

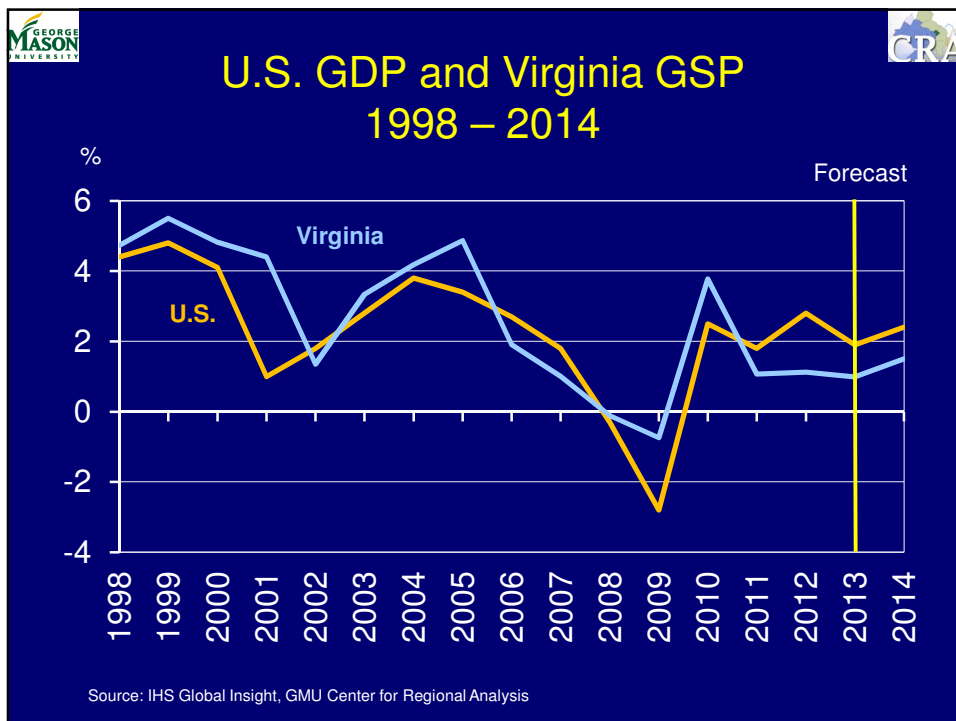





Center for Innovative Technology Spring Board Meeting

The Commonwealth of Virginia Economy is at a Turning Point

Stephen S. Fuller, Ph.D.
 Dwight Schar Faculty Chair and University Professor
 Director, Center for Regional Analysis
 George Mason University

May 22, 2014






Commonwealth of Virginia: Sources of Gross State Product 2003-2013 (percent share of GSP)

<u>Year</u>	<u>Federal</u>	<u>Military</u>	<u>P&BS</u>	<u>Mfg</u>	<u>Ed& H</u>
2003	5.3	4.5	15.2	9.2	5.8
2007	5.3	4.0	17.4	9.0	6.1
2008	5.5	4.0	18.6	8.1	6.5
2009	5.8	4.2	19.0	8.3	6.4
2010	5.7	4.0	19.1	9.3	6.6
2011	5.7	3.8	19.7	9.2	6.7
2012	5.7	3.7	19.5	9.4	6.6
2013	5.4	3.4	19.3	9.5	6.5


Sources: IHS Global Insight; GMU Center for Regional Analysis

Impacts of the Recession and the Sequester on the Commonwealth of Virginia Economy



