

# **The Economic Impact and Benefit-Cost Analysis of Dohn Community High School**

**March 12, 2020**

## Table of Contents

<b>Executive Summary</b> .....	4
<b>Introduction</b> .....	8
<b>Economic and Fiscal Impacts</b> .....	9
Capital .....	9
Operations.....	10
Fiscal .....	12
<b>Dohn Enrollment and Graduates</b> .....	12
<b>Background on Dropouts</b> .....	16
<b>Economic Benefits</b> .....	20
Earnings.....	20
<b>Annual Earnings</b> .....	22
<b>Lifetime Earnings</b> .....	25
<b>Fiscal Benefits</b> .....	26
Tax Revenues .....	27
<b>Income Tax Revenue</b> .....	27
<b>Sales Tax Revenue</b> .....	28
Government Assistance.....	29
Crime .....	32
<b>Economic and Fiscal Costs</b> .....	35
Pupil Expenditures .....	35
Foregone Earnings.....	35
<b>Net Benefit of High School Graduation</b> .....	36
<b>Conclusion</b> .....	37
<b>Methodology</b> .....	39
<b>Appendix</b> .....	42
<b>References</b> .....	44

## List of Tables

Table 1: Net Benefit of a High School Diploma for Graduates of Dohn Five Years Post-Graduation (2019\$).....	6
Table 2: Net Lifetime Benefit of a High School Diploma for Graduates of Dohn (2019\$)...	7
Table 3: Capital Expenditures, FY 2015-2019 (2019\$) .....	9
Table 4: Total Economic Impact of Capital Expenditures, FY 2015-2019 (2019\$).....	10
Table 5: Operations Expenditures, FY 2015-2019 (2019\$).....	11

Table 6: Total Economic Impact of Operations Expenditures, FY 2015-2019 (2019\$) .....	11
Table 7: Direct Fiscal Impact, FY 2015-2019 (2019\$) .....	12
Table 8: Dohn Enrollment, FY 2015-2019 .....	12
Table 9: Dohn Enrollment by Program, FY 2015-2019.....	13
Table 10: Dohn Graduates by Program, FY 2015-2019.....	13
Table 11: Dohn Enrollment in High School Programs by Grade Level, FY 2015-2019 .....	14
Table 12: Dohn Enrollment by Age Group, FY 2015-2019 .....	15
Table 13: Dohn Graduates by Age Group, FY 2015-2019.....	15
Table 14: Population by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 .....	18
Table 15: Employment Status by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 .....	18
Table 16: Occupational Category of Employed Individuals Aged 16 and Over by Education in the Cincinnati MSA, 2014-2018 Average.....	19
Table 17: Poverty Status by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 .....	20
Table 18: Average Annual Earnings by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$) .....	23
Table 19: Average Annual Earnings by Sex and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$) .....	23
Table 20: Average Annual Earnings by Race and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$) .....	24
Table 21: Average Annual Earnings by Age and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$) .....	25
Table 22: Average Annual Earnings in the Cincinnati MSA (2019\$) .....	26
Table 23: Additional Lifetime Earnings of Dohn Graduates (2019\$).....	26
Table 24: Average Annual Income Tax Payments to the City of Cincinnati (2019\$) .....	27
Table 25: Average Lifetime Income Tax Payments by Dohn Graduates (2019\$) .....	28
Table 26: Lifetime Aggregate Income Tax Payments by Dohn Graduates (2019\$) .....	28
Table 27: Average Annual Sales Tax Revenues to Hamilton County and State of Ohio (2019\$) .....	29
Table 28: SNAP, Public Health Insurance, and Public Assistance Reciprocity by Education in the Cincinnati MSA, 2014-2018 Average.....	31
Table 29: Annual Public Assistance Savings in the Cincinnati MSA (2019\$) .....	31
Table 30: Lifetime Public Assistance Savings of Dohn Graduates (2019\$).....	31
Table 31: Adult Correctional Population in Ohio Aged 25 and Over by Education, 2018 ..	33
Table 32: Annual Incarceration Cost Savings of Dohn Graduates (2019\$).....	34
Table 33: Total Pupil Expenditures for Dohn Graduates, FY 2015-2019 (2019\$) .....	35
Table 34: Foregone Earnings of Dohn Graduates by Years at Dohn (2019\$).....	36
Table 35: Net Benefit of a High School Diploma for Dohn Graduates Five Years Post-Graduation (2019\$).....	37
Table 36: Net Lifetime Benefit of a High School Diploma for Dohn Graduates (2019\$) ...	37
Table 37: Population by Education and Sex for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 .....	42
Table 38: Population by Education and Race for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 .....	43

## List of Figures

Figure 1: Distribution of Years at Dohn by Age at Graduation for Graduates .....	16
Figure 2: Median Annual Earnings by Age and Educational Attainment, 2006-2008 (2008\$) .....	21
Figure 3: Median Lifetime Earnings by Educational Attainment, 2007-2009 (2009\$) .....	22

## Executive Summary

Dohn Community High School (Dohn) has been educating at-risk youth and adult students in the Cincinnati Region since its inception in 2001. Dohn offers multiple programs across eight campuses<sup>1</sup> and continues to expand its offerings. Enrollment at Dohn increased from 261 students during fiscal year 2015 to 1,569 students in fiscal year 2019, or an average increase of 56.6 percent per year. The number of graduates from Dohn increased by an average of 48.9 percent annually from 114 graduates in fiscal year 2015 to 560 graduates in fiscal year 2019. Collectively, Dohn has provided 4,531 students with educational opportunities between fiscal year 2015 and fiscal year 2019 through its high school and 22+ programs. The combined graduation rate<sup>2</sup> among Dohn students was 41.2 percent during the 2018-19 academic year, which exceeded the Ohio Department of Education standards.<sup>3</sup> It often takes more than four years for a student to earn a high school diploma due to the transient nature of students' lives.

The capital investments and operations expenditures of Dohn over the past five years have positively impacted the Cincinnati Metropolitan Statistical Area<sup>4</sup> (MSA)(Region). Capital investments by Dohn between fiscal years 2015 and 2019 had a total economic impact of \$4.2 million<sup>5</sup>. This spending led to earnings of \$1.5 million and supported 29 jobs. Between fiscal years 2015 and 2019, Dohn's operations expenditures had a total economic impact of \$50.7 million, an earnings impact of \$20.0 million, and an employment impact of 516 jobs. Dohn's employees contributed \$281,475 in City of Cincinnati earnings taxes and \$288,732 in State of Ohio and Commonwealth of Kentucky income taxes over the past five years.

Average annual earnings, and therefore income and sales tax collections for state and local entities, rise as educational attainment increases. In the Cincinnati MSA, a high school dropout earns an average of \$10,303 per year. A high school graduate earns an average of \$20,334, or \$10,031 more per year. Given he or she was living and working within the City of Cincinnati, a graduate generates an additional \$211 to the City of Cincinnati in annual income taxes compared to a dropout. Compared with a high school dropout, a graduate also pays an additional \$191 in Hamilton County and State of Ohio sales tax per year, given all taxable purchases were made within Hamilton County.

As educational attainment increases, the demand for government assistance and the tendency to commit crime decreases.<sup>6</sup> In the Cincinnati MSA, 4.0 percent of high school dropouts and 1.6 percent of graduates receive public assistance funds.<sup>7</sup> A high school

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<sup>1</sup> Locations include Avondale, Downtown, Central Parkway, Colerain, Roselawn, Walnut Hills (2), and Westwood.

<sup>2</sup> The combined graduation rate is the weighted average of 4- through 8-year graduation rates.

<sup>3</sup> (Ohio Department of Education n.d.)

<sup>4</sup> A Metropolitan Statistical Area (MSA) is an area comprised of different communities with close economic ties to one another. The Cincinnati MSA encompasses five counties in Ohio: Brown, Butler, Clermont, Hamilton, and Warren; seven counties in Kentucky: Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton; and three counties in Indiana: Dearborn, Franklin, and Ohio.

<sup>5</sup> All dollars presented in this report are in 2019\$ unless otherwise stated.

<sup>6</sup> (Messacar and Oreopoulos 2012)

<sup>7</sup> IPUMS 2014 – 2018

dropout in the Cincinnati MSA receives an average of \$113 in public assistance annually compared to a graduate who receive \$43 in public assistance annually.<sup>8</sup> According to the American Community Survey, approximately 2.4 percent of individuals in Ohio with less than a high school diploma were incarcerated in 2018, whereas 0.9 percent of individuals with a high school diploma or equivalent were incarcerated. The average cost to incarcerate individuals in the State of Ohio was \$29,448 in fiscal year 2019 according to the Ohio Department of Rehabilitation and Correction.<sup>9</sup> Graduates of Dohn are estimated to save taxpayers \$474,066 in incarceration costs per year.

Although the benefits of high school graduation are numerous, there are also associated costs that must be considered. Costs of high school graduation include the expenditures made by Dohn to educate students and the earnings foregone by students while in school. Graduates of Dohn over the past five years spent an average of 1.4 years at Dohn prior to graduating. The average cost to educate one student at Dohn was \$7,784 per year. The total cost to educate the 1,507 graduates of Dohn was \$16.9 million between fiscal years 2015 and 2019. Foregone earnings represent the opportunity cost to students of a high school education. On average, a graduate of Dohn sacrificed \$3,094 in earnings to remain in school. In total, graduates of Dohn forfeited nearly \$4.7 million in earnings to graduate from high school between fiscal years 2015 and 2019.

Table 1 details the net benefit of the 1,507 students graduating from high school at Dohn during the five years following their graduation. Between fiscal years 2015 and 2019, the total cost of pursuing a high school diploma for Dohn graduates was \$21.5 million. The total benefits over the five years after graduation are estimated at \$81.5 million. The net benefit of these students graduating from Dohn is \$60.0 million, which translates into a benefit-cost ratio of 3.79. This means that every \$1 spent on education at Dohn for these graduates over the past five years leads to \$3.79 in benefits to society during the five years following their graduation.

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<sup>8</sup> IPUMS 2014 – 2018

<sup>9</sup> (Ohio Department of Rehabilitation and Correction 2019)

**Table 1: Net Benefit of a High School Diploma for Graduates of Dohn Five Years Post-Graduation (2019\$)**

<b>Category</b>	<b>Total</b>
Earnings	\$75,583,585
City of Cincinnati Income Tax Revenue	\$1,589,885
Hamilton County and State of Ohio Sales Tax Revenue	\$1,439,185
Public Assistance Savings	\$527,450
Incarceration Cost Savings	\$2,370,335
<b>Total Benefits</b>	<b>\$81,510,440</b>
Pupil Expenditures	\$16,859,492
Foregone Earnings	\$4,662,624
<b>Total Costs</b>	<b>\$21,522,116</b>
<b>Net Benefit</b>	<b>\$59,988,324</b>
<b>Benefit-Cost Ratio</b>	<b>3.79</b>

*Source: Economics Center calculations.*

The benefits of a high school diploma continue to accumulate over the course of an individual's remaining time in the workforce. A graduate of Dohn is estimated to earn an additional \$387,777 over the remainder of his or her working career, on average, compared to if he or she had not graduated. Collectively, the 1,507 graduates of Dohn are estimated to earn an additional \$584.4 million throughout their remaining time in the workforce compared to if they had not earned a high school diploma. Estimates of additional lifetime earnings increase if Dohn graduates choose to pursue additional education or training. A graduate of Dohn will also save taxpayers \$3,623 in public assistance over the remainder of his or her time in the workforce. In total, Dohn graduates from fiscal year 2015 to fiscal year 2019 are estimated to save taxpayers \$5.5 million in public assistance funds compared to if they had not graduated from high school.

Table 2 summarizes the lifetime benefits and costs of earning a high school diploma for Dohn graduates between fiscal years 2015 and 2019. By educating and graduating students, Dohn is helping to generate \$589.8 million in economic and fiscal benefits for their graduates and taxpayers. The lifetime costs associated with graduating from Dohn were \$21.5 million. Therefore, graduates of Dohn generate \$568.3 million in net economic and fiscal benefits. Although fiscal benefits are generated in terms of increased income and sales tax revenue and criminal cost savings, these benefits are excluded from lifetime benefits.

**Table 2: Net Lifetime Benefit of a High School Diploma for Graduates of Dohn  
(2019\$)**

<b>Category</b>	<b>Lifetime Total</b>
Lifetime Earnings	\$584,379,782
Public Assistance Savings	\$5,459,592
<b>Total Benefits</b>	<b>\$589,839,374</b>
Pupil Expenditures	\$16,859,492
Foregone Earnings	\$4,662,624
<b>Total Costs</b>	<b>\$21,522,116</b>
<b>Net Benefit</b>	<b>\$568,317,258</b>

*Source: Economics Center calculations.*

## Introduction

Dohn Community High School (Dohn) is a non-profit high school that serves at-risk youth and adult students in the Cincinnati Metropolitan Statistical Area<sup>10</sup> (MSA)(Region) across multiple campuses. Dohn was created in 2001 to help students recovering from drug and alcohol addiction gain an adequate education. Numerous programs offered on eight campuses<sup>11</sup> within the Cincinnati Region help promote community engagement, social development, and career fulfillment for Dohn students. The most popular programs include traditional high school, Success Academy, Transition Academy, and the 22+ program.

