

THE ECONOMIC BENEFITS OF CAREER TECHNICAL EDUCATION ON THE STATE OF OHIO



OVERVIEW

Career technical education prepares students for certificates, industry-recognized certifications, and state licensures to obtain employment in a variety of careers such as nursing, public safety, welding, construction, technology, automotive services, and other skilled trades. Career technical education is available to high school students through 49 joint vocational school districts (JVSD), also known as career centers, whereas adult students access career technical education through the 51 Ohio Technical Centers (OTCs) located throughout the State of Ohio. With the support of the Ohio Association of Career-Technical Superintendents (OACTS), this study explores the economic and fiscal benefits generated by the operations and capital expenditures of career centers and the benefits of career technical education for adult students.

- During the 2018-19 academic year, a total of **10,773** adult students were enrolled in career technical education. The majority of adult students were female (60.1%) and White (78.6%).¹
- **7,134** career technical certificates were awarded during the 2018-19 academic year. Approximately **64.3 percent** of the certificates awarded were less than one year in length.
- Approximately **62.0 percent** of the certificates awarded were in health professions or related clinical sciences programs. An additional **11.3 percent** of the total certificates awarded were in security and protective services programs.
- The top 20 programs based on statewide completions represent **93.4 percent** of the total certificates awarded.



Program	Total Completions
Nursing Assistant and Patient Care Aide*	1,251
Licensed Practical Nurse (LPN)*	1,101
Emergency Medical Technician (EMT)	780
Firefighter	526
Welding	492
Heating, Ventilation, and Air Conditioning (HVAC)	331
Phlebotomy	308
Police	277
Medical Assistant	246
Registered Nurse	192
Vehicle Operator	158
Dental Assistant	157
Industrial/Heavy Equipment Mechanics	128
Medical Office Assistant, Billing, and Coding	127
Cosmetology	127
Auto/Diesel Mechanics	109
Lineworker	89
Surgical Technologist	72
Machine Technology	70
Electrician	66
Industrial Engineering Technology	59
Other	468
Total	7,134

¹ Data on enrollment and completions during the 2018-19 academic year was obtained from the Integrated Postsecondary Education Data System (IPEDS) of the U.S. Department of Education.

* Nursing assistant and patient care aide certificate programs are combined with licensed practical nurse (LPN) certificate programs for the earnings and return on investment analysis because the programs correspond to similar relevant occupations.

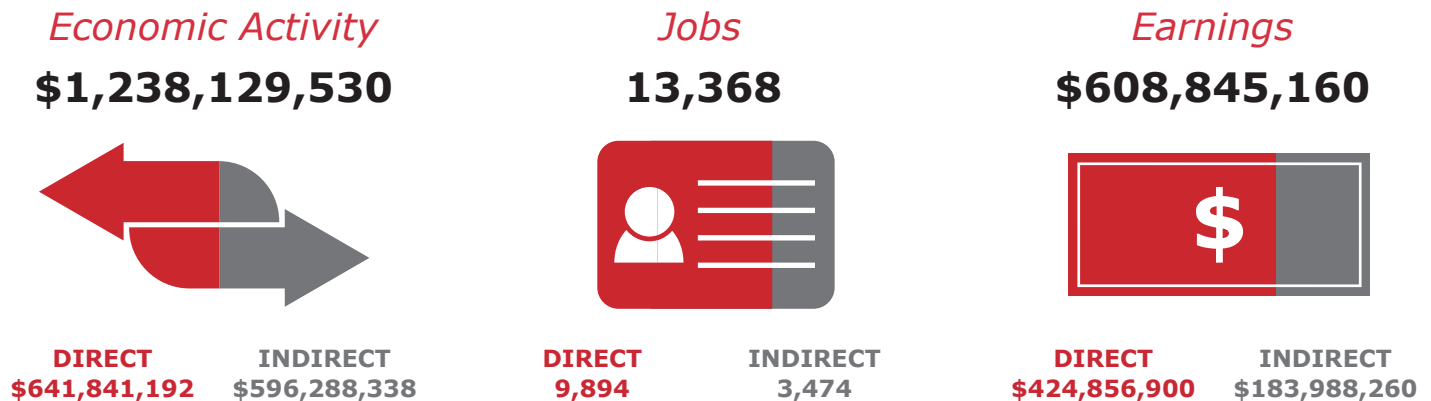
ECONOMIC IMPACT

In the State of Ohio, career technical education is available to current high school students at every public high school. The membership of OACTS comprises the 49 joint vocational school districts (JVSD), also known as career centers, which offer career technical education to two or more adjacent school districts.

