

Career and Technical Education in the State of Indiana

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Prepared by KSM Consulting

in partnership with the Central Indiana Corporate Partnership

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FOREWORD

By the Central Indiana Corporate Partnership

The Central Indiana Corporate Partnership (CICP) has long been focused on the state's talent pipeline. A world-class workforce is a necessary condition for the sustainable prosperity and quality of life that CICP and our initiatives strive every day to create at the behest of our members. We were recently asked by one of our members, the Richard M. Fairbanks Foundation, and the Chairman of the Governor's Workforce Cabinet to support the Cabinet on several initiatives, including a review of the sources and uses of funds associated with Indiana's workforce development programming.

This review found that funding in support of career and technical education (CTE) comprises a relatively large share of the state's workforce development dollars. CTE is also of increasing interest to Indiana policymakers and business leaders. However, the CTE system in Indiana is widely misunderstood, and for good reason. It is funded by a mix of both state and federal dollars. Outcomes and outputs can vary widely depending on specific areas of study. Multiple agencies play a role in its administration at the state level. And at the local level, CTE is delivered by specifically-developed CTE Districts, which are groups of school corporations that have joined together to offer CTE.

In an attempt to demystify CTE, CICP engaged KSM Consulting to develop the accompanying report. This report is intended to support productive, ongoing conversations among state policymakers on how to best invest in CTE by providing education and information related to the current system. The report validates many preconceived notions while also providing new insight into the complexity of Indiana's CTE system. Individual readers will undoubtedly discover any number of interesting findings. For our part, in undertaking this research we at CICP found four insights to be particularly significant to the state's ongoing efforts to refine and improve Indiana's CTE system.

Lack of transparency limits understanding of effectiveness.

A theme present throughout the report is the lack of consistent, readily available data and information relevant to CTE. For example, local agreements between school corporations and CTE Districts, the primary providers of CTE in Indiana, are not readily accessible for a systematic review. These agreements, according to some, limit the ability of individual school corporations to act independently in the interest of their students.

The agreements also dictate spending among school corporations and CTE Districts, including more than \$110 million in state funds and another \$25 million in federal funds that flow through the state annually. It is made further difficult to discern how these funds are used as spending data from prior years is viewed as being of questionable validity, and there is no known data on the actual cost to deliver CTE curriculum.

Additionally, data regarding CTE-specific outcomes, such as the number of students who earn industry credentials, is incomplete at best as a result of some outcomes being realized after students graduate from high school and limited longitudinal tracking information. Meanwhile, required performance reports include minimal data specific to CTE curriculum and the state-required reporting that drives CTE Per Pupil funding focuses solely on course enrolment while excluding data related to course completion or related outcomes.

While the transparency should be enhanced, this should occur within the context of the goals of the CTE system. Only after defining such goals, should the state seek to implement reforms that allow for the on-going collection and analysis of consistent data needed to enable iterative and responsive adjustments to the system moving forward.

The alignment of CTE systems can be improved.

Given the number of actors that play a role in delivering CTE it is no surprise that Indiana's CTE systems could be better aligned. For example, the state incents specific CTE subject areas through a tiered funding model. However, these dollars go to local school corporations while curriculum decisions and CTE delivery generally reside with one of the state's 49 CTE Districts. This, coupled with the lack of information and data described above, yields a systematic alignment challenge that is extraordinarily difficult to adjust at the local level given the multi-party agreements and distributed governance in most CTE Districts.

Further misalignment appears in that federal funding made available through the Carl D. Perkins Career and Technical Education Act seems to drive much of the CTE system structure (e.g. the formation of CTE Districts and CTE reporting requirements). Yet, Perkins funding amounts to less than a quarter of what the state directly spends on CTE. If the state decided to allow or mandate its funds be distributed in a different fashion or required different types of reporting to allow for greater transparency, it could choose to do so.

Finally, though it is not fully explored in the accompanying report, additional issues regarding systems alignment are potentially present with regard to the role of post-secondary institutions and the credits they award to CTE students. CTE is positioned to give students a head start earning post-secondary credit while still in high school, yet secondary and post-secondary courses intended to impart the same skills can be structured differently throughout the state. There are almost certainly opportunities to better coordinate the offering and awarding of "dual credits" in a systematic and consistent fashion.

CTE course valuation could be better oriented towards the future of work.

As mentioned above, the state has attempted to push certain CTE subject areas through increasing associated funding and a tiered funding model. Yet, the formula used by Indiana's Department of Workforce Development (DWD) to determine the value of CTE courses relies heavily on data illustrative of labor market demand and occupations as they currently exist. The most forward-looking variable included in DWD's methodology is a 10-year forecast. It accounts for only a small portion of the valuation formula, and it is occupation-focused.

While education should undoubtedly prepare students for entry into the workforce in the short-term, it should also prepare students for a lifetime of work and the associated skills, which may be less occupation-specific. In recent research on the nature of Central Indiana's labor market, scholars at the Brookings Institution note the following:

Central Indiana and the state have invested in thoughtful and directed efforts to train workers and students for in-demand skills...However, the findings of this report and other recent prominent research suggest not only waning future demand for those occupation-specific skills that currently secure a middle-class lifestyle, but a shrinking shelf life of nearly any highly-specific training at all.

Brookings scholars go on to note that "training in reasoning abilities and problem identification is critical" to a worker's ability to navigate the future labor market and access good, well-paying jobs. CTE can, of course, play a valuable role in imparting such abilities, but it requires CTE curriculum do more than connect high school to today's occupations.

Given the current CTE funding structure, there is real risk that the state is not setting up young CTE students for long-term economic success. As the state continues to rethink CTE, including new approaches to incenting desired outcomes, it has the opportunity to ensure that the future of work is better contemplated. Additionally, thoughtful implementation of the state's new graduation pathways requirements, which include work-based learning and CTE components, can emphasize the importance of skills and abilities that are most likely to enable long-term economic success as well as potentially prompt better alignment of CTE actors and funding streams.

The strategic objective of CTE should drive system reforms.

In light of the issues raised above, the state should clarify its objective as it pertains to CTE in order to ensure decisions on structure, funding and curriculum flexibility reflect those objectives. If CTE is intended to smooth the near-term transition from school to work, then how does it also ensure young Hoosiers leave school with the practical on-the-job skills of the workplace? If CTE is intended to prepare students for both the near- and long-term nature of work, then how can it be ensured that skills-based education is taught in a manner that imparts reasoning and problem-solving abilities and encourages student learning of multiple industries and occupations? In both cases, how is the expectation set that a first job is likely a first of many, and that lifelong learning is an important aspect of a sustained and successful career journey? Improving data collection and availability, realigning systems, and revising funding formulas without first clarifying why such actions need to be taken will likely lessen the chance that CTE skills-related outcomes are improved.

In advance of the upcoming session of the General Assembly, many state policymakers and thought leaders have continued to elevate the role of CTE in preparing young Hoosiers for work. The issues raised in this report coupled with the pace of technological disruption and the changing nature of work demands urgency in clarifying the role of CTE, and education more generally, in creating a world-class workforce.

Indeed, if Indiana is to increase its economic competitiveness and global relevance in the years ahead, we must make strategic, intentional investments in ensuring Hoosiers have the skills and abilities needed to succeed both now and in the future. CTE can play an important role in imparting such skills and abilities, and its role in doing so can be improved with strategic investments. CICP is hopeful that the accompanying report aids in guiding such investments in the years ahead.

EXECUTIVE SUMMARY

With the generous support of the Richard M. Fairbanks Foundation, the Central Indiana Corporate Partnership engaged KSM Consulting (KSMC) to conduct a review of Indiana’s Career and Technical Education (CTE) system. In recent years, policymakers and educators have given renewed attention to CTE. Formerly known as “vocational education,” CTE is intended to provide primarily high school-aged students with the skills demanded by employers to better prepare them for entry into the workforce.

CTE in Indiana is delivered at the local level through a variety of arrangements with funding from state and federal sources. As a result, there is no standard model through which CTE is delivered. This report attempts to clearly explain at a high level how CTE in Indiana is funded, managed, and operated. To do so, this report summarizes observations gleaned through research, document reviews, and conversations with a wide range of professionals, including, but not limited to, approximately two-dozen individuals involved with Indiana’s CTE programming, agency staff of the Indiana Department of Workforce Development (DWD) and the Indiana Department of Education (IDOE), current and former CTE District directors, program instructors, current and former school system superintendents, principals, administrators, students, teachers, and employers.

This report is intended to enable a productive dialogue concerning the state’s support of CTE. CTE is nuanced and complicated, requiring more time and resources to fully explore than permitted with this undertaking. This report, which was developed over three months, does not touch upon or explore every facet of CTE. It does present an overview of how CTE is administered in Indiana. This is followed by a description of how CTE is funded as well as summary statistics that aid in illustrating CTE. The report concludes with a consideration of CTE’s impact in the State of Indiana, including suggestions on how thinking about and measuring the state’s progress towards desired outcomes may be enhanced in the years ahead.

Administration and Curriculum

CTE continues to prepare students for careers consistent with traditional vocational education, such as those in the skilled trades. It also increasingly includes subjects associated with STEM and tech-related fields. Regardless of the area of education, CTE focuses on hands-on, “real world” skills, requiring capital-intensive investments in materials needed to impart practical knowledge. According to some with history in the CTE field, the capital-intensive investments required by CTE almost certainly led to the formation of CTE Districts, the primary provider of high school CTE in Indiana.

CTE Districts

CTE Districts are generally collaborations among local school corporations for the purposes of CTE delivery. The formation of CTE Districts is enabled by Indiana statute, which allows two or more local school corporations to jointly offer career and technical education if the governing bodies of the school corporations agree. Today, there are 49 CTE Districts in Indiana.

Indiana Code requires each CTE District to be overseen by a board that includes a representative from each member school corporation. Indiana Code also specifies that a CTE District's board must approve the CTE District's course offerings. If the CTE District board does not approve the offering of a course, then a majority of the member school boards may override the CTE District board's decision. This requirement could serve as a barrier to school corporations choosing to offer a CTE course on their own because without the approval of the full CTE District board, a school corporation will not receive state CTE Per Pupil Funding. Indeed, Indiana Code does not appear to readily enable a single school corporation to have much leverage over its CTE District.

The daily administration of each CTE District is undertaken by a CTE Director. Each CTE Director's responsibilities vary based on the agreements entered by member school corporations. Generally, each CTE District within Indiana operates using one of the following three broad models:

1. **Regional Career Center:** Multiple school corporations have entered into a partnership via an agreement wherein a career center provides CTE to students from the schools within the partnership.
2. **Regional Cooperative:** Multiple school corporations, having entered into a cooperative agreement, send their students to CTE courses located at a school belonging to a member school corporation.
3. **Congruent CTE and School:** There is a single school corporation within a CTE District in this model.

Each school corporation pays fees to its CTE District to cover the cost of providing education to each student the school corporation sends to the CTE District. These fees are determined between each school corporation and its CTE District. The exact fees paid by school corporations to their respective CTE District is not readily available via public sources, neither is information on the calculations or methods used to determine the fees. An informal survey of the state's CTE Directors found that fees range from \$2,500 to \$4,900 per student. However, these fees are not reported to the state and Indiana Code offers minimal guidance on the topic.

CTE Curriculum

In Indiana, CTE curriculum is comprised of 180 approved courses approved by the State Board of Education (SBOE). Each course is assigned to a cluster/pathway so that the value of the course can be determined (a process further described below). Additionally, a maximum credit value or credit range is assigned to each CTE course. Many CTE courses allow up to three credits per semester (six total credits per academic year) to be awarded following completion of the course as many courses require more classroom time than a typical high school course. Each CTE District determines the number of credits for a CTE course within the range authorized by the state.

CTE courses feed into a model that includes clusters, pathways, and courses. A career cluster refers to a high-level industry or sector with similar careers. Students who participate in CTE are categorized by the number of courses they take and how far down a pathway they travel.

1. Participants are students who have earned one or more credits in any CTE course.

2. Concentrators are students who have earned six or more credits in one CTE pathway.
3. Completers are CTE concentrators who have completed a sequence of courses in a pathway plan and have taken the pathway assessment.

Certain secondary CTE programs have end-of-pathway assessments designed to measure skills attainment for CTE concentrators. Structuring and sequencing CTE courses in an intentional manner can enable students to earn industry-recognized credentials and/or post-secondary credit while completing CTE coursework. CTE Directors are responsible for ensuring pathway assessment requirements are followed by each school within a CTE District.

Funding Sources and Uses

CTE is funded with a mix of state and federal dollars. The State of Indiana provides the largest share of funding through a portion of the IDOE’s K-12 budget. Federal funding is provided through the Carl D. Perkins Career and Technical Education grant. Together these funding sources, provide the dollars that directly support delivery of CTE education. The state also indirectly supports CTE education through payments made to Ivy Tech Community College and Vincennes University to incentivize the award of dual credits. As illustrated in Table ES1, these funding streams and smaller amounts intended to incent specific outcomes and IDOE administrative funds added up to over \$162.4 million in the 2017-2018 state fiscal year.

Table ES1. CTE Budget for 2017-2018 State Fiscal Year¹

	2017 - 2018 Funding Amount	Share of Total
State Funding Sources		
CTE Per Pupil Funding	\$113,863,650	70%
Ivy Tech Dual Credit	\$12,989,150	8%
Vincennes Dual Credit	\$3,933,800	2%
Incentive Funding	\$5,000,000	3%
CTE Admin for IDOE	\$1,212,903	1%
State Funding Subtotal	\$136,999,503	84%
Federal Funding Sources		
Perkins Grant	\$25,427,705	16%
Total CTE Funding	\$162,427,208	100%

In the last state fiscal year, the State of Indiana spent more than \$7 billion of its general fund on K-12 education. As illustrated above, \$113.9 million, or 1.61% of the state’s direct expenditures on K-12 education, supported CTE. CTE funding is provided in addition to the basic per pupil grant every Indiana school corporation receives for each student it serves. This means that the extra funding associated with

¹ Amounts provided are budgeted except for “CTE Per Pupil Funding,” which is the IDOE’s actual distribution to school corporations in support of CTE delivery as reported by the IDOE (<https://www.doe.in.gov/sites/default/files/finance/tuition-support-report-092318-final.pdf>). CTE Per Pupil Funding is not a line item in the state budget but rather a portion of the IDOE’s budget for K-12 education. The “Perkins Grant” includes a grant of \$24,933,705 and state matching funds totaling of \$494,000.

CTE courses effectively serves as an incentive to encourage school corporations to offer CTE and provides the appropriate funding to pay for equipment, materials, and instructors.

CTE Per Pupil Funding is provided to Indiana school corporations based on their reporting of CTE course enrollment in accordance with the following formula:

$$\text{Total CTE Per Pupil Funding} = \text{Course Value} \times \text{Credit Hours} \times \text{Students Enrolled}$$

Course value is determined by DWD in accordance with Indiana Code as required by Senate Enrolled Act 198-2017. This law requires DWD to submit a report with recommendations to the State Board of Education (SBOE) on designating the value of each CTE course. The designations place each CTE course into one of the three categories of value: High Value, Moderate Value, or Less than Moderate Value. Such values—\$680, \$400, and \$200, respectively—are multiplied by student credit hours to determine how much funding a school corporation is paid by the state. The current, 2018-2019, school year is the first year in which these course values are effective.

In addition to course values, each CTE course also has an assigned credit or credit range. School corporations and CTE Districts decide how many credits for which a course will be offered locally within the state assigned range. Indiana does not have a “seat time” requirement, meaning that there is not an actual amount of time (hours, minutes) required for a course. Thus, the total CTE Per Pupil Funding for a course with the same course title and designed to meet the same standards may vary across CTE Districts. For example, a \$680 course may be taught in one district as a 3-credit hour course, and it may be taught in another district as a 1-credit hour course. Therefore, the funding paid to each school corporation would be \$2,040 and \$680, respectively.

While most CTE funding in Indiana comes from CTE Per Pupil Funding, much of the CTE structure seems to be built around the federal Perkins grant the state receives each year. In the 2017-2018 school year, Indiana received approximately \$24.69 million in Perkins funding. Of this funding, 93% was distributed to local programs, including \$13.8 million to secondary CTE Districts, \$7.16 million to postsecondary CTE programs, and \$2 million to small and rural district grants.

One of the more confusing aspects of CTE is the funding relationships. CTE Per Pupil Funding goes to school corporations that ostensibly use the money to pay fees to CTE Districts, as described above. Perkins dollars are awarded to CTE Districts using a federally prescribed formula. Federal law also requires grants to be at least \$15,000, which limits the state’s ability to redirect the funding. Additional insight into the use of both CTE Per Pupil Funding and Perkins dollars is limited for the reasons described above. As a result, it is difficult to assess the responsiveness to changes in state funding formulas and funding-related incentives or identify alternative funding scenarios.

CTE Facts and Figures

The State of Indiana Management Performance Hub (MPH) maintains a growing warehouse of connected education and workforce data to help inform workforce and education related policy decisions. MPH served to facilitate access to datasets originating from IDOE, DWD, and CHE. The following data

adds a contextual understanding around CTE enrollment, course offerings, CTE Districts, and funding flows.

In each of the previous three school years, around half of all Indiana public high school students took at least one CTE course. Thus, CTE clearly offers an opportunity to reach and positively impact the lives of thousands of students annually. Because CTE allows students the opportunity to both to explore and focus on a range of potential career options, it is important to consider the manner in which Indiana high schoolers participate in CTE such that policymakers can drive it towards maximum impact.

For 2017-2018, 170,748 Indiana high school students enrolled in any CTE course. About 37% took either only an introductory course (16%) or a foundational course (21%), likely indicating that they were exploring careers or technical subjects of interest to them. Most CTE students, 108,324, were enrolled in at least one more advanced CTE course instead of or in addition to a foundational or introductory, likely indicating a more focused interest in a subject or career path. Interestingly, over the previous three school years, the observed rate of students taking only foundational or only introductory courses has declined. Meanwhile, the rate of students taking any CTE course other than foundational or introductory has increased each year suggesting greater focus on a specific career path or subject area.

While students take non-introductory and non-foundational courses at a high rate, this does not necessarily translate into a high rate of CTE concentrators or completers. Over the past 10 years, the number of students participating in CTE has steadily increased, rising from just over 53,300 among the graduating class of 2008 to over 70,500 among the graduating class of 2017. While this increase was possibly driven in part by state accountability requirements that incent certain CTE-related outcomes, the number of CTE concentrators has decreased from over 26,200 in the 2008 cohort to just over 20,700 in the 2017 cohort. What causes a student to become a completer or concentrator was not studied for this report. Nevertheless, many students who participate in CTE do not pursue completion or concentration. This might imply that CTE provides a valuable opportunity for high school-aged students to explore potential careers and post-secondary opportunities without significant personal investment or that students are unaware of or do not find value in the opportunity to become completers or concentrators.

An analysis of course offerings also yields interesting results. Six of the ten most popular CTE courses are either foundational or introductory. Foundational and introductory courses remain very common even while most CTE students go on to take a more advanced course. Though analysis of student pathways was not completed for this report, that so many students enroll in foundational and introductory courses and also take more advanced courses may imply that foundational and introductory courses do indeed serve as a way to learn about multiple subjects before further focusing on a specific pathway.

The ten most popular courses were offered at nearly each of the state's 49 CTE Districts. This is also true of the ten most popular CTE courses that are neither foundational nor introductory. These courses are also mostly limited to one credit per semester. The CTE courses with the lowest enrollment for the 2017-2018 school year were, unsurprisingly, only offered at a few of the state's CTE Districts. It is not immediately clear why these classes were less common. Nine of the ten least popular courses may be

offered for up to three credits per semester, which could imply that they tend to require more of a participating students time, potentially limiting the number of students capable of participating.

It also seems plausible that many of the least popular courses also have higher costs associated with them, meaning it may be more difficult for the course to be offered. Though there is not data available to assess how the cost of delivery varies by course, among the least popular courses are Heavy Equipment II and Tractor/Trailer Operation which would seemingly require a school to provide its students access to a heavy equipment and tractor-trailers. Better data on the cost of delivery could aid state policymakers in restructuring CTE-related incentives.

Current incentives are tied to employer demand for the skills associated with a course as determined by DWD. The more in-demand a course's skills, the higher the course's value and the more money the state gives Indiana school corporations per credit a student is enrolled in the course. As such, one would assume that CTE Districts and school corporations are offering high-demand courses at the maximum credits allotted in order maximize state funding. However, analysis undertaken for this report suggests otherwise. A review of high-demand course offerings found that CTE Districts and school corporations do not act with anything approaching uniformity in response to maximizing state incentives.

