

THE WORCESTER BIOMANUFACTURING PARK

OUR BUSINESS GOAL

Support and strengthen the economic development of Worcester by attracting, signing, and retaining world class biomanufacturing companies to build and develop facilities in the Worcester Biomanufacturing Park.

THE CHALLENGE

Worcester doesn't have a story. The perceived value of Worcester's potential to foster a thriving biomanufacturing hub isn't understood well enough to justify the investment needed to build from scratch when they can find existing space elsewhere.

CATEGORY

What are the outside forces, trends and tensions influencing and shaping the category?



CHANGING DYNAMICS IN THE INDUSTRY ARE SPURRING AN EVOLUTION IN MANUFACTURING INNOVATION

Increased therapeutic competition

More drugs going off patent resulting in more companies seeking to develop medicines that outperform efficacy, safety, disposition, or cost.

Greater prevalence of complex large molecule drugs

Large molecule biologics are living cells and require highly specialized, high quality manufacturing. Biologic patents have increased 25% every year. By 2020 36% of the global Pharma market will be biologics.

A rise in orphan treatments

Drugs developed specifically to target rare diseases, amongst a small population of patients, have a 12% annual growth rate since 2012.

Emergence of personalized medicine

Products that use a patients' genetic input to produce therapies; 80% of "breakthrough" therapies involve targeted therapies.

THE SHIFT

BIOPHARMACEUTICALS

FROM

Small Molecules

Simple

Mass

Chemical



TO

Large Molecules

Complex

Personal

Organic

HOW IS THIS IMPACTING BIOMANUFACTURING?

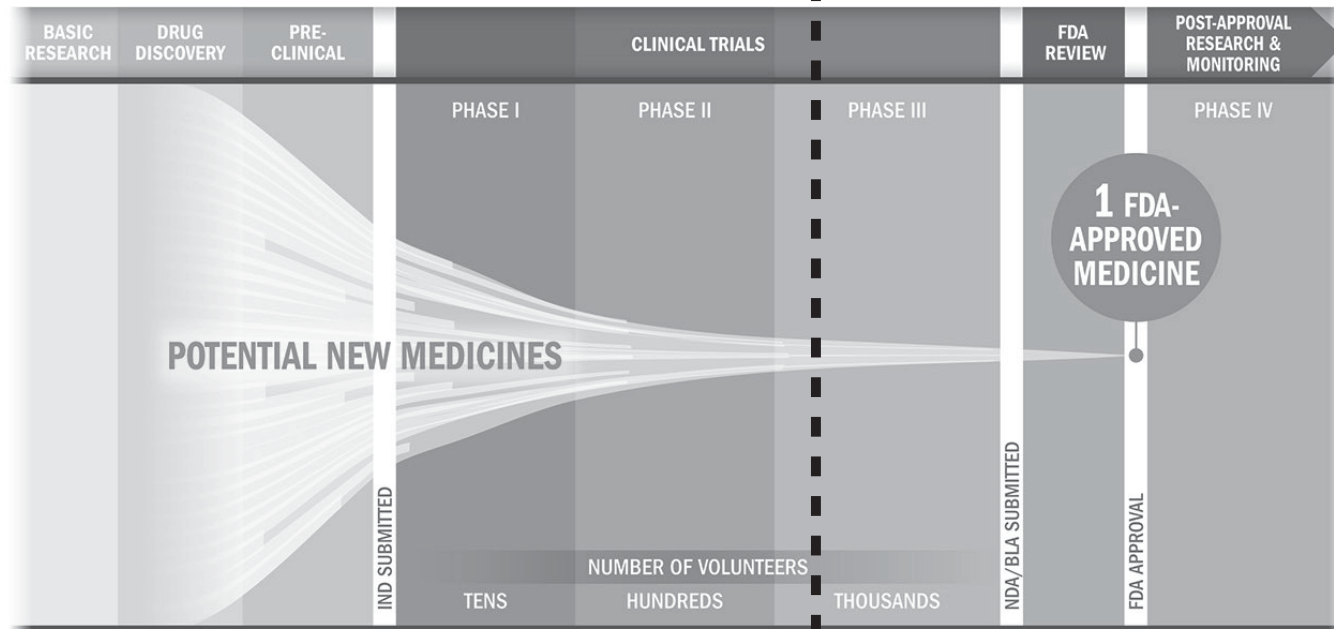
THERE ARE 2 GENERAL STATES OF NEED IN BIOMANUFACTURING

NEW THERAPIES

All about proving **quality** & **safety**.

ESTABLISHED THERAPIES

All about **cost** & **efficiency**.



Iterative, collaborative, rapid

Scalable, efficient, quality, consistency

ESTABLISHED THERAPIES HAVE REACHED MANUFACTURING MATURITY AND ARE BECOMING A COMMODITY SENT OVERSEAS

Large scale, late stage **established therapies that need commercial manufacturing**

- Proximity to other biotech doesn't matter
- Cost & efficiency matter most

40% of finished drugs **and 80%** of active ingredients are **developed overseas.**

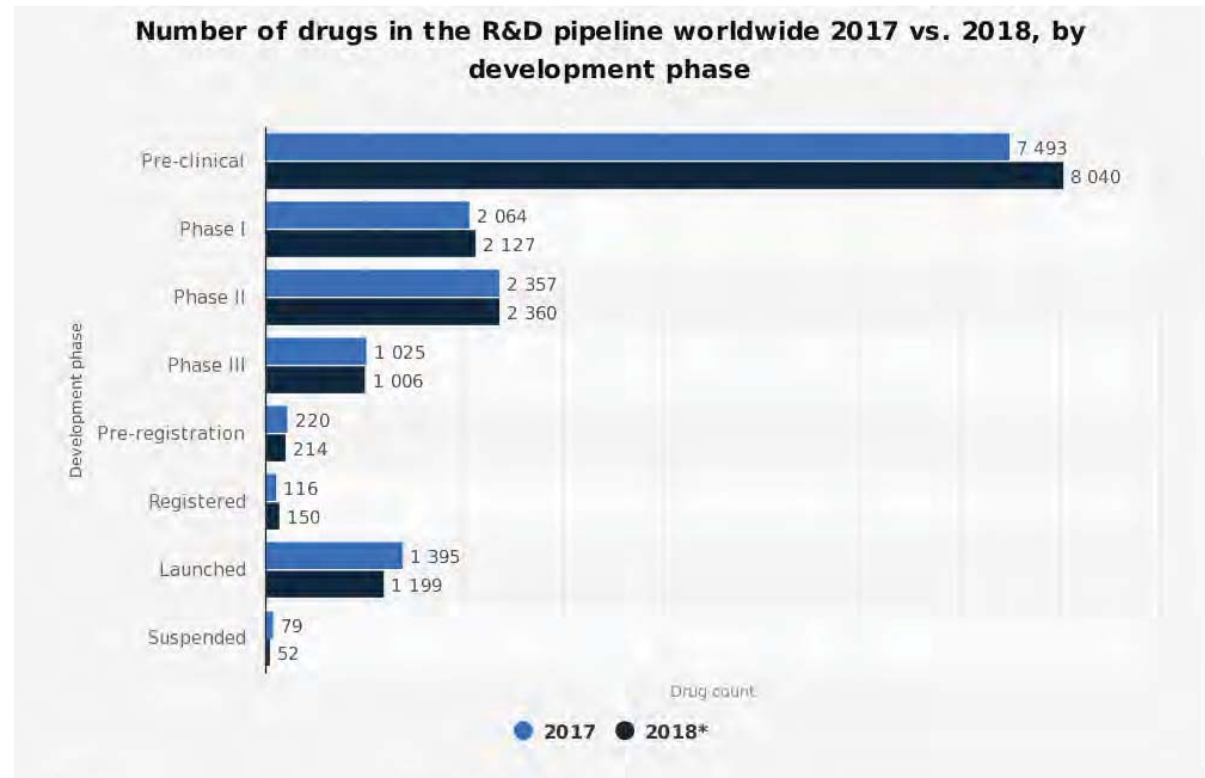


Table 1: Job growth/decline in biomanufacturing states, 2002–2012

	Growth/ Decline	% Change
Texas	1033	11.6%
California	4329	10.8%
Massachusetts	666	8.0%
North Carolina	234	1.1%
New York	-1716	-8.0%
Illinois	-3231	-15.4%
Indiana	-4887	-25.0%
Pennsylvania	-7951	-29.3%
New Jersey	-12651	-32.1%
Michigan	-3982	-33.4%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

