

Economic Impact of Increasing Maryland's High School Graduation Rate

Daraius Irani, Ph.D., Chief Economist
Michael Siers, Director of Research
Jacob Leh, Research Associate
Matthew Lee, Graduate Assistant

November 7, 2019



Towson, Maryland 21252 | 410-704-3326 | www.towson.edu/resi

Table of Contents

Table of Figures.....	2
1.0 Executive Summary.....	3
2.0 Introduction	4
3.0 Analysis of Increased Maryland’s Graduation Rate.....	6
3.1 Better Education Leads to Higher Lifetime Earnings	6
3.2 Total Graduate Earnings Increase Over Time	7
3.3 Statewide Impact of Increased Graduate Earnings.....	8
3.4 Other Economic Benefits of Education Spending	9
4.0 Conclusion.....	10
5.0 References	11
Appendix A—Detailed Methodology.....	12
B.1 Quantifying Additional Earnings	12
B.2 REMI Analysis	13
Appendix B—Detailed Tables	15

Table of Figures

Figure 1: New Lifetime Earnings for Maryland Graduates, Prior to Age 65	3
Figure 2: Annual Graduate Earnings and Statewide Income Created by New Graduates	3
Figure 3: Increased Average Earnings Between Levels of Educational Attainment	5
Figure 4: Increased Lifetime Earnings Before Age 65 per Student by Educational Attainment.....	6
Figure 5: Increased Lifetime Earnings Before Age 65 in Maryland for the Class of 2021	7
Figure 6: New Annual Graduate In-State Earnings Due to Increased Educational Attainment	7
Figure 7: Increased Statewide Income Resulting From Increased Graduate Earnings.....	8
Figure 8: Fiscal Impact in Selected Years of Increased High School Graduation	9
Figure 9: Increased Average Earnings Between Levels of Educational Attainment	13
Figure 10: Detailed Earnings by Year as a Result of Increased Graduation Rates	15
Figure 11: Increased Personal Income by Year Resulting from Increased Earnings.....	16
Figure 12: Fiscal Impact by Year of Increased High School Graduation	17

1.0 Executive Summary

Earlier this year, the Regional Economic Studies Institute (RESI) of Towson University hosted roundtable discussions on factors that contribute to disparities across Maryland. One of these focused on education, including access to social workers and preparing students for the opportunities and challenges awaiting them after high school. This conversation also touched on the recommendations of the Kirwan Commission, and their plan for increasing education spending to address issues with the state’s education system.

Following this roundtable, RESI analyzed the economic impact of increasing the state’s high school graduation rate by 4.1 percentage points, matching the highest rate in the country. RESI examined the effect that increased educational attainment would have on students’ lifetime earnings, as well as the ripple effects of those earnings on total personal income in Maryland. First, the analysis looked at the impact of an improved education on the lifetime earnings of Maryland graduates. These values are below in Figure 1.

Figure 1: New Lifetime Earnings for Maryland Graduates, Prior to Age 65

Average Graduate Increased Earnings	Number of New Graduates	Class of 2021 Increased Earnings
\$1,813,021	2,432	\$4,408,410,252

Source: RESI

RESI found that a high school graduate can expect, on average, to make an additional \$1.8 million over their lifetime compared to a student who drops out of high school. When the new graduation rate is applied to the expected size of the high school class of 2021, the impact increases to more than \$4.4 billion in lifetime earnings for new graduates. These numbers are based in part on the assumption that some new graduates will continue on to higher education.

However, it doesn’t take a lifetime for the state to see an impact from increased graduation rates. As new high school classes graduate and enter the workforce, the annual economic impact increases each year. Figure 2 illustrates some of the annual impacts seen in Maryland.

Figure 2: Annual Graduate Earnings and Statewide Income Created by New Graduates

Year	Increased Graduate Earnings	Increased Statewide Income
2025	\$58,098,460	\$77,148,064
2030	\$476,275,613	\$721,368,814
2035	\$944,316,519	\$1,524,439,111
2040	\$1,425,450,940	\$2,463,843,625

Sources: REMI PI+, RESI

As seen above, a 4.1 percentage point increase in the high school graduation rate starting in 2021 can lead to a nearly \$2.5 billion increase in statewide personal income in 2040. While educational spending may require a larger slice of the pie today, creating better outcomes for Maryland students will create a larger pie for Maryland in the future.

