21st Century U.S. Industrial Policy and Its Illusive Beneficiaries: Can We Build Life Sciences Capabilities in Gateway Cities?

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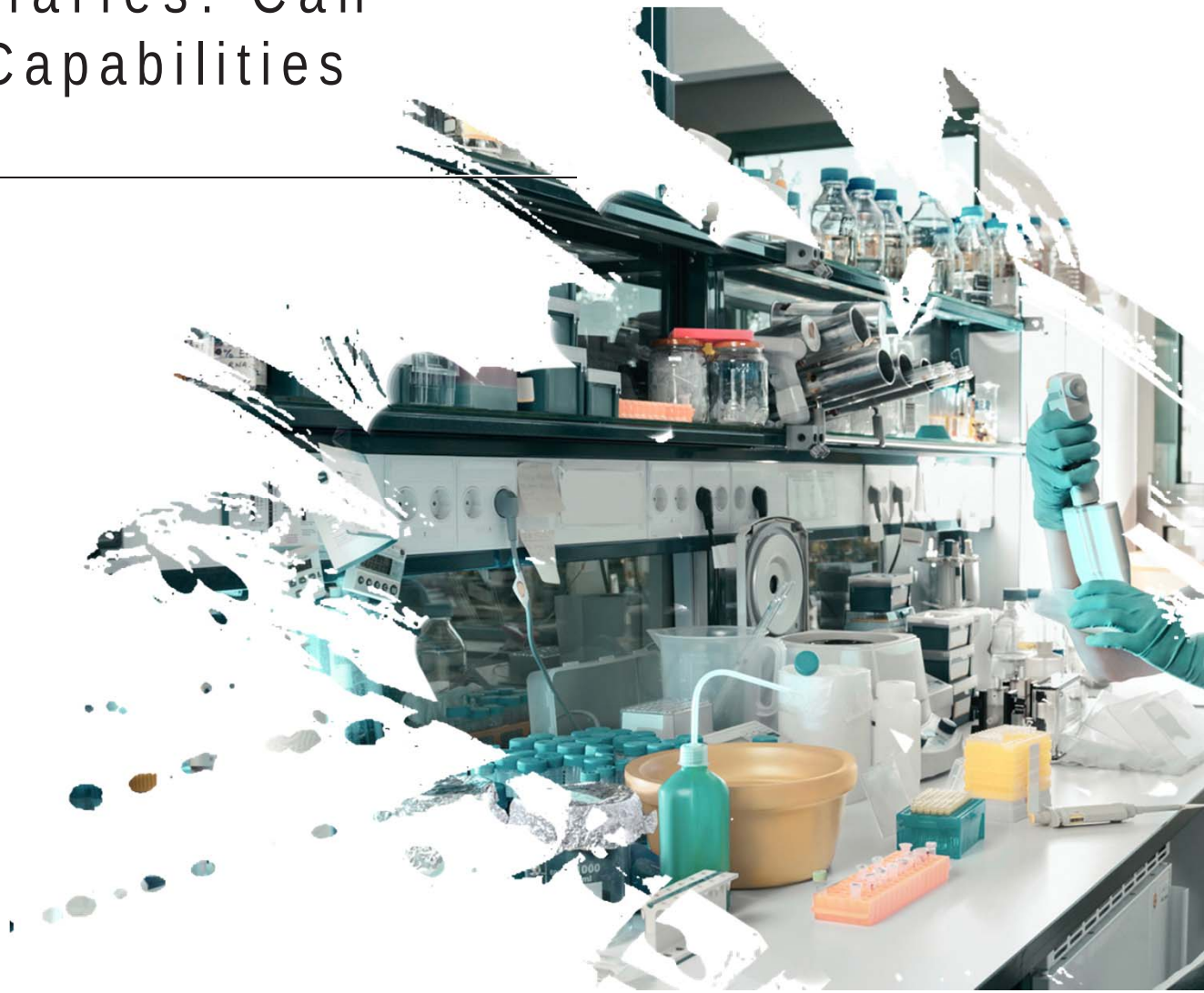

MASSACHUSETTS LIFE SCIENCES CENTER

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Outline

21st Century U.S. Industrial Policy and Its Illusive Beneficiaries: Can We Build Life Sciences Capabilities in Gateway Cities?

1 INTRODUCTION

- Introduction to the Research
- Methods
- Life Sciences Cluster
- Gateway Cities

2 CASE STUDY

- Brockton
- Worcester

3 TYPOLOGY

- Gateway Cities Typology

4 NEXT STEPS

- Next Steps
- Acknowledgements

1

INTRODUCTION

The Challenge of Inclusive Economic Development

At its core, the class is about the challenge of inclusive economic development and the potential to reverse the inequality of opportunity and outcomes that is visible across the state using one of its most successful economic clusters—life sciences. The will of political and business leaders to spread the wealth generated by (arguably) the state's most important economic cluster is certainly genuine, but there is currently no clear mechanism for systematically extending feasible opportunities to under- and disinvested areas.

Policy Problem

The overarching goal or policy problem is to develop strategies that sustain the competitiveness of a world-class regional cluster like the life sciences in Boston-Cambridge-Route 128, while creating opportunities for economically challenged areas to benefit from the economic assets and spillover effects of policy commitments of the Commonwealth of Massachusetts.

The project examines the interplay between market pressures, regional and sub-regional geographies of life sciences activity, and the availability of supply factors such as industrial land, residential housing stock, transportation assets, and skilled labor.

State Policy Emphasizes Traditional Tools:

- Financing, capital, tax abatements, infrastructure
- Skill development
- Partnerships
- Events
- Advocacy
- Research

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- Capital Program
- High School Apprenticeship Challenge
- Internship Challenge
- Massachusetts Next Generation Initiative
- Massachusetts Ramp-Up Program (MassRamp)
- Massachusetts Transition and Growth Program (MassTAG)
- Neuroscience Consortium
- NIIMBL
- STEM Equipment and Supplies Grant Program
- Tax Incentive Program

Program Overview

The Competitive Capital Program is designed to provide grants for capital projects that support the life sciences ecosystem in Massachusetts by enabling and supporting life sciences workforce development and training, research and development, commercialization and/or manufacturing in the Commonwealth. Applicants are academic organizations, research institutions, research hospitals, business incubators and other non-profit organizations. MLSC recognizes that investment in capital projects and infrastructure is required to create and sustain the attributes that make Massachusetts attractive to innovation clusters such as life sciences. This program is designed to help fund high potential economic development projects that promise to make a significant contribution to the state's life sciences ecosystem.

