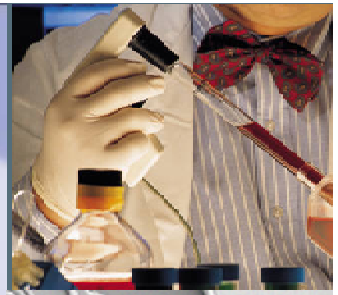
Catalyzing Innovation Opportunities in Virginia

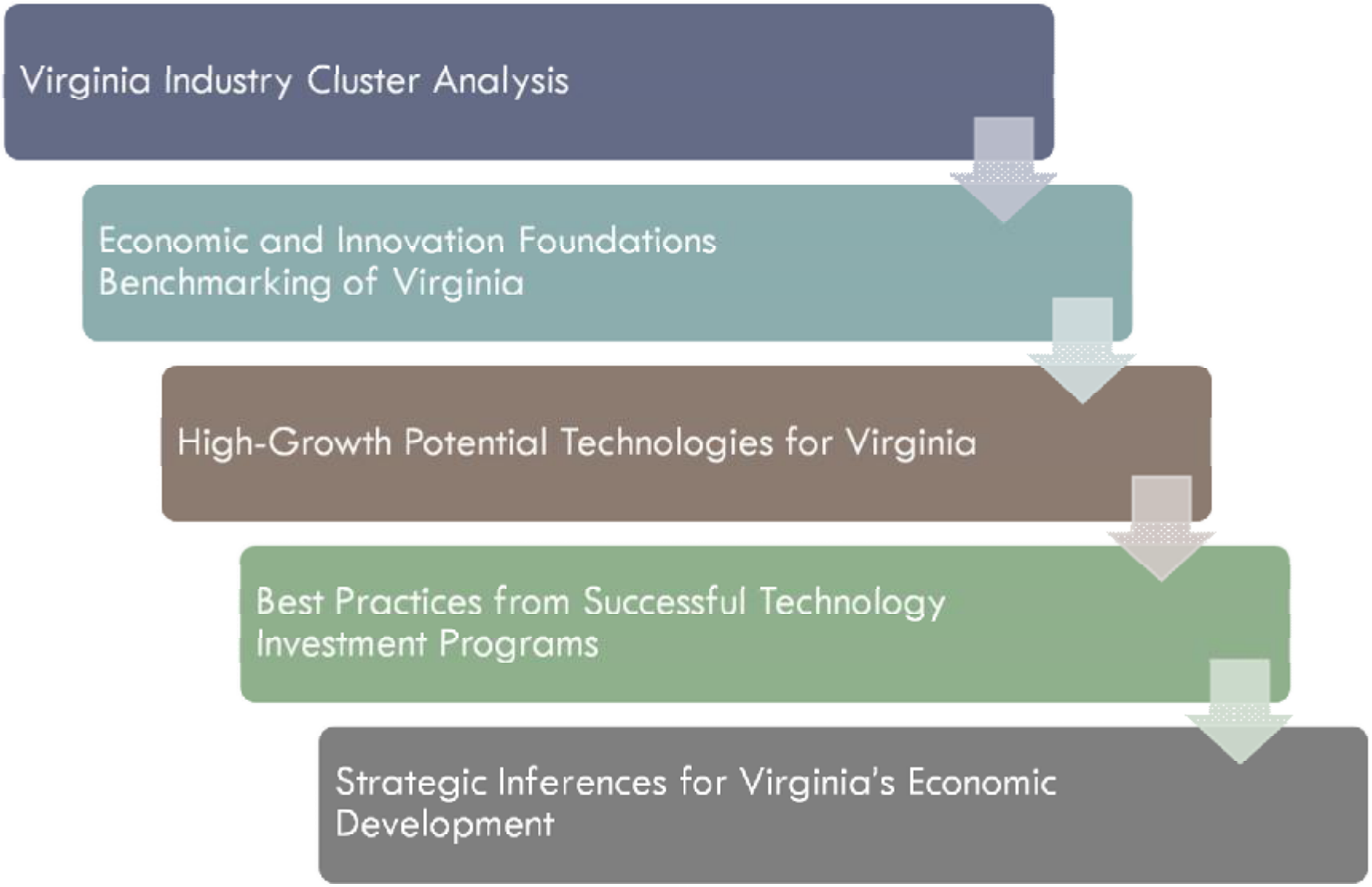
Growing Innovation Clusters for American Prosperity: National Academies