Although Dohn is a dropout recovery school with open enrollment, students are beginning to attend Dohn for high school as freshmen. The traditional high school program is distinctive in that grade promotion is based on student effort. Credit recovery is offered to students who have dropped out of high school. Additionally, credit flex, the ability to self-pace learning, is offered to students who wish to accelerate their learning.

The Success Academy is available for students between the ages of 19 and 21 that have dropped out of high school prior to completing all graduation requirements. Flexible schedules allow students to juggle classes in addition to work and family obligations. Similarly, the Transition Academy is aimed toward students with family or job responsibilities. Shorter school days allow students to learn from instructors as well as to experience self-paced learning. Additionally, students are able to study with individuals who are similar in age and have similar life responsibilities.

Started in 2016, the 22+ program provides students 22 years of age and older with the opportunity to earn a fully accredited high school diploma. To avoid redundancy, all previous earned credits and state testing results are accepted. In order to graduate, students must meet the Ohio Department of Education standards that were in effect when they began ninth grade. Dohn is one of approximately 25 providers in Ohio that offer this type of program. Since the inception of Dohn's 22+ program in 2016, it has awarded the most diplomas each fiscal year of any other 22+ provider in Ohio.<sup>12</sup>

Dohn is continually developing and offering new programs such as the Creative and Performing Arts Program and Keeping Teen Moms in School (KTMIS). The Creative and Performing Arts Program delivers education for students interested in acting, music, visual arts, creative writing, and dance. KTMIS offers pregnant teens and teen moms an alternative academic pathway to graduation with onsite care for their children, transportation to and from school, parenting classes, and job placement services. Dohn is

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<sup>10</sup> A Metropolitan Statistical Area (MSA) is an area comprised of different communities with close economic ties to one another. The Cincinnati MSA encompasses five counties in Ohio: Brown, Butler, Clermont, Hamilton, and Warren; seven counties in Kentucky: Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton; and three counties in Indiana: Dearborn, Franklin, and Ohio.

<sup>11</sup> Locations include Avondale, Downtown, Central Parkway, Colerain, Roselawn, Walnut Hills (2), and Westwood.

<sup>12</sup> (Ohio Department of Education 2016); (Ohio Department of Education 2017); (Ohio Department of Education 2018); (Ohio Department of Education 2019a)

able to offer its numerous programs due to strong teacher retention and graduation rates that exceed the Ohio Board of Education Standards.

By providing these educational programs, Dohn is contributing to the long-term success of their students. High school dropouts earn less, receive more in public assistance, are more likely to be incarcerated, have worse health, and are unhappier than high school graduates, in general.<sup>13</sup> This report has two primary objectives: to estimate the economic and fiscal impact of Dohn’s capital and operations expenditures on the Cincinnati MSA and to analyze the economic and fiscal benefits and costs of Dohn’s educational programs.<sup>14</sup>

## Economic and Fiscal Impacts

Through Dohn’s daily operations and investments in capital, the community is benefiting from the economic activity generated by Dohn in the Cincinnati MSA. The expenditures made by Dohn and its employees stimulate economic activity for other businesses and industries. The direct impact of Dohn is the amount spent directly and locally on capital investments and operations. The indirect impact is the additional economic activity that is a result of inter-industry linkages. Direct impacts also have ripple effects known as induced impacts as a result of the increases in household income and spending.<sup>15</sup>

### Capital

Between fiscal years 2015 and 2019, Dohn spent more than \$1.1 million on expenditures associated with construction and renovation; \$578,161 on planning, drawing, fees, and permits; \$842,347 on equipment and supplies; and \$6,854 on software, as shown in Table 3. These purchases were made largely from firms within the Cincinnati Region, which thereby created a positive economic effect locally and generated additional spending, earnings, and employment. Throughout this time frame, nearly \$2.0 million of the total capital expenditures made by Dohn remained within the Cincinnati Region. The remainder was paid to firms outside of the Region that provided necessary goods and services.

**Table 3: Capital Expenditures, FY 2015-2019 (2019\$)**

Expenditure	FY15	FY16	FY17	FY18	FY19	Total
Construction	\$12,853	\$108,407	\$504,399	\$412,326	\$82,563	<b>\$1,120,548</b>
Design/engineering	\$6,632	\$55,934	\$260,251	\$212,745	\$42,599	<b>\$578,161</b>
Equipment	\$9,662	\$81,492	\$379,171	\$309,957	\$62,065	<b>\$842,347</b>
IT	\$79	\$663	\$3,085	\$2,522	\$505	<b>\$6,854</b>
<b>Total</b>	<b>\$29,226</b>	<b>\$246,496</b>	<b>\$1,146,906</b>	<b>\$937,550</b>	<b>\$187,732</b>	<b>\$2,547,910</b>

Source: Economics Center calculations.

<sup>13</sup> (Messacar and Oreopoulos 2012)

<sup>14</sup> The Cincinnati MSA encompasses five counties in Ohio: Brown, Butler, Clermont, Hamilton, and Warren; seven counties in Kentucky: Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton; and three counties in Indiana: Dearborn, Franklin, and Ohio.

<sup>15</sup> Induced impacts are reported within indirect impacts for the entirety of this report.

Capital expenditures reached a high of \$1.1 million in fiscal year 2017, which led to a total economic impact of nearly \$1.9 million. After controlling for economic leakage<sup>16</sup>, direct spending of \$895,244 in the local economy led to indirect spending of \$981,381 by the firms supported by Dohn's capital expenditures. This spending in fiscal year 2017 generated \$361,618 in direct earnings, which then led to \$296,697 in indirect earnings throughout the Cincinnati MSA. Approximately four jobs were supported in fiscal year 2017 because of the direct spending of Dohn. Subsequent spending by firms supported an additional 9.1 full- and part-time jobs.

Between fiscal year 2015 and fiscal year 2019, Dohn's capital purchases had a direct economic impact in the Cincinnati MSA of nearly \$2.0 million. An additional \$2.2 million in indirect economic activity was generated for a total economic impact of \$4.2 million between fiscal year 2015 and fiscal year 2019. Dohn's spending on capital purchases led to total earnings of \$1.5 million in the Cincinnati Region. Between fiscal years 2015 and 2019, 8.6 full- and part-time jobs were supported directly by Dohn's capital purchases, which led to an additional 20.2 indirect jobs.

**Table 4: Total Economic Impact of Capital Expenditures, FY 2015-2019 (2019\$)**

Impact Type		FY15	FY16	FY17	FY18	FY19	Total
Output	Direct	\$22,813	\$192,408	\$895,244	\$731,826	\$146,539	<b>\$1,988,830</b>
	Indirect	\$25,008	\$210,921	\$981,381	\$802,240	\$160,638	<b>\$2,180,188</b>
	<b>Total</b>	<b>\$47,821</b>	<b>\$403,329</b>	<b>\$1,876,625</b>	<b>\$1,534,066</b>	<b>\$307,177</b>	<b>\$4,169,018</b>
Earnings	Direct	\$9,215	\$77,720	\$361,618	\$295,609	\$59,192	<b>\$803,354</b>
	Indirect	\$7,560	\$63,767	\$296,697	\$242,538	\$48,565	<b>\$659,127</b>
	<b>Total</b>	<b>\$16,775</b>	<b>\$141,487</b>	<b>\$658,315</b>	<b>\$538,147</b>	<b>\$107,757</b>	<b>\$1,462,481</b>
Employment	Direct	0.1	0.8	3.9	3.2	0.6	<b>8.6</b>
	Indirect	0.2	2.0	9.1	7.4	1.5	<b>20.2</b>
	<b>Total</b>	<b>0.3</b>	<b>2.8</b>	<b>13.0</b>	<b>10.6</b>	<b>2.1</b>	<b>28.8</b>

Source: Economic Center calculations.

## Operations

During fiscal years 2015 and 2019, Dohn made \$29.1 million in operations expenditures such as salaries, benefits, supplies, and purchased services. Salaries, the largest component of operations expenditures, comprised an average of 45.5 percent of annual operations expenditures. These expenditures had substantial direct and indirect impacts on the Region by means of output, earnings, and employment.

<sup>16</sup> 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. Leakage estimates were obtained from Emsi.

**Table 5: Operations Expenditures, FY 2015-2019 (2019\$)**

Expenditure	FY15	FY16	FY17	FY18	FY19	Total
Salaries	\$1,330,611	\$1,545,931	\$2,521,516	\$3,690,981	\$4,470,935	<b>\$13,559,974</b>
Fringe Benefits	\$322,364	\$348,943	\$603,996	\$927,633	\$966,860	<b>\$3,169,796</b>
Purchased Services	\$699,059	\$1,299,475	\$1,714,606	\$2,422,650	\$2,425,805	<b>\$8,561,595</b>
Supplies	\$74,155	\$74,377	\$111,015	\$260,837	\$235,801	<b>\$756,185</b>
Debt Service	\$26,727	\$0	\$0	\$26,927	\$398,596	<b>\$452,250</b>
Transfer Out	\$576,386	\$248,680	\$1,155,520	\$445,013	\$0	<b>\$2,425,599</b>
Other	\$14,387	\$10,963	\$13,454	\$34,699	\$147,974	<b>\$221,477</b>
<b>Total</b>	<b>\$3,043,689</b>	<b>\$3,528,369</b>	<b>\$6,120,107</b>	<b>\$7,808,740</b>	<b>\$8,645,971</b>	<b>\$29,146,876</b>

Source: Dohn Community High School, adjusted for inflation.

Operations spending retained in the local economy increased from \$2.8 million in fiscal year 2015 to approximately \$8.0 million in fiscal year 2019. This represents an annual increase of approximately 30.4 percent. Between fiscal years 2015 and 2019, the direct earnings of Dohn employees grew from \$1.3 million to \$4.4 million. This growth corresponds with the increased number of employees at Dohn. Dohn's direct employment grew by 28.8 percent annually from 40 employees in fiscal year 2015 to 110 employees in fiscal year 2019.

Dohn's operations spending led to a total direct output of \$26.7 million, which generated an additional \$24.0 million in indirect economic activity in fiscal year 2015 through fiscal year 2019. Individuals employed directly by Dohn earned \$13.6 million between fiscal years 2015 and 2019. Dohn's spending on purchased services and supplies, among other spending, led to indirect earnings of \$6.4 million. Dohn directly employed 388.0 individuals and supported an additional 128.3 full- and part-time jobs within the Region these past five years.

**Table 6: Total Economic Impact of Operations Expenditures, FY 2015-2019 (2019\$)**

Impact Type		FY15	FY16	FY17	FY18	FY19	Total
Output	Direct	\$2,769,139	\$3,205,891	\$5,528,927	\$7,178,959	\$8,012,627	<b>\$26,695,543</b>
	Indirect	\$2,488,349	\$2,880,814	\$4,968,293	\$6,451,013	\$7,200,146	<b>\$23,988,615</b>
	<b>Total</b>	<b>\$5,257,488</b>	<b>\$6,086,705</b>	<b>\$10,497,220</b>	<b>\$13,629,972</b>	<b>\$15,212,773</b>	<b>\$50,684,158</b>
Earnings	Direct	\$1,330,611	\$1,545,931	\$2,521,516	\$3,690,981	\$4,470,935	<b>\$13,559,974</b>
	Indirect	\$629,113	\$730,916	\$1,192,173	\$1,745,096	\$2,113,858	<b>\$6,411,156</b>
	<b>Total</b>	<b>\$1,959,724</b>	<b>\$2,276,847</b>	<b>\$3,713,689</b>	<b>\$5,436,077</b>	<b>\$6,584,793</b>	<b>\$19,971,130</b>
Employment	Direct	40.0	48.0	82.0	108.0	110.0	<b>388.0</b>
	Indirect	13.2	15.9	27.1	35.7	36.4	<b>128.3</b>
	<b>Total</b>	<b>53.2</b>	<b>63.9</b>	<b>109.1</b>	<b>143.7</b>	<b>146.4</b>	<b>516.3</b>

Source: Economic Center calculations.

## Fiscal

During fiscal years 2015 through 2019, Dohn employees contributed \$570,207 in state and local income taxes. Employment grew by an average of 28.8 percent annually between fiscal year 2015 and 2019. However, total income tax contributions grew by 31.6 percent annually over these five years. The City of Cincinnati collected \$281,475 in income tax revenue from Dohn employees between fiscal years 2015 and 2019. State income tax collections totaled \$288,732 over the past five years. On average, the State of Ohio received approximately 79.7 percent of the annual state income tax contributions of Dohn employees. The Commonwealth of Kentucky received the remaining 20.3 percent of annual income tax revenue collected from Dohn employees.

