Tunnel District is one of them) and this project would represent an opportunity for localities to improve their ability to plan and execute regional projects.

Proponents of a stadium often argue that such developments serve as a catalyst for economic development. The American Airlines Center-Victory Park project in Dallas, for example, generated more jobs than initially projected, almost doubled expected sales tax revenue and led to $1 billion in economic activity. However, the success of such efforts in Dallas, Miami and Nashville is likely a spillover from local economic conditions instead of increased economic activity from a new stadium or arena complex. Improving economic and population growth led to the perception that these projects were economic catalysts instead of the realization that the projects prospered because of vibrant local economic conditions.

There is also very strong evidence that public funding of sports stadiums is not a wise investment of taxpayer resources. In 1997, Roger Noll and Andrew Zimbalist, in their book "Sports, Jobs, and Taxes," found that new sports facilities have extremely small (or negative) effects on overall economic activity and employment. James Bennett traced the history of public subsidies for private sports teams in his 2012 book, "They Play, You Pay." He argued that that public investments in sports stadiums result in a transfer of wealth from taxpayers to multimillionaire and billionaire owners of professional franchises. Sports economist Michael Leeds, when interviewed in 2015 about the economic impact of sports stadiums, put it succinctly, "If you ever had a consensus in economics, this would be it. There is no impact."[12]

The Bridgestone Arena in Nashville generated about $17 million in sales tax revenue within its walls in 2017, more than the city's subsidy. A recent study, however, estimated that the arena needs an additional $8 million to $12 million a year for capital improvements over the next two decades to remain competitive. A new arena in Hampton Roads would likely lose money in its initial years as it worked to attract concerts, sporting teams and other events. Clear eyes would need to balance the full hearts to objectively determine the worth of any proposal.

Steve Jolley fears that top-level professional soccer may have already outgrown this region's potential to host it. With MLS expansion fees currently at $200 million and no local facility ready to host a team, Jolley believes that Hampton Roads isn't even on the lengthy list of cities and regions trying to woo an MLS franchise. "I don't want to say that ship has sailed, but it would take so much cooperation. Such strong leadership. So much money."

Andy Smith was a high school teammate of Jolley's at Kempsville High School and helped launch professional teams across North America, most recently in Reno, Nevada. He said conversations locally have articulated what needs to happen for Hampton Roads to move up the ranks of prospective pro soccer franchise sites, including the development of a top-tier soccer stadium. A new stadium, however, is not enough. "First and foremost, you need an owner with deep pockets or a group of investors who are also influencers, because the price of admission is only going up."

12 https://www.marketplace.org/2015/03/19/are-pro-sports-teams-economic-winners-cities/.

Final Thoughts

While recent declines in youth registrations for soccer are concerning, soccer appears to be increasingly popular nationwide. Increases in Hispanic participation at the college level are a signal of the changing demographics of the sport. Soccer must, however, battle the reality that it has become a sport of the upper class in the United States. Outreach and scholarship programs are a part of the solution. Another is to question whether the travel model, which has taken over much of youth sports in America, is more a product of middle-class economic anxiety than the professional prospects of youth players.

There are numerous soccer organizations in Hampton Roads, ranging from the Hickory Hawks Soccer Booster Club (supporting the Hickory High School teams in Chesapeake) to the much larger Hampton Roads Soccer Council. While there is paid staff in some of the larger organizations, it is the love of "the beautiful game" that leads thousands to volunteer their time. From corralling kids at a small recreation field to working at the concession booth during the travel season, these volunteers make soccer in Hampton Roads a reality.

The ongoing collaboration among soccer organizations also continues to be a strength for the sport in our region. We found numerous examples of cooperation instead of competition, of recognition that a win for one club is a win for the region. Whether out of necessity or by choice, the ongoing efforts to cooperate and collaborate increase choices for players in Hampton Roads. Economically, these efforts reap economies of scale, lower costs to those involved in soccer and provide a worthwhile example to other private and public organizations in the region.

Whether or not soccer continues to grow here, however, may be more dependent upon local communities than soccer clubs and organizations. Field space continues to be at a premium. The Warhill Sports Complex in Williamsburg is an example of how investing in fields can generate significant economic activity. The Hampton Roads Soccer Complex, with its affiliations with several local clubs, is another example. Chesapeake, one of the fastest-growing cities in the region, continues to be mentioned as the locale for a sports complex development, but, so far, this remains just a rumor. Sober analysis and, where warranted, wise investments in these facilities can be a boon to the sport and have positive spillovers to the regional economy.

The question now for soccer in Hampton Roads is: What is next? The sport has grown organically to date, with local organizations collaborating out of necessity. If Hampton Roads desires to up its game, it will need a concerted effort across the region to share the costs and benefits of attracting higher-tier professional teams. In the meantime, providing spaces to play, capitalizing on efforts to offer family-friendly professional soccer and finding ways to lower the cost to those who play may be the best way to continue to grow "the beautiful game" in our region.

Can Defense Save Us?

CAN DEFENSE SAVE US?

This is never going to happen.
– House Speaker John Boehner in 2011, quoted in Bob Woodward's "The Price of Politics"

… No enemy in the field has done more to harm the combat readiness of our military than sequestration.
– Defense Secretary James Mattis, June 12, 2017

Congress never loses its capacity to disappoint you.
– John Oliver, Comedian

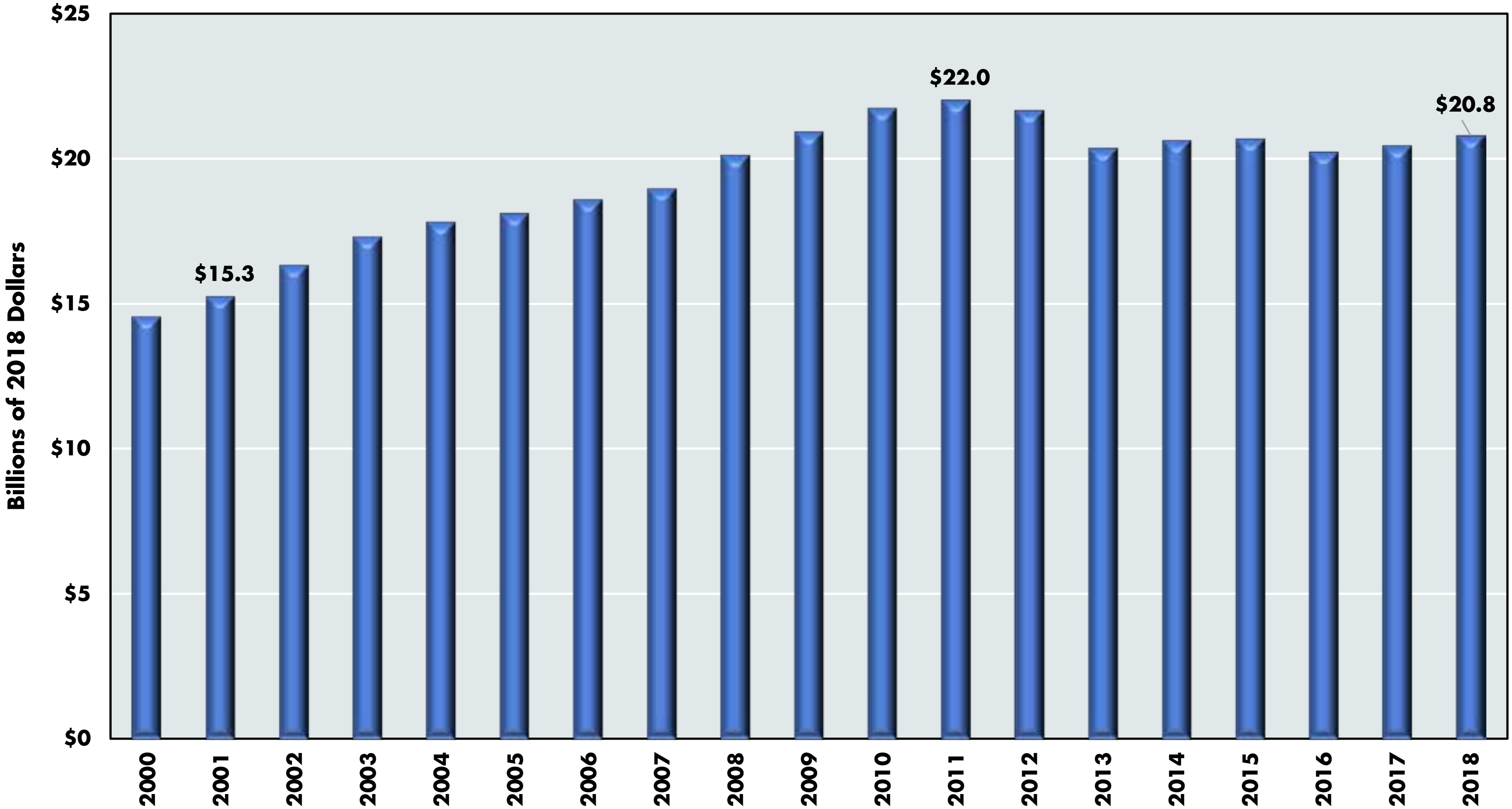
The Hampton Roads economy is often caricatured as a three-legged stool, made up of defense spending, the port and tourism. **However, depicting the region as a unicycle might be a more apt analogy. The port and tourism industries provide balance for the area, but defense spending is the impetus that moves the economy forward or pumps the proverbial brakes on economic activity. Hampton Roads' reliance on defense spending means that changes in national security policy, force structure or technology can ripple through the regional economy.**

Undoubtedly, changes in Department of Defense (DOD) spending and strategy over the last two decades have led to the ebb and flow of the Hampton Roads economy. In the aftermath of the attacks of Sept. 11, 2001, and the subsequent wars in Afghanistan and Iraq, direct defense expenditures in our region, after adjusting for inflation, increased from an estimated $15.3 billion in 2001 to $22 billion in 2011, an approximately 44% increase (Graph 1). For a time at the turn of the century, the regional economy outperformed that of the United States, boosting incomes, housing prices and employment. These rapid increases in DOD spending, however, tapered in the second half of the 2000s and real (inflation-adjusted) DOD spending peaked at $22 billion in 2011.

Several factors contributed to the slowdown and then outright decline in defense spending in Hampton Roads in the first part of the current decade. In Iraq, U.S. strategy shifted toward a drawdown and eventual (for a time) exit of combat forces in 2011. After peaking at about 100,000 troops in 2011, U.S. forces in Afghanistan rapidly fell to approximately 10,000 in 2015. While these shifts in deployments and strategy were important, the passage of the Budget Control Act of 2011 (BCA) and implementation of the BCA's discretionary spending caps in fiscal year (FY) 2013 played a much larger role in the slowdown of the regional economy. By 2018, direct defense spending in Hampton Roads was approximately $20.8 billion, 5.5% below its peak in 2011. As defense spending stagnated, so did regional economic growth.

GRAPH 1

ESTIMATED REAL DIRECT DEPARTMENT OF DEFENSE SPENDING: HAMPTON ROADS, 2000-2018



Sources: U.S. Department of Defense and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Estimates include federal civilian, military personnel and procurement and are adjusted for inflation to 2018 dollars with the urban consumer price index from the Bureau of Labor Statistics.

Hampton Roads' dependence on defense spending means that the region must come to terms with the uncomfortable prospect that this spending will not continue to increase in perpetuity. First, the current increases in defense spending are not sustainable, given the fiscal imbalance of the federal government and the increasing dissatisfaction of the American public with what George Washington termed "foreign entanglements." Almost 50% of Americans in a recent Pew Research Center survey responded that the U.S. "mostly failed" in Afghanistan and only 45% supported the initial decision to use military force there.[1] Another Pew survey found a similar result for the conflict in Iraq, with over 50% of Americans responding that the U.S. "mostly failed" to achieve its goals in that country.[2]

Second, technological change may lead to a decline in some defense platforms (carriers) in favor of others (unmanned aircraft). The rise of autonomous airplanes, ships and submarines will likely reduce the number of personnel necessary to field and operate these weapons systems. Even before autonomous military ships and planes enter operations, technological advances are reducing the number of personnel needed to operate equipment. Simply put, fewer soldiers, sailors, airmen and Marines are needed to do the same job.

Lastly, while some argue that sequestration will never occur again, as it would be too painful, we need only point out that similar arguments were made in 2012 and 2013. While the Bipartisan Budget Agreement of 2019 may effectively end the BCA's spending caps, the deteriorating fiscal position of the federal government may revive the BCA in some form in the future. A prolonged recession would also place significant pressure on defense spending and calls to shift resources to more pressing domestic needs. Simply put, the good times may not last forever.

In this chapter, we examine the prospects for economic growth in Hampton Roads and how these prospects are intertwined with future defense spending. Challenges facing the region range from the absence of innovation to longer-term trends in military and fiscal policy. The future defense environment will also likely be more challenging, as these issues are connected. Undulations in defense spending are not new to Hampton Roads. Thus, we use history as our guide to understand how changes in defense spending may affect economic growth in the region and where we collectively might go from here.

1 https://www.pewresearch.org/fact-tank/2018/10/05/after-17-years-of-war-in-afghanistan-more-say-u-s-has-failed-than-succeeded-in-achieving-its-goals/.
2 https://www.pewresearch.org/fact-tank/2018/03/19/iraq-war-continues-to-divide-u-s-public-15-years-after-it-began/.

The Bear In The Room: Threats To Defense Spending In Hampton Roads

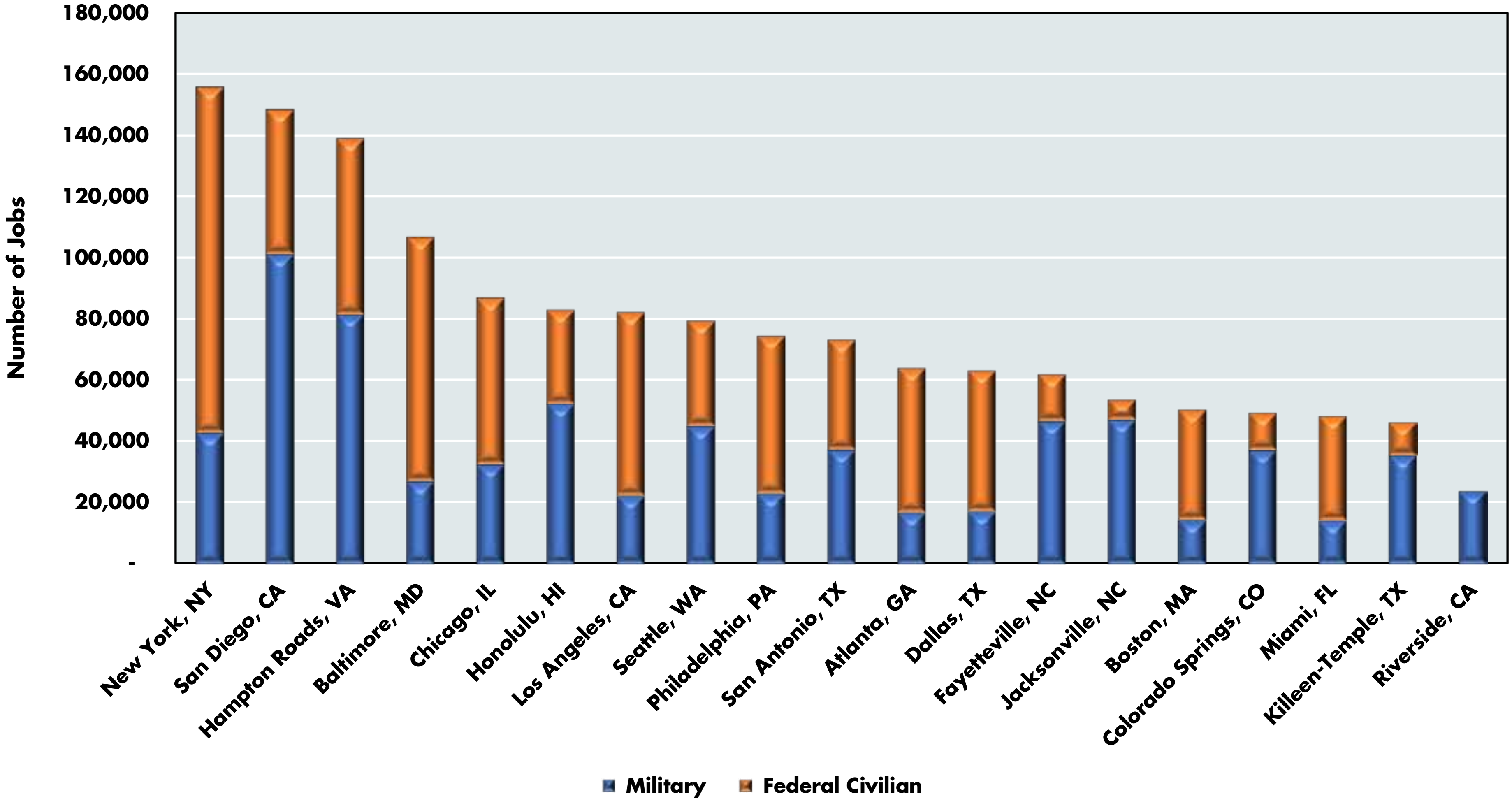
Future defense spending in Hampton Roads is in danger of looking a bit like the bear markets many investors fear. The notion of a bear market comes from how bears attack, rising on their hind legs and swiping down at their victims. In this section, we examine several threats to defense spending in Hampton Roads that could perpetuate a bear market for the region.

THREAT ALPHA: DEPENDENCE ON MILITARY PERSONNEL AND PROCUREMENT SPENDING

To many outside the region, Hampton Roads is simply a place many sailors call home. However, focusing solely on military personnel masks several important avenues of defense-related federal spending. Graph 2 shows the top 20 metropolitan statistical areas (MSAs) in 2017, based on the number of military and federal civilian personnel, excluding Washington, D.C. Only the San Diego MSA had more military service members residing in it in 2017, while only the New York City MSA had more civilian federal employees. In other words, the 57,000 federal civilian workers complemented the 81,000 military personnel stationed in Hampton Roads, making the region the third-largest combined federal workforce outside of the Washington, D.C., metro area.

