SHEEO

STATE HIGHER EDUCATION EXECUTIVE OFFICERS ASSOCIATION

A Federal-State Partnership for True College Affordability

David Tandberg
Sophia Laderman
Andy Carlson

June, 2017

Disclaimer:
This report was made possible thanks to generous support from Lumina Foundation. The views and findings expressed in this paper are those of the authors and do not necessarily reflect the views of Lumina Foundation.

The State Higher Education Executive Officers (SHEEO) is the national association of the chief executives of statewide governing, policy, and coordinating boards of postsecondary education. Founded in 1954, SHEEO serves its members as an advocate for state policy leadership, as a liaison between states and the federal government, as a vehicle for learning from and collaborating with peers, as a manager of multistate teams to initiate new programs, and as a source of information and analysis on educational and public policy issues. SHEEO seeks to advance public policies and educational practices to achieve more widespread access to and completion of higher education, more discoveries through research, and more applications of knowledge that improve the quality of human lives and enhance the public good.

Table of Contents

Executive Summary

In the United States, the cost of higher education has become an acute problem for many families. The cost limits opportunity, keeping entire segments of the population from receiving the benefits of a postsecondary education. In order to significantly increase educational attainment rates, the cost of higher education for students and their families must be addressed in new and systemic ways. In 2014, Lumina Foundation organized an effort to generate new ideas for approaches to student financial aid. As part of this effort, the State Higher Education Executive Officers (SHEEO) proposed a federal-state student financial aid partnership. Other organizations and researchers proposed other models and, once each of the proposals had been considered, Lumina produced their recommendations regarding an affordability benchmark which they titled *The Rule of 10*.

Under the proposed SHEEO model, federal funds would match any additional funding the states provided to support low-income students, with the goal of each state eventually meeting an affordability threshold of students devoting no more than 10% of their discretionary income toward student loan repayment. The Lumina *Rule of 10* affordability benchmark argues that students and their families should pay no more for college than the family savings that can be generated through 10% of discretionary income for the 10 years prior to the student's enrollment (which may be little to nothing for low-income students) plus the earnings from working 10 hours a week while in school. This benchmark creates a time horizon for paying for college and integrates reasonable thresholds for different family income levels.

In this paper we reexamine the original SHEEO model, update the data and analyses, revise some of the basic assumptions, and extend our analyses to part-time and adult students. We also present and cost out the Lumina *Rule of 10* affordability model. Our high-level results include:

- In order for each state to meet the affordability threshold of the revised SHEEO model (students devote no more than 10% of their discretionary income toward student loan repayment) in the fourth year of implementation, the total cost nationally is projected to be just under $12 billion for full-time, first-time traditional students (with the cost estimated to be $4 billion, half from states and half from the federal government, in the first year).

- Extending the revised SHEEO model to part-time and adult students is estimated to cost an additional $21.8 billion nationally to meet the affordability threshold (again, with half covered by the states and half covered by the federal government).

- Nationally, to meet Lumina's affordability threshold[1], it is estimated to cost almost $11 billion per year for full-time, traditional-age students.

Shown graphically, *Table 1* includes the estimated costs to meet both affordability thresholds for each of the targeted student groups in the final year of our estimates.

[1] Family savings of 10% discretionary income for 10 years plus student income from working while in school. Therefore, the threshold differs by family income and by state.

TABLE 1:
ESTIMATED COSTS TO MEET AFFORDABILITY THRESHOLD USING SHEEO AND LUMINA MODELS, BY STUDENT TYPE

	2020-2021
SHEEO MODEL	
TRADITIONAL STUDENTS	**$11,979,773,859**
PART TIME (UNDER 25)	$6,286,023,682
PART TIME (25 AND ABOVE)	$7,246,873,683
FULL TIME (25 AND ABOVE)	$8,229,632,039
ALL STUDENTS	**$33,742,303,263**
LUMINA MODEL (TRADITIONAL STUDENTS)	**$10,888,248,339**

Note: Assumes full implementation by 2020 and uses predicted fall 2020 enrollment (NCHEMS & SHEEO).

Source: State Higher Education Executive Officers

Our estimates reveal a larger cost for non-traditional students than for traditional students. Clearly, more needs to be done. While we do not expect that the entire gap can be met all at once, states and the federal government ought to reevaluate their financial aid requirements. Are they unnecessarily restricting access for part-time and adult students? This is particularly problematic as non-traditional students are a growing population of postsecondary students, without whose success in postsecondary education our country cannot remain competitive and meet its educational attainment goals. This point is manifest in the fact that, in our estimates, there are more than double the number of part-time and adult students than full-time, first-time students.

While the costs shown here are significant, they appear more feasible when the state share is isolated and compared to overall state educational appropriations and if the costs are spread out over multiple years. If we focus only on the state portion (50%) of the cost of meeting the SHEEO affordability threshold and spread that cost over four years, it would require a 2% increase in total state educational appropriations per year over the four years, on average, to meet the costs for traditional students. To meet the cost for all students, it would require a 5% increase each year for four years. These increases are not insignificant and vary by state, but may be manageable for many states.

The models discussed here are presented as starting points for broader discussions on how to better target resources to make college more affordable for students with documented financial need. We conclude that, while the models presented here assume a federal-state partnership, states need not wait for the federal government to act on addressing affordability and improving student success. Students are responsible for paying that price now, and for many the cost is too high. Each state will need to approach increasing student access and success in a way that reflects its state population and budgets. However, as our estimates reveal, nearly every state must do more to ensure affordability, and with each passing year more and more students are being priced out of postsecondary education. For their sake, and for the sake of the states' own future well-being, states need to act.

Introduction

If states are to achieve their postsecondary education attainment goals they must take direct and immediate action to address the equity gaps between underserved populations and upper-income white and Asian students (who are succeeding at higher rates). One necessary step in closing these gaps is to make college affordable to low-income individuals. Reducing these gaps and increasing educational attainment generally, is both a moral imperative and an economic imperative. Not only is earning a postsecondary credential essential for individual economic vitality, it is also necessary to the economic vitality of our states and our nation. As Steve Murdock (2015), demographer and former director of the U.S. Census Bureau, has said, the economic prosperity of the entire nation hinges on reducing these gaps, since reducing them is the single greatest way for us to drive economic growth and if progress is not made our economy will suffer. In that regard, the federal-state partnerships for college affordability we review in this white paper could properly be termed *partnerships for the future of America*. The need to address college affordability is that important.

This white paper, written with support from Lumina Foundation as an update to SHEEO's 2014 *Moving the Needle* report," (Carlson & Zaback, 2014)[2] examines innovative policies to improve college affordability for students from families in the two lowest income quintiles, using updated data and analyses. The policies examined here update the data from SHEEO's original proposed partnership between willing states and the federal government to direct funds from both states and the federal government toward reducing net price for lower-income students. Under this federal-state partnership, the federal funds would match any additional funding the states provide to low-income students. In this paper we also take the analyses beyond the scope of the original report by exploring what it may cost to extend such a partnership to include two of the fastest growing populations in postsecondary education—part-time and adult students—in response to an acknowledged criticism of the original 2014 proposal which focused exclusively on traditional age, full-time students.

As articulated in *Moving the Needle*, existing grant aid programs do not provide sufficient support to allow a great number of students with documented need to cover the full cost of higher education. Therefore, many low-income individuals never enroll in college and or have a difficult time remaining enrolled because they must work, some full time, and are unable to devote themselves to full-time study. Research has shown this to be the case. College costs have a significant negative impact on the likelihood of potential students enrolling in college and on both timely college completion and on the likelihood of completing college at all. This is particularly the case for low-income students (e.g., Bowen, Chingos, & McPherson, 2009).

Focusing on the varying contexts of individual states, we discuss and cost out two proposed state and federal partnership proposals for college affordability. We reexamine our original 2014 model, updating some of the assumptions with newly available data, and examine a model proposed by Lumina Foundation. While our model explored here is based on a partnership between states and the federal government, the primary responsibility for funding public higher education and helping ensure affordability and student success lies with the states. State leaders may choose to act independently of the federal government to address affordability challenges and to focus financial aid on those students who most need it. The need and urgency are great: states must address this fundamental barrier to

[2] The 2014 report is available here:
http://www.sheeo.org/sites/default/files/publications/Moving_the_Needle_041414.pdf

student success in order to make progress towards the attainment goals that so many of them have established as necessary for the future well-being of their citizens (Matthews, 2016).

In the sections that follow we will first present data on the current costs of higher education for full-time, part-time, and adult students at 2-year and 4-year public institutions. Second, we present our revised federal-state partnership model and the Lumina *Rule of 10* model, discussing and comparing their construction and basic assumptions. We also cost out our revised SHEEO model and the Lumina model for each of the states and nationally. We then present national figures on what it would cost to extend the SHEEO model to part-time and adult students. Finally, we end by discussing how states might approach increasing their educational appropriations in order to meet the SHEEO affordability threshold.

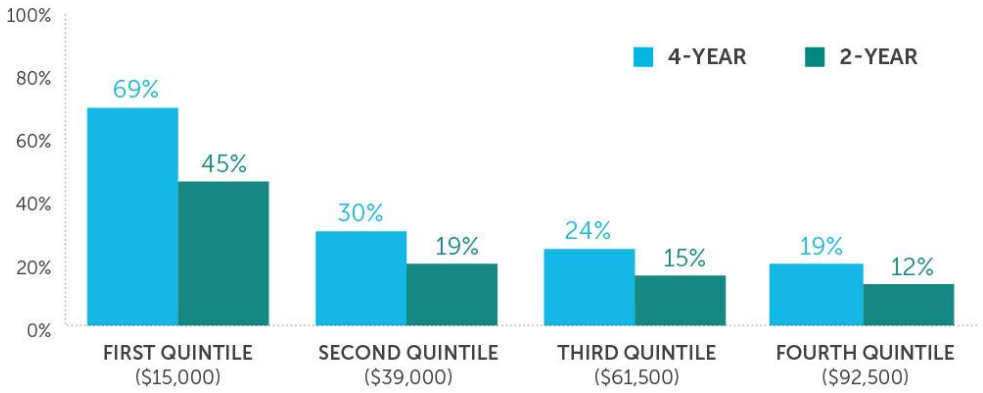
Section 1. The Costs of Higher Education

Student loan debt and the cost of higher education in the United States have received considerable attention in the popular media and in the academic literature. The price of higher education has grown faster than the cost of health insurance, prescription drugs, and family income (The College Board, 2016; Bureau of Labor Statistics, 2017). While, on average, top earners have experienced significant income growth over the last several decades, middle- and lower-income earners have not experienced comparable growth (Stone, Trisi, Sherman, & Horton, 2016). The combination of these two trends has resulted in an increasingly large gap between the cost of college and a family's ability to pay for college.

Not surprisingly, both college participation and attainment rates are considerably higher for students in the highest income quartile compared with those in the lowest income quartile (Bailey & Dynarski, 2011; Belley & Lochner, 2007). Researchers further found that low-income students are less likely to enroll in college even when controlling for student achievement (Hoxby & Avery, 2012; Bowen, Chingos, & McPherson, 2009). This is concerning for many reasons including that future earnings are clearly associated with educational attainment. Over a lifetime, the average difference between a high school and college graduate's wages is $1 million (Carnevale, Cheah, & Hanson, 2015). And the impacts reverberate across generations, as children from higher-income families, and those whose parents went to college, are significantly more likely to attend and graduate from college (Putnam, 2015).

In *Figure 1*, we take the average net price[3] as a percent of the median income within each of the lowest four income quintiles. As this figure shows, those who come from families earning $15,000 (median income of the bottom income quintile) experience a disproportionately larger burden in paying for college, with net price making up as much as 69% of their annual income.

FIGURE 1:
AVERAGE U.S. NET PRICE AT PUBLIC 2- AND 4-YEAR INSTITUTIONS AS A PERCENT OF INCOME, FOR FAMILIES IN THE FIRST FOUR QUINTILES, 2014



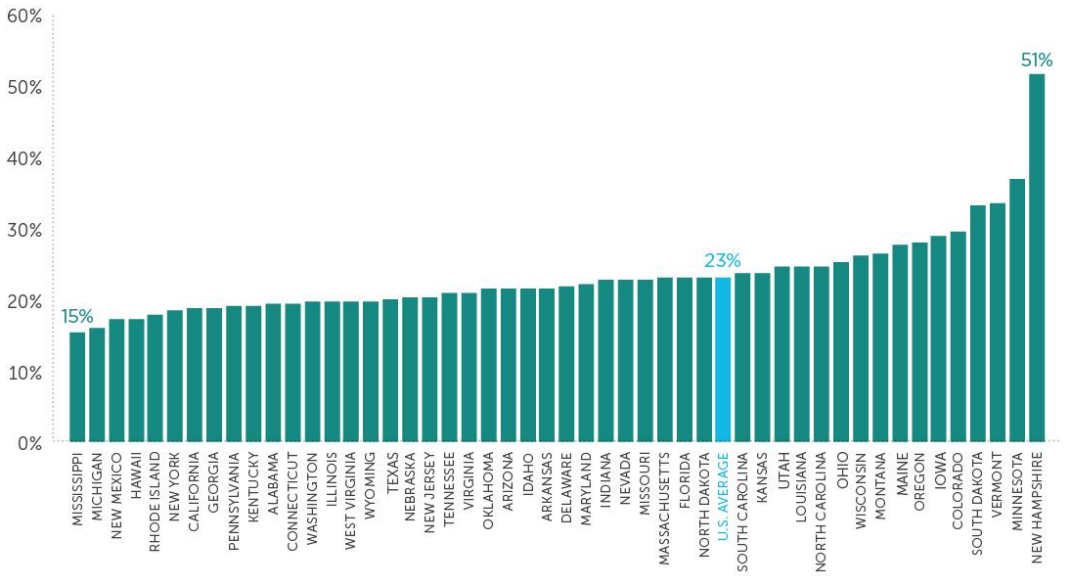
Note: Based on the middle-point income for each of the lowest four income quintiles ($0-$30,000, $30,001-$48,000, $48,001-$75,000, $75,001-$110,000).

Source: IPEDS 2013-2014 average net price calculations in *Table A-1* in the *Appendix*

[3] Net price is calculated by subtracting the average amount of federal, state/local government, and/or institutional grant and scholarship aid from the total cost of attendance using IPEDS 2013-2014 Average Net Price by Income Quintile and Total Price for In-State Students (weighted by living situation).

However, these national data obscure the significant state-to-state variance in what we call the college cost burden. For example, in *Figures 2* and *3*, we show a 240% difference between the highest (New Hampshire) and lowest (Mississippi) states in average net price as a percent of income for students attending 2-year institutions from households making $30,000 (median income of those families of four in the first two income quintiles). For students attending a 4-year institution, there is a 121% difference between the highest and lowest states (New Hampshire and Alaska). See *Appendix A* for tables detailing the average cost of attendance, net price, and percent of cost of attendance covered by aid for the first four family income quintiles by state for 2-year and 4-year institutions separately.

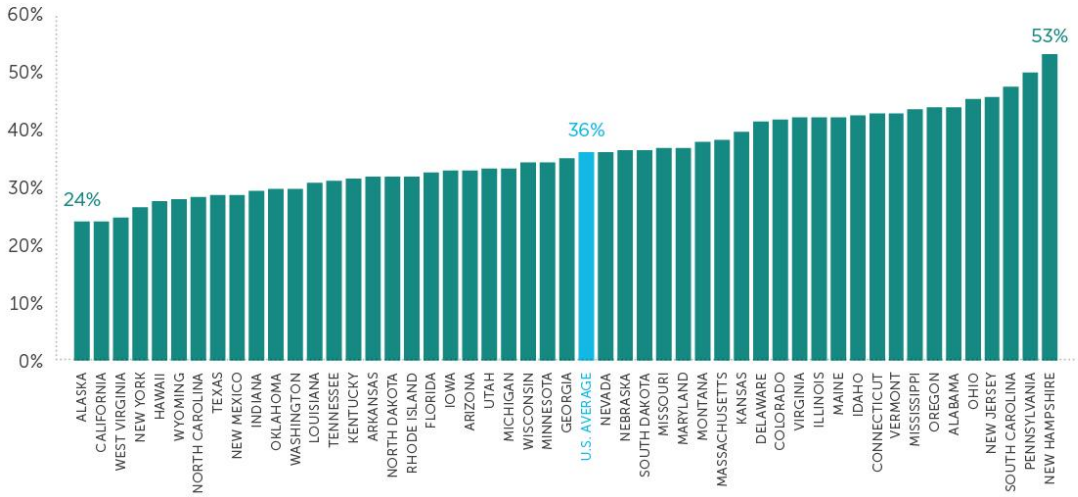
FIGURE 2:
NET PRICE AS A PERCENT OF INCOME FOR FAMILIES EARNING $30,000 AT PUBLIC 2-YEAR INSTITUTIONS, 2014



Notes: $30,000 is the middle-point income for families of four at or below 200% of Federal Poverty. Alaska is excluded from the figures above because it does not have a 2-year sector.

Source: IPEDS 2013-2014 average net price calculations in *Table A-1* in the Appendix and 2016 Federal Poverty Guidelines.