The causes of this variation could be numerous and are certainly worth further exploration. As mentioned previously, data on the cost of delivery is all but impossible to attain, yet many CTE courses would seemingly carry high delivery costs if they are to be taught in a robust manner. Another possibility for the variation is simply reporting error. CTE is unique among high school curriculum in that CTE courses can be offered for multiple credits. More than once in developing this report concerns regarding data integrity, driven in part by the unique nature of CTE, were shared.

Another possibility driving the lack of uniformity is the misalignment of incentives relative to CTE actors. As described above, CTE Per Pupil Funding flows from the state to school corporations. However, much of the state's CTE delivery is carried out by CTE Districts and decisions regarding CTE education are frequently delegated to CTE Directors. Funding flows from school corporations to CTE Districts may or may not be aligned with changes in state incentive structures. As described above there is no readily available window into the agreements between school corporations and CTE Districts, so it is difficult to assess how responsive they are to state incentives.

Return on Investment Analysis

There have been prior efforts to quantify the impact of CTE in Indiana. However, given recent and ongoing changes to CTE in Indiana, an updated impact analysis is needed. Unfortunately, several data limitations prevent a robust ROI calculation. As a result, using more readily accessible data, this analysis identifies the wage differential between CTE participants and CTE concentrators among those who earned a post-secondary credential and those who did not.

Annualized wage outcomes associated with post-secondary completion of those who were CTE concentrators during secondary education was \$35,610. However, it is likely that by the time students earn a post-secondary credential, the impact of CTE is diminished due to the compounding effect of post-

secondary education. In other words, the effects of post-secondary attainment supersede the effects of high school CTE participation, making it difficult to assess the impact of CTE on one's earnings.

When one factors out attainment of a post-secondary credential from the equation and completely separates CTE participants from CTE concentrators who went directly into the workforce, the impacts become more pronounced. Annualized median wages among CTE participants amount to just over \$18,000, while the annualized mean wage among concentrators is more than \$19,600. This 8% wage premium among CTE concentrators, as compared to participants, implies concentration has positive effects. That said, the annualized median earnings of both CTE participants and CTE concentrators who did not earn a post-secondary credential are rather low. These median wages suggest some students may live in poverty. The 2018 US Federal Poverty Guidelines the annual poverty amount which state set for a single person is \$12,140.² The median wages are well short of the \$37,440 that a recent Brookings Institution study found is needed to make ends meet in Central Indiana.³

Given the increased attention being paid to CTE, the state has the opportunity to uncover significant insight into the return on investment of CTE programming by changing what information is collected and by conducting additional analysis on available data. A 2015 report from the W.E. Upjohn Institute for Employment Research, published by the U.S. Department of Education's National Research Center for Career and Technical Education, provides a robust framework for calculating the ROI of CTE. However, in considering an ongoing effort to measure CTE's effectiveness, the state should not overlook the ever-changing nature of work, particularly as it relates to automation and other disruptive technologies. Indeed, the evolving nature of the workforce landscape presents some limitations on calculating ROI, including likely diminishing returns in areas of CTE that are subject to automation.

Nevertheless, the attention being paid to CTE and the increasing abilities of the Management Performance Hub provide the state the opportunity to systematically measure and evaluate the ongoing outcomes of CTE. Improving the collection, validity, and robustness of data is a first step in doing so. However, better data must also be accompanied by its strategic use. Clearly defining goals relative to CTE—be they future earnings, career exploration, or simply educational attainment—is critical to ensuring effective use of data. Further, accounting for the future of work by preparing students to adapt must be a critical component of both CTE delivery and attempts to measure its effectiveness.

Indiana once led the nation in launching state-wide support of what is now known as CTE. With passage of the Indiana Vocational Law in 1913, the State of Indiana funded CTE-like education four years before the federal government made similar investments. A confluence of factors now positions Indiana to yet again lead the nation in advancing CTE to produce a workforce for the remainder of the 21st Century.

² <https://www.in.gov/judiciary/adr/files/poverty-guidelines.pdf>

³ <https://www.brookings.edu/research/advancing-opportunity-in-central-indiana/>

INTRODUCTION

In recent years, policymakers and educators have given renewed attention to Career and Technical Education (CTE). Formerly known as “vocational education,” CTE is intended to provide primarily high school-aged students with the skills demanded by employers to better prepare them for entry into the workforce. In Indiana, the General Assembly has considered an average of five pieces of CTE related legislation, each year since 2013.⁴ Indiana is not alone in paying renewed attention to CTE. A recent *Wall Street Journal* article cited an analysis finding that in 2017 alone, 49 states enacted 241 policies in support of CTE.⁵

CTE in Indiana is delivered at the local level through a variety of arrangements with funding from both state and federal sources. As a result, there is no standard model through which CTE is delivered. This report attempts to clearly explain how CTE in Indiana is funded, managed, and operated. It does so by summarizing observations gleaned through research, document reviews, and conversations with a wide range of professionals, including, but not limited to, approximately two-dozen individuals involved with Indiana’s CTE programming, agency staff of the Indiana Department of Workforce Development (DWD) and the Indiana Department of Education (IDOE), current and former CTE District directors, program instructors, current and former school system superintendents, principals, administrators, students, teachers, and employers.

Everyone that provided input into this report expressed enthusiasm for the goals of CTE and its ability to positively impact the life of CTE students. Nearly everyone also expressed some desire to see improvements in the administration and delivery of CTE. The recent volume of state and national CTE-related policies demonstrates that improving the administration and delivery of CTE is a priority for policymakers. There is good reason for this: in 2017-2018, over 170,000 Indiana public high school students, more than 52% of high schoolers, took at least one CTE course.

This report is intended to enable a productive dialogue around the State of Indiana’s support for CTE. As with any topic related to education, CTE is nuanced and complicated, requiring more time and resources to fully explore than permitted with this undertaking. This report, which was developed over three months, does not touch upon or explore every facet of CTE. It does present an overview of how CTE is administered in Indiana. This is followed by a description of how CTE is funded as well as summary statistics that aid in illustrating CTE. The report concludes with a consideration of the State of Indiana’s return on its investment (ROI) in CTE, including suggestions on how thinking about and measuring the state’s ROI may be enhanced in the years ahead.

⁴ Unpublished analysis presented by the National Conference of State Legislatures on October 4, 2018 at a briefing it hosted entitled “Building Tomorrow’s Workforce: Learning from World Leaders and Exploring Indiana’s Best Practices.”

⁵ <https://www.wsj.com/articles/college-or-trade-school-its-a-tough-call-for-many-teens-1520245800>

ADMINISTRATION AND CURRICULUM

CTE provides skills-based education to prepare students to enter the labor market, and the delivery and content of CTE is somewhat unique. This is particularly so when compared to traditional, lecture-based education in that CTE requires students to gain experience working with the same materials and equipment used by practitioners in the students' area of study. As a result, both Indiana and the federal government have made multiple direct, targeted investments in CTE that have led to today's CTE system.

Indiana made its first investment in CTE in 1913 when the Indiana General Assembly passed the Indiana Vocational Law.⁶ This law "aimed to give the young people of the state vocational training which would fit them definitely and efficiently for productive work in agriculture, trades, and industries, and in the business of homemaking."⁷ Four years later, the United States Congress followed suit with the passage of the Smith-Hughes Act. Indiana received \$43,900 from the federal government and divided the funding between vocational teacher training and salaries of those who taught trade, home economics, industrial, and agricultural subjects.⁸

In the one hundred years since, laws and funding at both the state and federal level have naturally adapted, but the focus of CTE education today is not altogether dissimilar from its initial focus on "agriculture, trades, and industries." Today, CTE continues to prepare students for careers consistent with traditional vocational education, such as careers associated with skilled trades. CTE also increasingly includes subjects associated with STEM and tech-related fields. Regardless of the area of education, the CTE focuses on hands-on, "real world" skills, requiring capital-intensive investments in materials needed to impart practical knowledge.

CTE Districts

According to those with a long history in the CTE field, the capital-intensive investments required by CTE almost certainly led to the formation of CTE Districts, the primary provider of CTE in Indiana. CTE Districts are generally collaborations among local school corporations for the purposes of CTE delivery. The formation of CTE Districts is enabled by Indiana statute, which allows two or more local school corporations to jointly offer career and technical education if the governing bodies of the school corporations agree.⁹ Today, there are 49 CTE Districts in Indiana, as illustrated in Figure 1 and listed in Appendix 1. Because CTE Districts are conglomerates of local school corporations, the shape of each CTE District is dictated by the aggregation of the geographic boundaries of each member school corporation.

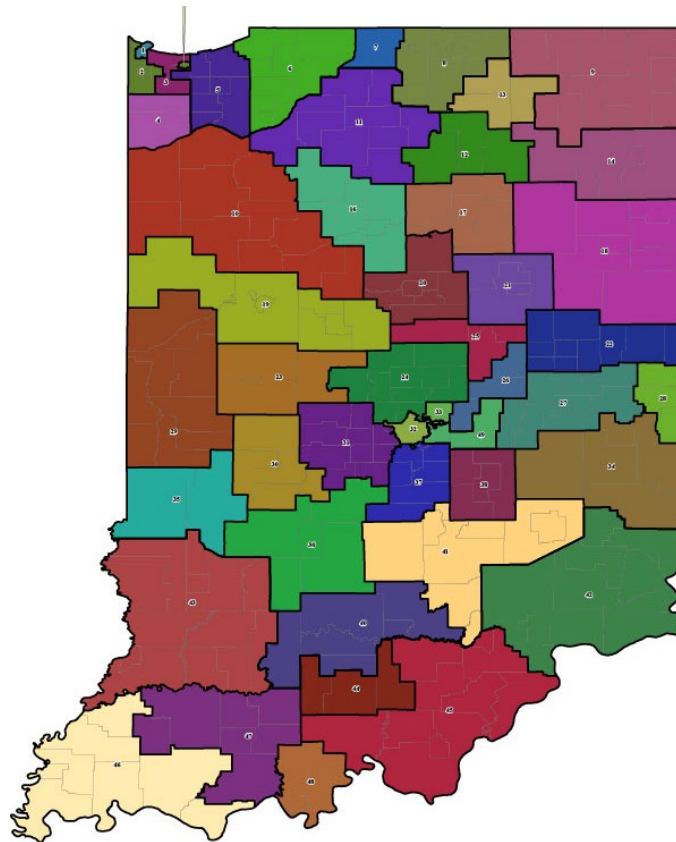
⁶ Esarey, Logan, and William F. Cronin. *History of Indiana from Its Exploration to 1922*. Vol. 3.

⁷ Prichard, Dora G. "A History of Secondary Education in Indiana, 1910-1920." *Indiana State Teachers College*, 1941.

⁸ *Ibid.*

⁹ Indiana Code 20-37-1-1.

Figure 1. Map of Indiana CTE Districts¹⁰



Governance Structure

Indiana Code requires each CTE District to be overseen by a board that includes a representative from each member school corporation. This board “may adopt a plan of organization, administration, and support for the [CTE District]. The plan, if approved by the state board [of education], is a binding contract between the cooperating school corporations.”¹¹ State code further permits the board of each CTE District to enter into agreements to acquire by lease or purchase buildings or equipment and form an executive committee that is permitted to “exercise the authority of the full board” in the management of the CTE District. Information on contracts between CTE Districts and school corporations, the make-up and meetings of CTE executive committees, and assets owned by CTE Districts are not readily available to the public.¹²

Each of the state’s CTE Districts are required by Indiana Code (IC 20-37-2-10) to establish “an advisory committee composed of members representing local trades, industries, and occupations” to advise the

¹⁰ <http://www.iacted.org/index.php/directors>

¹¹ Indiana Code 20-37-1-1

¹² Neither Indiana Association of Career and Technical Education Districts (IACTED) nor IDOE currently have a full inventory of each CTE District agreement. Therefore, reviewing all agreements would require reviewing documentation held by each CTE District and/or local school corporation.

CTE District board. Indiana Administrative Code (511 IAC 8-2-7) further requires school corporations to maintain advisory committees for their vocational programs as well as each “program area” within the vocational program. For example, an HVAC-related CTE program might maintain an advisory committee which may be made up of local HVAC business owners and professionals. The two types of advisory boards are locally known as “general advisory” and “program advisory” boards. These advisory boards serve as a direct link between CTE Districts, educators, school corporations, students, and local and regional employers and businesses. The records relating to committees, membership rosters, and minutes, are maintained at the CTE District level.

Indiana Code also specifies that a CTE District’s board must approve the CTE District’s offering of a course. If the CTE District board does not approve the offering of a course, then majority of the member school boards may override the CTE District board’s decision (see IC 20-37-2-11). This requirement could serve as a barrier to school corporations choosing to offer CTE course on their own. Indeed, Indiana Code does not appear to readily enable a single school corporation to have much leverage over its CTE District.

The IDOE recently developed a “CTE District Transfer Form” that a school corporation wishing to transfer from one CTE District to another may complete and submit to IDOE.¹³ However, this document does not actually fulfill a request to transfer, it serves more to provide notification to IDOE. No additional information is publicly available that specifies how a school corporation is able to withdraw from its CTE District. It appears as though the only formal way in which a participating school corporation may depart a CTE District is through dissolution of the district, which requires a majority vote of the district board as per state code. Additional procedures for reorganization or withdrawal may or may not be found in a CTE District’s plan of organization. In recent years there are isolated examples of changes to CTE Districts. Whitley County Consolidated Schools recently moved to a different CTE District.¹⁴ Additionally, the Metropolitan School District of Pike Township withdrew from CTE District 24, the J. Everett Light Career Center.¹⁵ Pike Township now operates as a single school corporation in CTE District 24A. The precise way in which Pike was able to separate to become its own CTE District is not clear.¹⁶

¹³ <https://www.doe.in.gov/sites/default/files/cte/area-cte-district-transfer-form.docx>

¹⁴ <https://www.doe.in.gov/sites/default/files/cte/2017-2018-perkins-districts-allocations-facts-and-observations-6-7-17.pdf>

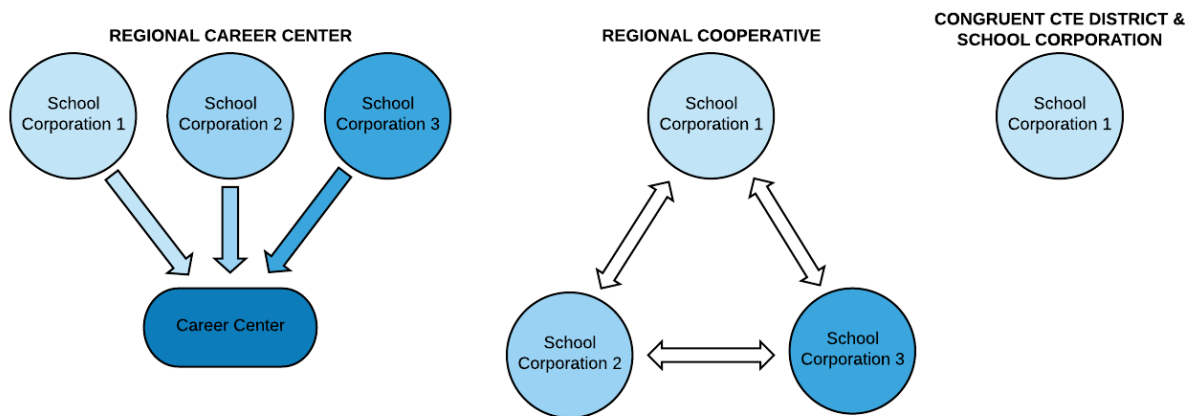
¹⁵ J.E Light Career Center participating districts include: #5370 MSD Washington, #0665 Lebanon, #3070 Noblesville, #3005 Hamilton Southeastern, #3025 Hamilton Heights, #3055 Marion Adams, #3030 Westfield Washington, #0630 Eagle Union, #3060 Carmel Clay.

¹⁶ In speaking with individuals at Pike High School about the decision to separate from J. Everett Light, there did not appear to be a standard process by which a school corporation could withdraw from a CTE District. Instead, the Metropolitan School District of Pike Township engaged attorneys to negotiate with IDOE in order to for it to become its own CTE District.

Operating Models

The daily administration of each CTE District is undertaken by a CTE Director. Each CTE Director's responsibilities vary based on the agreements entered by member school corporations. Generally, each CTE District within Indiana operates using one of the following three broad models:

Figure 2. CTE District Structures



1. **Regional Career Center:** Multiple school corporations have entered into a partnership via an agreement wherein a career center provides CTE to students from the schools within the partnership. The career center may be stand alone or may be located within a high school. Students travel to the career center when enrolled in CTE courses under this model. Participating school corporations may host some CTE courses at their own schools rather than the career center. Doing so is subject to the agreements between the school corporations and CTE Districts. This is the most prevalent model of CTE delivery with more than half of all CTE Districts employing a variation of the model.
2. **Regional Cooperative:** Multiple school corporations, having entered into a cooperative agreement, send their students to CTE courses located at a school belonging to a member school corporation. There may be multiple locations providing different types of CTE. For example, one school may have automotive CTE programs while a different school may offer cosmetology CTE programs, all of which are open to enrollment by students in other schools in the cooperative. Around a dozen CTE Districts utilize a variation of this model.
3. **Congruent CTE and School:** There is a single school corporation within a CTE District in this model. CTE programs may be delivered at a high school within the school corporation or the school corporation may have its own career center. Generally, this model only provides CTE to students enrolled within the respective corporation. Fewer than ten CTE Districts operate with this model, and nearly all of them are larger, urban school corporations.

Each school corporation pays fees to its CTE District to cover the cost of providing education to each student the school corporation sends to the CTE District. These fees are determined between each

school corporation and its CTE District. The districts interviewed for this report all sent enrollment fee agreements to sending schools that included a base enrollment fee and, in some cases, additional fees for supplies. The interviewed districts provided a record of fees to the sending schools annually, with some updates or adjustments based on the CTE Districts costs.

The exact fees paid by school corporations to their respective CTE District are not readily available via public sources, nor is information on the calculations or methods used to determine the fees. These fees are not reported to the state and Indiana Code offers minimal guidance for fees on the topic. State code does state that CTE Districts may “require students enrolling in this system to pay a reasonable tuition fee” and “differentiate between students living in the attendance unit and those living outside the attendance unit in the amount of tuition charged.”¹⁷

The Indiana Association of CTE Directors (IAC TED) conducted an informal survey of its membership to collect information on CTE District fees in 2017. About half of Indiana’s CTE Districts reported the fees they charge their member school corporations for each student enrolled in CTE courses. It is unclear if the fees listed applied to every student, regardless of course enrolled, or was more limited. Nevertheless, the fees ranged from \$2,500 to \$4,900 per student.

In summary, the state has limited systematic insight into relationships between CTE Districts and school corporations. Short of reviewing documents held by each of the state’s CTE Districts and local school corporations, there appears to be no opportunity to gather information on these inter-governmental relationships that spend millions of state dollars and educate thousands of Hoosier children each year.

CTE Curriculum Structure

CTE curriculum in Indiana’s high schools follows a model that includes clusters, pathways, and courses. A career cluster refers to a high-level industry or sector with similar careers. As illustrated in Figure 3, below, there are 12 career clusters in Indiana’s CTE curriculum ranging from agriculture to transportation and logistics (Appendix 2 provides a brief description of each cluster). These 12 clusters include 64 pathways, which are focused on more specific careers, and comprised of a subset of 180 unique courses.

Each of Indiana’s CTE courses receive approval from the State Board of Education (SBOE) for their inclusion in CTE curriculum. Each course is assigned to a cluster/pathway so that the value of the course can be determined (a process further described below). Additionally, a maximum credit value or credit range is assigned to each CTE course. Many CTE courses allow up to three credits per semester (six total credits per academic year) to be awarded following completion of the course as many courses require more classroom time than a typical high school course.¹⁸ Within the state-approved range, each CTE District determines the number of credits that it will award to a student who completes a CTE course. Therefore, throughout the state CTE courses bearing the same name and designed to meet the same

¹⁷ IC 20-37-2-1 (b)

¹⁸ It is common for many CTE courses to last half of the school day.

state standards could have a varying number of credits associated with them depending on the location of delivery.

