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*Annual Report to the Governor and General  
Assembly*

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## EXECUTIVE SUMMARY

This report seeks to understand this population (high school graduates, class of 2013) and their workforce outcomes within the context of the other critical factor in the lives of recent high school graduates: postsecondary education. The first five years after high school is traditionally the time when high school graduates engage in college; and that is certainly the case with the cohort analyzed for this report. Notably, 76% of the high school graduates had or continue to have some involvement with college during the first five years after high school. The impact of college on workforce outcomes is of critical importance and highlighted throughout this report.

The report groups the cohort of high school graduates based on whether the high school graduates entered college and received degrees, attempted college but exited without a degree, are still in college, or bypassed college altogether and went straight into the workforce. Not surprisingly, each pathway yields different workforce outcomes. Those high school graduates with no college degree had a median wage in the 20<sup>th</sup> quarter (five years) after high school ranging from \$5,300 to \$6,300, which is \$1,500 to \$2,500 below the estimated living wage in Maryland. Those high school graduates who earned a college degree had median 20<sup>th</sup> quarter wages that ranged from \$7,000 to \$14,000, which is \$800 below to \$6,100 above the living wage.

Several important observations can be gleaned from the wage earnings data. First, there is no immediate return on the investment (both time and money) in college unless a degree is earned. Students who attempted college but did not earn a degree have a lower 20<sup>th</sup> quarter median wage than those students who directly enter the workforce. And, unlike students who earned a degree, they do not have the financial reward of higher wages to help offset any costs incurred with going to college. Second, the value of any postsecondary degree is significant. While those without a degree are on pace to earn \$1 million in their lifetime, those with a degree are on pace to earn \$1.5 to \$2 million in their lifetime. Finally, while all postsecondary degree earners have improved workforce outcomes over non-degree earners, bachelor's degree earners have a median 20<sup>th</sup> quarter wage that is approximately \$1,400 to \$2,500 higher than associate and certificate degree earners, respectively.

The report requirement to provide information on the hours worked cannot be directly addressed with MLDS data since the source of wage data only includes the total wage earned per quarter. One reason that hours worked is important is it helps paint a picture of the high school graduates' level of engagement in the workforce. Another approach to understanding the level of engagement in the workforce is to analyze the number of quarters during the five year period in which the high school graduates are reported as having wages. The results show that 87% of the cohort had at least one wage record during the five year period after high school, with 29% having wages in almost every quarter and 19% having wages in as few as one to five quarters. The range of workforce participation is once again impacted by college going. For example, bachelor's degree recipients have a high rate of irregular wage visibility, which may be explained by the fact that actively pursuing and completing a four year degree leaves little time for work within five years. Further, the pattern and timing of when they are engaged in work corresponds with summer periods when they are less likely to be fully involved in college. However, the workforce participation patterns of certificate and associate degree earners indicates that

they are more likely to have continuous or frequent wages during the five year period. This pattern may reflect their shorter time to degree as only one to two years of full-time enrollment are required to complete their degrees, leaving a longer period to be fully engaged in employment after college. Finally, high school graduates with no college attendance make up 37% of those students with no wage records. It is possible that those students left the state for employment or joined the military. However, the no college group also has a range of wages that are less than continuous, indicating that a portion of this group has remained in Maryland. This sporadic employment may be due to under-employment; possibly due to lack of jobs for individuals with no postsecondary credential.

The final requirement of the report is to identify the industry sector in which the high school graduates are employed. Generally, five years after high school, the sector with the largest percentage of high school graduates is *Trade, Transportation, and Utilities*, followed by *Leisure and Hospitality*. Once again, educational attainment has an impact on sector and wage outcomes. *Trade, Transportation, and Utilities* sector was the largest employer of high school graduates for all educational attainment groups, except Bachelor's, with wages ranging from a low of \$4,300 for those Still in College and as high as \$6,400 for those with No College, which are both below living wage. *Professional and Business Services* was the largest employer of Bachelor's degree earners with a median quarterly wage of \$11,700, which is above the living wage.

In addition to the methodologies for analyzing wages introduced in last year's report, this year's report adds additional methodologies for analyzing wages and workforce participation of the graduates. These include: (1) a comparison of the salaries of the graduates to Maryland's minimum wage; (2) an analysis of the percent of graduates employed in a sector as compared to that sector's contribution to the Maryland economy; (3) a comparison of the salaries of graduates in an industry sector to the average quarterly wage of all Marylanders working in that sector; and (4) a comparison of projected growth in industry sectors to the percentage of graduates working in those sectors.

Finally, there are two supplemental analyses provided in this year's report. The first is on *Wage Outcomes for High School Graduates with No College Enrollment by High School Program Completion Type*. The analysis finds that of the four high school graduation completion types, those graduates whose completion fulfilled the requirements for an approved Career and Technology Education Program of Study (CTE) had a higher rate of engagement in the workforce at five years after high school and slightly higher earnings than graduates without CTE.

The second supplemental analysis is on *Student Loans and Wages*. This analysis calculates the estimated amount of loan repayments and whether the graduates' wages are sufficient to make those repayments and meet cost of living requirements. Findings vary by educational attainment groups: the Bachelor's group had median quarterly wages sufficient to cover the basic cost of living, loan repayment costs, and some amount of surplus; the Associate's group had median quarterly wages that were below, but close to what is needed for both cost of living and loan repayment; and the Some College group had a large gap between quarterly wages and cost of living plus loan repayment.

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# INTRODUCTION

## Report Requirements

This Report is submitted in fulfillment of the requirement in *The Career Preparation Expansion Act* (CPEA), Chapter 695 of 2017 (see Education Article § 21-205, Annotated Code of Maryland). The Maryland Longitudinal Data System (MLDS) Center and the Governor’s Workforce Development Board (GWDB) are required to produce a report on high school graduates for the five-year period after graduation on:

1. Wages earned;
2. Hours worked per week; and
3. The industry in which the individuals are employed.

## Overview of State Agencies

The MLDS is the State’s central repository for student and workforce data. The MLDS Center develops and maintains the System in order to provide analyses, produce relevant information, and inform choices to improve student and workforce outcomes in the State of Maryland.

The Governor's Workforce Development Board helps plan, coordinate, and monitor State programs and services for workforce development, and advises the Governor on the development, implementation, and modification of the four-year State Plan, as required by federal law.

## MLDS Data

The MLDS is the State’s central repository for student and workforce data. The MLDS System connects data from across Maryland’s education and workforce agencies. These data are subject to strict data management, security, and privacy requirements. The MLDS may only report aggregated, de-identified data.

The MLDS Center develops and maintains the System in order to provide analyses, produce relevant information, and inform choices to improve student and workforce outcomes in the State of Maryland. All research conducted by the MLDS Center focuses on what happens to students before and after critical transitions between education and workforce pathways. All research and analysis using the MLDS is cross-sector.

This analysis focuses on the employment of individuals as they move from earning their high school diploma into the workforce, including whether or not any of the graduates enrolled in college or earned a college degree subsequent to high school graduation. Below is an overview of the available data within the System to support this analysis:

### Education Data

The MLDS System contains education data on all students from Maryland’s public schools, community colleges, 4-year public institutions and state-aided independent institutions.

Education data begin with the 2007-2008 academic year and are current through the 2018-2019 academic year. The System does not contain education data on students in private high schools or private institutions of higher education. Nor does the System contain data on postsecondary students in continuing education or non-credit programs. The System also contains limited information out-of-state college enrollment and graduation for Maryland public high school graduates.

### Wage Data

The MLDS workforce data include quarterly Unemployment Insurance (UI) wages from 2008 through the last quarter of 2018. Unemployment Insurance (UI) filings are only available for employees who work for a business required to file UI. UI wages reflect the sum of all compensation. For some records, wages include bonuses, commissions, tips and other forms of compensation. Bonuses and other forms of compensation are periodic and may cause fluctuations in earnings. Wages reflect the period the compensation was paid, not when the compensation was earned. The wage data contained in the System cannot distinguish between part-time and full-time employment, hourly and salaried wages, regular wages and commissions, bonuses and other incentive pay. The UI data provided do not indicate the number of days a person worked in a particular quarter or the number of hours a person worked in a week.

The federal government (including the military), certain non-profits, and self-employed and independent contractors are not subject to Maryland UI filings. Individuals working in temporary employment, including federal postsecondary work-study programs, are also not subject to UI filings. MLDS data do not include information on out-of-state employment. These data gaps mean it is incorrect to assume that individuals not counted as “employed” in this report are unemployed.

Wage data in the System include North American Industry Classification System (NAICS) codes for employers. This system classifies employers by sector rather than identifies the specific jobs performed by employees.

### Contextual Data

Five sources of data were selected to provide context for the results and guide the analysis. Collectively, these sources provide comparison points between the quarterly wage data, Maryland minimum wage, the cost of living in Maryland, overall worker earnings in Maryland, and contribution of each industry sector to Maryland’s economy.

### MIT Living Wage Calculator

The [Living Wage Calculator](#) developed by the Massachusetts Institute of Technology<sup>1</sup> provides data on the cost of living in various geographic areas across the United States. The living wage calculator incorporates the cost of food, housing, health insurance, transportation, taxes, clothing and other personal items to derive the minimum annual income required for basic self-sufficiency. It is more comprehensive than traditional poverty measures, which do not incorporate these broader costs of living. More information on the MIT Living Wage Calculator is available on their [website](#). The measure selected from the Living Wage Calculator was “required annual income before taxes” for one adult with no dependent children which was \$31,365 annually or \$7,841<sup>2</sup> per fiscal quarter in 2018. This income was converted to a quarterly income to align to the MLDS quarterly wage data and is referred to as the “living wage” in the remainder of this analysis.

### American Community Survey 5 Year Estimates

The second source of contextual data is the [American Community Survey \(ACS\) 5-Year Estimates, 2012 to 2016](#).<sup>3</sup> This survey provides extensive data on demographic characteristics, housing, and wages for states and counties throughout the United States. The measure selected from the ACS was “median earnings for workers”. This income measure was converted to quarterly earnings to align to the MLDS quarterly wage data and is referred to as the “ACS wage” in the remainder of this analysis. The ACS median earnings for workers in Maryland was \$43,488 annually or \$10,872 quarterly in 2018.<sup>4</sup>

### Minimum Wage in Maryland

The minimum wage in Maryland from July 2017 to June 2018 was \$9.25 per hour. A minimum wage worker employed for 30 hours per week earns \$3,608 per quarter<sup>5</sup>. The 30 hours per week threshold was selected to calculate earnings as employment at 30 hours is the minimum to be qualified as full-time.

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<sup>1</sup> Glasmeier, Amy K. (2018). [Living Wage Calculator](http://livingwage.mit.edu/). (<http://livingwage.mit.edu/>) Massachusetts Institute of Technology.

<sup>2</sup> Values reported in the Living Wage Calculator were \$31,365 annually in 2018 dollars. This was divided to a quarterly wage of \$7,841 in 2018 dollars. This value did not need to be adjusted for inflation as it is contemporary to the period under study.

<sup>3</sup> United States Census Bureau. (2016). 2012-2016 American Community Survey 5-Year Estimates. U.S. Census Bureau’s American Community Survey Office. <https://factfinder.census.gov>

<sup>4</sup> Values reported in the ACS were \$40,893 annually in 2016 dollars. This was divided to a quarterly wage of \$10,223 in 2016 dollars. The values were inflation adjusted to 2018 dollars using the CPI Inflation Calculator provided by the [U. S. Department of Labor, Bureau of Labor Statistics](https://www.bls.gov/data/inflation_calculator.htm) - [https://www.bls.gov/data/inflation\\_calculator.htm](https://www.bls.gov/data/inflation_calculator.htm).

<sup>5</sup> This quarterly wage was derived by multiplying (( $\$9.25 \times 30$  hours per week)  $\times$  52 weeks in a year) and dividing by 4. This value did not need to be adjusted for inflation as it is contemporary to the period under study.

## U. S. Bureau of Economic Analysis

The U. S. Bureau of Economic Analysis (BEA) is an agency within the U. S. Department of Commerce. BEA produces statistics on gross domestic product (GDP), personal income and other measures of the U. S. economy to support government policy. The measure selected from BEA is the [Gross Domestic Product by State](#) for all industries in fiscal quarter 2 of 2018 for Maryland<sup>6</sup>. GDP is a measure of the total dollar value of all goods and services produced and sold, and it represents a measure of the contribution of each industry (NAICS) to the Maryland economy. The GDP is used to provide context for the percentage of graduates employed in a NAICS as compared to that NAICS' contribution to the Maryland economy.

## Maryland Department of Labor

The Maryland Department of Labor collects and analyzes data related to the Maryland labor market to provide information to individuals, businesses, and policy makers on the Maryland economy and its workforce. Two statistical tables were selected from the Maryland Department of Labor.

1. *2018 second quarter employment and wage data from the [Maryland Industry Series](#)*<sup>7</sup>. This table provides data on the number of employees in each NAICS and the average weekly wages for all employees in each NAICS. The first measure provides context for the workforce size of each NAICS relative to total employment and is compared to the total population of graduates employed in each NAICS. The second measure is weekly wages. The Maryland Department of Labor derives weekly wages by summing all the wages paid to all employees subject to UI reporting within a NAICS and then calculates the average weekly wage. The weekly wage was converted to a quarterly wage by multiplying the value by 52 and dividing the product by four. The average quarterly wage provides a snapshot of the wages paid in that NAICS across all types and classifications of employment and is compared to the quarterly median for Maryland high school graduates employed in the NAICS.
2. [Workforce projected growth](#) from 2018 to 2020 by NAICS<sup>8</sup>. These data provide the projected growth for each NAICS and allow for a comparison of the percentage of graduates entering the NAICS to the projected growth in the NAICS.

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<sup>6</sup> GDP calculations for 2017 and 2018 are reported in current (2019) dollars. The values have not been inflation adjusted to 2017 and/or 2018. <https://apps.bea.gov>.

<sup>7</sup> Maryland Second Quarter 2018 - Industry Series - Maryland's Quarterly Census of Employment and Wages (QCEW) - OWIP <https://www.dllr.state.md.us/lmi/emppay/tab1md22018.shtml>

<sup>8</sup> Maryland Industry Projections - 2018-2020 - Workforce Information and Performance <https://www.dllr.state.md.us/lmi/iandoprojshort/industryshort.shtml>

## Population Groups

The population of interest is high school students who graduated from a Maryland public high school with a diploma between January and October of 2013 and are between the ages of 16 and 24 at the time of graduation<sup>9</sup>. This is the latest year that high school graduates had five years of available wage data post-high school graduation. Almost 60,000 students graduated from Maryland public high schools in 2013 under this definition. See **Table 1**.

**Table 1. High School Graduates, State of Maryland, 2013, Distribution by High School Program Completion Type and Educational Attainment**

Education Level	Record Count	Program Completion Type							
		USM	%	CTE	%	USM & CTE	%	Other	%
<i>All High School Graduates</i>	59,560	36,236	61%	4,774	8%	6,612	11%	11,938	20%
High School Graduates, No College	14,226	5,157	36%	2,582	18%	1,201	8%	5,286	37%
Some College	21,316	12,482	59%	1,510	7%	2,440	11%	4,884	23%
Still in College	11,704	8,591	73%	412	4%	1,553	13%	1,148	10%
Certificate	269	132	49%	*	*	*	*	*	*
Associate's	1,490	973	65%	92	6%	273	18%	152	10%
Bachelor's	10,496	8,857	84%	123	1%	1,101	10%	415	4%
Other Degree	59	44	75%	*	*	*	*	*	*

\*value suppressed

High school graduates were disaggregated into educational attainment groups. See **Table 1**<sup>10</sup>. Definitions used to determine assignment to each group can be found in **Appendix 1**. Analyzing wage data by educational attainment is critical to any exploration of wage and industry of employment as:

1. Research suggests employment outcomes and wages may vary by educational attainment<sup>11</sup>;
2. Variation in length of degree program impacts the length of time in the workforce post-degree, which in turn impacts employment outcomes and wages; and
3. Enrollment in school negatively impacts amount of hours available for work each week.

<sup>9</sup> This definition of high school graduate was selected to align to reporting definitions used by the National Center for Education Statistics (NCES) and the U. S. Bureau of Labor Statistics (BLS) in reports on educational attainment and employment of high school graduates.

<sup>10</sup> Educational attainment should not be interpreted as college graduation rates as this report does not provide data on the number of students starting each degree, only the number of students who obtained each degree, are still enrolled in college or stop attending college without graduating. Reporting on time to degree and college completion is outside the scope of this report.

<sup>11</sup>For example, see:

Baum, Sandy, Jennifer Ma and Kathleen Payea. (2013). Education Pays 2013: The benefits of higher education for individuals and society. College Board.

Hout, Michael. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology*. 38: 379-400.

Kane, T.J. and Rouse, C. E. (1995). Labor market returns to two-year and four-year college. *The American Economic Review*, 85(3): 600-614

Thomas, Scott L. and Liang Zhang. (2005). Post-baccalaureate wage growth within 4 years of graduation: The effects of college quality and college major. *Research in Higher Education*. Volume 46. 4: 437-459.

## ANALYSIS AND RESULTS

### Question 1. Wages Earned Five Years after High School Graduation

This section outlines the approach used to determine the median quarterly wages for high school graduates five years after high school graduation.

#### Methodology

The high school graduates included in the wage analysis were selected by using the U. S. Census Bureau Stable or Full-Quarter Employment Methodology (referenced as Full-Quarter throughout this report)<sup>12</sup>. This methodology excludes individuals from the median calculation who do not have wage data in either the fiscal quarter before or after the period of interest. For this study, the period of interest is the 20<sup>th</sup> quarter after high school graduation or fiscal quarter 2 of 2018. Accordingly, individuals were included in the median wage calculation<sup>13</sup> if, in addition to having wages in quarter 2 of 2018, they also had wages in fiscal quarter 1 of 2018 and fiscal quarter 3 of 2018. See **Appendix 3** for a comparison of individuals with full-quarter employment to all individuals with wage data in fiscal quarter 2.

The Full-Quarter Employment Methodology was used because it provides a standardized method of determining whose wages to include in the analysis. Using a standardized methodology allows the Center to compare its outcomes to the outcomes in other research that uses this same methodology. More importantly, restricting analysis to “stable wage earners” provides a clearer picture of wage outcomes for workers fully engaged in the workforce and eliminates the potential to deflate median wage calculations by including the wages, or lack of wages, of workers for who are absent, transient, or not fully engaged in the workforce. Other sections of this report identify and analyze issues related to high school graduates who may not be fully engaged in the workforce or have limited wage data available for analysis.

Wage bands were constructed to align to the contextual indicators selected for this report. The wages earned in the 20<sup>th</sup> quarter for those with full-quarter employment were used to assign each high school graduate to one of four wage groups. See **Table 2**.

**Table 2. Wage Bands**

Income Band	20 <sup>th</sup> Fiscal Quarter Wage
Less than Minimum Wage	\$1 to \$3,608
Between Minimum Wage and Living Wage	\$3,609 to \$7,841
Between the Living Wage and ACS Wage	\$7,842 to \$10,872
Greater than or equal to the ACS Wage	>= \$10,872

<sup>12</sup> The Full-Quarter Employment (Stable) methodology is utilized by the U. S. Census Bureau to calculate average monthly earnings for individuals engaged in stable employment with any employer. The methodology is applied here to derive quarterly, rather than monthly median earnings. [https://lehd.ces.census.gov/doc/QWI\\_101.pdf](https://lehd.ces.census.gov/doc/QWI_101.pdf).

<sup>13</sup> Some individuals have wages in a quarter from more than one employer. Those wages were summed and then the sum was used in the median quarterly wage calculation.

## Results

### Median Quarterly Wages by Educational Attainment

There were 27,822 high school graduates, or 47% of all graduates, who had full-quarter employment and were therefore included in median wage analysis. See **Table 3**<sup>14</sup>. Conversely, 53% of high school graduates did not have wage data for the full nine month period five years after high school graduation. High school graduates excluded from this calculation include individuals who may have had wage data for some but not all of the quarters required to meet the full-quarter definition, had wages from a source not reported to the MLDS, or were unemployed.