FIGURE 3:
NET PRICE AS A PERCENT OF INCOME FOR FAMILIES EARNING $30,000 AT PUBLIC 4-YEAR INSTITUTIONS, 2014

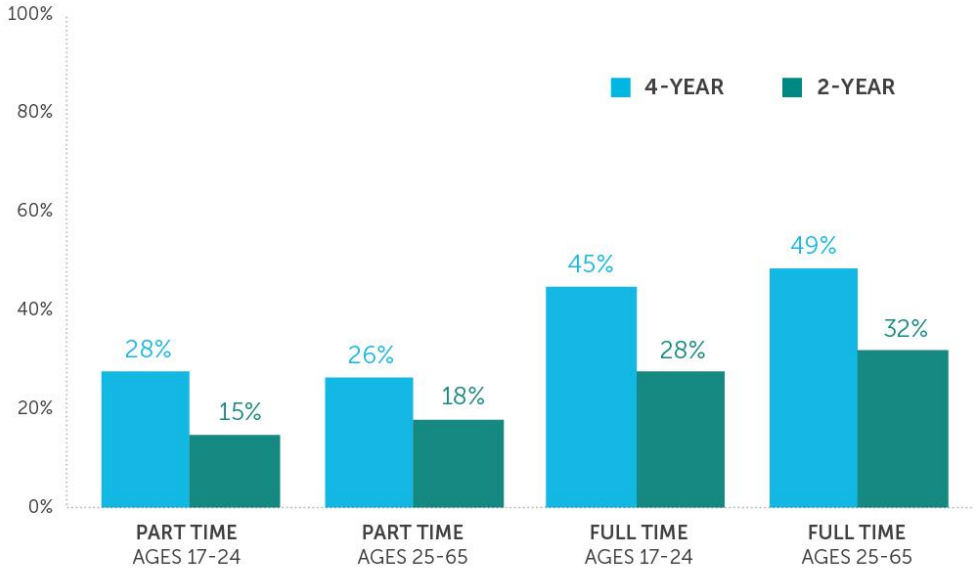


Note: $30,000 is the middle-point income for families of four at or below 200% of Federal Poverty.

Source: IPEDS 2013-2014 average net price calculations in *Table A-1* in the Appendix and 2016 Federal Poverty Guidelines

Income data from the Integrated Postsecondary Education Data System (IPEDS) do not allow us to analyze the cost burden for part-time and adult students by income across the states. However, nationally representative data from the National Postsecondary Student Aid Study, administered by the U.S. Department of Education, allow us to explore these issues at a national level. As seen in *Figure 4*, net price is a significant burden for both part-time and full-time students from families of four making $30,000 (midpoint for such families at or below 200% of Federal Poverty).

FIGURE 4:
AVERAGE U.S. NET PRICE FOR PART-TIME AND ADULT STUDENTS AT PUBLIC 2- AND 4-YEAR INSTITUTIONS AS A PERCENT OF INCOME, FOR FAMILIES EARNING $30,000, 2012



Note: $30,000 is the middle point of the first two income quintiles and represents median income for a family of four at or below 200% of the Federal Poverty Line.

Source: NPSAS 2012 net price calculations in *Table 5*

As our original report argued, to increase student progress and completion and meet state and national attainment goals, financial assistance must be targeted at students not now completing degrees. Most critically, policymakers and others concerned with educational attainment must focus on students who are academically able but who fail to pursue and complete postsecondary education because they believe it is financially out of reach. As the cost of attendance increases, lower-income students at all levels of ability are much less likely to aspire to college and less likely to enroll at all (Destin & Oyserman, 2009; Leslie & Brinkman 1988). For example, the most recent data from the National Education Longitudinal Survey (NELS, 2013) show that the lowest academically performing high school students from the highest income quartile have the same probability of attending college as the highest academically performing students from the lowest income quartile.

Further, lower-income students, even academically high- achieving low-income students, are less likely to complete college. NELS data reveal that the highest-scoring students from the bottom quartile are now less likely to earn a college degree than the lowest-performing students from the highest income quartile (Putnam, 2015). These lower-income students and their families may find higher education to be unaffordable, may need to work while in college and provide assistance to their families, may lack a clear understanding of the types of aid available, and may suffer from "sticker shock" when presented with the price of attending college (Kane, 1995; McPherson & Schapiro, 1998). Lower-income students need assurance of their ability to afford postsecondary education and, once enrolled, need predictable and transparent costs and adequate financial assistance to remain enrolled. These data have been understood for a number of years, yet little progress has been made in closing gaps among lower- and

higher-income individuals. SHEEO put forth one strategy for reducing net price for the lower-income students in 2014 and this white paper updates and improves upon that strategy and examines Lumina's model of postsecondary affordability.

Section 2. Strategies to Address Affordability

In recent years, a number of organizations recommended federal-state partnerships that primarily encouraged states to invest additional funds in their higher education institutions. Most of the proposals did not explicitly help additional lower-income students enroll. In 2014, Lumina Foundation supported a series of papers that explored what new affordability models might look like. These papers were released at the 2014 Lumina Ideas Summit in Washington, D.C. SHEEO's *Moving the Needle* was one of those papers [4]. Following the Summit, Lumina produced their recommendations regarding an affordability benchmark (*The Rule of 10*). In this section we discuss both SHEEO's updated federal-state partnership for affordability and Lumina's *Rule of 10* and provide cost estimates for each.

SHEEO's federal-state matching grant program:

In its 2014 report, SHEEO proposed a federal-state matching framework designed to reduce net price for lower-income students and encourage states to focus on policies that ensure greater completion (Carlson & Zaback, 2014). Our proposal built on existing financial aid allocations from all sources in each state. It was designed to encourage states (in part, through federal matching dollars) to target additional funding to need-based financial aid programs and to reduce net price for students from lower-income families. The proposal focused primarily on reducing net price for students falling within the two lower income quintiles (those students within 200% of the poverty threshold).

We proposed to use existing policies to define affordability. The model was forward looking; meaning that it was, in part, indexed to students' likely future earnings, reflecting the benefits of earning their college degrees. The income based repayment plans utilized by the Department of Education for loan debt provided a reasonable threshold for affordability. The theory behind these plans is that students can reasonably afford to pay a portion of their discretionary income toward student loan repayment. Our previous formula utilized 15% of discretionary income. However, 10% has become a more commonly discussed norm for income-based repayment plans and is the percentage utilized by Lumina in its model. Therefore, we have adjusted our model to utilize 10% of discretionary income[5].

Following SHEEO's original model, we used this formula to calculate a state threshold, using median income for workers (in each state) with the appropriate degree level and the Federal Poverty threshold to estimate average discretionary income, and calculated what a reasonable total loan threshold would be if a person were to pay that amount over 10 years following graduation. The revised SHEEO model determines an affordable net price for each sector in each state. The model assumes that after earning a degree, students, with an income exceeding 150% of the Federal Poverty threshold for a family of three, can afford to pay 10% of their income toward student loans. For additional details on our methodology and model assumptions see *Appendix B*.

[4] http://www.sheeo.org/resources/publications/moving-needle-how-financial-aid-policies-can-help-states-meet-student

[5] We also calculate program costs using 15% and include those figures in the *Appendix Table A-12*.

The Lumina Rule of 10: 10 percent for 10 years + 10 hours of work

The Lumina *Rule of 10* affordability benchmark[6] argues that students and their families should pay no more for college than the family savings that can be generated through 10% of discretionary income for 10 years prior to their enrollment (which may be little to nothing for low-income students), plus the earnings from working 10 hours a week while in school. The benchmark creates a time horizon for paying for college and integrates reasonable thresholds for different family income levels. The affordability benchmark is calculated based on the assumption that individuals and families making more than 200% of the poverty rate can afford to save 10% of their discretionary income. This line also serves as an *income exclusion*, so that no one is expected to save until they reach at least 200% of the poverty level (the 2016, 200% of the poverty rate is $23,760 for a single person and $48,600 for a family of four, as used in our model). Under the Lumina benchmark, students are expected to work an average of 10 hours per week while in school, or 500 hours per year, and contribute those earnings toward the cost of education. For example, ten hours of work at federal minimum wage ($7.25) would be $3,625 annually or $14,500 over the course of a degree that takes four years to complete. This amount would be available to help cover the full costs of college while enrolled, including living expenses.

Comparing the Models

In *Table 2* we compare the specific requirements and basic assumptions of each model. As the table shows, there are significant differences between the two models. SHEEO's income-based repayment model is forward looking and is connected to students' future earnings, reflecting the benefits of earning their college degree. Lumina's model accounts for students' work during college, while SHEEO's does not. Likewise, Lumina's model uses 200% of the Federal Poverty level for a family of four as the family savings threshold and SHEEO's model applies a 150% of poverty threshold for a family of three, meaning that those families in the second income quintile are expected to contribute something toward the cost of their student's education under the SHEEO model. Both models assume that 10% of discretionary income will go toward higher education.

[6] For more details on the Lumina model see: https://www.luminafoundation.org/files/resources/affordability-benchmark-1.pdf and the methodology and model assumptions employed in costing out Lumina's model, see *Appendix B*.

TABLE 2:
COMPARISON OF AFFORDABILITY MODEL ASSUMPTIONS (USING U.S. AVERAGES AT 4-YEAR INSTITUTIONS)

	SHEEO MODEL				LUMINA RULE OF 10 MODEL			
MODEL PERSPECTIVE	Based on future earnings of the graduate				Based on family income of the student			
FEDERAL/STATE PARTNERSHIP	Federal government matches additional state funds used to reduce net price for low income families.				Not specified			
FEDERAL POVERTY LEVEL	150% for a family of three ($30,240)				200% for a family of four ($48,600)			
FAMILY SAVINGS	None				10% of family income above poverty for 10 years			
STUDENT'S CONTRIBUTION (LOANS AND/OR WORK STUDY)	10% of discretionary income from future earnings (U.S. Avg $51,643) for 10 years				500 hours per year of work study at minimum wage ($7.25) while enrolled			
INCOME QUINTILE	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
MEDIAN FAMILY INCOME	$15,000	$39,001	$61,501	$92,501	$15,000	$39,001	$61,501	$92,501
FAMILY SAVINGS				$-	$-	$-	$12,901	$43,901
STUDENT'S CONTRIBUTION	$21,403				$18,125			
AFFORDABILITY THRESHOLD FOR A BACHELOR'S DEGREE	**$21,403**	**$21,403**	**$21,403**	**$21,403**	**$18,125**	**$18,125**	**$31,026**	**$62,026**

Notes: Calculations in this table use U.S. median income for persons with a bachelor's degree and U.S. minimum wage.

Sources: U.S. Dept. of Labor, NCSL State Minimum Wage chart, Lumina's *Rule of 10*, and 2016 Federal Poverty Guidelines.

Costing out the SHEEO and Lumina Models

In *Table 3* we estimate the state-by-state costs associated with reducing college costs for students in the lowest two income quintiles. As a change from our original report, we employ likely college-going rates for all students and likely retention rates for students in the bottom two income quintiles (Beginning Postsecondary Students (BPS) 04:09 survey). We use likely college-going rates for all students because these rates have traditionally been higher than those for low-income students. We anticipate that a financial aid model like we are proposing would incentivize more low-income students to enroll in college, thereby bringing their rates closer to those of all students.[7] In this updated model we attempt to approximate more closely the anticipated actual access and progression rates to more accurately estimate the potential costs. The revised college-going, retention, and completion rate assumptions are presented and discussed in *Appendix B*.[8]

Further, we extend our previous analysis by calculating the projected costs associated with each state meeting the SHEEO affordability threshold. In the prior iteration, we modeled the cost to reduce net price for students in the bottom two income quintiles by $4,000. In order for each state to actually meet the threshold, the cost is significantly higher (as shown in *Table 3*) than simply reducing the cost by $4,000, as assumed in our original analyses (see: Carlson & Zaback, 2014, Table 2). Also, as noted earlier, we now use 10% of discretionary income as our affordability threshold.[9] In the fourth year, the total cost nationally is projected to be just under $12 billion for all states to meet the affordability threshold, up from $4 billion in the first year.

[7] For projected state enrollment rates see *Table A-11* in the appendix.
[8] The first report utilized an aspirational model in that it assumed that 60 % of students would attend college, and 100 % would retain and complete. It also only modeled the cost to reduce net price for students in the bottom two income quintiles by $4,000. For an updated version of the original 2014 model, see *Appendix Table A-5*.
[9] We calculate program costs using 15% of discretionary income and include those figures in the *Appendix Table A-10*.

TABLE 3:
USING LIKELY COLLEGE-GOING AND RETENTION RATES — ESTIMATED COSTS FOR STATES TO MEET SHEEO'S AFFORDABILITY THRESHOLD FOR FIRST-TIME FULL-TIME STUDENTS AT OR BELOW 200% OF POVERTY

	YEAR 1 - 2017-2018	YEAR 2 - 2018-2019	YEAR 3 - 2019-2020	YEAR 4 - 2020-2021
ALABAMA	$98,690,031	$185,708,172	$260,312,831	$311,882,808
ALASKA	$276,408	$530,643	$763,201	$979,925
ARIZONA	$85,247,318	$164,402,283	$230,875,446	$268,984,915
ARKANSAS	$66,592,980	$126,266,427	$177,717,766	$213,316,086
CALIFORNIA	$434,381,651	$804,376,165	$1,076,963,176	$1,134,073,718
COLORADO	$83,340,451	$155,964,955	$216,660,838	$259,895,160
CONNECTICUT	$18,741,445	$35,556,486	$49,802,462	$58,532,676
DELAWARE	$9,145,577	$17,397,674	$24,721,361	$30,026,097
FLORIDA	$290,032,680	$535,644,456	$731,252,928	$811,384,977
GEORGIA	$153,984,268	$293,477,754	$410,665,806	$489,487,511
HAWAII	$5,709,330	$10,599,975	$14,420,949	$16,080,450
IDAHO	$25,091,725	$48,623,246	$69,293,030	$84,706,424
ILLINOIS	$105,382,443	$198,889,694	$277,872,538	$326,599,632
INDIANA	$79,176,757	$148,687,356	$207,894,670	$249,860,546
IOWA	$39,712,386	$73,909,222	$100,608,464	$111,208,766
KANSAS	$53,629,345	$101,288,365	$142,650,602	$170,344,245
KENTUCKY	$56,138,518	$105,935,074	$146,748,885	$174,242,884
LOUISIANA	$87,505,226	$165,332,498	$230,337,736	$270,399,464
MAINE	$16,639,892	$31,875,320	$44,961,376	$54,242,079
MARYLAND	$37,198,571	$71,118,262	$99,811,241	$118,052,094
MASSACHUSETTS	$44,587,028	$84,186,186	$116,359,872	$134,487,335
MICHIGAN	$97,580,591	$186,358,875	$262,751,773	$322,338,178
MINNESOTA	$55,309,726	$103,363,385	$141,701,571	$158,987,200
MISSISSIPPI	$74,035,749	$139,823,697	$193,495,352	$225,683,358
MISSOURI	$94,894,922	$179,194,390	$249,602,974	$288,661,957
MONTANA	$17,489,240	$33,222,084	$47,259,705	$57,443,978
NEBRASKA	$27,180,978	$52,484,637	$75,364,796	$93,559,747
NEVADA	$26,580,415	$50,274,575	$70,689,881	$84,450,818
NEW HAMPSHIRE	$15,462,837	$28,876,828	$39,631,249	$44,691,438
NEW JERSEY	$60,299,505	$115,722,365	$166,390,726	$208,520,517
NEW MEXICO	$32,851,169	$61,722,392	$85,776,612	$99,424,022
NEW YORK	$136,215,109	$253,088,594	$346,287,400	$385,727,793
NORTH CAROLINA	$161,739,873	$304,068,761	$414,065,793	$459,457,564
NORTH DAKOTA	$6,053,421	$11,425,304	$15,962,943	$18,838,059
OHIO	$243,030,059	$458,329,881	$643,582,665	$777,542,808
OKLAHOMA	$48,936,666	$93,804,316	$132,602,377	$158,393,521
OREGON	$56,877,204	$106,600,285	$147,170,595	$169,357,485
PENNSYLVANIA	$177,911,308	$339,792,154	$487,982,656	$611,587,826
RHODE ISLAND	$5,557,642	$10,783,300	$15,740,848	$20,208,674
SOUTH CAROLINA	$90,863,552	$171,363,818	$238,417,291	$280,492,643
SOUTH DAKOTA	$12,498,334	$23,822,990	$33,587,417	$40,618,691
TENNESSEE	$72,436,002	$136,757,940	$192,818,834	$232,011,327
TEXAS	$354,694,066	$664,957,946	$914,237,002	$1,020,361,894
UTAH	$41,615,525	$79,964,155	$113,411,805	$140,511,637
VERMONT	$4,742,538	$8,989,569	$12,725,848	$15,512,641
VIRGINIA	$106,244,236	$200,862,375	$285,448,599	$338,360,509
WASHINGTON	$41,973,234	$78,997,980	$108,377,151	$121,296,839
WEST VIRGINIA	$19,623,928	$37,408,913	$52,691,477	$63,303,420
WISCONSIN	$76,764,662	$146,000,806	$204,691,386	$242,976,891
WYOMING	$3,645,824	$6,871,085	$9,453,175	$10,664,630
U.S.	**$3,954,312,346**	**$7,444,703,619**	**$10,332,615,079**	**$11,979,773,859**

Notes: The model is fully implemented in year four. Data reflect in-state first-time freshmen directly out of high school. Poverty status is based on family income for individuals age 0-17. This model assumes that college-going rates for students at or below 200% of poverty are equal to college-going rates for all students in a state. Persistence and graduation rates are based on 3- and 5-year BPS data for full-time, in-state students at public institutions up to 200% of Federal Poverty. The model supports students for 150% of on-time degree completion.

Sources: WICHE *Knocking at the College Door Projections of High School Graduates* through 2021, calculations by NCHEMS (data from NCES, IPEDS Fall 2014 Residency and Migration File, U.S. Census Bureau, 2015 American Community Survey), and SHEEO graduation and persistence estimates using data from BPS 04/09.