2.0 Introduction

In May 2019, the Regional Economic Studies Institute (RESI) of Towson University released research on disparities in education, income, and life expectancy across Maryland. In fall 2019, RESI convened roundtable discussions to examine four of the interconnected factors leading to disparities in Maryland's workforce:

1. Education
2. Food insecurity
3. Access to employment
4. Transportation

Participants in the education roundtable consisted of representatives from public school systems, area nonprofits, and institutions of higher education. During the roundtable, participants stressed the importance of providing more than basic education to students. For

"The first thing I do is link someone with a social worker."
-Roundtable Participant

example, one participant stressed how much of a barrier trauma is on a child's ability to learn. The participant noted that they had recently been at a career fair event for high school students and had talked with four separate children whose parents had

been shot. Providing students with access to social workers and other support staff within schools is one way to ensure that all students receive the support they need, regardless of their circumstances.

Other roundtable participants discussed the importance of working with students to prepare them for life after high school. Whether recent high school graduates choose to directly enter the workforce, pursue a college degree, or enter a trade school, participants noted that students are often unprepared for the challenges they face outside of high school. For example, students often are unaware of what options they have post-graduation. Representatives from both higher education and trade schools noted that students did not fully understand what different careers existed in the area and how they could pursue those opportunities.

"Students want to do more, but don't know how."
-Roundtable Participant

Participants stressed hiring additional guidance counselors, expanding apprenticeship programs and internship opportunities, and providing financial literacy materials and training as ways to help students identify their next steps after high school.

Participants in the roundtable were unanimous in their desire to see all Maryland students graduate from high school. Recently, the Commission on Innovation and Excellence in Education, also known as the Kirwan Commission, has been at the forefront of the discussion on the future of education in Maryland.

The Kirwan Commission was formed in 2016 to examine potential changes to the education funding formula determined by the previous Commission (the Thornton Commission), originally

Economic Impact of Increasing Maryland’s High School Graduation Rate
RESI of Towson University

enacted by the legislature in 2002.¹ In their January 2019 Interim Report, the Kirwan Commission further clarifies this mission by stating that they were charged to find policies and strategies that “will enable all Maryland schools—and schoolchildren—to perform at the level of the world’s top education systems.”²

What would it mean for Maryland to have one of the best performing school systems in the world? To start, it would likely mean that Maryland would have a high school graduation rate that matches or exceeds any other state in the country. For the high school class of 2017, Maryland’s 5-year graduation rate was 89.2 percent. In contrast, the highest 5-year graduation rate in the country belonged to Iowa, with a graduation rate of 93.3 percent, 4.1 percentage points higher than Maryland.

Raising the high school graduation rate in Maryland is likely to have a significant economic impact on the state. A high school degree allows a student to obtain a better job and a higher salary than a student who does not have their diploma. In addition, increasing the number of students who complete high school is also likely to increase the number of students who go on to higher levels of education, commanding even higher income as a result. Figure 3 shows the difference in personal income earned by Maryland residents with different levels of educational attainment.

Figure 3: Increased Average Earnings Between Levels of Educational Attainment

Level of Educational Attainment	Average Earnings	Additional Earnings Over Less Than High School Graduate
Less than high school graduate	\$14,816	\$0
High school graduate (includes equivalency)	\$36,577	\$21,761
Some college or associate degree	\$39,653	\$24,837
Bachelor's degree	\$66,219	\$51,403
Graduate or professional degree	\$98,598	\$83,782

Source: U.S. Census Bureau

As seen above, an improvement in educational attainment has the potential for a significant rise in the earnings of Maryland residents. Based on the difference in earnings, this report examines the economic impact associated with Maryland matching Iowa’s current high school graduation rate.

