

The Economic and Community Value of the Wicomico County Public Schools

Conducted by:



Executive Summary

The Wicomico County Public Schools (WCPS) provides significant value to the local economy and the community with nearly 3,300 employees and operating on a budget of \$203.4 million in FY18.

The study examines four components of value that the public school system brings to the local economy and community.

Value 1. Economic and Employment from WCPS Operations

First, the economic impact from operating the school system itself is examined. This value component estimates the economic activity generated through the spending associated with the annual operational and capital expenditures.

Every \$1.00 in operational monies spent by WCPS and retained in the county results in total spending locally of \$1.66. Every WCPS job supports another 0.3 jobs in the local economy.

Every \$1.00 in capital spending that is retained in the county results in total spending locally of \$1.51. For every \$1 million in WCPS capital spending, 9.3 additional jobs are supported in the county.

Value II. Economic Value of Degrees Awarded

The second value component focuses on the economic value of a more educated population including the additional lifetime earning potential of graduates and the additional income tax implications. In the past five years, WCPS has annually graduated students who will realize an additional lifetime earnings of approximately \$38.4 million (estimated total present value). The present value of the county income tax to be paid on these additional earnings is approximately \$859 thousand per graduating class.

WCPS students who go on to graduate from a two-year college or four-year college will earn approximately \$25.3 million and \$287.9 million respectively, in additional lifetime earnings. The present value of the county income tax to be paid on these additional earnings is approximately \$586 thousand for those who hold an associate's degree and \$6.2 million for those who hold a bachelor's degree.

Value III. Economic Development Impacts

The third value component focuses on the impact quality public education has on the community including increased property values, increased property tax revenues, and occupied housing rates. The additional economic impact activity generated by WCPS graduates who work and spend in the county positively impacts property values and property tax revenues. Over the past five years, each graduating class will on average add nearly \$2.1 million in real property values and \$20 thousand in real property tax revenues.

Value IV. Public Cost Savings

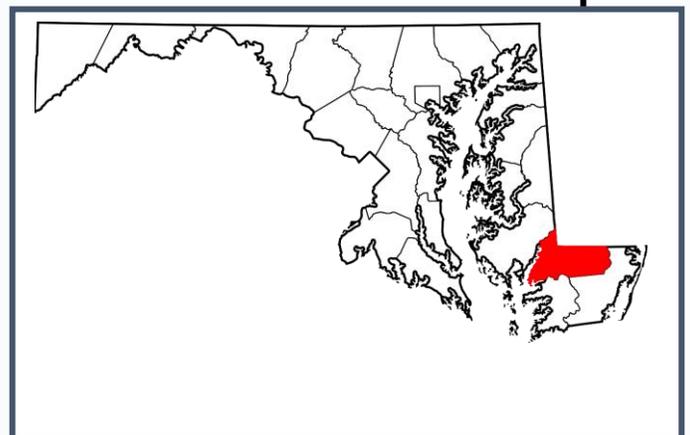
Lastly, the public costs savings associated with high school graduation through a reduced reliance on public healthcare, welfare, and unemployment, and a lower instance of crime is estimated. Over the past five years, each WCPS graduating class has been associated with approximately \$43.1 million in future public healthcare savings, over \$28.3 million in savings in future crime related costs, over \$3.2 million in future welfare costs and nearly \$333 thousand in future unemployment costs.

Beyond the individual benefits of education, a quality public school system also creates significant value in the community in which it operates. Residents are drawn to locate near quality schools, thus increasing property values as well as property tax revenues in the surrounding areas. An educated population also requires less investment in other public resources which results in savings to the local economy. Public cost savings associated with having a high school diploma manifest themselves through public healthcare, welfare, unemployment, and crime related cost savings. There is a lower likelihood that high school graduates will require the use of these publicly funded services, thus resulting in cost savings. Beyond the individual benefits of education, a quality public school system also creates significant value in the community in which it operates. Residents are drawn to locate near quality schools, thus increasing property values as well as property tax revenues in the surrounding areas. An educated population also requires less investment in other public resources which results in savings to the local economy. Public cost savings associated with having a high school diploma manifest themselves through public healthcare, welfare, unemployment, and crime related cost savings. There is a lower likelihood that high school graduates will require the use of these publicly funded services, thus resulting in cost savings.