**Table 3. High School Graduates, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Educational Attainment Compared to Living Wage, Five Years after High School Graduation**

Educational Attainment	Total	Total with Full-Quarter Employment	% with Full-Quarter Employment	Median Wage for Quarter 20	Variation to Living Wage (\$7,841)
<i>All High School Graduates</i>	59,560	27,822	47%	\$6,160	↓ \$1,681
High School Graduates, No College	14,226	6,355	45%	\$6,331	↓ \$1,510
Some College	21,316	10,973	51%	\$5,532	↓ \$2,309
Still in College	11,704	5,686	49%	\$5,299	↓ \$2,542
Certificate	269	167	62%	\$8,629	↑ \$788
Associate's	1,490	822	55%	\$7,509	↓ \$332
Bachelor's	10,496	3,797	36%	\$10,000	↑ \$2,159
Other Degree	59	22	37%	\$13,973	↑ \$6,132

↑value is above living wage, ↓ value is below living wage

Overall, the median quarterly wage for all high school graduates with full-quarter employment was \$6,160 in the 20<sup>th</sup> quarter – fiscal quarter 2 of 2018. Comparatively, this was approximately \$1,600 below the living wage<sup>15</sup> in Maryland and \$4,000 below the ACS median nonfamily income<sup>16</sup> in Maryland. This result was not uniform across all educational attainment groups. See **Table 3** and **Chart 1**. High school graduates who did not continue to college, those with some college, and those still in college had a median quarterly wage that fell below the living wage. Of these three educational attainment groups, the *No College* group, which presumably went directly into the workforce, had higher wages than the other two groups. Further, as may be expected, students in the *Still in College* group fell below the living wage as they are most likely working in a part-time capacity to prioritize their education. These students may have had a portion of their living expenses covered by their parents or received federal, state, or institutional financial aid to cover their living expenses. Perhaps unexpected is the median

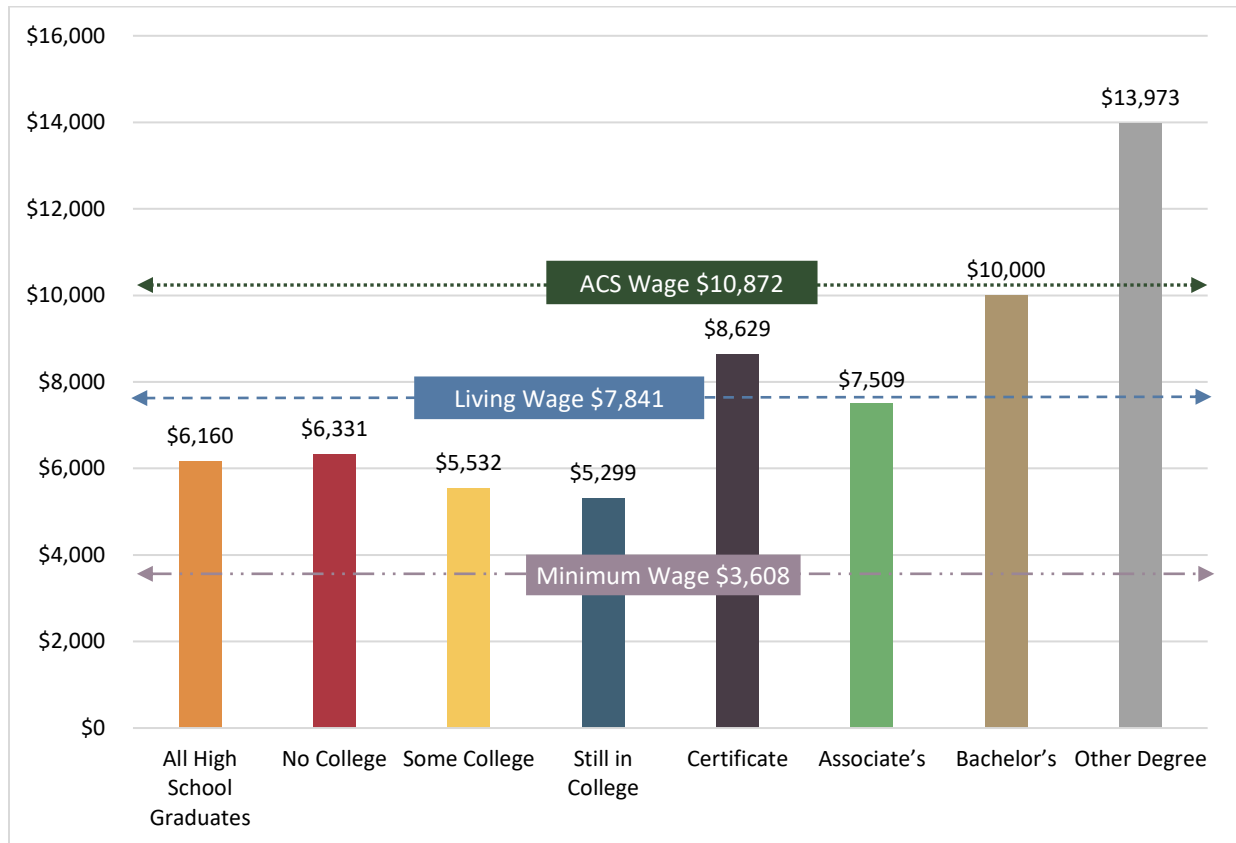
<sup>14</sup> Wages are actual for Q2 2018 and not inflation adjusted to current day values. If an individual had more than one source of wages for the period those sources were summed to a personal quarterly wage and that value was used in determining the median.

<sup>15</sup> Glasmeier, Amy K. (2018). [Living Wage Calculator](#). Massachusetts Institute of Technology.

<sup>16</sup> United States Census Bureau. (2016). 012-2016 American Community Survey 5-Year Estimates. U.S. Census Bureau's American Community Survey Office.

quarterly wage for the *Some College* group, this group, who had some college but did not earn a degree, had a median quarterly wage approximately \$800 less than those who never went to college. This low median wage may result from delayed entry into career track employment while attempting college, a condition then exacerbated by the lack of college degree that might otherwise command a higher starting salary when delaying entry into the workforce.

**Chart 1. High School Graduates, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Educational Attainment Compared to Wage Indicators, Five Years after High School Graduation**



High school graduates who completed a *Certificate*, *Associate's*, *Bachelor's*, or *Other Degree* had median quarterly earnings at or above the living wage. See **Table 3 and Chart 1**. *Associate's* degree graduates, some of whom may have been in the workforce post-college graduation for two or more years, had median quarterly earnings that were within \$300 of the living wage. *Certificate*, *Bachelor's*, and *Other Degree* graduates had median quarterly wages that exceeded the living wage in Maryland by \$1,000, \$2,200, and \$5,000 respectively. At the point of wage evaluation, *Certificate* graduates may have been in the workforce post-college graduation for two or more years, while those in the *Bachelor's* and *Other Degree* groups realized these earnings despite having only nine months lapse since completing their college degrees.

Whether the earnings gaps between educational attainment groups persist, narrow or widen will be determined as additional time passes in the workforce. Currently, the *No College*, *Some College* and *Still in College* groups are on pace to earn \$1 million in their lifetime, while individuals with some level of college degree are on pace to earn \$1.5 to \$2 million in their lifetime,<sup>17</sup> which aligns to research<sup>18</sup> on the financial returns to education. For additional analysis on the *No College* group, see **Supplement 1**.

#### Wage Bands by Educational Attainment

Another way to analyze wages five years after high school graduation is to determine the number of graduates with full-quarter employment that fell into the wage bands constructed from the wage indicators. The median quarterly wage identifies the quarterly wage for the person in the exact middle of a population; half the records in that population have a quarterly wage above this value, and half the records have a quarterly wage below this value. Identifying the number of high school graduates with quarterly wages at different levels of income helps quantify the number of graduates that were engaged in the workforce at a level that provides for or exceeds the basic cost of living in Maryland and the number who may be working but unable to meet these basic costs. See **Table 4**.

**Table 4. High School Graduates, State of Maryland, 2013, Full-Quarter Employment by Educational Attainment and Wage Band, Five Years after High School Graduation**

Education Level	Total with Full-Quarter Employment	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	%	#	%	#	%	#	%
<b>All High School Graduates</b>	27,822	6,618	24%	11,581	42%	5,069	18%	4,553	16%
High School Graduates, No College	6,355	1,287	20%	2,921	46%	1,293	20%	854	13%
Some College	10,973	2,887	26%	5,252	48%	1,935	18%	898	8%
Still in College	5,686	1,888	33%	2,134	38%	789	14%	875	15%
Certificate	167	23	14%	*	*	*	*	*	*
Associate's	822	106	13%	330	40%	194	24%	192	23%
Bachelor's	3,797	427	11%	884	23%	821	22%	1,665	44%
Other Degree	22	**	**	*	*	*	*	*	*

\*value suppressed

\*\*no records meet definition

Overall, 66% of high school graduates with full-quarter employment do not have wages sufficient to meet the basic cost of living in Maryland five years after high school graduation. See **Table 4**. Collectively, 24% of all high school graduates fell below the minimum wage while 42% were between

<sup>17</sup> Projected lifetime earnings are based on the sum of median quarterly wages for individuals through the age of 65 for each education level.

<sup>18</sup> For example, Baum, Sandy, Jennifer Ma and Kathleen Payea. (2013). [Education Pays 2013: The benefits of higher education for individuals and society](#). College Board.

minimum wage and the living wage. Only 34% of all graduates with full-quarter employment had wages above the living wage, with 16% achieving a quarterly wage equal to or greater than the ACS wage. This means that, despite being engaged in the workforce for three fiscal quarters, a full nine months, the majority of high school graduates, five years after graduation, did not have sufficient wages to cover the basic cost of living in Maryland.

Applying this measure also called attention to differences in outcomes at each educational attainment level. See **Table 4**. High school graduates that continued on to college and graduated, appeared with greater frequency in the higher wage bands than those who did not continue on to college (*No College*), are *Still in College*, or attempted college and did not graduate (*Some College*). For example, 44% of high school students with a Bachelor’s degree had a quarterly wage that placed them at or above the ACS wage. Comparatively, only 13% of high school graduates that did not continue on to college (*No College*) fell into this band. Conversely, 23% of Bachelor’s degree graduates had quarterly wages that placed them into the *Between Minimum Wage and Living Wage* as compared to 48% of high school graduates that attempted college but did not graduate (*Some College*). Failure to earn a degree or delays in completing a degree could have an impact on lifetime earnings for the *Some College* and *Still in College* graduates who may have delayed career track employment.

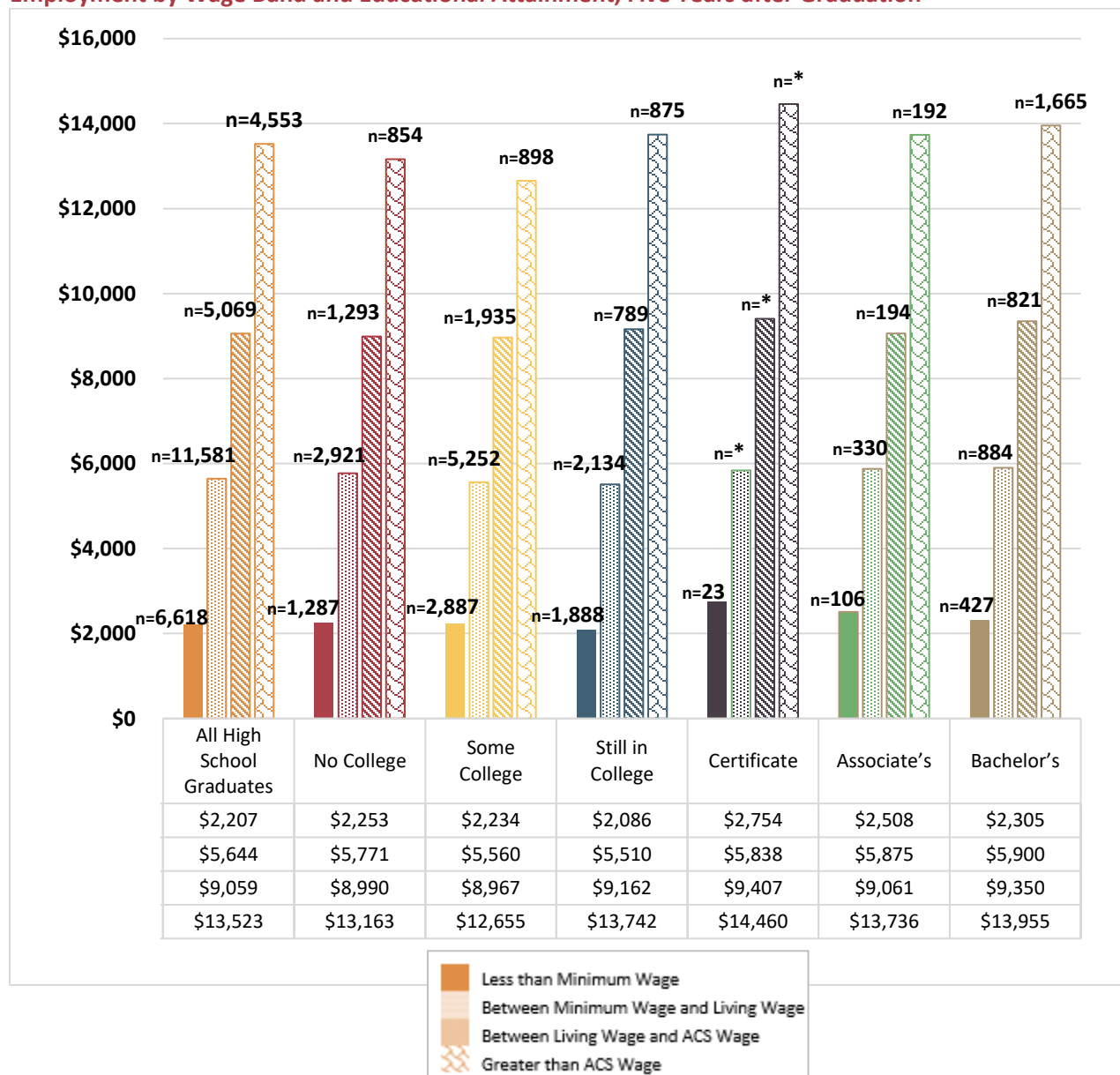
**Table 5. High School Graduates, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Educational Attainment and Wage Band, Five Years after High School Graduation**

Education Level	Total with Full-Quarter Employment	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	Median Wage	#	Median Wage	#	Median Wage	#	Median Wage
<b>All High School Graduates</b>	27,822	6,618	\$2,207	11,581	\$5,644	5,069	\$9,059	4,553	\$13,523
High School Graduates, No College	6,355	1,287	\$2,253	2,921	\$5,771	1,293	\$8,990	854	\$13,163
Some College	10,973	2,887	\$2,234	5,252	\$5,560	1,935	\$8,967	898	\$12,655
Still in College	5,686	1,888	\$2,086	2,134	\$5,510	789	\$9,162	875	\$13,742
Certificate	167	23	\$2,754	*	\$5,838	*	\$9,407	*	\$14,460
Associate’s	822	106	\$2,508	330	\$5,875	194	\$9,061	192	\$13,736
Bachelor’s	3,797	427	\$2,305	884	\$5,900	821	\$9,350	1,665	\$13,955
Other Degree	22	**	**	*	\$5,580	*	\$9,436	*	\$14,937

The median quarterly wage was derived for each wage band and educational attainment group. See **Table 5** and **Chart 2**. Reviewing the median wages for each wage band and educational attainment group revealed that for the wage bands, *Between Living Wage and ACS Wage*, and *Above ACS Wage*, the

medians were not just above the wage indicator, but were thousands of dollars above the wage indicator. For example, the median quarterly wage for *No College* in the *Between Living Wage and ACS Wage* was \$8,990 or \$1,100 above the living wage. This means that half of the graduates in this group (approximately 1,500 graduates) were not just at the living wage, they were well above it and within \$1,800 of the ACS Wage. Highlighting another example, the *Bachelor's Degree* group had a median wage in the *Above ACS Wage* band of \$13,955 or \$3,000 above the ACS Wage indicator. In this group, over 800 graduates were not only above the ACS Wage, they were thousands of dollars above the wage. Further, the median wage in each wage-education band showed little variation across educational attainment groups. Simply, those that were above the living wage and/or above the ACS Wage were above it regardless of educational attainment.

**Chart 2. High School Graduates, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Wage Band and Educational Attainment, Five Years after Graduation**



Relatedly, the median quarterly wage for those in the *Below Minimum Wage* band and *Between Minimum Wage and Living Wage* band, at all educational attainment levels, was not just below the wage indicator, it was well below. For example, the median wage in the *Below Minimum Wage* band for the *No College* group was \$1,400 below the minimum wage while the median for the *Between Minimum Wage and Living Wage* band was \$2,000 below the living wage. This means that for high school graduates in these groups, half were not just below the wage indicator, they were well below. Many of these graduates had wages that were not even equivalent to working a minimum wage job 30 hours a week. It is possible that these wages represent part-time work. It is also possible that wages for graduates in these two wage bands represent supplemental income from a second job, and that they derive their primary income from sources that were not subject to UI reporting. Further, although to be included in the wage analysis graduates had to have wages in the 19<sup>th</sup> and 21<sup>st</sup> wage periods, it is possible that the 20<sup>th</sup> wage quarter represents a period of employment transition. Wages may be lower than normal wages if the graduate did not derive wages for some portion of the 20th fiscal quarter while transitioning between jobs.

Finally, it is also important to consider that 53% of high school graduates did not have full-quarter employment (earnings for a nine month period) five years after high school graduation. This population is excluded from this analysis as their irregular wage data at the five year mark makes it difficult to analyze and interpret. It is possible that these individuals were unemployed or under-employed, or were employed but out-of-state, with the federal government, or working as contractors (self-employed). It is impossible to predict if medians for each group would increase, decrease or remain relatively unchanged if complete data were available.

## Question 2. Hours Worked Per Week

### Methodology

The second requirement for the report is to analyze the hours worked for the five year period following graduation. As previously stated, the wage data received from UI does not contain hours worked. Knowing the number of hours worked would shed light on whether employment was full-time or part-time and the extent to which the high school graduate was engaged in the workforce. While the full-time/part-time question cannot be directly answered, data are available to help assess the level of engagement in the workforce amongst this cohort of high school graduates.

Wage data were analyzed for each fiscal quarter after high school graduation to determine the number of graduates with wage data in each fiscal quarter. As with the previous method, wage visibility was defined as having a wage record in a specific quarter. Also, as previously noted, wage visibility is directly affected by gaps in the MLDS employment data. The MLDS does not contain workforce data on self-employed persons, independent contractors, military personnel, out-of-state, or federal employees. Further, as individuals change jobs over the course of the period of analysis it is possible that the gaps in wage data may be due to changes in type and location of employment rather than due to unemployment. For a full discussion regarding wage visibility see **Appendix 2**.

## Results

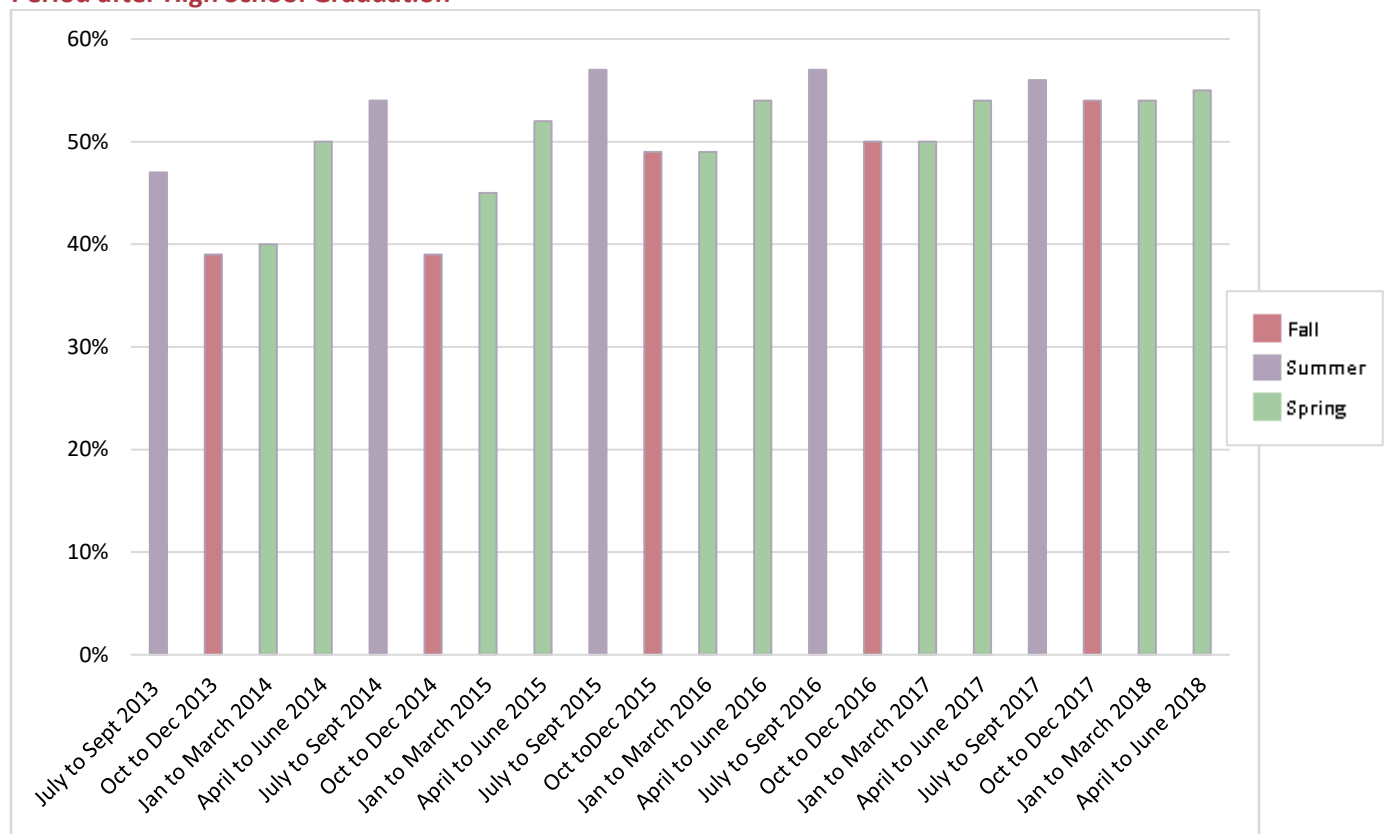
The results of the analysis are presented in **Table 6** and **Chart 3**. For a full analysis by educational attainment, see **Appendix 4**. The number high school graduates with wage data in any one quarter was somewhat consistent for the majority of the five year period; however it ranged from a low of 39% to a high of 57% with an average of 50%.