¹ Michael Dresser, “Hogan, General Assembly leaders name Kirwan to head education commission,” The Baltimore Sun, August 9, 2016, accessed October 21, 2019, <https://www.baltimoresun.com/politics/bal-hogan-assembly-leaders-name-kirwan-to-to-head-education-commission-20160809-story.html>.

² “Interim Report, January 2019,” Maryland Commission on Innovation & Excellence in Education, January 2019, <http://dls.maryland.gov/pubs/prod/NoPblTabMtg/CmsnInnovEduc/2019-Interim-Report-of-the-Commission.pdf>, 2.

3.0 Analysis of Increased Maryland's Graduation Rate

Improving the high school graduation rate will better prepare Maryland's workforce to meet the needs of employers. With additional education, graduates can generally access better paying positions, thereby increasing their potential lifelong earnings. Additionally, an increase in earnings will generate further economic activity, as Maryland residents have more money available to spend on goods and services. For this analysis, RESI quantified both the increase in earnings graduates could expect as a direct result of having higher levels of education, as well as the statewide increase in income due to additional economic activity.

3.1 Better Education Leads to Higher Lifetime Earnings

Even when looking at only a single class of high school graduates, there is a significant long-term economic impact from increased graduation rates. Based on average earnings by level of educational attainment in Maryland, a single new high school graduate is set to gain substantially more earnings prior to a standard retirement age of 65. This is especially true when considering that many high school graduates will move on to higher levels of education. Figure 4 shows the likelihood of a Maryland graduate obtaining each level of education, along with increased lifetime earnings for each level.

Figure 4: Increased Lifetime Earnings Before Age 65 per Student by Educational Attainment

Educational Attainment	Attainment Percentage	Increased Lifetime Earnings	Weighted Average
High school graduate (includes equivalency)	28.0%	\$1,044,528	\$291,956
Some college or associate degree	28.6%	\$1,112,870	\$318,494
Bachelor's degree	23.4%	\$2,202,468	\$515,054
Graduate or professional degree	20.0%	\$3,429,948	\$687,517
Total	100.0%		\$1,813,021

Source: RESI

A single new high school graduate can increase their earnings by an average of \$1.8 million before retirement.

As seen above, a single new high school graduate would increase their earnings in Maryland by an average of more than \$1.8 million between high school and retirement at age 65. Although predicted earnings are significantly higher for greater levels of educational attainment, even students who end their education with a high school diploma are expected to earn more than \$1 million more than those who dropped out.

When looking at an entire high school class, the increase in lifetime earnings becomes truly remarkable. Based on predicted population patterns, a 4.1 percentage point increase in Maryland's graduation rate would result in 2,432 additional high school graduations in 2021.

Economic Impact of Increasing Maryland's High School Graduation Rate
RESI of Towson University

Figure 5 shows the total additional graduate earnings expected from this high school class prior to the standard retirement age of 65.

Figure 5: Increased Lifetime Earnings Before Age 65 in Maryland for the Class of 2021

Educational Attainment	Number of New Graduates	Per-Student Lifetime Earnings	Total Lifetime Earnings
High school graduate (includes equivalency)	680	\$1,044,528	\$709,899,046
Some college or associate degree	696	\$1,112,870	\$774,426,745
Bachelor's degree	569	\$2,202,468	\$1,252,367,205
Graduate or professional degree	487	\$3,429,948	\$1,671,717,256
Total	2,432		\$4,408,410,252

Source: RESI

As seen above, the expected lifetime earnings of the class of 2021 would increase by more than \$4.4 billion as a result of the bump in the high school graduation rate. As the enrollment in Maryland schools increases along with an expected growth in population, the impact of the higher graduation rate would increase as well. It should also be noted that any increase in the retirement age, due to potential factors such as increased life expectancy or a reduction in federal social security benefits, would also cause an increase in the expected lifetime earnings from any given student or high school class.

An increase of 2,432 high school graduates results in more than \$4.4 billion in total lifetime earnings.