Introduction

Wicomico County Public Schools is one of the largest and most diverse school systems of the nine Eastern Shore of Maryland counties. The system consists of 24 public schools with 14,953 students in grades pre-K through 12; including 16 elementary schools, 1 elementary/middle school, 3 middle schools, 1 middle/high school, and 3 high schools. The growing diverse student population includes African Americans at approximately 37%, Hispanics at approximately 10% and Asians at

approximately 3%. Wicomico County Public Schools are attended by approximately 92% of school-age children in Wicomico County. As of October 31, 2018, almost 65% of Wicomico County students were eligible for free and reduced meals (FARMs), an indication of financial



need. Eight of Wicomico County's 24 schools receive Title I funds for additional educational services to meet the needs of the county's poorest students. Special Education services are provided to approximately 12% of our student population, ages 3-21 and English Language Learners comprise a fast-growing population of approximately 8% of Wicomico County students. Guided by our strategic plan, *Imagine 2022*, Wicomico County Public Schools continues to use every resource made available to support the success of all of our students and to contribute to the economic growth of the community-at-large.

Public education has a direct impact to the community, its economy, and the savings that could be incurred by the county. Wicomico County students attend at a rate of 91% and about 91% of high school students are promoted to the next grade level at year end. Upon graduation, 55% of students from the area intend go on to attend a 4 year college and 22.9% intend to attend a 2 year college. In Wicomico County, 63.9% will go on to attend college while still working full or part time.

Value 1. Economic and Employment from WCPS Operations

These impacts include the direct, indirect, and induced impact of the dollars spent by WCPS including salaries of employees, supplies, and services provided by local vendors. The direct spending (the initial payments made by WCPS) that stays within the county will then create a “multiplier” or “trickle down” effect as money is re-spent in the local economy. This recirculation of money generates indirect and induced effects. The economic and employment impacts are estimated separately for WCPS’ annual operating and capital budgets.

Value 2. Economic Value of Degrees Awarded

A higher level of educational attainment is associated with a higher economic value in the job market. Graduates of WCPS will have a higher lifetime earning potential than non-graduates. Furthermore, an improvement in the academic achievement of WCPS students increases the likelihood of successfully completing a college degree. Therefore, a portion of the increased lifetime earnings of those students from WCPS who go on to graduate from college can be attributed to the education provided by WCPS.

Value 3. Economic Development Impacts

WCPS impacts local wealth through enhancing the ability of the county to attract and/or retain families with skilled and/or professional workers who are net wealth creators. Some of these benefits include:

- Quality-of-Life measures that encourage parents to use school quality as a residential location factor which adds a premium to the local property values;
- Quality-of-Life issues that are based on a “Sense of Well Being” for parents who believe high quality public education is essential to the success of their child’s transition from high school to higher education or the labor market;
- Property value enhancements attributable to the presence of good local public schools;

- Productivity enhancements in local businesses due to quality K–12 education;
- Business, economic, workforce, and community enhancements due to increases in the number of post-secondary institution graduates in a jurisdiction due to quality K-12 education.

Value 4. Reduction in Public Costs

Research has shown that high school graduation rates are negatively correlated with crime, public healthcare costs, and welfare expenditures. This means that as graduation rates go up, these public expenses go down. This study estimates the impact that WCPS graduates have on these public costs.

Value I. Economic and Employment Impacts from WCPS Operations

IMPLAN

To estimate the economic impact of the public school systems, the IMPLAN software package (produced by the Minnesota IMPLAN Group, Inc) was utilized. The IMPLAN model includes all economic effects when calculating total output/employment (i.e. this includes “direct” *plus* “indirect” *plus* “induced” (ripple effect) impacts). The IMPLAN model is based on Input-Output (IO) theory, for which Wassily Leontief was awarded the Nobel Prize in Economics in 1973. In IO models, the “jobs supported” estimates are the number of jobs that are needed to produce the current level of local output at the average productivity levels of workers in their respective industries. The IMPLAN model is based on actual County data from 2016 inflated to 2018 figures. The principle advantage of the IO IMPLAN model is in its utilization of state and county-specific data. The Social Accounting Matrixes in IMPLAN provide the multipliers or estimates of additional effects of the indirect and induced economic and employment impacts.

Economic and employment impacts are separated into three categories: direct, indirect, and induced.

The *direct economic impact* includes the initial spending by WCPS to its employees, through salaries, or to businesses selling directly to the school system.

The *indirect economic impact* accounts for the additional spending and jobs supported in the local economy from the spending to local suppliers. These local suppliers pay salaries to their employees from the money received through contracts with WCPS. Additionally, they contract with other local firms for goods and services.

The *induced economic impact* accounts for the additional spending and jobs supported in the local economy from consumer retail spending associated with the direct and indirect effects. For example, employees of WCPS and those of the firms contracting with WCPS will spend a significant portion of their salaries in the local economy. This spending supports additional jobs at local firms.

