



**VISION PROJECT REPORT—TECHNICAL APPENDIX
Version 1.0—December 2013**

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Overview

- **Board Approval:** The initial metrics to be used in the Vision Project were approved by the Board of Higher Education in May 2010. An extensive period of refinement and review followed, including numerous public presentations of emerging data and methodology, with the Board approving three revisions to the metrics in March 2012.
- **Advice from national experts:** This review period included consultation with national experts including Cheryl Blanco, Vice President for Special Projects at the Southern Regional Education Board and former senior program director at the Western Interstate Commission for Higher Education; Patrick Callan, President of the National Center for Public Policy and Higher Education; Peter Ewell, Vice President of the National Center for Education Management Systems(NCHEMS); NCHEMS President Dennis Jones; Complete College America President Stan Jones; Bill Mass, Director of the Center for Industrial Competitiveness at UMass Lowell; Navjeet Singh, Vice President of Applied Research and Evaluation, Commonwealth Corporation; Andrew Sum, Director of the Center for Labor Market Studies at Northeastern University; Dawn Terkla, Associate Provost for Institutional Research and Evaluation at Tufts University.
- **National comparisons** are made with public institutions of similar Carnegie class, where possible. In some cases, fewer than 50 states are included in the comparison due to lack of comparability or data availability.
- **Timeliness of Data:** Data used are the most recent available. Postsecondary education data typically becomes publicly available a year or more after the point of initial collection.

1. College Participation

College Readiness Rates

- **% of HS Seniors Scoring Proficient in Math/Reading (page 72)**

1	Metric	% of MA public high school seniors who are academically proficient in math and reading, as gauged by the 12th grade National Assessment of Educational Progress (NAEP)
2	Segment	Statewide Metric
3	Data Source	National Center for Education Statistics, US Department of Education
4	Cohort	Public high school seniors
5	Data Year	2009 (most recent available)
6	Achievement Gap Data (page 73)	Available for race/ethnic and SES (measured by student report of parent’s highest degree of educational attainment); no breakdown by gender.
7	Comparison Group	Public high school seniors nationally (for the national average) and in 11 pilot study states (for the Pilot State Leader).
8	# of Comparison States	50 for national average, 11 for top state
9	Lead State (of 11)	MA
10	Special Notes	Begun in 1969, NAEP is the only nationally representative and continuing assessment of student knowledge in core subjects. 2009 marked the first year that state-level results were available for the 12th grade test—and only for 11 states in a pilot study. The 2009 12th grade NAEP also marked a change in the content assessed by the test as part of a shift from measuring what 12th graders know to a predictive measure of college readiness. Plans call for expanding the state level NAEP data to all states beginning in 2013.

- **% of Recent High School Graduates Enrolling in Remedial Courses (page 72)**

1	Metric	% of MA public high school students who enter our public higher education system under-prepared for college level work
2	Segment	Community Colleges, State Universities, UMass
3	Data Source	Massachusetts Department of Higher Education’s Higher Education Information Resource System (HEIRS)
4	Cohort	First-time, full-time degree seeking students who are recent MA public high school graduates
5	Data Year	Fall 2012
6	Achievement Gap Data (pages 80–81)	Available for Gender and Race/Ethnicity

7	Comparison Group	Internal metric only-no national comparison possible.
8	# of Comparison States	Internal metric only-no national comparison possible.
9	National Leaders	Internal metric only-no national comparison possible.
10	Special Notes	This metric looks at first-time, full-time degree seeking students who graduated from a MA public high school in the previous 12 months, and shows the percent of this group who enrolled in remedial (non-credit bearing pre-college) courses. Because developmental education enrollment policies vary so significantly by state, no national comparison is possible and the metric is limited to Massachusetts.

College Enrollment Rates

- **College Enrollment Rates of Recent High School Graduates (page 72)**

1	Metric	College-going rates of recent MA high school graduates
2	Segment	Statewide Metric
3	Data Source	IPEDS, WICHE’s Knocking on the College Door
4	Cohort	Recent high school graduates enrolled as first-time degree seeking students
5	Data Year	Fall 2010
6	Achievement Gap Data (pages 80–81)	1-Public High School Graduate College Going Rate Gap analysis is based on a match of MA public high school graduates to National Student Clearinghouse House Data provided by the Massachusetts Department of Elementary and Secondary Education via the Massachusetts State Longitudinal Education Data System. The indicator captures the share of MA public high school graduates who enrolled in postsecondary education in the immediate fall after high school graduation. The enrollment gaps are calculated based on the three year average of 2010, 2011, and 2012 high school graduating classes.
7	Comparison Group	National
8	# of Comparison States	49 (Mississippi is excluded from the analysis because of concerns with the high school cohort.)
9	National Leaders	LA, NY, SC, MA, GA
10	Special Notes	For this metric, the Vision Project report uses the approach developed by Thomas Mortenson, Senior Scholar at the Pell Institute for the Study of Opportunity in Higher Education. The approach combines two data sources: IPEDS for the numerator, and the Western Interstate Commission for Higher Education’s projections of public and private high school graduates for the denominator. More specifically, the numerator is the number of first-time students from a given state enrolled in fall 2010 in any postsecondary institution reporting to IPEDS, and the denominator is the total estimated

