Our forecasts and commentary do not constitute official viewpoints of Old Dominion University, its President, Brian O. Hemphill, Ph.D., 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.
GDP and Inflation
Real Gross Domestic Product
United States, Q1 2010 - Q3 2022

Sources: U.S. Bureau of Economic Analysis and Dragas Center for Economic Analysis and Policy.
Compounded annual rate of change, seasonally adjusted annual rate.
Advance Retail and Food Services Sales
United States, January 2010 - December 2022

Source: U.S. Census Bureau, seasonally adjusted data.
Monthly Inflation
United States, January 2007 - December 2022

Source: Bureau of Labor Statistics, seasonally adjusted data. Core inflation does not include the food and energy sectors.
Monthly Inflation in Durables, Nondurables, and Services
United States, January 2007 - December 2022

Percent

Source: Bureau of Labor Statistics, seasonally adjusted data.
Monthly Inflation
Selected OECD Countries, January 2007 - December 2022

Sources: OECD Main Economic Indicators and Bureau of Labor Statistics, seasonally adjusted data.
Monthly Inflation and Inflationary Expectations
United States, January 2010 - November 2022

Sources: Bureau of Labor Statistics, seasonally adjusted data; University of Michigan, Inflationary Expectations, not seasonally adjusted data.
Real M2 Money Stock
United States, January 1970 - November 2022

Billions of 1982-1984 Dollars

Source: Federal Reserve Bank of St. Louis, Real M2 Money Stock.
M2 is a measure of the money supply that includes cash, checking deposits, and easily-convertible near money.
Inflation and Growth of M2 Real Money Stock
United States, January 1970 - November 2022

Year-Over-Year Change

Inflation
M2 Growth

Sources: Bureau of Labor Statistics and Federal Reserve Bank of St. Louis, Real M2 Money Stock
Labor Markets Recover
Civilian Labor Force and Individual Employment
United States, January 2019 - December 2022

Thousands of Individuals

Source: Bureau of Labor Statistics, seasonally adjusted data.
Unemployment Rate by Race and Ethnicity
United States, February 2020 - December 2022

Black or African American
- 16.8% in 2021
- 5.7% in 2022

Hispanic
- 14.1% in 2021
- 4.1% in 2022

White
- 3.0% in 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Nonfarm Payrolls (Jobs)
United States, January 2019 - December 2022

Thousands of Jobs

Source: Bureau of Labor Statistics, seasonally adjusted data.
Employment-Population Ratio for Workers Aged 25 to 54

Source: Bureau of Labor Statistics, seasonally adjusted data.
Change in employment-population ratio from the start of each recession.
Job Openings and Quits
United States, January 2019 - November 2022

Thousands of Jobs

Job Openings

Job Quits

Source: Bureau of Labor Statistics, seasonally adjusted data.
Virginia Lags the Nation
Real Gross Domestic Product
Virginia, Q1 2010 - Q3 2022

Source: U.S. Bureau of Economic Analysis. Compounded annual rate of change, seasonally adjusted annual rate.
Civilian Labor Force and Individual Employment
Virginia, January 2019 - November 2022

Thousands of Individuals

Source: Bureau of Labor Statistics, seasonally adjusted data.
Unemployment Rate (U3)
Virginia, January 2019 - November 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Job Openings and Quits
Virginia, January 2019 - November 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Department of Defense Base Budget
Fiscal Year 2010 - 2027*

Sources: Office of Management and Budget, FY 2023 Omnibus, and Dragas Center for Economic Analysis and Policy.
*FY 2023 is an estimate. FY 2024 - FY 2027 are forecasts.
Department of Defense Base Budget
Fiscal Years 2020 - 2027*

Sources: Office of Management, FY 2023 Omnibus, and Dragas Center for Economic Analysis and Policy.
*FY 2023 is an estimate. FY 2024 - FY 2027 are forecasts. 2020 is the base year for real dollars.
Looking Ahead

- China's recovery in the 2nd half of 2023 will ease supply chain constraints globally.

- The Federal Reserve's effort to break inflationary expectations leads to a mild recession in the second half of 2023.

- Even with higher unemployment in the latter half of 2023, employers will find it difficult to fill some positions as long COVID, retirements, and the opioid epidemic limit labor force participation.

- Congress is a major source of downside risk. A failure to extend the debt ceiling would spark a global financial crisis much worse than the Great Recession of 2007 - 2009.

