



Mass Insight
GLOBAL PARTNERSHIPS

A Growth and Talent Agenda

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Global Massachusetts

Winning the Competition for Talent and Innovation

2024

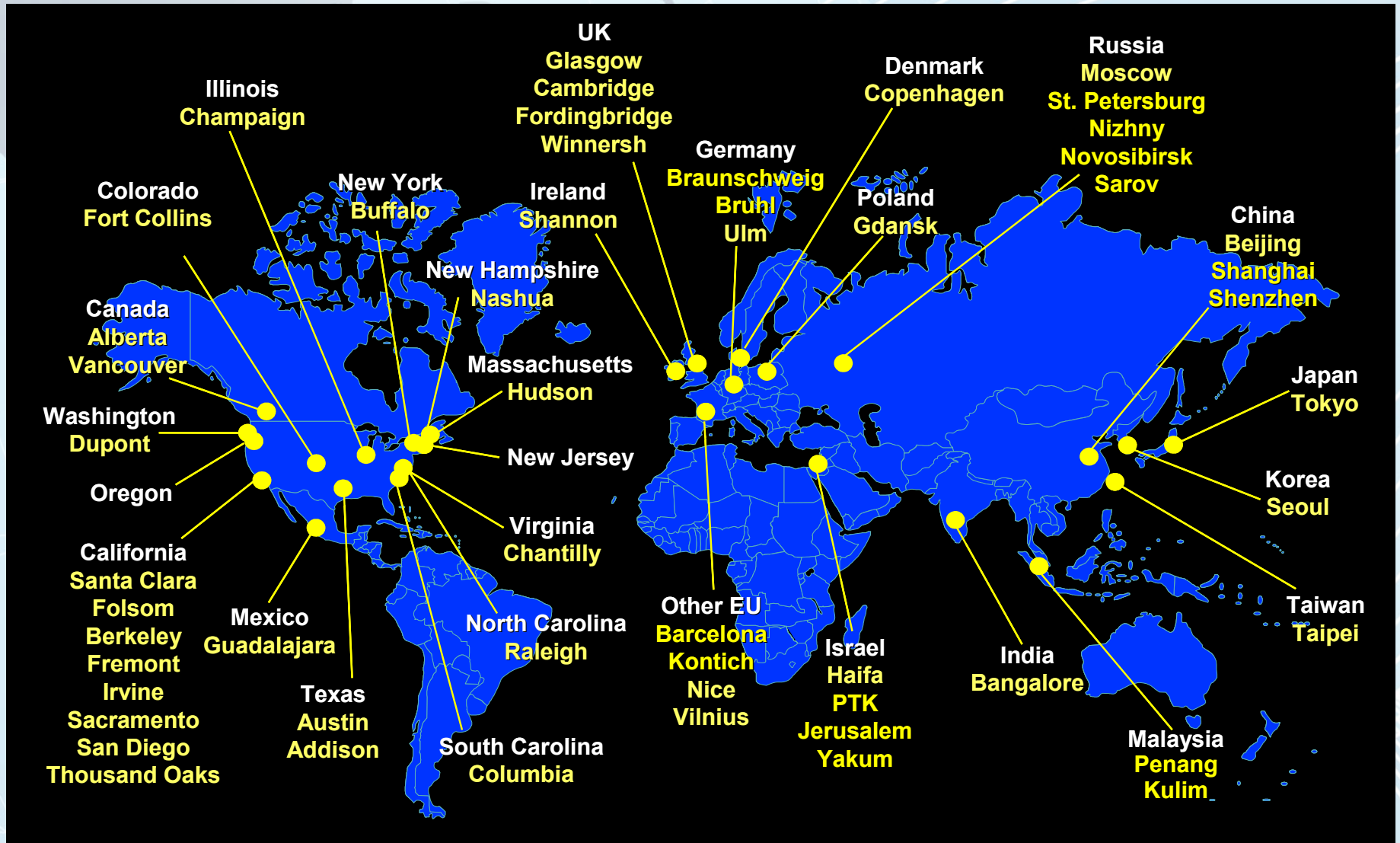
Global Massachusetts 2024 GOALS

- **Establish a vision** for success over the next decade in key technologies and sectors
- **Develop strategies** to achieve the vision. Collaborative research and talent initiatives to win globally where we choose to compete

