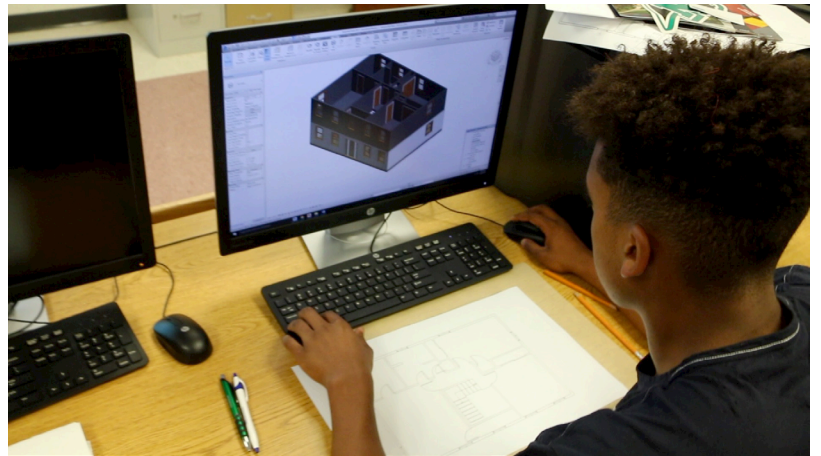


# High Quality Career Technical Education in Massachusetts

*A Critical Investment in Our State's Future*



March 2, 2018



*The Alliance for  
Vocational  
Technical  
Education*



As its first major undertaking, AVTE raised \$60,000 for a contract with the Dukakis Center for Urban and Regional Policy at Northeastern University. The Dukakis Center, under the leadership of founding director Barry Bluestone, was hired to study public perceptions of vocational technical education. “The Critical Importance of Vocational Education in the Commonwealth” was published in January 2016.

# High Quality Career Technical Education in Massachusetts

A Critical Investment in Our State’s Future

## *Part I: Who We Are and What We Believe*

The Alliance for Vocational Technical Education (AVTE), a broad-based association of diverse partners from across Massachusetts, was established to build on the successes achieved by vocational technical education during the past several years. It is a coalition of business groups, comprehensive and vocational high school administrators, and community groups formed to engage decision-makers in the Baker Administration and the Legislature to work with us in advancing vocational education in Massachusetts. The mission of the AVTE is to increase access to high quality vocational education for middle and high school students in the Commonwealth.

The Alliance commissioned this white paper to advance a research-based definition of high quality career technical education and offer recommendations to address the unique challenges facing vocational education in the Commonwealth of Massachusetts.

## High Quality Career Technical Education in Massachusetts



The Alliance for Vocational Technical Education (AVTE) is a partnership from various sectors that all recognize the value of Career Technical Education (CTE) in Massachusetts.<sup>1</sup> The Alliance believes that every young person should have access to high quality CTE programs, facilities and equipment, and that career technical education students should reflect the socioeconomic diversity of the Commonwealth. We further believe that CTE programs should satisfy the immediate and long-term needs of Massachusetts employers. Three co-chairs mobilized the group: Timothy P. Murray, President & CEO of the Worcester Regional Chamber of Commerce, David J. Ferreira, Executive Director of the Massachusetts Association of Vocational Administrators, and Lewis Finfer, Executive Director of the Massachusetts Communities Action Network. More than twenty members of the Alliance meet regularly to map strategy and identify steps to improve access to vocational education programs. The group represents a host of public, not-for-profit, and private sector partners.

The Alliance is a diverse team of public and private organizations that have varied positions on public policy issues. They include the Massachusetts Competitive Partnership, the Massachusetts Business Roundtable, the Massachusetts Business Alliance for Education, the Massachusetts Association of Vocational Administrators, the Massachusetts Association of School Superintendents, the Workforce Solutions Group, Catholic Charities of the Archdiocese of Boston, JFY NetWorks, MassINC, SkillWorks, MassDevelopment, the Massachusetts Communities Action Network, the Nellie Mae Foundation, the Pioneer Institute, Commonwealth Corporation, the Federal Reserve Bank of Boston, the Worcester Regional Chamber of Commerce, Parents Forum, and Massachusetts Parents United, among others.

Evidence and research indicate that CTE programs deliver tremendous value statewide to students, families, communities, and employers. Our collective experience tells us that graduates of CTE programs

- secure high-wage jobs
- possess strong academic, technical, and professional skills

### AVTE Member Organizations



AccuRounds  
Assoc. Industries of MA  
Assoc. Subcontractors of MA  
Boston Centerless  
Boston Private Industries Council  
Boston Public Schools  
Catholic Charities  
Commonwealth Corporation  
EdVestors  
Greater Boston Chamber of Commerce  
Greater Boston Manufacturing Partnership  
JFY NetWorks  
MA Marine Trades Association  
MA Association of School Superintendents  
MA Association of Vocational Administrators  
MA Business Alliance for Education  
MA Business Roundtable  
MA Communities Action Network  
MA Competitive Partnership  
Mass Development  
MA Non-profit Network  
MA Parents United  
Parents Forum  
Pioneer Institute  
Regional Employment Board of Hampden County  
Rennie Center  
SkillWorks  
Western Massachusetts EDC  
Worcester Regional Chamber of Commerce  
Workforce Solutions Group

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<sup>1</sup> Career Technical Education (CTE), a term common in the literature, is used to mean a contemporary, modernized approach to vocational education. In this paper, CTE and CVTE are used interchangeably to reflect the Commonwealth's tradition of excellence in vocational technical schools and programs that remain so named.



- are well prepared for further training in skilled occupations and careers
- enroll in and graduate from 2- and 4-year post-secondary schools.

The Alliance works with employers, educators, parents, community and mission-based organizations, agencies, and all levels of government to promote CTE as a powerful educational and workforce development resource and an indispensable foundation for future prosperity across the Commonwealth.

### Part II: Introduction

Massachusetts Secretary of Education Jim Peyser asserts that high quality career technical education (CTE) in Massachusetts is not a zero sum game. We could not agree more. Accountability in the post-Education Reform era and a dwindling state of resources unnecessarily pit Massachusetts academic, comprehensive, and vocational technical high schools against one another, creating winners and losers. However, the real losers are young people, especially those from low-income families who are denied access to career technical education, and are therefore destined for low-wage jobs that do not provide a family sustaining income. The sad reality is that only one in five Massachusetts high school students is enrolled in a vocational technical program and approximately 3,200 students are wait-listed each year. Massachusetts can and must do better if our economy is to continue to thrive and if we are to maintain our standing as a national and world leader in both education and leading-edge industries.

Unlike many of their counterparts across the nation, Massachusetts vocational technical schools are highly regarded as a CTE success story.<sup>2</sup> These achievements can be attributed to high expectations and an initial investment in career technical education and education in general. The Massachusetts Education Reform Act of 1993, commonly referred to as “the grand bargain,” was the driving force behind the state’s high quality CTE and other educational achievements. The Act promulgated the simultaneous adoption of challenging state standards and a means-tested state finance system. Chapter 70, the state aid program that provides general financial assistance to local school districts and establishes minimum local contributions, was enacted at this time. Through its “equity provisions,” the Act assured a foundation level of funding for all 351 districts in exchange for greater accountability for

### The Massachusetts Education Reform Act of 1993



Commonly referred to as “the grand bargain,” it was the driving force behind the state’s high quality CTE and other educational achievements.