**BUT THERE IS
HUGE DEMAND
FOR THESE
INNOVATIVE EARLY
STAGE THERAPIES**

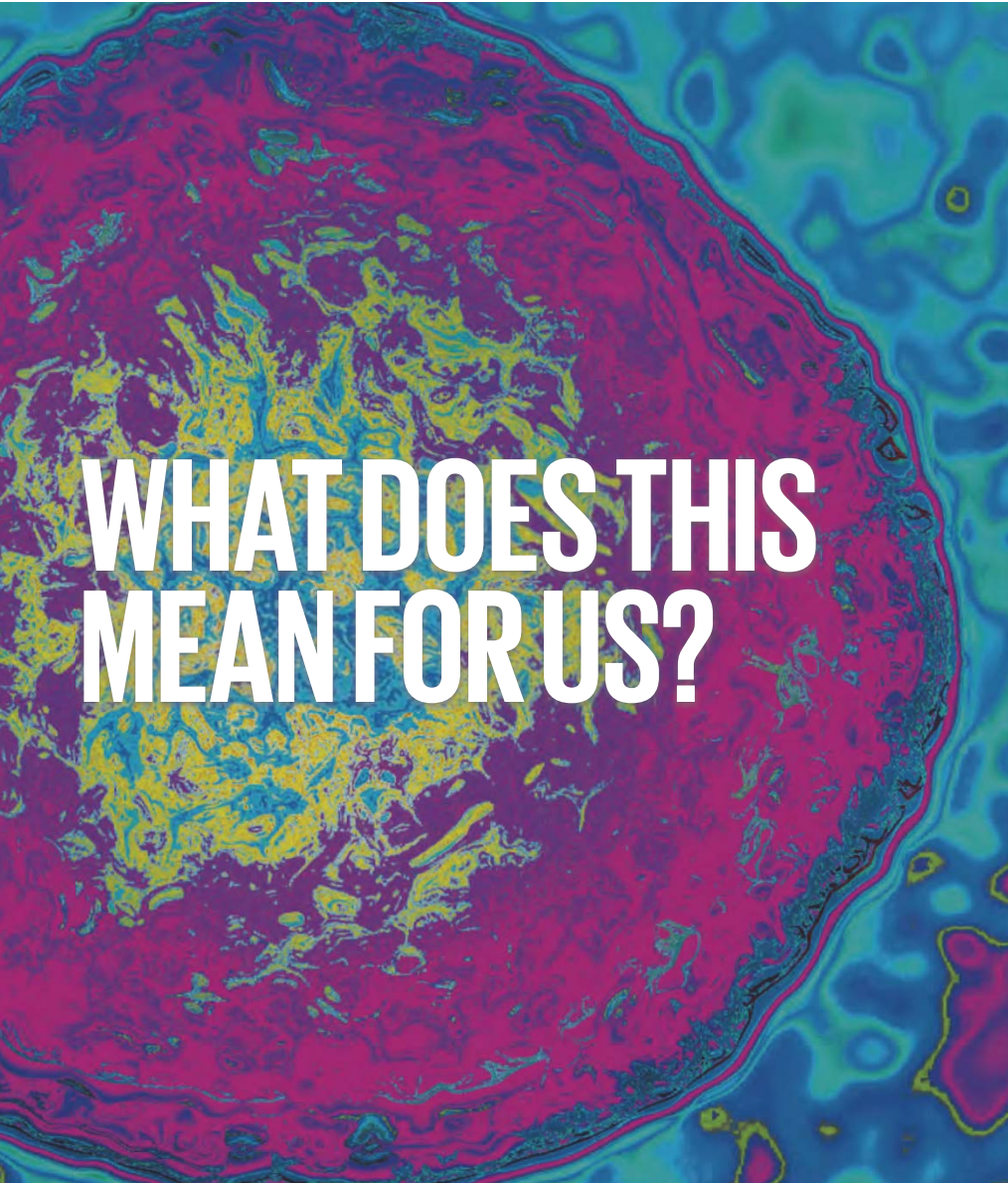


THE SHIFT

BIOMANUFACTURING

PARADIGM SHIFT FROM
LARGE SCALE PRODUCTION
TO SMALL BATCH
BIOLOGICS INTENDED FOR
SPECIFIC PATIENT GROUPS,
DEMANDS...

NICHE, SMALL,
MODULAR, FLEXIBLE,
COLLABORATIVE,
SINGLE-USE
MANUFACTURING
PLATFORMS



**WHAT DOES THIS
MEAN FOR US?**

**THE FUTURE GROWTH OF
THE BIOTECH INDUSTRY IS
LARGE (MOLECULES),
THE FUTURE GROWTH OF
BIOMANUFACTURING IS
EARLY, SMALL, DYNAMIC
INNOVATIVE (MANUFACTURING).**

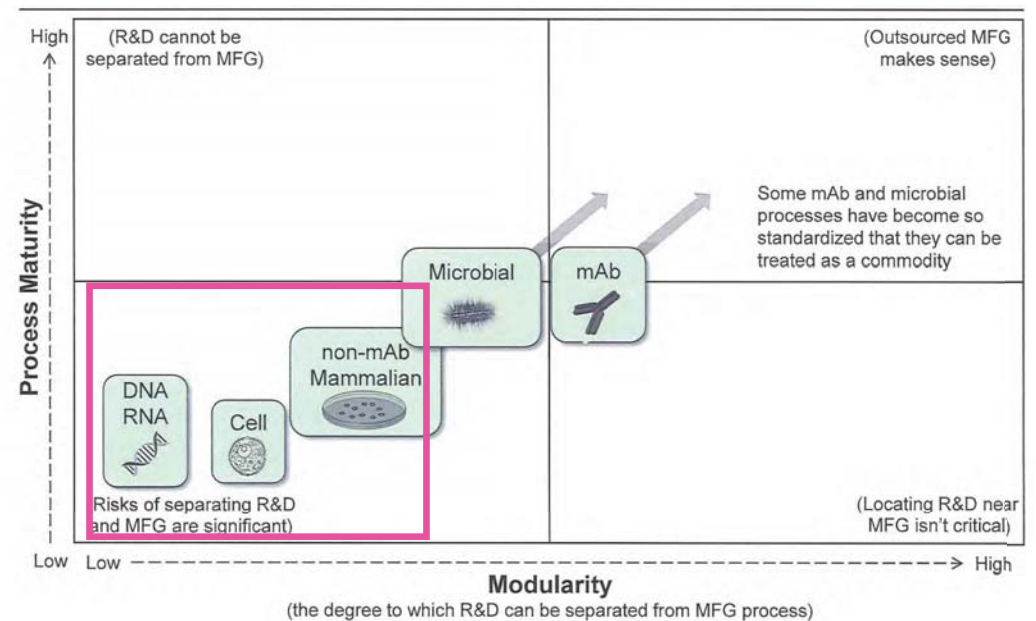
OUR AUDIENCE

Who are the people we are trying to influence? What matters to them?