GRAPH 2

MILITARY PERSONNEL AND FEDERAL CIVILIAN EMPLOYMENT: TOP TWENTY METROPOLITAN STATISTICAL AREAS IN TERMS OF EMPLOYMENT, 2017



Source: Bureau of Economic Analysis

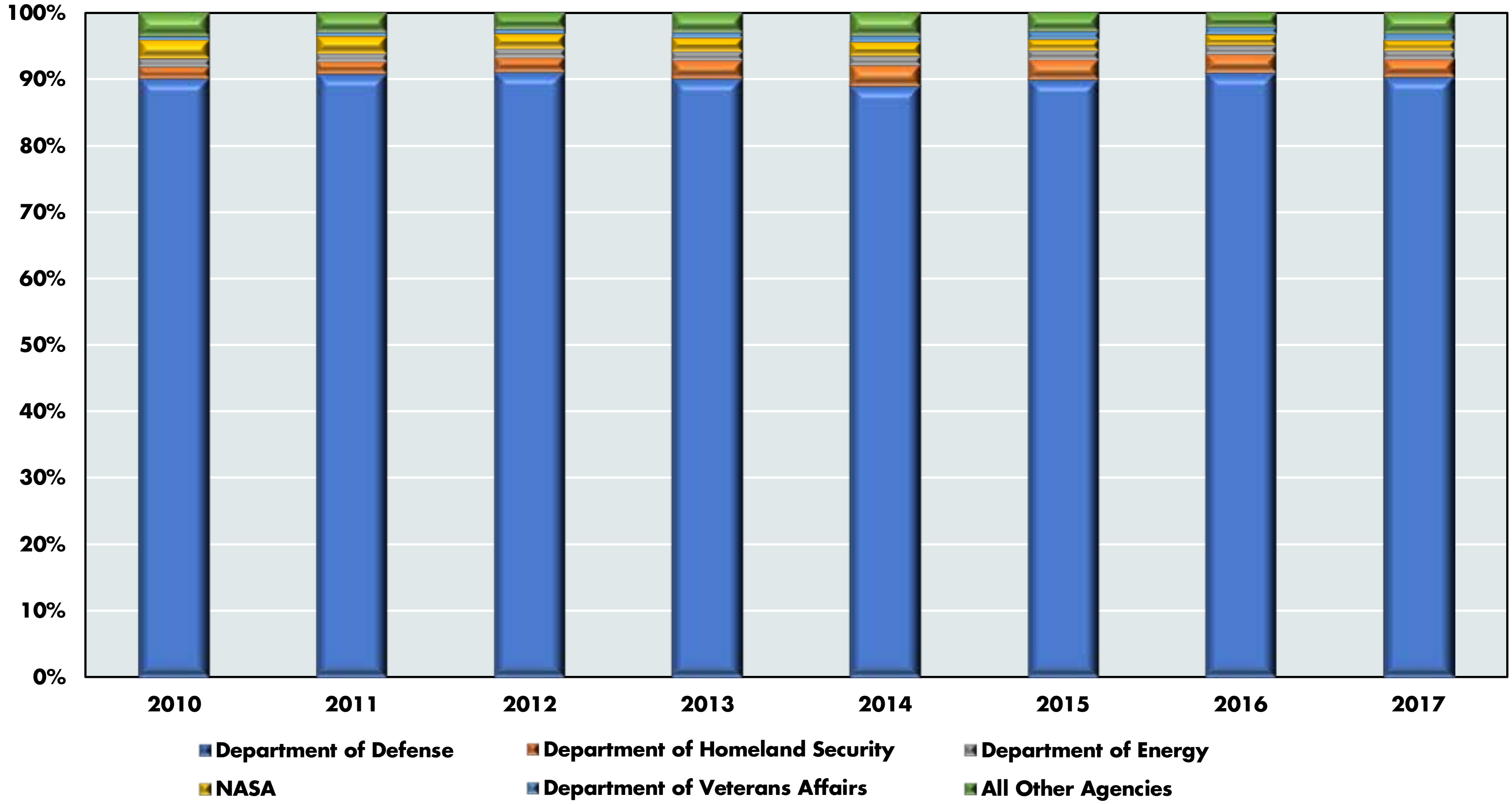
Hampton Roads is more than just the home to 3% of the country's military service members and federal civilian employees. Agencies in the federal government also contract with private-sector firms in the region to produce a wide range of goods and services. Graph 3 shows that these procurement contracts come overwhelmingly from the DOD, accounting for about 90% of all federal contracts.

The mix of military personnel and DOD contracts puts Hampton Roads in a unique place among regions with a significant defense presence. Table 1 indicates where Hampton Roads falls in comparison to several other areas known for their relationship with the military. Direct military expenditures accounted for about 17% of 2017 gross domestic product (GDP) in the region. While this may not rank us in the top 10 "military towns" nationally, we must note that many regions on the list are much smaller than ours. **If we just focus on regions with a population of more than 1 million, Hampton Roads had the highest military dependence in 2017.**

In comparison, the San Diego MSA had 8% of its GDP coming directly from defense expenditures, while the Jacksonville, Florida, MSA had only 3%. The composition of defense spending is important. The regions that have a higher dependency on defense spending tend to focus on either military personnel or procurement spending. **In contrast, defense spending in Hampton Roads is split evenly between personnel and procurement contracts with the private sector. While this may appear as a useful way to diversify the local economy within the defense sector, in reality, it threatens the region by making it susceptible to declines in either type of defense spending.**

GRAPH 3

PERCENTAGE OF PROCUREMENT SPENDING BY AGENCY IN HAMPTON ROADS, 2010-2017



Sources: USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University

TABLE 1 DEPARTMENT OF DEFENSE DEPENDENCE BY METRO AREA, 2017								
Name of MSA	Population	Gross Domestic Product (Millions $)	Defense Dependence	Personnel Share of Defense Spending	Procurement Share of Defense Spending	Defense Dependence Rank	Military Compensation Dependence Rank	Defense Procurement Dependence Rank
Jacksonville, NC	193,893	$ 8,396	50%	88%	12%	1	1	16
Hinesville, GA	80,400	$ 3,470	47%	84%	16%	2	2	13
Fayetteville, NC	386,662	$ 17,263	32%	85%	15%	3	3	24
New London, CT	269,033	$ 15,754	31%	11%	89%	4	33	1
Clarksville, TN	285,042	$ 11,027	27%	84%	16%	5	4	29
Lawton, OK	127,349	$ 5,155	23%	81%	19%	6	5	28
Killeen, TX	443,773	$ 17,556	21%	87%	13%	7	6	50
Huntsville, AL	455,448	$ 25,793	20%	4%	96%	8	63	2
Warner Robins, GA	191,779	$ 7,163	19%	26%	74%	9	23	5
Destin, FL	271,346	$ 14,404	18%	63%	37%	10	9	14
Amarillo, TX	264,925	$ 13,695	18%	1%	99%	11	244	3
Sumter, SC	106,847	$ 3,872	17%	76%	24%	12	7	31
Hampton Roads, VA	1,725,246	$ 94,855	17%	48%	52%	13	16	8
Colorado Springs, CO	723,878	$ 32,683	16%	64%	36%	14	10	18
Fort Knox, KY	150,430	$ 6,275	15%	56%	44%	15	13	15
Tucson, AZ	1,022,769	$ 39,034	15%	10%	90%	16	46	4
Columbus, GA	303,811	$ 13,821	15%	80%	20%	17	8	46
Bremerton, WA	266,414	$ 11,474	14%	63%	37%	18	12	23
Oshkosh, WI	170,414	$ 10,511	11%	1%	99%	19	303	6
Hanford-Corcoran, CA	150,101	$ 5,191	11%	82%	18%	20	11	68
San Diego, CA	3,337,685	$ 231,845	8%	46%	54%	32	32	27
Jacksonville, FL	1,504,980	$ 76,650	3%	49%	51%	71	47	83
Sources: Bureau of Economic Analysis, USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University								

THREAT BRAVO: MAINTAIN, TRAIN AND ASSEMBLE, NOT INNOVATE AND CREATE

The roots of the military in Hampton Roads date back to just after the founding of the U.S. Department of the Navy in 1798. Soon after the end of the American Revolution, the Navy was looking for a shipyard to maintain and expand its fleet. In 1801, the Navy acquired Gosport Shipyard in Portsmouth, which remains in business today as the Norfolk Naval Shipyard. The shipyard contributed to the Navy's fleet by building one of the first six frigates. The private sector also had a hand in shaping the region's naval maritime history. The most notable firm, Newport News Shipbuilding, which would become a division of Huntington Ingalls Industries, opened in 1886. By 1897, it had produced three warships for the Navy.

However, it wasn't until the beginning of the 20th century that Hampton Roads began to experience an influx of military personnel. The Navy needed to increase its manpower and the technical skills to operate its growing fleet. To train the next generation of sailors, it opened a training center in 1908, named St. Helena, in conjunction with the Norfolk Naval Shipyard. Since World War I, the military's presence has expanded in the region to the Peninsula with Langley Air Force Base and Fort Eustis; Sewell's Point, the current home of Naval Station Norfolk; and Virginia Beach with Naval Air Station Oceana, among numerous others. Together, these military facilities have been responsible for operational support and training.

This brief history of the genesis of the military in Hampton Roads provides several insights on defense spending in the region. **The region's historic forte in the defense industry has been to maintain, train and assemble. This strength has carried to the present. The military installations in the area continue to maintain equipment and train a variety of naval occupations, such as sailors, pilots and mechanics. On the other hand, many private-sector firms with DOD procurement contracts focus on support activities, to include maintenance and assembly. Of course, there are notable exceptions, including the shipyards that are building the new Ford-class carriers and Columbia-class submarines, and even these yards depend on lengthy, national supply chains.**

Graph 4 gives the breakdown of DOD procurement contracts with the private sector in Hampton Roads for 2010 to 2017. The largest categories are in shipbuilding, along with maintenance, repair and rebuilding of equipment, which are often related to ships. Huntington Ingalls Industries (HII) in Newport News is far and away the largest firm in these categories and accounts for the lion's share of procurement contracts in the region. This facility is the nation's sole designer, builder and refueler of nuclear-powered aircraft carriers, and is one of only two shipyards with the ability to design and build nuclear-powered submarines.

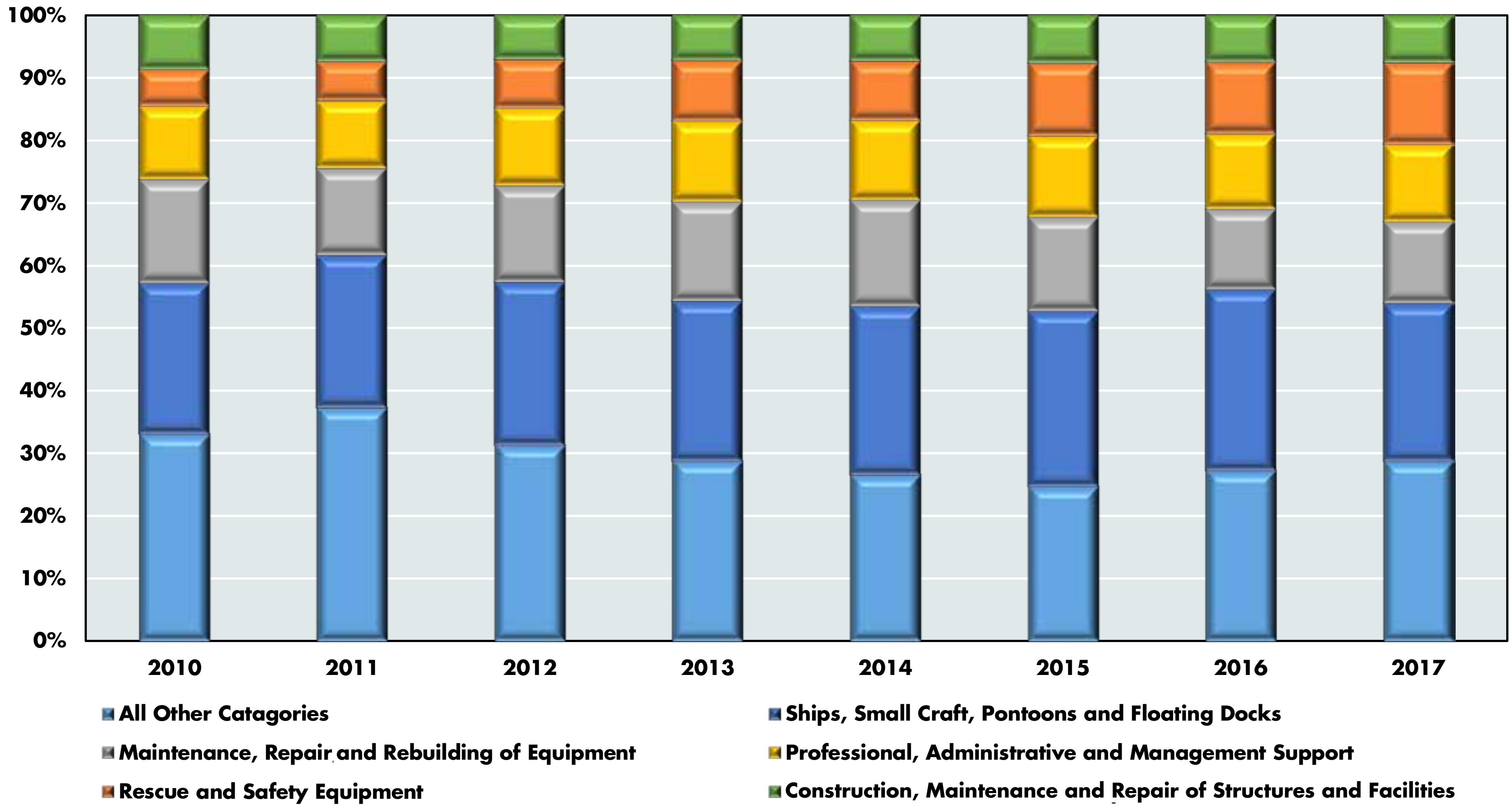
This brings us to the challenge for the region. Hampton Roads' competence in maintaining, training and assembling is clearly a useful component of the military industrial complex; nonetheless, it may not lend itself to creating innovation and entrepreneurship, which fosters economic growth. HII is undoubtedly the anchor of defense procurement here, but we must also recognize that it is larger than just its presence in Hampton Roads. In 2018, the gross revenue from all HII operations (with major facilities in Hampton Roads, Pascagoula, Mississippi, and San Diego, California) was about $7 billion. This means that the supply chain for HII's operations here reaches far outside our region, curbing its local impact. Furthermore, it differs from anchors in other areas, like Microsoft or Amazon in Seattle, because HII does not spur the creation of new firms at the same rate. It is the creation of new firms that a number of researchers increasingly believe produces regional job growth.[3]

Culture is a key driver in this process. Locales with an energetic startup and innovation culture tend to work from a paradigm where firms collaborate, cooperate and then compete. Firms collaborate on technology and innovation, and cooperate on policy and infrastructure, before the competition begins. Uber and Lyft, for example, exited the Austin, Texas, market together when faced with more stringent background requirements for drivers.[4]

3 See, for example, John Haltiwanger, Ron Jarmin and Javier Miranda, "Who creates jobs? Small versus large versus young," *Review of Economics and Statistics* 95, no. 2 (2013): 347-361.
4 https://www.businessinsider.com/r-uber-lyft-spend-big-lose-big-in-texas-vote-on-driver-fingerprinting-2016-5.

GRAPH 4

BREAKDOWN OF DEPARTMENT OF DEFENSE CONTRACTS BY CATEGORY: HAMPTON ROADS, 2010-2017



Sources: USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University

The culture of defense procurement flips this paradigm on its head. Firms know the level of defense spending and see it as a zero-sum game, where one firm wins, and the others lose. The recent high-profile case involving a former Virginia state delegate shows the worst of this, where the only innovation seems to be the creative lengths firms will go to obtain contracts set aside for small and veteran-, women- and minority-owned businesses.[5] Even when defense firms cooperate, it is to share the defense pie, not to innovate to make more pies.

THREAT CHARLIE: LONG-TERM TRENDS IN MILITARY AND GOVERNMENT POLICY

There are also long-term trends at play pushing the military to become smaller, nimbler and smarter. In reality, the size of the active-duty force in the United States, shown in Graph 5, has been on a decline for decades. Furthermore, since the end of World War II, the Army, not the Navy, has typically seen a boost in personnel. Long-term trends, including fiscal pressure from rising costs, shrinking budgetary space and a changing threat environment, could influence the size of the defense establishment in Hampton Roads. These challenges do not exist in isolation of each other, but instead, magnify and build off one another.

There have been several major "budget deals" passed by Congress to suppress the full budgetary effect of the spending limits imposed by the Budget Control Act of 2011 (BCA). In the near term, the defense sector may have escaped the worst-case scenario, and the defense budget might see increases in the next several years. While this is good news, it should be tempered with the realization that policy actions like the Tax Cuts and Jobs Act of 2017 and the Bipartisan Budget Acts of 2016, 2018 and 2019 have ballooned the national debt. This precarious fiscal situation is particularly notable because it is taking place during the most prolonged periods of economic expansion in recent history. According to the Congressional Budget Office, the federal government could spend more servicing the debt than supporting national defense by 2025.[6]

5 https://pilotonline.com/news/local/crime/article_4e66fea6-4a4d-11e9-8506-c75ccfa08aba.html.
6 https://www.nytimes.com/2018/09/25/business/economy/us-government-debt-interest.html.