At each level of impact, there is “leakage.” Leakage accounts for the spending that goes to employees and vendors outside of the county. Once this money exits the county, it is not

available for re-spending or recirculating within the county. This includes spending to vendors outside of the county and employees who live outside of the county and spend the majority of the salaries elsewhere.

Impact of the WCPS Operating Budget

The total operating budget of WCPS was just under \$203.4 million for FY18. The significance of this spending increases as the multiplier effect of the money being spent is taken into consideration. Many individuals and business receive funds from the school system and spend the money again in the local economy. The portion of spending that stays within the county is calculated in the model through use of the Social Accounting Matrix, which estimates the percent of each expenditure category that stays within the defined geography.

Every \$1.00 in operational monies spent by WCPS and retained in the county results in total spending locally of \$1.66. Every WCPS job supports another 0.3 jobs in the local economy.

Table 1 shows the estimated annual economic and employment impact of the WCPS operating budget for FY18. After accounting for leakage, the direct impact of WCPS is estimated to be \$147.2 million within Wicomico County. This spending creates an indirect impact of \$5.1 million and an induced impact of \$92.5 million for a total economic impact of \$244.8 million. In other words, for every \$1 spent on operations by WCPS and retained in the county, nearly \$1.66 in total economic activity is generated locally.

Table 1. Economic and Employment Impact of WCPS Operating Budget		
	Economic (\$ millions)	Employment
Direct Effect	\$147.2	2,593
Indirect Effect	\$5.1	30
Induced Effect	\$92.5	690
Total Effect	\$244.8	3,312

The employment impacts in the local economy are also significant. In addition to the nearly 2,593 WCPS employees that reside in Wicomico County (79% of the total 3,269 employees), another 30 indirect jobs and 690 induced jobs are supported in the local economy through the operational spending of the WCPS. Every WCPS job is associated with a total of 1.3 jobs in the county. In other words, every WCPS job supports an additional 0.3 jobs in the local economy.

While a significant portion of the impacts remain within the county, as can be seen by the leakage of approximately 28%, some of the impact that leaks out of Wicomico County will flow to surrounding counties in the region. This includes the spending of WCPS employees that both live within and outside the county. Therefore, the impact to the region as a whole is larger than that of Wicomico County. The total economic impact of WCPS on the Eastern Shore of Maryland is approximately \$280.7 million while the total employment impact in the region is 3,849.

Impact of the WCPS Capital Budget

WCPS also makes substantial capital expenditures that have impacts within the county. Capital expenditures include both those for updating and modernizing existing schools as well as the construction of new school buildings. Capital expenditures are not consistent from year to year. Therefore, rather than examining the impact for one given year, the impact of the average capital expenditures is examined here for projects completed over the last ten years (FY08 to FY18).

Every \$1 in capital spending that is retained in the county results in total spending locally of \$1.51. For every \$1 million in capital spending, 9.3 additional jobs are supported in the county.

WCPS spent an average of \$21.5 million for capital projects per year between FY08 and FY18. Table 2 shows the total impact of the average annual capital expenditures of WCPS over the last ten years at the county level is over \$32.1 million with 201 jobs supported locally. This means that every \$1 in capital expenditures generates \$1.51 in economic activity and for every \$1 million in WCPS capital spending, 9.3 additional jobs are supported within the county. In summary, there is a 51% return on the economic activity generated by the spending associated with WCPS' capital projects.

Impact	Economic (\$ millions)	Employment
Direct Effect	\$21.3	129
Indirect Effect	\$5.6	33
Induced Effect	\$5.2	39
Total Effect	\$32.1	201

Value II. Economic Value of Degrees Awarded

The goal of an education system is to produce knowledgeable and skilled individuals who can create value for themselves as well as their communities. When an individual receives a high school diploma, it increases the likelihood of earning higher wages, moving up in the management chain, and ultimately contributing more earnings to the economy. Having both a trained and trainable workforce in the community attracts businesses who are looking to hire employees. The first way to examine the value of an education system is to examine the increased earning potential of students who graduate from the WCPS system. The total economic value of the K-12 public education system in Wicomico County is directly related to the number of students who are retained in the county upon graduation, including those students who return to the county after further (post-secondary) education or employment elsewhere.