**Table 7: Direct Fiscal Impact, FY 2015-2019 (2019\$)**

Government Entity	FY15	FY16	FY17	FY18	FY19	Total
City of Cincinnati	\$27,787	\$32,434	\$52,466	\$76,882	\$91,906	<b>\$281,475</b>
State of Ohio	\$22,364	\$26,878	\$43,830	\$65,885	\$79,653	<b>\$238,610</b>
Commonwealth of Kentucky	\$10,860	\$11,329	\$7,375	\$9,137	\$11,421	<b>\$50,122</b>
<b>Total</b>	<b>\$61,011</b>	<b>\$70,641</b>	<b>\$103,671</b>	<b>\$151,904</b>	<b>\$182,980</b>	<b>\$570,207</b>

Source: Dohn Community High School, adjusted for inflation.

## Dohn Enrollment and Graduates

Dohn has experienced significant growth in its student body over the last five years. From fiscal year 2015 through fiscal year 2019, the total enrollment at Dohn increased by 501.1 percent or an average of 56.6 percent per year. The number of graduates increased from 114 during fiscal year 2015 to 560 in fiscal year 2019. This represents an average annual growth in graduates of 48.9 percent. Over the past five years, 4,531 students were enrolled (3,310 unique students) at Dohn with 1,507 students graduating.

**Table 8: Dohn Enrollment, FY 2015-2019**

Student Type	FY15	FY16	FY17	FY18	FY19	Total
Graduate	114	112	320	401	560	<b>1,507</b>
Non-Graduate	147	407	600	861	1,009	<b>3,024</b>
<b>Total</b>	<b>261</b>	<b>519</b>	<b>920</b>	<b>1,262</b>	<b>1,569</b>	<b>4,531</b>

Source: Dohn Community High School.

Table 9 details student enrollment at Dohn by program. The most popular programs offered by Dohn were traditional high school, Success Academy, Transition Academy, and the 22+ program. On average, 89.8 percent of students were enrolled in one of these four programs annually over the past five years. Enrollment in the traditional high school program grew by an average of 7.1 percent annually and averaged 148 students per year. Between fiscal years 2015 and 2019, enrollment in the Success Academy and Transition Academy increased by 59.9 percent and 33.9 percent per year, respectively. Since its inception in fiscal year 2016, the 22+ program has grown from an enrollment of 115 students to 742 students in fiscal year 2019.

**Table 9: Dohn Enrollment by Program, FY 2015-2019**

<b>Program</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>	<b>FY19</b>	<b>Total</b>
22+		115	420	581	742	<b>1,858</b>
Dohn Behavior Intervention			8		9	<b>17</b>
Fitness Academy				115	74	<b>189</b>
Gate Academy					6	<b>6</b>
Home Instruction	49	42		20	1	<b>112</b>
Independent Learning					6	<b>6</b>
Night School					26	<b>26</b>
Prep Academy				7	10	<b>17</b>
Success Academy	49	159	127	260	320	<b>915</b>
Traditional High School	108	145	196	150	142	<b>741</b>
Transition Academy	55	58	169	129	177	<b>588</b>
Young Women's Academy					56	<b>56</b>
<b>Total</b>	<b>261</b>	<b>519</b>	<b>920</b>	<b>1,262</b>	<b>1,569</b>	<b>4,531</b>

Source: Dohn Community High School.

Between fiscal years 2015 and 2019, students in the traditional high school comprised an average of 10.1 percent of graduates annually. Students in the Success Academy and Transition Academy comprised an average of 30.1 percent and 12.0 percent of graduates per year, respectively. Students in the 22+ program accounted for approximately 41.5 percent of the graduating class in a given year.

**Table 10: Dohn Graduates by Program, FY 2015-2019**

<b>Program</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>	<b>FY19</b>	<b>Total</b>
22+		34	181	238	342	<b>795</b>
Home Instruction	16	17			1	<b>34</b>
Night School					7	<b>7</b>
Prep Academy					4	<b>4</b>
Success Academy	47	34	77	157	89	<b>404</b>
Traditional High School	24	15	24		49	<b>112</b>
Transition Academy	27	12	38	6	68	<b>151</b>
<b>Total</b>	<b>114</b>	<b>112</b>	<b>320</b>	<b>401</b>	<b>560</b>	<b>1,507</b>

Source: Dohn Community High School.

Table 11 details the grade level of students enrolled in high school programs<sup>17</sup> at Dohn who have not yet graduated. Students enrolled in the 22+ program generally have two consecutive school years to complete the requirements to earn a high school diploma, and thus are excluded from Table 11.<sup>18</sup> Approximately 72.9 percent of students enrolled in high

<sup>17</sup> High school programs currently include all programs offered by Dohn except the 22+ program.

<sup>18</sup> (Ohio Department of Education 2019a)

school programs who have not graduated were in 11<sup>th</sup> or 12<sup>th</sup> grade. In fiscal year 2015, 9 students who had not yet graduated were in 12<sup>th</sup> grade. By fiscal year 2019, 255 students who had not yet graduated were in 12<sup>th</sup> grade. This means there were increasingly more students who were eligible to graduate.

**Table 11: Dohn Enrollment in High School Programs by Grade Level, FY 2015-2019**

Grade Level	FY15	FY16	FY17	FY18	FY19	Total
9 <sup>th</sup>	20	30	37	46	61	<b>194</b>
10 <sup>th</sup>	40	52	63	94	89	<b>338</b>
11 <sup>th</sup>	78	121	138	176	204	<b>717</b>
12 <sup>th</sup>	9	123	123	202	255	<b>711</b>
<b>Total</b>	<b>147</b>	<b>326</b>	<b>361</b>	<b>518</b>	<b>609</b>	<b>1,961</b>

*Source: Dohn Community High School.*

During fiscal years 2015 through 2019, the demographics of Dohn students have remained consistent. Approximately 59.9 percent of enrollment and 62.8 percent of graduates were females in a given year, on average. However, females have accounted for larger portions of the student body and of graduates since fiscal year 2017. During fiscal year 2017, females comprised 65.8 percent of enrollment and 72.8 percent of the graduating class.

The vast majority of both the student body and graduates were African American. Between fiscal years 2015 and 2019, African Americans comprised 96.6 percent of enrollment and 95.4 percent of graduates per year. White students represented 2.7 percent of enrollment and 3.7 percent of graduates annually, on average. Less than 1.0 percent of both the student body and graduates in a given year was comprised of students of other races.

Approximately three-quarters of annual enrollment at Dohn was among students between 14 and 29 years of age as seen in Table 12. On average, enrollment among students aged 14 to 19 grew by 31.2 percent annually. Enrollment of students aged 20 to 29 grew from 27 in fiscal year 2015 to 348 in fiscal year 2019, or an average of 89.5 percent per year. With the implementation of the 22+ program, enrollment among individuals 30 years of age and older substantially increased from 63 in fiscal year 2016 to 528 in fiscal year 2019, or an average of 103.1 percent per year.

**Table 12: Dohn Enrollment by Age Group, FY 2015-2019**

Age Group	FY15	FY16	FY17	FY18	FY19	Total
14 to 19	234	355	422	567	693	<b>2,271</b>
20 to 29	27	101	244	304	348	<b>1,024</b>
30 to 39		35	125	208	299	<b>667</b>
40 to 49		18	73	119	138	<b>348</b>
50 to 59		9	49	44	68	<b>170</b>
60 to 69		1	7	16	16	<b>40</b>
70+				4	7	<b>11</b>
<b>Total</b>	<b>261</b>	<b>519</b>	<b>920</b>	<b>1,262</b>	<b>1,569</b>	<b>4,531</b>

*Source: Dohn Community High School data.*

Similar trends were observed among graduates from Dohn. An average of 70.0 percent of graduates per year were between the ages of 14 and 29 at the time of graduation. However, the portion of graduates aged 14 to 29 fell from 100.0 percent during fiscal year 2015 to 52.9 percent during fiscal year 2019. Graduates aged 30 and over at the time of graduation grew from 17.9 percent during fiscal year 2016 to 47.1 percent in fiscal year 2019.

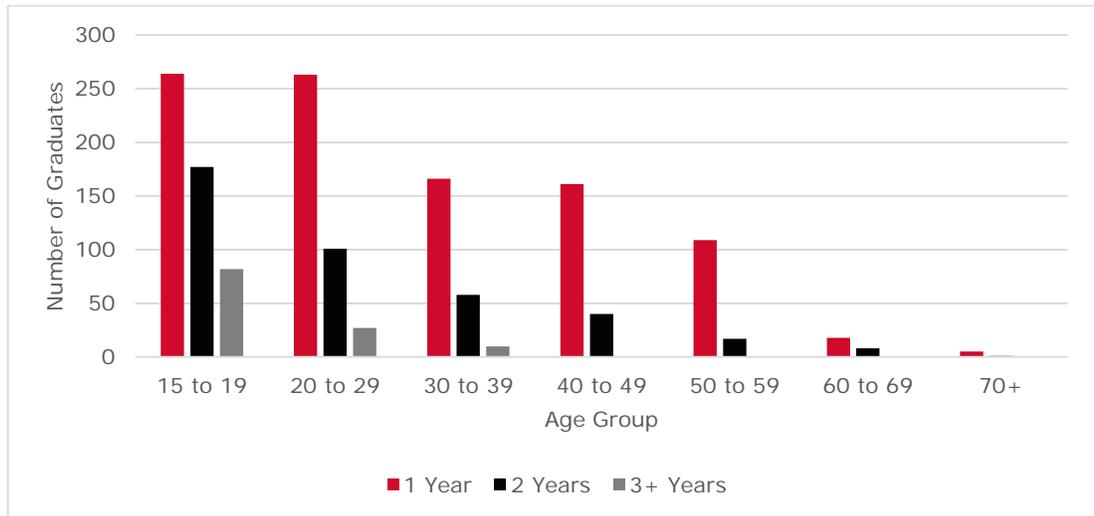
**Table 13: Dohn Graduates by Age Group, FY 2015-2019**

Age Group	FY15	FY16	FY17	FY18	FY19	Total
14 to 19	88	59	89	113	174	<b>523</b>
20 to 29	26	33	107	103	122	<b>391</b>
30 to 39		9	41	77	107	<b>234</b>
40 to 49		7	47	66	81	<b>201</b>
50 to 59		4	32	29	61	<b>126</b>
60 to 69			4	11	11	<b>26</b>
70+				2	4	<b>6</b>
<b>Total</b>	<b>114</b>	<b>112</b>	<b>320</b>	<b>401</b>	<b>560</b>	<b>1,507</b>

*Source: Dohn Community High School data.*

Approximately 65.4 percent of Dohn graduates spent only one year at Dohn between fiscal years 2015 and 2019. An additional 26.7 percent of graduates spent two years at Dohn, while 7.9 percent spent three years or more at Dohn over the past five years. As illustrated in Figure 1, the length of time spent at Dohn decreased with age. Graduates spending three or more years at Dohn were all between the ages of 15 and 39.

**Figure 1: Distribution of Years at Dohn by Age at Graduation for Graduates**



Source: Dohn Community High School data.

## Background on Dropouts

It is well-documented that high school dropouts experience worse economic and social prospects than high school graduates. However, several factors influence students' decisions to drop out of high school. Messacar and Oreopoulos (2013) identified factors affecting decisions to drop out of high school prior to graduating. School-related factors such as low attendance, grade failure, misconduct, and lack of motivation affect students' decisions to drop out. Household characteristics such as family type and household income influence the likelihood of dropping out of high school. Students from low-income families, divorced families, and single-parent families are more likely to drop out of high school. Additionally, household conflict, financial difficulties, and unexpected pregnancies contribute to decisions to drop out. Encouraging students to remain in high school could lead to reductions in teen pregnancy, health improvements, decreased need for public assistance, reduced crime rates, and increased voting.

The relationship between misconduct, measured as suspensions, and graduation rates among students in 10<sup>th</sup> through 12<sup>th</sup> grade in California was evaluated by Rumberger and Losen (2017). The graduation rate among students with no history of suspension was 83.0 percent, while students with at least one suspension had a graduation rate of 60.0 percent. After controlling for common predictors of dropping out, graduation rates declined by 6.5 percentage points after a student was suspended.

According to McFarland et al. (2018), dropout rates varied significantly by level of family income. The percentage of 16 to 24 year-olds that were not enrolled in school and did not have a high school diploma or equivalent, i.e. the status dropout rate, was 2.6 percent for students from high-income families and 9.7 percent for students from low-income families

during 2016.<sup>19</sup> This means students from low-income families were more than 3.5 times more likely to drop out than students from high-income families. This study also revealed that race, like income, can be a significant predictor of dropout rates. Since 1976, the status dropout rate for White students had been consistently lower than that for Black students until 2016, when there was no significant difference. Additionally, Hispanic students had higher status dropout rates than White students from 1976 to 2016.

While the state graduation rate in Ohio was 84.1 percent in 2017<sup>20</sup>, which was marginally lower than the national average of 85.0 percent<sup>21</sup> in 2017, this still implies that nearly 16.0 percent of students are not graduating on time. The Alliance for Excellent Education (2017) quantified the impact of increasing the graduation rate within the Cincinnati Region from 84.0 percent to 90.0 percent. An additional 1,270 graduates would result from the six percentage point increase in graduation rates in the Region. Of those new graduates, approximately 51.0 percent would go on to higher education, leading to an additional \$16.9 million in annual income. The regional economy could expect increased spending of \$13.5 million, increased state and local tax revenue of \$650,000, and increased economic growth of \$28.1 million per year. Additionally, the State of Ohio could expect health-care cost savings of \$49.0 million, due to the increased likelihood that high school graduates will obtain personal or employer-provided health insurance.

