

July 22, 2019

Mr. David Eager
Executive Director
Kentucky Retirement Systems
1260 Louisville Road
Frankfort, KY 40601

**Re: Actuarial Analysis of Proposed Pension Legislation HB 2 (Provided July 19, 2019)
(Establish Employer Contribution Rates in State Statute) and its Financial Impact on the
Kentucky Employees Retirement System (KERS)**

**19 SS HB 2
AA Statement 1 of 1**

Dear Mr. Eager:

The purpose of this letter is to provide an actuarial analysis of proposed legislation HB 2 (provided July 19, 2019) as it applies to the Non-Hazardous Kentucky Employees Retirement System (System). For the years beginning July 1, 2019 and ending June 30, 2044, this proposed legislation would prescribe a statutory contribution rate of 49.47% of pay for approximately 118 quasi-governmental agencies (e.g. health districts, regional mental health services, non-P1 agencies, and universities) and maintain the actuarially determined contribution rate for all other employers participating in the System. This legislation will also establish a contribution floor for fiscal years beginning July 1, 2020 and ending June 30, 2044 such that each quasi and non-quasi agency in KERS will make contributions that are not less than the dollar amount they contributed for the 2018/2019 fiscal year. This fiscal impact is the same as we previously communicated regarding BR 11.

Summary of Cost Impact

The proposed legislation has a \$121 million fiscal impact on the KERS Non-Hazardous system (approximately \$11 million annually, payable for 23 years) as a result of maintaining the 49.47% contribution rate for the quasi agencies for the 2019/2020 fiscal year without a corresponding increase in the contribution amount paid by the non-quasi agencies. The proposed legislation will require the quasi agencies to continue contributing the same 49.47% of pay on their payroll (subject to a minimum dollar amount) and a corresponding increase in the contribution effort for the non-quasi agencies beginning with July 1, 2020 such that the total contribution dollars received by the System in future years remains equals the total calculated actuarially determined amount. This means that the contribution requirement for the non-quasi employers will need to increase from 90.29% to 104.07% of pay (pension and insurance) beginning with FY 2021.

Also, the amortization payments for the retiree insurance fund would be redirected to the pension fund in fiscal years beginning in July 1, 2019 through June 30, 2024. The redirection of approximately \$130 million contributions for each of these five years is not projected to materially change the total employer contribution requirement, but will result in a reduction in the contribution rate to the pension fund and a corresponding increase in the contribution rate in the insurance fund.

Requiring the non-quasi agencies to make contributions based on an actuarially determined contribution rate continues to protect the System in the event of unfavorable investment and/or liability experience. Also, the establishment of a minimum dollar contribution requirement for all the agencies (quasi and non-quasi) in KERS will meaningfully reduce the KERS's financial risk of declining covered payroll. Please refer to page 4 for additional explanation and comments.

The attached exhibits provide a projection of the financial status of the System under two scenarios:

1. Active membership remains constant, which results in approximately 2% annual payroll increases over the 30-year projection. This represents experience that is more favorable than the current 0% payroll growth assumption and the experience in recent years. As shown in the exhibits, the actuarially determined contribution rate decreases as a percentage of payroll as payroll increases.
2. Active membership decreases by 2% each year, which results in relatively constant payroll over the 30-year projection. This represents experience that approximately aligns with the current 0% payroll growth assumption. As shown in the exhibits, the actuarially determined contribution rate remains relatively constant as a percentage of covered payroll, and the dollar contribution amounts required to pay for the unfunded liability remain the same as the first scenario.

Both scenarios are consistent with the assumptions used in prior actuarial and fiscal analysis of the System. The use of different payroll growth scenarios provides the stakeholders with an idea of the sensitivity of the future costs due to varying demographic experience. We believe Scenario 2 is more applicable for providing the anticipated long-term contribution effort of the System.

Summary of Proposed Legislation

This proposed legislation establishes the following statutory employer contribution requirements.

Employer Contribution Rates						
Fiscal Years	Pension		Insurance		Total	
	Quasi	Non-Quasi	Quasi	Non-Quasi	Quasi	Non-Quasi
(1)	(2)	(3)	(4)	(5)	(6)	(7)
7/1/19 to 6/30/20	47.26%	81.22%	2.21% ¹	2.21% ¹	49.47%	83.43%
7/1/20 to 6/30/24	47.26% ³	ADEC ²	2.21% ¹	2.21% ¹	49.47%	ADEC ²
7/1/24 to 6/30/44	41.06%	ADEC ²	8.41%	ADEC ²	49.47%	ADEC ²

¹ The employer normal cost rate, but not to exceed 2.21% of pay.

