Kentucky's Affordable Prepaid Tuition

Actuarial Valuation Report
as of June 30, 2018

GRS Retirement Consulting
800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

September 10, 2018

Board of Directors
Kentucky's Affordable Prepaid Tuition
100 Airport Road, P.O. Box 798
Frankfort, KY 40601

Attention: David Lawhorn, 529 Program Manager

Re: Kentucky's Affordable Prepaid Tuition Actuarial Valuation as of June 30, 2018

Dear Directors:

Gabriel, Roeder, Smith & Company ("GRS") has performed an actuarial valuation of Kentucky's Affordable Prepaid Tuition program ("KAPT" or "the program") as of June 30, 2018. The purpose of this actuarial valuation is to evaluate the financial status of the program as of June 30, 2018.

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, 2018;
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, plan provisions, and actuarial assumptions and methods utilized in the actuarial calculations.

The main conclusion of the valuation is that the fund will become depleted in 4-5 years. 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 Section A. In addition, we show the sensitivity of the depletion date and unfunded liabilities to certain assumptions in Section G.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

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, 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. Further, the data and information provided is through June 30, 2018, and does not reflect subsequent market changes.

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.

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 Kentucky's Affordable Prepaid Tuition program as of June 30, 2018.

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 individuals are independent of the program sponsor.

Respectfully submitted,

Kenneth G. Alberts

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

James R. Sparks, ASA, MAAA

KGA/BBM/JRS:sc

Kentucky's Affordable Prepaid Tuition
Table of Contents

SECTION A

EXECUTIVE SUMMARY

Kentucky's Affordable Prepaid Tuition
Summary of Results

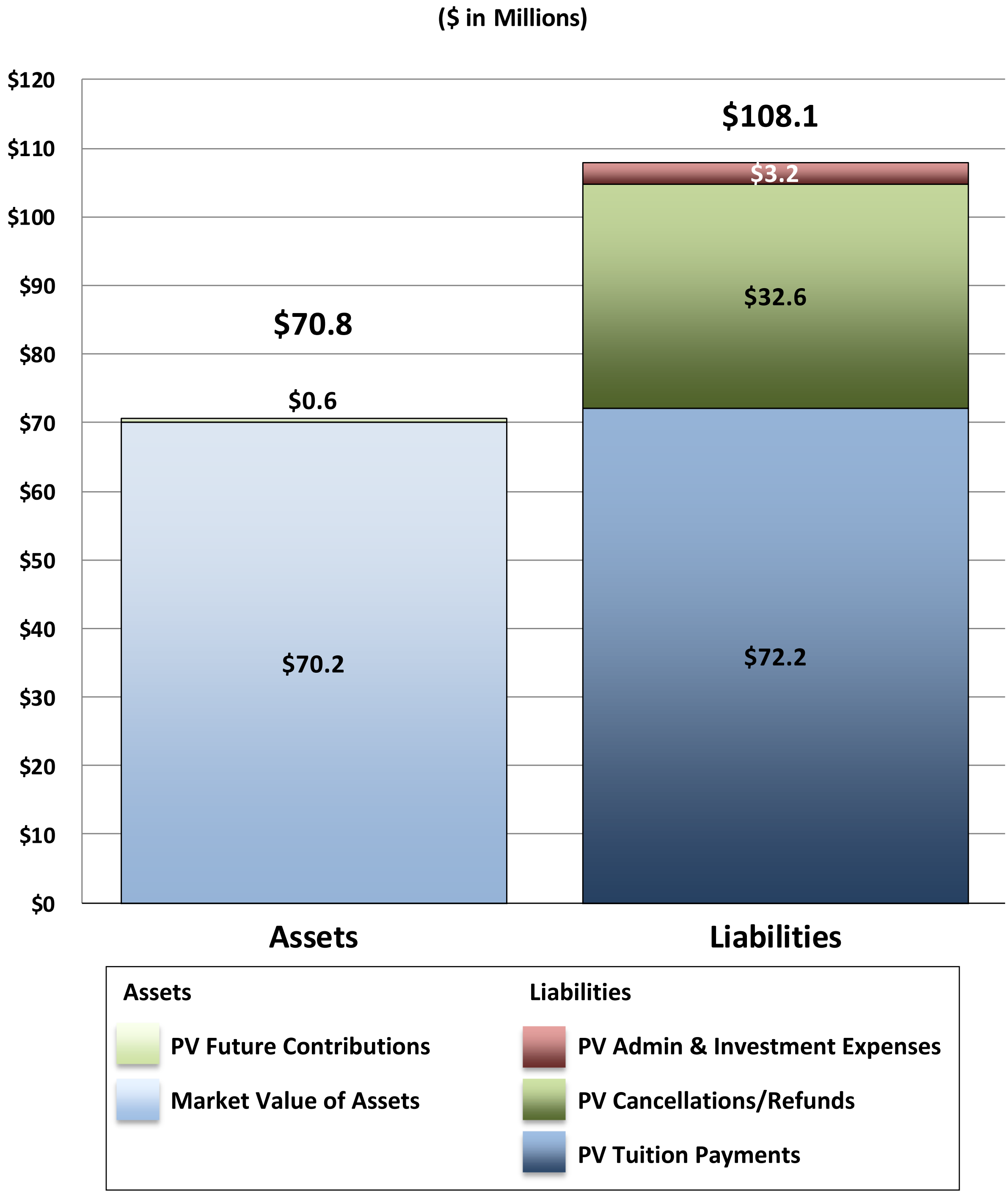
Valuation Date:	Valuation Results June 30, 2018	June 30, 2017*
Membership Summary:		
Accounts		
Not Yet Matriculating	1,686	N/A
Matriculated or Termination in Progress	2,045	N/A
Total	3,731	N/A
Average Years until Expected Enrollment (Negative if Past Matriculation Year)	(2.6)	N/A
Assets		
Market Value of Assets	$ 69,982,608	$ 81,801,720
Present Value of Future Contract Payments	$ 575,230	$ 963,828
Fees Receivable	$ 195,828	$ 195,816
Total	$ 70,753,666	$ 82,961,364
Annual Return on Market Value of Assets July 1, 2017 to June 30, 2018^	5.81%	
Actuarial Liabilities (Present Value of Future Tuition Payments, Refunds, Fees, and Administrative Expenses)	$ 108,131,117	$ 115,850,221
Margin/(Deficit)	$ (37,377,451)	$ (32,888,857)
Funded Ratio	65.4%	71.6%
Estimated Fiscal year Fund Depleted	2023	2024

** Based upon Prior Actuary's results.*
^ Net of fees. Reported to GRS by KAPT's prior investment consultant.

Kentucky's Affordable Prepaid Tuition
Summary of Results

Value as of Valuation Date:	Valuation Results
Invested Assets & Future Contract Receivables	$ 70,557,838
Other Payables & Receivables	195,828
Actuarial Liabilities	108,131,117
Other Liabilities	N/A
Actuarial Deficit	$ (37,377,451)
Deficit as a Percent of Liabilities	34.6%

Kentucky's Affordable Prepaid Tuition
Summary of Assets and Liabilities as of June 30, 2018



PV – Present Value

Numbers may not add due to rounding.