Within the Cincinnati MSA, the population when stratified by educational attainment has remained largely consistent throughout 2014 through 2018 as illustrated in Table 14. On average, high school dropouts comprised 8.8 percent of the population 16 and over who were no longer in school, while high school graduates made up 30.9 percent.<sup>22</sup> Individuals with a bachelor's degree or an advanced degree comprised approximately 30.5 percent of the population. Between 2014 and 2018, the number of dropouts has fallen 12.4 percent, or 3.3 percent annually. Meanwhile, all other education levels have grown over this time period. The number of individuals with an associate's degree has grown by 1.7 percent per year, and those with a minimum of a bachelor's degree have increased by 2.6 percent per year. Detailed population information by educational attainment and sex and race can be found in the Appendix.

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<sup>19</sup> High-income refers to family income above the 75<sup>th</sup> percentile, while low-income refers to family income at or below the 25<sup>th</sup> percentile.

<sup>20</sup> (Ohio Department of Education 2019b)

<sup>21</sup> (McFarland, Hussar, et al. 2019)

<sup>22</sup> This report examines the population 16 and over who are no longer in school unless otherwise stated.

**Table 14: Population by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018**

Education	2014	2015	2016	2017	2018	Average
HS Dropout	149,695	144,284	147,587	137,999	131,087	<b>142,130</b>
HS Graduate	499,111	496,346	483,443	496,598	504,516	<b>496,003</b>
Some College	350,363	345,335	362,212	361,341	353,309	<b>354,512</b>
Associate's	117,260	130,908	120,292	126,796	125,231	<b>124,097</b>
Bachelor's+	467,710	477,192	490,919	495,698	517,927	<b>489,889</b>

Source: IPUMS-USA.

Individuals with higher levels of educational attainment experienced higher rates of employment. As seen in Table 15, approximately 5.1 percent of high school dropouts were unemployed from 2014 to 2018 compared with 4.0 percent of high school graduates. Dropouts did not participate in the labor force at an average rate of 60.5 percent from 2014 to 2018, compared to 38.8 percent among high school graduates. Employment rates ranged from the 34.3 percent for high school dropouts to the 76.3 percent for graduates of four-year colleges.

**Table 15: Employment Status by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018**

Employment Status	Education	2014	2015	2016	2017	2018	Average
Employed	HS Dropout	33.0%	31.2%	33.8%	39.3%	34.7%	<b>34.3%</b>
	HS Graduate	56.9%	56.0%	57.6%	57.4%	58.4%	<b>57.2%</b>
	Some College	63.8%	64.9%	67.0%	64.7%	65.3%	<b>65.1%</b>
	Associate's	74.0%	73.8%	72.6%	72.3%	73.3%	<b>73.2%</b>
	Bachelor's+	76.4%	76.3%	75.8%	76.3%	76.8%	<b>76.3%</b>
Unemployed	HS Dropout	6.4%	5.5%	5.8%	3.4%	4.5%	<b>5.1%</b>
	HS Graduate	5.4%	4.3%	4.1%	2.9%	3.2%	<b>4.0%</b>
	Some College	4.5%	4.0%	3.2%	3.8%	2.5%	<b>3.6%</b>
	Associate's	4.9%	2.7%	3.6%	1.5%	1.1%	<b>2.7%</b>
	Bachelor's+	2.2%	1.7%	2.0%	1.4%	1.4%	<b>1.7%</b>
Not in Labor Force	HS Dropout	60.6%	63.2%	60.4%	57.3%	60.8%	<b>60.5%</b>
	HS Graduate	37.7%	39.7%	38.3%	39.7%	38.5%	<b>38.8%</b>
	Some College	31.8%	31.1%	29.8%	31.5%	32.3%	<b>31.3%</b>
	Associate's	21.1%	23.4%	23.8%	26.3%	25.6%	<b>24.1%</b>
	Bachelor's+	21.4%	22.0%	22.3%	22.3%	21.8%	<b>22.0%</b>

Source: IPUMS – USA.

Table 16 reveals the occupational category for employed individuals of differing educational attainment between 2014 and 2018. High school dropouts were most likely employed in service; transportation and moving materials; production; construction and extraction; and sales occupations. The top occupations in which high school graduates were employed were

service; office and administrative support; transportation and material moving; production; and sales occupations. While most of the top occupational categories were the same for dropouts and graduates, increased levels of education influence the opportunities available in other industries. For example, the percentage of those with bachelor's degrees working in management, business, and financial occupations is nearly 7 times higher than the percentage of dropouts employed in those occupations.

**Table 16: Occupational Category of Employed Individuals Aged 16 and Over by Education in the Cincinnati MSA, 2014-2018 Average**

<b>Occupation</b>	<b>HS Dropout</b>	<b>HS Graduate</b>	<b>Some College</b>	<b>Associate's</b>	<b>Bachelor's+</b>
Computer, Engineering, and Science	0.6%	1.9%	3.9%	7.2%	12.4%
Construction and Extraction	11.5%	7.4%	4.2%	2.3%	0.6%
Education, Legal, Community Service, Arts, and Media	0.9%	2.8%	5.0%	6.7%	20.7%
Farming, Fishing, and Forestry	0.8%	0.3%	0.1%	0.1%	0.1%
Healthcare Practitioners and Technical	0.8%	1.6%	4.6%	16.1%	11.4%
Installation, Maintenance, and Repair	4.4%	4.8%	3.4%	4.5%	0.6%
Management, Business, and Financial	4.1%	8.5%	12.3%	14.2%	28.4%
Military	0.0%	0.0%	0.0%	0.1%	0.1%
Office and Administrative Support	7.5%	16.4%	18.8%	14.5%	7.9%
Production	14.8%	11.7%	7.1%	4.9%	1.6%
Sales and Related	8.9%	9.9%	11.6%	9.6%	9.9%
Service	30.2%	21.6%	21.4%	16.0%	4.9%
Transportation and Material Moving	15.7%	13.0%	7.6%	3.8%	1.5%
<b>Total<sup>23</sup></b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: IPUMS – USA.

The percentage of adults in poverty between 2014 and 2018 fell drastically with higher levels of education. Table 17 details the poverty status of adults within the Cincinnati MSA by educational attainment. On average, 31.9 percent of dropouts were below the federal

<sup>23</sup> Percentages may not sum due to rounding.

poverty threshold between 2014 and 2018, compared to 16.3 percent of high school graduates and 4.4 percent of graduates from a four-year college.

**Table 17: Poverty Status by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018**

Poverty Level	Education	2014	2015	2016	2017	2018	Average
Below Poverty	HS Dropout	32.9%	32.3%	32.5%	30.6%	31.3%	<b>31.9%</b>
	HS Graduate	17.7%	17.1%	16.3%	14.8%	15.7%	<b>16.3%</b>
	Some College	17.1%	17.6%	17.0%	17.6%	16.6%	<b>17.2%</b>
	Associate's	9.2%	8.0%	8.8%	8.6%	5.1%	<b>7.9%</b>
	Bachelor's+	3.8%	4.5%	4.7%	4.2%	4.8%	<b>4.4%</b>
Above Poverty	HS Dropout	67.1%	67.7%	67.5%	69.4%	68.7%	<b>68.1%</b>
	HS Graduate	82.3%	82.9%	83.7%	85.2%	84.3%	<b>83.7%</b>
	Some College	82.9%	82.4%	83.0%	82.4%	83.4%	<b>82.8%</b>
	Associate's	90.8%	92.0%	91.2%	91.4%	94.9%	<b>92.1%</b>
	Bachelor's+	96.2%	95.5%	95.3%	95.8%	95.2%	<b>95.6%</b>

Source: IPUMS-USA.

## Economic Benefits

The economic benefits of earning a high school diploma are meaningful, powerful, and far-reaching. The primary beneficiary is the individual who graduates from high school and becomes eligible for new, higher-paying job opportunities. There is a strong relationship between earnings and the highest level of education attained.<sup>24</sup> Earnings are also influenced by other factors such as age, sex, race, and occupation.<sup>25</sup> This means lifetime earnings are inherently individualistic. However, educational attainment offers a clear prediction of estimated lifetime earnings.

## Earnings

Compared with high school graduates, high school dropouts experience higher unemployment rates and are more likely to face longer periods of unemployment.<sup>26</sup> Increased levels of education contribute to the increased likelihood of full-time employment for high school graduates, thus resulting in higher earnings.<sup>27</sup> High school dropouts will not only earn less than their graduate counterparts, but they will also have less opportunities for career growth.

Julian and Kominski (2011) analyzed the relationship between education and earnings over the course of an individual's working career using data from 2006 to 2008. Wage growth among full-time workers was largely flat for high school dropouts, while high school graduates and those with post-secondary education typically experienced wage increases

<sup>24</sup> (Julian and Kominski 2011)

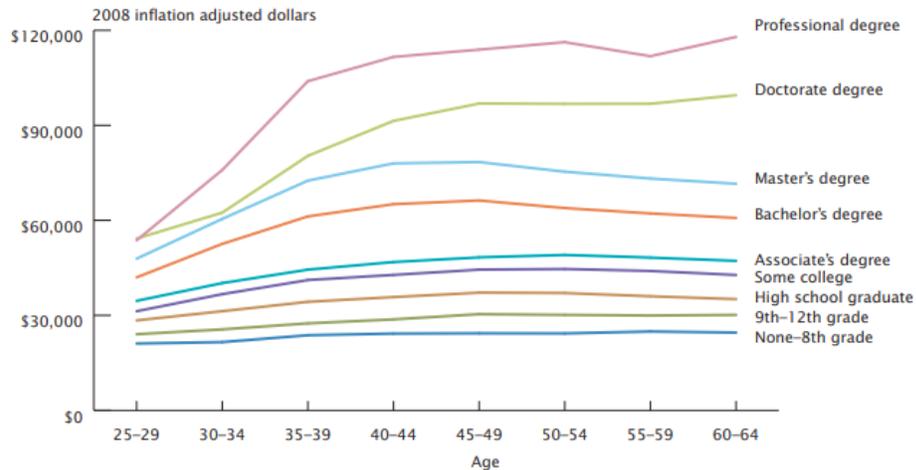
<sup>25</sup> (Carnevale, Rose and Cheah 2011)

<sup>26</sup> (Tamborini, Kim and Sakamoto 2015)

<sup>27</sup> (Julian and Kominski 2011)

throughout the middle of their careers as illustrated in Figure 2. Additionally, increased levels of education corresponded with higher likelihoods of full-time employment. Approximately 38.0 percent of dropouts were employed full-time, year-round, compared to over 50.0 percent of high school graduates and over 60.0 percent of college graduates.

**Figure 2: Median Annual Earnings by Age and Educational Attainment, 2006-2008 (2008\$)**



Source: Julian and Kominski (2011).

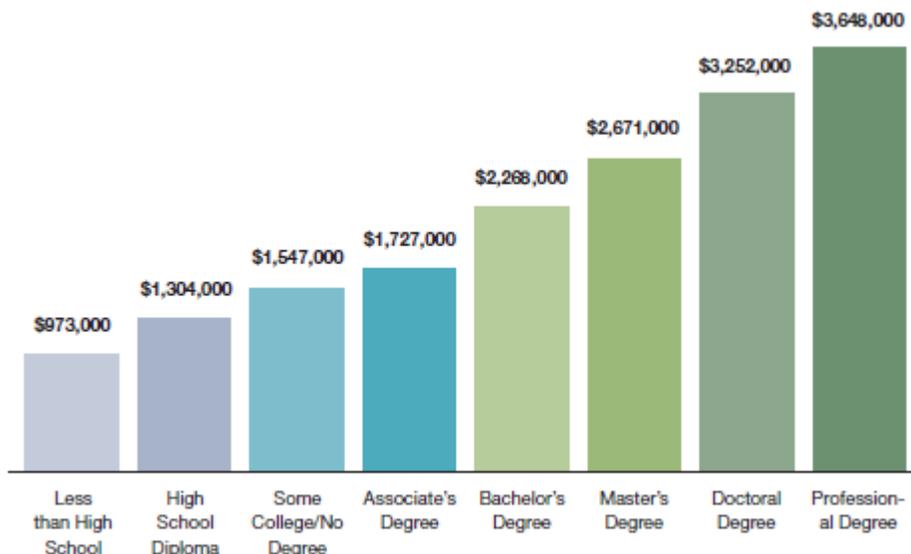
Across the educational attainment spectrum, achieving an additional level of education leads to increases in total lifetime earnings regardless of age, sex, race, or occupation. However, Mustre-del-Rio and Pollard (2019) found that labor market experience alone explained an estimated 40.8 percent of the difference in earnings, sex alone explained 10.4 percent, and education alone explained 14.9 percent. Taken together, approximately 54.8 percent of the differences in lifetime earnings were accounted for by sex, race, marital status, parental status, education, and labor market experience.