SRI International

June 3, 2009

Project Process: Analytical Tasks



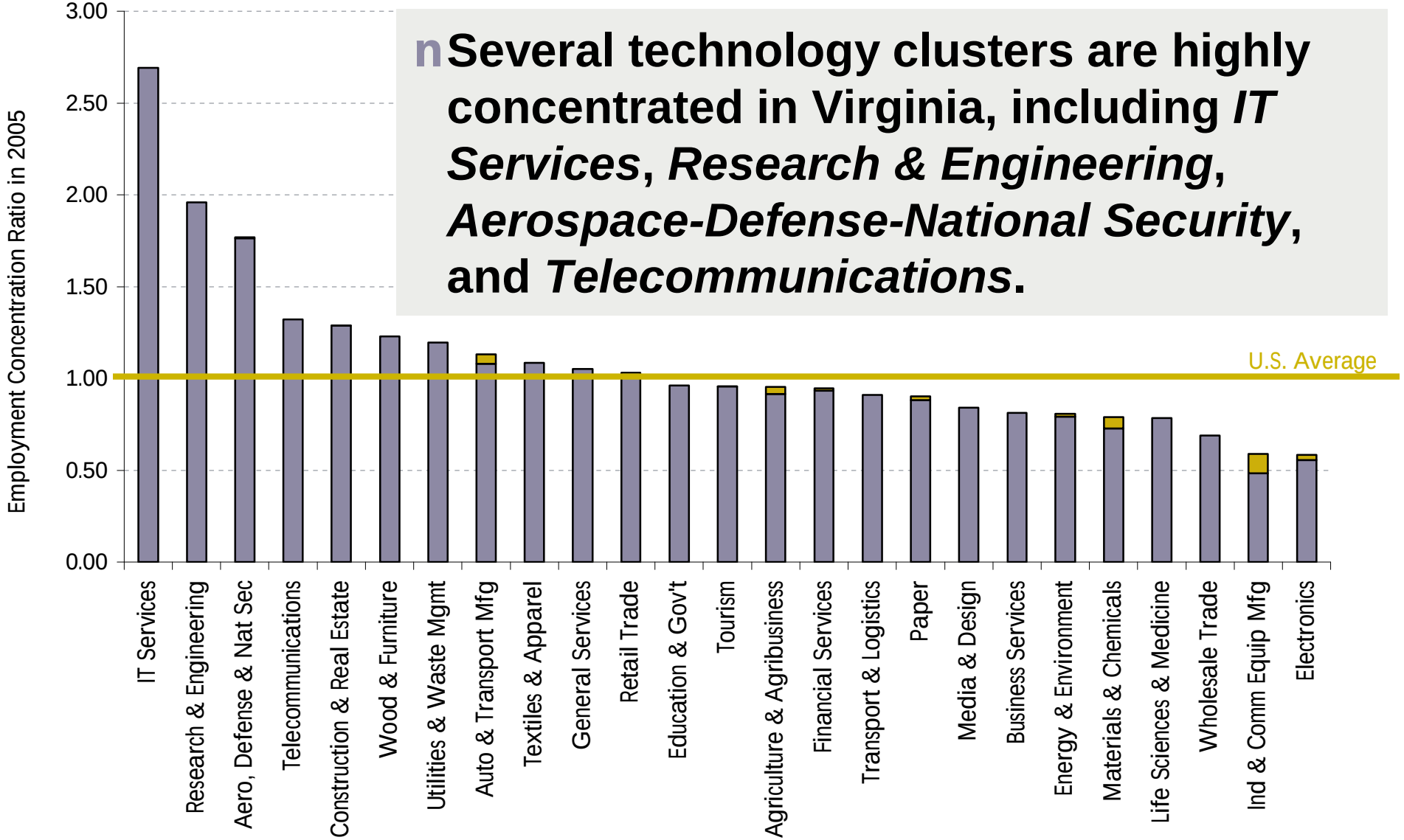
Virginia Industry Cluster Analysis

- **Like most states, Virginia's economy is dominated by service industries:**
  - ***Education & Government***
  - ***Retail Trade***
  - ***Construction & Real Estate***
  - ***Tourism***
  - ***General & Business Services*.**
- **Several technology and knowledge-based sectors stand out for their high levels of employment:**
  - ***Life Sciences & Medicine* (336,535 workers)**
  - ***Research & Engineering Services* (161,633 workers)**
  - ***IT Services* (140,016 workers)**

Employment Concentration Ratio By Cluster

State-Level Analysis

- **Several technology clusters are highly concentrated in Virginia, including *IT Services*, *Research & Engineering*, *Aerospace-Defense-National Security*, and *Telecommunications*.**



The Employment Concentration Ratio is the industry cluster's share of total employment in the state versus its share in the country. Clusters with a ratio greater than 1.0 are more concentrated in Virginia than in the United States.

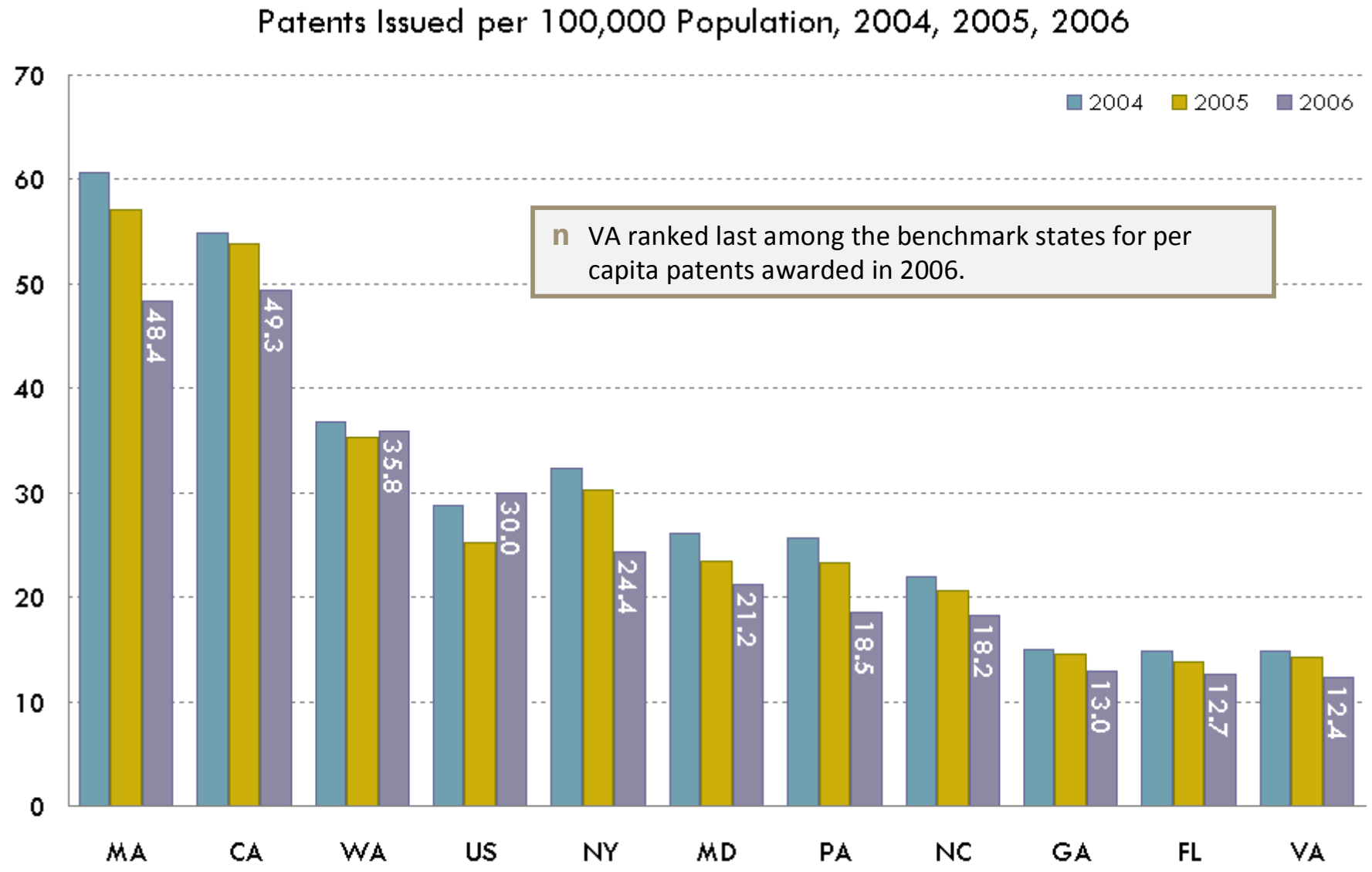
Benchmarking Virginia's Innovation Foundations