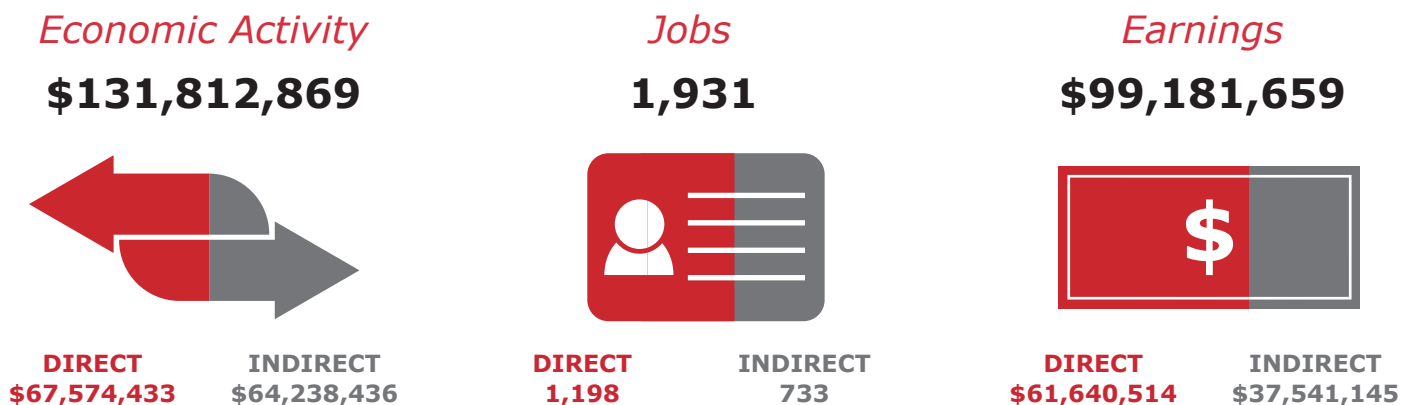
To provide career technical education, career centers incur expenses related to operations and capital projects. Operations expenditures represent the day-to-day expenses such as the salaries paid to provide instructional and support services, purchase supplies, and other services, among other things. Career centers also incur expenses related to capital projects such as building expansion, equipment, or information technology upgrades. These expenditures are associated with a specific project and are generally a one-time expenditure, as opposed to ongoing.

The expenditures made by career centers on operations and capital generate economic activity in the State of Ohio. These expenditures in turn stimulate additional economic activity for the businesses and industries that provide goods and services to career centers. The direct impact is the amount spent directly by career centers that was retained in the State of Ohio after accounting for economic leakage. Economic leakage refers to the percentage of demand for products and services that cannot be met immediately within the local economy, and thus must be imported from outside the local economy. The indirect impact is the additional impact resulting from the inter-industry linkages. Direct impacts also have ripple effects known as induced impacts as a result of the increases in household income and spending. Induced impacts are reported within indirect impacts.

Economic Impact of Operations Expenditures on the State of Ohio, FY 2019 (2020\$)



Economic Impact of Capital Expenditures on the State of Ohio, Annual Average FY 2015-2019 (2020\$)



EARNINGS



The economic benefit of completing a career technical certificate is represented by the potential earnings associated with full-time employment in a related occupation. The projected earnings for each certificate program were compared to the baseline earnings for individuals with a high school diploma or equivalent. The difference in earnings represents the additional earnings potential resulting from specialized training and continued related employment for a certificate holder from each program.

On average, career technical certificate holders are estimated to have annual earnings of **\$46,208** five years after starting the program. This represents a potential earnings gain of \$12,323 compared to the annual earnings of high school graduates. Average annual earnings for certificate holders are projected to increase to **\$50,742** after 10 years, or approximately \$14,032 more than high school graduates. After 20 years, the average annual earnings of certificate holders are projected to increase to **\$61,309**, which represents a potential earnings gain of \$18,221 compared to high school graduates.

The lineworker certificate program has the highest projected annual earnings after 20 years of approximately **\$106,704**. Registered nurse (**\$88,263**), industrial/heavy equipment mechanics (**\$86,657**), police (**\$86,389**), and firefighter (**\$79,517**) programs each had projected annual earnings after 20 years that exceeded the high school baseline by more than \$36,000. Of the top 20 programs, all but one have higher earnings during each time period compared to the high school baseline.