		<p>graduating high school class for 2010 (according to WICHE’s Knocking at the College Door).</p> <p>While this metric is the best available for analyzing college participation of recent high school graduates, it does not allow for achievement gap analysis. We therefore use two additional metrics. For Massachusetts, data from the Department of Elementary and Secondary Education combined with that from the National Student Clearinghouse enables us to quantify participation gaps based on race/ethnicity, gender, or income for Massachusetts public high school graduates. This data does not, however, allow for national comparison. For this we turn to the American Community Survey of the U.S. Census Bureau, the source used by the US Department of Education in its state-level comparisons. This data takes a different age group than the key metric (18 to 24 year olds rather than recent high school graduates) but it does allow for comparison with other states for gaps based on race/ethnicity.</p>
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- **College Enrollment Rates of 18– 24-year-olds (page 72)**

1	Metric	
2	Segment	
3	Data Source	
4	Cohort	
5	Data Year	
6	Achievement Gap Data (page 73)	
7	Comparison Group	
8	# of Comparison States	
9	National Leaders	
10	Special Notes	

2. College Completion

Graduation and Student Success Rates

- **Community Colleges—Six-Year Success Rate (page 74)**

1	Metric	Achieving the Dream Six Year Success Rate
2	Segment	Community Colleges
3	Data Source	DHE/HEIRS and NSC, Jobs for the Future for comparison data

4	Cohort	First-time degree-seeking students
5	Data Year	Fall 2005 entering cohort for MA, Fall 2003 entering cohort for comparison group
6	Achievement Gap Data (page 80–81)	Race/Ethnicity and Gender available for MA only
7	Comparison Group	Participants in Achieving the Dream Cross-State Data Work Group
8	# of Comparison States	8
9	National Leader	Washington
10	Special Notes	This measure was developed by Achieving the Dream Cross State Data Workgroup, initially published in <u>Test Drive: Six State Pilot Better Ways to Measure and Compare Community College Performance</u> (http://www.jff.org/sites/default/files/testdriveforWeb.pdf) and updated and revised in <u>On the Road to Success: How State Collaborate and Use Data to Improve Student Outcomes</u> . (http://www.jff.org/sites/default/files/ATD_OnTheRoadToSuccess_012712.pdf) This indicator expands the IPEDS cohort to include students who enroll part-time in the initial fall, and tracks graduation, transfer, credit accumulation and persistence outcomes over a six-year period. It measures the degree completion, transfer, and persistent outcomes after six years of all students who initially enroll as first-time degree seeking students (including part-time students). Transfer is assessed for both students earning an award at a community college first and students transferring prior to earning an award. NSC is used to capture transfer outside of the state public system. For more information see: http://www.jff.org/publications/education/road-success/1386

- **State Universities, UMass—Six-Year Graduation Rate of First-Time Freshmen (page 74)**

1	Metric	Six year graduation rate, <i>same institution</i>
2	Segment	State Universities, UMass
3	Data Source	USDOE\ IPEDS
4	Cohort	First-time, full-time degree seeking students
5	Data Year	Fall 2005 entering cohort
6	Achievement Gap Data (page 74, 80–81)	Race/ethnicity, gender; 3 year rolling average based on Fall 2003 to Fall 2005 entering cohorts
7	Comparison Group	All states with at least one public master one institutions (according to 2000 Carnegie Classification)
8	# of Comparison States	45 states for State Universities, 25 states for UMass
9	Top State	IA, VA, NJ, WA, NH for State Universities, VA, NJ, CA, PA, SC

		for UMass
10	Special Notes	<p>The National Center for Education Statistics defines the four-year college graduation rate as the cohort of first-time full-time, degree-seeking new freshmen who, in 6 years or less, complete a degree program at the initial institution in which they enrolled. This is the traditional IPEDS 150% of normal time completion metric required by Student Right to Know Act for all postsecondary institutions participating in Title 4. It measures the percent of first-time, full-time baccalaureate degree seeking students who earn a bachelors degree within six years from the institutions of initial enrollment. The following students may be excluded from the cohort reported to IPEDS if they left the institution for the following reasons: death or total and permanent disability; service in the armed forces (including those called to active duty); service with a foreign aid service of the federal government, such as the Peace Corps; or service on official church missions.</p> <p>Achievement gap comparisons are limited to states with at least 100 students in the initial cohort for the subgroup used in the analysis. For example a state with fewer than 100 Hispanic first-time, full-time degree seeking students in the initial cohort would not be included in the Latino-White graduation gap rankings.</p>

