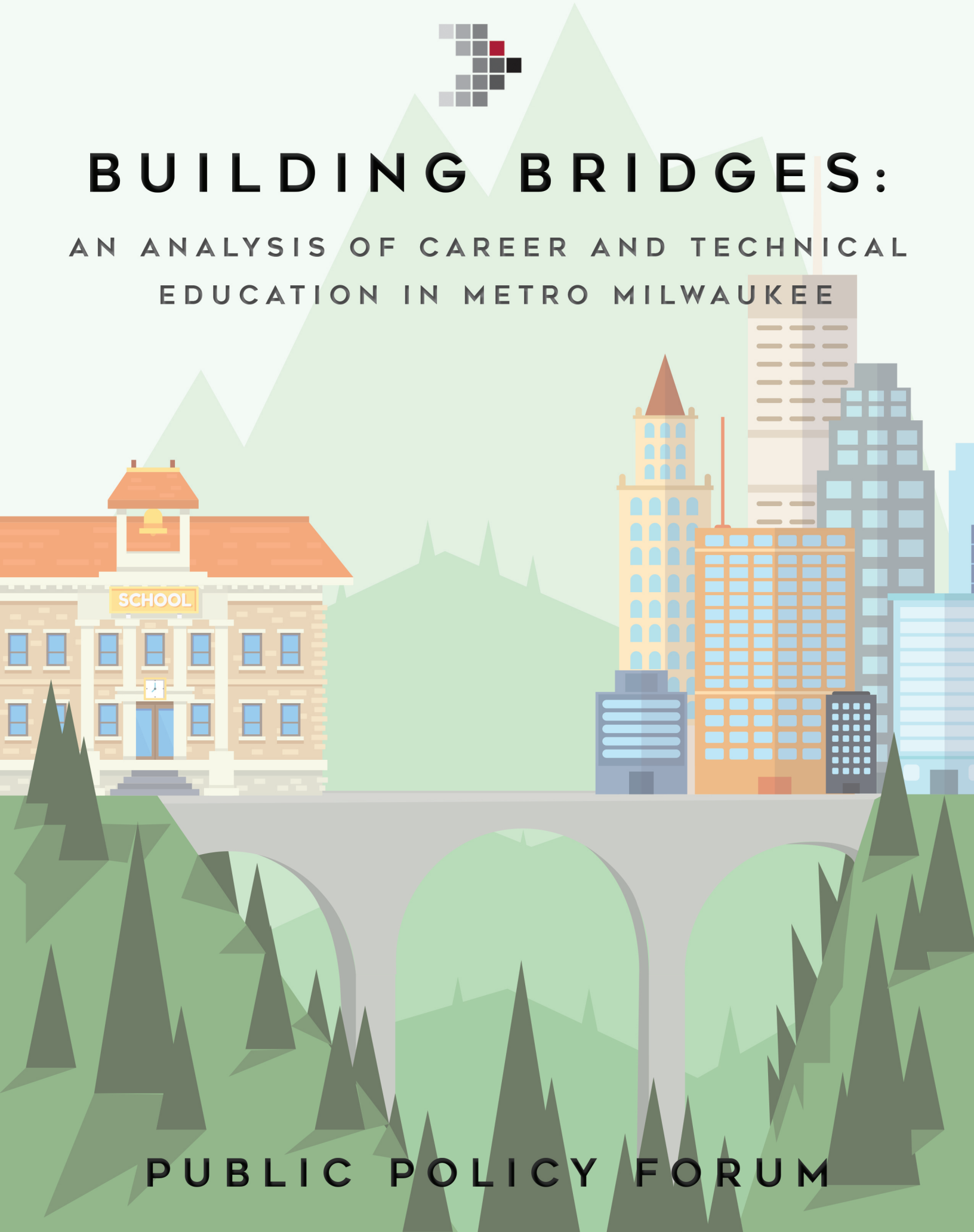
BUILDING BRIDGES:

AN ANALYSIS OF CAREER AND TECHNICAL EDUCATION IN METRO MILWAUKEE



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The Milwaukee-based Public Policy Forum, established in 1913 as a local government watchdog, is a nonpartisan, nonprofit organization dedicated to enhancing the effectiveness of government and the development of Southeastern Wisconsin through objective research of regional public policy issues.

PREFACE AND ACKNOWLEDGMENTS

This report is intended to provide citizens, school leaders, and policymakers with useful statistical information regarding Career and Technical Education in the four-county Metro Milwaukee region. We hope this report's findings will be useful to inform education discussions and policy debates at the local and state levels.

We would like to thank the Greater Milwaukee Foundation and the Northwestern Mutual Foundation for their generous support of our education research. We also would like to thank the Herzfeld Foundation for its generous 100th anniversary gift, which also helped make this report possible.

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INTRODUCTION

There has been considerable discussion among policymakers and school leaders in recent years about the need to prepare students as early as junior high and high school for the demands of the 21st Century knowledge economy. The hope is that providing students with certain aptitude and content knowledge during their K-12 years will enable them to enter professions that are – or are expected to be – in high demand in our increasingly technical and skills-oriented economy.

Efforts to provide this combination of knowledge and skills – and to correspondingly establish and encourage students to embark upon career pathways – often fall under the label of "Career and Technical Education" (CTE). The underlying intention not only is to prepare students for successful careers, but also to boost the competitiveness of the local and regional economy by ensuring that the future workforce is appropriately equipped to meet the needs and demands of employers.

But what exactly is Career and Technical Education and how is it being effectuated in Wisconsin and Metro Milwaukee high schools?

This report seeks to answer those questions with a comprehensive look at CTE in public school districts in the region and state. Our analysis explores several sources of state and local data to answer a number of questions, including:

- How is Career and Technical Education defined by the state and local school districts, and how is it different from the general curriculum?
- How extensive are CTE course offerings and how many students are CTE efforts impacting?
- What are the academic and employment outcomes for CTE students?
- What does the CTE teacher workforce look like and how is that impacting the provision of CTE?

In the pages that follow, we analyze CTE enrollment and programming at the state, regional, and district level. We describe historical patterns and trends to show how CTE has changed over time and to gauge whether it is achieving desired outcomes. We also discuss a number of policy recommendations for school leaders and policymakers aimed at strengthening the CTE curriculum.

Proponents of Career and Technical Education say it is critical for national, state, and local economic health and argue that its expansion and enhancement must be among our foremost K-12 education priorities. The research findings presented here are intended to shed light on how CTE is working in Wisconsin and Metro Milwaukee, and to inform discussion on its progression at the state and regional level.

DATA AND METHODOLOGY

The primary source of data for this report is the Career and Technical Education Enrollment Reporting System (CTEERS) maintained by the Wisconsin Department of Public Instruction (DPI). The system is part of the accountability and reporting structure required by federal legislation covering CTE. Our analysis draws from three annual CTEERS reports: Basic Facts, Follow-up, and District Profiles.

The Basic Facts report describes the enrollment, demographics, and characteristics of public high school students in grades 11-13 based on their level of CTE involvement. The Follow-up report tracks a number of post-graduation metrics for students who took multiple CTE courses, including employment and further education. Each district conducts an annual survey of CTE graduates and reports the findings to DPI. The District Profile report measures each district on a set of benchmarks related to academic achievement and gender inclusion among students who took multiple CTE courses. The annual report is part of the federal accountability structure, though the standards are developed by each state.

The annual 'All Staff' files compiled by DPI include a variety of metrics for each public school employee in Wisconsin, including the position and assignment of each staff member as well as the district and school in which they are employed. Using the 2015-16 'All Staff' data file as a starting point, we conducted analyses to explore the CTE teacher workforce at public schools.

The sample for analysis includes staff members who are classified as Teacher, Teacher in Charge, and Instructional Technology Integrator. The sample includes any teacher who had at least one contract day in the academic year and was assigned to a CTE subject area, regardless of whether CTE was their primary teaching subject. Substitute teachers are not included in the analysis.

The geographic focus of our analysis is the four-county Milwaukee Standard Metropolitan Statistical Area, which includes the public school districts in Milwaukee, Ozaukee, Washington, and Waukesha counties. We also added the Racine Unified School District at the bottom of data tables to provide perspective on another large urban district that has some similarity to the Milwaukee Public Schools. We do not include Racine figures in aggregate Metro Milwaukee numbers, however.

It is important to note how charter schools are counted. Schools that are chartered by the Milwaukee Public Schools (MPS) are counted in the aggregate figures for Metro Milwaukee and are included in the district figures for MPS. Schools that are chartered by the Milwaukee Common Council and the University of Wisconsin-Milwaukee are not included in the aggregate figures for Metro Milwaukee, but are included in state figures.

Private schools are not included in any analyses, however, as data regarding CTE in those schools are not collected by DPI and are not publicly available. Consequently, because of the unavailability of these data, the analysis provided here reflects a large, but still incomplete view of CTE in the region and state.

A glossary of selected terms and their definitions is provided in **Appendix A**.

UNDERSTANDING CAREER AND TECHNICAL EDUCATION

We begin our analysis of Career and Technical Education by seeking to understand what these courses are and how they differ from the general curriculum. In this section, we also explore how CTE is structured in Wisconsin and the funding mechanisms used to support it. This foundation of knowledge will enable further exploration of CTE in later sections of this report.

WHAT IS CTE?

CTE does not have a common or concise definition and its different definitions can vary considerably in scope and scale. The U.S. Department of Education has a more specific definition of CTE than that used by the Wisconsin Department of Public Instruction, which in turn has a definition that differs from that used by some individual school districts within the state. Instead of focusing on the differences, however, we believe it is more constructive to describe the common elements and attributes.

CTE is a curriculum designed to provide students with a combination of academic knowledge and career-oriented skills that will prepare them for seamless entry into the workforce or additional education. A defining characteristic of CTE is that it is a progressive sequence of courses in a specific subject that begins in high school and continues to postsecondary education or industry certification and employment.

To accomplish these goals, school districts are encouraged to engage with the business community and higher education. Through partnerships and articulation agreements, these relationships can provide students with valuable work-based learning opportunities and the ability to earn college credit while in high school. Such programs represent important steps in the progressive sequence of courses continuing past high school.

Career & Technical Student Organizations (CTSOs) represent another important facet of CTE. Designed to strengthen knowledge and connection to industries, these groups provide students with leadership development and community engagement opportunities while building upon lessons from the classroom. Wisconsin has six CTSOs, including Future Farmers of America and Future Business Leaders of America. In 2015-16, nearly 47,000 Wisconsin students participated in one of the 868 CTSO chapters throughout the state.

ACADEMIC AND CAREER PLANNING

In 2015, the Wisconsin Legislature passed the Education for Employment Plans and Program, which requires school districts to develop and implement programs that provide each student with an academic and career plan (ACP). These individualized plans cover students in grades 6-12 and are intended to prepare students "for future employment, ensure technological literacy, [and] to promote lifelong learning."[1] The plans are required to include academic and career planning services and

[1] Wisconsin State Legislature. 2015. *Education for Employment Plans and Program.* https://docs.legis.wisconsin.gov/code/admin_code/pi/26

guidance and districts must implement ACP by the 2017-18 school year. Career and Technical Education can be a component of a student's plan (and therefore ACP), but ACP does not necessarily include CTE.

CAREER CLUSTERS, CAREER PATHWAYS, AND PROGRAMS OF STUDY

Students interested in CTE have a number of resources to help plan their academic career. Wisconsin has adopted a nationally-recognized set of 16 Career Clusters, which are occupational groupings using a common set of skills. The clusters, which are shown in **Appendix B**, include knowledge and skills statements that can help design a CTE curriculum that integrates technical and academic knowledge to enhance career development. Career Pathways are more specific subgroups within each cluster. Altogether, there are 79 Career Pathways within the 16 Career Clusters used by school districts in Wisconsin.

Table 1 shows the number of distinct Career Pathways used by individual high schools in Metro Milwaukee. Of the 113 high schools in the region, only 55 have established pathways. This list is meant to be illustrative rather than exhaustive, as some districts do not use the Career Pathways framework, while others do not regularly update their offerings. However, this further underscores the point that CTE lacks a common framework and can vary greatly from one district to another.

Table 1: Number of established Career Pathways by school and district

District	School	Number of Career Pathways
Arrowhead UHS	Arrowhead High	32
Brown Deer	Brown Deer Middle/High	11
Burlington Area	Burlington High	10
Cedarburg	Cedarburg High	13
Cudahy	Cudahy High	2
Elmbrook	Central High	9
Franklin Public	Franklin High	8
Germantown	Germantown High	21
Grafton	Grafton High	12
Greendale	Greendale High	5
Greenfield	Greenfield High	7
Hamilton	Hamilton High	13
Hartford UHS	Hartford High	13
Kettle Moraine	Kettle Moraine High	9
Kewaskum	Kewaskum High	14
Menomonee Falls	Menomonee Falls High	9
Mequon-Thiensville	Homestead High	5
Milwaukee	Bay View High	3
Milwaukee	Bradley Technology High	3
Milwaukee	Hamilton High	5
Milwaukee	James Madison	2
Milwaukee	North Division High	2
Milwaukee	Pulaski High	3
Milwaukee	Riverside High	2
Milwaukee	South Division High	1
Milwaukee	Vincent High	3
Milwaukee	WHS Information Tech	2
Mukwonago	Mukwonago High	7
Muskego-Norway	Muskego High	9
New Berlin	New Berlin West Middle/High	4
Nicolet UHS	Nicolet High	10
Northern Ozaukee	Ozaukee High	8
Oak Creek-Franklin Joint	Oak Creek High	7
Oconomowoc Area	Oconomowoc High	12
Pewaukee	Pewaukee High	8
Port Washington-Saukville	Port Washington High	11
Saint Francis	Saint Francis High	2
Shorewood	Shorewood High	1
Slinger	Slinger High	16
South Milwaukee	South Milwaukee High	6
Union Grove UHS	Union Grove High	6
Waterford UHS	Waterford High	15
Waukesha	North High	18
Waukesha	South High	17
Waukesha	Waukesha Acad. of Health Prof	3
Waukesha	Waukesha Engineering Prep Acad	1
Waukesha	West High	21
West Allis-West Milwaukee	Nathan Hale High	18
West Bend	East High	10
West Bend	West High	19
Whitefish Bay	Whitefish Bay High	4
Whitnall	Whitnall High	6
Racine Unified	Case High	24
Racine Unified	Horlick High	25
Racine Unified	Park High	25

A Program of Study is a plan of academic and CTE courses within a Cluster or Pathway that leads to a postsecondary degree or industry-recognized certificate. The Program helps to integrate classroom knowledge with additional experiences such as work-based learning and service learning. Many districts have plans that lay out the sequence of courses students should take each semester within a Career Cluster. A Program of Study is one component of Wisconsin's new Academic Career Plan requirements.

HOW IS CTE DIFFERENT FROM VOCATIONAL EDUCATION?

CTE may seem like a new curricular movement, but its foundation – vocational education – has been around for more than a century. Vocational education has had both champions and critics. Advocates argue that the courses taught valuable and practical skills that could be used to gain employment. Critics contend that some students were "tracked" into vocational education courses, which were said to be less rigorous than core academic courses. Indeed, the federal legislation authorizing CTE funding frequently distinguishes between "academic" and "CTE" courses and includes language requiring that CTE students "are taught to the same challenging academic proficiencies as are taught to all other students."[2] This legislation tacitly acknowledges that there once was – and still may be – a difference in quality between career-oriented and academic courses.

As conceived, however, there are a number of key differences between CTE and vocational education. First, CTE is meant to be integrated into core academic subjects using techniques such as project-based learning and career academies. Moreover, CTE is designed to be a progressive sequence of courses from high school through postsecondary education and to a career. As with any concept, there are likely differences in implementation fidelity which will affect the quality of CTE from school to school and district to district.

HOW IS CTE STRUCTURED IN WISCONSIN?