Program	Year 5	Year 10	Year 20
Licensed Practical Nurse (LPN), Nursing Assistant, Patient Care Aide	\$39,700	\$43,567	\$52,519
Emergency Medical Technician (EMT)	\$36,444	\$40,416	\$49,705
Firefighter	\$59,011	\$65,178	\$79,517
Welding	\$46,407	\$50,754	\$60,793
Heating, Ventilation, and Air Conditioning (HVAC)	\$52,439	\$54,938	\$60,305
Phlebotomy	\$37,611	\$41,701	\$51,265
Police	\$68,728	\$74,170	\$86,389
Medical Assistant	\$37,415	\$41,939	\$52,694
Registered Nurse	\$71,488	\$76,691	\$88,263
Vehicle Operator	\$44,862	\$49,842	\$61,691
Dental Assistant	\$44,630	\$50,561	\$64,892
Industrial/Heavy Equipment Mechanics	\$62,181	\$69,444	\$86,657
Medical Office Assistant, Billing, and Coding	\$41,958	\$47,457	\$60,814
Cosmetology	\$28,127	\$33,823	\$48,995
Auto/Diesel Mechanics	\$45,021	\$49,720	\$60,723
Lineworker	\$76,534	\$85,405	\$106,704
Surgical Technologist	\$51,996	\$57,642	\$70,839
Machine Technology	\$43,156	\$46,984	\$55,689
Electrician	\$62,385	\$67,241	\$78,508
Industrial Engineering Technology	\$53,710	\$55,807	\$60,248
Other	\$56,376	\$61,885	\$74,762
Weighted Average	\$46,208	\$50,742	\$61,309
High School Baseline	\$33,885	\$36,710	\$43,088

* Cosmetology begins with lower annual earnings compared to the high school baseline; however, the annual earnings for cosmetology exceed the high school baseline 14 years after the start of the program. Due to data limitations, the earnings of cosmetology occupations do not include tips, and discrepancies in reported earnings may be more prevalent due to more home-based businesses. Cosmetology occupations also have a high turnover rate, which suppresses earnings growth.

RETURN ON INVESTMENT

Obtaining a career technical certificate has both explicit and implicit costs that are often incurred at the beginning of the program, while the benefits are not immediate. Therefore, obtaining a certificate is often considered an investment that delivers future returns in the form of additional earnings. The benefits refer to the increased earnings potential that results from attaining additional education relative to individuals with a high school diploma or equivalent. The total cost includes the explicit costs such as tuition, books, and fees as well as the implicit opportunity costs of pursuing a certificate. Opportunity costs refer to the earnings a student foregoes as a result of the decrease in hours worked in order to pursue career technical education.

On average, the return on investment of a career technical certificate is **223.6 percent** after five years, **757.0 percent** after 10 years, and **2,071.4 percent** after 20 years. Firefighter programs have a return on investment of **9,548.1 percent** after 20 years, which represents the highest return on investment among the top programs. Of the top 20 programs, all but one has a positive return on investment after 20 years. This means that a graduate of each of these programs is expected to have earnings that recoup the cost of their career technical certificate and result in earnings above that of a high school graduate.

Program	Year 5	Year 10	Year 20
Licensed Practical Nurse (LPN), Nursing Assistant, Patient Care Aide	-89.6%	70.6%	480.1%
Emergency Medical Technician (EMT)	-64.0%	179.8%	968.9%
Firefighter	1,714.4%	4,009.7%	9,548.1%
Welding	159.4%	579.3%	1,579.5%
Heating, Ventilation, and Air Conditioning (HVAC)	328.9%	892.5%	1,979.7%
Phlebotomy	109.3%	530.7%	1,787.4%
Police	694.8%	1,659.5%	3,811.6%
Medical Assistant	-142.0%	-35.6%	318.0%
Registered Nurse	230.6%	799.5%	2,047.3%
Vehicle Operator	550.2%	1,449.1%	3,798.5%
Dental Assistant	51.6%	450.0%	1,592.1%
Industrial/Heavy Equipment Mechanics	429.9%	1,237.5%	3,247.0%
Medical Office Assistant, Billing, and Coding	-42.5%	215.1%	983.8%
Cosmetology*	-42.5%	-293.4%	-256.2%
Auto/Diesel Mechanics	23.6%	345.5%	1,158.0%
Lineworker	756.9%	2,047.3%	5,206.2%
Surgical Technologist	46.1%	397.0%	1,268.0%
Machine Technology	16.3%	287.5%	920.6%
Electrician	382.1%	1,222.9%	3,098.0%
Industrial Engineering Technology	439.9%	1,074.8%	2,258.7%
Other	627.8%	1,666.8%	4,118.2%
Weighted Average	223.6%	757.0%	2,071.4%