Kentucky's Affordable Prepaid Tuition
Funded Status

	June 30, 2018	June 30, 2017*
Actuarial Present Value of Future Tuition Payments, Fees and Expenses	$ 108,131,117	$ 115,850,221
Market Value of Assets (Including the Present Value of Installment Contract Receivables)	$ 70,753,666	$ 82,961,364
Margin/(Deficit)	$ (37,377,451)	$ (32,888,857)

** Based upon prior Actuary's results.*

Change in Margin/(Deficit)

		Margin/(Deficit)
(1.)	Values as of June 30, 2017*	$ (32,888,857)
(2.)	Interest on Margin/(Deficit) at assumed rate from prior actuary (5.07%)	$ (1,667,465)
(3.)	**Projected margin/(deficit) as of June 30, 2018 [(1) + (2)]**	**$ (34,556,322)**
(4.)	Change Due to:	
	a. Investment experience above/(below) assumed	1,169,045
	b. Tuition/fee inflation below/(above) assumed	3,056,582
	c. Change in program assumptions^	(7,034,441)
	d. Other program experience during fiscal year 2018	(12,315)
	Total	$ (2,821,129)
(5.)	**Actual values as of June 30, 2018 [(3) + (4)]**	**$ (37,377,451)**

** Based upon prior Actuary's results.*
^ Includes changes in liability as a result of changes in actuarial software, annual increases in future tuition, assumed increases in future rates of investment return and handling of refunds.

GRS did not audit the prior Actuary's June 30, 2017 Actuarial Valuation.

Kentucky's Affordable Prepaid Tuition
Discussion

Financial Status of Plan

Plan Status

As of June 30, 2018, the present value of all future tuition obligations under contracts outstanding (and including estimated future administrative and investment expenses) at that date is $108.1 million. Program assets as of June 30, 2018, including the Market Value of Assets and the present value of installment contract receivables, are $70.8 million.

The difference between the assets of $70.8 million and future obligations of $108.1 million represents a program deficit of $37.4 million. The program is 65.4% funded. This compares to 71.6% as of the prior actuarial valuation. 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 in the program to satisfy all the program liabilities.

We understand that the program is backed by the full faith and credit of the Commonwealth of Kentucky. The deficit of $37.4 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 Plan. Since the Plan obligations will become Commonwealth obligations upon asset depletion, the unfunded obligations of the Plan of $37.4 million is one measure of the obligations 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 $46.1 million in tuition, refund payments and expenses.

Fiscal Year	Projected Tuition Payments	Projected Refunds	Projected Admin Expenses	Total Obligations
2023	$ 9,552,950 *	$ 2,820,611	$ 281,734	$ 12,655,295
2024	7,395,656	1,916,159	244,444	9,556,259
2025	4,513,908	1,231,023	208,333	5,953,265
2026	1,963,803	1,111,999	172,222	3,248,025
2027	648,198	959,944	136,111	1,744,253
2028	-	12,885,457	100,000	12,985,457
TOTAL	$ 24,074,515	$ 20,925,194	$ 1,142,845	$ 46,142,554

**Net of remaining program assets/future contract payments in Fiscal Year 2023.*

Kentucky's Affordable Prepaid Tuition
Discussion (Continued)

Valuation Methods

During the year there was a change in actuarial firms. As each actuarial firm will have different software and different technical approaches to the calculations, it is common for different actuarial firms to calculate different cost estimates. While a full replication of the prior actuary's results was not in the scope of our assignment, we did attempt to replicate the prior results in order to ensure that our application of the assumptions was similar to the prior actuary's application. Our calculation of the prior year's results was approximately 1.7% higher than the prior actuary, using the assumptions disclosed in the last valuation report. This proximity gave us comfort that we were generally applying assumptions in a similar manner. A closer result may be attainable (or an explanation of the differences) if we were to perform a full replication. Such a replication would likely involve discussions with the prior actuary (at a minimum) and possibly the collection of test life calculations. This would also involve additional fees. Please let us know if the Board would like a fee quote for this kind of service.

Valuation Assumptions

<u>Changes from Prior Valuation</u>

Tuition Increase Assumption

We were informed that the Board adopted a tuition increase assumption of 6% through 2025 and 3% from 2026 through 2028. This assumption is lower than the 6.25% (for all years) assumption used in the prior valuation.

Asset Allocation Glide Path and Assumed Rate of Investment Return

We were also informed that the Board adopted the same asset allocation glide path as the previous year.

Graystone Consulting reviewed the Board's adopted Glide Path and then projected rates of the returns for the period 2019 to 2025 based on that Glide Path. We used the Graystone projected rates in the valuation. A comparison of these rates with the rates used in the prior valuation are shown below.

	Assumed Investment Return								
Fiscal Year Ending:	2018	2019	2020	2021	2022	2023	2024	2025	2026+
Assumed Rates of Return from Prior Actuarial Valuation	5.07%	4.67%	6.34%	6.34%	5.37%	4.57%	3.91%	2.99%	2.66%
Assumed Rates of Return from Graystone Consulting	N/A	4.40%	4.40%	3.80%	3.40%	3.10%	2.50%	2.40%	2.40%

Kentucky's Affordable Prepaid Tuition
Discussion (Continued)

<u>Other Assumptions to Consider Monitoring</u>

Tuition Increase Assumption

At 6%, this assumption is higher than many of our other prepaid tuition plans assume. In addition, KAPT's own experience has been below this assumption in each of the last 5 years (5-year average of 3.9% and 4.2% for the University of Kentucky and the Kentucky Community and Technical College, respectively). However, even if no increase in tuition is assumed, the fund will still be depleted by the 2023 Fiscal Year end.