- In the best case, the U.S. 'muddles through' through 2023.
<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S. Real GDP Growth</strong></td>
<td>-2.8%</td>
<td>5.9%</td>
<td>2.2%</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Civilian Job Growth</strong></td>
<td>-5.8%</td>
<td>2.8%</td>
<td>4.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td><strong>Unemployment Rate</strong></td>
<td>8.1%</td>
<td>5.4%</td>
<td>3.7%</td>
<td>4.1%</td>
</tr>
<tr>
<td><strong>Inflation Rate</strong></td>
<td>1.2%</td>
<td>6.7%</td>
<td>8.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td><strong>Core Inflation Rate</strong></td>
<td>1.6%</td>
<td>5.0%</td>
<td>6.2%</td>
<td>4.0%</td>
</tr>
<tr>
<td><strong>Federal Funds Rate</strong></td>
<td>0.2%</td>
<td>0.2%</td>
<td>4.5%</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>10-year Treasury Bill</strong></td>
<td>0.9%</td>
<td>1.4%</td>
<td>2.9%</td>
<td>3.5%</td>
</tr>
<tr>
<td><strong>30-year Conventional Mortgage</strong></td>
<td>3.1%</td>
<td>3.0%</td>
<td>5.3%</td>
<td>5.5%</td>
</tr>
<tr>
<td><strong>Federal Deficit (Fiscal Year, Billions)</strong></td>
<td>-$3,132</td>
<td>-$2,772</td>
<td>-$1,375</td>
<td>-$1,200</td>
</tr>
<tr>
<td><strong>Virginia Real GDP Growth</strong></td>
<td>-2.1%</td>
<td>5.5%</td>
<td>2.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>Virginia Civilian Job Growth</strong></td>
<td>-5.0%</td>
<td>2.2%</td>
<td>3.2%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
2023 Hampton Roads Economic Forecast
Estimated Direct Department of Defense Spending
Hampton Roads, 2010 - 2027

Billions of Nominal Dollars

Fiscal Year

Sources: Office of Management and Budget, FY 2023 Omnibus, and Dragas Center for Economic Analysis and Policy.
*FY 2023 is an estimate. FY 2024 - FY 2027 are forecasts.
Nominal and Real Gross Domestic Product
Hampton Roads, 2001 - 2022*
Jobs and Employment
Index of Nonfarm Payrolls

Hampton Roads, Virginia, and the United States, February 2010 - February 2020

Source: Bureau of Labor Statistics, seasonally adjusted data.
February 2010 was the trough of nonfarm payrolls for the United States, Virginia, and Hampton Roads.
Index of Nonfarm Payrolls
Hampton Roads, Virginia, and the United States, January 2020 - November 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Nonfarm Payrolls
Hampton Roads, January 2007 - November 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Civilian Labor Force and Employment
Hampton Roads, January 2020 - November 2022

Source: Bureau of Labor Statistics, seasonally adjusted data.
Headline and Alternative Unemployment Rate
Hampton Roads, January 2020 - November 2022

Unemployment Rate

- Headline Unemployment Rate
- Alternative Unemployment Rate

Source: Bureau of Labor Statistics, seasonally adjusted data.
Alternative unemployment rate includes departures from the labor force and counted as unemployed.
Change in Civilian Labor Force
Selected Metro Areas, February 2020 - November 2022

- Washington, DC: -4.9%
- Hampton Roads: -4.4%
- Richmond: -4.0%
- Greenville: -1.3%
- Nashville: 1.8%
- Durham-Chapel Hill: 3.8%
- Charlotte: 4.1%
- Charleston: 5.0%
- Raleigh: 5.0%
- Jacksonville: 6.2%

Source: Bureau of Labor Statistics, seasonally adjusted data. Hampton Roads is the Virginia Beach-Newport News MSA and Washington, DC is the Washington-Arlington-Alexandria MSA.
Growth in Nonfarm Payrolls
Selected Metropolitan Areas, February 2020 - November 2022

Washington, DC  -2.0%
Richmond    -1.7%
Hampton Roads -1.1%
Greenville    -0.4%
Charlotte     5.4%
Durham-Chapel Hill 5.4%
Charleston    5.8%
Nashville     6.5%
Jacksonville  6.6%
Raleigh       7.2%

Source: Bureau of Labor Statistics, seasonally adjusted data. Hampton Roads is the Virginia Beach-Newport News MSA and Washington, DC is the Washington-Arlington-Alexandria MSA.
Civilian Jobs Gained/Lost in Selected Sectors
Hampton Roads, November 2019 - November 2022