Dodging the BRAC Bullet

Hampton Roads has not been immune to the Department of Defense's efforts to increase efficiency by closing and realigning military installations. Most notably, the 2005 round of cuts by the Base Realignment and Closure Commission (BRAC) affected several Hampton Roads military installations. Fort Monroe was closed and designated a national monument. On the Peninsula, Fort Eustis and Langley Air Force Base were merged to create Joint Base Langley-Eustis, while in Virginia Beach, Joint Expeditionary Base Little Creek-Fort Story was formed from combining the Navy's Naval Amphibious Base Little Creek and the Army's Fort Story.

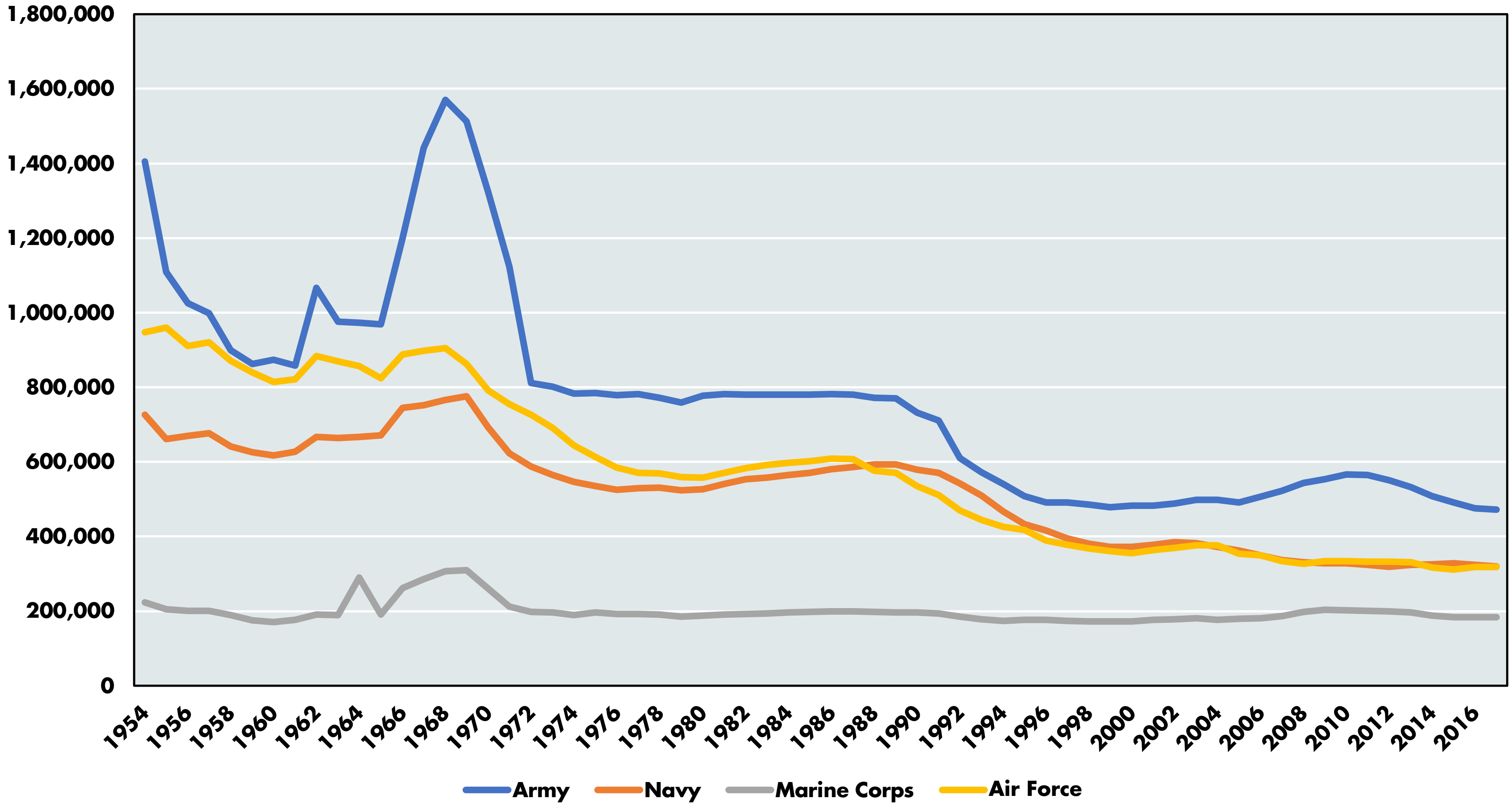
The 2005 BRAC also put in peril Naval Air Station Oceana and its 15,000 personnel in Virginia Beach. The commission voted to close Oceana and move its operations to Jacksonville, Florida, in part because of urban sprawl approaching the base. To preserve the base, local officials created development buffers around it. Hampton Roads dodged a bullet and should continue preparing for future BRAC rounds.

The Department of Defense is also using technology in a variety of ways in the face of rising costs of physical assets and fringe benefits (pension and health care) for DOD employees. For example, the DOD is substituting capital for personnel with the new Ford-class aircraft carrier. The new fleet carrier USS Gerald R. Ford uses about 700 fewer personnel than the previous-generation Nimitz-class carriers. Estimates suggest that the Ford class carriers will save more than $4 billion in ownership costs compared to the previous Nimitz-class carriers over their 50-year service life.[7]

7 https://www.military.com/equipment/gerald-r-ford-class-aircraft-carrier.

GRAPH 5

ACTIVE-DUTY MILITARY BY BRANCH OF SERVICE: UNITED STATES, 1954-2017



Sources: Defense Manpower Data Center and Department of Defense

Finally, the threat environment facing the military is evolving quickly in ways that could impact Hampton Roads. For instance, there is an increased reliance on technological solutions to future threats by leveraging automation, drones, special operations and cyber warfare. Furthermore, if the U.S. defense strategy continues to pivot toward Asia, there is an increased chance the region will lose an aircraft carrier group, along with the attendant active-duty military personnel and families, to the West Coast or Hawaii.

We must also recognize that our competitors get a "vote." Russia has become quite adept at using disinformation campaigns spread through social media. These campaigns, which aim to increase partisanship, highlight the burgeoning role of cybersecurity in future conflicts. China has aggressively moved to promote its interests within the "Nine-Dash Line" in the South China Sea. China also recently slashed its budget for ground forces, reinvesting the funds in its naval and air forces. China's improvements in anti-ship missile technology and efforts to deny U.S. Navy ships access to ports in the region seek to undermine the value of carriers and other surface assets. Iran's recent proclamation that it had flown unmanned aerial vehicles (UAVs) over U.S. Navy ships in the Persian Gulf highlights the evolution of threats, from manned aircraft and ships to potentially a swarm of UAVs and malware aimed at critical systems.

These threats have serious implications for the Hampton Roads economy as it continues to be reliant on personnel and big gray ships. As such, any scenario that reduces shipbuilding or the number of active-duty military personnel will be detrimental to the region. For instance, it is possible that DOD expenditures could shift toward equipment and technology that are not produced in large quantities in Hampton Roads, such as drones (equipment) and information operations and warfare (technology). In terms of personnel, Table 2 shows how the average military and federal civilian worker's compensation stacks up against other sectors. Federal employees represent the highest-earning group, and notably, federal civilian workers have experienced the largest inflation-adjusted compensation increase from 2013 to 2017. **To make up for the loss of each military service member, the region must generate 2.2 private nonfarm sector, 3.5 retail or 1.2 manufacturing jobs.**

TABLE 2

ESTIMATED REAL AVERAGE COMPENSATION: SELECTED INDUSTRIES IN HAMPTON ROADS, 2013 AND 2017

Industry	2013	2017	2013 - 2017 Percent Change
Private Nonfarm	$ 43,598	$ 43,686	0.20%
Manufacturing	$ 79,538	$ 79,597	0.07%
Retail Trade	$ 27,900	$ 27,734	-0.60%
Transportation and Warehousing	$ 62,515	$ 51,817	-17.11%
Federal Civilian	$ 104,031	$ 116,737	12.21%
Military	$ 97,461	$ 96,358	-1.13%
State and Local	$ 60,470	$ 66,130	9.36%

Source: Bureau of Economic Analysis, Compensation of Employees by NAICS Industry
Note: Values are adjusted for inflation to 2018 dollars by the Bureau of Labor Statistics' Urban Consumer Price Index.

Defense Spending Through A Historical Lens

The region's collective reliance on federal government personnel and procurement spending makes it susceptible to boom and bust cycles akin to those of resource-rich states like North Dakota and Texas, whose economies fluctuate based on the price of oil. Graph 6 shows the undulations in government spending on national defense since World War II after adjusting for inflation. It is not hard to see that defense spending is often driven by geopolitics on the world stage. Many of us can name the recent events that have driven the growth and subsequent declines of defense spending, such as the Vietnam War, the so-called peace dividend in the early 1990s and 9/11.

In this section, we'll examine how two recent declines in defense spending impacted the Hampton Roads economy – the thawing of the Cold War in the late 1980s and the Budget Control Act of 2011. These two case studies differ in time period, cause and, importantly, in magnitude. The rising defense spending of the post-9/11 era represents "the good," while together the Budget Control Act of 2011 and the thawing of the Cold War in the late 1980s provide a view of "the bad" and "the ugly" scenarios for Hampton Roads.

GRAPH 6

REAL FEDERAL GOVERNMENT NATIONAL DEFENSE CONSUMPTION EXPENDITURES, 1947-2018

Source: Federal Reserve Bank of St. Louis. National defense spending is composed of National Defense Budget Function (050), which includes the Department of Defense along with defense-related activities in several agencies outside the DOD. Data are adjusted for inflation to 2018 dollars using the gross domestic product price deflator from the Bureau of Economic Analysis.

The Bad: The Budget Control Act Of 2011

"Each non-exempt account within a category shall be reduced by a dollar amount calculated by multiplying the enacted level of sequestrable budgetary resources in that account at that time by the uniform percentage necessary to eliminate a breach within that category" (Section 101 of the Budget Control Act of 2011, modifying Section 251(a)(2) of the Balanced Budget and Emergency Deficit Control Act of 1985).

Sequestration is equivalent to a four-letter word to many in Hampton Roads, responsible for the ills that could beset the region again. Sequestration entails removing or "sequestering" funds that have been approved by Congress and signed into law by the president. Sequestration occurs when the president, acting in accordance with the law, withholds appropriated funds to ensure that obligations do not exceed a specified threshold. Imagine if you went to the grocery store with $100 to purchase items on your list. While at the store, you not only withheld $20, thus reducing the amount of groceries you bought, but you then put the $20 in a shoe box, not to be opened until next year. In a way, sequestration withholds discretionary funds which cannot be spent in the fiscal year and thus "expire" and return to the U.S. Treasury.

The most recent episode of sequestration started as a threat to induce a bipartisan deficit reduction strategy in the Budget Control Act (BCA) of 2011. After failed negotiations by the Joint Select Committee on Deficit Reduction – colloquially, the Supercommittee – the BCA spending caps led to the sequestration of funding in discretionary defense and nondefense programs in FY 2013. Further, the BCA of 2011 limited spending growth in subsequent years. Congress has modified the spending caps on several different occasions. However, these adjustments only provided temporary relief and increased uncertainty about future spending.

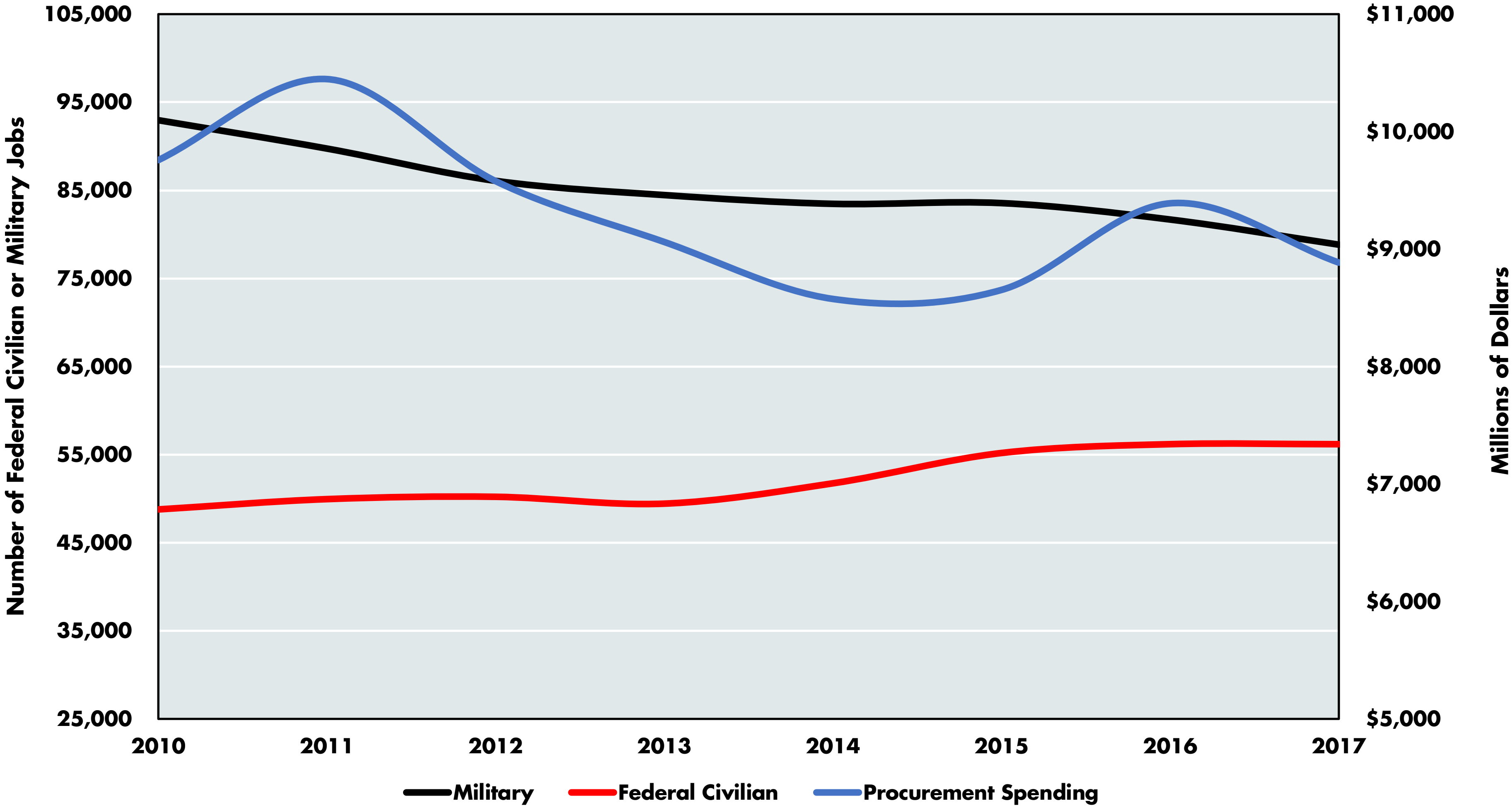
Graph 7 shows how the BCA of 2011 impacted federal personnel and procurement spending in Hampton Roads. The region continued to experience the long-run trend of declining numbers in the military. However, there was an uptick in federal civilian employees that offset some of these losses.

Nonetheless, from 2011 to 2017, federal (military and civilian) employment declined by 3.3%. DOD procurement spending peaked at $10.4 billion in 2011 and had declined $1.8 billion to about $8.6 billion by 2014. By 2017, DOD procurement spending was approximately $8.9 billion, 15% below the 2011 peak.

Due to the relatively small decline in federal employment from 2011 to 2017, we'll focus our attention on the $1.8 billion decline in DOD procurement spending from 2011 to 2014, as this was a "shock" to the regional economy. Table 3 shows a breakdown of the major sectors that acquire DOD procurement contracts in the region. Manufacturing, which includes shipbuilding, repair and maintenance, accounts for over half of all procurement contracts in the region. Several large players in the region dominate this category, like Huntington Ingalls and BAE Systems. Table 3 also shows how defense procurement spending in each industry changed from 2011 to 2014 and 2017. Manufacturing and professional, scientific and technical services (PSTS) experienced the most significant overall declines by 2014. PSTS contacts rebounded by 2017, but unfortunately, manufacturing spending continued to decline.

GRAPH 7

FEDERAL EMPLOYMENT AND REAL PROCUREMENT SPENDING: HAMPTON ROADS, 2010-2017



Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Procurement spending is adjusted for inflation to 2018 dollars with the urban consumer price index from the Bureau of Labor Statistics.

TABLE 3 DEFENSE PROCUREMENT SPENDING IN HAMPTON ROADS BY INDUSTRY (IN BILLIONS OF $), SELECTED YEARS					
Industry	2011	2014	2017	Change from 2011 to 2014	Change from 2011 to 2017
Construction	$621.7	$513.2	$558.9	-$108.5	-$62.8
Manufacturing	$5,839.6	$5,227.6	$4,588.2	-$612.0	-$1,251.5
Wholesale Trade	$831.6	$541.2	$970.3	-$290.4	$138.7
Transportation and Warehousing	$359.4	$427.4	$328.7	$67.9	-$30.7
Information	$166.5	$114.3	$122.9	-$52.2	-$43.6
Professional, Scientific and Technical Services	$1,790.8	$1,213.4	$1,773.3	-$577.4	-$17.5
Administrative, Support and Waste Management	$223.5	$182.2	$235.8	-$41.4	$12.3
Health Care and Social Assistance	$131.5	$147.3	$129.3	$15.9	-$2.2
All Other Industries	$482.4	$208.5	$177.6	-$273.8	-$304.7
Total - All Industries	$10,447.0	$8,575.1	$8,884.9	-$1,871.9	-$1,562.1

Sources: USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are adjusted for inflation to 2018 dollars with the urban consumer price index from the Bureau of Labor Statistics.