Global Massachusetts 2024 *STRATEGIES*

- Create **Research Centers of Excellence** to expand next-generation technology initiatives
- Establish **Talent Partnerships** to enhance university-industry collaborations
- Set goals for **College Success** - a K-12/college partnership
- Build a focused **International Strategy**

We are not alone: Intel R&D (2008)



Massachusetts Today: A Talent and Innovation Machine

Built on an economically diverse portfolio:

- **Major Sectors** - A global innovation leader in Life Sciences, Healthcare, IT, Energy, Defense Technologies, Finance, Education
- **Research & Innovation** - A rich history and continued leadership in R&D and commercialization of research
- **Education** – A globally-recognized cluster of over 110 colleges, universities and major research institutions that recruit out-of-state and international students, researchers and faculty

Can we sustain the life sciences R+D success and replicate in other sectors?

- **Life Sciences & Healthcare** – All the 10 top BioPharma companies have significant R&D presence in Massachusetts.
 - Recent successes: GE Healthcare (Marlborough), Baxter (Cambridge)
- **Finance and technology** – Could Boston become, for example, a FinTech capital attracting global financial firms' technology R&D operations?

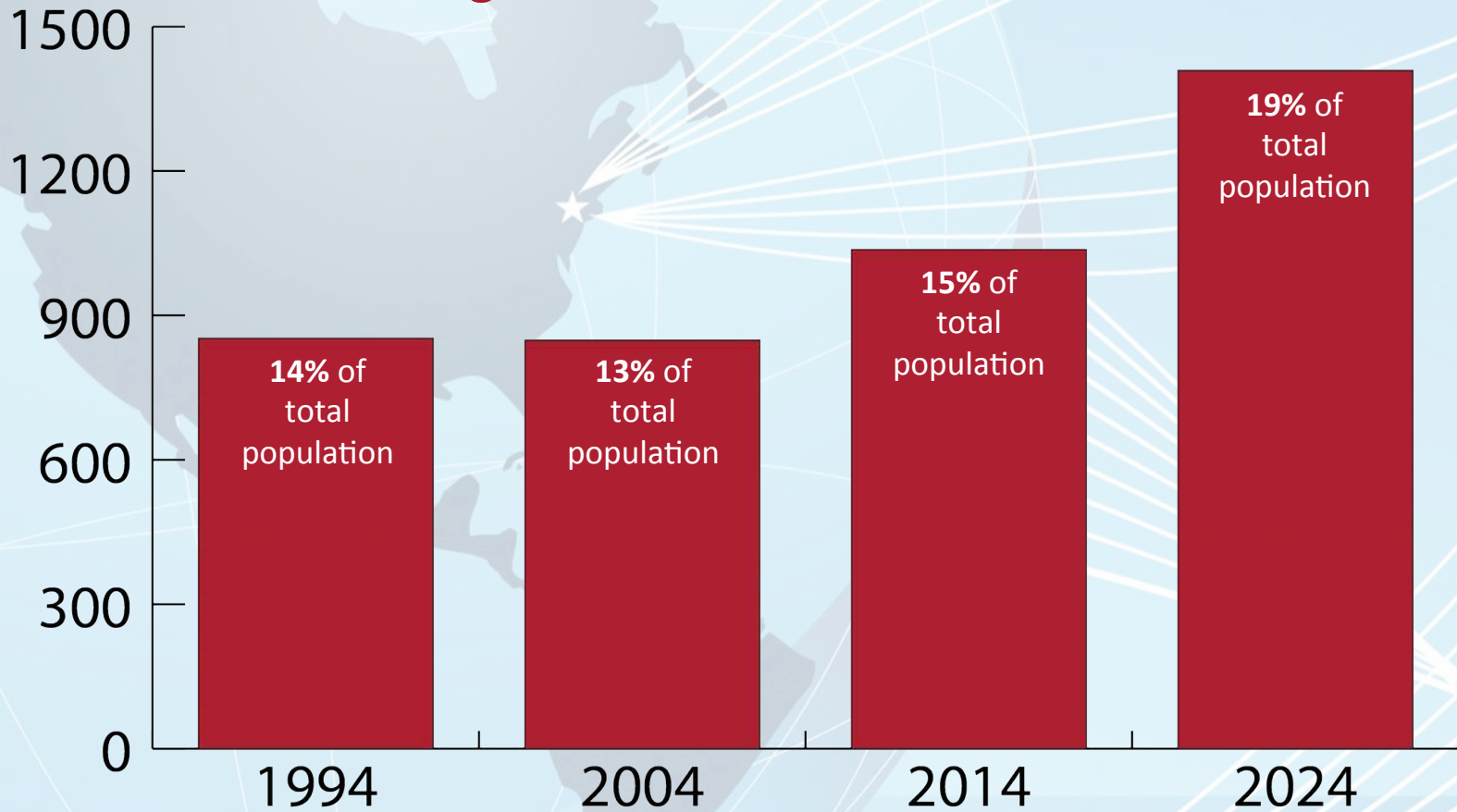
The Massachusetts economy: Challenges ahead.