TABLE 4:
USING LIKELY COLLEGE-GOING AND RETENTION RATES — ESTIMATED COSTS FOR STATES TO MEET LUMINA AFFORDABILITY THRESHOLD FOR FIRST-TIME FULL-TIME STUDENTS AT OR BELOW 200% OF POVERTY

	YEAR 1 - 2017-2018	YEAR 2 - 2018-2019	YEAR 3 - 2019-2020	YEAR 4 - 2020-2021
ALABAMA	$94,615,220	$178,960,898	$253,463,585	$311,703,321
ALASKA	$2,777,704	$5,332,583	$7,669,619	$9,847,541
ARIZONA	$77,785,239	$150,339,805	$212,076,869	$250,059,765
ARKANSAS	$44,128,919	$84,221,299	$120,102,114	$148,977,354
CALIFORNIA	$154,797,176	$292,649,262	$409,269,993	$487,161,972
COLORADO	$80,281,830	$150,396,290	$209,365,270	$252,487,940
CONNECTICUT	$17,391,301	$33,372,222	$47,821,315	$59,560,292
DELAWARE	$9,382,343	$17,844,084	$25,344,390	$30,748,027
FLORIDA	$226,134,016	$419,885,071	$579,657,848	$663,587,206
GEORGIA	$187,451,816	$358,539,909	$505,357,234	$613,579,367
HAWAII	$2,789,474	$5,253,745	$7,362,484	$8,887,121
IDAHO	$21,987,192	$42,801,298	$61,551,693	$76,947,267
ILLINOIS	$99,503,337	$188,775,365	$266,538,595	$321,966,961
INDIANA	$80,997,488	$152,194,516	$213,047,469	$256,816,626
IOWA	$42,805,359	$79,900,761	$109,441,817	$123,119,689
KANSAS	$52,394,281	$99,210,637	$140,448,058	$169,955,170
KENTUCKY	$51,370,899	$97,439,273	$136,410,328	$166,349,555
LOUISIANA	$81,995,787	$155,545,163	$218,480,362	$261,996,908
MAINE	$16,317,899	$31,257,759	$44,088,135	$53,181,989
MARYLAND	$39,934,914	$76,556,369	$108,036,554	$129,621,980
MASSACHUSETTS	$35,297,709	$67,284,553	$94,830,122	$115,305,236
MICHIGAN	$86,616,136	$166,367,783	$237,262,994	$299,252,577
MINNESOTA	$53,303,603	$99,572,981	$136,386,482	$152,648,789
MISSISSIPPI	$49,962,844	$95,194,933	$134,130,668	$163,864,582
MISSOURI	$77,081,331	$146,402,452	$206,348,409	$246,225,007
MONTANA	$15,278,119	$29,054,396	$41,422,532	$50,630,103
NEBRASKA	$20,627,162	$40,096,816	$58,337,223	$74,749,691
NEVADA	$28,670,825	$54,309,671	$76,594,317	$92,217,387
NEW HAMPSHIRE	$17,338,017	$32,369,373	$44,397,682	$49,982,026
NEW JERSEY	$84,033,541	$160,439,464	$228,342,136	$279,034,226
NEW MEXICO	$22,701,994	$42,950,435	$60,536,416	$72,815,981
NEW YORK	$73,023,070	$138,413,844	$197,234,384	$244,568,690
NORTH CAROLINA	$138,845,392	$262,824,197	$363,110,943	$419,385,528
NORTH DAKOTA	$5,577,041	$10,576,361	$14,919,805	$18,050,031
OHIO	$216,705,486	$409,587,434	$577,696,051	$705,772,259
OKLAHOMA	$50,873,563	$97,723,063	$138,731,860	$167,545,024
OREGON	$45,198,966	$85,048,198	$118,375,645	$139,217,058
PENNSYLVANIA	$198,379,545	$379,277,931	$545,795,778	$687,405,440
RHODE ISLAND	$5,681,227	$10,972,911	$15,876,554	$19,956,820
SOUTH CAROLINA	$84,002,886	$158,857,033	$222,249,855	$265,288,167
SOUTH DAKOTA	$11,619,727	$22,201,369	$31,452,375	$38,500,835
TENNESSEE	$76,916,998	$145,446,298	$205,715,315	$249,521,812
TEXAS	$335,030,229	$634,014,430	$888,739,190	$1,045,997,779
UTAH	$35,535,051	$68,419,271	$97,432,511	$121,908,566
VERMONT	$4,357,622	$8,252,355	$11,660,739	$14,148,466
VIRGINIA	$106,225,442	$202,348,533	$291,868,126	$359,471,557
WASHINGTON	$32,632,361	$62,339,889	$88,186,874	$107,115,476
WEST VIRGINIA	$12,781,328	$24,495,721	$34,875,696	$43,047,137
WISCONSIN	$74,674,694	$142,085,257	$199,371,581	$237,187,021
WYOMING	$3,738,054	$7,040,917	$9,675,330	$10,879,019
U.S.	**$3,387,552,157**	**$6,424,444,178**	**$9,047,091,325**	**$10,888,248,341**

Notes: The model is fully implemented in year four. Data reflect in-state first-time freshmen directly out of high school. Poverty status is based on family income for individuals age 0-17. This model assumes college-going rates for students at or below 200% of poverty are equal to college-going rates for all students in a state. Persistence and graduation rates are based on 3- and 5-year BPS data for full-time, in-state students at public institutions up to 200% of Federal Poverty. The model supports students for 150% of on-time degree completion.

Sources: WICHE *Knocking at the College Door Projections of High School Graduates* through 2021, calculations by NCHEMS (data from NCES, IPEDS Fall 2014 Residency and Migration File, U.S. Census Bureau, 2015 American Community Survey), SHEEO graduation and persistence estimates using data from BPS 04/09, and per-student funding gaps from Tables *A-7* and *A-8* in the Appendix.

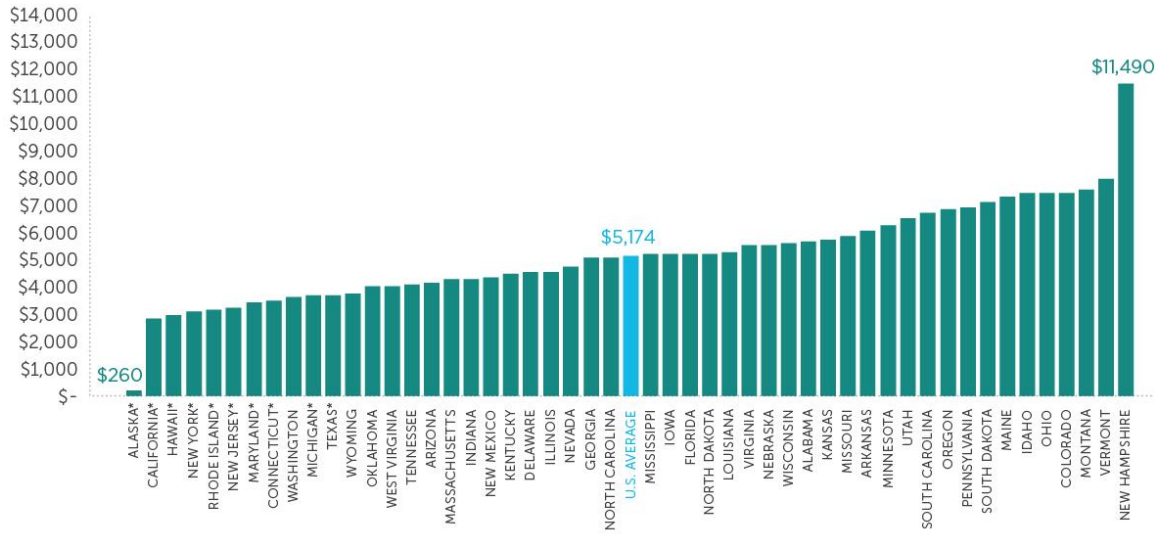
As seen in *Table 4*, under the Lumina model, the costs are projected to be similar (though slightly less) to those projected for the SHEEO model. Nationally, to meet Lumina's affordability threshold[10], it is estimated to cost almost $11 billion in year four.

The state and national figures obscure the actual increase needed per-student for states to meet the affordability thresholds. In *Figure 5* we show the per-student additional investment needed for states to meet SHEEO's threshold. For the students from families earning $30,000 (median income for families from the two lowest income quintiles), the U.S. average is a $5,174 increase. However, the costs are estimated to be as little as $260 for Alaska and $2,825 for California, to as high as $11,490 for New Hampshire (an extreme outlier) and $7,955 for Vermont, the state needing the second highest investment.

For the Lumina affordability model (see *Figure 6*), the national average increase is estimated to be $4,457, with California having the lowest estimated increase at $1,094 and New Hampshire again needing the largest increase of $11,951 (Pennsylvania is estimated as needing the second largest increase of $7,613).

[10] Family savings of 10% discretionary income for 10 years plus student income from working while in school. Therefore, the threshold differs by family income and by state.

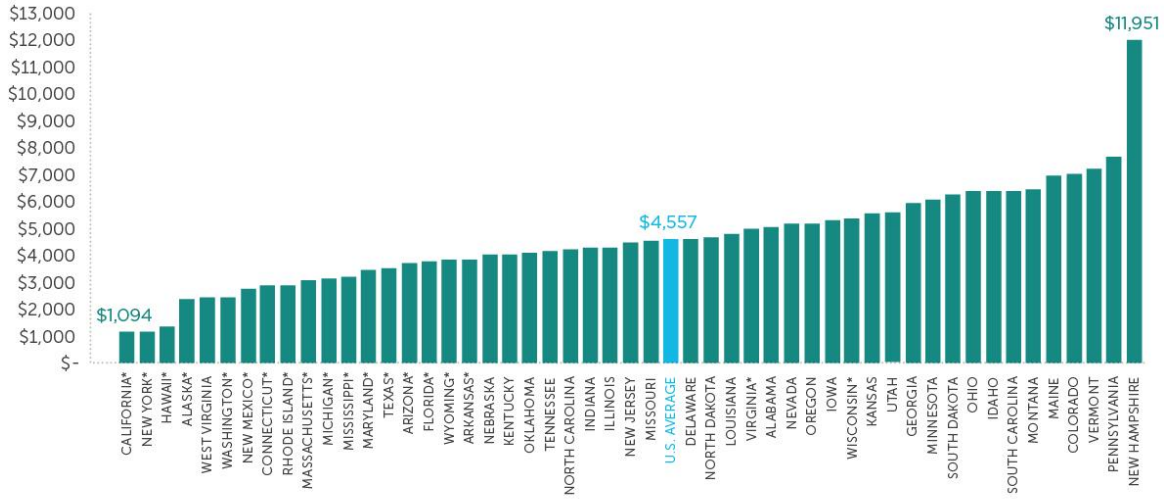
FIGURE 5:
SHEEO MODEL: ADDITIONAL YEARLY PER-STUDENT STATE INVESTMENT NEEDED TO MEET THE AFFORDABILITY THRESHOLD



Note: Cost to meet the SHEEO affordability threshold, based on the median income for a family at or below 200% of Federal Poverty, for students attending all public institutions.

Source: U.S. Census Bureau - Median Income by Education (2015) and IPEDS 2013-2014 Net Price by Income Quintile

FIGURE 6:
LUMINA MODEL: ADDITIONAL YEARLY PER-STUDENT STATE INVESTMENT NEEDED TO MEET AFFORDABILITY THRESHOLD (AVERAGE OF PUBLIC 2- AND 4-YEAR INSTITUTIONS FOR FAMILIES OF FOUR EARNING $30,000)



Note: Cost to meet the Lumina affordability threshold, based on the median income for a family at or below 200% of Federal Poverty, for students attending all public institutions.

Source: U.S. Dept. of Labor, NCSL State Minimum Wage chart, IPEDS 2013-2014 Net Price by Income Quintile. Calculations are based on the Lumina *Rule of 10*.

Section 3. Part-Time and Adult Students

Between 2004 and 2014 part-time student enrollments grew by 17% and enrollments of students age 25 and over increased by 16% (NCES, 2016). Students over the age of 25 now comprise 40% of undergraduate students in postsecondary education (Taliaferro & Duke-Benfield, 2016). These trends are expected to continue and are likely to increase. While SHEEO's original affordability model was focused on full-time students and encouraging full-time enrollment, we recognize that not all students will be able to enroll full-time but nonetheless face significant costs barriers. Similarly, adult students face unique and significant challenges in earing a postsecondary degree.

While our model and cost estimates (including those above) included only first-time students who were enrolled full time, this was primarily due to data constraints. IPEDS only include first-time, full-time students in their income brackets. In this section, we extend our analyses to part-time and adult students using data from a representative federal survey of postsecondary students. While the data do not allow for state breakouts, we are able to generate national estimates. We include additional details on our data and methods in *Appendix B.*

As *Table 5* shows, part time and adult students face significant cost burdens. This is particularly true for those students who come from families in the bottom two income quintiles, where net price can be as high as $15,785 for full time adults in the second income quintile attending 4-year institutions.

TABLE 5:
COST OF ATTENDANCE AND CURRENT NET PRICE FOR NON-TRADITIONAL STUDENTS

			FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)		FAMILY INCOME ($48,001-$75,000)		FAMILY INCOME ($75,001-$110,000)	
	Enrollment	Cost of Attendance (COA)	Net Price	% COA Covered by Aid	Net Price	% COA Covered by Aid	Net Price	% COA Covered by Aid	Net Price	% COA Covered by Aid
PART TIME UNDER 25										
2-YEAR	2,061,191	$6,057	$4,087	33%	$4,814	21%	$5,861	3%	$5,651	7%
4-YEAR	538,059	$11,233	$7,542	33%	$9,000	20%	$10,731	4%	$10,682	5%
PART TIME ADULT										
2-YEAR	1,590,041	$6,490	$5,265	19%	$5,543	15%	$6,052	7%	$5,358	17%
4-YEAR	475,460	$9,976	$8,271	17%	$7,620	24%				
FULL TIME ADULT										
2-YEAR	525,832	$12,341	$9,040	27%	$10,063	18%	$10,664	14%	$11,046	10%
4-YEAR	442,402	$18,013	$13,459	25%	$15,785	12%				

Note: Data is unavailable for 4-year adult students in the 3rd and 4th quintiles due to low enrollment.

Sources: IPEDS Fall 2014 Enrollment, NPSAS 2012 total student budget and net price

In *Table 6* we show the per-student reduction in net price the nation would need to make to meet SHEEO's affordability threshold. As the table shows, significant per-student reductions in net price would need to be achieved for part-time and adult students. This is particularly true for part-time adult students from the lowest income quintile attending 4-year institutions, where a $12,321 reduction is needed to the yearly net price in order to meet the SHEEO affordability threshold for those students.

Nationally, in order to extend SHEEO's model to reduce net price for part-time and adult students to meet the SHEEO affordability threshold, it is estimated to cost an additional $21.8 billion per year (see *Table 7*). These cost estimates are not directly comparable to the previous cost estimates for the full-time first-time students. These estimates are not cohort-based, but rather they include all undergraduates based on current enrollment and predicted change in enrollment. Therefore, *Table 7* shows the yearly cost to fund all enrolled students in each group for that year. A major factor driving the cost is the fact that there are more than double the number of students in these estimates (4.6 million) than are included in the earlier estimates for traditional students. Further, these estimates reveal a larger unmet need on the part of part-time and adult students. These students often do not qualify for traditional financial aid programs from the federal government and from states. Better data is needed to more fully understand the cost barriers facing these students and new financial models are needed if we are going to help non-traditional students gain access to and succeed in postsecondary education.

TABLE 6:
EXPECTED INCOME AND GAP IN FUNDING — SHEEO AFFORDABILITY THRESHOLD FOR NON-TRADITIONAL STUDENTS

			FAMILY INCOME ($0-$30,000)			FAMILY INCOME ($30,001-$48,000)		
	Median Income 2015	Maximum Loan Using IBR Standards	Net Price	Current Loan Estimate	Necessary Reduction to Net Price	Net Price	Current Loan Estimate	Necessary Reduction to Net Price
PART TIME UNDER 25								
2-YEAR	$38,501	$8,261	$4,087	$24,521	$2,710	$4,814	$28,885	$3,437
4-YEAR	$51,348	$21,108	$7,542	$75,418	$5,431	$9,000	$53,999	$3,289
PART TIME ADULT								
2-YEAR	$38,501	$8,261	$5,265	$31,588	$3,888	$5,543	$33,260	$4,166
4-YEAR	$51,348	$21,108	$8,271	$82,714	$6,161	$7,620	$45,722	$2,461
FULL TIME ADULT								
2-YEAR	$38,501	$8,261	$9,040	$27,120	$6,287	$10,063	$30,189	$7,310
4-YEAR	$51,348	$21,108	$13,459	$67,294	$9,237	$15,785	$78,925	$11,563

Sources: NPSAS 2012 net price by income and U.S. Census Bureau - Median Income by Education (2015)

TABLE 7:
ESTIMATED NATIONAL COST TO MEET THE SHEEO AFFORDABILITY THRESHOLD FOR NON-TRADITIONAL STUDENTS AT OR BELOW 200% OF FEDERAL POVERTY

	2017-2018	2018-2019	2019-2020	2020-2021
PART TIME UNDER 25	$5,979,769,376	$6,207,953,171	$6,055,711,136	$6,286,023,682
PART TIME ADULT	$7,131,191,145	$7,032,229,246	$7,353,574,056	$7,246,873,683
FULL TIME ADULT	$6,772,524,342	$8,031,329,197	$6,943,535,133	$8,229,632,039
TOTAL	**$19,883,484,863**	**$21,271,511,614**	**$20,352,820,325**	**$21,762,529,404**

Notes: Each year includes all non-traditional undergraduates rather than an incoming cohort. This table assumes that all students will be covered in the first year.

Sources: IPEDS Fall 2014 Enrollment, NPSAS 2012 income distributions, and IPEDS 2015 Digest of Education Statistics Table 303.40 projected change in enrollment

Section 4. What it Will Take

It will be challenging for states to meet their affordability thresholds. State budgets are tight and will likely not loosen any time soon. However, the challenge becomes more feasible if approached gradually and collaboratively as a federal-state partnership. Total state educational appropriations to higher education were $77 billion nationally in 2016 (SHEEO, 2016). As seen in *Table 8*, if we focus only on the state portion of the cost of meeting the SHEEO affordability threshold and spread that cost over four years, it would require a 2% increase in total state educational appropriations per year over the four years, on average, to meet the costs for traditional students. To meet the cost for all students, it would require a 5% increase each year for four years. These increases are not insignificant, and will vary by state, but they may be manageable in many states.