**Table 6. High School Graduates, State of Maryland, 2013, Wage Visibility by Quarter for Full Five Year Period after High School Graduation**

Year	Fiscal Quarter	High School Graduates with Wages in Quarter	% of All High School Graduates with Wages in Quarter	
Year 1	Q1	July to September 2013	28,158	47%
	Q2	October to December 2013	23,454	39%
	Q3	January to March 2014	23,783	40%
	Q4	April to June 2014	29,671	50%
Year 2	Q5	July to September 2014	32,009	54%
	Q6	October to December 2014	23,520	39%
	Q7	January to March 2015	26,690	45%
	Q8	April to June 2015	31,265	52%
Year 3	Q9	July to September 2015	33,843	57%
	Q10	October-December 2015	29,016	49%
	Q11	January to March 2016	29,031	49%
	Q12	April to June 2016	32,229	54%
Year 4	Q13	July to September 2016	33,784	57%
	Q14	October to December 2016	29,633	50%
	Q15	January to March 2017	29,861	50%
	Q16	April to June 2017	32,005	54%
Year 5	Q17	July to September 2017	33,534	56%
	Q18	October to December 2017	32,112	54%
	Q19	January to March 2018	32,010	54%
	Q20	April to June 2018	32,874	55%
Total High School Graduates		59,560	50%	

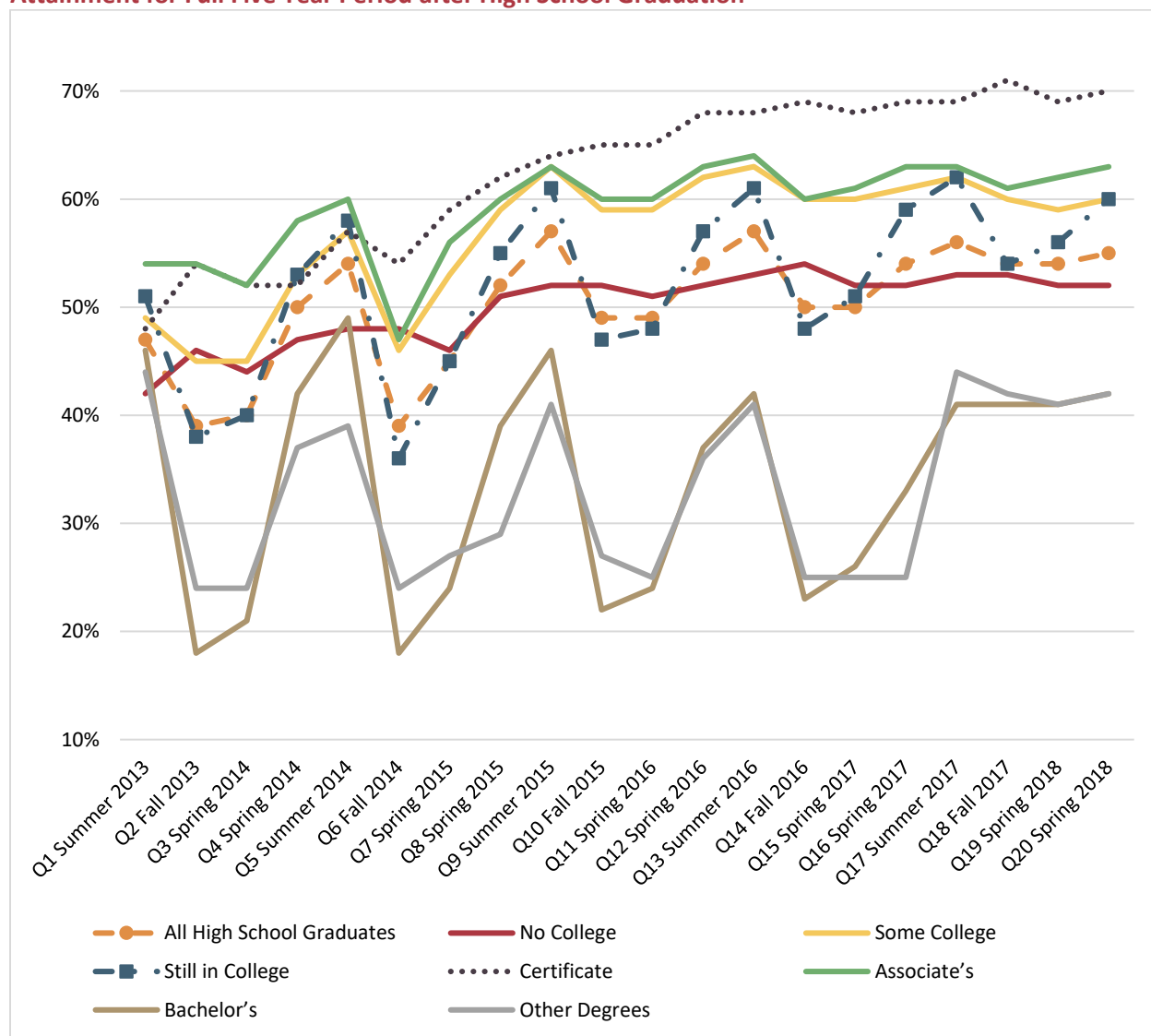
Wage visibility peaked each summer and declined each fall for the first four years of the period. See **Chart 3**. In fiscal quarters aligned to summer, the rate of wage visibility exceeded the average by four to seven percentage points. In fiscal quarters that aligned to fall, the rate of wage visibility fell below the average by eleven percentage points in two years, and then increased to meet and exceed the average in the remaining three years. This increase in fall wage visibility in the last three years of the five year period may be due to graduates from Certificate and Associate’s degree programs entering the workforce and students still enrolled in Bachelor’s degree programs beginning to seek employment as they get closer to graduation. See **Appendix 4** for distributions of wage visibility by quarter for each educational attainment group.

**Chart 3. High School Graduates, State of Maryland, 2013, Wage Visibility by Quarter for Full Five Year Period after High School Graduation**



Distinct patterns emerge when examining the wage visibility patterns for the full five year period across each educational attainment group. See **Chart 4**. First, for all educational attainment groups except the *No College* group, the rate of wage visibility distinctly dropped in fiscal quarters aligned to fall academic terms and increased in fiscal quarters aligned to summer academic terms. This is perhaps not surprising as students pursuing higher education are less likely to be enrolled in college in the summer and therefore have more time to work as compared to fall. Conversely, high school graduates in the *No College* group had a somewhat steady rate of wage visibility for the full five years, starting at 42% and slowing rising to rates in the low 50%'s by the start of year 3.

**Chart 4. High School Graduates, State of Maryland, 2013, Wage Visibility by Quarter and Educational Attainment for Full Five Year Period after High School Graduation**



The second pattern to consider is the variation in the overall rates of intragroup wage visibility. Most notably, students in the *Associate's*, *Some College* and *Certificate* groups have the highest intragroup rates of wage visibility, ranging from lows in the mid-40% to highs around 70%. See **Chart 4**. High

school graduates in these groups appear to be engaged in the workforce immediately after high school graduation and throughout their academic career at a rate higher than those in *Bachelor's or Other Degrees*. Conversely, what appears to be a lower rate of wage visibility for *Bachelor's or Other Degrees* may be the result of gaps in MLDS data related to out-of-state employment rather than a lower rate of employment. Approximately 27% of the 2013 high school graduates who enrolled in college did so out-of-state,<sup>19</sup> if these students were working while in college it would not be visible in MLDS data.

More importantly, the high rates of visibility that continued for the *Certificate and Associate's* groups after they most likely earned their college degrees suggests that there is a labor market need in Maryland for these degree recipients. Comparatively, *Bachelor's and Other Degree* students had wage visibility after graduation at only 42%. These rates, rather than indicating unemployment or lack of employment opportunities for graduates with these degrees in Maryland, may indicate an increase in mobility. Research by the Brookings Institute indicates that 42% of students with Bachelor's degrees remain in the area of the college they attended compared to 68% of students with Associate's degrees.<sup>20</sup> The linkage between degree attainment, local labor market needs and student mobility requires further research to better understand the patterns identified in this study.

The third distinct pattern is that, while the cycle of summer peaks and fall valleys for wage visibility is consistent across postsecondary educational attainment groups, the intragroup visibility for two groups, *Still in College* and *Bachelor's*, may reflect an important distinction in these two groups. See **Chart 5**. In fiscal quarters aligned to fall academic terms, only 18%-23% of all students who attain a Bachelor's degree by fall 2017 had wage data in the fall, compared to students who were still enrolled in college five years later. The *Still in College* group had a wage visibility of 36%-54% each fall. This is an 18 to 29 percentage point difference in wage visibility in the fall between the two groups. It cannot be said definitively that students who earned a bachelor's degree worked less than those still in college due to the gaps in MLDS wage data. It is possible that the rates of bachelor's degree students with wage data could be understated due to enrollment in out-of-state colleges rather than due to non-participation in the workforce<sup>21</sup>. However, the pattern suggests that those who *earn* a bachelor's degree in 4 years may in fact be devoting the majority of their time to school rather than working, allowing them to graduate on-time

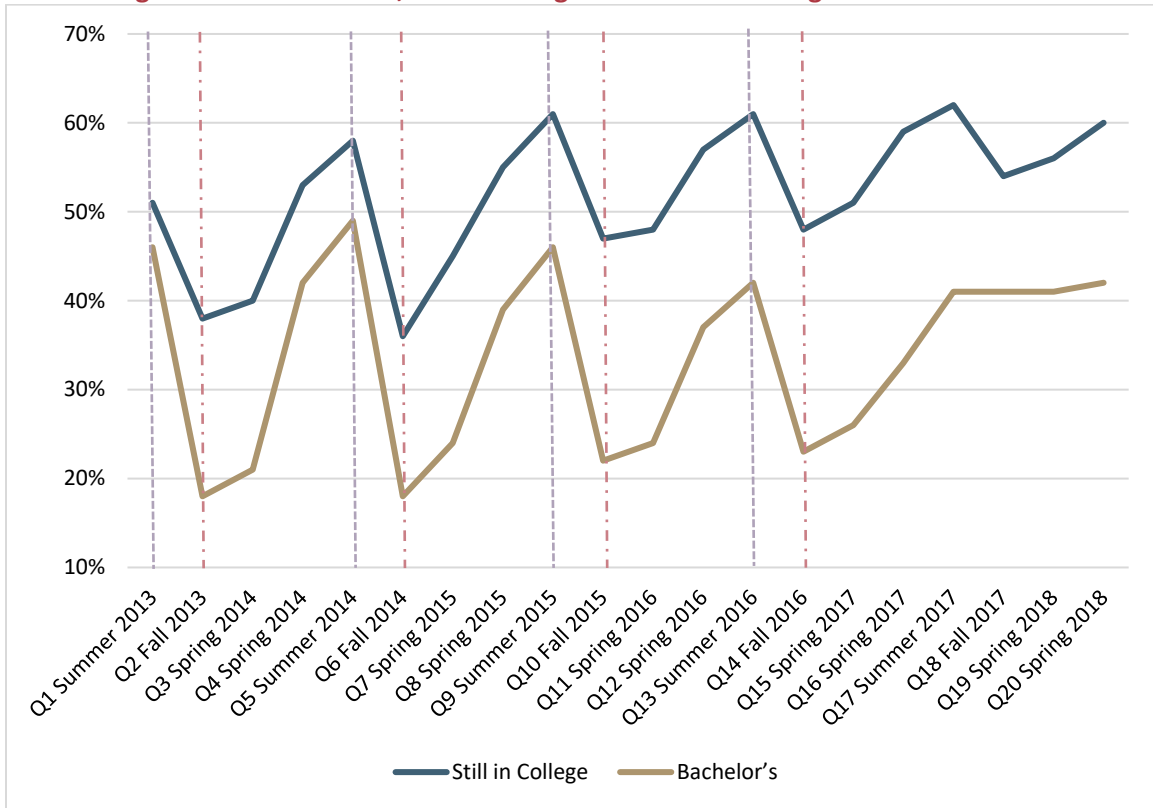
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<sup>19</sup> MLDS Center. [Initial Postsecondary Enrollments - In-State vs. Out-of-State Overview](#).

<sup>20</sup> Rothwell, Jonathan. (2015). [What colleges do for local economies: A direct measure based on consumption](#). Brookings Institute.

<sup>21</sup> Approximately 27% of the 2013 high school graduates had an initial enrollment that was out-of-state. MLDS Center. [Initial Postsecondary Enrollments - In-State vs. Out-of-State Overview](#).

**Chart 5. High School Graduates, State of Maryland, 2013, Wage Visibility by Quarter for Full Five Year Period after High School Graduation, Still in College and Bachelor's Degrees**



Interpreting data on the *Still in College* group is challenging. First, the *Still in College* group includes students that delayed entry to college to start a career and have now entered college to perhaps advance professionally. These students may even have an employer who is paying for their education. In fact, 17% of the *Still in College* group with full-quarter employment had six or less terms of enrollment. This means they enrolled in college (and remained enrolled) in the final two years of the five year period. See **Table 7**. Note the quarterly median wage for each *Still in College* enrollment period group has an inverse relationship between number of terms and wages. The median quarterly wages were *higher* for those *Still in College* with *fewer* enrollment periods and *lower* for those *Still in College* with *more* periods of enrollment. This pattern suggests that high school graduates, now around age 22 or 23, who delayed college entry were engaged in some type of career-track employment prior to entering college as the median quarterly wages were somewhat consistent with those in the *No College* group while those who were enrolled in college for the majority of the five year period were likely engaged in part-time employment.

**Table 7. High School Graduates, State of Maryland, 2013, College Enrollment Periods with Median Quarterly Wages for the Full Five Year Period after High School Graduation, Still in College**

Number of Enrollment Periods	Total Still in College	Still in College with Full-Quarter Employment	Q20 Median Quarterly Wage
<b>1 Term Only</b>	1,153	644	\$6,246
<b>2 to 6 Terms (1 to 2 Years of Study)</b>	625	305	\$6,561
<b>7 to 9 Terms (3 Years of Study)</b>	907	513	\$6,562
<b>10 to 12 Terms (4 Years of Study)</b>	5,012	2,426	\$5,218
<b>13 or More Terms (Over 4 Years of Study)</b>	4,007	1,798	\$4,506
<b>Total</b>	11,704	5,686	\$5,299

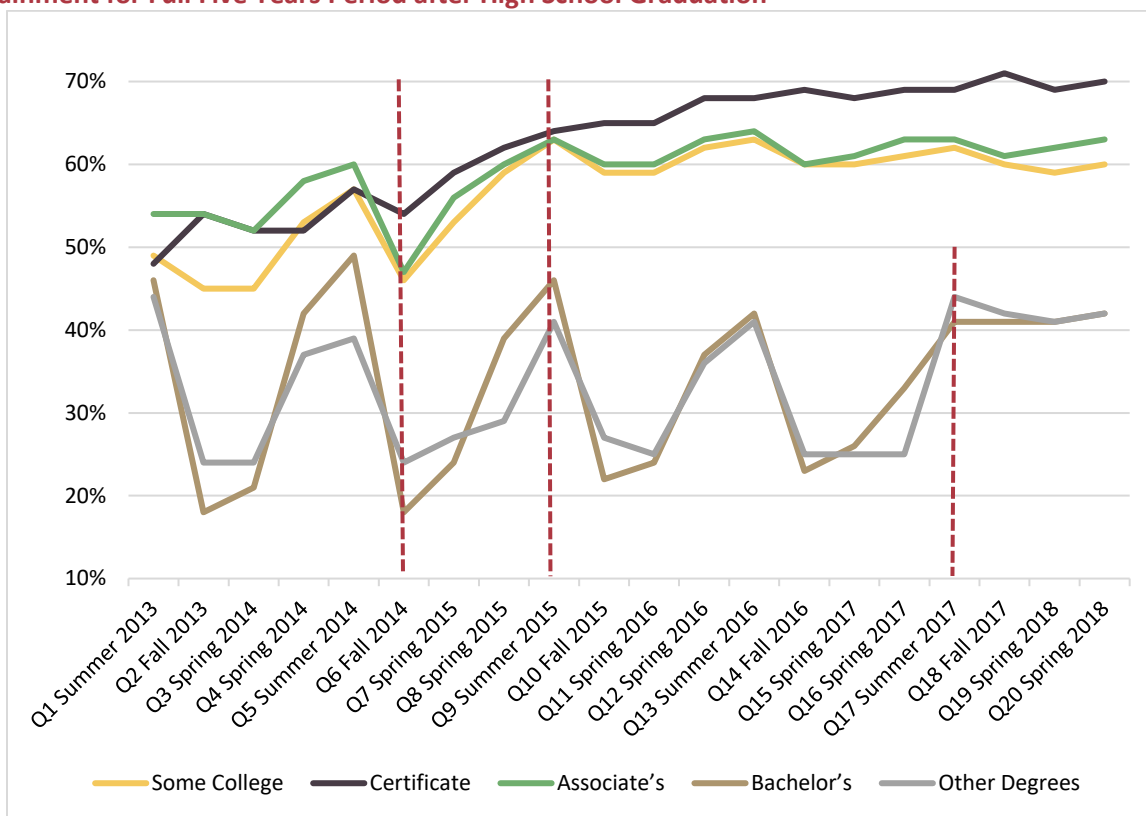
Second, this group includes students who transferred between colleges, earned a Certificate or Associate’s degree and continued on to a Bachelor’s, or earned a Bachelor’s and continued on to a graduate degree. Indeed, 34% of all *Still in College* or 32% of all *Still in College* with full-quarter employment were enrolled in college for almost every single term of the five year period, including Spring 2018, the last academic quarter of the five year period. These students, approximately one-third of the *Still in College* group, may be close to graduating with a bachelor’s degree or higher. Nationally, only 40% of students graduate with a bachelor’s degree in four years whereas 60% graduate within six years<sup>22</sup>.