- **State Universities, UMass—Six-Year Graduation Rate of Students Who Transfer In (page 74)**

1	Metric	Transfer Student Graduation Rate
2	Segment	State Universities, UMass
3	Data Source	DHE/HEIRS
4	Cohort	New, full-time degree seeking transfer students
5	Data Year	Fall 2005
6	Achievement Gap Data (see Supplemental Metrics document)	Race/Ethnicity, Gender
7	Comparison Group	National comparison data not available
8	# of Comparison States	National comparison data not available
9	National Leaders	National comparison data not available
10	Special Notes	This metric captures those students who transfer <i>into</i> our public postsecondary institutions, by looking at the graduation rates of transfer students. It shows the percent of new, full-time degree seeking transfer students entering in the fall term who earn a degree from the State University or the UMass campus that they transfer into within six years of entry.

- **Community Colleges—Three-Year Graduation Rate (page 74—Gaps section only)**

1	Metric	IPEDS 3 year graduation rate
2	Segment	Community Colleges
3	Data Source	IPEDS
4	Cohort	First-time, full-time degree seeking students
5	Data Year	2008 entering fall cohort
6	Achievement Gap Data (page 74)	Race/ethnicity and gender; 3 year rolling average based on Fall 2006 to Fall 2007 entering cohorts
7	Comparison Group	All states with at least one public associate college (based on 2000 Carnegie classification)
8	# of Comparison States	49
9	National Leaders	North Dakota, Florida, Montana, Iowa, Wyoming
10	Special Notes	This is the traditional IPEDS 150% of normal time completion metric required by Student Right to Know Act for all postsecondary institutions participating in Title 4. It measures the percent of first-time, full-time degree seeking students who earn a degree or certificate within a 150% of normal time. Normal time is defined as two years for an associate’s degree, so 150% of normal time is three years for an associate’s degree. Normal time for a certificate varies by program. Students may be excluded from the cohort reported to IPEDS if they left the institution for the following reasons: death or total and permanent disability; service in the armed forces (including those called to active duty); service with a foreign aid service of the federal government, such as the Peace Corps; or service on official church missions.

3. Student Learning

OVERVIEW: Professional Licensure and Graduate/Professional School Entrance Exams

- **Test selection:** To determine which exams to use, we began with a study of ten of the states (CT, KY, MD, MN, OH, OK, OR, SC, TX, WI) most active in higher education accountability. The study produced a list of 28 national licensure and certification exams used in state level accountability reports.

We then worked with national accreditation boards to identify which of these licensure exams were applicable to Massachusetts public higher education institutions. From this list we narrowed still further, using the criteria that the exam must be given at more than one Massachusetts public higher education institution, and that at least 50 students in the segment must take the exam. Lastly, the exam administered in Massachusetts had to be the same one administered nationally.

This last cut ruled out both the EMT and MTEL exams, where Massachusetts is one of just a few states not using the standard national exam. This process resulted in:

- **Ten Community College licensure exams** taken by 2,200 Massachusetts community college students. All 15 community colleges are represented in at least 2 of these exams, 10 in 4 or more of the exams.
- **Three State University licensure exams** taken by 360 state university students in 2011. Because of the comparatively small number of students, exam results were aggregated over the three most recent years, thus tripling the sample size. These licensure exams represent 5 of the 9 state universities: Bridgewater, Fitchburg, Salem, Westfield and Worcester. They were not taken by students at the other 4 state universities.
- **Three UMass licensure and four UMass Graduate Entrance exams** taken by 2500 UMass students. Students at 3 of the 4 campuses take 7 of the 7 exams; students at the remaining campus take 6 of the 7 exams.

Scores were limited to first-time test takers where possible, as was the case in the vast majority of exams.

- **Composite Pass Rate:** Individual test scores were aggregated as follows:
 - **Massachusetts Pass Rates** are calculated as segment-wide averages, with each student’s result counting equally for their segment, regardless of what institution they attended.
 - **National Average and National Leadership Pass Rates** are weighted by the number of Massachusetts students taking each exam. This approach is used to ensure that the national comparisons are not skewed by test taking patterns in Massachusetts; for example, if the NCLEX-PN exam represents 20% of MA community college licensure exam test takers, the national aggregates are similarly weighted so that the comparison represents differences in testing outcomes, rather than differences in the percentage of students taking a licensure exam with relatively higher or lower overall pass rates.
 - **State-level data** is not available for all exams, and thus the national leadership comparison represents a smaller pool of tests than that used for the national average comparisons.
- **Achievement Gap Data:** The limited licensure exam achievement gap data in the Vision Project report is a consequence of the fact that those who administer national certification and licensure exams do not collect demographic data from test takers. Thus there is no ability to disaggregate test results by race/ethnicity, gender, or income. The Department of Higher Education was able to develop achievement gap data on the nursing exams through a cooperative data merge with the Executive Office of Health and Human Service and on the MCAT through work with the AAMA.