Figure 3. Clusters, Pathways, Courses

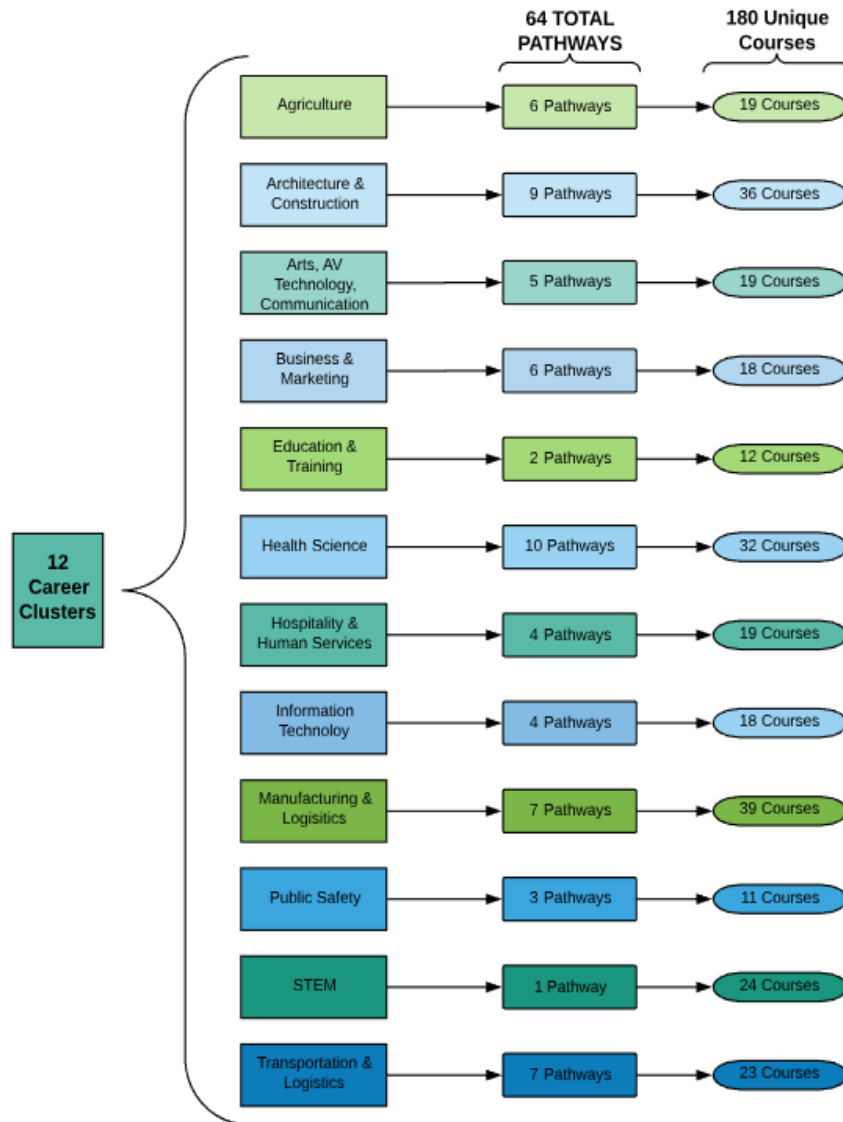
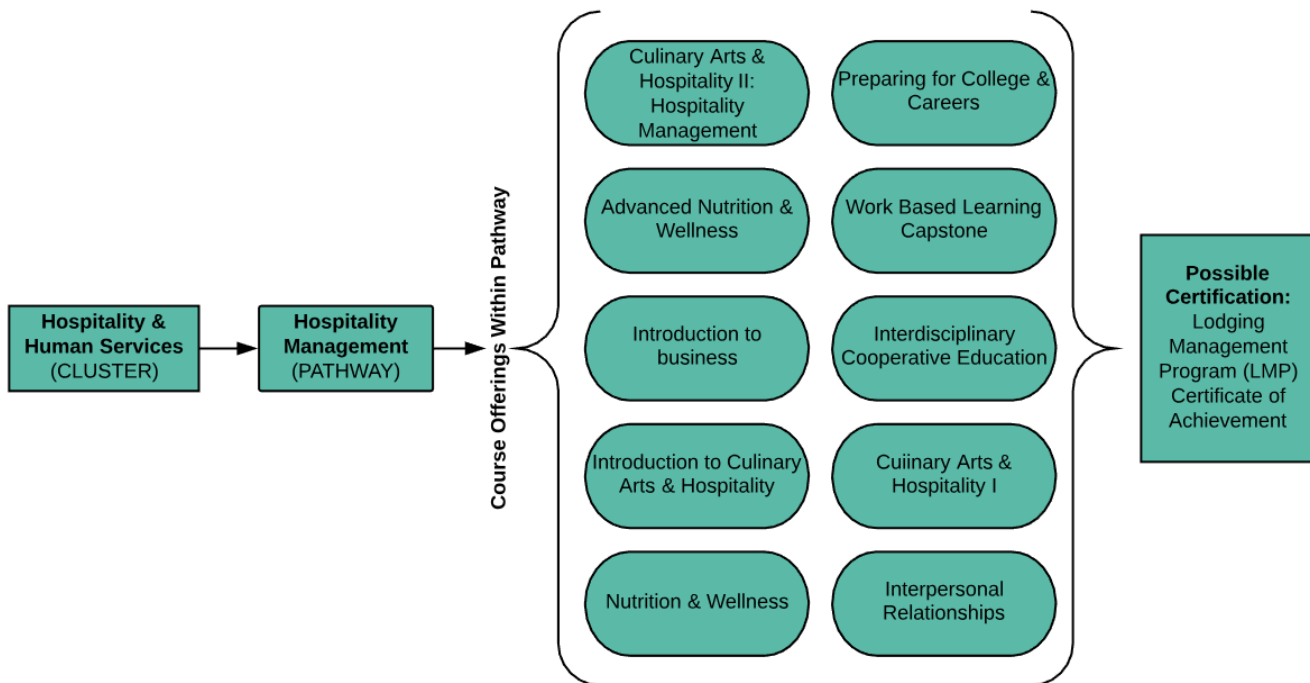


Figure 4 provides a sample illustration of a pathway (Hospitality Management), the courses that make up the pathway, and possible certifications a student might earn in completing the pathway. While each pathway includes multiple courses to be considered a pathway completer a student has to earn a total of six credits total, not necessarily complete any specified sequence of courses. These credits can be earned through any number of courses, some of which appear in multiple clusters and pathways. For example, “Nutrition and Wellness” is in both the Hospitality Management pathway of the Hospitality and Human Services Cluster, as illustrated below, and the Dietetics and Nutrition Science pathway of the Health Science cluster. “Preparing for College and Careers,” the “Work Based Learning Capstone,” and

“Interdisciplinary Cooperative Education” are found in each pathway as they are foundational and experiential learning opportunities respectively.

Figure 4. Example Cluster, Pathway, Courses, and Certification



The SBOE adoption of new graduation pathways rules in December 2017 permit the creation of local CTE pathways and local CTE concentrators to be established following state review and approval. A form to be completed by CTE Districts, or school corporations seeking a local pathway or local concentrator, explains that the review and approval process begins with review by a team consisting of SBOE staff, as well as staff from IDOE, DWD, and the Commission of Higher Education (CHE), and culminates with a vote of approval or rejection at an SBOE meeting.¹⁹ To date, two local pathways have been approved: a recreation vehicle construction pathway at Wa-Nee Community Schools and a civic arts pathway at Greater Clark County Schools.²⁰

CTE Students

Indiana high school students can fulfill a part of the state’s graduation requirements by taking CTE courses. Indiana’s current graduation requirements stipulate earning at least five credits in directed electives, which includes CTE.²¹ As such, CTE courses are included in the IDOE’s State Approved Course Titles and Descriptions list and have accompanying Indiana Academic Standards. The State’s new Graduation Pathways requirements, which apply to students beginning with the graduating class of

¹⁹ <https://www.in.gov/sboe/files/LCP%20-%20Application.v6.docm>

²⁰ <https://www.doe.in.gov/locally-created-pathways>

²¹ Directed electives can be world languages, fine arts, or career and technical education.

2023, include a requirement that students demonstrate “post-secondary ready competencies.” This requirement can be met in different ways including taking multiple CTE courses in a CTE pathway. Students wishing to use CTE to complete Indiana’s new graduation pathways requirements must earn a C average or higher in at least six credits in a career and college pathway.

Students who participate in CTE are categorized by the number of courses they take and how far down a pathway they travel.

1. **Participants** are students who have earned one or more credits in any CTE course.
2. **Concentrators** are students who have earned six or more credits in one CTE pathway.²²
3. **Completers** are CTE concentrators who have completed a sequence of courses in a pathway plan and have taken the pathway assessment.

Certain secondary CTE programs have end-of-pathway assessments designed to measure skills attainment for CTE concentrators. CTE Directors are responsible for ensuring pathway assessment requirements are followed by each school within a CTE District. The students may take assessments or industry-recognized credentials for respective CTE pathways and concentrations when ready.²³

Ideally designed CTE offerings enable students to earn industry-recognized credentials while completing CTE coursework. According to the available DWD list of industry certifications, there are 122 available certifications linked to CTE.²⁴ These certifications are linked to clusters, not pathways, meaning that CTE Districts need to be intentional in driving students towards certifications. Presently, IDOE funds 16 certifications. For example, IDOE pays for Public Safety Pathway Firefighter I Certification exams. Of the 16 funded certifications, relevant pathways include education and training, health science, hospitality and human services, manufacturing, public safety, and transportation.

In addition to certifications, many CTE courses also enable students to earn post-secondary credit through completion of CTE coursework. These “dual credit” courses allow high school students to earn credits that count towards the completion of both high school and post-secondary education. To qualify for dual credit a course must be “taught by high school faculty or by adjunct college faculty or college faculty either at the high school, at the college or university, or sometimes through online courses or distance education.”²⁵ In practice, this requirement generally results in high school or career center faculty receiving an adjunct appointment to Ivy Tech or Vincennes University.

²² While this is the current definition of concentrator, the recent reauthorization of Perkins creates a new, nation-wide definition. With the full implementation of Perkins V, a concentrator, within the Perkins context, will be a student who completes at least two courses in a single program or program of study. The Governor’s Workforce Cabinet, through its CTE Action Team, has recommended that Indiana further redefine a CTE Concentrator as a “student that completes at least two non-duplicative advanced courses (courses beyond an introductory course) within a particular program or program of study.”

²³ <https://www.doe.in.gov/sites/default/files/inters/pathways-assessment-guidance-16-17-4-21-17.pdf>

²⁴ 2018-2019 List of Industry Recognized Credentials accessed: <https://www.in.gov/dwd/2852.htm>

²⁵ <https://www.doe.in.gov/sites/default/files/standards/2018-2019-course-descriptions-posting.pdf>

CTE Educators

While CTE educators can come from a traditional background (i.e. earn a baccalaureate degree in education and apply for a state teaching license), the practical nature of CTE lends itself to instruction from non-traditional educators. However, there are limited opportunities for such educators to provide instruction. One path to do so is for an experienced professional to become a “Workplace Specialist.” To become a Workplace Specialist, one must meet experience requirements as well as complete a state-specified teacher training program.²⁶ In the upcoming session of the Indiana General Assembly, IDOE is expected to ask legislators to lessen the requirements Workplace Specialists must meet in order to address a state-wide shortage of CTE educators.²⁷ A secondary school offering dual credit must work with an eligible post-secondary institution to determine the CTE dual credit instructors.²⁸ Further, the post-secondary campus approves the dual credit teacher while the secondary school is responsible for hiring and compensation (if they are school employees).²⁹

In February 2018, IDOE made the determination to permit eligible higher education institutions to determine the necessary qualifications for CTE dual credit educators. Those individuals do not need an IDOE license.³⁰ Therefore, the post-secondary institution may authorize an individual who they deem qualified to teach a CTE dual credit course. Some areas of CTE curriculum present opportunities to leverage state-approved training providers. Though not currently a standard source of CTE educators, DWD maintains a database of approved training providers of services associated with DWD’s Workforce Innovation and Opportunity Act (WIOA) and other programs. Some of these providers offer training that leads to the same industry-recognized credentials as some well-designed CTE programs. As the state considers strategic integration of education and workforce development programs, identifying opportunities to leverage DWD-approved providers in support of CTE may be worth additional exploration.

²⁶ <https://www.doe.in.gov/licensing/workplace-specialist>

²⁷ <https://www.doe.in.gov/sites/default/files/legaffairs/workplace-and-career-specialist-licensing-flexibility-fact-sheet.pdf>

²⁸ <https://www.doe.in.gov/sites/default/files/student-assistance/doe-che-dual-credit-faqs-11218.pdf>

²⁹ <http://gcs.k12.in.us/wp-content/uploads/2017/05/Dual-Credit-QA-2011.pdf>

³⁰ https://www.doe.in.gov/sites/default/files/news/assignment-code-memo-2-final.pdf?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term

FUNDING SOURCES AND USES

CTE is primarily funded with a mix of state and federal dollars. Indiana provides the largest share of funding through a portion of the IDOE’s K-12 budget. Federal funding is provided through the Carl D. Perkins Career and Technical Education grant. Some school corporations have developed revenue streams to support CTE outside of state funding, yet state CTE Per Pupil Funding and federal Perkins funding provide the majority of dollars that directly support delivery of CTE. The state also indirectly supports CTE education through payments made to Ivy Tech Community College and Vincennes University to incentivize the award of dual credits as described above. As illustrated in Table 1, smaller amounts intended to incent specific outcomes and IDOE administrative funds round out the more than \$162 million in state and federal funds budgeted for CTE last fiscal year.

Table 1. CTE Budget for 2017-2018 State Fiscal Year³¹

	2017 - 2018 Funding Amount	Share of Total
State Funding Sources		
CTE Per Pupil Funding	\$113,863,650	70%
Ivy Tech Dual Credit	\$12,989,150	8%
Vincennes Dual Credit	\$3,933,800	2%
Incentive Funding	\$5,000,000	3%
CTE Admin for IDOE	\$1,212,903	1%
State Funding Subtotal	\$136,999,503	84%
Federal Funding Sources		
Perkins Grant	\$25,427,705	16%
Total CTE Funding	\$162,427,208	100%

While the specific sources of CTE funding are relatively easy to identify, specific uses are not. This is primarily because school corporations do not track expenditures related to CTE separately from non-CTE expenses. This is complicated by the number of different ways CTE is delivered. For example, CTE expenditures are likely present in the financial records of Indiana school corporations, yet career center financial records are often blended with the finances of a larger school corporation that serves as its fiscal agent.

The nature of costs involved in delivering CTE also vary depending on the needs of the course. Some courses involve more traditional resources such as reading materials and instruction; others require special equipment, facilities, and materials. These additional materials can result in substantial costs.

³¹ Amounts provided are budgeted except for “CTE Per Pupil Funding,” which is the IDOE’s distribution to school corporations in support of CTE delivery as reported by the IDOE (<https://www.doe.in.gov/sites/default/files/finance/tuition-support-report-092318-final.pdf>). The “Federal Perkins Grant” includes a grant of \$24,933,705 and state matching funds totaling of \$494,000.

Indiana’s most recent “Dollars to the Classroom” report, which covers state fiscal year 2016, includes several amounts that school corporations reported spending on “vocational education.”³² In theory, one should be able to calculate CTE spending through these reported amounts, but according to IDOE staff, it is believed that incorrect account codes are frequently used when reporting expenditures. This is one reason that IDOE recently conducted a survey of school corporations to quantify costs of providing CTE education, including:

- Professional development – includes travel, mileage, course registration, and consulting fees
- Supplies – includes classroom and operating supplies
- Textbooks – includes textbooks, workbooks, and software licenses
- Operating overhead – includes service contracts, equipment repair, design/architectural fees, and legal expenses
- Transfer tuition – includes payments for CTE courses made to the CTE District or other CTE education providers
- Other – reported expenditures not included above

An additional cost estimate report is now required for school corporations receiving state funding. P.L.230-2017 requires school corporations to report pupil counts and per pupil costs for CTE to IDOE for each fiscal year beginning after June 30, 2018.³³

CTE Per Pupil Funding

In fiscal year 2017 - 2018, the State of Indiana spent more than \$7 billion from the general fund on K-12 education. As illustrated in Table 1, \$113.9 million, or 1.61% of the state’s direct expenditures on K-12 education, supported CTE Per Pupil Funding. This funding was provided to Indiana school corporations based on their reporting of CTE course enrollment in accordance with the following formula:

$$\text{Total CTE Per Pupil Funding} = \text{Course Value} \times \text{Credit Hours} \times \text{Students Enrolled}$$

CTE Per Pupil Funding is provided in addition to the basic per pupil grant every Indiana school corporation receives for each student it serves. This means that the extra funding associated with CTE courses effectively serves as an incentive to encourage school corporations to offer CTE and provide the appropriate funding to pay for equipment, materials, and instructors. To better understand the state’s CTE funding model, one must understand each element of the formula provided above.

CTE Course Value (DWD Demand/Flame Methodology)

CTE course values are determined by DWD in accordance with Indiana Code as required by Senate Enrolled Act 198-2017. The current, 2018-2019 school year, is the first year in which these funding values

³² <https://www.in.gov/omb/files/5.%20Statewide%20Expenditure%20Report.pdf>

³³ IC 20-43-8-13

are effective.³⁴ This law requires DWD to submit a report with recommendations to SBOE on designating the value of each CTE course. The CTE course designations place each CTE course into either one of the three categories of value: High Value, Moderate Value, or Less than Moderate Value.

To determine this value, DWD utilizes its “IN Demand” methodology (also known as the “flame” methodology), which is described online as such:³⁵

“The Indiana Flame Ranking is calculated for each occupation by using Short term (2016-2018) Job Projection Data and Long Term (2014-2024) Job Projection Data. Job Projection Data is developed following the rules and jurisdiction of the US Department of Labor’s Employment & Training Administration. Indiana occupations score a rank from 1 to 10 in the categories below to produce a both short term and long-term outlook rating. Once the outlook scores are calculated, the scores are averaged to assign a flame ranking (1 to 5) to each occupation.

- Total Openings (2 & 10-year projected openings including new and backfill positions)
- Growth Openings (growth openings by occupation)
- Percentage Change (from base year to projected year)
- Real Time Labor Market Information, (job posting data from online job boards collected by Burning Glass Technologies)
- Wages (Bureau of Labor Statistics 2016 Wage Estimates)”

DWD updates its projections as new data becomes available. For the purposes of CTE, DWD’s occupational scores are mapped to one of three levels to determine how much the state will reimburse schools per student per course credit. The table below presents this mapping.

Table 2. CTE Course Value Designation

Course Value Designation	IN Demand (Flame) Ranking	Reimbursement Rate (per student, per credit)	Number of CTE Courses ³⁶ by Designation
Less than Moderate	0.00 – 2.99	\$200	67
Moderate	3.00 – 3.49	\$400	48
High	3.50 – 5.00	\$680	24

Additionally, foundational, introductory, and experiential CTE courses are assigned a per student value (as opposed to a per credit value) by SBOE following DWD’s recommendation. Introductory courses are valued at \$300 per student while foundational and experiential courses are valued at \$150 per student.

³⁴ The previous methodology and course valuation model gave each course a wage ranking and demand ranking. One of nine classifications would then be designated for each course. See <https://www.doe.in.gov/sites/default/files/cte/18-19-funding-memo-and-chart-updated-dwd.pdf>.

³⁵ <https://www.indianacareerready.com/Occupation/Demand>

³⁶ Of the 180 SBOE-approved courses, there are ten that have no associated funding. For example, DOE Course #4834, “Design Fundamentals” is found in the Commercial Photography Cluster, within the Arts, AV Technology and Communication Pathway, though it does not receive additional CTE funding.

An additional \$150 per student is also provided by the state for students participating in CTE if the student travels from their school of enrollment to the location of CTE instruction. This “area participation funding” is aimed at offsetting transportation costs.³⁷

School corporations may appeal a course value determination if the course is designated as “moderate value” or “less than moderate value.” Appeals likely occur for regional economic variations. For example, the value of a certain course may have a higher value in northwest Indiana than it does in southeast, or throughout the rest of the state given the concentration of demand in that region versus the state at large.

Credit Hours

For each CTE course, IDOE assigns a maximum credit value or credit range. Many CTE courses allow a student to earn up to three credits per semester (six total credits per academic year) following completion of the course. Each CTE District determines the number of credits it will award to a student who completes a course of a CTE course within the range authorized by the state. Indiana does not have a “seat time” requirement, meaning that there is not an actual amount of time (hours, minutes) required for a course. Thus, the total CTE Per Pupil Funding for the same course may vary across CTE Districts. For example, a high value course may be taught in one district as a 3-credit hour course and it may be taught in another district as a 1-credit hour course. Thus, CTE Per Pupil Funding would be \$2,040 and \$680, respectively.

Student Enrollment

CTE enrollment is reported through the completion of Form 30A, which is electronically submitted to IDOE using its INTERS system. Form 30A is the document of record stating the number of students enrolled in each CTE course and the associated number of credits.