Program to Date

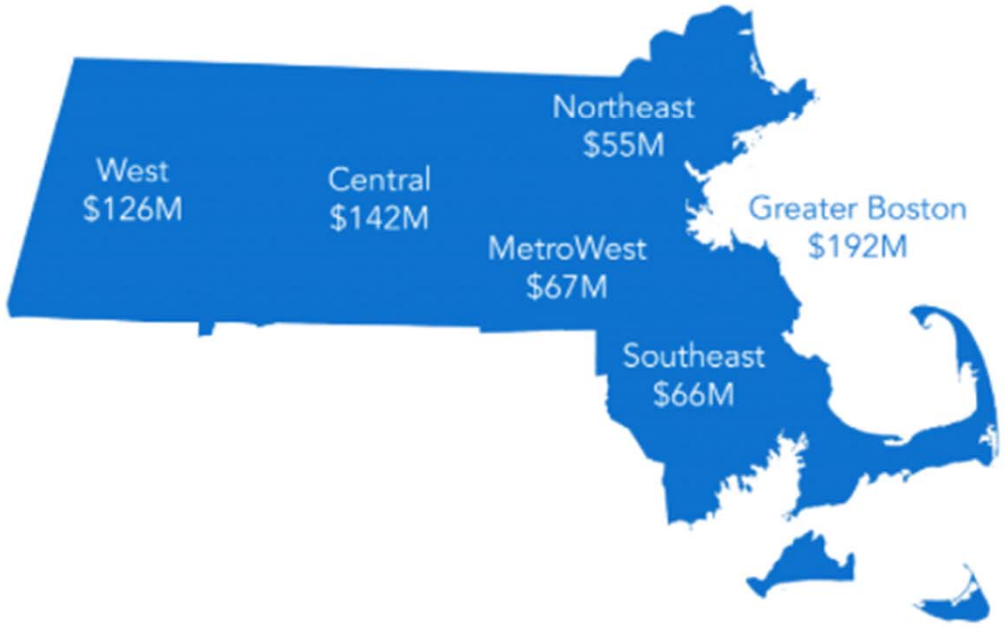
To date, the MLSC has awarded or committed more than $405 million to support capital projects across the state. This includes projects that were designated for funding in the Life Sciences Initiative, and projects funded through the MLSC's Capital Programs.

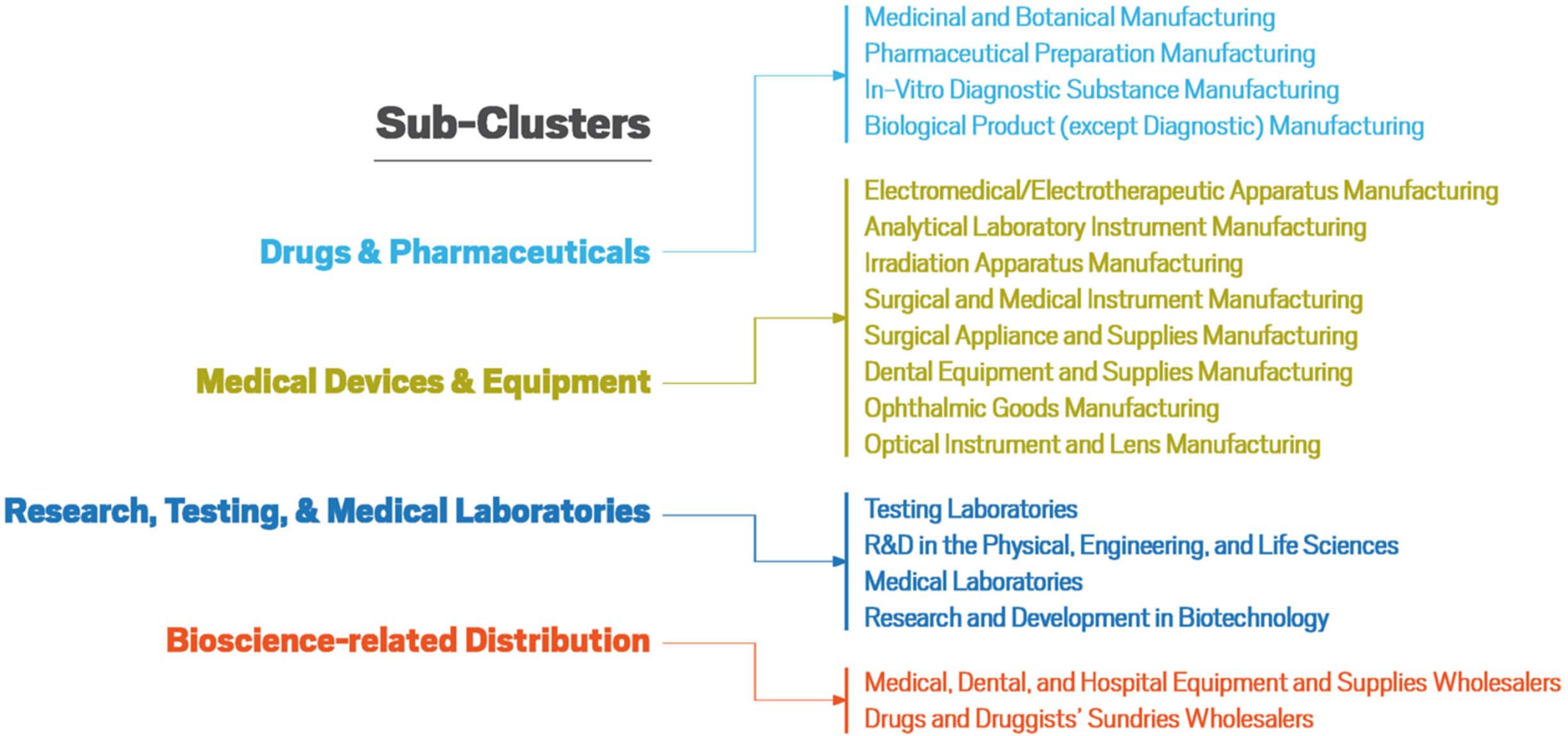
Program Eligibility

Applicants must be a Massachusetts legally organized "not-for-profit" entity such as an academic/research institution, a hospital engaged in research, business incubator or accelerator, or other not-for-profit entity that would be eligible for capital funding from the Commonwealth of Massachusetts. Institutions that are exclusively health care providers and/or requests for the purchase of equipment associated with standard healthcare would not be eligible for capital funding.

The Massachusetts Life Sciences Center has thus far invested or committed more than $650 million* in state funding, leveraged more than $2.8 billion in matching investment capital, and made investments thus far projected to create thousands of new jobs in the Commonwealth.

*approximate distribution of investments the MLSC has made across the state, rounded to the nearest million, as of June 2017





