




REGIONAL RESOURCE ASSESSMENTS

North Central Region

Massachusetts Alliance for Economic Development

April 2008

Moran, Stahl & Boyer

Connecting Companies With Communities™

E.M. Pemrick & Company

Topics for Discussion

- Economic development resource assessment process
- Target industries by region
- Life cycles of businesses and impact on resource needs
- Regional assessment
- Quality of life: cost of living and housing
- University R&D that supports target industries
- College and university enrollment as a labor source
- Transportation resources
- Real estate and utilities

Economic Development Resource Assessment Approach

Identify Target Industries:
- Biotechnology/Health Science
- Institutional Health/Education
- Computers/Electronics
- Plastics
- Fabricated Metals
- Financial Services
- Marine Science
- Renewable Energy
- Tourism

EXAMPLES

Select Life Cycle Stages:
- Initial Product Development (R&D)
- Business Incubator (Start-ups)
- Product/Business Expansion

Determine Types of Operations:
- Headquarters
- Shared Services/Consultants
- R&D/Labs
- Manufacturing
- Distribution

Aligning Industry Needs
With Community Resources

Define Resources:
- Facilities/Utilities
- Workforce
- Transportation Access
- Co-Location (With R&D, Others)
- Financial Support/Operation Costs
- Overall Business Climate
- Cost of Living/Housing

Target Industry Overview by Region

Industry/Segment	Berkshire	West	Central No.	Central So.	Metro West	Merrimack Valley	Greater Boston	Southeast	Cape & Islands
■ • Biotech/Pharmaceuticals		■		■	■	■	■	■	
■ • Medical Equipment		■			■	■		■	
■ • Marine Science								■	■
■ • Computers/Electronics		■			■	■			
■ • Food Processing			■					■	
■ • Fabricated Metals		■		■					
■ • Plastics (Resin/Parts/Products)	■	■	■						
■ • Renewable/Alternative Energy	■	■			■	■		■	■
■ • Aerospace/Defense/Security					■	■	■		
• Institutional Healthcare Services		■		■	■		■		
• Institutional Education Services				■			■		■
■ • University R&D		■		■			■		
■ • Financial Services		■			■		■		
■ • Prof/Tech/Creative/IT Services*	■	■			■	■	■		■
• Transportation/Distribution								■	
• Hospitality/Rec./Culture/Tourism	■	■					■	■	■
• Mgmt. of Companies/HQ					■		■		

■ State Target Industry

*Many Prof/Tech/Creative/IT Services companies are very small and operated from homes.

Employment by Selected Industry Segment (U.S. Department of Labor for 2005)

Industry	Total	Berkshire	West	Central No.	Central So.	Metro West	Merrimack Valley	Greater Boston	Southeast	Cape & Islands
Manufacturing	299,300	6,200	31,900	15,500	27,700	58,800	44,200	65,800	46,200	2,400
• *Medical Instruments*	12,000	0	900	20	1,100	3,100	1,100	2,700	2,900	0
• *Pharmaceuticals*	15,700	800	4,000	3,500	1,800	800	1,600	900	1,800	100
• *Computers/Electronics*	71,200	30	1,800	1,800	4,500	30,600	14,800	13,300	4,000	600
• *Food Processing*	22,900	200	2,200	800	700	2,800	2,500	8,600	4,800	400
• *Fabricated Metal*	35,200	500	6,300	1,400	4,700	4,500	3,400	6,100	4,700	200
• *Plastics*	15,700	800	4,000	3,500	1,800	800	1,600	900	1,800	100
• *Textiles*	6,400	200	400	200	700	900	400	300	2,600	10
• *Paper*	12,300	1,500	3,600	1,800	1,000	1,300	1,000	2,000	1,200	0
• *Furniture*	5,500	30	600	700	900	900	400	1,200	700	130
Healthcare Services	470,700	10,600	47,300	10,800	39,400	53,400	31,900	200,400	59,400	15,700
Education Services	309,800	6,800	40,000	9,400	26,500	48,600	21,500	114,800	33,600	7,600
Financial Services	180,600	2,100	1,700	1,700	12,300	21,400	6,400	109,100	12,200	2,700
Prof/Technical Services	245,900	2,800	8,000	2,600	12,100	59,600	18,600	117,700	13,400	4,900
Transportation/Ware.	100,600	1,200	11,000	2,300	8,000	9,300	7,000	45,200	13,200	2,800
Retail	351,100	8,800	34,300	10,500	29,000	55,300	20,900	109,500	61,800	19,100
Hospitality	250,000	7,100	21,600	6,100	18,300	33,900	17,200	93,200	35,500	16,500
Arts & Entertainment	52,000	1,800	5,100	1,700	3,200	9,300	3,400	16,100	7,200	3,900
Mgmt. of Companies	62,400	700	4,200	1,100	5,000	20,600	3,900	18,100	8,000	700

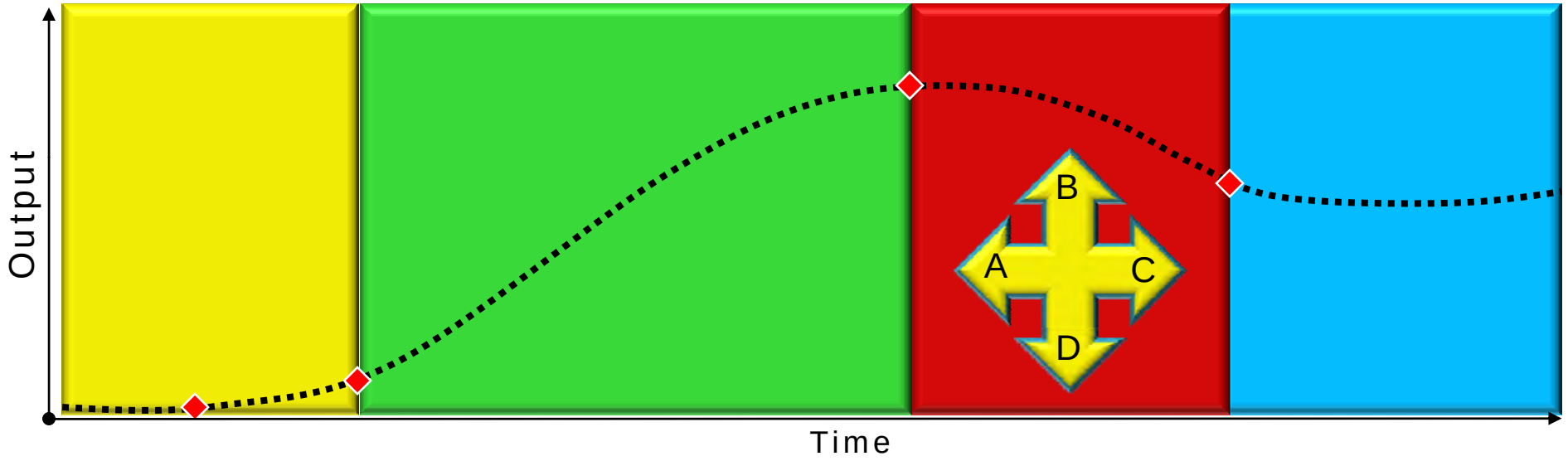
Company/Product Life Cycle: Key to Understanding Opportunities

Phase I
Business Start-up & Product Rollout

Phase II
Rapid Market Growth Through Internal Expansion and Acquisition

Phase III
Maturation & Consolidation

Phase IV
Sustained Niche or "Last One Standing"



Start-up Capital > Labor/Facilities/Capital > Minimize Cost > Sustained Market

Critical Decisions Made in Phase III

A: Attempt to go back to Phase II (new market expansion/product improvements)
B: Consolidate with competition to grow share in a shrinking market
C: Go/stay private with niche operation and proceed to Phase IV
D: Continue to enhance productivity to sustain margins (production improvements/cost takeouts)

Facility Requirements Through Life Cycle of Technology Company

Phase I Business Start-up & Product Rollout	Phase II Rapid Market Growth Through Internal Expansion and Acquisition	Phase III Maturation & Consolidation
Initially: Full service incubator Transition to: Multi-tenant building with some shared facilities • Parking facilities • Conference rooms • Café • Locker/exercise room	As Business Expands: HQ, R&D, back office and manufacturing operations are uncoupled and placed in the most optimum locations for cost and market access	At Maturity: Cost becomes an overriding issue for most operations

Life Cycle Stages by Target Industry

Industry/Segment	Product R&D	Business Startup	Product/Business Expansion
• Biotech/Pharmaceuticals	■	■	■
• Medical Equipment	■	■	■
• Marine Science	■	■	■
• Computers/Electronics	■	■	■
• Food Processing			■
• Fabricated Metals		■	■
• Plastics (Resin/Parts/Products)		■	■
• Renewable/Alternative Energy	■	■	■
• Aerospace/Defense/Security			■
• Institutional Healthcare Services			■
• Institutional Education Services			■
• University R&D	■		■
• Financial Services			■
• Prof/Tech/Creative/IT Services		■	■
• Transportation/Distribution			■
• Hospitality/Rec./Culture/Tourism		■	■
• Mgmt. of Companies/HQ			■

Types of Operations by Target Industry

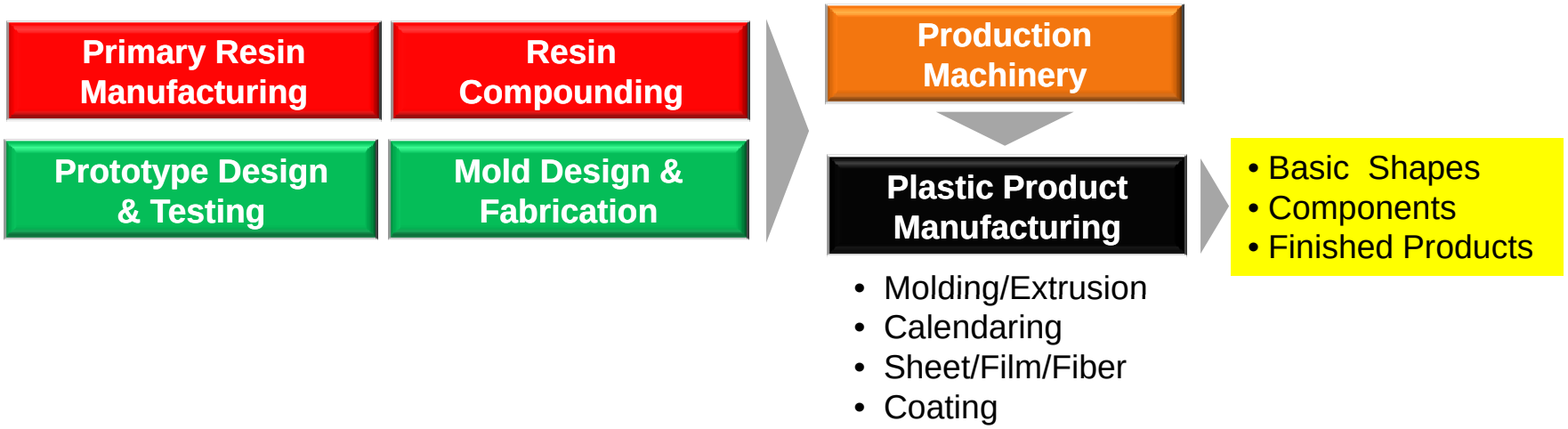
Industry/Segment	Headquarters	Back Office Shared Serv.	R&D	Manufacturing	Distribution
• Biotech/Pharmaceuticals		■	■	■	
• Medical Equipment	■	■	■	■	
• Marine Science	■	■	■	■	
• Computers/Electronics	■	■	■	■	
• Food Processing				■	
• Fabricated Metals				■	
• Plastics (Resin/Parts/Products)			■	■	
• Renewable/Alternative Energy	■		■	■	
• Aerospace/Defense/Security	■	■		■	
• Institutional Healthcare Services					
• Institutional Education Services					
• University R&D			■		
• Financial Services	■	■			
• Prof/Tech/Creative/IT Services	■				
• Transportation/Distribution					■
• Hospitality/Rec./Culture/Tourism					
• Mgmt. of Companies/HQ	■				