Refunds

With the value of contracts being frozen 2 years after the expected utilization period, it would seem likely that participants would refund at that point. However, the data shows that there are a substantial number of participants who are already more than 2 years past their expected utilization period. In addition, KAPT has indicated that refunds have been less than expected since the 2014 plan change that froze contract values 2 years after the expected utilization period. The prior actuary assumed 8% of participants matriculating in the future would hold onto their contracts until the end of the program (June 30, 2028). Staff confirmed they provided the basis for this assumption. Since there was no description of an assumption specifically related to participants who were already more than 2 years past their expected utilization period as of the valuation date, we believe that the prior actuary assumed they would hold their contracts until the end of the program.

The results shown in the beginning of this report are based on the following assumptions:

a) Participants who reach 2 years after the end of the expected utilization period in the future are assumed to refund at that point (assumed to be 8% of participants who currently are less than 2 years beyond the end of their utilization period); and
b) Participants who are already more than 2 years beyond the end of their utilization period as of the valuation date are expected to hold their contracts until the end of the program (June 30, 2028).

We have also added the ability to alter (b), above as a sensitivity test. For example, if the participants in group (b) were assumed to refund immediately (on the valuation date), liabilities (and deficit) would increase by approximately $2.6 million and the fund depletion date would accelerate by approximately 1 year.

Benefit Provisions

There were no changes in benefit previsions since the last Valuation.

Kentucky's Affordable Prepaid Tuition
Discussion (Concluded)

Plan Status

The program has a closure date of June 30, 2028, 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 page 27 for a discussion regarding the sales of new contracts.

Future Outlook

The program is expected to become insolvent in 4-5 years. If participants whose contract value has stopped increasing do not elect a timely refund, the insolvency date could be extended a year or two.

SECTION B

PLAN DESCRIPTION

Kentucky's Affordable Prepaid Tuition
Summary of Plan Description Evaluated June 30, 2018

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)

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:

- 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).

Accounts have until June 30, 2028 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)

		Present Value of Benefits	PV Future Contract Payments	Market Value of Assets	Margin/(Deficit)
(1.)	Values as of June 30, 2017*	$ 115,850,221	$ 963,828	$ 81,997,536	$ (32,888,857)
(2.)	Expected contract payments^	$ -	$ (404,789)	$ 404,789	$ -
(3.)	Expected tuition payments, refunds, and administrative fees^	$ (22,335,150)	$ -	$ (22,335,150)	$ -
(4.)	Interest on margin/(deficit) at assumed rate from prior Actuary (5.07%)	$ 4,741,214	$ 28,343	$ 3,045,406	$ (1,667,465)
(5.)	**Projected margin/(deficit) as of June 30, 2018 [(1) + (2) + (3) + (4)]**	**$ 98,256,285**	**$ 587,382**	**$ 63,112,581**	**$ (34,556,322)**
(6.)	Change due to:				
	a. Investment experience above/(below) assumed	-	-	1,169,045	1,169,045
	b. Tuition/fee inflation below/(above) assumed	(3,056,582)	-	-	3,056,582
	c. Change in program assumptions#	7,027,428	(7,013)	-	(7,034,441)
	d. Other program experience during fiscal year 2018	5,903,986	(5,139)	5,896,810	(12,315)
	Total	$ 9,874,832	$ (12,152)	$ 7,065,855	$ (2,821,129)
(7.)	**Actual values as of June 30, 2018 [(5) + (6)]**	**$ 108,131,117**	**$ 575,230**	**$ 70,178,436**	**$ (37,377,451)**

* *Based upon prior Actuary's results.*

^ *Discounted to beginning of prior year at assumed rate from prior Actuary (5.07%).*

Includes changes in liability as a result of changes in actuarial software, annual increases in future tuition, assumed increases in future rates of investment return and handling of refunds.

GRS did not audit the prior Actuary's June 30, 2017 Actuarial Valuation.

SECTION D

PLAN ASSETS

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

	Market Value of Cash & Investment Assets Held			
	as of June 30, 2018		as of June 30, 2017	
	Amount	% of Total	Amount	% of Total
Cash	$ 1,463,457	2.09%	$ 1,844,699	2.25%
Corporate Bonds	$ 28,544,289	40.67%	$ 32,755,096	39.95%
U.S. Treasury and Government Agency Securities	$ 4,921,560	7.01%	$ 5,591,328	6.82%
Corporate Stock	$ 34,884,148	49.71%	$ 41,582,490	50.71%
Money Market	$ 21,133	0.03%	$ 28,597	0.03%
Assumed Net Receivables	$ 343,849	0.49%	$ 195,326	0.24%
Total	**$ 70,178,436**	**100.00%**	**$ 81,997,536**	**100.00%**

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

Total Market Value of Assets as of 6/30/2017	**$**	**81,997,536**
Additions:		
Contract Payments	**$**	**163,440**
Investment Revenues:		
a. Net unrealized gain on investments	$	(1,553,769)
b. Interest and investment income		6,182,090
Total Investment Revenues	**$**	**4,628,321**
Deductions:		
a. Administrative expenses	$	40,548
b. Personnel and professional expenses		334,678
c. Refunds		2,638,957
d. Trustee fee expense		56,159
e. Tuition benefits expense, net		13,813,548
Total Deductions	**$**	**16,883,890**
Change in Net Position	**$**	**(12,092,129)**
Change in Net Receivables	**$**	**273,029**
Total Market Value of Assets as of 6/30/2018	**$**	**70,178,436**