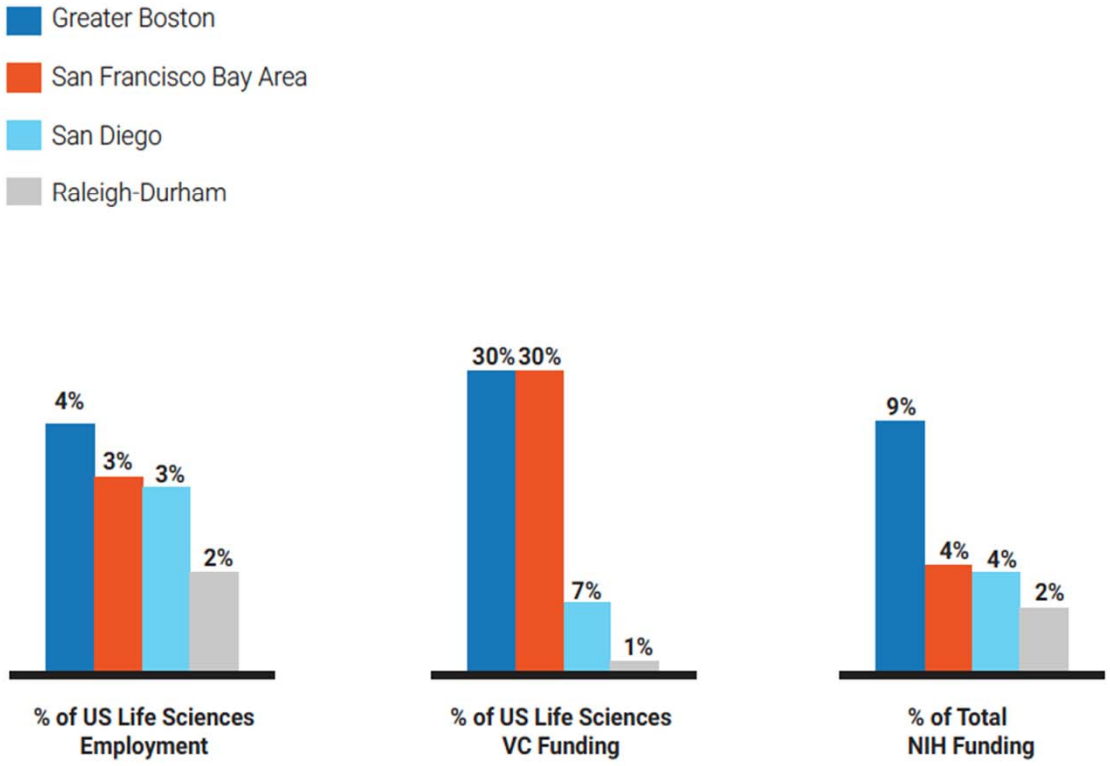
Source: Mass Economics

Life Sciences Cluster | National

"The common theme that brings them together is having a mixture of world-class academic institutions, top-notch research facilities and a tight-knit medical community."
-- JLL, Life Sciences 2017

- U.S. is the global leader in the life sciences
- Top U.S. clusters include Boston, San Francisco, San Diego, and Raleigh-Durham

Life Sciences Clusters in the US



Data source: JLL 2017, CBP

Life Sciences Cluster | Massachusetts

Jobs: **MA** has

100,000 jobs

more than any other state except **CA**

275,000 jobs

Wages: avg **MA wage** is

$135,000

more than any other state except **NJ**

$148,000

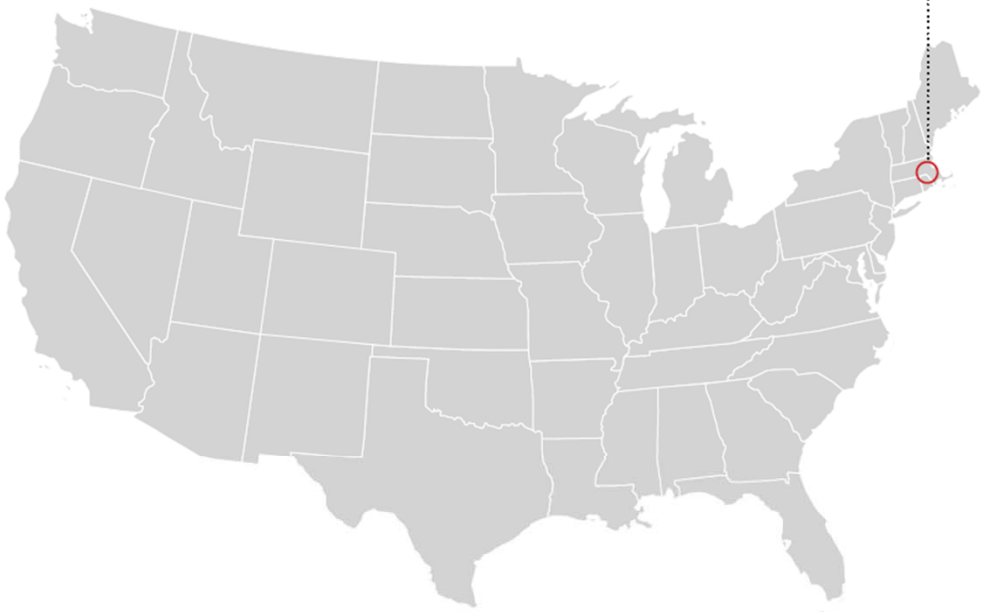
Growth: **MA** has added almost **30,000 jobs** since **2001**

Strengths: Research, Testing & Medical Labs; Medical Devices; Drugs and Pharmaceuticals

Supports: **National leader** in venture capital, federal grants, patents, and university research

Kendall Square

Kendall Square is anchored by MIT and Boston hospitals and has attracted global corporations to locate here because of **innovation and entrepreneurship**. The cluster also benefits from top-notch research facilities, significant NIH funding, and startups. The cluster is known for its work in **research and development**.



Greater Boston

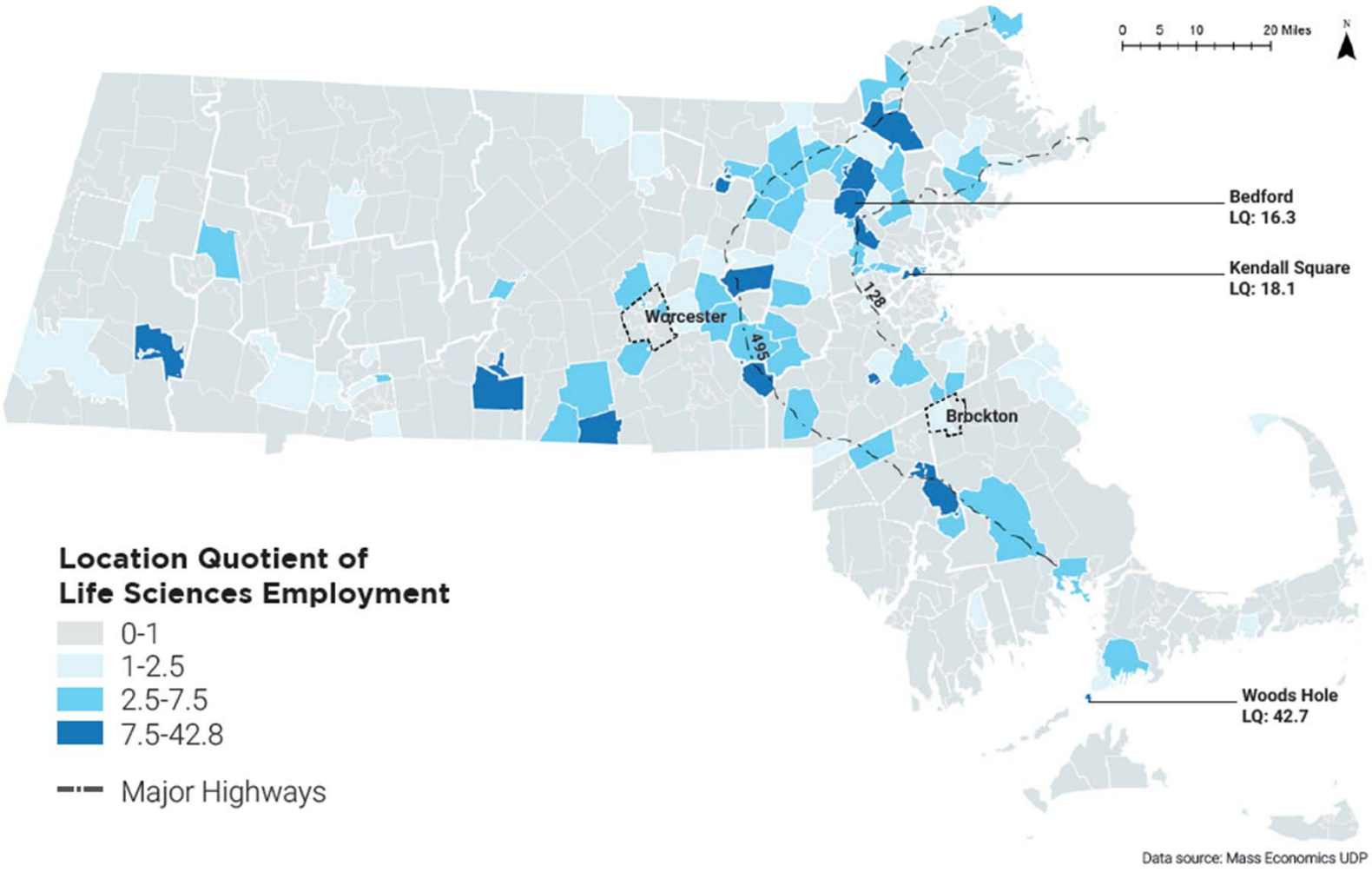
- **5** Tier 1 universities
- **52** colleges + universities
- **250,000** students