3.2 Total Graduate Earnings Increase Over Time

With every year of improved graduation rates, a new class of students enters the workforce with the ability to command a higher salary than if they had not completed high school. This means that over time, the overall impact of the graduation rate grows as the cumulative effect of each new high school class gets added to the economy. As a result, the size of the annual impact is highly dependent on the timeline of the analysis. This can be clearly seen when examining the additional annual earnings in multiple years, shown in Figure 6.

Figure 6: New Annual Graduate In-State Earnings Due to Increased Educational Attainment

Calendar Year	Model Year	Increased Graduate Earnings
2025	5	\$58,098,460
2030	10	\$476,275,613
2035	15	\$944,316,519
2040	20	\$1,425,450,940

Source: RESI

Economic Impact of Increasing Maryland's High School Graduation Rate

RESI of Towson University

The impact of higher graduation rates increases as new graduates enter the economy each year. By the fifth year of RESI'S analysis, earnings are still relatively modest, as most new graduates are still pursuing higher levels of education and have not entered the workforce. Although Maryland students who graduate high school are able to immediately earn more than students who have dropped out, those who continue on to higher levels of education may delay their entry into the workforce while they complete their education.

To account for this, RESI assumed a lag between the year that those students graduate high school and the year that their increased earnings begin to have an effect on the Maryland economy. While pursuing higher education, earnings for those students are assumed to be zero, resulting in a decrease of personal income earned in the short-term of \$14,816 per year. In addition, RESI assumed that some graduates would leave the state or otherwise not end up in the Maryland workforce, and reduced in-state impacts by 10 percent. New in-state graduate earnings for every year of the analysis can be seen in Appendix B.

By 2040, increased graduation rates could lead to over \$1.4 billion in additional earnings.

By the twentieth year of increased graduation rates (2040), annual earnings have increased to over \$1.4 billion more than would be seen at Maryland's original graduation rate. While not included in the analysis, annual earnings would be expected to grow every year until 2068, at which point the original class of 2021 will be reaching retirement age and beginning to cycle out of the workforce. After 2068, the growth of additional earnings would likely plateau.

3.3 Statewide Impact of Increased Graduate Earnings

In addition to the increased earnings directly resulting from higher educational attainment, there is another degree of statewide impact that occurs as a result of the new graduate earnings entering Maryland's economy. Figure 7 shows this increase in statewide income.

Figure 7: Increased Statewide Income Resulting From Increased Graduate Earnings

Year	Increased Graduate Earnings	Increased Statewide Income	Difference	Percent Difference
2025	\$58,098,460	\$77,148,064	\$19,049,604	32.8%
2030	\$476,275,613	\$721,368,814	\$245,093,200	51.5%
2035	\$944,316,519	\$1,524,439,111	\$580,122,592	61.4%
2040	\$1,425,450,940	\$2,463,843,625	\$1,038,392,685	72.8%

Source: RESI, REMI PI+

As seen above, the introduction of additional **graduate earnings** into Maryland's economy leads to a higher increase in **statewide income** beyond the original value of those earnings. This is a result of those graduate earnings being spent on goods and services across the state, impacting the income of individuals beyond those modeled to have improved levels of education.

Economic Impact of Increasing Maryland’s High School Graduation Rate
RESI of Towson University

Furthermore, the gap between new earnings due to education and higher personal income widens as more individuals with higher education enter the economy. Much of this gap is attributable to a predicted increase in population that results from a more attractive economy and stronger educational system. By 2040, the overall benefit to statewide income in Maryland is almost 73 percent higher than the amount of new graduate earnings entering the economy. Increased personal income for each year of the analysis is available in Appendix B. Much like with graduate earnings, this impact on statewide income would also be expected to grow in the years following those included in the analysis.

Any increase in statewide income for Maryland residents results in a commensurate increase in state and local taxes collected on that income. While tax rates vary by income bracket and local jurisdiction, RESI assumed an average effective combined tax rate of 6.5 percent on all increased income. This effective tax rate is lower than many Maryland residents’, but a conservative estimate is appropriate given that new earnings due to educational attainment go to individuals that would otherwise have a high chance of living below the poverty line. Estimated taxes can be seen in Figure 8.