The requirements by which a school corporation must count enrollment are found in state code (IC 20-43-8-13). This statute requires that after the start of each school year, a school corporation reports the pupil count and the per pupil cost for each CTE program identified as having enrolled pupils. IDOE determines the manner of report and delivery. The count days for the current school year are September 14, 2018 and February 1, 2019.³⁸

The following table is a recreated example of a Form 30A. For this example, School ABC Corporation is a member of CTE District #123. As further described below, the \$57,280 ABC receives does not necessarily match what the Career Center will charge sending schools fees for enrollment in the CTE courses.

³⁷ <https://www.doe.in.gov/sites/default/files/cte/18-19-funding-memo-and-chart.pdf>

³⁸ <https://www.in.gov/sboe/files/SBOE%20Membership%20Count%20Dates%20Request.pdf>

Table 3. Example Form 30A³⁹

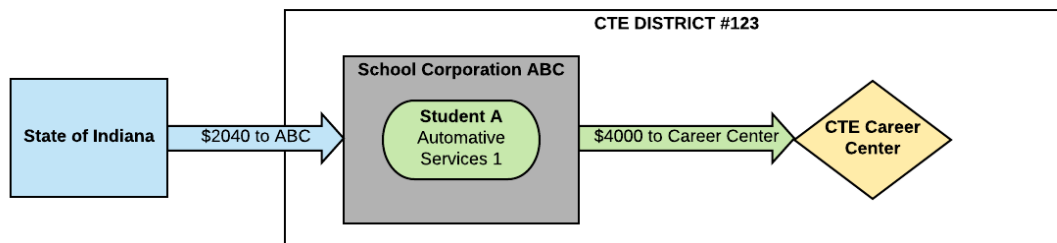
FORM 30A - School ABC Corporation - 20182019									
DOE Code	Name	Funding	AMT	WBL	1 Credit	2 Credit	3 Credit	Total Area Part	Amount
8360	Advanced Child Development	Intro	300	0	30	0	0	0	\$ 9,000
5608	Advanced Manufacturing I	High-High	680	0	0	0	10	0	\$ 20,400
5605	Advanced Manufacturing II	High-High	680	0	5	0	0	0	\$ 3,400
5284	Health Science Education II: Nursing	High-High	680	0	0	18	0	0	\$ 24,480
Totals				0	35	18	10	0	\$ 57,280

Per Pupil Funding Flows

The funding received per student enrolled in an approved CTE course is in addition to baseline per-pupil funding from the state. As described above, “sending” schools may be required to send a fee for to their CTE Districts for each student who enrolls in CTE courses.

Figure 5. CTE Funding Flows

Student A (School Corporation **ABC**) takes Automotive Services 1. ABC's **CTE District #123 Career Center** offers this course. Indiana pays ABC \$2040 for a student in a 3 credit, high-value course. The Career Center charges \$4000 in tuition for the course, which ABC pays.



For example, a member school corporation of a CTE District that sends Student A to the CTE Career Center will pay a fee amount to the CTE Career Center specified in a contractual agreement. If Student A is enrolled in a three-credit hour, high-value course the State of Indiana will send Student A’s school \$2,040. The fee Student A’s school pays to its CTE District may or may not be affected by the value of the course Student A takes.

Additionally, even though Student A’s school receives \$2,040 for Student A’s enrollment in a three-credit hour, high-value course, the amount charged by the CTE District may vary from that figure greatly. As previously noted, in some cases, a CTE District might charge a school corporation up to \$4,900 per student in fees, which implies school corporations must use a portion of their basic tuition support grants from IDOE to support CTE delivery. In other words, while the state sent \$113.9 million last year to Indiana school corporations to support CTE, it is unclear how much each school corporation in turn sent to their CTE Districts.⁴⁰ As a result, it is difficult to know what the State of Indiana fully invested in CTE without

³⁹ Within Form 30A, “AMT” refers to the amount of funding or value associated with the CTE course. WBL refers to work-based learning.

⁴⁰ According to the Student Instructional Expenditures Report for 2015-16 School Year, approximately \$47.6 million in statewide transfers were recorded to Account #17300, *Area Vocat. School (Part. Share)*. These transfers were payments to other government units, and may account for the statewide payments among schools, corporations, or to CTE Districts for CTE education. High-level figures are available for school corporations. <https://www.in.gov/omb/files/5.%20Statewide%20Expenditure%20Report.pdf>

an analysis of contractual data that is not readily available from each of Indiana's school corporations and CTE Districts.

Carl D. Perkins Career and Technical Education Grant

The Carl D. Perkins Career and Technical Education Grant is the federal government's primary investment in CTE. Administered by the U.S. Department of Education and originally authorized in 1984, the Perkins Act follows of a series of successive federal legislation directing investment in vocational education and CTE. While funding is currently being administered consistent with the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV), on July 31, 2018 President Trump signed into law the Strengthening Career and Technical Education for the 21st Century Act (Perkins V), meaning some changes for Perkins funding beginning with the 2019-2020 school year.⁴¹

Federal law requires at least 85% of the allocation to be distributed to a "local education agency" (LEA), which is generally a local school corporation, and a maximum of 10% distributed via competitive grants. Indiana law requires at least 60% of Perkins funding be allocated to secondary programs, meaning CTE Districts.⁴² As a result of these rules, as illustrated in Figure 6, the majority of Perkins funding goes to CTE Districts for secondary education. Another 31% of Perkins funding is awarded to post-secondary institutions (i.e. Ivy Tech and Vincennes). Remaining funds are primarily granted to small/rural secondary schools or districts with a high percentage of CTE enrollment, with a small amount (\$150,000) awarded to correctional facilities.^{43, 44} For 2017-2018, Indiana received approximately \$24.69 million in Perkins funding.⁴⁵ Of this funding, 93% was distributed to local programs, including \$13.8 million to secondary CTE Districts, \$7.16 million to postsecondary CTE programs, and \$2 million to small and rural district grants.⁴⁶

IDOE determines how much to subgrant to CTE Districts using a federally-required formula that is based on the number of youths living within a district and the number of youths in poverty living within a district.⁴⁷ Federal requirements mandate that subgrants must exceed \$15,000. This minimum grant amount excludes smaller school corporations from being direct recipients of Perkins funding. However, federal law permits consortiums among LEAs to be formed in order to meet the minimum allocation requirement, hence one of the primary roles of CTE Districts in Indiana.⁴⁸ The amount of Perkins funding distributed to each of the CTE Districts can be found in Appendix 1.⁴⁹

⁴¹ The new Perkins legislation will require Indiana to update its state plan, which affords the opportunity to rethink how Indiana will administer Perkins dollars specifically and CTE more broadly. For more information on the state planning process, see: <https://www.regulations.gov/document?D=ED-2018-ICCD-0108-0003>.

⁴² IC 20-20-38-12

⁴³ IDOE Perkins Allocations Memo 2017-2018

⁴⁴ https://s3.amazonaws.com/PCRN/docs/CARNarrative/IN_narrative_2016-2017.pdf

⁴⁵ IDOE Perkins Allocations Memo 2017-2018

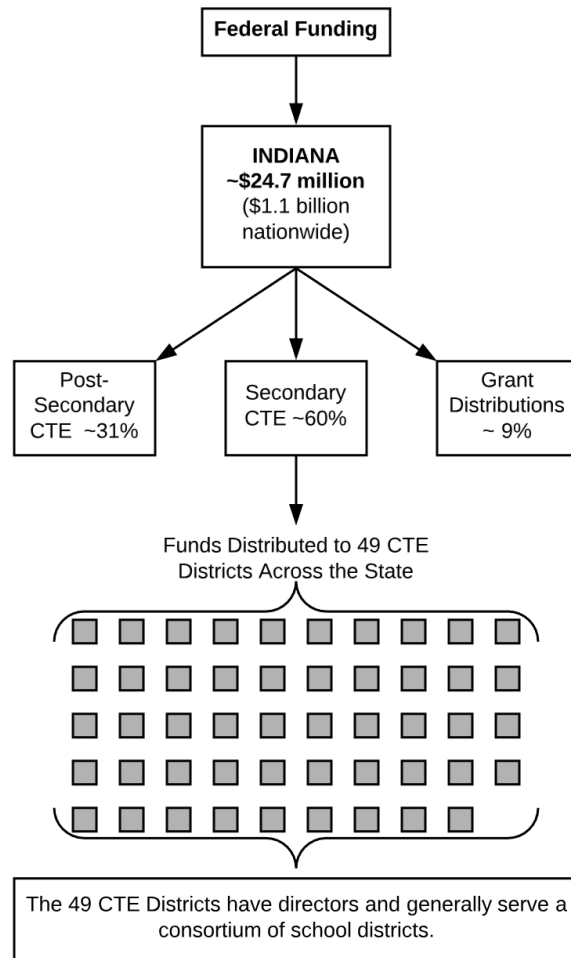
⁴⁶ IDOE has an MOU with DWD to administer Perkins post-secondary funds. These funds are prioritized for selected career pathways, credential attainment, and job placement at Ivy Tech and Vincennes.

⁴⁷ IDOE Perkins Allocations Memo 2017-2018

⁴⁸ https://s3.amazonaws.com/PCRN/uploads/perkins_iv.pdf

⁴⁹ The recipient listed may or may not align with the name for the CTE Districts. For example, the recipient listed in Appendix 2 for CTE District 24 is MSD Washington Township. In this case, MSD Washington Township is the fiscal agent for J.E. Light Career Center.

Figure 6. How Perkins Funds Flow to Indiana CTE Districts⁵⁰



Title 1 of Perkins IV, requires each area CTE District to submit local plans and budgets, meet required funding uses before using expenditures on permissive uses, and improve student performance. According to the 2012 Indiana Perkins State Plan the allowable Perkins expenditures include:⁵¹

1. Administration (not more than 5% of total)
2. Salaries and benefits (recommended not more than 50% of budget amount)
3. Contract services
4. Materials and supplies
5. Equipment
6. Professional development
7. Travel (with stipulations)

⁵⁰ https://s3.amazonaws.com/PCRN/docs/Estimated_FY2018_Perkins_State_Allocations.pdf

⁵¹ Indiana State Plan: FY 2009-2013 in Fulfillment of the Requirements of the Carl D. Perkins Career and Technical Education Improvement Act of 2006

Although it only accounts for roughly 16% of the state's spending on CTE, Perkins is the primary driver of CTE performance metrics. In accordance with Perkins, each of the state's CTE Districts prepare state plans annually that include goals relative to specific indicators. CTE District-level goals feed into state-wide goals relative to the same metrics.

Notably, these metrics capture only the performance of CTE concentrators (which, as further described below, is a small percentage of students who participate in CTE) and many of the performance metrics measure general educational outcomes rather than those tied specifically to CTE. For example, the first two performance indicators capture the number of CTE concentrators who have passed the English/language arts and mathematics portion of the state's Graduation Qualifying Exam. There is a performance indicator that captures the number of CTE concentrators and completers who passed state-approved technical skill assessments, but this is the lone metric that is directly relevant to the skill-specific content of CTE.⁵²

State Dual Credit Funding

As indicated in Table 1, last year the state spent nearly \$17 million on dual credit funding for Ivy Tech and Vincennes. Dual credit courses allow high school students to earn credits that count towards the completion of both high school and post-secondary education. Two types of dual credit are available to Indiana high schoolers: priority and technical. Generally, priority dual credits are associated with Advanced Placement (AP) courses and are earned by high schoolers who go onto a four-year college. Technical dual credits are generally associated with CTE and earned by high schoolers who typically pursue careers in fields requiring sub-baccalaureate credentials.⁵³

Indiana law requires high schools offer dual credit options, which likely explains why the State of Indiana also provides funding to state post-secondary institutions for awarding credits to high schoolers. The process for appropriating such funding does not appear to be well-documented. However, in speaking with those who are familiar with the process, dual credit funding is awarded through the budget making process for Indiana's post-secondary institutions ostensibly as an incentive for the institutions to award credits for which they would otherwise have received tuition dollars.

For state fiscal years 2018 and 2019, each institution was award \$50 for each credit the institution awarded for the completion of a dual credit course in the 2014-2015 school year. The total dual credit funding awarded to all seven of the state's post-secondary institutions totals nearly \$22.7 million in the current fiscal year. This includes \$3,933,800 for Vincennes University and \$12,989,150 Ivy Tech Community College, which are the most likely destinations for students earning CTE dual credit.⁵⁴

⁵² The state's 2017-2018 Perkins goals are available here: <https://www.doe.in.gov/sites/default/files/inters/faupl-2017-2018.pdf>.

⁵³ https://www.in.gov/che/files/DualCredit_final_041817.pdf

⁵⁴ <https://www.in.gov/che/4696.htm>

CTE Performance Grants

Financial incentives in the form of performance grants are administered by DWD and distributed to schools based upon attainment of senior concentrators, dual credits, and industry certifications.⁵⁵ These grants total \$5 million and are funded through the CTE Innovation and Advancement fund. These funds were first appropriated in the state's 2015–2017 biennial budget in an effort to encourage outcomes-based funding for CTE.⁵⁶ Awards are given directly to school corporations for their respective student achievement in the following three areas:⁵⁷

1. **CTE Concentrators:** Grade 12 students who have completed a minimum of six credits in two or more career and technical education courses that are part of a career and technical education pathway approved by the IDOE.
2. **CTE Dual Credits:** Grade 12 students who have earned at least nine transcribed dual credits for Priority Dual Credit/CTE courses.
3. **Industry-recognized Certification/Assessment:** Grade 12 students who at some point during high school passed an industry-recognized certification or assessment included on the approved list for school accountability.⁵⁸

Students earning industry-recognized certifications after the completion of secondary CTE education or outside of an educational environment are not necessarily captured by a school corporation or CTE District. This can cause reporting challenges and a partial understanding of certifications achieved.

In addition to the primary sources of CTE funding described above, there are state and federal funding sources that are related to or complementary of dollars that directly support CTE. In most cases, these funding sources provide CTE-like education to a population that is not enrolled in a traditional high school with access to secondary CTE programming. Some of these programs are described in Appendix 3 and could be further assessed as opportunities to efficiently coordinate funding through shared resources, streamlined processes, and enhanced stakeholder connections.

⁵⁵ https://www.doe.in.gov/sites/default/files/news/performance-grant-memo-4-18-certifications.pdf?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=

⁵⁶ https://cte.careertech.org/sites/default/files/2015_State_Policy_Review_Final.pdf and https://www.in.gov/sba/files/AP_2015_0_0_1_HEA_1001.pdf

⁵⁷ https://www.in.gov/dwd/files/Annual_Report.pdf

⁵⁸ <http://in.gov/dwd/2852.htm>

CTE SUMMARY FACTS AND FIGURES

Indiana has made significant progress in recent years around the collection and use of multi-agency data. To best understand the state of and outcomes from CTE in Indiana, it is necessary to bring together multiple datasets. The State of Indiana Management Performance Hub (MPH) maintains a growing warehouse of connected education and workforce data to help inform related policy decisions. MPH served to facilitate access to datasets originating from IDOE, DWD, and CHE. The following tables and charts add a contextual understanding around CTE Districts, enrollment, course offerings, and funding.

CTE District Statistics

The 49 CTE Districts, geographically spread throughout Indiana, are formed by the joining of separate school corporations into consortiums for the delivery of CTE.⁵⁹ The 49 CTE Districts vary in size, number of participating schools, and student enrollment. For example, District 1 is made up of a single school, the School City of East Chicago. Meanwhile, District 12 is a consortium of Warsaw Community School Corporation, Tippecanoe Valley School Corporation, and Whitko Community School Corporation. A result of such differences is that enrollment, funding, and CTE course offerings vary widely throughout the state.

Table 4 shows total enrollment, funding, and course offerings by CTE District. Each district's enrollment data is a sum of the enrollment for the participating high schools, and each district's funding data is a sum of the CTE per pupil funding received by each school corporation within the CTE District.

Table 4. CTE District Summary Enrollment and Funding (2017-2018)⁶⁰

CTE District Number and Name ⁶¹	HS Enrollment	CTE Enrollment	Percent in CTE	CTE Enrollment Funding	Perkins Funding	Courses Offered
1. East Chicago Central High School	1,236	717	58%	\$367,600	\$150,344	38
2. Area Career Center of Hammond	11,947	5,876	49%	\$4,176,350	\$541,419	94
3. Gary Area Career Center	1,233	180	15%	\$319,450	\$275,487	39
3A. Merrillville Career Consortium	2,214	1,428	65%	\$1,088,100	\$130,035	71
4. Southlake Career Cooperative	5,723	3,886	68%	\$2,754,900	\$142,322	84
5. Porter County Career and Technical Education	10,150	5,453	54%	\$4,220,800	\$316,426	101
6. A.K. Smith Career Center	5,291	3,112	59%	\$1,842,650	\$262,378	86
7. South Bend Community School Corporation	5,305	2,492	47%	\$1,470,700	\$458,637	81
8. Elkhart Area Career Center	15,503	9,272	60%	\$6,473,450	\$647,162	110
9. Impact Institute	6,862	4,220	62%	\$2,785,950	\$281,099	95

⁵⁹ See Figure 1 for a CTE District map and further explanation of the CTE design. Fifty locations receive Perkins funding, one of which (Edison Learning) had no related CTE District information available.

⁶⁰ District 39 is under district 43. Districts 47 and 48 were separate but now have the same director and function as one district.

⁶¹ CTE District totals (other than Perkins) were created by combining district members schools, based upon a list maintained by IACTED. As such, the all public high school enrollment in Indiana is higher than the total of 301,649 students listed.

CTE District Number and Name ⁶¹	HS Enrollment	CTE Enrollment	Percent in CTE	CTE Enrollment Funding	Perkins Funding	Courses Offered
10. Indian Trails Career Cooperative	3,728	2,756	74%	\$2,051,100	\$132,739	103
11. North Central Area Voc Cooperative	4,456	3,040	68%	\$2,246,950	\$183,862	91
12. Warsaw Area Career Center	3,257	2,453	75%	\$1,638,200	\$113,282	81
13. Wawasee Area Career & Technical Cooperative	2,233	1,500	67%	\$1,014,500	\$111,575	83
14. FWCS Career Academy @ Anthis	17,388	8,078	46%	\$4,137,650	\$889,923	104
16. Century Career Center	2,581	1,682	65%	\$1,358,150	\$100,119	86
17. Heartland Career Center	2,673	1,773	66%	\$1,331,550	\$99,762	73
18. Area 18 CTE Cooperative	6,106	4,083	67%	\$2,793,550	\$307,019	89
19. Wildcat Creek Career Cooperative	8,857	5,454	62%	\$2,703,200	\$383,836	90
20. Kokomo Area Career Center	5,027	2,524	50%	\$1,661,650	\$212,899	97
21. Marion Regional Career Center	2,934	1,553	53%	\$1,110,600	\$149,216	75
22. Muncie Area Career Center	5,228	2,581	49%	\$1,340,600	\$291,961	86
23. West Central Indiana CTE	2,401	1,482	62%	\$985,100	\$90,471	76
24. J.E. Light Career Center	24,129	10,745	45%	\$6,466,750	\$625,238	110
24A. Pike Career and STEM Center	3,306	2,096	63%	\$1,048,750	\$196,227	66
25. Hinds Career Center	2,322	1,301	56%	\$855,250	\$80,919	67
26. Anderson Community Schools CTE	5,087	2,639	52%	\$1,617,550	\$263,645	87
27. New Castle Career Center	3,190	2,071	65%	\$1,453,350	\$128,310	80
28. Richmond Area Career Center	1,971	1,089	55%	\$689,950	\$126,497	60
29. Wabash River CTE District	2,431	1,574	65%	\$1,092,750	\$110,276	79
30. Area 30 Career Center	1,873	1,300	69%	\$1,020,250	\$73,454	71
31. Area 31 Career Programs	18,442	10,971	59%	\$6,273,350	\$642,538	110
32. IPS Career Technology Center	5,693	2,145	38%	\$1,409,450	\$976,720	90
32A. Charter Schools USA	1,053	407	39%	N/A ⁶²	\$180,658	49
33. B. K. McKenzie Career Center	4,809	2,761	57%	\$2,326,900	\$242,694	79
34. Whitewater Career Center	3,927	2,454	62%	\$1,674,150	\$166,665	75
35. Vigo County School Corporation	5,633	3,723	66%	\$2,537,000	\$276,888	99
36. Hoosier Hills Career Center	7,035	3,702	53%	\$2,539,050	\$306,802	86
37. Central Nine Career Center	15,853	8,455	53%	\$5,147,400	\$576,833	106
38. Blue River Career Programs	2,228	1,373	62%	\$1,020,550	\$80,166	75
40. North Lawrence Career Center	3,087	1,729	56%	\$492,250	\$300,588	81
41. C4 Columbus Area Career Connection	7,755	5,326	69%	\$3,372,800	\$298,060	100
42. Southeastern Career Center	7,844	4,405	56%	\$3,122,250	\$271,565	103
43. Twin Rivers CTE Area	4,985	3,537	71%	\$2,124,650	\$138,155	89
44. Lost River Career Cooperative	991	733	74%	\$587,800	\$49,881	56
45. Prosser Career Education Center	12,017	6,186	51%	\$5,030,800	\$540,897	104
46. Southern Indiana Career and Technical Center	12,644	6,701	53%	\$3,737,800	\$584,134	98

⁶² 32A is the district for Charter Schools USA. Per the 2018 Indiana Tuition Support Annual Report, calculations for charter networks and turnaround academies were embedded in other districts.