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<sup>2</sup> Birmingham, T. (2017, February 6). Voc-Tech Schools Are a Massachusetts Success Story. *Commonwealth Magazine*. Retrieved from <https://commonwealthmagazine.org>



*The 2015 Report  
of the  
Foundation  
Budget Review  
Commission*



“Since then [1993] some of the assumptions contained in the formula for calculating the foundation budget have become outdated. In particular, the actual costs of health insurance and special education have far surpassed the assumptions built into the formula for calculating the foundation budget. As a result, those costs have significantly reduced the resources available to support other key investments.”

schools.<sup>3</sup> This more equitable funding system changed the landscape of education, inducing Massachusetts’ academic, comprehensive and vocational technical high schools to embrace the accountability movement, along with more innovative approaches to teaching and learning.

For a time, the foundation budget kept pace with the progressive ideas put forth in the Education Reform Act of 1993 and students in the Commonwealth were the beneficiaries of increased funding. Unfortunately, these hard-won equity provisions were short-lived: challenging fiscal times began to take their toll. The downward trend in funding culminated in the economic recession of 2007 – 2009. The Foundation Budget Review Commission Report of 2015 characterized the decades-old funding challenges this way:

*Since then [1993], some of the assumptions contained in the formula for calculating the foundation budget have become outdated. In particular, the actual costs of health insurance and special education have far surpassed the assumptions built into the formula for calculating the foundation budget. As a result, those costs have significantly reduced the resources available to support other key investments.*

One such neglected vital investment is career technical education. CTE often is overlooked and not made the priority it should be for the Commonwealth. Moreover, in addition to a lack of funding for expansion of high quality career technical education, CTE in Massachusetts is not considered as important as it truly is. Inexplicably, CTE is not mentioned in the MassCore, nor is it part of the Massachusetts accountability plan recently submitted to the federal government in response to the reauthorization of the Elementary and Secondary Schools Act (ESSA). Massachusetts is considered a national leader in career technical education, yet this

success story receives little or no mention in the Commonwealth’s most influential educational doctrines. Inclusion of CTE in key state policy and regulatory matters would significantly advance

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<sup>3</sup> Chester, M. (2014). *Building on 20 Years of Massachusetts Education Reform*. Retrieved from <http://www.doe.mass.edu>

## High Quality Career Technical Education in Massachusetts



Massachusetts’ educational mission to “prepare all students for success in the world that awaits them after high school.”<sup>4</sup>

Career technical education is not part of the MassCore, the Commonwealth’s high school program of studies, which was adopted by the Board of Elementary and Secondary Education in 2007 to ensure that the state’s high school graduates arrive at college or the workplace well-prepared and there is a reduction in the number of students taking remedial courses in college.

The working committee tasked with establishing the MassCore included a broad coalition of stakeholders with representatives from education, workforce development, and the business community. The committee was charged with identifying a rigorous course of study to best prepare students for their freshman year of college or for the workplace. The end result of the effort included four-year

	Massachusetts High School Diploma Requirements (2005)	Massachusetts Admission Requirements for Four-Year Colleges and Universities	MassCore Requirements (2007)
<b>English</b>	Meet Competency Determination	4 years	4 years
<b>Mathematics</b>	Meet Competency Determination	4 years (including Algebra II)	4 years
<b>Social Studies/ U.S. History</b>	1 year	2 years	3 years
<b>Science</b>	n/a	3 years (including 2 with lab)	3 years (all with lab)
<b>Foreign Language</b>	n/a	2 years (in a single language)	2 years (in a single language)
<b>Health/PE</b>	4 years	n/a	n/a
<b>Arts</b>	n/a	n/a	1 year

requirements in English and mathematics; three-year requirements in Social Studies/U.S. History and lab sciences; two years of study in a single foreign language, and one year of arts. The table above summarizes the current Massachusetts high school diploma requirements, four-year college admissions requirements, and the MassCore recommended high school program of studies.<sup>5</sup> High quality career technical education has the power to transform student engagement and post-secondary aspirations; therefore, it should hold a prominent place in the MassCore requirements.

Similarly, reauthorization of the Elementary and Secondary Schools Act (ESSA) represents another missed opportunity for the Commonwealth to signal a vision for greater student access to career technical education. As noted in the executive summary of the Massachusetts ESSA Plan, “Although most economically viable career pathways today require at least some postsecondary education, about one-quarter of Massachusetts public high school graduates do not enroll in a college or university in

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<sup>4</sup> “The Strategic Plan of the MA Department of Elementary and Secondary Education,” retrieved 10 September 2017 from <http://www.doe.mass.edu/research/StrategicPlan.pdf>.

<sup>5</sup> Image credit: U.S. Department of Education; [www.doe.mass.edu/ccr/masscore](http://www.doe.mass.edu/ccr/masscore).



the fall immediately after their high school graduation.” Historically, students enrolled in career technical education programs are significantly *more* likely to enroll in college than their counterparts.<sup>6</sup> The addition of an explicit career technical education strategy or goal to the Commonwealth’s ESSA Plan would be an effective way to increase college-going rates in Massachusetts.

In the recently submitted ESSA Plan, Massachusetts identifies five priorities for increasing college and career readiness: (1) strengthen standards, curriculum, instruction and assessments; (2) promote educator development; (3) support social-emotional learning, health, and safety; (4) turn around the lowest-performing districts and schools; and (5) use technology and data to support student learning. If college and career readiness are the drivers of the state’s accountability system, CTE should be added as a discrete goal in the Commonwealth’s newly developed ESSA Plan.

In April 2017 the Alliance began its work on this white paper in order to catalyze a conversation on career technical education. A small working group of Alliance members selected seminal data and research that identified the types of career technical education most likely to produce positive student outcomes. The Alliance believes that a strategic statewide focus on career technical education will mobilize policy- and decision-makers to effect the changes needed to increase successful outcomes for students across the Commonwealth. The Alliance hopes to engage state leaders in our effort to “increase access to high quality CTE programs for all students in Massachusetts.”

The literature on the impacts of career technical education strongly suggests that modest exposure to CTE courses produces positive outcomes for students. These results are more pronounced when certain aspects of CTE are present, such as sequential courses and intensive work-based learning experiences. In light of these findings, we must recognize that high quality CTE yields the best results, but that more CTE is likely to lead to better outcomes for Massachusetts students. Though resources are limited, there are practical ways to strengthen the Commonwealth’s commitment to college and career readiness by expanding access to high quality career technical education for all.

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<sup>6</sup> Castellano, M., Stone III, J.R., Stringfield, S. (2003). Secondary Career and Technical Education and Comprehensive School Reform: Implications for Research and Practice: Review of Educational Research; Vol. 73, No. 2, pp. 231 – 272.



## Part II: A New High Quality CTE Definition

The problem statement under consideration in this literature review is “How does the Alliance define high quality career technical education and how can we increase access for all students in Massachusetts?” To understand how the Alliance arrived at its definition, we begin with an exploration of the evolution of modern career technical education. Next, we explore the literature, synthesizing a meta-analysis, several studies, the eight categories of criteria of Chapter 74 of the Massachusetts General Laws, and the newly developed “high quality college and career pathways” of the Commonwealth of Massachusetts. The synthesis of these factors and characteristics of high quality CTE, along with other important ideas generated from careful analysis, form the basis of the Alliance’s new high quality CTE framework. The Alliance’s one-page high quality CTE framework includes a brief definition; five high quality CTE domains, including access and equity; infrastructure; curriculum, instruction and assessment; career readiness; data and outcomes; and three tiers—exposure, exploration, and immersion—comprising a high quality CTE continuum of learning for grades 7 – 12.

