



Commonwealth of Pennsylvania

**THE PENNSYLVANIA
BLUEPRINT FOR HIGHER
EDUCATION:**

Mapping the Return on Investment

March 2024

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Overview

Pennsylvania is facing a workforce crisis that is substantial and growing. Our economy requires 61,000 more people with the right college degrees and credentials to fill open jobs right now. If nothing is done to better align our postsecondary sector with the workforce needs of the Commonwealth, conservative estimates show that the talent gap will increase to at least 218,000 within a decade.

But we face strong headwinds. Decades of disinvestment coupled with one of the most decentralized higher education sectors in the country have created a complex set of deeply rooted challenges that prevent Pennsylvania's excellent colleges and universities from fulfilling their promise.

Figure 1 illustrates how the multiple challenges facing Pennsylvania's higher education sector interact to hamper the ability of our colleges and universities from providing accessible, affordable pathways to postsecondary-level skills and credentials that our residents and our employers need to ensure prosperity.

Pennsylvania's higher education sector is hampered by three underlying factors:

1. **Sustained Disinvestment in Higher Education.** Pennsylvania invests fewer dollars per capita in higher education than any other state except New Hampshire (i.e., we are 49th out of 50th in terms of state investment). For example, Pennsylvania's general operating appropriations¹ to colleges and universities declined more than any other state from 2001–2019, decreasing by 53% in constant dollars², according to the State Higher Education Officers Association³. This disinvestment has occurred gradually over decades and is among the most significant contributors to high college costs, low attainment rates, and lack of access.
2. **No Coordination or Comprehensive Public Postsecondary System.** Our colleges and universities lack a structure that can align their efforts with the workforce needs of their communities, regions, and the state. As a result, too many Commonwealth residents lack access to affordable higher education aligned with workforce needs. In addition, strong, clear credential pathways are lacking, which means it is too difficult for Pennsylvanians to chart a path to postsecondary credentials or degrees that fit their pocketbooks and their career pathways.
3. **No Predictable or Strategic Funding System.** Pennsylvania is one of ten states that lacks a predictable and transparent method for funding its publicly funded colleges and universities. We also lack a method of assuring legislators and the public that state dollars are being used to advance important state goals. This situation makes it difficult for our postsecondary institutions to plan for the future and also reduces trust in the sector.

¹ General operating is the portion of state and local support appropriated directly to public institutions for the purposes of general operations. Both measures include Federal American Reinvestment and Recovery Act (ARRA) revenue provided during the Great Recession to stabilize state and local sources of revenue for higher education.

² Constant dollars adjusted by the Higher Education Cost Adjustment (HECA). Constant dollar is an adjusted value of currencies to compare dollar values from one period to another.

³ Cummings, K., Laderman, S., Lee, J., Tandberg, D., & Weeden, D. (2021). *Investigating the impacts of state higher education appropriations and financial aid*. State Higher Education Executive Officers Association. Retrieved December 15, 2024, from https://sheeo.org/wp-content/uploads/2021/05/SHEEO_ImpactAppropriationsFinancialAid.pdf

The Problems:

30 Years of Disinvestment

No Coordination of System

No Predictable or Strategic Funding System



The Symptoms:

Too Expensive



Low Capacity



Lack of Alignment with Workforce Needs



Uneven distribution of affordable higher education



No Accountability



The Impacts:



Low Enrollment



Difficult to Compete for High Wage Employers



Too Few Credentials



Lack of Trust and Investment



High Debt



Postsecondary Deserts



Workforce Gaps

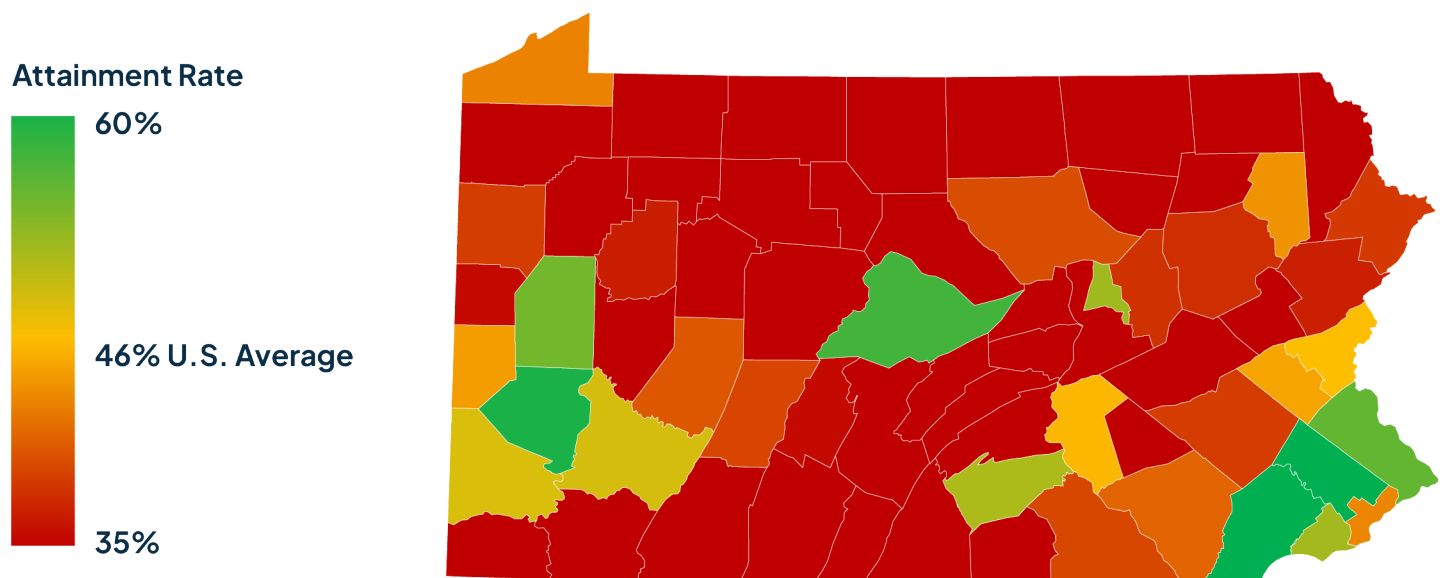


Competition, Not Coordination

When taken together, these factors add up to a complex set of challenges:

- **Low Enrollment and Postsecondary Attainment.** Pennsylvania college enrollment continues to lag. Whereas 62% of recent high school graduates enrolled in some form of postsecondary education in 2017, this proportion dropped to 55% by 2022. Overall postsecondary degree attainment rates are below the national average in 56 of 67 counties in Pennsylvania. See Figure 2 below for a map of postsecondary degree attainment levels.
- **Lack of Access to Affordable Colleges and Universities.** Access to affordable public postsecondary education is a major contributing factor of low enrollment and attainment levels. Of Pennsylvania’s 67 counties, 46 lack a community college or branch campus, and 49 lack a PASSHE university. Over half lack both a community college and a PASSHE university, and residents in only seven counties can access a full pipeline of affordable public postsecondary education, ranging from short-term credentials to associate and bachelor’s degrees. See Figure 3 below for a map of postsecondary accessibility.
- **High Cost and Student Debt Load.** Pennsylvania is among the most expensive states in the country in which to attend college. Our students are taking on too much debt, carrying the third highest debt load in the country at nearly \$40,000. These high costs are well-known, contributing to dropping enrollment and too-low attainment rates.