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

SECTION E

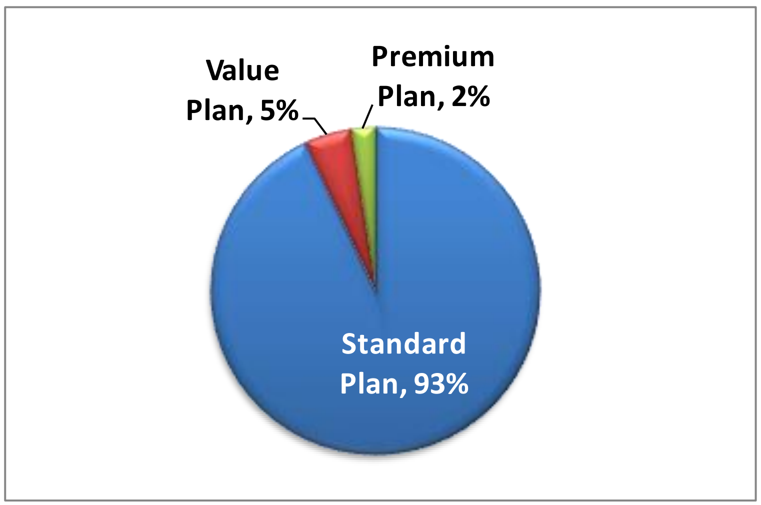
CONTRACT DATA

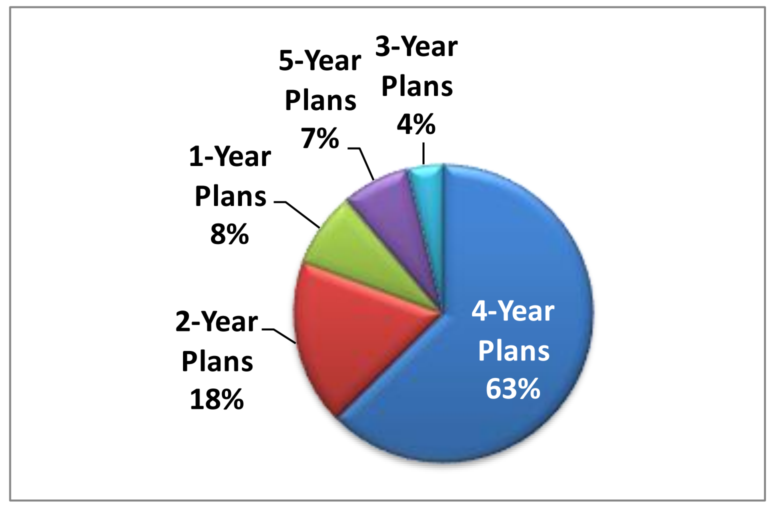
Kentucky's Affordable Prepaid Tuition
Member Matriculation Summary as of June 30, 2018

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	-	2	3	5	1	10	1	-	-	-	1	-	**23**	0.6%
2005	-	2	2	4	4	18	2	1	1	-	2	2	**38**	1.0%
2006	-	2	1	7	7	35	4	-	-	-	1	-	**57**	1.5%
2007	3	2	5	18	5	38	3	-	-	-	2	1	**77**	2.1%
2008	2	5	5	13	-	59	6	-	1	-	4	2	**97**	2.6%
2009	2	6	10	19	5	75	14	-	-	-	-	1	**132**	3.5%
2010	1	1	8	20	11	80	13	1	-	-	3	-	**138**	3.7%
2011	2	6	12	14	7	101	11	-	-	-	2	2	**157**	4.2%
2012	1	6	8	25	8	95	13	-	-	-	4	-	**160**	4.3%
2013	2	3	12	24	6	142	12	-	1	-	-	4	**206**	5.5%
2014	-	8	15	52	9	188	12	-	1	2	5	2	**294**	7.9%
2015	3	11	17	45	12	211	26	-	2	-	5	2	**334**	9.0%
2016	2	15	18	54	17	216	26	-	-	-	6	-	**354**	9.5%
2017	5	7	21	42	8	225	33	-	2	1	2	2	**348**	9.3%
2018	4	23	28	49	14	249	22	1	2	-	2	-	**394**	10.6%
2019	2	13	25	45	6	171	11	-	1	1	2	1	**278**	7.5%
2020	4	9	28	41	9	166	17	-	1	-	1	-	**276**	7.4%
2021	2	8	27	29	5	127	16	-	1	-	2	-	**217**	5.8%
2022	3	4	11	12	5	64	9	1	1	1	1	-	**112**	3.0%
2023	-	-	4	6	-	22	3	-	-	-	1	-	**36**	1.0%
2024	-	-	-	-	-	1	-	-	-	-	-	-	**1**	0.0%
2025	-	-	-	1	-	-	-	-	-	-	-	-	**1**	0.0%
2026	-	-	-	-	-	-	-	-	-	-	-	-	**-**	0.0%
2027	-	-	-	-	-	-	-	-	-	-	-	-	**-**	0.0%
2028	-	-	1	-	-	-	-	-	-	-	-	-	**1**	0.0%
Total	**38**	**133**	**261**	**525**	**139**	**2,293**	**254**	**4**	**14**	**5**	**46**	**19**	**3,731**	100.0%
	1.0%	3.6%	7.0%	14.1%	3.7%	61.5%	6.8%	0.1%	0.4%	0.1%	1.2%	0.5%	100.0%	

Kentucky's Affordable Prepaid Tuition
Member Payment Option Summary as of June 30, 2018

	Type of Contract												Total	
Contract Payment Type	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	12	33	149	208	47	981	115	2	7	5	25	9	**1,593**	42.7%
3-Year Monthly	3	15	19	28	7	131	16	-	-	-	3	2	**224**	6.0%
5-Year Monthly	3	7	15	42	10	207	30	1	2	-	5	5	**327**	8.8%
7-Year Monthly	5	27	28	107	34	413	39	-	-	-	9	2	**664**	17.8%
Monthly Extended	15	51	50	136	41	492	38	1	5	-	3	1	**833**	22.3%
Custom Monthly	-	-	-	4	-	69	16	-	-	-	1	-	**90**	2.4%
Total	**38**	**133**	**261**	**525**	**139**	**2,293**	**254**	**4**	**14**	**5**	**46**	**19**	**3,731**	100.0%
	1.0%	3.6%	7.0%	14.1%	3.7%	61.5%	6.8%	0.1%	0.4%	0.1%	1.2%	0.5%	100.0%	





SECTION F

METHODS AND ASSUMPTIONS

Kentucky's Affordable Prepaid Tuition
Valuation Methods and Assumptions

Assumed Rate Investment of Return – These rates were provided by Graystone Consulting and based upon the Board adopted Glide Path (see Appendix A for more details). The assumed rate of investment return is gross of investment and administrative expenses.

	Assumed Investment Return						
Fiscal Year Ending:	2019	2020	2021	2022	2023	2024	2025+
Assumed Rates of Return	4.40%	4.40%	3.80%	3.40%	3.10%	2.50%	2.40%

Assumed Rate of Tuition Increases:

4-Year Universities – 6.00% through the 2025/2026 Academic Year, 3.00% thereafter.
2-Year Community Colleges – 6.00% through the 2025/2026 Academic Year, 3.00% thereafter.

Assumed Utilization Hours[#]: 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 2 years after the end of their utilization period (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 will not utilize any additional KAPT hours and will continue holding their contract until 2 years after the end of their utilization period and then will be issued a refund.

Past Due Refunds: Those who are already 2 years past the end of their expected utilization period as of the valuation date and have not already refunded are assumed to continue holding their contracts until the program closure in 2028 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 are assumed to be $425,000 in the next year and steadily decrease to $100,000 in 2028 (the final year of the Program).

