

# Kentucky's Affordable Prepaid Tuition

Actuarial Valuation Report  
as of June 30, 2021





September 16, 2021

Board of Directors  
Kentucky's Affordable Prepaid Tuition  
100 Airport Road  
Frankfort, Kentucky 40601

Attention: Mr. David Lawhorn, 529 Program Manager

**Re: Kentucky's Affordable Prepaid Tuition Actuarial Valuation as of June 30, 2021**

Dear Directors:

Gabriel, Roeder, Smith & Company ("GRS") has performed an actuarial valuation of the Kentucky's Affordable Prepaid Tuition Program ("KAPT" or "the Program") as of June 30, 2021. The purpose of this actuarial valuation is to evaluate the financial status of the Program as of June 30, 2021.

This report presents the principal results of the actuarial valuation of KAPT including the following:

- a) A comparison of the actuarial present value of the obligations for prepaid tuition contracts purchased through December 13, 2004 (the most recent ending date for contract sales), with the value of the assets associated with the Program as of June 30, 2021;
- b) An analysis of the factors which caused the deficit/margin to change since the prior actuarial valuation; and
- c) A summary of the member data, financial data, Program provisions, and actuarial assumptions and methods utilized in the actuarial calculations.

The main conclusion of this valuation is that the fund is expected to become depleted in 3-4 years (one year later than the valuation last year). We understand that the liabilities of the fund are backed by the full faith and credit of the Commonwealth of Kentucky, who will be responsible for satisfying the liabilities not covered by the assets of the fund.

Our valuation results show estimates of the depletion date and present value of the unfunded liabilities under the glide path adopted by the Board (and resulting expected rates of return provided by Graystone Consulting) in Appendix A. In addition, we show the sensitivity of the depletion date and unfunded liabilities to changes in certain assumptions about future activity affecting KAPT in Section G.

This report was prepared at the request of the Program and is intended for use by the Board of Directors ("the Board") and those designated or approved by the Board. This report may be provided to parties other than the Board only in its entirety. This report should not be relied on for any purpose other than the purpose described above. GRS is not responsible for unauthorized use of this report.

The valuation results set forth in this report are based upon data and information as of June 30, 2021, furnished by KAPT, concerning Program benefits, financial transactions, and beneficiaries of KAPT. We reviewed this information for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by KAPT.

There are currently no Actuarial Standards of Practice that specifically refer to prepaid tuition plans. We have followed the guidance from the Actuarial Standards of Practice on pensions due to their similar nature.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The major actuarial assumptions used in this analysis were adopted by, and are the responsibility of the Program and the Program's Board. We have not performed an experience study, but have reviewed the assumptions. Based on our limited review, we believe these assumptions are within a reasonable range and are in compliance with actuarial standards regarding pension calculations.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

We have prepared this valuation with the understanding the Program is closed to new participants.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: Program experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in Program provisions or applicable law. We have performed an analysis of the sensitivity of certain changes in future assumptions. See Section G of this report for additional details. In addition, because it is not possible or practical to consider every possible contingency, we may use estimates or simplifications of calculations to facilitate the modeling of future events. We may also exclude factors or data that are deemed to be immaterial.



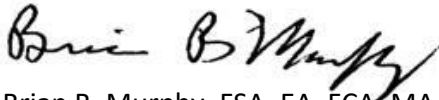
GRS makes no representations or warranties to any person participating in or considering participation in the Program.

To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the Kentucky's Affordable Prepaid Tuition Program as of June 30, 2021.

Brian B. Murphy and James R. Sparks are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The signing actuaries are independent of the Program sponsor.

Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



James R. Sparks, ASA, MAAA

BBM/JRS:dj

C3568



# Table of Contents

	<u>Page</u>
<b>Section A</b>	<b>Executive Summary</b>
	Summary of Results ..... 1
	Funded Status & Change in Margin/(Deficit) ..... 4
	Short-Term & Long-Term Present Values of Future Revenues and Expenditures ..... 5
	Discussion..... 6
<b>Section B</b>	<b>Program Description</b>
	Summary of Program Description..... 11
<b>Section C</b>	<b>Detailed Change in Margin/(Deficit) ..... 13</b>
<b>Section D</b>	<b>Program Assets</b>
	Statement of Total KAPT Assets (at Market Value) ..... 14
	Reconciliation of Total KAPT Assets (at Market Value) ..... 15
<b>Section E</b>	<b>Contract Data</b>
	Member Matriculation Summary ..... 16
	Member Payment Option Summary..... 17
<b>Section F</b>	<b>Methods and Assumptions</b>
	Valuation Methods and Assumptions..... 18
<b>Section G</b>	<b>Projection Results</b>
	Sensitivity Testing Results ..... 20
	Projection Results ..... 22
<b>Appendix A</b>	<b>Glide Path ..... 30</b>
<b>Appendix B</b>	<b>Discussion of Selling New Contracts..... 32</b>

## **SECTION A**

---

### **EXECUTIVE SUMMARY**

## Kentucky's Affordable Prepaid Tuition Summary of Results

Valuation Date:	Valuation Results	
	June 30, 2021	June 30, 2020
Membership Summary:		
Accounts		
8 or More Years Beyond Projected College Entrance Year (PCEY)	629	577
1-7 Years Beyond PCEY	1,817	1,936
At or Before PCEY	145	368
Total	2,591	2,881
Average Years until PCEY (Negative if Past PCEY)	(4.8)	(3.9)
Assets		
Market Value of Assets <sup>1</sup>	\$ 33,142,370	\$ 44,715,027
Present Value of Future Contract Payments	\$ 34,690	\$ 116,764
Fees Receivable	\$ 2,308	\$ 3,244
Total Valuation Assets	\$ 33,179,368	\$ 44,835,035
Estimated Annual Return on Market Value of Assets <sup>2</sup>	9.61%	4.37%
Actuarial Liabilities (Present Value of Future Tuition Payments, Refunds, Fees, Administrative and Investment Expenses)	\$ 63,026,944	\$ 78,804,442
Margin/(Deficit)	\$ (29,847,576)	\$ (33,969,407)
Funded Ratio (Total Assets ÷ Actuarial Liabilities)	52.6%	56.9%
Estimated Fiscal year Fund Depleted	2025	2024

<sup>1</sup> Market Value of Assets based upon current Program cash, cash equivalents and investments.

<sup>2</sup> Estimated money-weighted annual return.

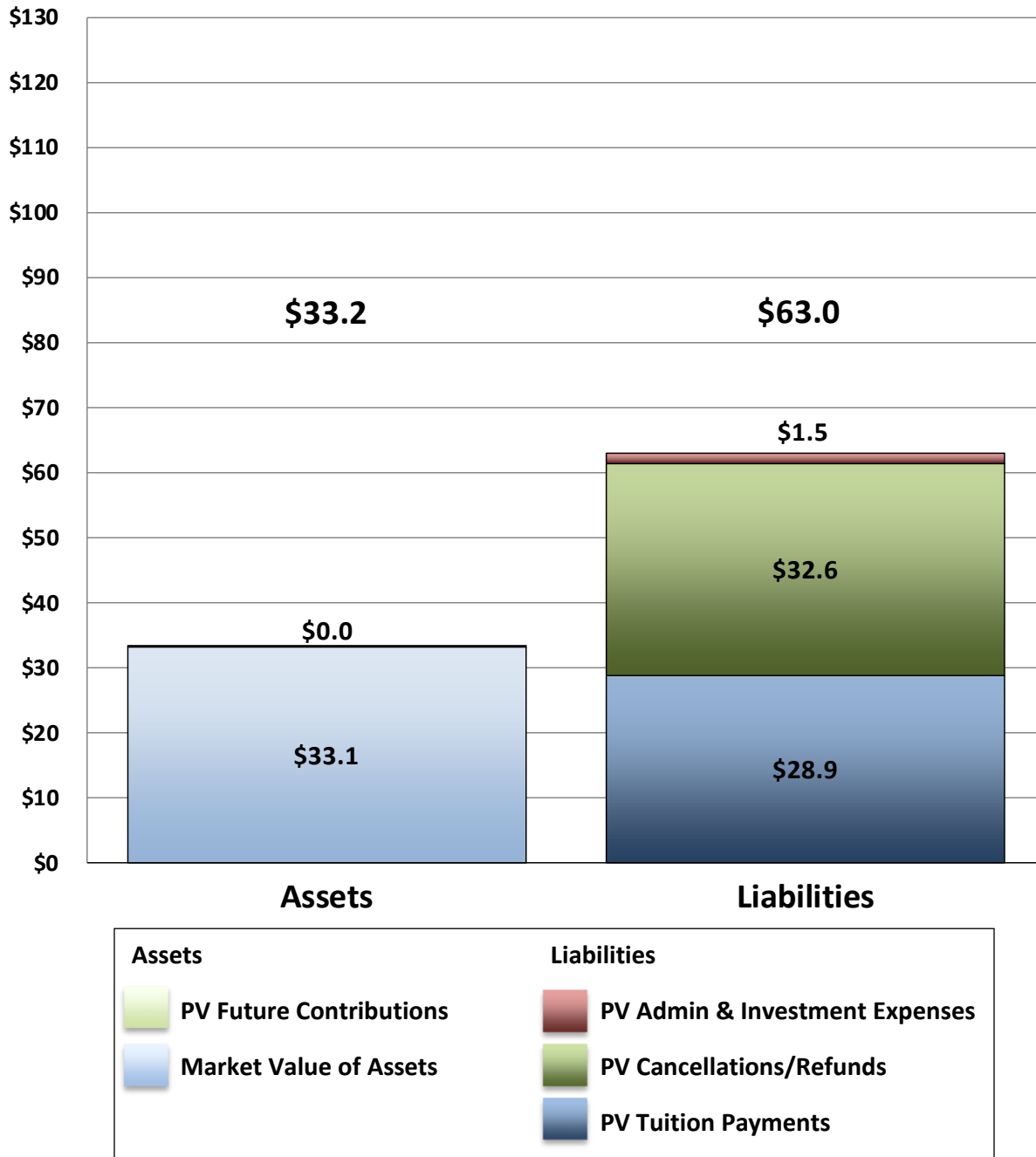
## Kentucky's Affordable Prepaid Tuition Summary of Results

<b>Valuation Results as of June 30, 2021</b>	
Market Value of Assets & Future Contract Receivables	\$ 33,177,060
Other Payables & Receivables	2,308
Actuarial Liabilities	63,026,944
Other Liabilities	<u>N/A</u>
Actuarial Deficit	\$ (29,847,576)
Deficit as a Percent of Liabilities	47.4%



# Kentucky's Affordable Prepaid Tuition Summary of Assets and Liabilities as of June 30, 2021

(\$ in Millions)



*PV – Present Value*

Numbers may not add due to rounding.