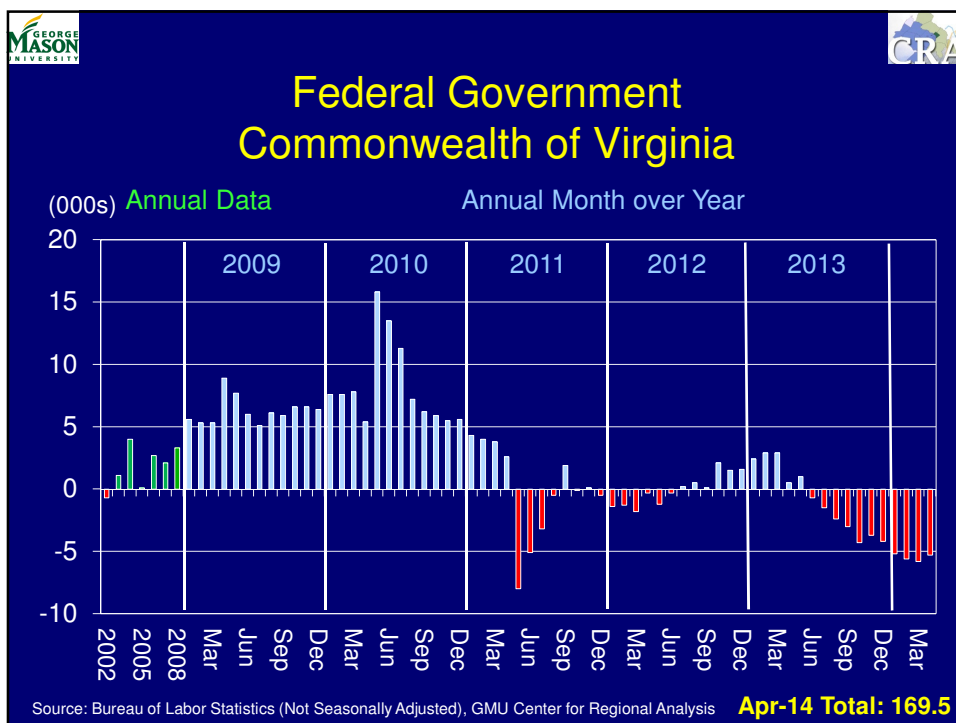
Recession Impacts

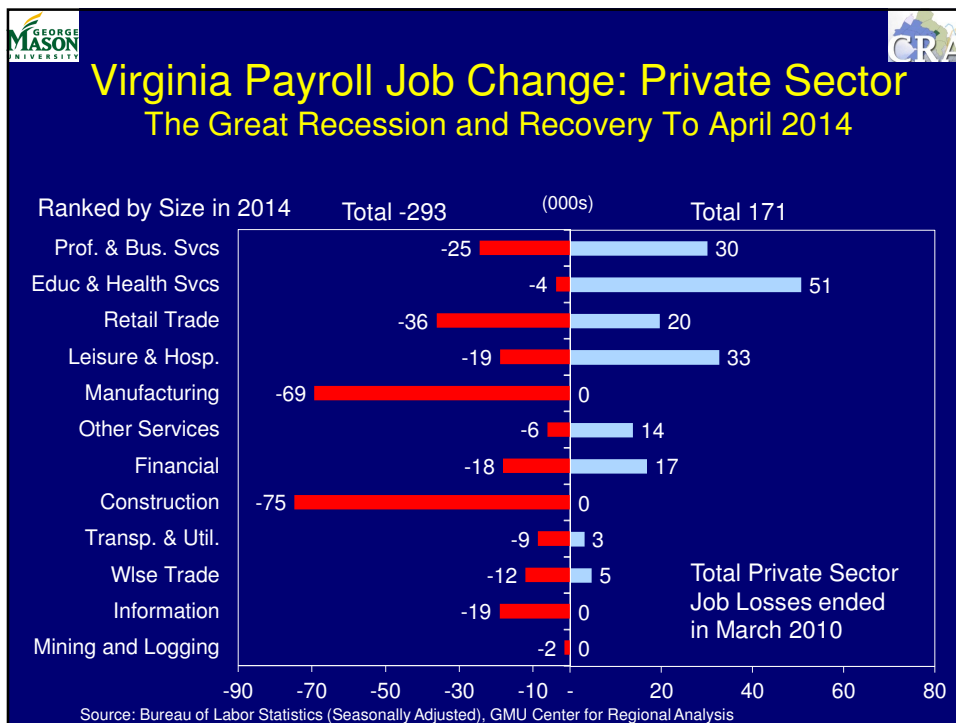
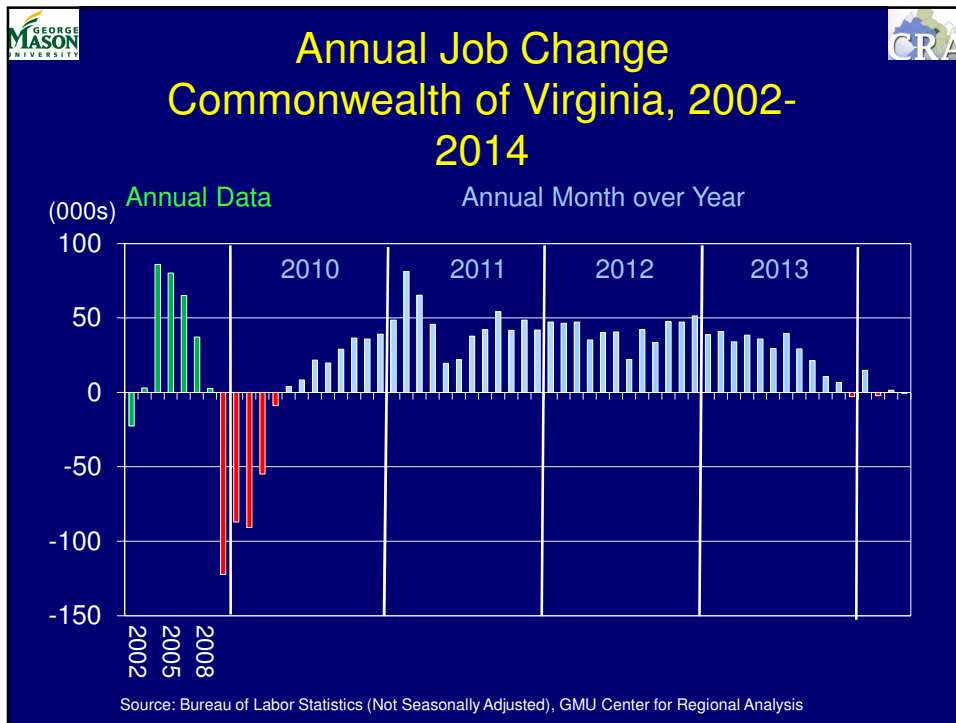