The Economic Impact Of The BCA On The Economy Of Hampton Roads

The total economic impact of defense spending on the Hampton Roads economy is made up of the primary and secondary economic impacts. To visualize how the economy reacts to a change in procurement contracts it is helpful to imagine a pebble dropped into a pool of water. The impact represents the initial round of economic activity – output, earnings and employment from DOD procurement funds flowing to firms in the region.

However, the initial round of economic activity moves through the economy like the ripples of water created by the pebble. These ripples represent the interconnectedness of the local economy. They are often broken down into indirect and induced impacts. The indirect economic impact is made up of economic activity by suppliers to firms that have won DOD procurement contracts, while the induced impact comes from income and employment in industries directly and indirectly affected by the direct procurement contracts.

Due to these spillovers, the economic impact of procurement spending in the region can be much larger than the direct impact on a firm that wins a contract. Attempts to quantify the total impact of a change in economic activity often use an economic multiplier. For example, if a firm wins a $100,000 DOD contract (direct impact) that generates $30,000 in indirect economic impacts and $20,000 in induced economic impacts, then the economic impact multiplier effect is ($100,000 + $30,000 + $20,000) / $100,000 = 1.5.

There are two important considerations when thinking about economic multipliers. First, the size of the multiplier inherently depends on how much of the economic activity continues to recycle within the region. If, for example, shipbuilding and repair firms source most of their materials from outside the region (a "leakage"), then the actual multiplier effect will necessarily be smaller. Second is the multiplier effect, where spending spillovers to a variety of other sectors are beneficial to the region when the direct impact is positive; however, by the same token, it is painful when there is a reduction in direct economic activity.

To estimate the impact from DOD procurement spending on employment and output in the Hampton Roads economy, we use the defense procurement spending data in Table 3 and JobsEQ software developed by Chmura Economics and Analytics. The JobsEQ software uses regional input-output tables to measure the connectedness of economic activity in the region.

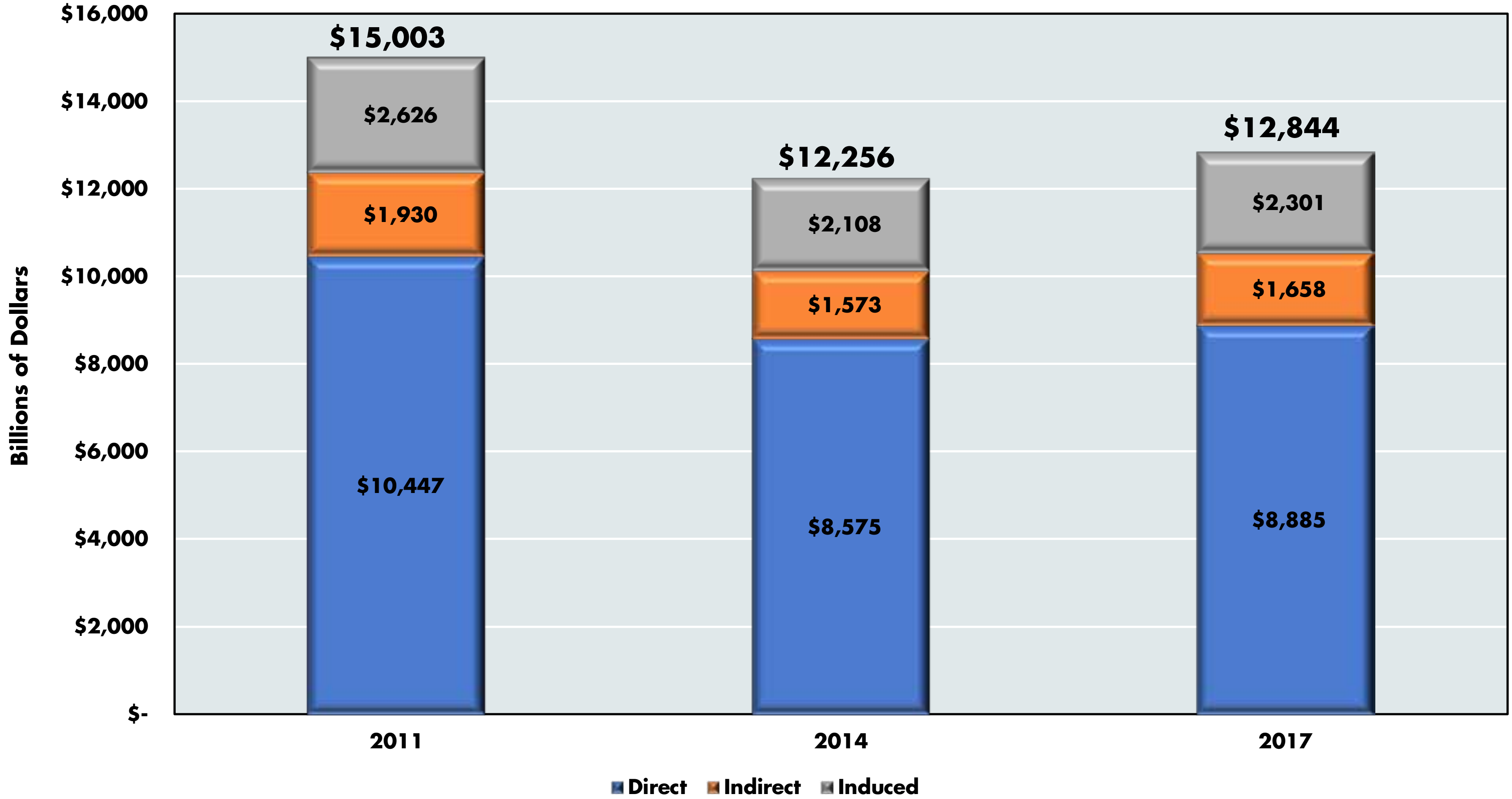
Graph 8 displays the total economic impact of DOD spending on output in Hampton Roads, while Graph 9 shows the impact on employment. To measure the impact of the BCA of 2011, we look at defense spending levels in 2011 before the imposed reduction in defense spending, and compare it to 2014 and 2017.

In 2011, the $10.4 billion in direct DOD procurement spending created a total output of $15 billion. This level plummeted in 2014. Direct defense spending dropped to $8.6 billion, resulting in an overall decline in economic activity in the region of $2.7 billion. To put this into context, this represented an almost 3% drop in Hampton Roads' $95 billion economy at the time.

As one might expect, the $10.4 billion in DOD procurement spending in 2011 created a significant number of jobs. In 2011, DOD procurement spending in Hampton Roads directly created over 43,000 jobs and rippled throughout the economy to create another 28,000 jobs. By 2014, however, the estimated impact of DOD procurement spending on employment fell from almost 72,000 total jobs in 2011 to slightly more than 58,000 jobs. The decline in DOD procurement spending undoubtedly contributed to the region's overall economic malaise during the first half of this decade. The good news is that the most recent data highlight recovery in the number of jobs attributable to DOD procurement spending, with almost 64,000 jobs attributable to this spending in 2017. With the recent increases in DOD spending and budgets in FY 2018 to FY 2020, it is likely that employment associated with DOD procurement spending in Hampton Roads will increase into 2020, if not 2021.

GRAPH 8

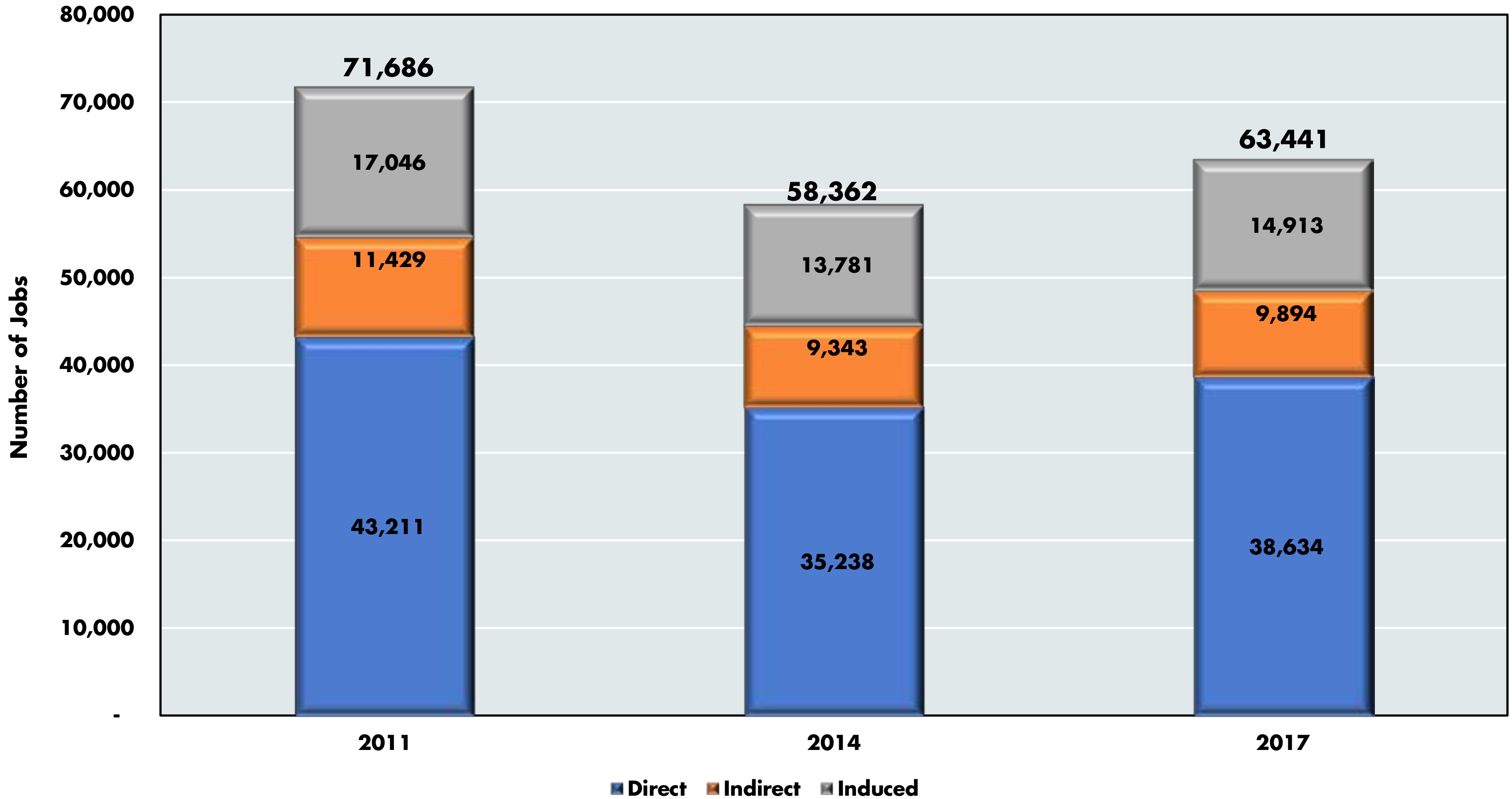
ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON OUTPUT IN HAMPTON ROADS



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 9

ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON EMPLOYMENT IN HAMPTON ROADS



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

The Ugly: The Cold War Thaws And Defense Spending Falls

Following more than a decade of relative stability after the Vietnam War and the changing geopolitical landscape associated with the thawing Cold War, Congress had an initial goal to reduce military spending by at least 25% between FY 1987 and FY 1997.[8]

Graph 10 shows how the overall decline in military spending corresponded to federal employment (military and federal civilian) and DOD procurement spending in Hampton Roads from 1983 to 2000. Both federal personnel and procurement spending peaked in the late 1980s at $5.4 billion, 140,000 service members and more than 53,000 federal civilian employees. The thawing of the Cold War and reduction in defense spending came down particularly hard on Hampton Roads. **From 1988 to 1998, procurement spending dropped by 45%, while military and federal civilian personnel fell by 25% and 15%, respectively. While sequestration was bad, it pales in comparison to the drawdown from the Cold War. Winter indeed came to Hampton Roads, to paraphrase a popular television series.**

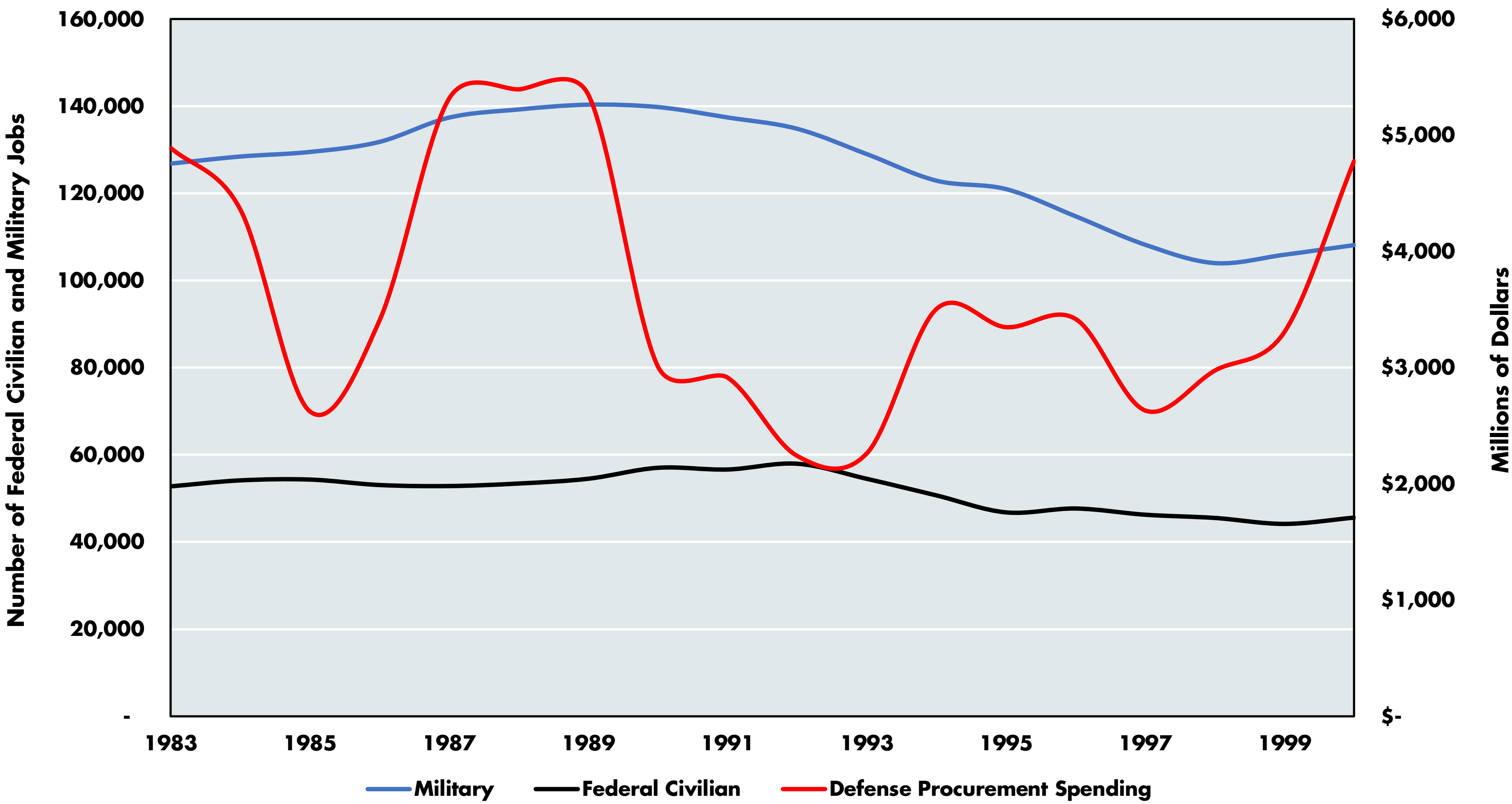
To measure how this drawdown in defense spending affected Hampton Roads, it is important to understand the "counterfactual," or "but for the drawdown, how would the economy have performed over time?"

Economist Ben Zou,[9] in the Journal of Labor Economics, measured how the drawdown in personnel and expenditures over this period affected economic activity. Zou used a statistical technique to elicit the counterfactual for areas with substantial defense spending. We use Zou's methodology to examine the actual growth rate and the growth rate that would have taken place without the defense drawdown for civilian employment and income in Hampton Roads. We present these results in Graphs 11 and 12.

8 Albert H. Schroetel, 1993, "Military Personnel: End Strength, Separations, Transition Programs and Downsizing Strategy," Adjusting to the Drawdown Report of the Defense Conversion Commission, Washington, D.C.
9 Ben Zou, 2018, "The Local Economic Impacts of Military Personnel," *Journal of Labor Economics*, 36(3), pp. 589-621.

