The forecasts and commentary do not constitute an official viewpoint of Old Dominion University, 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.

The data in this presentation are subject to revision. To our knowledge, all data in this presentation are accurate at the time of the presentation.
# Current and Historical Expansions

<table>
<thead>
<tr>
<th>Expansion</th>
<th>Duration In months</th>
<th>Annual Employment Growth</th>
<th>Annual Real GDP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1949 – July 1953</td>
<td>45</td>
<td>4.35%</td>
<td>6.14%</td>
</tr>
<tr>
<td>May 1954 – August 1957</td>
<td>39</td>
<td>2.51%</td>
<td>3.67%</td>
</tr>
<tr>
<td>April 1958 – April 1960</td>
<td>24</td>
<td>3.58%</td>
<td>4.86%</td>
</tr>
<tr>
<td>February 1961 – December 1969</td>
<td>106</td>
<td>3.23%</td>
<td>4.68%</td>
</tr>
<tr>
<td>November 1970 – November 1973</td>
<td>36</td>
<td>3.38%</td>
<td>4.60%</td>
</tr>
<tr>
<td>March 1975 – January 1980</td>
<td>58</td>
<td>3.51%</td>
<td>4.01%</td>
</tr>
<tr>
<td>December 1982 – July 1990</td>
<td>91</td>
<td>2.81%</td>
<td>3.81%</td>
</tr>
<tr>
<td>March 1991 – March 2001</td>
<td>120</td>
<td>2.01%</td>
<td>3.45%</td>
</tr>
<tr>
<td>November 2001 – December 2007</td>
<td>73</td>
<td>0.88%</td>
<td>2.66%</td>
</tr>
<tr>
<td>June 2009 – Present*</td>
<td>106</td>
<td>1.41%</td>
<td>2.16%</td>
</tr>
</tbody>
</table>

Growth in Real Gross Domestic Product
United States and Virginia, 2010 - 2018 Q1

Total Nonfarm Employment
United States, January 2007 – April 2018

Thousands of Jobs

Source: Bureau of Economic Analysis and Old Dominion University Economic Forecasting Project. Seasonally adjusted data. Data for March and April 2018 are preliminary. Trough was February 2010. Next update: June 1, 2018
Thousands of Jobs

Total Nonfarm Employment
Virginia, January 2007 – March 2018

+ 391,100 Jobs

Source: Bureau of Economic Analysis and Old Dominion University Economic Forecasting Project. Seasonally adjusted data. Data for March 2018 are preliminary. Trough was February 2010. Next update: May 18, 2018
Recovery from the Great Recession
Measured in Total Jobs Restored, 2008-2018*

Recovery from the Great Recession
Measured in Individual Employment, 2007-2018*

Alternative Measure of the Unemployment Rate (U6) Virginia and the United States, 2003 – 1\textsuperscript{st} Quarter 2018

Source: Bureau of Labor Statistics and Old Dominion University Economic Forecasting Project. U-6 measures total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all marginally attached workers. State level data based on 4-quarter moving average. Annual averages are presented. Next update: July 27, 2018.
Number of Unemployed Individuals per Job Opening
United States, January 2001 to March 2018

Corporate Profits as Percent of GDP
United States, 1st Quarter 1950 – 4th Quarter 2017

Source: Bureau of Economic Analysis and Old Dominion University Economic Forecasting Project. Corporate Profits After Tax Without Inventory Adjustment
Cyclically Adjusted Price/Earnings Ratio
Standard and Poor’s Composite Price Index
January 1881 – May 2018*

S&P Case-Shiller Home Price Index
United States, January 1987 – February 2018

Case-Shiller Home Price Index
Change from Pre-Recession Peak to February 2018

New Residential Construction
Single Unit and Units in Buildings with 5 Units or More
United States, January 2000 – March 2018

January 2000 = 100

Cash Out Refinance Activity
United States, 1st Quarter 1994 – 1st Quarter 2018

Source: Freddie Mac, Quarterly Refinance Statistics, 1st Quarter 2018. Percentage of refinances refers to loan amounts that were at least 5 percent higher than the amortized unpaid principal balance of the original loan.
Federal Spending Provides a Short-Term Boost
FY 2011 Enacted with Inflation  | Original BCA Caps  | Prior BBA Caps