### What Is Modern Career Technical Education and Why Does It Matter?

To understand modern career technical education, it is helpful to examine its evolution in historical and economic context. Massachusetts has a rich history of public support for both academic and vocational instruction dating back to the colonial period. During the 1600s in New England, there were two common forms of apprenticeship: voluntary and involuntary. The Europeans enforced involuntary apprenticeships for indentured whites that became obsolete with the widespread enslavement of African-Americans. By contrast, the New England colonists favored voluntary apprenticeships, and “for more than 150 years, Colonial America used an American version of apprenticeship as the chief source of education for training of the masses. However, as the factory system of production developed, the interest in apprenticeship declined.”<sup>7</sup>

The Industrial Revolution began in England and was brought to America by Francis Cabot Lowell, who was born in Newburyport, Massachusetts, in 1775. The city of Lowell, Massachusetts was named after him and is considered the birthplace of the American

#### *The Problem Statement*



How does the Alliance define high quality career technical education and how can we increase access for all students in Massachusetts?

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<sup>7</sup> Reprinted by permission of Waveland Press, Inc. from Gordon, H. (2014). *The History and Growth of Career and Technical Education in America: Fourth Edition*. Longrove, Illinois: Waveland Press, Inc. © 2014 All rights reserved.





### What Is Modern CTE?



“Modern CTE blends the academic and the vocational, matching students to the high-skill, high-demand jobs of the future that will give them an opportunity to earn a family sustaining wage.”

-Stone, 2017

industrial revolution.<sup>8</sup> A focus on manufacturing processes characterized the period from the mid-1700s to the mid-1800s. This 100-year period was marked by uncertainty as American manufacturers worried that England would continue to monopolize manufacturing and trade, forcing them to be forever dependent on English imports. Economist Robert E. Lucas, Jr., wrote, “For the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth.”<sup>9</sup> As a result, workers’ wages increased significantly through the first and second phases of the industrial revolution and through the early 1900s.<sup>10</sup> However, while the unprecedented economic growth was not in dispute, many economists and historians decried the effects of the industrial revolution on living conditions.

Fast-forward to the new millennium when economists began to recognize that the United States could no longer compete with less-developed countries and began to advise against training the American workforce to be blue collar laborers.<sup>11</sup> Instead of perpetuating a blue collar workforce for jobs that soon would be obsolete, there was a push for a new educational approach in the

United States. Economists urged educators to train students to be creative thinkers and generators of ideas, rather than workers engaged in the production of goods and services.

Modern career technology in Massachusetts has its roots in the historical and progressive educational practices and entrepreneurial spirit of the New England colonists. Career technical education continues to evolve as new ideas emerge about how to develop a highly skilled American workforce. A new way of thinking about the American economy and education’s role in it leads to what is known today as “new vocational education” or “modern career technical education.” Modern CTE blends the

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<sup>8</sup> <http://www.historyofmassachusetts.org/massachusetts>

<sup>9</sup> Applebaum, R. & Lichtenstein, N. (2016). *Achieving Workers’ Rights in the Global Economy*. Ithaca, New York: Cornell University Press.

<sup>10</sup> Nardinelli, Clark (2008). “Industrial Revolution and the Standard of Living,” *The Concise Encyclopedia of Economics*. Indianapolis, IN: Liberty Fund.

<sup>11</sup> Marshall, R. & Tucker, M. (1992). *Thinking for a Living: Education and the Wealth of Nations*. New York, NY: Basic Books.



academic and vocational, matching students to the high-skill, high-demand jobs of the future that will give them a chance to earn a family-sustaining wage.<sup>12</sup>

Beyond the more obvious college and career opportunities that characterize career technical education, a modern approach to CTE also enables young people to engage deeply with content, to learn in context, and to develop the higher order critical thinking skills needed for academic and career success. Yet many students still do not have access to career technical education of any kind, and a common outcry from young people in traditional classroom settings throughout the country is, “What does this have to do with my life?” We think it is a fair question.

Moreover, students whom some might consider disengaged or even apathetic are not the only ones disenchanted with the fixed and intractable models of education that persist today. In our experience, even highly motivated and academically talented students decry teaching and learning that has no connection to or meaning in their lives. Brain development research teaches us that “neuroscience actually confirms the brain’s need to find meaning.”<sup>13</sup> When students are able to make connections between their academic lessons and real-life situations, they are able to apply and synthesize new information and engage in higher order thinking. Education today is fraught with highly politicized battles, yet we hear little argument that a fundamental purpose of education is to help young people develop the critical thinking skills they need to be successful in the world.

Modern CTE rejects the notion that critical thought and reflection are out of reach for those who enter the workforce. Johnson (2002) characterizes the false dichotomy this way: “One reason traditional education has accepted a split between mind and action, thinking and acting, is the cleavage in society between white-collar and blue-

### A False Dichotomy



“One reason traditional education has accepted a split between mind and action, thinking and acting, is the cleavage in society between what have for years been called the white-collar and blue-collar workers. Custom describes the first group as those who use their intellects and the second as those who work with their hands, as if intelligent reflection had nothing to do with physical labor, and as if those sitting at desks should divorce themselves from the work they direct. Clearly, this is a false distinction.”

-Johnson, 2002

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<sup>12</sup> Stone, J. III (2017). Introduction to Pathways to a Productive Adulthood: The Role of CTE in the American High School, *Peabody Journal of Education*, 92:2, 155-165, DOI: 10.1080/0161956X.2017.1302207.

<sup>13</sup> Johnson, E.B. (2002). *Contextual Teaching and Learning: What It Is and Why It’s Here to Stay*. The University of Michigan: Corwin Press.



collar workers. Custom describes the first group as those who use their intellects and the second as those who work with their hands, as if intelligent reflection had nothing to do with physical labor, and as if those sitting at desks should divorce themselves from the work they direct. Clearly, this is a false distinction.”

One way to address the false dichotomy between white- and blue-collar is to create a definition of high quality CTE designed to break such barriers and misconceptions. We conducted a review of the pertinent literature to develop our working definition of high quality CTE. Succinct definitions were not prevalent in the literature, which may be due to the complex nature of CTE that is not easily explained in a sentence or two. We found that high quality CTE is more commonly defined by a researcher’s consolidation of standards, characteristics, or features extant in the literature. Several scholars, including Holzer, Linn & Monthey; Imperatore & Hyslop; and Stone, have adopted sets of standards defining high quality CTE that are largely similar, yet also distinct in some ways.

For the purposes of this literature review, we compared and contrasted three studies and conducted a document analysis of Massachusetts’ definitions of “high quality.” The analysis began with a review of the “characteristics of high quality career technical education” (Holzer, Linn & Monthey, 2013). Next, we conducted a thorough review of a meta-analysis including “12 standards of high quality career technical education” (Imperatore & Hyslop, 2016). Finally, we reviewed “signature features of high quality career technical education” (Stone, 2017).

Once the three studies were analyzed, comparisons were made to the eight categories of criteria of Chapter 74 of the Massachusetts General Laws and the guiding principles of the Massachusetts “high quality college and career pathways.” A synthesis of these standards, factors and principles is shown in Table 1: Crosswalk of Research-Based High quality Characteristics of CTE with Comparisons (pages 15-16).