GRAPH 10

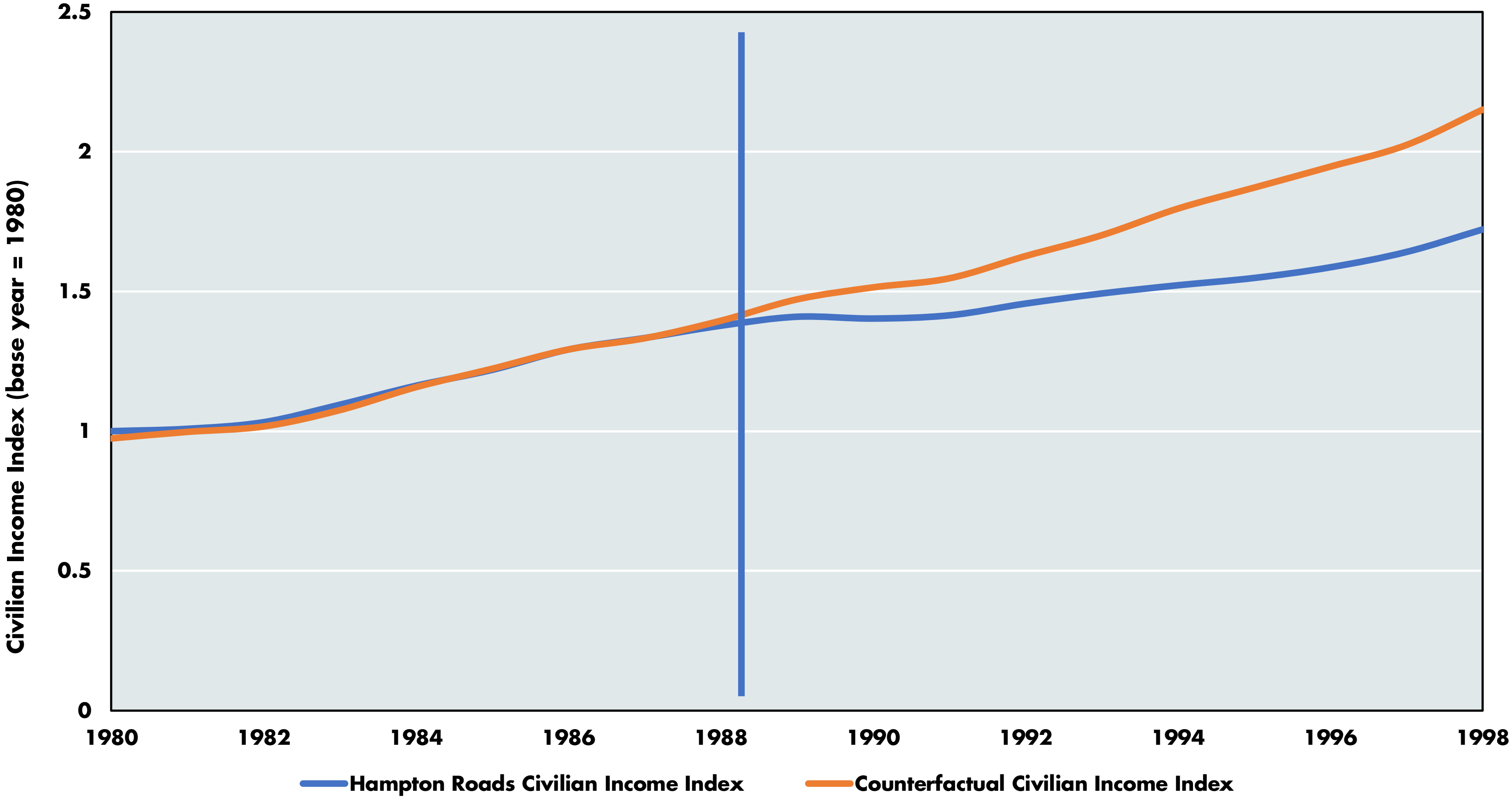
FEDERAL EMPLOYMENT AND REAL PROCUREMENT SPENDING: HAMPTON ROADS, 1983-2000



Sources: Bureau of Economic Analysis and U.S. Census Bureau. Procurement spending is adjusted for inflation to 2000 dollars, with the urban consumer price index from the Bureau of Labor Statistics.

GRAPH 11

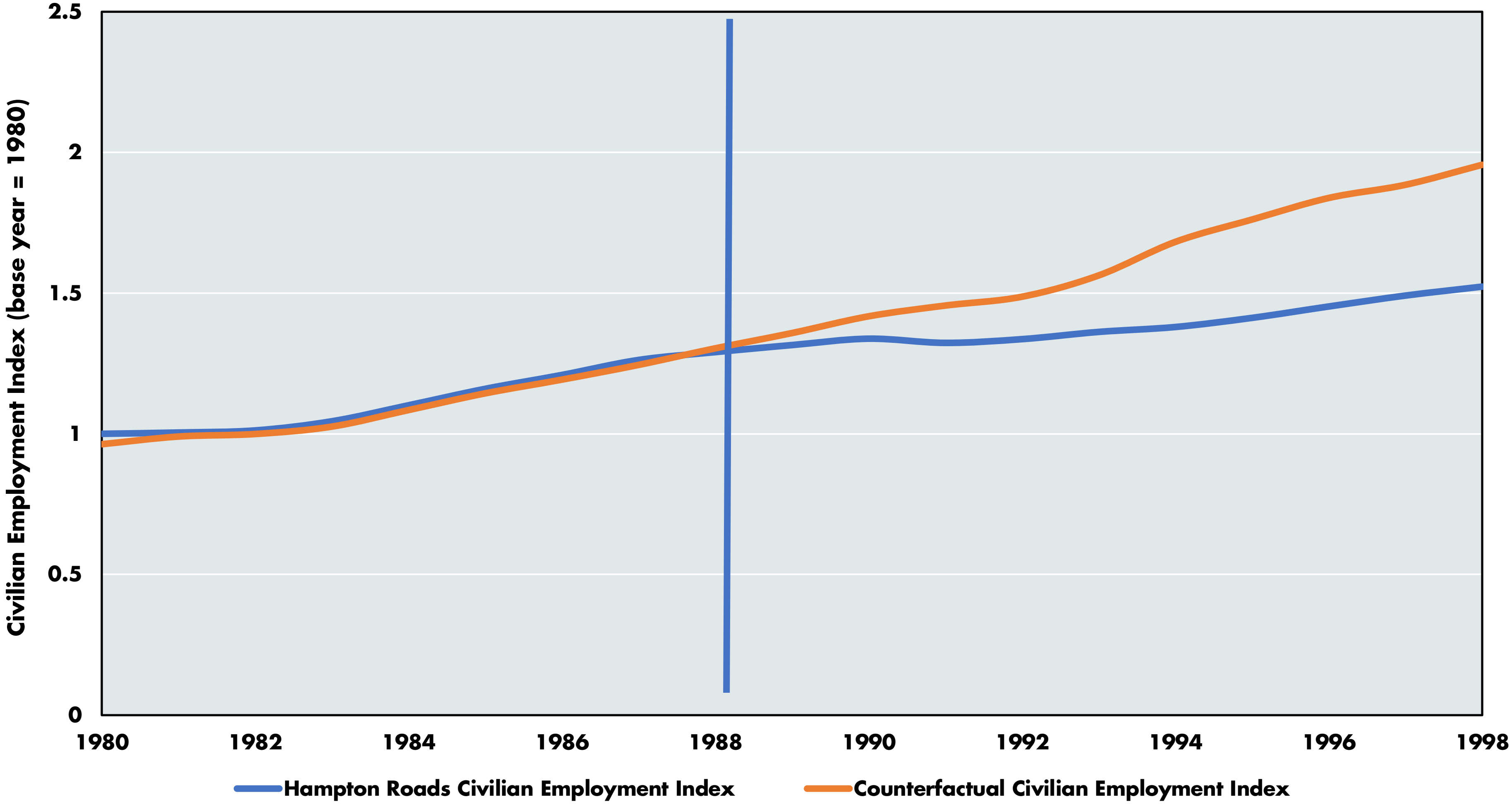
GROWTH IN CIVILIAN INCOME AND THE COUNTERFACTUAL: HAMPTON ROADS, 1980-1998



Source: Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 12

GROWTH IN CIVILIAN EMPLOYMENT AND THE COUNTERFACTUAL: HAMPTON ROADS, 1980-1998



Source: Dragas Center for Economic Analysis and Policy, Old Dominion University

The first thing to note in these graphs is that both civilian employment and income increased over this period. However, the gap between the actual outcome (blue line) and the counterfactual (orange line) after 1988 shows the effect of the decline in spending on defense. **In general, despite rising civilian income and employment, Hampton Roads should have grown at a much higher rate than it did. To add some perspective, the region's civilian income grew over 4% less and civilian employment grew over 5% less each year than they would have without the military spending cutback.**

The post-Cold War case study also again illustrates why context is critical. As William Mezger, a senior economist at the Virginia Employment Commission during this time period, put it: "Probably one of the reasons the defense cutbacks have hurt, but haven't hurt as much as they did after World War II or the Korean War or even after Vietnam, when there was a period when the economy was stagnant for a couple of years, has been the expansion in the overall economy."[10] **Hampton Roads didn't just dodge a bullet, it dodged the mother of all economic bombs, because the drawdown took place during a period of widespread economic growth. We may not be so lucky next time.**

10 T. Evanoff, (Jan. 8, 1996), "Federal Job Reduction Little Noticed in the Area," *The Virginian-Pilot, Business Weekly*, p. 4.

Where Does This Leave Us? Where Do We Go From Here?

There are a variety of threats to defense spending in Hampton Roads, and as our historical case studies have shown, declines in federal procurement spending and personnel can have problematic implications for the region. Is it time to bring two other "four-letter words" into the conversation: diversification and collaboration? There has been a reluctance to utter these words, in fear that the DOD might view any such efforts as a withdrawal of support for the military installations in the region. Others have argued that it's time for conversation and action. Where do we go from here?

First, it is helpful to recognize that long-term structural threats often require long-term structural solutions. The risks we have outlined suggest that with or without action, the region could lose either personnel or procurement contracts, or both. The worst-case scenario would be to lose an installation in a future BRAC round. In this light, the region needs to continue to be forward-looking to protect our current military assets and become a net winner in inevitable future BRAC rounds. Work in this area is already taking place on a variety of fronts. For instance, the military is in the business of moving large numbers of people and equipment. The widening of I-64 through the Peninsula and the planned Hampton Roads Bridge-Tunnel expansion alleviate DOD congestion concerns. These projects have the bonus of making the region more attractive to businesses and residents.

However, sea level rise remains the elephant in the room concerning long-term structural issues facing the region and its military assets. It is a significant threat that could make assets at the region's naval bases "float away" to other areas. There is unlikely to be one panacea to insulate the region from rising seas. Instead, local governments should continue to explore creative ways to invest in resilient infrastructure, such as so-called green bonds. Hampton Roads came out of the latest hurricane season relatively unscathed compared to metropolitan areas in neighboring states, but it is only a matter of time before a devastating hurricane makes its way to our shores, and preparation is vital.

Another piece to the puzzle to make the region more attractive to the military is its appeal to military personnel and families. We have some stiff competition in this department from the likes of San Diego. While we cannot compete directly in terms of climate, we can invest in K-12 education, promote policies to enable the hiring of military spouses and provide job training and placement for transitioning service members. Furthermore, the exiting military cohort is a prime source of workers in high-tech industries such as cybersecurity and data analytics.

Second, the region should promote policies that encourage innovation and entrepreneurial activities. Research shows that innovative firms act as the engine of economic growth in an area.[11] This would represent a cultural change for our region. Hampton Roads missed out on the entrepreneurial waves that swept across many areas of the country in the early and late 1990s. We missed out, in part, because defense spending was strong, and the region continued to flourish even if it was not creating the new technologies implemented by the military. However, for the region to grow its firms, it needs to move past the model of winning government contracts by simply "buying low" in wholesale markets and "selling high" to the military.

Promoting innovation and an entrepreneurial spirit among Hampton Roads residents again is a long-term play. We suggest two strategies to promote an entrepreneurial culture and economic growth. First, to promote technology-oriented startups, and not miss the next wave of entrepreneurism, the region should continue to develop innovation districts. There are several innovation districts spread throughout the region, like the Peninsula Technology Incubator in Hampton, Ignition in Williamsburg and Innovation Research Park at Old Dominion University. These organizations help fuel the growth of startups by providing resources, expertise and mentorship, as well as inspiring a culture of entrepreneurship.

The second strategy, often referred to as "economic gardening," is designed to grow existing firms. While attracting mega firms like Amazon might produce front-page headlines, the overall payoff from luring a large firm to relocate can be quite low. Gardening, on the other hand, focuses on the needs of existing firms, whether it involves additional financial capital or technical expertise to expand their business. Our local colleges and universities also can play an essential role in research and development, as well as provide appropriate business services to budding companies.

A crucial aspect of this for Hampton Roads is the notion of dual-use products and services. The region already has experience and expertise in procuring government contracts. However, firms would also benefit by looking for outlets for their products in the private sector. For example, a firm working on the next generation of marine propulsion equipment might have developed its technology initially for the military, yet it could also be valuable in private-sector applications. The military-to-civilian transition is important also for private firms and business lines and for spurring innovation.

All economic parties come to an end. While Hampton Roads cannot control poor fiscal choices at the federal level, it can recognize, plan and prepare for the eventual fallout. There are, as we have stated in previous reports, no magic bullets or short-term elixirs to fix these structural issues. If the road ahead is full of potholes, sometimes it is best to slow down and evaluate whether there is a better path. Undoubtedly, Hampton Roads will continue to play a keynote role in national defense in years to come. Now, however, is the time to broaden our horizons and make the cultural and economic changes needed to spur long-term growth.

11 For example, see Ryan Decker, John Haltiwanger, Ron Jarmin and Javier Miranda (2014), "The role of entrepreneurship in US job creation and economic dynamism," *Journal of Economic Perspectives*, 28(3), 3-24.

The Economic Impact Of A Hurricane On Hampton Roads

THE ECONOMIC IMPACT OF A HURRICANE ON HAMPTON ROADS

When clouds are seen, wise men put on their cloaks;
When great leaves fall, then winter is at hand;
When the sun sets, who doth not look for night?
Untimely storms make men expect a dearth.

– "Richard III," Act 2, Scene 3

The rain began to fall on Norfolk in the early morning of Sept. 2, 1821. Within two hours, winds reached gale force, increasing to hurricane force by 11:30 a.m.[1] When the winds and rain abated that afternoon, residents emerged to a scene of devastation. The Norfolk Herald recorded an account of the hurricane's passage: "From half past 11:00 until half past 12:00, so great the fury of the elements, that they seemed to threaten a general demolition of everything within their reach. During that period the scene was awful. There was the deafening roar of the storm, with the mingled crashing of windows and falling of chimneys, while the rapid rise of the tide threatened to inundate the town."

For the Virginia Beach-Norfolk-Newport News metropolitan statistical area (MSA), also referred to as the Hampton Roads MSA, the question is not if, but when a major tropical storm or hurricane will impact the region again. Even a relatively weak hurricane would likely cause significant damage to property, displace residents and reduce economic activity. Hurricane Matthew, which had weakened to a post-tropical cyclone by the time it skirted the coast of Hampton Roads in October 2016, provided a reminder of the region's vulnerability to a major storm.

Matthew arrived in a region already saturated by rain. In the previous month, rainfall totals approached 50% of the annual average. In just the day prior to Matthew's transit through Hampton Roads, rainfall totals approached 25% of the annual average. Flooding from rainfall, not wind, was the primary cause of damage. Matthew's relative weakness and track fortunately meant there was no appreciable storm surge. Yet, even though Matthew was a relatively weak storm when it passed through Virginia, Jeffrey D. Stern, state coordinator for the Virginia Department of Emergency Management (VDEM), estimated that Matthew caused nearly $500 million in damage.[2]

The damage inflicted by Matthew resulted in 2,661 approved applications to the Federal Emergency Management Agency's (FEMA) Individuals and Households Program (IHP).[3] Of the $10.2 million in approved applications, the majority (about $8.2 million) was for housing assistance. FEMA also provided approximately $15.9 million in public assistance grants. The National Flood Insurance Program (NFIP) paid out more than $10 million in claims. Many damaged residences, however, were not covered by flood insurance. Some houses and public infrastructure remain in a state of disrepair to this day.

1 Gale-force winds equal or exceed 32 miles per hour (mph) and can range up to 63 mph; hurricane-force winds equal or exceed 73 mph (National Weather Service, 2019).

2 https://pilotonline.com/news/local/weather/storms/article_2bc3125c-0056-5def-af77-42d6ed7f6e43.html.
3 FEMA's Individuals and Households Program (IHP) provides financial and direct services to eligible individuals and households affected by a disaster. For more information, see https://www.fema.gov/media-library-data/1528984381358-6f256cab09bfcbe6747510c215445560/IndividualsHouseholdsPrograms.pdf.

The estimated costs from Hurricane Matthew do not include the numerous volunteer agencies that provided financial assistance, cleanup and remediation of damaged housing. In the immediate aftermath, calls for volunteers highlighted the need to gut damaged homes and clear debris.[4] The Virginia Conference of the United Methodist Church, for example, reported several thousand volunteer hours in support of recovery efforts.[5] Including these efforts would likely raise damage and recovery estimates by millions of dollars.

We should consider ourselves fortunate. Aside from the physical damage from rain and wind, Matthew appears to have had a negligible impact on economic activity in Hampton Roads. Seasonally adjusted nonfarm payrolls (jobs) in October 2016 increased by 0.36% year-on-year, in line with increases in previous months. Monthly retail sales also increased year-over-year, suggesting that while some sales may have been displaced during the storm, the storm did not significantly impact sales over the entire month. The median sales price of residential housing in October 2017 was 5.5% higher than October 2016 and sales activity increased year-over-year.

While Hampton Roads has not been struck by a Category 3 or higher hurricane in over 150 years, past may be prologue. The physical and economic damages from a major hurricane making landfall in our region would be catastrophic. We estimate that residential housing would bear the brunt of the approximately $18 billion in wind and water damage. More than 200,000 residents would be displaced in the immediate aftermath of the storm, with almost 16,000 seeking accommodation in public shelters. In the first year after the hurricane, over 150,000 jobs could be lost, and economic activity could decline by over $20 billion. All told, the physical and economic impacts of a Category 3 hurricane making landfall in Hampton Roads could exceed $40 billion in the year following the storm.

Whether a major hurricane will impact Hampton Roads is not a question of if, but when. Understanding the extent of the potential physical and economic impacts will assist decision-makers in weighing the costs of planning and preparation with those of response. We must also recognize that even if a hurricane does not make landfall in Hampton Roads, the remnants of hurricanes often travel through our cities. Improving the economic resiliency of the region to these future storms complements the ongoing efforts to mitigate and adapt to sea level rise.

4 https://pilotonline.com/news/government/local/article_552b1f56-ec18-5245-84b9-b16da79f582d.html.
5 For an overview of the Virginia Conference of the United Methodist Church's Hurricane Matthew recovery efforts, see https://www.facebook.com/vaumconf/videos/10155682528153533/?v=10155682528153533.