FY 2011: $525
FY 2012: $530
FY 2013: $510
FY 2014: $530
FY 2015: $530
FY 2016: $550
FY 2017: $570
FY 2018: $590
FY 2019: $610

Source: BCA2011, Budget Requests for FY 18 and FY 19, CBO Sequestration Update Report, Various Years, and the Old Dominion University Economic Forecasting Project. FY 2011 Actual and FY 2012 Proposed Budget and FYDP. FY 18 and FY 19 are inflated from the FY12 FYDP estimate of FY17.
Department of Defense
Discretionary Budget Authority, FY 2010 – FY 2023

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>FY 18 Approved Units</th>
<th>FY 18 Approved $ Billions</th>
<th>FY 19 Request Units</th>
<th>FY 19 Request $ Billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-35 Joint Strike Fighter</td>
<td>90</td>
<td>$11.8</td>
<td>77</td>
<td>$10.7</td>
</tr>
<tr>
<td>KC-46 Tanker Replacement</td>
<td>15</td>
<td>$3.1</td>
<td>15</td>
<td>$3.0</td>
</tr>
<tr>
<td>F/A-18 Super Hornet</td>
<td>24</td>
<td>$1.8</td>
<td>24</td>
<td>$2.0</td>
</tr>
<tr>
<td>AH-64E Apache Attack Helicopter</td>
<td>80</td>
<td>$1.4</td>
<td>60</td>
<td>$1.3</td>
</tr>
<tr>
<td>P-8A Poseidon</td>
<td>10</td>
<td>$1.7</td>
<td>10</td>
<td>$2.2</td>
</tr>
<tr>
<td>CH-53K King Stallion</td>
<td>4</td>
<td>$1.1</td>
<td>8</td>
<td>$1.6</td>
</tr>
<tr>
<td>Shipbuilding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Class Submarine</td>
<td>2</td>
<td>$5.5</td>
<td>2</td>
<td>$7.4</td>
</tr>
<tr>
<td>DDG-51 Arleigh Burke Class Destroyer</td>
<td>2</td>
<td>$4.0</td>
<td>3</td>
<td>$6.0</td>
</tr>
<tr>
<td>Littoral Combat Ship</td>
<td>3</td>
<td>$1.7</td>
<td>1</td>
<td>$1.3</td>
</tr>
<tr>
<td>CVN-78 Class Aircraft Carrier</td>
<td>1</td>
<td>$4.6</td>
<td>-</td>
<td>$1.8</td>
</tr>
<tr>
<td>Fleet Replenishment Oiler</td>
<td>1</td>
<td>$0.5</td>
<td>2</td>
<td>$1.1</td>
</tr>
<tr>
<td>Towing, Salvage, and Rescue Ship</td>
<td>1</td>
<td>$0.1</td>
<td>1</td>
<td>$0.1</td>
</tr>
<tr>
<td>Expeditionary Sea Base</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>$0.7</td>
</tr>
</tbody>
</table>

Good News – For Two Years

- The passage of the Bipartisan Budget Agreement of 2018 reduces the uncertainty of defense appropriations through FY 2019

- The authorizing committees support a two-carrier buy and other increases in ship building

- Increasing geopolitical tension will likely continue pressure to increase DoD spending in the medium-term

- An opportunity exists to consolidate DoD activities in Hampton Roads
Congressional Budget Office: Projected Federal Deficit
FY 2018 - FY 2028

Source: Congressional Budget Office (2018), Budget and Economic Output: 2018 to 2028 and Old Dominion University Economic Forecasting Project. Federal deficits in nominal dollars. The Alternative Fiscal Scenario assumes that many of the provisions of the Tax Cuts and Jobs Act of 2017 would be made permanent and many of the Affordable Care Act taxes are repealed, among others.
Projected Net Interest
United States, FY 2017 – FY 2028