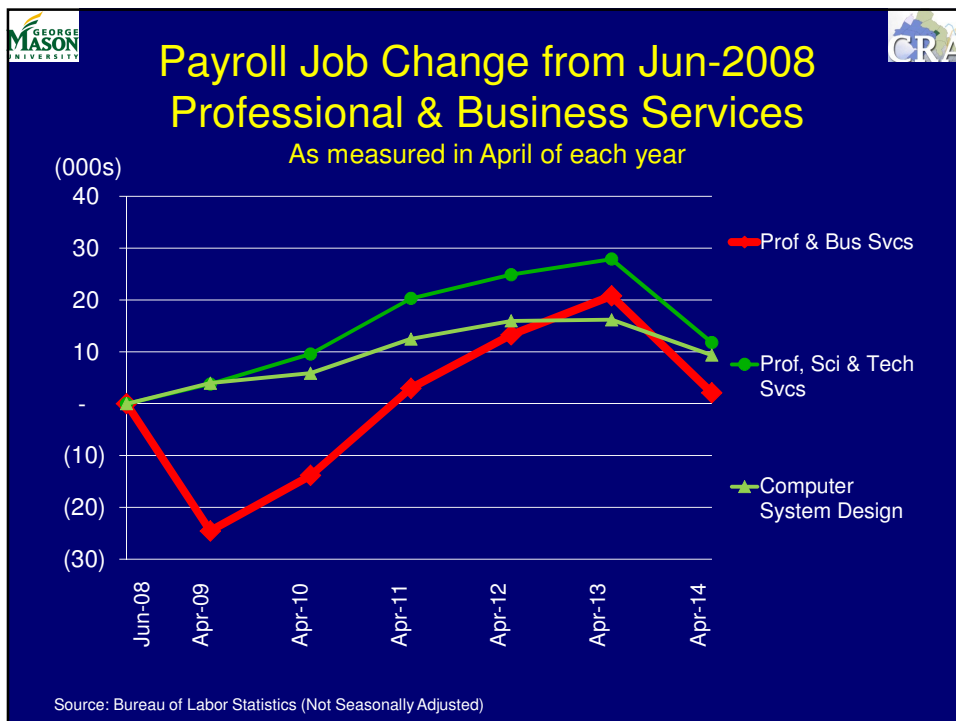
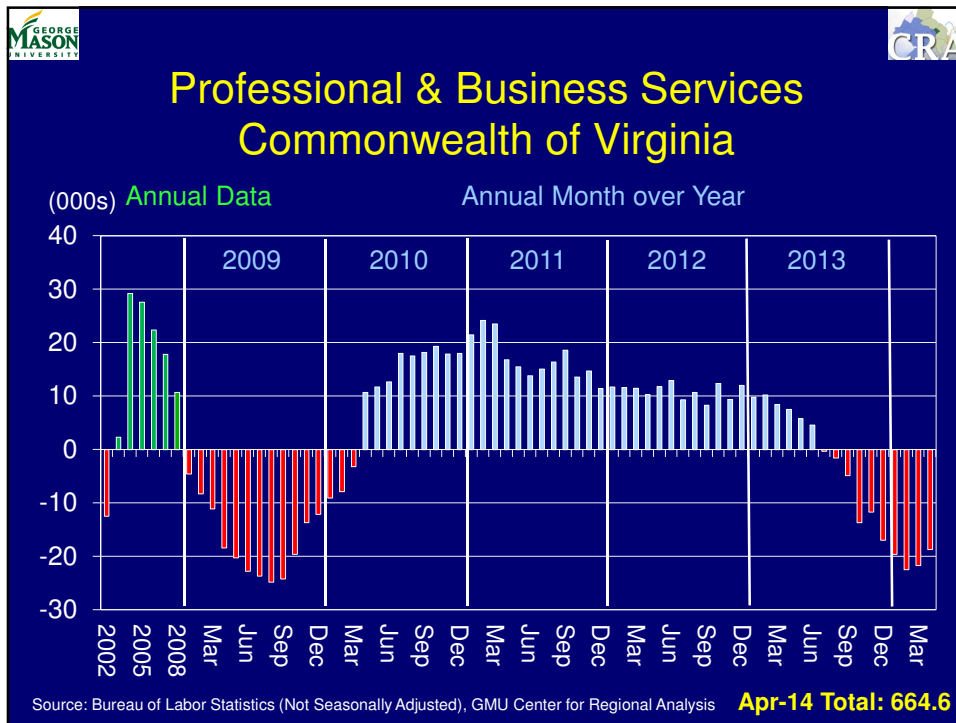
- Gross State Product declined 0.7% in 2008
 - The state lost 293,000 jobs

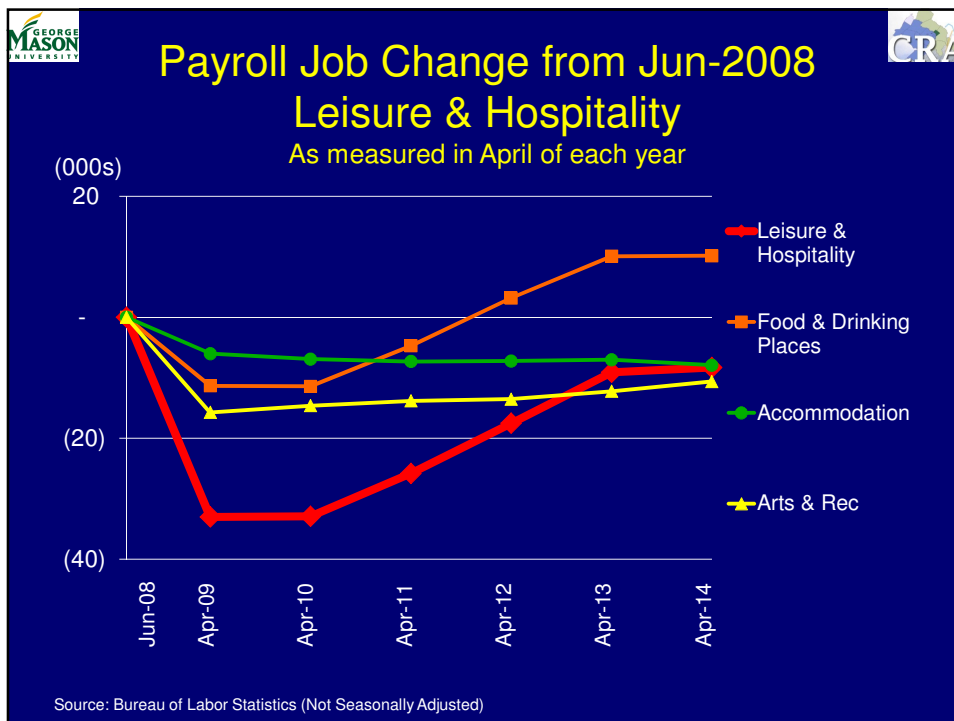
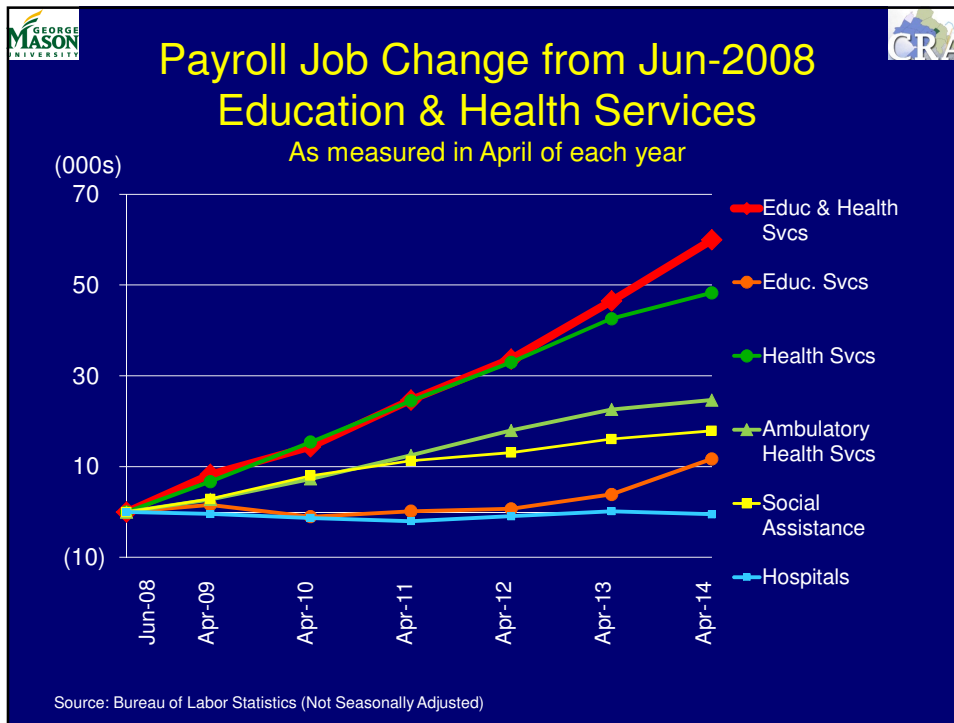
Impacts of Federal Spending Reduction