CTE District Number and Name ⁶¹	HS Enrollment	CTE Enrollment	Percent in CTE	CTE Enrollment Funding	Perkins Funding	Courses Offered
47/48. Patoka Valley/Perry County Career & Technical Cooperative	4,646	3,295	71%	\$2,403,250	\$134,831	83
49. Walker Career Center	6,365	4,435	70%	\$2,571,450	\$266,364	98
Subtotal – Data Used for Analysis	301,649	170,748	56.6%	\$110,488,250	\$13,910,978	84 (avg)
Other CTE Students Combined ⁶³	20,021	2,679	13%	\$1,440,250	N/A	N/A

CTE Student Statistics

The rate of Indiana public high school students participating in CTE was 52%, 54%, and 53% respectively over the past three years. This makes clear that CTE offers an opportunity to reach and positively impact the lives of tens of thousands of students annually. Because CTE allows students the opportunity to both to explore and focus on a range of potential career options, it is important to consider the way to which Indiana high schoolers participate in CTE such that policymakers can drive it towards maximum impact.

To further understand CTE enrollment trends, the distinction between foundational, introductory, and other CTE courses (wage/demand determined) is outlined below. There is not an exact course sequence combination a student must take. However, course completion contributes to the completion of pathways (which align with industries and careers). It may be logical for a student to begin with foundational courses, follow with introductory courses, and then more advanced CTE coursework.⁶⁴ This would allow a student to begin a broad exploration of interests and gradually narrow in specificity.

Foundational and introductory courses are funded by a per student enrollment, at a predetermined level, without flexibility across the state. Most other CTE courses are funded per credit (which varies across the state and within CTE Districts) depending on the number of credits for which a course is offered.

For 2017-2018, 170,748 unique students enrolled in any CTE course. As shown below in Table 5, about 37% of these students took either only an introductory course (16%) or only a foundational course (21%), likely indicating that they were exploring careers or technical subjects of interest to them. Most CTE students, 108,324, enrolled in at least one CTE course that was not foundational or introductory, likely indicating a more focused interest in a particular subject or career path. Over the previous three school years, the observed rate of students taking only foundational or only introductory courses has declined. Meanwhile, the rate of students taking any CTE course other than or in addition foundational or introductory has increased each year.

⁶³ The Other CTE Students Combined row includes students enrolled in CTE at 53 different schools, the majority of which are charter schools. Of the 53 schools, most were not direct CTE District members and or no CTE District link was immediately available.

⁶⁴ <https://www.doe.in.gov/cte/pathways>

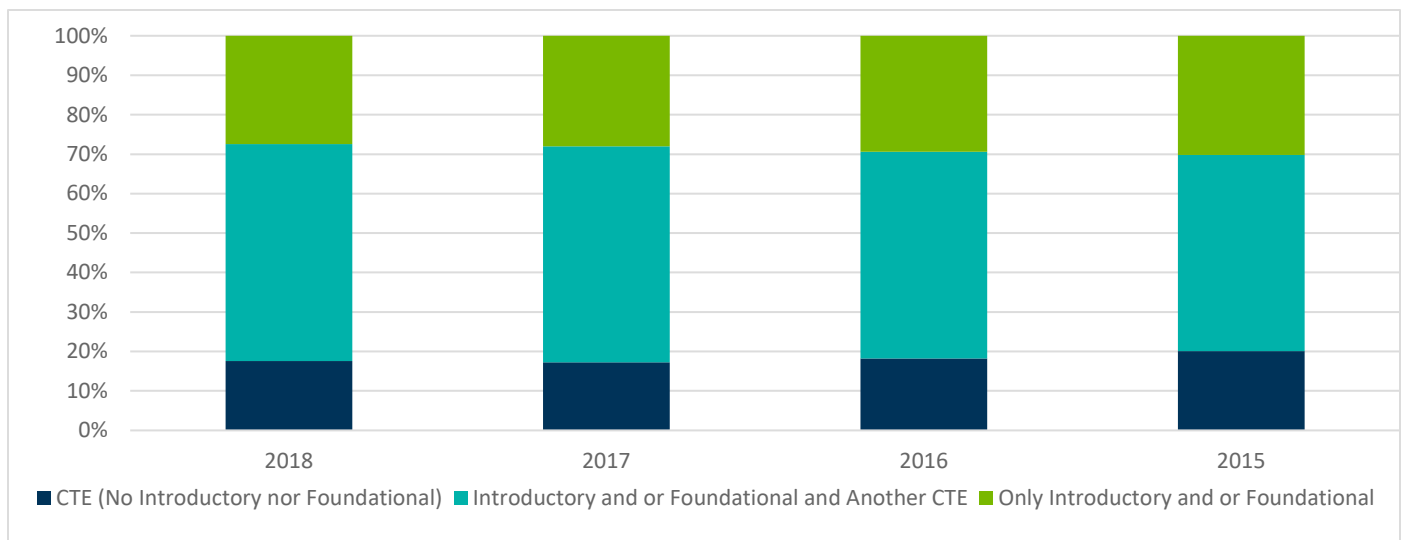
Table 5. Summary Enrollment in Secondary CTE⁶⁵

	2017-2018			2016-2017			2015-2016		
	Students	Share of All HS	Share of All CTE	Students	Share of All HS	Share of All CTE	Students	Share of All HS	Share of All CTE
Introductory Only	27,009	8%	16%	30,825	10%	18%	28,934	9%	17%
Foundational Only	35,415	11%	21%	40,750	13%	23%	42,471	13%	25%
Other CTE Courses	108,324	33%	63%	104,349	32%	59%	98,051	31%	58%
CTE Enrollment	170,748	52%	100%	175,924	54%	100%	169,456	53%	100%
Indiana Public HS Enrollment ⁶⁶	325,432	100%		323,669	100%		321,247	100%	

Focusing on respective graduating classes, rather than the entire universe of high school students, also finds that students took many non-introductory and non-foundational courses. Chart 1 includes three categories of students, that took at least one CTE course, by graduating class: (1) students who took CTE courses other than introductory or foundational, (2) students who took introductory or foundational and at least one additional CTE course, and (3) students who only took either introductory or foundational courses.

Consistent with the data presented above, Chart 1 indicates that in each of the past four years, a consistent 70% of CTE students took a more advanced CTE course.

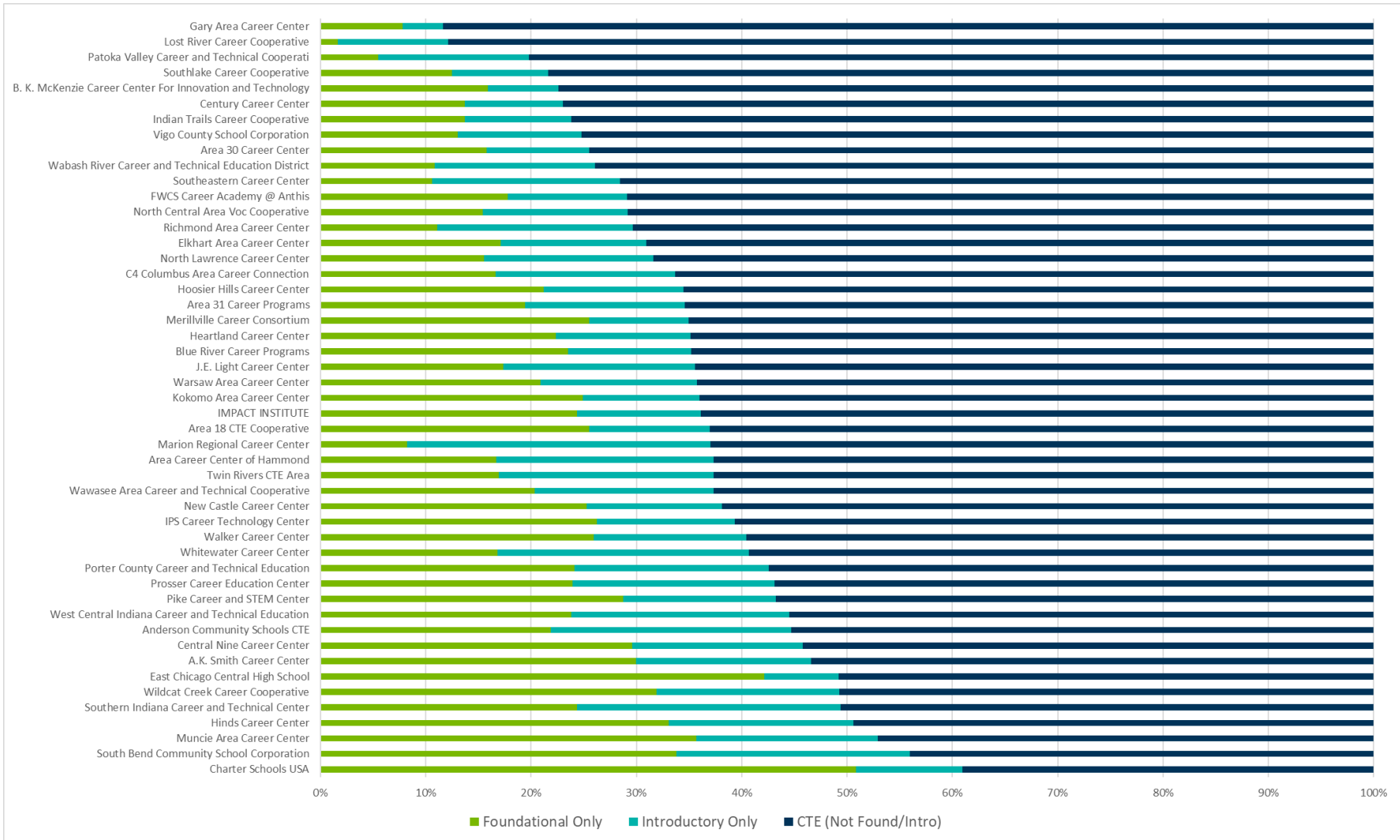
Chart 1. 2015-2018 Graduating Class and Student Enrollment by CTE Course Type



⁶⁵ Minor differences between Tables 4 and 5 exist, which are primarily caused by data entry error and enrollments without a CTE District.

⁶⁶ Indiana public high school enrollment totals calculated from reports Public Corporation Enrollments by Grade Level accessed on DOE Compass: <https://compass.doe.in.gov/dashboard/overview.aspx>. This figure is slightly higher than the total listed in Table 4, as there were minor data linkage issues resulting in the slight differences.

Chart 2. 2017-2018 CTE Enrollment by Course Type



Disaggregating the data to consider course type enrollment at the CTE District level further shows the high incidence of enrollment in non-foundational and non-introductory courses. Chart 2, above, shows, by CTE District, the percent of all high school student enrollment by course type in the 2017-2018 school year.

The dark blue, right-most portion of the bar represents the percent of students enrolled in non-foundational and non-introductory courses. The light blue center and green on the left portion of each bar represent foundational and introductory courses respectively. The rates of enrollment in foundational, introductory, and more advanced courses vary throughout the state, Chart 2 makes clear that the majority of CTE students statewide do indeed enroll in courses that are neither introductory nor foundational. In fact, in all but four of the state's 49 CTE Districts more than 50% of CTE students are taking non-introductory or non-foundational courses.

Interestingly, while students take non-introductory and non-foundational courses at a high rate, this does not necessarily translate into a high rate of CTE concentrators or completers. Recall that CTE concentrators are students who have earned six or more credits in one CTE pathway while completers are concentrators who have also completed taken the pathway assessment. Thus, concentration and completion are an indication of focus on or dedication to a particular CTE cluster, which in turn is an indication of how serious a student is in pursuing a job or career in his or her field of study.

Table 6, below, provides the number of Indiana high school students, by graduation cohort, who participated in CTE in each of the past 10 years. Over this time, the number of students participating in CTE has steadily increased, rising from just over 53,300 among the 2008 cohort to over 70,500 in the 2017 cohort.⁶⁷ Yet, despite this increase, the number of CTE concentrators has decreased from over 26,200 in the 2008 cohort to just over 20,700 in the 2017 cohort. This is partially explained by a definitional change that took place in 2012, that impacted cohorts thereafter.⁶⁸ However, given increase in CTE participation, one might still expect an uptick in concentration. While data for completion is unavailable for the full 10-year period provided in Table 6, it too has remained flat for the period for which data is available.

Table 6 also shows that a relatively consistent share of CTE participants graduate as expected with their age cohort. Over 77% of CTE participants graduated in 2008, while nearly 82% graduated as expected in 2017. An increase of nearly five percentage points over the past 10 years is undoubtedly positive; yet more than 18% of CTE participants failed to graduate from high school. Efforts to encourage persistence and increase the graduation rate among CTE participants are worthy of additional exploration, though this topic falls outside of this report's scope.

⁶⁷ What caused this increase in CTE participation was not fully explored in preparing this report. It is possible, however, that the state's K-12 accountability model helped drive this increase. This is because a portion of a high school's accountability grade is based on college and career readiness, which takes into account the percentage of a school's graduates who passed an Advanced Placement (AP) or International Baccalaureate (IB) exam or received dual college credit or industry certification. Because dual credit and industry certification are enabled by CTE, it seems possible that students who do not take AP or IB courses are encouraged to participate in CTE.

⁶⁸ <https://www.in.gov/irwc/files/2013-2014-pathway-assessment-guidelines-10-6-13.pdf>

Table 6. CTE Participants in Respective Graduation Years

Graduation Year	Participants in Graduation Cohort	Participants who Graduated from High School	CTE Graduation Rate	CTE Concentrators	CTE Completers
2008	53,316	41,136	77.2%	26,244	n/a
2009	58,015	44,230	76.2%	26,630	n/a
2010	58,770	45,517	77.4%	23,337	n/a
2011	59,956	46,673	77.8%	24,449	n/a
2012	61,394	48,418	78.9%	22,439	n/a
2013	66,163	51,371	77.6%	21,203	n/a
2014	67,388	54,550	80.9%	20,840	13,520
2015	67,404	55,587	82.5%	19,259	12,258
2016	68,991	56,839	82.4%	20,402	13,108
2017	70,504	57,539	81.6%	20,703	12,213

Table 7, below, shows the ten most popular areas of concentration over the last three years as well as the rate at which concentrators in these areas became completers. This data is aggregated by students, not graduation year, because a concentrator in 2017-2018 may become a completer in 2018-2019. For example, a junior in high school could feasibly become a concentrator prior to their senior year by earning the required number of credits. During their senior year they take a course with an assessment, thus making them a completer.

As illustrated below, engineering is the most common concentration over the past three years with more than 10,600 concentrating on this pathway. However, just shy of 59% of these students became completers. Among the most common areas of concentration, welding has the highest rate of completion, with over 78% of the more than 3,700 students who concentrated in welding becoming completers.

Table 7. Top Ten Pathway Concentrators by Volume, 2015, 2016, and 2017 School Years

Pathway ⁶⁹	Concentrator	Completer	Rate of Completion
Engineering	10,683	6,278	58.77%
Health Career Specialties	8,527	5,684	66.66%
Nursing	5,942	4,376	73.65%
Early Childhood	5,740	3,461	60.30%
Automotive Technology	5,484	4,188	76.37%
Construction	4,983	3,080	61.81%
Culinary Arts	4,956	2,838	57.26%
Agribusiness	4,302	2,046	47.56%
Welding	3,705	2,898	78.22%
Animal Science	3,499	1,694	48.41%

⁶⁹ <https://www.doe.in.gov/cte/pathways>

What causes a student to become a completer or concentrator was not studied for this report. Nevertheless, it is clear that many students who participate in CTE do not pursue completion or concentration. This might imply that such students are exploring potential careers in high school and deciding not to commit to them for whatever reason. This, in turn, implies that CTE likely provides a valuable opportunity for high school-aged students to explore potential careers and post-secondary opportunities without significant personal investment. While the desire to provide students with a potentially valuable industry-recognized credential through CTE completion is laudable, providing students with a hands-on exploration of various career opportunities is important as well. The way in which CTE courses are explored should be an item of further examination.

CTE Course Statistics

Prior to July 1, 2018, each CTE course was assigned a value based on demand *and* wage data. Nine possible demand and wage categories existed, ranging from high demand/high wage to low-demand/low-wage. However, as illustrated in Table 8, only four of the nine categories were actually used last school year. Eighty-five high demand, high wage courses were offered. Of these, 24 had an enrollment of less than 100 students across the state. Notably, no courses carried a value associated low demand or low wage. All but 8 courses were associated with high wages.

Table 8. CTE Enrollment and Funding Level 2017-2018 School Year ⁷⁰

Funding Level		Total Courses by State-wide Enrollment Range					2017-2018 Reimbursement	
Demand	Wage	<100	100-1,000	1,000-5,000	5,000-10,000	>10,000	Rate Per Credit Hour	Courses
High	High	24	39	20	2	-	\$500	85
	Moderate	-	5	-	-	-	\$450	5
	Low	-	-	-	-	-	\$300	-
Moderate	High	17	13	7	1	-	\$450	38
	Moderate	-	-	-	-	-	\$300	-
	Low	-	-	-	-	-	\$225	-
Low	High	-	1	2	-	-	\$300	3
	Moderate	-	-	-	-	-	\$225	-
	Low	-	-	-	-	-	\$150	-
Other Courses								
Introductory Courses		-	3	15	2	-	\$300 (per pupil)	20
Foundational Courses		-	-	2	1	2	\$150 (per pupil)	5
Work Based Learning		1	3	3	-	-	\$300 (per pupil)	7

The revised valuation methodology being used for the first time during the current school year yields a somewhat more equally distributed valuation of courses. Aside from Table 9, below, all analysis

⁷⁰ Tables 8 and 9 accounts for 163 funded CTE with enrollment in 2017-2018. Approved CTE courses without enrollment do not appear on either table, nor do approved CTE courses for which no value has been assigned.

presented in this section is based on the formerly used valuation. Table 9, however, maps last year’s (2017-2018) course enrollment to this year’s (2018-2019) funding model. As shown below, the valuation is still skewed high with 66 courses assigned to a program of high value, 43 courses assigned to a program of moderate value, and only 23 courses assigned to a program of less than moderate value.⁷¹

Only two courses determined to be of highest value under the current methodology—Anatomy and Physiology and Principles of Biomedical Sciences—had statewide enrollment of greater than 5,000 students. Interactive Media, which also had a state-wide enrollment of more than 5,000, moved from being the most valuable under the prior model (high wage/high demand) to the least valuable (less than moderate) under the new model.

Table 9. CTE Enrollment (2017-2018) Distributed to the Current (2018-2019) Funding Model

Program Value	Total Courses by State-wide Enrollment Range					2017-2018 Reimbursement	
	<100	100-1,000	1,000-5,000	5,000-10,000	>10,000	Rate Per Credit Hour	Courses
High	18	30	16	2	-	\$680	66
Moderate	15	20	8	-	-	\$400	43
Less than Moderate	8	9	5	1	-	\$200	23
Other Courses⁷²							
Introductory Courses	-	2	15	2	-	\$300 (per pupil)	19
Foundational Courses	-	-	2	1	2	\$150 (per pupil)	5
Work Based Learning	1	3	3	-	-	\$150 (per pupil)	7

Enrollment volume is, of course, in part driven by the number of districts offering a course. The courses with the highest enrollment are offered at nearly every CTE District. This is illustrated in Table 10 which lists the ten CTE courses that had the highest state-wide enrollment in the last school year. Half of the 10 most popular courses were offered at every CTE District, while the rest were offered at all but a few of the state’s 49 districts.