Target Industry Overview: Plastics Industry (NAICS 3261)



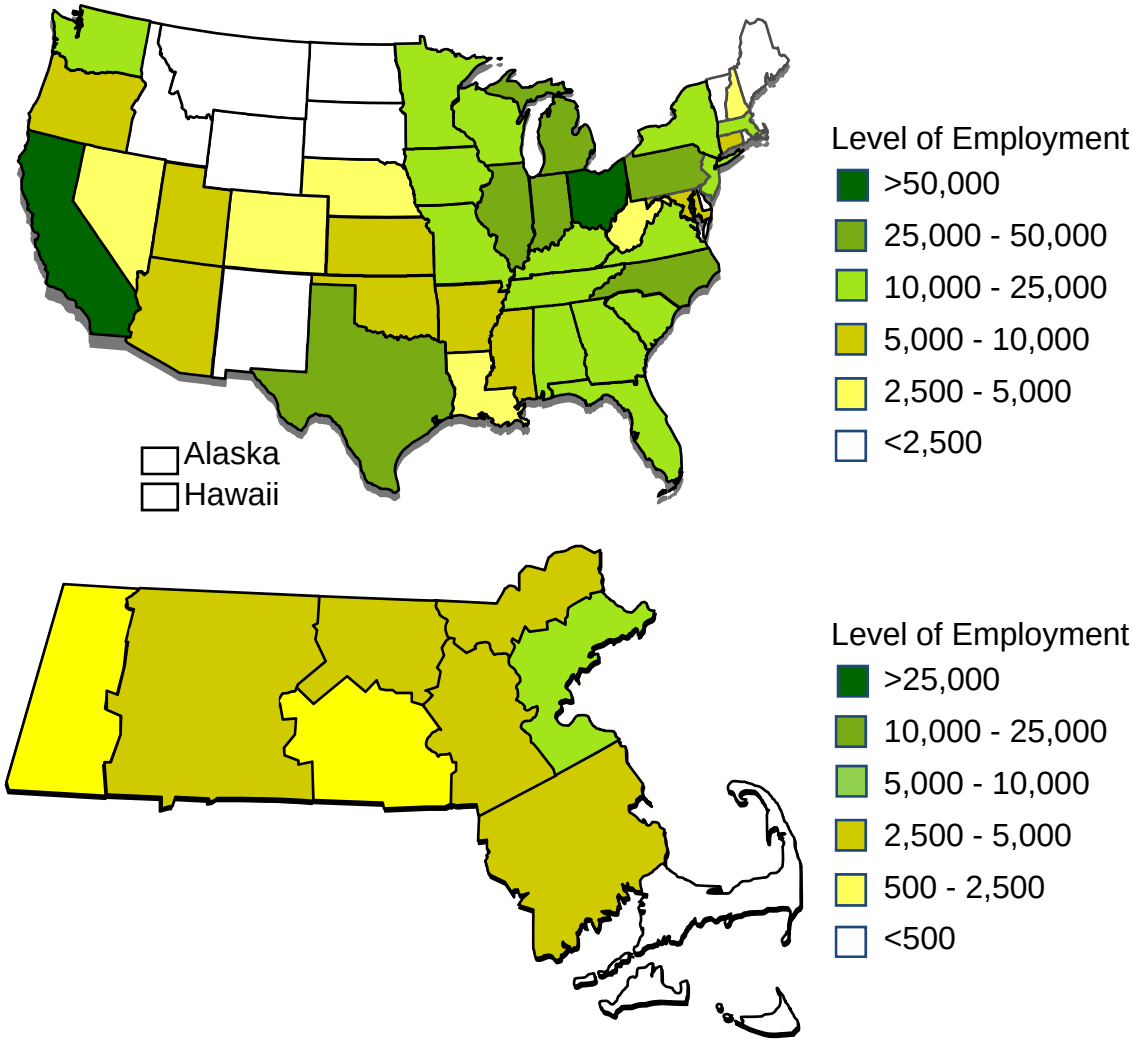
Industry Profile and Trends

- Global market highly fragmented, relatively low barriers to entry
- If it's light, low margin, long runs, small size . . . it's gone.
- Although employment has dropped substantially since 2000, the value of shipments has increased by 42% to $81.4 billion
- From 2005 to 2006, exports increased 12.3% and the trade surplus grew to $6.8 billion. Trade deficit significant with China ($4.7 billion)
- Product innovations: biodegradable plastics, nanocomposites to produce tougher, more heat/dent resistant, electrically conductive
- Process productivity is a relentless mission of plastics companies



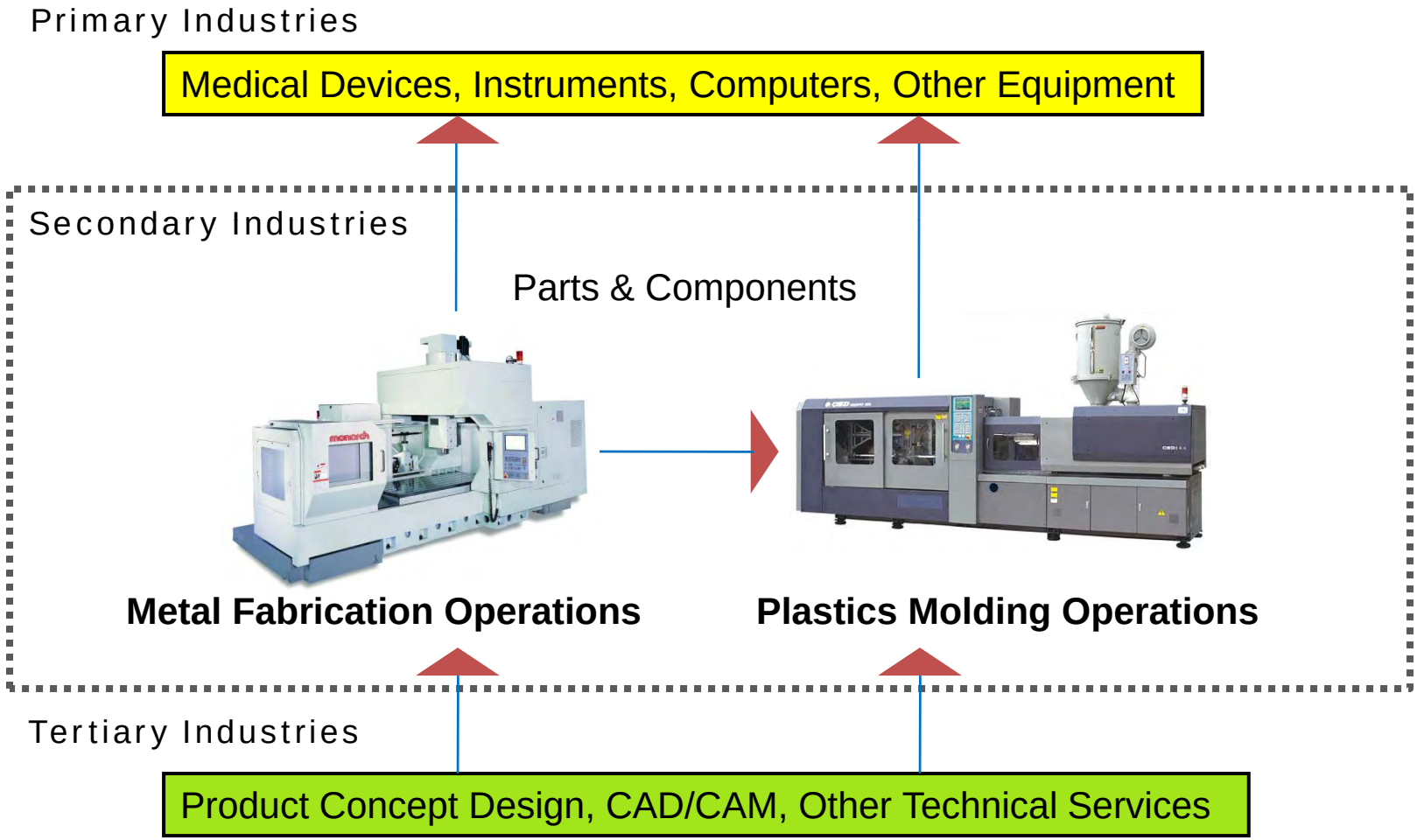
Target Industry Overview: Plastics Products (NAICS 3261)

Plastics Products (3261)			
State	2006	2000	Change
USA	715,867	876,848	-18.4%
CA	67,505	90,051	-25.0%
OH	58,030	72,796	-20.3%
MI	49,137	60,617	-18.9%
IL	45,753	61,994	-26.2%
TX	42,369	51,327	-17.5%
PA	39,642	45,840	-13.5%
IN	35,752	43,000	-16.9%
NC	28,855	30,217	-4.5%
NY	23,923	35,052	-31.7%
WI	23,732	30,559	-22.3%
GA	22,671	22,788	-0.5%
NJ	21,988	31,626	-30.5%
TN	19,070	22,494	-15.2%
VA	17,674	17,746	-0.4%
KY	16,242	18,128	-10.4%
▶ MA	15,127	20,682	-26.9%
MN	14,888	19,070	-21.9%
SC	14,482	15,122	-4.2%
FL	14,386	19,642	-26.8%
MO	13,789	17,695	-22.1%



Strategic Components of a Long-Term Cluster Formation

As the primary industries cycle out, the secondary and tertiary industries adapt to the evolving needs of the current “hot” industry.



North Central Region

Target Industries vs. Life Stages and Types of Operations

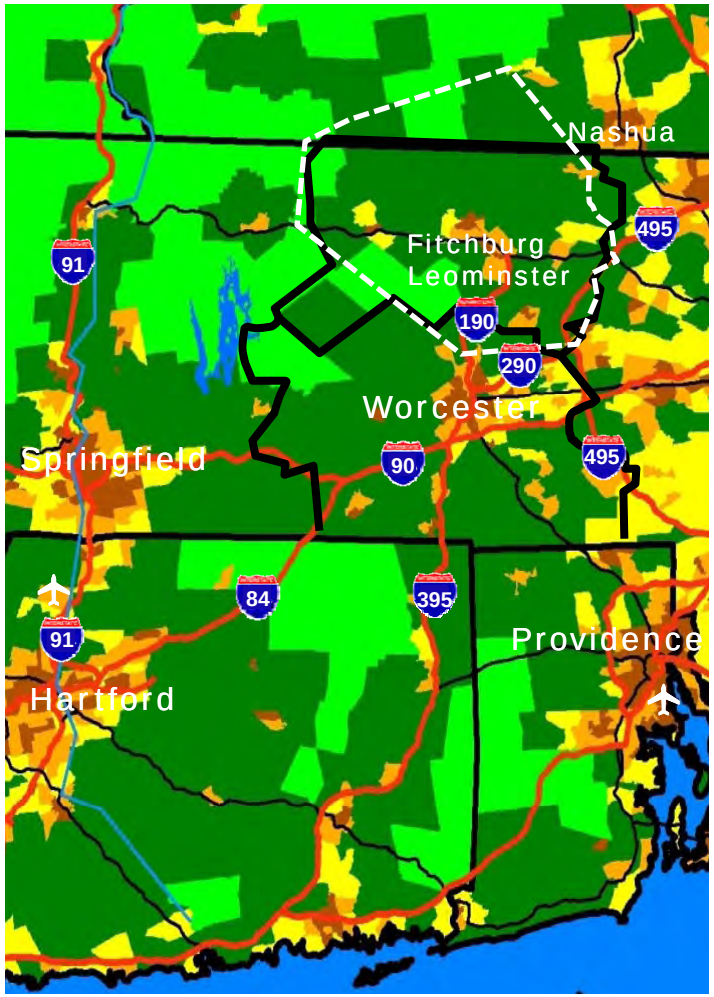
Industry	Life Stage(s)	Types of Operations
Food Processing	• Expansion of existing firms • Well established firms relocating to area	• Manufacturing
Plastics	• Start-up of new firms • Expansion of existing firms	• Manufacturing

Resource Assessment by Type of Operation

Type of Operation/Resources	Resource Assessment
Manufacturing (Food Processing and Plastics)	
Labor	• Six-year population growth is good for the state (3.8%) • In general, there is a good supply of manufacturing labor derived from a diverse industrial base including substantial plastics companies.
Real Estate/Facilities	• Plenty of industrial space available, but some considered functionally obsolete. • Limited supply of developable industrial sites with infrastructure.
Utilities	• Varied electric power costs . . . major factor for manufacturers. • Food processing operations typically require significant water resources.
Transportation	• Route 2 and I-190 provide good interstate access. • Some plastics molding operations require rail access.
Technical Support From University Research	• Plastics research support at UMass-Lowell and Amherst. Plastics Institute of America is located at UMass-Lowell. • Food processing research is best channeled through UMass-Amherst
Cost of Living/Housing	• Housing not an issue unless recruiting specific talent to the area. • Overall Cost of Living Index = 101; Housing = 68 (U.S. average = 100).
Incentives/Other Financial Resources	• North Central Massachusetts Development Corporation revolving loan pool for start-ups and existing businesses. • Business financing is offered by some communities, like Ayer, through affiliated industrial development authorities.
Other	• MassPLASTICS website established by the EDC to connect plastics companies with medical device manufacturers.