The Wisconsin Technical College System (WTCS) is the main authority on CTE in Wisconsin. The system receives all federal Perkins Grant funding for the state and delegates money and responsibility for elementary and secondary CTE activities to the Department of Public Instruction. DPI grants funding – $7.8 million in 2015 – to school districts and other local education agencies for CTE. Despite this arrangement, WTCS retains Perkins funding and authority for postsecondary CTE activities. In addition to distributing Perkins money, WTCS helps local school boards develop high school CTE programs.

Though postsecondary education is beyond the scope of this report, it is helpful to have context with regard to CTE at the college level. The WTCS offers more than 300 degree and diploma programs from 16 institutions spread across 49 campuses throughout the state. Collectively, the system enrolls more than 300,000 students each year in programs leading to technical diplomas and Associate's degrees. Each institution has articulation agreements with high schools, as well as the UW System, to help ensure a continuous educational pathway for students.

[2] U.S. Congress. (2006). Carl D. Perkins Career and Technical Education Improvement Grant of 2006. https://s3.amazonaws.com/PCRN/uploads/perkins_iv.pdf

HOW IS CTE FUNDED?

The principal funding mechanism for CTE is the federal Carl D. Perkins Grant, which gives money to states who then distribute funds to local education agencies. The legislation was passed in 1984 and is meant to be reauthorized every six years, though that does not always happen. The Perkins Grant was due for reauthorization in 2012, which did not occur. As a result, funding to states continues, but at the 2012 rate.

The amount of money given to states under the Perkins Grant is based on a formula that takes into account the number of students age 15-19 in the state relative to the total number of 15 to 19 year-olds in the country. In fiscal year 2016, this amounted to $20.2 million for Wisconsin out of total grant funding of $1.1 billion. The legislation stipulates that 85% of the funds be spent on CTE programming, while 10% can be used for leadership activities, and no more than 5% for administration.

Distribution of these federal funds within the state also follows a formula. Thirty percent of the funds are based on the number of 5 to 17 year-olds in the district relative to the number of 5 to 17 year-olds in the state. The remaining 70% is based on the share of low-income students in the district. Under this formula, districts with a higher concentration of low-income students receive more funding for CTE.

Table 2 shows the amount of Perkins Grant funding allocated to K-12 school districts in Metro Milwaukee in 2015. Districts are allowed to organize as consortia for Perkins funds to share administrative costs. For example, Whitnall is a consortium that includes Greendale, Greenfield, and Franklin. CESA 1 is another consortium that supports a number of school districts in southeast Wisconsin. MPS was the largest recipient, largely due to the high concentration of low-income students enrolled. Altogether, K-12 districts in Wisconsin received slightly less than $8 million in federal money to support CTE. This amounts to 36.7% of the total Perkins allocation to the state in 2015.

Table 2: End of year Perkins Grant dollar comparison, 2015

School District	Grant Award Dollars
Arrowhead UHS	$32,307
CESA 01*	$385,279
Milwaukee	$1,709,107
Mukwonago	$22,117
Oconomowoc Area	$27,492
South Milwaukee	$94,521
Wauwatosa	$38,211
West Allis-West Milwaukee	$97,052
West Bend	$45,096
Whitnall*	$98,976
Total State Perkins Funding to K-12	**$7,829,642**
Racine Unified	$255,230

* Denotes fiscal agent for a consortia of districts

Perkins Grant money can be used for several purposes, including professional development for teachers, equipment for CTE courses, academic and career counseling, and work-based learning experiences. States are responsible for establishing indicators and performance levels for accountability purposes. If a state does not meet 90% performance on each indicator, it must develop an improvement plan. The federal government can withhold Perkins funds if a state does not implement or is not making sufficient progress on the improvement plan.

The State of Wisconsin also contributes funding to CTE through the CTE Technical Incentive Grant, which awards $3 million annually to school districts to promote and support students earning an industry-recognized certification in addition to a high school diploma. Districts are awarded a set amount of money for each student who successfully meets the requirements, and they are then allowed to use the funds as they see fit (including on non-CTE activities). As shown in **Table 3**, the Metro Milwaukee region received $501,017 in CTE Technical Incentive Grant funding in 2015. Funding levels for individual districts ranged from $763 in Oconomowoc to a high of $41,179 in West Bend.

Table 3: CTE Technical Incentive Grant funding, 2015

District	Funds Received
Milwaukee County	
Brown Deer	$1,525
Cudahy	$11,439
Franklin Public	$34,316
Greendale	$6,863
Greenfield	$25,928
Milwaukee	$31,266
Nicolet Union	$12,201
Oak Creek-Franklin	$25,165
South Milwaukee	$28,216
West Allis	$17,539
Whitnall	$4,576
Ozaukee County	
Cedarburg	$19,827
Grafton	$10,676
Northern Ozaukee	$1,525
Port Washington-Saukville	$2,288
Washington County	
Germantown	$5,338
Hartford Union	$34,316
Kewaskum	$4,576
Slinger	$20,590
West Bend	$41,179
Waukesha County	
Arrowhead Union	$17,539
Elmbrook	$3,813
Hamilton	$8,388
Kettle Moraine	$19,065
Menomonee Falls	$6,863
Mukwonago	$28,216
Muskego-Norway	$28,978
New Berlin	$16,777
Oconomowoc Area	$763
Pewaukee	$1,525
Waukesha	$29,741
Metro Milwaukee	**$501,017**
State of Wisconsin	**$3,000,000**
Racine	$112,100

The federal Perkins Grant was not intended to be the primary source of CTE funding, but rather to supplement and enhance existing state funding. However, outside of the Technical Incentive Grant, Wisconsin does not have specific funding for CTE at the K-12 level. Since the Technical Incentive Grant has no requirement that the funds be spent on CTE, it could be argued that the state has no dedicated funding stream for CTE at the K-12 level. This leaves districts to fund any CTE activities out of their general budget, comprised primarily of state equalization aid and property tax revenue. Under this system, the availability and quality of CTE varies greatly from district to district.

CTE ENROLLMENT AND DEMOGRAPHICS

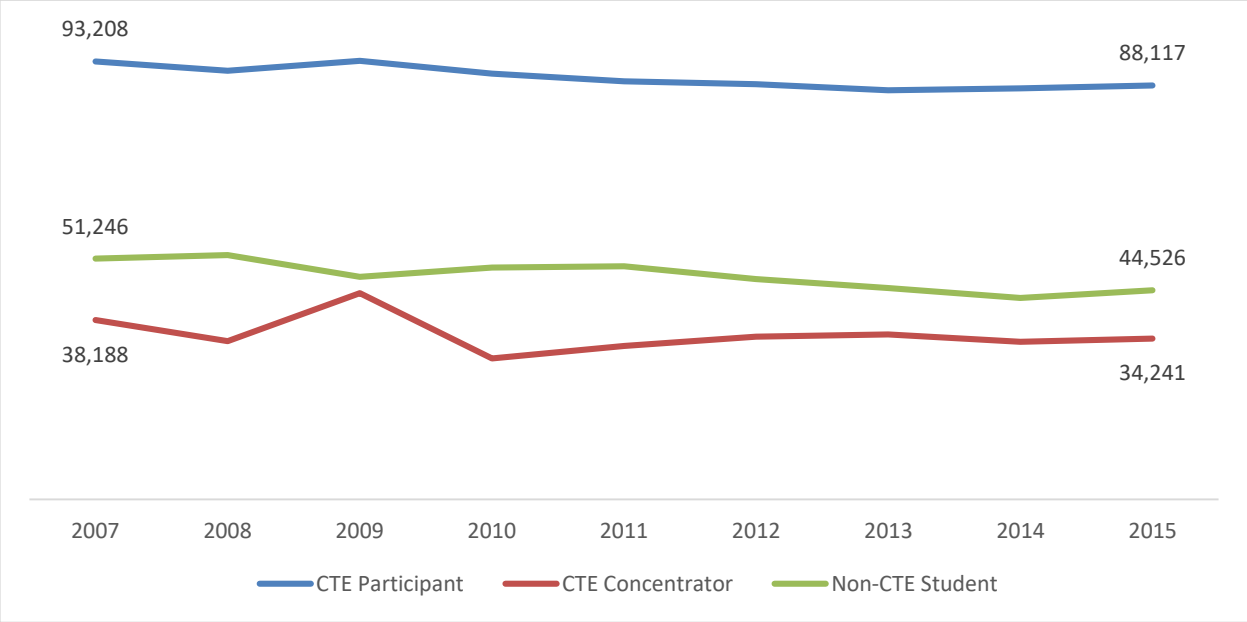
With a better understanding of what constitutes Career and Technical Education, we can begin to explore the extent to which students in the region and state are participating in CTE. In this section, we quantify the number of students enrolled in CTE courses and describe some of their characteristics.

The data presented are collected and compiled by the Wisconsin Department of Public Instruction and only include 11th and 12th grade students. Because 9th and 10th grade students are eligible to take CTE courses, the data presented, while the best available, likely undercount the number of students taking CTE courses in Wisconsin. Nevertheless, we have a high degree of confidence that the data describing characteristics of these 11th and 12 grade students is representative of all high school students who may or may not participate in CTE courses.

HOW MANY STUDENTS TAKE CTE COURSES?

Chart 1 depicts the statewide enrollment of students in CTE courses from the 2006-07 through the 2014-15 school years. A "CTE participant" is defined as a student who has participated in at least one CTE course, while a "CTE concentrator" is defined as one who has taken two or more courses within a specific CTE sequence. Across Wisconsin, two-thirds of 11th and 12th graders (88,117 students) in the 2014-15 school year were CTE participants, while 34,241 students were classified as CTE concentrators. These concentrators accounted for 25.8% of all 11th and 12th grade students in the state. Meanwhile, 44,526 students – or one-third of the 11th and 12th graders in Wisconsin – did not take a CTE course.

Chart 1: Statewide enrollment of CTE and non-CTE students over time



Since 2007, the number of 11th and 12th grade high school students in Wisconsin has declined by 8.2%. The number of CTE participants declined at a smaller rate (5.5%) and has been relatively stable since 2012. CTE concentrators, however, showed a sharper decrease of 10.3% over the period, though there was a slight increase of 2.2% in 2015. Non-CTE students showed the biggest decrease, falling 13.1% since 2007. This group has consistently accounted for about one-third of enrollments, meaning that the decline is largely the result of the overall decrease in students.

Table 4 provides a district-level view of enrollment by CTE status in the 2014-15 school year. The table includes totals for the four-county Milwaukee metropolitan area and the state. Additionally, we include the Racine Unified School District to provide a large urban district for comparison to Milwaukee Public Schools.

In the region as a whole, 57.9% of 11th and 12th graders at public school districts participated in at least one CTE course. This trails the state rate of 66.4%, meaning the region has a higher percentage of students who are not participating in CTE. However, the region does have a higher percentage of CTE concentrators (29.5%) than the state (25.8%).

The range in CTE participation levels varies greatly across the region, and to some extent, does not correspond to district size or affluence. Among individual districts, Slinger had the highest level of CTE enrollment with 94.4% of 11th and 12th grade students taking at least one CTE course. Elmbrook (90.8%), Kewaskum (87.6%), and Northern Ozaukee (85%) posted similarly high levels of CTE participation. In MPS, 37.4% of students participated in a CTE course, the lowest rate in the region, followed by Greenfield (41%), Whitefish Bay (48.7%), and Hamilton (49.8%)

Looking at CTE concentrators gives an understanding of the extent to which students are taking advantage of the CTE sequence of courses. Within the Elmbrook district, 66.2% of students are CTE concentrators, the highest percentage in the region. Nicolet (66%), Cedarburg (62.4%), and Pewaukee (62%) also have high levels of CTE concentrators. Conversely, Greenfield not only has a low CTE participation rate, but also has only 1.2% of its students enrolled as CTE concentrators. Other districts with low levels of CTE concentrators include Saint Francis (2.3%), Whitnall (5.6%), and Whitefish Bay (10%).

The range in CTE concentrator levels varies greatly across the region, with some districts having narrow but deep engagement and others having broad but shallow engagement. Hamilton has below average CTE participation (49.8% of students), though all but five of these students have taken two or more CTE courses. Slinger, on the other hand, has the highest participation rate, but only 15.9% of its students are CTE concentrators. For those districts with high participation rates but low levels of concentrators, officials may wish to consider whether, if CTE is most effective as a sequence of courses in a given subject area, their students are being well served if they do not continue in the sequence.

Table 4: District-level enrollment by CTE status, 2014-15

District	Number Non-CTE Students	Percent Non-CTE Students	Number CTE Participants	Percent CTE Participants	Number CTE Concentrators	Percent CTE Concentrators
Milwaukee County						
Brown Deer	82	35.7%	148	64.3%	65	28.3%
Cudahy	64	17.1%	311	82.9%	117	31.2%
Franklin Public	138	19.1%	585	80.9%	73	10.1%
Greendale	178	40.2%	265	59.8%	57	12.9%
Greenfield	399	59.0%	277	41.0%	8	1.2%
Milwaukee	8,667	62.6%	5,187	37.4%	3,963	28.6%
Nicolet Union	109	25.3%	321	74.7%	284	66.0%
Oak Creek-Franklin	203	19.6%	831	80.4%	341	33.0%
Saint Francis	99	31.8%	212	68.2%	7	2.3%
South Milwaukee	94	16.7%	469	83.3%	82	14.6%
Wauwatosa	471	43.7%	606	56.3%	197	18.3%
West Allis	504	30.3%	1,157	69.7%	343	20.7%
Whitefish Bay	273	51.3%	259	48.7%	53	10.0%
Whitnall	149	36.2%	263	63.8%	23	5.6%
Ozaukee County						
Cedarburg	97	16.4%	493	83.6%	368	62.4%
Grafton	155	41.3%	220	58.7%	90	24.0%
Mequon-Thiensville	306	45.4%	368	54.6%	117	17.4%
Northern Ozaukee	17	15.0%	96	85.0%	38	33.6%
Port Washington-Saukville	138	42.7%	185	57.3%	160	86.5%
Washington County						
Germantown	261	37.8%	429	62.2%	305	44.2%
Hartford Union	124	16.4%	634	83.6%	366	48.3%
Kewaskum	38	12.4%	269	87.6%	96	31.3%
Slinger	27	5.6%	456	94.4%	77	15.9%
West Bend	424	36.7%	731	63.3%	239	20.7%
Waukesha County						
Arrowhead Union	183	15.9%	971	84.1%	140	12.1%
Elmbrook	122	9.2%	1,202	90.8%	884	66.2%
Hamilton	346	50.2%	343	49.8%	338	49.1%
Kettle Moraine	298	40.5%	438	59.5%	176	23.9%
Menomonee Falls	282	38.3%	455	61.7%	297	40.3%
Mukwonago	188	23.6%	609	76.4%	344	43.2%
Muskego-Norway	274	33.7%	540	66.3%	227	27.9%
New Berlin	179	21.5%	655	78.5%	282	33.8%
Oconomowoc Area	162	21.9%	578	78.1%	270	36.5%
Pewaukee	66	16.8%	326	83.2%	243	62.0%
Waukesha	818	38.5%	1,308	61.5%	693	32.6%
Metro Milwaukee	**16,095**	**42.1%**	**22,138**	**57.9%**	**11,293**	**29.5%**
State of Wisconsin	**44,526**	**33.6%**	**88,117**	**66.4%**	**34,241**	**25.8%**
Racine	1,619	49.2%	1,670	50.8%	377	11.5%

CTE PARTICIPATION BY GENDER

Although there are roughly even numbers of male and female students in the region, females comprise 46.1% of all CTE participants and 42.3% of CTE concentrators, as shown in **Table 5**. While not shown in the table, the data also show that 53.8% of female students participate in CTE courses, as compared to 62% of male students. Metro Milwaukee does have slightly higher female representation among CTE participants and concentrators than the state.