Pass Rates on National Licensure Exams

- **Community Colleges—Pass Rates on National Licensure Exams—10 exams aggregated into one measure (page 75)**

1	Exam	CDA exam (Certified Dental Assistant)
2	Segment	Community Colleges

3	Data Source	Dental Assisting National Board
4	Cohort	Graduates of DANB certified programs (Pathway 1)
5	Data Year	2010 (calendar year)
6	Massachusetts N	56, on 5 Community College Campuses: Massasoit, Middlesex, Northern Essex, Quinsigamond, Springfield Tech
7	Achievement Gap Data	Not available; DANB does not collect demographic information from test takers.
8	Comparison Group	All DANB certified programs
9	# of Comparison States	29 (CDA certification is recognized or required in 29 states.)
10	National Leaders	OR, IL, MO, MN, MA
11	Special Notes	These results are for candidates who took the exam during the calendar year. Most candidates test the same year they graduate. Certificants who took the individual components to earn their CDA credential are not included in these numbers, as limiting the data to those who sat all 3 exams at once was the only way to compare with national results .

1	Exam	Dental Hygiene—American Dental Hygiene Licensing Exam
2	Segment	Community Colleges
3	Data Source	North East Regional Board of Dental Examiners
4	Cohort	First time test takers
5	Data Year	2010
6	Massachusetts N	119, on 6 Community College Campuses: Bristol, Cape Cod, Middlesex, Mount Wachusett, Quinsigamond, Springfield Technical
7	Achievement Gap Data	Not available; NERB does not collect demographic information from test takers.
8	Comparison Group	Public and private colleges in the Northeast Region
9	# of Comparison States	16: CT, IL, IN, ME, MD, MA, MI, HN, NJ, NY, OH, PH, RI VT, WV, DC. The Northeast regional represents 1/3 of all US test takers.
10	National Leaders	Individual State Data not available
11	Special Notes	Dental Examining Boards divided into regions. No national board.

1	Exam	Licensed Practical Nurse exam (NCLEX-PN)
2	Segment	Community Colleges
3	Data Source	National Council of State Boards of Nursing; Massachusetts Department of Health and Human Services

4	Cohort	First-time U.S.-Educated Candidates with Associates degrees
5	Data Year	2011
6	Massachusetts N	306, on 9 Community College campuses: Berkshire, Greenfield, Holyoke, MassBay, Mount Wachusett, North Shore, Northern Essex, Quinsigamond, Roxbury
7	Achievement Gap Data (pages 80–81)	Achievement gap data obtained through merge with DHE database.
8	Comparison Group	All candidates (see overview)
9	# of Comparison States	48 (2 excluded because N<50)
10	National Leaders	MT,WY,UT,VT,SD
11	Special Notes	None

1	Exam	Certified Medical Assistant exam (CMA-AAMA)
2	Segment	Community Colleges
3	Data Source	American Association of Medical Assistants
4	Cohort	1 st time test takers
5	Data Year	2009
6	Massachusetts N	131, on 8 Community College campuses: Bristol, Cape Cod, Massasoit, Middlesex, Mt. Wachusett, Northern Essex, North Shore, Quinsigamond, Springfield Tech
7	Achievement Gap Data	Achievement gap data obtained through merge with DHE database.
8	Comparison Group	Public and private medical assistant programs
9	# of Comparison States	28 (other states had < 50 test takers)
10	National Leaders	UT,IA,MI,WI,WA
11	Special Notes	Of the 4 Medical Assistant exams, the CMA-AAMA is the oldest and most stringent, with the best exam testing security and toughest eligibility requirements. Most states (including MA) do not license Medical Assistants. Certification is important for employability.

1	Exam	Occupational Therapy Assistant: Certified Occupational Therapy Assistant (COTA) exam
2	Segment	Community Colleges
3	Data Source	National Board for Certification in Occupational Therapy (NBCOT)
4	Cohort	First time new graduate test takers
5	Data Year	2009-2011

6	Massachusetts N	191, on 4 Community College campuses: Bristol, North Shore, Quinsigamond, Springfield Tech
7	Achievement Gap Data	Not available; NBCOT does not collect demographic data.
8	Comparison Group	National comparison
9	# of Comparison States	National comparison—state level data not available.
10	National Leaders	State level data not available.
11	Special Notes	None

1	Exam	Physical Therapy Assistant: National Physical Therapy Exam-PTA
2	Segment	Community Colleges
3	Data Source	Federation of State Boards of Physical Therapy (FSBPT)
4	Cohort	Includes students who took test more than once, although only final result used.
5	Data Year	2008-10
6	Massachusetts N	135, on 3 Community College campuses: Mount Wachusett, North Shore, Springfield Tech
7	Achievement Gap Data	Not available; FSBPT does not collect demographic data.
8	Comparison Group	Public institutions of the same Carnegie class.
9	# of Comparison States	34 (remaining states have < 50 test takers)
10	National Leaders	OR,LA,AZ,CT,TX
11	Special Notes	Data is ultimate pass rate aggregated over three years—the only way to get national comparison data.

