A scenic view of a mountain valley. On the left, a large, moss-covered tree trunk is visible. The background shows a dense forest of green trees leading to a valley with distant mountains under a cloudy sky. A bright yellow banner is positioned at the bottom of the image, containing the title and subtitle.

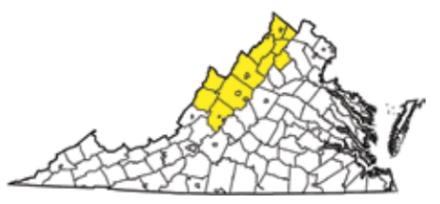
Analysis of Modeling & Simulation

# SHENANDOAH VALLEY REGION

REPORT SUMMARY  
The ASTA Group, LLC • November 2014

This study was prepared under contract with the Commonwealth of Virginia, with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the Commonwealth of Virginia and does not necessarily reflect the views of the Office of Economic Adjustment or the Department of Defense.

# Shenandoah Valley Regional Overview



The Shenandoah Valley region needs initial adopters of M&S. City governments may offer avenues to promote networking and development initiatives. The I-81 corridor has good infrastructure, but many rural areas still lack digital connectivity. Education programs are healthy in STEM initiatives. Stakeholders would like a state university to push for greater M&S investment in the region.

## Asset Summary

Seven M&S assets were identified in the region, mostly universities.

Industry Sector	Total Employment	M&S Specific Employment
Total Shenandoah Region Employment	276,657.56	
Total Shenandoah Region Employment, M&S Related Sectors Only	17,878.40	178.78
Pharmaceutical Preparation Manufacturing	41.62	0.42
Other Commercial & Service Industry Machinery Manufacturing	14.78	0.15
Ship Building & Repairing	0.00	0.00
<b>Software Publishers</b>	614.87	6.15
Telecommunications	2,046.48	20.47
Other Information Services	185.29	1.85
Architectural, Engineering & Related Services	1,491.45	14.92
<b>Custom Computer Programming Services</b>	1,060.68	10.61
<b>Computer Systems Design Services</b>	591.57	5.92
Other Computer Related Services, Including Facilities Management	128.46	1.29
<b>Management, Scientific &amp; Technical Consulting Services</b>	965.60	9.66
<b>Scientific Research &amp; Development Services</b>	289.17	2.89
<b>All Other Miscellaneous Professional, Scientific &amp; Technical Services</b>	350.44	3.50
Other Private Educational Services	865.89	8.66
Private Hospitals	9,232.11	92.32

*Bold text indicates core sectors of the M&S industry.*

## Regional Employment in M&S

This table includes estimates for total employment in the region, for employment in M&S related sectors, and estimates for employment in each individual industry sector analyzed in this study.

As shown in the table, the related sector of *Private Hospitals* has higher employment than any other M&S industry sector in the Shenandoah Valley region.

Also shown in the table, about 6.5% (17,878.40) of the region's total employment (276,657.56) is comprised of employment in the M&S related sectors. Approximately 0.06% to 0.08% of the total for M&S related sector employment is actually M&S specific in each sector, so at a minimum, 178 jobs in the related sectors are specific to M&S.

### Economic Impact

The M&S contribution to the regional GRP is estimated at \$545-\$650 million. Total economic impact of M&S on the regional economy is estimated at just under \$1 billion to \$1.2 billion.

Growth projections for M&S industry sectors within the Shenandoah Valley region range from 15% to 20% through 2020. Analyses project that the region will add 32 to 40 new M&S specific jobs, and that M&S will contribute \$4.9-\$5.85 billion to the regional GRP, from 2011-2020.

### M&S Workforce

The perception of poor job opportunity impedes workforce retention and recruitment. The M&S workforce needs training and educating for the downstream applications. Although the region's environment and relaxed lifestyle may attract workers, the lack of sufficient infrastructure beyond the I-81 corridor prevents development of technology-dependent industry.

### Market

The marketplace needs more regional entrepreneurship. Study participants currently host startup weekends, which are local efforts to help potential entrepreneurs develop business plans and navigate entrance into the marketplace.

### M&S Networking and Collaboration

Cooperation among educational institutions works well within the region. At the K-12 level, STEM, GIS and robotics are focal points. The community is working toward identifying more grant support and coordination of various school initiatives. At the community college level, there is an interest in growing STEM, but programs depend on faculty interests, which may or may not align with M&S. More government and business partnerships are needed for research and student projects at James Madison University (JMU).

### Solutions

The JMU small business center, Shenandoah Valley Technology Council, agriculture associations and cooperative extensions are all potential organizing forces that could energize the development of an M&S network. Within this dispersed region, small business development will be the key, coupled with applying M&S applications to architectural, environmental and agricultural concerns.



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## Report Description

This report provides regional highlights of a 2013 study undertaken to assess the state of Modeling and Simulation (M&S) within Virginia, analyze its economic impact, and identify projected growth areas. The study produced an inventory of Commonwealth M&S assets, a survey of M&S business regionally, economic analyses of the M&S sector and workforce, and a meta-analysis of previous studies. Focus group interviews were held in each Commonwealth region to provide insight and information about M&S. Participating stakeholders represented academia, government and industry. Impact Analysis for Planning (IMPLAN®) and United States Bureau of Labor Statistics data were used for the economic and workforce analyses. The full report can be found online at the following websites:

ModSim Connected: [modsimconnected.com](http://modsimconnected.com)

Secretary of Technology: [technology.virginia.gov](http://technology.virginia.gov)