Incremental Lifetime Earnings of Graduates

Data shows that high school graduates are more likely to earn a higher income than non-graduates. The additional lifetime earning of WCPS graduates will be calculated for each of the last five

On average over the previous five years, WCPS has annually graduated students who are likely to earn an additional \$38.4 million over the course of their lifetime.

graduating classes (2014-2018) as the incremental difference in lifetime earnings of graduates compared to non-graduates over their expected work life. A retirement age of 65 is assumed and therefore, a work life of 47 years is assumed (age 18 to 65). The U.S. Census indicates that non-graduates in Wicomico County earned approximately \$27,193 in 2016 (inflated to \$28,383 in 2018) while high school graduates earned approximately \$28,806 in 2016 (inflated to \$30,066 in 2018). The difference in inflated salaries is about \$1,684, which is assumed to be maintained throughout the work lifespan. The present value of the additional annual earnings is calculated using a discount rate of 3.10%, the annual rate on a 30-year constant maturity Treasury Bond in 2018¹. For a detailed explanation of how these estimates were calculated, refer to Appendix A. Table 3 shows the number of graduating seniors per year and the present value of the incremental lifetime earnings of the sum of graduates for each year. On average over the previous five years, WCPS has annually graduated students who are likely to earn an additional \$38.4 million earnings over the course of their lifetime.

Year	Number of Graduates	Present Value of Additional Earnings (\$ million)
2018	908	\$38.7
2017	920	\$39.2
2016	840	\$37.1
2015	886	\$39.2
2014	850	\$37.6

In addition to higher personal wealth, additional lifetime earnings also leads to increased spending in the community and additional income tax revenues for the local government. In order to calculate the additional county income taxes over an individual’s working lifespan that could be recognized through additional lifetime earnings, it is assumed that 70% of additional future income would be subject to local taxes each year. By using the 2018 local tax rate for Wicomico County, which is 3.2%², on average over the past five years, the present value of additional county income taxes over the work lifespan is about \$859 thousand.

¹ Federal Reserve System Historical Data on Selected Interest Rates

² Local Income Tax Rates – Maryland Taxes (taxes.maryland.gov)

The incremental lifetime earnings of WCPS graduates are substantial, but not all graduates are expected to remain within the county for their entire work life as some may move to a different county or another state. Alternatively, graduates from elsewhere will migrate into the county and state having graduated from other school systems. It should be noted that though the WCPS system is responsible for the direct education of students, there are a number of other factors that impact a student's success and performance that lead to graduation. Other factors that impact students and not specifically explained in this report include, but are not limited to, family life, the influence of other education systems and the natural abilities of individual students.

Incremental Lifetime Earnings of Graduates that go on to Graduate College

Following successful graduation from WCPS, many graduates go on to attend college. Students who obtain a college degree further increase their lifetime earning potential. Over the last five academic years, on average, 26% of WCPS seniors indicated their intention to attend a two-year

On average over the previous five years, WCPS has annually graduated students who are likely to earn an additional \$25.3 million over the course of their lifetime if they go on to graduate from a two-year college and \$287.9 million if they go on to graduate from a four-year college.

college and 55% indicated their intention to attend a four-year college³. The incremental annual earnings of those who have an associate's degree compared to a high school degree or equivalent inflated to 2018 is \$4,441. The incremental annual earnings of those who have a bachelor's degree compared to a high school degree or equivalent inflated to 2018 is \$24,395. The difference in salaries is assumed to be maintained throughout the work lifespan.

The additional lifetime earning potential of WCPS graduates who go on to graduate college will be calculated as the incremental difference in lifetime earnings of those with associate's and bachelor's degrees compared to those with high school degrees over the last five years for which data is available (2013-2018). Given the assumed retirement age of 65, a traditional graduate of a two-year college will have a work life of 45 years (20-25) while a traditional graduate of a four-year college will have a work life of 43 years (age 22 to 25). To determine the proportion of these students' future lifetime earnings that can be attributed to WCPS, the annual incremental earnings will be multiplied by the difference in the percent of students declaring their intent to go on to a two-year or four-year college over the last five years. The present value of the additional annual earnings is again calculated using a discount rate of 3.10%. For a detailed explanation of how these estimates were calculated refer to Appendix E.

The present value of additional lifetime earnings attributable to WCPS graduates who go on to successfully graduate from a two-year institution with an associate's degree is approximately \$25.3 million. The present value of additional lifetime earnings attributable to WCPS graduates who go on to successfully graduate from a four-year institution with a bachelor's degree is

³ Regional trends were utilized to estimate the percentage of students who intend to go either to a four-year or two-year college for the graduating classes of 2017 and 2018

approximately \$287.9 million. Assuming, as before, that 70% of the additional future income is subject to local tax each year, the present value of the additional county income taxes over the work lifespan is estimated to be approximately \$586 thousand for those who graduated with an associate's degree and \$6.2 million for those who graduated with a bachelor's degree.

