

Massachusetts R&D 2011

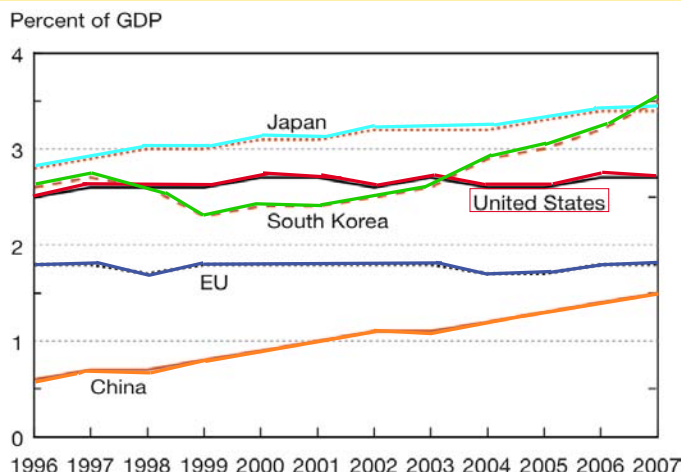
Science & Engineering R&D Fuels U.S. Economic Growth & New Jobs

A More than fifty years of experience shows that a strong federal commitment to scientific research is key to building a better America. **Discovery and innovation are proven fuels for economic growth and job creation.** And they are vital elements for achieving energy security and sustaining America's global leadership in science. We must begin to reduce the deficit and begin to live within our means. But we must be smart about how we go about it. **Federal support for science will spur economic growth and help restore a firm fiscal foundation for our nation.**

National Science Foundation (NSF) study found that 73% of the science papers cited in industry patents were funded by taxpayers through the federal government, especially university research operations.¹

Massachusetts received \$4.31 billion in federal prime award R&D contracts in FY 2010, with approximately 4,732 transactions taking place.² Information and charts on this page demonstrate the importance of federal investment in R&D to Massachusetts' economy, and its future in the global marketplace.

Federal R&D Expenditures as Percentage of GDP Compared to Strategic Competitors 1996 - 2007³



Fueling Massachusetts' 21st Century Workforce: Federal R&D Expenditures at Massachusetts Universities & Colleges FY 2008³

Massachusetts' colleges and universities received \$2.27 billion in federal R&D spending in FY 2008, making it 6th in the nation.

Key Reports and On-line Resource

- The Science-Engineering-Technology Working Group (SETWG) sponsors the annual Congressional Visits Day Program. See www.aboutastra.org/cvdl/
- **Science & Engineering Indicators 2010**, published by the National Science Board, provides a broad base of quantitative information on the U.S. and international science and engineering enterprise. It is created biennially by the National Science Foundation's Division of Science Resources Statistics (SRS). See www.nsf.gov/statistics/seind10/

Top 5 Recipients of Federal R&D Contracts (not Grants)² Performed in Massachusetts FY 2010*

1.	RAYTHEON	\$1,589,977,986	(37%)
2.	MIT	\$855,100,525	(20%)
3.	MITRE CORP.	\$325,091,046	(8%)
4.	GENERAL DYNAMICS	\$218,756,460	(5%)
5.	JOHN SNOW INC.	\$191,979,228	(4%)

* Note: R&D contract & grant amounts do not include management and administrative fees for the operation of Government-Owned, Contractor-Operated (GOCO) facilities under OMB definitions.

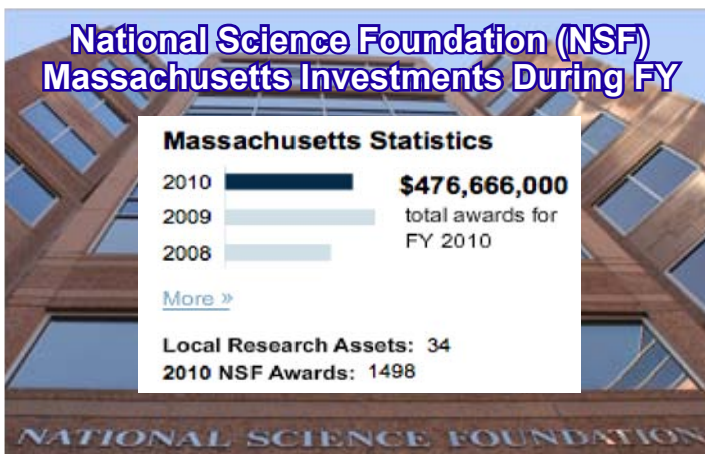
Top 5 Federally-Funded R&D Contract Product or Service Types Spent in Massachusetts FY 2010²