## Kentucky's Affordable Prepaid Tuition Funded Status

	June 30, 2021	June 30, 2020
Actuarial Present Value of Future Tuition Payments, Fees and Expenses	\$ 63,026,944	\$ 78,804,442
Market Value of Assets (Including the Present Value of Future Contract Payments)	\$ 33,179,368	\$ 44,835,035
Margin/(Deficit)	\$ (29,847,576)	\$ (33,969,407)

### Change in Margin/(Deficit)

	Margin/(Deficit)
(1.) Values as of June 30, 2020	\$ (33,969,407)
(2.) Interest on Margin/(Deficit) at assumed rate (3.30%)	\$ (1,120,991)
<b>(3.) Projected margin/(deficit) as of June 30, 2021 [(1) + (2)]</b>	<b>\$ (35,090,398)</b>
(4.) Change Due to:	
a. Legislation	\$ -
b. Investment experience above/(below) assumed	2,243,423
c. Change in program assumptions*	1,749,030
d. Tuition/fee inflation below/(above) assumed	1,220,024
e. Other program experience during fiscal year 2021	30,345
Total	\$ 5,242,822
<b>(5.) Actual Margin/(Deficit) as of June 30, 2021 [(3) + (4)]</b>	<b>\$ (29,847,576)</b>

\* Includes changes in liability as a result of changes to the assumed future annual increases in tuition and rates of investment return.

## Kentucky's Affordable Prepaid Tuition Short-Term and Long-Term Present Values of Future Revenues and Expenditures

	As of June 30, 2021
1. Future Contract Payment Revenue	
Short-Term <sup>a</sup>	\$ 29,806
Long-Term <sup>b</sup>	4,884
Total	\$ 34,690
2. Future Tuition Payments and Refunds	
Short-Term <sup>a</sup>	\$ 12,992,907
Long-Term <sup>b</sup>	48,498,737
Total	\$ 61,491,644
3. Future Administrative Expenses	
Short-Term <sup>a</sup>	\$ 195,079
Long-Term <sup>b</sup>	860,038
Total	\$ 1,055,117
4. Future Investment Expenses	
Short-Term <sup>a</sup>	\$ 123,921
Long-Term <sup>b</sup>	356,262
Total	\$ 480,183

<sup>a</sup> Present value of amounts in following year.

<sup>b</sup> Present value of amounts after first year.

# Kentucky's Affordable Prepaid Tuition Discussion

## Financial Status of Program

### Program Status

As of June 30, 2021, the present value of all future tuition obligations under contracts outstanding (and including estimated future administrative and investment expenses) is \$63.0 million. Program assets as of June 30, 2021, including the Market Value of Assets and the present value of installment contract receivables, are \$33.2 million.

The difference between the assets of \$33.2 million and future obligations of \$63.0 million represents a Program deficit of \$29.8 million. The Program is 52.6% funded. This compares to 56.9% as of the prior actuarial valuation. As the Program draws down its assets, the funded status is expected to go to zero. The funded status is not appropriate for measuring the settlement cost of the Program. A funded status less than 100% is an indication that additional contributions (in other words, contributions from sources other than contract payments) will be needed to satisfy the Program's liabilities.

We understand that the Program is backed by the full faith and credit of the Commonwealth of Kentucky. The deficit of \$29.8 million is one estimate of the present value of the contributions the Commonwealth will need to make in order to satisfy its obligation under the Program, if future activity is exactly as assumed.

### Other Measurements to Consider

This report is intended to measure the obligations of the Program. Since the Program obligations will become Commonwealth obligations upon asset depletion, the unfunded obligation of the Program of \$29.8 million is one measure of the obligation of the Commonwealth. However, there are other measures. For example, if the expected payment obligations were summed from the date of depletion, to the date of termination, the sum would total approximately \$33.7 million in tuition, refund payments and expenses.

Fiscal Year	Projected Tuition		Projected Admin.		Total Obligations
	Payments*	Projected Refunds	Expenses		
2025	\$ 3,241,522	\$ 5,328,059	\$ 138,889	\$	\$ 8,708,470
2026	1,557,071	5,886,898	126,111		7,570,080
2027	487,073	4,206,105	113,333		4,806,512
2028	58,122	3,159,325	100,556		3,318,003
2029	-	932,741	87,778		1,020,519
2030	-	8,191,149	75,000		8,266,149
TOTAL	\$ 5,343,788	\$ 27,704,278	\$ 641,667	\$	\$ 33,689,733

\* Net of remaining program assets in Fiscal Year 2025.

The projected expenses shown above are based on prior Staff projections. The tuition payments and refunds are based on current assumptions regarding future participant behavior and future tuition increases. If stakeholders intend to create future budgets from this chart, Stakeholders should consider that actual annual obligations will likely differ from the projections and allow for such differences in their budgeting.

### Management's Discussion and Analysis Language Describing Financial Status for Financial Statements

The following language was specifically requested by Fund Management:

*As of June 30, 2021, the Program had a deficit of \$29.8 million. This represents a \$4.1 million decrease from the previous year's deficit. Based on actuarial estimates, the Program's assets will be exhausted in fiscal year 2025, at which time the liability of the Program becomes a General Obligation of the Commonwealth of Kentucky. Per KRS 164A.708, once a real liability is expected to accrue, the General Assembly shall appropriate the necessary funds to meet the liability. Over the remaining estimated life of the Program, through fiscal year 2030, actuarial estimates show the Commonwealth of Kentucky will need to transfer approximately \$33.7 million, as shown above.*



# Kentucky's Affordable Prepaid Tuition Discussion (Continued)

## Program Experience During the Year

Program experience during the year was mostly favorable, resulting in the liabilities decreasing more than assumed, the deficit decreasing, and the solvency of the Program extending. We observed the following experience:

- 1) The market rate of return on fund assets was 9.61%. This compares to an assumed rate of return of 3.30%. This experience does not affect liabilities, but does result in a decrease in the deficit compared to assumptions (since the market contribution to the assets is greater than assumed);
- 2) The actual rate of tuition increases for UK and KCTCS were 1.00% and 0.00%, respectively, compared to an assumed increase of 4.75% for both (assumption from the June 30, 2020 valuation). This results in a lower liability compared to assumed; and
- 3) Tuition payments, refunds and administrative expenses were approximately \$15.1 million for the 2021 fiscal year compared with \$15.2 million projected from the June 30, 2020 valuation. Since payments were made at a rate close to assumed (in last year's valuation), this experience had little impact on liabilities, assets and solvency compared to assumed.

Overall, when experience is combined with the assumption changes (summarized on the following pages) and Program changes (none), the funded status of the Program declined from 56.9% to 52.6%; the deficit decreased from \$34.0 million to \$29.8 million and the insolvency date extended from the 2024 fiscal year into the 2025 fiscal year.

## Benefit Provision Changes

No Legislation changes occurred during the year.

## Valuation and Actuarial Methods

Valuation and Actuarial methods were unchanged during the year.

## Data Adjustments

Data adjustments were applied to remove Program experience reflected in the census data beyond the June 30, 2021 Valuation date. 249 records were adjusted to properly reflect contract status as of June 30, 2021.

# Kentucky's Affordable Prepaid Tuition Discussion (Continued)

## Valuation Assumptions

### Changes from Prior Valuation

#### Tuition Increase Assumption

The assumed rate of future tuition increases was lowered from 4.75% in the prior valuation to 3.00% for the 2022/2023 Academic Year and 4.25% thereafter.

#### Asset Allocation Glide Path and Assumed Rate of Investment Return

At the May 2021 Board meeting, the Board adopted the following Glide Path asset allocation:

Asset Classes	6/30/2020	6/30/2021	6/30/2022	6/30/2023*
Large Cap US Equity	24%	12%	12%	0%
Small/Mid Cap US Equity	6%	4%	4%	0%
International Equity	6%	3%	3%	0%
US Fixed income	33%	11%	11%	0%
TIPS	6%	0%	0%	0%
Short Duration US Fixed Income	15%	40%	40%	50%
Cash Equivalents	10%	30%	30%	50%
<b>Totals</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\* Not expected to have significant assets to invest. Any remaining assets will be in cash equivalents until depletion.

Graystone Consulting reviewed the Board's adopted Glide Path and then projected expected rates of return until assets were presumed to be 100% in cash or depleted (in 2023). We used the Graystone projected rates in the valuation through the 2023 fiscal year and extended the 2023 fiscal year assumed rate of 2.50% for the 2024 fiscal year as a result of the Program's additional solvency observed in this valuation. In fiscal years ending 2025 and thereafter, a 2.00% assumed rate of investment return was used. This ultimate assumption of 2.00% was first adopted with the June 30, 2020 valuation.