- Federal procurement \$s declined by 15.2% from their peak in 2011;
- DoD procurement declined 21.8%, or \$9.8 b
- There are 13,700 fewer federal jobs than at their peak in 2010, and
- Federal payroll is down 7.5% or \$1.16 billion





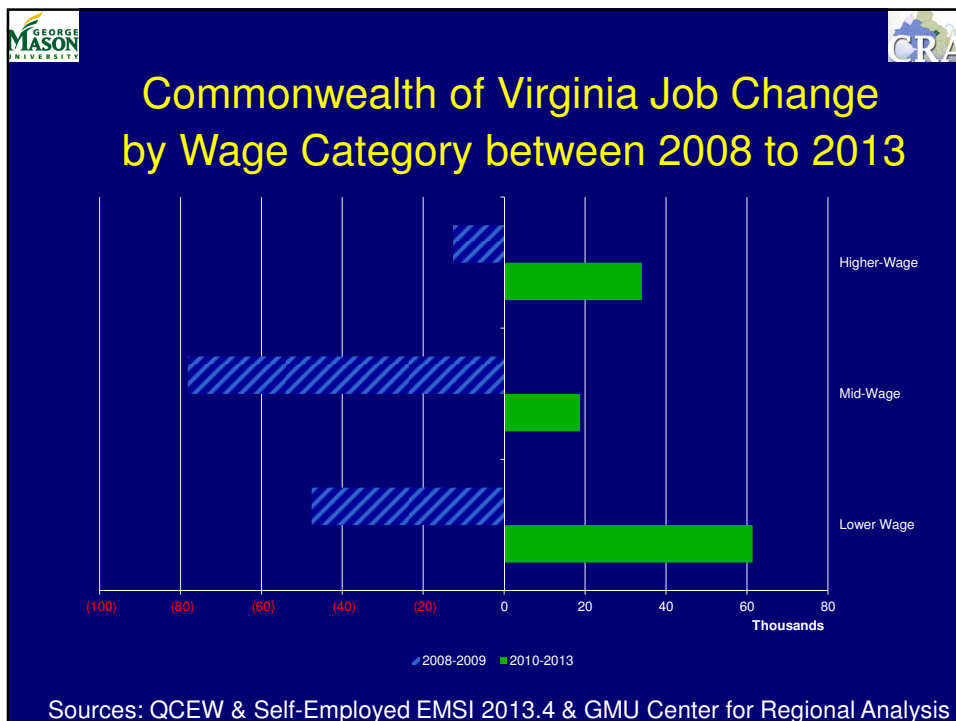




**Gross State Product Per Job By Sector
Commonwealth of Virginia, 2013**

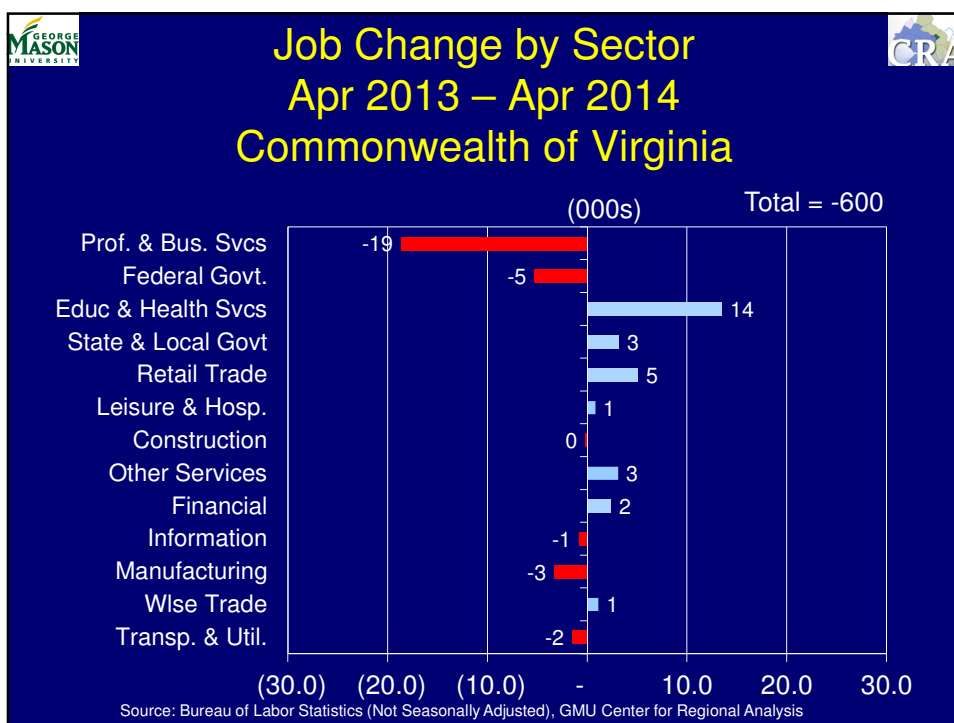
Sectors (largest 1 st)	(in 2013 dollars)	GSP per Job*
Professional & Business Services		\$126,267
Prof., Scientific, Technical		\$156,892
State and Local Government		\$69,102
Education/Health Services		\$63,890
Retail Trade		\$58,253
Hospitality Services		\$38,540
Manufacturing		\$178,652
Other Services		\$63,290
Construction		\$82,378
Federal Government		\$151,070
Military		\$121,681
Financial Services		\$242,966
Transport & Utilities		\$152,458
All Jobs in the Commonwealth		\$107,461