Kendall

- **13 of 16** top biopharma employers
- **55,000** Life sciences-related employees
- **43** acre development

Life Sciences Cluster | Regional Imbalance

- Life sciences employment is highly condensed in a few zip codes.
- Greater Boston has the largest concentration of life sciences researchers in the U.S. (JLL 2017).
- Beyond Kendall and outliers such as Bedford and Woods Hole, life sciences clusters follow footprint of major industrial corridors



Data source: Mass Economics UDP

Gateway Cities

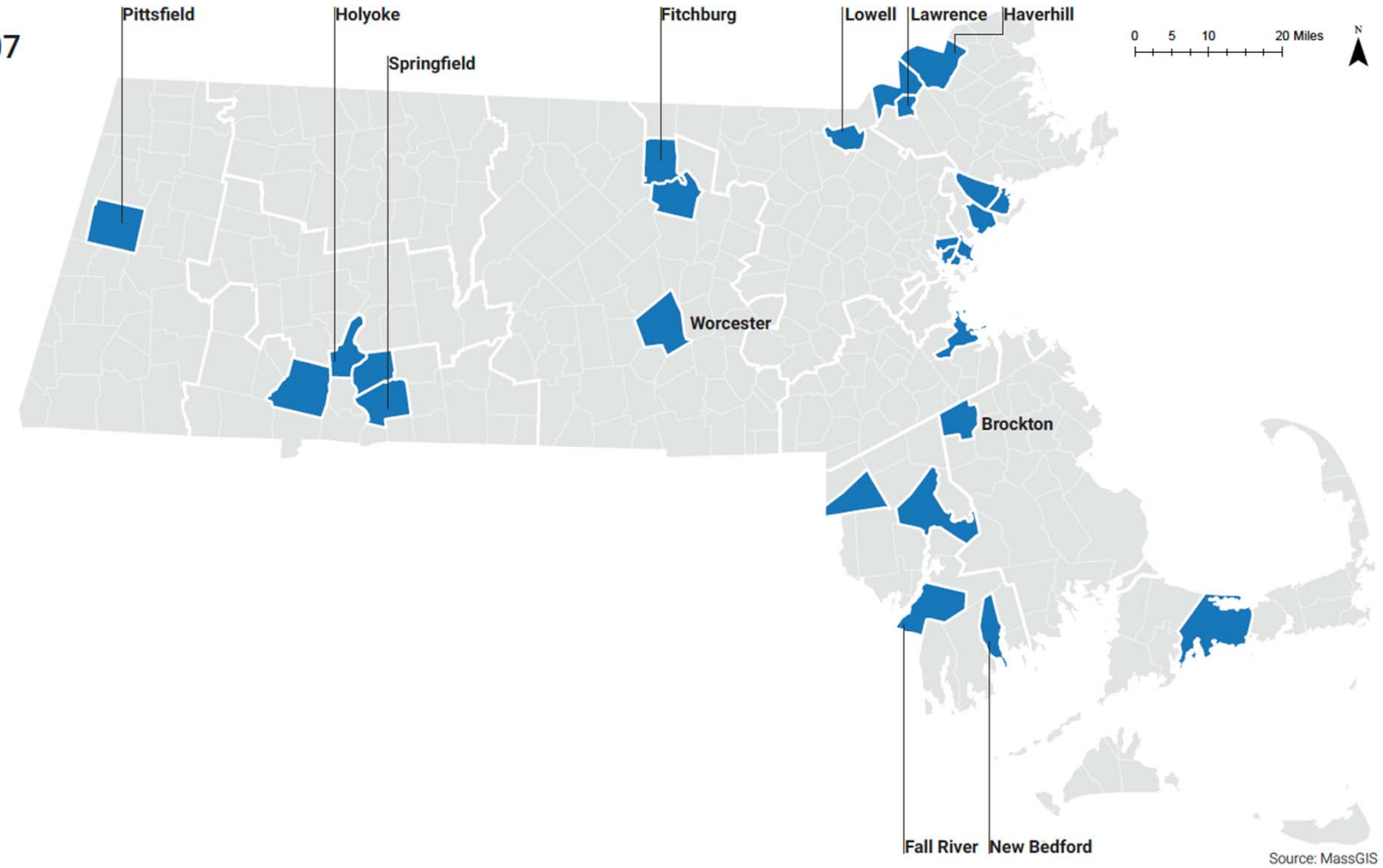
"Gateway Cities" coined in 2007 by MassINC and Brookings

- Mid-size urban centers that anchored regional economies
- Past manufacturing jobs have slowly disappeared

Originally 11 cities

New definition includes 26 cities:

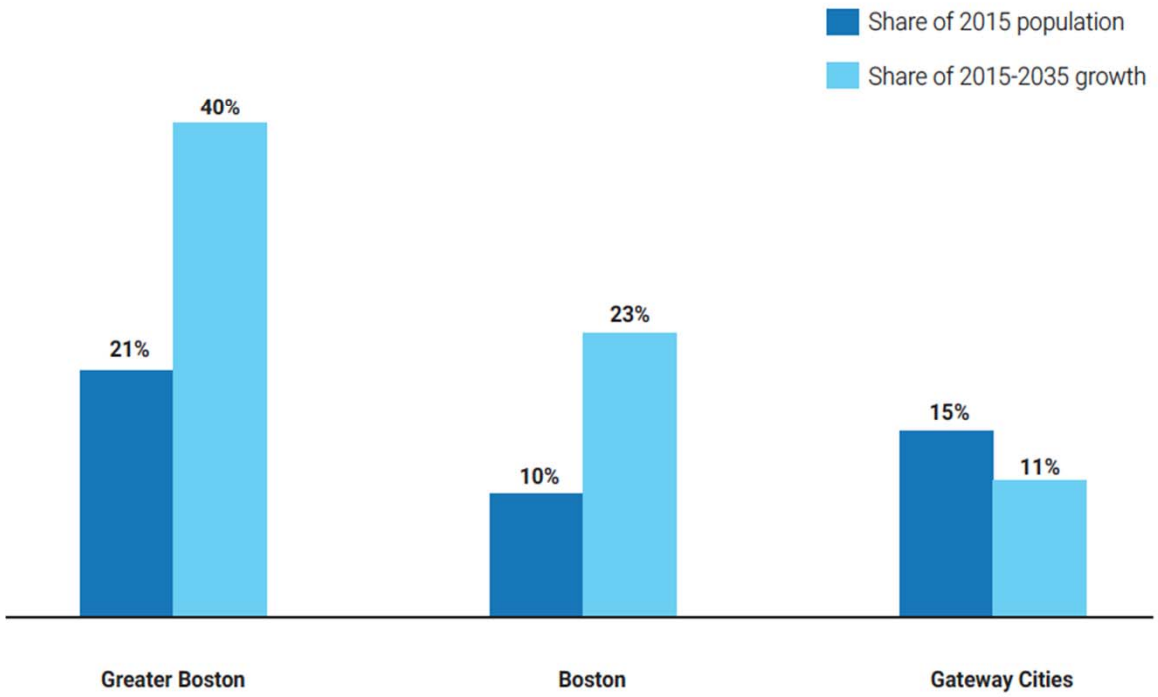
- Population between 35,000 and 250,000
- Household income below state average
- Education levels (bachelor's +) below state average



Will life sciences growth in Boston and Kendall spillover to the Gateway Cities?