McFarland et al. (2019) concluded that for adults aged 25 to 34, higher educational attainment was associated with higher median earnings. For example, those without a high school diploma in 2017 had median earnings of \$26,000, which was \$6,000 less than high school graduates and only half the median amount earned by holders of a bachelor's degree. For those with some college but no degree, median annual earnings were \$35,000, and those with an associate's degree had earnings of \$38,900.

Carnevale, Rose, and Cheah (2011) analyzed the lifetime earnings by educational attainment for full-time workers aged 25 to 64 years. Between 2007 and 2009, the median lifetime earnings for all workers was \$1.7 million over a 40-year career or approximately \$42,000 annually. For those without a high school diploma or GED, lifetime earnings were \$973,000 or \$24,000 per year. High school graduates earned \$331,000 more over their lifetime than high school dropouts. This means that obtaining a high school diploma added a full 33.0 percent to lifetime earnings, or approximately \$9,000 per year. For those who

were able to complete some college, median lifetime earnings were \$1.5 million or roughly \$574,000 more than dropouts. Holders of an associate's degree received, on average, \$1.7 million over their lifetimes or \$43,200 per year, which equates to \$754,000 more than dropouts. Figure 3 illustrates the median annual earnings by educational attainment during 2007 to 2009.

**Figure 3: Median Lifetime Earnings by Educational Attainment, 2007-2009 (2009\$)**



Source: Carnevale, Rose, and Cheah (2011)

Tamborini, Kim, and Sakamoto (2015) examined lifetime earnings by educational attainment for males and females. Lifetime earnings in 2015 were estimated to be \$1.2 million and \$586,000 for dropout males and females, respectively. For high school graduates, lifetime earnings were \$1.5 million for males and \$871,000 for females. This means that male and female graduates earned \$357,000 and \$285,000 more than their dropout counterparts, respectively. Students who attended at least some college earned between \$1.0 million and \$1.7 million, while college graduates received an estimated \$1.3 million to \$2.2 million.

### Annual Earnings

Any level of educational attainment beyond dropping out of high school yields net gains, on average, in annual earnings within the Cincinnati Region, as seen in Table 18. High school dropouts earned approximately \$10,303 per year, or \$10,031 less than high school graduates during 2014 to 2018. Compared with individuals with some college or a minimum of a bachelor's degree, high school dropouts earned approximately \$15,168 and \$50,742 less per year, respectively. Reduced annual earnings for high school dropouts leave them at a perpetual earnings disadvantage over their lifetime.

**Table 18: Average Annual Earnings by Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$)**

Education	2014	2015	2016	2017	2018	Average
HS Dropout	\$9,826	\$9,442	\$9,788	\$11,582	\$11,027	<b>\$10,303</b>
HS Graduate	\$20,227	\$19,622	\$20,448	\$20,835	\$20,539	<b>\$20,334</b>
Some College	\$23,709	\$25,854	\$26,665	\$26,627	\$24,437	<b>\$25,471</b>
Associate's	\$34,585	\$34,976	\$37,573	\$34,843	\$34,488	<b>\$35,280</b>
Bachelor's+	\$58,864	\$61,480	\$61,901	\$61,757	\$61,122	<b>\$61,045</b>

Source: IPUMS – USA, adjusted for inflation.

In the Cincinnati Region, males had higher earnings than females in general. Male dropouts earned \$8,231 more than female dropouts, while male graduates earned \$11,166 more than female graduates. Additionally, the average earnings differential between dropouts and graduates was larger for males than females. Male graduates earned approximately \$11,624 more than male dropouts, while female graduates earned \$8,734 more than female dropouts, on average. Table 19 details the average annual earnings by sex for high school dropouts and graduates within the Cincinnati MSA.

**Table 19: Average Annual Earnings by Sex and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$)**

Sex	Education	2014	2015	2016	2017	2018	Average
Female	HS Dropout	\$4,539	\$4,977	\$6,407	\$5,810	\$8,570	<b>\$6,031</b>
	HS Graduate	\$14,790	\$13,809	\$15,150	\$14,697	\$15,374	<b>\$14,765</b>
	Differential	\$10,251	\$8,832	\$8,743	\$8,887	\$6,804	<b>\$8,734</b>
Male	HS Dropout	\$14,757	\$13,688	\$12,882	\$16,556	\$13,577	<b>\$14,304</b>
	HS Graduate	\$25,705	\$25,373	\$25,838	\$27,053	\$25,682	<b>\$25,928</b>
	Differential	\$10,948	\$11,685	\$12,956	\$10,497	\$12,105	<b>\$11,624</b>
Total	HS Dropout	\$9,826	\$9,442	\$9,788	\$11,582	\$11,027	<b>\$10,303</b>
	HS Graduate	\$20,227	\$19,622	\$20,448	\$20,835	\$20,539	<b>\$20,334</b>
	Differential	\$10,401	\$10,180	\$10,660	\$9,253	\$9,512	<b>\$10,031</b>

Source: IPUMS – USA, adjusted for inflation.

Average annual earnings from 2014 to 2018 were greater for high school graduates compared to high school dropouts regardless of race despite statistical outliers in individual years. As shown in Table 20, the difference was most prominent in Whites with high school graduates earning more than \$10,469 more than dropouts per year. For African Americans and Asian/Pacific Islanders, the annual earnings gap was approximately \$9,155 and \$2,865, respectively.

**Table 20: Average Annual Earnings by Race and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$)**

<b>Race</b>	<b>Education</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Average</b>
African American /Black	HS Dropout	\$8,584	\$8,688	\$5,621	\$10,051	\$8,477	<b>\$8,339</b>
	HS Graduate	\$14,932	\$16,827	\$18,822	\$17,499	\$19,384	<b>\$17,494</b>
	Differential	\$6,348	\$8,139	\$13,201	\$7,448	\$10,907	<b>\$9,155</b>
American Indian/ Alaska Native	HS Dropout	\$2,539	\$50,272	\$8,050	\$3,758	\$19,095	<b>\$15,233</b>
	HS Graduate	\$20,347	\$29,014	\$8,343	\$0	\$15,202	<b>\$16,333</b>
	Differential	\$17,808	-\$21,258	\$293	-\$3,758	-\$3,893	<b>\$1,100</b>
Asian/PI	HS Dropout	\$19,814	\$5,697	\$18,345	\$21,923	\$17,279	<b>\$15,949</b>
	HS Graduate	\$13,739	\$20,254	\$12,135	\$26,381	\$20,652	<b>\$18,814</b>
	Differential	-\$6,075	\$14,557	-\$6,210	\$4,458	\$3,373	<b>\$2,865</b>
White	HS Dropout	\$9,666	\$9,083	\$10,177	\$11,885	\$11,413	<b>\$10,404</b>
	HS Graduate	\$21,259	\$20,208	\$20,921	\$21,363	\$20,614	<b>\$20,873</b>
	Differential	\$11,593	\$11,125	\$10,744	\$9,478	\$9,201	<b>\$10,469</b>
Other	HS Dropout	\$15,766	\$15,003	\$14,147	\$9,819	\$12,990	<b>\$13,645</b>
	HS Graduate	\$20,824	\$16,320	\$23,160	\$21,350	\$36,135	<b>\$23,370</b>
	Differential	\$5,058	\$1,317	\$9,013	\$11,531	\$23,145	<b>\$9,725</b>
More than One	HS Dropout	\$15,798	\$23,009	\$9,643	\$8,839	\$11,451	<b>\$14,537</b>
	HS Graduate	\$12,611	\$8,007	\$15,761	\$17,032	\$20,313	<b>\$15,499</b>
	Differential	-\$3,187	-\$15,002	\$6,118	\$8,193	\$8,862	<b>\$962</b>

Source: IPUMS – USA, adjusted for inflation.

Within the Cincinnati Region, individuals with a high school diploma earned more than dropouts regardless of age between 2014 and 2018. Table 21 details the average annual earnings by age group for individuals aged 16 or older. The earnings gap between high school dropouts and graduates was the largest between the ages of 30 and 60 and the smallest before the age of 20 and after the age of 70. For some age groups, the gap between dropout and graduate earnings narrowed between 2014 and 2018. The difference in earnings between dropouts and graduates between the ages of 16 and 19 fell by 16.0 percent annually, whereas the earnings differential for those in their thirties fell by 10.8 percent annually.

**Table 21: Average Annual Earnings by Age and Education for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018 (2019\$)**

Age	Education	2014	2015	2016	2017	2018	Average
16-19	HS Dropout	\$2,212	\$2,612	\$3,866	\$7,485	\$4,663	<b>\$3,994</b>
	HS Graduate	\$4,636	\$4,938	\$5,585	\$6,283	\$5,872	<b>\$5,457</b>
	Differential	\$2,424	\$2,326	\$1,719	-\$1,202	\$1,209	<b>\$1,463</b>
20-29	HS Dropout	\$9,409	\$9,154	\$9,227	\$11,092	\$9,299	<b>\$9,617</b>
	HS Graduate	\$17,577	\$16,655	\$18,483	\$17,776	\$18,091	<b>\$17,717</b>
	Differential	\$8,168	\$7,501	\$9,256	\$6,684	\$8,792	<b>\$8,100</b>
30-39	HS Dropout	\$11,050	\$14,690	\$14,816	\$15,193	\$18,371	<b>\$14,717</b>
	HS Graduate	\$25,062	\$24,973	\$27,218	\$27,381	\$27,240	<b>\$26,397</b>
	Differential	\$14,012	\$10,283	\$12,402	\$12,188	\$8,869	<b>\$11,680</b>
40-49	HS Dropout	\$15,160	\$12,148	\$15,156	\$21,427	\$15,748	<b>\$15,883</b>
	HS Graduate	\$30,734	\$31,944	\$32,167	\$31,205	\$31,365	<b>\$31,468</b>
	Differential	\$15,574	\$19,796	\$17,011	\$9,778	\$15,617	<b>\$15,585</b>
50-59	HS Dropout	\$20,539	\$15,775	\$15,385	\$14,351	\$18,915	<b>\$17,126</b>
	HS Graduate	\$31,472	\$29,695	\$30,752	\$30,636	\$30,211	<b>\$30,559</b>
	Differential	\$10,933	\$13,920	\$15,367	\$16,285	\$11,296	<b>\$13,433</b>
60-69	HS Dropout	\$6,908	\$10,006	\$8,194	\$14,371	\$11,292	<b>\$10,093</b>
	HS Graduate	\$15,132	\$14,276	\$16,440	\$18,627	\$18,069	<b>\$16,515</b>
	Differential	\$8,224	\$4,270	\$8,246	\$4,256	\$6,777	<b>\$6,422</b>
70+	HS Dropout	\$1,798	\$672	\$2,789	\$898	\$608	<b>\$1,399</b>
	HS Graduate	\$2,493	\$3,752	\$2,155	\$2,512	\$3,172	<b>\$2,830</b>
	Differential	\$695	\$3,080	-\$634	\$1,614	\$2,564	<b>\$1,431</b>

Source: IPUMS-USA, adjusted for inflation.

### Lifetime Earnings

Earnings differentials between those with a high school diploma and those who choose to drop out are present throughout the course of a career. As a high school graduate ages, he or she will continue to earn a higher annual income than a dropout. Given the average annual earnings of high school dropouts and graduates in the Cincinnati MSA, a high school graduate can expect to earn an additional \$10,031 per year compared to a high school dropout. By graduating 1,507 students between fiscal years 2015 and 2019, Dohn has helped those graduates earn \$30.6 million annually, or approximately \$15.1 million more than if those students had not earned a high school diploma.

**Table 22: Average Annual Earnings in the Cincinnati MSA (2019\$)**

Education	Average Annual	Aggregate Annual
HS Dropout	\$10,303	\$15,526,621
HS Graduate	\$20,334	\$30,643,338
Additional Earnings	\$10,031	\$15,116,717

Source: Economics Center calculations.

According to Current Population Survey microdata from 2014 to 2018, high school graduates were able to retire earlier than high school dropouts in the Cincinnati MSA. On average, female and male dropouts retire at the age of 75. Female graduates were able to retire at the age of 72, and male graduates were able to retire at the age of 71.

When accounting for the individual demographics of Dohn graduates and retirement ages in the Region, a graduate will earn an additional \$519,734 throughout the remainder of his or her working career, on average. If a Dohn graduate chooses to pursue further education or training, lifetime earnings would be expected to increase. If these students had not earned high school diplomas, they would have earned \$131,957, on average, over the remainder of their working career. This translates to an average earnings increase of \$387,777 per Dohn graduate. Educating and graduating 1,507 students over the past five years has allowed Dohn to help these individuals earn an additional \$584.4 million throughout the remainder of their working careers.

**Table 23: Additional Lifetime Earnings of Dohn Graduates (2019\$)**

Education	Average Lifetime	Aggregate Lifetime
HS Dropout	\$131,957	\$198,859,030
HS Graduate	\$519,734	\$783,238,812
Additional Earnings	\$387,777	\$584,379,782

Source: Economics Center calculations.