1	Exam	Radiation Technologist exam
2	Segment	Community Colleges
3	Data Source	American Registry of Radiologic Technicians
4	Cohort	First-time test takers
5	Data Year	2011
6	Massachusetts N	174, on 10 Community College campuses: Bunker Hill, Holyoke, MassBay, Massasoit, Middlesex, North Shore, Northern Essex, Quinsigamond, Roxbury, Springfield Tech
7	Achievement Gap Data	Not available; ARRT does not collect demographic information from test takers.
8	Comparison Group	Public and private institutions

9	# of Comparison States	41 (rest had < 50 test takers each)
10	National Leaders	OR,ME,WI, KS, WV, ID—exam data updated since report went to press; some shift in National Leaders
11	Special Notes	80% of MA test takers attend Community Colleges

1	Exam	Registered Nurse exam (NCLEX-RN, National Council Licensure Exam-Registered Nurse)
2	Segment	Community Colleges
3	Data Source	National Council of State Boards of Nursing; Massachusetts Department of Health and Human Services
4	Cohort	First-time U.S.-Educated Candidates with Associates degrees
5	Data Year	2011
6	Massachusetts N	1,069, on all 15 Community College campuses
7	Achievement Gap Data (pages 80–81)	Achievement gap data obtained through merge with DHE database.
8	Comparison Group	All candidates (see overview for comparison of private vs. public institution results)
9	# of Comparison States	50, plus Washington DC
10	National Leaders	ME,TN,LA, RI,ND
11	Special Notes	None

1	Exam	Respiratory Therapy Assistant: CRT exam
2	Segment	Community Colleges
3	Data Source	NBRC: National Board for Respiratory Care and Directors of Respiratory Therapy at MA Community Colleges
4	Cohort	Graduates of CoARC or CAAHEP accredited respiratory therapy assistant programs.
5	Data Year	2011
6	Massachusetts N	86, on 7 Community College campuses: Berkshire, Bunker Hill, Massasoit, North Shore, Northern Essex, Quinsigamond, Springfield Tech
7	Achievement Gap Data	None available; NBRC does not collect demographic data.
8	Comparison Group	Public and private institutions
9	# of Comparison States	National comparison—state level data not available.
10	National Leaders	State level data not available.
11	Special Notes	Students must pass CRT exam within three years of graduating.

1	Exam	Surgical Technologist: Surgical Technologist National Certifying exam (STNC)
2	Segment	Community Colleges
3	Data Source	NBSTSA: National Board of Surgical Technologists & Surgical Assistants
4	Cohort	Graduates of CAAHEP accredited Surgical Tech programs
5	Data Year	2010
6	Massachusetts N	51, on 5 Community College campuses: Bunker Hill, MassBay, North Shore, Quinsig, Springfield Tech
7	Achievement Gap Data	None available; NBSTA does not collect demographic data.
8	Comparison Group	Public and private institutions
9	# of Comparison States	National comparison—state level data not available.
10	National Leaders	State level data not available.
11	Special Notes	None

- **State Universities, UMass—Pass Rates on National Licensure Exams—3 exams per segment, aggregated into one measure per segment (page 75)**

1	Exam	CPA exam (Certified Public Accountant)
2	Segment	State Universities, UMass
3	Data Source	National Association of State Boards of Accountancy
4	Cohort	Bachelors only; Masters candidates excluded. Because retesting on one or more of the subtests on the CPA exam is so common, data includes all test-takers rather than being limited to first-time test takers.
5	Data Year	2011
6	Massachusetts N	<i>For the State Universities:</i> 79, on 5 campuses: Bridgewater, Fitchburg, Salem, Westfield, Worcester <i>For UMass:</i> 331, on all 4 campuses: Amherst, Boston, Dartmouth, Lowell
7	Achievement Gap Data	Not available; NASBA does not collect demographic information.
8	Comparison Group	Public Masters colleges (Carnegie 2000 Class 21) for State Universities; Public Research universities (Carnegie 2000 Class 15,16)for UMass. Note that inclusion of UMass Dartmouth (Carnegie 21) lowers the overall UMass pass rate by < 0.1%, an amount too small to affect UMass rank or the size of the gap between it and the National and National Leadership means.
9	# of Comparison	<i>For the State Universities:</i> 42 for the US average, 33 for

	States	National Leadership (states excluded because N too small). <i>For UMass: 50 for the US average, 44 for National Leadership (4 states excluded because N too small).</i>
10	National Leaders	<i>For the State Universities: FL, IA, MO, VA, WI.</i> <i>For UMass: FL, WI, RI, IA, MN.</i>
11	Special Notes	The CPA exam is composed of 4 sub-tests, or “events” in NASBA parlance, which can be taken separately. The pass rate is calculated as Sum of all passed tests/Sum of tests attempted, in accordance with NASBA practice.