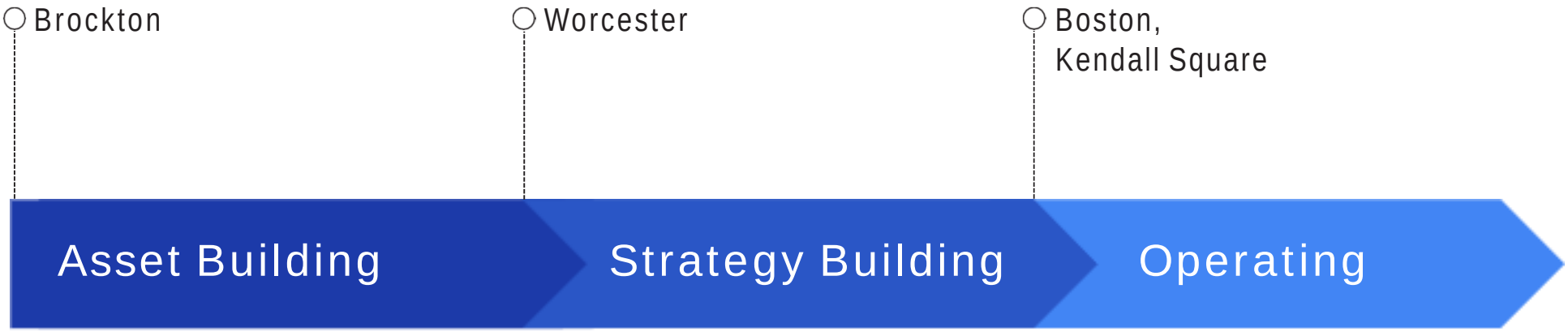
- Securing life sciences jobs is one way to boost the Gateway Cities
- MA population expected to grow by more than 500,000 by 2035
- But growth expected to mostly concentrate within greater Boston
- Default projections show Gateway Cities growing more slowly (11% compared to 40% of Boston Metro)

Distribution of Projected Population Growth, 2015-2035



Source: MassINC

Life Sciences Cluster | Process



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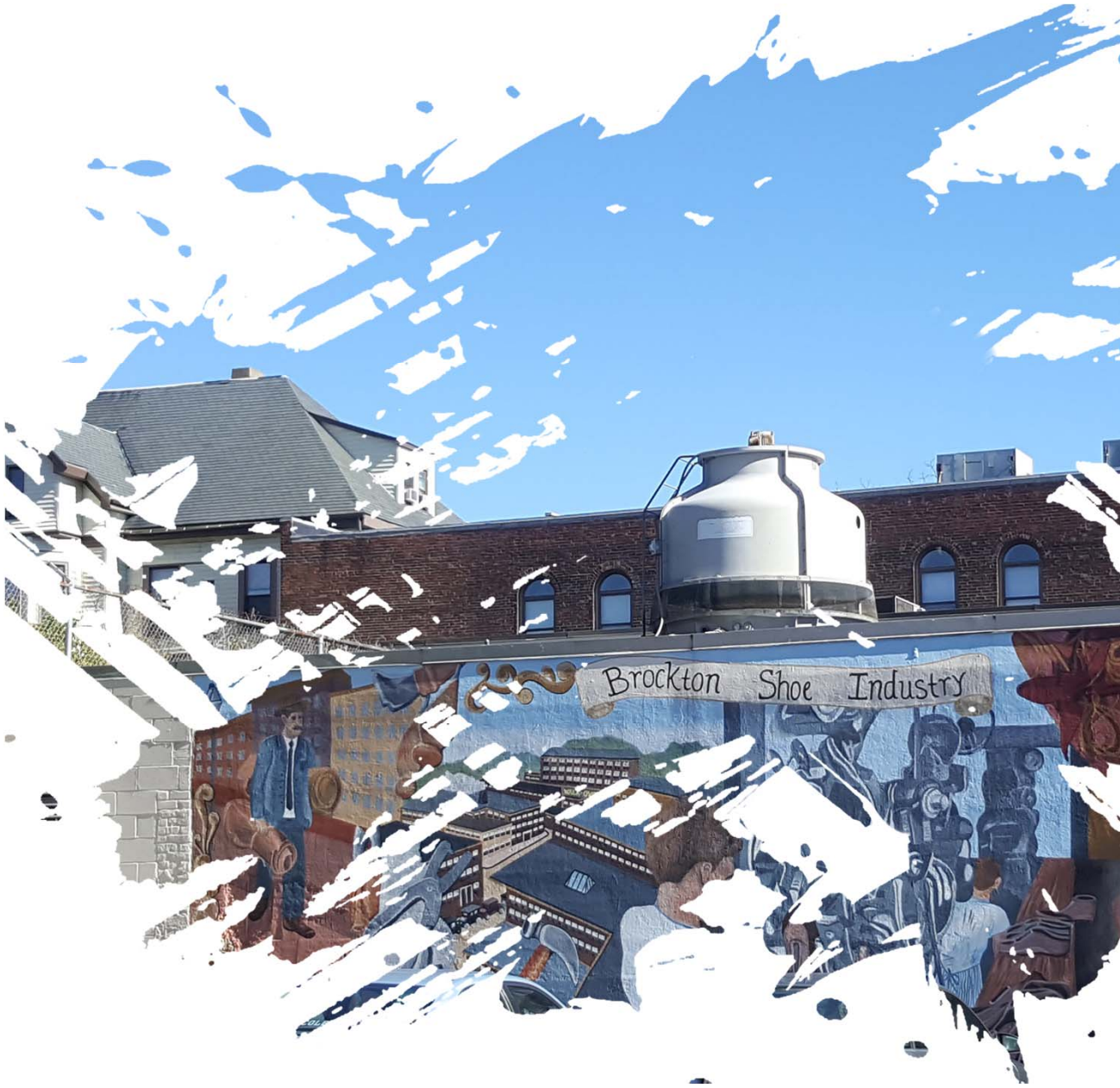
CASE STUDIES