NEW THERAPIES WHERE SYSTEMS ARE STILL EVOLVING, AND INNOVATION IS STILL HAPPENING IS WHERE IT'S AT

70% of innovative clinical programs are being led by small companies.

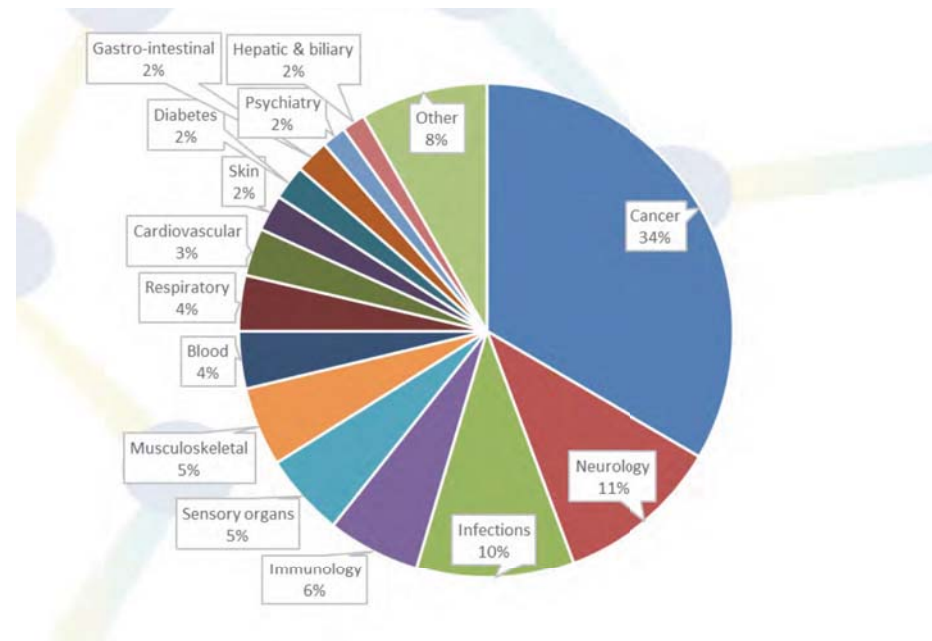
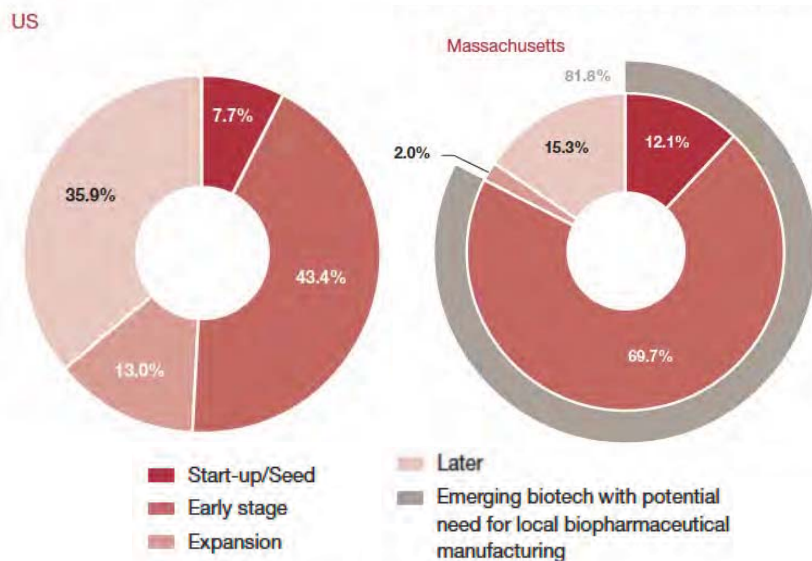
NEW THERAPIES NEED PROXIMITY TO INNOVATIVE MANUFACTURING



NOWHERE IS THE DEMAND FOR INNOVATIVE SMALL SCALE BIOMANUFACTURING GREATER THAN IN MASSACHUSETTS

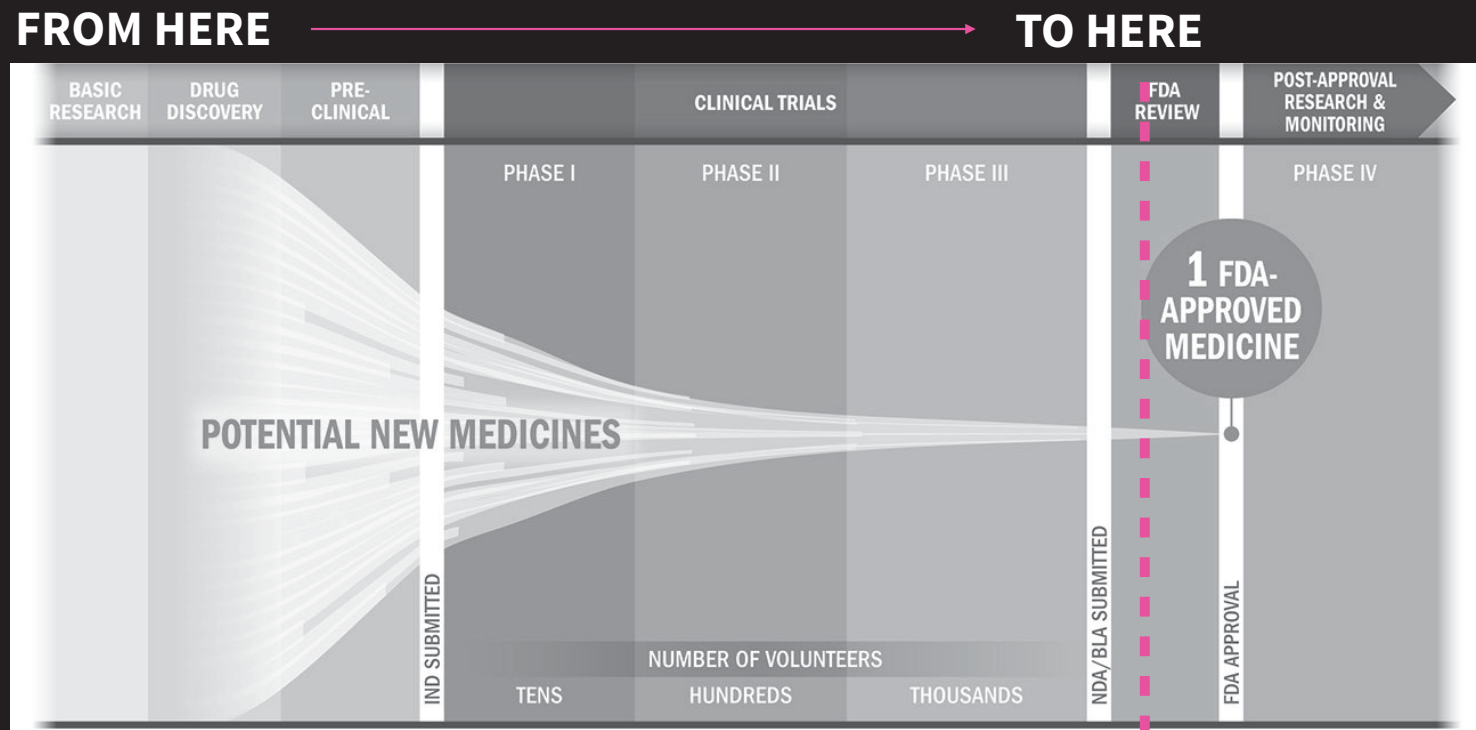
82% of MA Manufacturing needs are in early stages