² An actuarially determined contribution (ADEC) rate using a 30-year funding period as of June 30, 2013 (i.e. 24 years remaining as of June 30, 2019) with the non-quasi ADEC adjusted for the portion of the ADEC on quasi payroll not paid by the 49.47% contribution. For the period of July 1, 2020 through June 30, 2024, the unfunded accrued liability amortization contribution for the insurance plan will be paid to the pension plan.

³ 49.47% less the insurance contribution rate.

Additionally, this legislation establishes a minimum dollar contribution requirement for the quasi agencies for fiscal years beginning July 1, 2020 and ending June 30, 2044 that is equal to the dollar amount paid by the agency in fiscal year 2018/2019.

Finally, the proposed legislation will only allow the Board to adjust the assumed rate of return by a maximum of 0.25% per year and requires that the actuary and Board only consider investment return experience over a period greater than 20 years when evaluating historical investment return experience.

GRS Comments on Proposed Legislation

Bifurcating the required contributions for different agencies is a policy decision for the Commonwealth. The financial condition of the System is expected to continue to improve so long as the contributions received from all agencies participating in the System total the actuarially determined contribution amount calculated based on the established funding policy. Other than the \$121 million in lower contributions for fiscal year 2019/2020, this proposed legislation is projected to be materially fiscally neutral to KRS as a whole, meaning the total contribution dollars that the System expects to receive under the current plan and the proposed legislation are materially the same.

Continuing to require the non-quasi agencies to make contributions based on an actuarially determined contribution rate protects the System in the event of unfavorable actuarial experience. Also, the non-quasi agencies will experience lower future contributions if actual investment and liability experience is more favorable than assumed. Given the continual decline in covered payroll the System has experienced, we expect the establishment of a minimum dollar contribution requirement equal to the amount paid for fiscal year 2018/2019 for all participating agencies (quasi and non-quasi) will eliminate the risk of future declining payroll with respect to the quasi agencies since they were already contributing at the 49.47% contribution rate in fiscal year 2018/2019. This provision will also lower the System's exposure to the risk of declining payroll with respect to the non-quasi agencies, but to a lesser extent since the contribution rate for the non-quasi agencies is projected to increase from 83.43% of pay for fiscal year 2018/2019 to over 100% of pay beginning with the 2020/2021 fiscal year. As a result, payroll for a non-quasi agency would have to decrease more significantly for the minimum dollar contribution to apply.

We do not believe the limitations added in regard to the Board's authority to make investment return assumption changes are overly limiting. However, this provision may be problematic if KRS made a significant change to their investment policy that warranted a change in the investment return assumption that was greater than 0.25%.

Due to the shift in contribution effort from the insurance fund to the pension fund from July 1, 2019 to June 30, 2024, the funded ratio of the insurance fund is projected to decrease from 37% as of June 30, 2019 to 24% by June 30, 2024. In reality, the decline in the funded ratio for the insurance funds would likely be greater than shown in the exhibits as the funds would be less likely to actually earn a 6.25% investment return due to the increased liquidity needs to pay benefits. While this provision directs more contributions to the larger and less well funded pension fund, we do not recommend the underfunding of the insurance fund compared to the actuarially determined amount.

Basis of Calculations

GRS based the calculations and analysis in this letter on the member and financial data provided by Kentucky Retirement Systems for use in performing the actuarial valuation as of June 30, 2018. Except where noted otherwise, the projections assume no actuarial gains or losses will occur in the future, and that members will terminate, retire, become disabled, or die as predicted by the actuarial assumptions documented in the June 30, 2018 experience study report (recently adopted by the Board). Our calculations are based upon assumptions regarding future events, which may or may not materialize. Depending on actual plan experience, actual results could deviate significantly from our projections.

Closing

We are not attorneys and we cannot provide a legal opinion regarding the changes in this proposed legislation. Nothing in this letter should be construed as providing legal, investment or tax advice.

Mr. White is an Enrolled Actuary. Both of the undersigned are members of the American Academy of Actuaries and we meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. In addition, both of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,



Daniel J. White, FSA, MAAA, EA



Janie Shaw, ASA, MAAA

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Enclosures

Section 1. Comparison of Fiscal Impact

Section 2. Projected Cost of the Retirement and Insurance Funds – Current Plan

Section 3. Projected Cost of the Retirement and Insurance Funds – Proposed Legislation

HB 2

Section 1.