The high rate of wage visibility and low median quarterly wage suggests that many of the *Still in College* students with near continuous enrollments are likely working part-time while in college to help cover their costs of their education, delaying their time to degree employment. It is also possible that some of these students have only recently entered the labor market, perhaps in positions that are relevant to

<sup>22</sup> U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Winter 2016–17, Graduation Rates component. See Digest of Education Statistics 2017, table 326.10.

their degree or even required by their degree so that work experience supplements rather than supplants their education. Whatever the reason for extending time to degree, the delay has the potential to cost this group of high school graduates approximately \$18,000 in foregone earnings. High school graduates who earn a bachelor’s degree within four and a half years have an estimated annualized median earnings of \$40,000. High school graduates that are still in college, five years after high school graduation, have an estimated annualized median earnings of \$21,000.<sup>23</sup>

**Chart 6. High School Graduates, State of Maryland, 2013, Wage Visibility by Quarter and Educational Attainment for Full Five Years Period after High School Graduation**



A final pattern that emerges in the intragroup wage visibility analysis occurred in the fiscal periods that aligned to the fall 2014, summer 2015 and summer 2017 academic terms. See **Chart 6**. Fall 2014 for *Certificate, and Associate’s*, showed a distinct drop in visibility followed by an increase and plateau of visibility by summer 2015. For these groups, fall 2014 may have marked an exit from college and an entrance into post-college employment. For *Certificate* graduates, fall 2014 would have concluded the full-time or near-full time study required to earn a certificate (at least 1 year), while spring 2015 would have concluded the 2 years of full-time study required to earn an *Associate’s* degree. The increase and plateau visibility pattern repeats itself for *Bachelor’s* and *Other Degrees* students in summer 2017. For students in these two groups, wage visibility increased in summer 2017 and plateaued for the remaining period and may have marked an exit from college and an entrance into post-college employment. For

<sup>23</sup> The median quarterly wage for *Bachelor’s* was \$10,000. The median quarterly wage for *Still in College* was \$5,299. These values were multiplied by four to estimate annual wages.

these graduates, summer 2017 would have concluded four years of full-time study, the minimum typically required to earn a bachelor’s degree or a bachelor’s plus a post-baccalaureate or master’s degree. More analysis is needed to better understand the increase and plateau patterns identified.

For those with *Some College*, fall 2014 may have marked the point at which they stopped pursuing a college education. Nationally, 43% of students enrolled in 2-year colleges and 20% of students enrolled in 4-year colleges do not persist beyond their second year of study, it is possible that this group mirrors these national trends<sup>24</sup>. Indeed, 56% of the *Some College* group (overall and with full-quarter employment) were enrolled in college for two years or less. See **Table 8**. This group, like the *Still in College* group, also had an inverse relationship between duration of college enrollment and median quarterly wages for those with full-quarter employment. For *Some College*, the *longer* the enrollment, the *lower* the median wage and the *shorter* the enrollment, the *higher* the median wage. In short, the median quarterly wage for those who enrolled in college and exited college within two years is close to that of the *No College* (\$6,331) group and \$2,000 higher than those who remained in college for four or more years and disengaged without graduating. For this last group, the delayed entry to the workforce, low wages, and lack of degree attainment may have important policy implications, particularly if they also have student loan debt. See **Supplement 2**.

**Table 8. High School Graduates, State of Maryland, 2013, College Enrollment Periods with Median Quarterly Wages for the Full Five Year Period after High School Graduation, Some College**

Number of Enrollment Periods	Total Some College	Some College with Full-Quarter Employment	Q20 Median Quarterly Wage
<b>1 Term Only</b>	1,874	850	\$5,870
<b>2 to 6 Terms (1 to 2 Years of Study)</b>	10,001	5,254	\$6,130
<b>7 to 9 Terms (3 Years of Study)</b>	3,711	1,973	\$5,853
<b>10 to 12 Terms (4 Years of Study)</b>	3,466	1,798	\$4,392
<b>13 or More Terms (Over 4 Years of Study)</b>	2,291	1,098	\$3,788
<b>Total</b>	21,316	10,973	\$5,532

<sup>24</sup> U.S. Department of Education, National Center for Education Statistics, 2012/14 Beginning Postsecondary Students Longitudinal Study. Digest of Education Statistics 2016. [Table 326.50](#).

### Question 3. High School Graduates and Industry of Employment

This section outlines the approach used to analyze the industry of employment and corresponding median quarterly wages for high school graduates five years after high school graduation.

#### Methodology

The industry of employment was determined by evaluating the North American Industry Classification System (NAICS) code reported with each wage record. NAICS codes were grouped according to standard reporting categories.<sup>25</sup> The U.S. Census Bureau Stable Employment Methodology<sup>26</sup> was used as a basis for selecting high school graduates to include in the analysis with the added requirement that they must have been employed by the same employer for the nine month period (Q1 of 2018, Q2 of 2018 and Q3 of 2018) before deriving median wage calculations for fiscal quarter 2 of 2018<sup>27</sup> (referenced as Same-Employer throughout this report). Due to small population sizes, the *Certificate* and *Other Degrees* groups are omitted from this section.

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<sup>25</sup> The 20 NAICS codes were grouped based upon industry sector as aligned to Bureau of Labor Statistics and U.S. Statistical Agencies Office of Management and Budget (Federal), Economic Classification Policy Committee.

<sup>26</sup> The Full-Quarter Employment (Stable) methodology is utilized by the U.S. Census Bureau to calculate average monthly earnings for individuals engaged in stable employment with the same employer. The methodology applied here derives quarterly, rather than monthly, median earnings.

[https://lehd.ces.census.gov/doc/QWI\\_101.pdf](https://lehd.ces.census.gov/doc/QWI_101.pdf).

<sup>27</sup> For the NAICS quarterly median wage calculation, some individuals had wages in the quarter from more than one employer and more than one NAICS. Only wages from the employer that covered all three quarters were used in median wage calculations.

## Results

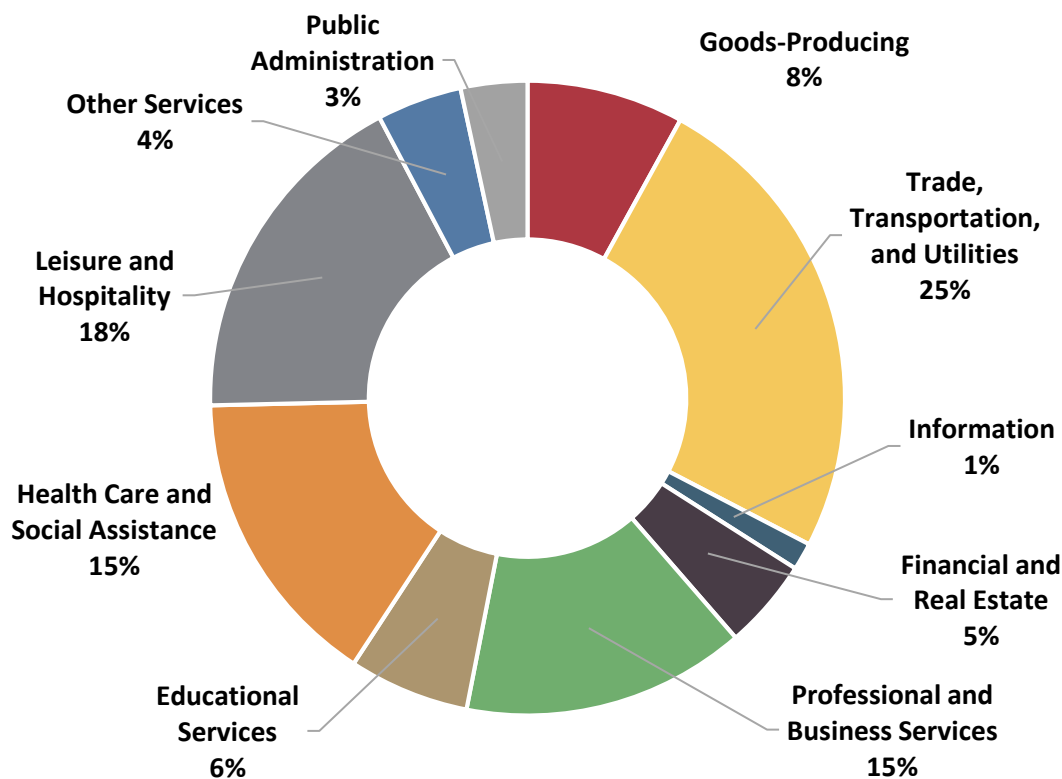
The Full-Quarter Employment with Same Employer Methodology (Same-Employer) yielded 19,940 high school graduates or 33% of all high school graduates. See **Table 9**. This means that 70% of high school graduates with full-quarter employment (wages for three quarters) remained with the same employer for all three fiscal quarters; only 30% of high school graduates with full-quarter employment changed employers at least once during this period. See **Appendix 5, 6 and 7** for sector of employment and median quarterly wages<sup>28</sup> by educational attainment.

**Table 9. High School Graduates, State of Maryland, 2013, Full-Quarter and Same-Employer Employment, Five Years after High School Graduation**

All High School Graduates	Total with Full-Quarter Employment	Total with Full-Quarter Same-Employer Employment	% Full-Quarter with Same-Employer Employment
59,560	27,822	19,490	70%

Five years after high school graduation, the NAICS sector with the largest percentage of high school graduates with same-employer wages was *Trade, Transportation and Utilities* (25%), followed by *Leisure and Hospitality* (18%). See **Figure 1 and Table 10**.

**Figure 1. High School Graduates, State of Maryland, 2013, Sector of Employment for Same-Employer Employment, Five Years after High School Graduation**



<sup>28</sup> Wages are actual for Q2 2018 and not inflation adjusted to current day values.

**Table 10. High School Graduates, State of Maryland, 2013, Sector of Employment for Same-Employer Employment, Five Years after High School Graduation**

Sector	Total with Same-Employer Employment	%
Goods-Producing	1,559	8%
Trade, Transportation, and Utilities	4,799	25%
Information	272	1%
Financial and Real Estate	896	5%
Professional and Business Services	2,820	14%
Educational Services	1,198	6%
Health Care and Social Assistance	3,003	15%
Leisure and Hospitality	3,437	18%
Other Services	845	4%
Public Administration	661	3%
<b>Total</b>	<b>19,490</b>	<b>33%</b>

The sector with the largest share of high school graduates overall, *Trade, Transportation and Utilities*, was the largest sector for the *No College*, *Some College*, *Still in College*, and *Associate's* educational attainment groups. See **Table 11**. The second largest sector overall, *Leisure and Hospitality*, was the second or third largest sector for *No College*, *Some College* and *Still in College*. *Health Care and Social Assistance* also employed large shares of high school graduates across four educational attainment groups.

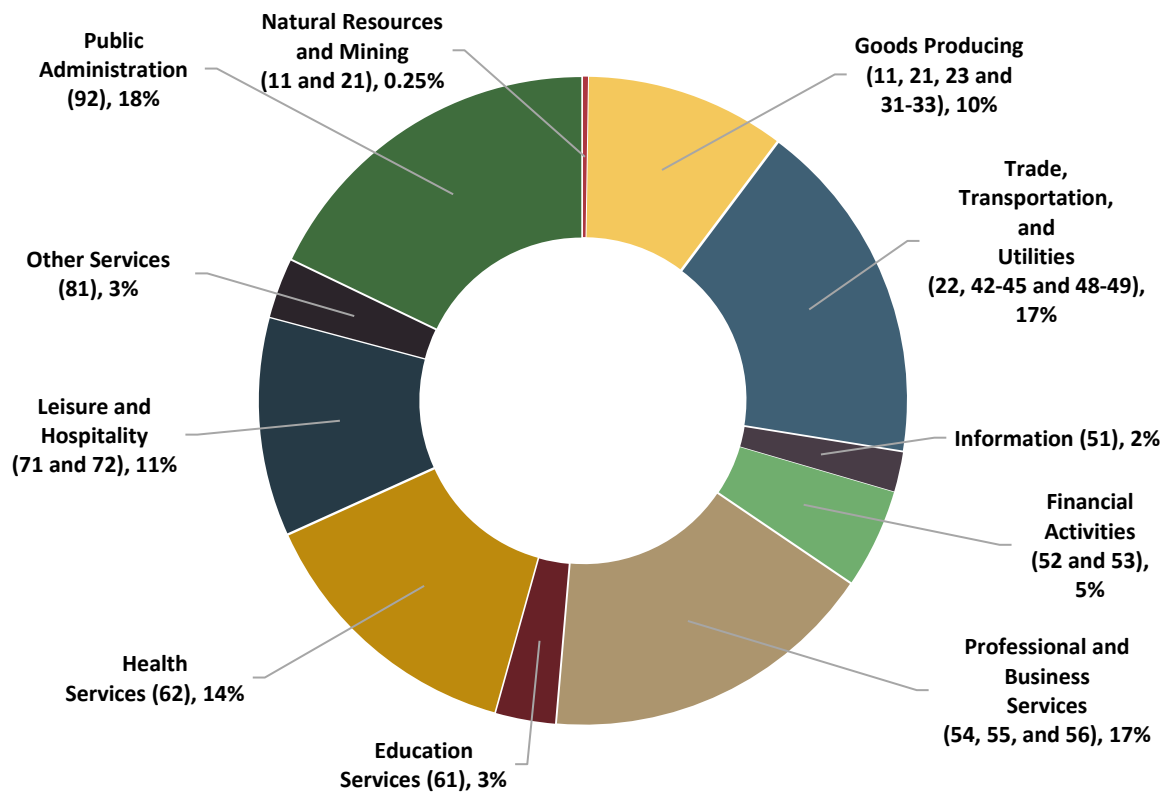
**Table 11. High School Graduates, State of Maryland, 2013, Sector of Employment for Same-Employer Employment by Educational Attainment, Five Years after High School Graduation**

Educational Attainment	Sector	Sector	Sector
<b>No College</b>	Trade, Transportation, and Utilities (31%)	Leisure and Hospitality (16%)	Goods-Producing (15%)
<b>Some College</b>	Trade, Transportation, and Utilities (29%)	Leisure and Hospitality (22%)	Health Care and Social Assistance (15%)
<b>Still in College</b>	Trade, Transportation, and Utilities (20%)	Health Care and Social Assistance (20%)	Leisure and Hospitality (18%)
<b>Associate's</b>	Trade, Transportation, and Utilities (23%)	Health Care and Social Assistance (19%)	Professional and Business Services (13%)
<b>Bachelor's</b>	Professional and Business Services (27%)	Educational Services (14%)	Health Care and Social Assistance (14%)

The distribution of high school graduates by sector can also be considered from the perspective of the size, projected growth, and wages of the overall Maryland workforce. This context reveals if graduates are being employed in sectors that are expanding or contracting and that offer long-term opportunities for wage increases with career advancement.

In fiscal quarter 2 of 2018, the Maryland workforce was comprised of over 2.6 million workers and was projected to increase by over 76,000 workers by 2020<sup>29</sup>. See **Figure 2**. The largest employment sectors were (1) *Public Administration*, (2) *Trade, Transportation and Utilities*, and (3) *Professional and Business Services*. These three sectors employed 52% of the Maryland workforce, and, in fiscal quarter 2 of 2018, contributed \$197 billion to Maryland’s economy and paid \$22 billion in wages<sup>30</sup>. Conversely, the three smallest sectors, (1) *Natural Resources*, (2) *Information*, and (3) *Education Services* employed less than 6% of the Maryland workforce, contributed \$26 billion to Maryland’s economy and paid \$2.1 billion in wages.<sup>28</sup>

**Figure 2. Distribution of Employment by Sector, State of Maryland, Fiscal Quarter 2 of 2018**



<sup>29</sup> Maryland Department of Labor. Maryland Industry Projections - 2018-2020 - Workforce Information and Performance.

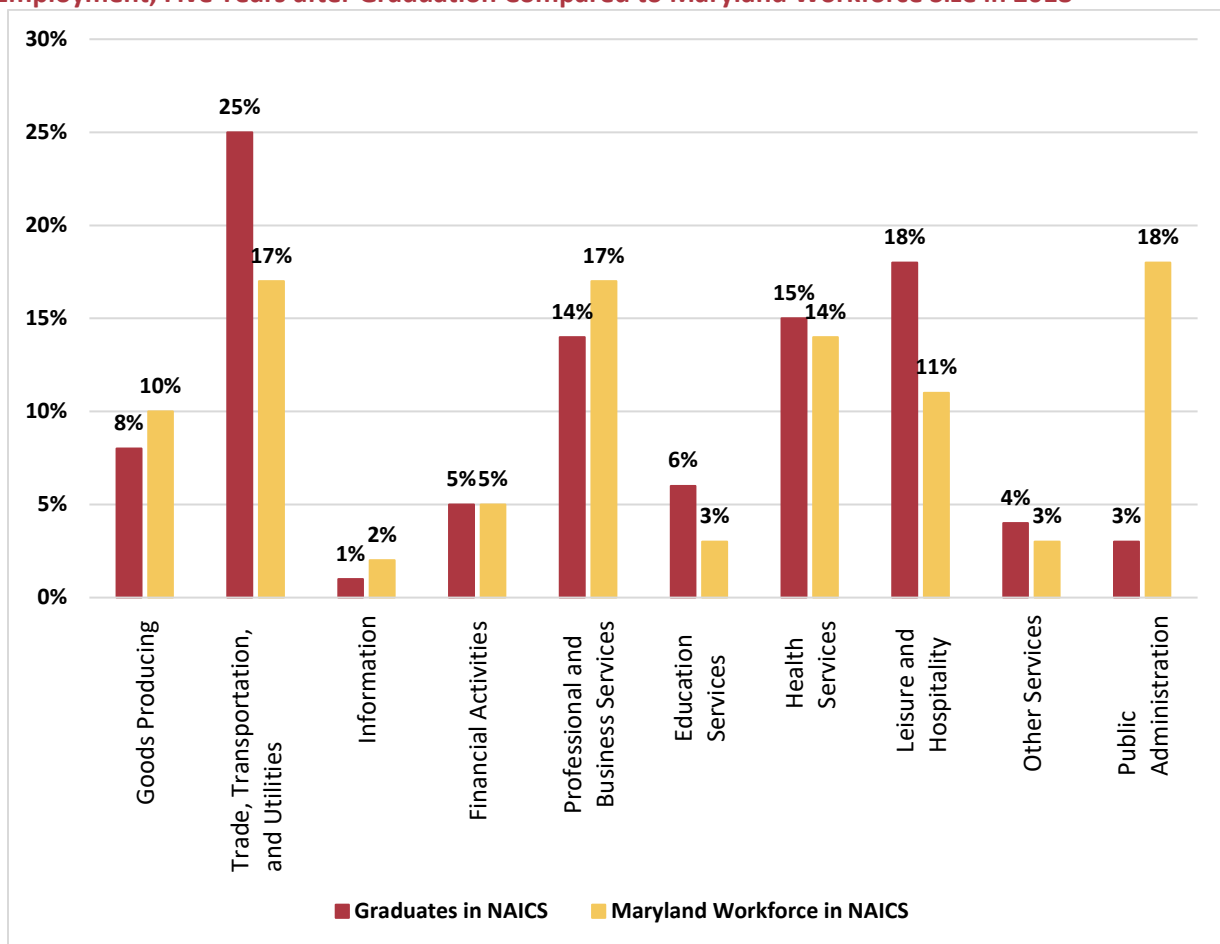
Maryland Department of Labor. Second Quarter 2018 - Industry Series - Maryland's Quarterly Census of Employment and Wages (QCEW) – OWIP. <http://www.dllr.state.md.us/lmi/emppay/tab1md22018.shtml>

<sup>30</sup> U. S. Bureau of Economic Analysis. Gross Domestic Product by State, Second Quarter, 2018.

Maryland Department of Labor. Second Quarter 2018 - Industry Series - Maryland's Quarterly Census of Employment and Wages (QCEW) – OWIP. <http://www.dllr.state.md.us/lmi/emppay/tab1md22018.shtml>

Overall, the two sectors employing the largest share of graduates are *Trade, Transportation and Utilities* (25%) and *Leisure and Hospitality* (18%), are the second (17%) and fifth (11%) largest employers in the state, and are projected to grow by 3% and 4%, respectively, by 2020. See **Chart 7**. *Trade, Transportation and Utilities* is expected to add around 15,000 workers while *Leisure and Hospitality* is expected to add 9,700 workers. Graduates in *Trade, Transportation and Utilities* are employed in sectors such as shipping, air transportation, electrical power distribution and other sectors critical in Maryland’s infrastructure and industry. Graduates in the *Leisure and Hospitality* are employed in sectors such as theater, music, casinos, golf courses, food service, hotels and other sectors critical to Maryland cultural and tourism economy.

**Chart 7. High School Graduates, State of Maryland, 2013, Sector of Employment for Same-Employer Employment, Five Years after Graduation Compared to Maryland Workforce Size in 2018**



The *Health Care and Social Assistance* sector ranked second or third in terms of share of high school graduates with same-employer wages for all educational attainment groups except the *No College* group. This sector includes jobs critical to the health of Maryland residents, such as nurses and social workers as well as an array of administrative and support positions that run hospitals and clinics that care for Marylanders. This sector paid over \$4 billion in wages and contributed \$31 billion to Maryland’s

economy in fiscal quarter 2 of 2018 and is projected to add 14,000 workers to Maryland by 2020<sup>31</sup>. The second largest same-employer sector for the *Bachelor's* educational attainment group was *Educational Services* (14%). This sector includes jobs critical to the education of Maryland residents, such as teachers and tutors, as well as an array of administrative and support positions that run the schools and colleges that educate Marylanders. The *Education Services* sector paid \$1 billion in wages and contributed \$7 billion to Maryland's economy in fiscal quarter 2 of 2018 and is expected to add almost 9,500 workers by 2020.<sup>29</sup>

Only 9% of graduates with same-employer wages were in sectors that are projected to experience workforce declines between 2018 and 2020. The sector with the biggest projected decline, *Information*, included the smallest share of graduates (1%) with same-employer wages. The other two, *Financial Activities* and *Public Administration*, each included 5% and 3% of graduates with same-employer wages.