Table 5: District-level CTE participation among female students, 2014-15

District	Percent Female		
	Non-CTE	Participant	Concentrator
Milwaukee County			
Brown Deer	47.6%	43.9%	44.6%
Cudahy	37.5%	42.8%	37.6%
Franklin Public	58.0%	46.8%	43.8%
Greendale	56.2%	47.2%	43.9%
Greenfield	51.4%	46.9%	50.0%
Milwaukee	52.1%	46.5%	45.9%
Nicolet Union	46.8%	51.1%	52.5%
Oak Creek-Franklin	58.6%	46.1%	34.3%
Saint Francis	55.6%	38.7%	14.3%
South Milwaukee	51.1%	50.3%	61.0%
Wauwatosa	50.7%	46.4%	49.2%
West Allis	52.6%	47.8%	41.4%
Whitefish Bay	61.2%	31.3%	17.0%
Whitnall	45.6%	49.0%	17.4%
Ozaukee County			
Cedarburg	57.7%	46.5%	41.3%
Grafton	53.5%	36.4%	28.9%
Mequon-Thiensville	59.8%	45.7%	38.5%
Northern Ozaukee	88.2%	39.6%	23.7%
Port Washington-Saukville	55.3%	29.0%	22.2%
Washington County			
Germantown	67.0%	39.6%	39.7%
Hartford Union	69.4%	47.0%	34.4%
Kewaskum	52.6%	49.1%	25.0%
Slinger	59.3%	50.9%	32.5%
West Bend	62.7%	41.6%	33.1%
Waukesha County			
Arrowhead Union	66.1%	46.7%	23.6%
Elmbrook	75.4%	50.6%	45.1%
Hamilton	59.2%	37.0%	36.7%
Kettle Moraine	60.7%	41.8%	36.9%
Menomonee Falls	47.9%	50.8%	50.2%
Mukwonago	54.3%	50.7%	47.7%
Muskego-Norway	54.4%	42.6%	33.5%
New Berlin	64.2%	47.5%	37.2%
Oconomowoc Area	59.9%	49.3%	45.2%
Pewaukee	66.7%	45.4%	46.9%
Waukesha	60.5%	45.3%	40.1%
Metro Milwaukee	**54.5%**	**46.1%**	**42.3%**
State of Wisconsin	**54.4%**	**45.7%**	**40.6%**
Racine	48.8%	47.4%	59.2%

The gender breakdown of CTE participants varies across the region, with female students having a slight majority in Nicolet (51.1%), Slinger (50.9%), and Menomonee Falls (50.8%), among others. Female students are quite underrepresented in Port Washington-Saukville (29%), Whitefish Bay (31.3%), and Grafton (36.4%). Focusing on students who take multiple CTE courses, we find female students account for 61% of concentrators in South Milwaukee, 59.2% in Racine, and 52.5% in Nicolet. On the other end of the spectrum, these students comprise just 14.3% of concentrators in Saint Francis, 17% in Whitefish Bay, and 17.4% in Whitnall.

Beyond the desire for equal opportunity, there are important reasons to measure CTE participation by gender. The federal Perkins Grant has standards on gender participation and graduation rates for CTE concentrators, as well as a requirement that each gender comprise at least 25% of the participants in any given CTE program area. Failure to reach these benchmarks for a sustained period of time can result in the district (or the state) being ineligible for funds from the Perkins Grant.

CTE PARTICIPATION BY RACE

Across Wisconsin, students of color comprised 28.2% of public school district enrollment in the 2014-15 school year. As shown in **Chart 2**, non-white students across the state accounted for 21.8% of CTE participants in the same year, signaling that students of color are underrepresented in the CTE curriculum. It also should be noted, however, that students of color made up a larger portion of CTE participants in 2014-15 than in 2006-07, as the chart also demonstrates.

Chart 2: Non-white students as a percentage of all CTE participants in Wisconsin over time

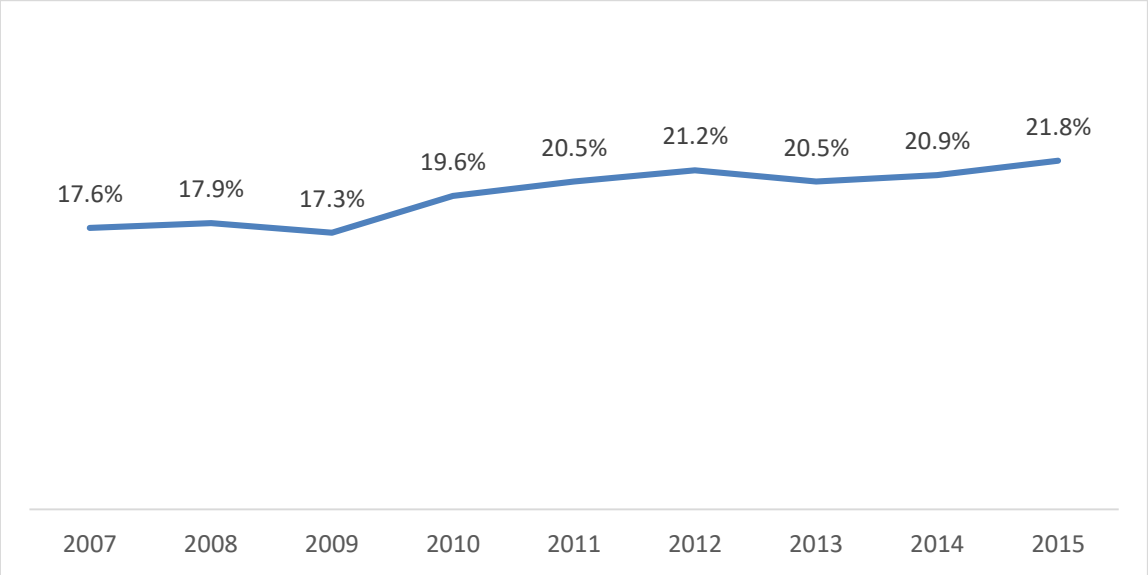


Table 6 provides a district-level view of non-white student enrollment by CTE status in the 2014-15 school year. It also shows the corresponding percentage of non-white students among total enrollment in each district.

Among public school districts in the region, non-white students account for 36.3% of CTE participants, which surpasses the statewide figure but still trails the diversity of the region, where

students of color account for 44.4% of enrollments. Diversity is more pronounced among CTE concentrators at 43.1%; that is nearly 20 percentage points higher than the state as a whole (23.7%), but it still falls slightly below the percentage of non-white students enrolled in the region.

Table 6: District-level enrollment of non-white students by CTE status, 2014-15

District	Percent Non-White			
	Total Enrollment	Non-CTE	Participant	Concentrator
Milwaukee County				
Brown Deer	70.4%	63.4%	72.3%	63.1%
Cudahy	32.5%	50.0%	24.4%	26.5%
Franklin Public	22.8%	23.2%	21.4%	17.8%
Greendale	22.2%	16.3%	18.5%	17.5%
Greenfield	40.4%	35.3%	39.7%	37.5%
Milwaukee	86.6%	83.6%	92.2%	91.9%
Nicolet Union	36.7%	31.2%	33.0%	32.0%
Oak Creek-Franklin	25.8%	35.0%	28.4%	27.9%
Saint Francis	34.0%	37.4%	37.3%	14.3%
South Milwaukee	24.3%	39.4%	22.6%	15.9%
Wauwatosa	34.7%	28.5%	42.6%	41.1%
West Allis	43.9%	43.7%	44.3%	35.6%
Whitefish Bay	24.1%	24.9%	22.0%	13.2%
Whitnall	24.5%	17.4%	21.7%	21.7%
Ozaukee County				
Cedarburg	8.7%	10.3%	7.3%	7.6%
Grafton	12.7%	5.8%	13.2%	14.4%
Mequon-Thiensville	20.6%	22.9%	18.5%	14.5%
Northern Ozaukee	12.3%	11.8%	4.2%	5.3%
Port Washington-Saukville	11.0%	10.2%	9.1%	8.9%
Washington County				
Germantown	16.9%	14.2%	15.9%	16.7%
Hartford Union	10.1%	14.5%	9.6%	7.7%
Kewaskum	7.5%	13.2%	6.3%	6.3%
Slinger	7.0%	0.0%	5.9%	3.9%
West Bend	12.3%	9.4%	9.7%	6.3%
Waukesha County				
Arrowhead Union	7.3%	8.7%	6.7%	2.9%
Elmbrook	25.1%	27.6%	19.5%	17.5%
Hamilton	15.9%	17.1%	11.4%	10.9%
Kettle Moraine	9.4%	9.1%	7.5%	6.3%
Menomonee Falls	24.4%	28.7%	18.5%	17.5%
Mukwonago	7.9%	10.1%	8.9%	8.1%
Muskego-Norway	8.2%	7.3%	7.6%	8.8%
New Berlin	15.4%	11.7%	13.7%	13.8%
Oconomowoc Area	9.3%	10.5%	8.5%	6.3%
Pewaukee	19.1%	18.2%	13.8%	13.6%
Waukesha	31.9%	24.4%	22.2%	20.9%
Metro Milwaukee	**44.4%**	**55.5%**	**36.3%**	**43.1%**
State of Wisconsin	**28.2%**	**34.7%**	**21.8%**	**23.7%**
Racine	56.9%	49.4%	55.7%	51.7%

Diversity among CTE concentrators largely corresponds to the diversity of overall district enrollments. Districts with high numbers of students of color showed a high concentration of non-white students among CTE participants, including MPS (92.2%), Brown Deer (72.3%), and West Allis (44.3%).

Conversely, districts with relatively low non-white student enrollment showed limited CTE participation for students of color, including Northern Ozaukee (4.2%), Slinger (5.9%), and Kewaskum (6.3%).

District enrollment demographics cannot completely explain the racial underrepresentation, however, as the percentage of non-white students in CTE courses in 27 of the 35 districts in the analysis is smaller than their percentage of non-white students in overall enrollment. Waukesha had the largest gap in the region, with non-white students comprising 31.9% of enrollment but 22.2% of CTE participation, a gap of 9.7 percentage points. Cudahy and Northern Ozaukee had similarly large gaps of 8.1 points each. Conversely, students of color in Wauwatosa accounted for 34.7% of district enrollments but 42.6% of CTE participants.

CTE PARTICIPATION AMONG SPECIAL POPULATIONS

Table 7 shows a district-level look at the enrollment of special student populations and their CTE status. "Special population" is a term used by DPI that encompasses students who are physically handicapped, have limited English proficiency, or are academically or economically disadvantaged. It is possible for a student to belong to more than one group, though the DPI measure for special population is an unduplicated student count. The table also shows each district's special population as a percentage of total enrollment.

In Metro Milwaukee, 51.3% of district enrollments fall into a special population, a higher concentration than the state (46.6%). Among students in the region who do not participate in CTE courses, 60.2% are a special population, which exceeds the statewide rate of 52.2%. Despite the high proportion of special population students not taking CTE courses, the region also leads the state in the percentage of special population students as CTE participants (47.3%) and CTE concentrators (52.6%).

The regional figure, however, is strongly influenced by MPS, which has a high number of special population students. If MPS is removed from the calculation, the percentage of special population students as CTE participants falls to 24.4%, nearly 20 percentage points below the statewide figure.

Among individual districts, MPS had the highest concentration of special population students among CTE participants (98.8%), followed by Brown Deer (88.5%) and West Allis (65.4%). Conversely, Cedarburg had relatively few special population students among CTE participants (9.9%), as did Whitefish Bay (10%) and Menomonee Falls (15.8%). Twenty-four of the 35 districts in the analysis had a smaller percentage of special population students in CTE courses than in the total enrollment, meaning special population students are under enrolled in CTE in those districts.

Beyond the desire for inclusivity, there are important reasons to measure CTE participation among special populations. As with gender, the federal Perkins Grant requires that CTE participation for special populations in the state and districts must be equal to or greater than the CTE participation of the general student population. Of the districts in the analysis, only three – Brown Deer, Greenfield, and MPS – met this benchmark. The other 32 districts, plus the region and state, were not compliant with the Perkins requirements. Failure to reach this benchmark for a sustained period of time can result in the district (or the state) being ineligible for funds from the Perkins Grant.

Table 7: District-level enrollment of special populations by CTE status, 2014-15

District	Percent Special Populations			
	Total Enrollment	Non-CTE	Participant	Concentrator
Milwaukee County				
Brown Deer	92.6%	100.0%	88.5%	76.9%
Cudahy	64.0%	84.4%	59.8%	60.7%
Franklin Public	24.8%	32.6%	22.9%	19.2%
Greendale	26.2%	19.7%	30.6%	17.5%
Greenfield	44.2%	46.4%	41.2%	12.5%
Milwaukee	87.7%	81.2%	98.8%	98.6%
Nicolet Union	30.0%	39.4%	26.8%	26.4%
Oak Creek-Franklin	20.3%	24.6%	19.3%	20.5%
Saint Francis	65.6%	72.7%	62.3%	42.9%
South Milwaukee	50.4%	57.4%	49.0%	37.8%
Wauwatosa	34.2%	27.4%	39.4%	36.0%
West Allis	66.0%	67.3%	65.4%	57.7%
Whitefish Bay	13.9%	17.6%	10.0%	13.2%
Whitnall	40.0%	40.9%	39.5%	47.8%
Ozaukee County				
Cedarburg	11.9%	21.6%	9.9%	10.9%
Grafton	54.9%	54.2%	55.5%	51.1%
Mequon-Thiensville	17.1%	16.3%	17.7%	13.7%
Northern Ozaukee	21.2%	23.5%	20.8%	15.8%
Port Washington-Saukville	26.2%	27.0%	25.3%	25.6%
Washington County				
Germantown	24.2%	28.0%	21.9%	21.3%
Hartford Union	32.2%	37.9%	31.1%	28.7%
Kewaskum	42.0%	63.2%	39.0%	37.5%
Slinger	28.0%	63.0%	25.9%	20.8%
West Bend	46.4%	40.6%	49.8%	47.3%
Waukesha County				
Arrowhead Union	18.5%	10.9%	20.0%	19.3%
Elmbrook	22.4%	38.1%	20.6%	20.4%
Hamilton	18.7%	19.1%	18.4%	18.0%
Kettle Moraine	21.2%	19.5%	22.4%	18.2%
Menomonee Falls	24.4%	38.3%	15.8%	14.8%
Mukwonago	29.4%	27.1%	30.0%	36.6%
Muskego-Norway	24.6%	18.2%	27.8%	30.4%
New Berlin	17.6%	14.5%	18.5%	16.3%
Oconomowoc Area	28.8%	25.3%	29.8%	31.9%
Pewaukee	20.4%	27.3%	19.0%	17.7%
Waukesha	39.5%	44.5%	36.4%	33.9%
Metro Milwaukee	**51.3%**	**60.2%**	**47.3%**	**52.6%**
State of Wisconsin	**46.6%**	**52.2%**	**43.8%**	**43.4%**
Racine	97.0%	94.2%	99.7%	99.5%

WHAT PROGRAMS DO CTE STUDENTS STUDY?

Now that we have an understanding of how many and what kinds of students participate in CTE courses, we can dive deeper into the types of CTE offerings they are pursuing. In this section, we explore the program areas that students choose to study and the extent to which they are taking part in work learning opportunities.

WHAT PROGRAMS ARE MOST POPULAR AMONG CTE PARTICIPANTS?

CTE in Wisconsin is separated into six program areas: Agriculture & Natural Resources; Business and Information Technology; Family & Consumer Sciences; Health Science; Marketing, Management & Entrepreneurship (MM&E); and Technology & Engineering.

Chart 3 illustrates the breakdown of regional and state CTE participants by program area in 2014-15. It is helpful to remember that a CTE participant can take a course in more than one program area. CTE concentrators, on the other hand, take two or more courses within a specific program area.