Summary Results

	Weakness	Average	Strength
Financial Resources	Small business loans ($) VC investment ($)		STTR awards ($) SBIR awards ($)
Human Resources	Advanced S&E degrees		NAEP Science & Math Scores S&E degrees Labor force growth
Innovation Resources	Patents Academic R&D expenditures ($) Industrial R&D expenditures ($)	Academic R&D productivity	Federal R&D performance ($)
Innovation Economy Outcomes	Business Start-Ups Entrepreneurs Exports ($)	R&D to GSP ($ ratio)	Tech Fast 500 companies Real GSP growth

Innovation Resources

Patents per Capita

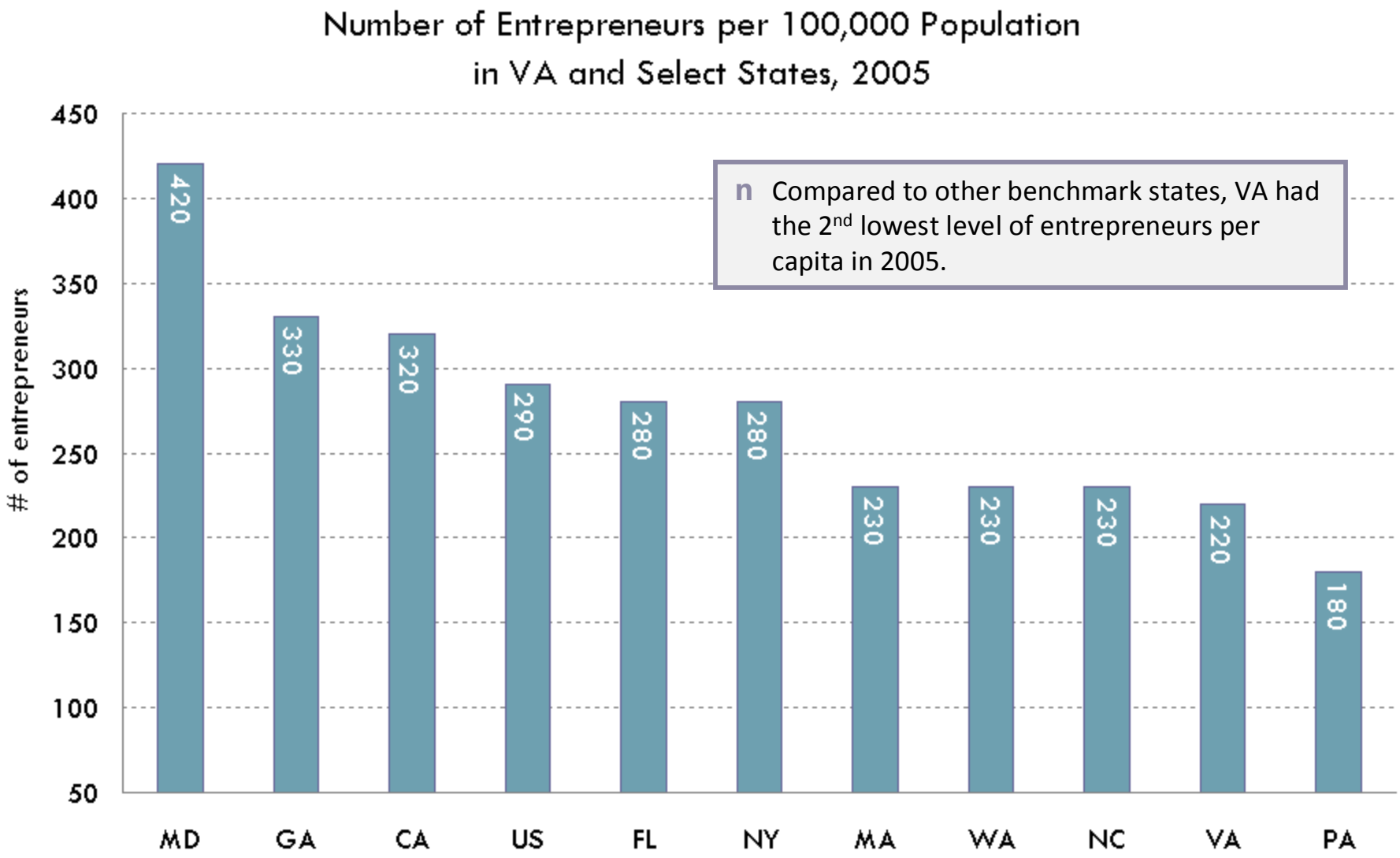


- VA ranked last among the benchmark states for per capita patents awarded in 2006.