## Fiscal Benefits

In addition to the economic benefits, fiscal benefits are also realized when an individual graduates from high school. The fiscal benefits include increased tax revenue due to higher earnings for high school graduates compared with dropouts, decreased usage of government assistance programs such as Supplemental Nutrition Assistance Program (SNAP), and reduced likelihood to commit crime.

Estimates of the lifetime societal cost of dropping out of high school are varied. Sum et al. (2009) determined a lifetime cost to taxpayers of \$292,000 per high school dropout for a negative net fiscal impact of \$5,200 per dropout. Belfield (2014a) estimated social losses of between \$380,660 and \$579,820 and fiscal losses of between \$117,890 and \$175,120 per dropout in California. In Florida, Belfield (2014b) predicted social losses of \$353,730 to \$475,570 and fiscal losses of \$115,680 to \$151,560 per high school dropout. Rumberger and Losen (2017) determined that a high school dropout resulted in social losses of \$579,820 and fiscal losses of \$175,120.

## Tax Revenues

Increased education is associated with increased earnings and therefore results in increased tax revenues. Sum et al. (2009) estimated that high school dropouts in 2007 contribute \$6,087 in federal, state, and local tax payments per year, whereas high school graduates contribute \$9,938. This means that high school graduates contribute \$3,851 more in federal, state, and local tax payments each year compared to their dropout counterparts.

According to Belfield (2014b), a high school dropout in the State of Florida would, on average, contribute state and local tax payments of between \$45,430 and \$49,700 over her or his lifetime, respectively. For high school graduates, state and local tax contributions would be \$61,350 for females and \$72,800 for males. Compared with high school dropouts, female and male graduates contributed approximately \$15,920 and \$23,100 more in state and local taxes over their lifetime, respectively. Additionally, high school graduates contributed \$28,370 and \$41,290 more in federal taxes over her or his lifetime than their dropout counterparts, respectively.

In a similar study, Belfield (2014a) analyzed the economic losses resulting from high school dropouts in the State of California. Female high school graduates in California paid \$37,350 more in state and local taxes than high school dropouts in addition to \$28,140 more in federal taxes. Compared with males who drop out of high school, males that graduate paid \$44,680 more in state and local taxes and \$43,490 in federal taxes. For graduates who continue to higher education, their tax contributions were even higher.

## Income Tax Revenue<sup>28</sup>

Individuals with a high school diploma will contribute more in both local and state taxes during the course of their lifetime compared with high school dropouts, as shown in Table 24. The average high school graduate living and working in the City of Cincinnati will contribute \$427 in earnings taxes, annually, to the City of Cincinnati. The average high school dropout will contribute \$216 in annual earnings taxes to the City of Cincinnati, or \$211 less than graduates. Based on annual earnings, neither high school dropouts nor graduates living and working in the City of Cincinnati will pay income taxes to the State of Ohio because their income falls below the minimum threshold. Graduates of Dohn contribute approximately \$317,977 more in income taxes to the City of Cincinnati annually compared to if they had not earned a high school diploma.

**Table 24: Average Annual Income Tax Payments to the City of Cincinnati (2019\$)**

Education	Average Annual	Aggregate Annual
HS Dropout	\$216	\$325,512
HS Graduate	\$427	\$643,489
Additional Income Tax Revenue	\$211	\$317,977

Source: Economics Center calculations.

<sup>28</sup> Calculations assume all Dohn graduates live and work in the City of Cincinnati.

After accounting for the individual demographics of graduates from Dohn, a graduate who is living and working within the City of Cincinnati will contribute \$10,914 in income taxes to the City of Cincinnati over the remainder of his or her working career, on average. If these students had not earned a high school diploma, they would have contributed \$2,771 in income taxes to the City of Cincinnati over the course of their working career. A Dohn graduate will contribute an average of \$5,733 in income taxes to the State of Ohio over the remainder of his or her working career. If these students had not graduated, they would have contributed an average of \$58 in income taxes to the State of Ohio. By earning a high school diploma, Dohn graduates contribute an additional \$8,143 to the City of Cincinnati and \$5,675 to the State of Ohio in income taxes over their remaining time in the workforce, on average, as shown in Table 25.

**Table 25: Average Lifetime Income Tax Payments by Dohn Graduates (2019\$)**

Education	Average Lifetime – City of Cincinnati	Average Lifetime – State of Ohio
HS Dropout	\$2,771	\$58
HS Graduate	\$10,914	\$5,733
Additional Income Tax Revenue	\$8,143	\$5,675

*Source: Economics Center calculations.*

Assuming all Dohn graduates between fiscal years 2015 through 2019 live and work in the City of Cincinnati, they will collectively pay \$16.4 million in income taxes to the City of Cincinnati and \$8.6 million in income taxes to the State of Ohio over the remainder of their working careers. If these students had not graduated, their total income tax contributions to the City of Cincinnati and State of Ohio would have been \$4.2 million and \$87,078, respectively, over the remainder of their working careers. This translates to an additional \$12.2 million in income taxes for the City of Cincinnati and nearly \$8.6 million in income taxes for the State of Ohio over the remainder of the working careers of Dohn graduates, as shown in Table 26. Dohn graduating 1,507 students over the past five years increases income tax collections for the City of Cincinnati and State of Ohio by approximately \$20.8 million over the graduates' working careers.

**Table 26: Lifetime Aggregate Income Tax Payments by Dohn Graduates (2019\$)**

Education	Aggregate Lifetime – City of Cincinnati	Aggregate Lifetime – State of Ohio
HS Dropout	\$4,176,040	\$87,078
HS Graduate	\$16,448,015	\$8,639,352
Additional Income Tax Revenue	\$12,271,975	\$8,552,274

*Source: Economics Center calculations.*

### Sales Tax Revenue

Increased annual earnings for high school graduates, compared with dropouts, generates additional sales tax revenue for local and state governments. Taxable purchases made with income from sources other than wages are subject to sales tax with few exceptions. A notable exception are items purchased with Supplemental Nutrition Assistance Program

(SNAP) benefits. To estimate the sales tax revenues generated by Dohn graduates, annual total income of high school dropouts and graduates in the Cincinnati MSA was utilized. In addition to earned wages, total income includes public assistance income<sup>29</sup>; interest, dividend, and rental income; retirement income; and Supplemental Security Income among other sources of income. Within the Cincinnati MSA, the average annual total income of high school dropouts and graduates were \$19,617 and \$28,866 during 2014 to 2018, respectively.

Based on average annual total income, a high school dropout would pay \$406 in sales tax per year to Hamilton County and the State of Ohio, given all taxable purchases were made within Hamilton County. For a high school graduate making all taxable purchases within Hamilton County, \$597 in annual sales tax would be collected by Hamilton County and the State of Ohio. In total, the 1,507 graduates from Dohn over the past five years generate an additional \$287,837 in sales tax to Hamilton County and the State of Ohio per year, as shown in Table 27.

**Table 27: Average Annual Sales Tax Revenues to Hamilton County and State of Ohio (2019\$)**

Education	Average Annual	Aggregate Annual
HS Dropout	\$406	\$611,842
HS Graduate	\$597	\$899,679
<b>Additional Sales Tax Revenue</b>	<b>\$191</b>	<b>\$287,837</b>

*Source: Economics Center calculations.*

## Government Assistance

Government assistance programs aim to increase overall community well-being by reducing financial burdens for low-income families and individuals. These programs are provided throughout the country, and some are dually funded by federal and state governments. The utilization of government assistance programs varies by educational attainment. Individuals with higher levels of education tend to utilize less government assistance than their less-educated counterparts.

The Alliance for Excellent Education (2013b) stated that \$7.3 billion in Medicaid spending could be saved nationwide in one year if the high school dropout population were cut in half during 2012. High school graduates were estimated to utilize Medicaid 50 percent less than high school dropouts. The differences in contributions to Medicaid caused the annual savings per graduate to vary by state, from a low of \$777 in Utah to a high of \$2,482 in Massachusetts. If the number of high school dropouts in Ohio was reduced by half, total Medicaid savings for the State of Ohio were estimated to be \$175.9 million in 2012. The projected societal savings were even larger due to improved productivity at work, decreased health problems, and reduced pain and suffering. After accounting for these factors, societal savings were estimated at \$380.6 million in heart disease-related savings,

<sup>29</sup> Public assistance includes General Assistance, Aid to Families with Dependent Children, and federal and state Supplementary Security Income payments to elderly (aged 65 and over), blind, or disabled individuals with low incomes.

\$378.8 million in obesity-related savings, \$202.9 million in alcoholism-related savings, and \$284.2 million in smoking-related savings in Ohio during 2012.

Belfield (2014b) analyzed the fiscal benefits to society in terms of health and welfare for each high school graduate in the State of Florida. A female high school graduate generated \$9,960 in lifetime state and local health savings and \$1,380 in welfare savings compared with a female high school dropout. For a male high school graduate, lifetime state and local savings of \$5,000 for health and \$840 for welfare were realized compared with a male high school dropout. The lifetime federal savings in health and welfare were \$15,790 and \$8,370 for female high school graduates, respectively. Male high school graduates generated \$7,900 in lifetime federal health savings and \$5,100 in welfare savings.

A similar analysis was conducted by Belfield (2014a) for the State of California. Each female graduate generated \$11,400 and each male graduate generated \$5,650 in lifetime state and local health savings, compared with a high school dropout. Additionally, welfare savings of \$770 and \$490 were generated for female and male graduates, respectively. Over their lifetime, female high school graduates produced federal savings of \$16,340 for health and \$4,140 for welfare compared to their dropout counterparts. The lifetime federal savings in health and welfare were \$8,170 and \$2,600 for male high school graduates, respectively.

According to the Ohio Department of Jobs and Family Services (2019), 9,580 individuals received Ohio Works First (OWF) and 95,305 individuals received SNAP benefits in Hamilton County in October 2019. Ohio Works First is a temporary financial assistance program, lasting up to 36 months, which provides cash benefits to needy families. This program is under the Temporary Assistance to Needy Families Program (TANF). The Supplemental Nutrition Assistance Program helps eligible low-income individuals stretch their food budgets and buy healthy food. In October 2019, Ohio dispersed an average monthly issuance of \$210 for OWF and \$128 for SNAP. Additionally, the State of Ohio issued \$55.2 million in total on publically funded child care for 152,422 children.

Within the Cincinnati MSA, usage of government assistance programs such as SNAP, public health insurance<sup>30</sup>, and public assistance<sup>31</sup> generally decreased as educational attainment increases, as shown in Table 28. On average, 28.1 percent of high school dropouts and 13.1 percent of high school graduates received SNAP benefits during 2014 to 2018. Approximately 63.8 percent of high school dropouts received public health insurance coverage, whereas 40.6 percent of high school graduates received public health insurance coverage. In the Cincinnati Region, 4.0 percent of dropouts and 1.6 percent of graduates received public assistance, on average.

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<sup>30</sup> Public health insurance includes Medicare, Medicaid, and Department of Veterans Affairs insurance.

<sup>31</sup> Public assistance includes General Assistance, Aid to Families with Dependent Children, and federal and state Supplementary Security Income payments to elderly (aged 65 and over), blind, or disabled individuals with low incomes.

**Table 28: SNAP, Public Health Insurance, and Public Assistance Reciprocity by Education in the Cincinnati MSA, 2014-2018 Average**

Education	SNAP	Public Health Insurance	Public Assistance
HS Dropout	28.1%	63.8%	4.0%
HS Graduate	13.1%	40.6%	1.6%
Some College	10.6%	32.1%	1.8%
Associate's	8.5%	27.0%	1.3%
Bachelor's+	2.3%	19.5%	0.3%

Source: IPUMS – USA.

Table 29 details the average annual public assistance received by high school dropouts and graduates in the Cincinnati Region during 2014 to 2018. A high school dropout received an average of \$113 in public assistance annually, whereas a high school graduate received an average of \$43. A high school graduate saves taxpayers \$70 in public assistance per year, on average. The 1,507 graduates from Dohn between fiscal years 2015 and 2019 save taxpayers \$105,490 annually in public assistance.

**Table 29: Annual Public Assistance Savings in the Cincinnati MSA (2019\$)**

Education	Average Annual	Aggregate Annual
HS Dropout	\$113	\$170,291
HS Graduate	\$43	\$64,801
Public Assistance Savings	\$70	\$105,490

Source: Economics Center calculations.

After accounting for the individual demographics of Dohn graduates, a graduate is expected to receive \$2,021 in public assistance over the remainder of his or her working career, on average. If these students had not graduated, they would have received an average of \$5,644 in public assistance over the remainder of their working career. Collectively, the 1,507 graduates of Dohn are anticipated to receive approximately \$3.0 million in public assistance throughout their remaining time in the workforce. If these students had not graduated, they would have received \$8.5 million in public assistance. By graduating these students from high school, Dohn saves taxpayers nearly \$5.5 million in public assistance over the remainder of the graduates' working careers.