Population/Demographics

Population (2006) • 30-minute commute zone around Leo/Fitch/Gard	269,900
Population growth (2000 - 2006) • 30-minute commute zone around Leo/Fitch/Gard • State average • National average	3.8% 0.67% 6.4%
Adult population with High School diploma only • 30-minute commute zone around Leo/Fitch/Gard • State average • National average	30.4% 28.2% 30.2%
Adult population with four-year+ college • 30-minute commute zone around Leo/Fitch/Gard • State average • National average	26.6% 37.0% 27.0%
Percent of Population in 25 - 34 cohort • 30-minute commute zone around Leo/Fitch/Gard • State average • National average	11.9% 12.7% 13.3%
Median Age • Leominster/Fitchburg/Gardner MSA • State average • National average	35.7 years 38.3 years 36.4 years



Population Concentration

< 100 | 100-499 | 500-1,000 | 1,000-2,500 | >2,500

30-minute commute zone

Labor Supply and Cost

Job Title	Code	Median Salary (U.S. Average)	Median Salary (State Average)	Median Salary (Leo/Fitch/Gar)	Employment Level (Leo/Fitch/Gar)
Financial Services					
Accountants/Auditors	13-2011	$60,670	$62,060	$52,900	220
Engineering/Science					
Electronics Engineers	17-2072	$82,820	$86,450	$56,500	40
Mechanical Engineers	17-2141	$72,580	$82,930	$83,250	80
Administrative					
Customer Service Reps.	43-4051	$30,400	$36,980	$30,790	660
Production					
Electrical/Electronic Equipment Assemblers	51-2022	$27,510	$32,370	$30,000	80
Computer-Controlled Machine tool Operators	51-4011	$32,820	$36,790	$45,920	80
Machinists	51-4041	$35,810	$40,560	$39,250	120
Inspectors/Testers	51-9061	$32,190	$36,840	$31,140	170

Unemployment Rates

Location	2001	2003	2005	2007
Leominster/Fitchburg/Gardner MSA	4.4%	7.0%	6.4%	5.3%
Massachusetts Average	3.7%	5.8%	4.8%	4.7%
U.S. Average	4.7%	6.0%	5.1%	4.6%

Major Non-Government Employers

Target Industry Employer

Company/Organization	Description	Employment Range
Health Alliance	Health care services	1,500 – 2,500
L.S. Starrett Company	Fabricated metal manufacturing (equipment)	500 – 1,000
Simonds International	Fabricated metal manufacturing (tools)	500 – 1,000
Heywood Hospital	Health care services	500 – 1,000
Fitchburg State College	Higher education	500 – 1,000
New England Business Services	Supplier of business forms	500 – 1,000
Simplex Grinnell	Communications equipment manufacturing	500 – 1,000
Mount Wachusett Community College	Higher education	250 – 500
International Rectifier	Plastic products manufacturing	250 – 500
Highlands Long Term Care Center	Nursing home	250 - 500
Evergreen Solar	Solar power products manufacturing	250 – 500
TRW Automotive	Plastic products manufacturing	250 – 500
Sterlite Corporation	Plastic products manufacturing	250 – 500
Sonoco Products	Packaging service	250 – 500
Nashoba Valley Medical Center	Health care services	250 - 500
Georgia Pacific / Dixie Cutlery	Plastic products manufacturing	250 - 500
Nicols & Stone	Furniture manufacturing	250 - 500
Mohawk Wire and Cable	Fiber optics and cable manufacturing	250 – 500
Bristol-Myers Squibb	Pharmaceutical mfg *(under construction)*	250 – 500*

* - As of Jan. 2008, 200 workers (non-construction) were employed on-site. The plant is expected to employ upwards of 400 by 2011.

Major Non-Government Employers

Target Industry Employer

Company/Organization	Description	Employment Range
Avery Dennison/Fastener Division	Plastic products manufacturing	100 – 250
Bemis Associates	Plastic products manufacturing	100 – 250
Cycles Incorporated	Plastic products manufacturing	100 – 250
Fosta-Tek Optics	Plastic products manufacturing	100 – 250
Alpha Gary Corporation	Plastic products manufacturing	100 - 250
Injectronics	Plastic products manufacturing	100 – 250
Laddawn Products	Plastic bag manufacturing	100 – 250
Nova Packaging Systems	Plastic products manufacturing	100 - 250
Plastican	Plastic container manufacturing	100 – 250
United Plastic Housewares	Plastic products manufacturing	100 - 250
CPF Inc.	Beverage manufacturing	100 – 250
Vitasoy USA	Food manufacturing	100 – 250
DRS Power Technology Inc.	Engineering services/ defense	100 – 250

Recent Developments

Company	Description
Bristol-Myers Squibb	• Major pharmaceutical company is constructing a $750 million biologics manufacturing facility at the former Fort Devens U.S. Army base. • Project is expected to be completed in 2009 and will employ ~350 people.
Nypro Inc.	• Precision plastics injection molding company recently invested $15 million to add two new clean room environments at its facility in Clinton, adding 100 new jobs.
L-3 Communications	• Two divisions of the defense and telecom firm seeking to consolidate manufacturing operations at a 216,000 sf facility in Ayer previously occupied by Veryfine. • Project to relocate 236 employees and create an estimated 30 new manufacturing and engineering jobs.

Utilities and Real Estate

Utilities	Supply-Related Issues
Water	Varies by community. Some issues extending water lines to development sites.
Wastewater Treatment	Varies by community. Some issues extending sewer lines to development sites. Town of Ayer pursuing additional wastewater pre-treatment options to support food processing industry.
Telecom/Broadband	Fiber optic telecommunications infrastructure is available in some parts of the region. Lack of broadband internet access even in some urban centers.
Gas	Gaps in service – not widely available.
Electric Power	Most areas served by Unitil or National Grid. Issues with lag time in preparing sites for development or addressing the needs of businesses that require redundant power.

Real Estate	Supply-Related Issues
Office Space	Plenty of office space available, with a vacancy rate exceeding 20%. Limited demand for Class B and C office space. Lease rates average $17/sf.
Industrial Space	Plenty of available light industrial, flex and warehouse space in the region, particularly in Gardner and Leominster; vacancy rate of ~20%. With development of modern space, some space formerly occupied by industrial users is vacant and considered functionally obsolete. Limited supply of developable shovel-ready industrial land, but demand appears to be meeting supply.
R&D Space	See above. Limited demand in this market.
Incubator Space	None. Studies have indicated inadequate demand for a “bricks-and-mortar”-type incubator.
Other	Many building reuse opportunities in urban centers as well as suburban business parks throughout the region.

Quality of Life

Cost of Living and Housing



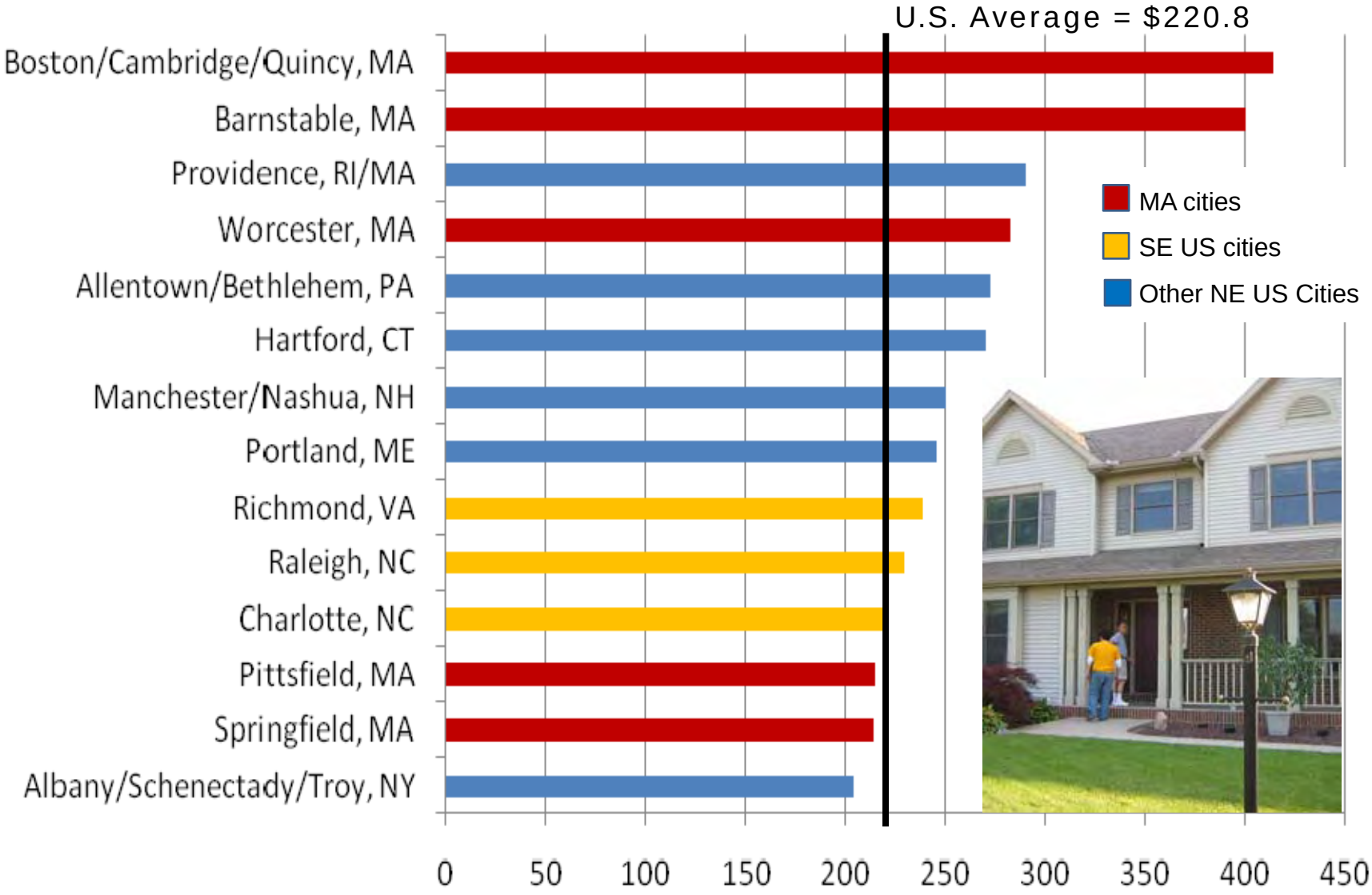


Cost of Living Index: Comparison

Location	COL Index	Grocery	Health Care	Housing	Utilities	Transportation	Misc.
Pittsfield	101	120.6	131	68	130	113	116
Springfield	88	117.5	117	48	103	112	105
Worcester	100	113.1	126	81	110	110	107
Framingham	114	108	125	118	121	113	108
Fitchburg	97	111.9	126	73	110	109	107
Lowell	103	109.3	127	85	121	112	109
Boston	128	112.2	130	148	132	115	111
Taunton	109	112.1	132	98	122	116	110
Brockton	107	113	129	87	131	116	113
Fall River	105	113.2	133	85	122	116	110
New Bedford	102	112	131	79	124	117	109
Barnstable	122	111.8	129	132	128	115	112
Manchester	97	103.4	111	77	133	104	106
Albany	105	121.1	146	66	150	113	124
Philadelphia	92	106.2	102	56	130	117	112
Richmond	87	94	89	70	107	100	94
Raleigh	106	101.9	106	111	94	100	107
Charlotte	91	98.6	103	78	90	99	98
Austin	96	86.8	107	97	90	95	102
Charlotte	91	98.6	103	78	90	99	98
San Diego	147	114.7	130	206	126	112	104