Source: US Patent & Trademark Office and US Census Bureau

Innovation Economy Outcomes

Entrepreneurs Per Capita



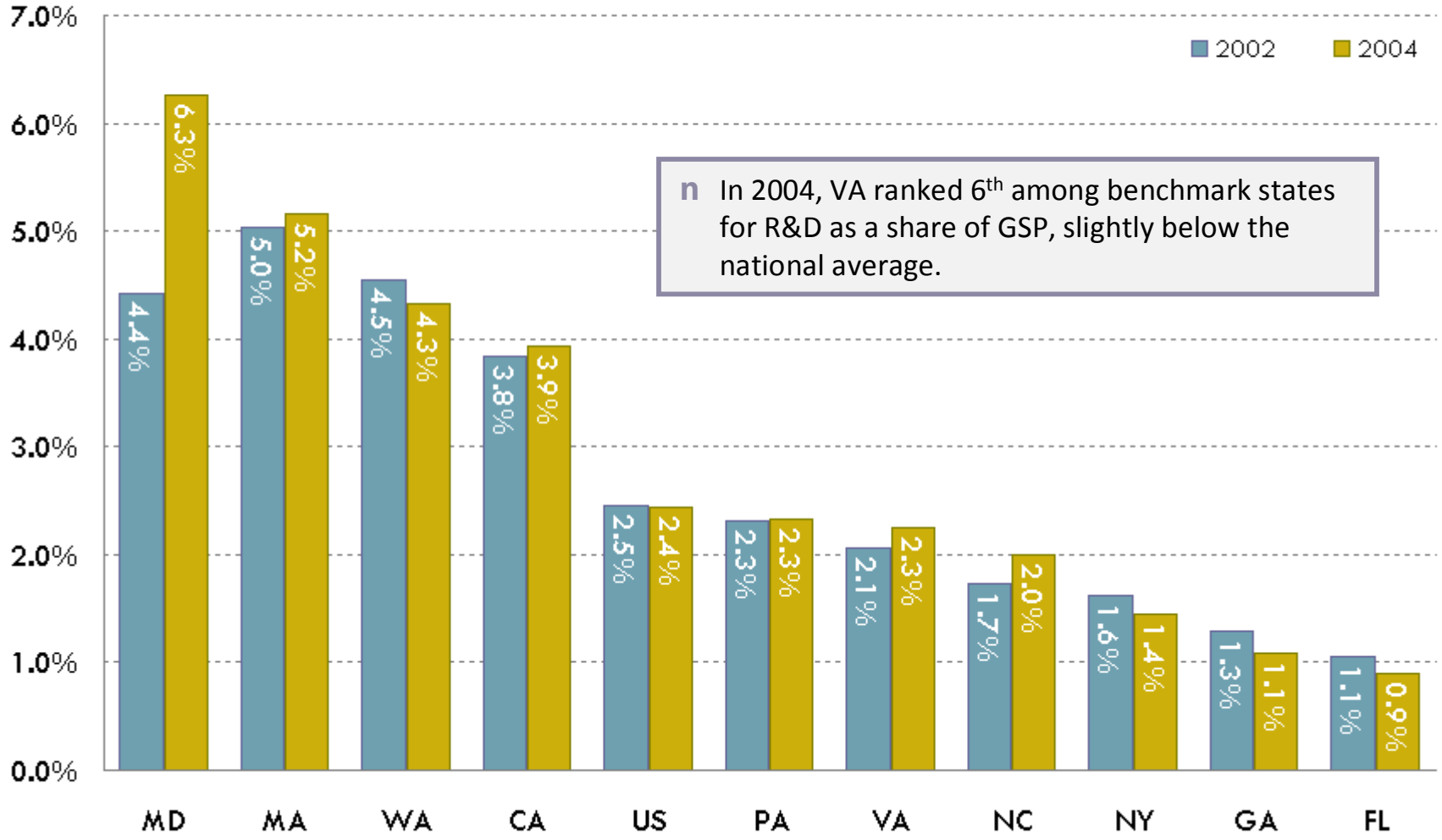
- Compared to other benchmark states, VA had the 2nd lowest level of entrepreneurs per capita in 2005.

Source: Kauffman Foundation

Innovation Economy Outcomes

R&D Share of GSP

Total R&D Expenditures as a Share of GSP in VA and Select States, 2002 and 2004



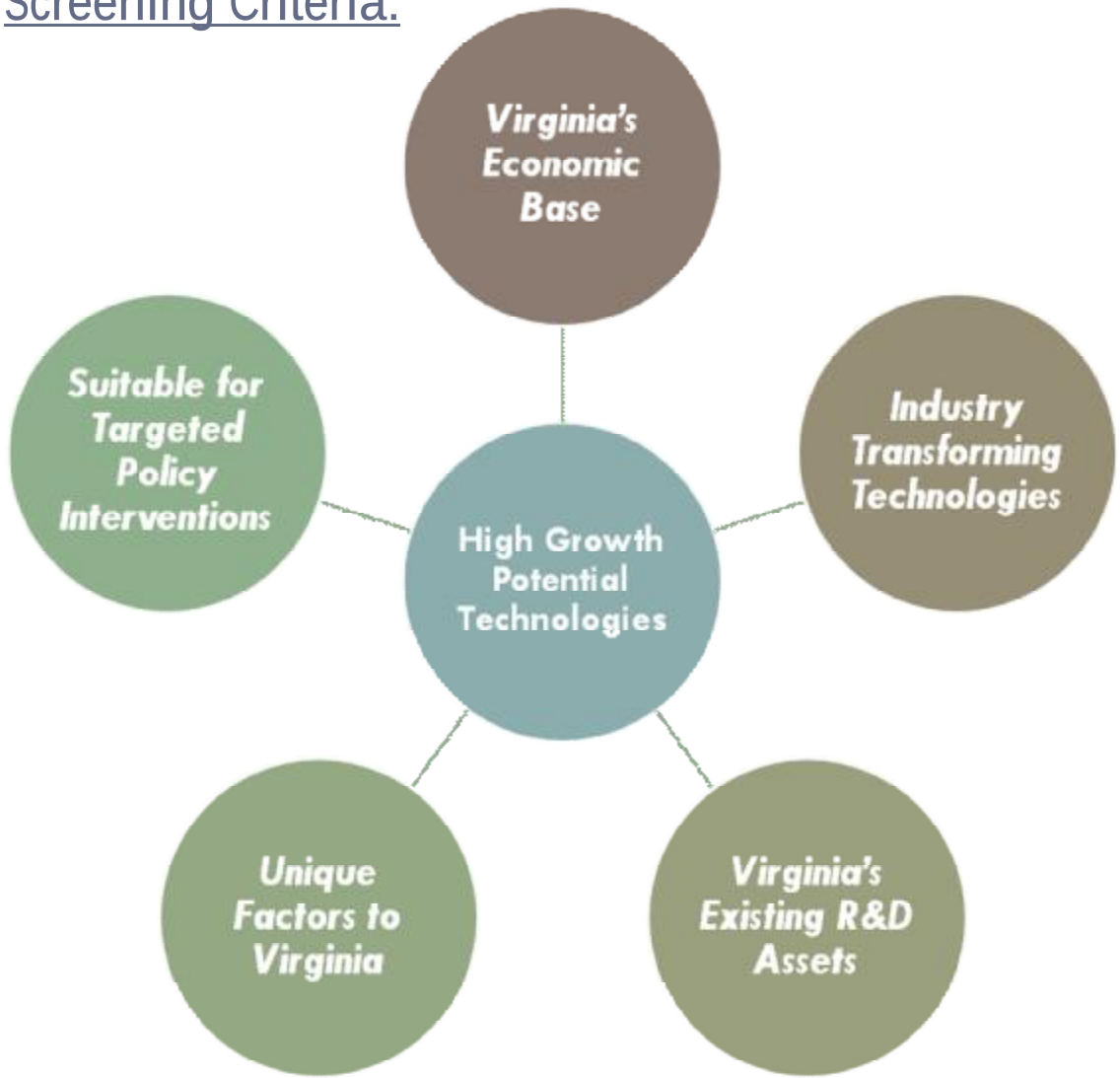
- In 2004, VA ranked 6th among benchmark states for R&D as a share of GSP, slightly below the national average.