Figure 8: Fiscal Impact in Selected Years of Increased High School Graduation

Year	Increased Personal Income	Tax Rate	Increased State and Local Taxes
2025	\$77,148,064	6.5%	\$5,014,624
2030	\$721,368,814	6.5%	\$46,888,973
2035	\$1,524,439,111	6.5%	\$99,088,542
2040	\$2,463,843,625	6.5%	\$160,149,836

Source: RESI

Much like with all other impacts in this analysis, increased state and local taxes grow over time as the graduation rate has a cumulative impact on Maryland’s economy. By 2040, annual state and local taxes would increase by more than \$160 million over the baseline. These impacts would continue to grow until the first expanded graduating class cycles out of the workforce. The fiscal impacts for every year of the analysis can be viewed in Appendix B.

3.4 Other Economic Benefits of Education Spending

While these figures represent a significant potential impact to Maryland’s economy, it is important to state that they only capture a fraction of the full economic impact of increased education spending. Most notably, this analysis leaves out the entire direct impact of any spending, including the economic impact from construction projects, increased salaries for teachers, and jobs added to the economy that support expanded programs and hire other additional staff. The figures presented herein represent only the economic benefits derived from earnings due to increased educational attainment, without any impact of policies or spending used to achieve those educational goals.

In addition, this analysis leaves out all secondary effects that result from increased salaries and improved life outcomes for Maryland's citizens. In particular, higher levels of wealth and income are correlated with lower incidences of crime, reduced hospitalization rates, and lower incidences of homelessness and dependency on welfare. Reducing the prevalence of each factor would result in reduced need for government spending on incarceration, hospital visits, and the alleviation of homelessness and poverty.

4.0 Conclusion

Education spending is a topic ripe for spirited debate. While there are few who would question the value of a strong educational system, there are many competing needs when it comes to government funding. While debates on education often involve test scores, career paths, drop-out rates, and poverty, the actual economic impact of a proper education can be left out.

In the Commission's Interim Report, they outlined a plan to increase education spending in Maryland by an additional \$3.8 billion annually by 2030.³ This spending would be used to improve Maryland's education system in a number of ways, addressing all levels of education from early childhood to college and career readiness standards.

It is important to note that the figures in this report are not meant to act as an analogue for the potential impact of the Kirwan Commission recommendations. Increasing education spending in the manner recommended by the Commission may result in a change to the high school graduation rate that is higher or lower than the change modeled in this analysis. It would also likely have many other effects that are not represented by these figures. In addition, it is impossible to know the exact amount of spending that would be necessary to achieve an increase of 4.1 percentage points in Maryland's graduation rate. Instead, this analysis is intended to demonstrate a long-term economic benefit associated with improved education that may otherwise not be considered.

Although this analysis does not provide a direct examination of the Commission recommendations, or of any specific policy, it demonstrates that government spending is not a zero-sum game with regards to education. Although increased spending towards education would require a shifting of spending priorities in the short-term, the economic growth that occurs will help to offset these costs in the long-term. In other words, while educational spending may require a larger slice of the pie today, creating better outcomes for Maryland students will create a larger pie for Maryland in the future.

³ Report, 4

5.0 References

Dresser, Michael. "Hogan, General Assembly leaders name Kirwan to head education commission." The Baltimore Sun. August 9, 2016. Accessed October 21, 2019, <https://www.baltimoresun.com/politics/bal-hogan-assembly-leaders-name-kirwan-to-head-education-commission-20160809-story.html>.

"Educational Attainment, 2013-2017 American Community Survey 5-Year Estimates." U.S. Census Bureau. Accessed October 15, 2019. https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/S1501/0400000US24.

"Public School Enrollment Projections, 2018-2027." Maryland Department of Planning. September 2018. https://planning.maryland.gov/MSDC/Documents/school_enrollment/school_2018/Final-Public-School-Enrollment-Projections-Report-2018.pdf.