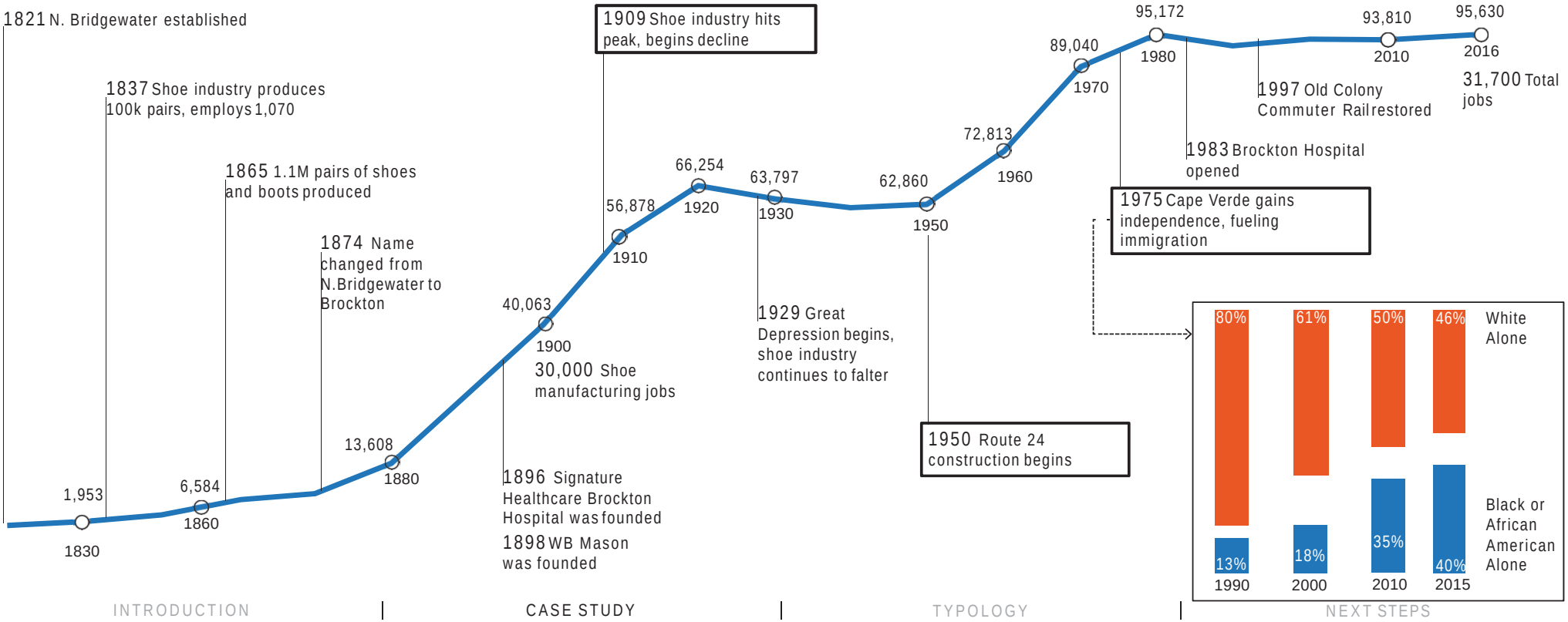
BROCKTON



Population Change in the History of Brockton
(1830-2016)

Data source: Trends in Brockton:Population Trends, ACS

"Shoe City" ***(late 1800s - early 1900s)*** Manufacturing Growth → **"City of Champions"** ***(1920s - 1980s)*** Industry Decline, Boxing Greats, Route 24 → **"Two Brocktons"** ***(1970s to now)*** Immigration, Desalination Plant, Commuter Rail



Stories We've Heard...

Access vs. Isolation

While Brockton has easy access to many resources both locally and in Greater Boston, stakeholders often function in isolation and do not connect to one another or the regional economy.

Opportunities vs. Action

Interviewees typically described Brockton as an attractive place to locate businesses, but many scratched their heads about how Brockton can look so good on paper but still have trouble "closing deals" to attract life sciences and other companies.

Existing Workforce vs. Desired Jobs

There is a perceived disconnect between the training level of the existing labor force inside Brockton and the ability to attract quality jobs from outside Brockton in high-skill industries like the life sciences.

Old vs. New Brockton(s)

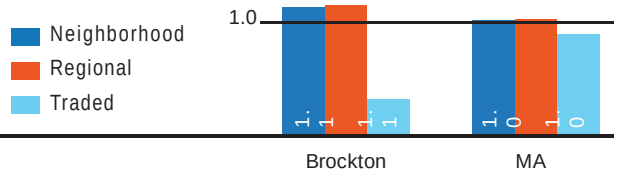
Many stakeholders commented on the divides between older, white residents who wield the most institutional and economic power and the immigrant community leaders and young professionals who are gaining influence.

Economy

- Food manufacturing concentration (3% of jobs), growing regional healthcare cluster (39%)
- Ongoing shift toward lower-education, lower-wage jobs
- Lacking base of traded cluster firms and activities

Location Quotient

Data source: County Business Patterns, Mass Economics



Job Gains and Losses by Industry, 2009-2015

Data source: County Business Patterns, Mass Economics

	Change	% Change		
	Brockton	Brockton	Adjacent Counties	MA
Largest Job Gains				
Healthcare and Social Assistance	+2,040	+20%	+21%	+13%
Management of Companies & Enterprises	+460	+110%	+22%	+10%
Retail Trade	+330	+7%	+6%	+7%
Wholesale Trade	+280	+30%	+3%	+4%
Largest Job Losses				
Professional and Technical Services	-850	-58%	+17%	+10%
Arts, Entertainment, and Recreation	-220	-52%	+8%	+10%
Information	-210	-43%	-2%	+12%
Other Services, Ex. Public Admin	-160	-10%	+11%	+4%

Workforce

- Resident education below (18% bachelor's) state (41%) and other Gateway Cities' average (24%)
- Easy access from Brockton to jobs in Boston Metro Area
- Accessible to large and educated regional workforce

Commute Time and Cost

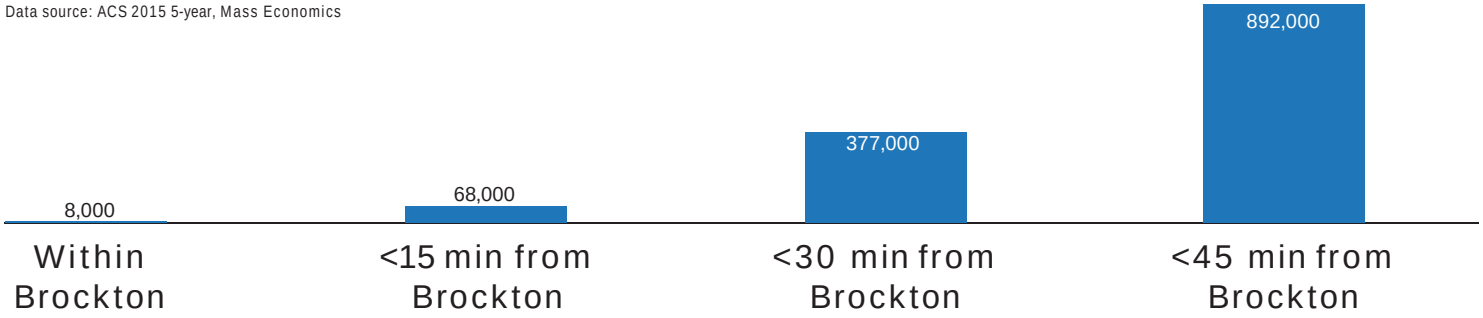
Downtown Brockton to Kendall Square, AM Peak

Data source: Google Map, MBTA, BAT, AAA

	Time	Cost
Driving	1h05min - 2h10min	$197 Operating $633 Total
Commuter Rail to Red Line	57 min	$263 w/out BAT $298 w/BAT
Brockton Area Transit to Red Line	1h38min	$145

