



UMASS DONAHUE INSTITUTE •



The Massachusetts Defense Industry: Characteristics and Economic Impact

Executive Summary

Prepared for MassDevelopment by Rebecca Loveland with Michael Goodman,
Matt Hoover, Alexandra Proshina and William Proulx

November 2007



MASSDEVELOPMENT

Build. Create. Innovate.

Produced by the Economic and Public Policy Research Unit, University of Massachusetts Donahue Institute.

Michael Goodman, Director

Anna Curtis, Research Assistant

Katera Como, Administrative and Projects Coordinator

John Gaviglio, Data Manager

Mathew Hoover, Research Analyst

Lindsey Koshgarian, Research Analyst

Rebecca Loveland, Research Manager

Katherine Modzelewski, Research Analyst

William Proulx, Research Assistant

Timothy Richard, Research Assistant

Susan Strate, Project Manager

Raija Vaisanen, Research Assistant

Jeremy Wolf, Research Assistant

Copyright October 2007

University of Massachusetts Donahue Institute

The contents of this publication may be reproduced only with permission of the authors.



Executive summary

Purpose of the study

To inform its effort to maintain and develop the state's competitive position in the defense technology industry, MassDevelopment commissioned a study to examine the nature, scale, and competitiveness of the defense industry in Massachusetts. Carried out by the University of Massachusetts' Donahue Institute, the two-part analysis looks at the nature and scope of Massachusetts business activities generated by defense and homeland security contracts over the following topic areas: historical trends; scale of contracting activity; key industry sectors and sub-sectors; the nature of products and services; and research and development strengths. The study also provides an economic impact analysis that documents the output and employment effects generated by the defense industry in the Commonwealth. All years referenced are federal fiscal years.

Conclusions

The defense sector, defined in this study as commercial activity generated by U.S. defense and homeland security contracts, military personnel payroll, and retiree benefits paid to state residents, is a key driver of the Massachusetts economy. During 2005, defense sector spending in Massachusetts by federal agencies totaled \$9.2 billion and generated an additional \$5.5 billion in indirect spending. All told, defense sector spending impacts accounted for 4.6 percent of the state's gross domestic product in 2005. Critical industry players in the Commonwealth include both large and small businesses. While large businesses earned the largest share of profits (68 percent of contract awards), small businesses also play an important role in the industry (earning 13 percent of Massachusetts contract awards).

Summary of key findings

Characteristics of the defense industry in Massachusetts

Scale and distribution of contracting activities in Massachusetts

Prime contracts

- Prime contracts – those worth at least \$25,000 – generated \$9.1 billion in revenues to Massachusetts businesses and institutions in 2006, an increase of \$744 million (8.9 percent) from 2005.
- In 2005, prime contracts represented approximately 2.8 percent of Massachusetts GDP, an increase from 2000, when prime contracts represented about 1.7 percent of Massachusetts GDP.
- The dollar value of prime contract awards between 2000 and 2005 increased 91.6 percent – a far higher rate than the 18.5 percent growth rate in the Massachusetts GDP during that time.

All contracts

- Federal fiscal year 2005 defense and security contracting activity in Massachusetts involved 13,391 contracts providing products and services worth \$9.8 billion or the equivalent of three percent of Massachusetts GDP. Of these, 12,202 contracts worth \$9.6 billion were from the Department of Defense (DoD), with the remainder coming from the Department of Homeland Security (DHS).
- Massachusetts ranked eighth among states in DoD prime contract awards in 2005.
- The 13,391 contracts went to 2,435 Massachusetts companies.
- These Massachusetts-based contractors performed most of their work – \$8.1 billion or 83 percent of it by dollar value – in Massachusetts itself.
- The largest proportion of contract awards (\$6.5 billion or 67 percent of the total) went to “large U.S. businesses,” while more than \$1.2 billion in contracts (13 percent of the total) went to small Massachusetts businesses.
- Four major defense technology sectors operate in Massachusetts: professional and technical services (26 percent of all Massachusetts defense and homeland security contracts in FY05); computer and electronic product manufacturing (nearly 23 percent of all contracts in FY05); transportation equipment manufacturing (14.5 percent of all contracts in FY05); and telecommunications manufacturing (9.8 percent of all contracts in FY05).
- More than 32,000 jobs were directly dependent on defense and security contracting activities in Massachusetts.