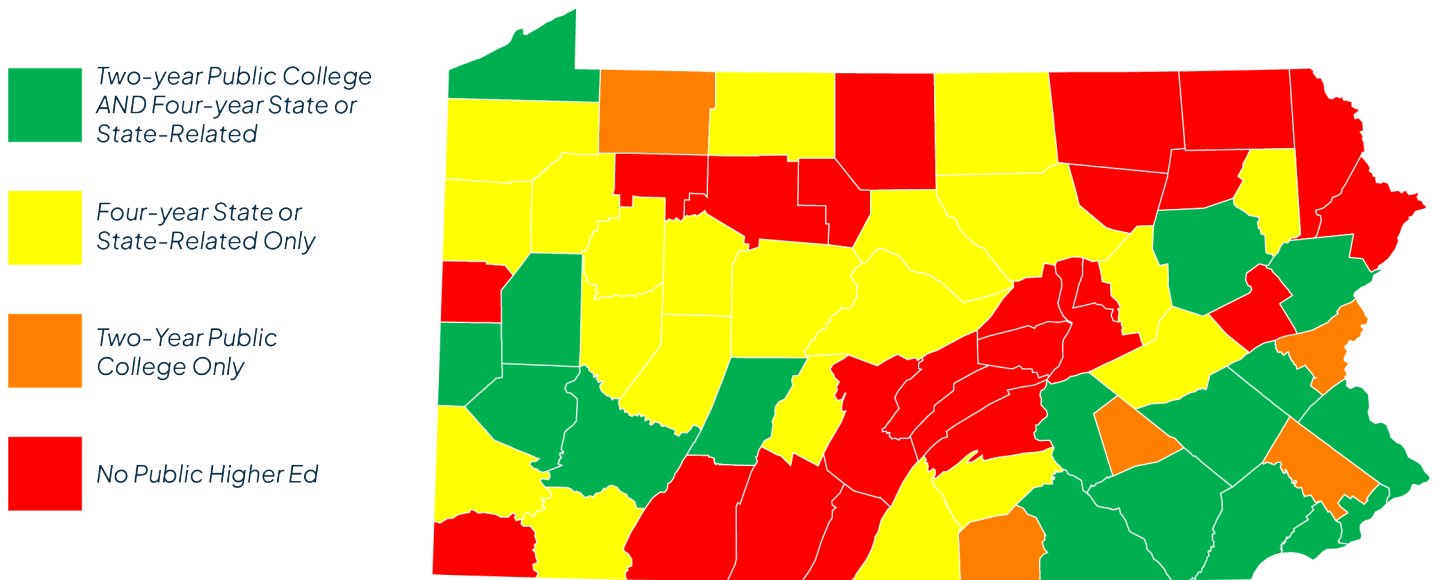
Figure 2 **Pennsylvania Working Age Degree Attainment by County**



Note: Working age (25–64) degree attainment does not include non-degree certificates. U.S. attainment average from Lumina Foundation;

Source: U.S. Census Bureau’s American Community Survey, Lumina Foundation, Baker Tilly Analysis

Figure 3 Distribution of Access to Public Postsecondary Institutions by County



Notes: Campus locations include all Pennsylvania Department of Education approved community college branch campuses and branch campuses of Pennsylvania's State System of Higher Education (PASSHE) and state-related institutions.

2-year public college includes community colleges, Thaddeus Stevens College of Technology, and Northern Pennsylvania Regional College (NPRC).

Source: Pennsylvania Department of Education, Baker Tilly Analysis

The result: a postsecondary sector that is not positioned to address the workforce and economic development needs of the Commonwealth and its residents.

These challenges are complex and deep-seated, and the time to address them is now. Pennsylvanians deserve access to world class, affordable higher education that will lead to good-paying jobs – keeping our residents in the state and attracting new out-of-staters to the Commonwealth. Pennsylvania's path to prosperity begins with a serious effort to overcome the challenges facing our higher education sector and unleash its potential to serve as our workforce and economic development engine.

Pennsylvania's Blueprint for Higher Education will Deliver Results

In January of 2024, Governor Shapiro unveiled his Blueprint for Higher Education in Pennsylvania which includes three major elements that address the challenges detailed above:

- Create a new system for higher education that unites our PASSHE universities and our 15 community colleges under a new governance system.
- Increase affordability by ensuring Pennsylvanians making up to the median income will pay no more than \$1,000 in tuition and fees per semester at state-owned universities and community colleges or receive an additional \$1,000 per year in state financial aid if attending state-related or independent colleges and universities.
- Increase direct institutional supports to PASSHE institution and community colleges by 15% and to state-related universities by 5% through a newly established, predictable, performance-based funding formula that rewards public and state-related colleges and universities for achieving outcomes that benefit the Commonwealth.

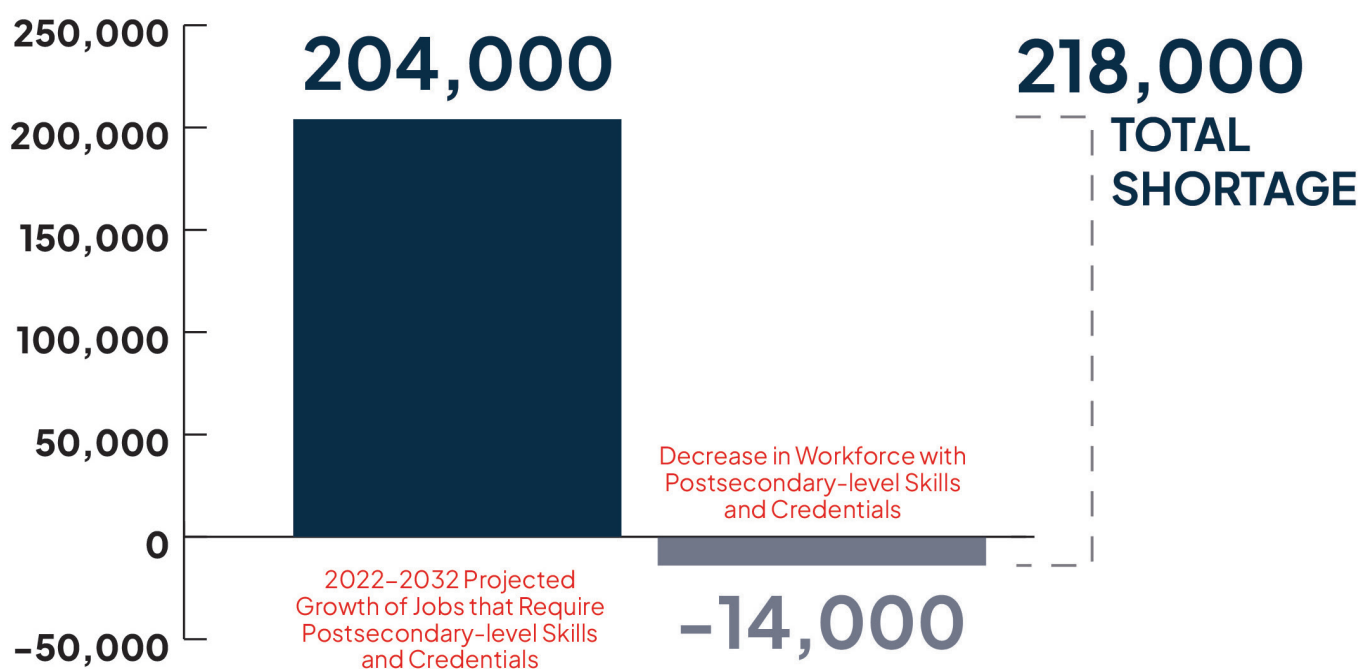
When taken together, the three interrelated elements of Pennsylvania's Blueprint for Higher Education will:

- Increase affordability and reduce debt by increasing financial aid, which could decrease the average eligible financial aid recipient's debt by \$2,500 for a community college graduate and \$4,500 for a PASSHE graduate.
- Reverse enrollment declines via more affordable postsecondary pathways. Evidence regarding the effects of increased affordability in other states suggests an overall increase in enrollment of 5% as a result of the blueprint's expanded financial aid assistance.
- Expand access to affordable postsecondary education by utilizing the new system to deliver postsecondary credential pathways to areas of the Commonwealth that currently lack them.
- Invest in our public postsecondary institutions and incentivize and reward colleges and universities to align with important state priorities while providing the kind of transparency and accountability that the Commonwealth needs to ensure its increased investments will be used wisely.
- Shrink the projected 2032 workforce credential gap of 218,000 by creating 48,000 additional credentials based on making higher education dramatically more affordable and enacting a one-year investment by the Commonwealth through 2032. The number of additional credentialed individuals could more than triple to 160,000 if Pennsylvania continues to invest in postsecondary institutions with similar levels of sustained year-over-year growth via an outcomes-based funding formula through FY 2028.
- Grow the economy significantly via increased employment. Based on economic impact analysis, the cumulative economic impact from 2023–2032 (or over a decade) after just one year of the proposed investment in the blueprint plan is projected to be \$19.8 billion (See Appendix C).

By The Numbers: Pennsylvania's Large and Growing Postsecondary Workforce Credential Gap

By 2032, the number of jobs requiring a postsecondary-level skill or credential in Pennsylvania is conservatively⁴ predicted to grow by 204,000⁵. During the same time, the number of workers with postsecondary level skills and credentials in Pennsylvania is forecast to decline by 14,000, primarily due to an aging population⁶. This means that Pennsylvania will have a workforce credential gap of 218,000 (Figure 4) in eight years.

Figure 4 Pennsylvania Projected 2032 Postsecondary-level Skilled Workforce Shortage



Source: Pennsylvania Department of Labor & Industry: Center for Workforce Information and Analysis, Center for Rural Pennsylvania, U.S. Census Bureau, U.S. Bureau of Labor Statistics, Baker Tilly Analysis

¹ In Carnevale, A.P., Smith, N., Van Der Werf, M., & Quinn, M.C. (2023). *After everything: Projections of jobs, education, and training requirements through 2031*. Georgetown University Center on Education and the Workforce. Retrieved December 13, 2023, from <https://cew.georgetown.edu/cew-reports/projections2031/>), skilled job growth is projected to be 310,000 by 2031.

² Extrapolation of Center for Workforce Information & Analysis (CWIA) Occupational Employment 2022-2024 Short-Term Forecast. <https://www.workstats.dli.pa.gov/Products/ShortTermForecasts/Pages/default.aspx>

³ Technical report on the 2032 skills shortage is available on Pennsylvania's Department of Education website.

The Combination of Increased Institutional Investment and Greater Affordability Will Maximize the Impact of State Investments

Pennsylvania is facing a daunting workforce credential gap that will only grow unless we take action. The Blueprint is designed to begin to fill this gap with two complimentary types of investment. Increased institutional support will allow our historically under-resourced institutions to better support students through to obtaining a credential or degree; and increased financial aid will allow more students to enroll and persist in college. Increases in direct institutional support are estimated to create 41,284 new credentials while the financial aid increase is estimated to create 7,035 new credentials for a total of approximately 48,319 new credentials in Pennsylvania by 2032 via the current Blueprint investment proposals.

The Pennsylvania economy stands to gain exponentially from the addition of 48,000 workers with a postsecondary degree or credential from one of Pennsylvania's colleges or universities, yielding an overall economic impact of \$19.8 billion by 2032. These newly credentialed workers will generate \$9.8 billion on a direct basis as a result of their increased salaries and generate an additional \$10 billion through the multiplier and purchases from Pennsylvania based businesses and purchases made at the household level. Based on increased earnings from credential and degree attainment, an estimated 100,160 additional jobs will be supported and sustained in the Pennsylvania economy, 48,319 of which are directly attributable to the increased number of workers with post-secondary level skills and credentials filling demands at companies and organizations throughout the Commonwealth⁷.

Expansion of financial aid and/or sustained year-over-year increased institutional investments would increase impact. We provide more detailed analysis below.

1. Credentials Increase as Direct Institutional Support Increases

Beginning in FY 2024, the Blueprint proposes to provide a 15% increase in direct institutional support for community colleges and PASSHE universities and a 5% increase for state-related universities.

Research clearly demonstrates that increases in direct institutional investments increase postsecondary credential attainment⁸. Baker Tilly, an accounting and advisory firm, utilized existing research approaches developed by the State Higher Education Officers Association (SHEEO), to analyze the estimated increases in credential attainment that can be expected as a result of the blueprint's proposed 15% increase in direct institutional support in the Commonwealth's community colleges and PASSHE institutions and 5% increase in direct

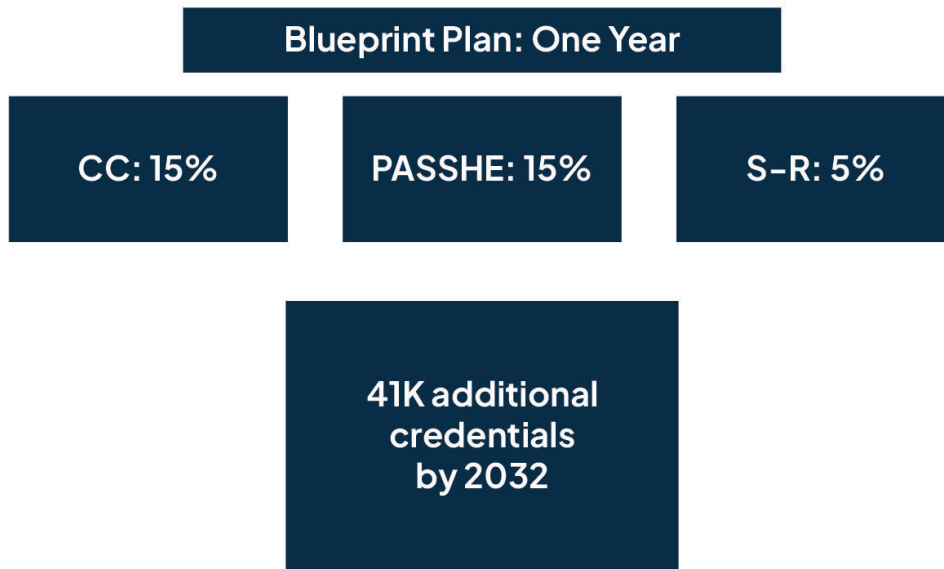
⁷ Parker Philips. *Economic Impact of Closing Pennsylvania's Workforce Gap*. March, 2024.