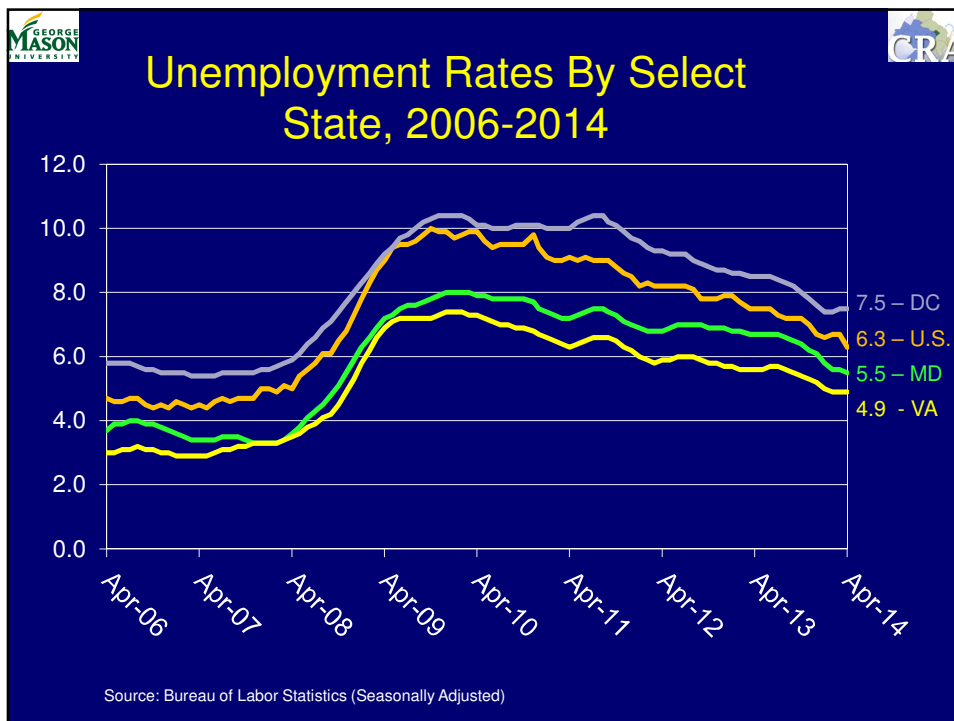
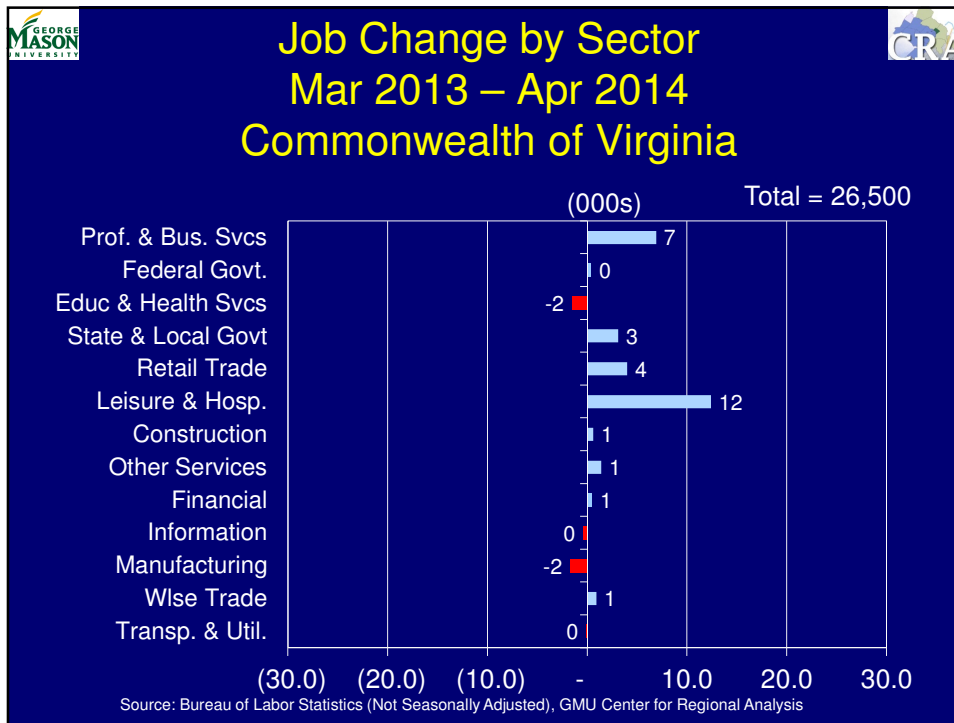
Sources: IHS Global Insight; GMU Center for Regional Analysis