Source: Sperling's Best Places COL calculator

Median Home Sales Price ($000) for 3rd Quarter 2007



Source: National Association of Realtors

Cost of Housing Comparison: Central (North)

$200,000



Fitchburg
$204,800 ● 3 Bed, 2 Bath
1,520 Sq. Ft. ● 0.27 Acres



Leominster
$207,900 ● 3 Bed, 1 Bath
1,613 Sq. Ft. ● 0.24 Acres



Gardner
$205,000 ● 3 Bed, 2 Bath
1,900 Sq. Ft. ● 0.23 Acres

$250,000



Fitchburg
$249,900 ● 3 Bed, 2 Bath
1,456 Sq. Ft. ● 0.3 Acres



Leominster
$254,750 ● 3 Bed, 1 Bath
1,545 Sq. Ft. ● 0.17 Acres



Gardner
$249,800 ● 3 Bed, 2.5 Bath
2,182 Sq. Ft. ● 0.25 Acres

$350,000



Fitchburg
$349,900 ● 3 Bed, 2.5 Bath
2,020 Sq. Ft. ● 0.46 Acres



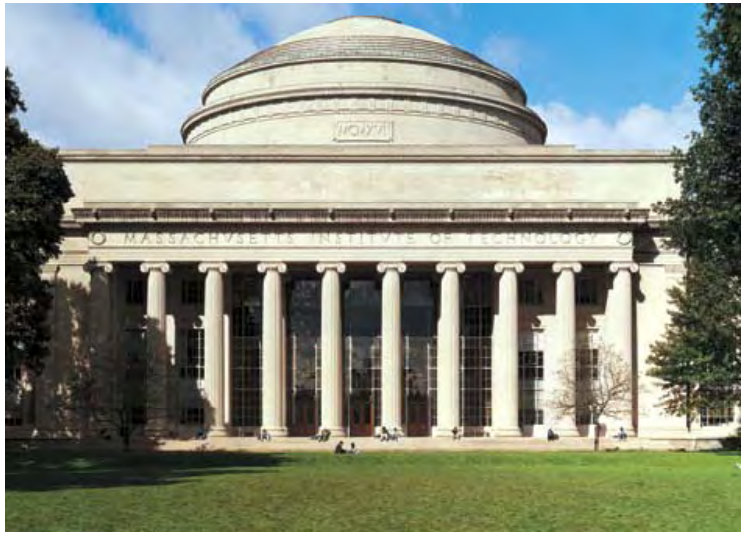
Leominster
$349,900 ● 4 Bed, 2 Bath
3,270 Sq. Ft. ● 0.32 Acres



Gardner
$339,900 ● 4 Bed, 2.5 Bath
1,956 Sq. Ft. ● 0.28 Acres

University R&D

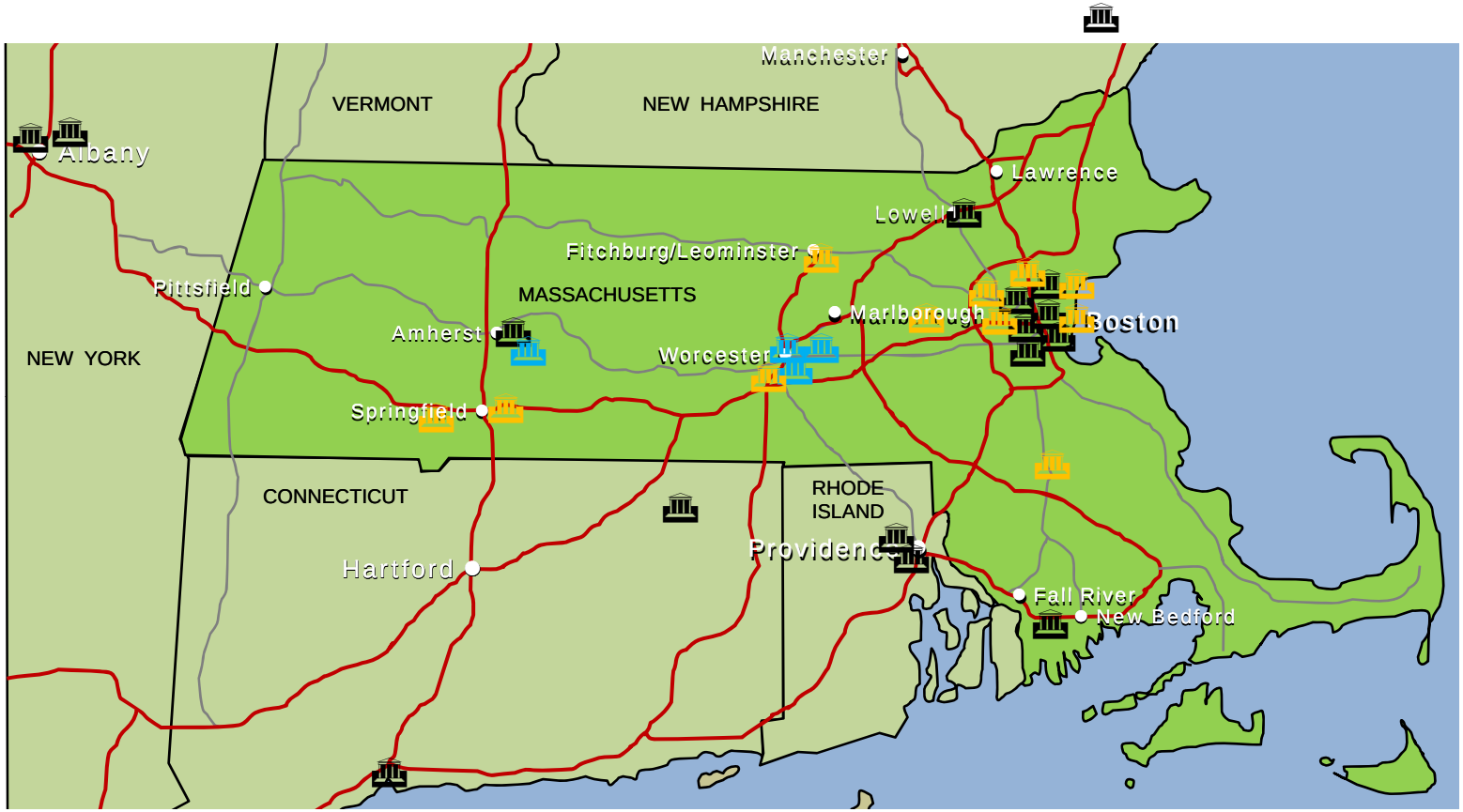
Research Centers That Support Economic Development







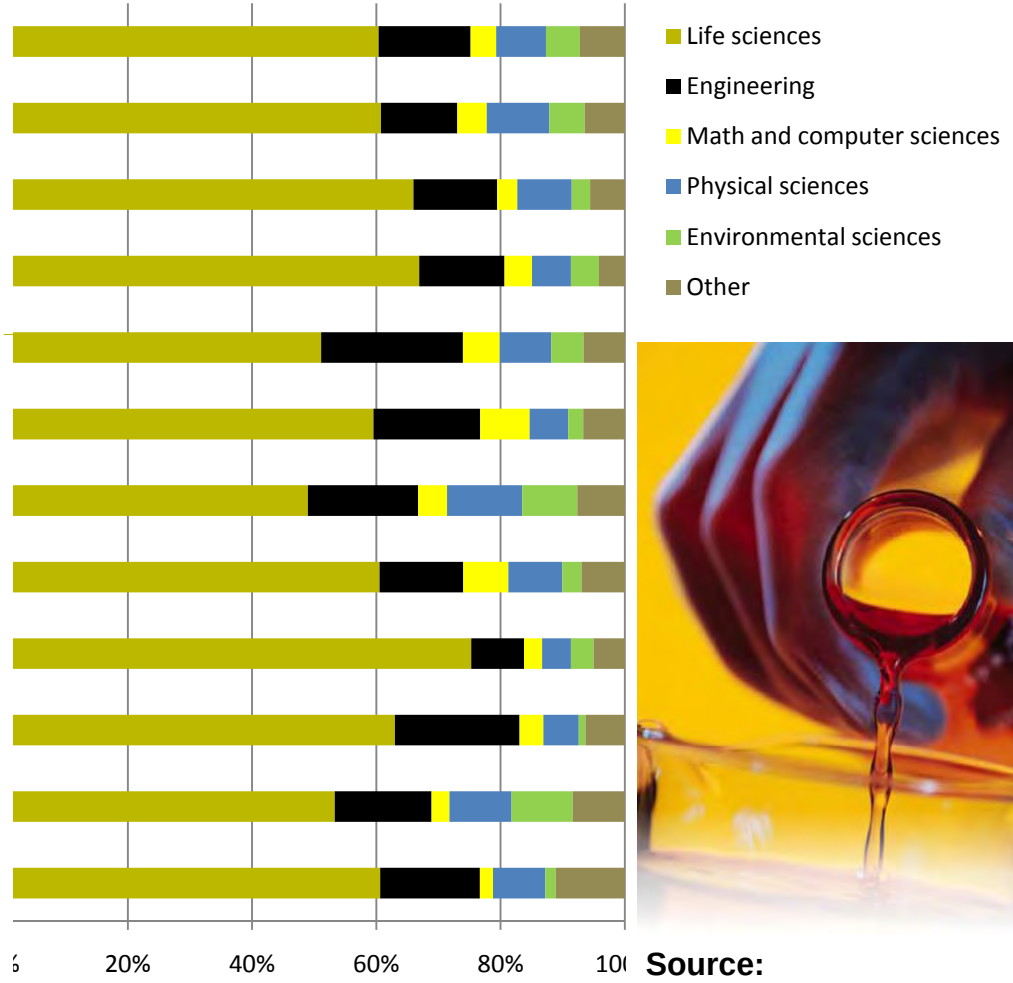
Major Academic and R&D Institutions



- Major Institutions (>5,000 students) with R&D
- Major Institutions (>5,000 students) without R&D
- Institution with R&D and <5,000 students

University R&D: National Total and Top Ten States ($000)

United States (Total)	47,760,402
California	6,493,388
New York	3,789,658
Texas	3,270,728
Maryland	2,530,231
Pennsylvania	2,428,346
▶ Massachusetts	2,158,748
Illinois	1,823,787
North Carolina	1,710,496
Ohio	1,636,473
Florida	1,527,666
Michigan	1,472,727