Largest demand comes from **oncology & neurology**

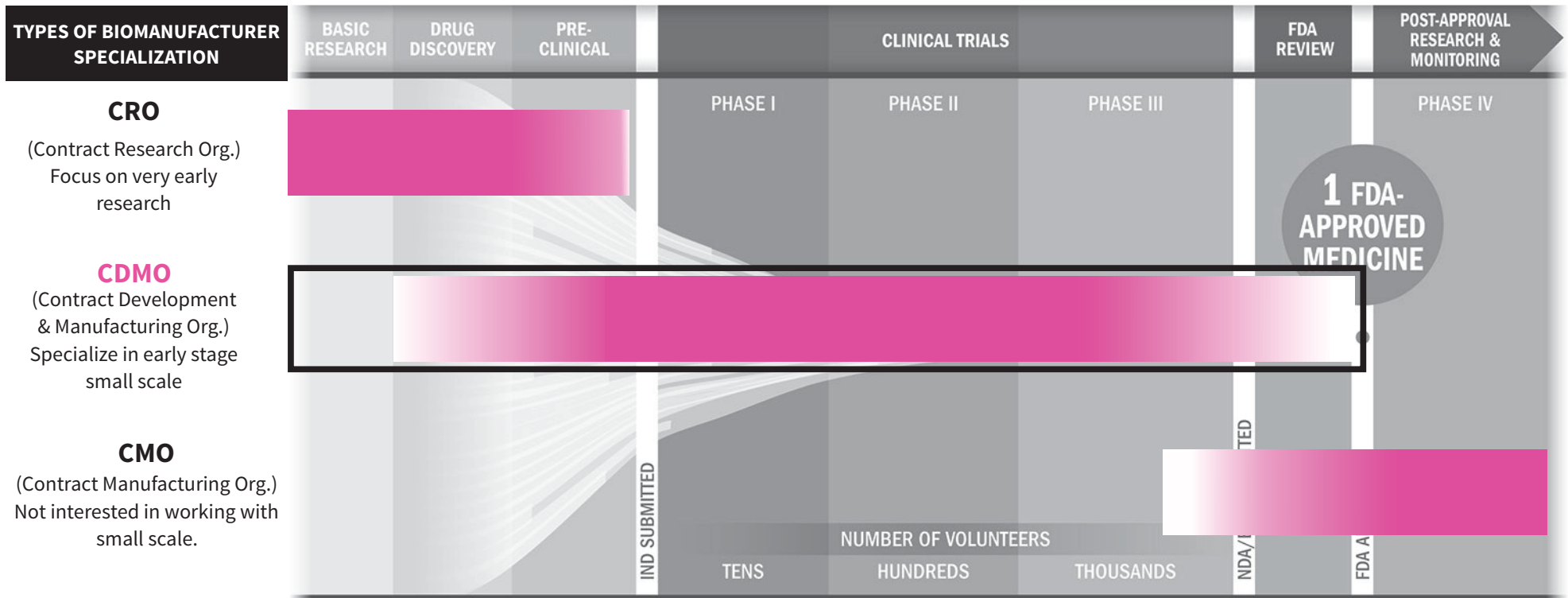


BUT TO GET FROM RESEARCH TO TRIALS, TO APPROVAL, THEY NEED MANUFACTURING HELP

They need small scale, small batch, innovative manufacturing partners that they can afford



GIVEN THE DEMAND FOR NEW THERAPIES IN THE EARLY STAGES, **CONTRACT DEVELOPMENT MANUFACTURERS** REPRESENT THE GREATEST OPPORTUNITY





CDMOs

Contract
Development
Manufacturing
Organization

WHAT MATTERS TO THEM? WHAT DO THEY NEED?

They want to ensure the potential for success is worth the investment

ESSENTIALS

Access to R&D Customer Pipeline
Availability of a steady supply of R&D customers to ensure sustainable flow of revenue.

Proximity to R&D
For both the CDMO and the company, proximity to R&D helps save on costs and is essential to smooth, collaborative development.

Access to quality workforce
Access to the right people with the right skills and education to operate and ensure efficiency, quality, safety, etc. is essential.

Proximity to life science/innovation ecosystem
Density of people and ideas drive innovation, and innovation drives business growth.

Low cost of doing business
Ensuring that capital investments, overhead, and operating costs, are as low as possible.

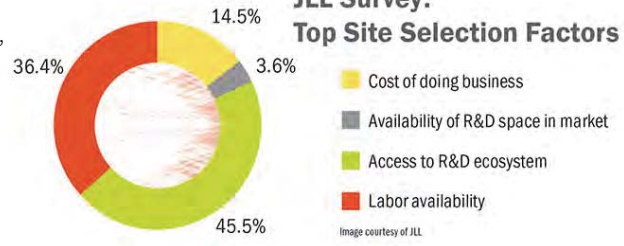
SECONDARY

Access to vendors
Equipment and component supplies for manufacturing and being able to work directly with them to meet specific needs.

Financial Incentives
Tax breaks and upfront capital support is highly valued.

Partnerships
The people and businesses to help support and ensure success. Who is involved in building is almost as important as what you're building.

JLL Survey: Top Site Selection Factors



WHAT MOTIVATES THEM?

While they need to make calculated decisions to ensure the success of their business, they know that **nothing says growth and ongoing success like the proximity to innovation.**