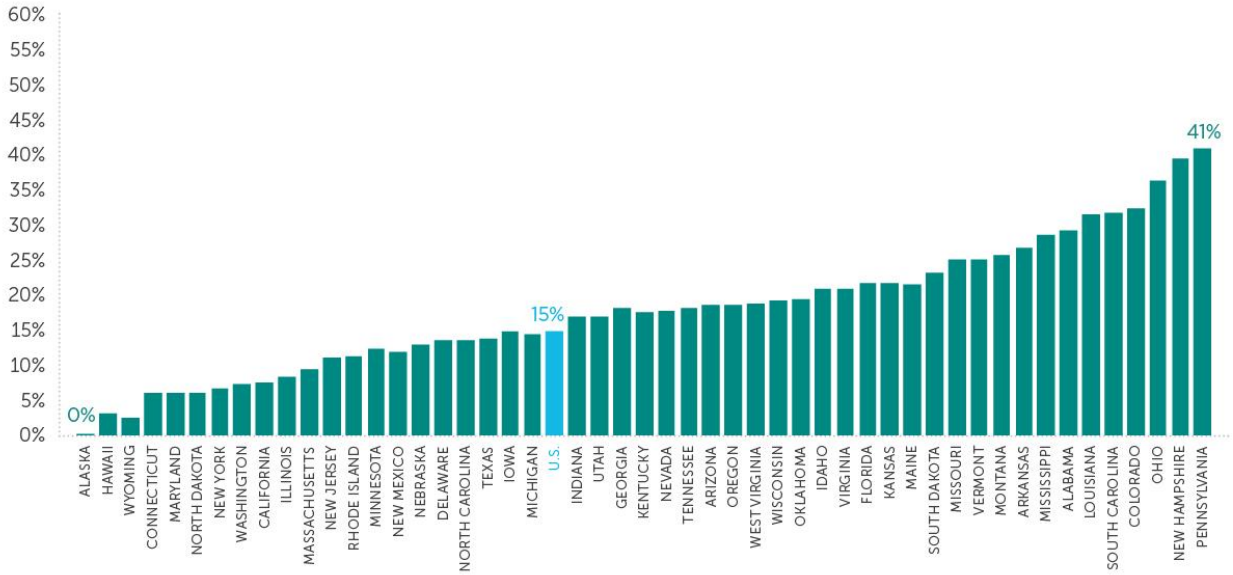
TABLE 8:
ADDITIONAL STATE FUNDING NEEDED TO MEET THE SHEEO AFFORDABILITY THRESHOLD OVER FOUR YEARS

STUDENT TYPE	COST TO REACH SHEEO AFFORDABILITY THRESHOLD (YEAR 4)	STATE PORTION	2016 EDUCATIONAL APPROPRIATIONS	ADDITIONAL STATE APPROPRIATIONS (FOR 4 YEARS)
Traditional Students	$11,979,773,859	$5,989,886,930		2%
Part Time (under 25)	$6,286,023,682	$3,143,011,841		1%
Part Time (25 and above)	$7,246,873,683	$3,623,436,841		1%
Full Time (25 and above)	$8,229,632,039	$4,114,816,020		1%
All Students	**$33,742,303,263**	**$16,871,151,632**	**$77,009,407,298**	**5%**

Sources: Estimated costs in *Table A-12*, and *SHEEO's 2016 State Higher Education Finance* report

The additional funding needed, however, does vary significantly by state. *Figure 7* compares the total cost (combined state and federal shares) for states to meet the SHEEO affordability threshold for traditional students (first-time full-time) to total state educational appropriations. In Pennsylvania, the cost would make up 41% of existing state appropriations (that cost would be split evenly between states and the federal government). Covering the state share would place a significant burden on Pennsylvania's budget and may require more than a four-year roll out. However, in a number of other states, the increase would be insignificant relative to existing state appropriations and may therefore be accomplished in less than four years. For detailed state-by-state estimates, see *Table A-12* in the Appendix.

FIGURE 7:
TOTAL STATE AND FEDERAL INVESTMENT NEEDED TO MEET SHEEO AFFORDABILITY THRESHOLD, AS A PERCENT OF EDUCATIONAL APPROPRIATIONS, BY STATE



Sources: Estimated costs in *Table A-12* and SHEEO's 2016 *State Higher Education Finance* (SHEF) report

Conclusions

Both of the models discussed here were presented as starting points for broader discussion on how to better target resources to make college more affordable for students with documented financial need. In doing so, we have provided an initial calculation of what the state-by-state costs of both the revised SHEEO model and Lumina model might be. Further, these models highlight a reasonable cost obligation for students pursuing postsecondary education and their potential savings relative to their average existing college cost burdens. We recognize that there are other factors related to student access and degree attainment that must be explored to identify and minimize any negative unintended consequences and better improve student success. However, the models explored here ought to serve as a starting point for conversations and potential policy approaches regarding affordability and the distribution of postsecondary costs, with the ultimate goal of producing postsecondary systems that are accessible and affordable.

Our estimates reveal a larger cost for non-traditional students than for traditional students. Clearly, more needs to be done. While we do not expect that the entire cost gap can be met all at once, states and the federal government ought to reevaluate their financial aid requirements. Are they unnecessarily restricting access for part-time and adult students? This is particularly problematic as non-traditional students are a growing population of postsecondary students, without whose success in postsecondary education our country cannot remain competitive and meet its educational attainment goals. This point is manifest in the fact that, in our estimates, there are more than double the number of part-time and adult students than full-time first-time students.

The models and cost estimates may help policymakers consider how they might approach increasing affordability in their states. However, these analyses can serve only as a starting point for discussion because they are limited by the availability of relevant data. Our state-by-state analyses include only first-time full-time students and required that we make a number of assumptions to arrive at our estimates because of the limitations of the IPEDS data and the lack of a better data source. Likewise, our part-time and adult student analyses include only national estimates based on a random sample of students, and similarly required that we make a number of assumptions in order to provide reasonable cost figures for these students. Better data are needed. In our federal system, where the primary responsibility for postsecondary education is given to the states, but where the federal government nonetheless plays an important role in helping provide affordable access, we need solid state-level and national data. These data need to allow disaggregation by income bands for adult part-time and full-time students, at a minimum. One effort that may provide better data for these types of analyses is the U.S. Department of Education's goal of collecting representative samples of students from each state in their NPSAS surveys.

Even if states adopt one of these models, they must monitor effects and make adjustments to ensure that students can afford to attend and complete. Policies, programs, and strategies, once implemented, must be evaluated and (if necessary) altered. Such policy evaluation and revision should be done on a regular basis, with a goal of improving college access and success, particularly for low-income and other underrepresented students, and to avoid any negative unintended consequences.

The final conclusion is one that we provided in the introduction: states need not wait for the federal government to act on increasing affordability and improving student success. The primary responsibility is with the states. Students bear the cost burden now, and for many the cost is too high. This means

many students are losing opportunities and states are losing the benefits that come with higher levels of educational attainment. Each state will need to approach increasing student access and success in a way that reflects its state population and budgets. However, as our estimates reveal, nearly every state must do more to ensure affordability. With each passing year, more and more students are being priced out of postsecondary education. For their sake, for the well-being of the states, and for the sake of our country, states need to act.

References

Bailey, M. J., and Dynarski, S. (2011). *Gains and Gaps: Changing Inequality in U.S. College Entry and Completion* (University of Michigan Population Studies Center Report 11-746). Retrieved December 1, 2013, from http://www.psc.isr.umich.edu/pubs/pdf/rr11-746.pdf.

Belley, P. & Lochner, L. (2007). The Changing Role of Family Income and Ability in Determining Educational Achievement. *Journal of Human Capital*. University of Chicago Press, vol 1(1). Pages 37-89

Bowen, W.G., Chingos, M.M., and McPherson, M. (2009). *Crossing the Finish Line: Completing College at America's Public Universities*. Princeton, New Jersey: Princeton University Press.

Bureau of Labor Statistics (2017). *Consumer price index summary*. Washington, DC: Bureau of Labor Statistics.

Carnevale, A. P., Cheah, B., & Hanson, A. R. (2015). *The economic value of college majors*. Washington, DC: Georgetown University Center on Education and the Workforce.

Destin, M., & Oyserman, D. (2009). From Assets to School Outcomes How Finances Shape Children's Perceived Possibilities and Intentions. *Psychological Science, 20*(4), 414-418.

Hoxby, C.M. and Avery, C. (December 2012). The Missing "One-Offs": the Hidden Supply of High-Achieving, Low Income Students . *NBER Working Paper No. w18586*. Available at SSRN: http://ssrn.com/abstract=2186316

Kane, T. (1995). Rising public college tuition and college entry: How well do public subsidies promote access to college? *NBER Working Paper no. 5164*. Cambridge Mass.: National Bureau of Economic Research.

Kelchen, R., Goldrick-Rab, S., & Hosch, B. (2017). The Costs of College Attendance: Examining Variation and Consistency in Institutional Living Cost Allowances. *The Journal of Higher Education*, 1-25. http://dx.doi.org/10.1080/00221546.2016.1272092

Leslie, L.L., Brinkman, P. T. (1989). The Economic Value of Higher Education. *The Journal of Higher Education, 60*(5), 609-611.

Matthews, D. (2016). *A Stronger Nation 2016*. Lumina Foundation. https://www.luminafoundation.org/stronger_nation2016

McPherson, M. S., & Schapiro, M. O. (1998). *The Student Aid Game*. Princeton, NJ: Princeton University Press

Murdock, S. (2015). *Population Change in the United States: Implications for Education and Socioeconomic Development*. Presentation at SHEEO Higher Education Policy Conference, Newport Beach, CA.

National Education Longitudinal Survey (2013). *Education Longitudinal Study of 2002 (ELS:2002)*. Washington, DC: Institute of Education Sciences.

NCES (2016). *Characteristics of postsecondary students.* Washington, DC: National Center for Education Statistics.

Putnam, R. D. (2016). *Our kids: The American dream in crisis.* New York, NY: Simon and Schuster.

Stone, C., Trisi, D., Sherman, A., & Horton, E. (2016). *A guide to statistics on historical trends in income inequality*. Washington, DC: Center on Budget and Policy Priorities.

Taliaferro, W. & Duke-Benfield, A.E. (2016). *Redesigning state financial aid to better serve nontraditional adult students: Practical policy steps for decision makers.* Washington, DC: CLASP.

The College Board (2016*). Trends in college pricing* (Trends in higher education series). Washington, DC: The College Board.

Western Interstate Commission for Higher Education (2016). *Knocking at the College Door: Projections of High School Graduates by Sex and for Major Metropolitan Areas*. Boulder, CO: WICHE.

Appendices

Appendix A – Additional Tables

TABLE A-1:
NET PRICE AT 4-YEAR INSTITUTIONS FOR FIRST-TIME FULL-TIME STUDENTS, BY FAMILY INCOME

		FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)		FAMILY INCOME ($48,001-$75,000)		FAMILY INCOME ($75,001-$110,000)	
State	Cost of Attendance	Net Price	% Covered by Aid	Net Price	% Covered by Aid	Net Price	% Covered by Aid	Net Price	% Covered by Aid
ALABAMA	$21,066	$12,768	39%	$14,404	32%	$17,104	19%	$18,894	10%
ALASKA	$14,991	$6,898	54%	$8,075	46%	$10,321	31%	$11,529	23%
ARIZONA	$23,408	$9,560	59%	$10,417	55%	$14,278	39%	$16,782	28%
ARKANSAS	$18,839	$9,328	50%	$9,946	47%	$12,180	35%	$14,206	25%
CALIFORNIA	$23,388	$6,715	71%	$8,432	64%	$12,291	47%	$18,511	21%
COLORADO	$21,907	$12,036	45%	$13,379	39%	$16,559	24%	$19,667	10%
CONNECTICUT	$23,691	$12,267	48%	$13,754	42%	$16,176	32%	$19,525	18%
DELAWARE	$23,213	$12,370	47%	$12,379	47%	$14,496	38%	$18,187	22%
FLORIDA	$19,217	$9,270	52%	$10,736	44%	$13,299	31%	$15,433	20%
GEORGIA	$19,410	$10,014	48%	$11,559	40%	$14,100	27%	$15,966	18%
HAWAII	$19,686	$7,604	61%	$9,368	52%	$11,686	41%	$13,898	29%
IDAHO	$19,107	$12,450	35%	$13,141	31%	$16,007	16%	$18,011	6%
ILLINOIS	$26,175	$12,264	53%	$13,399	49%	$17,806	32%	$22,523	14%
INDIANA	$20,197	$8,644	57%	$9,098	55%	$13,873	31%	$17,953	11%
IOWA	$19,696	$9,029	54%	$10,707	46%	$14,004	29%	$16,554	16%
KANSAS	$19,549	$11,540	41%	$12,691	35%	$15,010	23%	$17,354	11%
KENTUCKY	$20,226	$9,327	54%	$9,714	52%	$12,934	36%	$15,551	23%
LOUISIANA	$18,688	$9,008	52%	$9,644	48%	$11,993	36%	$13,552	27%
MAINE	$21,117	$12,117	43%	$13,599	36%	$16,389	22%	$18,726	11%
MARYLAND	$22,151	$10,365	53%	$12,519	43%	$15,898	28%	$19,279	13%
MASSACHUSETTS	$22,836	$10,885	52%	$12,306	46%	$15,604	32%	$19,237	16%
MICHIGAN	$21,948	$9,349	57%	$11,218	49%	$14,425	34%	$17,949	18%
MINNESOTA	$21,209	$10,018	53%	$10,616	50%	$14,205	33%	$18,381	13%
MISSISSIPPI	$21,085	$12,838	39%	$13,756	35%	$15,799	25%	$16,855	20%
MISSOURI	$19,745	$10,663	46%	$11,517	42%	$14,218	28%	$16,482	17%
MONTANA	$16,978	$10,915	36%	$12,160	28%	$14,949	12%	$16,807	1%
NEBRASKA	$19,479	$10,480	46%	$11,382	42%	$13,920	29%	$17,266	11%
NEVADA	$18,391	$10,531	43%	$11,381	38%	$13,841	25%	$16,568	10%
NEW HAMPSHIRE	$27,523	$15,177	45%	$16,948	38%	$20,365	26%	$23,929	13%
NEW JERSEY	$26,168	$13,300	49%	$14,550	44%	$19,815	24%	$24,091	8%
NEW MEXICO	$16,450	$8,151	50%	$9,448	43%	$11,477	30%	$12,919	21%
NEW YORK	$19,635	$7,170	63%	$10,116	48%	$15,481	21%	$18,831	4%
NORTH CAROLINA	$19,677	$7,872	60%	$9,544	51%	$13,315	32%	$17,686	10%
NORTH DAKOTA	$18,140	$8,913	51%	$10,383	43%	$13,740	24%	$15,790	13%
OHIO	$23,018	$13,112	43%	$14,501	37%	$17,912	22%	$20,300	12%
OKLAHOMA	$18,448	$8,360	55%	$9,869	47%	$13,415	27%	$16,300	12%
OREGON	$22,769	$12,803	44%	$13,656	40%	$16,044	30%	$20,027	12%
PENNSYLVANIA	$25,646	$14,517	43%	$15,719	39%	$19,218	25%	$22,663	12%
RHODE ISLAND	$22,198	$9,091	59%	$10,704	52%	$14,545	34%	$19,242	13%
SOUTH CAROLINA	$24,687	$14,243	42%	$13,923	44%	$16,711	32%	$18,331	26%
SOUTH DAKOTA	$20,522	$9,863	52%	$12,540	39%	$16,020	22%	$17,491	15%
TENNESSEE	$21,821	$8,729	60%	$10,616	51%	$15,004	31%	$16,517	24%
TEXAS	$19,993	$8,273	59%	$9,107	54%	$13,363	33%	$17,579	12%
UTAH	$16,043	$9,649	40%	$10,485	35%	$12,252	24%	$13,892	13%
VERMONT	$25,356	$12,547	51%	$13,250	48%	$15,691	38%	$19,106	25%
VIRGINIA	$24,423	$12,003	51%	$13,511	45%	$16,864	31%	$20,225	17%
WASHINGTON	$24,078	$8,425	65%	$9,660	60%	$13,715	43%	$20,772	14%
WEST VIRGINIA	$17,080	$7,195	58%	$7,870	54%	$10,283	40%	$12,963	24%
WISCONSIN	$19,202	$9,602	50%	$11,112	42%	$15,051	22%	$17,942	7%
WYOMING	$18,691	$7,886	58%	$9,154	51%	$10,347	45%	$14,402	23%
U.S. AVERAGE	**$20,979**	**$10,323**	**51%**	**$11,559**	**45%**	**$14,680**	**30%**	**$17,653**	**16%**

Source: IPEDS 2013-2014 Average Net Price by Income Quintile and Total Price for In-State Students (weighted by living situation)