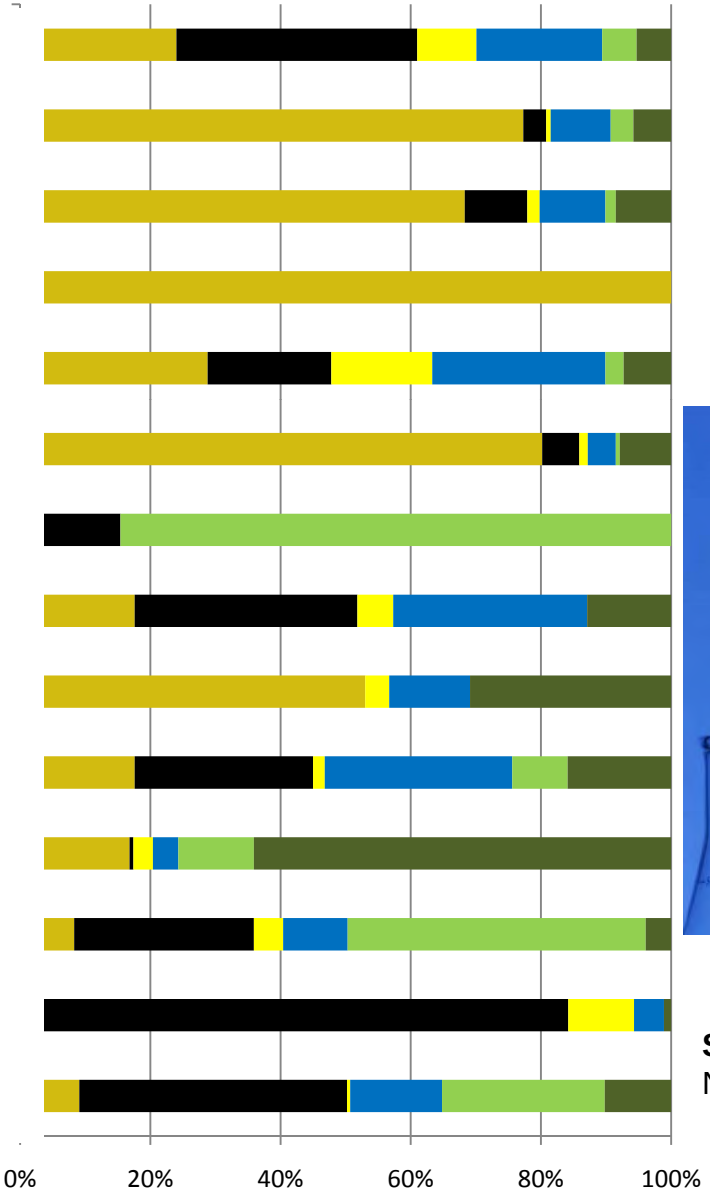


Source:
NSF Data for Fiscal Year 2005

Massachusetts University Research ($000)

MIT	600,748
Harvard U.	453,156
Boston U.	255,615
U. MA Worcester	191,659
U. MA Amherst	136,057
Tufts U.	128,695
Woods Hole Ocean. Inst.	121,888
Northeastern U.	66,495
Brandeis U.	57,017
U. MA Lowell	27,625
U. MA Boston	21,056
U. MA Dartmouth	19,171
WPI	14,483
Clark U.	5,304

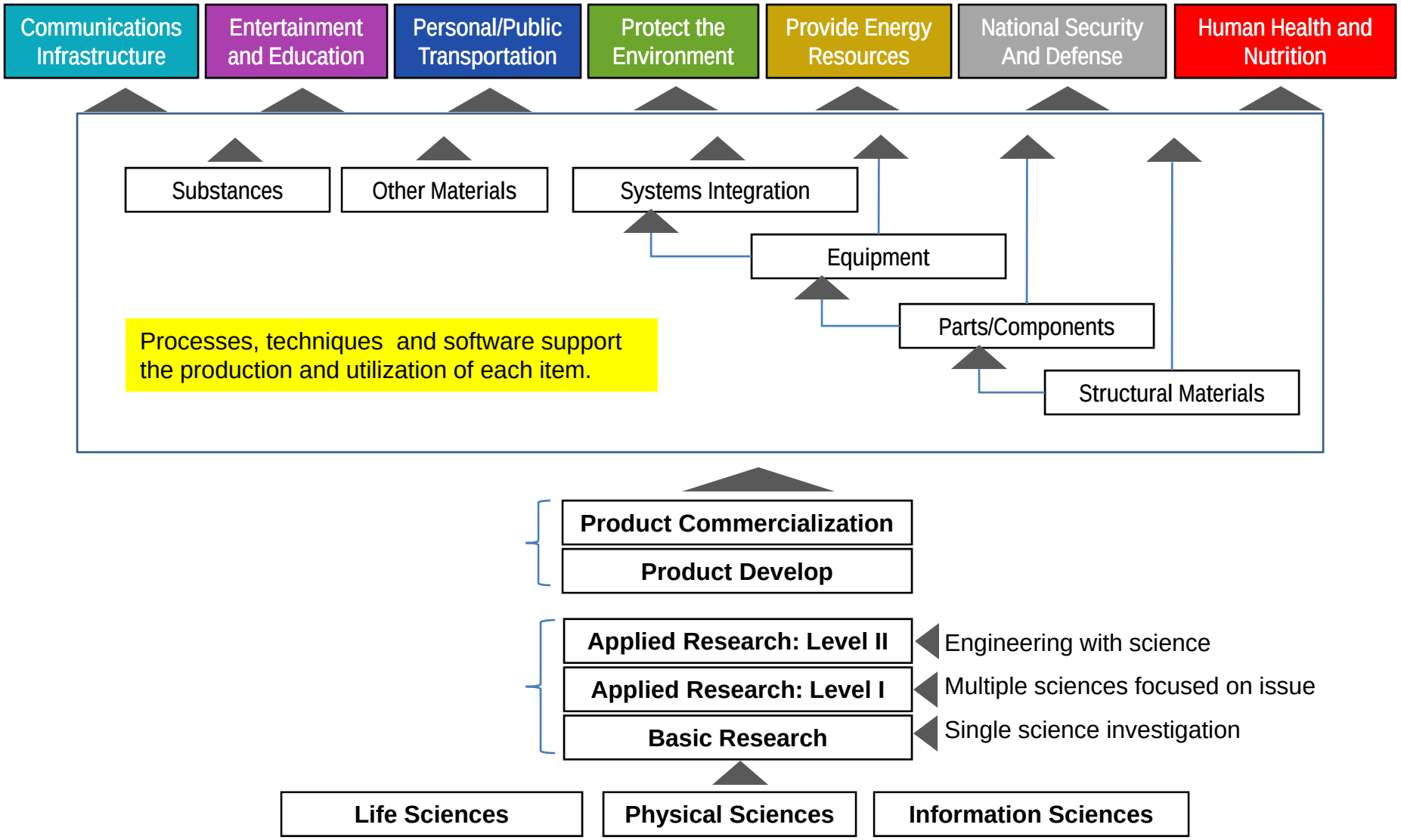
UMass Total ~ $400 million





Source:
NSF Data for Fiscal Year 2005

R&D vs. Economic Development



University R&D by Program Area

R&D Program Area	MIT	Harvard	Boston Univ.	UMASS-Worcester	UMASS-Amherst	Tufts Univ.	Woods Hole Ocean. Inst.	Northeastern Univ.
Life Sciences: Disease Dynamics	■	■	■	■	■	■		■
Life Sciences: Pharmaceuticals	■	■				■		■
Life Sciences: Medical Devices	■	■						
Life Sciences: Tissue/Skin/Bone Syn.	■	■		■		■		■
Life Sciences: Bioinformatics	■	■	■	■	■			
Marine Sciences	■						■	■
Food and Nutrition		■			■	■		
Computers/Electronics	■		■		■			■
Material Sciences: Polymers	■		■		■			
Material Science: Metals								
Material Science: Nanomaterials	■		■		■			■
Alternative Energy	■				■			
Aerospace/Defense/Security	■							■

Source: Websites for each institution

University R&D by Program Area

R&D Program Area	Brandeis Univ.	UMASS - Lowell	UMASS - Boston	UMASS-Dartmouth	WPI	Clark Univ.
Life Sciences: Disease Dynamics		■			■	
Life Sciences: Pharmaceuticals					■	
Life Sciences: Medical Devices		■		■	■	
Life Sciences: Tissue/Skin/Bone Syn.			■		■	■
Life Sciences: Bioinformatics	■	■		■		
Marine Sciences			■	■		
Food and Nutrition				■		
Computers/Electronics		■		■		
Material Sciences: Polymers		■				
Material Science: Metals					■	
Material Science: Nanomaterials		■		■	■	
Alternative Energy		■			■	
Aerospace/Defense/Security					■	

Source: Websites for each institution

Colleges & Universities

Enrollment and Graduates Within Specific Programs





College/University Enrollment and Graduates by Selected Programs

					Bio-Related		Business		Comp./Info. Sc.		Engineering	
College/University	Location	Tot. Enroll.	Undergrad Students	Grad Students	Bach	MS/PhD	Bach	Masters	Bach	MS/PhD	Bach	MS/PhD
Berkshire Region												
Williams College	Williamstown	2,079	2,033	46	61	0	0	0	9	0	0	0
Mass College of Liberal Arts	No. Adams	1,800	1,450	350	15	0	45	0	6	0	0	0
Western Region												
UMass-Amherst	Amherst	25,593	19,823	5,770	238	50	577	255	77	55	215	100
Westfield State College	Westfield	5,426	4,603	823	13	0	120	0	19	0	0	0
Springfield College	Springfield	4,994	3,506	1,488	18	0	44	0	2	0	0	0
Western New England College	Springfield	3,653	2,813	840	5	0	190	69	11	0	60	6
Smith College	Northhampton	3,092	2,634	458	56	3	0	0	4	0	33	0
Mount Holyoke College	South Hadley	2,153	2,149	4	56	0	0	0	4	0	0	0
American International College	Springfield	1,957	1,443	514	9	0	59	47	1	0	0	0
Amherst College	Amherst	1,648	1,648	0	32	0	0	0	11	0	0	0
Bay Path College	Longmeadow	1,479	1,321	158	6	0	79	0	1	23	0	0
Hampshire College	Amherst	1,448	1,448	0	18	0	0	0	4	0	0	0
College of Our Lady of the Elms	Chicopee	1,172	1,013	159	9	0	27	0	3	0	0	0

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

College/University Enrollment and Graduates by Selected Programs

					Bio-Related		Business		Comp./Info. Sc.		Engineering	
College/University	Location	Tot. Enroll.	Undergrad Students	Grad Students	Bach	MS/PhD	Bach	Masters	Bach	MS/PhD	Bach	MS/PhD
North Central												
Fitchburg State College	Fitchburg	5,508	3,768	1,740	5	4	107	47	17	21	0	0
South Central												
Worcester State College	Worcester	5,440	4,626	814	39	9	171	0	22	0	0	0
Worcester Polytechnic Institute	Worcester	3,918	2,866	1,052	61	10	28	27	89	48	401	132
Clark University	Worcester	3,071	2,262	809	35	6	36	122	18	8	0	0
College of the Holy Cross	Worcester	2,821	2,821	0	32	0	0	0	0	0	0	0
Assumption College	Worcester	2,792	2,420	372	29	0	148	28	8	0	0	0
Becker College	Worcester	1,729	1,729	0	1	0	88	0	0	0	0	0
Nichols College	Dudley	1,470	1,470	0	0	0	141	77	0	0	0	0
Anna Maria College	Paxton	1,183	818	365	0	0	12	25	0	0	0	4
UMass Medical School - Worcester	Worcester	1,020	0	1,020	0	27	0	0	0	0	0	0
Atlantic Union College	South Lancaster	821	753	68	7	0	13	0	3	0	0	0
Merrimack Valley												
UMass-Lowell	Lowell	11,207	8,648	2,559	27	30	233	54	153	44	162	120
Merrimack College	North Andover	2,282	2,246	36	11	0	167	0	7	0	18	0
Metro West												
Framingham State College	Framingham	5,836	3,804	2,032	25	0	117	22	22	0	0	0
University of Phoenix-Central Mass	Westborough	264	189	75	0	0	18	27	4	0	0	0