⁸ Cummings, K., Laderman, S., Lee, J., Tandberg, D., & Weeden, D. (2021). *Investigating the impacts of state higher education appropriations and financial aid*. State Higher Education Executive Officers Association. Retrieved December 15, 2024, from https://sheeo.org/wp-content/uploads/2021/05/SHEEO_ImpactAppropationsFinancialAid.pdf

institutional support in our state-related universities. The analysis showed the one-time increase in direct institutional support are estimated to lead to 41,284 new postsecondary credentials by 2032 from our publicly-funded colleges and universities (see Figure 5). More information can be found in Appendix A.

Via the creation of a transparent, predictable funding formula to drive out state investments, Pennsylvania's colleges and universities will be incentivized and rewarded for meeting critical state needs. This unprecedented level of accountability will ensure that state dollars are wisely spent.

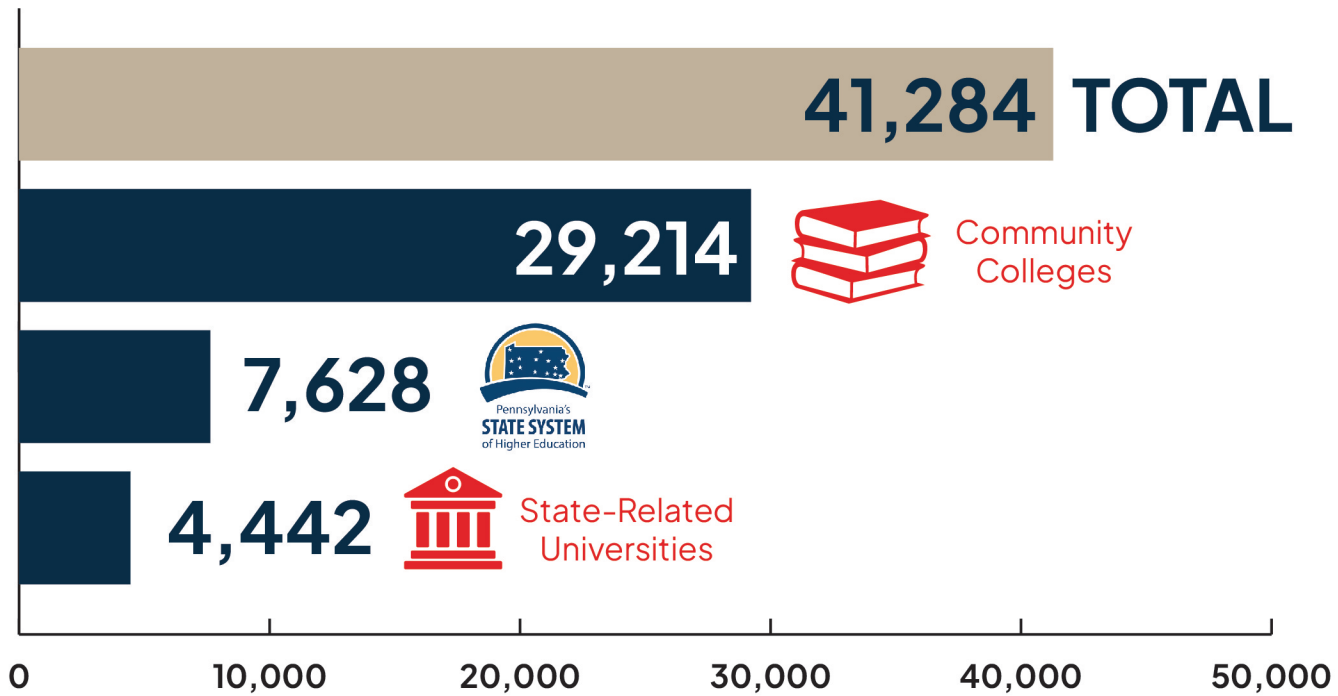
Figure 5 **Higher Education Blueprint Direct Institutional Support Initiatives**



Source: State Higher Education Executive Officers Association, Baker Tilly Analysis

The 41,284 new credentials include 29,214 (or 71%) new credentials from Pennsylvania's community colleges, 7,628 new credentials from PASSHE institutions, and 4,442 new credentials from state-related universities by 2032 (see Figure 6).

Figure 6 2032 Cumulative Increase in Postsecondary Credentials Due to Higher Education Blueprint: Direct Institutional Support Investment



Note: Appropriations increases in fiscal year 2024: 15% for Community Colleges and PASSHE Universities; 5% increase for State-Related Universities
 Source: State Higher Education Executive Officers Association, Baker Tilly Analysis

Research consistently shows how increased direct investments in colleges and universities lead to higher graduation rates⁹. When institutions receive additional operating funds, they can improve the learning environment through smaller classes, more student support, and better trained faculty – all factors leading to higher graduation rates¹⁰. Evidence from other states that have increased support to postsecondary institutions indicates that a 10% increase in state direct institutional support increases instructional spending by 9.7%, academic support spending by 17.2%, and student services spending by 10.4%¹¹.

⁹ Chakrabarti, R., Gorton, N., & Lovenheim, M. (2020). State investment in higher education: Effects on human capital formation, student debt, and long-term financial outcomes of students. Federal Reserve Bank of New York Staff Report 941.

¹⁰ Horn, A., Toutkoushian, R.K., Horner, O., Williams-Wyche, S., & Tandberg, D. (2021). The effect of state appropriations on college graduation rates of diverse students. Policy Report Horn.; Midwestern Higher Education Compact. <https://eric.ed.gov/?id=ED623525>.

¹¹ Deming, D. and Walters, C. (2017). The impacts of price and spending subsidies on U.S. postsecondary attainment. NBER Working Paper.

The impact of increased institutional investments is particularly strong among community colleges. Over 70% of the 41,284 projected credential increase generated by the Blueprint will come from the community college sector. Credential awards at community colleges are more sensitive to changes in direct institutional funding because the relatively low tuition at community colleges creates more reliance on direct support¹². Research shows¹³ that when states cut direct institutional support, the rate of decline for faculty-to-student ratios at community colleges is nearly twice as large as declines at four-year institutions¹⁴.

2. Enrollment Expands and Credentials Increase as Financial Aid Increases

The Blueprint proposes that beginning in FY 2025, Pennsylvanians making up to the median household income (\$70,000) will pay no more than \$1,000 in tuition and fees per semester at state-owned universities and community colleges. For students attending independent and state-related institutions, PHEAA grants will increase by \$1,000.

The Blueprint is designed to reverse Pennsylvania's sustained drops in enrollment by expanding access via more affordability. Research indicates¹⁵ that every additional \$1,000 in financial aid increases enrollment by 5% and credential completion by 2.5% annually for recipients. Over 68,000 students per year will receive additional financial aid via the Blueprint. Figure 7 below displays the number of students in each sector who will receive additional aid, as well as the average increase in financial aid that eligible students will receive as a result of the blueprint¹⁶.