Fiscal Year Ending:	Assumed Investment Return/Discount Rate				
	2021	2022	2023	2024	2025+
Prior Actuarial Valuation (6/30/2020)	3.30%	2.50%	2.50%	2.00%	2.00%
Current Assumption (6/30/2021)	N/A	3.30%	2.50%	2.50%	2.00%

Generally, the valuation uses the assumed rate of investment return as a discount rate to calculate the present value of future tuition payments and expenses (the Actuarial Liability). However, since the concept of an assumed rate of return loses meaning once assets are depleted (and Graystone's Glide Path effectively ends at that point), we used an assumed rate of price inflation as the discount rate to recognize the time value of money. In reviewing the reasonableness of the price inflation assumption for the remainder of the program, we reviewed short-term inflation projections from different sources, including the Congressional Budget Office and the Philadelphia Federal Bank of Reserve.

# Kentucky's Affordable Prepaid Tuition Discussion (Continued)

## Valuation Assumptions (Continued)

### Other Assumptions to Consider Monitoring

#### Refunds

With the value of contracts growing at full value for up to eight years beyond the Projected College Entrance Year (PCEY), it would seem likely that participants who have not utilized all of their contracts for schooling would hold their contracts until the date the contract reaches its maximum value. The results shown in this report are based on the following assumptions:

- 1) Participants who reach eight years beyond their PCEY in the future are assumed to refund at that point in time (assumed to be 8% of participants); and
- 2) Participants who already have maximized their contract value and not yet refunded (more than eight years beyond their PCEY) are expected to hold their contracts until the end of the Program (June 30, 2030).

#### Expenses

Our projections of Program expenses are based on Staff estimates received in connection with the June 30, 2020 valuation. In prior years, administrative expense projections for the upcoming Fiscal Year were based upon amounts that were similar to the expenses shown in the assets for the year ending on the valuation date. After discussions with Staff, there was some concern that the expenses shown in the assets for the year ending June 30, 2020, may include some one-time expenses related to bringing certain administrative functions in-house. As a result, projected expenses for the 2021 fiscal year was assumed to be \$190,000. Expenses are assumed to steadily decrease to \$75,000 in 2030 (the final year of the Program). The assumed expenses for the 2022 fiscal year are \$177,222.

# Kentucky's Affordable Prepaid Tuition Discussion (Concluded)

## Program Status

The Program has a closure date of June 30, 2030, at which point any remaining contract values will be refunded or rolled over to individual 529 College Savings Plans. The Board could elect to start selling contracts again and is charged with annually making that decision. However, if new contracts were to be sold, they would be part of a different plan and would not be backed by the full faith and credit of the Commonwealth. See Appendix B for a discussion regarding the sales of new contracts.

## Future Outlook

The Program is expected to become insolvent in 3-4 years. We understand that the obligations will be transferred to the Commonwealth once the Program becomes insolvent.

The COVID-19 pandemic has created additional short-term uncertainties related to the experience of this Program, including:

- How changes in the delivery of education might affect near term changes in tuition and enrollment;
- How changes in the delivery of education might affect the selection of colleges for those participants who have not yet matriculated; and
- How economic conditions will evolve during the pandemic, potentially affecting future investment returns, tuition increases, and refund experience.

While our sensitivity modeling shows that different experiences will generally only affect the estimated depletion date by a few years, readers should remember that since the baseline line assumptions show depletion in approximately four years, a change of even one year would be a material change in valuation results. It is also important to remember that the projections shown herein are based on future activity that cannot be precisely predicted. While future positive activity may delay the point of fund depletion (the point of becoming pay-as-you-go), future adverse experience may hasten the point of fund depletion. Combining the short-term projections of fund depletions with the need to consider the effects of adverse experience and the greater uncertainty in short-term activity due to the pandemic, stakeholders should prepare for the possibility of trust asset depletion a year or two prior to when the baseline valuation results indicate, just in case future adverse experience accelerates the depletion date.



## **SECTION B**

---

### **PROGRAM DESCRIPTION**

# Kentucky's Affordable Prepaid Tuition

## Summary of Program Description Evaluated June 30, 2021

**Purchasing Contracts** – KAPT is currently closed to new participants. Current members purchased from three types of contracts with the following benefits:

- **Value Plan** – Provides in-state tuition and mandatory fees at Kentucky Community and Technical College System (KCTCS). KCTCS tuition price for full-time enrollment will be guaranteed. Depending on tuition rates, any money left over can cover qualified educational expenses.
- **Standard Plan** – Provides in-state undergraduate tuition and mandatory fees at Kentucky's eight public universities. Guarantees tuition price for full-time enrollment at the Commonwealth's most expensive public university (currently University of Kentucky). Depending on tuition rates, any money left over can cover qualified educational expenses such as books, room, and board.
- **Premium Plan** – Provides tuition at Kentucky's private colleges and universities. While no particular school's tuition is guaranteed, your value of the plan grows at the same rate as the University of Kentucky's tuition. Depending on tuition rates, any money left over can cover qualified educational expenses such as books, room, and board.

**Contract Payments** – Contract holders may agree to pay-off their contracts in a variety of ways:

- Lump-Sum Payment (Full Contract paid-in-full at time of enrollment to the Program)
- 3-Year Monthly Payments (36 monthly payments after purchase of contract)
- 5-Year Monthly Payments (60 monthly payments after purchase of contract)
- 7-Year Monthly Payments (96 monthly payments after purchase of contract)
- Extended Monthly Payments (Monthly payments after purchase of contract for defined period up to and including the year of high school matriculation)
- Custom Monthly Payments (Monthly payments based upon a custom determined schedule)

# Kentucky's Affordable Prepaid Tuition

## Summary of Program Description Evaluated June 30, 2021

### ***Refunds***

**If a contract holder elects to close account prior to July 1 of their Projected College Entrance Year (PCEY),** the amount refunded will include payments made towards the contract minus administrative and cancellation fees.

**If a contract holder elects to close account beyond July 1 of their PCEY and before the end of their contract's utilization period,** the contract holder receives the tuition payout value of the account at that time minus administrative and cancellation fees and any benefits already used.

**If a contract holder elects to close account beyond the end of their contract's utilization period, the contracts receive the following:**

*If refunds occurred prior to June 30, 2019:*

- Accounts with utilization period end dates prior to 2012 – The value of the remaining prepaid tuition account for the 2014-2015 academic year.
- Accounts with utilization period end dates on or after 2012 – The value of the remaining prepaid tuition account at the end of the utilization period plus any applicable tuition plan value increases in each of the next two years (capped at 3% per annum).

*If refunds occur on or after June 30, 2019:*

- The value of the remaining prepaid tuition account at the end of the utilization period plus any applicable tuition plan value increases through the first eight years beyond the contract holder's original Projected College Entrance Year (PCEY).

Accounts have until June 30, 2030 to utilize benefits. Any remaining contract value will be rolled over into a 529 College Savings Program or refunded.

### ***Change in Beneficiary***

Contract holders can change the beneficiary as long as the new beneficiary is an eligible member of the family of the current beneficiary.

*For purposes of this valuation, it is assumed that no contracts will change beneficiaries.*

*This is a summary of the contract provisions as they pertain to this valuation. This should not be construed as actual contract terms.*



## SECTION C

---

### DETAILED CHANGE IN MARGIN/(DEFICIT)

## Kentucky's Affordable Prepaid Tuition Detailed Change in Margin/(Deficit)

	(A) Present Value of Benefits	(B) PV Future Contract Payments	(C) Market Value of Assets	(C) - (A) + (B) Margin/(Deficit)
(1.) Values as of June 30, 2020	\$ 78,804,442	\$ 116,764	\$ 44,718,271	\$ (33,969,407)
(2.) Expected Contract Payments	\$ -	\$ (84,843)	\$ 84,843	\$ -
(3.) Expected Tuition Payments, Refunds, and Administrative Fees	\$ (15,223,708)	\$ -	\$ (15,223,708)	\$ -
(4.) Interest on Margin/(Deficit) at assumed rate (3.30%)	\$ 2,350,715	\$ 2,461	\$ 1,227,263	\$ (1,120,991)
<b>(5.) Projected Margin/(Deficit) as of June 30, 2021 [(1) + (2) + (3) + (4)]</b>	<b>\$ 65,931,449</b>	<b>\$ 34,382</b>	<b>\$ 30,806,669</b>	<b>\$ (35,090,398)</b>
(6.) Change Due to:				
a. Legislation	\$ -	\$ -	\$ -	\$ -
b. Investment experience above/(below) assumed	-	-	2,243,423	2,243,423
c. Change in program assumptions*	(1,749,183)	(153)	-	1,749,030
d. Tuition/fee inflation below/(above) assumed	(1,220,024)	-	-	1,220,024
e. Other program experience during fiscal year 2021	64,702	461	94,586	30,345
Total	\$ (2,904,505)	\$ 308	\$ 2,338,009	\$ 5,242,822
<b>(7.) Actual values as of June 30, 2021 [(5) + (6)]</b>	<b>\$ 63,026,944</b>	<b>\$ 34,690</b>	<b>\$ 33,144,678</b>	<b>\$ (29,847,576)</b>

\* Includes changes in liability as a result of changes to the assumed future annual increases in tuition, rates of investment return and administrative expenses.