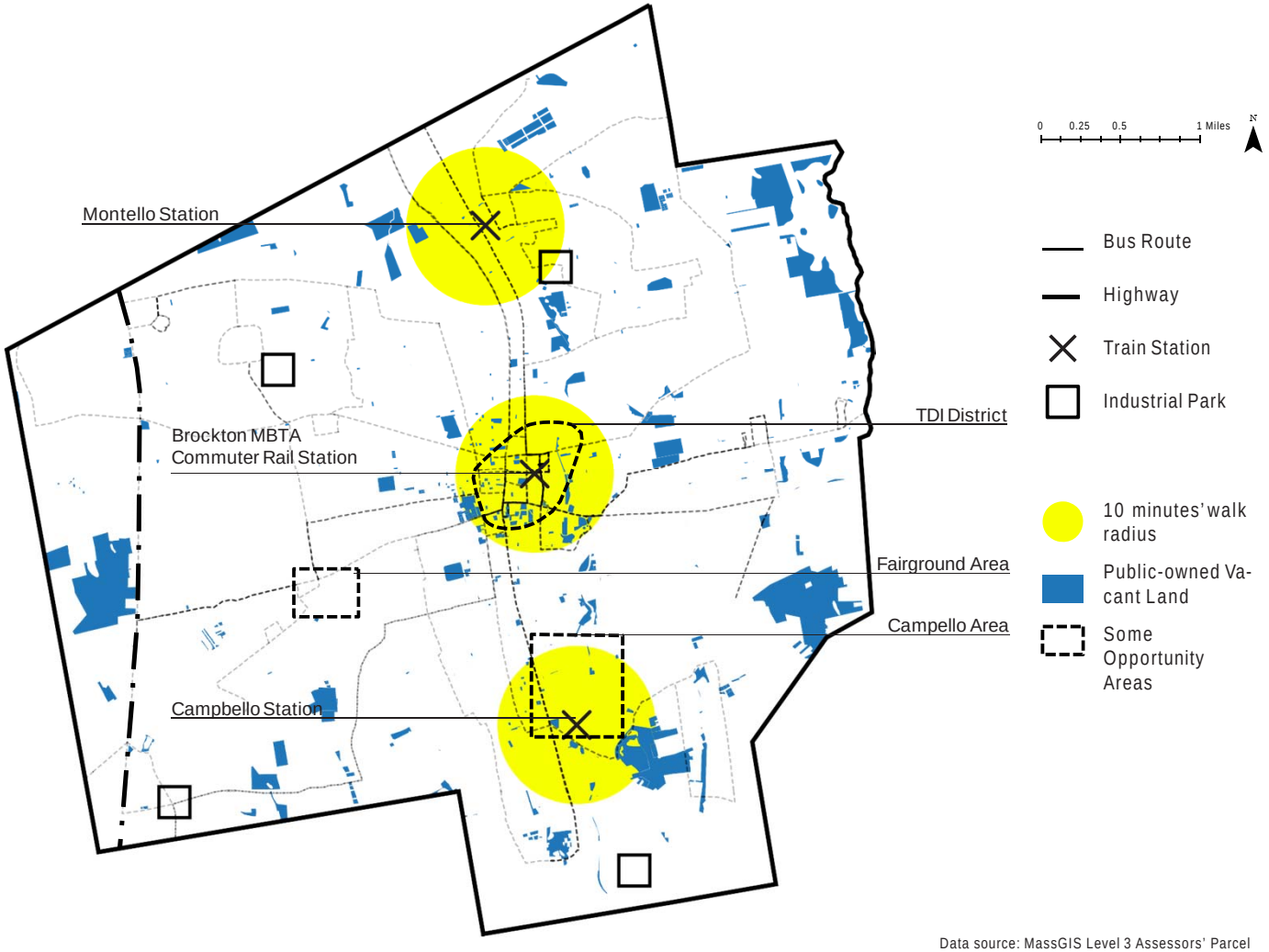
25-64 Year Olds With College Degree by Commute Time

Data source: ACS 2015 5-year, Mass Economics



Real Estate

- Inexpensive land and office space
- Several large sites identified in “Blueprint for Brockton”
- Below-average gas rates (-26%) and commercial electricity rates (-47%), median water rates for MA
- Third-highest commercial tax rate in the Metro South region ($32.94 in FY2017)



Data source: MassGIS Level 3 Assessors' Parcel Mapping data set, A blueprint for Brockton

Existing Life Sciences

- Concentration of medical and testing laboratories, but primarily for routine healthcare.
- Other life sciences activity small, but present.

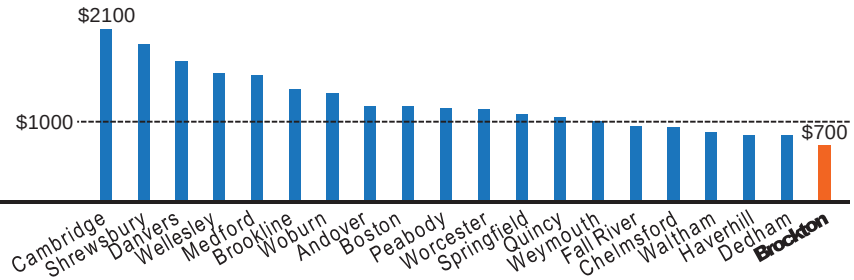
Brockton Life Sciences Jobs (2015) and Trends (2009-2015)

Data source: County Business Patterns, Mass Economics

	Jobs (2015)	Growth (2009-2015)	Location Quotient (2015)
Research, Testing, & Medical Laboratories	680	-50	2.7
Drugs & Pharmaceuticals	80	+80	1.3
Bioscience-related Distribution	70	+10	0.5
Medical Devices & Equipment	10	-	0.1
Total Life Sciences	840	+40	1.5

Average Weekly Wage*

Medical and Diagnostic Laboratories (2015)



Data source: MA ES-202

* Newton is an outlier, which has an average weekly wage of 5938.

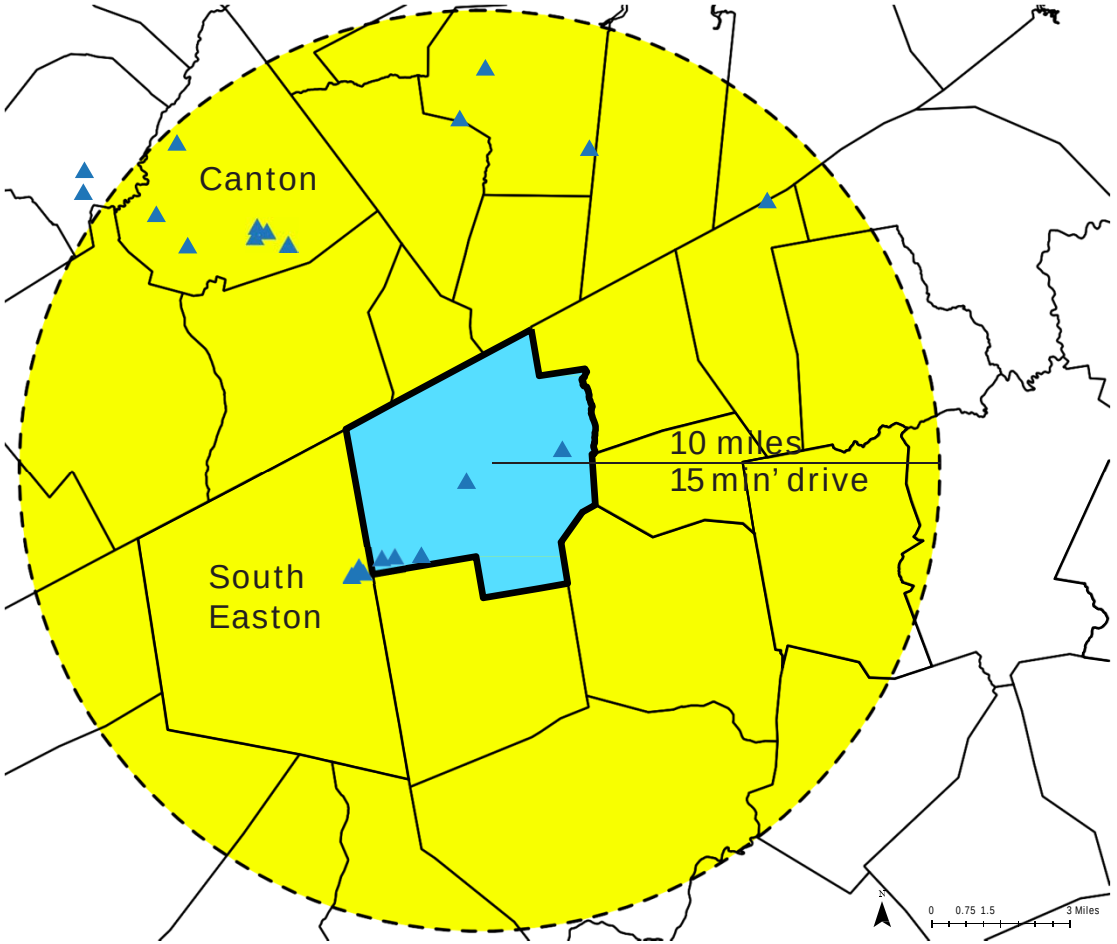
Existing Life Sciences Companies in the Region