### High Quality Career Technical Education: A Review of Related Literature

In a collaboration among the Georgetown Public Policy Institute, the Business Roundtable, and the College Board, researchers Holzer, Linn & Monthey (2013) make the economic case for high quality career technical education, highlighting what they found to be its most important characteristics, including building career pathways, K-12 through adult; focusing on program design; curriculum framework; rigorous CTE curriculum; curriculum derived from industry and reflecting qualifications of future employment; curriculum delivered through projects that address contextualized problems; curriculum continually enhancing related mathematics, literacy and science concepts; community-based learning; CTE teachers highly qualified in technical and pedagogical skills; CTE teachers focusing on core 21st-century skills; work-based learning that is developmental, progressive and



### Why CTE?



There is no national system linking education and the workforce. “Career Technical Education has the potential to play a key role in American economic competitiveness.”

-Stone, 2017

progressively intensive; Career Technical Student Organizations (CTSOs) that are an integral part of pedagogy; and an assessment framework.

In 2015, the Association for Career and Technical Education (ACTE) commissioned researchers Imperatore and Hyslop to conduct a meta-analysis and to develop a framework for high quality CTE. The research began in 2015 and concluded in 2016 with a high quality CTE framework useful for self-evaluation, programmatic reviews, and improving networking and communication between high school and post-secondary schools. According to the researchers, a meta-analysis was needed to “help synthesize the myriad voices that are part of the dialogue on high quality CTE.”

The researchers developed three drafts and met with a number of focus groups before releasing their final draft, “Defining High Quality CTE: Quality CTE Program of Study Framework, Draft Version 3.0,” in November 2016 that includes 12 standards of high quality CTE: (1) standards-aligned and integrated curriculum; (2) sequencing and

articulation; (3) student assessment; (4) prepared and effective program staff; (5) engaging instructional strategies; (6) access and equity; (7) facilities and equipment; (8) business and community partnerships; (9) career development; (10) career technical student organizations; (11) work-based learning; and (12) data and outcomes.

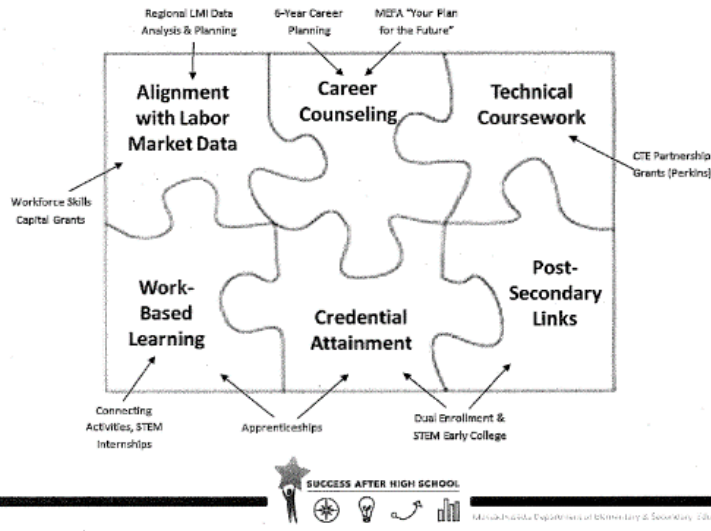
In 2017, Stone explored the role of CTE in the American high school, warning that there is no national system linking education and the workforce (Stone & Lewis, 2012); rather, CTE is a “non-system built upon a series of ad hoc efforts begun in 1862 to address education for the workplace.” He suggests that “CTE has the potential to play a key role in American economic competitiveness,” and he advocates for the integration of “signature features of high quality 21<sup>st</sup> century CTE” in American high schools. The signature features of Stone’s definition of high quality CTE include (1) building career pathways, K-12 through adult (i.e., occupational expression of academics; occupational or employability skills; technical skills); (2) focus on program design, curriculum framework, and high quality 21<sup>st</sup> century CTE (i.e., designing and delivering programs); and (3) a high quality, rigorous CTE curriculum (i.e., curriculum derived from industry and reflecting qualifications for future employment; curriculum delivered through projects that address authentic problems; and curriculum continually enhancing related mathematics, literacy and science concepts).



## How Does Massachusetts Define High Quality CTE?

We draw on the work of the Massachusetts Department of Elementary and Secondary Education (DESE) to inform our definition of high quality career technical education. A set of elements of high quality college and career pathways have guided DESE’s work for the past several years, which are examined further in this section. We begin with an

### 6 Elements of High Quality College & Career Pathways



exploration of the six identified elements of high quality college and career pathways: (1) alignment with labor market demand; (2) career counseling; (3) technical coursework; (4) work-based learning; (5) credential attainment; and (6) post-secondary links. DESE uses a puzzle graphic to illustrate its operating definition of college and career pathways, which includes: alignment with labor market data; career counseling; technical coursework; work-based learning; credential attainment; and post-secondary links.

Chapter 74 of the Massachusetts General Laws is the state law that regulates vocational, technical, and agricultural education in Massachusetts. The state has developed regulations necessary to implement the law. The Department of Elementary and Secondary Education most recently revised the regulations, 603 CMR 4.00 *et seq.*, in early 2015. School leaders must follow the Massachusetts Vocational Technical Education Frameworks and the admissions policy to win Chapter 74 approval.<sup>14</sup> The Massachusetts Chapter 74 Career/Vocational Technical Education Program Directory contains the official list of Chapter 74 approved programs in the Commonwealth.<sup>15</sup> The approved list includes twenty-six vocational technical school districts; thirty-two local school districts; nine academic regional school districts; two county agricultural and technical school districts; one independent vocational and agricultural school district; and one educational collaborative in a variety of CTE clusters (i.e., agriculture and natural resources; arts and communication; business and consumer services;

<sup>14</sup> <http://www.doe.mass.edu/cte/frameworks/> and [http://www.doe.mass.edu/cte/admissions/policies\\_manual.doc](http://www.doe.mass.edu/cte/admissions/policies_manual.doc)

<sup>15</sup> Massachusetts Chapter 74 Career/Vocational Technical Education Program Directory retrieved on 12 October 2017 at [www.doe.mass.edu/cte/programs/directory.pdf](http://www.doe.mass.edu/cte/programs/directory.pdf)



construction; education; health services; hospitality and tourism; information technology services; legal and protective services; manufacturing, engineering and technology; and transportation).

Chapter 74 approved vocational technical education programs are funded through the state's Chapter 70 program, the major mechanism of state aid to public elementary and secondary schools.<sup>16</sup> All Chapter 74 approved programs result in an additional \$4,000 per student factored into each school district's Chapter 70 formula to determine the state's share of funding and the municipality's minimum aid requirement. A section of the regulations outlines the required elements for vocational technical programs. These Chapter 74 program approval factors address how schools are governed and include elements essential for high quality programming. Known commonly as "the eight approval factors," they are actually eight *categories* of criteria, with multiple rules and requirements in six of the eight. See 603 CMR 4.03 (1) (8).

These required elements include rules on how vocational technical schools are led and governed; the need for Program Advisory Committees and General Advisory Committees that include business, industry and community representatives; requirements for industry-standard facilities and equipment that ensure the safety of students; rules mandating competency-based learning and the delivery of instruction; requirements for career guidance and placement services; the need for specialized licensing of teaching personnel including educators in technical programs; guidelines on admissions policies; and rules governing cooperative education.

