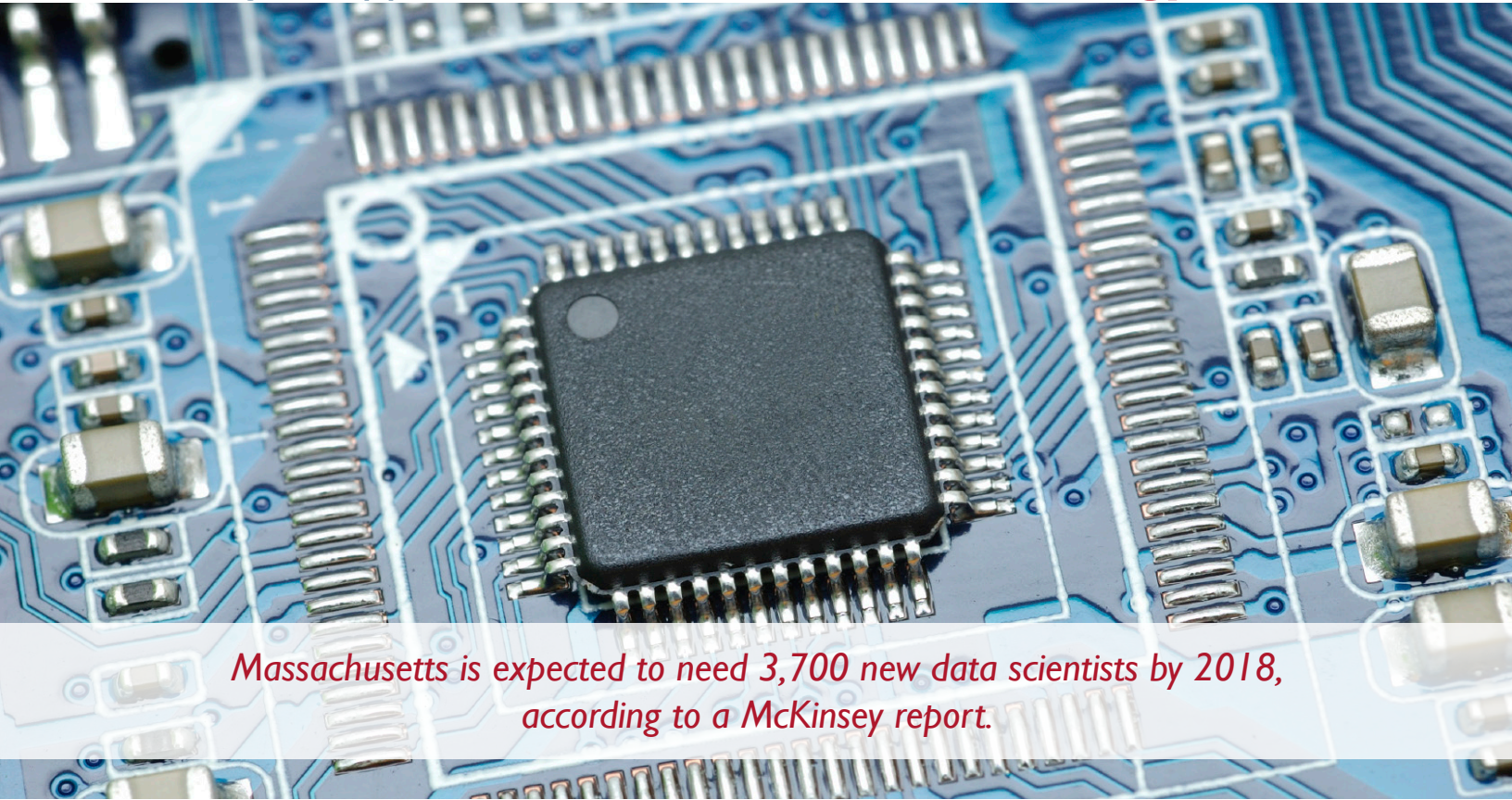# DISCUSSION DRAFT

Challenges, Opportunities, and Vision for **Technology**

Massachusetts is expected to need 3,700 new data scientists by 2018, according to a McKinsey report.

Global Massachusetts 2024 is an initiative of Mass Insight Global Partnerships that convenes leaders from major business groups, industry, and higher education to build consensus for a comprehensive 10-year economic agenda that will position Massachusetts to win the competition for talent and innovation – the key to securing prosperity for all citizens.

Building on the success of the 2006-2008 Global Massachusetts initiative, this new effort will outline how the Commonwealth can grow in the next 10 years, where the opportunities lie, and how government can target limited resources to realize the opportunities.