Billions of Dollars

Source: Congressional Budget Office (2018), Budget and Economic Output: 2018 to 2028 and Old Dominion University Economic Forecasting Project. Interest expenditures in nominal dollars. The Alternative Fiscal Scenario assumes that many the provisions of the Tax Cuts and Jobs Act of 2017 would be made permanent and many of the Affordable Care Act taxes are repealed, among others.
<table>
<thead>
<tr>
<th>Metric</th>
<th>2017 Forecast</th>
<th>2017 Actual</th>
<th>2018 Forecast (Jan)</th>
<th>2018 Forecast (May)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Real Gross Domestic Product</td>
<td>2.2%</td>
<td>2.3%</td>
<td>3.0%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Civilian Job Growth</td>
<td>1.5%</td>
<td>1.2%</td>
<td>1.1%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>4.7%</td>
<td>4.1%</td>
<td>3.8%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>2.8%</td>
<td>2.2%</td>
<td>2.9%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Core Consumer Price Index</td>
<td>2.4%</td>
<td>1.7%</td>
<td>2.2%</td>
<td>2.3%</td>
</tr>
<tr>
<td>3-month Treasury Bill</td>
<td>1.3%</td>
<td>1.4%</td>
<td>2.0%</td>
<td>2.1%</td>
</tr>
<tr>
<td>10-year Treasury Bill</td>
<td>3.2%</td>
<td>2.4%</td>
<td>3.2%</td>
<td>3.3%</td>
</tr>
<tr>
<td>30-year Treasury Bill</td>
<td>--</td>
<td>2.8%</td>
<td>3.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>30-year Conventional Mortgage</td>
<td>4.3%</td>
<td>4.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Federal Deficit</td>
<td>---</td>
<td>-$666 Billion</td>
<td>-$850 Billion</td>
<td>-$825 Billion</td>
</tr>
<tr>
<td>Virginia Real GDP*</td>
<td>1.5%</td>
<td>2.0%</td>
<td>2.5%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Virginia Employment Growth</td>
<td>---</td>
<td>1.4%</td>
<td>1.3%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Source: 2017 data reflects the annual rate of growth, last month, or day business day of 2017 where appropriate. Data are rounded to nearest tenth. *The initial forecast for real GDP for Virginia has increased from 2.2% to 2.7% due to increases in federal spending in FY 2018 and 2019 and revisions to quarterly growth in VA during 2017.
2018 Midyear Hampton Roads Economic Forecast

Accelerating Growth, Challenges Remain
Annual Growth Rate in Real GDP
Hampton Roads and the United States

2001 to 2009: 1.62% United States, 2.12% Hampton Roads
2009 to 2015: 2.17% United States, 1.49% Hampton Roads
2015 to 2016: 1.49% United States, -1.09% Hampton Roads
2016 to 2017e: 2.27% United States, 0.90% Hampton Roads

Recovery from the Great Recession
Measured in Total Jobs Restored, 2008-2018*

Estimated Direct DoD Spending
Hampton Roads, 2000 to 2017

Billions of Dollars

Change in Private Sector Employment: Selected Industries in Hampton Roads, 2007 Q1 to 2017 Q1 (Thousands)

Health Care and Social Assistance: 19
Accomodation and Food: 4
Transportation and Warehousing: 1
Professional and Scientific: 1
Management of Companies: 1
Utilities: -1
Finance and Insurance: -2
Admin and Support: -3
Real Estate: -4
Information: -5
Wholesale Trade: -5
Retail Trade: -6
Manufacturing: -7
Construction: -11

Source: Virginia Employment Commission: Covered Employment and Wages by Private Ownership and the Old Dominion University Economic Forecasting Project.
Net New Civilian Jobs Gained or Lost
Selected Metropolitan Areas, Virginia, and North Carolina
Peak Pre-Recession Employment to March 2018 (thousands)

North Carolina: 297.0
Virginia: 198.5
Charlotte: 174.4
Northern Virginia: 146.3
Raleigh: 100.0
Jacksonville, FL: 70.2
Richmond: 50.0
Durham-Chapel Hill: 29.5
Hampton Roads: -1.2

Source: U.S. Department of Labor CES seasonally adjusted data and the Old Dominion University Economic Forecasting Project. Peak pre-recessionary employment occurred in 2008 for all regions except Florida, Hampton Roads, and Richmond which peaked in 2007. Comparison of total nonfarm employment in March 2018 to pre-recessionary peak employment. Data for March 2018 are preliminary.
More Jobs (Slowly)
Average Annual Civilian Jobs: Hampton Roads, 2000 – 2017

Source: U.S. Department of Labor CES data and the Old Dominion University Economic Forecasting Project. Total nonfarm employment, not seasonally adjusted. Data revised on March 12, 2018.
Average Annual Employment:
Hampton Roads, 2000 to 2017