Significant challenges are likely to affect growth:

- **Talent shortages** – the ‘retirement cliff’, decreasing K-12 graduates, changing requirements for new positions, community college challenges
- **Regulation and disruptive innovation** in key sectors – drug development and healthcare, higher education, finance
- **Aging infrastructure** – transportation, electric grid
- **Geographic divide** – concentration of growth in eastern MA

An Aging and Slow Growth Population

Age 65 and older in thousands



Source: Moody's analytics

Re-defining regional economic strategy

***If you have the talent...
the jobs will come.***

*An economic strategy
based on
talent and innovation.*

Talent clusters support and attract business

Talent clusters are concentrated geographic pools of talent focused on a particular technology or specialized discipline.

- **Proximity** still matters.
- **Critical mass** is important.
- Clusters need **stars** and **supporting talent**.

The Innovation Triangle

Strategic alliances are the key to R&D and talent leadership --
and economic growth

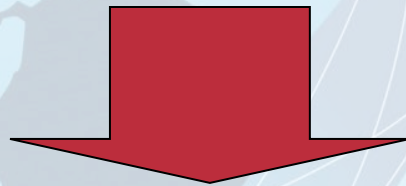


Changes in the innovation eco-system drive strategic university-industry alliances

- **“Open” innovation** – Decline of internal corporate labs, expanding corporate alliances between large and small companies
- **Technology convergence** – Innovation occurring through multi-disciplinary collaborations
- **Shared intellectual resources and facilities** – Science budgets outstrip individual capabilities and funding
- **Applied science rises** – Academic paradigm shifts as funding focuses on applications; basic science is embedded