In the summer of 2017, Massachusetts launched a "High Quality College and Career Pathways" (HQCCP) initiative focused on the need to significantly expand student access (particularly for underserved populations) to science, technology, engineering and math-related fields. Two new types of HQCCPs include "Early College Pathways" overseen by the Early College Joint Committee of the Board of Elementary and Secondary Education and the Board of Higher Education, and "Innovation Career Pathways" overseen by DESE. Funding is linked to five key design principles including (1) equitable access; (2) guided academic pathways; (3) enhanced student support; (4) connection to career; and (5) effective partnerships. The five principles are designed to ensure enrollment in early college and innovation career pathways for students historically underrepresented in higher education; ensure academic rigor; incorporate sufficient wrap-around services; expose students to a variety of career opportunities; and promote partnerships between institutions of higher education and secondary schools and/or districts, and possibly employers.<sup>17</sup>

The "High Quality Career Technical Education Crosswalk" (see Table 1) leads with the meta-analysis of Imperatore & Hyslop (2016) designed to synthesize the best research in the field. The next column

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<sup>16</sup> <http://www.doe.mass.edu/finance/chapter70/>

<sup>17</sup> <http://www.doe.mass.edu/bese/docs/FY2017/2017-01/joint-temI1-outline.docx>



contains the review of the characteristics of high quality CTE from Holzer, Linn & Monthey (2013). A summary of Stone’s signature features of high quality CTE can be found in the center column. Individual cells contain items from the reviews of the elements of high quality CTE as they relate to the Imperatore & Hyslop standard. For example, Imperatore & Hyslop recommend a “student assessment standard,” as do Holzer, Linn & Monthey (2013), which they refer to as “assessment and accountability,” and Stone (2017) “a bronze, silver, and gold-level CTE assessment framework.” The last two columns align the Massachusetts “Chapter 74 approval factors” and “high quality college and career pathways.”

The purpose of this crosswalk is to synthesize the elements of high quality career technical education to further develop the Alliance’s definition of high quality CTE that follows. Several interesting findings emerged from the analysis of this crosswalk including (1) data and outcomes are mentioned explicitly only in the Imperatore & Hyslop study; (2) access and equity are mentioned in two of the three literature reviews; (3) facilities and equipment are mentioned explicitly in only one of the three literature reviews; and (4) only Stone’s definition of high quality CTE directly discusses the need for students to engage in real-world projects that address authentic problems, although it can be inferred in the high quality characteristics identified by the other researchers (e.g., Certificate of Occupational Proficiency in the “student assessment” category and competency-based higher order thinking in the “engaging instructional strategies” category).

## High Quality Career Technical Education in Massachusetts



<b>TABLE 1: Crosswalk of Research-Based High Quality Characteristics of CTE with Comparisons to Massachusetts Chapter 74 Approval Factors and High Quality College and Career Pathways</b>				
<b>Imperatore &amp; Hyslop "12 Standards of HQCTE"</b>	<b>Holzer, Linn &amp; Monthey "Characteristics of HQCTE"</b>	<b>Stone's "Signature Features"</b>	<b>MA "Chapter 74 Approval Factors"</b>	<b>MA "HQ College &amp; Career Pathways"</b>
<b>Standards-aligned and integrated curriculum</b>	Rigorous academic curricula (contextualized learning, advanced placement, p. 10)	The curriculum continually enhances related mathematics, literacy, and science concepts	4.03 (4)(a)(1): State approved Vocational Curriculum Frameworks & Academic Frameworks  4.03 (4)(a)(6): National Occupational Program Approval Standards	Labor Market Credentials Guided Academic pathways (2 technical courses in a 4 course sequence)
<b>Sequencing and articulation</b>	Career oriented educational systems (p. 9)	The curriculum is derived from industry and reflects qualifications for future employment	4.03 (4)(a)(4): Post-secondary articulation agreements	Labor Market Integrated Instruction
<b>Student assessment</b>	Assessment and accountability (p. 12)	A bronze, silver, and gold-level CTE assessment framework	4.03 (4)(c): 4.14: Certificate of Occupational Proficiency	Credential preparation for students
<b>Prepared and effective program staff</b>	Professional development for teaching staff and leaders (p. 11)	CTE teachers are highly qualified in technical and pedagogic skills	4.03 (5): Qualifications of personnel	N/A
<b>Engaging instructional strategies</b>	N/A	Learning is community-based (i.e., students should learn in teams and be held accountable)  CTE teachers focus on core, 21 <sup>st</sup> -century skills (i.e., use contemporary technology associated with career pathway and take leadership and project management roles)	4.03 (4)(a)(2): Competency-based higher order thinking and problem solving skills  4.03 (4)(a)(3): Academic and technical integration	Career Advising
<b>Access and equity</b>	Strong options for all students (p. 9)	N/A	4.03 (4)(a)(9): Free of bias and stereotyping	See Guiding Principle 1 (page 3)
<b>Facilities and equipment</b>	N/A	N/A	4.03 (3): Location/facilities and equipment	N/A



## High Quality Career Technical Education in Massachusetts



<b>Business and community partnerships</b>	N/A	Secondary and postsecondary CTE programs share a common industry advisory committee and tightly integrated curriculum	4.03(1)(f): Program & General Advisory Committees	See Guiding Principle 5: Effective Partnerships
<b>Career development</b>	Rigorous technical skill development (p. 10)  Employability skills (p. 10)	Occupational or Employability Skills (i.e., soft skills, such as persistence, self-control, conscientiousness (p. 159)  Technical Skills (i.e., nest Industry Recognized Credentials in traditional academic degrees, providing stackable credentials, p.159).	4.03 (4)(d): Career guidance & placement; 4-year career plan; interest & aptitude  4.03 (4)(e) Exploratory program for 9th graders	See Guiding Principle 4: Career Advising
<b>Career technical student organizations</b>	Support services for students (i.e., CTSOs, p. 11)	Career-Technical Student Organizations (CTSOs) are an integral part of pedagogy	N/A	N/A
<b>Work-based learning</b>	N/A	Work-based learning is developmental, progressive, and progressively intensive.	4.03 (4)(a)(5): work-based experience wherever applicable and feasible  4.03 (7): Cooperative education	Work-Based Learning
<b>Data and outcomes</b>	N/A	N/A	4.05: Outcomes for competency determination  Positive placement	N/A



### Part III: The Alliance's Definition of High Quality CTE

The Alliance's definition of high quality career technical education is informed by the work of a number of experts in the field of high quality CTE and through advances in career technical education in Massachusetts. The Alliance's working definition is characterized by a definition of high quality CTE, five domains (i.e., access and equity; infrastructure; curriculum, instruction, and assessment; career readiness; data and outcomes), and three program tiers (i.e., exposure, exploration, and immersion). The Alliance defines high quality career technical education as *a comprehensive, rigorous and engaging education characterized by intensive work-based learning experiences, resulting in college and career placements to meet the business community's needs and labor market demands.*

A review of contemporary literature shows substantial overlap in the definitions of high quality CTE used by experts in the field. In formulating the Alliance's definition, we relied heavily on the meta-analysis conducted by Imperatore & Hyslop in 2016. In an effort to further streamline the information, making it more accessible to members of the Alliance and others who may be interested, we consolidated the 12 standards of the meta-analysis into five domains, including (1) access and equity; (2) infrastructure; (3) curriculum, instruction and assessment; and (4) career development; and (5) data and outcomes. The Alliance's five domains are derived from the cross-cutting standards found in the "High Quality Career Technical Education Crosswalk" (Table 1, page 15). We also incorporated aspects of high quality CTE based on certain research definitions that may have been excluded from others, as we explain in the following rationale for the five domains.