Value III. Economic Development Impacts

A quality public education system can have a lasting impact on community development. As the quality of public education in an area increases, it has parallel effects on real property values and owner-occupied housing. Families are attracted to quality school systems, thus the value of properties in the surrounding areas will increase with the growing number of people moving to the area. A growing population will bring additional commerce to the area, making it an attractive location for businesses further adding to the long-term economic growth and success of a community.

Real Property Values and Taxes

The quality of public schools can directly affect the housing values within the nearby communities.

When an area offers a level of education superior to other areas, people are willing to pay a higher premium to live in these areas. In addition, high school graduates have higher lifetime earnings, thus they have the ability to spend more money within the local economy. Additional spending makes the community a more attractive location for families and businesses, thus more people will move to the area which will increase housing values.

Over the past five years, each graduating class is estimated to generate additional real property values of \$2.1 million. For Wicomico County, the estimated increase in real property tax revenue is \$19.7 thousand.

To estimate the additional real property value, the method utilized by Walden (2011)⁴ was followed. The ratio of Wicomico County's real property values (\$5,915,496)⁵ to personal income (\$4,209,176)⁶ for 2017 is 1.41. This rate is was applied to the previous five years. This indicates that for each additional dollar of income represents an additional \$1.41 in real property values. On average over the past five years, each graduating class is estimated to generate additional real property values of \$2.1 million⁷. This number assumes that every member of each graduating class will remain in Wicomico County. Inevitably some students will leave the county, but graduates from other counties and school systems will also be moving to the county, thus keeping the number of graduates relatively consistent.

In order to estimate the impact of real property tax revenue in Wicomico County, we multiplied the yearly real property tax rate by the respective additional lifetime real property values

⁴ Walden, M. L. (2011). *The Economic Impact of the Virginia Beach City Public School System*.

⁵ Maryland State Department of Assessments and Taxation

⁶ U.S. Bureau of Economic Analysis

⁷ See Appendix B for calculation details

earned for that graduating class. For Wicomico County, the estimated increase in real property tax revenue over the past five years is \$19.7 thousand.

Occupied Housing

In counties where the quality of education is presumed to be better, there are more owner-occupied housing units compared to renter-occupied housing units. Owner-occupied housing benefits the community because people are more likely to stay in the county and reinvest their earnings back into the local community. Renter-occupied housing shows a lack of long-term commitment from possible homeowners to the local community, therefore renters cannot be expected to reinvest the same amount of funds back into the local economy as a full-time homeowner. There are multiple reasons why someone may purchase a home instead of renting one, but the school quality in a given area can be a compelling reason for someone to choose to purchase a home instead of renting one⁸.

In Wicomico County, the ratio of owner-occupied housing (8,520)⁹ compared to renter-occupied housing (6,154) is 1.38. Of the 8,520 houses that are owner-occupied, 6,806 owners have at least a high school degree or higher compared to the 1,714 owners that did not graduate high school. The ratio of high school graduates to non-graduates that own a house (3.97) is drastically higher than the ratio of those who rent (2.52).

Value IV. Public Cost Savings

Educational attainment has a significant impact on various public costs within the economy. A study conducted by Levin, Belfield, Muennig and Rouse (2007)¹⁰ found that individuals with higher education are less likely to use public programs. By increasing the number of graduating students in a geographic area, spending on public programs will decrease, resulting in public cost savings. These costs include, but are not limited to, healthcare costs, crime costs, welfare costs, and unemployment benefit costs.

Public Healthcare Costs Savings

There has been extensive research suggesting that the health status of an individual is greater for those who have completed high school versus those who have not. A study conducted by the Agency for Healthcare Research and Quality (2015)¹¹ found that individuals with a high school degree have enhanced non-cognitive and cognitive skills as well as access to more economic resources. These skills and resources affect

Over the past five years, each WCPS graduating class has been associated with \$43.1 million in future healthcare cost savings.

⁸ Yun, L. (2016). *Why Homeownership Matters*. Forbes.

⁹ U.S. Census Bureau, American FactFinder

¹⁰ Levin, H., Belfield, C., Muennig, P., & Rouse, C. (2007). *The Costs and Benefits of an Excellent Education for All America's Children*. Columbia University.