* The persistent negative return on investment is influenced by data limitation regarding earnings. Additionally, the higher costs to complete a cosmetology certificate is also contributing to the persistent negative return on investment. The return on investment for a cosmetology certificate becomes positive after 29 years following the start of the program.



FISCAL IMPACT

Operations and Capital Expenditures

The operations and capital expenditures of career centers generate fiscal impacts for state and local governments in addition to the economic impacts generated. The fiscal impact includes the earnings tax revenue resulting from the earnings generated by operations and capital expenditures as well as the sales tax revenue resulting from the spending of those earnings. In total, the expenditures of career centers generated **\$26.6 million** in tax revenue for state and local governments in fiscal year 2019. Income tax revenue totaled **\$15.6 million**, while sales tax revenue totaled **\$11.0 million**. The fiscal impact of operations expenditures accounted for **86.2 percent** of the total fiscal impact. The fiscal impact of capital expenditures accounted for the remaining **13.8 percent** of the total fiscal impact

Income Tax Revenue

\$15,603,624



OPERATIONS
\$13,319,794

CAPITAL
\$2,283,830

Sales Tax Revenue

\$11,018,589



OPERATIONS
\$9,635,243

CAPITAL
\$1,383,346

Total Tax Revenue

\$26,622,213



OPERATIONS
\$22,955,037

CAPITAL
\$3,667,176

Career Technical Education

The career technical education that adult education certificate holders receive leads to a higher earnings potential, on average, compared to individuals with a high school diploma or equivalent. The additional earnings potential generates fiscal impacts for state and local government through increased income and sales tax revenue. Collectively, adult education certificate holders during the 2018-19 academic year are estimated to generate an additional **\$74.6 million** in tax revenue over 20 years, or an average of **\$3.7 million** per year. The fiscal impact per certificate holder is **\$10,463** over 20 years, or approximately **\$523 per year**.