TABLE A-2:
NET PRICE AT 2-YEAR INSTITUTIONS FOR FIRST-TIME FULL-TIME STUDENTS, BY FAMILY INCOME

		FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)		FAMILY INCOME ($48,001-$75,000)		FAMILY INCOME ($75,001-$110,000)	
State	Cost of Attendance	Net Price	% Covered by Aid	Net Price	% Covered by Aid	Net Price	% Covered by Aid	Net Price	% Covered by Aid
ALABAMA	$11,326	$5,680	50%	$6,269	45%	$8,143	28%	$10,318	9%
ALASKA									
ARIZONA	$11,299	$6,219	45%	$7,026	38%	$8,931	21%	$10,322	9%
ARKANSAS	$12,499	$6,425	49%	$6,567	47%	$8,479	32%	$10,412	17%
CALIFORNIA	$12,158	$5,460	55%	$6,216	49%	$8,157	33%	$9,983	18%
COLORADO	$15,377	$8,512	45%	$9,716	37%	$11,971	22%	$14,151	8%
CONNECTICUT	$11,624	$5,680	51%	$6,299	46%	$7,718	34%	$11,280	3%
DELAWARE	$11,634	$6,297	46%	$7,087	39%	$8,907	23%	$10,484	10%
FLORIDA	$13,050	$6,752	48%	$7,593	42%	$9,401	28%	$11,150	15%
GEORGIA	$12,261	$5,395	56%	$6,451	47%	$8,488	31%	$10,913	11%
HAWAII	$10,524	$5,071	52%	$5,390	49%	$7,321	30%	$9,758	7%
IDAHO	$12,432	$6,343	49%	$6,773	46%	$8,447	32%	$10,613	15%
ILLINOIS	$15,537	$5,770	63%	$6,228	60%	$8,366	46%	$10,383	33%
INDIANA	$13,367	$6,572	51%	$7,492	44%	$10,476	22%	$12,675	5%
IOWA	$13,858	$8,517	39%	$9,029	35%	$11,305	18%	$13,195	5%
KANSAS	$12,056	$7,079	41%	$7,110	41%	$8,872	26%	$9,796	19%
KENTUCKY	$11,425	$5,683	50%	$5,713	50%	$7,699	33%	$9,919	13%
LOUISIANA	$13,438	$7,313	46%	$7,871	41%	$9,886	26%	$11,026	18%
MAINE	$13,917	$7,812	44%	$9,488	32%	$11,712	16%	$13,287	5%
MARYLAND	$14,824	$6,410	57%	$7,217	51%	$9,194	38%	$11,229	24%
MASSACHUSETTS	$12,217	$6,758	45%	$7,366	40%	$8,932	27%	$10,843	11%
MICHIGAN	$12,099	$4,610	62%	$5,246	57%	$7,508	38%	$9,182	24%
MINNESOTA	$15,901	$11,007	31%	$11,129	30%	$13,050	18%	$15,401	3%
MISSISSIPPI	$9,859	$4,413	55%	$5,269	47%	$7,015	29%	$8,266	16%
MISSOURI	$12,885	$6,645	48%	$7,165	44%	$8,552	34%	$9,709	25%
MONTANA	$13,852	$7,799	44%	$8,042	42%	$9,809	29%	$11,602	16%
NEBRASKA	$11,097	$5,972	46%	$6,182	44%	$8,382	24%	$10,101	9%
NEVADA	$12,261	$6,658	46%	$7,127	42%	$9,566	22%	$11,686	5%
NEW HAMPSHIRE	$18,669	$14,825	21%	$18,740	0%	$18,824	-1%	$18,937	-1%
NEW JERSEY	$13,948	$5,986	57%	$6,487	53%	$9,034	35%	$11,315	19%
NEW MEXICO	$11,104	$4,950	55%	$5,880	47%	$7,431	33%	$9,189	17%
NEW YORK	$12,595	$5,227	58%	$6,600	48%	$9,776	22%	$11,304	10%
NORTH CAROLINA	$12,377	$7,358	41%	$7,549	39%	$8,419	32%	$10,717	13%
NORTH DAKOTA	$13,655	$6,833	50%	$7,019	49%	$9,580	30%	$11,252	18%
OHIO	$12,007	$7,355	39%	$8,093	33%	$10,310	14%	$11,954	0%
OKLAHOMA	$12,596	$6,265	50%	$6,762	46%	$8,616	32%	$10,501	17%
OREGON	$13,441	$8,238	39%	$8,992	33%	$11,092	17%	$13,051	3%
PENNSYLVANIA	$14,841	$5,465	63%	$6,286	58%	$8,663	42%	$10,868	27%
RHODE ISLAND	$10,926	$5,040	54%	$6,136	44%	$8,548	22%	$10,461	4%
SOUTH CAROLINA	$14,080	$7,145	49%	$6,839	51%	$8,264	41%	$10,098	28%
SOUTH DAKOTA	$15,106	$9,800	35%	$10,379	31%	$12,823	15%	$14,009	7%
TENNESSEE	$12,287	$6,128	50%	$6,603	46%	$8,822	28%	$11,090	10%
TEXAS	$12,683	$5,794	54%	$6,494	49%	$8,855	30%	$11,427	10%
UTAH	$13,197	$7,455	44%	$6,277	52%	$8,648	34%	$11,325	14%
VERMONT	$15,134	$9,962	34%	$10,076	33%	$12,565	17%	$14,793	2%
VIRGINIA	$11,814	$6,120	48%	$6,685	43%	$8,330	29%	$11,020	7%
WASHINGTON	$12,995	$5,522	58%	$6,852	47%	$9,402	28%	$12,539	4%
WEST VIRGINIA	$12,118	$5,862	52%	$6,088	50%	$8,355	31%	$11,333	6%
WISCONSIN	$13,490	$7,697	43%	$8,261	39%	$10,876	19%	$12,843	5%
WYOMING	$11,729	$5,698	51%	$6,377	46%	$8,493	28%	$9,910	16%
U.S. AVERAGE	**$12,930**	**$6,767**	**48%**	**$7,399**	**43%**	**$9,429**	**27%**	**$11,380**	**12%**

Source: IPEDS 2013-2014 Average Net Price by Income Quintile and Total Price for In-State Students (weighted by living situation)

TABLE A-3:
EXPECTED INCOME AND GAP IN FUNDING — SHEEO AFFORDABILITY THRESHOLD AT PUBLIC 4-YEAR INSTITUTIONS, BY STATE

			FAMILY INCOME ($0 - $30,000)		FAMILY INCOME ($30,001 - $48,000)	
State	Median Income Bachelors Degree	Maximum Loan using IBR Standards	Current Average Loan Based on Net Price	Necessary Reduction to Net Price	Average Loan Based on Net Price	Necessary Reduction to Net Price
ALABAMA	$52,015	$21,775	$63,840	$8,413	$72,018	$10,049
ALASKA	$66,076	$35,836	$34,492	$-	$40,373	$907
ARIZONA	$50,000	$19,760	$47,798	$5,608	$52,084	$6,465
ARKANSAS	$45,065	$14,825	$46,641	$6,363	$49,732	$6,981
CALIFORNIA	$58,000	$27,760	$33,574	$1,163	$42,158	$2,880
COLORADO	$50,055	$19,815	$60,181	$8,073	$66,896	$9,416
CONNECTICUT	$65,000	$34,760	$61,335	$5,315	$68,770	$6,802
DELAWARE	$51,610	$21,370	$61,850	$8,096	$61,893	$8,105
FLORIDA	$50,050	$19,810	$46,352	$5,308	$53,681	$6,774
GEORGIA	$52,650	$22,410	$50,069	$5,532	$57,795	$7,077
HAWAII	$50,210	$19,970	$38,018	$3,610	$46,839	$5,374
IDAHO	$48,260	$18,020	$62,251	$8,846	$65,703	$9,537
ILLINOIS	$55,072	$24,832	$61,320	$7,298	$66,993	$8,432
INDIANA	$49,008	$18,768	$43,221	$4,891	$45,490	$5,344
IOWA	$55,016	$24,776	$45,145	$4,074	$53,536	$5,752
KANSAS	$50,020	$19,780	$57,701	$7,584	$63,457	$8,735
KENTUCKY	$50,000	$19,760	$46,634	$5,375	$48,572	$5,762
LOUISIANA	$50,003	$19,763	$45,038	$5,055	$48,220	$5,691
MAINE	$47,005	$16,765	$60,584	$8,764	$67,994	$10,246
MARYLAND	$57,000	$26,760	$51,826	$5,013	$62,597	$7,167
MASSACHUSETTS	$60,000	$29,760	$54,427	$4,933	$61,528	$6,354
MICHIGAN	$52,010	$21,770	$46,746	$4,995	$56,092	$6,864
MINNESOTA	$52,010	$21,770	$50,089	$5,664	$53,078	$6,262
MISSISSIPPI	$42,715	$12,475	$64,188	$10,343	$68,778	$11,261
MISSOURI	$49,600	$19,360	$53,317	$6,791	$57,584	$7,645
MONTANA	$45,016	$14,776	$54,577	$7,960	$60,800	$9,205
NEBRASKA	$50,100	$19,860	$52,399	$6,508	$56,912	$7,410
NEVADA	$54,320	$24,080	$52,657	$5,715	$56,904	$6,565
NEW HAMPSHIRE	$53,370	$23,130	$75,883	$10,551	$84,742	$12,322
NEW JERSEY	$58,006	$27,766	$66,502	$7,747	$72,752	$8,997
NEW MEXICO	$45,002	$14,762	$40,757	$5,199	$47,239	$6,495
NEW YORK	$57,194	$26,954	$35,852	$1,780	$50,582	$4,726
NORTH CAROLINA	$52,450	$22,210	$39,361	$3,430	$47,719	$5,102
NORTH DAKOTA	$50,040	$19,800	$44,567	$4,953	$51,916	$6,423
OHIO	$47,187	$16,947	$65,560	$9,723	$72,503	$11,111
OKLAHOMA	$50,084	$19,844	$41,801	$4,391	$49,345	$5,900
OREGON	$51,003	$20,763	$64,016	$8,651	$68,278	$9,503
PENNSYLVANIA	$55,000	$24,760	$72,587	$9,565	$78,597	$10,767
RHODE ISLAND	$50,006	$19,766	$45,455	$5,138	$53,518	$6,750
SOUTH CAROLINA	$49,925	$19,685	$71,217	$10,306	$69,615	$9,986
SOUTH DAKOTA	$50,159	$19,919	$49,315	$5,879	$62,701	$8,556
TENNESSEE	$50,005	$19,765	$43,643	$4,776	$53,080	$6,663
TEXAS	$56,091	$25,851	$41,364	$3,103	$45,534	$3,937
UTAH	$44,200	$13,960	$48,243	$6,857	$52,424	$7,693
VERMONT	$50,221	$19,981	$62,735	$8,551	$66,249	$9,254
VIRGINIA	$58,100	$27,860	$60,014	$6,431	$67,553	$7,939
WASHINGTON	$60,000	$29,760	$42,124	$2,473	$48,298	$3,708
WEST VIRGINIA	$46,700	$16,460	$35,976	$3,903	$39,350	$4,578
WISCONSIN	$47,502	$17,262	$48,009	$6,149	$55,559	$7,659
WYOMING	$42,014	$11,774	$39,430	$5,531	$45,770	$6,799
U.S. AVERAGE	**$51,643**	**$21,403**	**$51,614**	**$6,048**	**$57,796**	**$7,279**

Notes: This model defines discretionary income as that above 150% of the poverty level for a family of three. Income based repayment (IBR) assumes a maximum loan amount of 10% of the student's post-graduation discretionary income over 10 years.

TABLE A-4:

EXPECTED INCOME AND GAP IN FUNDING — SHEEO AFFORDABILITY THRESHOLD AT PUBLIC 2-YEAR INSTITUTIONS, BY STATE

			FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)	
State	Median Income Associates Degree	Maximum Loan using IBR Standards	Current Average Loan Based on Net Price	Necessary Reduction to Net Price	Average Loan Based on Net Price	Necessary Reduction to Net Price
ALABAMA	$36,400	$6,160	$17,040	$3,627	$18,806	$4,215
ALASKA						
ARIZONA	$40,003	$9,763	$18,656	$2,964	$21,078	$3,772
ARKANSAS	$33,000	$2,760	$19,276	$5,505	$19,702	$5,647
CALIFORNIA	$35,840	$5,600	$16,379	$3,593	$18,648	$4,349
COLORADO	$40,000	$9,760	$25,537	$5,259	$29,149	$6,463
CONNECTICUT	$40,000	$9,760	$17,039	$2,426	$18,898	$3,046
DELAWARE	$42,499	$12,259	$18,890	$2,210	$21,260	$3,000
FLORIDA	$36,000	$5,760	$20,255	$4,832	$22,779	$5,673
GEORGIA	$36,002	$5,762	$16,184	$3,474	$19,354	$4,531
HAWAII	$38,000	$7,760	$15,213	$2,484	$16,170	$2,803
IDAHO	$33,704	$3,464	$19,028	$5,188	$20,318	$5,618
ILLINOIS	$39,515	$9,275	$17,310	$2,678	$18,684	$3,136
INDIANA	$40,100	$9,860	$19,715	$3,285	$22,476	$4,205
IOWA	$40,303	$10,063	$25,551	$5,163	$27,086	$5,674
KANSAS	$39,002	$8,762	$21,238	$4,159	$21,331	$4,190
KENTUCKY	$37,000	$6,760	$17,049	$3,430	$17,139	$3,460
LOUISIANA	$36,302	$6,062	$21,940	$5,293	$23,614	$5,851
MAINE	$40,010	$9,770	$23,437	$4,556	$28,465	$6,232
MARYLAND	$43,000	$12,760	$19,231	$2,157	$21,650	$2,963
MASSACHUSETTS	$40,000	$9,760	$20,275	$3,505	$22,099	$4,113
MICHIGAN	$40,010	$9,770	$13,830	$1,353	$15,739	$1,990
MINNESOTA	$44,000	$13,760	$33,020	$6,420	$33,388	$6,543
MISSISSIPPI	$34,056	$3,816	$13,238	$3,141	$15,806	$3,997
MISSOURI	$35,008	$4,768	$19,935	$5,056	$21,496	$5,576
MONTANA	$38,000	$7,760	$23,397	$5,212	$24,126	$5,455
NEBRASKA	$36,060	$5,820	$17,915	$4,032	$18,547	$4,242
NEVADA	$42,002	$11,762	$19,974	$2,737	$21,382	$3,207
NEW HAMPSHIRE	$41,713	$11,473	$44,475	$11,001	$56,219	$14,915
NEW JERSEY	$46,010	$15,770	$17,959	$730	$19,461	$1,230
NEW MEXICO	$35,000	$4,760	$14,851	$3,364	$17,640	$4,293
NEW YORK	$36,522	$6,282	$15,681	$3,133	$19,800	$4,506
NORTH CAROLINA	$35,000	$4,760	$22,073	$5,771	$22,646	$5,962
NORTH DAKOTA	$36,191	$5,951	$20,499	$4,849	$21,057	$5,035
OHIO	$37,848	$7,608	$22,065	$4,819	$24,279	$5,557
OKLAHOMA	$40,000	$9,760	$18,795	$3,012	$20,286	$3,509
OREGON	$38,060	$7,820	$24,714	$5,631	$26,977	$6,386
PENNSYLVANIA	$40,034	$9,794	$16,396	$2,201	$18,859	$3,022
RHODE ISLAND	$45,320	$15,080	$15,120	$13	$18,408	$1,109
SOUTH CAROLINA	$38,603	$8,363	$21,436	$4,358	$20,518	$4,052
SOUTH DAKOTA	$37,600	$7,360	$29,401	$7,347	$31,138	$7,926
TENNESSEE	$40,300	$10,060	$18,384	$2,775	$19,809	$3,250
TEXAS	$36,111	$5,871	$17,381	$3,837	$19,483	$4,537
UTAH	$37,065	$6,825	$22,366	$5,180	$18,832	$4,002
VERMONT	$45,000	$14,760	$29,886	$5,042	$30,228	$5,156
VIRGINIA	$35,084	$4,844	$18,360	$4,505	$20,055	$5,070
WASHINGTON	$35,200	$4,960	$16,566	$3,869	$20,557	$5,199
WEST VIRGINIA	$36,000	$5,760	$17,586	$3,942	$18,263	$4,168
WISCONSIN	$40,001	$9,761	$23,092	$4,444	$24,783	$5,007
WYOMING	$38,052	$7,812	$17,093	$3,094	$19,130	$3,773
U.S. AVERAGE	**$38,501**	**$8,261**	**$20,301**	**$4,013**	**$22,196**	**$4,645**

Notes: This model defines discretionary income as that above 150% of the poverty level for a family of three. Income based repayment (IBR) assumes a maximum loan amount of 10% of the student's post-graduation discretionary income over 10 years. Alaska is excluded from the figures above because it does not have a 2-year sector.