1	Exam	Registered Nurse exam (NCLEX-RN)
2	Segment	State Universities, UMass
3	Data Source	National Council of State Boards of Nursing; Massachusetts Department of Health and Human Services
4	Cohort	First-time U.S.-Educated Candidates with Baccalaureate degrees
5	Data Year	2011
6	Massachusetts N	<i>For the State Universities: 274, on 3 campuses: Fitchburg, Salem, Worcester</i> <i>For UMass: 521, on all 4 campuses: Amherst, Boston, Dartmouth, Lowell</i>
7	Achievement Gap Data (pages 80–81)	Achievement gap data obtained through merge with DHE database.
8	Comparison Group	US BA-granting institutions
9	# of Comparison States	50, plus Washington DC
10	National Leaders	<i>For the State Universities: UT, NH, TN, OR, CT</i> <i>For UMass: UT, NH, TN, OR, CT</i>
11	Special Notes	None

1	Exam	Social Work-BA (ASWB exam)
2	Segment	State Universities
3	Data Source	Association of Social Work Boards (ASWB)
4	Cohort	First time test takers—Bachelors only
5	Data Year	2009-2011
6	Massachusetts N	108, on 3 campuses: Bridgewater, Salem, Westfield. Note that data aggregates most recent three years in order to obtain reasonable N.
7	Achievement Gap Data	Not available; ASWB does not collect demographic information.
8	Comparison Group	All test takers

9	# of Comparison States	National comparison—all 1 st time candidates
10	Top 5 States	ASWB does not release individual state results.
11	Special Notes	none

1	Exam	Engineering-FE (Fundamentals of Engineering)
2	Segment	UMass
3	Data Source	National Council of Examiners for Engineering and Surveying (NCEES)
4	Cohort	First-time test takers from ABET accredited schools; seniors or recent grads
5	Data Year	2011
6	Massachusetts N	155, on 3 UMass campuses: Amherst, Dartmouth, Lowell
7	Achievement Gap Data	Not available; NCSBN does not collect demographic information.
8	Comparison Group	All ABET-accredited schools.
9	# of Comparison States	National Comparison
10	National Leaders	Individual state data not available
11	Special Notes	The Engineering exam has 2 modules: one the same for all test takers, the other determined by undergraduate degree. The latter is comprised of 6 different exams, some of which (eg Civil Engineering) are more common in MA public institutions than in other states. The MA and US aggregate pass rates are therefore weighted by the number of <i>Massachusetts</i> test takers for each test.

Mean Scores on Graduate Entrance Exams

- **UMass—Mean Scores on Graduate Entrance Exams—4 exams aggregated into one measure (page 75)**

1	Exam	GRE (Graduate Record Examination)
2	Segment	UMass
3	Data Source	Educational Testing Service
4	Cohort	Students who reported their undergraduate institution.
5	Data Year	2011
6	Massachusetts N	902, on all 4 UMass campuses
7	Achievement Gap Data	Not available at the state level.
8	Comparison Group	All institutions, public and private

9	# of Comparison States	50
10	National Leaders	MN, VT,CT,RI, WA
11	Special Notes	Score represents average of Verbal and Quantitative scores; does not include writing results. New GRE exam administered beginning 8.1.11 will raise questions of longitudinal comparability in future years.

1	Exam	LSAT (Law School Admissions Test)
2	Segment	UMass
3	Data Source	Law School Admissions Council
4	Cohort	Includes roughly 27% repeat test takers; scores are averaged within a particular testing year and only counted once. Overall, 68% of LSAT test takers take exam only once, 25% twice, 6% > twice.
5	Data Year	2012 (Test Year is June to February)
6	Massachusetts N	301, on all 4 UMass campuses .
7	Achievement Gap Data	Participation by race/gender available for MA, but not mean score.
8	Comparison Group	US institutions, public and private.
9	# of Comparison States	National comparison
10	National Leaders	Individual state data not available.
11	Special Notes	Data limited to those who report their undergraduate institutions, about 2/3 of test takers.