Overall, high school graduates with same-employer wages had a median wage about \$1,000 below the living wage. See **Table 12**. The median wage varied by NAICS from a low of \$5,042 in *Leisure and Hospitality*, to a high of \$9,692 in *Good Producing*. Five sectors had a median quarterly wage above the living wage of \$7,841. This means that approximately 32% of all high school graduates with same-employer wages are employed in a sector with a median quarterly earnings above the living wage.

**Table 12. High School Graduates, State of Maryland, 2013, Sector of Employment and Median Quarterly Wages for Same-Employer Employment, Five Years after High School Graduation**

Sector	Total	Same-Employer Quarter 20 Median Wage
<b>Goods-Producing</b>	1,559	↑ \$9,692
<b>Trade, Transportation, and Utilities</b>	4,799	↓ \$5,695
<b>Information</b>	272	↑ \$7,962
<b>Financial and Real Estate</b>	896	↑ \$8,854
<b>Professional and Business Services</b>	2,820	↑ \$8,685
<b>Educational Services</b>	1,198	↓ \$7,686
<b>Health Care and Social Assistance</b>	3,003	↓ \$6,686
<b>Leisure and Hospitality</b>	3,437	↓ \$5,042
<b>Other Services</b>	845	↓ \$6,417
<b>Public Administration</b>	661	↑ \$8,642
<b>Total</b>	<b>19,490</b>	<b>\$6,736</b>

↑value is above living wage, ↓ value is below living wage

<sup>31</sup>Maryland Department of Labor. Maryland Industry Projections - 2018-2020 - Workforce Information and Performance.

Maryland Department of Labor. Second Quarter 2018 - Industry Series - Maryland's Quarterly Census of Employment and Wages (QCEW) – OWIP. <http://www.dllr.state.md.us/lmi/emppay/tab1md22018.shtml>  
U. S. Bureau of Economic Analysis. Gross Domestic Product by State, Second Quarter, 2018.

Overall, high school graduates had a quarterly wage at or above the living wage in five of the ten sectors. See **Table 13**. The median wage for each sector varied by educational attainment. Only two or three of the ten sectors had a median wage above the living wage for high school graduates in the *No College*, *Some College* or *Still in College* educational attainment groups. Comparatively, the median wage was above the living wage in six sectors for the *Associate's* and eight sectors for the *Bachelor's* educational attainment groups.

**Table 13. High School Graduates, State of Maryland, 2013, Sector of Employment and Median Quarterly Wages by Educational Attainment for Same-Employer Employment, Five Years after High School Graduation**

Industry	Same-Employer Employment Median Wage with Living Wage Indicator					
	All High School Graduates	No College	Some College	Still in College	Associate's	Bachelor's
<b>Goods-Producing</b>	↑ \$9,692	↑ \$9,718	↑ \$8,496	↑ \$9,884	↑ \$9,917	↑ \$14,346
<b>Trade, Transportation, and Utilities</b>	\$5,695	\$6,422	\$5,352	\$4,331	\$6,496	\$7,200
<b>Information</b>	↑ \$7,962	\$7,527	↑ \$8,008	\$5,374	↑ \$9,735	↑ \$8,680
<b>Financial and Real Estate</b>	↑ \$8,854	↑ \$8,343	↑ \$7,843	\$7,809	↑ \$8,316	↑ \$12,798
<b>Professional and Business Services</b>	↑ \$8,685	\$7,459	\$7,019	↑ \$8,726	↑ \$8,829	↑ \$11,745
<b>Educational Services</b>	\$7,686	\$6,509	\$5,348	\$7,109	\$5,809	↑ \$11,222
<b>Health Care and Social Assistance</b>	\$6,686	\$6,295	\$6,225	\$6,590	↑ \$8,229	↑ \$10,537
<b>Leisure and Hospitality</b>	\$5,042	\$5,048	\$5,063	\$4,502	\$6,846	\$6,318
<b>Other Services</b>	\$6,417	\$7,051	\$5,903	\$5,108	\$6,769	↑ \$9,000
<b>Public Administration</b>	↑ \$8,642	↑ \$8,897	\$7,376	\$7,117	↑ \$11,483	↑ \$9,712
<b>Total</b>	<b>\$6,736</b>	<b>\$6,872</b>	<b>\$5,974</b>	<b>\$5,817</b>	<b>\$7,953</b>	<b>\$10,744</b>

↑value is above living wage

Wages in each sector were also analyzed to determine the number of graduates with same-employer wages that fell into the wage bands constructed from the wage indicators. The median quarterly wage identifies the quarterly wage for the person in the exact middle of a population; half the records in that population have a quarterly wage above this value, and half the records have a quarterly wage below this value. Identifying the number of high school graduates with quarterly wages at different levels of income helps quantify the number of graduates that were engaged in the workforce in each sector at a level that provides for or exceeds the basic cost of living in Maryland compared to the number who may be working but unable to meet these basic costs.

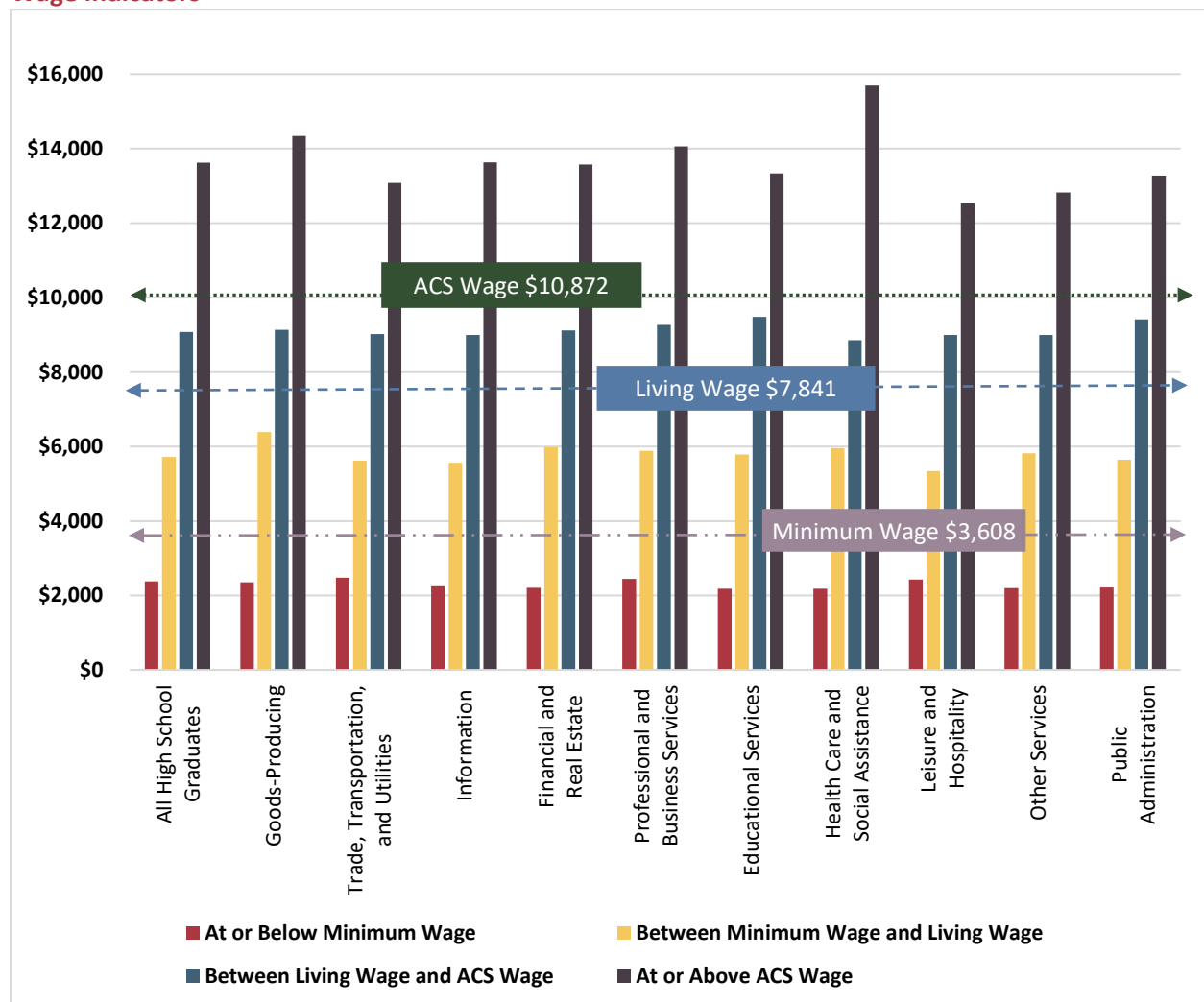
Overall, 40% of high school graduates with same-employer wages had a quarterly wage at or above the living wage and 60% had a quarterly wage below the living wage. See **Table 14**. Distributions by wage indicator varied by sector. The majority of high school graduates in four of the ten sectors had quarterly wages in fiscal quarter 2 of 2018 at or above the living wage, four had the majority below the living wage, and two other sectors were nearly evenly distributed between the above and below living wage measure.

**Table 14. High School Graduates, State of Maryland, 2013, Sector of Employment by Wage Band for Same-Employer Employment, Five Years after High School Graduation**

Education Level	Total Same-Employer Employment	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	%	#	%	#	%	#	%
<b>All High School Graduates</b>	19,490	3,685	19%	8,101	42%	3,888	20%	3,815	20%
<b>Goods-Producing</b>	1,559	79	5%	404	26%	450	29%	626	40%
<b>Trade, Transportation, and Utilities</b>	4,799	1,195	25%	2,303	48%	790	16%	511	11%
<b>Information</b>	272	56	21%	74	27%	71	26%	70	26%
<b>Financial and Real Estate</b>	896	58	6%	283	32%	253	28%	302	34%
<b>Professional and Business Services</b>	2,820	328	12%	856	30%	722	26%	914	32%
<b>Educational Services</b>	1,198	243	20%	373	31%	201	17%	381	32%
<b>Health Care and Social Assistance</b>	3,003	500	17%	1,450	48%	612	20%	441	15%
<b>Leisure and Hospitality</b>	3,437	955	28%	1,786	52%	450	13%	246	7%
<b>Other Services</b>	845	158	19%	397	47%	169	20%	121	14%
<b>Public Administration</b>	661	113	17%	175	26%	170	26%	203	31%

The median wage was derived for each wage band and sector. See **Chart 8**. Reviewing the medians for each wage band-sector group revealed that for the wage band *At or Above ACS Wage*, the median for each sector was not just above the wage indicator, but was thousands of dollars above the wage indicator. Similarly, the median for each sector for the wage band *Between Living Wage and ACS Wage* was also well above the lower limit of the living wage and close to the upper limit. Conversely, the median wage for the *Between Minimum Wage and Living Wage* and *At or Below Minimum Wage* bands were not just below the upper limits, they were well below the upper limit. The median wage in each band showed little variation across sectors. Simply, those that were above the living wage and/or above the ACS wage were above it regardless of sector; however the number of high school graduates in these upper bands is small for several of the sectors compared to those in the lower bands.

**Chart 8. High School Graduates, State of Maryland, 2013, Median Quarterly Wage by Wage Band and Sector of Employment for Same-Employer Employment, Five Years after Graduation Compared to Wage Indicators**



The median quarterly wage for each sector was compared to the average wage paid to all workers in a sector to understand how wages that are likely to be entry level may increase overtime as high school graduates continue to advance in the workforce. See **Table 15**. Average wages paid to all workers in Maryland varied from a low of \$5,850 in *Leisure and Hospitality* to a high of \$22,152 in *Information*.<sup>32</sup> In all sectors except one (*Leisure and Hospitality*), the average wage for all workers was 40% to 60% higher than the same-employer median quarterly wage. This indicates, that, in most sectors, the high school graduates may experience significant wage increases over time as they progress through their careers if they remain in that sector. Conversely, high school graduates in the *Leisure and Hospitality* sector had a median quarterly wage that was almost equal to the average of all workers in the sector. This suggests that high school graduates in *Leisure and Hospitality* may have limited opportunities for wage increases over time compared to workers in other sectors.

**Table 15. High School Graduates, State of Maryland, 2013, Sector of Employment and Median Quarterly Wages for Same-Employer Employment, Five Years after Graduation Compared to Living Wage and Average Wage for All Workers**

Sector	Full-Quarter Same-Employer Employment	Median Quarterly Wage	Variation to Living Wage (\$7,913)	Average Quarterly Wage for All Workers	Variation of Median to Average Wage for All Workers
<b>Goods-Producing</b>	1,559	\$9,692	↑ \$1,779	\$17,472	↓ \$7,780
<b>Trade, Transportation, and Utilities</b>	4,799	\$5,695	↓ \$2,218	\$11,310	↓ \$5,615
<b>Information</b>	272	\$7,962	↑ \$49	\$22,152	↓ \$14,190
<b>Financial and Real Estate</b>	896	\$8,854	↑ \$941	\$21,060	↓ \$12,206
<b>Professional and Business Services</b>	2,820	\$8,685	↑ \$772	\$18,980	↓ \$10,295
<b>Educational Services</b>	1,198	\$7,686	↓ \$227	\$14,170	↓ \$6,484
<b>Health Care and Social Assistance</b>	3,003	\$6,686	↓ \$1,227	\$11,921	↓ \$5,235
<b>Leisure and Hospitality</b>	3,437	\$5,042	↓ \$2,871	\$5,850	↓ \$808
<b>Other Services</b>	845	\$6,417	↓ \$1,496	\$10,660	↓ \$4,243
<b>Public Administration</b>	661	\$8,642	↑ \$729	\$18,109	↓ \$9,467
<b>Total</b>	<b>19,490</b>	<b>\$6,736</b>			

↑value is above living wage, ↓ value is below living wage or below Average Quarterly Wage for All Workers

<sup>32</sup> Maryland Department of Labor. Maryland - Second Quarter 2018 - Industry Series - Maryland's Quarterly Census of Employment and Wages (QCEW) – OWIP. <http://www.dllr.state.md.us/lmi/emppay/tab1md22018.shtml>

## SUPPLEMENTAL ANALYSIS

### Supplement 1: Wage Outcomes for High School Graduates with No College Enrollment by High School Program Completion Type

This supplement to the Career Preparation Expansion Act report focuses on select wage outcomes for high school graduates who did not continue on to college. Maryland public high school graduates of 2013 had four options for fulfilling high school graduation requirements.

1. USM – fulfills the admissions requirements for the University System of Maryland (USM).<sup>33</sup>
2. CTE – completes the requirements for an approved Career and Technology Education Program of Study (CTE).
3. USM & CTE – fulfills the requirements for both USM admission and a CTE program.
4. Other – earns the minimum credits in each required subject.<sup>34</sup>

USM program completers accounted for half of all high school graduates. See **Table A**. CTE program completers accounted for another nineteen percent of all high school graduates. Maryland offers CTE education in [twelve programs or career clusters](#) designed to prepare high school graduates for direct entry into the workforce. The CTE course of study varies by program and by Maryland public high school, but the intention of this course of study is for a student to earn industry-recognized credentials and college credit while in high school.

**Table A. High School Graduates, State of Maryland, 2013, Distribution by Educational Attainment and High School Program Completion Type**

Education Level	Total	High School Program Completion Type							
		USM	%	CTE	%	USM & CTE	%	Other	%
<b>All High School Graduates</b>	59,560	36,236	61%	4,774	8%	6,612	11%	11,938	20%
<b>High School Graduates, No College</b>	14,226	5,157	36%	2,582	18%	1,201	8%	5,286	37%
<b>Some College</b>	21,316	12,482	59%	1,510	7%	2,440	11%	4,884	23%
<b>Still in College</b>	11,704	8,591	73%	412	4%	1,553	13%	1,148	10%
<b>Certificate</b>	269	132	49%	*	*	*	*	*	*
<b>Associate's</b>	1,490	973	65%	92	6%	273	18%	152	10%
<b>Bachelor's</b>	10,496	8,857	84%	123	1%	1,101	10%	415	4%
<b>Other Degree</b>	59	44	75%	*	*	*	*	*	*

\*value suppressed

<sup>33</sup> In 2013, the USM admission requirements were the following: four or more years of English, two or more years of natural science, three or more years of social science/history, two or more years of a foreign language, and three or more years of math (which included Algebra, Algebra II, and geometry). This program completion does not guarantee students admission to the System institutions but is meant to signify, through its high school curriculum requirements, college readiness.

<sup>34</sup> Program completion type is identified by each school. It is possible that some graduates identified as “other” actually earned a USM, CTE or USM/CTE diploma but the school did not identify the student with one of the three flags in the data submitted.

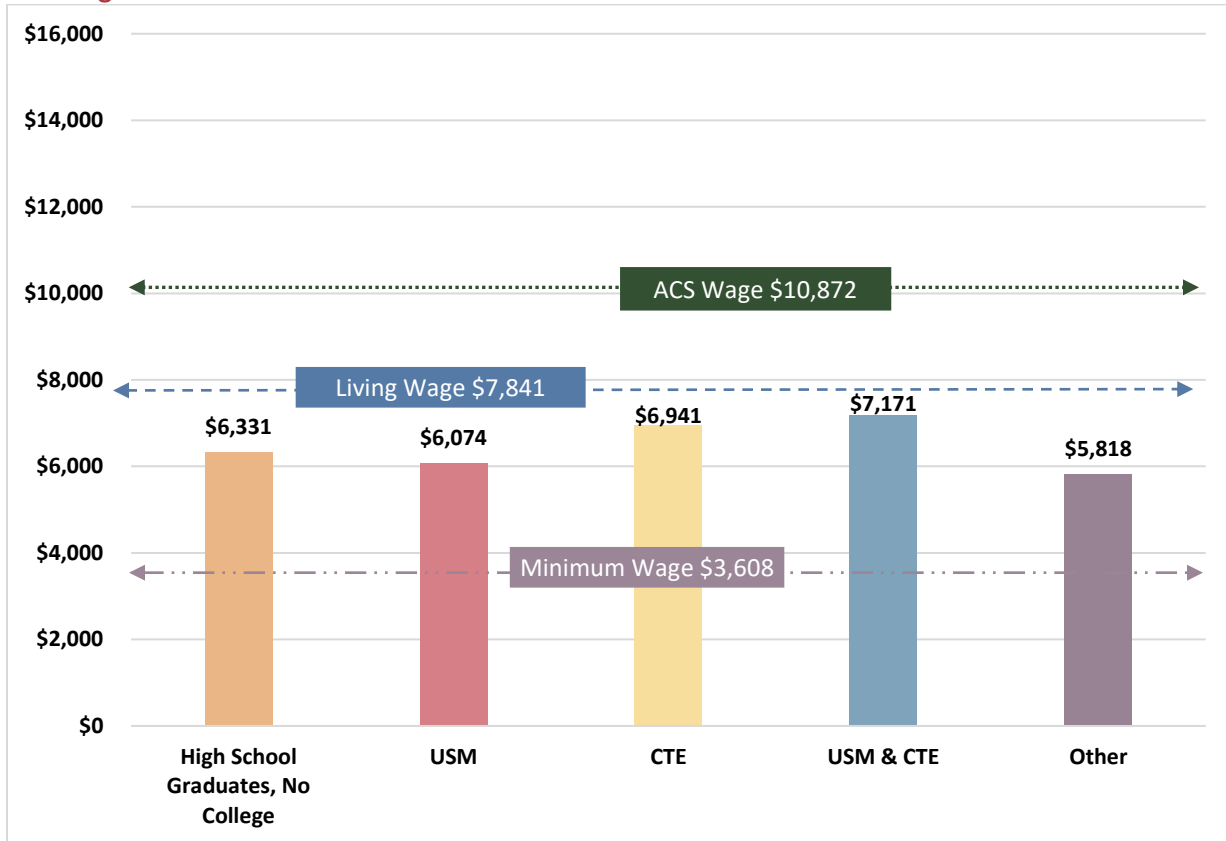
There are two noteworthy patterns present in the wage data when considering wages for high school graduates who did not continue on to college when reviewing results by high school program completion type. First, those in the *CTE* and *USM & CTE* groups had higher rates of full-quarter employment. See **Table B**. These groups were engaged in the workforce for the full nine-month period at a rate of 9 to 13 percentage points higher than the overall *No College* group and between 12 and 20 percentage points higher than the *USM* and *Other* groups. Simply, five years after high school graduation, these graduates were engaged in the workforce at a higher rate than graduates in the *USM* or *Other* groups.