**Table 30: Lifetime Public Assistance Savings of Dohn Graduates (2019\$)**

Education	Average Lifetime	Aggregate Lifetime
HS Dropout	\$5,644	\$8,505,290
HS Graduate	\$2,021	\$3,045,698
Public Assistance Savings	\$3,623	\$5,459,592

Source: Economics Center calculations.

## Crime

High school dropouts tend to have higher levels of interaction with law enforcement and higher incarceration rates than high school graduates. Increased education has been associated with decreased arrest rates, incarceration rates, and likelihood of recidivism. Therefore, increased education can reduce costs to the judicial and penal systems.

Harlow (2003) evaluated educational attainment among individuals incarcerated in federal prisons, state prisons, and local jails during 1997. Among individuals incarcerated in federal prisons, 26.5 percent had less than a high school diploma, 27.0 percent had a high school diploma, and 22.7 percent had a GED. Approximately 39.7 percent of individuals incarcerated in state prisons had less than a high school diploma, 20.5 percent had a high school diploma, and 28.5 percent had a GED. In local jails, 46.5 percent of incarcerated individuals had less than a high school diploma, while 40.0 percent had a high school diploma or equivalent. Among the total incarcerated population in 1997, 41.3 percent did not have a high school diploma compared with 18.4 percent in the general population.

Ewert and Wildhagen (2011) analyzed data from the American Community Survey to examine the educational characteristics of the adult correctional population in 2009. Compared with the general population, incarcerated individuals had lower levels of educational attainment. Approximately 40.2 percent of incarcerated males had less than a high school diploma compared to 15.4 percent of males in the general population. Among females, 36.5 percent of those incarcerated had less than a high school diploma, whereas 13.8 percent of females in the general population had less than a high school diploma. Incarcerated individuals, both male and female, were more likely to have a GED than the general population. Approximately 19.8 percent of incarcerated males had a GED, while 4.3 percent of the general population had a GED. For females, 16.0 percent of those incarcerated had a GED compared with 3.3 percent in the general population. Approximately 17.4 percent of incarcerated males and 17.1 percent of incarcerated females had a high school diploma.

Table 31 details the educational attainment of incarcerated individuals aged 25 and over in Ohio during 2018 as well as the incarceration rates by educational attainment. Approximately 29.7 percent of the incarcerated population in Ohio had less than a high school diploma in 2018, and an additional 38.3 percent had a high school diploma or equivalent. The incarceration rate in Ohio among those with less than a high school diploma was 2.4 percent in 2018. Those with a high school diploma or equivalent had an incarceration rate of 0.9 percent. Assuming the same education distribution among incarcerated females and males, the incarceration rate for females and males with less than a high school diploma was 0.5 percent and 4.3 percent, respectively. The incarceration rate among those with a high school diploma was 0.2 percent for females and 1.7 percent for males.

**Table 31: Adult Correctional Population in Ohio Aged 25 and Over by Education, 2018**

<b>Education</b>	<b>% of Incarcerated</b>	<b>Incarceration Rate</b>
Less than HS Diploma	29.7%	2.4%
HS Diploma or GED	38.3%	0.9%
Some College or Associate's	28.8%	0.8%
Bachelor's+	3.3%	0.1%
<b>Total<sup>32</sup></b>	<b>100.0%</b>	<b>0.8%</b>

*Source: U.S. Census Bureau, 2018 American Community Survey 5 year estimates.*

According to the Ohio Department of Rehabilitation and Corrections (2019), 48,988 individuals were incarcerated in Ohio during fiscal year 2019. Of the incarcerated population, 91.9 percent, or 45,040 individuals, were male. Approximately 46.6 percent of the male population were African American, while 49.5 percent were White. Of the 3,948 incarcerated females, 73.8 percent were White and 24.6 percent were African American. In fiscal year 2019, Hamilton County accounted for 1,229 commitments, or admissions into prison of individuals convicted and sentenced by a court. This represents approximately 7.2 percent of the total commitments in the State of Ohio.

The Ohio Department of Rehabilitation and Corrections (2018) detailed the recidivism rates for individuals released from prison in Ohio during 2014. For individuals released from prison in 2014, the three-year recidivism rate was 31.5 percent. Males and females had a three-year recidivism rate of 33.5 percent and 18.2 percent, respectively. Three-year recidivism rates were highest for individuals under 25 years of age (40.9%) and lowest for individuals aged 55 and over (13.4%). Individuals released from prison in 2015 had a one- and two-year recidivism rate of 11.9 percent and 24.7 percent, respectively. The one-year recidivism rate was 12.1 percent for individuals released from prison in 2016. In Hamilton County, the three-year recidivism rate in 2014 was 27.7 percent.

Lochner and Moretti (2004) analyzed the effect of education on crime using 1960, 1970, and 1980 Census data and 1960, 1970, 1980, and 1990 FBI data. An additional year of education was associated with a 0.10 and 0.37 percentage point decrease in the probability of incarceration for White and African American males, respectively. Furthermore, an additional year of education decreased arrest rates by 11.0 percent. Social savings of \$1.4 billion would be realized by increasing the male high school graduation rate by one percent, or approximately \$2,100 per graduate.

The Alliance for Excellent Education (2013a) evaluated the relationship between education and crime. A five percentage point increase in the male high school graduation rate would result in savings of \$18.5 billion in annual crime costs. The annual cost per incarcerated individual was more than twice as much as the annual cost to educate a student. Arrest rates for murder and assault, motor vehicle theft, and arson could be reduced by 20.0 percent, 13.0 percent, and 8.0 percent, respectively, due to a 10.0 percent increase in the male high school graduation rate. Compared with high school graduates, dropouts were

<sup>32</sup> % of Incarcerated does not sum to 100% due to rounding.

three and half times more likely to be arrested and more than eight times as likely to be incarcerated. Additionally, incarcerated males were approximately twice as likely to have dropped out of high school as males in the general population. Among individuals incarcerated in state prisons, those without a high school diploma or GED had an increased likelihood of recidivism than those with a high school diploma.

Belfield (2014a) and Belfield (2014b) estimated the lifetime federal and state and local crime savings per high school graduate in California and Florida, respectively. In California, lifetime local and state crime savings of \$2,860 for female graduates and \$40,690 for male graduates were generated compared to their dropout counterparts. Federal crime savings of \$670 and \$9,540 were realized for female and male graduates, respectively, over their lifetime. In Florida, a female high school graduate generated \$3,510 in state and local crime savings and \$820 in federal crime savings over her lifetime compared to a female dropout. For male high school graduates, lifetime crime savings of \$50,940 were realized for state and local entities in addition to \$11,950 for federal entities.

According to the Ohio Department of Rehabilitation and Corrections (2019), the average cost to incarcerate an individual in the State of Ohio was \$29,715 per year, or \$81.41 per day, during fiscal year 2019.<sup>33</sup> Security was the largest component of individual cost at 45.0 percent, followed by medical services at 15.1 percent. On average, individuals were incarcerated for 2.73 years. The Ohio Legislative Service Commission (2019) reported that the Ohio Department of Youth Services spent an average of \$534 per day in fiscal year 2017 to house, to care for, and to treat a juvenile.<sup>34</sup> This translates to approximately \$194,910 per year. Additionally, per capita justice expenditures were estimated to be \$662 in fiscal year 2015.<sup>35</sup> This includes \$317 for police protection, \$162 for judicial services, and \$183 for corrections.

The annual incarceration cost savings of Dohn graduates is detailed in Table 32. Of the 1,507 graduates of Dohn, approximately 2.1 female graduates and 8.0 male graduates will be incarcerated annually. If these students had not graduated, approximately 5.6 females and 20.5 males would be incarcerated each year. This translates into incarceration cost savings of \$104,087 for female Dohn graduates and \$369,980 for male Dohn graduates. By graduating 1,507 students over the past five years, Dohn saves taxpayers \$474,067 in incarceration costs annually.

**Table 32: Annual Incarceration Cost Savings of Dohn Graduates (2019\$)**

Education	Female	Male	Total
HS Dropout	\$166,599	\$608,529	\$775,128
HS Graduate	\$62,512	\$238,549	\$301,061
Incarceration Cost Savings	\$104,087	\$369,980	\$474,067

*Source: Economics Center calculations.*

<sup>33</sup> Estimates have been adjusted to 2019 dollars using the Consumer Price Index.

<sup>34</sup> Estimates have been adjusted to 2019 dollars using the Consumer Price Index.

<sup>35</sup> Estimates have been adjusted to 2019 dollars using the Consumer Price Index.

## Economic and Fiscal Costs

Although the benefits of high school graduation are numerous, there are also associated costs that must be considered. Costs of high school graduation include the expenditures made by Dohn to educate students and the earnings foregone by students while in school.

### Pupil Expenditures

Dohn has graduated 1,507 students over the past five years. Collectively, these graduates spent a total of 2,166 years at Dohn prior to graduation between fiscal year 2015 and fiscal year 2019. This is an average duration of 1.4 years at Dohn per graduate. The average cost to educate one student at Dohn was \$7,784 per year.

Table 33 details the total cost to educate the 1,507 graduates of Dohn over the past five years. During fiscal year 2019, 560 students graduated from Dohn. These students spent an average of 1.5 years at Dohn, which translates into a total cost of \$6.6 million to educate these graduates between fiscal years 2015 and 2019. The total cost to educate the 1,507 graduates of Dohn was \$16.9 million between fiscal years 2015 and 2019. The average cost per graduate, given an average of 1.4 years spent at Dohn, was \$11,187.

**Table 33: Total Pupil Expenditures for Dohn Graduates, FY 2015-2019 (2019\$)**

	FY15	FY16	FY17	FY18	FY19	Total
Graduates	114	112	320	401	560	1,507
<b>Total Cost</b>	<b>\$887,342</b>	<b>\$1,089,718</b>	<b>\$3,673,906</b>	<b>\$4,569,031</b>	<b>\$6,639,495</b>	<b>\$16,859,492</b>

*Source: Economics Center calculations.*

### Foregone Earnings

When a student decides to remain in school and graduate, the student foregoes the earnings that would have been earned by dropping out of school and working. These foregone earnings represent the opportunity cost for students of high school graduation. Dohn graduates sacrificed an average of \$3,094 in earnings during their time at Dohn over the five-year study period. Average foregone earnings differ based on the time spent at Dohn. The average foregone earnings of graduates who spent one year at Dohn were \$2,649. Collectively, the 986 graduates who spent one year at Dohn had total foregone earnings of \$2.6 million. For the 402 graduates who spent two years at Dohn, their average and total foregone earnings were \$4,010 and \$1.6 million, respectively. Graduates who spent three or more years at Dohn had average foregone earnings of \$3,687. In total, the 1,507 graduates of Dohn over the past five years sacrificed nearly \$4.7 million in earnings to graduate from high school.

**Table 34: Foregone Earnings of Dohn Graduates by Years at Dohn (2019\$)**

<b>Years at Dohn</b>	<b>Average</b>	<b>Aggregate</b>
1 Year	\$2,649	\$2,611,942
2 Years	\$4,010	\$1,611,978
3+ Years	\$3,687	\$438,704
<b>Total</b>	<b>\$3,094</b>	<b>\$4,662,624</b>

*Source: Economics Center calculations.*

## **Net Benefit of High School Graduation**

The costs of a high school education are incurred while students are attending school, whereas the benefits do not start to accrue until students have earned a high school diploma. The costs of high school graduation include both cost to educate students and the earnings students forego in order to attend school. The cost to educate the 1,507 graduates of Dohn over the past five years was \$16.9 million. These graduates forfeited \$4.7 million in earnings by attending school instead of dropping out and working. This translates into a total opportunity cost of \$21.5 million over the past five years.

Over the five years following graduation, Dohn graduates can expect increased earnings of \$75.6 million, which will lead to income tax revenue of \$1.6 million for the City of Cincinnati and sales tax revenue of \$1.4 million for Hamilton County and the State of Ohio.<sup>36</sup> By educating and graduating 1,507 students, Dohn saves taxpayers approximately \$527,450 in public assistance and \$2.4 million in incarceration costs during the five years following graduation. The total benefits of a high school diploma for Dohn graduates are \$81.5 million over the five years following graduation. The net benefit of these students graduating from Dohn is \$60.0 million, which translates into a benefit-cost ratio of 3.79. This means that every \$1 spent on education at Dohn for these graduates over the past five years leads to \$3.79 in benefits to society during the five years following their graduation, as shown in Table 35.

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<sup>36</sup> Assuming graduates live and work in the City of Cincinnati and all taxable purchases are made within Hamilton County.

**Table 35: Net Benefit of a High School Diploma for Dohn Graduates Five Years Post-Graduation (2019\$)**

Category	Total
Earnings	\$75,583,585
City of Cincinnati Income Tax Revenue	\$1,589,885
Hamilton County and State of Ohio Sales Tax Revenue	\$1,439,185
Public Assistance Savings	\$527,450
Incarceration Cost Savings	\$2,370,335
<b>Total Benefits</b>	<b>\$81,510,440</b>
Pupil Expenditures	\$16,859,492
Foregone Earnings	\$4,662,624
<b>Total Costs</b>	<b>\$21,522,116</b>
<b>Net Benefit</b>	<b>\$59,988,324</b>
<b>Benefit-Cost Ratio</b>	<b>3.79</b>

Source: Economics Center calculations.