Thousands of Individuals

Average Annual Civilian Labor Force
Hampton Roads, 2000 to 2017

Thousands of Individuals

Headline Unemployment Rate (U3)
United States, Virginia and, Hampton Roads, 2007 – 2018

Residential Housing is Looking Up
Existing Residential Home Sales
Hampton Roads, 2006 Q1 to 2018 Q1

4-Quarter Moving Average

Source: Real Estate Information Network and Old Dominion University Economic Forecasting Project. Information Deemed Reliable But not Guaranteed. Figures reported here represent only those properties that are listed through REIN by REIN members and may not represent all sales activity in our region.
Median Sale Price for Existing Homes
Hampton Roads, 2006 Q1 to 2018 Q1

Source: Real Estate Information Network and Old Dominion University Economic Forecasting Project. Information Deemed Reliable But not Guaranteed. Figures reported here represent only those properties that are listed through REIN by REIN members and may not represent all sales activity in our region.
New Construction Residential Home Sales
Hampton Roads, 2006 Q1 to 2018 Q1

Source: Real Estate Information Network and Old Dominion University Economic Forecasting Project. Information Deemed Reliable But not Guaranteed. 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.
Short Sales and Bank-Owned Sales as Percent of Existing Homes Sales: Hampton Roads, 2006-2017

Source: Real Estate Information Network and Old Dominion University Economic Forecasting Project. Information Deemed Reliable But not Guaranteed.

* Williamsburg represents Williamsburg, James City County, York County and Gloucester County.
# Median Sale Price of Existing Residential Homes for Selected Cities in Hampton Roads: 2007 and 2017

<table>
<thead>
<tr>
<th>City</th>
<th>Median Price 2007</th>
<th>Median Price 2017</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hampton</td>
<td>$180,000</td>
<td>$155,000</td>
<td>-13.9%</td>
</tr>
<tr>
<td>Newport News</td>
<td>$199,250</td>
<td>$170,000</td>
<td>-14.7%</td>
</tr>
<tr>
<td>Williamsburg*</td>
<td>$284,450</td>
<td>$283,000</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Chesapeake</td>
<td>$250,100</td>
<td>$245,000</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Norfolk</td>
<td>$195,000</td>
<td>$183,500</td>
<td>-5.9%</td>
</tr>
<tr>
<td>Portsmouth</td>
<td>$165,500</td>
<td>$140,000</td>
<td>-15.4%</td>
</tr>
<tr>
<td>Suffolk**</td>
<td>$257,500</td>
<td>$240,000</td>
<td>-6.8%</td>
</tr>
<tr>
<td>Virginia Beach</td>
<td>$245,000</td>
<td>$247,500</td>
<td>+1.2%</td>
</tr>
<tr>
<td>Hampton Roads</td>
<td>$223,000</td>
<td>$219,000</td>
<td>-1.8%</td>
</tr>
</tbody>
</table>

Source: Real Estate Information Network and Old Dominion University Economic Forecasting Project. Information Deemed Reliable But not Guaranteed.

* Williamsburg represents Williamsburg, James City County, York County and Gloucester County. ** Median price in Suffolk peaked in 2006 at $263,950.
The Hotel Industry Continues to Grow
Hotel Revenue in Hampton Roads
2000-2017

$520.2
$708.3
$645.3
$803.1
$841.6

4.8%

Source: STR Global and Old Dominion University Economic Forecasting Project.
Percent Change in Hotel Revenue within Hampton Roads: 2016 to 2017

- Williamsburg Mkt: 0.16%
- Virginia Beach: 4.15%
- Norfolk/Portsmouth: 14.43%
- Newport News/Hampton: 3.85%
- Chesapeake/Suffolk: 5.81%
- Hampton Roads: 4.80%

Source: STR Trend Reports January 24, 2017, January 17, 2018, and the Old Dominion University Economic Forecasting Project.
Percent Change in Hotel Revenue and REVPAR
2016 to 2017

Source: STR Trend Reports January 24, 2017, January 17, 2018, and the Old Dominion University Economic Forecasting Project.
Monthly Airbnb Revenue in Hampton Roads
2015-2017 (Millions of $)

Monthly Revenue of All Airbnb Properties: Williamsburg Market, 2015-2017 (Millions of $)

Source: Airdna data received in January 2018 excluding shared rooms
The Port of Virginia: Strong Growth and Prospects for 2018
General Cargo Tonnage
Port of Virginia, 2000-2017