¹¹ Zimmerman, E., Woolf, S., Haley, A. (2015). *Understanding the Relationship Between Education and Health: A Review of the Evidence and an Examination of Community Perspectives*. Agency for Healthcare Research and Quality.

the community health behaviors and increase the overall health status of individuals in the area. Additionally, individuals with a higher level of educational attainment tend to have higher quality jobs that provide access to private health insurance. Access to health insurance through an employer decreases reliance on publically funded healthcare. Based on their extensive research into health outcomes, Medicaid and Medicare enrollment, graduation rates, and present value calculations of per capita healthcare costs across different levels of educational attainment, Levin et al. estimate the lifetime health benefits savings from graduation to equal approximately \$48,940 per student in 2018 dollars. Table 4 provides the estimated the potential public healthcare costs savings for the graduating classes of 2014 through 2018 over their lifetime from. The average lifetime savings per graduating class in Wicomico County is estimated \$43.1 million in healthcare costs.

Table 4. Present Value of Estimated Lifetime Savings in Public Healthcare Costs		
Year	Number of Graduates	Present Value of Lifetime Public Healthcare Costs Savings for Graduating Class (\$ millions)
2018	908	\$44.4
2017	920	\$45.0
2016	840	\$41.1
2015	886	\$43.4
2014	850	\$41.6

Crime Costs Savings

Educational attainment is directly related to crime reduction. According to Gentry, Mokkaapati, and Rampersad (2016)¹², an increase in the percent of individuals educated at the high school level leads to a decrease in crime. Crime rates can also decrease with higher levels of educational attainment due to the additional time spent in the classroom in an academic setting. Delaying potential entrance into a criminal lifestyle until the age of eighteen will restrict development into that lifestyle. Levin et al. (2007) state that the four main public costs associated with crime are criminal justice costs for policing and trials, incarceration costs including parole and probation, state-funded victim costs such as medical and lost tax revenue, and governmental crime prevention agencies. An analysis of types of crime committed by high school dropouts along with the cost per crime compared to the decreased rate of crimes by a

Over the past five years, each WCPS graduating class has been associated with \$28.3 million in future public crime cost savings.

¹² Gentry, B., Mokkaapati, R., Rampersad, K. (2016). *Impact of Educational Attainment on Crime in the United States: A Cross-Metropolitan Analysis*. Georgia Institute of Technology.

high school graduate, identifies that the average lifetime savings due to crime reduction through educational attainment is about \$32,143¹³ per graduate in 2018 dollars.

Table 5 shows the total expected lifetime savings in public crime costs that could be realized due to reduced crime for the last five graduating classes. The average lifetime savings per graduating class in Wicomico County is estimated \$28.3 million in public crime costs.

Table 5. Present Value of Estimated Lifetime Savings in Public Crime Costs		
Year	Number of Graduates	Present Value of Lifetime Public Crime Cost Savings of the Graduating Class (\$ millions)
2018	908	\$29.2
2017	920	\$29.6
2016	840	\$27.0
2015	886	\$28.5
2014	850	\$27.3

Welfare Cost Savings

Graduating from high school increases the likelihood of finding a job or pursuing higher education, which would decrease the likelihood

Over the past five years, each WCPS graduating class has been associated with \$3.2 million in future welfare cost savings.

of relying on public welfare programs. According to Levin et al., an average of \$3,625¹⁴ in welfare expenditures can be saved per high school graduate. Welfare costs include costs included in their study are Temporary Assistance for Needy Families, food stamps, and housing assistance (federal programs were not included). The potential welfare cost savings associated with the last five graduating classes in Wicomico County can be seen in the table below. The average lifetime savings in welfare costs per graduating class over the last five years is estimated to be \$3.2 million.

¹³ See Appendix C for calculation details

¹⁴ See Appendix C for calculation details

Year	Number of Graduates	Present Value of Lifetime Welfare Cost Savings of the Graduating Class (\$ millions)
2018	908	\$3.3
2017	920	\$3.3
2016	840	\$3.0
2015	886	\$3.2
2014	850	\$3.1

Unemployment Benefits Cost Savings

The likelihood of unemployment varies by educational attainment. Unemployment benefit cost savings can be realized if students graduate from high school. A quality education system that allows and encourages completion will give the public the opportunity to save on annual unemployment spending. Unemployed persons have the opportunity to file for and receive unemployment insurance benefits from the state, as long as they meet certain requirements. Even though these expenses are paid by the state, each county’s tax funds contribute to this amount.

Over the past five years, each WCPS graduating class has been associated with over \$333 thousand in future unemployment benefits cost savings.

In Wicomico County, on average over the past 6 years, the unemployment rate for those with less than a high school diploma has been 16.80% compared to 10.03% for those with a high school diploma. It is assumed that one quarter of unemployed individuals are both eligible for and claim unemployment insurance benefits. If those who dropped out of high school had instead completed school, there would be a reduced reliance on unemployment insurance benefits for these individuals. The estimated lifetime savings potential for each graduating class in Wicomico County is over \$333 thousand.