By consulting leaders in key growth sectors, the broader infrastructure community, and international business and government representatives, Global Massachusetts 2024 is establishing a 10-year vision for the Commonwealth on how government and industry leaders can partner and structure talent and technology resources to grow. This report is a *discussion draft* focused on the **technology** sector.

Global Massachusetts 2024
Winning the Competition for Talent and Innovation

A partnership launched and supported by

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The vision for 2024: Massachusetts broadens its brand as a top tech destination. Through deliberate strategies, it emerges as a world leader in Big Data and cybersecurity by building collaborations between industry and universities to establish Research Centers of Excellence. These centers fund and promote cross-disciplinary innovation and training and provide an ongoing pipeline of top talent. University and community college curricula coalesce around targeted needs of technology companies, helping to supply more job-ready talent. Massachusetts tech leaders and elected officials have pressed for H1-B visa changes, allowing more foreign students to incubate startups here.

The state of the sector today:

The Massachusetts tech sector, a broad rubric that includes Big Data, mobile, robotics, cloud, security, and defense, has been on a roll since the Commonwealth began to climb out of the Great Recession. Technology jobs in Massachusetts have grown at a compounded rate of 3.3 percent since 2010 employing 209,000 people directly at the end of 2013, according to the Massachusetts Technology Leadership Council (Mass TLC) a leading tech trade group. Tech accounts for 19 percent of the Commonwealth's jobs, when factoring in indirect and induced jobs, and about a quarter of the Massachusetts payroll.

Those are big numbers, but they easily could be bigger. There's hardly a tech manager in Massachusetts who isn't in a hunt for talent. "If 50 qualified people walked in the door right now, I'd hire them," a human resources vice president at Altisource Labs, an IT incubator, told the Boston Business Journal in August. Altisource Labs at the time had 100 openings, and is so strapped for talent it hired a recruiting firm to help find recruiters.

Mass TLC has targeted a goal of an additional 100,000 tech jobs in Massachusetts, but tech firms increasingly must compete for available talent. This drives up salaries while compelling tech firms to expand where the talent is abundant, and relatively less expensive.

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Challenges:

A lack of qualified talent is constraining growth. When MassTLC surveyed a group of CXOs in late 2013, the majority of them identified talent acquisition and retention as the number one barrier to growth. Correspondingly, about half of the respondents said they cannot find sufficient talent in the local marketplace.

There's an insufficient supply of computer science majors at local universities. Meanwhile, community colleges are not sufficiently tapped as a talent source even though some have specialized tech programs.

Cyber security and Big Data represent major opportunities. However, demand for talent is outstripping supply. Massachusetts is expected to need 3,700 new data scientist positions by 2018, extrapolating from a McKinsey study that predicted up to 340,000 overall Big Data jobs. When Big Data end users are factored into the totals, Massachusetts has the potential to have 120,000 Big Data jobs, but many of those jobs could go unfilled because of a shortage of workers with the right skills. Cybersecurity faces a similar dilemma, but only worse: Between 2007 and 2013, cybersecurity jobs grew by 87 percent, and the time to fill them takes 24 percent longer, according to Burning Glass.

Foreign students represent a potent talent pool. Visa restrictions often force them to return to their countries when they would rather start their careers, or companies, here. Programs to extend the stays of foreign students, such as former Gov. Deval Patrick's 2014 Global Entrepreneur in Residence Program, provide promising students the opportunity to remain affiliated with a university while building their companies.

Recommendations/Potential Initiatives:

Create cross-sector collaborations with tech industry, government and universities to build advanced research capacities in industry verticals, such as cybersecurity and Big Data. Massachusetts' universities, along with its abundance of leading companies, provide an advantage in creating Research Centers of Excellence. Seeded with federal and state dollars, and supported by industry leaders, a Research Center of Excellence would help catapult Massachusetts as a worldwide innovator and create a magnet for top tech talent.

Coalesce tech industry around STEM education initiatives. Although individual companies and trade groups have increased their focus on STEM, Massachusetts needs a more concerted effort to increase the number of high school students taking computer science classes.

Create training programs for recent grads to provide the necessary skills to segue into tech careers – or augment the one they have. There's an opportunity to broaden early and mid-career training with targeted, accelerated coursework at colleges and universities that's closely informed by the needs of the tech industry – such as certification programs.

Develop better partnerships with community colleges. Lower-level tech jobs are creating a talent challenge at Massachusetts tech firms, and a stronger alignment between community college curriculum and real-world application would help fill the talent pipeline.

Advocate for immigration reform and H1B visas. Massachusetts is hit disproportionally hard by the ongoing stalemate on immigration reform and the static number of visas for foreign talent. Tech leaders must continue to make the case that raising the cap on visas would provide significant economic benefit.

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