## SECTION D

---

### PROGRAM ASSETS

## Kentucky's Affordable Prepaid Tuition Statement of Total Assets (at Market Value)

	Market Value of Cash and Investment Assets Held			
	as of June 30, 2021		as of June 30, 2020	
	Amount	% of Total	Amount	% of Total
Cash	\$ 9,955,153	30.04%	\$ 4,538,997	10.12%
Corporate Bonds	\$ 3,311,724	9.99%	\$ 14,922,307	33.28%
U.S. Treasury and Government Agency Securities	\$ 13,166,434	39.73%	\$ 9,184,049	20.48%
Corporate Stock	\$ 6,709,059	20.24%	\$ 16,062,794	35.82%
Money Market	\$ 50,650	0.15%	\$ 6,871	0.02%
Assumed Net Receivables	\$ (50,650)	-0.15%	\$ 126,163	0.28%
<b>Total</b>	<b>\$ 33,142,370</b>	<b>100.00%</b>	<b>\$ 44,841,181</b>	<b>100.00%</b>

## Kentucky's Affordable Prepaid Tuition Reconciliation of Total Assets (at Market Value)

	FY 2021	FY 2020
<b>Total Market Value of Assets at the beginning of the Fiscal Year</b>	\$ 44,841,181	\$ 58,484,395
<b>Additions:</b>		
<b>Contract Payments</b>	\$ 107,147	\$ 97,925
<b>Investment Revenues:</b>		
a. Net unrealized gain on investments	\$ (6,272,992)	\$ (6,657,397)
b. Interest and investment income	9,669,223	8,770,017
<b>Total Investment Revenues</b>	\$ 3,396,231	\$ 2,112,620
<b>Deductions:</b>		
a. Administrative expenses	\$ 124,173	\$ 141,933
b. Personnel and professional expenses	213,250	221,500
c. Refunds	2,995,222	2,187,352
d. Tuition benefits expense, net	11,743,389	13,276,587
<b>Total Deductions</b>	\$ 15,076,034	\$ 15,827,372
<b>Change in Net Position</b>	\$ (11,572,656)	\$ (13,616,827)
<b>Change in Net Receivables</b>	\$ (126,155)	\$ (26,387)
<b>Total Market Value of Assets at the end of the Fiscal Year</b>	\$ 33,142,370	\$ 44,841,181

Total asset value shown above excludes any receivables for future contract payments.



## **SECTION E**

---

### **CONTRACT DATA**

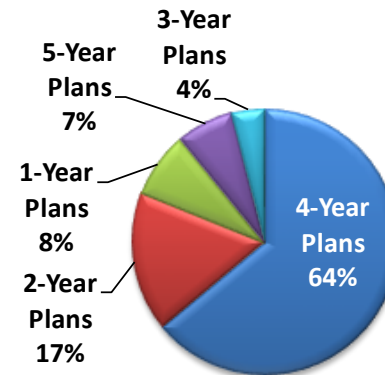
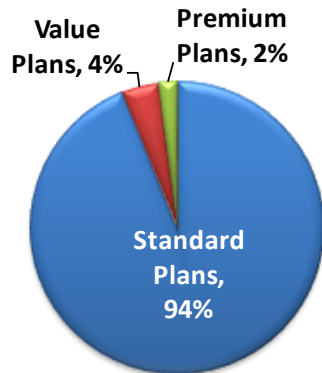
## Kentucky's Affordable Prepaid Tuition Member Matriculation Summary as of June 30, 2021

Projected Matriculation Year	Type of Contract												Total	
	Value Plan 1 Year	Value Plan 2 Years	Standard Plan 1 Year	Standard Plan 2 Years	Standard Plan 3 Years	Standard Plan 4 Years	Standard Plan 5 Years	Premium Plan 1 Year	Premium Plan 2 Years	Premium Plan 3 Years	Premium Plan 4 Years	Premium Plan 5 Years		
2004	-	1	2	1	-	8	-	-	-	-	1	-	13	0.5%
2005	-	-	-	3	3	11	-	-	-	-	1	-	18	0.7%
2006	-	1	-	6	4	20	3	-	-	-	1	-	35	1.4%
2007	3	1	4	8	6	24	2	-	-	-	2	-	50	1.9%
2008	1	2	5	6	-	37	4	-	1	-	3	2	61	2.4%
2009	1	3	5	16	5	43	5	-	-	-	-	1	79	3.0%
2010	-	-	6	9	6	46	8	1	-	-	2	-	78	3.0%
2011	1	2	7	13	3	60	6	-	-	-	2	-	94	3.6%
2012	1	3	6	17	6	52	2	-	-	-	1	-	88	3.4%
2013	1	2	10	14	2	72	10	-	-	-	-	2	113	4.4%
2014	-	6	11	32	6	98	5	-	1	1	3	1	164	6.3%
2015	2	3	8	17	4	105	12	-	-	-	3	1	155	6.0%
2016	1	9	10	20	11	112	21	-	-	-	4	-	188	7.3%
2017	4	4	11	24	6	168	27	-	2	-	1	2	249	9.6%
2018	2	12	19	36	11	224	21	1	1	-	2	-	329	12.7%
2019	2	10	17	36	5	166	11	-	1	1	2	1	252	9.7%
2020	3	7	24	38	9	169	16	-	1	-	1	-	268	10.3%
2021	2	9	27	31	5	119	15	-	2	-	2	-	212	8.2%
2022	3	4	12	12	5	64	9	1	-	1	1	-	112	4.3%
2023	-	-	3	5	-	18	3	-	-	-	1	-	30	1.2%
2024	-	-	-	-	-	1	-	-	-	-	-	-	1	0.0%
2025	-	-	-	1	-	-	-	-	-	-	-	-	1	0.0%
2026	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
2027	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
2028	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0%
2029	-	-	-	-	-	1	-	-	-	-	-	-	1	0.0%
<b>2004-2013</b>	<b>8</b>	<b>15</b>	<b>45</b>	<b>93</b>	<b>35</b>	<b>373</b>	<b>40</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>13</b>	<b>5</b>	<b>629</b>	<b>24.3%</b>
<b>2014+</b>	<b>19</b>	<b>64</b>	<b>142</b>	<b>252</b>	<b>62</b>	<b>1,245</b>	<b>140</b>	<b>2</b>	<b>8</b>	<b>3</b>	<b>20</b>	<b>5</b>	<b>1,962</b>	<b>75.7%</b>
<b>Grand Total</b>	<b>27</b>	<b>79</b>	<b>187</b>	<b>345</b>	<b>97</b>	<b>1,618</b>	<b>180</b>	<b>3</b>	<b>9</b>	<b>3</b>	<b>33</b>	<b>10</b>	<b>2,591</b>	<b>100.0%</b>
	1.0%	3.0%	7.2%	13.3%	3.7%	62.4%	6.9%	0.1%	0.3%	0.1%	1.3%	0.4%	100.0%	



## Kentucky's Affordable Prepaid Tuition Member Payment Option Summary as of June 30, 2021

Contract Payment Type	Type of Contract												Total	
	Value Plan 1 Year	Value Plan 2 Years	Standard Plan 1 Year	Standard Plan 2 Years	Standard Plan 3 Years	Standard Plan 4 Years	Standard Plan 5 Years	Premium Plan 1 Year	Premium Plan 2 Years	Premium Plan 3 Years	Premium Plan 4 Years	Premium Plan 5 Years		
Lump Sum	8	22	104	138	31	666	75	1	5	3	18	6	<b>1,077</b>	41.6%
3-Year Monthly	2	9	14	20	4	94	11	-	-	-	2	-	<b>156</b>	6.0%
5-Year Monthly	3	7	14	23	6	135	18	1	2	-	4	3	<b>216</b>	8.3%
7-Year Monthly	4	12	18	72	25	299	38	-	-	-	6	1	<b>475</b>	18.3%
Monthly Extended	10	29	37	88	31	369	26	1	2	-	2	-	<b>595</b>	23.0%
Custom Monthly	-	-	-	4	-	55	12	-	-	-	1	-	<b>72</b>	2.8%
<b>Total</b>	<b>27</b>	<b>79</b>	<b>187</b>	<b>345</b>	<b>97</b>	<b>1,618</b>	<b>180</b>	<b>3</b>	<b>9</b>	<b>3</b>	<b>33</b>	<b>10</b>	<b>2,591</b>	100.0%
	1.0%	3.0%	7.2%	13.3%	3.7%	62.4%	6.9%	0.1%	0.3%	0.1%	1.3%	0.4%	100.0%	



## **SECTION F**

---

### **METHODS AND ASSUMPTIONS**

# Kentucky's Affordable Prepaid Tuition Valuation Methods and Assumptions

The assumptions are based upon past Program experience and future expectations. We believe the assumptions are reasonable.

**Assumed Rate of Investment Return/Discount Rate** – The assumed rate of return is used as the discount rate for the determination of the present value of fund tuition payments, refunds and expenses. The rates in the table below are gross of investment expenses, as provided by Graystone Consulting, and are based upon the Board adopted Glide Path (see Appendix A for more details). The assumed rate of investment return for the purposes of this valuation are gross of investment and administrative expenses.

Graystone Consulting Glide Path	Assumed Investment Return	
Fiscal Year Ending:	2022	2023
Assumed Rates of Return	3.30%	2.50%

The assumed rate of investment return for the Fiscal Year ending 2024 was additionally 2.50%. After fund depletion, a price inflation assumption is used as the discount rate. The assumed rate of price inflation for fiscal years ending 2025 and thereafter was 2.00%. We used future short-term forecasts of price inflation from different sources to determine the reasonableness of this assumption, including forecasts from the CBO and Federal Reserve bank of Philadelphia.

**Assumed Rate of Tuition Increases:** The assumed rate of tuition increases is prescribed by KAPT.

4-Year Universities – 3.00% for the 2022/2023 Academic Year, 4.25% thereafter.

2-Year Community Colleges – 3.00% for the 2022/2023 Academic Year, 4.25% thereafter.