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The Current Performance of the Commonwealth of Virginia Economy








Net New and Replacement Job Growth in the Commonwealth of Virginia: 2013-2018

Commonwealth of Virginia Change in Jobs, Summary 2013 – 2018

Year	Total Jobs	Net New (% Change)	Replacement (% Change)	Openings (% Change)
2013Q3	3,640,058			
2013-2018	3,875,645	235,587	452,281	687,868
		6.5%	12.4%	18.9%
2018-2023	4,135,046	259,401	480,396	739,797
		6.7%	12.4%	19.1%



Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

<u>2-Digit SOC</u>	<u>Net New</u>	<u>%Total</u>	<u>%Change</u>
Healthcare (All)	30,244	12.8	10.9
Office & Admin Support	23,845	10.1	4.2
Computer & Mathematical	21,583	9.2	13.2
Sales & Related	20,131	8.5	5.4
Construction & Extraction	18,451	7.8	12.3
Business & Financial	16,212	6.9	7.6
Food Prep & Serving	15,975	6.8	5.1
Educ., Training & Library	13,344	5.7	5.4
Management Occupations	13,202	5.6	6.9
Personal Care & Service	12,536	5.3	11.2
All Others	50,066	21.3	4.8
Totals, All	235,587	100.0	6.5



Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

<u>5-Digit SOC</u>	<u>Net New</u>	<u>%Total</u>	<u>%Change</u>
Healthcare (All)	30,244	12.8	10.9
Registered Nurses	4,118	16.3	21.1
Home Health Aides	2,827	13.6	9.2
Nursing Assistants	1,922	9.3	13.5
Medical Assistants	4,925	6.4	8.3
Office & Admin Support	23,845	10.1	4.2
Customer Svc Reps	4,825	20.2	7.6
Secretaries & Admin Asst.	4,509	18.9	7.5
Bookkeeping&Accounting Clerks	3,133	13.1	7.1
Office Clerks, General	3,103	13.0	4.1
All Others	181,498	77.0	6.5
Total	235,587	100.0	6.5

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

 Commonwealth of Virginia 			
Major Sources of Net New Jobs, 2013 – 2018			
<u>5-Digit SOC</u>	<u>Net New</u>	<u>%Total</u>	<u>%Change</u>
<u>Computer & Mathematical</u>	21,583	9.2	13.2
Software Developers, Apps	3,907	1.7	16.7
Computer Systems Analysts	2,938	1.2	13.7
Computer Support Specialists	2,842	1.2	16.4
Software Developers, Systems	4,804	2.0	15.9
<u>Sales & Related</u>	20,131	8.5	5.4
Retail Salespersons	7,423	3.2	6.2
Sales Reps, Services	2,584	1.1	10.3
First-Line Supers, Retail	1,990	0.8	6.0
Sales Reps, Wholesale & Manuf	1,982	0.8	6.5
<u>All Others</u>	193,873	82.3	6.2
<u>Total</u>	235,587	100.0	6.5

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

STEM Jobs in Commonwealth of Virginia 2013-2018

**Commonwealth of Virginia
Change in STEM Jobs
Summary 2013 - 2018**

Year	Total STEM Jobs	Net New STEM Jobs (% Change)	Replacement STEM Jobs (% Change)	Openings STEM Jobs (% Change)
2013	518,015 (14.2%)			
2018	570,124 (14.7%)	52,109 10.1%	51,723 10.0%	103,832 20.0%

Source: JobsEQ® - 2013q4, GMU Center for Regional Analysis

**Commonwealth of Virginia
Net New STEM Jobs, 2013 – 2018**

<u>STEM 2-Digit SOC</u>	<u>Net New</u>	<u>% Total</u>	<u>%Change</u>
Computer & Mathematical	21,585	9.2%	13.2%
Healthcare Practitioners	18,332	7.8%	10.0%
Architecture & Engineering	4,590	1.9%	6.0%
Management	2,710	1.2%	9.9%
Life, Physical & Social Science	2,297	1.0%	5.8%
Education ,Training & Library	1,466	0.6%	9.4%
Sales & related	1,129	0.5%	9.6%
All STEM	52,109	22.1%	10.1%
Total Occupations	235,587	100.0%	6.5%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

Commonwealth of Virginia			
Major Sources of New STEM Jobs, 2013 – 2018			
<u>STEM 2-Digit SOC</u>	<u>Net New</u>	<u>%STEM</u>	<u>%Change</u>
<u>Computer & Mathematical</u>	21,585	41.4%	13.2%
Software Developers Application	4,804	9.2%	15.9%
Computer Systems Analysts	3,907	7.5%	16.7%
Computer Support Specialists	2,938	5.6%	13.7%
Software Developers, Systems	2,842	5.5%	16.4%
<u>Healthcare Practitioners</u>	18,332	35.2%	10.0%
Registered Nurses	4,925	9.5%	8.3%
Practical & Vocational Nurses	1,776	3.4%	11.1%
Pharmacy Technicians	840	1.6%	9.5%
Dental Hygienists	828	1.6%	16.3%
Other STEM	12,192	23.4%	7.1%
<u>All STEM</u>	52,109	100.0%	10.1%