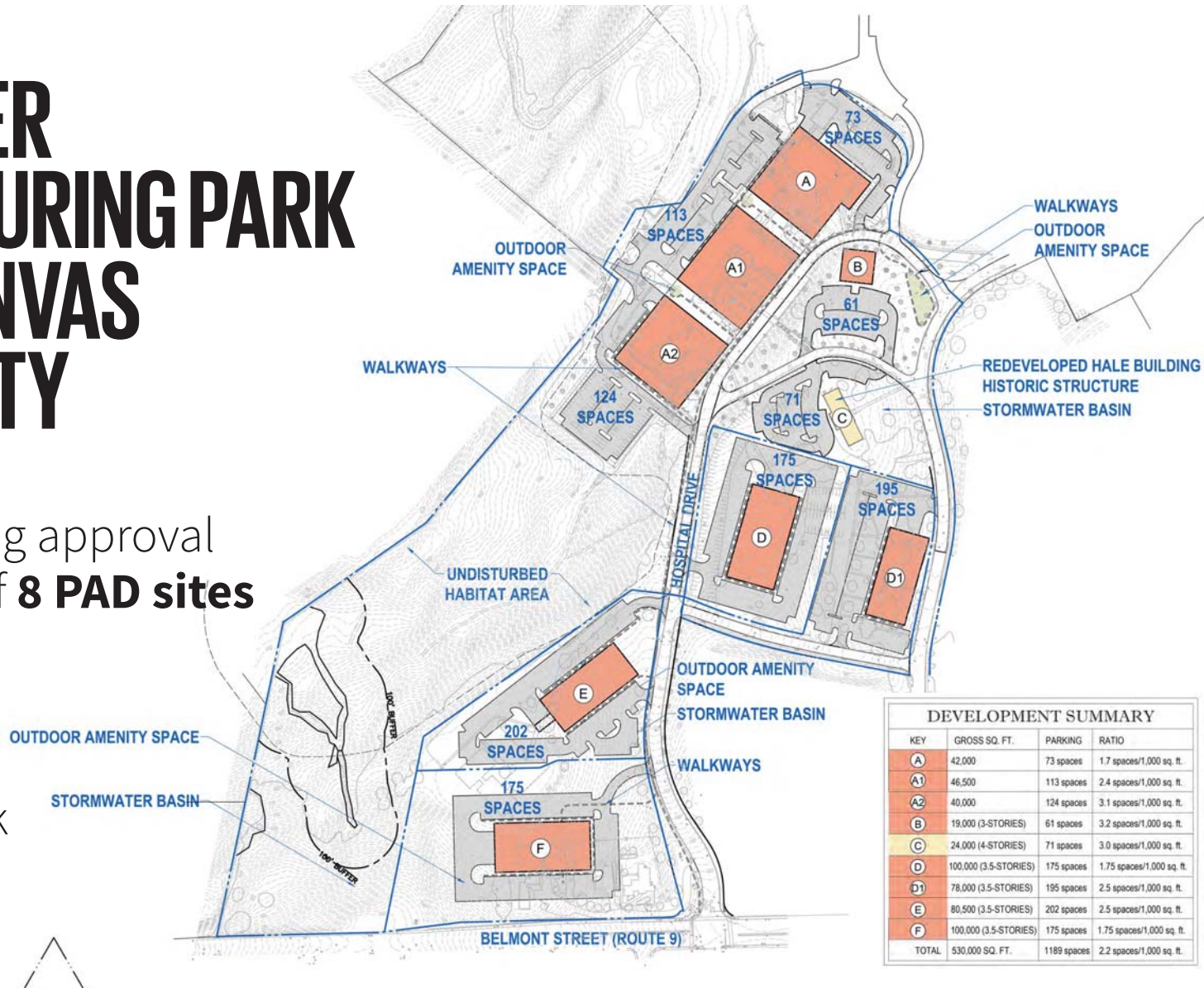
WHAT ARE WE OFFERING?

What are we selling and makes our development unique? What makes us unlike any other development?