Brockton

Companies	Main Activity
Lyne Laboratories	Develop and manufacture generic pharmaceuticals (liquid, semi-solid, powder)
Amphenol Alden Products	Develop and manufacture medical interconnects and cable assemblies
ACE Surgical Supply	Supply dental surgical instruments and supplies
Quest Diagnostics	Collect samples for medical laboratory testing
US Laboratories	Mobile testing services and medical laboratory testing
Boston Clinical Laboratories	Collect samples for medical laboratory testing

South Easton

Companies	Main Activity
Pressure Biosciences	Develop devices for laboratory research sample preparation
Pharmasol	Contract pharmaceutical development and manufacturing (aerosol, liquid, semi-solid)
Korsch America	Supply and service tablet compression machinery for pharmaceutical manufacturing



Data source: MassGIS Level 3 Assessors' Parcel Mapping data set

Institutions

Economic Development Organizations

City Hall

Brockton 21st Century Corp.

Brockton Redevelopment Authority

Brockton Area Workforce Investment Board

Metro South Chamber of Commerce

Community Organizations

Cape Verdean Association

Boys and Girls Club of Brockton

Old Colony YMCA

Brockton Interfaith Community

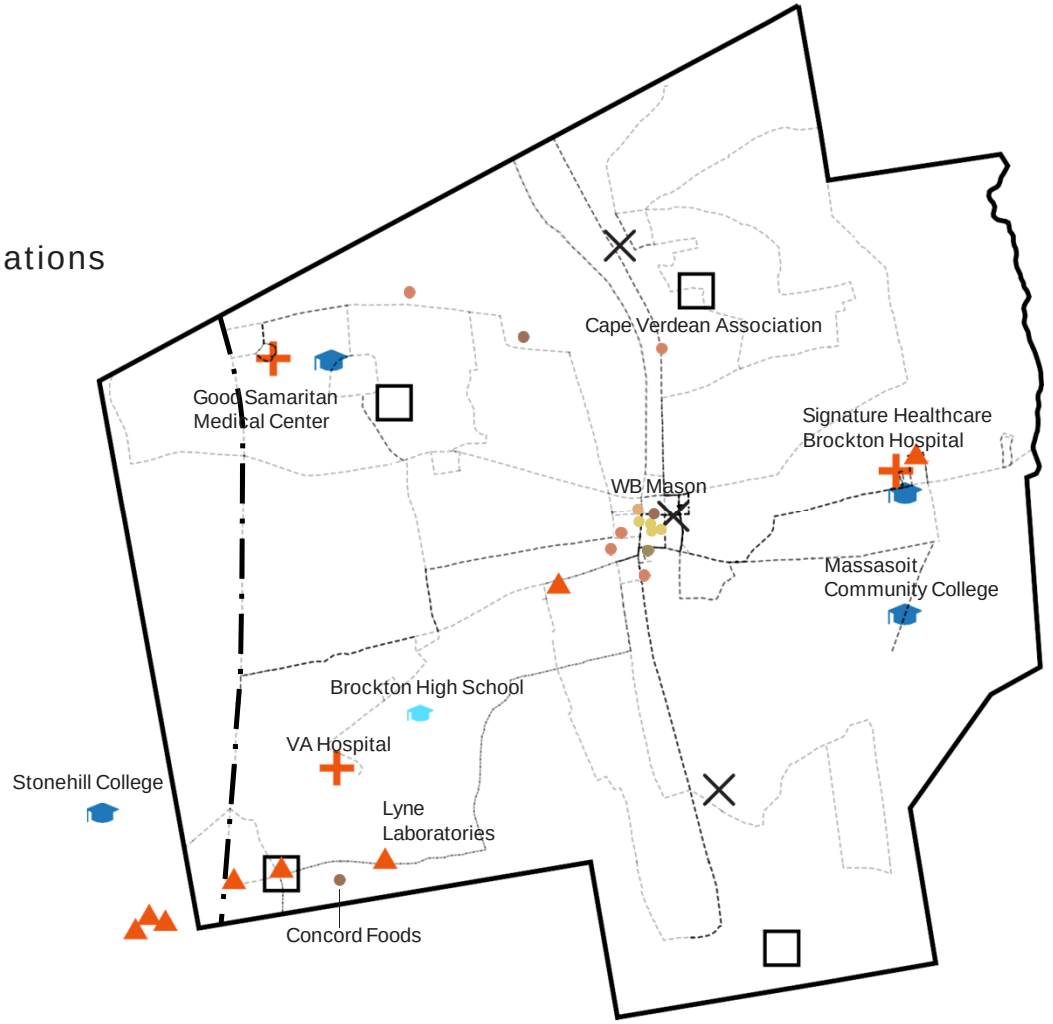
Fuller Craft Museum

Private Employers

W. B. Mason

Concord Foods

Crown Uniform & Linens



Data source: MassGIS Level 3 Assessors' Parcel Mapping data set

Strategies Summary

1
Invest in Real Estate Expertise

Create a Gateway Cities Life Sciences Fellow

2
Augment Local Workforce Planning

Develop workforce training targeting regional life sciences occupations

3
Create Coordination Council

Create new coordinating council for life sciences in Greater Brockton

4
Improve Processes & Strengthen Relationships

Workforce planning leads to strong connections among stakeholder groups

1

Invest in Real Estate Expertise

"Canton is seeing benefits from being Platinum [in the MassBio rankings]. Organogenesis heard about governor's MLSC initiative, and reaching out to ask about site locations in the Metro South. They said to look at Canton! ...Brockton has a hold-up without pre-permitted sites."

2

Augment Local Workforce Planning

"We stick with what we see live and what people come to us with... I hear that we need the land and the labor to interest life sciences company, and I think the labor is the hardest part – people with associate degrees and some knowledge on the bio side."

3

Create Coordination Council

“We have water, expressway exits, three train stations, community college partnerships.... If we got our act together, we’d be dangerous.”