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

College/University Enrollment and Graduates by Selected Programs

					Bio-Related		Business		Comp./Info. Sc.		Engineering	
College/University	Location	Tot. Enroll.	Undergrad Students	Grad Students	Bach	MS/PhD	Bach	Masters	Bach	MS/PhD	Bach	MS/PhD
Greater Boston												
Boston University	Boston	31,574	18,521	13,053	216	352	706	712	54	201	264	148
Harvard University	Cambridge	25,778	9,968	15,810	154	194	0	925	25	24	25	37
Northeastern University	Boston	23,411	18,001	5,410	87	26	811	366	103	67	306	207
Boston College	Chestnut Hill	14,661	9,880	4,781	167	7	486	528	38	0	0	0
UMass-Boston	Boston	12,362	9,246	3,116	95	10	361	69	27	16	0	0
MIT	Cambridge	10,253	4,127	6,126	111	43	81	494	171	155	407	894
Salem State College	Salem	10,230	7,455	2,775	23	0	163	20	15	0	0	0
Tufts University	Medford	9,638	4,995	4,643	83	46	0	13	19	32	198	91
Suffolk University	Boston	8,862	5,214	3,648	26	0	358	428	3	9	2	0
Lesley University	Cambridge	6,981	1,793	5,188	0	8	45	17	0	0	0	0
Bentley College	Waltham	5,555	4,296	1,259	0	0	949	475	39	21	0	0
Brandeis University	Waltham	5,313	3,304	2,009	96	34	0	50	14	113	0	0
Simmons College	Boston	4,650	2,009	2,641	14	0	28	96	5	0	0	0
Cambridge College	Cambridge	4,637	934	3,703	0	0	28	159	0	0	0	0
Emerson College	Boston	4,324	3,402	922	0	0	112	121	0	0	0	0
Wentworth Institute of Tech	Boston	3,613	3,613	0	0	0	116	0	71	0	21	0
Endicott College	Beverly	3,507	1,886	1,621	0	0	132	66	8	0	0	0
Babson College	Wellesley	3,359	1,776	1,583	0	0	426	572	0	0	0	0
Curry College	Milton	3,073	2,765	308	3	0	101	0	3	0	0	0
Wellesley College	Wellesley	2,370	2,370	0	35	0	0	0	10	0	0	0
Emmanuel College	Boston	2,340	2,156	184	23	0	115	48	0	0	0	0

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

College/University Enrollment and Graduates by Selected Programs

					Bio-Related		Business		Comp./Info. Sc.		Engineering	
College/University	Location	Tot. Enroll.	Undergrad Students	Grad Students	Bach	MS/PhD	Bach	Masters	Bach	MS/PhD	Bach	MS/PhD
Greater Boston (cont'd)												
Gordon College	Wenham	1,661	1,528	133	31	0	30	0	4	0	0	0
Mount Ida College	Newton	1,361	1,361	0	0	0	63	0	0	0	0	0
Dean College	Franklin	1,315	1,315	0	0	0	0	0	0	0	0	0
Regis College	Weston	1,315	860	455	7	0	24	9	1	0	0	0
Newbury College-Brookline	Brookline	1,282	1,282	0	0	0	68	0	9	0	0	0
Lasell College	Newton	1,275	1,225	50	0	0	71	12	0	0	0	0
Eastern Nazarene College	Quincy	1,222	1,063	159	10	0	102	20	3	0	4	0
Fisher College	Boston	1,121	1,121	0	0	0	67	0	0	0	0	0
Wheelock College	Boston	1,028	727	301	0	0	0	0	0	0	0	0
University of Phoenix-Boston	Boston	628	464	164	0	0	24	65	5	0	0	0
Pine Manor College	Chestnut Hill	501	491	10	11	0	22	0	0	0	0	0
Benjamin Franklin Institute of Tech	Boston	438	438	0	0	0	0	0	0	0	2	0
Franklin W. Olin College of Engr	Needham	296	296	0	0	0	0	0	0	0	64	0
Southeast												
Bridgewater State College	Bridgewater	9,655	7,825	1,830	40	0	176	0	26	0	0	0
UMass-Dartmouth	North Dartmouth	8,756	7,626	1,130	43	9	324	73	35	25	79	34
Stonehill College	Easton	2,386	2,371	15	42	0	132	7	10	0	0	0
Wheaton College	Norton	1,551	1,551	0	23	0	0	0	3	0	0	0
Mass Maritime Academy	Buzzards Bay	1,045	1,001	44	0	0	5	0	0	0	85	18

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

Major Community Colleges Enrollment and Graduates by Selected Programs

Community College/Vocational School	Location	Total Enrollment	Bio-Related	Business	Computer/IT	Engineering	Health-Related
Berkshire Region							
Berkshire Community College	Pittsfield	2,225	0	43	3	10	62
Mildred Elley	Pittsfield	104	0	0	0	0	23
Western Region							
Holyoke Community College	Holyoke	6,297	0	157	11	20	78
Springfield Tech. Community College	Springfield	5,992	4	104	35	118	194
Greenfield Community College	Greenfield	2,208	0	40	4	4	37
North Central Region							
Mount Wachusett Community College	Gardner	3,937	37	11	14	5	112
South Central Region							
Quinsigamond Community College	Worcester	6,022	0	114	38	60	155
Merrimack Valley Region							
Northern Essex Community College	Haverhill	6,361	0	115	27	24	122
Metro West Region							
Middlesex Community College	Bedford	8,109	0	149	10	40	148
Wyotech	Bedford	227	0	0	0	187	0
Greater Boston Region							
Bunker Hill Community College	Boston	8,212	12	148	32	0	133
North Shore Community College	Danvers	6,910	3	0	7	16	175
Massachusetts Bay Community College	Wellesley Hills	5,040	3	71	13	52	130
Quincy College	Quincy	3,801	0	88	15	0	203
Roxbury Community College	Roxbury Crossing	2,329	0	44	3	0	45
Labourne College	Boston	573	0	0	0	0	100
Gibbs College	Boston	520	0	70	21	0	61
ITT Technical Institute-Woburn	Woburn	408	0	0	70	29	0
ITT Technical Institute-Norwood	Norwood	327	0	0	32	44	0

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

Major Community College Enrollment and Graduates by Selected Programs

Community College/Vocational School	Location	Total Enrollment	Bio-Related	Business	Computer/IT	Engineering	Health-Related
Southeast Region							
Massasoit Community College	Brockton	6,975	147	44	12	44	136
Bristol Community College	Fall River	6,927	0	130	25	39	111
Diman Regional Technical Institute	Fall River	93	0	0	0	0	24
Cape Cod/Islands Region							
Cape Cod Community College	West Barnstable	4,212	0	14	15	4	99

25 - 99 annual graduates
100+ annual graduates

Source: U.S. Department of Education, Center for Education Statistics (2006-2007 school year)

Young Knowledge Worker's Basis for Location Decision

Job and Career-Related

- Familiarity with company (based on friends input, reputation or internship)
- Job content (challenging and interesting)
- Employment options if current job lost or doesn't meet needs
- Ability to pursue further education
- Spouse/significant other employment options
- Minimize commute distance

Life Style-Related

- Access to other young adults (size of cohort locally and places to meet people)
- Access to family and friends
- Recreational/cultural venues and events . . . "cool" place to live
- Affordability (particularly housing)
- The weather: impact on outside activities and culture

Locational needs shift with life stage:

Unmarried ▶ Married Without Children ▶ Married With Children

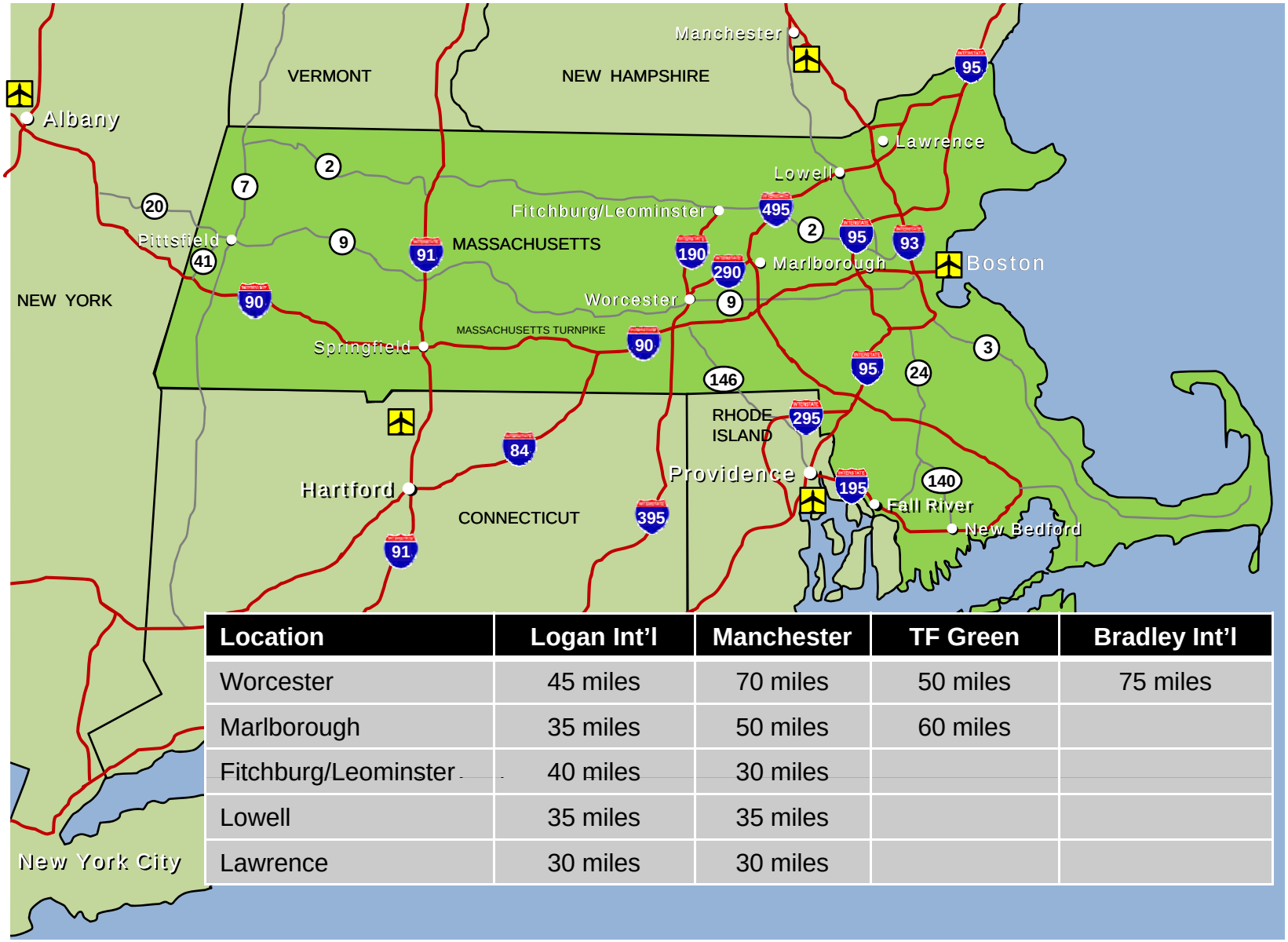
Transportation

Limited Access Highways and Commercial Airports





Transportation: Principal Highways and Commercial Airports



Location	Logan Int'l	Manchester	TF Green	Bradley Int'l
Worcester	45 miles	70 miles	50 miles	75 miles
Marlborough	35 miles	50 miles	60 miles	
Fitchburg/Leominster	40 miles	30 miles		
Lowell	35 miles	35 miles		
Lawrence	30 miles	30 miles		

Transportation: Air Access to Strategic Cities (Domestic)