**Table B. High School Graduates with No College, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Program Completion Type, Five Years after High School Graduation Compared to Living Wage**

High School Program Completion	Total	Total with Full-Quarter Employment	% with Full-Quarter Employment	Median Wage for Quarter 20	Variation to Living Wage (\$7,841)
<i>High School Graduates, No College</i>	14,226	6,355	45%	\$6,331	↓ \$1,510
USM	5,157	2,372	46%	\$6,074	↓ \$1,767
CTE	2,582	1,390	54%	\$6,941	↓ \$900
USM & CTE	1,201	695	58%	\$7,171	↓ \$670
Other	5,286	1,898	36%	\$5,818	↓ \$2,023

High school graduates who did not continue on to college had small but noticeable variations in median quarterly wages by high school program completion type. See **Table B** and **Chart A**. High School graduates in the *CTE* group, while still below the living wage, were within \$600 to \$900 of the living wage. Comparatively, those in the *USM* or *Other* groups were \$1,800 to \$2,000 below the living wage.

**Chart A. High School Graduates with No College, State of Maryland, 2013, Median Quarterly Wages for Full-Quarter Employment by Program Completion Type Compared to Wage Indicators, Five Years after High School Graduation**



Four wage bands were constructed to better understand the wage outcomes for high school graduates that did not continue on to college five years after high school. The median quarterly wage identifies the quarterly wage for the person in the exact middle of a population; half the records in that population have a quarterly wage above this value, and half the records have a quarterly wage below this value. Identifying the number of high school graduates with quarterly wages in each wage bands helps quantify the number of graduates that are engaged in the workforce at a level that provides for or exceeds the basic cost of living in Maryland.

Graduates who did not continue on to college but had full-quarter employment were placed into one of four wage bands – program completion groups. See **Table C**. High school graduates in the *CTE* or *USM & CTE* groups appeared more frequently in the top two wage bands as compared to the graduates in the *USM* and *Other* groups. For example, 41% of graduates in the *CTE* group were in the top two wage bands compared to 30% of graduates in the *USM* group. Graduates in the *CTE* or *USM & CTE* groups also appeared less frequently in the *At or Below Minimum Wage* band (between 6 and 10 percentage points less than graduates in the *USM* and *Other* groups).

**Table C. High School Graduates with No College, State of Maryland, 2013, Program Completion Type and Wage Band Distributions for Full-Quarter Employment, Five Years after High School Graduation**

Program Completion	Total with Full-Quarter Employment	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	%	#	%	#	%	#	%
<b>High School Graduates, No College</b>	6,355	1,287	20%	2,921	46%	1,293	20%	854	13%
USM	2,372	488	21%	1,158	49%	456	19%	270	11%
CTE	1,390	215	15%	611	44%	314	23%	250	18%
USM & CTE	695	106	15%	295	42%	153	22%	141	20%
Other	1,898	478	25%	857	45%	370	19%	193	10%

While graduates in the *CTE* or *USM & CTE* groups may have appeared in the top two wage bands with greater frequency, there was little variation in the median quarterly wage across program completion type. As with the full wage analysis in this report, those that were above the living wage and/or above the ACS wage were above it by several thousand dollars, regardless of program completion type. See **Table D**.

**Table D. High School Graduates with No College, State of Maryland, 2013, Median Quarterly Wages by Program Completion Type and Wage Band for Full-Quarter Employment, Five Years after High School Graduation**

Program Completion	Total with Full-Quarter Employment	At or Below Minimum Wage		Between Minimum Wage and Living Wage		Between Living Wage and ACS Wage		At or Above ACS Wage	
		#	Median Wage	#	Median Wage	#	Median Wage	#	Median Wage
<b>High School Graduates, No College</b>	6,355	1,287	\$2,253	2,921	\$5,771	1,293	\$8,990	854	\$13,163
USM	2,372	488	\$2,340	1,158	\$5,717	456	\$9,006	270	\$12,800
CTE	1,390	215	\$2,400	611	\$5,908	314	\$9,085	250	\$13,396
USM & CTE	695	106	\$2,320	295	\$6,020	153	\$8,909	141	\$13,200
Other	1,898	478	\$2,031	857	\$5,651	370	\$8,959	193	\$13,343

Finally, we can consider how industry of employment and wages varied by high school program completion for high school graduates that did not continue to college. The distribution of *No College* high school graduates in each sector was similar for all program completion types. The largest sector for each program completion type was *Trade, Transportation and Utilities*. See **Table E**. *Health Care and Social Assistance*, *Goods-Producing*, and *Leisure and Hospitality* also employed large shares of high school graduates without college for each program completion type.

**Table E. High School Graduates with No College, State of Maryland, 2013, Program Completion Type and Sector for Same-Employer Employment, Five Years after High School Graduation**

Sector	All High School, No College	% in Sector	USM	% in Sector	CTE	% in Sector	USM& CTE	% in Sector	Other	% in Sector
<b>Goods-Producing</b>	651	15%	199	12%	218	22%	78	16%	156	12%
<b>Trade, Transportation, and Utilities</b>	1,367	31%	499	31%	284	29%	154	31%	430	32%
<b>Information</b>	36	1%	15	1%	*	*	*	*	*	*
<b>Financial and Real Estate</b>	108	2%	45	3%	25	3%	*	*	*	*
<b>Professional and Business Services</b>	550	12%	214	13%	121	12%	59	12%	156	12%
<b>Educational Services</b>	116	3%	41	3%	*	*	*	*	*	*
<b>Health Care and Social Assistance</b>	543	12%	206	13%	82	8%	72	15%	183	14%
<b>Leisure and Hospitality</b>	706	16%	261	16%	116	12%	55	11%	274	20%
<b>Other Services</b>	234	5%	97	6%	64	7%	29	6%	44	3%
<b>Public Administration</b>	125	3%	38	2%	27	3%	26	5%	34	3%
<b>Total</b>	<b>4,436</b>		<b>1,615</b>		<b>979</b>		<b>492</b>		<b>1,350</b>	

\*value suppressed

Median quarterly wages varied by sector and program completion for high school graduates that did not continue on to college and had same-employer wages. See **Table F**. While the overall median quarterly wage was about \$1,000 below the living wage, graduates in the *CTE* or *USM & CTE* program completion groups had median quarterly wages about \$400 to \$700 higher than those in the *USM* and *Other* groups, falling only \$300 below the living wage.

Overall, three of the ten sectors had median quarterly wages above the living wage. Those in the *CTE* and *USM & CTE* groups had median quarterly wages above the living wage in four of ten sectors. The only sector where all program completion types had median quarterly wages above the living wage was in the *Goods-Producing*.

**Table F. High School Graduates with No College, State of Maryland, 2013, Median Quarterly Wages by Program Completion Type and Sector for Same-Employer Employment, Five Years after High School Graduation**

Sector	All High School, No College	USM	CTE	USM&CTE	Other
<b>Goods-Producing</b>	↑\$9,718	↑\$9,945	↑\$10,023	↑\$11,639	↑\$8,548
<b>Trade, Transportation, and Utilities</b>	\$6,422	\$6,240	\$6,660	\$6,884	\$6,192
<b>Information</b>	\$7,527	\$6,971	↑\$10,185	\$3,869	\$7,590
<b>Financial and Real Estate</b>	↑\$8,343	↑\$8,553	\$6,748	↑\$8,257	↑\$9,743
<b>Professional and Business Services</b>	\$7,459	\$6,992	↑\$8,112	\$7,253	\$7,037
<b>Educational Services</b>	\$6,509	\$6,597	\$6,659	\$7,492	\$4,584
<b>Health Care and Social Assistance</b>	\$6,295	\$6,703	\$5,983	\$6,349	\$5,760
<b>Leisure and Hospitality</b>	\$5,048	\$5,272	\$5,485	\$5,247	\$4,694
<b>Other Services</b>	\$7,051	\$6,754	\$7,254	↑\$9,254	\$6,080
<b>Public Administration</b>	↑\$8,897	↑\$8,672	↑\$9,696	↑\$10,858	\$7,648
<b>Total</b>	<b>\$6,872</b>	<b>\$6,795</b>	<b>\$7,496</b>	<b>\$7,524</b>	<b>\$6,222</b>

↑value is above living wage

This supplement was provided to further explore wages for high school graduates who did not continue to college within five years of high school graduation. The analysis presented here was conducted at the early stages of this population’s career. While some of these graduates have been in the workforce for the full five year period, others may be just entering the workforce after completing additional technical training, apprenticeships, or licensure requirements. These types of continuing educational experiences may initially depress wages while graduates build the skills and experience required. As data on apprenticeships and business licenses becomes available, those data points will provide additional insight into the outcomes for this population.

The analysis presented here should be viewed with caution as it is difficult to predict if the wage gaps present between program completion type groups will widen or narrow as this cohort progresses through their careers. It is also important to consider that 55% of high school graduates that did not continue on to college did not have full-quarter earnings (earnings for a nine month period) five years after high school graduation. This population is excluded from this supplement as their irregular wage data at the five year mark makes it difficult to analyze and interpret. It is possible these individuals have employment out-of-state, with the federal government, or as contractors. It is impossible to predict if medians for each group would increase, decrease or remain relatively unchanged if complete data were available.

## Supplement 2: Student Loans and Wages

This supplement to the Career Preparation Expansion Act report focuses high school graduates that continued on to college and either graduated with a degree or discontinued their education without graduating, have student loans and are fully engaged in the workforce five years after high school. This analysis is not a comprehensive study on student loans, rather, it provides additional insight into the financial resources required to cover both the cost of living and fulfill the financial obligations of a student loan.

### Methodology

The population of interest for this supplement was students who completed a postsecondary *Associate's* or *Bachelor's* degree within five years of high school graduation or attempted college and discontinued their education without graduating (*Some College*) and have full-quarter wages. High school graduates that were *Still in College* were omitted from this analysis because students in this group are:

- 1) at different stages in their education; some have finished a degree and are continuing with additional education while others are still attempting a first degree;
- 2) potentially accruing additional student loans so it is too early to evaluate the relationship between their student loans and wages; and
- 3) not required to make student loan payments, thus the expense of the loan payment is not yet a factor in their cost of living.

High school graduates in the *Certificate* or *Other Degrees* groups were omitted from analysis due to the small population size.

Students in the population of interest were evaluated to determine if they ever had financial aid classified as a loan. The following aid types<sup>35</sup> were included in the evaluation:

- 1) Federal Perkins Loan
- 2) William D. Ford Subsidized Direct Loans
- 3) Federal Unsubsidized Stafford Loans
- 4) PLUS Loan (Parent Loan for Undergraduate Students)
- 5) Other Federal Loans
- 6) Institutional Loans
- 7) Other Private Loans

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<sup>35</sup> These types of loans involve funds paid to the college where the student is enrolled. The funds are then applied to a student's account balance. Excess funds are either returned to the funder or provided to the student to cover expenses that are not billed through the college (such as rent, food, gas, etc.). It is possible that students (or their parents) have other private loans where funds are paid directly to the student (or parent) rather than the college. This information is not available to include in this analysis.

All loan amounts for a student were summed to a single amount for analysis<sup>36</sup>. Due to variations in institutional practices, the amounts recorded for loans may reflect awards, disbursements or net disbursements. Further, some students in each educational attainment category were enrolled in college in some or all terms out-of-state. Student loan data are not available on any enrollments that occurred out-of-state. Lack of data on out-of-state enrollments means that the number of students with loans or the total amount of loans is understated in this analysis.

Results presented here should be interpreted with caution due to the variation in data collected and gaps in data available; however, the results provide an approximate measure of the loan payments required after graduation or disengaging from college. Understanding the relationship between student loans, degree attainment and wages is important for administering federal student aid programs, such as loans.

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<sup>36</sup> This amount may be from one college or multiple colleges. Due to variations in institutional practices, the amounts recorded for loans may reflect awards, disbursements or net disbursements. Awards reflect monies intended to be paid to a student. Disbursements reflect actual monies paid to a student. Net disbursements reflect monies paid and monies refunded. This variation means that loan amounts may be overstated and not reflect the actual loan obligation.

## Results

There were over 33,000 students included in the population of interest and approximately 15,000 of these students met the definition for full-quarter employment. Approximately one-third of high school graduates with full-quarter employment had student loans. See **Table G**. Nationally, approximately 39% of all undergraduate students receive a federal student loan<sup>37</sup>.

**Table G. High School Graduates, State of Maryland, 2013, Full-Quarter Employment and Student Loans, Five Years after High School Graduation**

Educational Attainment	Total	Total with Full-Quarter Employment	% with Full-Quarter Employment	Full-Quarter Employment with Loan	% with Loan
<b>Some College</b>	21,316	10,973	51%	3,313	30%
<b>Associate's</b>	1,490	822	55%	227	28%
<b>Bachelor's</b>	10,496	3,797	36%	1,445	38%
<b>Total</b>	<b>33,302</b>	<b>15,592</b>	<b>47%</b>	<b>4,985</b>	<b>32%</b>

The percentage of students in each educational attainment group that had student loans in their financial aid varied from a low of 28% (*Associate's*) to a high of 38% (*Bachelor's*). See **Table G**. The slightly lower rate for *Associate's* students is not surprising as these programs are typically two years in length and offered at community colleges. The short term of enrollment and the low tuition rates most likely decreased reliance on student loans to finance the education costs. Conversely, those in the *Some College* or *Bachelor's* groups had longer periods of enrollment and/or paid higher tuition rates which most likely increased reliance on student loans to cover education costs. These results, particularly for *Some College* and *Bachelor's*, should be viewed with caution. Approximately 27% of Maryland high school graduates enroll in college out-of-state and student loan data are not available for these students, therefore the actual number of students with loans could be higher<sup>38</sup>.

**Table H. High School Graduates, State of Maryland, 2013, Full-Quarter Employment and Student Loans, Five Years after High School Graduation**

Educational Attainment	Total	Total with Full-Quarter Employment	Student's with Loan	Median Student Loan Amount
<b>Some College</b>	21,316	10,973	3,313	\$10,300
<b>Associate's</b>	1,490	822	227	\$12,938
<b>Bachelor's</b>	10,496	3,797	1,445	\$27,000

The median loan amount for each educational attainment group varied widely. See **Table H**. The median was lowest for *Some College*, around \$10,000, and highest for *Bachelor's*, around \$27,000. The median for the *Associate's* group fell in between, around \$12,000. These medians align to the loan

<sup>37</sup> U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Student Financial Aid component final data (2008-09 - 2014-15) and provisional data (2015-16).

<sup>38</sup> Approximately 27% of the 2013 high school graduates had an initial enrollment that was out-of-state. MLDS Center. [Initial Postsecondary Enrollments - In-State vs. Out-of-State Overview](#).

limits that the federal government establishes for each year of college enrollment.<sup>39</sup> For example, the current federal student loan limit for first year undergraduates is \$5,500 and for second year is \$6,500, therefore a student with two years of undergraduate study, those in an Associate’s degree program, may have a maximum federal loan amount of \$12,000. Not all students elect to receive a loan as part of their financial aid each year. Some student may elect to receive a loan during one year to cover a funding gap and decline the loan in future years. Similarly, students may opt to receive a loan each year but for an amount less than the loan limit. Alternatively, students may demonstrate financial hardship so that they may receive loans in excess of the standard limits.

**Table I. High School Graduates, State of Maryland, 2013, Full-Quarter Employment and Student Loans by Student Loan Band and Educational Attainment, Five Years after High School Graduation**

Educational Attainment	Total	Total with Full-Quarter Employment	Student Loan	Student Loan <=\$5,500	Student Loan >\$5,500 and <=\$13,000	Student Loan >\$13,000 and <=\$20,500	Student Loan >\$20,500
<b>Some College</b>	21,316	10,973	3,313	1,068	876	471	898
<b>Associate’s</b>	1,490	822	227	43	75	46	63
<b>Bachelor’s</b>	10,496	3,797	1,445	108	174	220	943

Students with full-quarter employment and loans were grouped into loan amount categories that approximated annual funding limits for undergraduates. See **Table I**. The distributions in **Table I** reveal both expected and unexpected patterns. For example, it is not surprising to see the vast majority (80%) of students with loans in the *Bachelor’s* group in the loan band for loans exceeding \$20,500. A bachelor’s degree requires a minimum of four years of study which, if a student received the maximum allowable loans each year will result in aggregate loans in excess of \$20,000 (\$5,000 to \$6,000 per year for four years).

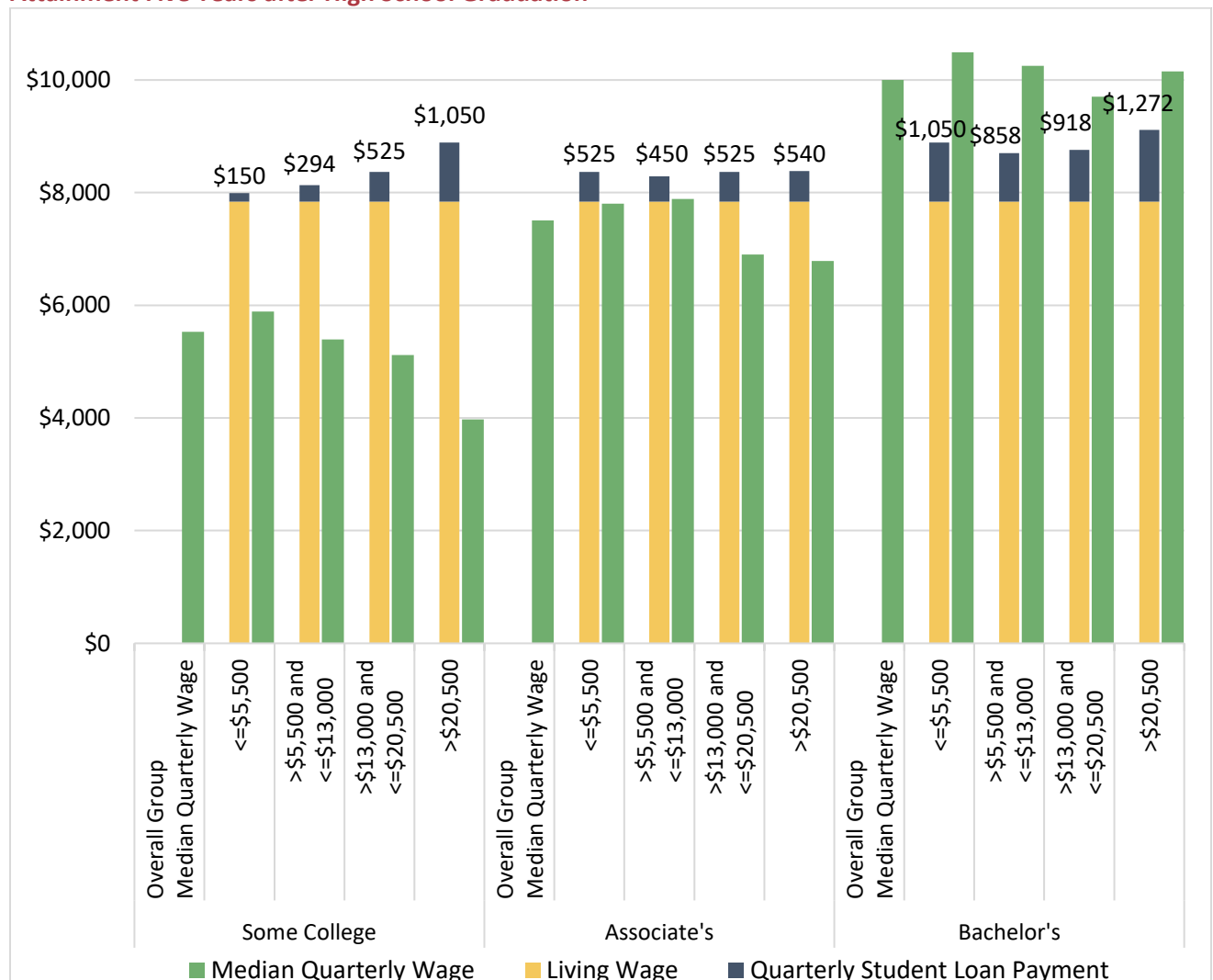
An unexpected pattern appears with the *Associate’s* degree group. Students in this group are enrolled in a program that requires 2 years of full-time study, yet the population with student loans is fairly equally split between students with less than \$13,000 and more than \$13,000. This may indicate that half of the *Associate’s* degree students were either 1) enrolled part-time (extending time to degree and receiving additional loans) 2) had to repeat (and pay for) courses that were failed on a first attempt, or took courses not needed for their degree, or 3) had PLUS loans or other private loans that resulted in larger than expected student loan amounts. This pattern is also present in the *Some College* group. One-third of students with loans in this group had aggregate loan amounts that suggest an enrollment period of only one year (<\$5,500); however 41% of students in this group, like the *Associate’s* group, had aggregate loans that either point to multiple years of study, academic deficiencies, loss of credit from transfer, or the inclusion of other private loans and PLUS loans. These students, unlike the *Associate’s*, ultimately, after five years, disengaged from college without earning a degree. The loan patterns require additional exploration. For this analysis, all types of loans were aggregated into a single sum.