A Primer On Hurricane Strength

To understand how a major storm (such as Superstorm Sandy in 2012) or hurricane (such as Hurricane Michael in 2018) could affect Hampton Roads, we first need to briefly discuss the categorization of hurricanes. A common measure of hurricane strength is the Saffir-Simpson Hurricane Wind Scale (Table 1), which ranges from Category 1 to Category 5. Hurricanes that reach Category 3 are classified as major hurricanes due to the potential for physical damage and loss of life. **In general, damage rises by a factor of 4 for every category increase; thus, a Category 3 hurricane will, on average, create 16 times the damage as a Category 1 hurricane.**

TABLE 1

SAFFIR-SIMPSON HURRICANE WIND SCALE

CATEGORY	SUSTAINED WINDS	TYPES OF DAMAGE DUE TO HURRICANE WINDS
1	74-95 mph 64-82 kt 119-153 km/h	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** Well-built frame homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** Well-built frame homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	**Catastrophic damage will occur:** A high percentage of frame homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: National Hurricane Center (2019), https://www.nhc.noaa.gov/aboutsshws.php

The Most Expensive Storms In U.S. History

Advances in weather forecasting and surveillance have, in most cases, led to dramatic reductions in the loss of life from major storms. In terms of known fatalities, the 1900 Galveston Hurricane had estimated sustained winds greater than 120 mph and a storm surge of approximately 20 feet. The estimated loss of life was between 6,000 and 12,000 people. More recently, Hurricane Maria struck Puerto Rico as a Category 5 hurricane with maximum sustained winds of 175 mph and a reported maximum storm surge of 3 to 5 feet.[6] Damage to the island was undeniably catastrophic, with most of the electrical, sanitation and communication infrastructure failing in the aftermath of the storm. Many of the fatalities associated with Hurricane Maria, however, occurred after the storm.

As the damage to public and private infrastructure increases, the impact of the hurricane may linger, leading to more deaths after it has passed than when it made landfall. The Milken Institute School of Public Health at George Washington University recently estimated that the total excess mortality post-hurricane Maria was between 2,658 and 3,290 deaths for the period of September 2017 through February 2018.[7] Every social and age group experienced increased mortality during this period. Individuals in lower socioeconomic development communities and males 65 or older experienced the highest rates of excess mortality. Partly as a result of the hurricane, the U.S. Census Bureau estimated that Puerto Rico's population declined by 4.3% from 2017 to 2018.

6 https://www.nhc.noaa.gov/data/tcr/AL152017_Maria.pdf.
7 Milken Institute School of Public Health, (2018), "Ascertainment of the Estimated Excess Mortality from Hurricane Maria in Puerto Rico," retrieved from Washington, D.C.: https://prstudy.publichealth.gwu.edu/.

Table 2 illustrates that nine of the 10 most expensive storms in U.S. history have occurred this century. Rising population in coastal areas is one of the primary drivers. Population density has increased at significantly higher rates for coastal counties over the last three-plus decades relative to the remainder of the United States. From 1980 to 2017, the population density in shoreline counties along the Gulf Coast and East Coast rose by 160 people per square mile, compared to 26 people per square mile in the rest of the continental United States.[8] More people, homes and businesses are now at risk from a major storm.

Another contributing factor is climate change. **The preponderance of scientific evidence is that average global temperatures have risen and will continue to rise over the coming decades.** The intensity and damage resulting from hurricanes in the North Atlantic basin appear to be positively correlated with the global average rise in sea level temperatures.[9] While projections on the number of major storms may be uncertain, the intensity and rainfall associated with these storms are expected to increase in the future. Rising sea levels and temperatures mean that storm surge risk is predicted to increase with future storms.[10]

Hurricane Harvey in 2018 is an example of the linkage between the average rise in ocean temperatures and rainfall after landfall. Prior to Harvey's formation and passage through the Gulf of Mexico in 2018, ocean heat content, the heat stored in the ocean, was the highest on record. After Harvey's passage, ocean heat content fell sharply. Harvey not only was "fueled" by record ocean temperatures, but it also accumulated more moisture, which, in turn, increased rainfall and flooding after landfall.[11] If average ocean temperatures continue to rise, we can reasonably expect that future hurricanes will become "wetter," increasing the odds of flooding relative to historical storms.

8 K. Dapena (Sept. 29, 2018), "The Rising Costs of Hurricanes," *The Wall Street Journal*, retrieved from https://www.wsj.com/articles/the-rising-costs-of-hurricanes-1538222400.
9 F. Estrada, W.W. Botzen and R.S. Tol (2015), "Economic losses from US hurricanes consistent with an influence from climate change," *Nature Geoscience*, 8(11), 880.
10 K.J. Walsh, J.L. McBride, P.J. Klotzbach, S. Balachandran, S.J. Camargo, G. Holland, G. and A. Sobel (2016), "Tropical cyclones and climate change, *Wiley Interdisciplinary Reviews: Climate Change*, 7(1), 65-89.
11 K.E. Trenberth, L. Cheng, P. Jacobs, Y. Zhang and J. Fasullo (2018), "Hurricane Harvey links to ocean heat content and climate change adaptation," *Earth's Future*, 6(5), 730-744.

TABLE 2

TOP 10 HURRICANES IN TERMS OF DIRECT DAMAGES: UNITED STATES, 2000-2018

Rank	Year	Name	Category	State	Estimated Direct Damages (Millions of 2018 Dollars)	Estimated Fatalities
1	2005	Katrina	3	FL, LA, MS	$138,861	1,833
2	2017	Harvey	4	TX, LA	$128,053	107
3	2017	Maria	5	PR	$93,222	3,057
4	2012	Sandy	TS	Eastern Seaboard	$76,560	285
5	2017	Irma	4	FL	$54,294	92
6	1992	Andrew	5	FL, LA	$48,860	65
7	2008	Ike	2	LA, TX	$34,429	103
8	2005	Wilma	3	FL	$27,009	23
9	2004	Ivan	3	AL, FL	$25,017	92
10	2004	Charley	4	FL	$20,089	15

Sources: FEMA (2018), NOAA (2018) and authors' calculations. Tropical Storm Sandy is included, given the magnitude of damages.

Hurricanes In Virginia And Hampton Roads

While historical records may not fully include all the major storms and hurricanes that have made landfall in Virginia, the first recorded hurricane was on Aug. 24, 1635 (Table 3). In September of 1667, records show that the Chesapeake Bay rose 12 feet, destroying many homes in Jamestown. Less than 100 years later, a hurricane caused the Chesapeake Bay to rise a reported 15 feet and destroyed Fort George at Old Point Comfort. Regardless of the incompleteness of early records, it is clear that major storms have struck Virginia in the past. **We should avoid letting the recent past bias our decision making. Major hurricanes have struck Hampton Roads in the past and will do so again.**

TABLE 3

HISTORICAL MAJOR STORMS AND HURRICANES IN THE COMMONWEALTH OF VIRGINIA

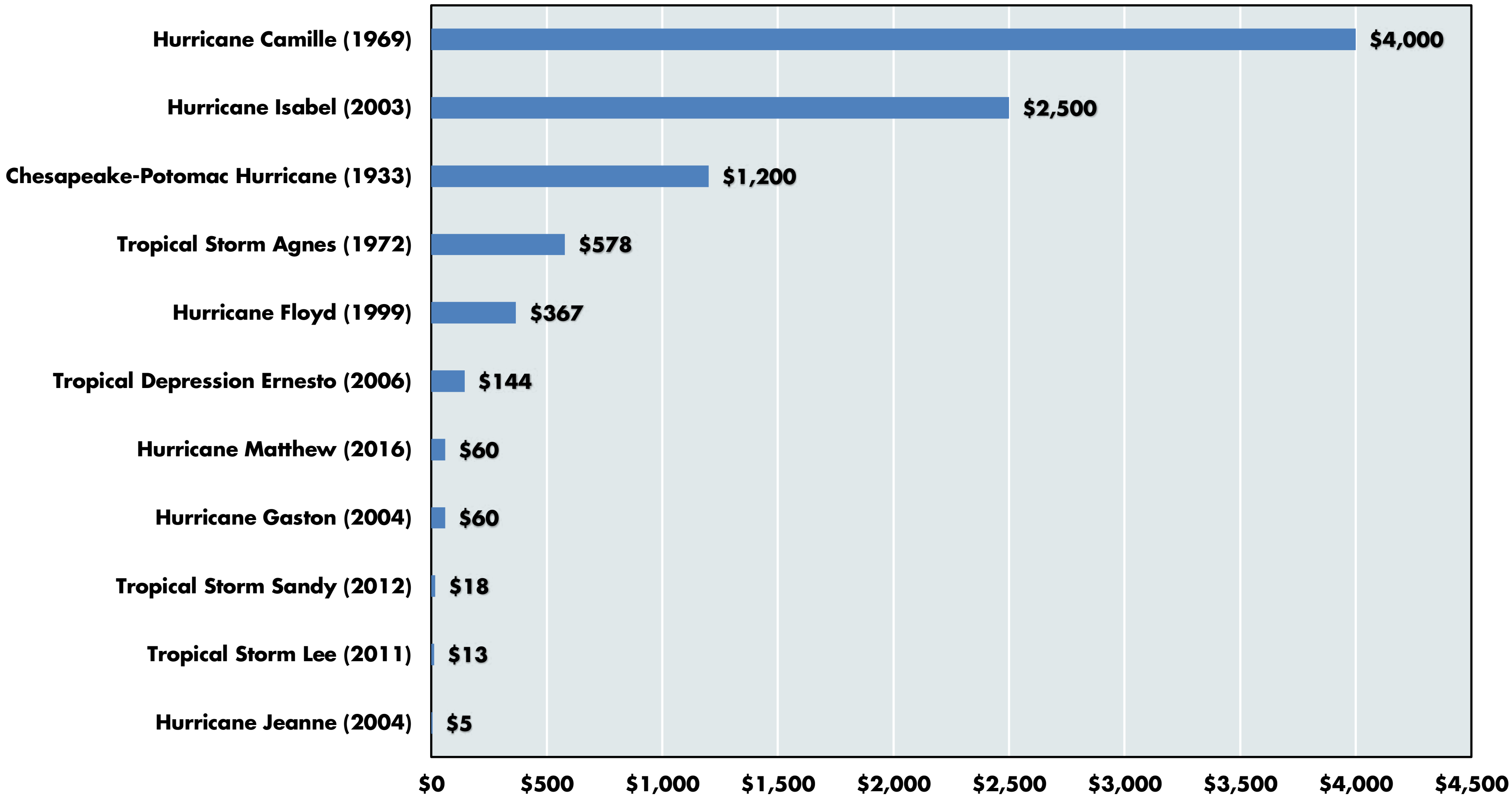
Period	Year of Major Storm or Hurricane
1600s	1635, 1667, 1693
1700s	1749, 1775, 1769, 1785
1800s	1804, 1821, 1846, 1876, 1878, 1879, 1888, 1889, 1893, 1894, 1896 (2), 1897, 1899
1900s	1903, 1924 (2), 1926 (2), 1928, 1932, 1933 (2), 1935, 1936, 1944, 1952, 1953, 1954, 1955, 1959 (2), 1960, 1964, 1969, 1971, 1972, 1979, 1985 (2), 1986, 1996 (2), 1997, 1998, 1999 (2)
2000s	2003, 2004 (3), 2006, 2009, 2011 (2), 2012, 2016

Source: Virginia Department of Emergency Management (2016). Official weather reporting began in Norfolk in 1871; however, early colonists and others also recorded severe weather events.

Graph 1 illustrates the physical damages for a select number of hurricanes that have, in some form, passed by or through Virginia in the past century. The damages represent the total impact of the storms on the U.S., not on Virginia. Hurricane Camille in 1969 tops the list with approximately $4 billion in damages in 2018 dollars, followed by Hurricane Isabel in 2003.

GRAPH 1

ESTIMATED PHYSICAL DAMAGE IN MILLIONS OF 2018 DOLLARS, SELECTED STORMS AND HURRICANES AFFECTING THE COMMONWEALTH OF VIRGINIA



Sources: Virginia Department of Emergency Management and the National Hurricane Center. Estimated damages do not include the economic impact of the storms. Then-year dollars have been converted to 2018 dollars using the Implicit Price Deflator for Gross Domestic Product from the Bureau of Economic Analysis.

The Norfolk-Long Island Hurricane Of 1821

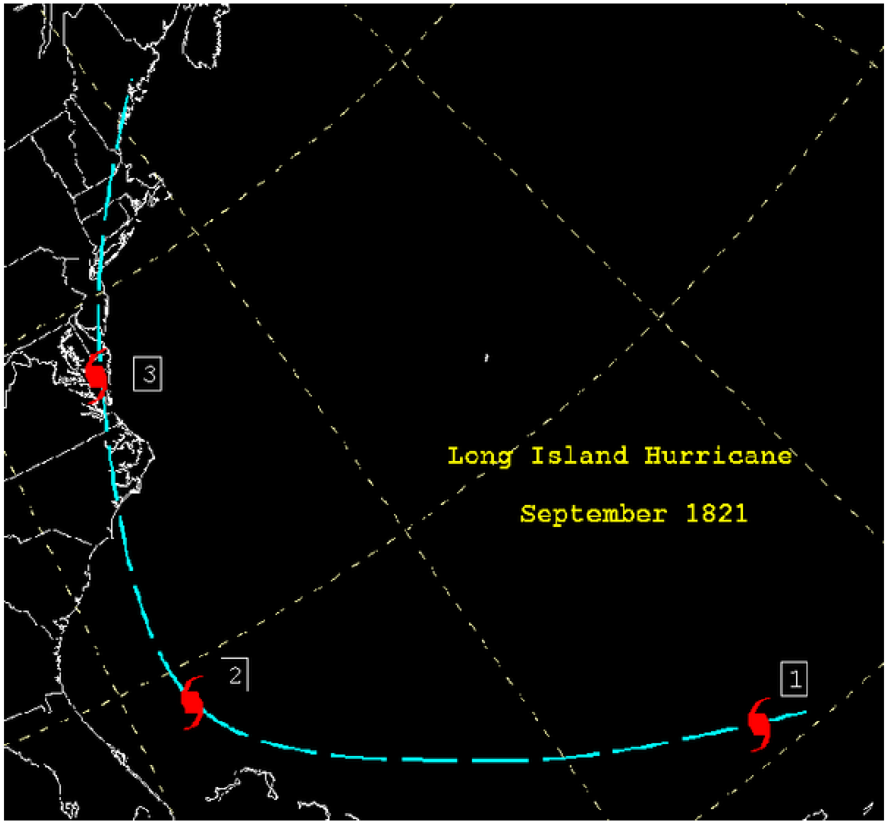
If there is a worst-case scenario for Hampton Roads, it may be similar in intensity to the Norfolk-Long Island Hurricane of 1821. Figure 1 illustrates the estimated track of the 1821 storm, including the passage of the eye of the estimated Category 3 hurricane over Norfolk. Weather observations from the time reported gale-force winds in Norfolk on Sept. 3, 1821, accompanied by at least a 10-foot storm surge. The storm continued north to the New York-New Jersey area without a significant loss of strength, with hurricane-force winds and a reported storm surge up to 20 feet in Atlantic City.[12] While significant in terms of damage, the numbers of people and structures at risk were considerably lower than they would be today. The U.S. Census of 1820 reported that the population of the Commonwealth of Virginia was 1,065,379, of which 15,478 resided in Norfolk County.

In contrast, in 2018, there were 8,517,865 Virginians and 244,076 of those called Norfolk home. In 1820, the combined population of New York City and Washington, D.C., was almost 140,000, compared to approximately 10 million in 2018. A Category 3 hurricane like that of 1821 would place millions of people and tens (if not hundreds) of billions of dollars' worth of public and private assets along the Eastern Seaboard at risk today. A 2014 simulation by Swiss Re, an international reinsurance company, estimated that wind and storm surge damages from a hurricane like that in 1821 would exceed $40 billion and $60 billion, respectively. The total economic impact would likely exceed $150 billion for the United States.[13]

Yet, we should be careful in our thinking with regard to the reported magnitude of a tropical storm or hurricane. Florence in 2018, for example, was only a Category 1 hurricane when it made landfall near Wilmington, North Carolina. Florence, however, caused extensive damage, primarily due to extensive rainfall in an already saturated area. Superstorm Sandy had been downgraded to an extratropical storm by the time it made landfall in 2012. Yet, because Sandy came ashore in densely populated areas of the Eastern Seaboard, it resulted in significant damage and continues to rank among the 10 most expensive storms to strike the United States in the last three decades.

FIGURE 1

ESTIMATED TRACK OF THE 1821 NORFOLK-LONG ISLAND HURRICANE



Source: https://www.wpc.ncep.noaa.gov/research/roth/sp1821.gif

12 M. Linkin (2014), "The big one: The East Coast's USD 100 billion hurricane event," Swiss Re.
13 M. Linkin (2014), "The big one: The East Coast's USD 100 billion hurricane event," Swiss Re.

What does this mean for the Commonwealth? Both Northern Virginia and Hampton Roads are relatively densely populated. A major storm such as Hurricane Michael (Florida, 2018), Florence, (North Carolina, 2018), Sandy (New York-New Jersey, 2012) or Katrina (Gulf Coast, 2005) would likely result in billions of dollars in damages due to storm surge and flooding. And it is probable that wind damage would be in the billions of dollars. These, unfortunately, are the direct consequences of such a storm. If a future storm damaged infrastructure, housing and businesses, the economic impact could be greater than the direct damages of the storm. Recovery could take years. Simply put, a major storm or hurricane striking Hampton Roads or Northern Virginia could, in the worst case, rank among the costliest storms in U.S. history.