**Comparison of Fiscal Impact
Current Plan vs. Proposed Changes**

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Comparison of Current Plan and Proposed Legislation
Exhibit 1-1
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Total Employer Contributions		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 13,656	\$ 13,656	\$ -	13%	13%	0%	41.06%	41.06%	0.00%	71.03%	71.03%	0.00%	\$ 940	\$ 940	\$ -
2019	14,269	14,269	-	13%	13%	0%	71.03%	47.26%	-23.77%	71.03%	81.22%	10.19%	1,049	1,080	31
2020	14,068	14,037	(31)	14%	14%	0%	78.11%	47.37%	-30.74%	78.11%	100.29%	22.18%	1,166	1,308	142
2021	13,696	13,517	(179)	16%	18%	2%	78.11%	47.47%	-30.64%	78.11%	100.39%	22.28%	1,180	1,326	146
2022	13,306	12,968	(338)	19%	21%	2%	75.55%	47.58%	-27.97%	75.55%	96.49%	20.94%	1,157	1,298	141
2023	12,926	12,425	(501)	21%	24%	3%	75.55%	47.69%	-27.86%	75.55%	96.60%	21.05%	1,174	1,319	145
2024	12,506	11,830	(676)	23%	27%	4%	72.81%	41.06%	-31.75%	72.81%	78.06%	5.25%	1,149	1,092	(57)
2025	12,088	11,435	(653)	26%	30%	4%	72.81%	41.06%	-31.75%	72.81%	78.06%	5.25%	1,168	1,110	(58)
2026	11,626	10,998	(628)	28%	32%	4%	69.96%	41.06%	-28.90%	69.96%	74.51%	4.55%	1,141	1,085	(56)
2027	11,166	10,563	(603)	30%	34%	4%	69.96%	41.06%	-28.90%	69.96%	74.51%	4.55%	1,160	1,103	(57)
2028	10,661	10,084	(577)	33%	37%	4%	67.06%	41.06%	-26.00%	67.06%	70.88%	3.82%	1,132	1,076	(56)
2029	10,156	9,607	(549)	36%	39%	3%	67.06%	41.06%	-26.00%	67.06%	70.88%	3.82%	1,153	1,096	(57)
2030	9,602	9,082	(520)	39%	42%	3%	64.14%	41.06%	-23.08%	64.14%	67.22%	3.08%	1,124	1,068	(56)
2031	9,048	8,559	(489)	42%	45%	3%	64.14%	41.06%	-23.08%	64.14%	67.22%	3.08%	1,147	1,090	(57)
2032	8,440	7,983	(457)	45%	48%	3%	61.14%	41.06%	-20.08%	61.14%	63.46%	2.32%	1,116	1,060	(56)
2033	7,833	7,409	(424)	49%	51%	2%	61.14%	41.06%	-20.08%	61.14%	63.46%	2.32%	1,139	1,083	(56)
2034	7,169	6,781	(388)	52%	55%	3%	58.09%	41.06%	-17.03%	58.09%	59.66%	1.57%	1,106	1,051	(55)
2035	6,504	6,152	(352)	56%	59%	3%	58.09%	41.06%	-17.03%	58.09%	59.66%	1.57%	1,131	1,075	(56)
2036	5,780	5,467	(313)	61%	63%	2%	55.01%	41.06%	-13.95%	55.01%	55.81%	0.80%	1,096	1,042	(54)
2037	5,054	4,781	(273)	65%	67%	2%	55.01%	41.06%	-13.95%	55.01%	55.81%	0.80%	1,123	1,067	(56)
2038	4,263	4,032	(231)	70%	72%	2%	51.75%	41.06%	-10.69%	51.75%	51.75%	0.00%	1,082	1,029	(53)
2039	3,474	3,286	(188)	76%	77%	1%	51.75%	41.06%	-10.69%	51.75%	51.75%	0.00%	1,109	1,054	(55)
2040	2,617	2,476	(141)	81%	82%	1%	48.19%	41.06%	-7.13%	48.19%	47.32%	-0.87%	1,059	1,006	(53)
2041	1,770	1,674	(96)	87%	88%	1%	48.19%	41.06%	-7.13%	48.19%	47.32%	-0.87%	1,084	1,031	(53)
2042	853	807	(46)	94%	94%	0%	42.87%	40.79%	-2.08%	42.87%	40.79%	-2.08%	988	940	(48)
2043	-	-	-	100%	100%	0%	4.26%	4.26%	0.00%	4.26%	4.26%	0.00%	101	101	-
2044	-	-	-	100%	100%	0%	4.23%	4.23%	0.00%	4.23%	4.23%	0.00%	102	102	-
2045	-	-	-	100%	100%	0%	4.21%	4.21%	0.00%	4.21%	4.21%	0.00%	104	104	-
2046	-	-	-	100%	100%	0%	4.19%	4.19%	0.00%	4.19%	4.19%	0.00%	106	106	-
2047	-	-	-	100%	100%	0%	4.17%	4.17%	0.00%	4.17%	4.17%	0.00%	108	108	-