Sources: IPEDS 2013-2014 Net Price by Income Quintile and U.S. Census Bureau - Median Income by Education (2015)

TABLE A-5:

ASPIRATIONAL MODEL — ESTIMATED COSTS TO REDUCE NET PRICE FOR FIRST-TIME FULL-TIME STUDENTS AT OR BELOW 200% OF POVERTY ($4,000 REDUCTION IN NET PRICE)

$4,000 REDUCTION IN NET PRICE ($2,000 STATE, $2,000 FEDERAL)				
State	Year 1 - 2017-2018	Year 2 - 2018-2019	Year 3 - 2019-2020	Year 4 - 2020-2021
ALABAMA	$28,952,609	$57,324,058	$71,834,330	$86,108,385
ALASKA	$3,535,511	$7,044,924	$8,857,126	$10,657,495
ARIZONA	$41,019,788	$82,306,381	$104,891,518	$127,937,235
ARKANSAS	$19,627,415	$39,399,254	$50,293,290	$60,860,363
CALIFORNIA	$238,425,572	$474,507,148	$601,631,772	$733,739,276
COLORADO	$24,851,350	$50,180,617	$64,540,152	$79,207,741
CONNECTICUT	$14,293,395	$28,355,997	$35,641,477	$43,266,230
DELAWARE	$4,811,654	$9,599,506	$12,248,385	$15,067,491
FLORIDA	$107,742,284	$216,375,451	$274,027,554	$331,615,455
GEORGIA	$61,225,415	$123,364,597	$157,121,695	$189,692,886
HAWAII	$5,325,860	$10,477,664	$13,427,712	$16,549,300
IDAHO	$11,268,358	$22,834,306	$29,272,379	$35,755,168
ILLINOIS	$68,701,006	$137,002,903	$173,567,607	$210,148,496
INDIANA	$40,301,068	$81,658,852	$103,433,565	$123,939,402
IOWA	$15,921,468	$31,655,210	$40,225,181	$49,053,981
KANSAS	$17,437,556	$34,968,824	$44,535,320	$54,396,403
KENTUCKY	$27,050,000	$54,189,500	$68,229,614	$82,451,707
LOUISIANA	$29,034,890	$57,446,177	$72,771,690	$87,863,498
MAINE	$6,551,482	$13,067,050	$16,473,153	$19,853,312
MARYLAND	$23,783,411	$47,328,789	$60,846,284	$74,696,314
MASSACHUSETTS	$26,193,784	$52,327,780	$66,368,770	$80,565,949
MICHIGAN	$55,892,095	$111,200,415	$139,727,663	$168,086,021
MINNESOTA	$23,036,231	$46,296,436	$58,920,736	$71,969,028
MISSISSIPPI	$21,049,003	$41,429,727	$51,981,900	$62,219,982
MISSOURI	$35,229,616	$70,317,081	$89,274,928	$108,315,849
MONTANA	$4,460,338	$9,051,972	$11,683,247	$14,261,468
NEBRASKA	$10,696,786	$21,565,413	$27,789,016	$34,055,664
NEVADA	$14,335,653	$28,888,486	$36,908,568	$44,666,749
NEW HAMPSHIRE	$4,779,932	$9,486,847	$12,013,929	$14,471,785
NEW JERSEY	$40,538,740	$80,949,964	$102,543,343	$124,303,088
NEW MEXICO	$13,542,805	$27,336,358	$34,929,795	$42,213,159
NEW YORK	$104,185,263	$207,603,272	$263,713,883	$321,407,703
NORTH CAROLINA	$62,828,261	$126,618,680	$160,872,465	$194,655,708
NORTH DAKOTA	$2,566,140	$5,253,064	$6,850,046	$8,498,641
OHIO	$67,190,049	$133,541,502	$168,421,187	$203,607,815
OKLAHOMA	$23,801,335	$47,729,168	$60,920,589	$74,465,554
OREGON	$19,594,192	$39,182,549	$49,683,258	$60,386,929
PENNSYLVANIA	$66,276,659	$132,062,100	$166,584,125	$202,034,158
RHODE ISLAND	$4,982,986	$10,256,937	$13,302,047	$16,180,006
SOUTH CAROLINA	$26,988,929	$54,120,106	$68,484,436	$82,678,590
SOUTH DAKOTA	$3,899,907	$7,715,486	$9,846,248	$12,102,813
TENNESSEE	$40,429,578	$80,666,844	$101,980,724	$123,224,475
TEXAS	$191,414,115	$386,915,247	$494,210,976	$603,123,302
UTAH	$16,896,686	$33,967,494	$43,647,773	$53,789,418
VERMONT	$2,570,312	$5,113,900	$6,466,714	$7,815,832
VIRGINIA	$37,377,835	$74,812,382	$95,428,497	$116,140,012
WASHINGTON	$32,184,386	$64,508,159	$81,793,325	$99,480,211
WEST VIRGINIA	$10,477,260	$20,742,281	$26,331,782	$31,856,149
WISCONSIN	$30,473,305	$60,651,230	$76,667,000	$93,093,366
WYOMING	$2,172,369	$4,358,189	$5,551,187	$6,852,057
U.S.	**$1,785,924,642**	**$3,573,756,277**	**$4,536,767,961**	**$5,509,381,619**

Notes: This model is aspirational. The costs represented here model continued yearly support for each incoming cohort of freshmen, assuming 100% retention and on-time completion. This model assumes that 60% of all low-income high school graduates will enroll in a public institution full time (45% at 2-year institutions and 55% at 4-year institutions). The model is fully implemented in year four.

Sources: WICHE 2016 *Knocking at the College Door Projections of High School Graduates*, and NCHEMS calculations from the 2015 American Community Survey

TABLE A-6:

ASPIRATIONAL MODEL — ESTIMATED COSTS FOR STATES TO MEET SHEEO AFFORDABILITY THRESHOLD FOR FIRST-TIME FULL-TIME STUDENTS AT OR BELOW 200% OF POVERTY

State	Year 1 - 2017-2018	Year 2 - 2018-2019	Year 3 - 2019-2020	Year 4 - 2020-2021
ALABAMA	$94,473,791	$187,051,225	$252,646,439	$317,104,588
ALASKA	$252,663	$503,462	$746,668	$988,190
ARIZONA	$95,943,313	$192,510,670	$259,337,903	$327,333,485
ARKANSAS	$59,691,429	$119,822,081	$155,384,952	$189,971,350
CALIFORNIA	$312,059,373	$621,050,843	$727,176,819	$840,416,971
COLORADO	$89,693,432	$181,111,759	$242,267,315	$304,714,108
CONNECTICUT	$31,268,502	$62,032,118	$83,845,130	$106,305,476
DELAWARE	$13,378,998	$26,691,814	$37,416,115	$48,597,123
FLORIDA	$292,698,401	$587,817,018	$755,207,388	$922,512,390
GEORGIA	$152,305,626	$306,884,357	$408,438,427	$507,304,772
HAWAII	$9,304,528	$18,304,972	$24,566,998	$31,092,494
IDAHO	$41,638,241	$84,376,121	$113,475,375	$142,880,085
ILLINOIS	$188,094,505	$375,096,301	$516,704,740	$658,116,408
INDIANA	$87,302,688	$176,894,503	$231,823,395	$284,207,021
IOWA	$40,214,045	$79,953,935	$100,687,259	$122,085,088
KANSAS	$54,341,860	$108,975,760	$146,888,779	$185,763,371
KENTUCKY	$61,548,556	$123,300,758	$162,034,646	$201,205,060
LOUISIANA	$76,920,588	$152,189,096	$192,324,374	$231,850,511
MAINE	$24,100,566	$48,069,016	$64,090,387	$79,997,182
MARYLAND	$50,043,429	$99,586,007	$137,854,780	$176,724,910
MASSACHUSETTS	$60,695,692	$121,252,843	$159,617,751	$198,331,270
MICHIGAN	$105,205,155	$209,311,478	$291,742,910	$373,556,314
MINNESOTA	$70,937,561	$142,564,827	$179,899,953	$218,525,741
MISSISSIPPI	$76,496,248	$150,563,839	$207,728,735	$263,154,769
MISSOURI	$109,956,181	$219,468,691	$286,957,930	$354,672,889
MONTANA	$15,527,588	$31,512,249	$42,366,544	$53,086,012
NEBRASKA	$30,130,431	$60,744,899	$81,994,255	$103,424,605
NEVADA	$32,901,289	$66,301,023	$90,336,357	$113,855,886
NEW HAMPSHIRE	$27,279,314	$54,141,919	$68,362,904	$82,191,889
NEW JERSEY	$98,277,871	$196,246,604	$285,228,714	$374,498,916
NEW MEXICO	$31,654,719	$63,895,531	$85,045,875	$105,534,441
NEW YORK	$155,426,965	$309,709,316	$382,255,453	$457,245,669
NORTH CAROLINA	$151,497,272	$305,314,587	$373,976,163	$441,289,734
NORTH DAKOTA	$6,753,961	$13,825,819	$18,224,263	$22,767,741
OHIO	$263,922,300	$524,550,595	$705,162,202	$886,435,255
OKLAHOMA	$48,737,838	$97,734,706	$129,831,835	$162,679,941
OREGON	$73,535,822	$147,049,747	$194,187,667	$242,084,988
PENNSYLVANIA	$218,402,680	$435,186,637	$611,538,320	$790,484,182
RHODE ISLAND	$8,036,414	$16,542,090	$24,743,160	$32,866,763
SOUTH CAROLINA	$102,107,585	$204,753,339	$278,955,508	$352,618,508
SOUTH DAKOTA	$13,987,919	$27,673,375	$35,009,186	$42,802,847
TENNESSEE	$86,339,956	$172,269,217	$230,375,498	$288,272,130
TEXAS	$348,733,783	$704,913,623	$885,517,476	$1,068,748,943
UTAH	$52,438,495	$105,417,375	$139,756,473	$175,571,684
VERMONT	$9,191,135	$18,286,710	$24,326,164	$30,339,909
VIRGINIA	$111,191,083	$222,550,870	$294,819,972	$367,389,466
WASHINGTON	$56,331,734	$112,907,435	$138,198,532	$164,171,258
WEST VIRGINIA	$21,169,066	$41,909,309	$53,374,487	$64,704,586
WISCONSIN	$88,607,904	$176,356,923	$231,307,037	$287,369,817
WYOMING	$5,189,396	$10,410,926	$13,981,079	$17,813,380
0	**$4,255,937,891**	**$8,515,588,318**	**$11,157,740,292**	**$13,815,660,116**

Notes: This model is aspirational. The costs represented here model continued yearly support for each incoming cohort of freshmen, assuming 100% retention and on-time completion. This model assumes that 60% of all low-income high school graduates will enroll in a public institution full time (45% at 2-year institutions and 55% at 4-year institutions). The model is fully implemented in year four.

Sources: WICHE 2016 *Knocking at the College Door Projections of High School Graduates*, NCHEMS calculations from the 2015 American Community Survey, and per-student funding gaps from *Tables A-3* and *A-4* in the *Appendix*

TABLE A-7:
FAMILY CONTRIBUTION AND GAP IN FUNDING — LUMINA RULE OF 10 AT 4-YEAR PUBLIC INSTITUTIONS, BY STATE

	FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)		FAMILY INCOME ($48,001-$75,000)		FAMILY INCOME ($75,001-$110,000)	
State	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap
ALABAMA	$18,125	$9,143	$18,125	$10,779	$31,026	$10,899	$62,026	$6,489
ALASKA	$24,375	$2,023	$24,375	$3,200	$37,276	$2,866	$68,276	$-
ARIZONA	$20,125	$5,535	$20,125	$6,392	$33,026	$7,673	$64,026	$3,977
ARKANSAS	$21,250	$5,078	$21,250	$5,696	$34,151	$5,350	$65,151	$1,176
CALIFORNIA	$26,250	$1,465	$26,250	$3,182	$39,151	$4,461	$70,151	$4,481
COLORADO	$20,775	$7,881	$20,775	$9,224	$33,676	$9,824	$64,676	$6,732
CONNECTICUT	$25,250	$7,217	$25,250	$8,704	$38,151	$8,546	$69,151	$5,695
DELAWARE	$20,625	$8,245	$20,625	$8,254	$33,526	$7,791	$64,526	$5,282
FLORIDA	$20,125	$5,245	$20,125	$6,711	$33,026	$6,694	$64,026	$2,628
GEORGIA	$12,875	$7,439	$12,875	$8,984	$25,776	$8,945	$56,776	$4,611
HAWAII	$23,125	$2,979	$23,125	$4,743	$36,026	$4,481	$67,026	$493
IDAHO	$18,125	$8,825	$18,125	$9,516	$31,026	$9,802	$62,026	$5,605
ILLINOIS	$20,625	$8,139	$20,625	$9,274	$33,526	$11,101	$64,526	$9,618
INDIANA	$18,125	$5,019	$18,125	$5,473	$31,026	$7,668	$62,026	$5,548
IOWA	$18,125	$5,404	$18,125	$7,082	$31,026	$7,799	$62,026	$4,149
KANSAS	$18,125	$7,915	$18,125	$9,066	$31,026	$8,805	$62,026	$4,949
KENTUCKY	$18,125	$5,702	$18,125	$6,089	$31,026	$6,729	$62,026	$3,146
LOUISIANA	$18,125	$5,383	$18,125	$6,019	$31,026	$5,788	$62,026	$1,147
MAINE	$18,750	$8,367	$18,750	$9,849	$31,651	$10,059	$62,651	$6,196
MARYLAND	$23,125	$5,740	$23,125	$7,894	$36,026	$8,693	$67,026	$5,874
MASSACHUSETTS	$27,500	$5,385	$27,500	$6,806	$40,401	$7,524	$71,401	$4,957
MICHIGAN	$22,250	$4,899	$22,250	$6,768	$35,151	$7,395	$66,151	$4,719
MINNESOTA	$23,750	$5,268	$23,750	$5,866	$36,651	$6,875	$67,651	$4,851
MISSISSIPPI	$18,125	$9,213	$18,125	$10,131	$31,026	$9,594	$62,026	$4,450
MISSOURI	$19,125	$6,838	$19,125	$7,692	$32,026	$7,813	$63,026	$3,877
MONTANA	$20,125	$6,890	$20,125	$8,135	$33,026	$8,344	$64,026	$4,002
NEBRASKA	$22,500	$5,980	$22,500	$6,882	$35,401	$6,840	$66,401	$3,986
NEVADA	$20,625	$6,406	$20,625	$7,256	$33,526	$7,136	$64,526	$3,663
NEW HAMPSHIRE	$18,125	$11,552	$18,125	$13,323	$31,026	$14,160	$62,026	$11,524
NEW JERSEY	$20,950	$9,110	$20,950	$10,360	$33,851	$13,045	$64,851	$11,121
NEW MEXICO	$18,750	$4,401	$18,750	$5,698	$31,651	$5,147	$62,651	$388
NEW YORK	$27,500	$1,670	$27,500	$4,616	$40,401	$7,401	$71,401	$4,551
NORTH CAROLINA	$18,125	$4,247	$18,125	$5,919	$31,026	$7,110	$62,026	$5,281
NORTH DAKOTA	$18,125	$5,288	$18,125	$6,758	$31,026	$7,535	$62,026	$3,385
OHIO	$20,250	$9,062	$20,250	$10,451	$33,151	$11,282	$64,151	$7,470
OKLAHOMA	$18,125	$4,735	$18,125	$6,244	$31,026	$7,210	$62,026	$3,895
OREGON	$24,378	$7,928	$24,378	$8,780	$37,279	$8,588	$68,279	$6,371
PENNSYLVANIA	$18,125	$10,892	$18,125	$12,094	$31,026	$13,012	$62,026	$10,258
RHODE ISLAND	$24,000	$4,291	$24,000	$5,904	$36,901	$7,165	$67,901	$5,662
SOUTH CAROLINA	$18,125	$10,618	$18,125	$10,298	$31,026	$10,506	$62,026	$5,926
SOUTH DAKOTA	$21,375	$5,588	$21,375	$8,265	$34,276	$9,165	$65,276	$4,436
TENNESSEE	$18,125	$5,104	$18,125	$6,991	$31,026	$8,799	$62,026	$4,112
TEXAS	$18,125	$4,648	$18,125	$5,482	$31,026	$7,158	$62,026	$5,174
UTAH	$18,125	$6,024	$18,125	$6,860	$31,026	$6,047	$62,026	$1,487
VERMONT	$25,000	$7,547	$25,000	$8,250	$37,901	$8,111	$68,901	$5,326
VIRGINIA	$18,125	$8,378	$18,125	$9,886	$31,026	$10,659	$62,026	$7,820
WASHINGTON	$23,675	$3,690	$23,675	$4,925	$36,576	$6,400	$67,576	$7,257
WEST VIRGINIA	$21,875	$2,820	$21,875	$3,495	$34,776	$3,328	$65,776	$-
WISCONSIN	$18,125	$5,977	$18,125	$7,487	$31,026	$8,846	$62,026	$5,537
WYOMING	$12,875	$5,311	$12,875	$6,579	$25,776	$5,192	$56,776	$3,047
U.S. AVERAGE	**$12,218**	**$6,250**	**$12,218**	**$7,487**	**$25,118**	**$8,027**	**$56,118**	**$4,847**

Notes: Total Student/Family Contribution is the sum of 10 years of savings and work-study during enrollment (see *Appendix B*). Funding gap is the per-year amount needed to reduce net price to equal the student/family contribution.

Sources: U.S. Dept. of Labor, NCSL State Minimum Wage chart, IPEDS 2013-2014 Net Price by Income Quintile. Calculations are based on the Lumina *Rule of 10*.