¹² Cummings, K., Laderman, S., Lee, J., Tandberg, D., & Weeden, D. (2021). *Investigating the impacts of state higher education appropriations and financial aid*. State Higher Education Executive Officers Association. Retrieved December 15, 2024, from https://sheeo.org/wp-content/uploads/2021/05/SHEEO_ImpactAppropationsFinancialAid.pdf

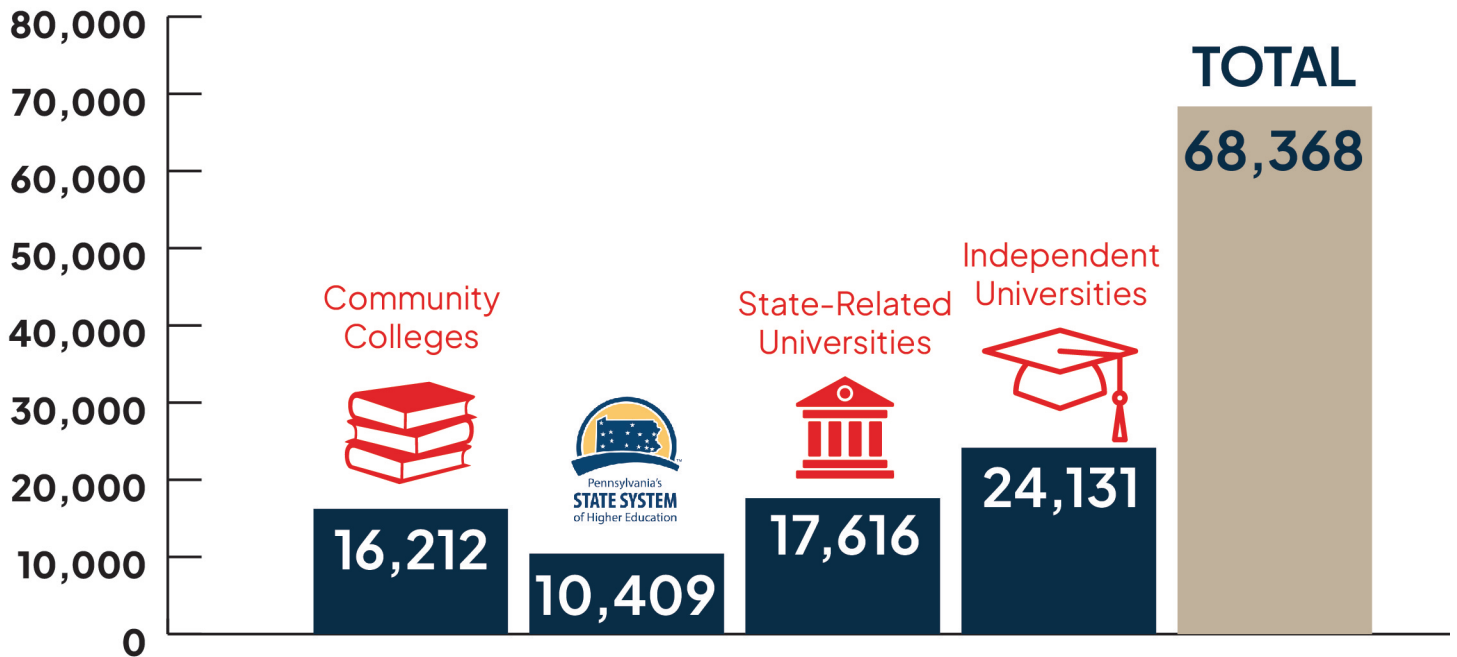
¹³ Zhao, B. (2018). *Disinvesting in the future? A comprehensive examination of the effects of state appropriations for public higher education*. Federal Reserve Bank of Boston: New England Public Policy Center

¹⁴ Ibid.

¹⁵ Cummings, K., Laderman, S., Lee, J., Tandberg, D., & Weeden, D. (2021). *Investigating the impacts of state higher education appropriations and financial aid*. State Higher Education Executive Officers Association. Retrieved December 15, 2024, from https://sheeo.org/wp-content/uploads/2021/05/SHEEO_ImpactAppropationsFinancialAid.pdf

¹⁶ An eligible credential is a credential from a student who would receive financial aid under the Blueprint for Higher Education. Additional details on this calculation of eligible credentials and eligible students can be found in Appendix B.

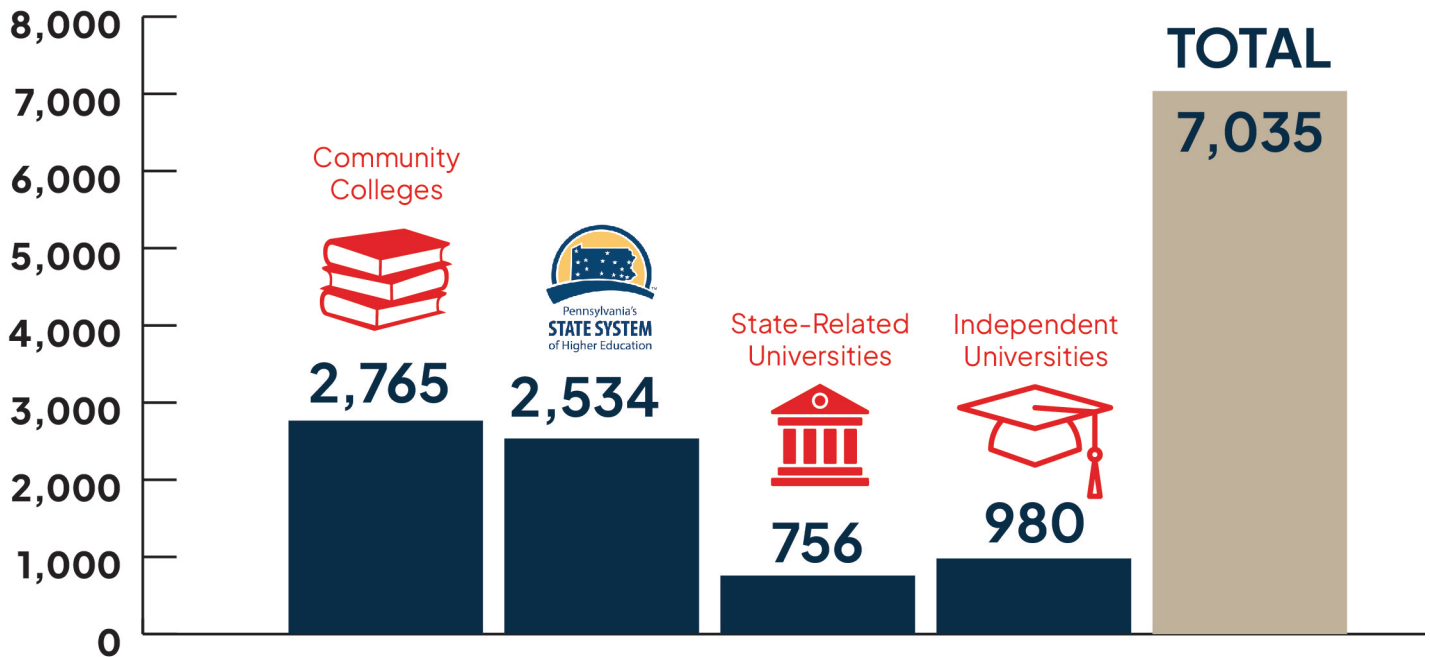
Figure 7 Number of Students Receiving Additional Aid Due to Higher Education Blueprint: Financial Aid Initiatives



Note: Students with less than \$70K in AGI pay no more than \$1,000 per semester (\$2,000 per year) starting in 2025. Increase in PHEEA Grants of \$1,000 per eligible student
 Source: HCM Strategists

HCM Strategists, a consultancy, analyzed the estimated increases in credential attainment from the Blueprint’s financial aid initiatives, utilizing methods and research developed by the State Higher Education Executives Association (SHEEO). The analysis indicated that 7,035 additional credentials would be awarded by 2032 as a result of financial aid initiatives (see Figure 6). Further details can be found in Appendix B.