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

Annual Payout Values for the 2018/2019 Academic Year (based on usage of 32 KAPT hours):

Value Plan – $5,664
Standard Plan – $12,420
Premium Plan:
2001-2002 KAPT Enrollment – $39,319
2002-2003 KAPT Enrollment – $42,999
2004-2005 KAPT Enrollment – $36,281

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 has paid into the program towards their contract.

	Contract Payment Plan					
Years Since Purchase	**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%

The assumptions were adopted by and provided by the Board either through Staff or through the prior Actuary's valuation report. Where the application of certain assumptions in the prior valuation was not completely clear (such as timing of refunds for participants more than 2 years past the expected utilization period), we worked with Staff to determine a clear application and/or showed a range of results.

We have reviewed the assumptions for reasonableness and believe the rationale for the assumptions is based on past program experience (for demographic assumptions) or future expectations (for economic assumptions). We believe the assumptions are reasonable.

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 Plan will earn 4.40% gross of investment expenses during the 2019 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:

Pg.	Description
20	Current valuation assumptions – Projection based upon the valuation assumptions and the current program assets plus the deficit of $37.4 as a lump-sum contribution to the program as of the valuation date to display solvency for the remainder of the program.
21	Current valuation assumptions – Projection based upon the valuation assumptions and current program assets for computation of the depletion date.
22	The investment return assumption is 200 basis points higher than assumed in each of the next 4 years.
23	Tuition increases are 100 basis points higher in each future year than assumed.
24	Tuition increases are 100 basis points lower in each future year than assumed.
25	Contracts which, as of the valuation date, are more than 2 years past their utilization period but have not refunded yet are assumed to refund immediately in the next fiscal year.

The summary of the impact of each of these scenarios on the principal valuation results is presented on the following page. See pages 20 through 25 for detailed projection results of each scenario.

Kentucky's Affordable Prepaid Tuition
Sensitivity Testing Results (Concluded)

	Valuation Results Pages 20 & 21	Plus 200 Basis Points for next 4 years Page 22	Assumed Tuition Increases +100 Basis Points Page 23	Assumed Tuition Increases -100 Basis Points Page 24	Assuming Outstanding Refunds Paid Immediately in the Next Fiscal Year Page 25
Assumed Investment Return in Fiscal Year Ending					
2019	4.40%	6.40%	4.40%	4.40%	4.40%
2020	4.40%	6.40%	4.40%	4.40%	4.40%
2021	3.80%	5.80%	3.80%	3.80%	3.80%
2022	3.40%	5.40%	3.40%	3.40%	3.40%
2023	3.10%	3.10%	3.10%	3.10%	3.10%
2024	2.50%	2.50%	2.50%	2.50%	2.50%
2025+	2.40%	2.40%	2.40%	2.40%	2.40%
Assumed Tuition Increases	6.00%/3.00%	6.00%/3.00%	7.00%/4.00%	5.00%/2.00%	6.00%/3.00%
Year Insolvent	2023	2023	2022	2023	2022
(Increase)/Decrease in Deficit ($ in Millions)		$5.0	($2.0)	$1.9	($2.7)
Dollar Obligations After Depletion	$ 46,142,554	$ 43,218,541	$ 48,704,022	$ 43,808,216	$ 47,579,956

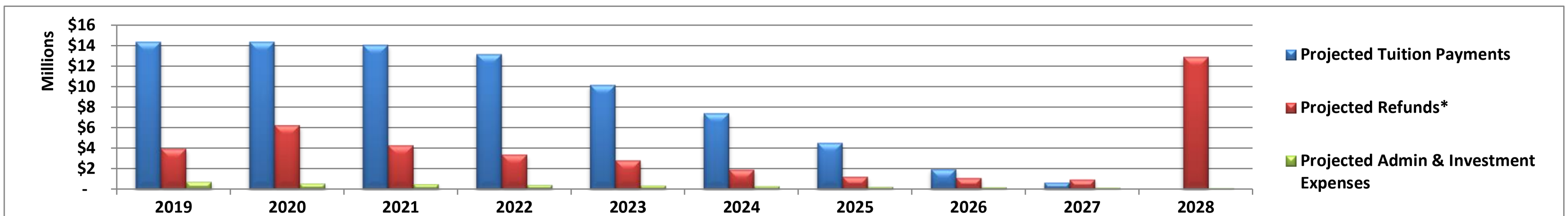
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Valuation Results
Projection of Lump-Sum Contribution for Program Solvency

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	Upon Termination of the Program (2028)	

Valuation Results		
Present Value of Future Tuition and Fees	$	108,131,117
Present Value of Future Contract Payments	$	575,230
June 30, 2018 Assets	$	70,178,436
(Margin)/Deficit	$	37,377,451
Funded Status		65.4%

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	Solvent Market Value of Assets End of Fiscal Year	Lump-Sum Contribution
2018									$ 70,178,436	$ 37,377,451
2019	4.40%	N/A	N/A	$ 107,555,887	$ 14,346,811	$ 3,960,560	$ 746,707	$ 271,587	92,990,779	
2020	4.40%	6.00%	6.00%	92,990,779	14,346,701	6,237,570	574,870	192,870	75,553,326	
2021	3.80%	6.00%	6.00%	75,553,326	14,044,752	4,292,890	503,884	100,984	59,241,282	
2022	3.40%	6.00%	6.00%	59,241,282	13,144,836	3,379,665	435,149	36,410	43,971,876	
2023	3.10%	6.00%	6.00%	43,971,876	10,149,089	2,820,611	368,499	7,116	31,746,037	
2024	2.50%	6.00%	6.00%	31,746,037	7,395,656	1,916,159	307,937	-	22,769,433	
2025	2.40%	6.00%	6.00%	22,769,433	4,513,908	1,231,023	253,872	-	17,227,375	
2026	2.40%	3.00%	3.00%	17,227,375	1,963,803	1,111,999	206,677	-	14,311,279	
2027	2.40%	3.00%	3.00%	14,311,279	648,198	959,944	164,734	-	12,858,096	
2028	2.40%	3.00%	3.00%	12,858,096	-	12,885,457	125,716	-	0	