TABLE A-8:
FAMILY CONTRIBUTION AND GAP IN FUNDING — LUMINA RULE OF 10 AT 2-YEAR PUBLIC INSTITUTIONS, BY STATE

	FAMILY INCOME ($0-$30,000)		FAMILY INCOME ($30,001-$48,000)		FAMILY INCOME ($48,001-$75,000)		FAMILY INCOME ($75,001-$110,000)	
State	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap	Student/Family Contribution	Funding Gap
ALABAMA	$10,875	$2,055	$10,875	$2,644	$23,776	$218	$54,776	$-
ALASKA	$14,625	$-	$14,625	$-	$27,526	$-	$58,526	$-
ARIZONA	$12,075	$2,194	$12,075	$3,001	$24,976	$606	$55,976	$-
ARKANSAS	$12,750	$2,175	$12,750	$2,317	$25,651	$-	$56,651	$-
CALIFORNIA	$15,750	$210	$15,750	$966	$28,651	$-	$59,651	$-
COLORADO	$12,465	$4,357	$12,465	$5,561	$25,366	$3,516	$56,366	$-
CONNECTICUT	$15,150	$630	$15,150	$1,249	$28,051	$-	$59,051	$-
DELAWARE	$12,375	$2,172	$12,375	$2,962	$25,276	$482	$56,276	$-
FLORIDA	$12,075	$2,727	$12,075	$3,568	$24,976	$1,076	$55,976	$-
GEORGIA	$7,725	$2,820	$7,725	$3,876	$20,626	$1,613	$51,626	$-
HAWAII	$13,875	$446	$13,875	$765	$26,776	$-	$57,776	$-
IDAHO	$10,875	$2,718	$10,875	$3,148	$23,776	$522	$54,776	$-
ILLINOIS	$12,375	$1,645	$12,375	$2,103	$25,276	$-	$56,276	$-
INDIANA	$10,875	$2,947	$10,875	$3,867	$23,776	$2,551	$54,776	$-
IOWA	$10,875	$4,892	$10,875	$5,404	$23,776	$3,380	$54,776	$-
KANSAS	$10,875	$3,454	$10,875	$3,485	$23,776	$947	$54,776	$-
KENTUCKY	$10,875	$2,058	$10,875	$2,088	$23,776	$-	$54,776	$-
LOUISIANA	$10,875	$3,688	$10,875	$4,246	$23,776	$1,960	$54,776	$-
MAINE	$11,250	$4,062	$11,250	$5,738	$24,151	$3,662	$55,151	$-
MARYLAND	$13,875	$1,785	$13,875	$2,592	$26,776	$268	$57,776	$-
MASSACHUSETTS	$16,500	$1,258	$16,500	$1,866	$29,401	$-	$60,401	$-
MICHIGAN	$13,350	$160	$13,350	$796	$26,251	$-	$57,251	$-
MINNESOTA	$14,250	$6,257	$14,250	$6,379	$27,151	$4,000	$58,151	$-
MISSISSIPPI	$10,875	$788	$10,875	$1,644	$23,776	$-	$54,776	$-
MISSOURI	$11,475	$2,820	$11,475	$3,340	$24,376	$427	$55,376	$-
MONTANA	$12,075	$3,774	$12,075	$4,017	$24,976	$1,484	$55,976	$-
NEBRASKA	$13,500	$1,472	$13,500	$1,682	$26,401	$-	$57,401	$-
NEVADA	$12,375	$2,533	$12,375	$3,002	$25,276	$1,140	$56,276	$-
NEW HAMPSHIRE	$10,875	$11,200	$10,875	$15,115	$23,776	$10,898	$54,776	$678
NEW JERSEY	$12,570	$1,796	$12,570	$2,297	$25,471	$543	$56,471	$-
NEW MEXICO	$11,250	$1,200	$11,250	$2,130	$24,151	$-	$55,151	$-
NEW YORK	$16,500	$-	$16,500	$1,100	$29,401	$-	$60,401	$-
NORTH CAROLINA	$10,875	$3,733	$10,875	$3,924	$23,776	$494	$54,776	$-
NORTH DAKOTA	$10,875	$3,208	$10,875	$3,394	$23,776	$1,655	$54,776	$-
OHIO	$12,150	$3,305	$12,150	$4,043	$25,051	$1,960	$56,051	$-
OKLAHOMA	$10,875	$2,640	$10,875	$3,137	$23,776	$691	$54,776	$-
OREGON	$14,627	$3,362	$14,627	$4,117	$27,527	$1,916	$58,527	$-
PENNSYLVANIA	$10,875	$1,840	$10,875	$2,661	$23,776	$738	$54,776	$-
RHODE ISLAND	$14,400	$240	$14,400	$1,336	$27,301	$-	$58,301	$-
SOUTH CAROLINA	$10,875	$3,520	$10,875	$3,214	$23,776	$339	$54,776	$-
SOUTH DAKOTA	$12,825	$5,525	$12,825	$6,104	$25,726	$4,248	$56,726	$-
TENNESSEE	$10,875	$2,503	$10,875	$2,978	$23,776	$897	$54,776	$-
TEXAS	$10,875	$2,169	$10,875	$2,869	$23,776	$930	$54,776	$-
UTAH	$10,875	$3,830	$10,875	$2,652	$23,776	$723	$54,776	$-
VERMONT	$15,000	$4,962	$15,000	$5,076	$27,901	$3,265	$58,901	$-
VIRGINIA	$10,875	$2,495	$10,875	$3,060	$23,776	$404	$54,776	$-
WASHINGTON	$14,205	$787	$14,205	$2,117	$27,106	$367	$58,106	$-
WEST VIRGINIA	$13,125	$1,487	$13,125	$1,713	$26,026	$-	$57,026	$-
WISCONSIN	$10,875	$4,072	$10,875	$4,636	$23,776	$2,951	$54,776	$-
WYOMING	$7,725	$3,123	$7,725	$3,802	$20,626	$1,618	$51,626	$-
U.S. AVERAGE	**$12,218**	**$2,662**	**$12,218**	**$3,276**	**$25,118**	**$1,250**	**$56,118**	**$-**

Notes: Total Student/Family Contribution is the sum of 10 years of savings and work-study during enrollment (see *Appendix B*). Funding gap is the per-year amount needed to reduce net price to equal the student/family contribution.

Sources: U.S. Dept. of Labor, NCSL State Minimum Wage chart, IPEDS 2013-2014 Net Price by Income Quintile. Calculations are based on the Lumina *Rule of 10*.

TABLE A-9:
ASPIRATIONAL MODEL — ESTIMATED COSTS FOR STATES TO MEET LUMINA AFFORDABILITY THRESHOLD FOR FIRST-TIME FULL-TIME STUDENTS AT OR BELOW 200% OF POVERTY

State	Year 1 - 2017-2018	Year 2 - 2018-2019	Year 3 - 2019-2020	Year 4 - 2020-2021
ALABAMA	$94,611,482	$187,323,843	$262,012,122	$335,381,075
ALASKA	$2,539,084	$5,059,425	$7,503,474	$9,930,592
ARIZONA	$91,238,747	$183,070,938	$250,392,225	$318,849,099
ARKANSAS	$38,998,052	$78,283,060	$107,557,450	$136,238,328
CALIFORNIA	$183,862,996	$365,918,408	$515,147,636	$667,716,116
COLORADO	$86,180,414	$174,018,163	$234,865,510	$296,993,656
CONNECTICUT	$34,312,037	$68,070,044	$97,977,732	$128,499,342
DELAWARE	$13,694,084	$27,320,429	$38,242,919	$49,633,140
FLORIDA	$253,428,908	$508,953,327	$682,306,399	$855,820,555
GEORGIA	$184,377,503	$371,506,771	$510,013,735	$645,499,351
HAWAII	$6,379,760	$12,551,021	$18,230,265	$24,044,878
IDAHO	$35,852,676	$72,652,199	$101,834,536	$131,388,862
ILLINOIS	$193,452,351	$385,780,866	$546,829,604	$707,586,463
INDIANA	$89,033,547	$180,401,605	$237,679,146	$292,393,986
IOWA	$45,775,958	$91,012,182	$117,809,782	$145,326,103
KANSAS	$54,329,209	$108,950,388	$149,591,185	$191,208,039
KENTUCKY	$56,472,608	$113,132,067	$155,239,362	$197,768,913
LOUISIANA	$71,436,585	$141,338,873	$185,273,808	$228,499,965
MAINE	$23,632,488	$47,135,427	$62,833,143	$78,418,578
MARYLAND	$56,298,878	$112,034,299	$157,655,530	$203,927,576
MASSACHUSETTS	$53,115,633	$106,110,027	$149,276,389	$192,725,930
MICHIGAN	$95,678,278	$190,357,228	$276,235,168	$361,437,082
MINNESOTA	$68,012,545	$136,686,357	$171,816,732	$208,178,082
MISSISSIPPI	$61,741,313	$121,522,419	$174,500,057	$225,857,104
MISSOURI	$94,800,802	$189,219,084	$258,478,036	$327,886,922
MONTANA	$13,124,443	$26,635,220	$36,374,300	$46,016,041
NEBRASKA	$22,713,453	$45,791,790	$65,432,346	$85,267,527
NEVADA	$35,857,553	$72,258,337	$99,527,597	$126,250,979
NEW HAMPSHIRE	$30,499,190	$60,532,486	$76,231,152	$91,494,619
NEW JERSEY	$127,198,742	$253,997,374	$360,322,690	$467,048,688
NEW MEXICO	$23,880,600	$48,203,354	$67,265,126	$85,885,152
NEW YORK	$102,950,533	$205,142,905	$294,024,635	$384,224,576
NORTH CAROLINA	$141,939,043	$286,051,753	$373,192,725	$459,420,077
NORTH DAKOTA	$6,156,510	$12,602,795	$17,298,661	$22,159,044
OHIO	$235,810,935	$468,678,721	$641,666,190	$815,099,703
OKLAHOMA	$51,400,059	$103,073,296	$139,222,061	$176,175,039
OREGON	$61,500,050	$122,981,786	$167,128,584	$211,909,083
PENNSYLVANIA	$243,043,896	$484,286,438	$686,687,730	$891,930,286
RHODE ISLAND	$7,868,429	$16,196,311	$23,662,030	$31,018,973
SOUTH CAROLINA	$98,069,042	$196,654,969	$272,532,920	$347,917,328
SOUTH DAKOTA	$12,531,102	$24,791,241	$32,174,283	$39,949,950
TENNESSEE	$92,163,146	$183,887,899	$249,018,855	$313,911,250
TEXAS	$375,099,936	$758,208,890	$1,028,773,182	$1,303,793,009
UTAH	$42,254,265	$84,943,964	$115,843,892	$147,966,537
VERMONT	$8,485,459	$16,882,696	$22,264,653	$27,624,891
VIRGINIA	$117,222,770	$234,623,394	$328,670,869	$423,062,126
WASHINGTON	$48,637,592	$97,485,827	$134,978,107	$173,126,717
WEST VIRGINIA	$12,868,833	$25,476,982	$34,362,097	$43,126,297
WISCONSIN	$86,268,477	$171,700,745	$226,006,765	$281,388,256
WYOMING	$5,243,758	$10,519,987	$14,067,181	$17,878,897
U.S.	**$3,992,043,754**	**$7,990,017,610**	**$10,976,030,576**	**$13,974,854,782**

Notes: This model is aspirational. The costs represented here model continued yearly support for each incoming cohort of freshmen, assuming 100% retention and on-time completion. This model assumes that 60% of all low-income high school graduates will enroll in a public institution full time (45% at 2-year institutions and 55% at 4-year institutions). The model is fully implemented in year four.

Sources: WICHE 2016 *Knocking at the College Door Projections of High School Graduates*, NCHEMS calculations from the 2015 American Community Survey, and per-student funding gaps from *Tables A-3* and *A-4* in the *Appendix*

TABLE A-10:
COST TO REACH SHEEO AFFORDABILITY THRESHOLD USING 15% INCOME-BASED REPAYMENT

State	Year 1 - 2017-2018	Year 2 - 2018-2019	Year 3 - 2019-2020	Year 4 - 2020-2021
ALABAMA	70,448,554	139,483,005	188,914,110	237,486,932
ALASKA	-	-	-	-
ARIZONA	58,635,303	117,651,987	162,167,009	207,419,958
ARKANSAS	49,658,139	99,681,675	127,192,108	153,874,933
CALIFORNIA	152,735,127	303,968,692	303,519,039	307,066,443
COLORADO	67,056,027	135,401,608	182,385,646	230,359,324
CONNECTICUT	12,374,064	24,548,326	33,459,546	42,622,435
DELAWARE	8,339,332	16,637,412	24,531,438	32,704,153
FLORIDA	210,730,764	423,203,985	533,120,972	642,888,875
GEORGIA	101,344,652	204,201,834	267,955,027	329,862,768
HAWAII	4,829,873	9,501,900	12,821,600	16,275,804
IDAHO	34,590,447	70,094,404	93,459,218	117,056,419
ILLINOIS	117,284,893	233,888,436	329,840,652	425,625,712
INDIANA	51,601,181	104,555,375	139,030,345	172,053,575
IOWA	23,357,946	46,440,485	56,523,680	67,015,953
KANSAS	39,127,157	78,464,587	106,913,527	136,061,003
KENTUCKY	39,992,411	80,117,145	104,819,376	129,803,707
LOUISIANA	54,540,277	107,909,152	132,760,626	157,257,645
MAINE	18,679,787	37,257,175	50,421,243	63,492,415
MARYLAND	21,160,855	42,109,925	62,346,257	82,796,295
MASSACHUSETTS	29,671,774	59,275,820	76,636,741	94,171,267
MICHIGAN	54,039,195	107,513,968	158,510,443	209,099,064
MINNESOTA	45,259,651	90,959,348	114,554,117	138,970,159
MISSISSIPPI	66,263,012	130,422,259	180,864,241	229,770,630
MISSOURI	84,900,878	169,459,183	218,489,770	267,707,073
MONTANA	12,417,216	25,199,947	34,117,639	42,934,508
NEBRASKA	21,953,808	44,260,297	59,407,425	74,681,036
NEVADA	17,085,122	34,429,078	48,821,880	62,975,792
NEW HAMPSHIRE	22,182,413	44,025,976	55,315,202	66,289,867
NEW JERSEY	59,732,254	119,276,618	177,973,134	236,830,235
NEW MEXICO	23,739,559	47,918,660	63,486,550	78,552,697
NEW YORK	72,643,141	144,751,314	160,003,642	176,535,655
NORTH CAROLINA	101,908,496	205,377,628	235,903,443	265,282,653
NORTH DAKOTA	4,784,032	9,793,240	12,651,938	15,601,279
OHIO	213,439,560	424,215,189	575,072,294	726,404,507
OKLAHOMA	27,037,923	54,219,546	73,236,252	92,676,004
OREGON	56,601,884	113,186,914	149,375,505	186,148,649
PENNSYLVANIA	148,933,142	296,762,446	430,009,473	564,929,250
RHODE ISLAND	5,001,456	10,294,957	15,602,010	20,872,713
SOUTH CAROLINA	79,033,400	158,483,355	218,485,422	278,083,696
SOUTH DAKOTA	10,775,283	21,317,569	26,528,805	32,102,244
TENNESSEE	49,112,906	97,992,196	134,972,808	171,815,481
TEXAS	170,514,799	344,670,379	387,318,601	430,276,714
UTAH	41,627,362	83,683,698	111,288,476	140,068,598
VERMONT	6,356,139	12,646,193	17,340,444	22,011,533
VIRGINIA	75,764,371	151,643,695	195,220,505	238,993,402
WASHINGTON	26,774,822	53,665,603	55,768,349	58,152,121
WEST VIRGINIA	14,163,446	28,039,983	34,878,301	41,643,108
WISCONSIN	62,987,701	125,364,856	166,475,113	208,356,462
WYOMING	3,849,620	7,723,078	10,590,964	13,654,677
U.S.	**2,745,041,155**	**5,491,690,100**	**7,111,080,906**	**8,737,315,427**

Notes: This model is aspirational. The costs represented here model continued yearly support for each incoming cohort of freshmen, assuming 100% retention and on-time completion. This model assumes that 60% of all low-income high school graduates will enroll in a public institution full time (45% at 2-year institutions and 55% at 4-year institutions). The model is fully implemented in year four.

Sources: WICHE 2016 *Knocking at the College Door Projections of High School Graduates*, NCHEMS calculations from the 2015 American Community Survey, and per-student funding gaps from *Tables A-3* and *A-4* in the *Appendix*