Summary and Conclusion

WCPS has a significant impact within the county. The economic and employment impact created by the operational and capital spending alone is substantial. Every \$1.00 in operational monies spent by WCPS and retained in the county results in total spending locally of \$1.66. Every WCPS job supports another 1.3 jobs in the local economy. WCPS is a major employer in the county with a majority of its employees residing within the county. By providing additional incentives for employees residing outside of the county to reside in Wicomico County, more of the impact from employee salaries and spending can be retained within the county.

In terms of capital expenditures, every \$1.00 in capital spending that retained in the county results in total spending locally of \$1.51. For every \$1 million in WCPS capital spending, 9.3 additional jobs are supported in the county.

Beyond the economic and employment impacts generated through WCPS operations, its graduates generate many additional positive societal and economic benefits in the local economy. The value of a more educated population and trainable workforce manifests itself in many ways. The three main categories of value examined in this study include: the economic development impacts, community impact and development, and the reduction in public costs.

Current data indicates that high school graduates earn a higher annual income than non-graduates. The lifetime value of the incremental earnings for high school graduates is approximately \$38.7 million. The present value of the county income tax to be paid on these additional earnings is approximately \$831 thousand per graduating class. In addition, those who graduate with either an associate's or bachelor's degree will earn even higher incremental lifetime earnings. Students who graduate with an associate's degree or a bachelor's degree as opposed to only graduating high school will earn on average an additional \$25.3 million and \$287.9 million, respectively. The present value of the county income tax to be paid on these additional earnings is approximately \$586 thousand for those who graduate with an associate's degree and \$6.1 million for those who graduate with a bachelor's degree.

A trained and trainable workforce positively impacts the economic development of a region in many ways including:

- Quality-of-Life measures that push parents to use school quality as a residential location factor which adds a premium to the local property values;
- Quality-of-Life issues that are based on a "Sense of Well Being" for parents who believe high quality public education is essential to the success of their child's transition from high school to higher education or the labor market;
- Property value enhancements attributable to the presence of good local public schools;
- Increased owner-occupied housing due to a long-term commitment to the community;
- Productivity enhancements in local businesses due to quality K-12 education

Of these benefits, the increased real property values and real property taxes are quantified in this study. The additional economic activity generated by WCPS graduates who work and spend in the county positively impacts property values and property tax revenues. Each graduating

class is estimated to add nearly \$2.1 million in real property values and almost \$20 thousand in real property tax revenues.

Lastly, a more educated population has been found to result in lower public costs including public healthcare, public crime costs, unemployment, and welfare costs. For each graduating class, the public cost savings are estimated as follows:

- \$43.1 million in future public healthcare cost savings
- \$8.3 million in future public crime cost savings
- \$3.2 million in future welfare cost savings
- \$333 thousand in future unemployment-benefit cost savings

Although it can be argued that public school systems are a cost to the public, such expenses should more properly be thought of as an investment. In addition to the significant and widespread economic activity generated by the operations of WCPS, the benefits to the county are multiplied when also considering the impact of the educated population produced by the school system, and the added benefits of educational outcomes when they are attained. Based on these findings, it is important to note that, such benefits are directly linked to the number of graduates who choose to stay in the county or return to the county after either further education or work experiences. When WCPS graduates leave the county and do not return, most of these benefits accrue to the jurisdictions where they choose to reside. These facts indicate the need for a concerted public-private effort to retain the graduates in Wicomico County and encourage those who left to return.

Appendix A: Calculating the Additional Lifetime Earnings of Graduates Compared to Non-Graduates

The present value of the incremental lifetime earnings of graduates as compared to non-graduates were calculated as follows. First, the incremental annual income was multiplied by the number of graduates in the given year.

Second, the present value of the total incremental income for the whole graduating class was calculated. The discount rate of 3.10% was utilized for each of the 47 years of the work life. The present value was calculated for each year's incremental income as

=total incremental income/ (1.0310^{Number of years in the future that the income payment occurs})

Lastly, the present values for each year were summed to obtain the present value of the entire stream of future cash flows. This value is reported in Table 3.

Appendix B: Calculating the Impact of an Educated Population on Property Values and Property Taxes

To estimate the increase in the real property value attributable to the higher earning and spending of graduates, the number of graduating seniors was multiplied by the incremental annual earnings per student. This figure was then multiplied by the ratio of real property value to personal income.

of graduates X incremental annual earnings X real property to personal income ratio= additional real property value

The estimated real property value taxes were calculated by multiplying the corresponding year's tax rate by the additional real property value calculated previously.