Millions of Tons

Source: Virginia Port Authority and Old Dominion University Economic Forecasting Project.
Thousands of TEUs
Port of Virginia, 2000-2017

Source: Virginia Port Authority and Old Dominion University Economic Forecasting Project.
Average TEUs per Container Vessel Call
Port of Virginia, 2011-2017

Number of TEUs

Source: Virginia Port Authority and the Old Dominion University Economic Forecasting Project.
Performance of the Hampton Roads Economy: Year to Date March 2017 and Year to Date March 2018

<table>
<thead>
<tr>
<th>Metric</th>
<th>YTD March 2017</th>
<th>YTD March 2018</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilian Labor Force</td>
<td>840,978</td>
<td>841,657</td>
<td>+0.08%</td>
</tr>
<tr>
<td>Employment</td>
<td>802,545</td>
<td>810,019</td>
<td>+0.93%</td>
</tr>
<tr>
<td>Unemployment</td>
<td>38,433</td>
<td>31,638</td>
<td>-17.68%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>4.57%</td>
<td>3.76%</td>
<td>--</td>
</tr>
<tr>
<td>Civilian Nonfarm Payrolls</td>
<td>767,167</td>
<td>768,033</td>
<td>+0.11%</td>
</tr>
<tr>
<td>Taxable Sales</td>
<td>$5.09 Billion</td>
<td>$5.28 Billion</td>
<td>+3.74%</td>
</tr>
</tbody>
</table>

Source: Multiple sources available upon request.
## Performance of the Hampton Roads Economy: Year to Date March 2017 and Year to Date March 2018

<table>
<thead>
<tr>
<th>Category</th>
<th>YTD March 2017</th>
<th>YTD March 2018</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel Revenue</td>
<td>$131.32 Million</td>
<td>$141.22 Million</td>
<td>+7.54%</td>
</tr>
<tr>
<td>General Cargo Tonnage**</td>
<td>7.35 Million</td>
<td>7.39 Million</td>
<td>+0.55%</td>
</tr>
<tr>
<td>TEU Containers**</td>
<td>906,236</td>
<td>910,772</td>
<td>+0.50%</td>
</tr>
<tr>
<td>Number of 1 Unit Housing Permits</td>
<td>1,209</td>
<td>1,100</td>
<td>-9.02%</td>
</tr>
<tr>
<td>Value of 1 Unit Housing Permits</td>
<td>$270.74 Million</td>
<td>$245.11 Million</td>
<td>-9.47%</td>
</tr>
<tr>
<td>Number of Existing Homes Sold**</td>
<td>6,424</td>
<td>6,865</td>
<td>+6.86%</td>
</tr>
<tr>
<td>Distressed Sales as Percentage of Existing Homes Sold**</td>
<td>15.47%</td>
<td>12.34%</td>
<td>--</td>
</tr>
<tr>
<td>Median Price of Existing Homes Sold**</td>
<td>$206,000</td>
<td>$216,900</td>
<td>+5.29%</td>
</tr>
</tbody>
</table>

Source: Multiple sources available upon request. **Data are for YTD April 2017 and YTD April 2018.
<table>
<thead>
<tr>
<th></th>
<th>2017 Forecast</th>
<th>2017 Actual</th>
<th>2018 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hampton Roads Real Gross Domestic Product Initial Forecast</td>
<td>1.4%</td>
<td>--</td>
<td>1.2%</td>
</tr>
<tr>
<td>Hampton Roads Real Gross Domestic Product Mid-year revision</td>
<td>0.9%</td>
<td>--</td>
<td>2.2%</td>
</tr>
<tr>
<td>Civilian Job Growth</td>
<td>0.5%</td>
<td>0.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>4.3%</td>
<td>4.2%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Taxable Sales</td>
<td>2.6%</td>
<td>2.8%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Hotel Revenue</td>
<td>4.4%</td>
<td>4.8%</td>
<td>3.9%</td>
</tr>
<tr>
<td>General Cargo Tonnage</td>
<td>2.7%</td>
<td>5.3%</td>
<td>2.7%</td>
</tr>
<tr>
<td>One Unit Housing Permit Value</td>
<td>2.6%</td>
<td>8.6%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Source: 2017 data reflects the annual rate of growth. Dragas Center forecast current as of April 2018.
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