THE WORCESTER BIOMANUFACTURING PARK IS A BLANK CANVAS OF OPPORTUNITY

Vacant land with zoning approval for the development of **8 PAD sites**

350,000 total sq. ft. in a designated biomanufacturing park



A THRIVING LOCAL ECOSYSTEM OF BIOTECH & LIFE SCIENCES

Two hospitals: Saint Vincent, UMass Memorial

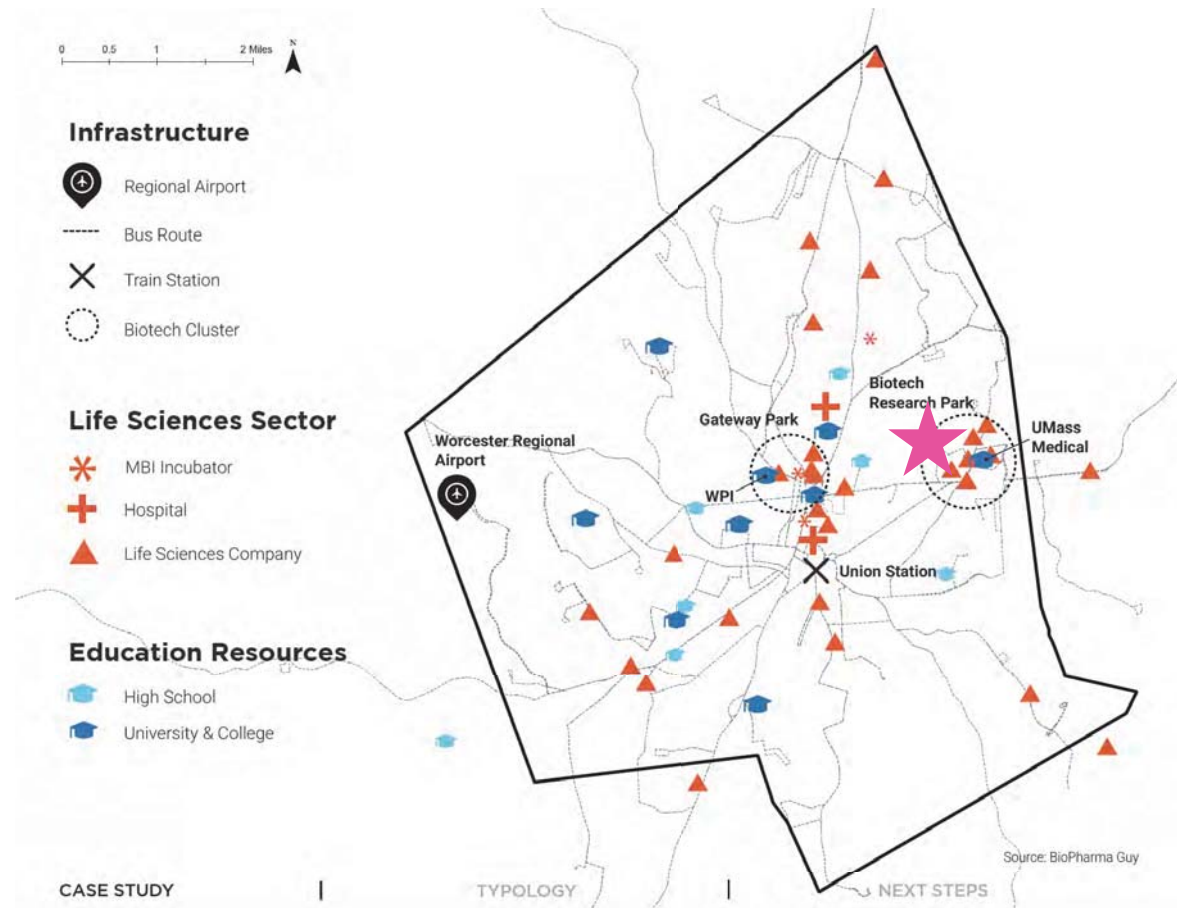
Thirty biotech companies in the city

Two research clusters: Biotech Park, Gateway Park

One biotech incubator (MBI) with three locations

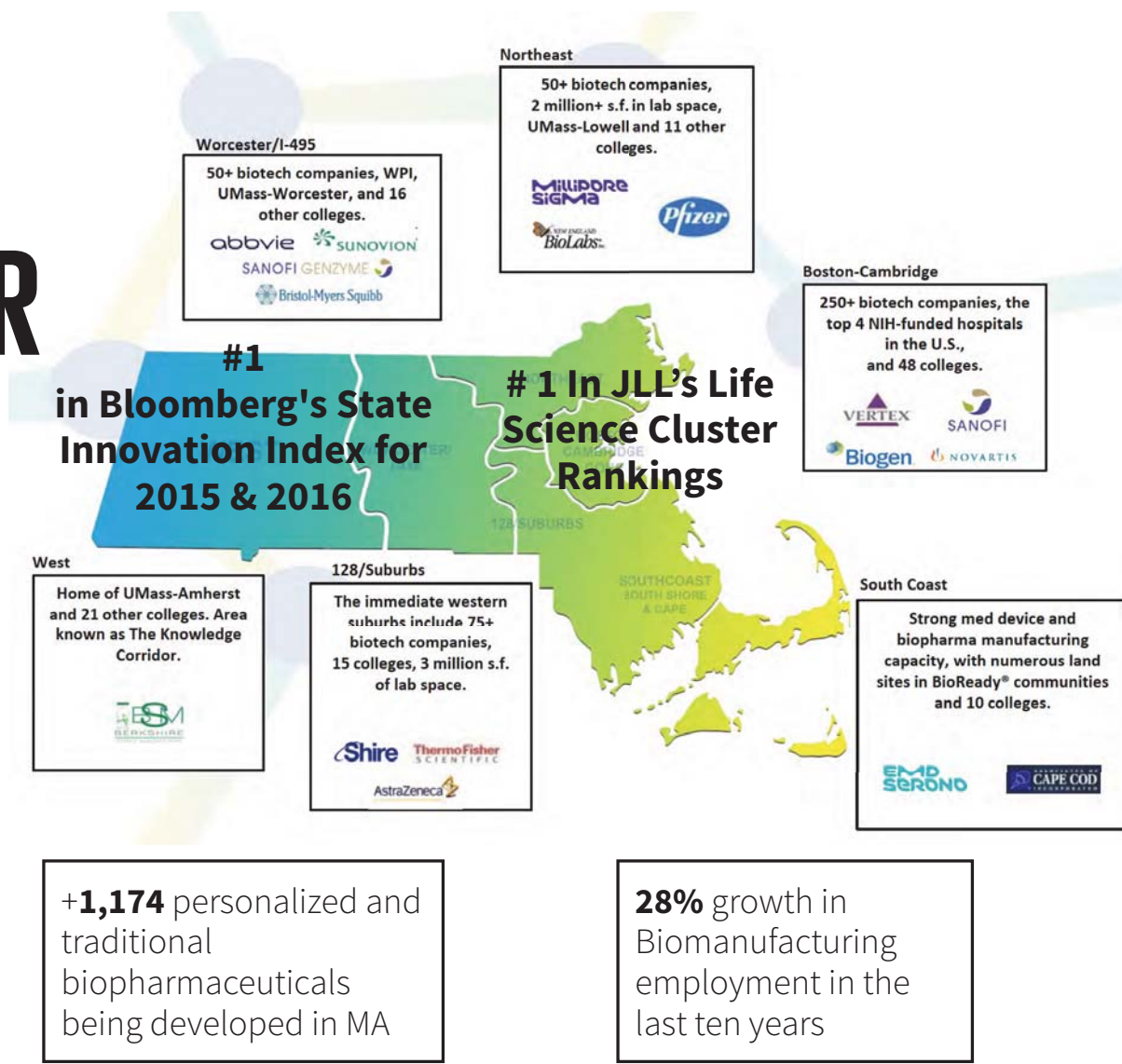
31%
share of total life science patents, Boston **30%**

#3 in number of biopharma companies in Massachusetts



WITHIN THE MOST INNOVATIVE SUPER CLUSTER IN THE WORLD

A statewide ecosystem of innovation that is fueling a tsunami of demand and potential for growth.





A DIVERSE POOL OF HIGHLY SKILLED WORKFORCE

9 Colleges & Universities

Worcester State, Clark, UMass Medical, Assumption College, WPI, Holy Cross

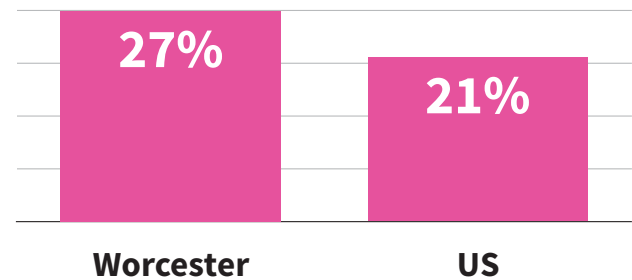
7 High Schools: Nationally acclaimed technical high school

Major universities awarded **400 life sciences-related degrees** in 2016

Higher proportion of life sciences graduate degrees awarded (27%) than the US (21%)

Industry-education partnerships (MBI/WPI, WTHS/LakePharma) BETC ongoing professional education

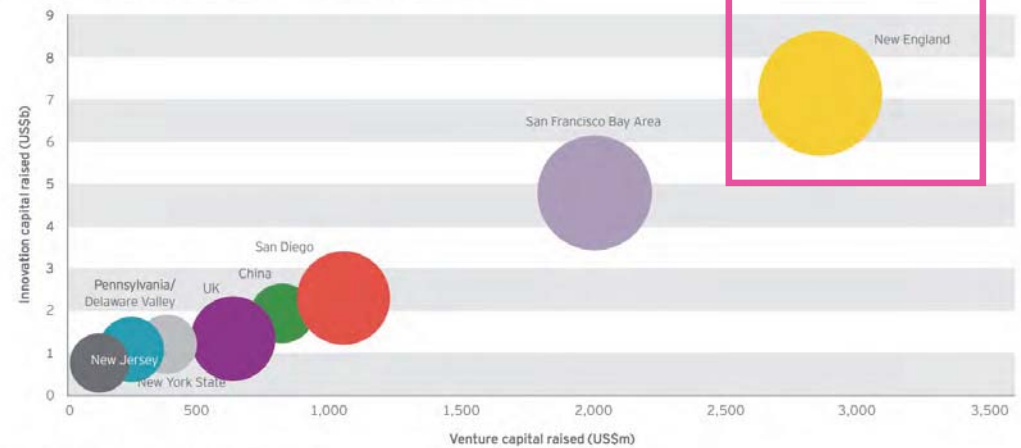
% Graduate Degrees In Biological & Biomedical Sciences



A STATE ATTRACTING MORE INVESTMENT THAN ANYWHERE ELSE IN THE COUNTRY



Innovation capital raised by leading biotech clusters, 2016



Size of bubbles shows number of financings per region.
Innovation capital is the amount of equity capital raised by companies with revenues of less than US\$500 million.
Source: EY, Capital IQ and VentureSource.

Venture Investment in MA biopharma companies was **2.9 billion** in 2016
\$7 billion in last 3 years

\$2,5782,549,176 in NIH funding
second only to CA

A NETWORK OF PEOPLE, PARTNERSHIPS & COLLABORATION

A broad spectrum of people and businesses mutually dedicated to helping ensure the success of biomanufacturing in Worcester.



WORCESTER REGIONAL



MASSDEVELOPMENT



The City of WORCESTER

ACCESSIBILITY & INFRASTRUCTURE OF NEW ENGLAND'S 2ND LARGEST CITY



A major regional airport 2nd largest in MA with all major regional routes (including JetBlue service)

Central location 50 min west of Boston and north of Providence 40 min east of Springfield.

- I-90, I-290, I-190, Rt. 146, and I-84

Commuter Rail with 20 round trip trains to Boston.