Appendix A—Detailed Methodology

Improving the high school graduation rate will better prepare Maryland's workforce to meet the needs of employers. With additional education, workers can generally access better paying positions, thereby increasing their potential lifelong earnings. Additionally, an increase in earnings will generate further economic activity, as Maryland residents have more money available to spend on goods and services. For this analysis, RESI quantified both the increase in earnings workers could expect as a direct result of having higher levels of education, as well as the statewide increase in income due to additional economic activity.

B.1 Quantifying Additional Earnings

To estimate the economic impact of increasing the number of high school graduates, RESI first needed to estimate the number of graduates that would result from a boost in the state's high school graduation rate. To estimate 12th grade enrollment through 2040, RESI first calculated the ratio of 12th grade enrollment as compared to Census estimates of Maryland's total population of residents aged 5 to 19 for each year from 2011 to 2017.

The average ratio for those seven years was then applied to projected population figures for this age cohort for each year from 2021 through 2040, based on figures provided by the Maryland Department of Planning (Planning).⁴ RESI then calculated the number of new high school graduates by multiplying each year's enrollment estimate by the 4.1 percentage point difference between Maryland and Iowa's graduation rate.

Although Planning has created its own separate estimate of expected enrollment, the most recent figures only project enrollment through 2027.⁵ For the years available, estimated enrollment from Planning is significantly higher than RESI's own calculations, suggesting that the enrollment estimates used in this analysis may be conservative. In addition, RESI's estimate of the number of additional graduates in each year was reduced by 10 percent, to account for individuals who move out-of-state or are otherwise removed from the Maryland workforce.

After estimating the number of additional high school graduates, the next step was to estimate the additional annual earnings of each new graduate based on their increased education level. For this analysis, it was assumed that many of the additional graduates would continue on to further levels of education at a similar rate to current Maryland high school graduates. To assign each new graduate a final level of education, RESI used educational attainment data for the Maryland population 25 years of age and over, as provided by the U.S. Census.⁶

⁴ "Demographic and Socio-Economic Outlook," Maryland Department of Planning, July 2014, <https://planning.maryland.gov/MSDC/Documents/county/stateMD.pdf>.

⁵ "Public School Enrollment Projections, 2018-2027," Maryland Department of Planning, September 2018, https://planning.maryland.gov/MSDC/Documents/school_enrollment/school_2018/Final-Public-School-Enrollment-Projections-Report-2018.pdf.

⁶ "Educational Attainment, 2013-2017 American Community Survey 5-Year Estimates," U.S. Census Bureau, accessed October 15, 2019, https://factfinder.census.gov/bkmk/table/1.0/en/ACS/17_5YR/S1501/0400000US24.

Economic Impact of Increasing Maryland’s High School Graduation Rate
RESI of Towson University

Additional Census data was used to determine increased earnings based on the difference in average income between a Maryland worker with less than a high school diploma and a worker with a higher level of education. The difference in earnings can be seen below in Figure 9.

Figure 9: Increased Average Earnings Between Levels of Educational Attainment

Level of Educational Attainment	Average Earnings	Additional Earnings Over Less Than High School Graduate
Less than high school graduate	\$14,816	\$0
High school graduate (includes equivalency)	\$36,577	\$21,761
Some college or associate degree	\$39,653	\$24,837
Bachelor's degree	\$66,219	\$51,403
Graduate or professional degree	\$98,598	\$83,782

Source: U.S. Census Bureau

For RESI’s model, the annual increase in earnings for each new graduate is equivalent to the difference in pay between the average worker with no high school diploma and the average worker at the new level of education. Using this value creates a conservative estimate, since it assumes that there are no unemployed workers available or willing to move into the low-wage positions that would be unfilled as a result of increased educational attainment. If the open positions were instead filled by new employees, earnings would increase further to account for the new wages being earned in those positions.