**Assumed Utilization Hours<sup>#</sup>:** It is assumed 92% of contracts who reach Projected Contract Enrollment Year (PCEY) on or after the valuation date will utilize 32 KAPT hours per year until they have exhausted all value or reached the end of their utilization period. Contracts with remaining value beyond the utilization period are assumed to refund eight years after their PCEY (maximum refundable value).

*# Liabilities are modeled assuming two payments per year for Tuition payouts (one at beginning of September and one at beginning of January).*

**Refunds:** It is assumed 8% of contracts with PCEY on or after the valuation date will not utilize any additional KAPT hours in the future and will continue holding their contract until eight years after PCEY, at which time they will be issued a refund.

**Past Due Refunds:** Those who are already eight years past their PCEY and have not already refunded are assumed to continue holding their contracts until the Program closure in 2030 and then will be issued a refund.

**Election of Program Changes:** None.

**Election of Change of Beneficiary:** None.

**Liability Adjustments for Investment and Administrative Expenses:** There is a 0.2% expense based upon the Market Value of Assets for Investment Expenses. Administrative expenses were assumed to be \$190,000 in the 2021 fiscal year and steadily decrease to \$75,000 in 2030 (the final year of the Program). The administrative expense assumed for the 2022 fiscal year was \$177,222.

**Contract Terms:** No changes in contract terms are assumed once initiated.



## Kentucky's Affordable Prepaid Tuition Valuation Methods and Assumptions

**Annual Payout Values for the 2021/2022 Academic Year (based on usage of 32 KAPT hours):**

Value Plan: \$5,984  
 Standard Plan: \$12,610  
 Premium Plan: 2001-2002 KAPT Enrollment – \$39,908  
                   2002-2003 KAPT Enrollment – \$43,644  
                   2004-2005 KAPT Enrollment – \$36,826

**Cancellations:** It is assumed contracts which have not yet reached their PCEY will cancel and refund based upon the rates below. It is assumed the amount refunded equals the amount of money the contract holder has paid into the Program.

Years Since Purchase	Contract Payment Plan					
	Lump-Sum	36 Monthly Payments	60 Monthly Payments	84 Monthly Payments	Extended Payments	Custom Payments
0	1.50%	3.00%	5.00%	6.00%	8.00%	8.00%
1	1.00%	2.00%	4.00%	4.00%	7.00%	7.00%
2	0.75%	1.00%	3.00%	3.00%	5.00%	5.00%
3	0.75%	1.00%	2.00%	2.00%	4.00%	4.00%
4	0.50%	0.75%	1.00%	1.00%	3.00%	3.00%
5	0.50%	0.75%	0.75%	1.00%	2.00%	2.00%
6	0.50%	0.75%	0.75%	1.00%	1.00%	1.00%
7+	0.50%	0.75%	0.75%	0.75%	0.75%	0.75%

## **SECTION G**

---

### **PROJECTION RESULTS**

# Kentucky's Affordable Prepaid Tuition

## Sensitivity Testing Results

The actuarial assumptions regarding future increases in tuition costs and fees and the future rate of investment return were adopted by KAPT. In our opinion, the adopted assumptions are reasonable for the purpose of the measurement. However, no one knows with certainty what the future holds with respect to economic and other contingencies. For example, while it is assumed that the assets of the Program will earn 3.30% gross of investment expenses during the 2022 fiscal year, actual return is expected to vary from year to year. Therefore, we have projected the Program's results under alternative assumptions for future investment income and tuition increases as follows:

**Page**   **Description**

- 21   Summary of Sensitivity Testing Results.
- 22   Current valuation assumptions – Projection based upon the valuation assumptions and the current Program assets plus the deficit of \$29.8 million as a lump-sum contribution to the Program as of the valuation date to display solvency for the remainder of the Program.
- 23   Current valuation assumptions – Projection based upon the valuation assumptions and current Program assets for computation of the depletion date.
- 24   The investment return assumption is 200 basis points higher than assumed in each of the next four years.
- 25   The investment return assumption is 200 basis points lower than assumed in each of the next four years.
- 26   Tuition increases are 100 basis points higher in each future year than assumed.
- 27   Tuition increases are 100 basis points lower in each future year than assumed.
- 28   Contracts which, as of the valuation date, are more than eight years past their Projected College Entrance Year (PCEY) but have not refunded yet are assumed to refund immediately in the next fiscal year.
- 29   Contracts once beyond the Projected College Entrance Year (PCEY) are assumed to not refund their contracts until Program closure in 2030.

The summary of the impact of each of these scenarios on the principal valuation results is presented on the following page. See pages 22 through 29 for detailed projection results of each scenario.



## Kentucky's Affordable Prepaid Tuition Sensitivity Testing Results

	Valuation Results Pages 22 & 23	Plus 200 Basis Points For Next 4 years Page 24	Minus 200 Basis Points For Next 4 years Page 25	Assumed Tuition Increases +100 Basis Points Page 26	Assumed Tuition Increases -100 Basis Points Page 27	Assuming All Maximized Refunds Paid Next Fiscal Year Page 28	Assuming All Maximized Refunds Paid Upon Program Closure Page 29
Assumed Investment Return in Fiscal Year Ending							
2022	3.30%	5.30%	1.30%	3.30%	3.30%	3.30%	3.30%
2023	2.50%	4.50%	0.50%	2.50%	2.50%	2.50%	2.50%
2024	2.50%	4.50%	0.50%	2.50%	2.50%	2.50%	2.50%
2025	2.00%	4.00%	0.00%	2.00%	2.00%	2.00%	2.00%
2026	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
2027	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
2028+	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Assumed Tuition Increase (University/Community College)							
2022/2023 Academic Year	3.00%/3.00%	3.00%/3.00%	3.00%/3.00%	4.00%/4.00%	2.00%/2.00%	3.00%/3.00%	3.00%/3.00%
2023/2024 and Thereafter	4.75%/4.75%	4.75%/4.75%	4.75%/4.75%	5.75%/5.75%	3.75%/3.75%	4.75%/4.75%	4.75%/4.75%
Year Insolvent	2025	2025	2024	2024	2025	2024	2030
(Increase)/Decrease in Deficit (\$ in Millions)		\$2.9	(\$3.2)	(\$1.2)	\$1.2	(\$1.1)	\$2.3

# Kentucky's Affordable Prepaid Tuition

## June 30, 2021 Projection Based on Valuation Results

### Projection of Lump-Sum Contribution for Program Solvency

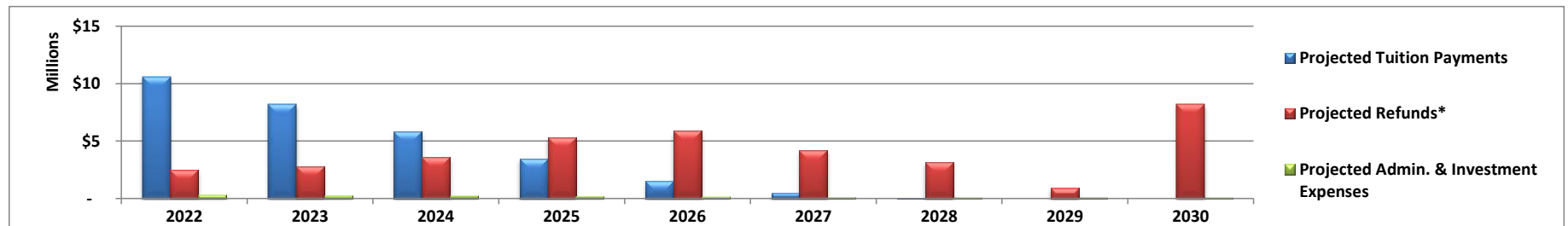
Inputs		
Investment Expenses:	% of BOY Assets:	
	0.20%	
Assumed Admin. Expenses:	2021:	2030:
	\$177,222	\$75,000
Closure of Program:	2030	

Valuation Results	
Present Value of Future Tuition and Fees	\$ 63,026,944
Present Value of Future Contract Payments	\$ 34,690
June 30, 2021 Assets	\$ 33,144,678
(Margin)/Deficit	\$ 29,847,576
Funded Status	52.6%

Fiscal Year	Assumed Investment Return During Year <sup>^</sup>	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Solvent Market Value of Assets End of Fiscal Year	Lump-Sum Contribution
2021									\$ 33,144,678	\$ 29,847,576
2022	3.30%	N/A	N/A	\$ 62,992,254	\$ 10,615,814	\$ 2,531,868	\$ 324,206	\$ 30,292	51,350,589	
2023	2.50%	3.00%	3.00%	51,350,589	8,192,998	2,829,043	267,146	5,108	41,175,738	
2024	2.50%	4.25%	4.25%	41,175,738	5,832,141	3,583,012	234,018	-	32,411,591	
2025	2.00%	4.25%	4.25%	32,411,591	3,451,992	5,328,059	203,712	-	23,975,031	
2026	2.00%	4.25%	4.25%	23,975,031	1,557,071	5,886,898	174,061	-	16,755,391	
2027	2.00%	4.25%	4.25%	16,755,391	487,073	4,206,105	146,844	-	12,200,615	
2028	2.00%	4.25%	4.25%	12,200,615	58,122	3,159,325	124,957	-	9,068,716	
2029	2.00%	4.25%	4.25%	9,068,716	-	932,741	105,915	-	8,201,082	
2030	2.00%	4.25%	4.25%	8,201,082	-	8,191,149	91,402	-	0	

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).

<sup>^</sup> Assumed rate of future investment returns are based upon current Program assets. If the Program were to receive a lump-sum contribution, this may impact future projected rates of investment return.