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



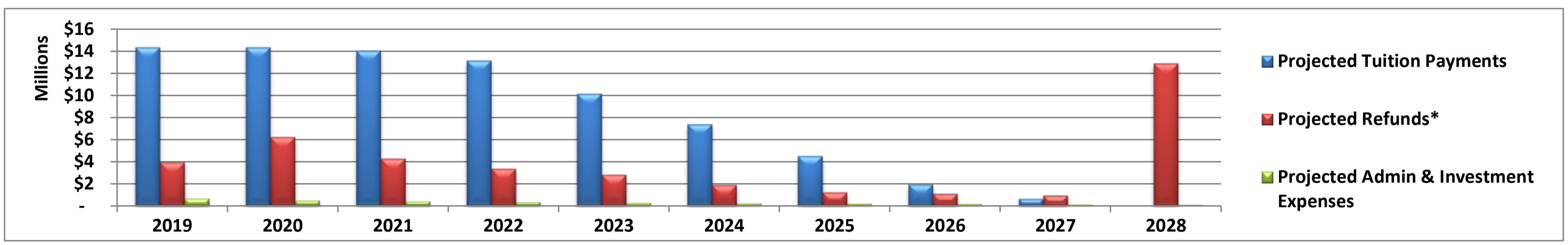
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Valuation Results
Projection of Program Depletion

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	Upon Termination of the Program (2028)	

Solvency Results	
Year Insolvent	2023

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
2018									$ 70,178,436
2019	4.40%	N/A	N/A	$ 70,178,436	$ 14,346,811	$ 3,960,560	$ 671,952	$ 271,587	54,045,107
2020	4.40%	6.00%	6.00%	54,045,107	14,346,701	6,237,570	496,979	192,870	34,973,638
2021	3.80%	6.00%	6.00%	34,973,638	14,044,752	4,292,890	422,725	100,984	17,202,258
2022	3.40%	6.00%	6.00%	17,202,258	13,144,836	3,379,665	351,071	36,410	589,023
2023	3.10%	6.00%	6.00%	589,023	10,149,089	2,820,611	281,734	7,116	(12,893,580)
2024	2.50%	6.00%	6.00%	(12,893,580)	7,395,656	1,916,159	244,444	-	(22,921,892)
2025	2.40%	6.00%	6.00%	(22,921,892)	4,513,908	1,231,023	208,333	-	(29,514,459)
2026	2.40%	3.00%	3.00%	(29,514,459)	1,963,803	1,111,999	172,222	-	(33,517,492)
2027	2.40%	3.00%	3.00%	(33,517,492)	648,198	959,944	136,111	-	(36,089,601)
2028	2.40%	3.00%	3.00%	(36,089,601)	-	12,885,457	100,000	-	(50,096,418)

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



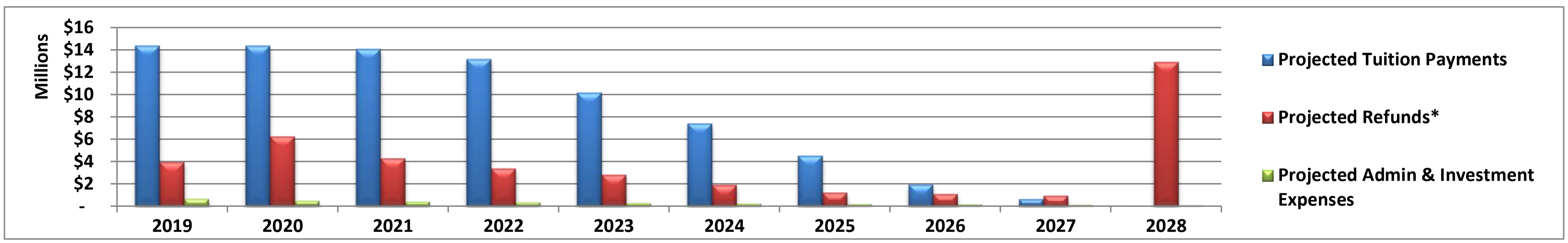
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Investment Return +200 Basis Points for 3 Years

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	Upon Termination of the Program (2028)	

Solvency Results	
Year Insolvent	2023

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
2018									$ 70,178,436
2019	6.40%	N/A	N/A	$ 70,178,436	$ 14,346,811	$ 3,960,560	$ 672,961	$ 271,587	55,216,393
2020	6.40%	6.00%	6.00%	55,216,393	14,346,701	6,237,570	499,322	192,870	37,045,700
2021	5.80%	6.00%	6.00%	37,045,700	14,044,752	4,292,890	426,869	100,984	19,859,549
2022	5.40%	6.00%	6.00%	19,859,549	13,144,836	3,379,665	356,386	36,410	3,518,896
2023	3.10%	6.00%	6.00%	3,518,896	10,149,089	2,820,611	287,593	7,116	(9,878,832)
2024	2.50%	6.00%	6.00%	(9,878,832)	7,395,656	1,916,159	244,444	-	(19,831,775)
2025	2.40%	6.00%	6.00%	(19,831,775)	4,513,908	1,231,023	208,333	-	(26,350,179)
2026	2.40%	3.00%	3.00%	(26,350,179)	1,963,803	1,111,999	172,222	-	(30,277,270)
2027	2.40%	3.00%	3.00%	(30,277,270)	648,198	959,944	136,111	-	(32,771,613)
2028	2.40%	3.00%	3.00%	(32,771,613)	-	12,885,457	100,000	-	(46,698,798)

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



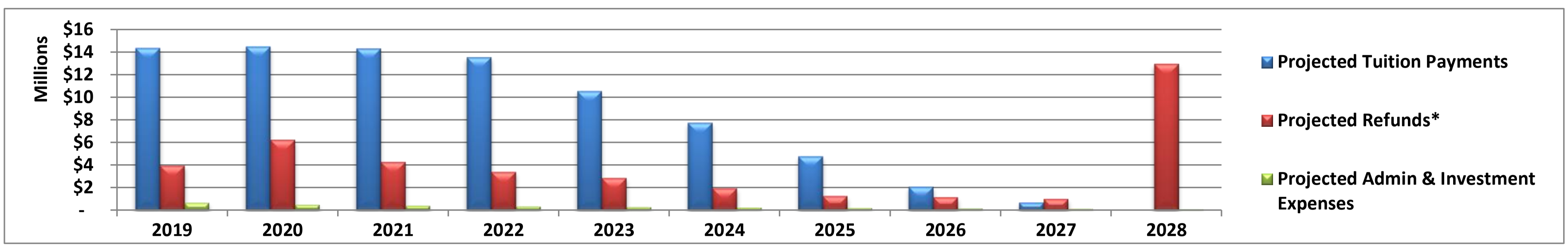
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Tuition Increases +100 Basis Points

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	Upon Termination of the Program (2028)	