- Local Government: -5,300
- Prof. and Business Services: -4,200
- Manufacturing: -1,400
- Information: -1,300
- Retail Trade: -1,300
- Financial Activities: -1,300
- Other Services: -1,200
- Wholesale Trade: -100
- Health Care and Social Assistance: 2,100
- Leisure and Hospitality: 2,400
- Mining, Logging, and Construction: 2,400
- Transportation and Warehousing: 2,600

The Port of Virginia
General Cargo Tonnage
Port of Virginia, 2010 - 2022

 Millions of Tons

2010: 15.3
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021: 25.4
2022: 26.2

Sources: Virginia Port Authority and the Dragas Center for Economic Analysis and Policy.
Shares of Total Loaded TEUs
Selected East Coast Ports, 2010 - 2022*

<table>
<thead>
<tr>
<th>Year</th>
<th>Charleston</th>
<th>New York/NJ</th>
<th>Savannah</th>
<th>Virginia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>11.5%</td>
<td>42.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>16.5%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>18.3%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>16.1%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>16.1%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>16.1%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>17.4%</td>
<td>38.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: American Association of Port Authorities, websites of ports, and the Draga Center for Economic Analysis and Policy.
*Data for 2022 are through October 2022.
Hotels Rebound but Challenges Remain
Nominal and Real (Inflation-Adjusted) Hotel Revenue
Hampton Roads, 2000 - 2022

Sources: STR Trend Reports (January 2018, 2022) and STR Monthly Report (January 2023),
Bureau of Labor Statistics (base year is chained; 1982-84=100), and the Dragas Center for Economic Analysis and Policy.
### Percent Change in Revenue, RevPAR, and Rooms Sold

United States, Virginia, Northern Virginia, and Hampton Roads

2019 - 2022

<table>
<thead>
<tr>
<th></th>
<th>Hotel Revenue</th>
<th>RevPAR</th>
<th>Hotel Rooms Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USA</strong></td>
<td>11.0%</td>
<td>8.1%</td>
<td>-2.3%</td>
</tr>
<tr>
<td><strong>Virginia</strong></td>
<td>4.2%</td>
<td>3.4%</td>
<td>-3.2%</td>
</tr>
<tr>
<td><strong>Northern Virginia</strong></td>
<td>-17.0%</td>
<td>-10.7%</td>
<td>-15.6%</td>
</tr>
<tr>
<td><strong>Hampton Roads</strong></td>
<td>20.8%</td>
<td>17.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Chesapeake/Suffolk</strong></td>
<td>23.8%</td>
<td>23.8%</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>Newport News/Hampton</strong></td>
<td>15.7%</td>
<td>17.0%</td>
<td>-1.9%</td>
</tr>
<tr>
<td><strong>Norfolk/Portsmouth</strong></td>
<td>19.8%</td>
<td>12.9%</td>
<td>6.3%</td>
</tr>
<tr>
<td><strong>Virginia Beach</strong></td>
<td>24.7%</td>
<td>15.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Williamsburg</strong>*</td>
<td>15.5%</td>
<td>17.8%</td>
<td>-1.8%</td>
</tr>
</tbody>
</table>

*Williamsburg market includes City of Williamsburg and James City County. Sources: STR Monthly Report January 2023, and the Dragas Center for Economic Analysis and Policy.
Airbnb & Vrbo Revenue as a Percent of Hotel Revenue
Hampton Roads, January 2015 - September 2022

Sources: STR Trend Report, January 2022, STR Monthly Reports, and AirDNA, October 2022. AirDNA data exclude shared rooms.
Shares of Hotel and Airbnb & Vrbo Revenue
Hampton Roads Sub-Markets, 2021

<table>
<thead>
<tr>
<th>Sub-Market</th>
<th>Airbnb &amp; Vrbo</th>
<th>Hotels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia Beach</td>
<td>64.0%</td>
<td>42.5%</td>
</tr>
<tr>
<td>Williamsburg Mkt</td>
<td>16.8%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Norfolk/Portsmouth</td>
<td>8.5%</td>
<td>14.0%</td>
</tr>
<tr>
<td>Newport News/Hampton</td>
<td>4.8%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Chesapeake/Suffolk</td>
<td>1.3%</td>
<td>13.7%</td>
</tr>
</tbody>
</table>

Annual Revenue of Airbnb & Vrbo Private Rooms and Whole House Rentals
Hampton Roads, 2016 - 2021

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$12</td>
<td>$2</td>
<td>$9</td>
<td>$10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Rooms</td>
<td>$2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole House</td>
<td>$10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: AirDNA data received in October 2022; excludes shared rooms.
Taxable Sales
Hampton Roads, 2007 - 2022