Easy access to freight through **CSX Intermodal Rail Yard** and **Port of Worcester**

City	Distance	Drive Time	Distance to Rail Access		Proximity to Airports	
Boston, MA	40 miles	50 minutes	Passenger Rail (Union Station)	1.5 miles	Worcester Regional Airport	6 miles
Providence, RI	40 miles	40 minutes			Logan International Airport (Boston, MA)	43 miles
Hartford, CT	60 miles	1 hour	Freight Rail (Port of Worcester)	2.5 miles	Providence TF Green Airport (Providence, RI)	50 miles
Manchester, NH	72 miles	1 ½ hours			Bradley International Airport (Hartford, CT)	73 miles
New York City, NY	180 miles	3 hours				

LOW COST OF DOING BUSINESS, HIGH QUALITY OF LIFE

22%

lower cost of
living than the
Metro Boston Area

\$1,315

average rent for
an apartment

\$239,900

median home
price

20min

average commute
time

\$85K

median income



OTHER LOCATIONS COMPETE ON LOCATION, WORKFORCE, AND THE BENEFIT OF EXISTING BUILDING STOCK, BUT CAN'T COMPETE WITH THE ECOSYSTEM OF WORCESTER

WORCESTER

A vibrant urban ecosystem that breeds innovation



HOPKINTON

CANTON

DEVENS

FRANKLIN

BROCKTON

GRAFTON

LOWELL

MARLBOROUGH

NEW BEDFORD

WOBURN

WHAT
MAKES US
UNIQUE?

**CHEAPER THAN BOSTON,
CLOSER THAN ASIA, AND MORE
HAPPENING THAN DEVENS**

Worcester offers the perfect storm of ingredients. No one can compete with the blend of affordability, in a thriving ecosystem, with an abundance of industry essentials and amenities, within close proximity to a hub of innovation, that Worcester has.

PLACE

What makes this place and the cultural fabric of the area unique? What makes Worcester special?