A regional talent and innovation-based strategy: *Four organizing steps*

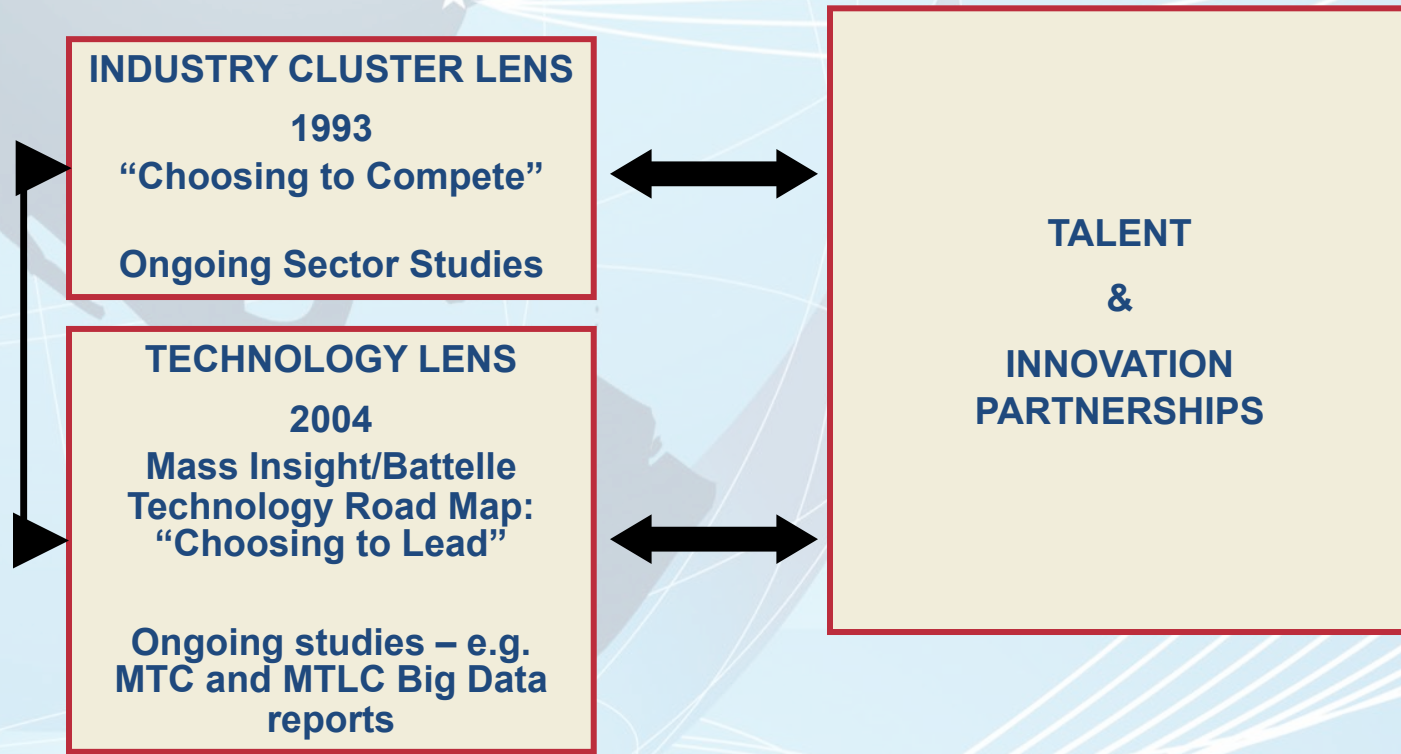
- 1. Focus and Set Goals** – Assess where you can lead and select priorities and goals
- 2. Talent** – Make higher education, schools linked to industry the unifying theme
- 3. Regional Alliances** – Organize strategies to connect assets



- 4. Global Partnerships** – Support an international strategy

Focus: a comprehensive strategy assesses clusters and technologies

Linking **higher education, schools, industry, government**





Science and Technology Strategies and Research Centers of Excellence

Massachusetts in the 1990's: No technology, university-focused strategy

The Economist frames our past marketing message:

“We’re smart. Send money.”

- **Impact of MIT and Harvard** breeds complacency. Conventional wisdom against picking winners and losers leads to no state role.
- **Missed large scale technology opportunities.**
- **Fragmented higher education marketplace** with a powerful mix of public and private. Limited institutional alliances.
- **Increasingly fragmented industry sectors** as small and medium-size enterprises (SME's) dominate. Continuing losses of large firm headquarters.

2004 – 2014 Technology Initiatives

Annual strategic investments in sector-specific centers:

- **Life Sciences** – Life Sciences Center, up to \$100 million, 10 years
- **Tech** – MA Tech Collaborative, \$10 million - new five year commitment in 2012
- **Clean Energy** – Clean Energy Center, \$29 million into energy generation; \$14 million into company building, R&D, workforce development
 - *Each structured, funded, operated differently*

Going Forward: 2015 – 2024

Focus and Goals

The Power of Cross Sector Technologies:

Will MA be a global center for...