TABLE A-11:
ENROLLMENT PROJECTIONS FOR FIRST-TIME FULL-TIME STUDENTS UP TO 200% OF POVERTY

STATE	HIGH SCHOOL GRADUATES (2014)	PERCENT LOW INCOME	PERCENT ENROLLING IN POSTSECONDARY		DERIVED ENROLLMENT (FALL 2014)		PROJECTED PERCENT CHANGE IN HIGH SCHOOL GRADUATES (WICHE)						
			2-Year	4-Year	2-Year	4-Year	2015	2016	2017	2018	2019	2020	2021
ALABAMA	49,242	49%	37%	30%	8,903	7,219	-1.6%	-0.5%	1.6%	-2.0%	-2.9%	-1.8%	-0.6%
ALASKA	7,964	36%	9%	35%	270	1,027	-0.8%	2.3%	0.0%	-0.7%	-3.0%	-0.7%	0.7%
ARIZONA	68,060	49%	40%	21%	13,487	6,882	0.8%	0.6%	1.1%	0.7%	-0.6%	1.4%	-0.2%
ARKANSAS	30,947	53%	27%	37%	4,477	6,006	-0.4%	-0.7%	1.1%	0.7%	-0.2%	-1.3%	0.1%
CALIFORNIA	449,202	45%	49%	21%	97,326	42,219	-1.3%	-1.9%	2.4%	-1.0%	-0.7%	1.7%	0.0%
COLORADO	54,882	36%	23%	32%	4,532	6,170	1.8%	0.3%	3.8%	1.9%	0.8%	2.0%	0.1%
CONNECTICUT	42,968	28%	26%	15%	3,163	1,793	0.0%	-0.2%	-1.6%	-1.6%	-2.5%	1.7%	-2.6%
DELAWARE	9,829	40%	27%	20%	1,064	788	-2.0%	1.3%	2.8%	-0.5%	0.5%	3.3%	-1.3%
FLORIDA	179,533	49%	41%	21%	36,597	18,631	-1.3%	0.4%	2.4%	0.8%	-2.3%	0.3%	1.2%
GEORGIA	102,511	48%	27%	35%	13,052	17,057	0.9%	-0.1%	2.9%	1.5%	-1.3%	-1.3%	0.8%
HAWAII	14,088	31%	34%	12%	1,489	543	-2.9%	-0.7%	5.6%	-3.3%	3.8%	1.7%	1.2%
IDAHO	19,562	46%	15%	21%	1,337	1,914	3.1%	1.3%	0.5%	2.6%	-0.5%	1.6%	3.4%
ILLINOIS	149,249	39%	28%	15%	16,482	8,584	-4.1%	-0.3%	1.8%	-0.6%	-1.2%	-0.2%	1.0%
INDIANA	73,359	45%	22%	34%	7,185	11,026	0.2%	0.2%	1.9%	2.6%	-3.5%	-2.0%	2.3%
IOWA	34,768	37%	38%	21%	4,909	2,744	0.1%	0.0%	2.1%	-1.2%	0.0%	1.1%	0.3%
KANSAS	34,098	40%	35%	28%	4,824	3,869	2.4%	-0.9%	4.1%	0.5%	-0.7%	1.9%	0.1%
KENTUCKY	46,929	47%	25%	30%	5,578	6,663	0.4%	-1.5%	2.3%	0.3%	-3.4%	0.8%	-0.4%
LOUISIANA	45,236	50%	30%	41%	6,866	9,245	2.9%	-1.4%	4.8%	-2.1%	-0.1%	-1.8%	-1.5%
MAINE	15,227	37%	20%	21%	1,109	1,185	0.2%	-2.7%	-0.9%	-0.5%	-2.5%	-0.7%	1.3%
MARYLAND	65,968	30%	33%	17%	6,626	3,456	-0.9%	-2.5%	2.9%	-1.0%	2.9%	0.9%	1.4%
MASSACHUSETTS	74,792	29%	25%	19%	5,527	4,095	1.1%	-2.5%	1.0%	-0.2%	-1.2%	0.5%	-0.4%
MICHIGAN	109,270	43%	31%	31%	14,531	14,576	-1.3%	-2.3%	1.6%	-1.0%	-2.9%	-0.8%	0.9%
MINNESOTA	60,719	31%	28%	20%	5,279	3,784	-0.9%	0.8%	1.5%	1.0%	-1.2%	2.3%	2.2%
MISSISSIPPI	29,642	57%	57%	22%	9,541	3,738	0.0%	-0.1%	4.0%	-3.2%	-1.7%	-3.1%	0.7%
MISSOURI	68,165	43%	30%	23%	8,806	6,692	0.7%	-2.1%	2.3%	-0.4%	-0.8%	0.1%	0.9%
MONTANA	9,668	39%	14%	44%	519	1,652	0.5%	-1.5%	-1.0%	2.9%	1.0%	0.1%	1.6%
NEBRASKA	22,836	38%	24%	30%	2,038	2,599	-0.3%	-0.6%	4.9%	1.6%	1.6%	1.1%	2.3%
NEVADA	24,689	49%	28%	25%	3,356	2,973	-2.6%	-0.8%	3.2%	1.5%	-0.6%	-1.1%	0.1%
NEW HAMPSHIRE	16,315	25%	19%	15%	771	608	-0.8%	-3.0%	-0.1%	-1.5%	-0.6%	-2.2%	0.2%
NEW JERSEY	106,594	32%	32%	18%	11,030	6,109	-0.9%	-1.6%	0.8%	-0.3%	-1.4%	0.3%	0.3%
NEW MEXICO	19,873	57%	41%	28%	4,630	3,094	-2.2%	2.2%	0.5%	1.9%	-0.8%	-1.4%	0.9%
NEW YORK	212,185	41%	29%	22%	25,801	19,208	-2.8%	-1.3%	3.1%	-0.7%	-0.4%	1.2%	-0.3%
NORTH CAROLINA	101,942	49%	38%	27%	18,721	13,256	1.6%	-1.0%	4.7%	1.5%	-2.0%	-0.1%	-6.9%
NORTH DAKOTA	7,388	29%	22%	29%	467	629	1.0%	0.9%	-1.7%	4.7%	2.4%	3.9%	6.5%
OHIO	125,152	43%	24%	29%	13,201	15,492	3.4%	-1.6%	1.5%	-1.2%	-1.9%	-0.1%	-0.5%
OKLAHOMA	39,223	48%	33%	30%	6,198	5,576	2.5%	0.6%	2.2%	0.5%	-0.1%	1.7%	0.9%
OREGON	37,757	43%	29%	19%	4,675	3,114	1.6%	-0.9%	0.5%	0.0%	-1.4%	1.0%	0.7%
PENNSYLVANIA	143,382	38%	20%	26%	10,789	14,300	-1.0%	0.1%	1.4%	-0.7%	-2.2%	1.1%	0.9%
RHODE ISLAND	11,774	39%	26%	19%	1,192	893	-3.4%	-10.7%	4.0%	5.8%	0.3%	-0.7%	2.2%
SOUTH CAROLINA	43,943	48%	42%	26%	8,887	5,432	1.5%	0.8%	3.6%	0.5%	-2.3%	-0.4%	0.8%
SOUTH DAKOTA	8,582	37%	17%	38%	538	1,213	-2.0%	0.9%	3.6%	-2.2%	1.8%	2.3%	2.6%
TENNESSEE	66,336	49%	25%	27%	8,279	8,701	0.4%	1.3%	1.5%	-0.5%	-1.8%	-0.4%	0.0%
TEXAS	313,846	47%	37%	24%	54,639	36,106	3.3%	-0.1%	4.2%	2.1%	-1.1%	1.8%	1.0%
UTAH	34,482	37%	12%	37%	1,521	4,726	3.6%	3.6%	2.3%	1.0%	1.2%	3.1%	1.5%
VERMONT	7,175	31%	11%	17%	257	390	-1.1%	1.5%	-5.0%	-1.0%	-1.3%	-0.6%	0.5%
VIRGINIA	88,589	34%	32%	28%	9,440	8,332	1.3%	-0.5%	3.2%	0.2%	0.0%	0.3%	2.1%
WASHINGTON	70,104	38%	23%	21%	6,139	5,473	0.4%	-1.4%	2.7%	0.4%	-1.7%	1.5%	1.1%
WEST VIRGINIA	18,013	48%	18%	37%	1,576	3,188	1.5%	-2.9%	1.9%	-2.0%	0.4%	-1.6%	1.2%
WISCONSIN	66,068	38%	25%	28%	6,272	7,011	0.2%	0.0%	1.8%	-1.0%	-1.5%	0.9%	1.1%
WYOMING	5,720	31%	36%	14%	639	251	0.8%	0.7%	1.1%	0.6%	-0.7%	5.2%	0.0%
U.S.	**3,437,846**	**41%**	**28%**	**26%**	**484,535**	**359,697**	**0.1%**	**-0.6%**	**1.9%**	**0.1%**	**-0.8%**	**0.5%**	**0.6%**

Notes: Percent change in future graduates generated from WICHE's most recently available public and private high school graduation (2014). The proportion of students who enroll in postsecondary assumes enrollment at Title IV degree-granting in-state public institutions directly out of high school (NCES). Proportion of all students who come from low-income families is based on the percent of the population age 0-17 living at or below 200% of the Federal Poverty threshold (ACS).

Sources: WICHE *Knocking at the College Door: Projections of High School Graduates*, 2016; NCES, IPEDS Fall 2014 Residency and Migration File, ef2014c Provisional Release Data File; and U.S. Census Bureau, 2015 American Community Survey (ACS) One-Year Public Use Microdata Sample (PUMS)

TABLE A-12:
ESTIMATED COST TO REACH SHEEO AFFORDABILITY THRESHOLD AS A PERCENT OF TOTAL EDUCATIONAL APPROPRIATIONS

STATE	EDUCATIONAL APPROPRIATIONS (FISCAL 2016)	ESTIMATED COST IN YEAR 4	PERCENT
ALABAMA	$1,056,190,358	$311,882,808	30%
ALASKA	$320,961,268	$979,925	0%
ARIZONA	$1,425,928,300	$268,984,915	19%
ARKANSAS	$788,472,269	$213,316,086	27%
CALIFORNIA	$14,805,886,906	$1,134,073,718	8%
COLORADO	$795,355,855	$259,895,160	33%
CONNECTICUT	$950,931,636	$58,532,676	6%
DELAWARE	$219,180,525	$30,026,097	14%
FLORIDA	$3,696,175,594	$811,384,977	22%
GEORGIA	$2,673,406,742	$489,487,511	18%
HAWAII	$508,722,595	$16,080,450	3%
IDAHO	$401,003,486	$84,706,424	21%
ILLINOIS	$3,954,561,953	$326,599,632	8%
INDIANA	$1,454,699,754	$249,860,546	17%
IOWA	$742,859,645	$111,208,766	15%
KANSAS	$777,626,330	$170,344,245	22%
KENTUCKY	$984,873,676	$174,242,884	18%
LOUISIANA	$849,511,882	$270,399,464	32%
MAINE	$250,507,446	$54,242,079	22%
MARYLAND	$1,897,496,319	$118,052,094	6%
MASSACHUSETTS	$1,409,154,410	$134,487,335	10%
MICHIGAN	$2,205,890,720	$322,338,178	15%
MINNESOTA	$1,276,135,428	$158,987,200	12%
MISSISSIPPI	$779,502,161	$225,683,358	29%
MISSOURI	$1,143,841,736	$288,661,957	25%
MONTANA	$220,760,665	$57,443,978	26%
NEBRASKA	$718,528,762	$93,559,747	13%
NEVADA	$470,470,653	$84,450,818	18%
NEW HAMPSHIRE	$112,249,707	$44,691,438	40%
NEW JERSEY	$1,873,131,000	$208,520,517	11%
NEW MEXICO	$822,380,371	$99,424,022	12%
NEW YORK	$5,628,554,353	$385,727,793	7%
NORTH CAROLINA	$3,334,374,735	$459,457,564	14%
NORTH DAKOTA	$309,988,835	$18,838,059	6%
OHIO	$2,121,992,112	$777,542,808	37%
OKLAHOMA	$807,370,784	$158,393,521	20%
OREGON	$900,896,807	$169,357,485	19%
PENNSYLVANIA	$1,482,407,876	$611,587,826	41%
RHODE ISLAND	$177,477,126	$20,208,674	11%
SOUTH CAROLINA	$874,380,942	$280,492,643	32%
SOUTH DAKOTA	$173,252,776	$40,618,691	23%
TENNESSEE	$1,263,259,743	$232,011,327	18%
TEXAS	$7,300,752,846	$1,020,361,894	14%
UTAH	$823,682,214	$140,511,637	17%
VERMONT	$61,137,241	$15,512,641	25%
VIRGINIA	$1,595,094,358	$338,360,509	21%
WASHINGTON	$1,634,172,211	$121,296,839	7%
WEST VIRGINIA	$332,376,200	$63,303,420	19%
WISCONSIN	$1,255,876,652	$242,976,891	19%
WYOMING	$408,542,862	$10,664,630	3%
U.S.	**$77,009,407,298**	**$11,979,773,859**	**16%**

Notes: Includes IBHE estimates for Illinois. Educational appropriations are a measure of state and local support available for public higher education operating expenses including ARRA funds, and exclude appropriations for independent institutions, financial aid for students attending independent institutions, research, hospitals, and medical education.

Sources: Educational appropriations are from the 2016 *State Higher Education Finance* (SHEF) report, and estimated costs are from *Table 3* in this document.

Appendix B – Methodology

This paper reviews models for a federal-state partnership that are designed to encourage states and institutions to make college affordable for students in lower income quartiles through a matching grant program. The models explored in this paper are based on the theory that cost is a primary barrier to student success and reducing student cost should be a priority for state and federal policy makers. In order to develop cost estimates for the models we had to utilize available data from a variety of sources and base our estimates on a series of assumptions. In this section we provide additional details on our data and model assumptions.

Data and Assumptions

The models use two common cost measures collected at the institutional level in Integrated Postsecondary Education Data System (IPEDS): total cost of attendance and net price. Total cost of attendance incorporates tuition, fees and living expenses (which vary for on-campus students, off-campus students living with family, and off-campus students living without family). An average cost of attendance for each state was calculated by weighting the cost of attendance based on institution and the distribution of the student's living situation. This assumes that low-income students have the same living situation distribution as all students. Average net price is a measure of how much students actually pay after grants and scholarships. Average net price is collected for all students receiving Title IV, broken down into five income bands. This analysis focuses on the costs for students in the $0-$30,000 and $30,001-$48,000 income bands.

To estimate the costs of the programs, the model used high school graduation projections from the Western Interstate Commission for Higher Education (2016). The first iteration of *Moving the Needle* used an aspirational model that tied in with Lumina's goal of 60% completion. In this update, we use a "likely student progress" model for our calculations in the narrative and include the aspirational model in the *Appendix*.

The "likely" model used in this report starts with the same projections of high school graduates and calculates enrollment by sector using the immediate 2-year and 4-year college participation rates for in-state high school graduates from the IPEDS Fall 2014 Residency and Migration file. These rates vary by state; the national average has 28.3% enrolling at 2-year institutions and another 25.5% enrolling at 4-year institutions. These college-going rates were multiplied by the total number of students under 200% of the poverty threshold using the U.S. Census Bureau's three-year poverty estimates for children under 18. We use likely college-going rates for all students because these rates have traditionally been higher than those for low-income students. We anticipate that a financial aid model like we are proposing would incentivize more low-income students to enroll in college, thereby bring their rates closer to those of all students.

Graduation and student progression rates are based on calculations using the Beginning Postsecondary Students (BPS) 04:09 survey for in-state full-time students at public institutions up to 200% of the poverty line. Fifteen percent at 2-year institutions dropped out each year, while 21% attained a certificate or associate's degree within three years (the model does not support 2-year students beyond three years). Seven percent of students at 4-year institutions dropped out each year, while 34% attained a bachelor's degree within five years.

The aspirational model (included in the Appendix) starts with the WICHE projected high school graduates (public and private) through 2021. This model assumes that 60% of high school graduates will matriculate to a 2- or 4-year institution within the state. Sixty percent was chosen because it is approximately the national average for all income bands and it corresponds with Lumina Foundation's completion goal. We then estimated the total number of students under 200% of the poverty line using the U.S. Census Bureau's 200%, 3-year poverty estimates for children under 18. To distribute students across sector we utilized estimates from the National Center for Higher Education Management Systems (NCHEMS) done for Lumina Foundation to help them identify what states must do to reach the 60% completion goal. Based on these estimates we assumed 45% of students would enroll in the 2-year sector or below and 55% would enroll in the 4-year sector. The aspirational model assumes 100% student retention and 100% on-time graduation for all students.

To calculate the affordability threshold the model uses an Income Based Repayment (IBR) formula. To estimate the current loan amounts in each state, this model uses the State Median Income based on level of education from the American Community Survey for potential income after graduation. The model also uses 150% of poverty for a family of three, which is $30,240 according to the most recent numbers from the U.S. Census Bureau.

IBR Payment = 0.10 * (State Median Income – $30,240)

Note: Our previous formula utilized 15% of discretionary income. However, 10% is quickly becoming the norm for income-based repayment plans and is the percentage utilized by Lumina in their model, and so accordingly, we adjusted our model to utilize 10% of discretionary income.

The calculated IBR payment was utilized to determine the reasonable size of a 10-year loan at that payment rate:

Maximum loan using IBR standards = IBR Payment * 10 years

This figure was then compared to an estimate of how much students were likely to take out in loans based on their net price, if they covered the remaining net price through loans and it took them five years to graduate from a 4-year institution and three years to graduate from a 2-year institution.

SHEEO affordability threshold = maximum loan using IBR standards

Lumina Methods

To calculate the affordability threshold based on Lumina's *Rule of 10*, the expected family savings is added to a student's potential work contribution. In this paper, family savings is calculated using the median income in each quintile. Unlike the SHEEO affordability model, the Lumina model uses 200% of poverty for a family of four, which is $48,600 according to the most recent estimates. Families are expected to save 10% of their discretionary income for 10 years:

Total family savings = 0.10 * (Family Income – 200% of Federal Poverty for a family of 4) * 10 years

The Lumina model also assumes that students can work at least 10 hours per week while enrolled, or 500 per year for three or five years. In this paper, we assumed that students would earn state minimum wage:

Total student work contribution = State minimum wage * 500 hours * years enrolled (3 or 5)

The possible family and student contribution was then compared to current costs assuming the student and family together cover their remaining net price for the five years they are expected to take to graduate from a 4-year institution and three years to graduate from a 2-year institution.

For each state in which the student and family contribution was less than the current estimated cost, a per-year funding gap was calculated for each income band. The Lumina model was extended to include the first four income quintiles to show how family income influences ability to pay.

Lumina affordability threshold = total family savings + state minimum wage

Part-time and Adult Students' Data and Methods

Our exploration of part-time and adult student data was limited by data availability. NPSAS 2012 provided national estimates for student budget (cost of attendance) and net price by adjusted gross income (AGI). We defined adult students as those students who were independent and age 25 or above. Part-time students were enrolled in six credits. NPSAS 2012 was also used for a distribution of part-time and adult student enrollment across income quintiles.

We based our enrollment on IPEDS Fall 2014 enrollment for part-time students under age 25, part-time students over age 25, and full-time students over age 25. Projections through 2021 came from the IPEDS 2015 Digest of Education Statistics, using Table 303.40 which shows projected change in enrollment. Estimated costs did not assume a federal-state match because state data was unavailable. Part-time students were given half of the grant awarded to full-time students. Retention and graduation data were not available for low-income students in these groups, so full enrollment was used to calculate the estimated costs instead of the roll-out cohort model used in the traditional student analysis.

The SHEEO affordability model for non-traditional students was constructed using the same assumptions as the original model for full-time students, but we did assume that part-time students would take twice as long to complete their degrees (six and ten years, respectively).

Unexplored Consequences

It is important to note that the models and frameworks discussion presented here is a starting point for a deeper conversation about how a model like this may work to help reduce costs and encourage better completion. There are a number of assumptions built into the models that could be improved and there are a number of complex issues that should be examined in greater detail. Among these, are:

- Fully considering institutional incentives and responses: We need to examine how the models may impact an institution's admissions and financial aid decisions if implemented and ensure the program builds in the proper infrastructure to encourage institutional responses that support access and increased affordability.
- Impact of living cost variations: The primary models currently employ IPEDS cost of attendance figures primarily because those same figures are also utilized to define a family's expected

contribution to college. We do, however, note that these costs are not consistent across institutions; in fact, it is not uncommon to see institutions within the same metropolitan area have significantly different costs. Institutions use many different models and motivations to set these costs and the full impact they have on net price should be considered (see: Kelchen, Goldrick-Rab, & Hosch, 2017).

- Impact of assumptions in the models: Many of the assumptions made in these models are unlikely to hold with program implementation. More testing should be done on these assumptions before a model is fully formed.
- Impact on students in upper quintiles: Finally, we want to ensure we fully consider the implications of these policies on affordability for all students including those in the higher income quintiles who will not necessarily benefit from a state match.

The models put forth in this paper provide new ways for us to consider a state-federal matching program that directs resources to the students who need additional aid the most. The models continue to need rigorous testing and development but we believe they offer a new way for us to look at how the federal government, states, institutions, and students all work together to improve postsecondary attainment in this nation.

STATE HIGHER EDUCATION EXECUTIVE OFFICERS

3035 CENTER GREEN DRIVE, SUITE 100, BOULDER, COLORADO, 80301
303.541.1600 • **SHEEO.org**