Defense products and services provided by Massachusetts firms

- 41 percent of DoD procurements were for the purchase of supplies, 31 percent were for services and 27 percent were for research, development, test and evaluation services (RDTE). In contrast, close to 60 percent of DHS procurements were for services (many not highly technical in nature) and only 24 percent were for products.
- The DoD is, relative to the DHS, the major consumer of high-technology products and services from Massachusetts companies.
- Major manufactured defense product groups include transportation equipment manufacturing (\$1.3 billion in sales), communications equipment manufacturing (\$1.0 billion) and weapons manufacturing (\$928 million).
- Fourteen of 16 product types purchased by DoD involve complex, technology-based manufacturing.
- Nineteen of the 20 highest-valued products supplied by Massachusetts companies are produced by technology-intensive industry sectors.
- Within the defense services category, major product groups include technical and professional services (\$1.29 billion) and equipment maintenance and inspection (\$944 million).
- In FY05, five of the top ten service sectors, all of which clearly build upon the critical mass of professional and/or technically-trained workers in Massachusetts, represented \$1.8 billion or 60 percent of the dollar value of all DoD service contracts.
- Of the ten top-valued services provided by Massachusetts defense contractors to the DoD, all but two require highly trained professional and technical workers.
- Within defense-related research and development, top product groups include technical and professional R&D (\$993 million), other R&D (\$886 million), and weapons-related R&D (\$552 million).
- RDTE services are predominantly provided by Commonwealth companies in high-technology sectors. Spending in these sectors amounted to 95 percent of RDTE spending in FY05.
- DHS procurements from Massachusetts for supplies were dominated by purchases of high-tech products, the most lucrative of which by far was electronics and optics, which brought in \$18 million in DHS contracts.
- DHS procures services with relatively lower skilled labor requirements. Moderate skill sectors include seven of the top ten product sectors in terms of dollar value of contracts.

SBIR and STTR research awards

- In 2005, Massachusetts ranked first in the nation in defense-related Small Business Technology Transfer (STTR) awards and second in Small Business Innovation Research (SBIR) awards, receiving more than \$137 million from both programs. This amount accounted for nearly 17 percent of the STTR defense funding and more than 12 percent of SBIR defense funding for 2005.
- In 2004, more than 50 percent of total SBIR and STTR awards to Massachusetts came from the Department of Defense or the Department of Homeland Security. In 2005, nearly 50 percent of SBIR funding and nearly 60 percent of STTR funding came from these two departments.
- Despite Massachusetts' front-runner status, the number of SBIR and STTR contracts awarded to Massachusetts dropped from 528 to 503, or 4.7 percent, from 2004 to 2005; total funding dropped more deeply, however, by 13 percent.
- In both 2004 and 2005, products related to sensors, electronics and electronic warfare received the highest level of SBIR awards and funding, though funding increased from roughly \$30 million for 103 grants in 2004 to more than \$37 million for just 91 grants in 2005.
- Other significant defense technology sectors in Massachusetts, defined by larger numbers of awards and higher levels of funding, include information systems technology, weapons, and materials and processes. Funding declined across these three categories, however, from 2004 to 2005.
- DHS spending in the Commonwealth dramatically increased from 2004 to 2005 – from \$599,000 to more than \$3 million. This spending increased most dramatically in three divisions: human factors; chemical and biological; and explosives.
- In 2004, projects related to information systems technology received the most awards and funding from STTR with more than \$5 million. In 2005, projects related to sensors, electronics and electronic warfare received the most awards, but the majority of funding for Massachusetts projects went to materials and processes.

DHS grants

- In 2005, Massachusetts received nearly \$62.5 million in grants from the Department of Homeland Security, accounting for 2.5 percent of the nation's \$2.5 billion allocation.

Economic impact analysis

Total economic impacts

- In 2005, defense industry production and spending on salaries for military personnel and retirees in the state generated a combined total of \$9.2 billion in direct impacts – \$8.4 billion in contracts and another \$746 million in disposable income from salaries and retirement benefits.
- This combined spending generated an additional \$5.5 billion in indirect and induced impacts.
- Combined economic impacts within the Commonwealth total \$14.7 billion.
- Defense industry production and spending on military salaries in Massachusetts support 114,560 jobs.

Economic impacts of defense sector spending

- In 2005, \$8.4 billion in contracts went to contractors who performed work in Massachusetts. Through the multiplier effect, every dollar that went to contractors generated an additional \$0.61 in spending. These contracts generated an additional \$5.2 billion of indirect and induced activities in the state.
- In 2005, Massachusetts defense contracts directly supported 32,240 jobs in the state. Through the multiplier effect, defense-related economic activity generated an additional 39,187 jobs in the state, yielding a total of 71,427 jobs generated by defense contract activities in the Commonwealth.
- The search, detection and navigation instruments sector generates the highest level of economic impacts within the state, generating more than \$1.2 billion in annual impacts for the Commonwealth. Contracts to the next top-ranked industry sectors – aircraft engine and engine parts manufacturing and scientific research and development services – together contribute \$1.9 billion annually.

Economic impacts of Massachusetts military active and retiree payroll spending¹

- In 2005, 35,925 military service members, staff, and retirees residing in Massachusetts received more than \$787 million in payroll and \$308 million in retirement benefits, a total of \$1.095 billion.
- Disposable income for these active duty personnel, civilian staff and retirees totaled more than \$745 million in 2005, generating an additional \$161 million in indirect impacts and \$193 million in induced impacts. These individuals thus generate \$1.099 billion in total economic impacts.
- Spending by military personnel and retirees directly supports the equivalent of 4,484 additional jobs in the state. Indirect and induced employment generated by military household spending brings the total number of jobs generated by military personnel spending to 7,208.

¹ Most numbers (personnel- and contract-related figures) in this study are reported on a fiscal year basis. Massachusetts National Guard figures are reported, however, on calendar-year basis.



UMASS DONAHUE INSTITUTE



MASSDEVELOPMENT

Build. Create. Innovate.

800.445.8030

www.massdevelopment.com