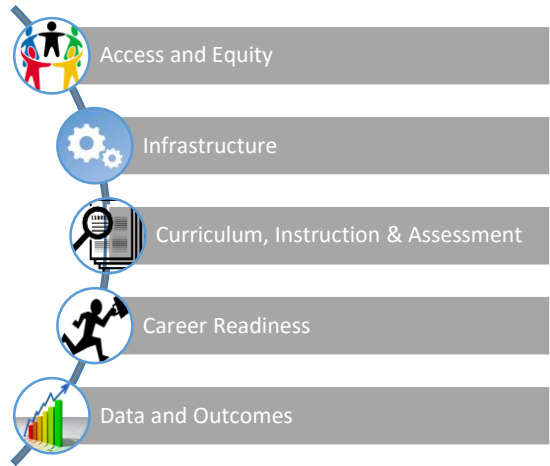


## AVTE's Definition of High Quality Career Technical Education (CTE)

*High quality CTE is a comprehensive, rigorous and engaging education characterized by intensive work-based learning experiences, resulting in college and career placements to meet the business community's needs and labor market demands.*

### Domain 1: Access and Equity

During the past two and a half years, the Alliance devoted a considerable amount of time on examining issues of access and equity. While some researchers made mention of bias-free CTE opportunities, others did not include access and equity in their definitions of high quality CTE (i.e., Stone, 2017). The Alliance views this domain as the single, most important component of our working definition of high quality CTE. Access to high quality career technical education is vital to our ability to close persistent achievement gaps and improve the life outcomes of every child in the Commonwealth.



### Domain 2: Infrastructure

This domain consolidates standards relating to state-of-the-art facilities, equipment, and high quality staffing. We recognize that CTE cannot exist without adequate facilities and highly qualified, knowledgeable teachers and staff.

### Domain 3: Curriculum, Instruction & Assessment

A standards-based integrated curriculum combining contextual learning with rigorous academic expectations is critical to teaching and learning. A curriculum that emphasizes both the cognitive and psychomotor domains clearly articulates what students should know and be able to do.

### Domain 4: Career Readiness

High quality CTE develops a student's readiness for careers through exploratory or career awareness; work-based learning; business and community partnerships; and student organizations with a CTE focus. Student support in the form of CTSOs (Career Technical Student Organizations) and similar peer support groups can help reduce any barriers to access and equity, reinforcing inclusivity in high quality CTE programs.

### Domain 5: Data and Outcomes

Measurable outcomes to determine the effectiveness of a program are an essential component of high quality career technical education. Outcomes may include, but are not limited to, dropout, graduation and college-going and persistence rates; work-based learning and internship and externship hours; job placement that meets the needs of the business community. Data and outcomes play a significant role in high quality CTE programs, as they can be closed due to lack of interest and/or economic viability. These unique reasons to close a program reside outside the scope of budget cuts.



### 5 HIGH QUALITY CTE DOMAINS

1. **ACCESS AND EQUITY** – High quality CTE programs are inclusive, ensuring that all young people in a given community, regardless of their differences and abilities, are able to access and flourish in CTE programs and beyond.
2. **INFRASTRUCTURE** – High quality CTE programs have competent teachers and program staff, as well as appropriate facilities and equipment.
3. **CURRICULUM, INSTRUCTION, AND ASSESSMENT**– High quality CTE programs include sophisticated teaching and learning practices based on (a) a standards-aligned and integrated curriculum; (b) engaging instructional strategies; (c) student assessment; and (d) clear sequencing and articulation of contextualized courses.
4. **CAREER READINESS** – High quality CTE programs offer an in-depth array of career development activities, including (a) work-based learning; (b) business and community partnerships; and (c) student organizations with a CTE focus.
5. **DATA AND OUTCOMES** – High quality CTE programs achieve measurable outcomes, including, but not limited to: high graduation rates, low drop-out rates, high college-going and persistence rates, and high rates of student attainment of jobs for which they trained.

### 3 PROGRAM TIERS

**Table 2: The CTE Continuum of Learning for Grades 7 to 12**

<b>Tier I: Exposure</b>	<b>Tier II: Exploration</b>	<b>Tier III: Immersion</b>
<ul style="list-style-type: none"> <li>• The learner is exposed to courses and possible CTE pathways.</li> <li>• The learner meets all high school graduation requirements.</li> <li>• The learner has an opportunity to earn hours gaining experience in the workforce.</li> </ul>	<ul style="list-style-type: none"> <li>• The learner meets all Tier I expectations.</li> <li>• The learner begins to explore authentic real-world, contextualized work-based experiences.</li> <li>• The learner is involved in weekly internships or externships.</li> <li>• The learner earns at least one Industry Recognized Credential.</li> <li>• The learner takes a dual or concurrent enrollment course.</li> <li>• The learner completes a college and career plan.</li> </ul>	<ul style="list-style-type: none"> <li>• The learner meets all Tier II expectations.</li> <li>• The learner demonstrates mastery in a 3.5 year sequential CTE program that meets Ch. 74 standards.</li> <li>• The learner actively engages in intensive work-based learning experiences (e.g., registered apprenticeship; cooperative ed.).</li> <li>• The learner earns more than one stackable Industry Recognized Credential.</li> <li>• The learner’s sequential CTE program concludes with at least one dual/concurrent enrollment college course in the technical sequence.</li> </ul>





## Part IV: Outcomes and Evidence of Effectiveness of CTE

Career technical education blends academic and practical skills to provide students with engaging and meaningful contextualized learning experiences, but to what extent does it improve student outcomes? Also, how much career technical education do students need and is there a particular type of student who benefits? To gauge its impact on student outcomes, we examined a number of studies analyzing CTE effectiveness. Students with significant exposure to CTE are more likely to graduate, enroll in college, get a job, and earn higher wages. Moreover, those who enroll in a sequential CTE program, commonly defined as “a coherent sequence of state-approved courses,”<sup>18</sup> graduate from high school at significantly higher rates.

In 2008, Kemple & Willner conducted a randomized, controlled study in nine large urban (or near-urban) school districts with higher rates of high school dropouts and unemployment than the national average. The participants in the study included higher percentages of African-American and Hispanic students and a greater percentage of low-income families compared with school districts nationally. Students could apply to a career academy, but there were more students than seats, so students were randomly assigned through a lottery system. The career academies had three standard features (1) small personalized learning communities; (2) academic and technical skills embedded in the curriculum and organized around one career, occupation, or industry; and (3) work-based learning experiences through partnerships with employers, and summer employment, internships, and mentoring.

The researchers found the career academies to have a statistically significant impact on the average monthly earnings over the eight years following students’ scheduled graduation dates. Students from the career academies earned an average of \$1,358 per month, compared with \$1,225 in the control group (a difference of \$133) in the first four years after graduation. The difference in the average monthly wage between students from the career academies and the control group increased to about \$216 over the period five to eight years after scheduled high school graduation. As measured five to eight years after graduation, the labor market impacts were greater for young men who attended career academies than they were for the control group (\$2,558 vs. \$2,197 per month).