Figure 8 **2032 Cumulative Increase in Postsecondary Credentials Due to Higher Education Blueprint: Financial Aid Initiatives**



Note: Students with less than \$70K in AGI pay no more than \$1,000 per semester (\$2,000 per year) starting in 2025. Increase in PHEEA Grants of \$1,000 per eligible student

Source: State Higher Education Executive Officers Association, HCM Strategists

3. Increasing Affordability and Improving Time to Degree Reduces Student Debt

As a result of reduced debt, the Blueprint for Higher Education will directly improve Pennsylvanians' lives well past the time they spend in college. Not surprisingly, there is a strong connection between increased grant aid, shorter time to degree or credential, and reduced student debt. Using cautious estimates, research indicates that every \$1,000 dollar increase in financial aid will reduce borrowing on average by \$320¹⁷, and other studies suggest it could lead to even more savings for students¹⁸.

Reducing student debt is significant and important to Pennsylvania. The percentage of bachelor's degree graduates in Pennsylvania with student debt is the 5th highest in the nation, and graduates who take on loans have an average student debt of \$39,375--the 3rd highest debt level in the U.S.¹⁹ The blueprint will reduce average student debt for eligible recipients

¹⁷ Evans, B.J. & Nguyen, T.D. (2019). Monetary substitution of loans, earnings, and need-based aid in postsecondary education: The impact of Pell Grant eligibility. *Economics of Education Review*, 70(1), 1–19. Elsevier Ltd. Retrieved February 24, 2024 from <https://www.learntechlib.org/p/208133/>. This research focused on the impact of increases to Pell Grants. Authors found an average increase of \$1,100 in grant aid reduced borrowing by an average of \$300–400 dollars.

¹⁸ A report in the *American Economic Journal* found that a \$1,000 increase in financial aid would lead to a reduction of debt of \$1,190 for eligible students. Denning, J.T., Marx, B.M., & Turner, L.J. (2019). ProPelled: The effects of grants on graduation, earnings, and welfare. *American Economic Journal: Applied Economics*, 11(3), 193–224. <https://doi.org/10.1257/app.20180100>.

¹⁹ The Institute for College Access & Success (TICAS). (2021). Student debt and the class of 2020, <https://ticas.org/wp-content/uploads/2021/11/classof2020.pdf>.

by nearly \$2,500 for graduates of community colleges and \$4,400 for graduates of PASSHE universities (see figure 7). Lower student debt means higher quality of life, more purchasing power, and a stronger economy for Pennsylvania.

In addition, research shows²⁰ that students in the \$40,000 - \$70,000 household income range, on average, have 59% more debt than students with less than \$40,000 in household income – more than any other cohort of students. The financial aid reforms of the blueprint will specifically help reduce the debt of students with \$40,000–\$70,000 in household income²¹.

4. The Blueprint for Higher Education will yield billions in economic returns for Pennsylvania:

Based on the assumption that more than 48,000 individuals with postsecondary-level skills and credentials will enter the workforce as a result of the Blueprint’s increased investment in higher education, the cumulative economic impact of increasing postsecondary educational attainment and filling the workforce credential gap is significant.

The economic impact of the increased investment by Pennsylvania in the blueprint plan, based on the number and type of credentials awarded, was calculated by Parker Philips, a consultancy, utilizing IMPLAN – an input/output modeling software (see Appendix C). The analysis looks at how the average salary by industry and degree type will have an impact over the next decade.

Direct	Indirect	Induced
Newly credentialed and degreed workers entering the Pennsylvania workforce.	Pennsylvania supply chain providing local goods and services to the new workers.	Additional expenditures made at the household level by newly credentialed and degreed workers and employees of the Pennsylvania companies supplying goods and services to these workers.

From 2023–2032, 100,160 jobs will be supported and sustained in the Pennsylvania economy due to the impact of the blueprint (see Figure 9). Of these jobs, 48,319 jobs are directly attributable to the increased number of individuals with postsecondary-level skills and credentials filling demand at companies and organizations throughout the commonwealth.

- These workers will generate a combined impact of \$19.8 billion on the statewide economy (\$9.8 billion direct and \$10 billion indirect/induced) from 2023–2032.
- As a result of direct spending in the economy by the 48,319 workers, an additional 51,841 jobs (indirect and induced) will be supported in Pennsylvania as a result of the multiplier.

²⁰ Marx, B.M., & Turner, L.J. (2018). Borrowing trouble? Human capital investment with opt-in costs and implications for the effectiveness of grant aid. *American Economic Journal: Applied Economics*, 10(2), 163–201. <https://doi.org/10.1257/app.20160127>.

²¹ The maximum Pell Grant is \$7,395 in the 2024–2025 academic year, and in general to qualify for the maximum Pell Grant, a student’s household income will need to be less than \$52,500. Students with \$40,000–\$70,000 in household income will be the cohort that benefits the most from financial aid reforms.

Figure 9 Projected Cumulative Impact of Additional Workers with Postsecondary-level Skills and Credentials

Employment (jobs)	Labor Income	Value Added	Economic Output
48,319 jobs Direct	\$4,852,345,240 Direct	\$5,619,504,509 Direct	\$9,812,710,775 Direct
20,616 jobs Indirect	\$1,468,682,304 Indirect	\$2,304,334,267 Indirect	\$4,265,995,421 Indirect
31,225 jobs Induced	\$1,973,761,616 Induced	\$3,373,886,131 Induced	\$5,709,852,070 Induced
Total 100,160 jobs	Total \$8,294,789,160	Total \$11,297,724,907	Total \$19,788,558,266

Source: Parker Philips using Baker Tilly data in IMPLAN

The addition of workers with postsecondary-level skills and credentials into the Pennsylvania economy will generate an additional \$900.1 million in local (\$369.6 million) and state taxes (\$530.4 million) from 2023–2032 (see Figure 10).

Figure 10 Projected Cumulative Local and State Tax Impact of 48,319 Workers with Postsecondary–level Skills and Credentials

Sub County General (City and Township Taxes)	Sub County Special Districts (Fire, EMS, and School Districts)	County	State	Total
\$48,306,911 Direct	\$76,806,724 Direct	\$13,977,259 Direct	\$213,511,708 Direct	\$352,602,602 Direct
\$25,025,333 Indirect	\$53,183,155 Indirect	\$10,679,873 Indirect	\$123,295,546 Indirect	\$212,183,907 Indirect
\$38,566,830 Induced	\$85,678,203 Induced	\$17,414,221 Induced	\$193,631,303 Induced	\$335,290,557 Induced
Total \$111,899,074	Total \$215,668,082	Total \$42,071,353	Total \$530,438,557	Total \$900,077,066

Source: Parker Phillips using Baker Tilly data in IMPLAN

5. A New Public Higher Education System Will Serve as a Workforce Development Engine by Expanding Access to High Quality Affordable Credentials, Creating Seamless Credential Pathways and Bolstering Institutional Effectiveness

A well-coordinated system of public higher education will amplify and expand the impact of the Commonwealth’s increased investment in institutional and student aid proposed in the Blueprint. When all 25 community colleges and PASSHE institutions are fully aligned to meet the needs of our state and our students, Pennsylvania will be positioned as an economic powerhouse--fully able to provide its residents with the quality of life they seek.