Solvency Results	
Year Insolvent	2022

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
2018									$ 70,178,436
2019	4.40%	N/A	N/A	$ 70,178,436	$ 14,346,811	$ 3,960,560	$ 671,952	$ 271,587	54,045,107
2020	4.40%	7.00%	7.00%	54,045,107	14,482,047	6,237,570	496,979	192,870	34,834,347
2021	3.80%	7.00%	7.00%	34,834,347	14,310,997	4,292,890	422,446	100,984	16,785,004
2022	3.40%	7.00%	7.00%	16,785,004	13,520,381	3,411,330	350,237	36,410	(257,784)
2023	3.10%	7.00%	7.00%	(257,784)	10,537,527	2,873,961	280,556	7,116	(14,216,044)
2024	2.50%	7.00%	7.00%	(14,216,044)	7,751,152	1,970,899	244,444	-	(24,694,239)
2025	2.40%	7.00%	7.00%	(24,694,239)	4,775,515	1,278,136	208,333	-	(31,642,795)
2026	2.40%	4.00%	4.00%	(31,642,795)	2,097,787	1,165,450	172,222	-	(35,887,118)
2027	2.40%	4.00%	4.00%	(35,887,118)	699,145	1,015,577	136,111	-	(38,624,155)
2028	2.40%	4.00%	4.00%	(38,624,155)	-	12,943,790	100,000	-	(52,750,832)

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



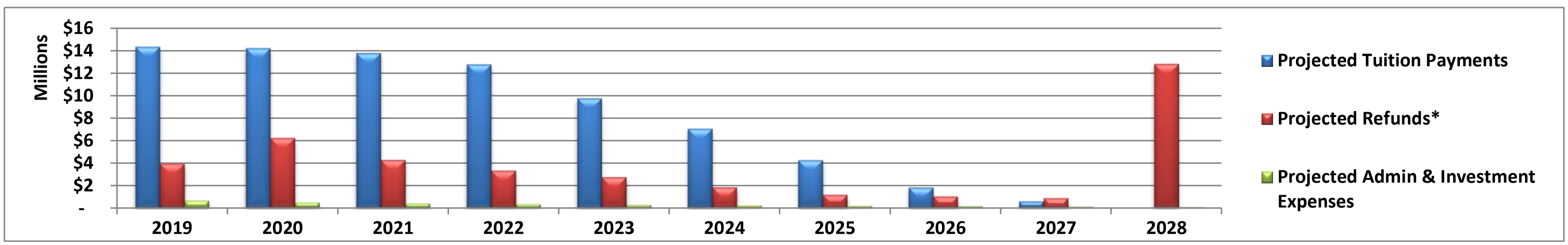
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Tuition Increases -100 Basis Points

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	Upon Termination of the Program (2028)	

Solvency Results	
Year Insolvent	2023

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
2018									$ 70,178,436
2019	4.40%	N/A	N/A	$ 70,178,436	$ 14,346,811	$ 3,960,560	$ 671,952	$ 271,587	54,045,107
2020	4.40%	5.00%	5.00%	54,045,107	14,211,354	6,237,570	496,979	192,870	35,112,930
2021	3.80%	5.00%	5.00%	35,112,930	13,781,006	4,292,890	423,004	100,984	17,616,950
2022	3.40%	5.00%	5.00%	17,616,950	12,776,310	3,348,001	351,901	36,410	1,426,011
2023	3.10%	5.00%	5.00%	1,426,011	9,771,489	2,767,763	283,408	7,116	(11,593,313)
2024	2.50%	5.00%	5.00%	(11,593,313)	7,053,324	1,862,443	244,444	-	(21,186,716)
2025	2.40%	5.00%	5.00%	(21,186,716)	4,264,354	1,185,226	208,333	-	(27,437,761)
2026	2.40%	2.00%	2.00%	(27,437,761)	1,837,221	1,050,232	172,222	-	(31,199,848)
2027	2.40%	2.00%	2.00%	(31,199,848)	600,530	889,351	136,111	-	(33,596,469)
2028	2.40%	2.00%	2.00%	(33,596,469)	-	12,814,891	100,000	-	(47,472,041)

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



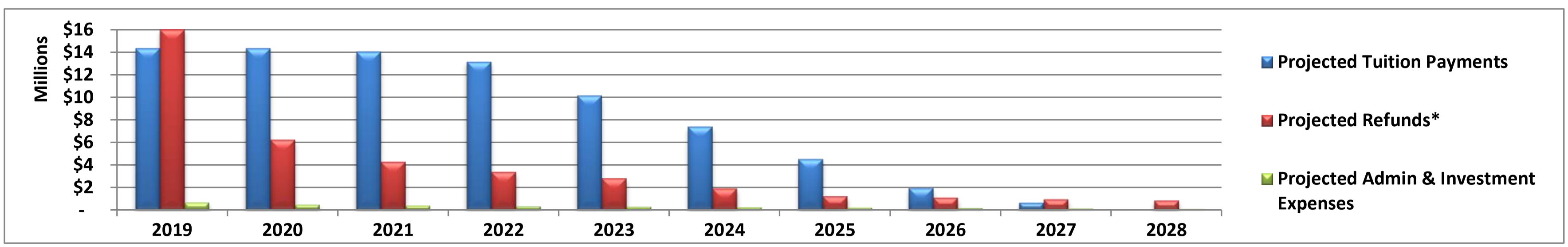
Kentucky's Affordable Prepaid Tuition
Projection Based on June 30, 2018 Outstanding Refunds Paid Immediately

Inputs		
	% of BOY Assets:	
Investment Expenses:	0.20%	
Admin Expenses:	2018: $425,000	2028: $100,000
Assumed Refund of Max Value Held Contracts:	In The Next Fiscal Year (Immediately)	

Solvency Results	
Year Insolvent	2022

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
2018									$ 70,178,436
2019	4.40%	N/A	N/A	$ 70,178,436	$ 14,346,811	$ 15,991,032	$ 671,952	$ 271,587	41,751,864
2020	4.40%	6.00%	6.00%	41,751,864	14,346,701	6,237,570	472,393	192,870	22,164,616
2021	3.80%	6.00%	6.00%	22,164,616	14,044,752	4,292,890	397,107	100,984	3,932,594
2022	3.40%	6.00%	6.00%	3,932,594	13,144,836	3,379,665	324,532	36,410	(13,104,821)
2023	3.10%	6.00%	6.00%	(13,104,821)	10,149,089	2,820,611	280,556	7,116	(27,010,737)
2024	2.50%	6.00%	6.00%	(27,010,737)	7,395,656	1,916,159	244,444	-	(37,391,978)
2025	2.40%	6.00%	6.00%	(37,391,978)	4,513,908	1,231,023	208,333	-	(44,331,826)
2026	2.40%	3.00%	3.00%	(44,331,826)	1,963,803	1,111,999	172,222	-	(48,690,477)
2027	2.40%	3.00%	3.00%	(48,690,477)	648,198	959,944	136,111	-	(51,626,737)
2028	2.40%	3.00%	3.00%	(51,626,737)	-	854,985	100,000	-	(53,832,178)