In 2016, the Thomas B. Fordham Institute enlisted researcher Shaun M. Dougherty, assistant professor of educational policy and leadership at the University of Connecticut’s Neag School of Education.

### Career Technical Education: How Much Matters?



While concentrations in career technical education produced significant gains in high school graduation rates, even modest exposure to CTE led to an increase in the number of students graduating from high school.

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<sup>18</sup> <http://www.cteresource.org/apg/introduction>



Dougherty researched career technical education in Massachusetts and New York City, and in his landmark study he examined the Arkansas Research Center (ARC) database and its outcomes for approximately 100,000 eighth grade students. He then followed three cohorts from eighth grade into college and the workforce to determine which students were taking CTE courses, whether exposure to contextualized learning improves education and employment outcomes, and the possible benefits of three or more CTE sequential courses.

Dougherty's findings suggest that students enrolled in CTE programs are more likely to graduate from high school, enroll in college, obtain employment, and earn better compensation. While concentrations in career technical education produced significant gains in high school graduation rates, even modest exposure to CTE led to an increase in the number of students graduating from high school. In general, taking just one additional CTE course increases students' probability of graduating from high school by 3.2 percentage points and the likelihood that they will enroll in a two-year college the following year by 0.6 percentage points. Additionally, successful completion of one CTE course increases students' probability of being employed the year after graduation by 1.5 percentage points and escalates their expected quarterly wage that year by \$28 (or roughly 3%). Dual enrollment gives students an opportunity to earn college credit while still in high school. When students enroll in dual enrollment courses, it doubles the probability that they will enter a two-year college the year after graduation. Dougherty summarizes his findings this way:

*Students with greater exposure to CTE are more likely to graduate, enroll in a two-year college, be employed, and have higher wages. Furthermore, those students are just as likely to pursue a four-year degree as their peers. In addition, students who “concentrate” their CTE coursework are more likely to graduate high school by 21 percentage points compared to otherwise similar students—a truly staggering number.*

A lack of opportunity for underachieving young men has ignited a conversation about gender bias in vocational education. Interestingly, Dougherty's findings suggest that lower-income students are 25% more likely to graduate, twice as likely to enroll in college if they obtain college credit in high school, and males are 22% more likely to graduate from high school. Moreover, the results of this study suggest that CTE benefits those who may need it most—boys from low-income families. Harvard education researchers point to the dismal employment opportunities for young men and call for a revival of vocational education.<sup>19</sup> Advocates for the expansion of career technical education for young men suggest that sufficient opportunities already are afforded to young women. In 2010, young women held more than 60% of the seats in graduate programs in social sciences, public administration,

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<sup>19</sup> Symonds, W., Schwartz, R., and Ronald F. Ferguson (2011). *Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21<sup>st</sup> Century*. Cambridge, MA: Pathways to Prosperity Project, Harvard University Graduate School of Education.



veterinary medicine and health sciences. The proponents for redoubling efforts for low-achieving males maintain, “it is our underachieving young men that destiny is leaving behind, and they are being discouraged rather than encouraged by our political elites.”<sup>20</sup>

Dougherty appears more interested in the expansion of career technical education for all than in the gender debate, urging policymakers to consider four recommendations (1) continue to increase exposure to inclusive CTE opportunities; (2) make known the benefits of concentrating; (3) expand dual enrollment; and (4) invest more heavily in CTE. The findings in the Arkansas study suggest that enrolling students early in CTE courses that are non-tracked produces positive outcomes. Further, exposing students to a particular career technical education pathway and counseling them to complete their program signals an educator’s belief in their students’ ability to engage in post-secondary education, improve their technical skills, and advance their future college and career opportunities. Dual enrollment helps ease the transition from high school to college from a financial as well as an informational standpoint, encouraging students to signify a possible college and career pathway early in high school. Finally, Dougherty urges state leaders who are eager to close achievement and opportunity gaps to intensify their efforts and invest in career technical education.

### *Part V: Conclusions and Further Considerations*

The benefits of high quality career technical education are incontrovertible, yet student exposure to CTE in Massachusetts remains limited. Young people enrolled in CTE schools and programs are less likely to drop out of high school, more likely to graduate and earn top paying jobs, and just as likely to participate in college as their non-CTE peers. The benefits of CTE are more compelling when students concentrate in sequential career technical education courses, yet even modest exposure to CTE appears to lead to better student outcomes. These findings support the Alliance’s definition of high quality CTE as a continuum of learning, progressing from exposure, to exploration, to immersion. Moreover, the link between CTE and student achievement supports the Alliance’s mission to “increase access to high-quality programs for all students in Massachusetts.”

A leader in career technical education since the Education Reform Act of 1993, “Massachusetts has a network of twenty-six academically rigorous vocational-technical high schools serving 27,000 students who spend their day in traditional academic classes and apprenticing in a field of their choice. The Massachusetts program is so successful it has become known as the “Cadillac of Career Training Education (CTE).” Students enrolled in CTE graduate and go to college at higher levels, have better employment opportunities, and earn better wages, leading to a more rewarding and fulfilling life. Yet, the unfortunate reality is that students are suffering due to a limited number of seats in career technical education schools and programs in Massachusetts, which has broad implications for educators and policymakers.

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<sup>20</sup> Hoff Sommers, C. (2013). *The War Against Boys*, Simon & Schuster.



Currently, only 20% of the state’s high school students are enrolled in some form of career technical education. We believe all young people deserve equitable access to a CTE school or program, particularly the more than 3,000 wait-listed students who are without access today. Many of these young people are from low-income families, and they graduate from high school with few prospects and little hope. Moreover, we deny thousands of Massachusetts students the opportunity to develop their critical thinking skills through contextual learning opportunities afforded through high quality career technical education. Drawing on the entrepreneurial spirit of our ancestors and the Commonwealth’s collective creativity, intellect, and concern for the well-being of every young person, we can and must do more to ensure that students are learning in engaging and meaningful ways. We believe that an investment in high quality CTE is an investment in our state’s future, and we urge all elected officials and policymakers to help us increase access to career technical education so we can give young people in Massachusetts the rewarding and fulfilling lives they so deserve.

### AVTE Policy Recommendations

**The Goal:** In today’s highly competitive labor market in which employers’ demand for qualified workers to fill middle and high skill jobs continues to grow, the Alliance for Vocational Technical Education (AVTE) is working to maximize the Commonwealth’s career and technical education (CTE) workforce pipeline to meet employer needs and provide high quality career pathways for more students. The Commonwealth’s CTE system effectively prepares students for the workforce and higher education; however, it only serves 20% of the state’s enrolled high school population. Therefore, our goal is to increase students’ access to CTE schools and programs, which are aligned with regional industry demand.

**Need and Background:** Massachusetts faces an acute skills gap and employers struggle to find qualified talent across nearly every sector and region of the state. Our state’s CTE schools and programs are teaching timely competencies that align with the skills required for in-demand jobs from advanced manufacturing, healthcare, building trades and engineering, innovation and technology, and more. Our existing CTE schools and programs have been validated by employers for decades as a talent pipeline, outperform their peer high schools on indicators for graduation and dropout rates, and compete on state assessment and post-secondary matriculation.

**Challenge:** CTE enrollment has grown in the past decade, however, the capital infrastructure, financing mechanisms, and governance of our schools has not expanded to meet our workforce needs and, as a result, schools are challenged to serve additional students. For example, there are several cases where state law has posed multiple challenges for regional CTE schools to expand, including a daunting requirement that regional schools secure unanimous support from all member towns for new construction or renovation projects.