Business was the most popular program area with 60.7% of CTE participants in Metro Milwaukee and 53.7% statewide taking at least one course. Substantial numbers of students also took a course in multiple program areas, with 45.8% of regional and 51.2% of Wisconsin CTE participants falling in this group. It is reasonable that Metro Milwaukee would have lower enrollment in Agriculture courses than the state average given its urbanized nature, though one might expect a higher concentration in Health Occupations and MM&E given the proximity to health care and marketing industries in the region.

Chart 3: Distribution of regional and state CTE participants by program area, 2014-15

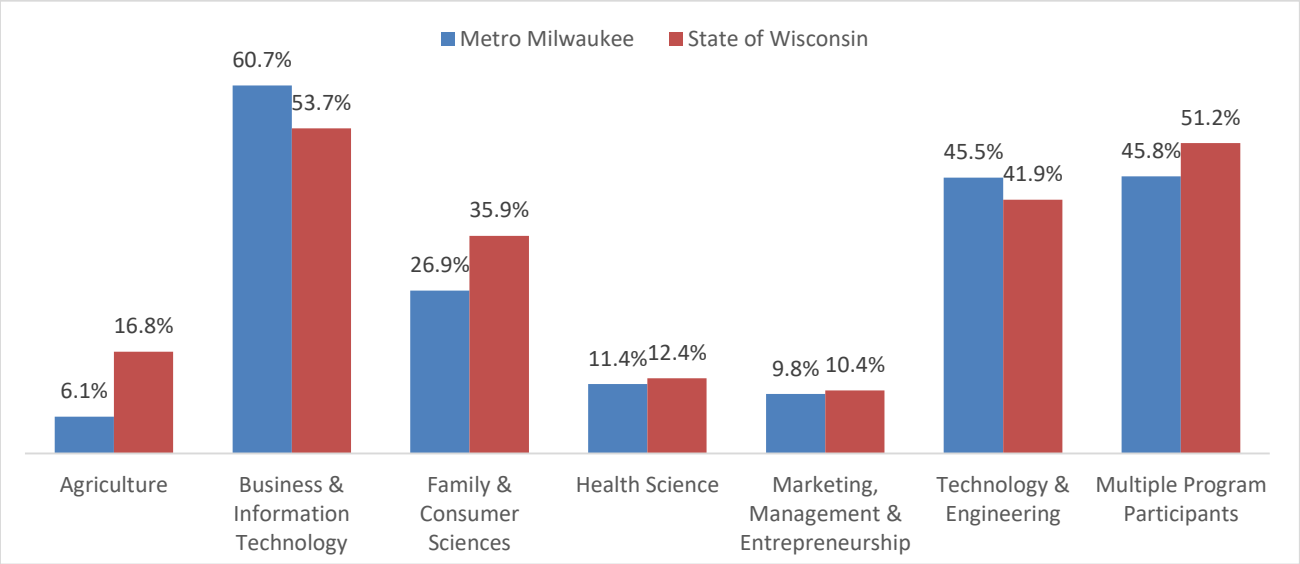


Table 8 provides a district-level view of the enrollment of CTE participants by program area. Mirroring the regional and state patterns, Business & IT is the most popular program area among CTE participants within individual districts. In fact, only 7 of the 35 districts in the analysis had a different program area with higher enrollment (in most cases that area was Technology & Engineering). Slinger had the highest concentration of CTE participants in the Business program (83.6%), followed by Saint Francis (82.1%) and Cudahy (82%).

Table 8: Distribution of CTE participants by program area, 2014-15

District	Percentage of CTE participants by program area						
	Agriculture	Business & IT	Family & Consumer	Health Science	MM&E	Tech & Engineering	Multiple Programs
Milwaukee County							
Brown Deer	2.7%	69.6%	4.7%	10.8%	12.2%	50.7%	35.8%
Cudahy	0%	82.0%	46.6%	16.4%	0%	46.0%	67.2%
Franklin Public	0%	48.7%	37.1%	21.9%	0%	43.4%	43.6%
Greendale	0.4%	48.3%	23.4%	32.5%	1.1%	18.5%	22.3%
Greenfield	0%	58.5%	10.1%	26.4%	0%	17.7%	15.2%
Milwaukee	10.7%	67.6%	3.2%	2.6%	1.5%	49.1%	33.1%
Nicolet Union	2.5%	76.9%	39.6%	14.6%	5.9%	27.7%	55.1%
Oak Creek-Franklin	0.1%	59.6%	15.8%	20.6%	1.6%	48.3%	39.5%
Saint Francis	0%	82.1%	0%	10.4%	0%	34.4%	25.9%
South Milwaukee	0%	48.2%	69.1%	20.9%	26.0%	29.6%	63.5%
Wauwatosa	0%	44.7%	59.1%	9.6%	2.0%	12.4%	24.9%
West Allis	0.3%	36.0%	54.6%	16.1%	4.0%	39.5%	42.7%
Whitefish Bay	0%	71.0%	0%	0.4%	1.2%	39.8%	12.4%
Whitnall	0%	60.1%	9.5%	14.1%	6.1%	36.1%	24.0%
Ozaukee County							
Cedarburg	6.3%	65.9%	63.7%	10.8%	50.5%	47.1%	77.7%
Grafton	0%	50.9%	49.5%	7.7%	11.4%	55.0%	56.4%
Mequon-Thiensville	1.1%	79.3%	9.5%	3.0%	3.0%	31.3%	25.3%
Northern Ozaukee	1.0%	64.6%	0%	26.0%	33.3%	45.8%	49.0%
Port Washington	0%	71.5%	1.1%	7.5%	5.9%	58.6%	43.5%
Washington County							
Germantown	4.7%	63.2%	41.7%	29.6%	31.0%	49.4%	80.9%
Hartford Union	28.4%	73.0%	27.8%	1.6%	0.3%	48.4%	59.0%
Kewaskum	29.0%	62.5%	52.4%	14.5%	1.1%	59.1%	76.2%
Slinger	25.7%	83.6%	54.8%	0.0%	0%	79.2%	84.2%
West Bend	0%	47.1%	40.1%	4.7%	0%	48.8%	35.4%
Waukesha County							
Arrowhead Union	0%	61.8%	26.6%	6.0%	24.1%	48.2%	51.6%
Elmbrook	5.2%	73.3%	35.2%	24.5%	20.0%	78.3%	78.7%
Hamilton	1.7%	59.8%	31.8%	14.6%	24.2%	60.1%	64.7%
Kettle Moraine	1.8%	64.6%	26.5%	5.5%	31.3%	31.7%	47.7%
Menomonee Falls	5.9%	68.6%	46.8%	7.9%	3.5%	41.3%	60.7%
Mukwonago	4.8%	55.5%	50.4%	25.0%	11.2%	32.7%	52.4%
Muskego-Norway	0.2%	34.1%	51.3%	5.6%	15.9%	34.4%	34.4%
New Berlin	0.3%	53.7%	2.3%	21.5%	31.1%	42.7%	43.5%
Oconomowoc Area	30.1%	79.1%	0.7%	9.7%	11.1%	42.6%	54.5%
Pewaukee	1.5%	35.0%	53.4%	20.9%	1.2%	46.0%	51.2%
Waukesha	2.2%	45.5%	25.2%	14.1%	18.7%	41.1%	38.2%
Metro Milwaukee	**6.1%**	**60.7%**	**26.9%**	**11.4%**	**9.8%**	**45.5%**	**45.8%**
State of Wisconsin	**16.8%**	**53.7%**	**35.9%**	**12.4%**	**10.4%**	**41.9%**	**51.2%**
Racine	0%	43.7%	37.3%	32.9%	13.7%	14.3%	34.5%

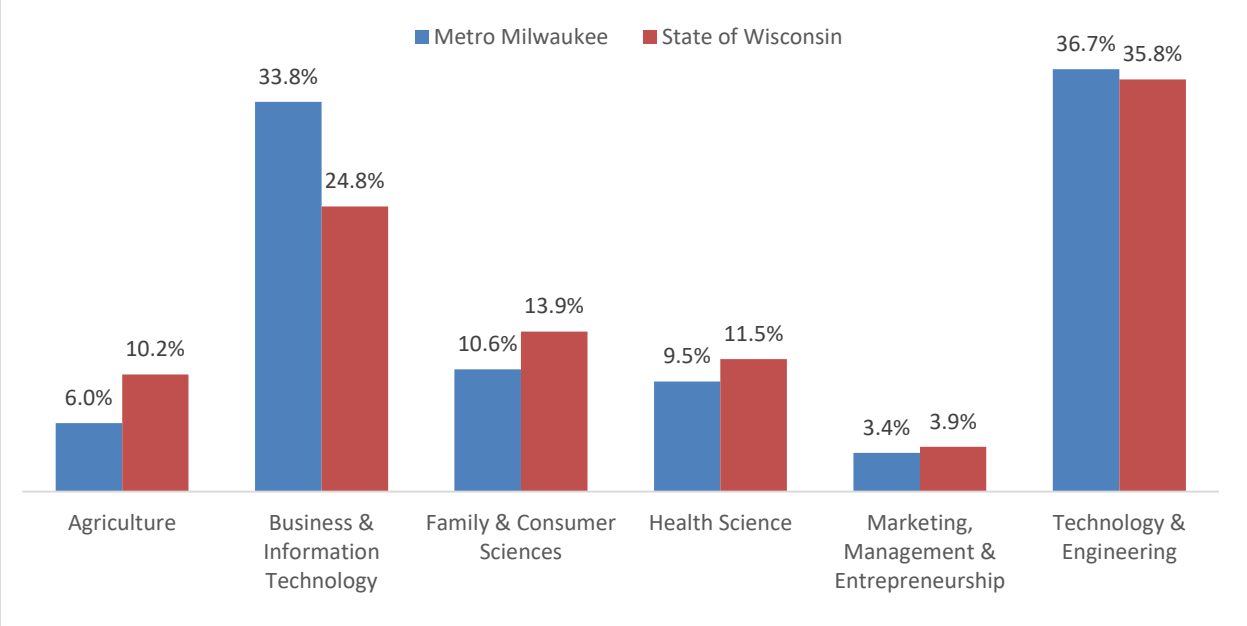
Oconomowoc led the region with 30.1% of CTE participants in the Agriculture program, with Kewaskum (29%) and Hartford (28.4%) close behind. South Milwaukee had the highest concentration of students in Family & Consumer Sciences (69.1%), followed by Cedarburg (63.7%) and Wauwatosa (59.1%). In the Health Science program, Greendale had the highest proportion of students (32.5%), followed by Germantown (29.6%) and Greenfield (26.4%).

The Marketing, Management & Entrepreneurship program was most popular in Cedarburg with 50.5% of CTE participants enrolled, followed by Northern Ozaukee (33.3%) and Kettle Moraine (31.3%). All districts enrolled CTE participants in the Technology & Engineering program area, though Slinger (79.2%), Elmbrook (78.3%), and Hamilton (60.1%) had the highest concentrations. Taking courses from multiple CTE programs was popular, especially in Slinger and Elmbrook, where 84.2% and 78.7% of CTE participants, respectively, chose this option. This outcome is not necessarily surprising given that both districts had CTE participation rates of 90% and above.

What programs are most popular among CTE concentrators?

Chart 4 illustrates the breakdown of regional and state CTE concentrators by program. Again, these students take two or more courses within a specific area, which aligns with the premise of CTE being a progressive sequence of courses in a given field.

Chart 4: Distribution of regional and state CTE concentrators by program area, 2014-15



Though Business & IT had the highest enrollment among CTE participants in 2014-15, Technology & Engineering was most popular among concentrators, with 36.7% of concentrators in the region and 35.8% statewide selecting this program area. Business & IT was the second most popular program area, with 33.8% of concentrators in the Metro Milwaukee and 24.8% statewide studying this field.

The number of concentrators in Agriculture and Health Sciences was relatively similar to the number of CTE participants in those program areas. Among districts in Metro Milwaukee, the Family and Consumer Sciences program had less than half the number of concentrators (10.6%) as participants (26.9%), indicating that students may take a course in this area, but largely do not pursue the sequence. There also was a decline in concentrators studying MM&E relative to the number of participants in this field, though the decrease was not as pronounced.

Table 9 shows the enrollment of CTE concentrators on a district-by-district basis for the region. In some instances, districts with a high number of participants in a given field tended to have a high number of concentrators in the same field. For example, Oconomowoc, Kewaskum, and Hartford had the highest enrollment in Agriculture among both CTE participants and concentrators. Among the other program areas, however, districts with large concentrator enrollment were not necessarily those with large numbers of participant.

In Oconomowoc, 59.6% of concentrators studied Business & IT, the highest rate in the region, followed by Mequon-Thiensville (49.6%) and Whitefish Bay (49.1%). Family Consumer Sciences was the most popular program in Pewaukee, with 35.4% of concentrators. South Milwaukee (28%) and Wauwatosa (27.4%) had the next highest numbers of concentrators in this field. Greendale had the highest level of participants studying Health Sciences, and again led the region with 54.4% of concentrators in this program area. South Milwaukee (32.9%) and Cudahy (29.9%) had the next highest levels of concentrators studying Health Sciences.

Marketing, Management & Entrepreneurship was the program with the smallest percentages of concentrators at the regional (3.4%) and state level (3.9%). Among individual districts, Port Washington-Saukville (12.2%), Kettle Moraine (10.2%), and Waukesha (9.5%) enrolled the most MM&E concentrators. Technology & Engineering, the most popular program among concentrators in the state and region, accounted for the majority of concentrators in several districts, including Saint Francis (85.7%), Greenfield (75%), and Arrowhead (68.6%).