# Kentucky's Affordable Prepaid Tuition

## June 30, 2021 Projection Based on Valuation Results

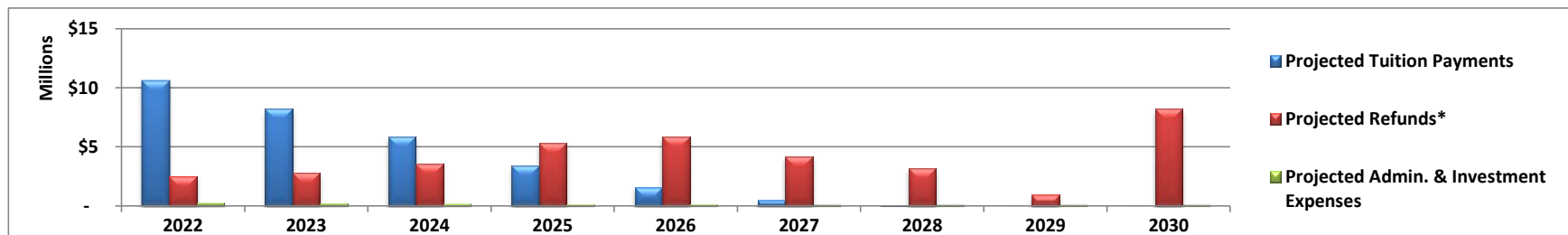
### Projection of Program Depletion

Inputs		
Investment Expenses:	% of BOY Assets: 0.20%	
Assumed Admin. Expenses:	2021:	2030:
	\$177,222	\$75,000
Closure of Program:	2030	

Solvency Results	
Year Insolvent	2025

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	3.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 2,531,868	\$ 264,511	\$ 30,292	20,578,717
2023	2.50%	3.00%	3.00%	20,578,717	8,192,998	2,829,043	205,602	5,108	9,696,880
2024	2.50%	4.25%	4.25%	9,696,880	5,832,141	3,583,012	171,060	-	209,503
2025	2.00%	4.25%	4.25%	209,503	3,451,992	5,328,059	139,308	-	(8,806,053)
2026	2.00%	4.25%	4.25%	(8,806,053)	1,557,071	5,886,898	126,111	-	(16,632,887)
2027	2.00%	4.25%	4.25%	(16,632,887)	487,073	4,206,105	113,333	-	(21,821,583)
2028	2.00%	4.25%	4.25%	(21,821,583)	58,122	3,159,325	100,556	-	(25,609,282)
2029	2.00%	4.25%	4.25%	(25,609,282)	-	932,741	87,778	-	(27,152,158)
2030	2.00%	4.25%	4.25%	(27,152,158)	-	8,191,149	75,000	-	(36,043,739)

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).



# Kentucky's Affordable Prepaid Tuition

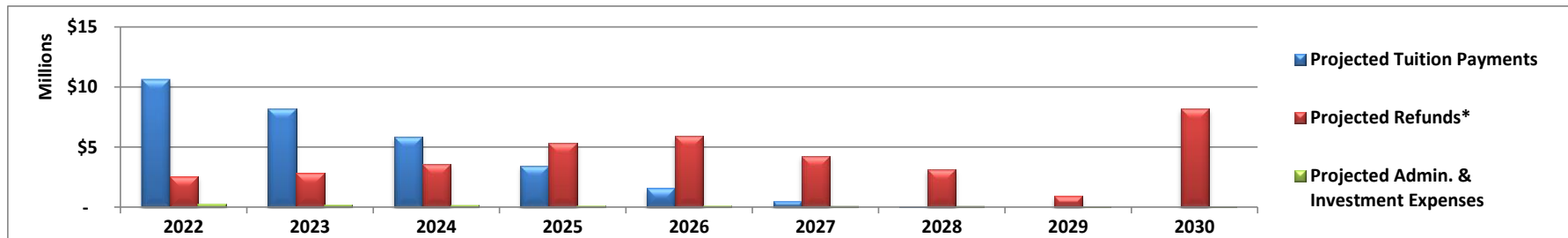
## June 30, 2021 Projection Based on Investment Return +200 Basis Points for 4 Years

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222      2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2025

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	5.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 2,531,868	\$ 264,712	\$ 30,292	21,074,306
2023	4.50%	3.00%	3.00%	21,074,306	8,192,998	2,829,043	206,593	5,108	10,487,228
2024	4.50%	4.25%	4.25%	10,487,228	5,832,141	3,583,012	172,641	-	1,113,638
2025	4.00%	4.25%	4.25%	1,113,638	3,451,992	5,328,059	141,116	-	(7,963,178)
2026	2.00%	4.25%	4.25%	(7,963,178)	1,557,071	5,886,898	126,111	-	(15,773,155)
2027	2.00%	4.25%	4.25%	(15,773,155)	487,073	4,206,105	113,333	-	(20,944,657)
2028	2.00%	4.25%	4.25%	(20,944,657)	58,122	3,159,325	100,556	-	(24,714,817)
2029	2.00%	4.25%	4.25%	(24,714,817)	-	932,741	87,778	-	(26,239,804)
2030	2.00%	4.25%	4.25%	(26,239,804)	-	8,191,149	75,000	-	(35,113,137)

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).



# Kentucky's Affordable Prepaid Tuition

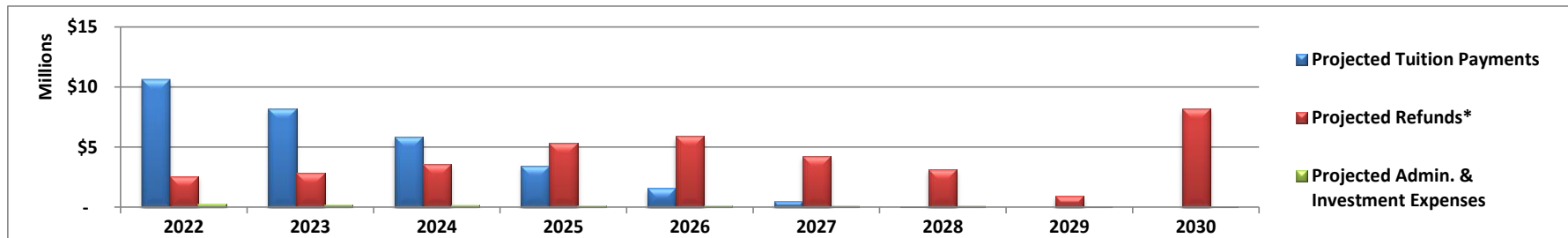
## June 30, 2021 Projection Based on Investment Return -200 Basis Points for 4 Years

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222      2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2024

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	1.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 2,531,868	\$ 264,307	\$ 30,292	20,084,092
2023	0.50%	3.00%	3.00%	20,084,092	8,192,998	2,829,043	204,613	5,108	8,928,112
2024	0.50%	4.25%	4.25%	8,928,112	5,832,141	3,583,012	169,523	-	(640,724)
2025	0.00%	4.25%	4.25%	(640,724)	3,451,992	5,328,059	138,889	-	(9,559,664)
2026	2.00%	4.25%	4.25%	(9,559,664)	1,557,071	5,886,898	126,111	-	(17,401,570)
2027	2.00%	4.25%	4.25%	(17,401,570)	487,073	4,206,105	113,333	-	(22,605,640)
2028	2.00%	4.25%	4.25%	(22,605,640)	58,122	3,159,325	100,556	-	(26,409,020)
2029	2.00%	4.25%	4.25%	(26,409,020)	-	932,741	87,778	-	(27,967,891)
2030	2.00%	4.25%	4.25%	(27,967,891)	-	8,191,149	75,000	-	(36,875,786)

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).



# Kentucky's Affordable Prepaid Tuition

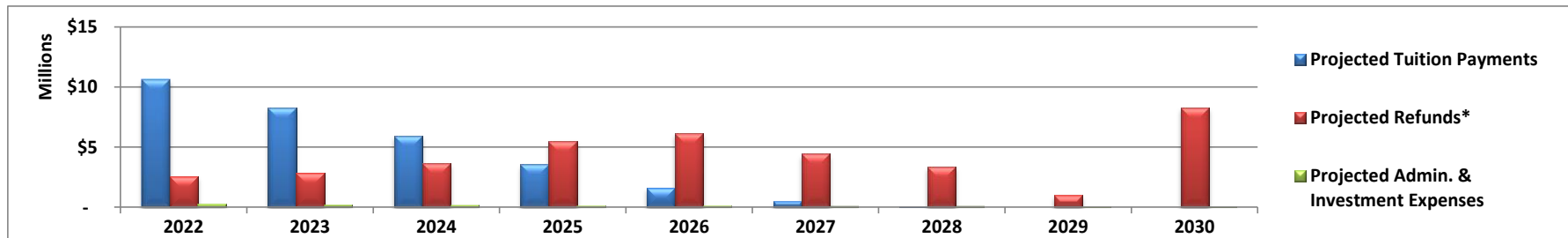
## June 30, 2021 Projection Based on Tuition Increases +100 Basis Points

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222      2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2024

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	3.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 2,531,868	\$ 264,511	\$ 30,292	20,578,717
2023	2.50%	4.00%	4.00%	20,578,717	8,272,542	2,856,457	205,602	5,108	9,588,259
2024	2.50%	5.25%	5.25%	9,588,259	5,945,251	3,652,497	170,843	-	(86,951)
2025	2.00%	5.25%	5.25%	(86,951)	3,552,695	5,483,487	138,889	-	(9,367,031)
2026	2.00%	5.25%	5.25%	(9,367,031)	1,617,867	6,116,745	126,111	-	(17,498,826)
2027	2.00%	5.25%	5.25%	(17,498,826)	510,945	4,412,247	113,333	-	(22,937,227)
2028	2.00%	5.25%	5.25%	(22,937,227)	61,555	3,345,951	100,556	-	(26,939,203)
2029	2.00%	5.25%	5.25%	(26,939,203)	-	997,309	87,778	-	(28,573,888)
2030	2.00%	5.25%	5.25%	(28,573,888)	-	8,250,842	75,000	-	(37,554,192)

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).