Additional real property value X real property tax rate= additional real property taxes

Appendix C: Calculating the Public Cost Savings in 2018 Inflation Adjusted Dollars

Levin et al. estimated that in 2007 the present value of lifetime health-care cost savings from graduation were equal to approximately \$40,500 per high school graduate, the average lifetime savings due to reduced crime were approximately \$26,600 per graduate, and the lifetime welfare cost savings were approximately \$3,000 per graduate. These numbers are inflated to 2018 dollars by using the Consumer Price Index (CPI) for 2007 and for 2018. The CPI for 2007 is 207.3 and the CPI for 2018 is 250.5**. The formulas for computing the inflation adjusted dollars are as follows:

Health-Care Cost Savings= $40,500 \times (2018 \text{ CPI}/2007 \text{ CPI})$

Crime Cost Savings= $26,600 \times (2018 \text{ CPI}/2007 \text{ CPI})$

Welfare Cost Savings= $3,000 \times (2018 \text{ CPI}/2007 \text{ CPI})$

Appendix D: Calculating the Potential Annual Public Cost Savings from Unemployment

The 2017 dropouts were multiplied by the 6-year average unemployment rate for dropouts and the 6-year average unemployment rate for those who have graduated high school. This unemployment rate included individuals ages 25 and older because individuals ages 18-24 are unemployed at a much greater rate than ages 25 and older. It was assumed that 25% of these unemployed individuals would be actually receiving benefits, therefore that number was multiplied by 25%. The results were multiplied by the amount of weekly unemployment benefits available to that individual and then by the 26 weeks per year an individual can receive benefits. The difference between these two numbers is the amount of potential public cost savings that are available to the county annually.

Number of Dropouts x Unemployment rate for high school drop outs x 25% x weekly unemployment benefits x 26 weeks = Unemployment Spending on Dropouts

Number of Dropouts x Unemployment rate for high school graduates x weekly unemployment benefits x 26 weeks = Unemployment Spending if those Dropouts had Graduated

Unemployment spending on dropouts - unemployment spending if those dropouts had graduated = Potential Annual Savings if Dropouts had Graduated

To reach a lifetime savings amount (ages 18-65), the annual savings were discounted using the 2018 discount rate over a period of 47 years.

Benefits are paid based on the prior quarterly salary of the individual. The individual median earnings in 2018 for graduates and non-graduates was inflated from the 2016 median, which was found using the U.S. Census Bureau. To find the weekly unemployment benefits paid, the method used by the Department of Labor, Licensing and Regulation was followed and is simplified into the following calculation.

Average salary for graduate and non-graduate per county / 4 quarters = salary per quarter

Using the Department of Labor, Licensing and Regulation Schedule of Unemployment Benefits, weekly unemployment benefits based on quarterly salary were located.

The average increase in likelihood of a non-graduate being unemployed than a high school graduate is calculated as follows:

Average 6-year unemployment rate of a high school dropouts – average 6-year unemployment rate of high school graduates

Appendix E: Calculating the Impact of Improved High School Performance on the Lifetime Earnings of College Graduates

To calculate the impact of improved high school performance on the lifetime earnings of those graduates who go on to college the number of students meet the following criteria were identified for each jurisdiction:

- 1) Voluntarily declare their intentions to go on to a 2-year institution of higher education at the time of their exit survey, and
- 2) Voluntarily declare their intentions to go on to a 4-year institution of higher education at the time of their exit survey.

To determine the portion of the incremental lifetime earning of college graduates that can be attributable to the county's , the following formula was utilized for each jurisdiction:

$PV(\%2YR \times \#HSG \times IEAD)$

$PV(\%4YR \times \#HSG \times IEBD)$

%2YR= the percent of graduates intending to go to a 2-year institution of higher education

%4YR= the percent of graduates intending to go to a 2-year institution of higher education

#HSG= the number of high school graduates

IEAD= the incremental annual earnings those with an Associate's Degree compared to high school graduates

IEBD= the incremental annual earnings those with an Bachelor's Degree compared to high school graduates

PV for 2-year institution= present value of the incremental future cash flows, calculated with a discount rate of 3.10% and a work life of 45 years (20 years old to 65 years old) beginning two years out from the year of high school graduation.

PV for 4-year institution= present value of the incremental future cash flows, calculated with a discount rate of 3.10% and a work life of 43 years (22 years old to 65 years old) beginning four years out from the year of high school graduation.