1	Exam	MCAT (Medical College Admissions Test)
2	Segment	UMass
3	Data Source	American Association of Medical Colleges
4	Cohort	Includes repeat test takers; most recent score used.
5	Data Year	2011
6	Massachusetts N	284, on all 4 UMass campuses
7	Achievement Gap Data (pages 80–81)	Breakout available by race/ethnicity, gender
8	Comparison Group	US public institutions of same Carnegie Class
9	# of Comparison States	50
10	National Leaders	Individual state data not available. (AAMA calculated National Leadership data, but will not share what those states were.)
11	Special Notes	none

1	Exam	PCAT (Pharmacy College Admissions Test)
2	Segment	UMass
3	Data Source	Pearson Testing Agency
4	Cohort	First time test takers who provided information on their college or university (public vs. private; 2 yr vs. 4 yr)
5	Data Year	2012
6	Massachusetts N	51
7	Achievement Gap Data	Not available; test takers do not provide demographic data.
8	Comparison Group	U. S. Public 4 year institutions
9	# of Comparison States	National comparison
10	National Leaders	UT, WI, WA, MT, MI
11	Special Notes	Home mailing address provided by student determines state of residency—out-of-state students may not be included in UMass data.

4. Workforce Alignment

Trends and Projections in College Attainment

- **Community Colleges, State Universities, UMass—Associate’s and Bachelor’s Degrees in All Fields (pages 76–77)**

1	Metric	MA public degrees produced compared against degrees needed
2	Segment	Community Colleges, State Universities, UMass
3	Data Source	NCHEMS, HEIRS, Georgetown Center for Education and the Workforce
4	Cohort	Not applicable
5	Data Year	Projection is 2013-2020; actual data available for 2010-12
6	Achievement Gap Data	Not applicable
7	Comparison Group	None-internal metric only
8	# of Comparison States	None-internal metric only
9	National Leaders	None-internal metric only
10	Special Notes	While there is a near national-consensus on the importance of increasing college attainment, there is the wide variety of approaches to measuring this goal, with different groups using different end dates (2020 vs. 2025), different population cohorts

		<p>(25- to 34- year olds vs. 25- to 64-year olds) and different levels of minimum educational achievement (Associates Degree vs. Some College).</p> <p>The metric used in the Vision Project Report is based on the national college attainment goal of having 60% of 25- to 34-year olds hold an AA degree or higher by 2020. Note that this omits certificates—the fastest growing award at many Massachusetts community colleges, and a key component of the national focus on middle skill jobs. The choice to use AA degrees or higher is partly a consequence of data limitations--the census' American Community Survey does not distinguish between college dropouts and certificate holders in its “some college” category—and partly a consequence of seeking to align with the national goal, which in turn aligns with international comparisons in its focus on degree holders. The DHE would hope to include certificates in future reports.</p> <p>We used NCHEMS 2010 state-level projections as the base for our calculations, and refined this calculation further by looking at:</p> <ul style="list-style-type: none"> • Public share of Massachusetts undergraduate degrees: In order to determine public higher education’s share of the total degrees needed, we used Massachusetts’ 2010 public share of Associates and for Bachelors degrees. • Segmental Breakout within Massachusetts public degrees: In order to refine this to a segmental projection, we used CEW’s projections of the percentage of Bachelors and Associates degrees needed in Massachusetts in 2018. • Mobility: This analysis also assumes that the net inflow and outflow of degree holders will remain unchanged.
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• **Community Colleges, State Universities, UMass—Projected Level of Alignment in High-Need Fields by 2020 (pages 78–79)**

1	Metric	Alignment between degrees produced and forecasted growth in key occupational areas
2	Segment	Community Colleges, State Universities and UMass combined (public BAs)
3	Data Source	IPEDS for Degree Production; Georgetown Center for Education and the Workforce for estimates of future job openings by occupational category; “Baccalaureate & Beyond Longitudinal Study 2000/2001” (B&B) from the U.S. DOE for occupational and geographic mobility rate data.
4	Cohort	Not Applicable
5	Data Year	Baseline year for projected jobs is 2010, Degree data are actual for 2010-2012 and projected from 2013
6	Achievement Gap Data	Not Applicable