Destination	Logan Int'l	Manchester	TF Green	Bradley Int'l	Albany
Atlanta	■	■	■	■	■
Baltimore	■	■	■	■	■
Charlotte	■	■	■	■	■
Chicago	■	■	■	■	■
Cincinnati	■	■	■	■	■
Cleveland	■	■	■	■	■
Columbus	■			■	
Dallas	■			■	
Denver	■			■	
Detroit	■	■	■	■	■
Fort Lauderdale	■		■	■	
Houston	■			■	
Las Vegas	■	■	■	■	
Los Angeles	■			■	
Memphis	■				
Miami	■			■	
Minneapolis	■	■	■	■	
Nashville	■		■	■	

Transportation: Air Access to Strategic Cities (Domestic)

Destination	Logan Int'l	Manchester	TF Green	Bradley Int'l	Albany
NYC Area	■	■	■	■	■
Norfolk	■				
Orlando	■	■	■	■	■
Philadelphia	■	■	■	■	■
Phoenix	■	■	■	■	
Pittsburgh	■		■	■	■
Portland, OR	■				
Raleigh	■			■	
Richmond	■				
Salt Lake City	■				
San Diego	■				
San Francisco	■				
San Juan, PR	■			■	
San Jose	■				
Seattle	■				
St. Louis	■			■	
Tampa	■	■		■	■
Washington, DC	■	■	■	■	■
West Palm Bch	■			■	

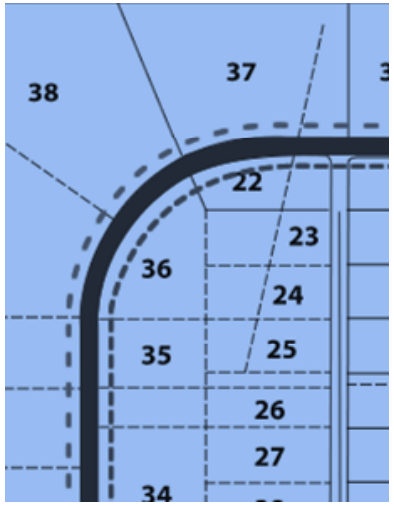
Transportation: Air Access to Strategic Cities (International)

Destination	Logan Int'l	Manchester	TF Green	Bradley Int'l	Albany
Amsterdam	■			■	
Frankfurt	■				
Halifax	■				
Keflavik (Iceland)	■				
London	■				
Milan	■				
Montreal	■			■	
Ottawa	■				
Paris	■				
Shannon	■				
Toronto	■	■		■	■
Zurich	■				

Travel Distance to Major Cities

Location	Boston	NYC
Pittsfield	136	186
Springfield	91	142
Deerfield	120	176
Amherst	94	167
Worcester	45	178
Fitchburg/Leominster	41	204
Lowell	40	221
Lawrence	30	231
Marlborough	31	194
Brockton	24	225
Taunton	39	200
New Bedford	50	172
Fall River	52	160

Real Estate and Utilities









Site Requirements/Potential Concerns vs. Type of Operation

Description	Office	R&D	Manufacturing	Distribution
Level of Readiness Required	Back Office: within 3 mos. HQ: may opt to build in 12-18 mos.	Within 3 mos. or build on fast track (9-12 mos.)	Within 3 mos. or build on fast track (9-12 mos.)	Within 3 mos.
Overall Image of Site, Park and Building	Important: reflects on company image and helps attract talent.	Important: reflects on company image and helps attract talent.	Varies	Varies
Specialized Space Required	Meeting/Training Spaces	Labs/Pilot Facilities	Certain Processes	
Local Amenities (restaurants, shopping, daycare, etc.)	Important	Important	Varies	
Adequate Parking (urban area)	Important	Important		
Truck Traffic			Varies	Heavy
Access to Interstate	Commuter access Brand exposure for some Security an issue for others	Commuter access	Truck access (varies by type and size of operation)	Track access
Public Transportation	Important near metro areas	Important near metro areas	Important for low income employees	
Rail Access			Some operations	Some operations
Reuse Potential for Community	High	Varies	Varies	High
Ability for Company to Easily Liquidate Facility	Back Office: Lease HQ: Lease or own (harder to liquidate due to specialized layouts)	Tend not to build with liquidation as a consideration	Tend not to build with liquidation as a consideration	Tend to be generic buildings that are easier to liquidate
Sewer/Water Requirements		Water quality an issue	Volume varies	
Cost of Energy	Moderate	Moderate	Critical issue	Moderate
Access to University R&D	Important if HQ and R&D are co-located	Local and distance access to university R&D partners	Having access to technical support	

Resource Requirements by Type of Operation

Resource Requirement	Headquarters	Back Office/ Shared Services	R&D	Manufacturing	Distribution
• Labor: Recruit Local Skills (High School)	Clerical	Customer Serv.		■	■
• Labor: Recruit Local Skills (College)	■	■	■	Some	
• Labor: Recruit From Other Locations*	Frequently	Some	Frequently	Limited	
• Facility Needs	Class A Office	Class A/B/C Office	R&D/Office	Mfg./Office	Warehouse/Office
• Utilities: Water	■	■	High Quality	High Volume Pot.	■
• Utilities: Sewer	■	■	■	High Volume Pot.	■
• Utilities: Electricity	Back-Up Power	Back-Up Power	Back-Up Power	Back-Up Power	Back-Up Power
• Utilities: Gas			Some Operations	■	
• Utilities: Telecom	Broad Band/Back-Up	Broad Band/Back-Up	Broad Band/Back-Up	■	■
• Transportation: Interstate	Within 5 miles	Near	Varies	Near	Near
• Transportation: Air Access	Within 30-45 min.	Within 30-45 min.	Within 30-45 min.		
• Transportation: Rail				Some Operations	Some Operations
• Co-Location Needs			University Partners		
• Operating Cost as an Issue	Low to Moderate	Moderate to High	Moderate	High	High
• Incentives: Training		For Some Jobs		■	■
• Incentives: Tax Reduction	■	■	■	■	■
• Incentives: In-Kind Provisions (roads)	■	■	■	■	■
• Community Responsiveness	■	■	■	■	■

*Quality of Life is an issue: cost of living/housing, education quality, healthcare, etc.

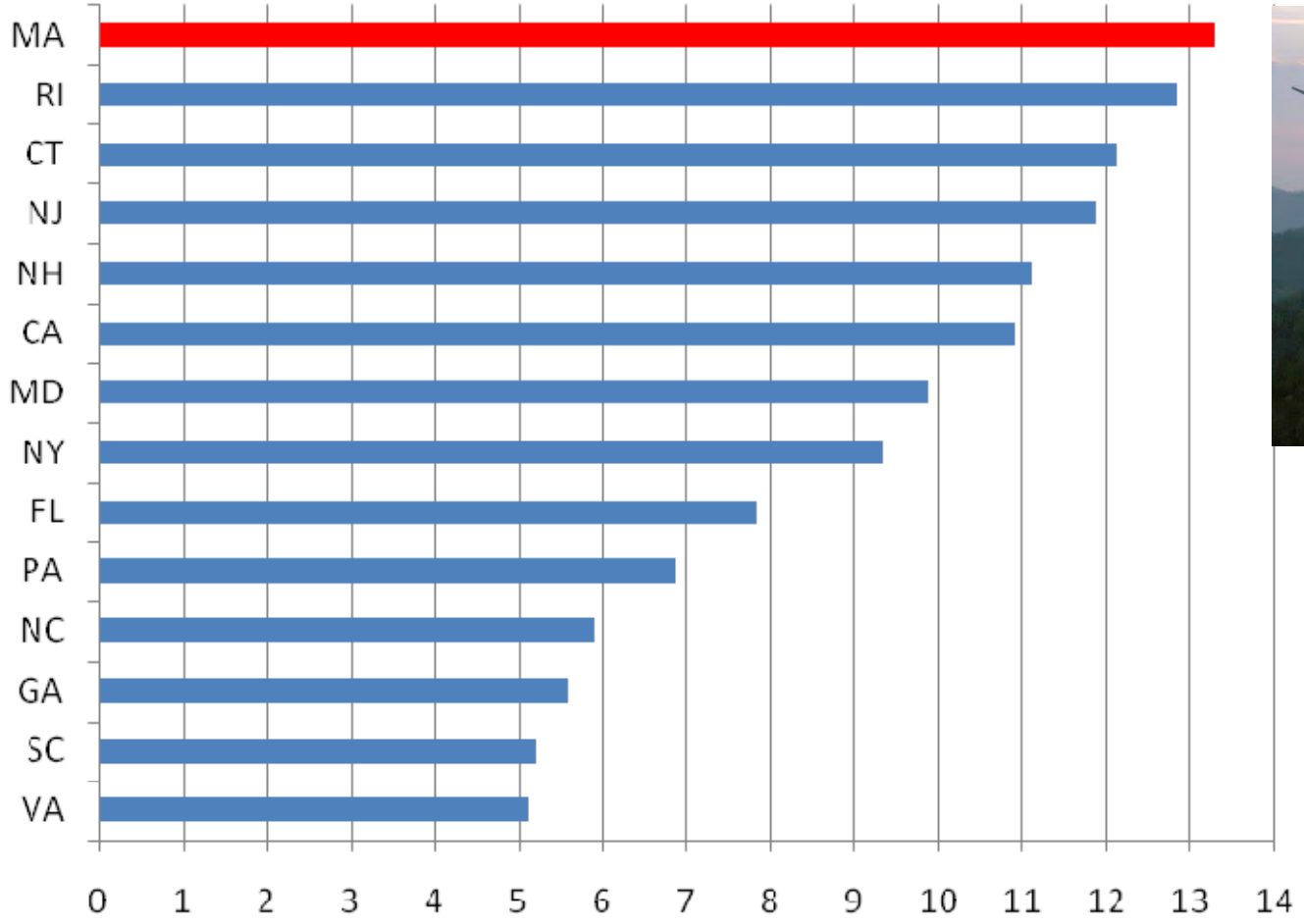
Significant Utility Requirements by Target Industry

Industry/Segment	Water	Wastewater Treatment	Electrical Power	Natural Gas	Broadband/ Telecom
■ • Biotech/Pharmaceuticals	High Quality	Quantity	Quantity/Backup	■	■
■ • Medical Equipment	■	■	■		■
■ • Marine Science	■	■	■		■
■ • Computers/Electronics	High Quality	■	High Vol./Backup	■	■
■ • Food Processing	High Quality	■	High Volume	■	■
■ • Fabricated Metals	■	■	■		■
■ • Plastics (Resin/Parts/Products)	■	■	■	■	■
■ • Renewable/Alternative Energy	■	■	■		■
■ • Aerospace/Defense/Security	■	■	Backup Power		Data Center
• Institutional Healthcare Services	■	■	Backup Power		■
• Institutional Education Services	■	■	Backup Power		■
■ • University R&D	High Quality	■	Backup Power		Data Center
■ • Financial Services	■	■	Backup Power		Data Center
■ • Prof/Tech/Creative/IT Services	■	■	■		■
• Transportation/Distribution	■	■	■		■
• Hospitality/Rec./Culture/Tourism	■	■	■		■
• Mgmt. of Companies/HQ	■	■	Backup Power		Data Center

■ State Target Industry

■ Significant/Special Requirements

Comparison of Average Energy Cost to Industrial Users (cents/kilowatthour)