Annual Tax Revenue

\$3,732,389



**INCOME TAX
REVENUE**
\$3,174,032

**SALES TAX
REVENUE**
\$558,357

Total Tax Revenue

\$74,647,774



**INCOME TAX
REVENUE**
\$63,480,636

**SALES TAX
REVENUE**
\$11,167,138



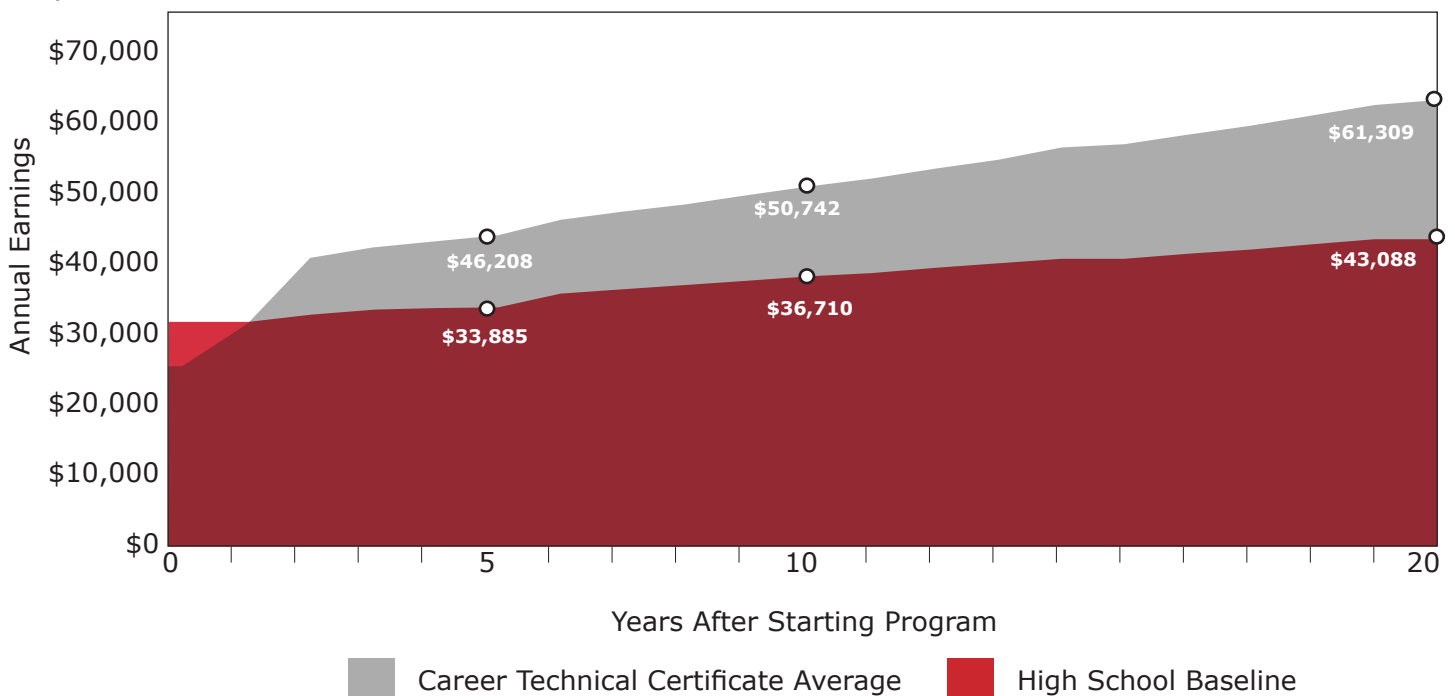
SUMMARY

By providing career technical education and training, career centers and OTCs generate economic benefits for the State of Ohio. The operations and capital expenditures of career centers generate economic activity, jobs, and earnings as well as generate income and sales tax revenue for state and local governments. The career technical education and training provided by OTCs to adult students leads to additional earnings potential, on average, for certificate holders. The additional earnings potential also leads to fiscal impacts for state and local governments.

To provide career technical education, career centers pay employees and purchase supplies and services to support their day-to-day operating. Career centers also make purchases related to construction, renovation, and equipment. The expenditures made by career centers on operations and capital generated substantial economic activity in the State of Ohio during fiscal year 2019. In total, capital and operations expenditures generated **\$1.4 billion** in economic activity, supported **15,299 jobs**, and generated **\$708.0 million** in earnings. Additionally, career centers generated **\$26.6 million** in income and sales tax revenue during fiscal year 2019.

Career technical education also generates economic benefits by providing specialized training and education to adults throughout the State of Ohio. After completion of a career technical certificate program, student are equipped for employment in a variety of industries. These certificate holders, who previously only had a high school diploma or equivalent, have the potential for an improved employment and earnings position. However, there are both explicit and implicit costs associated with obtaining a career technical certificate. The return on investment for each program compares the cumulative gain of each program with the total costs of the program. The cumulative gain in a given year is the sum to date of the annual gains where the annual gain represents the annual difference between the baseline earnings for high school graduates and the estimated earnings for certificate holders after subtracting the costs incurred to complete the program.

On average, career technical certificate holders are estimated to have annual earnings of **\$46,208** five years after starting the program. This represents a potential annual earnings gain of \$12,323 compared to high school graduates. After 10 years, the average annual earnings are projected to increase to **\$50,742**, or approximately \$14,032 more than the high school baseline. The average annual earnings for certificate holders increases to **\$61,309** after 20 years, which represents a potential annual earnings gain of \$18,221 compared to high school graduates. The average return on investment of a career technical certificate is **223.6 percent** after five years, **757.0 percent** after 10 years, and **2,071.4 percent** after 20 years.





The Ohio Association of Career-Technical Superintendents (OACTS) fosters collaboration among career center and joint vocational school district superintendents to share best practices and to advance career technical education in Ohio. OACTS advocates with legislators to promote the growth and quality of Ohio's career centers and to foster an understanding of how career technical and adult education impacts the lives of students and contributes to the workforce of Ohio.



Ohio Technical Centers (OTCs), a division of the Ohio Association of Career-Technical Superintendents (OACTS), are educational providers offering postsecondary and adult learners the training and credentials needed for today's most in-demand jobs.



The Research and Consulting division of the Alpaugh Family Economics Center provides tools to help clients make better financial, policy, and economic and workforce development decisions. Our dynamic approach and critical data analyses empower business and civic leaders to respond to changing economic conditions, strengthen local economies, and improve the quality of life for their communities.