Table 9: Distribution of CTE concentrators by program area, 2014-15

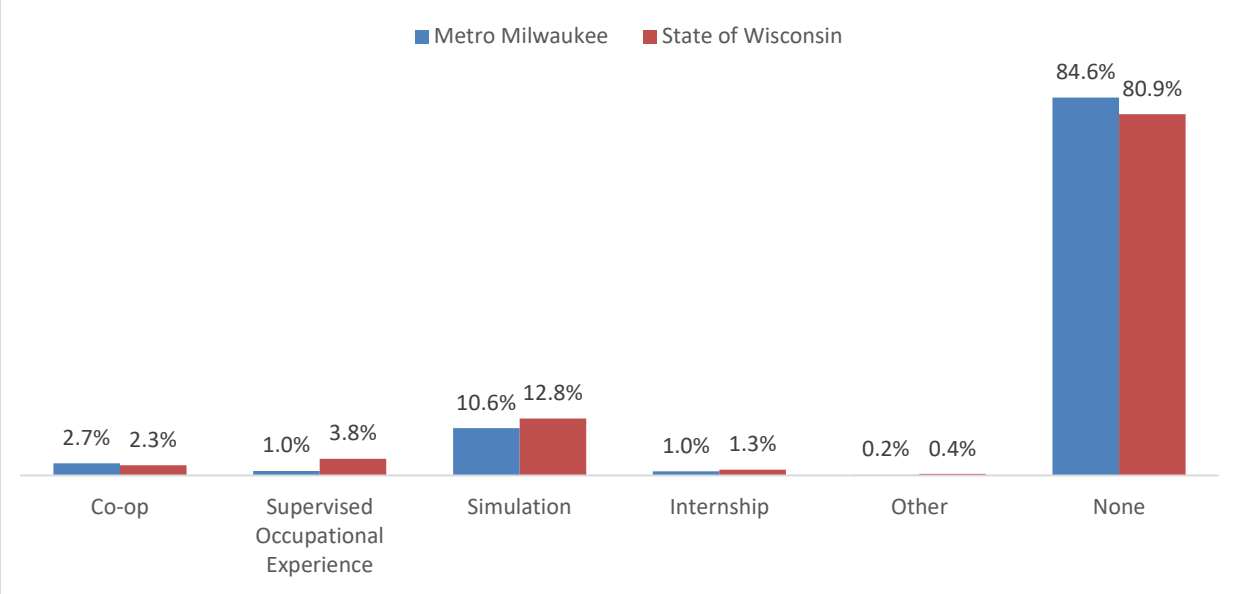
District	Percentage of CTE concentrators by program area					
	Agriculture	Business & IT	Family & Consumer	Health Science	MM&E	Tech & Engineering
Milwaukee County						
Brown Deer	6.2%	21.5%	9.2%	23.1%	1.5%	38.5%
Cudahy	0%	19.7%	0%	29.9%	0%	50.4%
Franklin Public	0%	32.9%	13.7%	8.2%	0%	45.2%
Greendale	1.8%	17.5%	3.5%	54.4%	5.3%	17.5%
Greenfield	0%	12.5%	0%	12.5%	0%	75.0%
Milwaukee	7.7%	44.2%	3.5%	2.2%	1.6%	40.8%
Nicolet Union	2.8%	44.4%	7.0%	16.5%	1.1%	28.2%
Oak Creek-Franklin	0.3%	37.8%	23.2%	8.5%	2.6%	27.6%
Saint Francis	0%	14.3%	0%	0%	0%	85.7%
South Milwaukee	0%	22.0%	28.0%	32.9%	4.9%	12.2%
Wauwatosa	0%	36.0%	27.4%	17.8%	4.6%	14.2%
West Allis	0.6%	13.7%	18.7%	16.6%	3.5%	46.9%
Whitefish Bay	0%	49.1%	0%	1.9%	5.7%	43.4%
Whitnall	0%	26.1%	8.7%	4.3%	0%	60.9%
Ozaukee County						
Cedarburg	8.4%	25.8%	18.2%	14.4%	5.4%	27.7%
Grafton	0%	26.7%	10.0%	10.0%	2.2%	51.1%
Mequon-Thiensville	3.4%	49.6%	10.3%	6.0%	9.4%	21.4%
Northern Ozaukee	2.6%	23.7%	0%	26.3%	2.6%	44.7%
Port Washington-Saukville	0%	32.2%	2.2%	0%	12.2%	53.3%
Washington County						
Germantown	6.6%	29.2%	8.9%	24.6%	5.2%	25.6%
Hartford Union	15.6%	33.3%	13.1%	1.9%	0.5%	35.5%
Kewaskum	16.7%	11.5%	4.2%	2.1%	3.1%	62.5%
Slinger	6.5%	32.5%	9.1%	0%	0%	51.9%
West Bend	0%	28.0%	23.4%	0.4%	0%	48.1%
Waukesha County						
Arrowhead Union	0%	22.1%	0%	9.3%	0%	68.6%
Elmbrook	7.0%	25.3%	15.7%	16.7%	3.5%	31.7%
Hamilton	1.8%	26.3%	15.1%	10.1%	8.9%	37.9%
Kettle Moraine	4.5%	27.3%	15.9%	13.1%	10.2%	29.0%
Menomonee Falls	9.1%	37.7%	15.5%	12.1%	5.4%	20.2%
Mukwonago	8.1%	14.5%	20.9%	23.8%	5.2%	27.3%
Muskego-Norway	0.4%	13.2%	18.9%	12.8%	4.0%	50.7%
New Berlin	0.7%	30.9%	5.3%	17.4%	2.8%	42.9%
Oconomowoc Area	17.4%	59.6%	1.5%	0%	1.5%	20.0%
Pewaukee	2.1%	20.6%	35.4%	8.2%	1.6%	32.1%
Waukesha	4.2%	23.7%	12.1%	15.7%	9.5%	34.8%
Metro Milwaukee	**6.0%**	**33.8%**	**10.6%**	**9.5%**	**3.4%**	**36.7%**
State of Wisconsin	**10.2%**	**24.8%**	**13.9%**	**11.5%**	**3.9%**	**35.8%**
Racine	0%	10.3%	34.0%	18.3%	10.1%	27.3%

HOW MANY CTE STUDENTS TAKE PART IN WORK LEARNING OPPORTUNITIES?

One component of a well-structured CTE program is work learning opportunities, which fall into two categories: those that culminate in a certificate and those that do not. Definitions for each type of program are provided in **Appendix A**.

Chart 5 shows the number of CTE concentrators in both the region and state who took part in a non-certificated work learning program in the 2014-15 school year. Co-ops and supervised occupational experiences are paid positions, while internships may or may not be paid. All three programs, however, require coordination between schools and employers to ensure the experiences align with curricula. Simulation describes a practice of illustrating workplace experiences within a classroom setting to teach basic professional skills.

Chart 5: Participation in non-certificated work learning opportunities, 2014-15

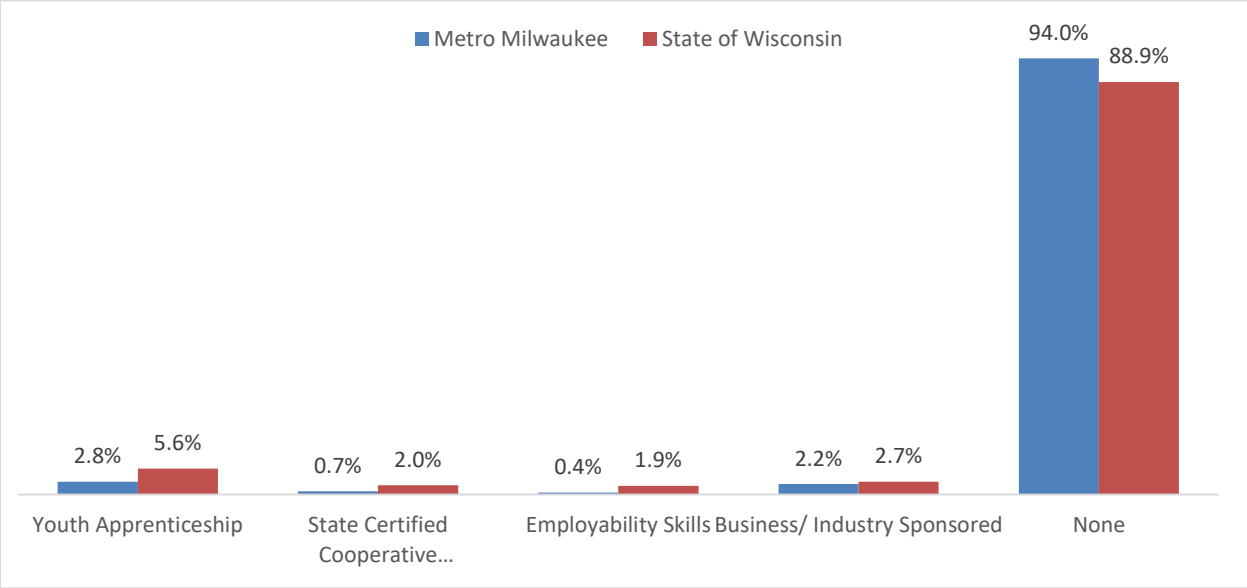


A casual look at the data reveals that very few CTE concentrators take part in these work learning programs. It is unclear from our analysis why more students do not participate in these programs. Except for simulation, the programs require partnerships with employers, which may be challenging to establish. Moreover, it is likely that employers have a finite capacity to host students, which limits the number of CTE concentrators who can participate. Lastly, these work-based learning opportunities take place off school grounds, which may present transportation and scheduling challenges for students. Whatever the cause or causes, it is clear that CTE concentrators in the region and state are not benefitting from learning opportunities often cited as critical components of robust CTE curricula.

Chart 6 provides a similar look at the percentage of CTE concentrators who participated in work learning programs leading to a certificate. These programs are longer in duration and are more structured with an established set of criteria that students must complete. The youth

apprenticeships, state certified co-op, and employability skills programs are paid experiences, while the business/industry sponsored programs may or may not be paid.

Chart 6: Participation in certificated work learning opportunities, 2014-15



Once again, taking part in a certificated work learning opportunity is the exception rather than the rule, with 94% of regional and 88.9% of statewide CTE concentrators not participating. The challenges involved with enrolling greater numbers of CTE concentrators in these programs likely are similar to the obstacles described for non-certificated programs. Additionally, the greater structure and length of time required for these programs make it unrealistic that every CTE concentrator would have the opportunity to take part. Nevertheless, the statewide figures are surprisingly low for programs that so clearly align with the stated mission and goals of CTE.

ACADEMIC PERFORMANCE AND CTE

In this section, we explore a number of metrics related to the impact of CTE on academic achievement. There are some limits to this analysis based on the way data are collected and reported in Wisconsin. For example, some measures comparing CTE and non-CTE students only are available at the state level. Additionally, district-level achievement metrics only are available for CTE concentrators. Despite these limitations, the following section does provide important insights into academic achievement among CTE students.

DO CTE STUDENTS GRADUATE AT HIGHER RATES?

The primary goal of CTE is to prepare students for further education and for the workforce. A necessary step in this process is to complete a high school diploma. Our analysis begins by looking at Wisconsin high school graduation rates for different student groups. In the state as a whole, 94.2% of the cohort of students who entered high school four years earlier went on to graduate in the 2014-15 school year. As shown in **Chart 7**, CTE concentrators exceeded the state average (96.8%) as did CTE participants (96%). Non-CTE students graduated at a lower rate (90.2%) than CTE students and below the state average.

Chart 7 also shows how graduation rates for these groups have changed over time. While all groups saw a decline in 2012, each had a higher rate in 2015 than in 2010. The rate for CTE concentrators increased 1.3 percentage points over the period, while the rate for non-CTE students increased 0.9 points. Both groups exceeded the increase in the overall state average rate of 0.7 points over this period.

Chart 7: Statewide high school graduation rate by CTE status over time

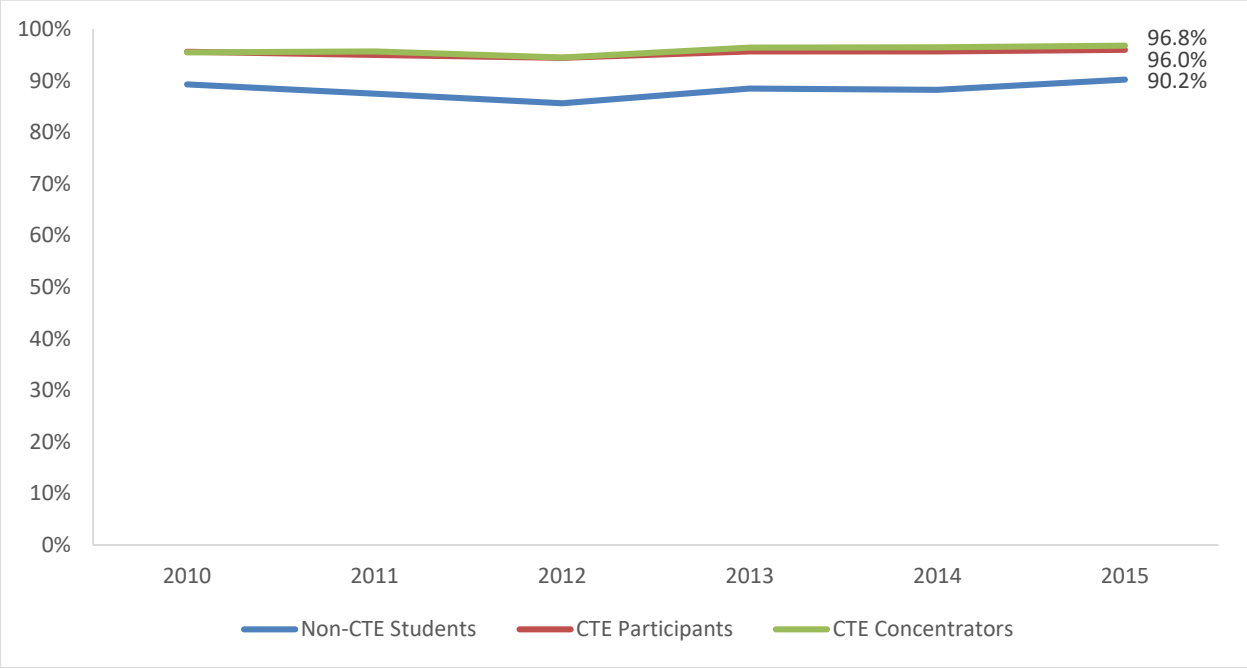
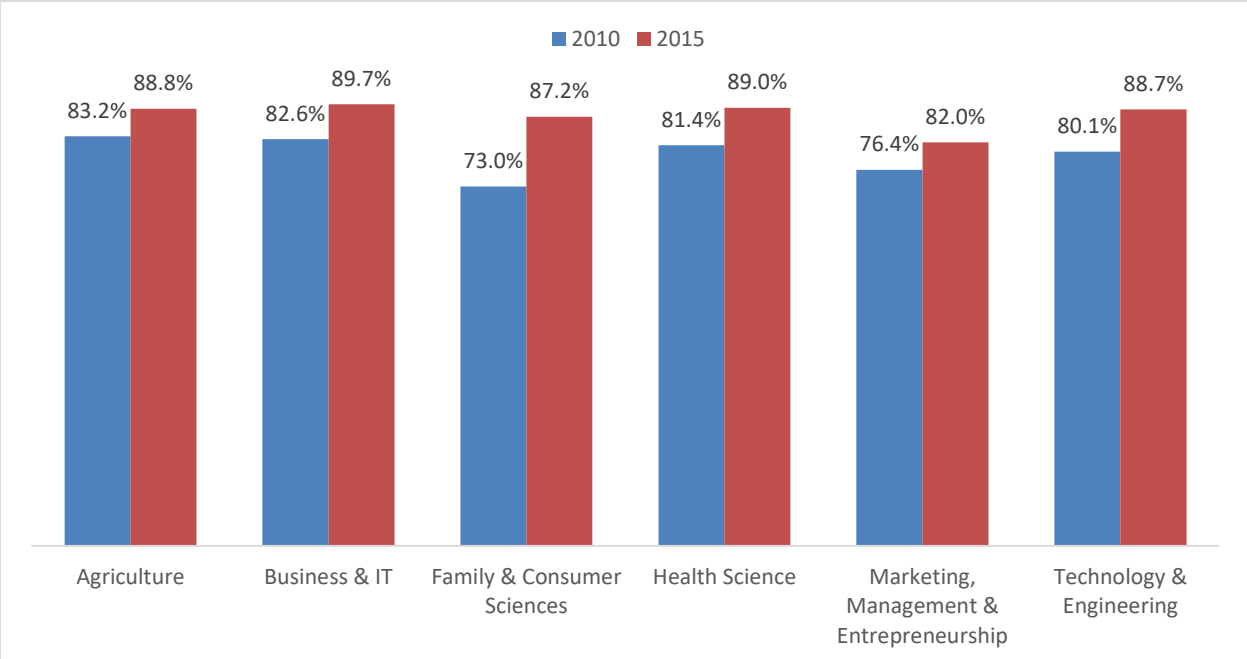


Chart 8 provides a deeper look at CTE concentrators by showing the percentage that graduated *and* completed their chosen program of study. Students are counted as a CTE concentrator if they take two or more courses in a chosen program area, and they are counted as a program completer if they take three or more courses in their chosen career pathway.

In the 2014-15 school year, program completion and graduation ranged from a low of 82% of concentrators studying MM&E, to a high of 89.7% of concentrators studying Business & IT. Rates of completion and graduation have improved for each program over time, with Family & Consumer Sciences showing the largest gain of 14.2 points since 2009-10. Concentrators studying Technology & Engineering and Health Science also showed large improvements of 8.6 and 7.6 points, respectively.

Chart 8: Statewide graduation and program completion among concentrators by CTE field over time



It is not surprising that the number of students who complete their program of study and graduate is lower than the number of CTE concentrators who graduate given the additional courses required for program completion. However, if CTE is conceived of as a continuous sequence of courses in a chosen field that branches secondary and postsecondary education, then school and district leaders should explore ways to encourage more students to remain in the career pathway and complete the program.