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Comparison of Current Plan and Proposed Legislation
Exhibit 1-2
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Total Employer Contributions		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 1,549	\$ 1,549	\$ -	36%	36%	0%	8.41%	8.41%	0.00%	12.40%	12.40%	0.00%	\$ 167	\$ 167	\$ -
2019	1,633	1,633	-	37%	37%	0%	12.40%	2.21%	-10.19%	12.40%	2.21%	-10.19%	182	32	(150)
2020	1,581	1,735	154	41%	35%	-6%	10.90%	2.10%	-8.80%	10.90%	2.10%	-8.80%	162	31	(131)
2021	1,533	1,832	299	44%	33%	-11%	10.90%	2.00%	-8.90%	10.90%	2.00%	-8.90%	164	30	(134)
2022	1,487	1,943	456	47%	31%	-16%	10.31%	1.89%	-8.42%	10.31%	1.89%	-8.42%	158	29	(129)
2023	1,446	2,063	617	49%	28%	-21%	10.31%	1.78%	-8.53%	10.31%	1.78%	-8.53%	160	28	(132)
2024	1,399	2,192	793	52%	24%	-28%	9.72%	8.41%	-1.31%	9.72%	16.13%	6.41%	153	225	72
2025	1,354	2,122	768	54%	28%	-26%	9.72%	8.41%	-1.31%	9.72%	16.13%	6.41%	156	229	73
2026	1,302	2,042	740	56%	31%	-25%	9.13%	8.41%	-0.72%	9.13%	15.07%	5.94%	149	220	71
2027	1,253	1,967	714	58%	34%	-24%	9.13%	8.41%	-0.72%	9.13%	15.07%	5.94%	152	224	72
2028	1,196	1,879	683	60%	38%	-22%	8.55%	8.41%	-0.14%	8.55%	14.09%	5.54%	145	215	70
2029	1,141	1,795	654	62%	41%	-21%	8.55%	8.41%	-0.14%	8.55%	14.09%	5.54%	147	219	72
2030	1,078	1,698	620	65%	44%	-21%	7.97%	8.41%	0.44%	7.97%	13.09%	5.12%	140	210	70
2031	1,018	1,604	586	67%	47%	-20%	7.97%	8.41%	0.44%	7.97%	13.09%	5.12%	143	215	72
2032	949	1,498	549	69%	51%	-18%	7.45%	8.41%	0.96%	7.45%	12.17%	4.72%	136	206	70
2033	883	1,395	512	71%	54%	-17%	7.45%	8.41%	0.96%	7.45%	12.17%	4.72%	139	211	72
2034	808	1,278	470	73%	58%	-15%	6.95%	8.41%	1.46%	6.95%	11.25%	4.30%	133	202	69
2035	735	1,163	428	76%	61%	-15%	6.95%	8.41%	1.46%	6.95%	11.25%	4.30%	136	206	70
2036	653	1,035	382	78%	65%	-13%	6.49%	8.41%	1.92%	6.49%	10.39%	3.90%	130	198	68
2037	573	908	335	81%	70%	-11%	6.49%	8.41%	1.92%	6.49%	10.39%	3.90%	133	203	70
2038	484	768	284	84%	74%	-10%	6.04%	8.41%	2.37%	6.04%	9.51%	3.47%	127	194	67
2039	395	627	232	87%	79%	-8%	6.04%	8.41%	2.37%	6.04%	9.51%	3.47%	130	199	69
2040	297	472	175	90%	84%	-6%	5.57%	8.41%	2.84%	5.57%	8.57%	3.00%	123	188	65
2041	202	320	118	93%	89%	-4%	5.57%	8.41%	2.84%	5.57%	8.57%	3.00%	126	192	66
2042	95	153	58	97%	95%	-2%	4.84%	7.45%	2.61%	4.84%	7.45%	2.61%	112	172	60
2043	-	-	-	100%	100%	0%	0.48%	0.48%	0.00%	0.48%	0.48%	0.00%	11	11	-
2044	-	-	-	100%	100%	0%	0.46%	0.46%	0.00%	0.46%	0.46%	0.00%	11	11	-
2045	-	-	-	100%	100%	0%	0.45%	0.45%	0.00%	0.45%	0.45%	0.00%	11	11	-
2046	-	-	-	100%	100%	0%	0.44%	0.44%	0.00%	0.44%	0.44%	0.00%	11	11	-
2047	-	-	-	100%	100%	0%	0.43%	0.43%	0.00%	0.43%	0.43%	0.00%	11	11	-