As earlier described, each CTE District determines the number of credits it will offer for a CTE course within a range authorized by the state. Therefore, throughout the state, CTE courses with the same name and intended to meet the same state standards could have varying credit values associated with them. For example, as illustrated in the table below, Interactive Media can be offered for 1, 2, or 3 credits a semester, for a total of 2, 4, or 6 credits maximum possible per academic year. As Table 10 makes clear, nearly all of the most popular CTE courses maybe offered for a maximum of one credit per semester, meaning they require less of a student’s day. This may imply that courses carrying multiple credits, and requiring more of a student’s time, are less appealing to students or more difficult for CTE Districts or school corporations to fund or schedule.

⁷¹ The state’s memo on 2018-2019 CTE course funding provides a course-by-course list of prior and current value: <https://www.doe.in.gov/sites/default/files/cte/18-19-funding-memo-and-chart.pdf>.

⁷² Previously, there were 32 introductory, foundational, or work based learning courses. The new methodology moved Business Law and Ethics from an introductory course to a course of less than moderate value. Thus, 31 total “Other Courses.”

Table 10. CTE Courses with the Highest State-wide Enrollment (2017-2018)

Course Title	Districts Offering	2017-2018 Enrollment	Demand/Wage	Credit Range (Semester/Max)
Preparing for College & Careers	49	24,348	Foundational	1/1
Nutrition and Wellness	49	17,600	Foundational	1/1
Child Development	49	9,363	Foundational	1/1
Anatomy and Physiology	49	9,280	Moderate/High	1/2
Intro. to Engineer. Design PLTW	48	9,195	Introductory	1/2
PLTW Principles of Biomedical Sciences	45	7,696	High/High	1/2
Interactive Media	44	5,557	High/High	1-3/6
Introduction to Construction	47	5,208	Introductory	1/2
Interpersonal Relationships	49	4,628	Foundational	1/1
Principles of Marketing	48	4,458	High/High	1/2

Six of the ten most popular CTE courses are either foundational or introductory. Though an analysis of student pathways was not completed for this report, that so many students enroll in foundational and introductory courses and also take more advanced courses may imply that foundational and introductory courses do indeed serve as a gateway to further exploration of a particular subject.

Table 11, below, provides the ten most popular CTE courses that are neither foundational nor introductory. Again, these courses are offered at the vast majority of the state’s 49 CTE Districts. These courses also are mostly limited to one credit per semester. The majority of the most popular courses are broadly related to a STEM field of some manner.

Table 11. Non-foundational and Non-introductory CTE Courses with the Highest State-wide Enrollment (2017-2018)

Course Title	Districts Offering	2017-2018 Enrollment	Demand/Wage	Credit Range (Semester/Max)
Anatomy and Physiology	49	9,280	Moderate/High	1/2
PLTW Principles of Biomedical Sciences	45	7,696	High/High	1/2
Interactive Media	44	5,557	High/High	1-3/6
Principles of Marketing	48	4,458	High/High	1/2
Animal Science	46	4,449	Moderate/High	1-3/6
Principles of Business Management	48	4,098	High/High	1/2
PLTW Human Body Systems	43	3,989	High/High	1/2
Principles of Engineering PLTW	47	3,888	High/High	1/2
WBL Capstone, Multiple Pathways	41	3,776	WBL ⁷³	1-3/6
Health Science Education I	49	3,389	High/High	1-3/6

⁷³ Work-based learning (WBL) is an instructional method for CTE courses or other courses:
<https://www.doe.in.gov/sites/default/files/standards/work-based-learning-course-framework.pdf>

Table 12, below, shows the ten CTE courses with the lowest enrollment for the 2017-2018 school year. Note, the number of districts offering these courses are far fewer than the highest enrollment courses. For three of the courses—Energy Industry I, Energy Industry II, and Health Science Education II: Athletic Training—this may be due to the fact that they are only a few years old as they were added to the SBOE-approved course list for the 2015-2016 school year. Also, of note is that nine of the ten courses may be offered for up to three credits per semester.

Though there is not data available to assess how the cost of delivery varies by course, it seems plausible, based on the courses listed, that many of the least popular courses also have higher costs associated with them, meaning it may be more difficult for the course to be offered. For example, it seems relatively safe to assume that Heavy Equipment II requires access to heavy equipment. Similarly, one would think that Tractor/Trailer Operation would require a school to provide its students access to a tractor-trailer given that the course is intended to prepare students to enter the trucking industry. The lack of data associated with the cost of course delivery is indeed a barrier to understanding how policymakers can best support CTE Districts and school corporations in educating Hoosier students.

Table 12. CTE Courses with the Least State-wide Enrollment (2017-2018)

Course Title	Districts Offering	2017-2018 Enrollment	Demand/Wage	Credit Range (Semester/Max)
Energy Industry II	1	7	High/High	1-3/6
Construction Trades: Heavy Equipment II	1	10	High/High	1-3/6
Tractor/Trailer Operation	2	10	High/High	1-3/6
Aerospace Engineering non PLTW	3	15	High/High	1/2
Building & Facilities Maintenance II	2	15	High/High	1-3/6
Energy Industry I	1	15	High/High	1-3/6
Warehouse Operations & Materials Handling	1	17	Moderate/High	1-3/6
Fashion and Textile Careers II	2	19	High/High	1-3/6
Health Science Education II: Athletic Training	4	23	High/High	1-3/6
Building & Facilities Management I	1	23	High/High	1-3/6

As previously described, the state’s approach to funding CTE courses is meant to incent the offering of courses associated with skills most demanded by employers by providing additional funding to the most-demanded courses. Because this funding is awarded on a per credit basis, CTE Districts could be offering courses associated with the most in-demand skills, at the maximum credits permissible in order to maximize funding received from the state.⁷⁴ The view that this is occurring was frequently discussed by those who provided input to this report.

Chart 3, below, illustrates the many ways in which a course is delivered across the state. The chart shows that the highest value courses, delivered within a range of 1 to 3 credits per semester, and taught in 50%

⁷⁴ A \$680 course can be offered for 1, 2, or 3, credits a semester. A school offering it for 3 credits receives three times the funding than a school offering the same course for 1 credit.

or more districts, are offered for different credits across the state and within CTE Districts. Within each vertical bar in Chart 3, there are four possible subsections (bottom to top):

- Dark Blue: the number of districts in which a course is offered for a varying number of credits.
- Turquoise: the number of districts in which a course is offered for 1 credit.
- Green: the number of districts in which a course is offered for 2 credits.
- Yellow: the number of districts in which a course is offered for 3 credits.

These calculations come from student enrollment data for students enrolled at a school corporation (and is a member of a CTE District). Varying credits for the same course, within the same CTE District, may be a result of schools teaching the course for different credit amounts.⁷⁵ What Chart 3, below, makes clear is CTE Districts and the school corporations that comprise them do not act with uniformity in response to the state incentive structure.

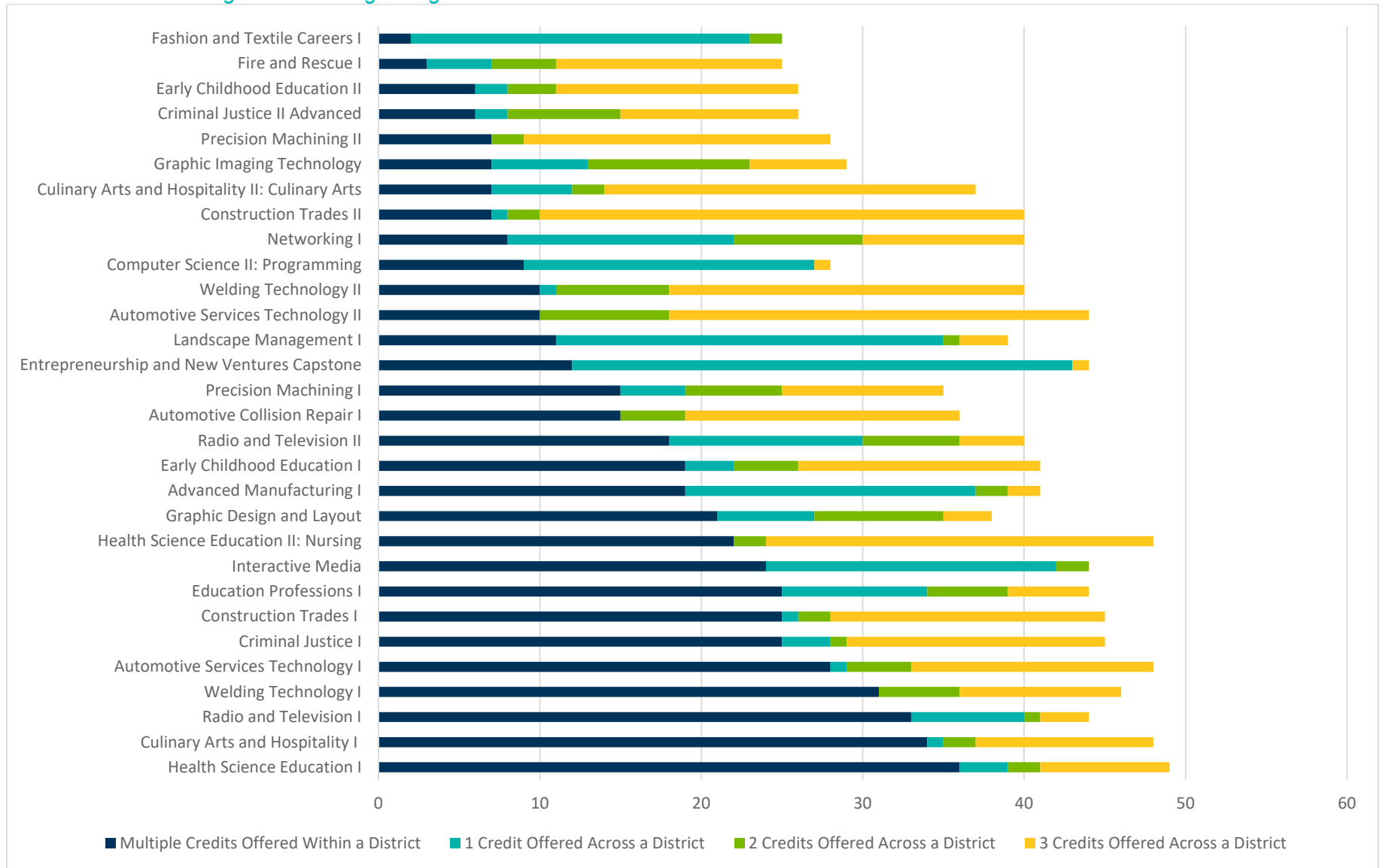
The causes of this variation could be numerous and are certainly worth further exploration. As mentioned previously, data on the cost of delivery is all but impossible to attain, yet many of CTE courses would seemingly carry high delivery costs if they are to be taught in a robust manner. Several courses included in Chart 3 could be affected or limited by high delivery costs. Automotive Service Technology I, for example, likely requires access to costly automobiles, diagnostic equipment, and a host of other tech-heavy tools if it is to be taught in an intensive, hands-on manner that would, in turn, necessitate multiple credits. Conversely, the course could be taught in a more traditional, less costly, and less intensive manner, in turn necessitating fewer credits but, potentially, less applied learning.

Another possibility for the variation depicted in Chart 3 is simply reporting error. CTE is unique among high school curriculum in that CTE courses can be offered for multiple credits. More than once in developing this report concerns regarding data integrity, driven in part by the unique nature of CTE, were shared. Because most high school courses in Indiana are only permissible to be offered for one credit, it is suspected that many school corporations, in reporting their course offerings, do not accurately indicate the number of courses associated with a CTE course. State reporting processes place CTE Directors as the intended check on data veracity, but it is unclear whether reports from CTE Directors are, in turn, checked for accuracy. If school corporations are indeed underreporting the credits associated with CTE courses, then they are leaving state CTE dollars on the table.

Another possibility driving the lack of uniformity depicted in Chart 3 is the misalignment of incentives relative to CTE actors. As described above, per pupil CTE funding flows from the state to school corporations. However, much of the state's CTE delivery is carried out by CTE Districts, and decisions regarding CTE education are frequently delegated to CTE Directors. Funding flows from school corporations to CTE Districts may or may not be aligned with changes in state incentive structures. As described above there is no readily available window into the agreements between school corporations and CTE Districts, so it is difficult to assess how responsive they are to state incentives.

⁷⁵ See Appendix 4 for additional detail.

Chart 3. 2017-2018 High Demand/High Wage Courses Offered at 50% or More of CTE Districts



The dynamism of CTE can be tested, however, through the adding and dropping of course offerings. Because CTE is in part intended to aid in preparing students for a smooth transition to the workforce, it should, in theory, represent one of the more dynamic areas of secondary education which should manifest itself in CTE Districts adding and dropping courses. Over the previous three school years, the average net change in course offerings by CTE Districts was an increase in six courses. Seven CTE Districts dropped one or more course while not adding.⁷⁶ Forty-one districts added courses, with fifteen districts adding over 10 courses. Twenty-nine CTE Districts did not drop any courses. The table below lists the courses that were dropped or added most in the last school year. Without surveying each CTE District, it is difficult to know why a course might be added or dropped, or the barriers and challenges for course offerings based on market demand.

Table 13. Top Courses Added or Dropped from in 2017 from Previous Year

Courses Added	Incidence	Courses Dropped	Incidence
Mechanical Drafting and Design I	13	Veterinary Careers I	15
Commercial Photography	11	Computer Science II: Programming	9
Human Development and Wellness	10	Fashion and Textile Careers I	9
Introduction to Communication	8	Work Based Learning Capstone, Family	9
Fashion and Textile Careers I	8	Diesel Service Technology I	9
Graphic Imaging Technology	8	Strategic Marketing	9
Industrial Automation and Robotics I	8	Introduction to Design Processes	8
Fire and Rescue I	8	Landscape Management I	8
Introduction to Engineering Design	7	Natural Resources	8
Computer Integrated Manufacturing PL	7	Emergency Medical Services	8
Advanced Life Science: Foods (Chemistry)	7	Work Based Learning Capstone, Business	8
Food Science	7	Human and Social Services I	8
Automotive Collision Repair II	7	Commercial Photography	8
Architectural Drafting and Design I	7		
Marketing in Hospitality	7		

⁷⁶ For this analysis, a course is “dropped” if there is no enrollment in the previous year.

RETURN ON INVESTMENT

Previous analyses of Indiana's CTE programming has indicated a positive impact from participating in CTE programming, with CTE concentrators demonstrating larger benefits than CTE participants that did not concentrate. However, previous studies have been limited in providing an estimated Return on Investment (ROI) number due to the incomplete reporting on CTE related expenditures at the local level.

The following section examines ways to analyze CTE in Indiana by providing a summary of previous efforts taken in Indiana to quantify the ROI of CTE programming, offering a new impact analysis based on available data, and discussing a framework for improving future ROI analysis to obtain a more complete estimate of impact.

Existing Analyses of Indiana's CTE System

Given the attention paid to CTE, it is no surprise that there have been previous efforts to quantify the impact of CTE in Indiana in recent years. This has primarily involved two efforts. The first is an IDOE effort to quantify CTE outcomes. The second effort was an attempt to calculate the ROI of CTE. It was undertaken by the, now dissolved, Center for Education & Career Innovation (CECI).

IDOE Annual Reports

Until recently, IDOE has published annual reports for the state's CTE system available for public consumption online.⁷⁷ The content of these reports has remained consistent over the years, though the most recent report available covers the 2015-2016 school year. This most recent report indicates the following trends of note:

- A steadily increasing CTE enrollment rate as a percentage of total secondary enrollment.
- An increasing CTE concentrator rate as a percentage of total CTE enrollment.
- A rapidly increasing rate of industry certification attainment by CTE concentrators – with nearly 54% of all concentrators who left high school in 2015 earning industry certification.
- A significantly higher high school graduation rate for CTE concentrators compared to the state average (with more than 95% of CTE concentrators graduating high school after the 2014-2015 school year, compared to the state average of 88% during that same timeframe).
- Of the CTE completers that completed high school in 2015, 57% went on to pursue post-secondary education, 28% went directly to work (within two quarters post-graduation), leaving 15% for whom there is no reliable data.

While the contents of these annual reports provide a window into the CTE system, the reports do not offer a return on investment analysis in that the cost of delivery is not calculated. Rather, they are focused

⁷⁷ <https://www.doe.in.gov/sites/default/files/cte/2014-indiana-cte-achievements-report-fall-2014.pdf>
<https://www.doe.in.gov/sites/default/files/cte/2015-cte-data-analysis-report-final-6.23.2015.pdf>
<https://www.doe.in.gov/sites/default/files/cte/17-state-cte-career-readiness-report-final-3-3-17.pdf>

on output and outcome data, and include minimal discussion of methodology, program costs, or comparison to baseline data.

Center for Education & Career Innovation Report

In 2014, the CECEI, in partnership with DWD,⁷⁸ engaged Educational Data Systems, Inc. (EDSI) to complete an ROI analysis of CTE.⁷⁹ The goals of this report were to review the CTE funding model utilized at the time and to determine a career pathways ROI.

CECEI created six cohorts for the model, with each cohort including 12th graders associated with each of the six years reviewed from 2008-2013. For each student within these cohorts, EDSI identified the CTE courses taken from 8th grade through 12th grade. Additionally, EDSI identified those students in each cohort who were concentrators. At the time of this study, a CTE “concentrator” was defined as a student who obtained either four or six credits taken across a CTE pathways, depending on year enrolled, during high school. These CTE participants and CTE concentrators were then compared to each other and to a baseline of non-CTE participants.

A number of outcomes were outlined by EDSI and those focused on include: diploma and graduation rates, post-secondary enrollments and completions, and wages post-graduation. The wage analysis was the most difficult to study since the earliest cohort (graduation high school in 2008) would have had no more than six years of post-graduate data and may or may not have included bias resulting from those pursuing higher education. To correct for this, EDSI only reviewed those reporting full time employment and compared only those identified as not pursuing full time higher education, though EDSI recommended future studies allow for a longer-term wage review.

The investment portion of the ROI equation included approximately \$100 million in CTE Per Pupil Funding and \$14.3 million in federal Perkins funding for secondary education. To obtain specific corporation-level investment information EDSI conducted electronic surveys, however the survey did not yield significantly useful information, so actual local costs of providing CTE (infrastructure cost, overhead in general, etc.) was excluded from analysis.

The analysis found that CTE participation was associated with higher graduation rates, post-secondary enrollments and completions, and higher wages than non-participants. Graduation rates were not much different between CTE participants and non-CTE students, but graduation rates were much higher for students who achieved a CTE concentration. Similarly, wages were observed to be highest amongst CTE concentrators, especially for those with 3+ years of full time work post-graduation. Wages were generally higher for CTE participants (regardless of concentrator status) than non-CTE students.

EDSI used these core findings and applied them to their overall ROI formula to identify existing gaps and recommend funding model changes for the State of Indiana.⁸⁰ The CTE Per Pupil Funding model at the

⁷⁸ https://www.in.gov/icc/files/Sector_Strategies_Taskforce_-_CTE_ROI_10-28-14_Final.pdf

⁷⁹ https://www.in.gov/icc/files/CECI_CTE-ROI_White_Paper_FINAL.pdf

⁸⁰ EDSI calculated ROI by measuring outcomes of students within the cohorts and comparing it to the amount of public investment in CTE via the following formula: ROI% = (Outcome / Investment) * 100.

time consisted of funding positively related to the anticipated wages associated with the career of that course, and the amount of student demand for the course. The model created by EDSI in partnership with the State of Indiana led to a shift toward outcomes-based funding, with a focus on the anticipated market demand for careers (needs of business as opposed to the immediate demand of students enrolled).

EDSI's research led to two other significant recommendations. First, they concluded from their analysis that it would be important to incentivize concentrators and completions of career pathways: "School corporations should be incentivized to offer a full sequence of courses in a pathway or concentration to receive any CTE Funding for an individual course, shifting the responsibility to the school corporations to determine how to get more enrollments and concentrators in the right areas." Second, they concluded that the State of Indiana should provide clear guidance to school corporations by "developing an improved and dynamic list of industry certifications and credentials...[to] give the school corporations a guide to which career paths and industry credentials are valued by the state."

An Updated Analysis of CTE's Impact

Given recent and ongoing changes to CTE in Indiana, an updated analysis of its impact is needed. In this section, such an analysis is provided that specifically focuses on the wage differential between CTE participants and CTE concentrators. The results serve to validate the relatively positive impact on CTE concentration on wage outcomes found by EDSI. However, it is important to note that the following is not a full ROI analysis and is looking at one important aspect of broader impact. Increased access to cost of delivery data and a longer timeframe for analysis would be required for a complete ROI analysis, if ROI is a desired measure instead of outcome data.