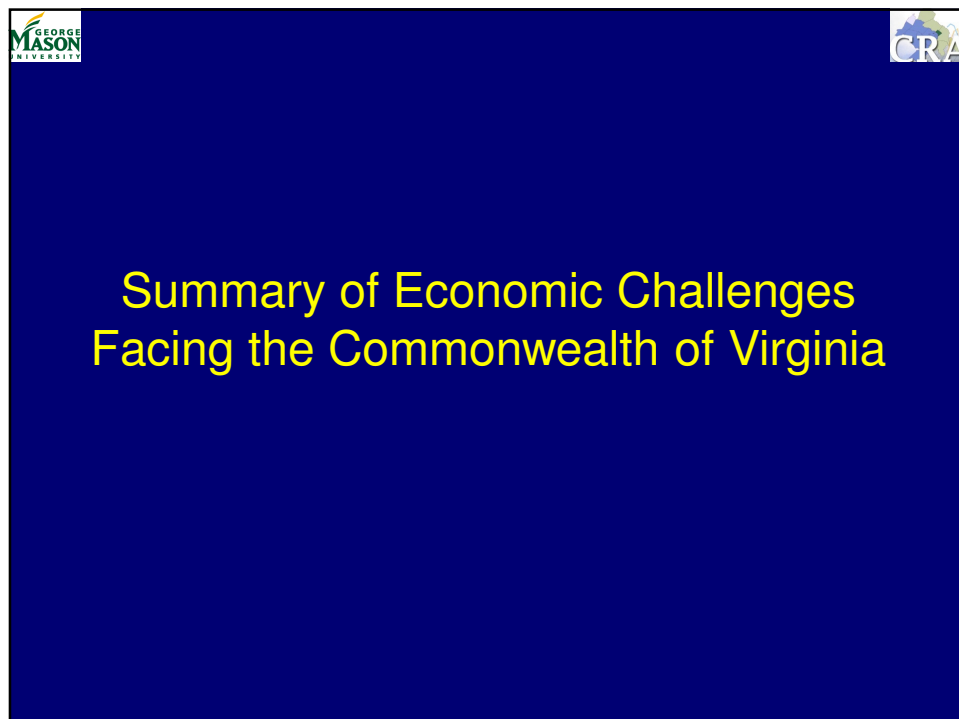
Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis



Commonwealth of Virginia			
Major Sources of New STEM Jobs, 2013 – 2018			
<u>STEM 2-Digit SOC</u>	<u>Net New</u>	<u>%STEM</u>	<u>%Change</u>
<u>Architecture & Engineering</u>	4,590	8.8%	6.0%
Civil Engineers	1,064	2.0%	10.6%
Computer Hardware Engineers	377	0.7%	13.2%
Architects, excl Landscape&Naval	340	0.7%	9.5%
Electrical Engineers	334	0.6%	6.9%
<u>Management</u>	2,710	5.2%	9.9%
Computer Systems Managers	1,548	3.0%	12.1%
Medical Health Svcs Managers	700	1.3%	9.8%
Architect & Engineering Manager	383	0.7%	7.0%
Natural Sciences Managers	79	0.2%	4.0%
Other STEM	44,809	86.0%	10.8%
<u>All STEM</u>	52,109	100.0%	10.1%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

Commonwealth of Virginia			
Major Sources of New STEM Jobs, 2013 – 2018			
<u>STEM 2-Digit SOC</u>	<u>Net New</u>	<u>%STEM</u>	<u>%Change</u>
<u>Life, Physical, & Social Science</u>	2,297	4.4%	5.8%
Environmental Scientists	358	0.7%	10.0%
Medical Scientist Excl Epidemiolo	215	0.4%	6.9%
Clinic,Counsel & School Psycholo	193	0.4%	6.9%
Environ Sci & Protection Techs	167	0.3%	12.7%
<u>Education, Training & Library</u>	1,466	2.8%	9.4%
Health Teachers, Postsecondary	672	1.3%	15.6%
Nursing Teachers, Postsecondary	226	0.4%	15.5%
Bio Sci Teachers, Postsecondary	114	0.2%	8.5%
Math Sci eachers, Postsecondary	71	0.1%	4.9%
Other STEM	48,346	92.8%	10.4%
<u>All STEM</u>	52,109	100.0%	10.1%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis





Population Change in the Commonwealth of Virginia , 2013-2018 (in thousands)

<u>Age Cohorts</u>	<u>2013</u>	<u>2018</u>	<u>Change</u>	<u>%</u>
Under 25 yrs	2,169.4	2,233.6	64.2	3.0
25-64 years	5,007.4	5,150.9	143.5	2.9
65 yrs & over	1,115.0	1,347.1	232.1	20.8
Totals	8,291.8	8,731.6	439.8	5.3

Source: IHS Global Insight, GMU Center for Regional Analysis

Virginia and U.S. Economic Growth 2012-2018 (annual percent real change)

<u>Year</u>	<u>Virginia</u>	<u>U.S.</u>
2000-2007	3.0	2.5
2008-2009	- 0.8	- 3.1
2012	1.1	2.8
2013	1.0	1.9
2014	1.5	2.4
2015	2.3	3.2
2016	2.6	3.5
2017	2.7	3.2
2018	2.7	2.7

Sources: IHS Global Insight; GMU Center for Regional Analysis



Summary of Economic Challenges Facing the Commonwealth of Virginia



- The Virginia economy has undergone a significant structural shift as a result of the Great Recession;
- Changing federal spending patterns have extended the structural shift in Virginia's economy through the recovery and will shape its future growth trajectory;
- The State's economy is lagging the national growth rate where historically it had performed better;



- Demand for workers to fill new and replacement jobs will substantially exceed the supply of available workers in every major occupational category;
- In order to sustain a competitive economy, the State will need to build on its inherent strengths and, in particular, its technology-intensive business base; and,
- The next five years will be the most critical development period in recent history as the State's investment decisions during this period will determine its competitive position going forward.



Key Questions for Discussion



- What is the potential economic impact of doing nothing at this time? What could happen if we adopt a “wait and see” posture?
- What can be done to diversify the State’s economy and to reduce its dependency on federal spending?
- What role can technology play in achieving the economy’s diversification and globalization?
- What should state government do to accelerate the generation of high value added jobs?