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Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Comparison of Current Plan and Proposed Legislation
Exhibit 1-3
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Total Employer Contributions		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 13,656	\$ 13,656	\$ -	13%	13%	0%	41.06%	41.06%	0.00%	71.03%	71.03%	0.00%	\$ 940	\$ 940	\$ -
2019	14,268	14,268	-	13%	13%	0%	71.03%	47.26%	-23.77%	71.03%	81.22%	10.19%	1,035	1,065	30
2020	14,081	14,050	(31)	14%	14%	0%	79.22%	47.37%	-31.85%	79.22%	101.97%	22.75%	1,148	1,289	141
2021	13,725	13,548	(177)	16%	17%	1%	79.22%	47.47%	-31.75%	79.22%	102.07%	22.85%	1,144	1,285	141
2022	13,371	13,040	(331)	18%	20%	2%	79.27%	47.58%	-31.69%	79.27%	102.09%	22.82%	1,140	1,280	140
2023	13,007	12,515	(492)	20%	23%	3%	79.27%	47.69%	-31.58%	79.27%	102.20%	22.93%	1,136	1,278	142
2024	12,623	11,959	(664)	22%	26%	4%	79.27%	41.06%	-38.21%	79.27%	86.22%	6.95%	1,133	1,078	(55)
2025	12,221	11,578	(643)	24%	28%	4%	79.27%	41.06%	-38.21%	79.27%	86.22%	6.95%	1,131	1,076	(55)
2026	11,795	11,175	(620)	27%	31%	4%	79.20%	41.06%	-38.14%	79.20%	86.17%	6.97%	1,127	1,073	(54)
2027	11,348	10,751	(597)	29%	33%	4%	79.20%	41.06%	-38.14%	79.20%	86.17%	6.97%	1,124	1,070	(54)
2028	10,877	10,305	(572)	31%	35%	4%	79.13%	41.06%	-38.07%	79.13%	86.04%	6.91%	1,121	1,066	(55)
2029	10,383	9,837	(546)	34%	37%	3%	79.13%	41.06%	-38.07%	79.13%	86.04%	6.91%	1,119	1,065	(54)
2030	9,862	9,342	(520)	36%	40%	4%	79.03%	41.06%	-37.97%	79.03%	85.89%	6.86%	1,116	1,062	(54)
2031	9,312	8,822	(490)	39%	42%	3%	79.03%	41.06%	-37.97%	79.03%	85.89%	6.86%	1,117	1,062	(55)
2032	8,733	8,273	(460)	42%	45%	3%	78.74%	41.06%	-37.68%	78.74%	85.49%	6.75%	1,113	1,058	(55)
2033	8,124	7,696	(428)	46%	48%	2%	78.74%	41.06%	-37.68%	78.74%	85.49%	6.75%	1,114	1,059	(55)
2034	7,482	7,087	(395)	49%	52%	3%	78.31%	41.06%	-37.25%	78.31%	84.93%	6.62%	1,109	1,054	(55)
2035	6,807	6,449	(358)	53%	55%	2%	78.31%	41.06%	-37.25%	78.31%	84.93%	6.62%	1,111	1,056	(55)
2036	6,095	5,774	(321)	57%	59%	2%	77.76%	41.06%	-36.70%	77.76%	84.24%	6.48%	1,107	1,052	(55)
2037	5,349	5,068	(281)	62%	64%	2%	77.76%	41.06%	-36.70%	77.76%	84.24%	6.48%	1,111	1,056	(55)
2038	4,558	4,317	(241)	67%	69%	2%	76.82%	41.06%	-35.76%	76.82%	83.06%	6.24%	1,104	1,049	(55)
2039	3,732	3,536	(196)	72%	74%	2%	76.82%	41.06%	-35.76%	76.82%	83.06%	6.24%	1,109	1,054	(55)
2040	2,858	2,708	(150)	79%	80%	1%	75.58%	41.06%	-34.52%	75.58%	81.52%	5.94%	1,097	1,042	(55)
2041	1,949	1,847	(102)	85%	86%	1%	75.58%	41.06%	-34.52%	75.58%	81.52%	5.94%	1,102	1,047	(55)
2042	988	936	(52)	92%	93%	1%	73.74%	41.06%	-32.68%	73.74%	79.20%	5.46%	1,079	1,026	(53)
2043	-	-	-	100%	100%	0%	4.31%	4.31%	0.00%	4.31%	4.31%	0.00%	63	63	-
2044	-	-	-	100%	100%	0%	4.27%	4.27%	0.00%	4.27%	4.27%	0.00%	63	63	-
2045	-	-	-	100%	100%	0%	4.24%	4.24%	0.00%	4.24%	4.24%	0.00%	63	63	-
2046	-	-	-	100%	100%	0%	4.21%	4.21%	0.00%	4.21%	4.21%	0.00%	62	62	-
2047	-	-	-	100%	100%	0%	4.18%	4.18%	0.00%	4.18%	4.18%	0.00%	62	62	-