1.	Defense Elect. Basic R&D	\$885,524,065	(21%)
2.	Engineering — Adv. R&D	\$608,809,578	(14%)
3.	Defense Missile and Space Syst. R&D	\$574,018,221	(13%)
4.	Other Research R&D	\$333,136,742	(8%)
5.	Defense Missile and Space Systems R&D	\$302,133,547	(7%)

Top 5 Contracting Agencies for Massachusetts R&D Investments During FY 2010²

1.	AIR FORCE	\$1,535,738,049	(36%)
2.	ARMY (except Corps of Engineers Civil Program Financing)	\$834,807,307	(19%)
3.	NAVY	\$822,620,780	(19%)
4.	Missile Defense Agency	\$559,446,801	(13%)
5.	U.S. Agency for Int'l. Development	\$206,649,227	(5%)

National Science Foundation (NSF) Massachusetts Investments During FY



The 2010 CVD State R&D Sheet State Series are made possible by the American Chemical Society www.acs.org/, IEEE-USA www.ieee-usa.org/, and SPIE-The International Society for Optical Engineering www.spie.org/



How Massachusetts Ranks 2011

Rank	Science & Technology in Massachusetts' Economy ^{3, 4, 5}	Massachusetts	Total U.S. ^{**}
15	Massachusetts' Population as of July 1, 2010 (U.S. Census Bureau estimates)	6,631,280	309,050,816
8	High-Technology Share of all Business Establishments 2006 (%)	9.78%	8.35%
33	Net High-Tech Business Formations as Share of All Business Estab. 2006 (%)	.11%	.18%
1	Employment in High-Tech Establishments as % of Total Employment 2006 (%)	16.32%	11.45%
1	Average Annual SBIR Funding <i>per</i> \$1 Million of Gross Domestic Product 2006-2008 (\$)	\$626	\$127
1	Venture Capital Disbursed <i>per</i> \$1,000 of Gross Domestic Product 2008 (\$)	\$8.15	\$2
13	Venture Capital Disbursed <i>per</i> Venture Capital Deal 2008 (\$ millions)	\$7.34	\$7.43
2	R&D as Share of Gross Domestic Product 2007 (%)	6.97%	2.62%
1	2010 State <i>New Economy Index</i> Overall Rank (composite of 26 innovation indicators) ⁵	NA	NA
Rank	Elementary & Secondary Education ³		
1	Fourth Grade Mathematics Performance 2007 (Score out of 500)	252	239
3	Fourth Grade Science Performance 2005 (Score out of 300)	160	149
1	Eighth Grade Mathematics Performance 2007 (Score out of 500)	298	280
5	Eighth Grade Science Performance 2005 (Score out of 300)	161	147
5	Public School Teacher Salaries 2007 (\$)	\$58,895	\$50,816
10	Share of Public H.S. School Students Taking Advance Placement Exams 2008 (%)	29.2%	25%
Rank	Higher Education ³		
7	Bachelor's Degrees in Nat. Sciences & Engineering. <i>per</i> 1,000 Indiv. 18–24 Yrs. Old 2007	11.5	8.1
2	S&E Graduate Students per 1,000 Individuals 25–34 Years Old 2007	28.7	12.3
Rank	Workforce Indicators ³		
2	Individuals in S&E Occupations as Share of Workforce 2008 (%)	6.35%	3.75%
4	Engineers as Share of Workforce 2008 (%)	1.59%	1.06%
3	Life and Physical Scientists as Share of Workforce 2008 (%)	.79%	.40%
3	Computer Specialists as Share of Workforce 2008 (%)	3.27%	2.08%
Rank	Financial R&D Indicators ³		
47	State Agency R&D Expenditures per \$1 Million of Gross Domestic Product 2007 (\$)	\$16	\$89
1	Business-Performed R&D as Share of Private-Industry Output 2007 (%)	\$6.08%	2.20%
2	Academic R&D per \$1,000 of Gross Domestic Product 2008 (\$)	\$6.22	\$3.66
Rank	Academic R&D and Patent Output Indicators ³		
1	Academic S&E Article Output per 1,000 Doctorate Holders in Academia 2006-2008	723	577
2	Academic S&E Article Output per \$1 Million of Academic R&D 2008 (# articles)	4.77	3.24
5	Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia 2006	15.6	11.6
8	Patents Awarded per 1,000 Individuals in S&E Occupations 2008	16.2	13.4

Sources: 3. *Science & Engineering Indicators 2010*, National Science Board and National Science Foundation / Science Resources Study Division; 4. National Venture Capital Association www.nvca.org; 5. Information Technology & Innovation Foundation www.itif.org

** rankings include the District of Columbia