DO CTE CONCENTRATORS PERFORM BETTER ON STATE ASSESSMENTS?

Performance on state assessment exams provides another measure of how CTE concentrators are performing academically. As part of the annual report for the federal Perkins Grant, districts and the state report the percentages of senior CTE concentrators who score proficient or advanced on the reading and math sections of the state assessment. For seniors included in the 2015 Perkins report, this measure is based on the WKCE taken when they were in 10th grade. Using data from the Wisconsin Department of Public Instruction, we can compile the districtwide proficiency rates for 10th graders to understand how CTE concentrators performed relative to their peers in each district.

Table 10 provides a district-level look at reading and math proficiency for all students and for CTE concentrators. On the reading component, 38% of CTE concentrators in the region and 36.3% in the state scored proficient or advanced as 10th graders. These rates are slightly lower than the 39% proficiency rate for all 10th graders in the region and 38.8% statewide. On the math section we see the reverse, as 47.1% of senior CTE concentrators in Metro Milwaukee were proficient or advanced, compared to 43.9% of all 10th graders. Statewide, 46.2% of senior CTE concentrators were proficient or advanced, compared to 44.9% of all 10th graders.

Individual districts largely follow the regional and state patterns. Focusing on the reading section, only 9 of the 35 districts showed higher proficiency rates for the senior CTE concentrators. In some cases, the difference between these groups is quire stark. Grafton had a proficiency rate of 51.2% for all 10th graders in the district, while only 26.7% of senior CTE concentrators met this mark, a gap of 24.5 percentage points. Conversely, 46.2% of senior CTE concentrators in Brown Deer were proficient, compared to 38.7% of all 10th graders, a positive advantage of 7.5 points.

On the math section of the assessment, 15 of the 35 districts showed higher proficiency rates for their senior CTE concentrators. They were led by Slinger, where senior CTE concentrators had proficiency rates that were 11 points higher than all 10th graders in the district (74% compared to 63%). In West Bend, however, 50% of 10th graders were proficient or advanced, compared to 34.8% of senior CTE concentrators, a gap of 15.2 points.

Based on the available data, we cannot conclusively say that CTE concentrators perform better or worse than non-CTE concentrators on state assessments. Similarly, we cannot explain why CTE concentrators lag their district totals in reading proficiency rates but exceed district totals in math. It is worth noting that while a majority of districts showed senior CTE concentrators to have lower proficiency levels than all 10th grade test takers, in some cases the difference was less than a percentage point. In fact, only 8 of the 35 districts showed senior CTE concentrators to have higher proficiency rates on both the reading and math sections.

Table 10: WKCE percent proficient and advanced for senior CTE concentrator students, 2014-15

District	10th Grade Reading		10th Grade Math	
	District Total*	CTE Concentrators	District Total*	CTE Concentrators
Milwaukee County				
Brown Deer	38.7%	46.2%	37.9%	38.5%
Cudahy	25.9%	12.5%	34.3%	37.5%
Franklin Public	52.7%	56.9%	55.3%	65.3%
Greendale	59.2%	52.6%	69.5%	78.9%
Greenfield	36.0%	87.5%	38.8%	87.5%
Milwaukee	14.3%	10.4%	12.8%	8.5%
Nicolet Union	58.3%	59.6%	62.8%	65.2%
Oak Creek-Franklin	39.5%	35.9%	37.2%	36.8%
Saint Francis	32.3%	33.3%	31.5%	66.7%
South Milwaukee	39.9%	39.3%	39.4%	39.3%
Wauwatosa	52.6%	40.4%	61.0%	56.0%
West Allis	31.3%	24.9%	33.3%	31.1%
Whitefish Bay	65.6%	62.0%	66.4%	80.0%
Whitnall	34.7%	14.3%	42.0%	50.0%
Ozaukee County				
Cedarburg	67.4%	61.9%	70.7%	69.0%
Grafton	51.2%	26.7%	52.9%	40.0%
Mequon-Thiensville	68.9%	61.1%	71.1%	74.1%
Northern Ozaukee	52.2%	37.5%	48.9%	45.8%
Port Washington-Saukville	50.0%	35.0%	51.6%	43.6%
Washington County				
Germantown	55.3%	54.0%	70.0%	68.0%
Hartford Union	50.9%	42.0%	52.1%	47.6%
Kewaskum	36.8%	34.6%	47.9%	46.2%
Slinger	48.3%	50.6%	63.0%	74.0%
West Bend	40.4%	31.7%	50.0%	34.8%
Waukesha County				
Arrowhead Union	65.3%	67.9%	71.8%	79.2%
Elmbrook	62.6%	60.2%	69.8%	69.4%
Hamilton	57.2%	52.2%	74.8%	72.6%
Kettle Moraine	46.1%	42.5%	72.2%	70.8%
Menomonee Falls	40.6%	41.5%	63.6%	69.7%
Mukwonago	56.3%	44.3%	66.8%	57.0%
Muskego-Norway	50.3%	37.3%	66.4%	57.0%
New Berlin	51.2%	50.6%	65.7%	66.7%
Oconomowoc Area	38.2%	32.0%	51.5%	48.1%
Pewaukee	51.1%	53.4%	67.2%	65.1%
Waukesha	42.5%	39.8%	52.2%	55.0%
Metro Milwaukee	**39.0%**	**38.0%**	**43.9%**	**47.1%**
State of Wisconsin	**38.8%**	**36.3%**	**44.9%**	**46.2%**
Racine	23.2%	19.5%	21.5%	20.8%

* Data are from the 2012-13 WSAS to align with when senior CTE concentrators in 2014-15 would have taken the WKCE. Non-test taking students are not included in calculations.

OUTCOMES FOR CTE CONCENTRATORS

In this section, we explore how CTE students are faring after they complete high school. The data come from an annual survey of CTE concentrators conducted a year after their high school graduation. The survey – which is designed by DPI but administered by individual districts and Perkins consortia (who report the data back to DPI) – attempts to gain insight into concentrators' post-graduation activities, measuring a number of factors related to employment and continuing education. Survey data are not without their limitations; however, with a relatively robust response rate of 69.5%, we are confident that the survey responses presented here are representative of the larger universe of CTE concentrators.

WHAT DO CTE CONCENTRATORS DO AFTER HIGH SCHOOL?

Table 11 shows that based on the most recent DPI survey for which results are available, nearly 74% of CTE concentrators in the region and state were pursuing further education a year after graduating high school, making that by far the most common track for those graduates. Employment was the next most common pursuit, with 16.5% of concentrators in Metro Milwaukee and 19.6% statewide reporting that they were currently employed. Slightly more than 8% of CTE concentrators in the region were seeking employment at the time the survey was conducted, nearly double the statewide rate of 4.3%. A few concentrators were pursuing a career in the military, while a small number were classified as "Other."

Individual districts tend to follow this pattern of outcomes, though there is variation as to the degree. Twenty-eight districts in Metro Milwaukee saw concentrators pursue further education at a higher rate than the region. In fact, six districts had 100% of concentrators pursuing further education. These districts tend to be more affluent or have small numbers of CTE concentrators. Additionally, 11 of the 35 districts saw their concentrators enter the workforce at a higher rate than the region.

MPS is an outlier, with nearly equal numbers of CTE concentrators across three outcomes. MPS saw 35.6% of concentrators enter the workforce, 33% pursue further education, and 30.2% unemployed but seeking employment. MPS has the highest percentage of special population students among CTE concentrators in the region (98.6%), as discussed in a previous section. While that factor may be a contributor in MPS' outlier status, we find that in Racine, where 99.5% of concentrators are special population students, only 9.1% of their concentrators were unemployed and seeking employment, while 69.7% were pursuing education and 19.2% had entered the workforce.

Table 11: Outcomes for CTE concentrators, 2014-15

District	Employed	Further Education	Military	Seeking Employment	Other*
Milwaukee County					
Brown Deer	20.0%	70.0%	0.0%	10.0%	0.0%
Cudahy	23.5%	67.6%	5.9%	0.0%	2.9%
Franklin Public	0.0%	94.0%	2.0%	4.0%	0.0%
Greendale	0.0%	100.0%	0.0%	0.0%	0.0%
Greenfield	0.0%	100.0%	0.0%	0.0%	0.0%
Milwaukee	35.6%	33.0%	0.6%	30.2%	0.6%
Nicolet Union	0.0%	96.7%	0.0%	3.3%	0.0%
Oak Creek-Franklin	17.8%	74.3%	3.5%	4.5%	0.0%
Saint Francis	25.0%	50.0%	25.0%	0.0%	0.0%
South Milwaukee	17.8%	66.7%	8.9%	4.4%	2.2%
Wauwatosa	6.0%	89.3%	1.2%	3.6%	0.0%
West Allis	25.2%	66.2%	3.3%	5.3%	0.0%
Whitefish Bay	0.0%	100.0%	0.0%	0.0%	0.0%
Whitnall	16.7%	75.0%	8.3%	0.0%	0.0%
Ozaukee County					
Cedarburg	7.6%	89.4%	0.0%	3.0%	0.0%
Grafton	0.0%	100.0%	0.0%	0.0%	0.0%
Mequon-Thiensville	0.0%	100.0%	0.0%	0.0%	0.0%
Northern Ozaukee	12.5%	87.5%	0.0%	0.0%	0.0%
Port Washington-Saukville	0.0%	85.7%	14.3%	0.0%	0.0%
Washington County					
Germantown	5.8%	92.3%	0.0%	1.9%	0.0%
Hartford Union	12.9%	87.1%	0.0%	0.0%	0.0%
Kewaskum	18.0%	78.0%	4.0%	0.0%	0.0%
Slinger	5.5%	94.5%	0.0%	0.0%	0.0%
West Bend	20.0%	72.8%	2.4%	4.8%	0.0%
Waukesha County					
Arrowhead Union	13.1%	85.9%	1.0%	0.0%	0.0%
Elmbrook	3.3%	94.6%	1.1%	1.1%	0.0%
Hamilton	2.9%	94.1%	2.9%	0.0%	0.0%
Kettle Moraine	8.0%	88.0%	0.0%	4.0%	0.0%
Menomonee Falls	10.9%	87.0%	2.2%	0.0%	0.0%
Mukwonago	18.6%	77.7%	1.1%	2.7%	0.0%
Muskego-Norway	10.0%	90.0%	0.0%	0.0%	0.0%
New Berlin	0.0%	100.0%	0.0%	0.0%	0.0%
Oconomowoc Area	1.2%	98.8%	0.0%	0.0%	0.0%
Pewaukee	2.8%	91.7%	2.8%	2.8%	0.0%
Waukesha	11.3%	83.9%	0.0%	4.8%	0.0%
Metro Milwaukee	**16.5%**	**73.6%**	**1.6%**	**8.1%**	**0.2%**
State of Wisconsin	**19.6%**	**73.8%**	**2.1%**	**4.3%**	**0.2%**
Racine	19.2%	69.7%	2.0%	9.1%	0.0%

*Other includes Homemaker, Not Seeking Employment, and Deceased

WHAT KINDS OF HIGHER EDUCATION INSTITUTIONS DO CTE CONCENTRATORS ATTEND?

Given that the follow-up survey of CTE concentrators shows further education to be the most popular post-graduation outcome, it is instructive to know what kinds of educational opportunity these students pursue. **Table 12** provides a district-level look at the percentage of CTE concentrators who chose further education in each district as well as the type of higher education school they were attending.

Table 12: Types of further education among CTE concentrators, 2014-15

District	Further Education	2-yr	4-yr	Other
Milwaukee County				
Brown Deer	70.0%	0.0%	100.0%	0.0%
Cudahy	67.6%	43.5%	52.2%	4.3%
Franklin Public	94.0%	14.9%	85.1%	0.0%
Greendale	100.0%	15.4%	79.5%	5.1%
Greenfield	100.0%	0.0%	100.0%	0.0%
Milwaukee	33.0%	54.3%	44.5%	1.2%
Nicolet Union	96.7%	13.8%	75.9%	10.3%
Oak Creek-Franklin	74.3%	24.0%	73.3%	2.7%
Saint Francis	50.0%	100.0%	0.0%	0.0%
South Milwaukee	66.7%	13.3%	86.7%	0.0%
Wauwatosa	89.3%	26.7%	70.7%	2.7%
West Allis	66.2%	32.0%	66.0%	2.0%
Whitefish Bay	100.0%	6.7%	86.7%	6.7%
Whitnall	75.0%	66.7%	33.3%	0.0%
Ozaukee County				
Cedarburg	89.4%	8.5%	89.8%	1.7%
Grafton	100.0%	11.1%	66.7%	22.2%
Mequon-Thiensville	100.0%	0.0%	100.0%	0.0%
Northern Ozaukee	87.5%	57.1%	42.9%	0.0%
Port Washington-Saukville	85.7%	16.7%	83.3%	0.0%
Washington County				
Germantown	92.3%	14.6%	83.3%	2.1%
Hartford Union	87.1%	25.9%	70.4%	3.7%
Kewaskum	78.0%	46.2%	53.8%	0.0%
Slinger	94.5%	29.0%	71.0%	0.0%
West Bend	72.8%	46.2%	41.8%	12.1%
Waukesha County				
Arrowhead Union	85.9%	17.6%	77.6%	4.7%
Elmbrook	94.6%	4.6%	92.0%	3.4%
Hamilton	94.1%	9.4%	84.4%	6.3%
Kettle Moraine	88.0%	9.1%	86.4%	4.5%
Menomonee Falls	87.0%	5.0%	95.0%	0.0%
Mukwonago	77.7%	28.1%	68.5%	3.4%
Muskego-Norway	90.0%	33.3%	63.0%	3.7%
New Berlin	100.0%	17.2%	79.3%	3.4%
Oconomowoc Area	98.8%	62.0%	38.0%	0.0%
Pewaukee	91.7%	6.1%	90.9%	3.0%
Waukesha	83.9%	11.5%	88.5%	0.0%
Metro Milwaukee	**73.6%**	**28.9%**	**68.3%**	**2.9%**
State of Wisconsin	**73.8%**	**33.0%**	**63.3%**	**3.6%**
Racine	69.7%	27.5%	65.2%	7.2%

Though the state and Metro Milwaukee have about the same percentage of CTE concentrators seeking further education – roughly 74% – there are differences in the types of schools attended. Among the concentrators who were continuing their education, 68.3% of those in the region and 63.3% statewide were doing so at a 4-year institution. Meanwhile, 28.9% of concentrators in Metro Milwaukee and 33% in Wisconsin were attending a 2-year college. A small number attend other educational programs.[3]

Individual districts largely followed this pattern of attending 4-year institutions. Of the 35 districts in the analysis, 19 had more than 75% of concentrators pursue a 4-year education. In fact, three districts in Metro Milwaukee – Brown Deer, Greenfield, and Mequon-Thiensville – saw 100% of their concentrators attend a 4-year university. Six districts had a larger percentage of concentrators attend 2-year colleges than 4-year institutions.

While not shown in the tables presented in this section, the DPI survey also asks respondents who are classified as pursuing further education whether they are also employed while doing so. Across the state, 39% of concentrators pursuing further education have a job while enrolled. Among the concentrators attending a 2-year college, 55.6% work, while 29.3% of concentrators at 4-year institutions do so.

WHAT DO CTE CONCENTRATORS STUDY IN COLLEGE?

CTE is conceived of as a continuous sequence of courses in a given subject that branches secondary and postsecondary education. Therefore, it is instructive to understand if concentrators continue in their program of study or if they select another field. It is not uncommon for college students to change majors. However, if the data show that large numbers of concentrators are jettisoning their program of study, then it may be worth rethinking how the CTE curriculum is structured.

