Nationally, about 1 in 16 workers (6.2% or 9 million) have occupations as scientists or engineers (4.9%), or technical workers (1.3%). The STEM workforce is larger still when defined as either those who hold a bachelor’s degree or higher in S&E (24.5 million) or those who use S&E technical expertise in their jobs (23.8 million), regardless of level of degree.

A state’s S&E performance helps fuel its and the nation’s economy. Four benchmarks of Massachusetts’ S&E performance are highlighted here: the cost of public higher education, the size of the STEM workforce, investment in research and development, and venture capital funding.

**Rising Cost of a Bachelor’s Degree**

A bachelor’s degree is one of several entry points to higher paying jobs associated with science, engineering, and many technical occupations.

Nationally, 34% of the total U.S. workforce has a bachelor’s degree or higher. In contrast, 76% of workers in S&E occupations have a bachelor’s degree or higher.

**Average annual in-state cost of a public 4-year institution**

(Adjusted for inflation to 2018 dollars)

- **2000:** $10,000
- **2005:** $15,000
- **2010:** $20,000
- **2015:** $25,000
- **2018:** $30,000

**Massachusetts**

**U.S.**

Source: National Center for Education Statistics, *Digest of Education Statistics*

**STEM Workforce: People Working in STEM Occupations**

Nationally, about 1 in 16 workers (6.2% or 9 million) have occupations as scientists or engineers (4.9%), or technical workers (1.3%). The STEM workforce is larger still when defined as either those who hold a bachelor’s degree or higher in S&E (24.5 million) or those who use S&E technical expertise in their jobs (23.8 million), regardless of level of degree.

**Jobs in S&E as a percent of all jobs in 2018**

- **Massachusetts:**
  - Scientists/Engineers: 7.0%
  - Workers in Technical Occupations: 1.8%

- **U.S.:**
  - Scientists/Engineers: 4.9%
  - Workers in Technical Occupations: 1.3%

Research and development (R&D) spending is a driver of innovation. Investing in science and technology today has ripple-effect benefits throughout the economy over the long term.

Annual state performance in R&D varies considerably, from $289 million (SD) to $135.1 billion (CA). Massachusetts is one of 9 states that performs between $15 to $30 billion per year in R&D. In this figure, Massachusetts’ percent change in R&D spending is compared to the highest and the two lowest states within this group.

**Total 2016 Research and Development Performed**

<table>
<thead>
<tr>
<th>State</th>
<th>R&amp;D Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA</td>
<td>$28.9B</td>
</tr>
<tr>
<td>U.S.</td>
<td>$515.3B</td>
</tr>
</tbody>
</table>

Source: NSF, National Center for Science and Engineering Statistics, National Patterns of R&D Resources

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Venture capital investment supports U.S. businesses that take on the risk of developing and commercializing cutting-edge, emerging technologies. States with high values are successful at attracting venture capital to fuel new kinds of business, and ultimately, expand economic growth.

**Total 2017 Venture Capital Investment**

<table>
<thead>
<tr>
<th>State</th>
<th>VC Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA</td>
<td>$9.3B</td>
</tr>
<tr>
<td>U.S.</td>
<td>$80.6B</td>
</tr>
</tbody>
</table>

Source: Pitchbook Venture Capital and Private Equity Database

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**Percent change in R&D spending: 2000 to 2016**

(Adjusted for inflation to 2016 dollars)

- **80.6%** Maryland
- **59.7%** Massachusetts
- **38%** U.S.
- **-4.0%** New Jersey
- **-17.2%** Michigan
- **59.7%** Massachusetts

**Year 2000 R&D Spending Level**

2000 2016

**Total annual venture capital investment: 2000 to 2017**

(Adjusted for inflation to 2017 dollars)

Massachusetts Total

Year 2000 R&D Spending Level