WORCESTER IS THE BACKBONE OF MASSACHUSETTS

2nd

Largest city in
New England

184,000

Population

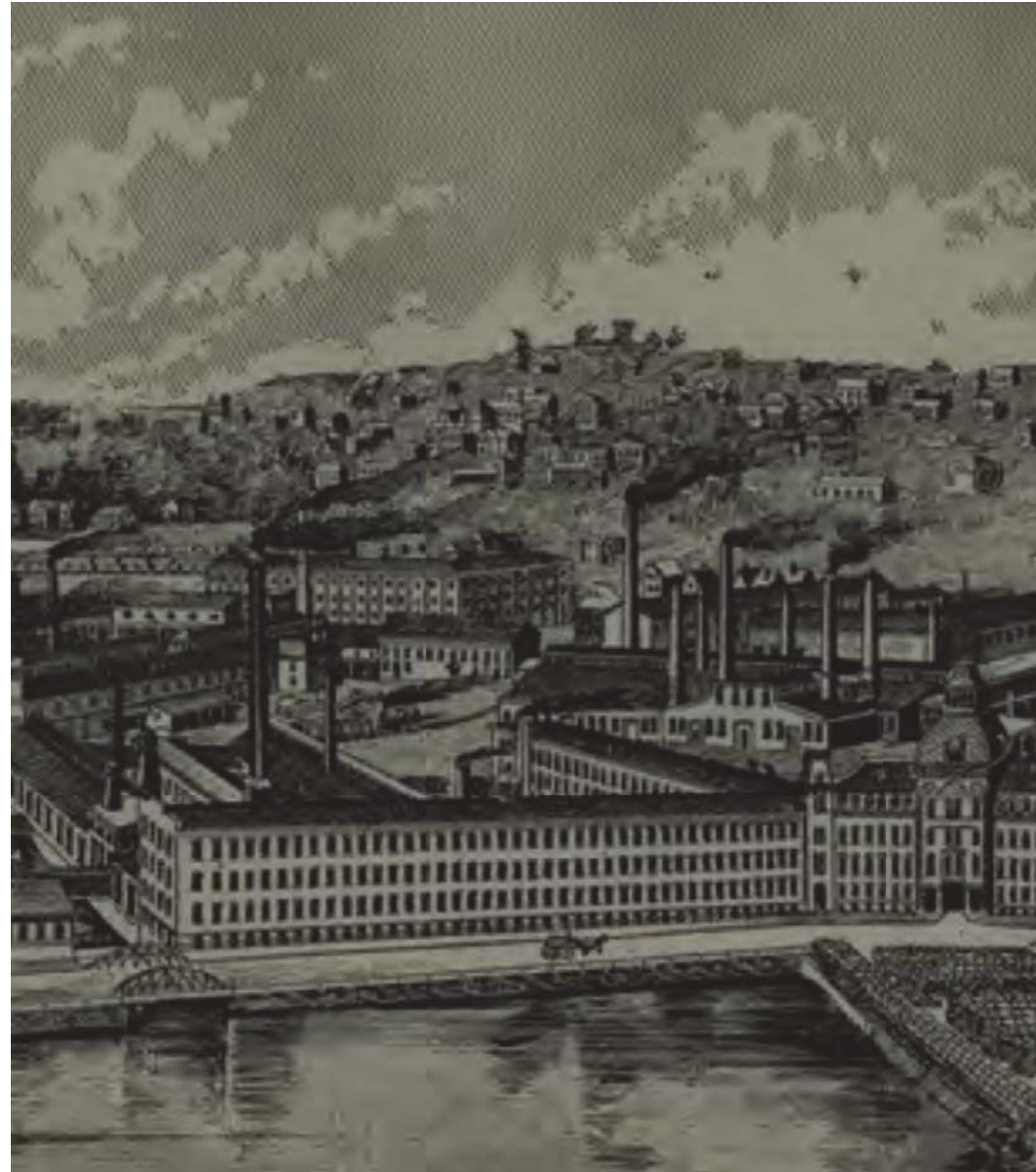


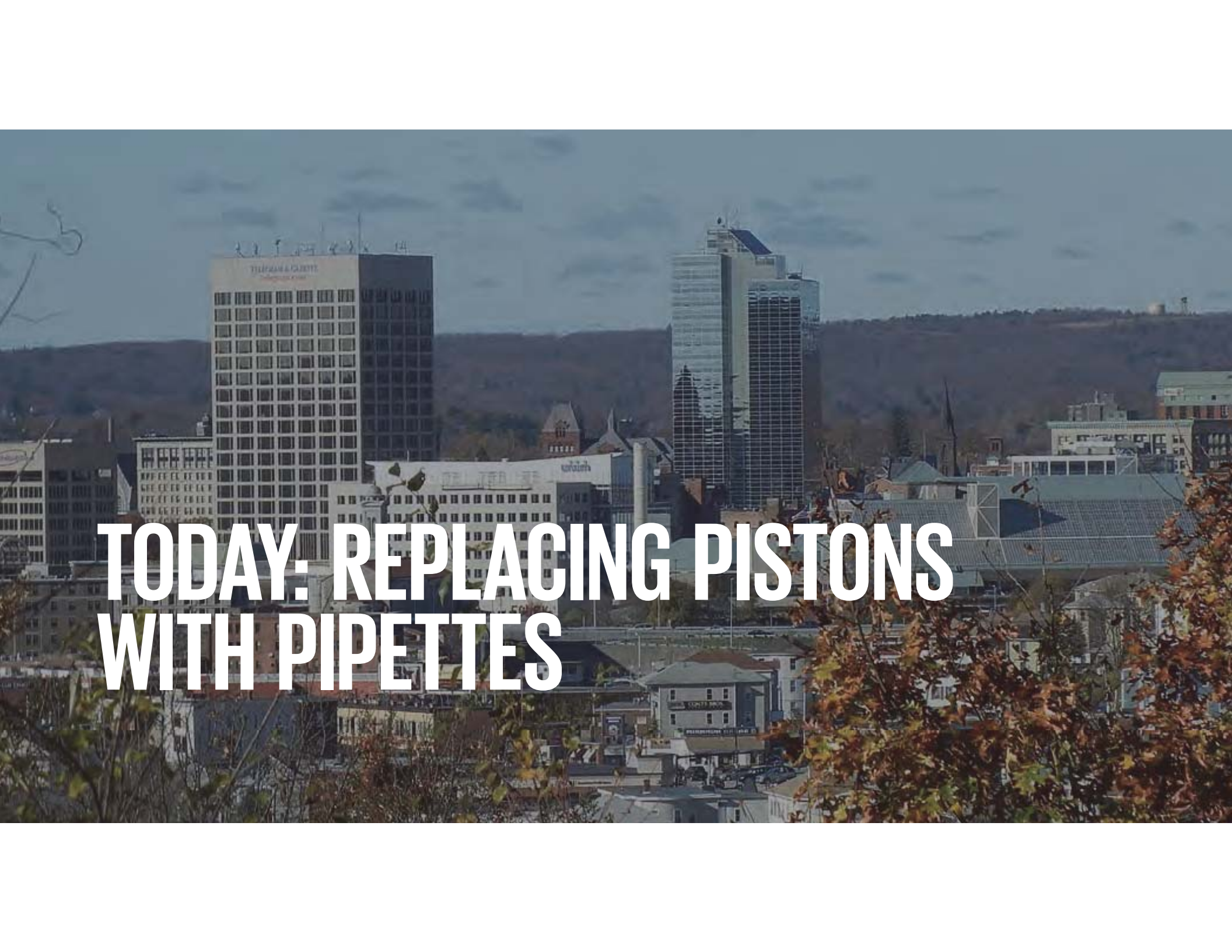
★ Designed by TownMapsUSA.com

MANUFACTURING IS IN ITS DNA

1700 -1950s INDUSTRIAL BOOM TOWN

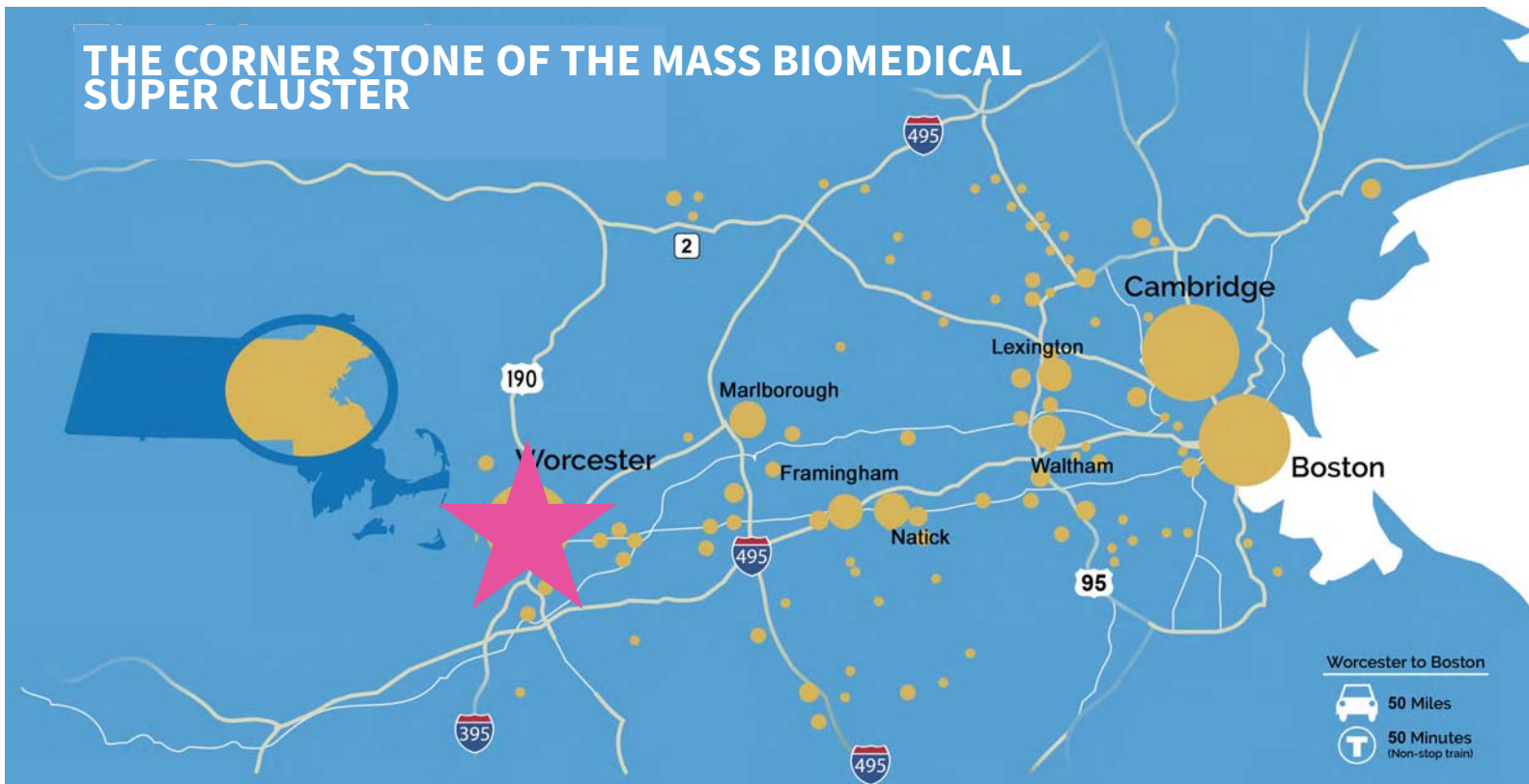
Worcester helped fuel the progress of the country machinery, wire, tools, textiles, and shoes





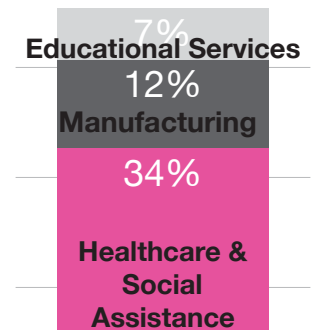
**TODAY: REPLACING PISTONS
WITH PIPETTES**

IT HAS EVOLVED FROM **INDUSTRIAL** MANUFACTURING TO MANUFACTURING THE FUTURE OF **ED & MED, AND LIFE SCIENCES**



Over **60** Biotech companies alone

EMPLOYMENT BY SECTOR



AND IT'S ON THE RISE

A CITY REDEFINED

Worcester ranked **#2 City in New England to start a business**

\$2B total in dedicated development funds for projects completed or underway

\$96M committed for 20 year renovation plan of downtown

665 new housing units being built

2.3m sq ft of commercial/residential space

1,300 new jobs anticipated

**WHY
WORCESTER?**

**WORCESTER KNOWS
HOW TO DO IT,
HOW TO BUILD IT,
HOW TO MAKE IT,
HOW TO GET IT DONE.**

**WORCESTER IS
WHAT'S NEXT IN MASS**