

MANUFACTURING IN METRO BOSTON IS... GROWING. YES, GROWING

A COMMERCIAL BANKING PERSPECTIVE



Though not the first industry most would identify with metropolitan Boston, manufacturing in The Hub is experiencing an innovation revolution. Biotechnology, robotics, telcom equipment and greentech are all thriving. Powered by the region's deep experience in complex product development, engineering and innovation, manufacturing is one of the top three industries in Greater Boston, with real GDP of \$34.2 billion in 2014.¹

The manufacturing landscape in Boston has changed significantly in the past decade. Employment in the sector stands at nearly 191,000.² Average hourly earnings for manufacturing production employees are growing, and 16% higher in Boston than the national average. Though the city's higher-than-average cost of living makes it less appealing for low-cost manufacturers, the area is attractive for firms that both value a highly-skilled workforce and seek to leverage Boston's technology and life sciences research infrastructures. In addition, Boston's robust access to markets - including a port that handles more than 1.5 million metric tons of cargo annually and strong international distribution networks - enhances local manufacturers' export potential. In fact, led by the Boston gateway, Massachusetts is ranked seventh among the 50 states in successful globalization initiatives by the 2014 New Economy Index.

Today, innovators are developing new products that drive organic growth - from 3D printers to solar-powered park benches - and traditional manufacturers are applying advanced techniques to bring competitive advantage to the production of staples like coffee and sneakers as well as technology products like printed circuit boards and OEM components.

WHY BOSTON'S DNA HELPS MENTOR MODERN MANUFACTURING

Manufacturing innovation depends on ideas and capital, and Boston offers plenty of both. The proximity of more than 100 colleges and universities, including eight world-class research universities, fuels continuous research with skilled engineering, technical, medical and business graduates. Boston's strong educational infrastructure powers economic growth, from MIT - consistently one of the top recipients of new patents among universities around the world - to Wentworth Institute of Technology, an up-and-coming leader in practical engineering education, explicitly focused on delivering "the designers, architects and engineers who form the backbone of the state's innovation economy."³ What's more, Boston institutions are leaders in commercializing research innovations, executing more than 2,000 technology transfer licenses from 2008 to 2012 - a volume that ranks Boston as a leader among metro areas in the U.S.⁴

But the best ideas, from robotics to pharmaceuticals to navigational instruments, can only be commercialized with capital, and Boston is one of the nation's leading financial centers. Home to one of the first two venture capital firms formed in the U.S. - the American Research and Development Corporation (ARDC), founded in 1946 - Greater Boston ranked third in total VC investment in 2015 with nearly \$5.6 billion invested, according to the National Venture Capital Association. From venture capital to private equity and commercial finance, Boston's financial power and vision have powered start-ups, turnarounds and value-creating strategies across the manufacturing spectrum.



A Sampling of New Economy Manufacturers

- Waltham's **Preserve Products** manufactures ecofriendly household items from recycled plastic and the company is commended by consumers and businesses for reducing energy, water resources and carbon emissions.
- **Formlabs**, based in Somerville, sprouting from research done at MIT, produces high-quality and affordable 3D desktop printers for designers, engineers and artists around the globe. Industry experts identify 3D printing as one of the hottest technology areas.
- **Moderna Therapeutics**, a Cambridge-based biotech firm - which leverages collaboration with Harvard and MIT researchers, as well as Brigham and Women's and Children's Hospitals of Boston - received \$950 million in funding since its founding in 2011, and is expanding its R&D and manufacturing space in Kendall Square.
- **Ambri**, a high-tech electricity storage startup headquartered in Cambridge, opened its first manufacturing plant in Marlborough in November 2013. Leveraging liquid metal battery technology developed at MIT, the company is poised to take off having raised \$35 million in Series C funding in April 2014.
- **Sarepta Therapeutics**, a Cambridge-based biotech firm, is a worldwide leader in the development and manufacture of PMO-based chemistries for RNA therapeutics. The company has recently built a 60,000 square foot manufacturing facility in Andover.
- In Boston, **Changing Environments**, an MIT Media Lab spin-out, produces "Soofas," solar-powered benches that charge phones and retrieve data, capabilities which are now in demand nationwide.