Source: National Science Foundation and US Bureau of Economic Analysis

High Growth Potential Technologies for VA

Resources for R&D and technology development are limited. Determining where scarce resources should be deployed is a critically important task.

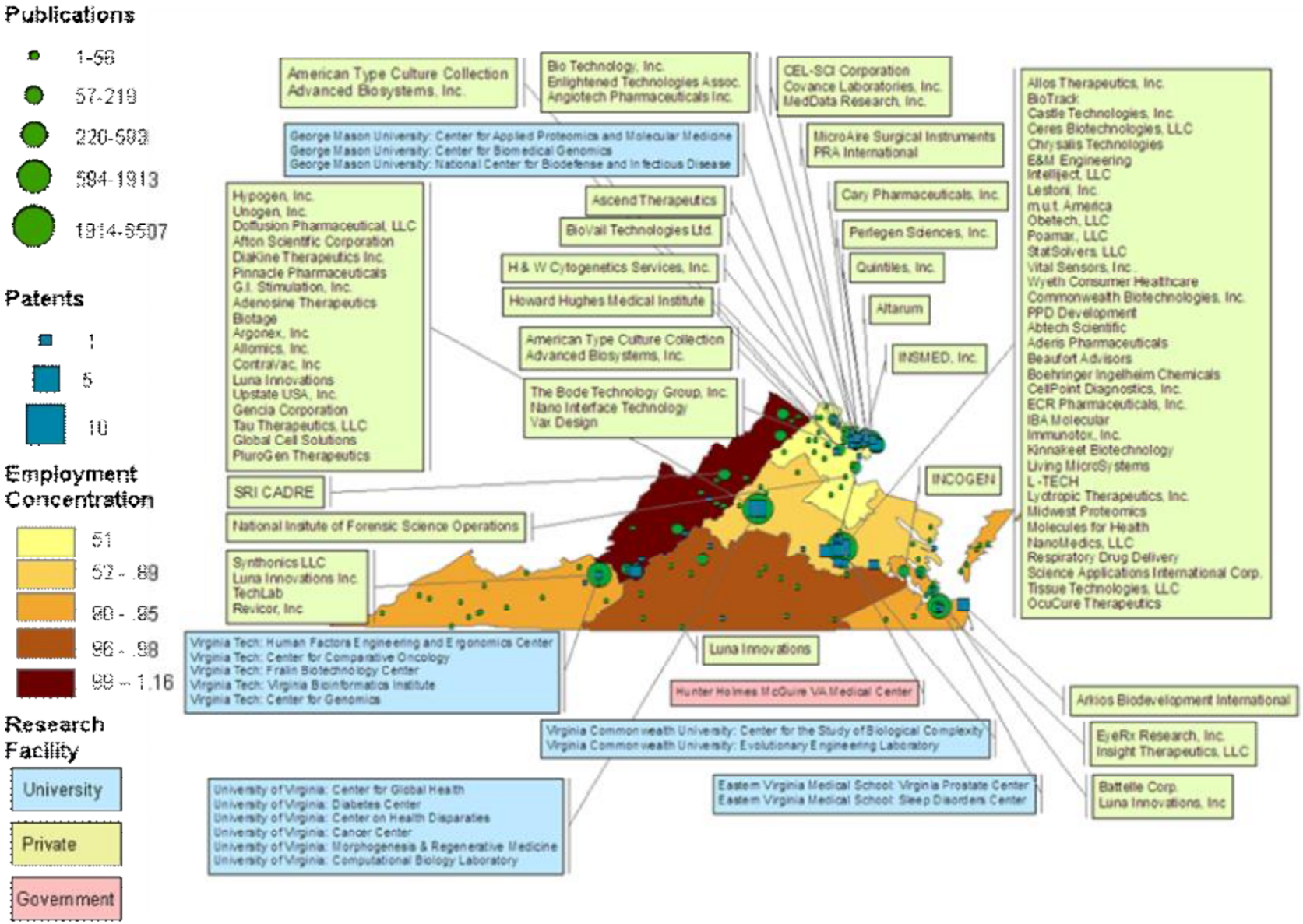
Screening Criteria:



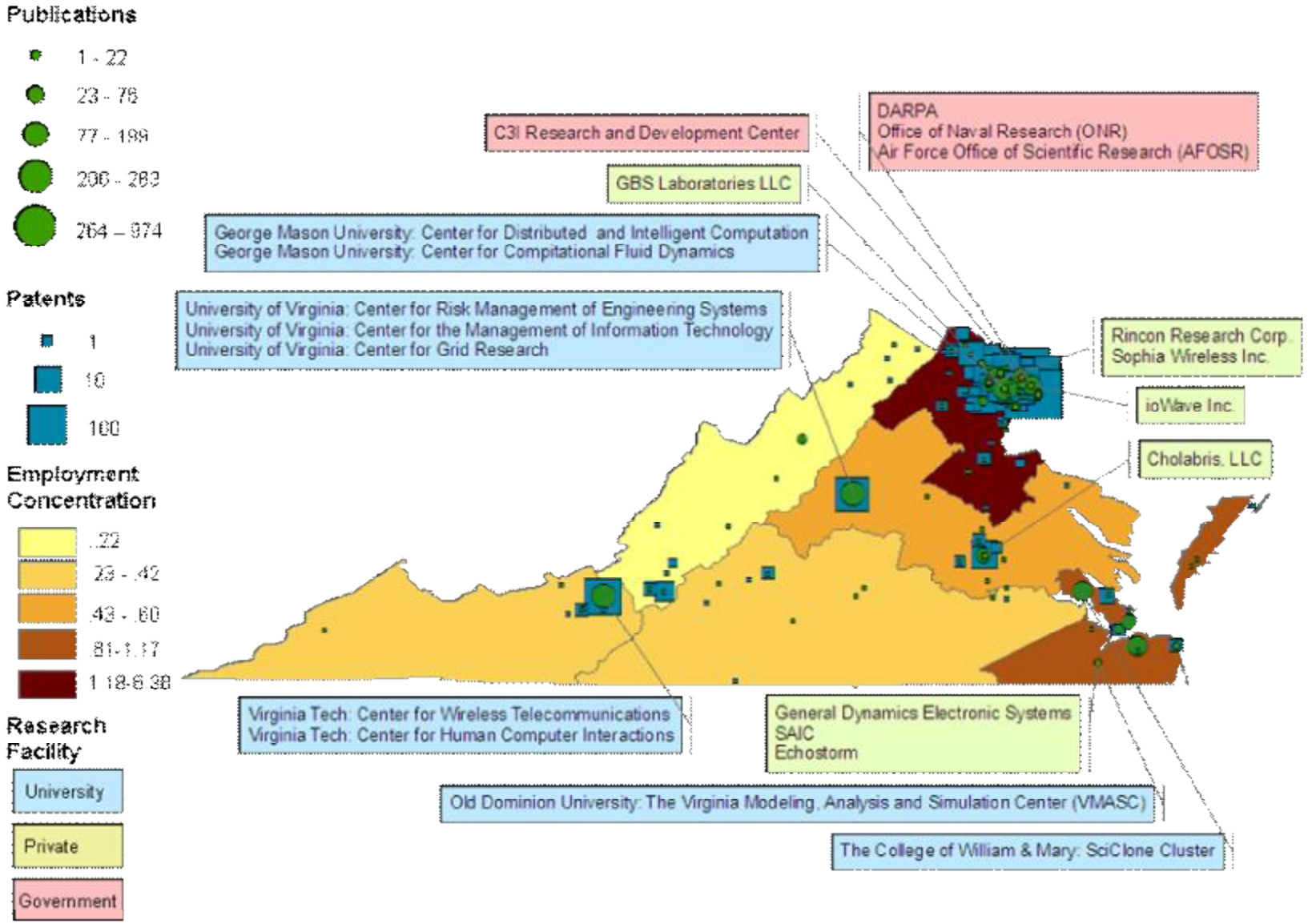
High Growth Potential Technologies

Technology-Based Industry Cluster	High Growth Potential Technologies
Biomedical Sciences and Health Care	Point of Care Diagnostics
	Computational Technologies
Information Technology Services	Health IT
	Cybersecurity
Chemicals and Materials	Nanomaterials
	Biopolymers
Clean Energy and Environment	Fuel Cells and Distributed Hydrogen
	Carbon Capture and Storage
Transportation and Logistics	Radio Frequency Identification
	“Smart” Roads