<sup>39</sup> <https://studentaid.ed.gov/sa/types/loans/subsidized-unsubsidized#how-much>

The loans could be further analyzed by type and amount, and course outcomes, such as grades and credits earned, analyzed to understand why some students have higher than expected student loans.

Ultimately, the question guiding this supplement is, for each group, does it appear that wages are sufficient to meeting the cost of living in Maryland and repay student loans? To consider this question, the median loan repayment amount and the median quarterly wage amount were derived for each loan category-educational attainment group<sup>40</sup>. The quarterly loan payment amount was added to the living wage and the sum compared to the median quarterly wage. See **Chart B**.

**Chart B. High School Graduates, State of Maryland, 2013, Full-Quarter Employment with Living Wage, Quarterly Student Loan Payment and Median Quarterly Wage by Loan Band and Educational Attainment Five Years after High School Graduation**



<sup>40</sup> The median loan amount was input into the federal student loan calculator using the Direct Loan specifications for a 10 year repayment plan at 5% interest. Note, not all loans in this student are direct loans, payment terms and interest rates could vary widely. <https://studentloans.gov/myDirectLoan/repaymentEstimator.action>

At all loan levels, the median quarterly wage for the *Bachelor's* group was sufficient to cover the basic costs of living in Maryland and the payment on the median loan, with some amount of surplus. At all loan levels, the median quarterly for the *Associate's* group was close to a break-even point between cost of living, the payment on the median loan, and the median wage, particularly at lower loan levels.

The group with the largest gap between the median quarterly wage and the sum of the cost of living with student loan payment was for those in the *Some College* group. Even those in the lowest loan category still fall almost \$2,000 short of having a median quarterly wage that covers the cost of living and a student loan repayment. Those in the highest loan category have a quarterly deficit of \$4,000.

The results presented here may vary greatly for any one student within an educational attainment-loan amount category as all calculations are completed with loan and wage medians and estimated loan repayment amounts. Results should be interpreted with caution; however, the data suggest that, students who graduate with loans and are fully engaged in the workforce have sufficient funds to cover loan payments. Students with loans in the *Bachelor's* category have a median annual salary of approximately \$40,000. As noted previously, students who are *Still in College* realize a median annual wage of \$21,000 (see pages 22-23). This may mean that students, who incur modest amounts of student loan debt to finance educational costs rather than extending time to degree may be better off financially (or at least not worse off) than students who extend time to degree and forego career-level earnings.

Students who do not graduate from college; however, are likely to struggle financially as their wages are not even sufficient to cover the basic cost of living in Maryland, let alone pay for money borrowed for an incomplete college education. This population may benefit from the Maryland Higher Education Commission's near completer program, a program designed to help students with credit accumulations close to what is required for a degree, complete their degree. Completing a degree, even a lower level undergraduate degree, may help students in this group move to higher wages that will allow them to cover the cost of living in Maryland as well as their student loan payments.

## CONCLUSIONS AND IMPLICATIONS

The Career Preparation Expansion Act, Chapter 695 of 2017 (CPEA) requires the Maryland Longitudinal Data System (MLDS) Center and the Governor’s Workforce Development Board (GWDB) to produce a report on employment for high school graduates five years after graduation. The analysis in this report demonstrates that outcomes, five years after high school graduation, vary greatly by educational attainment and sector of employment. The results are consistent with national data available on earnings by educational attainment level<sup>41</sup>. However, the analysis must be interpreted with caution as limitations on MLDS data result in gaps in wage data. It is impossible to speculate on how the analysis may change if complete wage data were available on all 59,560 high school graduates of 2013. The chart below summarizes the variation in wage data available for analysis:

Method	Definition	Count	Percent
Population of Interest	2013 High School Graduates	59,560	
Wages in Quarter 20	2013 High School Graduates with wages in Q20 or fiscal quarter 2 of 2018	32,874	55%
Full-Quarter Employment	2013 High School Graduates with wage data in Q19, Q20 and Q21 or fiscal quarter 1, 2 and 3 of 2018	27,822	47%
Full-Quarter Employment – Same Employer	2013 High School Graduates with wage data from the same employer in Q19, Q20 and Q21 or fiscal quarter 1, 2 and 3 of 2018	19,490	33%
Wage Visibility Overall	2013 High School Graduates with at least one quarter of wage data in the 5 year period.	51,875	87%
Wage Visibility – Quarter Average	The average number of 2013 High School Graduates with wage data in any one of the twenty fiscal quarters		50%

It is important to note that the analysis presented here is conducted at the early stages in this population’s career. Many individuals in this population have only been in the workforce for 1 to 3 years after college graduation. Even for high school students that do not continue to college, many may be exploring career options and training programs, including completing licensure requirements or apprenticeships, which may depress wages during the first two or three years of employment after high school. Much of the analysis is based upon what are likely to be entry level wages and therefore it is difficult to predict if the wages gaps present between educational groups and employment sectors will widen or narrow as this cohort progresses through their careers.

The analysis presented provides a high-level overview of the earnings outcomes for one cohort of high school graduates five years after graduation. The age of the 2013 high school graduates is approximately 23 years old five years after graduation, so it is too soon to draw extensive comparisons between the earnings report here and contextual wage indicators selected to support this analysis. Most students require six years to graduate from college with a bachelor’s degree, so observing students five years after high school eliminates a large number of bachelor degree graduates that will complete college one

<sup>41</sup> For example, Baum, Sandy, Jennifer Ma and Kathleen Payea. (2013). [Education Pays 2013: The benefits of higher education for individuals and society](#). College Board.

year later. It is difficult to predict if the wage premium that appears to be associated with bachelor's degree graduates who complete in four years will be still be presented when the pool is expanded to include those who required extended time to complete a bachelor's degree. Further, the analysis also does not account for the relationship between wages and multiple and/or stackable credentials. Some high school graduates in this population obtained multiple Associate's or Certificate's or obtained an Associate's followed by a Bachelor's during the five year period. Additional analysis is required to understand which degree "pays" when a student has multiple degrees.

It is also important to note that all wage comparisons here are made to overall State of Maryland living wage of \$7,841, something that varies greatly by region. The quarterly living wage according to the MIT Living Wage Calculator in Garrett County is \$5,582 while it is \$9,123 in Montgomery County. This wide variation may mean that median wages and median wages by sector, are not necessarily above or below the living wage when regional variation is factored into the analysis.

This year's CPEA included two supplements. The first focused wage outcomes for high school students that do not continue on to college to explore earnings by program complete type. Nationally, over 7 million high school students pursued career and technical education (CTE) while in high school in 2012-2013<sup>42</sup>. CTE education is thought to improve career outcomes, including earnings, by providing focused career-oriented training to students who are not college bound<sup>43</sup>. The data presented here show that, for high school graduates that do not continue on to college, the median quarterly wage for those who complete a CTE concentration is slightly higher when compared to those graduates who do not complete a concentration.

The second supplement focused on high school graduates with full-quarter employment and student loans. Overall, only 32% of students with full-quarter wages had student loans. This is slightly lower than the national average of 39%<sup>44</sup>. More importantly, the preliminary analysis suggests that students who complete a Bachelor's degree, are fully engaged in the workforce, and have a student loan have earnings that are both sufficient for the basic costs of living as well as for making student loan payments, while those with an Associate's degree break even. The results also demonstrate the consequences of receiving student loans and not completing college. There were 21,316 students in the 2013 cohort who attempted college and did not finish. Of those with full-quarter employment (10,973), over 3,000 had student loans. This group does not have sufficient earnings to cover basic costs of living nor make student loan payments.

Finally, it is important to remember that in 2013, as this cohort was graduating from high school, the impact of the economic recession on unemployment and underemployment was still lingering in the

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<sup>42</sup> <https://perkins.ed.gov/pims/DataExplorer/CTEParticipant>

<sup>43</sup> State of Maryland. (2019). Career & Technology Education Programs of Study.

<http://www.marylandpublicschools.org/programs/Documents/CTEProgramsStudy/CTEProgramsofStudy2019.pdf>

<sup>44</sup> U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Student Financial Aid component final data (2008-09 - 2014-15) and provisional data (2015-16).

economy.<sup>45</sup> The extended recovery from the recession may impact this analysis in three ways. First, it may mean that there were fewer jobs available in the early part of the analysis, thus, wage visibility may be lower due to scarcity of open positions in the job market rather than individuals employed in positions that are exempt from UI reporting. Second, it may mean that wages were lower during the first year or two of the period than in pre-recession periods, something that may curtail life-time earnings. Third, for high school graduates that did not continue to college, this group may have been competing with more experienced and/or college educated individuals for the entry-level employment typically available to recent high school graduates. This may have limited the high school graduates' employment opportunities or may have required more frequent job changes to advance careers. It also could have been responsible for depressing wages. Additional research is required to understand both the short-term and long-term impact of the recession on the high school graduates of 2013.

This report is the second CPEA to examine employment outcomes for high school graduates five years after high school. Last year's [report](#) focused on outcomes for the 2012 cohort of high school graduates in fiscal quarter 2 of 2017. The overall population in 2013 had approximately the same number of high school graduates as 2012, and, their distributions by educational attainment were similar. In short, there is little differences in college-going rates and college degree attainment between the cohorts: 24% of high school graduates never enrolled in college, 35%-36% attempted college and disengaged without graduating, 20%-21% completed a college degree, and 19%-21% are still in college.

There is also little variation in outcomes or wage visibility for the two cohorts. In 2012, 46% of all high school graduates met the definition for full-quarter employment. This year, that rate was 47%. The variation between living wage and median quarterly wage by educational attainment was also similar. The 2013 cohort with full-quarter employment has slightly higher median quarterly wages overall and for each educational attainment group compared to the 2012 cohort. The 2012 cohort overall median quarterly wage was \$5,916, comparatively, the 2013 cohort overall median quarterly wage as \$6,160. When adjusting for inflation this difference is about \$100<sup>46</sup>. This slight increase is present in all educational attainment groups. Each group realizes between \$30 and \$500 wage increase from the 2012 cohort when adjusting for inflation. These small increases also translate to slightly larger percentages of the 2013 cohort with a quarterly wage above the living wage when compared to 2012. Overall, 31% of the 2012 cohort had a quarterly wage above the living wage, this increased to 34% for the 2013 cohort. This small increase holds across all educational attainment groups. For example, there is a four percentage point increase in the number of high school graduates from the 2013 cohort in the *No College* group with wages at or above living wage and a six percentage point increase for high school graduates with an Associate's degree when compared to the 2012 cohort.

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<sup>45</sup> For example, see Abel, Jaison R. and Richard Deits (2016). Underemployment in the early careers of college graduations following the great recession. NBER Working Paper #22654.; Oreopoulos, Philip, Till von Wachter, and Andrew Heisz. (2012). The Short- and Long- Term Career Effects of Graduating in a Recession. *American Economic Journal: Applied Economics*, 4(1): 1-29.

<sup>46</sup> \$5,916 in fiscal quarter 2 of 2017 is equivalent to \$6,061 in fiscal quarter 2 of 2018. <https://data.bls.gov/cgi-bin/cpicalc.pl>

The sectors with the largest share of employment are also consistent from 2012 to 2013. *Trade, Transportation, and Utilities* is the largest employment sector for high school graduates with same-employer employment for *No College, Some College, Still in College* and *Associate's*, while *Professional and Business Services, Educational Services* and *Health Care and Social Assistance* were again the largest sectors for high school graduates with Bachelor's degrees. Also consistent were the overall median quarterly wages for each sector, the sectors that had median wages above the living wage in 2012 were the same in 2013. And, as last year, those sectors had the smallest shares of graduates.

### Policy Considerations

First, there is a large number of high school graduates with "some college" (20,000+). This population, almost a third of the population of high school graduates, attempted college for the first one to four years after high school graduation but stopped attending at the start of year five. This group has median quarterly wages of \$5,532, almost \$2,500 below the living wage, and, unlike high school graduates that never attended college, one-third of these high school graduates with full-quarter wages have student loan debt. Further, over 5,000 of the students who tried college and disengaged were enrolled almost every term for the four year period subsequent to high school graduation. Given the high rate of term-over-term of enrollment, it is likely that many students accumulated large amounts of college credit, credit that could be translated to a lower division degree, such as a Certificate or Associate's. Providing some type of capstone to an otherwise incomplete college educational experience may help increase the earnings prospects for this group. This group may benefit from programs like the Maryland Higher Education Commission's Reverse Transfer or Near Completer initiatives or the Department of Labor, Licensing and Regulation's adult training programs.

Second, the data point to another important policy area to explore – the relationship between time to degree and working. Over 11,000 high school graduates were still enrolled in college at the close of the five year period. Over 9,000 were enrolled for almost every term for the full five year period. The *Still in College* group had a median quarterly wage of \$5,299, or \$1,766 per month, five years after high school graduation. These students, five years after high school, have median annualize earnings of approximately \$21,000, or \$18,000 less than the median for high school graduates who earned a bachelor's degree in four years. The foregone earnings that result from extending time to degree could have a long lasting impact on lifetime earnings for these students. Funding supports are needed to allow this group to focus on college and reduce the need to work so they can graduate sooner, with less debt, and launch into career tracks four years after high school graduation rather than five or six years after graduation.

Third, CTE education does appear to offer modest financial returns, at least initially, to high school graduates who forgo college. Not all high schools offer all possible CTE concentrations. Expanding CTE education and aligning it to regional labor markets demands benefits both high school graduates and employers. CTE education requires additional exploration to understand which program result in a wage premium.

Fourth, student loan debt is a problem for some – *but not all* – high school graduates who enroll in college. Providing financial advising to incoming students so that they make informed decisions on borrowing is critical to addressing this problem. Excess borrowing and insufficient borrowing can both be problematic. Students who take out excessive loans and do not graduate will struggle indefinitely. Students who do not take out loans, and instead work, extend time to degree at the cost of decreased lifetime earnings. Students need to be counseled on the judicious use of student loans. Federal loan forgiveness programs and state level programs, such as Maryland’s Student Loan Debt Relief Tax Credit, are important new policies that are designed to help students pay off student loan debt.

## APPENDICES

### Appendix 1. Educational Attainment Methodology

Educational attainment has the following important implications for workforce outcomes. First, research suggests that employment outcomes and wages may vary by level of educational attainment<sup>47</sup>. Second, high school graduates enrolled in college may be employed in part-time entry-level minimum-wage positions so they can prioritize college; comparatively high school graduates that did not enroll in college may have been available to enter the workforce in full-time career-track employment. Finally, the time to degree widely varies based upon the type the postsecondary degree. Certificate's, Associate's and Bachelor's degree programs are designed to require one, two or four years of full-time study respectively. The length of each program impacts the amount of time graduates may have been in the workforce after earning their college degree. For example, Certificate graduates may enter the workforce three years earlier than Bachelor's degree graduates, while Associate's graduates may enter the workforce two years earlier than Bachelor's degree graduates.

Accordingly, separating the population of interest into groups by educational attainment helps identify wages differences that may occur when using a common point in time (five years after high school graduation) as a measure for a population who has had different amounts of time in the workforce. These distinctions in educational attainment should not be interpreted as college graduation rates as this report does not provide the starting number of students entering each educational attainment category, only the number of students who obtained each degree, are still enrolled in college or stop attending college without graduating. Reporting on time to degree and college completion rates is outside the scope of this report.

For this report, the following seven educational groups were created See **Figure 1** and **Table 1** for distributions. Education attainment definitions:

1. **High School Graduates:** High school graduates without an in-state or out-of-state college enrollment record by the end of spring term 2018.
2. **Some College:** High school graduates enrolled for at least one term between fall 2013 and fall 2017 but who did not earn a postsecondary degree and are not actively enrolled in college in the spring 2018 or fall 2018 terms.
3. **Still in College:** High school graduates enrolled in college in-state or out-of-state in the spring 2018 and/or fall 2018 terms. These graduates may have earned a postsecondary degree by the

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<sup>47</sup>For example, see:

Baum, Sandy, Jennifer Ma and Kathleen Payea. (2013). Education Pays 2013: The benefits of higher education for individuals and society. College Board.

Hout, Michael. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology*. 38: 379-400.

Kane, T.J. and Rouse, C. E. (1995). Labor market returns to two-year and four-year college. *The American Economic Review*, 85(3): 600-614

Thomas, Scott L. and Liang Zhang. (2005). Post-baccalaureate wage growth within 4 years of graduation: The effects of college quality and college major. *Research in Higher Education*. Volume 46. 4: 437-459.

end of the fall 2017 term; however, they are still actively pursuing additional postsecondary education.

4. **Certificate Graduates:** High school graduates who earned a postsecondary certificate by the end of the fall term 2017 and are not enrolled in college in the spring 2018 or fall 2018 terms.
5. **Associate's Graduates:** High school graduates who earned a postsecondary associate's degree by the end of the fall term 2017 and are not enrolled in college in the spring 2018 and/or fall 2018 terms.
6. **Bachelor's Graduates:** High school graduates who earned a postsecondary bachelor's degree by the end of the fall term 2017 and are not enrolled in college in the spring 2018 and/or fall 2018 terms.
7. **Other Degree Attainment:** High school graduates who earned a post-baccalaureate degree or a graduate degree by the end of fall 2017 term and are not enrolled in college in the spring 2018 or fall 2018 terms.

Note, some high school graduates received more than one degree during the five year period. Each graduate is counted only once, based upon highest degree attained. For example, if a high school graduate earned an Associate's degree and then earned a Bachelor's degree, the high school graduate is counted in the Bachelor's category. Other high school graduates earned a degree but were still progressing toward an additional degree, therefore some high school graduates in the *Still in College* category have already earned a degree.

The 20<sup>th</sup> quarter after high school graduation aligns with the postsecondary spring term which would end in May or June of 2018; however, assignment to an educational attainment category is made as of each student's status in fall 2017 (December 2017 or quarter 18 post-high school graduation). The decision to use this term for placement into an educational attainment category was made to allow students in each category time to transition from college to workforce and thus provide a more accurate picture of wages and industry of employment after college.

## Appendix 2: Wage Visibility Across the Five Year Period

Wage visibility is defined as the number of quarters in which an individual has reported wages for the timeframe of interest. Wage visibility is directly affected by gaps in the MLDS employment data. The MLDS does not contain workforce data on self-employed persons, independent contractors, military personnel, out-of-state, or federal employees. Further, as individuals change jobs over the course of the period of analysis it is possible that the gaps in wage data may be due to changes in type and location of employment rather than due to unemployment.

Two types of wage visibility analysis were completed. First, wage visibility for the population of interest was analyzed and individuals were placed into one of five mutually exclusive groups based upon the following criteria:

1. **No Visibility** – no wages for the entire 20 quarters,
2. **Irregular Visibility** – wages for 25% of the period (1 to 5 quarters)
3. **Intermittent Visibility** – wages for 25%-49% of the period (6 to 10 quarters)
4. **Frequent Visibility** – wages for 50%-74% (11 to 15 quarters), or
5. **Continuous Visibility** – wages for 75% or more of the period (16 to 20 quarters).

This analysis provides insight into the number of high school graduates that never appear in wage data, those with limited wage data, and those with complete wage data for the full five year period. For those with wage data, the median quarterly wage was calculated by selecting wages in the final quarter of visibility for each individual and then determining the median wage. For example, if one individual in the Intermittent group had 8 quarters of wages, and another had 6 quarters of wages, those two quarters were selected to determine the overall median for the group.

## Results

At least one quarter of wage data were available for 87% of this population. The wage data available varies, with 13% of high school graduates never appearing in the wage data, 29% appearing in almost every wage quarter (continuous), 39% appearing periodically (intermittent and frequent), and another 19% appearing in only 1 to 5 quarters in the 5 year period (irregular). See **Table J**.