With this in mind, let's examine the impact of a major hurricane making landfall in Hampton Roads.

Estimating The Physical Damage From A Hurricane

Estimating the physical damage from a major storm is a journey in uncertainty. Every weather event is unique, and the estimates from any model are a product of the underlying assumptions. To explore the potential physical damages from a hurricane striking Hampton Roads, we modified the track and strength of Hurricane Florence, where the modified Category 3 storm makes landfall near the Virginia-North Carolina border (Figure 2). The modeled storm surge occurs at the worst possible time and generates the largest possible estimates in terms of damage.[14]

We used the HAZUS model to generate the damage estimates for a Category 3 hurricane making landfall in Hampton Roads. According to FEMA, the HAZUS model is a regional multihazard model designed to "assist in risk-informed decision-making efforts by estimating potential losses from earthquakes, floods, hurricanes, and tsunamis and visualizing the effects of such hazards." FEMA developed HAZUS in concert with the National Institute of Building Sciences (NIBS). HAZUS estimates multihazard losses on a regional scale and is widely used by state, regional and local officials in emergency preparedness. One way to think about HAZUS is that it employs data on structures and geographies to generate estimates of wind and water damage resulting from different types of hazards (hurricanes, floods and earthquakes).

14 According to the National Hurricane Center, the maximum of the Maximum Envelope of Water (MEOW) provides a worst-case snapshot for a particular storm category under "perfect" storm conditions. For more information, see: https://www.nhc.noaa.gov/surge/momOverview.php.

FIGURE 2

MODIFYING FLORENCE TO IMPACT HAMPTON ROADS

Hurricane Florence (actual)

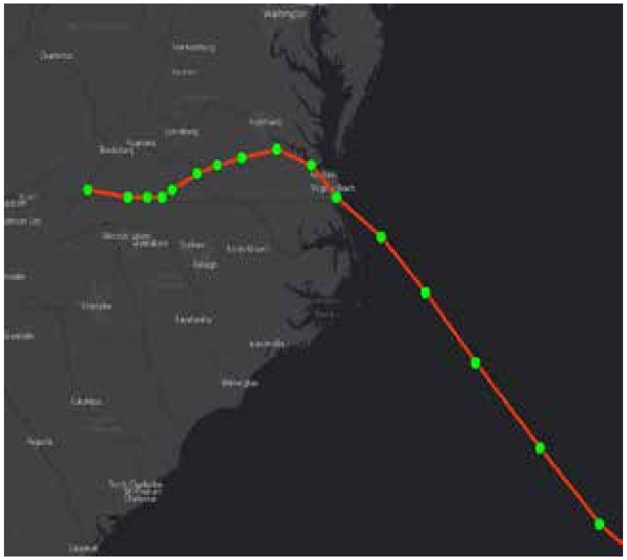
Landfall: Near Wilmington, North Carolina

Storm Surge: 6 feet

Rainfall: 30-plus inches

Speed at Landfall: slow

High Category 1 at landfall



Modified Hurricane Track

Landfall: Virginia-North Carolina Border

Storm Surge: Category 3

Rainfall: 36 inches

Speed at Landfall: slow

High Category 2 at landfall

Sources: NOAA (2018) and HAZUS (2018). Storm surge in the modified track is generated using the Maximum Envelope of Water Category 3 scenario.

Wind Damage

For Hampton Roads, HAZUS estimates that there are 580,120 buildings with an aggregate replacement value of $209.4 billion in 2014 dollars. About 92% of the physical structures are residential, followed by commercial (5.1%) and industrial (1.3%). On a valuation basis, 83% of the value is residential, followed by commercial (11.3%) and industrial (2.4%). All the building stock in Hampton Roads is considered at risk.

We estimate that 3% (20,137) of all the buildings in Hampton Roads would be at least moderately damaged by the winds from the Category 3 hurricane. Approximately 1,388 buildings would be severely damaged, while 1,114 buildings would be destroyed (Table 4). The physical damage and loss of contents would be approximately $4.1 billion for residential property, $197 million for commercial property and $129 million for other types of property. The hurricane would also result in approximately 1.8 million tons of debris, the majority of which is tree debris (63%), followed by brick and wood debris. The destruction of property would displace about 1,500 households and require short-term shelter for around 800 people.

TABLE 4

EXPECTED WIND DAMAGE BY OCCUPANCY TYPE, CATEGORY 3 HURRICANE STRIKING HAMPTON ROADS

Occupancy	Total	No Damage		Minor Damage		Moderate Damage		Severe Damage		Destruction	
	Count	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Agriculture	1,587	1,298	81.8%	195	12.3%	61	3.8%	29	1.8%	4	0.3%
Commercial	29,561	24,649	83.4%	3,471	11.7%	1,241	4.2%	199	0.7%	1	0.0%
Education	1,421	1,201	84.5%	161	11.3%	53	3.7%	6	0.4%	0	0.0%
Government	1,128	964	85.5%	121	10.7%	39	3.4%	4	0.4%	0	0.0%
Industrial	7,503	6,236	83.1%	864	11.5%	330	4.4%	69	0.9%	4	0.1%
Religion	3,554	3,027	85.2%	414	11.7%	102	2.9%	11	0.3%	0	0.0%
Residence	535,367	435,493	81.3%	81,889	15.3%	15,810	3.0%	1,070	0.2%	1,105	0.2%
Total	580,120	472,869		87,115		17,634		1,388		1,114	

Source: HAZUS (2019). Numbers may not sum to totals due to rounding.

Water Damage

The number of buildings that may be affected by flooding is less than that possibly affected by significant winds. While wind damage may occur miles inland, water damage is primarily concentrated in areas close to the ocean, rivers and low-lying areas prone to flooding. Of the $209.4 billion in building stock in Hampton Roads, approximately $44.2 billion would be at risk from water damage.

Table 5 illustrates that over 33% of the number of buildings exposed to flooding risk would be damaged by the simulated Category 3 hurricane. Of the estimated 19,464 buildings that are damaged, 6,321 are destroyed. All the destroyed buildings in this scenario are residential. Water damage would generate 643,591 tons of debris. Most of the debris comes from interior structures and furnishings (62%), followed by structural debris (22%) and foundation debris (15%). Approximately 25,744 25-ton truckloads would be required to remove the debris.

Given the significant amount of residential damage, it should be no surprise that the number of people displaced is significantly higher due to flooding than wind damage. More than 200,000 residents would be displaced in the immediate aftermath as a result of flooding. While many of these residents would find shelter with family or friends in the region, over 15,000 people would seek temporary accommodations in public shelters.

Combining the wind and water damage, the total physical damage from a Category 3 hurricane would approach $20 billion. Over half of the losses ($10.6 billion) would be borne by homeowners. Lastly, downed trees and damaged and destroyed structures would create over 2.4 million tons of debris, which would require more than 50,000 25-ton truck trips to landfills.

TABLE 5

EXPECTED WATER DAMAGE BY OCCUPANCY TYPE: ESTIMATED BUILDING DAMAGE BY PERCENTAGE, CATEGORY 3 HURRICANE STRIKING HAMPTON ROADS

Occupancy	1-10		11-20		21-30		31-40		41-50		>50		Total Damaged
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Agriculture	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
Commercial	41	18.0%	187	81.0%	3	1.0%	1	0.0%	0	0.0%	0	0.0%	232
Education	5	100%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5
Government	52	66.0%	27	34.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	79
Industrial	8	11.0%	45	60.0%	19	25.0%	2	3.0%	1	1.0%	0	0.0%	75
Religion	0	0.0%	9	100%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9
Residence	931	5.0%	6,157	32.0%	3,127	16.0%	1,603	8.0%	925	5.0%	6,321	33.0%	19,064
Total	1,037		6,425		3,149		1,606		926		6,321		19,464

Sources: Dragas Center for Economic Analysis and Policy, Old Dominion University, and the Commonwealth Center for Recurrent Flooding Resiliency. Percentages are rounded to nearest 10th and may not sum to 100%.

The Economic Impact Of A Hurricane Striking Hampton Roads

The physical damage from a hurricane is only part of the total impact on the economy. A major storm striking the region would not only damage structures and displace residents, it also would impact economic activity. Damage to infrastructure may limit the ability of many to travel to work, and displaced residents may be far from their place of employment. Damage to businesses may result in reduced hours or complete closure. These impacts ripple through the economy.

To estimate the total economic impact of a hurricane making landfall in Hampton Roads, we must explore the direct economic impact and, from that, the indirect and induced economic impacts. One can think of these impacts as an economic chain, where a jolt in one part of the chain is transmitted to each link in the chain, affecting many more people. The direct economic impact is often the most visible: people unable to work and businesses unable to operate due to storm damage.

Businesses that are directly impacted by the storm do not need as many supplies and reduce their orders accordingly. The decline in orders to suppliers is the indirect economic impact of the storm. As businesses that are directly and indirectly affected by the storm experience a slowdown in business activity, employment and output fall. The declines in employment and output ripple out through the economy. This third-order effect is known as the induced impact. In other words, because of the interconnectedness of the economy, the total economic impact of a hurricane is larger than the direct economic impact.

How Bad Could It Get? A Worst-Case For Hampton Roads

To examine the impact of a major hurricane on the economy of Hampton Roads, we have drawn upon historical data that reflect the direct physical damages discussed previously. Examining recent history, we selected Katrina, which struck New Orleans and the Gulf Coast as a Category 3 hurricane in 2005. While Katrina generated significant wind damage across the Gulf Coast, much of the damage was due to storm surge and flooding. Hurricane Katrina also offers an example of what happens to a region when a significant percentage of the population is displaced by a major weather event.

Katrina remains the costliest hurricane to hit the United States. With a total estimated cost of $138 billion and well over 1,000 fatalities, Hurricane Katrina had a devastating impact on the economy of the New Orleans region. The Bureau of Economic Analysis (BEA) reported that the New Orleans-Metairie MSA had 783,035 jobs in 2004, the last full year before the storm. By 2006, the number of jobs had declined to 648,243, a 17% loss in employment.

How would the Hampton Roads economy react if a major hurricane made landfall here? To estimate the economic impact of a Category 3 hurricane striking Hampton Roads, we calculated the annual change in employment from 2004 to 2006 by industry sector in the New Orleans MSA. We then applied these changes to the Hampton Roads workforce of 2018 to estimate the potential economic impact of a Category 3 hurricane on the regional economy.[15]

Table 6 illustrates the estimated economic impacts of a Category 3 hurricane on the Hampton Roads economy. The direct economic impact of the hurricane would be a loss of almost 95,000 jobs and $15 billion in output. When these direct impacts ripple throughout the regional economy, another 81,000 jobs would be lost, and output would decline by

15 We used JobsEQ software developed by Chmura Economics and Analytics. The software is based on regionalized input-output tables and makes estimates based on the relationships between industries.

almost another $8 billion. The overall economic impact would approach (if not exceed) one-quarter of the region's economic activity.

TABLE 6

ONE-YEAR TOTAL ESTIMATED ECONOMIC IMPACTS OF A CATEGORY 3 HURRICANE STRIKING HAMPTON ROADS

	Direct Impact	Indirect Impact	Induced Impact	Total Economic Impact
Employment	-94,950	-20,844	-60,234	-176,028
Sales/Output (in millions)	-$15,093	-$2,614	-$5,119	-$22,825.8
Compensation (in millions)	-$4,152	-$901	-$1,622	-$6,676

Sources: Quarterly Census of Employment and Wages (2019), Chmura Economics - JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Percentages from the New Orleans MSA are applied to 2017 employment and wages in the Hampton Roads MSA. Note that compensation is included in the sales/output estimates and is broken out for illustrative purposes.

Table 7 illustrates the estimated impact on jobs by industry. There is a sliver of good news in the estimates. Construction employment increases in the aftermath of a hurricane due to the need to repair or replace damaged structures. The pillars of the Hampton Roads economy – defense, tourism and trade – however, would experience significant declines in employment, output and compensation. The government sector, for example, would shed almost 32,000 jobs. The decline in direct government employment would ripple throughout the regional economy, causing the loss of approximately another 56,000 jobs. In total, the economic impact on the public sector could result in the loss of almost 88,000 jobs.

TABLE 7

ESTIMATED IMPACT ON SELECTED INDUSTRY EMPLOYMENT (JOBS), CATEGORY 3 HURRICANE STRIKING HAMPTON ROADS

	Direct Impact	Indirect and Induced Impact	Total
Public administration	-31,801	-55,839	-87,640
Health care and social assistance	-15,147	-7,028	-22,175
Accommodation and food services	-12,224	-2,228	-14,452
Retail trade	-9,353	-2,620	-11,973
Other services	-6,581	-2,050	-8,631
Finance and insurance	-4,366	-2,927	-7,293
Manufacturing	-2,693	-2,166	-4,859
Administrative and support	-3,497	-1,107	-4,604
Arts, entertainment and recreation	-3,119	-986	-4,105
Professional, scientific and technical services	-2,490	-1,582	-4,072
Information	-1,688	-1,656	-3,344
Wholesale trade	-1,417	-976	-2,393
Transportation and warehousing	-1,548	-824	-2,372
Educational services	-1,274	-351	-1,625
Management of companies and enterprises	-770	-528	-1,298
Real estate and rental and leasing	58	156	214
Construction	2,960	1,634	4,594
Total	-94,950	-81,078	-176,028

Sources: Quarterly Census of Employment and Wages (2019), Chmura Economics - JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Percentages from the New Orleans MSA are applied to 2017 employment and wages in the Hampton Roads MSA. Three sectors – forestry, mining and utilities – are not included due to disclosure requirements for the QCEW.

Summing Up The Estimates

In Table 8, we summarize the estimates of the physical and economic impacts. We estimate that physical damages from a Category 3 hurricane that makes landfall on the Virginia-North Carolina border, with significant storm surge, would exceed $20 billion. Almost all the buildings damaged during the hurricane would be residential. Tens of thousands of residents would be internally displaced within the region and more than 15,000 would need some form of public shelter. Approximately 2.5 million tons of debris would need to be removed from residential and other areas, requiring about 50,000 landfill trips.

The potential economic costs of the hurricane in the first year are just as staggering. More than 170,000 jobs would be lost, and economic output would decline by over $20 billion. These economic costs do not include the fiscal impact to local governments, as property tax revenue would fall due to the number of destroyed residences, and sales tax revenue would decline due to the loss of jobs. The Commonwealth's resources would be rapidly overwhelmed by the magnitude of the disaster and the state budget would also likely take a substantial hit.

TABLE 8

SUMMARY OF PHYSICAL AND ECONOMIC IMPACTS OF A KATRINA-CLASS HURRICANE STRIKING HAMPTON ROADS

	Buildings Affected (Destroyed)	Estimated Impact	Individuals Affected (Requiring Shelter)
Wind Damage	**20,137 (1,114)**	**>$4 billion**	**1,500 (800)**
Water Damage	**18,427 (6,231)**	**>$13 billion**	**204,125 (15,000)**
Employment Loss	**--**	**--**	**>170,000**
Output Loss (Including Compensation)	**--**	**>$22 billion**	**--**
Total	**>38,000 (>7,000)**	**>$40 billion**	**>380,000 (>15,000)**

Sources: Quarterly Census of Employment and Wages (2019), Chmura Economics - JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Percentages from the New Orleans MSA are applied to 2017 employment and wages in the Hampton Roads MSA. HAZUS model estimates use a track similar to Hurricane Florence. Table represents the estimated one-year impact. Some double counting may occur, as some individuals may have residences physically damaged and have employment loss.

Are Military Bases Vulnerable?

Recognizing that climate change poses a threat to national security, the Department of Defense has engaged in a wide range of planning to prepare for current and future climate-driven threats. Among these threats is how a climate-related event would affect key military installations. In January 2019, the DOD highlighted 79 military installations most vulnerable to five climate-related hazards: recurrent flooding, wildfire, drought, desertification and permafrost thaw.[16] In March 2019, the DOD further refined the list to provide the military installations most at risk from climate change. **Four of our region's military installations were on the list (Table 9). One of the main drivers of perceived risk was recurrent flooding – flooding that would undoubtedly be exacerbated by a hurricane.**

In advance of a hurricane, military assets would be sent to sea and flown to other bases inland. Coastal bases, however, would remain at risk from the hurricane. If Naval Support Activity Hampton Roads or Naval Air Station Oceana, for example, sustained significant damage, the ships and planes could go away, never to return. With the ships and planes go the soldiers, sailors, airmen, Marines, civilian employees and contractors. Some might argue that Hurricane Andrew's damage to Homestead Air Force Base in 1992 (near Homestead, Florida) contributed to its selection for closure by the Base Realignment and Closure Commission in the mid-1990s (see photo).

The potential for base closure and the relocation of military assets is not far-fetched. Hurricane Michael damaged nearly every structure on Tyndall Air Force Base, located 12 miles east of Panama City, Florida, in October 2018. With approximately one-third of the structures destroyed and operations impeded by the damage, some of the assets at Tyndall were relocated to Langley Air Force Base in Hampton.

16 Office of the Undersecretary of Defense for Acquisition and Sustainment, Department of Defense (January 2019), report on "Effects of a Changing Climate" to the DOD.

The damage to Tyndall was compounded by an impasse over disaster aid between Congress (and within Congress) and the administration.[17] Current estimates are that it will take billions of dollars and years to fully repair Tyndall Air Force Base. One can easily draw the conclusion that a similar level of destruction in Hampton Roads might spur arguments for the Navy, Air Force or other services to relocate personnel and assets to other locations in the United States.

Homestead Air Force Base, post-Andrew damage, 1992.

17 https://www.wsj.com/articles/hurricane-torn-air-force-bases-recovery-stalls-as-congress-lingers-on-disaster-aid-11556988607.