7	Comparison Group	Top 25 most populous states
8	# of Comparison States	25
9	National Leaders	Not Applicable
10	Special Notes	<p>This metric compares estimated job openings in key occupational fields with projected public higher education degree production in these fields. This complex comparison depended on a number methodological decisions and adjustments.</p> <p>Key Occupational Areas: Key occupational areas were defined as those fields which are predicted to have the largest growth in absolute number of jobs over the next decade. To determine this, we identified the occupations that occurred most frequently in each state’s list of top 20 occupations, based on projected change in jobs from 2008 to 2018. From this list, we removed occupations for which less than 60% of the jobs required a postsecondary education, using Bureau of Labor Statistics data for jobs requiring an Associate’s degree or higher. The remaining high growth occupations were then aggregated to the 3 digit SOC level, resulting in the following group of non-STEM key occupational areas: Business and Finance, Healthcare Practitioners, and Healthcare Support.</p> <p>STEM Fields: STEM occupations include 7 separate STEM occupational categories at the 2 and 3 digit SOC level: Computer Science and Math, Architects, Engineers, Drafters and Surveyors, Engineering Technicians, Life and Physical Scientists, and Science Technicians. The STEM composite indicators are different at the Associate’s and Baccalaureate levels. The former includes technical occupations like biomedical technicians and HVAC technicians. The latter focuses on more general STEM occupations like physical scientists and civil engineers.</p> <p>Healthcare Fields. The two healthcare indicators link two different sets of occupational and instructional program codes. Healthcare Practitioners includes occupations primarily requiring a bachelor degree or above. This includes fields like registered nursing, nutrition and medical practice. Healthcare Support includes occupations primarily requiring an associate’s degree or undergraduate certificate. This includes fields like practical nursing, home health aides and dental assistance.</p> <p>Projected Job Openings: This metric focuses on <i>projected</i> job openings between 2010 and 2020. Projected jobs during this period include both net new jobs and replacement jobs for individuals retiring from the workforce. Because the alignment metric looks only at graduates of public institutions, projected jobs are adjusted to reflect the fraction of total jobs equal to the percent of all degrees awarded by public post-secondary institutions in each state and in the nation as a whole.</p> <p>Crosswalk between job openings and degrees: In order to align job openings and degrees, we used a crosswalk, which links SOC codes to their related degrees, as defined by the Classification of Instructional Programs (CIP) codes. For</p>

		<p>example, the 13-1XXX Business Operations SOC codes link to some of the following CIP codes: 440401-Public Administration, 521802-Merchandising and Buying Operations, and 520203-Logistics and Materials Management. Contact the Department of Higher Education for a copy of the crosswalk used for the analysis.</p> <p>Projected Degrees: The degree projection begins with a count of the 2010 to 2012 public post-secondary degree conferred for each of the CIP codes identified through the crosswalk (data from IPEDS). 2012 to 2018 degree production is projected by applying an annual growth rate based on projected changes in the high school graduating class using state level projections of high school graduates using data from WICHE’s <i>Knocking on the College Door</i>. Note that Health Care Support includes only associate degree and certificates. Health care practice includes BA/BS and above degrees, STEM Technicians includes associate degrees and business and finance includes only BA/BS degrees.</p> <p>Occupational Mobility Rates: Diversion occurs when graduates take jobs in occupations that are not directly aligned with their degree. For example, an engineering graduate might take a sales job in an engineering company, rather than a job working directly as an engineer. Using the SOC/IPEDS crosswalk described above, this person would be counted as someone who was <i>not</i> working in STEM, but rather in sales. Because of the diversion of graduates into alternative occupations, the estimated degree production for each occupation is adjusted based on occupational mobility rate data analysis provided by Georgetown’s CEW. These data shows percentage working in a field immediately after graduation and ten years later; assuming a constant rate of change, the ten-year average diversion rate was estimated as the midpoint between these two measures.</p> <p>Geographic Mobility Rates: In addition to the occupational mobility of graduates into other fields, alignment can be affected by geographic mobility—graduates who move to other states, thus reducing the number available to fill jobs in the home state of their college. State-specific mobility rates for public bachelor graduates one year after graduation were used in combination with longer term national geographic mobility estimates to generate state-specific 10 year differences to adjust each state’s target ratio.</p>
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- **Community Colleges, State Universities, UMass—% of Graduates Employed and/or Pursuing Additional Education in MA in the Year After Graduation (pages 80–81)**

1	Metric	Employment and/or Continuing Ed of MA public graduates
2	Segment	Community Colleges, State Universities, UMass
3	Data Source	DHE/HEIRS for graduating students, MA Department of Career Services for employment records, National Student Clearinghouse for continuing postsecondary education

		enrollment.
4	Cohort	Massachusetts residents earning undergraduate degrees or certificates from a MA community college.
5	Data Year	FY 2011 for graduates, FY2011 and FY2012for employment records
6	Achievement Gap Data	Race/ethnicity and gender
7	Comparison Group	Not Available
8	# of Comparison States	Not Applicable
9	National Leaders	Not Applicable
10	Special Notes	<p>This metric matches 2011 undergraduate degree and certificate recipients to MA employment records and National Student Clearinghouse enrollment records in the five quarters after graduation. The metric counts as employed any graduate who has been employed in at least one quarter in the five quarters after graduation and counts as continuing education if an enrollment record at a postsecondary institution is found in any quarter after the quarter of graduation during this same five quarter time period. The combined percent of employed and/or continuing education includes graduates who were working, who were working and continuing their education, and those just continuing their education.</p> <p>Note that employment records are limited to MA employers who report to the unemployment insurance division of the Massachusetts. The metric therefore does not capture as employed graduates who are: working out of state, working in-state but not listed as having a wage record in Massachusetts, self-employed, in the military, or working for a family business or farm without pay. The wage record was obtained through a collaborative effort of the Massachusetts Departments of Higher Education and the Department of Labor and Workforce Development, with consultation provided by the Commonwealth Corporation.</p>