For those furthering their education, the concentrator follow-up survey asks if the college courses in which they are enrolled are related to the training received in the high school CTE courses. As shown in **Table 13**, 72.3% of concentrators statewide are studying a field related to their CTE coursework. There is slight variation based on the type of college a concentrator attends. Among concentrators at 2-year colleges, 70.3% study a field related to their training, while concentrators at 4-year institutions post a slightly higher level at 73.9%. Concentrators attending 'Other' colleges seem to explore more fields, though nearly two-thirds still study a field related to their CTE training.

Table 13: Do CTE concentrators pursue the fields they studied?

Program of Study	Number	Percent
2-Year, Related to Training	2,102	70.3%
2-Year, Unrelated to Training	889	29.7%
4-Year, Related to Training	4,241	73.9%
4-Year, Unrelated to Training	1,498	26.1%
Other, Related to Training	209	63.7%
Other, Unrelated to Training	119	36.3%
Total, Related to Training	**6,552**	**72.3%**
Total, Unrelated to Training	**2,506**	**27.7%**

[3] These programs include industry-related certification and other sub-Associate's degree programs offered at schools that are not a technical or community college.

Based on these responses, it appears that the foundational education provided by high school CTE courses does indeed steer students toward career paths that they continue to pursue as part of their higher education. It is unknown if this is because students develop a passion for the subject matter or if they are simply continuing to study what they know.

WHAT IS THE NATURE OF CTE CONCENTRATORS' EMPLOYMENT?

While not a precise barometer, whether CTE concentrators in the workforce a year after graduation were employed in full-time or part-time positions may indicate whether their CTE preparation in high school has allowed them to obtain the means to fully support themselves and/or to find a stable source of employment that is connected to a career path. **Table 14** provides a district-level look at the percentage of CTE concentrators who were in the workforce a year after graduation and whether their employment was full- or part-time. These data exclude those working while enrolled in college and focus squarely on those who entered the workforce.

Table 14: Types of employment among CTE concentrators, 2014-15

District	Employed	Full-Time	Part-Time	Unknown
Milwaukee County				
Brown Deer	20.0%	100.0%	0%	0%
Cudahy	23.5%	0%	12.5%	87.5%
Milwaukee	35.6%	53.1%	25.4%	21.5%
Oak Creek-Franklin	17.8%	52.8%	16.7%	30.6%
Saint Francis	25.0%	0%	100.0%	0%
South Milwaukee	17.8%	50.0%	0%	50.0%
Wauwatosa	6.0%	40.0%	40.0%	20.0%
West Allis	25.2%	0%	0%	100.0%
Whitnall	16.7%	100.0%	0%	0%
Ozaukee County				
Cedarburg	7.6%	80.0%	20.0%	0%
Northern Ozaukee	12.5%	100.0%	0%	0%
Washington County				
Germantown	5.8%	100.0%	0%	0%
Hartford Union	12.9%	100.0%	0%	0%
Kewaskum	18.0%	33.3%	11.1%	55.6%
Slinger	5.5%	75.0%	0%	25.0%
West Bend	20.0%	60.0%	32.0%	8.0%
Waukesha County				
Arrowhead Union	13.1%	0%	0%	100.0%
Elmbrook	3.3%	100.0%	0%	0%
Hamilton	2.9%	100.0%	0%	0%
Kettle Moraine	8.0%	100.0%	0%	0%
Menomonee Falls	10.9%	60.0%	40.0%	0%
Mukwonago	18.6%	0%	0%	100.0%
Muskego-Norway	10.0%	100.0%	0%	0%
Oconomowoc Area	1.2%	0%	100.0%	0%
Pewaukee	2.8%	100.0%	0%	0%
Waukesha	11.3%	71.4%	28.6%	0%
Metro Milwaukee	**16.5%**	**43.5%**	**17.8%**	**38.8%**
State of Wisconsin	**19.6%**	**66.5%**	**11.9%**	**21.6%**
Racine	19.2%	63.2%	10.5%	26.3%

Note: Districts with no CTE concentrators employed were not included.

In Metro Milwaukee, 16.5% of CTE concentrators were in the workforce a year after high school; of those, 43.5% had obtained full-time employment, 17.8% were working part-time, and the employment frequency for 38.8% was unknown. The state has a higher rate of full-time employment (66.5%) than the region, and lower rates of part-time workers (11.9%) and unknowns (21.6%).

While the survey responses show that nearly all districts in the region have more CTE concentrators working full-time than part-time, the substantial number of "unknowns" in a number of districts places a substantial limitation on this finding and its utility for those districts. For example, more than a quarter of CTE concentrators in West Allis directly entered the workforce, yet it cannot be determined whether a single student is employed in full-time or part-time work. Given that this question has value in determining the effectiveness of CTE programs, DPI and/or districts may wish to review and address this data problem.

ARE CONCENTRATORS' JOBS RELATED TO THEIR CTE TRAINING?

Just as the survey results allowed us to explore whether concentrators pursuing higher education were studying fields related to their CTE training, we can look at whether concentrators who were employed were working in fields related to their training. Because CTE is intended to encompass a continuous sequence of courses, one might expect concentrators to find employment more easily in fields for which they have training.

The survey asked concentrators who were employed a year after graduation if their employment was related to the training received in their high school CTE courses. As shown in **Table 15**, only 36.3% of concentrators statewide were working in a job that was related to their CTE coursework, while 63.7% were not. For concentrators working full-time jobs, 40% were in a related field, while 60% are not. This pattern is even more skewed for concentrators with part-time employment, where 74.7% of jobs were unrelated to their CTE training.

Table 15: Do CTE concentrators work in the fields they studied?

Employment Breakout	Number	Percent
Full-time, Related to Training	638	40.0%
Full-time, Unrelated to Training	958	60.0%
Part-time, Related to Training	72	25.3%
Part-time, Unrelated to Training	213	74.7%
Unknown, Related to Training	162	31.3%
Unknown, Unrelated to Training	356	68.7%
Total, Related to Training	**872**	**36.3%**
Total, Unrelated to Training	**1,527**	**63.7%**

Based on these responses, it appears that the foundational education provided by high school CTE courses does not necessarily lead to employment within the field of study. It is unclear what factors contribute to this disconnect between training and employment, though several questions come to mind. For example, are the high school CTE curricula out of touch with the needs of employers? Are students informed about which fields are most in demand prior to selecting a program of study? Do jobs in other fields pay more than jobs in their program of study?

Data from the DPI survey provide some insight in the last question. **Table 16** shows the average hourly wage for CTE concentrators based on employment frequency and relation to CTE training. Full-time concentrators in the region and state earn about $1 more per hour when employed in a job related to their training. Part-time workers also see higher wages when employed in their field of training, with those in the region earning $1.29 more per hour and those statewide making about $1 more.

Table 16: Average hourly wages of former CTE concentrator students, 2014-15

	Full-Time Related to Training	Full-Time Not Related to Training	Part-Time Related to Training	Part-Time Not Related to Training
Metro Milwaukee	$12.53	$11.53	$10.48	$9.19
State of Wisconsin	$12.02	$11.08	$10.06	$9.07

The data suggest, therefore, that there is a financial incentive to have a job that is related to CTE training. Yet, full-time jobs that are unrelated to CTE training pay more than $1 more per hour than part-time jobs that are related to CTE training. It is not unreasonable to think that a full-time position of any kind would have a higher wage than a part-time position.

However, if a CTE concentrator cannot readily find a full-time job in his or her program of study, what incentive is there for that individual to remain in the field? And, more broadly, if the CTE curriculum is designed to help concentrators find employment in their field, and if concentrators largely are not doing so, then what is the point of CTE? The answers to these questions should be considered by state and local education stakeholders as they consider possible changes in CTE curricula and requirements.

THE CTE TEACHER WORKFORCE

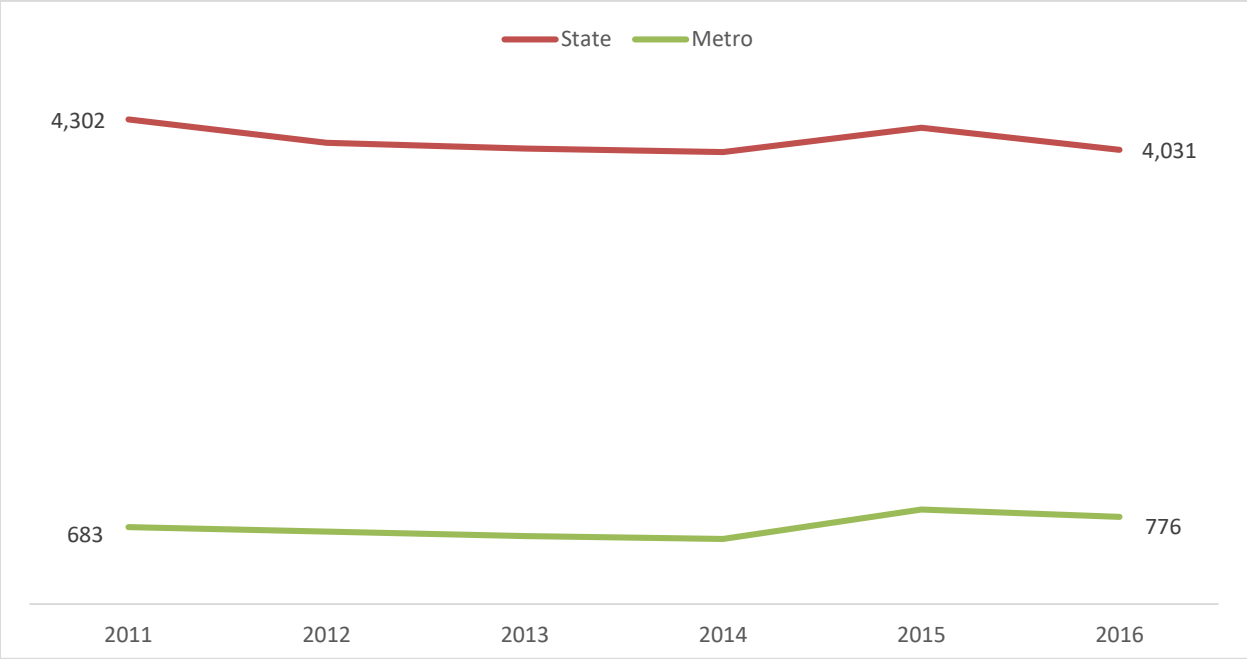
Per DPI regulations, a course only can be counted as CTE if it is taught by an instructor with a license in that specific subject area. As such, the teacher workforce places two important constraints on the availability of CTE. First, the number of CTE courses that can be offered in individual districts is limited by the number of teachers they employ who are licensed in CTE. Second, the variety of CTE courses offered is constrained by the types of licenses held by CTE teachers. In this section, we seek to provide insight on these important issues related the CTE teacher workforce.

HOW MANY CTE TEACHERS ARE THERE IN WISCONSIN AND THE REGION?

There were 3,479 teachers in Wisconsin and 738 teachers in Metro Milwaukee assigned to at least one CTE course in the 2015-16 school year. Those figures, however, only tell part of the story. Educators often teach multiple subjects within a school or teach the same subject at multiple schools, particularly in rural parts of the state. To better capture the breadth of the CTE workforce, therefore, our analysis focuses on the number of CTE assignments rather than the number of teachers who instruct CTE.

Chart 9 shows the number of CTE assignments in the region and state since the 2009-10 school year. In 2015-16, there were 4,031 CTE assignments in the state and 776 in the region. These figures represent a 6.3% decrease in assignments across the state, while Metro Milwaukee saw a 20.4% *increase* in CTE assignments.

Chart 9: Teacher assignments in CTE courses over time



WHAT SUBJECTS DO CTE EDUCATORS TEACH?

Table 17 provides a breakdown of the different CTE subjects and the number of assignments and teachers for each, both in Metro Milwaukee and across the state. Additionally, the table shows the number of schools in the state and region that have at least one teacher assigned to that subject.

Table 17: CTE assignments, teachers, and schools by subject, 2015-16

Assignment Subject	Assignments in State	Assignments in Metro	Teachers in State	Teachers in Metro	Schools in State	Schools in Metro
Agriculture	400	9	300	9	354	7
Business Education	863	153	742	145	560	72
Business Office - Vocational	212	168	210	168	66	25
Career Education	107	5	103	5	65	4
Computer Science	133	36	127	35	122	31
Environmental Education	84	29	84	29	76	24
Family Consumer Education	716	115	600	107	497	63
Family Consumer Services HERO	34	4	31	4	28	3
FCE Children Services	23	0	23	0	22	0
FCE Community Services	19	1	19	1	14	1
FCE Food Service	26	1	26	1	21	1
Health Occupations - Vocational	11	7	10	6	10	6
Marketing Education - Vocational	92	12	89	11	83	11
Tech Occupations Communications	5	0	5	0	4	0
Tech Occupations Construction	8	1	7	1	8	1
Tech Occupations Manufacturing	4	1	4	1	4	1
Tech Occupations Transportation	3	1	3	1	3	1
Tech Related Occupations	4	0	4	0	4	0
Technology Education	1,244	228	1,049	209	693	105
Trade Specialist	4	3	4	3	3	2
Vocational Special Education	39	2	39	2	32	2
Total CTE	**4,031**	**776**	**3,479**	**738**	**857**	**133**
Percent of All	**5.2%**	**4.1%**	**5.8%**	**5.2%**	**36.2%**	**27.8%**

Looking at the overall figures, 4.1% of all assignments in the region and 5.2% in the state are for a CTE subject. Across Wisconsin, 5.8% of teachers are licensed to teach a CTE course, slightly more than the 5.2% of teachers in Metro Milwaukee. Technology Education is by far the largest subject in terms of number of assignments, accounting for roughly 30% of all CTE assignments in Metro Milwaukee and the state. Business Education and Family Consumer Education also have large numbers of assignments.

Slightly more than one-third of schools in Wisconsin have a teacher assigned to a CTE subject, compared to 27.8% of schools in Metro Milwaukee. Technology Education, Business Education, and Family Consumer Education are the CTE subjects found at the greatest number of schools in the state, though Agriculture can be found at 354 schools in Wisconsin. The metro area largely mirrors

this pattern, though subjects like Computer Science and Business Office – Vocational are more common than Agriculture.

CHALLENGES FACING THE CTE TEACHER WORKFORCE

Ensuring an abundant number of teachers with CTE licenses, as well as an appropriate variety of subjects licensed, is a challenge to expanding and strengthening the CTE curriculum in Wisconsin. However, the broader teacher workforce in the state faces a number of challenges of its own.

Previous research by the Public Policy Forum quantified the number of teachers in the region and state, showed how the workforce has changed over time, and examined enrollment trends at teacher preparation programs.[4] Our research found that between 2009 and 2014, the number of teachers leaving the profession increased 22.5%. In addition, more than a quarter of teachers in Metro Milwaukee are over age 50, meaning high numbers of teachers will continue to leave the profession with each passing year. Meanwhile, enrollment in Wisconsin teacher preparation programs has declined 27.9% in recent years. With greater numbers of teachers exiting the workforce and fewer students preparing to become teachers, each future vacancy will be harder to fill.

While a general teacher shortage may be a few years away, district officials already describe an acute shortage of CTE teachers, particularly in smaller and rural districts. To help with this challenge, the Wisconsin Legislature has taken steps in recent years to ease licensure requirements for CTE teachers. Wisconsin Act 55, passed in July 2015, and Wisconsin Act 259, passed in March 2016, enable individuals with experience in certain technical or vocational subjects to obtain teaching licenses without meeting the standard requirements, such as a having a Bachelor's degree.

Under these guidelines, a person must have training or experience in a technical or vocational field, some level of pedagogical experience, and a school district wanting to hire them. Candidates are awarded a set number of points for different milestones and must gain at least 100 points, with at least 25 points from professional experiences and 25 points from pedagogical experiences. The initial three-year license requires candidates to complete a professional development curriculum; it is only valid in the district seeking to hire the candidate and cannot be transferred to another district. At the end of the three-year period, DPI can issue a five-year professional teaching license, provided the candidate completed required professional development.