** Assumed all maximized refunds as of 6/30/2018 are paid based upon the above assumption input. All other contracts are assumed to refund 2 years after the end of their utilization period (time at which contract value is maximized).*



APPENDIX A

GLIDE PATH

Kentucky's Affordable Prepaid Tuition
Glide Path

Graystone Consulting

Allocations and Expected Performance

	Secular Forecasts		Strategic Forecasts	
	Return	Volatility	Return	Volatility
Cash & Bonds				
Ultra-Short Fixed Income	3.4%	0.9%	2.3%	0.9%
Short Term Fixed Income	3.6%	1.4%	2.6%	1.4%
US Fixed Income	4.9%	5.3%	3.4%	5.3%
Municipal Bond	3.5%	6.7%	3.2%	6.7%
International Fixed Income	4.6%	4.2%	2.0%	4.2%
Inflation-Linked Securities	5.9%	7.5%	1.8%	7.5%
High Yield	7.2%	8.3%	3.8%	8.3%
Emerging Markets Fixed Income	7.7%	12.3%	5.8%	12.3%
Convertible Bond	8.4%	8.9%	4.6%	8.9%
Equities				
US Large Cap Growth Equity	10.4%	16.8%	4.3%	15.7%
US Large Cap Value Equity	10.1%	14.4%	5.9%	13.7%
US Mid Cap Growth Equity	11.6%	19.9%	4.6%	18.5%
US Mid Cap Value Equity	10.9%	15.5%	6.2%	14.8%
US Small Cap Growth Equity	12.5%	22.3%	6.3%	21.1%
US Small Cap Value Equity	11.6%	17.2%	6.6%	16.8%
Europe Equity	8.7%	17.3%	6.9%	16.4%
Japan Equity	9.4%	20.7%	7.0%	20.0%
Asia Pacific ex Japan Equity	12.0%	23.0%	8.0%	21.9%
Emerging Markets Equity	13.6%	22.7%	8.4%	21.6%
Non-Traditional Asset Classes*				
Absolute Return Assets	5.5%	4.0%	3.5%	4.0%
Equity Hedge Assets	6.1%	8.2%	4.6%	8.2%
Equity Return Assets	7.6%	8.1%	4.7%	8.1%
Real Estate Investment Trusts	9.3%	16.7%	7.1%	16.7%
Commodities	5.4%	14.5%	4.4%	14.5%
Master Limited Partnerships	9.2%	16.0%	7.1%	16.0%
Natural Resources	11.3%	20.1%	7.2%	20.1%
Private Real Estate Funds	10.1%	17.3%	8.3%	17.3%
Core Private Real Estate Funds	7.0%	9.8%	7.5%	9.8%
Private Credit	8.1%	8.0%	3.4%	8.0%
Private Equity	13.3%	19.1%	8.1%	19.1%

Source: Global Investment Committee as of Feb 28, 2018. Annual return is the forecasted arithmetic average annual return. Annualized volatility, skewness and kurtosis estimates are based on the longest available data through Feb 28, 2018. Strategic Forecasts are calibrated to a 7 year investment horizon. Secular Forecasts are calibrated to a 20+ year horizon.

Forecast estimates are for illustrative purposes only, are based on proprietary models and are not indicative of the future performance of any specific investment, index or asset class. Actual performance may be more or less than the estimates shown in this table. Estimates of future performance are based on assumptions that may not be realized.

* The GIC applies significant statistical adjustments to correct for distortions typically associated with hedge fund, private equity and private real estate index returns.

Investor Suitability: Morgan Stanley recommends that investors independently evaluate each asset class, investment style, issuer, security, instrument or strategy discussed. Legal, accounting and tax restrictions, transaction costs and changes to any assumptions may significantly affect the economics and results of any investment. Investors should consult their own tax, legal or other advisors to determine suitability for their specific circumstances. Investments in private funds (including hedge funds, managed-futures funds and private-equity funds) are speculative and include a high degree of risk.

	Glide Path							
Asset Classes	2018	2019	2020	2021	2022	2023	2024	2025
Large Cap US Equity	30	30	30	24	18	12	6	0
Small/Mid Cap US Equity	9	9	9	6	4	3	0	0
International Equity	9	9	9	6	4	3	0	0
US Fixed Income	44	44	44	33	22	11	0	0
TIPS	7	7	7	6	3	0	0	0
Short Duration US Fixed Income	0	0	0	0	5	10	15	20
Cash Equivalents	1	1	1	25	44	61	79	80
Totals	100	100	100	100	100	100	100	100
2018 Annual Returns (%)	**4.40**	**4.40**	**4.40**	**3.80**	**3.40**	**3.10**	**2.50**	**2.40**
2018 Standard Deviations (%)	**7.10**	**7.10**	**7.10**	**5.40**	**3.80**	**2.60**	**1.10**	**0.90**
Equity	48	48	48	36	26	18	6	0
Intermediate Duration Fixed Income	51	51	51	39	25	11	0	0
Short Duration Fixed Income	1	1	1	25	49	71	94	100

The prices, quotes, and statistics contained herein have been obtained from sources believed to be reliable, however, the accuracy cannot be guaranteed.

From September 5, 2018 correspondence received from Graystone Consulting and Kentucky Higher Education Assistance Authority Staff.

Appendix B

Discussion of Selling New Contracts

Kentucky's Affordable Prepaid Tuition
Discussion on 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 6 years beyond the expected utilization period. Since the growth of the value of the contracts is limited, an appropriate pricing can be determined.

Separation of Plans

We understand that if the Board were to re-open sales of new contracts, a separate plan would be created (such as a KAPT II). We further understand that contracts under the new plan would not be backed by the full faith and credit of the Commonwealth and the assets of the new plan would not be used to pay the benefits of the old plan. 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 plan).

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
- Board's funding and pricing policy/guidelines

Kentucky's Affordable Prepaid Tuition
Discussion on 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 6 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 6 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 exceed 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 on 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.