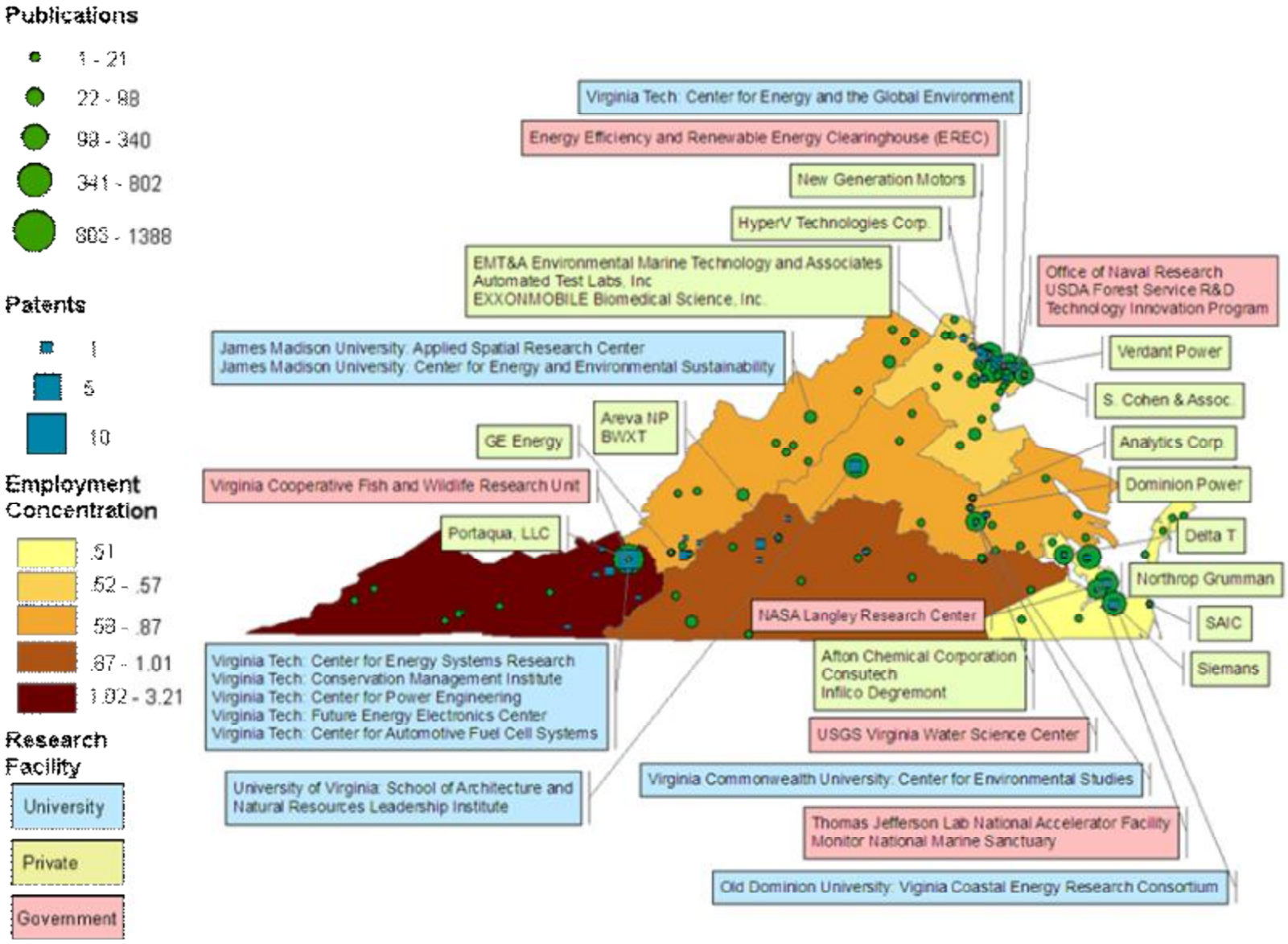
Biomedical Sciences and Health Care



Information Technology Asset Map



Energy and Environment Asset Map



Case Studies

- Enhancing Research Excellence at Universities
  - Georgia Research Alliance
  - University of Texas Eminent Scholars Program
  - Ohio Third Frontier (Wright Mega-Centers)
- Enhancing Collaboration Across Sectors/Disciplines
  - NY Centers for Advanced Technology
  - MD Industrial Partnerships Program
  - CA Industry-University Coop. Research Program
  - NC Research Triangle
- Enhancing Entrepreneurship and Access to Capital
  - MD Venture Fund
  - GA Advanced Technology Development Fund
  - PA Ben Franklin Technology Partners

Lessons Learned

- Highlight collaboration as a central component of all programs.
- Utilize industry and technology experts as key players in decision-making.
- Seek to leverage multiple sources of funding.
- Incorporate key economic development objectives and milestones.
- Introduce and maintain strong systems of accountability.
- Include flexibility to allow for corrections and to support longevity.
- Measure innovation progress.

Summary Assessment

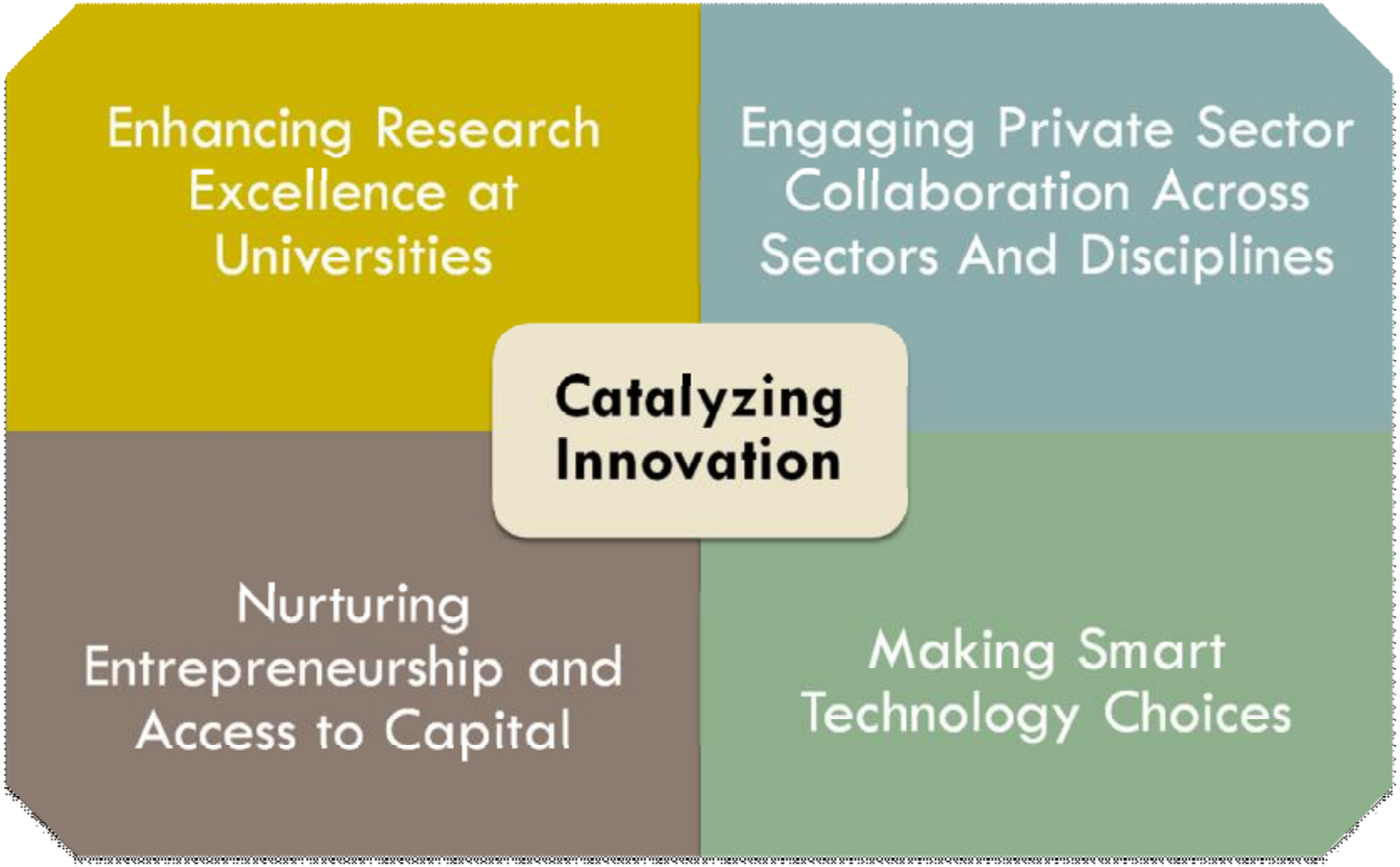
Global and national economic realities challenge forward-looking states to expand industries driven by technology and innovation.