# Kentucky's Affordable Prepaid Tuition

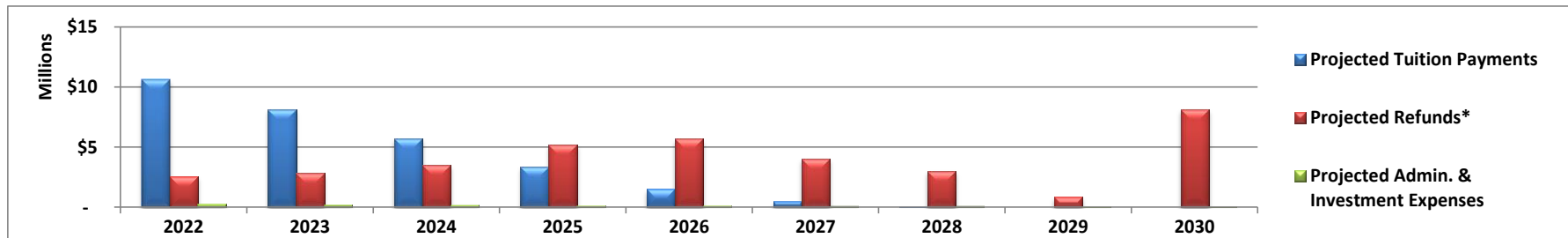
## June 30, 2021 Projection Based on Tuition Increases -100 Basis Points

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222 2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2025

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	3.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 2,531,868	\$ 264,511	\$ 30,292	20,578,717
2023	2.50%	2.00%	2.00%	20,578,717	8,113,455	2,801,628	205,602	5,108	9,805,499
2024	2.50%	3.25%	3.25%	9,805,499	5,720,118	3,514,195	171,278	-	504,175
2025	2.00%	3.25%	3.25%	504,175	3,353,210	5,175,597	139,897	-	(8,252,006)
2026	2.00%	3.25%	3.25%	(8,252,006)	1,498,005	5,663,590	126,111	-	(15,782,374)
2027	2.00%	3.25%	3.25%	(15,782,374)	464,101	4,007,742	113,333	-	(20,730,443)
2028	2.00%	3.25%	3.25%	(20,730,443)	54,849	2,981,456	100,556	-	(24,313,359)
2029	2.00%	3.25%	3.25%	(24,313,359)	-	871,791	87,778	-	(25,768,760)
2030	2.00%	3.25%	3.25%	(25,768,760)	-	8,135,338	75,000	-	(34,576,306)

\* Assumed all maximized refunds as of 6/30/2021 are paid upon termination of the Program (2030). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).



# Kentucky's Affordable Prepaid Tuition

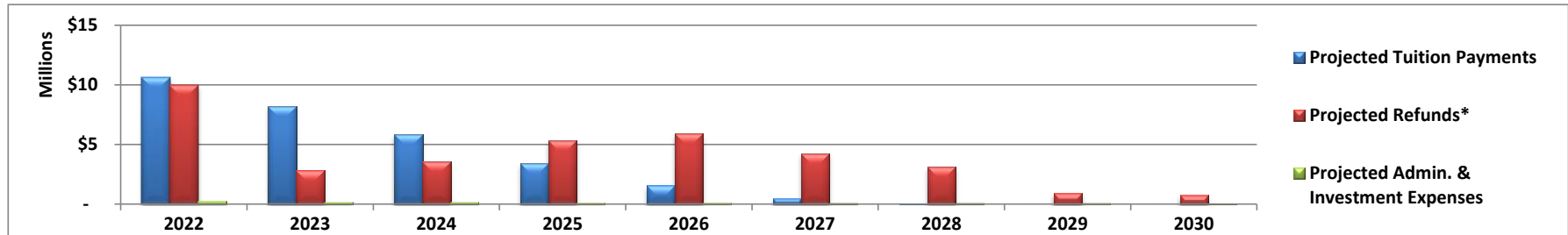
## June 30, 2021 Projection Based on Maximized Refunds Paid Next Fiscal Year

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222      2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2024

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	3.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 9,972,062	\$ 264,511	\$ 30,292	13,016,424
2023	2.50%	3.00%	3.00%	13,016,424	8,192,998	2,829,043	190,477	5,108	1,960,842
2024	2.50%	4.25%	4.25%	1,960,842	5,832,141	3,583,012	155,588	-	(7,704,271)
2025	2.00%	4.25%	4.25%	(7,704,271)	3,451,992	5,328,059	138,889	-	(16,877,679)
2026	2.00%	4.25%	4.25%	(16,877,679)	1,557,071	5,886,898	126,111	-	(24,865,945)
2027	2.00%	4.25%	4.25%	(24,865,945)	487,073	4,206,105	113,333	-	(30,219,303)
2028	2.00%	4.25%	4.25%	(30,219,303)	58,122	3,159,325	100,556	-	(34,174,956)
2029	2.00%	4.25%	4.25%	(34,174,956)	-	932,741	87,778	-	(35,889,145)
2030	2.00%	4.25%	4.25%	(35,889,145)	-	750,955	75,000	-	(37,441,116)

\* Assumed all maximized refunds as of 6/30/2021 are paid immediately in the next Fiscal Year (2022). All other contracts are assumed to refund 8 years after Projected College Entrance Year (time at which contract value is maximized).





# Kentucky's Affordable Prepaid Tuition

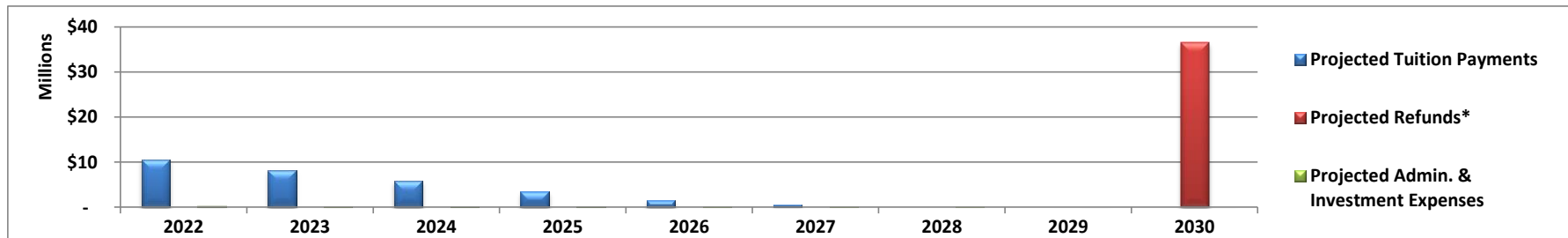
## June 30, 2021 Projection Based on Maximized Refunds Paid Upon Program Closure

Inputs	
Investment Expenses:	% of BOY Assets: 0.20%
Assumed Admin. Expenses:	2021: \$177,222 2030: \$75,000
Closure of Program:	2030

Solvency Results	
Year Insolvent	2030

Fiscal Year	Assumed Investment Return During Year	Assumed Tuition Increase for UK	Assumed Tuition Increase for KCTCS	Solvent Market Value of Assets Beginning of Fiscal Year	Projected Tuition Payments	Projected Refunds*	Projected Admin. & Investment Expenses	Projected Contract Payments	Market Value of Assets End of Fiscal Year
2021									\$ 33,144,678
2022	3.30%	N/A	N/A	\$ 33,144,678	\$ 10,615,814	\$ 22,476	\$ 264,511	\$ 30,292	23,129,290
2023	2.50%	3.00%	3.00%	23,129,290	8,192,998	5,382	210,703	5,108	15,164,863
2024	2.50%	4.25%	4.25%	15,164,863	5,832,141	273	181,996	-	9,430,453
2025	2.00%	4.25%	4.25%	9,430,453	3,451,992	195	157,750	-	5,961,658
2026	2.00%	4.25%	4.25%	5,961,658	1,557,071	137	138,034	-	4,363,570
2027	2.00%	4.25%	4.25%	4,363,570	487,073	136	122,060	-	3,833,879
2028	2.00%	4.25%	4.25%	3,833,879	58,122	135	108,223	-	3,742,223
2029	2.00%	4.25%	4.25%	3,742,223	-	134	95,262	-	3,720,721
2030	2.00%	4.25%	4.25%	3,720,721	-	36,619,333	82,441	-	(33,272,446)

\* Assumed all refunds after Projected Contract Enrollment Year are paid at closure of Program (2030).



## **APPENDIX A**

---

### **GLIDE PATH**

# Kentucky's Affordable Prepaid Tuition Glide Path

From May 2021 Glide Path Presentation from Graystone Consulting.