Boston's academic research and innovative business applications have benefited well-established manufacturers as well.

- **New Balance**, founded in 1906, employs 1,300 skilled workers at five facilities in Massachusetts and Maine. The company has remained competitive in the largely off-shored industry in part by investing in flexible manufacturing systems and innovations, including the use of 3D printing to develop customized plates based on individual runners' biomechanical data. Its investment in state-of-the-art IMEVA injection molding enables it to manufacture end-to-end in the U.S. - a claim that buttresses the brand's popularity as it remains "the only major company making athletic footwear in the USA."
- **AccuRounds**, a contract manufacturer of precision machining of custom cylindrical components since 1976, currently employs a staff of nearly 100. It is focused on machining complex shafts, pins, valves and assemblies for medical, defense, semi-conductor, aerospace and energy industries, among others. In 2006, it became the first contract metalworking company in North America to receive the Shingo Prize for lean manufacturing excellence. And in October 2014, it completed an 18,000 square foot expansion to its Avon facility, in part driven by winning back manufacturing contracts previously outsourced to China.
- A pioneer of Boston's Seaport District, **Harpoon Brewery** produced its first craft beer, Harpoon Ale, in 1987 at a converted warehouse on the Boston waterfront. In 2000, Harpoon expanded its production capabilities with a second brewery in Windsor, Vermont. As of 2014, Harpoon was the 12th largest craft brewery in the U.S. with 187 full-time employees between its two facilities. Preserving its ethos of independence and maintaining its team-lead culture, Harpoon's most recent milestone was achieved in August 2014 when it became an employee-owned company through an Employee Stock Ownership Plan (ESOP).

ENSURING A STRONG MANUFACTURING FOUNDATION FOR BOSTON'S FUTURE

The importance of manufacturing to the metro area and the state's economy overall is clear. Between emerging and established firms, manufacturers generate 12% of the state's GDP⁵ while accounting for 8.2% of employment in Greater Boston.⁶

The state of Massachusetts has shown a commitment to prepare the next generation of highly skilled manufacturers through its STEM Plan 2.0: Expanding the Pipeline for All. With this initiative, the state intends to increase students' exposure to and certification attainment in science, technology, engineering and math disciplines.

Continued collaboration among academic, government and industry stakeholders is important to maintain and build Boston's manufacturing advantage, ensure availability of top-quality skilled workers, and support the innovation advantage fueled by Boston's power triumvirate of education leadership, manufacturing prowess and access to capital.

Citizens Commercial Banking is proud to support Massachusetts businesses in the advanced manufacturing sector and, by extension, to contribute to the positive impact on the region's citizens, economy and industrial heritage.

ABOUT CITIZENS COMMERCIAL BANKING

Citizens Commercial Banking, one of the nation's leading commercial banking institutions, is a division of Citizens Financial Group Inc., one of the nation's oldest and largest financial institutions, with \$140.1 billion in assets as of March 31, 2016. Headquartered in Providence, Rhode Island, the company has offices in 11 states. We help corporations, municipalities, real estate investors and non-profits build value. We partner with clients to create customized financial solutions to achieve their objectives, drawing from our comprehensive array of services including lending and deposits, capital markets, treasury services, foreign exchange and interest hedging, leasing and asset finance, specialty finance and trade finance.

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¹ Bureau of Economic Analysis, 2014

² Bureau of Labor Statistics (for Boston-Cambridge-Quincy MSA), 2015

³ *Nuts-and-bolts focus sets Wentworth apart*, Boston Globe, October 19, 2014, bostonglobe.com

⁴ *Continuous Reinvention: Greater Boston's Knowledge Economy Edge*, J. Sevin, September 24, 2014

⁵ Bureau of Economic Analysis, 2014, 2014

⁶ Bureau of Labor Statistics, 2015