Thank You
Questions

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Replacement Jobs in Commonwealth of Virginia 2013-2018

Commonwealth of Virginia Replacement Jobs, Summary 2013 - 2018 - 2023

Year	Total Jobs	Net New Jobs (% Change)	% of Total
2013	3,640,058		
2013 – 2018	3,875,645	452,281 12.4%	12.4%
2018 - 2023	4,135,046	480,396 12.4%	11.6%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

<u>2-Digit SOC</u>	<u>Replacement</u>	<u>% Total</u>	<u>% Change</u>
Office & Admin Support	65,936	14.6	11.6
Sales & Related	60,379	13.3	16.3
Food Prep & Serving	58,119	12.9	18.5
Healthcare (All)	26,913	6.0	9.7
Transport & Material Moving	25,819	5.7	12.3
Educ, Training, & Library	25,373	5.6	10.3
Management	23,098	5.1	12.2
Business & Financial Ops	22,321	4.9	10.4
Production Occupations	22,277	4.9	12.0
Install, Maintain & Repair	16,566	3.7	12.0
All Others	105,479	23.3	11.4
Total	452,281	100.0	12.4

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis



<u>5-Digit SOC</u>	<u>Replacements</u>	<u>%Total</u>	<u>%Change</u>
<u>Office & Admin Support</u>	65,936	14.6	11.6
Customer Svc Reps	8,460	12.8%	13.3%
Office Clerks, General	7,952	12.1%	10.4%
Stock Clerks & Order Fillers	7,266	11.0%	15.4%
First-Line Supervisors	4,197	6.4%	11.6%
<u>Sales & Related</u>	60,379	13.3	16.3
Retail Salespersons	20,703	34.3%	17.3%
Cashiers	20,048	33.2%	21.7%
First-Line Supers of Retail	4,657	7.7%	14.1%
Sales Reps, Services	3,443	5.7%	13.7%
<u>All Others</u>	325,966	72.1	12.1
<u>Total</u>	452,281	100.0	12.4

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

Commonwealth of Virginia			
Major Sources of Replacements, 2013 – 2018			
<u>5-Digit SOC</u>	<u>Replacements</u>	<u>%Total</u>	<u>%Change</u>
<u>Food Prep & Serving</u>	58,119	12.9	18.5
Food Prep & Serving	15,313	26.3	18.5
Waiters and Waitresses	15,152	26.1	23.8
Counter Attendants	3,634	6.3	31.0
Hosts and Hostesses	3,608	6.2	37.3
<u>Healthcare (All)</u>	26,913	6.0	9.7
Registered Nurses	5,460	20.3	9.2
Nursing Assistants	2,842	10.6	9.2
Licensed Practical Nurses	1,837	6.8	11.5
Home Health Aides	1,669	6.2	8.5
<u>All Others</u>	367,249	81.2	12.0
<u>Total</u>	452,281	100.0	12.4



Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

Replacement STEM Jobs in Commonwealth of Virginia 2013-2018

 **Commonwealth of Virginia** 
Replacement STEM Jobs, Summary
2013 - 2018 - 2023



Year	Total STEM Jobs (% of ALL Jobs)	Replacement STEM Jobs (% Change)	STEM Share of All Replacements
2013	518,015 (14.2)		
2018	570,124 (14.7)	51,723 11.4%	11.4%

Sources: EMSI Total Employment - 2013.4, GMU Center for Regional Analysis



 **Commonwealth of Virginia** 
Replacement STEM Jobs, 2013 – 2018

<u>STEM 2-Digit SOC</u>	<u>Replacement</u>	<u>% Total</u>	<u>%Change</u>
Healthcare Practitioners	18,420	4.1%	10.0%
Computer & Mathematical	13,438	3.0%	8.2%
Architecture & Engineering	9,108	2.0%	11.9%
Life, Physical & Social Science	5,857	1.3%	14.9%
Management	2,649	0.6%	9.7%
Sales & related	1,149	0.3%	9.8%
Education ,Training & Library	1,102	0.2%	7.1%
All STEM	51,723	11.4%	10.0%
Total Occupations	452,281	100.0%	12.4%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis

 Commonwealth of Virginia  Replacement STEM Jobs, 2013 – 2018			
<u>STEM 2-Digit SOC</u>	<u>Replacmnt</u>	<u>%STEM</u>	<u>%Change</u>
<u>Healthcare Practitioners</u>	18,420	35.6%	10.0%
Registered Nurses	5,460	10.6%	9.2%
Practical & Licensed Voc Nurses	1,837	3.6%	11.5%
Physicians & Surgeons, All Other	1,057	2.0%	13.0%
Pharmacists	816	1.6%	11.6%
<u>Computer & Mathematical</u>	13,438	26.0%	8.2%
Computer Programmers	2,211	4.3%	13.8%
Software Developers, Apps	1,912	3.7%	6.3%
Computer Systems Analysts	1,849	3.6%	7.9%
Computer Support Specialists	1,649	3.2%	7.7%
Other STEM	19,865	38.4%	11.6%
<u>All STEM</u>	51,723	11.4%	10.0%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis * % Total of All Net New Jobs

 Commonwealth of Virginia  Replacement STEM Jobs, 2013 – 2018			
<u>STEM 2-Digit SOC</u>	<u>Replacmnt</u>	<u>%STEM</u>	<u>%Change</u>
<u>Architecture & Engineering</u>	9,108	17.6%	11.9%
Mechanical Engineers	1,286	2.5%	17.1%
Civil Engineers	1,196	2.3%	12.0%
Industrial Engineers	719	1.4%	14.8%
Electrical Engineers	548	1.1%	11.3%
<u>Life, Physical & Social Science</u>	5,857	11.3%	14.9%
Environ Sci & Specialists	525	1.0%	14.7%
Clinic, Counsel & School Psych	502	1.0%	18.0%
Forest & Conservation Techs	394	0.8%	21.7%
Life, Physical, & Social Sci Techs	381	0.7%	19.4%
Other STEM	36,758	71.1%	9.1%
<u>All STEM</u>	51,723	11.4%	10.0%

Sources: JobsEQ® as of 2014Q1 and GMU Center for Regional Analysis * % Total of All Net New Jobs