Billions of Nominal Dollars

Sources: Virginia Department of Taxation and the Dragas Center for Economic Analysis and Policy.
Housing Values and Rents Continue to Rise
### Percent Change in Median Sale Price of Existing Residential Homes
Selected Cities in Hampton Roads, 2020, 2021, and 2022

<table>
<thead>
<tr>
<th>City</th>
<th>2019 to 2020</th>
<th>2020 to 2021</th>
<th>2021 to 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake</td>
<td>6.4%</td>
<td>11.7%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Norfolk</td>
<td>11.4%</td>
<td>12.7%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Portsmouth</td>
<td>13.0%</td>
<td>15.2%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Suffolk</td>
<td>10.1%</td>
<td>13.6%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Virginia Beach</td>
<td>9.8%</td>
<td>8.8%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Hampton</td>
<td>8.8%</td>
<td>16.6%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Newport News</td>
<td>8.4%</td>
<td>10.0%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Williamsburg*</td>
<td>9.5%</td>
<td>8.4%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Hampton Roads</td>
<td>9.0%</td>
<td>9.4%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

*Represents Poquoson, Williamsburg, James City County, York County and Gloucester County.
Sources: Real Estate Information Network and the Dragas Center for Economic Analysis and Policy.
Existing Residential Homes Sold and Average Days on the Market
Hampton Roads, 2010 - 2022

Sources: Real Estate Information Network Inc. and the Dragas Center for Economic Analysis and Policy.
Weekly 30-Year Fixed Mortgage Rate
United States, January 3, 2019 - January 19, 2023

Annual Mortgage Rates
3.11% for 2020; 2.96% for 2021; 5.34% for 2022

Sources: Freddie Mac and Federal Reserve Bank of St. Louis. Weekly rate ending Thursday of each week.
Sales of Existing Single-Family Homes
Hampton Roads, January 2021 - December 2022

Number of Homes

Sources: Real Estate Information Network Inc. and Dragas Center for Economic Analysis and Policy.
Median Price of Existing Residential Homes
Hampton Roads, 2021 - 2022

Sources: Real Estate Information Network Inc. and Dragas Center for Economic Analysis and Policy.
Estimated Months of Supply of Existing Homes
Hampton Roads, January 2010 - December 2022

Average = 5.1 months

Sources: Real Estate Information Network Inc. and the Dragas Center for Economic Analysis and Policy.
Months of supply are based on average sales in the last 12 months.
Ratio of Selling Price to Listed Price of Existing Homes
Hampton Roads, January 2019 - December 2022

Selling to Listed Price Ratio

Source: Dragas Center for Economic Analysis and Policy.
Zillow Observed Rent Index (ZORI)
Hampton Roads and the United States, January 2016 - December 2022

Index (Jan. 2016 = 100)

Dec-16  Dec-17  Dec-18  Dec-19  Dec-20  Dec-21  Dec-22

Hampton Roads  United States

Source: Zillow Research Data All Homes Plus Multifamily Time Series, smoothed seasonally adjusted data.
## Regional Forecast

<table>
<thead>
<tr>
<th></th>
<th>2020 Actual</th>
<th>2021 Actual</th>
<th>2022 Estimated/Actual</th>
<th>2023 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hampton Roads Real GDP</td>
<td>-2.5%</td>
<td>6.3%</td>
<td>2.4%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Civilian Job Growth</td>
<td>-5.3%</td>
<td>1.7%</td>
<td>2.0%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>7.1%</td>
<td>4.5%</td>
<td>3.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Taxable Sales</td>
<td>6.7%</td>
<td>16.2%</td>
<td>4.0%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Hotel Revenue</td>
<td>-35.2%</td>
<td>68.8%</td>
<td>10.0%</td>
<td>6.5%</td>
</tr>
<tr>
<td>General Cargo Tonnage</td>
<td>-3.9%</td>
<td>20.3%</td>
<td>3.1%</td>
<td>3.6%</td>
</tr>
<tr>
<td>General Cargo TEUs</td>
<td>-4.2%</td>
<td>25.2%</td>
<td>5.1%</td>
<td>5.4%</td>
</tr>
<tr>
<td>One-Unit Housing Permit Value</td>
<td>10.9%</td>
<td>6.7%</td>
<td>-13.0%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>
2023: Hampton Roads May Outperform the Nation

- Defense spending will continue to provide a boost for the Hampton Roads economy.

- Hampton Roads is likely to grow faster than the United States.

- Port of Virginia is expected to hit new cargo records in 2023.

- While mortgage rates will be higher for most of 2023, median home values will not decline significantly.

- Going forward, political uncertainty in Washington, D.C. will continue to be a major concern for the health of the regional economy.
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