**Table J. High School Graduates, State of Maryland, 2013, Wage Visibility Across Five Years**

Wage Visibility	All High School Graduates	% Wage Visibility
<b>No Wages for Full Five Years (NONE)</b>	7,685	13%
<b>Total with Wages</b>	51,875	87%
<b>Irregular (IRRG)</b>	11,332	19%
<b>Intermittent (INTR)</b>	11,241	19%
<b>Frequent (FREQ)</b>	12,154	20%
<b>Continuous (CONT)</b>	17,148	29%
<b>Total High School Graduates</b>	<b>59,560</b>	

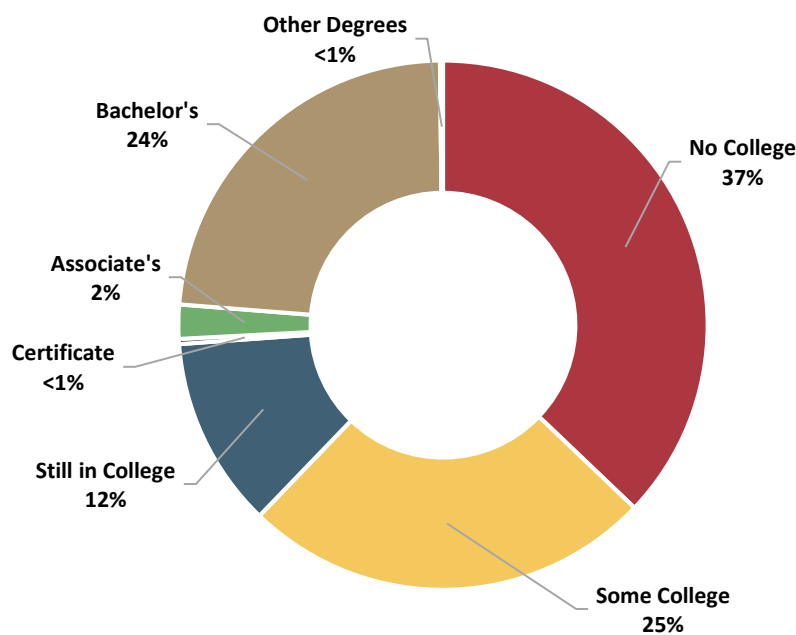
This table presents the number of high school graduates by wage visibility frequency and educational attainment. Each high school graduate is evaluated for the full five year period and placed in one of the mutually exclusive wage frequency group based upon the total number of quarters that graduate has wage data. Note, this table represents total number of quarters with wage data, quarters do not necessarily represent consecutive periods of employment. See **Table K**.

**Table K. High School Graduates, State of Maryland, 2013, Wage Visibility Across Five Years by Educational Attainment**

Wage Visibility	Total	NONE	% NONE	IRRG	% IRRG	INTR	% INTR	FREQ	% FREQ	CONT	% CONT
<b>All High School Graduates</b>	59,560	7,685	13%	11,332	19%	11,241	19%	12,154	20%	17,148	29%
<b>High School Graduates, No College</b>	14,226	2,853	20%	2,072	15%	2,059	14%	2,696	19%	4,546	32%
<b>Some College</b>	21,316	1,927	9%	3,164	15%	3,893	18%	4,884	23%	7,448	35%
<b>Still in College</b>	11,704	896	8%	2,382	20%	2,567	22%	2,555	22%	3,304	28%
<b>Certificate</b>	269	24	9%	37	14%	*	*	54	20%	*	*
<b>Associate's</b>	1,490	160	11%	192	13%	226	15%	327	22%	585	39%
<b>Bachelor's</b>	10,496	1,811	17%	3,465	33%	2,456	23%	1,627	16%	1,137	11%
<b>Other Degree</b>	59	14	24%	20	34%	*	*	11	19%	*	*

The vast majority of high school graduates without a single wage record for the entire five year period are those graduates in the *No College*, *Some College* and *Bachelor's* degree educational attainment groups. See **Figure A**. It is possible that the lack of visibility for the *Bachelor's* and *Some College* groups could be driven by out-of-state college enrollment. Approximately 27% of the 2013 high school graduates who enrolled in college did so out-of-state.<sup>48</sup> Those in the *No College* group may also reflect high school graduates that are working out-of-state, joined the military after high school or are pursuing other types of employment that does not require reporting for Unemployment Insurance (UI) and therefore are not wage data contained within the MLDS System.

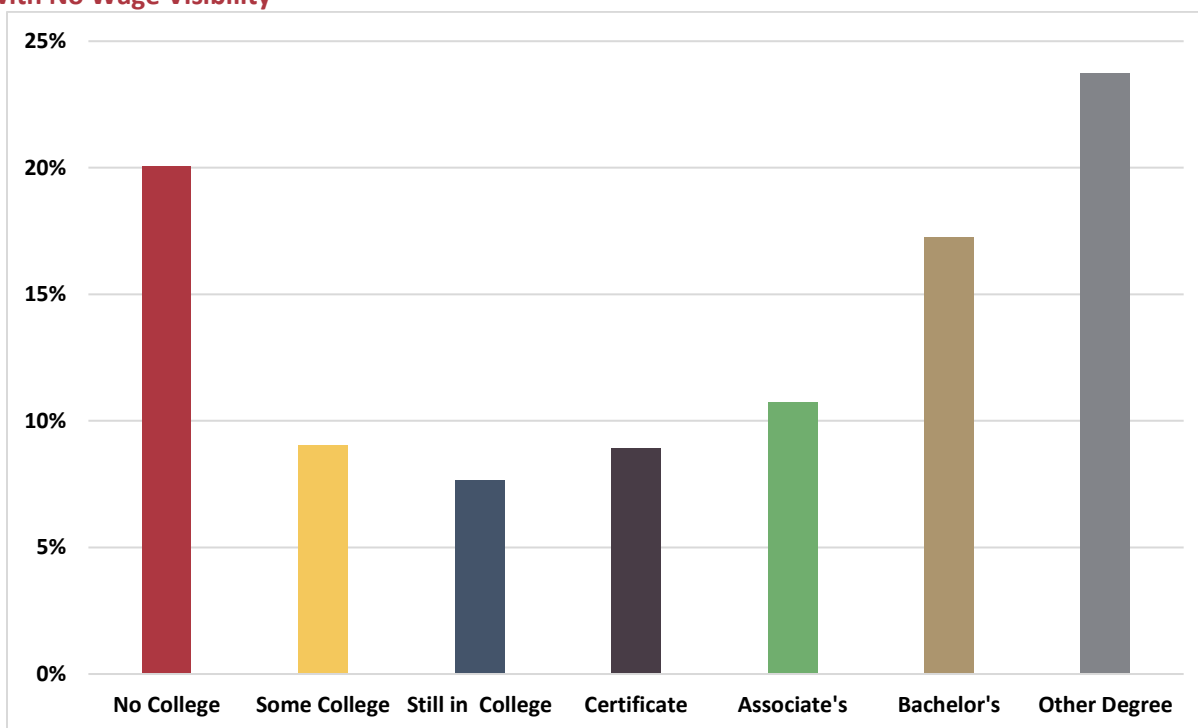
**Figure A. High School Graduates, State of Maryland, 2013, Distribution of No Wage Visibility by Educational Attainment**



<sup>48</sup> MLDS Center. [Initial Postsecondary Enrollments - In-State vs. Out-of-State Overview](#).

Another option for considering the distribution of the No Wage Visibility group is to consider what percentage of each educational attainment group does not have wages. See **Chart C**. From this perspective, the *Other Degree* (24%) has the most high school graduates without any wage data, at nearly double the overall average. The *No College* group (20%) and *Bachelor's* (17%) now rank second and third respectively. The lack of wage data for such a large percentage of the *Other Degree* group may reflect two phenomenon. First, to earn both a bachelor's and either a post-baccalaureate or Master's degree in five years would leave little time to work. Second, research suggests that the higher the level of the college degree the more likely a graduate is to relocate outside the geographic area of the college that conferred the degree.<sup>49</sup>

**Chart C. High School Graduates, State of Maryland, 2013, Percentage of Educational Attainment Group with No Wage Visibility**



As with the high school graduates without wages, wage visibility patterns vary within each educational attainment group. See **Chart D**. A high percentage of high school graduates in the *Bachelor's* have irregular wages. As with the No Wage group, this again is not surprising as completion of a Bachelor's degree within five years allows very little time to work. This group may also be unique in that it most likely contains more students that went out-of-state for a degree<sup>50</sup> as compared to the other groups and

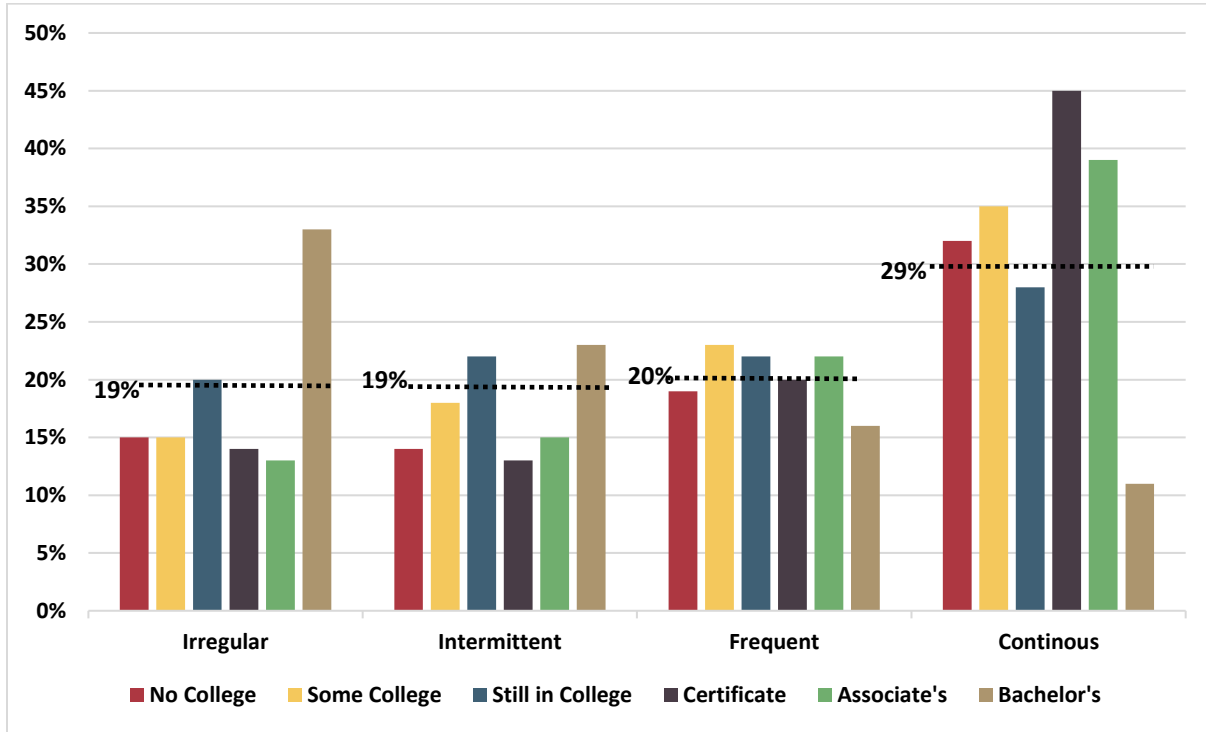
<sup>49</sup> Rothwell, Jonathan. (2015). [What colleges do for local economies: A direct measure based on consumption](#). Brookings Institute.

<sup>50</sup> Approximately 27% of the 2012 high school graduates had an initial enrollment that was out-of-state. MLDS Center. [Initial Postsecondary Enrollments - In-State vs. Out-of-State Overview](#).

\*Note: The Other Degrees category was omitted from this analysis due to small cell size.

therefore their wage data may be restricted to summer fiscal quarters when they return home from college.

**Chart D. High School Graduates, State of Maryland, 2013, Percentage of Wage Visibility by Educational Attainment**



\*Note: The *Other Degrees* category was omitted from this analysis due to small cell size.

Another noticeable variation from the overall averages presented in **Table K** is in the Continuous wage group\*. Overall, 29% of high school graduates fall into this wage visibility group. However, for each educational attainment group, the percent that falls into Continuous category varies widely with 45% of *Certificate* students, 39% of *Associate's* students and 11% of *Bachelor's* students in this groups. The low rate in the *Bachelor's* degree group may again reflect a combination of little time to work or pursuing a degree out-of-state. The higher rates in the *Certificate* and *Associate's* groups may reflect both financial need to work while in college as well as more time in workforce post-degree as a *Certificate* is typically a one year program and an *Associate's* is two year program. High school graduates in these two degree groups will have a longer period of time post-college degree attainment to begin working full-time in the workforce. They are also less likely to have gone out-of-state for college so that their rate of employment during college will be more visible.

### Appendix 3. High School Graduates, State of Maryland, 2013, Median Quarterly Wages by Educational Attainment, Five Years after High School Graduation

This table presents the number of high school graduates, graduates with wages in Q20 and graduates with wages in Q19, Q20 and Q21. The Full-Quarter Employment methodology reduces the graduates included in quarterly median wage calculation between 6% and 11% percentage points for each educational attainment category and increases the median quarterly wage between \$356 and \$979.

Education Level	Total	Total with Wages in Quarter 20th	% of Group with Wages in Q20	Quarter 20 Median Wage	Total with Wages in Quarters 19, 20, and 21 (Full-Quarter Employment)	% of Group with Wages in Q20	Quarter 20 Median Wage	Variation in Quarterly Median
<b>All High School Graduates</b>	59,560	32,874	55%	\$5,502	27,822	47%	\$6,160	\$658
<b>High School Graduates, No College</b>	14,226	7,425	52%	\$5,788	6,355	45%	\$6,331	\$543
<b>Some College</b>	21,316	12,856	60%	\$5,000	10,973	51%	\$5,532	\$532
<b>Still in College</b>	11,704	7,070	60%	\$4,469	5,686	49%	\$5,299	\$830
<b>Certificate</b>	269	189	70%	\$7,650	167	62%	\$8,629	\$979
<b>Associate's</b>	1,490	935	63%	\$6,958	822	55%	\$7,509	\$551
<b>Bachelor's</b>	10,496	4,374	42%	\$9,120	3,797	36%	\$10,000	\$880
<b>Other Degree</b>	59	25	42%	\$13,616	22	37%	\$13,972	\$356

#### Appendix 4. High School Graduates, State of Maryland, 2013, Wage Visibility by Educational Attainment, Five Years after High School Graduation

This table presents the percentage of high school graduates with wages each quarter for the five year period after high school graduation by educational attainment. The percentages are calculated as the number of high school graduates in a given educational attainment category each quarter divided by the total high school graduates in that educational attainment category.

Fiscal Quarter to Academic Semester Alignment				% All High School Graduates with Wages	% No College with Wages	% Some College with Wages	% Still in College with Wages	% of Certificate with Wages	% Associate's with Wages	% Bachelor's with Wages	% Other Degrees with Wages
Year 1	Q1	July to September 2013	Summer	47%	42%	49%	51%	48%	54%	46%	44%
	Q2	October to December 2013	Fall	39%	46%	45%	38%	54%	54%	18%	24%
	Q3	January to March 2014	Spring	40%	44%	45%	40%	52%	52%	21%	24%
	Q4	April to June 2014	Spring	50%	47%	53%	53%	52%	58%	42%	37%
Year 2	Q5	July to September 2014	Summer	54%	48%	57%	58%	57%	60%	49%	39%
	Q6	October to December 2014	Fall	39%	48%	46%	36%	54%	47%	18%	24%
	Q7	January to March 2015	Spring	45%	46%	53%	45%	59%	56%	24%	27%
	Q8	April to June 2015	Spring	52%	51%	59%	55%	62%	60%	39%	29%
Year 3	Q9	July to September 2015	Summer	57%	52%	63%	61%	64%	63%	46%	41%
	Q10	October to December 2015	Fall	49%	52%	59%	47%	65%	60%	22%	27%
	Q11	January to March 2016	Spring	49%	51%	59%	48%	65%	60%	24%	25%
	Q12	April to June 2016	Spring	54%	52%	62%	57%	68%	63%	37%	36%
Year 4	Q13	July to September 2016	Summer	57%	53%	63%	61%	68%	64%	42%	41%
	Q14	October to December 2016	Fall	50%	54%	60%	48%	69%	60%	23%	25%
	Q15	January to March 2017	Spring	50%	52%	60%	51%	68%	61%	26%	25%
	Q16	April to June 2017	Spring	54%	52%	61%	59%	69%	63%	33%	25%
Year 5	Q17	July to September 2017	Summer	56%	53%	62%	62%	69%	63%	41%	44%
	Q18	October to December 2017	Fall	54%	53%	60%	54%	71%	61%	41%	42%
	Q19	January to March 2018	Spring	54%	52%	59%	56%	69%	62%	41%	41%
	Q20	April to June 2018	Spring	55%	52%	60%	60%	70%	63%	42%	42%
Average				50%	50%	57%	52%	63%	59%	34%	33%

Appendix 5. High School Graduates, State of Maryland, 2013, Sector of Employment by Educational Attainment, Five Years after High School Graduation

This table presents the number of high school graduates with full-quarter employment with the same employer in quarters 19, 20 and 21 and the overall median quarterly wage and an indicator to living wage.

Sector	Total High School Graduates	% of Same-Employer High School Graduates in Sector	Median Quarterly Wage in Q20	No College	%	Some College	%	Still in College	%	Associate's	%	Bachelor's	%
<b>Goods-Producing</b>	1,559	8%	↑ \$9,692	651	15%	469	6%	190	5%	45	7%	204	7%
<b>Trade, Transportation, and Utilities</b>	4,799	25%	↓ \$5,695	1,367	31%	2,192	29%	795	20%	137	23%	308	10%
<b>Information Technology</b>	272	1%	↑ \$7,962	36	1%	93	1%	62	2%	10	2%	71	2%
<b>Financial and Real Estate</b>	896	5%	↑ \$8,854	108	2%	361	5%	155	4%	28	5%	244	8%
<b>Professional and Business Services</b>	2,820	14%	↑ \$8,685	550	12%	820	11%	559	14%	82	13%	809	27%
<b>Educational Services</b>	1,198	6%	↓ \$7,686	116	3%	236	3%	392	10%	30	5%	424	14%
<b>Health Care and Social Assistance</b>	3,003	15%	↓ \$6,686	543	12%	1,171	15%	770	20%	114	19%	405	14%
<b>Leisure and Hospitality</b>	3,437	18%	↓ \$5,042	706	16%	1,675	22%	697	18%	81	13%	278	9%
<b>Other Services</b>	845	4%	↓ \$6,417	234	5%	316	4%	172	4%	32	5%	91	3%
<b>Public Administration</b>	661	3%	↑ \$8,642	125	3%	232	3%	139	4%	49	8%	116	4%
<b>Total</b>	<b>19,490</b>	<b>33%</b>	<b>\$6,736</b>	<b>4,436</b>		<b>7,565</b>		<b>3,931</b>		<b>608</b>		<b>2,950</b>	

↑ value is above living wage, ↓ value is below living wage

Appendix 6. High School Graduates, State of Maryland, 2013, High School Graduates Above the Living Wage by Sector and Educational Attainment, Five Years after High School Graduation

This table presents the number of high school graduates with same-employer full-quarter employment that have a quarterly wage above the living wage for each educational attainment-sector grouping.

Sector	No College	#>=Living Wage	Some College	#>=Living Wage	Still in College	#>=Living Wage	Associate's	#>=Living Wage	Bachelor's	#>=Living Wage
<b>Goods-Producing</b>	651	471	469	277	190	119	45	36	204	173
<b>Trade, Transportation, and Utilities</b>	1,367	454	2,192	504	795	154	137	51	308	138
<b>Information Technology</b>	36	16	93	48	62	22	10	*	71	50
<b>Financial and Real Estate</b>	108	63	361	181	155	77	28	15	244	219
<b>Professional and Business Services</b>	550	253	820	341	559	305	82	55	809	682
<b>Educational Services</b>	116	34	236	56	392	177	30	*	424	308
<b>Health Care and Social Assistance</b>	543	135	1,171	312	770	265	114	61	405	280
<b>Leisure and Hospitality</b>	706	138	1,675	321	697	106	81	29	278	102
<b>Other Services</b>	234	92	316	87	172	39	32	12	91	60
<b>Public Administration</b>	125	85	232	109	139	66	49	40	116	73
<b>Total</b>	<b>4,436</b>		<b>7,565</b>		<b>3,931</b>		<b>608</b>		<b>2,950</b>	