Other states with postsecondary systems provide ample examples of their benefits:

- ✓ The State University of New York (SUNY) system has created the first multi-directional transfer framework in the country, allowing students across its 64 community colleges and universities to seamlessly transfer to build pathways from short-term credentials to bachelor’s degrees and beyond. The result is a substantial increase in transfer rates and shorter time to credential attainment—saving both cost and time.
- ✓ The University of Wisconsin System of Higher Education utilizes its substantial database to create a predictive analytics advising platform to coordinate progress to degree completion.
- ✓ The City University of New York (CUNY) adopted a comprehensive initiative to increase community college graduation rates with impressive results—more than doubling the 3-year graduation rate. Based on the success of this effort, CUNY has adopted this model to support students seeking bachelor’s degrees.

Other postsecondary systems have adopted common application and admissions processes, expanded access to academic programs via cross-registration and course-sharing, and provided additional financial resources and capacity to bolster institutional effectiveness and alignment with workforce needs.

Pennsylvania's new public postsecondary system will also have the capacity to address challenges unique to the Commonwealth, most notably:

- ✓ Expanding access to affordable higher education in the dozens of counties that lack a PASSHE institution, a community college, or both.
- ✓ Creating seamless, affordable credential pathways that allow students to progress from k-12 academic and career technical education through short-term postsecondary credentials through to associate's and bachelor's degrees.
- ✓ Aligning academic offerings to the workforce needs in each region of the state to ensure that Pennsylvanians can attend college, obtain good jobs, and raise their families where they choose.
- ✓ Creating strong partnerships across all sectors of higher education and employers to create a coordinated economic development strategy.
- ✓ Ensuring that adult students have access to the support, flexibility and direction they need to succeed while juggling multiple responsibilities.

Summing it Up

Now is the time to reverse our decades-long neglect of Pennsylvania's rich array of excellent colleges and universities. For too long we have asked them to do too much with too little. As costs have risen to fill in the gap created by state disinvestment and our lack of a coordinated system makes effective statewide solutions impossible, we have hampered our ability to provide affordable access to world-class higher education, and have not done enough to ensure that our residents are equipped to land the high-paying jobs and quality of life that our residents seek.

A strong, effective, and coordinated higher education sector is the foundation of a prosperous Pennsylvania. When taken together, the three elements of the Blueprint maximize the impact of state investments by aligning resources and institutional efforts to the pressing needs of the Commonwealth's economy and its residents.

Appendix A: Methodology to Calculate Attainment Impact as a Result of Direct Institutional Support Increases

Data and Analysis Used to Calculate the Attainment Impact of Increases in Direct Institutional Support Increases Proposed in Pennsylvania’s Blueprint for Higher Education

The methodology used to calculate the impact of increases in financial aid and institutional support is based on a variety of sources including the review of appropriation and financial literature conducted by Cumings et al. “Investigating the Impacts of State Higher Education Appropriations and Financial Aid,” SHEEO (2021). As part of the research, the authors and others in the SHEEO organization created an excel-based simulation tool to calculate the impact of increases in state appropriation on credentials awarded. This tool was provided to the Pennsylvania Department of Education and utilized by Baker Tilly.

The underlying research for the SHEEO tool was a study by Deming and Walters’ (2018) “The Impact of State Budget Cuts on U.S. Postsecondary Attainment” was leveraged²². The research used a two-stage least squares (2SLS) framework to analyze institutions’ response to budget cuts of direct institutional support, especially institutions that are constrained in their ability to raise prices. The research focused on understanding the impact across multiple variables. One key finding is that academic support spending (e.g., tutoring, advising) is very sensitive to changes in state support. The analysis focused on the impact of certificates and degree awards given a 1% increase to state direct institutional support for the two-year and four-year public sector on credential outcomes, and only statistically significant findings were included in the assumptions listed below.

As stated in Cumings et al., “Deming and Walters’ (2018) results represent the Local Average Treatment Effect for institutions in states that had tuition caps and freezes that prevented them from raising additional revenue through tuition increases beyond a specified point.” Therefore, Deming and Walter’s (2018) research measures the impact of decreasing state funding by 1% and not allowing institutions to raise tuition in response. However, Deming and Walters present their findings as the impact of increases in spending and appropriation.

Using Deming and Walters’s (2018) research, the simulation tool calculated that for a 1% change in state direct institutional support, two-year credential awards increase by 1.455% one year after investment and 1.459% two years after investment compared to credentials awarded before investment. For all subsequent years, the credential increase is assumed to remain at the level reached two years after investment.

Using Deming and Walters’s (2018) research, the simulation tool calculated that for a 1% change in state direct institutional support, four-year credentials increase by 0.459% two years after investment and 0.451% three years after investment compared to degrees awarded before investment. For all subsequent years, the credential increase is assumed to remain at the level reached two years after investment.

²² Deming and Walters: *The Impact of State Budget Cuts on U.S. Postsecondary Attainment* (2018).

The blueprint includes direct institutional support increases of 15% to PASSHE universities and community colleges and a 5% increase to state-related universities, implemented in FY24. The analysis assumes an increase in state direct institutional support occurs at the beginning of the fiscal year. Completion data reflects the beginning of the academic year. The percent change was multiplied by the 2022 awarded credentials to calculate the increase in the number of credentials for a given year, which was derived from all completion and credential award data was derived from the Integrated Postsecondary Education Data System (IPEDS).

Appendix Figure 1.A 2022–2032 Increase in Postsecondary Credentials Due to Higher Education Blueprint: Appropriations Investment

Budget Year	Community College	PASSHE Universities	State-Related Universities	Independent Universities	Total
2024					0
2025	3,643				3,643
2026	3,653	1,106	644		5,403
2027	3,653	1,087	633		5,373
2028	3,653	1,087	633		5,373
2029	3,653	1,087	633		5,373
2030	3,653	1,087	633		5,373
2031	3,653	1,087	633		5,373
2032	3,653	1,087	633		5,373
Cumulative Impact	29,214	7,628	4,442		41,284

Note: Appropriations increases in fiscal year 2024: 15% for Community Colleges and PASSHE Universities; 5% increase for State-Related Universities

Source: State Higher Education Executive Officers Association, Baker Tilly Analysis

Appendix Figure 1.B **2024–2032 Increase in Postsecondary Credentials from Community Colleges: Sustained Appropriation Investment**

Budget Year	Community College	PASSHE Universities	State-Related Universities	Independent Universities	Total
2024					0
2025	3,643				3,643
2026	7,296	1,106	644		9,046
2027	10,949	2,193	1,277		14,419
2028	14,602	3,280	1,910		19,792
2029	18,255	4,367	2,543		25,165
2030	18,265	5,454	3,176		26,895
2031	18,265	5,435	3,165		26,865
2032	18,265	5,435	3,165		26,865
Cumulative Impact	109,540	27,270	15,880		152,690

Note: Appropriations increases in fiscal year 2024: 15% for Community Colleges and PASSHE Universities; 5% increase for State-Related Universities. Sustained year-over-year increases in FY 2025 - FY 2028

Source: State Higher Education Executive Officers Association, Baker Tilly Analysis

Appendix B: Methodology to Calculate Attainment Impact as a Result of Financial Aid

Data and Analysis Used to Calculate the Attainment Impact of Increases in Financial Aid Proposed in Pennsylvania's Blueprint for Higher Education

The methodology used to calculate the impact of increases in financial aid and institutional support is based on a variety of sources including the meta-analysis conducted by Cumings et al. "Investigating the Impacts of State Higher Education Appropriations and Financial Aid," SHEEO (2021). The authors reviewed 81 research papers that focused on the impact of changes in direct institutional support and financial aid. The authors' conclusions aligned with a similar meta-analysis by Nguyen et al. (2019)²³ that found that an additional \$1,000 in financial aid increases completion by 2.5% for those receiving the financial aid benefit.