Although Maryland students who graduate high school are able to immediately earn more than students who have dropped out, those who continue on to higher levels of education may delay their entry into the workforce while they complete their education. To account for this, the model introduces a lag between the year that those students graduate high school and the year that their increased earnings begin to have an impact on the Maryland economy. This lag is represented as two years for students who achieve some college or an associate degree, four years for those who achieve a bachelor’s degree, and six years for those who achieve a graduate or professional degree. Since the model does not assume replacement workers for new graduates, this lag results in decreased earnings for a high school class during the first two years after graduation, while the majority of the class continues to attend school rather than join the workforce.

B.2 REMI Analysis

When additional earnings enter the economy, there are usually additional impacts that result due to the spending of those earnings. To capture some of these impacts, RESI used REMI PI+. The REMI model is a modeling tool used by various federal and state government agencies in economic policy analysis, which has been calibrated to the specific demographic features of Maryland. When an economic event or other change is input into the model, REMI calculates the direct impact of the economic event (for example, the sales made to a new business), as well as secondary effects, such as the new business’ payments to vendors and the money spent in the local economy by workers in the new business.

Economic Impact of Increasing Maryland's High School Graduation Rate

RESI of Towson University

To model the effect of increased earnings due to educational attainment, RESI input the change in earnings as a change in the Wage Bill policy variable. This variable allowed RESI to increase the amount of wages earned in the Maryland economy without modifying the expected salaries earned from any particular profession. This reflects the fact that increased earnings are due to improved education, rather than an industry-wide or state-wide increase in wages. The increased earnings are based on existing wage levels by education and no change to those wage levels exists in RESI's model.

Economic Impact of Increasing Maryland's High School Graduation Rate
RESI of Towson University

Appendix B—Detailed Tables

Figure 10: Detailed Earnings by Year as a Result of Increased Graduation Rates

Year	High School Graduates	Some College or Associate Degree	Bachelor's Degree	Graduate or Professional Degree	Change in Earnings	Cumulative Total
2021	\$13,310,607	(\$9,279,175)	(\$7,582,206)	(\$6,499,033)	(\$10,049,807)	(\$10,049,807)
2022	\$13,333,106	(\$9,294,860)	(\$7,595,022)	(\$6,510,019)	(\$10,066,794)	(\$20,116,602)
2023	\$13,355,604	\$15,523,901	(\$7,607,838)	(\$6,521,004)	\$14,750,664	(\$5,365,938)
2024	\$13,378,103	\$15,550,194	(\$7,620,654)	(\$6,531,989)	\$14,775,654	\$9,409,717
2025	\$13,400,602	\$15,576,487	\$26,254,629	(\$6,542,974)	\$48,688,743	\$58,098,460
2026	\$13,448,288	\$15,585,220	\$26,284,745	(\$6,566,258)	\$48,751,996	\$106,850,457
2027	\$13,495,975	\$15,593,954	\$26,314,862	\$36,660,438	\$92,065,228	\$198,915,685
2028	\$13,543,662	\$15,649,682	\$26,344,978	\$36,710,259	\$92,248,581	\$291,164,266
2029	\$13,591,349	\$15,705,411	\$26,375,094	\$36,760,080	\$92,431,934	\$383,596,200
2030	\$13,639,036	\$15,761,139	\$26,469,338	\$36,809,901	\$92,679,414	\$476,275,613
2031	\$13,733,591	\$15,784,195	\$26,536,884	\$36,836,838	\$92,891,508	\$569,167,121
2032	\$13,828,146	\$15,807,250	\$26,604,430	\$36,945,619	\$93,185,445	\$662,352,566
2033	\$13,922,701	\$15,917,751	\$26,671,976	\$37,054,400	\$93,566,827	\$755,919,393
2034	\$14,017,256	\$16,028,251	\$26,739,522	\$37,163,180	\$93,948,210	\$849,867,603
2035	\$14,111,811	\$16,138,752	\$26,926,392	\$37,271,961	\$94,448,916	\$944,316,519
2036	\$14,146,892	\$16,290,713	\$27,147,141	\$37,409,780	\$94,994,527	\$1,039,311,046
2037	\$14,181,973	\$16,442,675	\$27,367,890	\$37,699,888	\$95,692,426	\$1,135,003,472
2038	\$14,217,054	\$16,483,672	\$27,588,639	\$37,989,996	\$96,279,361	\$1,231,282,832
2039	\$14,252,135	\$16,524,669	\$27,809,387	\$38,280,104	\$96,866,295	\$1,328,149,128
2040	\$14,287,216	\$16,565,666	\$27,878,718	\$38,570,212	\$97,301,812	\$1,425,450,940