## Projected Fiscal Year End Balances

Graystone  
Consulting

### 2020 Projections

Date	6/30/2020		6/30/2021		6/30/2022	
Large Cap US Equity	\$ 8,792,200.20	24.0%	\$ 2,347,568.20	12.0%	\$ -	0.0%
Small/Mid Cap US Equity	\$ 2,198,050.05	6.0%	\$ 782,522.73	4.0%	\$ -	0.0%
International Equity	\$ 2,198,050.05	6.0%	\$ 586,892.05	3.0%	\$ -	0.0%
US Fixed Income	\$ 12,089,275.27	33.0%	\$ 2,151,937.52	11.0%	\$ -	0.0%
TIPS	\$ 2,198,050.05	6.0%	\$ -	0.0%	\$ -	0.0%
Short Duration US Fixed Income	\$ 5,495,125.12	15.0%	\$ 7,825,227.34	40.0%	\$ 854,174.81	50.0%
Cash Equivalents	\$ 3,663,416.75	10.0%	\$ 5,868,920.51	30.0%	\$ 854,174.81	50.0%
<b>Anticipated Balance</b>	<b>\$ 36,634,167.49</b>	<b>100.0%</b>	<b>\$ 19,563,068.36</b>	<b>100.0%</b>	<b>\$ 1,708,349.61</b>	<b>100.0%</b>
2020 Annual Returns (%)		4.1%		3.3%		2.5%
2020 Standard Deviations (%)		5.5%		2.8%		0.1%

### 2021 Projections

Date	6/30/2021		6/30/2022		6/30/2023	
Large Cap US Equity	\$ 3,600,000.00	12.0%	\$ 1,473,684.00	12.0%	\$ -	0.0%
Small/Mid Cap US Equity	\$ 1,200,000.00	4.0%	\$ 491,228.00	4.0%	\$ -	0.0%
International Equity	\$ 900,000.00	3.0%	\$ 368,421.00	3.0%	\$ -	0.0%
US Fixed Income	\$ 3,300,000.00	11.0%	\$ 1,350,877.00	11.0%	\$ -	0.0%
TIPS	\$ -	0.0%	\$ -	0.0%	\$ -	0.0%
Short Duration US Fixed Income	\$ 12,000,000.00	40.0%	\$ 4,912,280.00	40.0%	\$ (2,923,071.95)	50.0%
Cash Equivalents	\$ 9,000,000.00	30.0%	\$ 3,684,210.00	30.0%	\$ (2,923,071.95)	50.0%
<b>Anticipated Balance</b>	<b>\$ 30,000,000.00</b>	<b>100.0%</b>	<b>\$ 12,280,700.00</b>	<b>100.0%</b>	<b>\$ (5,846,143.90)</b>	<b>100.0%</b>
2021 Annual Returns (%)		2.3%		2.3%		1.3%
2021 Standard Deviations (%)		3.4%		3.4%		1.6%

For Illustrative Purposes Only

The projections and other information generated by the Morgan Stanley Asset Allocation Center regarding likelihood of various investment outcomes are hypothetical in nature, they do not reflect actual investment results and are not a guarantee of future results.



# Kentucky's Affordable Prepaid Tuition Glide Path

From May 2021 Glide Path Presentation from Graystone Consulting.

## Glide Path

Graystone  
Consulting

Current		2021	2022	2023	2024
	<b>Asset Classes</b>				
	Large Cap US Equity	12	0	0	0
	Small/Mid Cap US Equity	4	0	0	0
	International Equity	3	0	0	0
	<b>Total Equity</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>
	US Fixed Income	11	0	0	0
	TIPS	0	0	0	0
	Short Duration US Fixed Income	40	50	0	0
	<b>Total Fixed Income</b>	<b>51</b>	<b>50</b>	<b>0</b>	<b>0</b>
	<b>Cash Equivalents</b>	<b>30</b>	<b>50</b>	<b>0</b>	<b>0</b>
	<b>Totals</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>0</b>
	2021 Annual Returns (%)	2.30	1.30	0.00	0.00
	2021 Standard Deviations (%)	3.40	1.60	0.00	0.00
	Change in Expected Return		-43%	-100%	0%
	Change in Expected Risk		-53%	-100%	0%
	2020 Annual Returns (%)	3.30	2.50	0.00	0.00
	2020 Standard Deviations (%)	2.80	0.09	0.00	0.00
	<b>Asset Classes</b>				
	Large Cap US Equity	12	12	0	0
	Small/Mid Cap US Equity	4	4	0	0
	International Equity	3	3	0	0
	<b>Total Equity</b>	<b>19</b>	<b>19</b>	<b>0</b>	<b>0</b>
	US Fixed Income	11	11	0	0
	TIPS	0	0	0	0
	Short Duration US Fixed Income	40	40	50	0
	<b>Total Fixed Income</b>	<b>51</b>	<b>51</b>	<b>50</b>	<b>0</b>
	<b>Cash Equivalents</b>	<b>30</b>	<b>30</b>	<b>50</b>	<b>0</b>
	<b>Totals</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0</b>
	2021 Annual Returns (%)	2.30	2.30	1.30	0.00
	2021 Standard Deviations (%)	3.40	3.40	1.60	0.00
	Change in Expected Return			-43%	-100%
	Change in Expected Risk			-53%	-100%
	2020 Annual Returns (%)	3.30	3.30	2.50	0.00
	2020 Standard Deviations (%)	2.80	2.80	0.09	0.00

For Illustrative Purposes Only

The projections and other information generated by the Morgan Stanley Asset Allocation Center regarding likelihood of various investment outcomes are hypothetical in nature, they do not reflect actual investment results and are not a guarantee of future results.



## **APPENDIX B**

---

### **DISCUSSION OF SELLING NEW CONTRACTS**

# Kentucky's Affordable Prepaid Tuition

## Discussion of Selling New Contracts

### Background

The Board must annually consider the selling of new contracts. Contracts were last sold in 2004.

### Long-Term Growth of Contracts

Under the original Program, Participants could leave their contracts in the Program (unused) for as long as they desired and the contract value would continue to grow at the rate of the increase in tuition growth (primarily at the University of Kentucky). Since pricing is based on a present value of expected payments, appropriate pricing under a Program design, such as this, cannot be determined when the value of the contract can grow forever and the rate of increase in value (assumed tuition increases) exceeds the discount rate (assumed rate of investment return).

However, the legislated Program changes in 2014 limited the growth of unused contracts to six years beyond the expected utilization period. Legislated changes in 2019 modified that limit to eight years past the Projected College Entrance year (PCEY). Under either the 2014 limit or the 2019 limit, an appropriate pricing can be determined. If the limit is changed in the future, we would need to assess whether appropriate prices could still be determined.

### Separation of Programs

We understand that if the Board were to re-open sales of new contracts, a separate Program would be created (such as a KAPT II). We further understand that contracts under the new Program would not be backed by the full faith and credit of the Commonwealth and the assets of the new Program would not be used to pay the benefits of the old Program. We further understand that there would be a time limit on the growth of the contract value (similar or the same as under the current KAPT Program).

### Development of Pricing

Under these parameters, we believe that appropriate pricing can be developed. The pricing would be dependent on the following:

- The age of the participant at contract purchase;
- Expected matriculation date;
- Assumptions regarding:
  - Rates of utilization
  - Rates of future tuition increases (or growth of contract value)
  - Rates of assumed investment return
  - Timing of expected tuition payments (or refunds)
  - Rates of cancellation
  - Rates of administrative expenses paid by the contract holder
- Risk margin; and
- Board's funding and pricing policy/guidelines.

# Kentucky's Affordable Prepaid Tuition

## Discussion of Selling New Contracts (Continued)

### Important Considerations

#### Risk Margins

Risk margins are an important aspect of contract pricing. Essentially the contracts are an insurance policy with one-time pricing. Pricing is traditionally built using assumptions developed on average expectations. Meaning that half the time, the contracts are underpriced and that half the time contracts are overpriced. This type of pricing can work when only a short period of time is covered and assumptions can be continually reviewed and contracts can be repriced (such as automobile insurance). In the case of a prepaid tuition plan the time frame between purchase and benefit payment can be as long as 25 years. In addition, short-term risks (for participants who are older at contract purchase) may place significant pressure on cash flow for Programs that are new or smaller. By recognizing these risks, Programs can build a margin into the pricing to manage these risks.

There are two types of Risk Margins that we have seen utilized in contract pricing: implicit risk margin and explicit risk margin. Implicit risk margins are created when pricing assumptions are more conservative than average expectations. For example, a Program may believe that the long term average increase in tuition will be 6%, but include pricing based on increases of 10% for the next six years, 7% for the following six years and 4% for the remaining six years (assuming 18 years for complete payment of benefits).

Another example of an implicit risk premium would be if the long term investment return expectation is 5%, but pricing assumed 2% for the next six years, 4% for the six years after that and 7% for the remaining six years (assuming 18 years for complete payment of benefits).

Explicit risk margins are created when pricing is increased by a specific factor, such as 5%, as the final step.

We have assisted other pre-paid Programs in developing funding policies that connect the risk margin in the pricing to the funded status of the Program (and the relativity to the Board's funding target). For example, an initial risk premium could be established of 3% explicit and 3% implicit. In addition, a funded status target might be established of 115%. Then, in years when the funded target is exceeded by 200 basis points, the risk margin is reduced. Conversely, if the funded target missed by 200 basis points, the risk margin would be increased.

#### Program Size

There is a common misconception that a prepaid tuition Program must have a certain level of participation to be viable. While we do not agree with this sentiment, we do believe that the Program size has implications for the Board to consider. One consideration is the funding target (or risk reserve). Because the Program is basically insurance, the size of the Program is the risk pool. The larger the pool, the more the Program is spreading risk and therefore the smaller the risk reserve will need to be (as a percent of liabilities). Conversely, the smaller the risk pool, the larger the risk reserve needs to be in order to keep the Program healthy.

## **Kentucky's Affordable Prepaid Tuition Discussion of Selling New Contracts (Concluded)**

Program size is also a consideration when determining if the Program is an appropriate use of resources. This is a policy decision, not an actuarial decision. However, the issue is essentially, the expected size of the Program (once it matures) sufficient to justify allocating Commonwealth resources to the maintenance of the Program. A side concern is whether or not the Program is being utilized by the intended population.

### **Final Thoughts**

Should the Board wish to explore opening a new Program and selling new contracts, we would be happy to work with the Board to develop a funding policy, initial pricing assumptions and contract pricing.