The number of additional completers and awards is calculated as the number of eligible completions multiplied by 2.5% for every \$1,000 increase in aid for each sector (i.e., for a \$2,500 increase in aid, the multiplication factor would be 6.25%). This increase was assumed to occur in all years after investment.

Eligible completions represent the number of 2021 credentials awarded to students who will be eligible for financial aid under the Blueprint for Higher Education. Eligible completions are calculated by multiplying the total awards for associate and bachelor's degrees by the percentage of first-time degree-seeking students from Pennsylvania, multiplied by the percentage of eligible students at each institution and aggregated by sector.

Total awards and percentage of first-time degree-seeking students are sourced via IPEDS data by each institution and aggregated by sector. Completion data reflects the academic year²⁴.

Eligible students in PASSHE and community college sectors are derived from the higher Pell or PA state grant recipients less than \$70,000, plus an estimated number of students who are income eligible but don't file for financial aid. The latter is based on an analysis of National Postsecondary Student Aid Study (NPSAS) national data²⁵ by HCM Strategists. Eligible students from state-related universities and independents are sourced from PHEAA (Pennsylvania Higher Education Assistance Agency).

Estimated average increases to aid were analyzed by HCM Strategists and represent current estimates of the financial aid benefit students will receive from the financial aid proposals in the blueprint. The estimated financial benefit used to calculate the increase in completions is a weighted average, derived from estimated benefits to students who receive financial aid and those who don't file for aid. The estimated benefit to community college students uses a weighted average of in-district and out-of-district students. To estimate the financial benefit of

²³ Nguyen, T.D., Kramer, J.W., Evans, B.J. (2019). *The effects of grant aid on student persistence and degree attainment: A systematic review and meta-analysis of the causal evidence*. *Review of Educational Research*

²⁴ U.S. Department of Education, National Center for Education Statistics, *Integrated Postsecondary Education Data System (IPEDS)*

²⁵ National Center for Education Statistics, *National Postsecondary Student Aid Study*.

each option to community college and PASSHE students, national data from NPSAS was used to estimate student income and Expected Family Contribution (EFC) levels. The EFC data were used to estimate the average financial aid that students already receive from federal and state sources. The calculated estimated average for eligible students' increases in student aid is as follows:

- a. Community Colleges: \$2,251
- b. PASSHE Universities: \$2,642
- c. State-Related Universities: \$1,000
- d. Independent Not-For-Profit Universities: \$1,000

Financial aid initiatives are assumed to be implemented in FY25, and the increase in attainment begins in the year after investment (2026). Assumed affordability initiatives, in FY25 and beyond, tuition and fees per student at community colleges and PASSHE universities will not exceed \$1,000 per semester. PHEEA Grants will increase by \$1,000 per year for students at state-related and independent institutions.

Appendix Figure 2.1 2024–2032 Increase in Postsecondary Credentials Due to Higher Education Blueprint: Financial Aid Initiatives

Budget Year	Community College	PASSHE Universities	State-Related Universities	Independent Universities	Total
2024					0
2025					0
2026	395	362	108	140	1,005
2027	395	362	108	140	1,005
2028	395	362	108	140	1,005
2029	395	362	108	140	1,005
2030	395	362	108	140	1,005
2031	395	362	108	140	1,005
2032	395	362	108	140	1,005
Cumulative Impact	2,765	2,534	756	980	7,035

Note: Students with less than \$70K in AGI pay no more than \$1,000 per semester (\$2,000 per year) starting in 2025. Increase in PHEEA Grants of \$1,000 per eligible student

Source: State Higher Education Executive Officers Association, HCM Strategists

Appendix C: Economic Impact Methodology

Data used to complete the economic impact analysis about the impact of one year of blueprint (48,319 workers obtaining a postsecondary credential or degree) was provided by Baker Tilly to Parker Philips to complete the analysis. The study is a snapshot of the economic impact of one year of investment in the blueprint projected from 2023 to 2032. This is the cumulative impact of one year of investment.

Median base salaries by degree type were obtained from the National Center for Education Statistics and were used as a baseline to calculate the impact by degree type (associate: \$45,000 and bachelor's: \$65,000) and industry cluster with a 3% inflationary increase over the base year over year. In addition, postsecondary credentials or degrees were grouped by occupational cluster in programmed into IMPLAN. Parker Philips used IMPLAN data from 2022 in 2024 dollars.

OVERVIEW AND THE IMPLAN MODEL

The most common and widely accepted methodology for measuring the economic impact is input-output (I-O) analysis. At its core, an I-O analysis is a table that records the flow of resources to and from companies and individuals within a region at a given time. For a specified region, like a state; the input-output table accounts for all dollar flows between different sectors of the economy in a specific time period. With this information, a model can then follow how a dollar added into one sector is spent and re-spent in other sectors of the economy, generating outgoing ripples of subsequent economic activity. This chain of economic activity generated by one event is call the “economic multiplier” effect.

The primary tool used in the performance of this study is the I-O model and dataset developed and maintained by IMPLAN Group LLC (formerly Minnesota IMPLAN Group Inc.). IMPLAN is a widely accepted and used software model first developed by the U.S. Forest Service in 1972. That data used in the baseline IMPLAN model and dataset come largely from federal government databases. The input-output tables themselves come from the Bureau of Economic Analysis. Much of the annual data on labor, wages, final demand, and other market data comes from the Bureau of Labor Statistics, the Census Bureau, and other government sources.

Government agencies, companies and researchers use IMPLAN to estimate the economic activities associated with spending in a particular industry or on a particular project. The IMPLAN model extends conventional I-O modeling to include the economic relationships between government, industry, and household sectors, allowing IMPLAN to model transfer payments such as taxes. Producers of goods and services must secure labor, raw materials, and other services to produce their product.

IMPLAN METHODOLOGY

The model uses national production functions for over 536 industries to determine how an industry spends its operating receipts to produce its commodities. These production functions are derived from U.S. Census Bureau data. IMPLAN couples the national production functions with a variety of county-level economic data to determine the impacts at a state and congressional district level. IMPLAN collects data from a variety of economic data sources to generate average output, employment, and productivity for each industry. IMPLAN combines this data to generate a series of economic multipliers for the Commonwealth of Pennsylvania.

The multiplier measures the amount of total economic activity generated by a specific industry's spending an additional dollar in Pennsylvania. Based on these multipliers, IMPLAN generates a series of tables to show the economic event's direct, indirect, and induced impacts to gross receipts, or output, within each of the model's more than 536 industries. The model calculates three types of effects: direct, indirect, and induced. The economic impact of the one year of investment in the blueprint is the sum of these three effects.

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