Source: RESI

Economic Impact of Increasing Maryland's High School Graduation Rate
RESI of Towson University

Figure 11: Increased Personal Income by Year Resulting from Increased Earnings

Year	Increased Earnings	Increased Personal Income	Difference	Percentage Increase
2021	(\$10,049,807)	(\$12,437,441)	(\$2,387,634)	-23.8%
2022	(\$20,116,602)	(\$26,146,529)	(\$6,029,927)	-30.0%
2023	(\$5,365,938)	(\$8,985,007)	(\$3,619,069)	-67.4%
2024	\$9,409,717	\$10,768,616	\$1,358,899	14.4%
2025	\$58,098,460	\$77,148,064	\$19,049,604	32.8%
2026	\$106,850,457	\$148,640,196	\$41,789,739	39.1%
2027	\$198,915,685	\$282,403,335	\$83,487,650	42.0%
2028	\$291,164,266	\$423,803,319	\$132,639,053	45.6%
2029	\$383,596,200	\$570,850,091	\$187,253,892	48.8%
2030	\$476,275,613	\$721,368,814	\$245,093,200	51.5%
2031	\$569,167,121	\$874,861,704	\$305,694,583	53.7%
2032	\$662,352,566	\$1,031,416,628	\$369,064,062	55.7%
2033	\$755,919,393	\$1,191,429,183	\$435,509,790	57.6%
2034	\$849,867,603	\$1,355,515,385	\$505,647,782	59.5%
2035	\$944,316,519	\$1,524,439,111	\$580,122,592	61.4%
2036	\$1,039,311,046	\$1,698,699,134	\$659,388,088	63.4%
2037	\$1,135,003,472	\$1,879,379,189	\$744,375,717	65.6%
2038	\$1,231,282,832	\$2,066,822,597	\$835,539,765	67.9%
2039	\$1,328,149,128	\$2,261,579,611	\$933,430,483	70.3%
2040	\$1,425,450,940	\$2,463,843,625	\$1,038,392,685	72.8%

Sources: REMI PI+, RESI

Economic Impact of Increasing Maryland's High School Graduation Rate
RESI of Towson University

Figure 12: Fiscal Impact by Year of Increased High School Graduation

Year	Increased Personal Income	Tax Rate	Increased State and Local Taxes
2021	(\$12,437,441)	6.5%	(\$808,434)
2022	(\$26,146,529)	6.5%	(\$1,699,524)
2023	(\$8,985,007)	6.5%	(\$584,025)
2024	\$10,768,616	6.5%	\$699,960
2025	\$77,148,064	6.5%	\$5,014,624
2026	\$148,640,196	6.5%	\$9,661,613
2027	\$282,403,335	6.5%	\$18,356,217
2028	\$423,803,319	6.5%	\$27,547,216
2029	\$570,850,091	6.5%	\$37,105,256
2030	\$721,368,814	6.5%	\$46,888,973
2031	\$874,861,704	6.5%	\$56,866,011
2032	\$1,031,416,628	6.5%	\$67,042,081
2033	\$1,191,429,183	6.5%	\$77,442,897
2034	\$1,355,515,385	6.5%	\$88,108,500
2035	\$1,524,439,111	6.5%	\$99,088,542
2036	\$1,698,699,134	6.5%	\$110,415,444
2037	\$1,879,379,189	6.5%	\$122,159,647
2038	\$2,066,822,597	6.5%	\$134,343,469
2039	\$2,261,579,611	6.5%	\$147,002,675
2040	\$2,463,843,625	6.5%	\$160,149,836

Source: RESI

END OF DOCUMENT