The flexibility provided by these two statutes may help ease staffing shortages for CTE teachers moving forward, though it is unclear if this is a long-term solution. Teacher salaries may present another obstacle to staffing CTE positions. In 2014-15, the average salary of a Wisconsin public school teacher was $50,402.[5] By comparison, the annual median wage for a Wisconsin electrician is $58,160, and $68,230 for a plumber.[6] Teaching is a calling for many people. However, districts may continue to struggle to fill CTE positions if the wages they are offering are not comparable to the professional fields.

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[4] Yeado, J. (2016). *Help Wanted: An analysis of the teacher pipeline in Metro Milwaukee*. Public Policy Forum. http://www.publicpolicyforum.org/research/help-wanted-analysis-public-school-teacher-pipeline-greater-milwaukee

[5] Wisconsin Department of Public Instruction. (2015). *Teacher average salary report by district.*

[6] U.S. Bureau of Labor Statistics. (2015). Occupational Employment Statistics. https://data.bls.gov/oes/#/home

POLICY RECOMMENDATIONS

Our analysis of DPI data pertaining to Career and Technical Education enrollment, programs, and outcomes paints a broad picture of the CTE landscape in Metro Milwaukee school districts. While in some cases the data raise more questions than answers, this broad picture does allow us to formulate a handful of policy recommendations aimed at strengthening CTE in school districts throughout Wisconsin. These recommendations are by no means an exhaustive list, but rather a starting point for further conversation among school leaders and policymakers.

RECOMMENDATION #1: ESTABLISH A UNIVERSAL CTE DEFINITION AND ENHANCE DATA COLLECTION

Our analysis of CTE began with several pages of research questions, most of which were set aside after we discovered that data limitations prevented us from fully exploring them. This problem stems, in part, from the lack of a common definition of CTE among the state and individual districts. Because some districts might constitute certain courses to be CTE while others do not, it is difficult to reliably compare districts to one another and to obtain a truly accurate picture of where CTE is producing desired results and where it is not.

Beyond developing a standard definition, school leaders and policy makers should enhance the data being collected about CTE students and their outcomes. More robust data could help school leaders understand the CTE programs that are fostering student success as well as those that need more support. For example, more extensive knowledge of the types of employment and wages secured by CTE concentrators post graduation may indicate whether students are being adequately prepared for the job market. Additionally, these data could help illustrate which Career Clusters are in high demand and which are stagnant, information that would benefit career counselors and current CTE students.

RECOMMENDATION #2: BETTER DEFINE CTE PATHWAYS THROUGH ENHANCED PARTNERSHIPS WITH HIGHER EDUCATION

One common element of CTE is the progressive sequence of courses that extends beyond high school, whether that leads to a college degree or an industry certification. Steps to enhance the attractiveness and utility of that concept could more clearly identify the pathway for students from high school CTE courses through college and to a career.

One approach would be to strengthen articulation agreements, which establish a process for transferring credit between institutions. Each of the 16 technical colleges in the state has articulation agreements with high schools (though it is unclear if each high school in the state has an agreement with a technical college). Furthermore, WTCS has articulation agreements with each of the University of Wisconsin campuses and many private colleges in the state. Expanding the number of courses and credits that can be transferred between institutions as part of articulation agreements could heighten the attractiveness of CTE and help ensure that students use it as a pathway.

One example of this kind of partnership is the cooperative relationship between MPS, the Milwaukee Area Technical College (MATC), and the University of Wisconsin-Milwaukee (UWM) at Bradley Tech High School. Collectively, these partners adjusted the curriculum at Bradley Tech to ensure students were prepared for the rigor of college-level courses. Additionally, they increased the number of dual-credit courses which could be transferred to MATC and UWM. Initial collaboration has expanded into a formal new initiative, M-cubed, aimed at helping MPS students make a smooth and successful transition to MATC, UWM, or another college. M-cubed serves as a model for other school districts and higher education institutions to create partnerships that will ensure a stable pathway for CTE students.

RECOMMENDATION #3: BETTER OUTREACH TO BUSINESSES AND THE COMMUNITY

Work-based learning experiences are considered an integral component of a high-quality CTE program. These opportunities can enhance content knowledge from the classroom and provide valuable insight into industries and careers. However, the latest data show only 15.4% of CTE concentrators in Metro Milwaukee take part in a non-certificated program such as an internship or co-op. Even fewer concentrators (6%) participated in a certificated work learning program such as a youth apprenticeship.

Concerted efforts to engage with potential business and community partners could improve those connections, as shown by the School District of New Berlin. The district distributes the *Partnership Bulletin,* an e-newsletter, several times a year to update the community on career exploration and development as well as ways to partner with students and the district. Additionally, the district hosts a yearly partnership breakfast and recognizes businesses and organizations that have made noteworthy contributions with the 'SDNB Friend of Education Award.' CTE concentrators in New Berlin take part in co-ops and internships at rates that are nearly three times higher than the regional average. Other districts could undertake similar efforts to ensure that greater numbers of students complement their academic CTE offerings with work-based learning.

RECOMMENDATION #4: HELP CTE PARTICIPANTS BECOME CONCENTRATORS

Two-thirds of Wisconsin's 11th and 12th grade students are CTE participants, meaning they have taken at least one CTE course. Yet, only 25.8% of students in the state are CTE concentrators who have taken two or more courses in the same field.

A hallmark of CTE is the progressive sequence of courses in the same program area. The substantial number of students taking a single CTE course is encouraging, but those students should not be seen as truly obtaining the benefits of CTE. Consequently, a worthwhile policy goal for school and district leaders seeking to increase the impact of CTE would be to do more to help CTE participants become concentrators.

One solution may include academic and career counseling to help students understand the Career Clusters and Career Pathways. Additionally, counselors could help students to create a map of courses to take each semester to seamlessly integrate the CTE classes necessary to be a

concentrator. One obstacle may be the number of CTE courses offered, which is influenced by the number of licensed CTE teachers. Consequently, it also will be important for policymakers and school leaders to continue working to stem and reverse the shortage of CTE teachers.

RECOMMENDATION #5: CREATE IMPROVED AND/OR ENHANCED FORMS OF STATE FUNDING FOR CTE

The Technical Incentive Grant is a well-intended effort to provide state funds for CTE, but it is flawed. The legislation originally was designed to award districts $1,000 per student who graduated high school and completed an industry-recognized certificate. However, program spending was capped at $3 million annually regardless of the number of students who met the criteria. As a result, districts received $763 per qualified student in 2015, nearly 25% less than the legislation intended.

Perhaps even more problematic is the fact that districts receive the funds after the qualified students have graduated, and there are no restrictions on how districts can spend the money. The point of the grant is to incentivize districts to increase CTE participation and completion, but districts can use the funds however they see fit. We recommend that legislators revisit this legislation and consider requiring districts to use Technical Incentive Grant funds on CTE. The spending requirements could be the same as those associated with the Perkins Grant that are already familiar to districts.

It is also important to recognize that expanding CTE among Wisconsin high school students likely will require new resources. The federal Perkins Grant provides the majority of funding for K-12 CTE, but its reauthorization is nearly five years overdue. Funding continues at the 2012 amount, but with each passing year buys fewer services. Given that the state cannot rely on increased federal investment in CTE, a new or enhanced dedicated state funding source for CTE at the K-12 level may be required to expand its impact on college and career development for Wisconsin students.

CONCLUSION

This report set out to explore Career and Technical Education in Metro Milwaukee high schools. Using data from the Wisconsin Department of Public Instruction, we identified a number of patterns and trends relating to enrollment and outcomes for CTE students.

Overall, we find that the majority of 11th and 12th grade students in the region and the state take at least some CTE courses during high school. A smaller percentage of students – less than one third – concentrate on CTE by taking two or more courses in a program of study. Additionally, we find:

- Women and students of color are underrepresented in CTE courses, though their participation has increased in recent years.
- CTE participants and concentrators have higher high school graduation rates than non-CTE students.
- CTE concentrators have a mixed performance on state assessment exams, with higher proficiency rates in math than the district average, but lower proficiency on the reading section.
- Nearly 75% of CTE concentrators continue their education after high school, with 68% attending a 4-year college.
- Less than 17% of CTE concentrators in the region enter the workforce directly from high school and most take jobs unrelated to their CTE training.
- The number of CTE teacher assignments in Metro Milwaukee has grown in nearly 14% in recent years, yet a shortage of CTE-licensed teachers remains a constraint to expanding CTE courses.

These findings provide insight about CTE in the region. The omission of private schools, who do not submit the same data, means the results of the report are not comprehensive. However, this research contributes to the understanding of how students in Metro Milwaukee are utilizing CTE, how CTE is impacting their post-graduation endeavors, and how districts compare to one another.

Some questions for future research include:

- What are the enrollment and completion patterns of CTE students who go on to attend Wisconsin higher education institutions?
- What are the employment outcomes of CTE concentrators four to five years after high school?
- Is the CTE curriculum effectively aligned to the workforce needs of employers?
- Have recent changes to CTE teacher licensing resulted in more teachers hired and more CTE courses offered?

While often thought of as a relatively new phenomenon, Career and Technical Education has existed in some form for more than a century. We know that a high-quality CTE curriculum should contain several key elements, but this report suggests that not every school or district in the state or region incorporates each of those elements. We encourage school leaders and policymakers to carefully review these findings and we hope they will use them to improve the effectiveness of CTE programs and enhance their role in boosting post-graduation outcomes and preparing our future workforce.

APPENDIX A: GLOSSARY OF TERMS

Career and Technical Education: CTE is a curriculum designed to provide students with a combination of academic knowledge and career-oriented skills that will prepare for seamless entry into the workforce or further education. A defining characteristic of CTE is that it is a progressive sequence of courses in a specific subject that begins in high school and continues through to postsecondary education or industry certification and employment.

CTE Concentrator: A high school student who has earned credit in at least two CTE courses within a chosen pathway.

CTE Participant: A high school student who has earned credit in at least one CTE course in any pathway.

Certificated Learning Methodology[7]

- Youth Apprenticeship Program: A one or two-year school-supervised paid work experience, in which the student learns specific industry developed, state approved occupational competencies in a specific career field. The student is awarded a Certificate of Occupational Proficiency by the Wisconsin Department of Workforce Development upon successful completion of the program.

- State Certified Cooperative Education Skill Standards Program: A one-year school-supervised paid work experience in which a student is also enrolled in a DPI approved co-op class in one of the CTE education content areas. The student learns industry endorsed, state approved occupational competencies as well as general employability skills. The student is awarded a Certificate of Occupational Proficiency by the Wisconsin Department of Public Instruction upon successful completion of the program.

- Employability Skills Certificate Program: A DPI approved school-supervised paid work experience of a minimum of 180 hours wherein the student learns SCANS employability skills and develops a written career plan. The student is awarded an Employability Skills Certificate by the Wisconsin Department of Public Instruction upon successful completion of the program

- Business/Industry Sponsored Certificate Program: This is a school-supervised program of varying time or length in a specific occupational area within the sponsoring business or industry. The student takes a business/industry developed course or training, or must meet related competencies on-the-job. The certificate is awarded to the student by the sponsoring business or industry upon successful completion of the program.

[7] Definitions taken from the Wisconsin Department of Public Instruction 2016 CTEERS Field Manual. http://dpi.wi.gov/sites/default/files/imce/cte/pdf/cteers2016.pdf

Economically Disadvantaged: Student is considered economically disadvantaged if the family or student is eligible for the Aid to Families of Dependent Children program, food stamps, or the Free or Reduced Price Lunch Program. Additionally, a student meets the criteria if they are identified as low-income if the family meets federal poverty levels.

English Language Learners (ELL): ELLs include any students whose first language, or parents' or guardians' first language, is not English, and whose level of English proficiency requires specially designed instruction.

Program Area: one of six subject areas that CTE concentrators can pursue. The six subject areas are Agriculture and Natural Resources Education; Business and Information Technology Education; Family and Consumer Science Education; Health Science Education; Marketing Education; and Technology and Engineering Education.

Non-Certificated Learning Methodology[8]

- Co-op: The student is engaged in a written cooperative agreement between the school and a paying employer wherein the student receives instruction by alternation of study in school, which includes academic courses and related technical instruction, with a job in any occupational field. The instruction must be planned and supervised by the school and the employer so that each directly contributes to the student's education and employability.

- Supervised Occupational Experience: The student is engaged in an on-the-job experience designed to give the student knowledge of the skills required of an occupation under the direction of an employer, a training sponsor and/or a teacher-coordinator. The supervised occupational experience does not meet the criterion of a coop.

- Simulation: The student is engaged in an instructional classroom experience planned to give the illusion of real life from which the student may learn basic skills and competencies for an occupational area.

- Internship: The student is engaged in a school approved program where the student is placed with an employer for a specific period of time to learn about a particular industry or occupation. The student may or may not be paid.

Wisconsin Knowledge and Concepts Examinations (WKCE): These tests were the primary state assessment of student knowledge in the areas of reading language arts, mathematics, science, and social studies. Proficiency levels describe how well students performed on the statewide tests. The WKCE was pared down to just science and social studies in 2014-15, as the Badger Exam assessed reading language arts and mathematics. With the transition to the Forward Exam in the 2015-16 school year, the WKCE was discontinued entirely.

[8] Definitions taken from the Wisconsin Department of Public Instruction 2016 CTEERS Field Manual. http://dpi.wi.gov/sites/default/files/imce/cte/pdf/cteers2016.pdf

APPENDIX B: CAREER CLUSTERS AND PATHWAYS

Agriculture, Food & Natural Resources
Food products and Processing Systems
Plant Systems
Animal Systems
Power, Structural & Technical Systems
Natural Resources Systems
Environmental Service Systems
AgriBusiness Systems

Architecture & Construction
Design/Pre-Construction
Construction
Maintenance/Operations

Arts, Audio/Viedo Technology & Communications
Audio and Video Technology and Film
Printing Technology
Visual Arts
Performing Arts
Journalism and Broadcasting
Telecommunications

Business, Management & Administration
Management
Business Financial management & Accounting
Human Resources
Business Analysis
Marketing
Administrative & Information Support

Education & Training
Administration and Administrative Support
Professional Support Services
Teaching/Training

Finance
Financial and Investment Planning
Business Financial Management
Banking and Related Services
Insurance Services

Government & public Administration
Governance
National Security
Foreign Service
Planning
Revenue and Taxation
Regulation
Public Management and Administration

Hospitality & Tourism
Restaurants and Food/Beverage Services
Lodging
Travel and Tourism
Recreation, Amusement & Attractions

Human Services
Early Childhood Development & Services
Counseling & Mental Health Services
Family and Community Services
Personal Care Services
Consumer Services

Information Technology
Network Systems
Information Support and Services
Interactive Media
Programming and Software Development

Law, Public Safety, Corrections & Security
Correction Services
Emergency and Fire Management Services
Security and Protective Services
Law Enforcement Services
Legal Services

Manufacturing
Production
Manufacturing Production Process Development
Maintenance, Installation and Repair
Quality Assurance
Logistics and Inventory Control
Health, Safety and Environmental Assurance

Marketing, Sales & Service
Management and Entrepreneurship
Professional Sales and Marketing
Buying and Merchandising
Marketing Communications and Promotion
Marketing Information Management and Research
Distribution and Logistics
E-Marketing

Science, Technology, Engineering & Mathematics
Engineering and Technology
Science and Math

Health Science
Therapeutic Services
Diagnostic Services
Health Informatics
Support Services
Biotechnology Research and Development

Transportation, Distribution & Logistics
Transportation Operations
Logistics Planning and Management Services
Warehousing and Distribution Center Operations
Facility and Mobile Equipment Maintenance
Transportation Systems/Infrastructure Planning, Management, and Regulation
Health, Safety and Environmental Management
Sales and Service