To assess the impact of CTE in Indiana, one must first identify the potential outcomes realized by a high school student. Of course, there are innumerable outcomes, but in consideration of the data available, students who participated in CTE and graduated from an Indiana high school between 2006 and 2013 were placed into one of two groups:

1. The first group includes graduates from 2006-2013 who enrolled in a post-secondary program and earned a degree or certification, and for whom four quarters of employment and wage information is available two years after their post-secondary completion.
2. The second group includes graduates from 2006-2013 who did not earn a post-secondary credential, nor do they have any indication of post-secondary enrollment, and for whom four quarters of employment and wage information is available four years post-high school graduation.

Across both groups, employment and wages were compared for the purposes of gauging the impacts of CTE on wage outcomes: (1) CTE Participants and (2) CTE Concentrators. Wage data is the important outcome variable since CTE is intended to impart skills demanded by area employers which should theoretically result in sustainable employment at a higher-level.

Employment and wage data come from the quarterly wage records obtained by the DWD and maintained by MPH. All wage data were annualized across all profiles for graduates that had any positive wages

reported in any quarter. If an individual had reported wages for only one quarter, their total wages were multiplied by four. If an individual had reported wages in two quarters, their total wages were multiplied by two. If an individual had reported wages in three quarters, their wages were multiplied by 4/3. If an individual had reported wages in four quarters, their wages did not require annualizing. Annualized earnings inaccurately state true annual earnings, but this methodology allows for an initial starting point for the comparison between the cohorts listed above. The mean and median annualized earnings should not be construed to represent actual annual earnings.

Key Findings

The annualized wage outcomes associated with post-secondary completion of those who were CTE concentrators during secondary education was \$35,610. As shown below, wage outcomes for the same population that did not attain a post-secondary credential in Indiana are significantly lower. It is likely that by the time a student completes their post-secondary education, the impact of CTE is diminished due to the compounding effect of the significant training that post-secondary education provides. In other words, the effects of post-secondary attainment supersede the effects of high school CTE participation, making it difficult to assess the impact of CTE on one’s earnings.

When one factors out attainment of a post-secondary credential from the equation and completely separates CTE participants from CTE concentrators who went directly into the workforce, the impacts become more pronounced. As presented in the table below, there is an 8% wage premium of CTE concentrators, as compared to participants, after four years of high school graduation amongst the population of high schoolers that did not attend in-state college.

That said, the annualized earnings of both CTE participants and CTE concentrator who did not earn a post-secondary credential are rather low. These wages are not much beyond the 2018 US Federal Poverty Guidelines which state that for one person, the annual poverty amount is \$12,140.81.

Table 13. Comparison of Annualized Earnings Among CTE Participants and Concentrators

	CTE Participants (Excluding Concentrators)	CTE Concentrators	% Difference
High School Graduates (2006-2013)	78,985	100,867	N/A
Mean Annualized Earnings	\$18,145	\$19,644	8.3%
Median Annualized Earnings	\$15,931	\$17,293	8.6%

In addition to employment and wage analysis, graduation rates between CTE concentrators and completers and the overall CTE population, over the same timeline, were also compared. As anticipated, the high school graduation rate of CTE concentrators and completers (85.8%) was significantly higher than that of CTE Participants (78.6%).

⁸¹ <https://www.in.gov/judiciary/adr/files/poverty-guidelines.pdf>

Limitations of Analysis

The data associated with these profiles are detailed but limited in some important ways. For example, the employment and wage data available lack a status indicator for “full-time” vs. “part-time” and wages were reported as totals, not rates. There are also validity concerns with the enrollment data, suggesting inconsistency in the number of credit hours attributed to concentrators.

Framework for Improving ROI Measurement

Given the data limitations described above, the analysis undertaken for this project stops short of suggesting the ROI being realized by the state. However, given the increased attention being paid to CTE, the state has the opportunity to uncover significant insight into the return on investment of CTE programming by changing what information is collected and by conducting additional analysis on available data. A 2015 report from the W.E. Upjohn Institute for Employment Research, published by the U.S. Department of Education’s National Research Center for Career and Technical Education (NRCCTE), provides a robust framework for conducting CTE ROI analysis. This framework accounts for multiple factors that, if appropriately accounted for, could strengthen the state’s ability to truly determine its ROI on CTE funding.

Methodology

A robust ROI model and methodology must account for net impacts and costs. The methodology suggested by the Upjohn Institute is described in this section. It includes the steps described below.

First, a full calculation of “net impact” (impact over and above the baseline) of CTE, controlling to the degree possible any bias resulting from the data analysis. NRCCTE does not call out “required” benefits/outcomes for analysis, but does cite some benefits/outcomes for consideration including:

- Employment
- Hourly wage
- Earnings (with fringe benefits)
- Hours worked
- Tax payments
- Receiving unemployment insurance benefits
- Receiving TANF benefits
- Receiving food stamps
- Enrolled in Medicaid

Second, costs of delivery must be fully calculated and included. For a standard ROI calculation, costs would include foregone earnings/wages as means of incorporating an opportunity cost associated with pursuing education and training rather than working. However, for high school CTE students the opportunity cost is not foregone earning, but rather the foregone experience of an alternative high school course (assuming, of course, the student is fully enrolled and committed to high school). As a result, the cost-related inputs can be simplified to focus solely on the cost of delivering CTE. At present CTE data in Indiana is lacking with respect to costs. For example, while there is a sense of the amount of state money dedicated to CTE, there is little data available regarding the infrastructure and other costs

(including opportunity costs) associated with CTE. Further, outside of state funding, employer partners are frequent donors of equipment and materials to support CTE and philanthropy often underwrites curriculum development. Such third-party funding should also be considered in calculating the true cost of CTE.

Once the full landscape of net impacts and costs are understood, it is important to convert these measures to an ROI. This involves forecasting the net impact over a period of time in the future, and the construction of a similar timeline of projected program costs. Additionally, benefits and costs should be attributed to the participant/student, the government, and society as a whole (a summation of the participant/private sector side and the public sector side) and adjusted to account for their value over time.

Factors to Overcome for Best Practices

The Upjohn Institute identifies four factors that can confound the ability to attribute benefits or outcomes to a CTE program that must be overcome in any best practice ROI analysis.:

1. **Program Definition** – Students in CTE receive different courses from different instructors over different time periods. And, even if they take the same CTE courses, student effort may vary considerably across a CTE program (and include students that drop out of the program). For example, the Upjohn Institute cites the importance, particularly when reviewing secondary CTE, to be careful to define “participation” of having taken any CTE since most high school students (regardless of state) are required to take at least one CTE class. This issue becomes apparent when reviewing the outcomes of CTE – a researcher must be very careful to define a “participant” versus a “concentrator” versus a “completer” and to make sure that the comparison groups are not duplicative within the categories. The previous section, for example, compares participants to concentrators and the analysis took care to ensure these were separate groups for measurement purposes.
2. **Baseline** – In order to sufficiently measure positive impacts of CTE that might not otherwise have occurred were it not for CTE – a baseline of “not CTE” must be established for comparison purposes. Indiana has data available to compare the wage and post-secondary education outcomes of high school students with those of CTE participants. This is useful for comparison purposes but has limited value. This is because students who participate in CTE programming may have unique different characteristics that influence their participation.
3. **Outcomes Definition** – While many CTE programs collect data for program performance purposes, outcomes data to effectively evaluate the program more holistically may not be collected or easily extracted since a large amount of the outcomes data would necessarily require data gathering for a significant length of time after CTE engagement. Simply due to the nature of data collection for these programs, wage information (and other outcome measures) is often not readily available for long periods of time after the CTE treatment itself. And more importantly, the larger the gap of time between CTE participation and outcome measure means the greater likelihood of other causes of certain outcomes (i.e. issues of attribution, as discussed below).
4. **Attribution** – Because CTE engagement by students takes a significant length of time before outcomes can be observed, thereby making it difficult to attribute the CTE program as a causal factor with the outcome(s) as opposed to some other confounding factor (business cycles, other

programs a student may have engaged in, etc.). As discussed in the previous section, the data suggests that college, for example, tends to drown out the impact associated with CTE.

While many of the above limitations can be addressed through the collection of high-quality data and the use of advanced statistical techniques, they are limitations, nonetheless. Should Indiana choose to invest additional resources in measuring and assessing the outcomes of CTE a careful consideration of these limitations and how to address them should occur while simultaneously considering how to implement new CTE policies and data collection requirements.

Impact of Automation on ROI

In considering the implementation and measurement of new CTE policies, the state should also account for the future of work, including changes due to automation. Indeed, the evolving nature of the workforce landscape presents some limitations on calculating ROI, likely diminishing returns in areas of CTE that are subject to automation and other disruptive technologies. For the state to develop and maintain a positive ROI with respect to CTE, it must facilitate the flexibility and adaptability demanded by technologically-driven labor market changes. In 2017, the McKinsey Global Institute published a report on the impact of automation on employment and productivity.⁸² A number of insights from this report may impact CTE:

- Nearly all occupations will be impacted by automation, an estimated 61 million FTEs in the United States alone.
- Low wage occupations will be impacted most, exacerbating income/wealth inequality.
- Workforce activities within various occupations most susceptible to disruption include:
 - Predictable physical activities,
 - Data processing, and
 - Data collection.
- Occupations will require a workforce that is resilient, adaptable, and that adopts significant critical thinking skills, as all jobs will likely change to some degree.
- Public sector should provide income support for most impacted groups to support reskilling and to minimize impact of job displacement.

McKinsey also tracks state-by-state and MSA occupational information on automation risk.⁸³ They measure the potential for technical automation by looking at the percentage of time that could be automated of work activities within 750 different occupations that are expected to be impacted in the coming decades. By this measure, the potential for technical automation is slightly higher for Indiana than its surrounding states, at 44.8%. That said, the variance of this potential across the states is small, with the least potential impact expected in states like Connecticut and Virginia (~42%) and the most impact expected in states like Alabama and Oklahoma (~45%). Similarly, within Indiana MSAs, the potential

⁸²https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20future%20that%20works/MGI-A-future-that-works_Full-report.ashx

⁸³ <https://public.tableau.com/profile/mckinsey.analytics#!/vizhome/AutomationandUSjobs/USAutomationlandscape>

impact ranges from 43% in Evansville up to nearly 48% in Elkhart. Thus, the impact of automation is anticipated to be widespread across most geographical boundaries.

The Brookings Institute underscores the important policy implications for automation's impact on training programs like CTE, by making the following recommendations:⁸⁴

- Students should receive strong general training in “21st century skills” whenever they receive occupation or industry-specific training: “...general skills they [workers] build should make them more trainable in new and complimentary tasks when substitution [due to automation] for their performance of other tasks occurs.”
- If and when displacements happen, more robust lifelong learning training models (retraining) should be available to workers
 - The states of Maine and Washington presently fund “lifelong learning account” where workers can save a portion of employer-matched tax-deferred income.
 - Online learning should be expanded as it relates to accessibility.
- For those displaced workers where retraining is not a viable option, public safety net support such as temporary income supports in the form of unemployment and publicly funded wage insurance are important considerations
 - Unemployment insurance is already widespread in the United States, but wage insurance is an existing gap. It would serve to replace part of a displaced workers’ lost earnings when and if they become reemployed at lower wages, for a defined period of time.

Collectively, these insights indicate that workforce programs like CTE can and should play a role in ensuring Indiana’s workforce develops the long-term skills necessary to outlast and thrive as many industries adopt more and more automation into their processes. It is not easily predictable what new occupations will form and what existing occupations will decline due to automation. Indeed, it is likely that many existing occupations, regardless of automation risk, will continue to require access to significant potential workforce population given ongoing demographic changes, including the aging of the existing workforce. But it is also true that many of these occupations’ workforce will require even more (re)tooling, and the transferable and critical skills necessary to accommodate the more automated future state. Familiarity and comfort with evolving technology, computer systems, etc. – and change in general - will become increasingly necessary for sustained employment across all industries. As a result, it is important that CTE contain a focus on imparting critical thinking and problem-solving skills in addition to industry-specific skills.

Future Impact and ROI Analyses

The Indiana Management Performance Hub provides the state with a platform for in-depth analysis of program impact. Potential analysis includes:

⁸⁴ <https://www.brookings.edu/research/will-robots-make-job-training-and-workers-obsolete-workforce-development-in-an-automating-labor-market/>

1. **Dual Credit Analysis:** Analysis of CTE dual credit attainment and college attainment to identify the impact expanded dual credit offerings has on post-secondary education outcomes. The above analysis indicated that post-secondary attainment produces higher wages. This analysis could help Indiana refine and incentivize students earning dual credit through CTE in a more strategic and intentional manner.
2. **Course Combination Analysis:** Analysis of CTE course combinations that are most predictive of employment outcomes in the absence of post-secondary education. It is not clear from this report what role the 12 clusters and 64 pathways play in course offerings at the local level. This analysis would take a deeper look at what pairings of courses have been the most impactful over time.
3. **Post-Secondary Analysis:** Analysis of ROI comparison between students participating in CTE programming and similar individuals participating in post-secondary CTE programming (outside of secondary education). Many of the technical certifications provided by secondary CTE programs are also provided by post-secondary programs and eligible training providers. For example, some career centers provide the courses necessary to obtain a nursing assistant certification while in high school. There are also private educators approved by the state that specialize in providing nursing assistant certification courses for adults. Comparing outcomes for these two groups will help identify what delivery formats are most effective for Hoosiers.

There are steps that Indiana can take toward producing more meaningful analysis of impact and return on investment in the future. These include:

1. **Improved Cost Tracking:** Indiana must develop a more representative account of the cost of delivering CTE at the secondary level in order to determine the impact of state funding. As covered in an earlier section of this report, there is very little required in the way of transparency and it is believed that incorrect account codes are frequently used when reporting expenditures. The nature of providing CTE can include larger and more complicated expenditures, sometimes requiring large capital investments. The state must obtain a clear and uniform account of expenditures in order to inform effective programming and funding decisions.
2. **Enhanced Enrollment Reporting:** Enrollment information collected by the IDOE provides the most useful insight into annual participation in secondary CTE programs. This information is collected by CTE Districts and sent to the Department of Education using the electronic Form 30A and the Indiana Technical Education Reporting System (INTERS). IDOE and DWD have taken significant steps in recent years to improve the integrity and usefulness of this system in collaboration with the Indiana Management Performance Hub. This system provides an opportunity for collecting additional information from school corporations and career centers. The state can improve future analysis by adding additional information to this form, validating existing enrollment records, developing reporting requirements for increased data quality.

3. **Public Benefit and Tax Data:** Incorporate information on the use of public benefits as well as income tax payments into the Management and Performance Hub in order to produce more comprehensive assessments of impact, as proposed by the Upjohn Institute and NACCTE. The Indiana Management and Performance Hub has provided a foundation for analysis by working with state agencies to bring together data sets relevant to CTE. The state can obtain a more complete understanding of the impact of CTE programming by continuing to bring data sets together for expanded analysis.

4. **Certification and Credential Data:** Indiana can gain a better understanding of short-term impacts of CTE by compiling data on the credentials and certifications obtained by CTE participants. This information is already being collected in different ways across the state. There is significant potential in understanding how this information is being collected, potentially expanding what is collected, and preparing it for use in analysis.

Through renewed attention on CTE and the increasing abilities of the Management Performance Hub, should it choose to do so, the State of Indiana is positioned to systematically measure and evaluate the ongoing ROI of CTE. Improving the collection, validity, and robustness of data through the steps described above is a first step in doing so. However, better data must also be accompanied by its strategic use. Clearly defining goals relative to CTE—be they future earnings, career exploration, or simply educational attainment—is critical to ensuring effective use of data. Further, accounting for the future of work by preparing students to adapt must be a critical component of both CTE delivery and attempts to measure its effectiveness.

CONCLUSION

The increased attention being paid to CTE presents unique opportunities to improve state-wide systems and their ability to prepare Hoosier students to join the workforce. Given that CTE touches around half of all Indiana high school students each year, CTE curriculum and its delivery have an outsized opportunity to significantly affect the state's economic future. Yet, as this report makes clear, there is much still to be done to make sure CTE's impact can be fully realized.

Next steps for CTE include improving the collection and availability of information and data. As described throughout this report, there are numerous data points that are opaque at best and non-existent at worse. Improved cost tracking, enhanced enrollment reporting, more readily available public benefit and tax data, and higher quality certification and credential data can all aid in illuminating the effectiveness of CTE. Ongoing use and analysis of this data can enable state policymakers and educators to make refinements as needed. Clearer, more prescribed processes around governance and reporting can aid in increasing transparency and ensuring consistency and validity of data.

Indiana once led the nation in launching state-wide support of what is now known as CTE. As described above, with passage of the Indiana Vocational Law in 1913, the State of Indiana funded CTE four years before the federal government. A confluence of factors now positions Indiana to yet again lead the nation in advancing CTE to produce a workforce for the 21st Century.

APPENDIX 1. CTE DISTRICTS

District ⁸⁵	CTE District Name	Perkins Grantee/ Fiscal Agent ⁸⁶	Member School Corporations (District Numbers and Names) ⁸⁷	Perkins Funding FY 17-18
1	East Chicago Central High School	School City of East Chicago	#4670 School City of East Chicago	150,344
2	Area Career Center of Hammond	School City of Hammond	#4710 Hammond, #4720 Highland, #4760 Whiting School City, #4615 Lake Central, #4700 Griffith, #4740 Munster, #4680 Lake Station, #4650 Lake Ridge	541,419
3	Gary Area Career Center	Gary Community School Corporation	#4690 Gary Community School Corporation	275,487
3A	Merrillville Career Consortium	Merrillville Community School Corp	#4600 Merrillville Community School Corp	130,035
4	Southlake Career Cooperative	Tri-Creek School Corp	#4580 Hanover, #4645 Tri-Creek, #4660 Crown Point, #3785 Kankakee Valley	142,322
5	Porter County Career and Technical Education	Porter County Education Interlocal	#4730 School City of Hobart, #6460 MSD Boone Township, #6520 Porter Township, #6530 Union Township, #6470 Duneland, #6550 Portage Township, #6560 Valparaiso, #6510 East Porter County	316,426
6	A.K. Smith Career Center	Michigan City Area Schools	#4925 Michigan City, #4770 Cass Township, #4790 Dewey Township, #4860 New Durham, #4880 Prairie Township, #4805 New Prairie #4940 South Central, #4945 Laporte	262,378
7	South Bend Community School Corporation	South Bend Community School Corporation	#7205 South Bend	458,637
8	Elkhart Area Career Center	Elkhart Community Schools	#2305 Elkhart, #2260 Baugo, #2275 Middlebury, #2285 Wa-Nee, #2315 Goshen, #7200 Mishawaka, #2270 Concord, #7175 Penn-Harris, #5480 Bremen	647,162
9	Impact Institute	Dekalb County Eastern Community School District	#1820 Garrett-Keyser-Butler, #4515 Prairie Heights, #4525 Westview, #4535 Lakeland, #6055 Central Noble, #6060 East Noble, #7605 Fremont, #7610 Hamilton, #7615 MSD Steuben, #1805 DeKalb County Eastern, #1835 DeKalb County Central, #8625 Smith-Greene, # West Noble	281,099
10	Indian Trails Career Cooperative	Twin Lakes School Corporation	#8565 Twin Lakes, #3815 Rensselaer, #5945 North Newton, #8515 North White, #6630 West Central, #0750	132,739

⁸⁵ In recent years, there has been some consolidation of CTE Districts. For example, District 15 school corporations moved to either District 10 or District 19. District 39 merged with District 43. For more information see:

<https://www.doe.in.gov/sites/default/files/cte/2017-2018-perkins-districts-allocations-facts-and-observations-6-7-17>.

⁸⁶ As described above, by law Perkins funding must be distributed to a “local education agency,” which is generally a local school corporation. In CTE Districts that are aggregations of multiple school corporations, one of the school corporations typically serves as the fiscal agent and local education agency for the CTE District. The school corporation is the recipient of Perkins funding, which often means the school corporation serves as the de facto leader of the CTE District.

⁸⁷ The list of member schools was compiled by IACTED: <http://www.iacted.org/index.php/directors>.