Source: Energy Information Administration

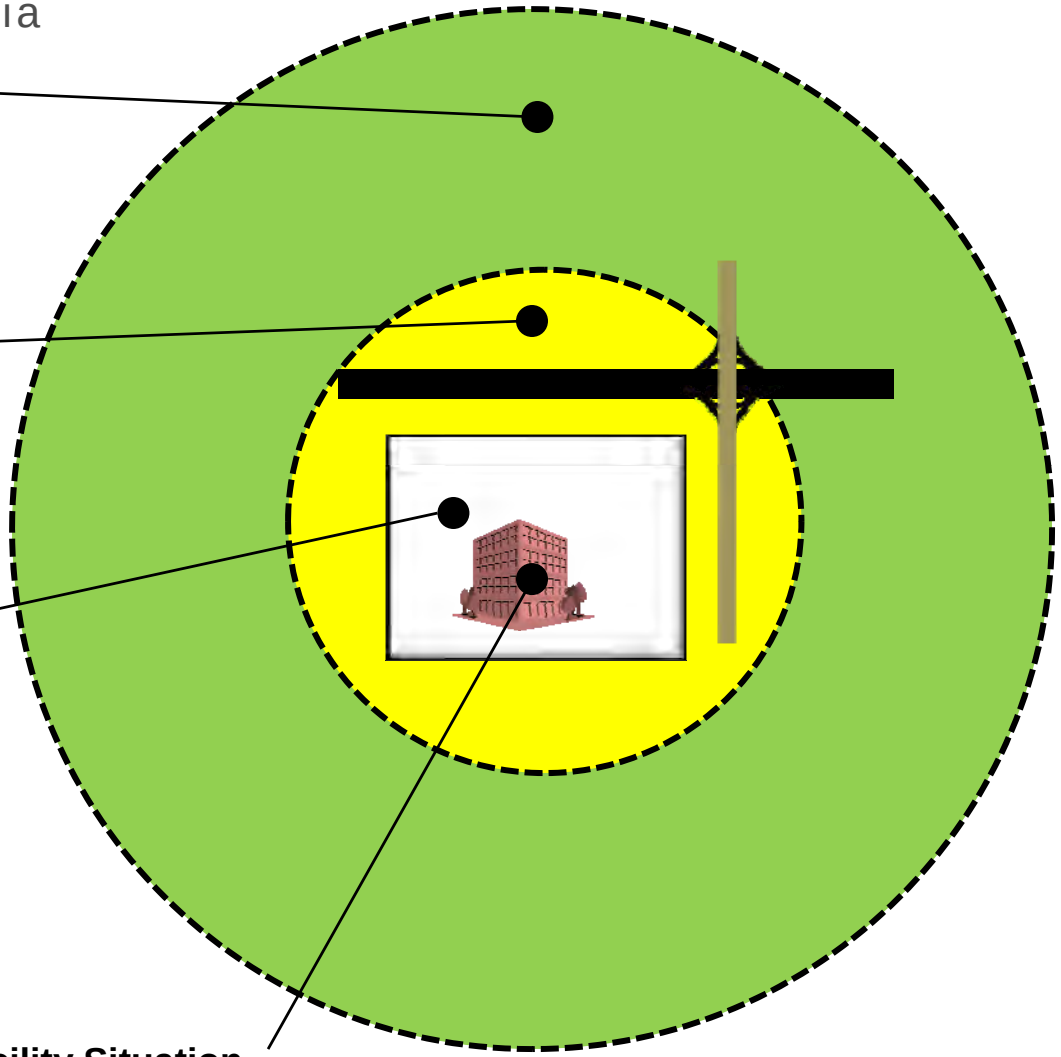
High energy costs forces the imperative of a focus on renewable energy.

Location/Site Assessment Criteria

Level 1: **Proximity (30-45 minutes)**
- Labor resources (education/demographics)
- Quality of life/housing costs
- Business/R&D partners
- Airport access

Level 2: **Local Access**
- Distance to limited access highway
- Public transportation access
- Restaurants/shopping/services
- Business services
- Sensitive areas for trucks

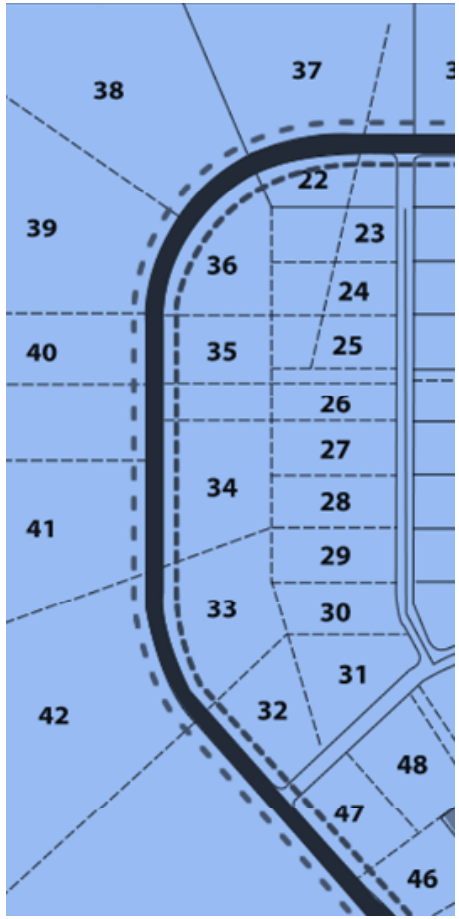
Level 3: **Site Conditions**
- Overall size of site/lot sizes
- Options for future expansion
- Wetlands/flood plains/soil
- Utility capacity, cost, backup
- Zoning/adjacent site use
- Road access and condition
- Rail access (some industrial)
- Level of site readiness



Level 4: **Facility Situation**
- Size/age/condition of structure
- Layout/types of space/flexibility
- Cost and buy vs. lease options
- Level of Readiness

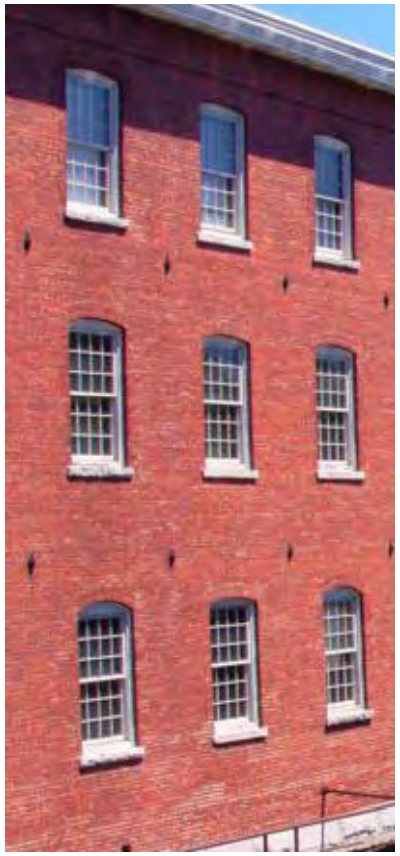
Levels of Site Readiness for Suburban Sites

Description of Readiness Levels	Time to Move-In
1. Completed building ready for painting and carpeting	3 to 4 months
2. Building shell in place or existing building needing modest renovation	6 to 9 months
3. Developed site with virtual permitted building	12 to15 months
4. Developed site ready for building construction • Lots defined and graded • Roads and utilities in place with service to lots • Some permits secured and covenants defined	18 months
5. Undeveloped site (“Shovel Ready”) • Ownership/title cleared and ready for sale • Proper zoning in place • Surveys/studies completed • Permitting agencies poised for approvals • Infrastructure within reasonable access • Compatible adjacent land use • Conceptual site plan and covenants	18 to 24 months
6. Zoned land in hands of original owner	> 24 months



Levels of Site Readiness for Urban Sites

Description of Readiness Levels	Time to Move-In
1. Completed building ready for painting and carpeting	3 to 4 months
2. Refine office and support areas and install walls and major partitions (complete utility installation)	9 to15 months
3. Upgrade/development of building • Rough out floor plans by functional use • Remove any hazardous materials • Upgrade/replace all utilities/services • Address structural and facade issues	18 to 24 months
4. Development-ready building • Ownership/title cleared and ready for sale • Proper zoning in place for office/R&D • Assessment of building to meet code and provide adequate parking • Permitting agencies poised for approvals • Infrastructure within reasonable access • Compatible adjacent land use	24 to 30 months
5. Older building or old mill complex needing substantial upgrade	> 30 months



Office Space Requirements

Industry/Segment	Office Space Requirements (Number of Employees)
Renewable/Alt. Energy	Office staff (5 - 20) that may grow over time
Aero/Defense/Security	Range: satellite support office (50-150) up to major operation (1,000+)
Financial Services	Range: small back office (50-250) up to major operation (500+)
Prof/Tech/Creative/IT Serv.	Range: small office (5-25) up to major firm (150+)
Mgmt. of Companies/HQ	Range: small HQ office (25-50) up to major HQ (250+)

Office Space Requirements by Number of Employees

Employees	225 SF Per Person	250 SF Per Person	300 SF Per Person
25	6,250	6,250	7,500
50	11,250	12,500	15,000
100	22,500	25,000	30,000
150	33,750	37,500	45,000
250	56,250	62,500	75,000
500	112,500	125,000	150,000
1,000	225,000	250,000	300,000

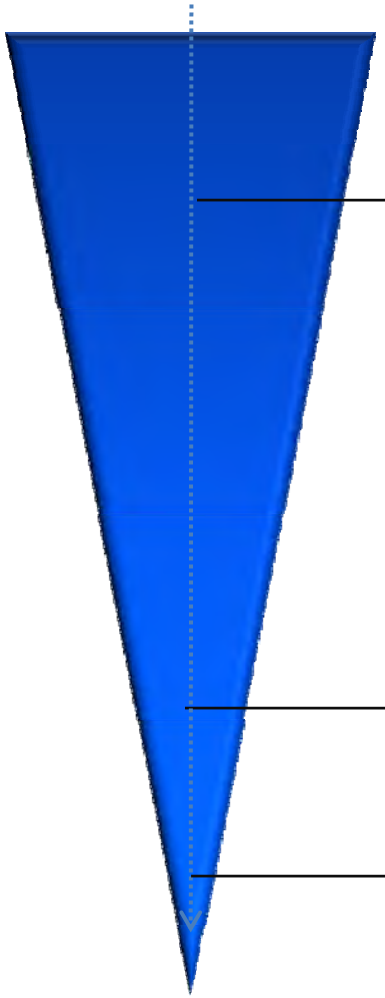
- 225 SF/person is typical for a back office while 300 SF/person is for headquarters or smaller operations.
- Actual space requirements may be expanded if there are large training and conference room or cafeteria requirements.

Real Estate/Facility Requirements by Target Industry

Industry/Segment	General Office Space	R&D/Lab With Office	Distribution/ Warehousing	Manufacturing With Office	Other Specialized Space	Home Office
■ • Biotech/Pharmaceuticals		■		Pharma Grade		
■ • Medical Equipment		■		Pharma Grade		
■ • Marine Science		■		■		
■ • Computers/Electronics		■		Clean Rooms		
■ • Food Processing				Food Grade		
■ • Fabricated Metals				■		
■ • Plastics (Resin/Parts/Products)				■		
■ • Renewable/Alternative Energy	Class A/B	■		■		
■ • Aerospace/Defense/Security	Class A/B			■		
• Institutional Healthcare Services					■	
• Institutional Education Services					■	
■ • University R&D		■				
■ • Financial Services	Class A/B					
■ • Prof/Tech/Creative/IT Services	Class A/B					■
• Transportation/Distribution			■			
• Hospitality/Rec./Culture/Tourism					■	
• Mgmt. of Companies/HQ	Class A					

■ State Target Industry

Location Selection Decision Process by Prospective Companies



1. Screen "A"
> Geographic preference
> Metro area size preference

2. Screen "B" . . . Value Proposition
> Logistic positioning (time of travel)
> Air access (cost and flights)
> Industry presence
> Workforce (quantity/quality of skills)
> Education and training resources
> Overall costs (real estate, labor, taxes, insurance, energy, etc.)
> Ability to recruit staff to an area (quality of life/cost of housing)

3. On-Site Tour and Incentive Analysis
> Availability of real estate
> Costs and incentives analysis

4. Final Decision

Next Steps

Phase I Activities

- Complete format assessment with SWOT analysis
- Develop external marketing materials (state and region level)

Phase II Activities

- On-site review of priority sites
- Collect further details on sites
- Complete site-level assessment
- Submit assessment to region

Phase III Activities

- Marketing of sites