The lifetime benefits and costs of high school graduation for Dohn graduates are summarized in Table 36. The 1,507 graduates of Dohn between fiscal years 2015 and 2019 are estimated to generate \$568.3 million in net economic and fiscal benefits over the course of their remaining time in the workforce. Although fiscal benefits are also generated in terms of increased income and sales tax revenue and criminal cost savings, these benefits are excluded from lifetime benefits. Therefore, total lifetime benefits are understated.

**Table 36: Net Lifetime Benefit of a High School Diploma for Dohn Graduates (2019\$)**

Category	Lifetime Total
Lifetime Earnings	\$584,379,782
Public Assistance Savings	\$5,459,592
<b>Total Benefits</b>	<b>\$589,839,374</b>
Pupil Expenditures	\$16,859,492
Foregone Earnings	\$4,662,624
<b>Total Costs</b>	<b>\$21,522,116</b>
<b>Net Benefit</b>	<b>\$568,317,258</b>

Source: Economics Center calculations.

## Conclusion

Dohn provides youth and adults the opportunity to earn a fully accredited high school diploma by serving as a dropout recovery school in the Cincinnati Region. Between fiscal years 2015 and 2019, 4,531 students have attended Dohn and 1,507 students have graduated. Dohn's capital investments and operations expenditures generated \$54.9 million in economic activity in the Cincinnati MSA between fiscal years 2015 and 2019. This economic activity led to \$21.4 million in total earnings and supported 545 full- and part-

time jobs. The individuals directly employed by Dohn contributed \$570,207 in income taxes to local and state governments over this five-year period.

By earning a high school diploma, Dohn students will earn more, retire sooner, contribute more in taxes, receive less in public assistance funding, and have reduced incarceration costs over the remainder of their working career. By educating and graduating students over the past five years, Dohn has helped those graduates earn an additional \$15.1 million annually compared to if the graduates had not earned a high school diploma. This translates into increased earnings tax contributions of \$317,977 to the City of Cincinnati, assuming graduates live and work in the City of Cincinnati. Dohn graduates generate an additional \$287,837 in sales tax annually for Hamilton County and the State of Ohio by earning a high school diploma, assuming all taxable purchases are made in Hamilton County. By graduating students, Dohn saves taxpayers \$105,490 in government assistance and \$474,067 in incarceration costs per year.

Dohn graduates generate \$81.5 million in benefits during the five years following their graduation. Between fiscal years 2015 and 2019, the costs associated with educating Dohn graduates and the earnings foregone while in school totaled \$21.5 million. The net benefit of high school graduation over the five years following graduation is \$60.0 million, which translates into a benefit-cost ratio of 3.79. Every \$1 spent on education at Dohn for these graduates over the past five years leads to \$3.79 in benefits to society during the five years following their graduation. Graduates of Dohn over the past five years are estimated to generate \$589.8 million in total lifetime benefits. The net lifetime benefit is \$568.3 million, given the \$21.5 million in costs associated with high school graduation for Dohn graduates.

## Methodology

### Economic and Fiscal Impacts

An economic impact analysis measures the effect of expenditures made by an organization or industry on a surrounding community. The dollars spent by an organization and its employees stimulate other businesses and industries. These dollars are then spent by other entities and households. The direct impact is the amount spent directly and locally by an organization on capital investments and operations. The indirect impact is the additional economic activity that is a result of 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 for the entirety of this report.

Expenditure data provided by Dohn was factored for economic leakage to represent only the economic impact of money retained in the Cincinnati MSA. 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. Leakage estimates were obtained from Emsi.

The post-leakage expenditures were used in an input-output model that uses multipliers to represent the inter-industry linkages and household economic relationships. Multipliers are used to determine the total economic impact when applied to the direct impact. These multipliers are location and industry specific and are obtained from the Regional Industrial Multiplier System (RIMS) created by the U.S. Bureau of Economic Analysis.

### Lifetime Earnings

To estimate additional lifetime earnings of Dohn graduates, their additional years in the workforce were calculated first. The average retirement age in the Cincinnati MSA by sex and educational attainment was obtained from Current Population Survey microdata from IPUMS for 2014 to 2018. Using a retirement age of 72 for female graduates and 71 for male graduates, the additional number of years in the workforce for each Dohn graduate was categorized into 5-year age brackets. For example, an individual who graduated at age 23 would spend an additional 1.5 years in the 20 to 24 age group, followed by 5 years in the 25 to 29 age group, and so on. For the age at graduation, a half year in the workforce was assumed.

Using U.S. census microdata from IPUMS for the Cincinnati MSA from 2014 to 2018, average annual earnings and employment-to-population ratios by sex, race, 5-year age group, and educational attainment were calculated. Average annual earnings were adjusted for inflation using the Consumer Price Index. The employment-to-population ratios for high school graduates by sex, race, and age group were applied to the number of corresponding Dohn graduates to determine the number of Dohn graduates that were likely employed. Corresponding average earnings were then multiplied by the number of likely employed Dohn graduates and the average additional years in the workforce. The total lifetime earnings was then the sum of all remaining 5-year age brackets.

The same calculation was completed using the average annual earnings and employment-to-population ratios of high school dropouts to determine the lifetime earnings of Dohn graduates had they not graduated. In instances when average annual earnings were larger for high school dropouts than graduates, the earnings for dropouts were inputted as zero to account for the spurious findings. The additional lifetime earnings of Dohn graduates was the differential in lifetime earnings using high school graduate data compared to high school dropout data.

### **Income Tax Revenue**

The City of Cincinnati operates under a flat tax system in which every working person within the City pays 2.1 percent of their income to finance city-wide expenditures. The State of Ohio utilizes a progressive tax, meaning taxes increase as income increases. Under the 2019 income tax rates for Ohio, the minimum income threshold is \$21,750. Therefore, individuals earning less than \$21,750 pay no income tax to the State of Ohio.

Based on the average annual earnings by sex, race, 5-year age group, and educational attainment calculated previously, the annual City of Cincinnati and State of Ohio income tax collections were calculated. The same methodology as lifetime earnings was applied to determine the additional lifetime income tax contributions to the City of Cincinnati and State of Ohio for Dohn graduates. These calculations assume that Dohn graduates live and work within the City of Cincinnati.

### **Sales Tax Revenue**

The Bureau of Labor Statistics' Consumer Expenditure Survey for the Midwest region for 2017-18 was utilized to determine the average annual expenditures of individuals by income range. Non-taxable expenditures were excluded to determine the percentage of taxable expenditures. This percentage was then applied to the average annual total income of high school dropouts and graduates within the Cincinnati MSA. The effective sales tax rate for Hamilton County of 7.0 percent was applied to the annual taxable expenditures to estimate annual sales tax collections by Hamilton County and the State of Ohio, assuming all taxable purchases were made within Hamilton County.

### **Public Assistance**

Using U.S. census microdata from IPUMS for the Cincinnati MSA from 2014 to 2018, average public assistance reciprocity rates and amounts received were calculated by 5-year age group and educational attainment. Public assistance amounts were adjusted for inflation using the Consumer Price Index. Similar to the lifetime earnings calculations, the average reciprocity rate was applied to the number of Dohn graduates to determine the number who would likely receive public assistance. Using the average additional years in the workforce previously calculated, the average public assistance amount was applied to the number of Dohn graduates likely receiving public assistance and the additional years in the workforce. The differential in lifetime public assistance received by Dohn graduates was then determined by subtracting the amount of public assistance they would have received had they not graduated.

## **Crime**

Population estimates by educational attainment and by sex for the adult correctional population in Ohio during 2018 were retrieved from the U.S. Census Bureau's American Community Survey. The educational attainment of incarcerated females and males was assumed to be the same to approximate the incarceration rate by education and sex. The incarceration rate for high school graduates by sex was applied to the respective number of Dohn graduates. Using the incarceration rate for high school dropouts by sex, the number of incarcerations of Dohn graduates had they not graduated was calculated. The incarcerations avoided were estimated by subtracting the two estimates. The average annual cost of incarceration in Ohio during fiscal year 2019 was utilized to estimate the cost savings.

## **Pupil Expenditures**

Expenditure per equivalent pupil data for Dohn was retrieved from the Ohio Department of Education for fiscal years 2015 through 2019. Expenditures per equivalent pupil are calculated by dividing total expenditures by a weighted average of daily attendance. Expenditure data was adjusted for inflation using the Consumer Price Index. The total number of years each graduate spent at Dohn between fiscal years 2015 and 2019 was calculated. This total was then multiplied by the average expenditure per equivalent pupil over the past five years to derive the total cost of educating Dohn's graduates.

## **Foregone Earnings**

To estimate foregone earnings, the previously calculated average annual earnings and employment-to-population ratios for high school dropouts by sex, race, and 5-year age group were utilized. The ages of graduates during their time spent at Dohn were approximated from their age during the year of graduation. Employment-to-population ratios were applied to the number of corresponding Dohn graduates to determine the number who would likely be employed. Average annual earnings were then multiplied by the number of likely employed and the number of years spent at Dohn. The sum of each 5-year age bracket represents the total foregone earnings for Dohn graduates.

## Appendix

**Table 37: Population by Education and Sex for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018**

Sex	Education	2014	2015	2016	2017	2018	Average
Female	HS Dropout	72,232	70,333	70,524	63,881	66,761	<b>68,746</b>
	HS Graduate	250,501	246,864	243,825	249,916	251,703	<b>248,562</b>
	Some College	186,241	181,760	190,699	186,047	187,361	<b>186,422</b>
	Associate's	70,798	80,014	73,575	76,724	69,251	<b>74,072</b>
	Bachelor's+	240,042	246,315	252,502	258,958	267,888	<b>253,141</b>
Male	HS Dropout	77,463	73,951	77,063	74,118	64,326	<b>73,384</b>
	HS Graduate	248,610	249,482	239,618	246,682	252,813	<b>247,441</b>
	Some College	164,122	163,575	171,513	175,294	165,948	<b>168,090</b>
	Associate's	46,462	50,894	46,717	50,072	55,980	<b>50,025</b>
	Bachelor's+	227,668	230,877	238,417	236,740	250,039	<b>236,748</b>

Source: IPUMS – USA.

**Table 38: Population by Education and Race for Individuals Aged 16 and Over in the Cincinnati MSA, 2014-2018**

<b>Race</b>	<b>Education</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Average</b>
African American	HS Dropout	27,627	26,174	23,194	25,480	25,302	<b>25,555</b>
	HS Graduate	66,184	65,495	68,915	64,092	64,264	<b>65,790</b>
	Some College	49,046	51,490	56,074	49,308	52,703	<b>51,724</b>
	Associate's	15,076	13,870	15,263	17,884	15,043	<b>15,427</b>
	Bachelor's+	29,938	32,102	25,930	35,095	36,796	<b>31,972</b>
American Indian/Alaska Native	HS Dropout	336	606	412	1,310	265	<b>586</b>
	HS Graduate	486	925	862	325	1,314	<b>782</b>
	Some College	419	419	522	1,102	527	<b>598</b>
	Associate's	232	277	68	917	59	<b>311</b>
	Bachelor's+	483	271	490	357	513	<b>423</b>
Asian/PI	HS Dropout	2,308	3,698	4,037	2,581	2,935	<b>3,112</b>
	HS Graduate	5,025	6,329	5,032	5,203	5,783	<b>5,474</b>
	Some College	2,335	4,254	7,433	5,008	7,424	<b>5,291</b>
	Associate's	1,295	3,364	1,913	1,920	1,777	<b>2,054</b>
	Bachelor's+	22,897	21,365	23,098	27,200	28,722	<b>24,656</b>
White	HS Dropout	114,041	108,195	114,342	104,206	97,749	<b>107,707</b>
	HS Graduate	417,647	414,539	398,286	416,355	420,818	<b>413,529</b>
	Some College	290,276	281,810	290,275	296,857	284,053	<b>288,654</b>
	Associate's	98,725	110,820	101,442	104,434	105,992	<b>104,283</b>
	Bachelor's+	405,595	417,314	430,564	421,316	442,453	<b>423,448</b>
Other	HS Dropout	3,318	3,559	4,241	3,177	2,816	<b>3,422</b>
	HS Graduate	3,233	3,908	3,274	2,752	3,293	<b>3,292</b>
	Some College	2,456	1,084	1,495	2,023	2,698	<b>1,951</b>
	Associate's	131	127	76	215	403	<b>190</b>
	Bachelor's+	1,186	724	3,882	4,348	1,437	<b>2,315</b>
More than One	HS Dropout	2,065	2,052	1,361	1,245	2,020	<b>1,749</b>
	HS Graduate	6,536	5,150	7,074	7,871	9,044	<b>7,135</b>
	Some College	5,831	6,278	6,413	7,043	5,904	<b>6,294</b>
	Associate's	1,801	2,450	1,530	1,426	1,957	<b>1,833</b>
	Bachelor's+	7,611	5,416	6,955	7,382	8,006	<b>7,074</b>

Source: IPUMS – USA.

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