District ⁸⁵	CTE District Name	Perkins Grantee/ Fiscal Agent ⁸⁶	Member School Corporations (District Numbers and Names) ⁸⁷	Perkins Funding FY 17-18
			Carroll, #0755 Delphi, #8525 Frontier, #8535 Tri- County, #5995 South Newton	
11	North Central Area Voc Cooperative	Culver Community Schools Corporation	#5455 Culver, #7495 Oregon Davis, #7515 North Judson- San Pierre, #7525 Knox, #5470 Argos, #5485 Plymouth, #5495 Triton, #7150 John Glenn, #7215 Union-North United, #2645 Rochester	183,862
12	Warsaw Area Career Center	Warsaw Community Schools	#4415 Warsaw, #4445 Tippecanoe Valley, #4455 Whitko Community	113,282
13	Wawasee Area Career and Technical Cooperative	Wawasee Community School Corporation	#4345 Wawasee, #2155 Fairfield, #6065 West Noble	111,575
14	FWCS Career Academy @ Anthis	Fort Wayne Community Schools	#0235 Ft. Wayne, #0125 MSD Southwest Allen County, #0225 Northwest Allen County, #0255 East Allen County, #8665 Whitley County	889,923
16	Century Career Center	Logansport Community School Corporation	#0875 Logansport, #0815 Southeastern, #0775 Pioneer, #6620 Eastern Pulaski, #2650 Caston	100,119
17	Heartland Career Center	Heartland Career Center	#5620 North Miami, #5635 Peru, #8045 Manchester, #8050 MSD Wabash, #8060 Wabash	99,762
18	Area 18 CTE Cooperative	MSD Bluffton- Harrison	#0015 Adams Central, #0035 South Adams, #8425 South Wells, #0025 North Adams, #8445 MSD Bluffton- Harrison, #3945 Jay County, #8435 Northern Wells, #3625 Huntington County, #0515 Blackford County	307,019
19	Wildcat Creek Career Cooperative	Tippecanoe School Corporation	#7865 Tippecanoe, #7875 West Lafayette, #7855 Lafayette, #1160 Clinton Prairie, #1170 Frankfort, #1180 Rossville, #1150 Clinton Central, #0395 Benton	383,836
20	Kokomo Area Career Center	Kokomo-Center Township Consolidated School Corporation	#3500 Kokomo, #3460 Taylor, #3470 Northwestern, #3480 East Howard, #3490 Western, #5615 Maconaquah, #7935 Tri-Central	212,899
21	Marion Regional Career Center	Marion Community Schools	#2865 Marion, #2815 Eastbrook, #2855 Mississinewa, #5625 Oak Hill	149,216
22	Muncie Area Career Center	Muncie Community Schools	#1970 Muncie, #1875 Delaware, #1895 Liberty-Perry, #1900 Monroe, #1910 Yorktown, #6825 Randolph Central, #1885 Wes-Del, # Daleville, #6835 Randolph Eastern, #6820 Monroe Central	291,961
23	West Central Indiana Career and Technical Education	Crawfordsville Community Schools	#5855 Crawfordsville, #5835 North Montgomery, #5845 South Montgomery, #0615 Western Boone	90,471
24	J.E. Light Career Center	MSD Washington Township	#5370 MSD Washington, #0665 Lebanon, #3070 Noblesville, #3005 Hamilton Southeastern, #3025 Hamilton Heights, #3055 Marion Adams, #3030 Westfield Washington, #0630 Eagle Union, #3060 Carmel Clay	625,238
24A	Pike Career and STEM Center	MSD Pike	#5350 MSD Pike	196,227

District ⁸⁵	CTE District Name	Perkins Grantee/ Fiscal Agent ⁸⁶	Member School Corporations (District Numbers and Names) ⁸⁷	Perkins Funding FY 17-18
25	Hinds Career Center	Elwood Community School Corporation	#5280 Elwood, #7945 Tipton, #5245 Frankton-Lapel, #2825 Madison-Grant	80,919
26	Anderson Community Schools CTE	Anderson Community School Corporation	#5275 Anderson, #5265 Alexandria, #5255 South Madison, #3135 Mt. Vernon	263,645
27	New Castle Career Center	New Castle Community School Corporation	#3145 Eastern Hancock #3445 New Castle, #3405 Blue River Valley, #3415 South Henry, #3435 Shenandoah, #3455 C.A. Beard, #6795 Union, #8305 Nettle Creek	128,310
28	Richmond Area Career Center	Richmond Community School Corporation	#8385 Richmond, #8375 Northeastern Wayne, #6805 Randolph Southern	126,497
29	Wabash River Career and Technical Education District	South Vermillion Community School Corporation	#8020 South Vermillion, #8010 North Vermillion, # 6375 North Central Parke, # Southwest Parke, #2435 Attica, #2440 Covington, @2455 Southeast Fountain, #8115 MSD Warren County	110,276
30	Area 30 Career Center	Area 30 Interlocal	#6700 Area 30, #6750 Cloverdale, #6705 South Putnam, #6715 North Putnam, #6755 Greencastle, #5910 Eminence	73,454
31	Area 31 Career Programs	MSD Wayne Township	#5375 MSD Wayne, #3295 N.W. Hendricks, #3305 Brownsburg, #3315 Avon, #3325 Danville, #3330 Plainfield, #3335 Mill Creek, #5400 Speedway, #5930 Mooresville, #5300 MSD Decatur, #5900 Monroe-Gregg	642,538
32	IPS Career Technology Center	Indianapolis Public Schools	#5385 Indianapolis Public Schools	976,720
32A	Charter Schools USA	Charter Schools USA	#8815 Charter Schools USA	180,658
33	Bernard K. McKenzie Career Center for Innovation and Technology	MSD Lawrence Township	#5330 MSD Lawrence	242,694
34	Whitewater Career Center	Fayette County School Corporation	#2395 Fayette County, #6995 Rushville, #7950 Union County, #2475 Franklin County, #8355 Western Wayne, #8360 Centerville-Abington	166,665
35	Vigo County School Corporation	Vigo County School Corporation	#8030 Vigo County, #1125 Clay Community	276,888
36	Hoosier Hills Career Center	Monroe County Community School Corporation	#5740 Monroe County, #2940 Eastern Greene, #5705 Richland Bean Blossom, #5925 Martinsville, #6195 Spencer Owen	306,802
37	Central Nine Career Center	Central Nine Career Center	#5340 MSD Perry, #5310 MSD Franklin, #4145 Clark- Pleasant, #4205 Center Grove, #4225 Franklin, #4245 Greenwood, #4255 Nineveh-Hensley-Jackson#5380 Beech Grove	576,833
38	Blue River Career Programs	Blue River Career Programs	#7365 Shelbyville Central, #7285 Shelby Eastern, #7360 Shelby Southwestern, #7350 Shelby North Western	80,166

District ⁸⁵	CTE District Name	Perkins Grantee/ Fiscal Agent ⁸⁶	Member School Corporations (District Numbers and Names) ⁸⁷	Perkins Funding FY 17-18
40	North Lawrence Career Center	North Lawrence Community Schools	#5075 North Lawrence, #5085 Mitchell, #3695 Brownstown, #5520 Shoals, #6145 Orleans, #3640 Medora	138,155
41	C4 Columbus Area Career Connection	Bartholomew Consolidated School Corporation	#0365 Bartholomew, #1655 Decatur County, #1730 Greensburg, #3710 Crothersville, #3675 Seymour, #0670 Brown County, #0370 Flat Rock – Hawcreek, #4215 Edinburgh	300,588
42	Southeastern Career Center	Southeastern Career Center	#4015 Jennings County, #6865 S. Ripley, #6895 Batesville, #6900 Jac-Cen-Del, #6910 Milan, #1560 Sunman, #1600 S. Dearborn, #1620 Lawrenceburg, #6080 Rising Sun, #3995 Madison, #4000 S.W. Jefferson County, #7775 Switzerland County	298,060
43	Twin Rivers CTE Area	Twin Rivers Vocational Area	#7715 Southwest, #7645 Northeast, #2950 Linton-Stockton, #2960 Shakamak, #2980 White River Valley, #4315 North Knox, #4325 South Knox, #4335 Vincennes, #1315 Barr-Reeve, #1375 North Daviess, #1405 Washington, #5525 Loogootee, #2920 Bloomfield	271,565
44	Lost River Career Cooperative	Lost River Career Cooperative	#6155 Paoli, #6160 Springs Valley, #8220 W. Washington	49,881
45	Prosser Career Education Center	New Albany-Floyd County Consolidated School Corporation	#2400 New Albany, #3190 S. Harrison, #3180 N. Harrison, #0940 West Clark, #1000 Clarksville, #1010 Greater Clark, #7230 Scott #1, #7255 Scott #2, #3160 Lanesville, #8205 Salem, #8215 E. Washington, #1300 Crawford County, Rock Creek (Charter)	540,897
46	Southern Indiana Career and Technical Center	Evansville-Vanderburgh School Corporation	#7995 Evansville, #2735 N. Gibson, #2765 South Gibson, #6590 Mt. Vernon, #6600 North Posey, #8130 Warrick County, #7445 South Spencer County	584,134
47/48	Patoka Valley Career and Technical Cooperative	Greater Jasper Consolidated Schools	#2120 Jasper, #6445 Pike County, #2040 Northeast Dubois, #2100 Southeast Dubois, #2110 Southwest Dubois, #7385 North Spencer, #2725 East Gibson, #6350 Tell City, #6325 Perry Central, #6340 Cannelton	134,831
	Perry County Career and Technical Cooperative			
49	Walker Career Center	MSD Warren Township	#5360 MSD Warren, #3125 Greenfield, #3115 S. Hancock	266,364

APPENDIX 2. CAREER CLUSTERS

Indiana's Perkins plan notes that the state's CTE career clusters are "modeled on the work completed at the national level."⁸⁸ This is a reference to the 16 national career cluster definitions that come from Advance CTE, a national non-profit.⁸⁹ There are multiple nuanced differences between the national and state clusters, but generally the differences are that (1) Indiana's Business and Marketing cluster combines the national Business Management & Administration, Finance, and Marketing clusters; (2) Indiana's Hospitality & Human Services cluster combines the national Hospitality & Tourism and Human Services clusters, and (3) Indiana does not have a Government & Public Administration cluster that exists nationally. Indiana's clusters and corresponding national definitions are as follows:

1. **Agriculture:** Focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.
2. **Architecture & Construction:** Careers in designing, planning, managing, building and maintaining the built environment.
3. **Arts, AV Technology and Communication:** Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services.
4. **Business and Marketing:** Careers in planning, organizing, directing and evaluating business functions essential to efficient and productive business operations.
5. **Education and Training:** Planning, managing and providing education and training services, and related learning support services.
6. **Health Science:** Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
7. **Hospitality & Human Services:** The management, marketing and operations of restaurants and other food services, lodging, attractions, recreation events and travel related services. Preparing individuals for employment in career pathways that relate to families and human needs such as counseling and mental health services, family and community services, personal care, and consumer services.
8. **Information Technology:** Building linkages in IT occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia and systems integration services.
9. **Manufacturing & Logistics:** Planning, managing and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.
10. **Public Safety:** Planning, managing, and providing legal, public safety, protective services and homeland security, including professional and technical support services.

⁸⁸ https://www.in.gov/dwd/files/Final_Perkins_5_Year_State_Plan.pdf

⁸⁹ <https://careertech.org/career-clusters>

11. **STEM:** Planning, managing and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.
12. **Transportation and Logistics:** Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

APPENDIX 3. RELATED OR COMPLEMENTARY STATE AND FEDERAL FUNDING

The programs described below provide CTE-like education to populations that are generally not enrolled in a traditional high school with access to secondary CTE programming. These programs, likely among others, could be further assessed as opportunities to stretch funding farther through shared resources, streamlined processes, and enhanced stakeholder connections.

Vincennes University Career and Technical Early College Program

This program offers high school students the chance to earn or make progress on an associate degree in a CTE area offered by Vincennes University (VU). VU partners with CTE Districts to deliver CTE education.⁹⁰ Secondary students enrolled in certain Indiana high schools (Early College high schools) can receive transferable credits at a low cost. Students must apply to the program.⁹¹ Approximately 24 high schools or CTE District career centers are currently participating in the Vincennes Early College program.

Indiana Workforce Ready Grants

The Workforce Ready Grant program is an initiative under the Indiana Commission for Higher Education. The aim of the grant is to provide Hoosier adults with funding to cover tuition and fees related to high-value certificate programs at Ivy Tech Community College, Vincennes University, or other providers.⁹² There are program qualifying requirements and the eligible programs must align with the highest demanded sectors in Indiana. The programs align with advanced manufacturing, building and construction, health and life sciences, IT and business services, and transportation and logistics. Numerous specific programs and opportunities exist under each of those five industries.⁹³

Adult Basic Education

Adult Basic Education (ABE) funds are administered by DWD and support programming that helps adults and out-of-school youth develop foundational skills. This programming enables participants to earn a high school equivalency diploma, pursue post-secondary education, or enter an entry-level occupational certification program. ABE is administered in coordination with WorkINdiana which enables Hoosiers to earn one of over 30 certifications in fields such as advanced manufacturing, business administration and support, construction, health care, hospitality, information technology, and transportation and logistics. For the 2018-2019 state fiscal year, ABE is funded with a mix of state and federal dollars that total nearly \$22.7 million while WorkINdiana is funded with \$5 million in state dollars.

⁹⁰ [https://www.in.gov/che/files/Vincennes_University\(1\).pdf](https://www.in.gov/che/files/Vincennes_University(1).pdf)

⁹¹ Example application: <http://www.hcc.k12.in.us/images/vu/HECCC%20Application.pdf>

⁹² <https://www.in.gov/che/4773.htm>

⁹³ <https://www.nextleveljobs.org/Job-Seeker/Available-Job-Training>

Vocational Rehabilitation

Vocational Rehabilitation (VR) funds are administered by the Family and Social Services Administration (FSSA) in order to help people with disabilities in preparing for, obtaining, and retaining employment. VR funds a wide range of activities, including Project SEARCH a worksite-based school-to-work program that provides employment and education opportunities for students with disabilities transitioning from high school. For the 2018-2019 state fiscal year, VR is funded with nearly \$76.4 million dollars, nearly 80% of which are from the U.S. Department of Education's Vocational Rehabilitation State Grant. Both VR and ABE are referenced in Indiana's WIOA state plan, indicating an intent to administer these programs in a coordinated manner.

APPENDIX 4. CTE COURSE OFFERINGS

The courses below are the high demand/high wage, \$500 value, CTE courses with any 2017-2018 enrollment. The table shows the various ways in which each course is offered across the state and within a district. Various credits mean that the course was offered for a different number of credits within a CTE District, likely at different schools.

DOE Code	Course Name	Districts Offering	Districts NOT Offering	Districts Offering for Various Credits	Districts Offered for 1 Credit	Districts Offered for 2 Credits	Districts Offered for 3 Credits
4588	Networking II: Infrastructure (replaces Infrastructure of the Internet in 2016-2017)	10	39	1	3	0	6
4830	Construction Trades: Electrical I (replaced Construction Technology: Electrical I 2014)	11	38	1	1	1	8
4832	Construction Trades: Electrical II (replaced Construction Technology: Electrical II 2014)	7	42	0	0	0	7
5136	Landscape Management I	39	10	11	24	1	3
5137	Landscape Management II	6	43	0	4	0	2
5203	Dental Careers I	23	25	5	0	5	14
5204	Dental Careers II	11	38	0	0	4	7
5215	Health Science II: Physical Therapy	7	42	0	4	3	0
5232	Interactive Media	43	5	24	18	2	0
5234	Networking I (replaces Network Fundamentals in 2016-2017)	39	9	8	14	8	10
5236	Computer Science II: Programming (replaced Computer Programming II in 2015-2016)	28	21	9	18	0	1
5251	Computer Science II: Informatics (NEW 2015-2016)	2	47	0	2	0	0
5252	Computer Science II: Special Topics	6	43	0	4	1	1
5257	Networking II: Servers (replaces Servers and Security in 2016-2017)	6	43	0	2	2	2
5258	Banking and Investment Capstone (replaces Banking and Investment Careers in 2016-2017)	16	33	1	15	0	0
5282	Health Science Education I	48	0	36	3	2	8
5284	Health Science Education II: Nursing	47	1	22	0	2	24

DOE Code	Course Name	Districts Offering	Districts NOT Offering	Districts Offering for Various Credits	Districts Offered for 1 Credit	Districts Offered for 2 Credits	Districts Offered for 3 Credits
5286	Health Science II: Special Topics	23	26	8	2	4	9
5290	Health Science Education II: Athletic Training (NEW 2015-2016)	4	45	0	2	1	1
5336	Human and Social Services I	23	26	7	12	2	2
5346	Culinary Arts and Hospitality II: Culinary Arts (replaces Advanced Culinary Arts in 2016-2017)	37	12	7	5	2	23
5404	Education Professions II	23	26	5	6	8	4
5406	Early Childhood Education II	26	23	6	2	3	15
5408	Education Professions I	44	5	25	9	5	5
5412	Early Childhood Education I	41	8	19	3	4	15
5420	Fashion and Textile Careers I	25	24	2	21	2	0
5421	Fashion and Textile Careers II	2	47	0	2	0	0
5440	Culinary Arts and Hospitality I (replaces Culinary Arts and Hospitality Management in 2016-2017)	47	1	34	1	2	11
5456	Nutrition Science Careers I	6	42	0	7	0	0
5458	Culinary Arts and Hospitality II: Hospitality Management (replaces Advanced Hospitality Management in 2016-2017)	7	42	1	1	0	5
5462	Human and Social Services II	5	44	0	4	0	1
5495	Construction Trades: Heavy Equipment II (replaced Construction Technology: Heavy Equip II 2014)	1	48	0	0	0	1
5496	Construction Technology HVAC I	14	35	1	0	0	13
5497	Construction Trades: Heavy Equipment I (replaced Construction Technology: Heavy Equip I 2014)	3	46	0	0	0	3
5498	Construction Technology HVAC II	11	38	1	0	2	8
5510	Automotive Services Technology I	48	1	28	1	4	15
5514	Automotive Collision Repair I (replaced Auto Collision Repair Technology I 2014)	36	13	15	0	4	17
5544	Automotive Collision Repair II (replaced Auto Collision Repair Technology II 2014)	23	26	3	0	3	17
5546	Automotive Services Technology II	44	5	10	0	8	26
5550	Graphic Design and Layout	37	11	21	6	8	3
5572	Graphic Imaging Technology	29	20	7	6	10	6

DOE Code	Course Name	Districts Offering	Districts NOT Offering	Districts Offering for Various Credits	Districts Offered for 1 Credit	Districts Offered for 2 Credits	Districts Offered for 3 Credits
5578	Construction Trades II (replaced Construction Technology II 2014)	40	9	7	1	2	30
5580	Construction Trades I (replaced Construction Technology I 2014)	45	4	25	1	2	17
5592	Building & Facilities Management I	1	48	0	0	0	1
5593	Building & Facilities Maintenance I	9	40	3	1	0	5
5594	Building & Facilities Maintenance II	2	47	0	0	0	2
5601	Supply Chain Management and Logistics	4	45	1	2	0	1
5606	Advanced Manufacturing II	21	27	5	13	1	3
5608	Advanced Manufacturing I	40	8	19	18	2	2
5610	Industrial Automation and Robotics I (replaces Automation and Robotics I in 2016-2017)	18	31	6	6	4	2
5612	Industrial Automation and Robotics II (replaces Automation and Robotics II in 2016-2017)	7	42	2	2	1	2
5616	Energy Industry I (NEW 2015-2016)	1	48	0	0	0	1
5618	Energy Industry II (NEW 2015-2016)	1	48	0	0	0	1
5620	Diesel Service Technology I	18	31	0	0	0	18
5622	Tractor/Trailer Operation	2	47	0	0	0	2
5624	Diesel Service Technology II	8	41	0	0	0	8
5686	Industrial Technical Maintenance I (replaces Industrial Repair and Maintenance in 2016-2017)	4	45	0	1	0	3
5688	Industrial Technical Maintenance II (new in 2016-2017)	3	46	0	1	0	2
5776	Welding Technology I	46	3	31	0	5	10
5778	Welding Technology II	40	9	10	1	7	22
5782	Precision Machining I	35	14	15	4	6	10
5784	Precision Machining II	28	21	7	0	2	19
5820	Fire and Rescue I	24	24	3	4	4	14
5822	Criminal Justice I	44	4	25	3	1	16
5824	Criminal Justice II Advanced	26	23	6	2	7	11
5826	Fire and Rescue II	11	38	0	0	6	5

DOE Code	Course Name	Districts Offering	Districts NOT Offering	Districts Offering for Various Credits	Districts Offered for 1 Credit	Districts Offered for 2 Credits	Districts Offered for 3 Credits
5966	Entrepreneurship and New Ventures Capstone (replaces Entrepreneurship and New Ventures in 2016-2017)	43	5	12	31	0	1
5986	Radio and Television I	43	5	33	7	1	3
5992	Radio and Television II	39	9	18	12	6	4