**Timing:** For more than a century, career and technical schools and programs in Massachusetts have successfully prepared students for post-secondary education and productive careers. However, with the increased demands on the Commonwealth’s talent pool, now is the time to reenergize our commitment to effective workforce development and adapt the state’s funding mechanisms to be based on 21<sup>st</sup> century needs and best practices.

To facilitate this needed increase in capacity, AVTE has outlined ideas for short-term improvements and long-term solutions that target each of the five, high quality CTE domains outlined in AVTE’s definition of high quality career technical education. These recommendations will expand access to state Chapter 74-approved career and technical programs for more students, incentivize partnerships that advance students’ college and career readiness, and develop effective financing strategies designed to increase capacity and maximize outcomes for students, businesses, and communities.

### **Domain 1: Access and Equity**

- Create the position of Deputy Commissioner of CTE within the Massachusetts Department of Elementary and Secondary Education (DESE) that is strictly focused on improving and maximizing CTE throughout the state. This position will ensure that regulations and policies are developed and executed to enhance the state’s CTE programs. For example, the Deputy Commissioner could enforce the state regulation [603 CMR 4.14] for Certificates of Occupational Proficiency that has not been previously enforced.
- Provide students and parents with all adequate information about their educational options for high school, and ensure a bias-free and fair admissions and interview process for English Language Learners, students of color, students with special needs, and students who are socioeconomically disadvantaged.
- In this current age of multi-media, multi-language issues and equity concerns, physical access and other contact methodologies for middle school students should be strongly encouraged to improve equity of access.<sup>21</sup> When middle schools release the names and addresses of grades 7 and 8 students to the authorized personnel of a CTE school or program, require the middle school to release full contact information, including but not limited to parents’ email addresses, for the purpose of informed parent and student decision-making. This can be accomplished by amending state regulation: 603 CMR 4.03 (6) (f).
- Support the expansion of articulation and other dual credit programs to allow CTE students to earn credit and stacked credentials that lead to an associate’s degree.
- Sponsor innovative and collaborative CTE demonstration programs where students split time between their academic or comprehensive high school and a school offering Chapter 74 programs. The student would take academic classes in the morning and vocational courses in the afternoon when the equipment is available. Each school would receive a 0.5 FTE reimbursement per student, shared under the school aid formulas set between the schools

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<sup>21</sup>Information from email exchange with DESE officials on January 7, 2018.



involved. To incentivize the collaborations, allocate \$900,000 in the Fiscal Year 2019 budget to fund six demonstration programs, which would cover the student reimbursement within the same year, rather than the current one-year lag and any transportation costs.

- Incentivize collaboration between high school faculty and guidance counselors of schools offering Chapter 74 programs and those that do not to utilize resources developed by CTE to provide access to skill-training and career options for all students.
- Require that students graduating from high quality CTE programs are credentialed in applied knowledge, effective relationships, and workplace skills as described in the federal Employability Skills Framework.<sup>22</sup>
- Actively promote and facilitate the introduction of CTE programs that align with regional demand into comprehensive high schools.

### **Domain 2: Infrastructure**

#### *Short-Term:*

- Authorize and direct the Massachusetts School Building Authority (MSBA) to add 20 percentage points to the square footage reimbursement rates only for the approved Chapter 74 educational spaces in programs that align to labor market demand.
- Revise or create the appropriate regulations to authorize the MSBA to reimburse projects that provide square footage dedicated to post-graduate and post-secondary Chapter 74 programs that align with labor market demand.
- Simplify state law [Chapter 71 Section 16] so all regional school districts can secure bonding for critical capital projects by the district-wide referendum process outlined in M.G.L. Chapter 71 Section 16(n).
- Revise the language in Chapter 71 Section 16(d) to allow all regional school districts the option to secure project bonding approval via town meeting if no more than one-third of their members disapprove.

#### *Long-Term:*

- Establish a dedicated \$3 billion bond program to fund the replacement and renovation of CTE programs and school districts and to fund equipment purchases for Chapter 74-approved programs. Of the \$3 billion bond, \$2 billion will be dedicated to construction costs and \$1 billion to equipment. Additionally, the 10-year bond would pay for capital construction at 2-3 schools per year and up to \$250,000 for program development and operating costs. Capital construction projects would be administered by the Massachusetts School Building Authority (MSBA); the equipment purchasing program would be administered by the Executive Office of Education/Workforce Skills Cabinet.

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<sup>22</sup> <http://cte.ed.gov/employabilityskills/>



### **Domain 3: Curriculum, Instruction & Assessment**

- Revise the MassCore to include a minimum of one CTE course or an approved internship to increase all graduates' exposure to CTE fields, enabling students to have the knowledge to access both college and careers.
- Assure curricular alignment to both local employers' need and expected national standards.
- Assure instructional ability and competence through the utilization of occupational advisory boards and nationally validated teacher competency testing.
- Utilize both pre- and post-technical assessment in both cognitive and psychomotor domains to determine what students know and are able to do.

### **Domain 4: Career Readiness**

- Collaborate with recognized industry credential providers (e.g., NOCTI) to develop state-customized credentials to measure Career Readiness through skill assessments appropriate to each tier of Massachusetts CTE.<sup>23</sup>
- For post-graduate and post-secondary Chapter 74 programs, explore the use of the 21<sup>st</sup> Century Skills for Workplace Success Credential which validates overall workplace readiness skills and is aligned to the Employability Skills Framework of the Office of Career and Technical Adult Education.<sup>24</sup> This credential can be utilized to validate basic competencies before participation in externships or school based enterprises. It can be utilized with state one-stop career centers or as a graduation/completion requirement.

### **Domain 5: Data and Outcomes**

- Support Chapter 74 programs' use of Industry Recognized Credentials (IRCs). IRCs are performance-based credentials developed and validated by industry to assess a student's knowledge and level of mastery of valuable competencies. For example, NIMS, the National Institute for Metalworking Skills, sets skill standards and provides sequential curriculum modules that offer learners stackable, globally recognized credentials.
- Support the use of both longitudinal and pre- and post-student assessment as a means of obtaining meaningful data for curricular improvement. Data can be utilized for facilities improvement, equipment investments, mission success, and professional development.
- Engage in statewide data sharing agreements with credential providers that include a variety of access portals for a variety of levels of personnel (state, local CTE administration, CTE teachers, parents, and students), giving access to stakeholders to assess program effectiveness.

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<sup>23</sup> The National Occupancy Competency Testing Institute (NOCTI), which is the largest provider of Industry Recognized Credentials, partners with CTE programs in 11 states and SkillsUSA nationally, to assess and validate students' professional skills. NOCTI also offers college credit at over 1500 colleges and universities, 46 located in Massachusetts. In addition, NOCTI has the ability to develop state-customized credentials, using Commonwealth employers to establish passing scores.

<sup>24</sup> <http://cte.ed.gov/employabilityskills/index.php/framework/index>

## High Quality Career Technical Education in Massachusetts



The AVTE Coalition was organized in 2014 by Massachusetts Communities Action Network after research showed extensive waiting lists at vocational technical schools, especially in the Gateway Cities.

**For more information, contact the Alliance for Vocational Technical Education (AVTE) at (617) 595-8649. View our website at [www.allianceforvoeducation.org](http://www.allianceforvoeducation.org).**