Many of Virginia's high-tech industries serve the Federal market. While important, this narrow focus limits the state's diversity and overall ability to provide high value jobs.

Virginia possesses important assets and initiatives related to innovation, but the Commonwealth has not reached its potential.

An initiative to stimulate innovation and catalyze collaboration among industries, universities, laboratories, etc., can transform Virginia into a model innovation economy.

Strategic Focuses for Virginia



Recommended Approach for Virginia

- Overall Strategic Goal:

  Virginia will become a *Model Innovation Economy*

  - *Crafted and directed by business, government and university communities*

- Implementation Mechanism:

  Virginia Innovation Alliance (VIA)

  - *Public/Private Partnership*
  - *A structure to power collaboration*
  - *Catalyzes Virginia's assets, addresses liabilities*
  - *Introduces a seamless innovation value chain*

VIA Principles and Intent

- Catalyze technology and innovation activities and outcomes
- Leverage additional, sustained private and public resources for R&D
- Gain political support that transcends administrations
- Stimulate increased collaboration among public and private stakeholders
- Support and strengthen existing technology centers of excellence

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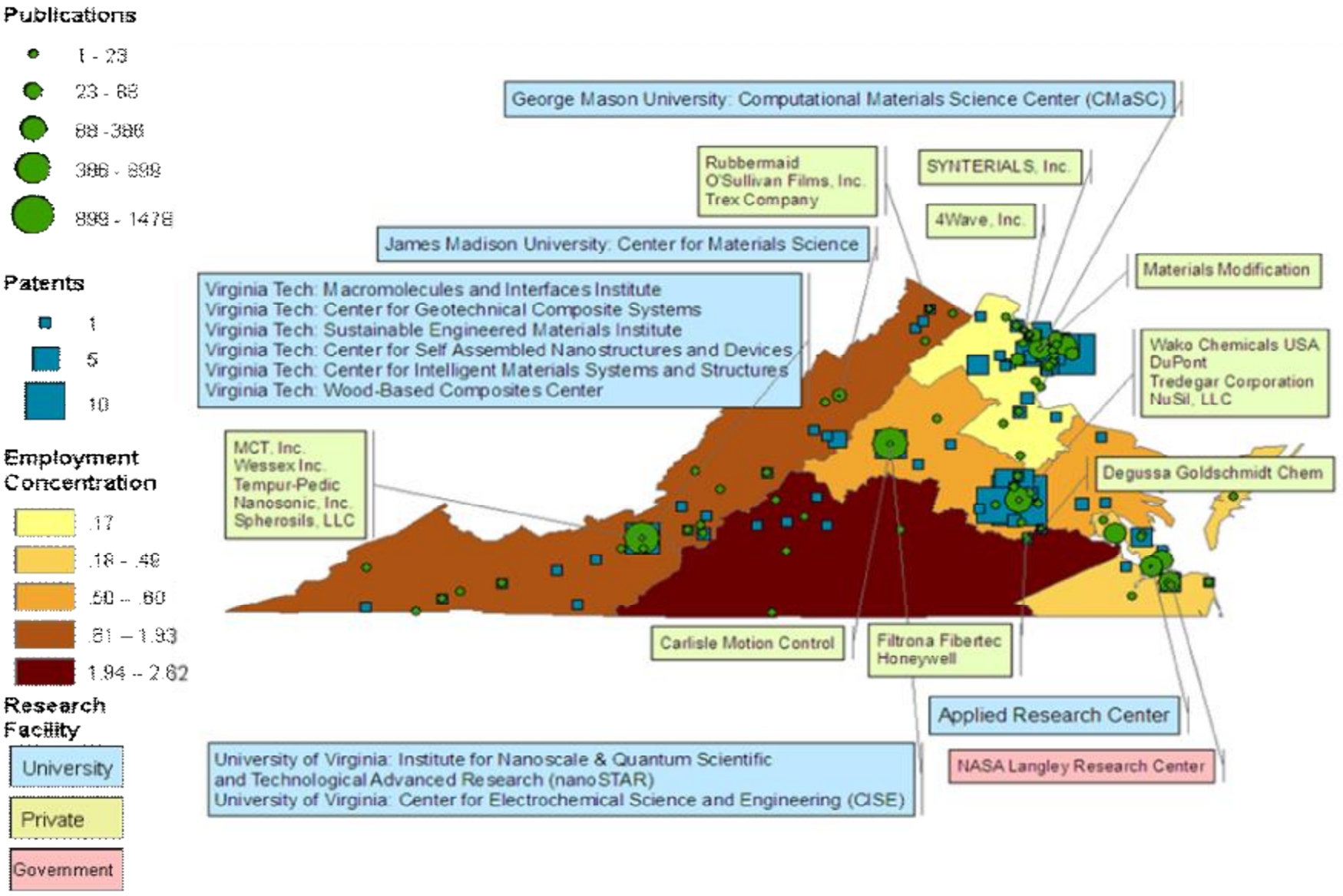
Materials and Chemicals Asset Map



Transportation and Logistics Asset Map