- **Cybersecurity** – a human behavior problem. Strong industry players with multi-disciplinary university assets across tech, social sciences, economics, law, policy
- **Big Data** – every sector's opportunity. 3rd after CA, NY?
- **Advanced Manufacturing** – where R&D needs to be close by
- **Robotics** – already a leading innovation center for undersea, aerial and every day applications

Research Centers of Excellence: Winning requires platforms to connect assets

Joint university-industry centers to fund research projects at scale, engage industry with faculty and students to:

- **Lead in science/research** - Compete for federal funding
- **Lead in education** – Develop/recruit local, global talent
- **Create jobs** – Recruit global partners, incubate firms
- **Commercialize innovation** - Create applications

Research Centers of Excellence: Competitors investing at scale in IT/Tech

- **CA: Calit2** - \$700 million in federal grants since 2000
 - www.calit2.net
- **NY: SUNY Albany Nanotechnology** – One of 5 Centers of Excellence funded with \$1.4 billion from state and industry partners
 - www.sunycnse.com
- **Israel: CyberSpark** – \$8.5 million common campus for government agencies, industry, academics
 - www.bgu.ac.il

Research Centers of Excellence

MA:

- **\$100 million+ five-university supercomputing facility** (MGHPCC) provides shared infrastructure and the opportunity for joint research projects.
- **Raytheon's recent partnerships at UMass Lowell** include a building to bring together students and Raytheon staff.
- **The Advanced Cyber Security Center's Research Consortium** will engage university and industry partners. MIT is launching two new cyber security centers.

Should the Commonwealth run or fund Research Centers of Excellence?

Key elements of successful university-industry technology initiatives:

- **Scale:** Willingness to invest large sums
- **Sustainability:** A commitment to think strategically, act for the long-term
- **Risk-taking culture:** Critical to support and encourage risk

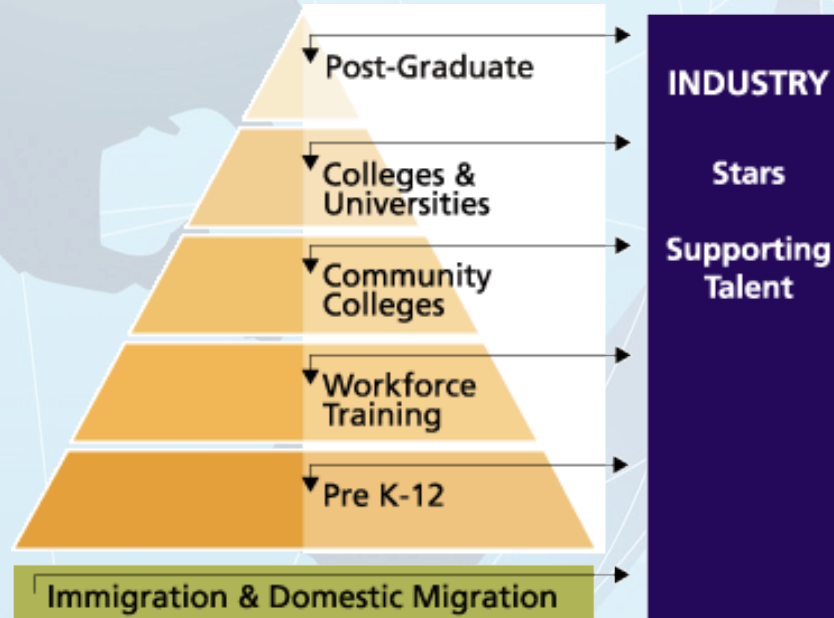
Embedded in an independent nonprofit platform bridging the academic and commercial cultures.



Talent and Education Partnerships

Talent: Higher education linked to industry

Target investments in education, recruit globally for gaps, and build alliances between educational institutions and industry.



Propagate and Support Talent Initiatives

- **Collaborative training** between multiple employers and higher education
- **Internships** and co-op programs
- **Curriculum shaped** to address long-term talent gaps
- **International student training**

The College Success Campaign:

A Partnership of 2 and 4-year Colleges and Schools

Set goals to increase the talent pipeline:

- 1. Double the number** of low-income students graduating from college
- 2. Double the number** of students graduating from college with a STEM major

Align programs in higher education and middle school/high school

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