TABLE 9 DEPARTMENT OF DEFENSE, SELECTED MILITARY INSTALLATIONS AT RISK FROM THE IMPACT OF CLIMATE CHANGE			
Rank	Installation	Service	State
1	Hill Air Force Base (AFB)	USAF	UT
2	Beale Air Force Base (AFB)	USAF	CA
3	Vandenburg Air Force Base (AFB)	USAF	CA
4	Greeley Air National Guard Station (ANGS)	USAF	CO
5	Eglin Air Force Base (AFB)	USAF	FL
6	Patrick Air Force Base (AFB)	USAF	FL
7	Joint Base (JB) Andrews	USAF	MD
8	Malmstrom Air Force Base (AFB)	USAF	MT
9	Tinker Air Force Base (AFB)	USAF	OK
10	Shaw Air Force Base (AFB)	USAF	SC
26	Naval Air Station (NAS) Oceana	USN	VA
27	Naval Station (NS) Norfolk	USN	VA
28	Naval Support Activity (NSA) Hampton Roads	USN	VA
29	Naval Support Activity (NSA) Hampton Roads - Northwest	USN	VA

Source: Office of the Undersecretary of Defense for Acquisition and Sustainment, Department of Defense (March 2019), via communication with U.S. Rep. Jim Langevin.

Evacuating Hampton Roads: A Wicked Problem

Virginia is one of a few states to use the Regional Tiered Evacuation System, more commonly known by its interactive tool: "Know Your Zone." This resource, which can be found on the Virginia Department of Emergency Management website,[18] serves about 1.25 million residents in Coastal Virginia by providing clarity on whether to evacuate and how to do so. Figure 3 displays the zones in the region, A through D, with A being the most vulnerable to hurricanes and other types of severe storms.

This approach incorporates the lessons learned from evacuations in the past. When a serious storm is expected to affect the Hampton Roads region, state and local emergency agencies are to determine which zones are most at risk and, if necessary, provide evacuation instructions. A severe storm, cyclone or hurricane may result in a call for the evacuation of Zone A, for example, and instructions for residents of Zones B through D to shelter in place for the duration of the storm. Unlike a call for evacuation that creates confusion and panic, the zone approach to evacuation may reduce unnecessary travel, traffic congestion, overcrowding at shelters and unnecessary financial expenditures for those not in an evacuation area.

What happened prior to the arrival of Hurricane Florence? To understand why Virginia issued its first mandatory evacuation order using the Regional Tiered Evacuation System, we must first look at the days prior to the potential arrival of Hurricane Florence rather than after Florence made landfall in North Carolina.

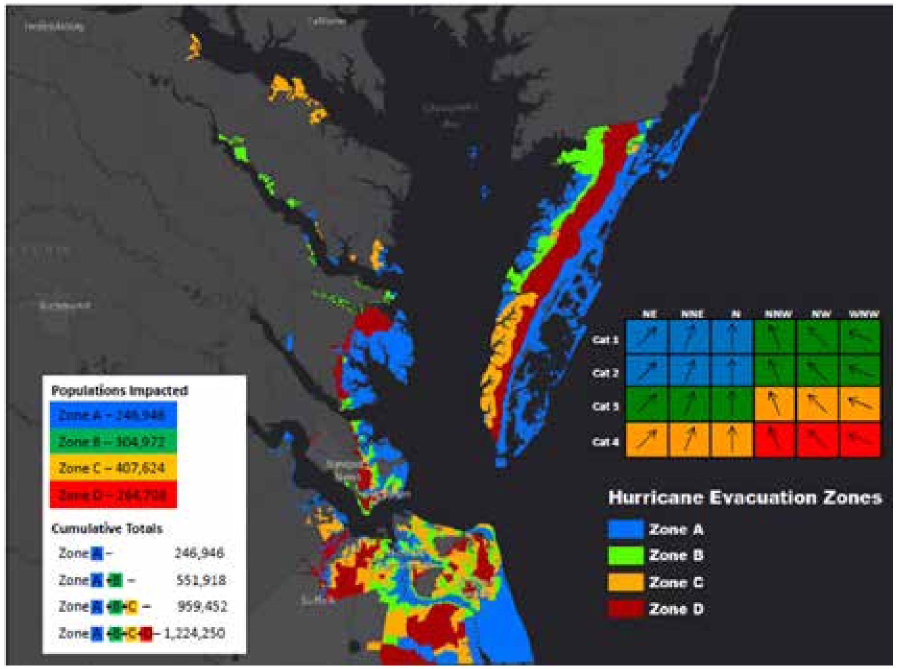
The question of whether to evacuate a zone or multiple zones is fraught with uncertainty. This wicked problem is only compounded in Hampton Roads, which is likely to be adversely impacted by a severe weather event, as many areas are low-lying and already prone to flooding. Relative to many other major metropolitan areas, Hampton Roads also has limited options in terms of evacuation routes. Furthermore, there are questions of how to evacuate residents who do not have private transportation and where to care for the

18 https://www.vaemergency.gov/hurricane-evacuation-zone-lookup/.

homebound, disabled and those with significant medical conditions. A decision to evacuate is understandably not taken lightly, given the costs imposed on evacuees, local governments and the state government.

FIGURE 3

EVACUATION ZONES IN THE HAMPTON ROADS METROPOLITAN AREA



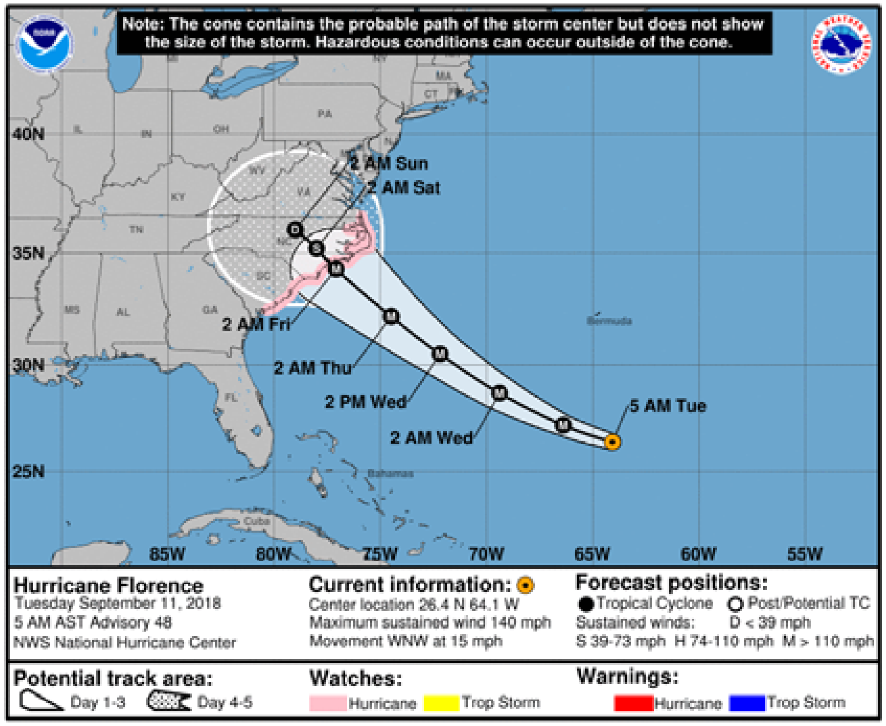
Source: Virginia Department of Emergency Management (2018)

Furthermore, we must understand that the National Hurricane Center's (NHC) forecast cones are representations of the *probable* track of the center for a tropical cyclone. The forecast cone is a representation of uncertainty and evolves over time. As noted by the NHC, the entire track of a tropical cyclone is expected to remain in the forecast cone *roughly 60 to 70 percent of the time.*[19] We present the 5 a.m. forecast cone on Sept. 11, 2018, for Hurricane Florence to illustrate the uncertainty associated with the storm's arrival. At the time, there was a significant probability that much of Hampton Roads would be impacted by Florence (Figure 4).

19 https://www.nhc.noaa.gov/aboutcone.shtml.

FIGURE 4

NATIONAL HURRICANE CENTER, TRACK FORECAST CONE: HURRICANE FLORENCE, 0500 AST UPDATE, SEPT. 11, 2018



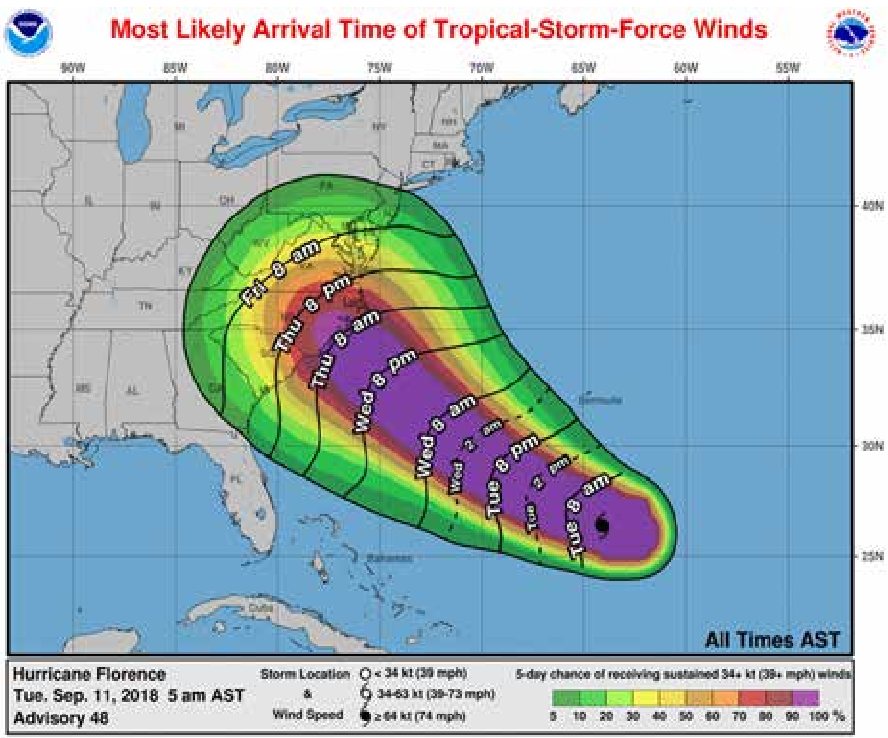
Source: National Hurricane Center, Florence Graphics Archive (2018)

The NHC's discussion of Florence on the morning of Sept. 11 was to the point: "A life-threatening storm surge is likely along portions of the coastlines of South Carolina, North Carolina, and Virginia, and a Storm Surge Watch has been issued for a portion of this area. All interests from South Carolina into the mid-Atlantic region should ensure they have their hurricane plan in place and follow any advice given by local officials."

Even if one believed that Florence would make landfall in North Carolina, the NHC's wind projections on Sept. 11 strongly suggested that much of Hampton Roads would be subject to tropical-force winds (Figure 5). In other words, the question of what to do had to be made with information that, by its very definition, was uncertain but appeared to be highly probable: that much of the Hampton Roads region would be negatively impacted by the approaching storm.

FIGURE 5

NATIONAL HURRICANE CENTER, TRACK FORECAST CONE: HURRICANE FLORENCE, 0500 AST UPDATE, SEPT. 11, 2018



Source: National Hurricane Center, Florence Graphics Archive (2018)

Using the Regional Tiered Evacuation System, Gov. Ralph Northam ordered the evacuation of Zone A in Hampton Roads. The evacuation order affected approximately 245,000 residents of the region. At the same time, the Commonwealth implemented the 2006 State Managed Shelter Program, establishing shelters for 5,775 people. The Commonwealth partnered with private-sector contractors for the provision of these shelters. The implementation of the 2006 State Managed Shelter Program (involving Christopher Newport University, William & Mary and Virginia Commonwealth University) and other shelter plans led to over $31 million in costs. These costs, however, were shared between Virginia and FEMA. FEMA paid approximately $23 million and Virginia bore almost $8 million of the total shelter costs.

It is certainly appropriate to reflect on the decision to evacuate and the evacuation process, and ask whether these actions could have been done more efficiently and effectively, when the next storm approaches Virginia. We can also ask, given the information available at that time, whether the decision to evacuate was appropriate. Obviously, if the actual track of the storm and its impact on Hampton Roads had been known prior to landfall, then there would have been no need to evacuate. While Florence's impact on Hampton Roads, in retrospect, was relatively mild, this information was not available to decision makers on Sept. 11, 2018. The nature of the problem prevents a certain solution from being known until the event has passed, at which time it is too late to take preventive action to mitigate the impact of an adverse event. Simply put, you have to decide before all the facts are known, and sometimes the correct decision made with uncertain information might appear to be the wrong one after the fact.

One potential critique is that the Commonwealth "spent too much for too little" with regard to shelter services. At face value, the relatively high unit cost per potential evacuee seems to lend credence to this argument. We argue, however, that this is the wrong question. The question should be whether the Commonwealth should spend resources building, maintaining and servicing shelters that, in many years, will go unused. In all likelihood, establishing and funding such a network of shelters would be costlier in the long run than contracting for shelter services when necessary.

Lastly, we need to recognize that prevention of the loss of life can be valued and this value can inform our decision-making. Using guidelines from the federal government on the "Value of a Statistical Life," we estimate that each life saved through an evacuation-sheltering plan is worth approximately

$5.5 million (this is the lowest of the estimates from the federal government). A simple thought experiment provides insight: If Florence had struck Hampton Roads and the evacuation-sheltering plan saved 10 lives, the value of the lives saved would itself have outweighed the total cost of the sheltering plan.

Final Thoughts

It's only a matter of time before Hampton Roads is struck by a major hurricane.

On Aug. 27, 1668, a storm lashed the Chesapeake Bay with gale-force winds and rain that, by some accounts, lasted for over 24 hours. When the rain and winds finally abated on Aug. 28, the scene was one of utter devastation. "Houses and barns were ruined, chimneys wrecked, fences flattened, tobacco in the fields cut to pieces. By the action of the gale and resulting high tide, the waters of Chesapeake Bay were driven into the rivers and creeks, so that rowboats and sailboats were left high and dry, and during the height of the storm, the rising tide overflowed banks and forced people to take refuge on rooftops."[20]

Our estimates suggest that the cost of a major hurricane striking Hampton Roads would be in the billions, if not tens of billions, of dollars. For a Category 3 hurricane, we estimate that direct physical damages would likely approach $20 billion, and the economic impact could approach $25 billion. Tens of thousands of residents would be displaced, and more would find themselves out of work. A significant number of displaced residents would likely seek their fortunes elsewhere, additionally depressing economic activity in the decade following a hurricane.

The historical record shows that the Commonwealth, and Hampton Roads in particular, has been struck by hurricanes in the past. While geography may lower the likelihood of a hurricane directly making landfall in Hampton Roads, the well-documented hurricane of 1821 illustrates that, at some point, there will be a major weather strike on our region. While we cannot know the exact timing, we can be certain that, at some point, Hampton Roads will face the prospect of being in the bull's-eye of a hurricane.

One possible reaction to such an uncertain event is to dismiss the possibility that it will ever occur. This is obviously not a prudent course of action. Likewise, acting as if Hampton Roads will be struck every year by a hurricane is also imprudent. There are, however, policy issues that we can work on today that will reduce the impact of a hurricane.

First, we need, as a region, to continue to tackle the issue of sea level rise. To our credit, we are making progress and working together to improve drainage, elevate buildings and mitigate recurrent flooding. These efforts are placing Hampton Roads at the forefront of the national policy conversation. **We should accelerate efforts to mitigate, where possible, the impact of sea level rise. Where possible, we should also look at development more closely to ensure we are not making flooding worse.**

Second, we should seriously consider whether some structures are too costly to save. Rising tides and the prospect of a significant storm surge may render some low-lying areas as flood-prone. The National Flood Insurance Program may actually incentivize building in flood-prone areas. If we do not want to have to continually repair or rebuild following severe storms, then we should consider restoring some low-lying areas to their natural state. The added benefit is that these areas would possibly alleviate flooding, to some extent, and mitigate a portion of a hurricane's storm surge.

Third, the Commonwealth should seriously review building codes in Florida and other states and adopt more stringent codes. The lessons of Hurricanes Rita and Harvey are that many people may end up better off by sheltering in place. Strengthening residences will likely reduce injuries and the loss of life, when sheltering in place is warranted by the type of storm approaching Hampton Roads. The Commonwealth should ensure that essential facilities (such as hospitals, fire stations and police stations) have electrical generation equipment well above ground to avoid the catastrophic events and loss of life that occurred post-Katrina. While some may complain

20 R.D. Whichard (1959), *The History of Lower Tidewater Virginia*, New York: Lewis Historical Publishing Co. Inc.

about spending public funds now, such expenditures will seem trivial if the essential services are up and running following a major hurricane.

Fourth, the uncertain nature of hurricanes means the Commonwealth should not invest resources in maintaining a system of shelters. Shelters (and warehousing the goods needed for shelters to operate) are expensive to maintain relative to the uncertain demand for their use. The private sector can more aptly plan for these expenses in many cases. **Instead, the Commonwealth could budget for the anticipated costs of a sheltering program and apportion the costs to an emergency fund over time, akin to Virginia's Revenue Stabilization Fund.** Such a fund would also mitigate arguments about the costs of using contractors to operate shelters, which are always easier to make in hindsight.

Given that tens of thousands of residents would find themselves displaced and out of work following a major hurricane strike on Hampton Roads, it is now time to prepare for this eventuality. As the saying goes, "Time and tide wait for no man."

Inside Front Cover: The Dragas Center for Economic Analysis and Policy

Page 1: Steve Daniel

Page 105: Courtsey of Hampton Roads Soccer Complex 2019

Page 106: Courtesy of Lionsbridge FC 2019

Page 107: Courtesy of North American Sand Soccer Championships

Page 108: Courtesy of the Scanlon family

Page 162: U.S. Air Force (2012):
https://www.homestead.afrc.af.mil/News/Article-Display/Article/701110/homestead-arb-and-hurricane-andrew-a-look-back-a-look-forward/

OLD DOMINION UNIVERSITY

1930