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Comparison of Current Plan and Proposed Legislation
Exhibit 1-4
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Total Employer Contributions		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 1,549	\$ 1,549	\$ -	36%	36%	0%	8.41%	8.41%	0.00%	12.40%	12.40%	0.00%	\$ 167	\$ 167	\$ -
2019	1,633	1,633	-	37%	37%	0%	12.40%	2.21%	-10.19%	12.40%	2.21%	-10.19%	180	32	(148)
2020	1,583	1,736	153	41%	35%	-6%	11.07%	2.10%	-8.97%	11.07%	2.10%	-8.97%	160	30	(130)
2021	1,538	1,833	295	44%	33%	-11%	11.07%	2.00%	-9.07%	11.07%	2.00%	-9.07%	159	29	(130)
2022	1,496	1,945	449	46%	30%	-16%	10.82%	1.89%	-8.93%	10.82%	1.89%	-8.93%	155	27	(128)
2023	1,458	2,067	609	49%	27%	-22%	10.82%	1.78%	-9.04%	10.82%	1.78%	-9.04%	155	25	(130)
2024	1,417	2,197	780	51%	24%	-27%	10.60%	8.41%	-2.19%	10.60%	17.69%	7.09%	151	221	70
2025	1,374	2,132	758	53%	27%	-26%	10.60%	8.41%	-2.19%	10.60%	17.69%	7.09%	151	221	70
2026	1,328	2,061	733	55%	30%	-25%	10.37%	8.41%	-1.96%	10.37%	17.35%	6.98%	148	217	69
2027	1,280	1,987	707	57%	33%	-24%	10.37%	8.41%	-1.96%	10.37%	17.35%	6.98%	147	216	69
2028	1,228	1,909	681	59%	36%	-23%	10.13%	8.41%	-1.72%	10.13%	17.06%	6.93%	144	213	69
2029	1,174	1,826	652	61%	39%	-22%	10.13%	8.41%	-1.72%	10.13%	17.06%	6.93%	144	212	68
2030	1,115	1,737	622	63%	42%	-21%	9.89%	8.41%	-1.48%	9.89%	16.77%	6.88%	140	209	69
2031	1,055	1,645	590	65%	45%	-20%	9.89%	8.41%	-1.48%	9.89%	16.77%	6.88%	140	209	69
2032	991	1,546	555	67%	48%	-19%	9.65%	8.41%	-1.24%	9.65%	16.45%	6.80%	137	206	69
2033	924	1,443	519	69%	51%	-18%	9.65%	8.41%	-1.24%	9.65%	16.45%	6.80%	137	206	69
2034	852	1,332	480	71%	55%	-16%	9.46%	8.41%	-1.05%	9.46%	16.20%	6.74%	134	204	70
2035	777	1,216	439	73%	58%	-15%	9.46%	8.41%	-1.05%	9.46%	16.20%	6.74%	135	204	69
2036	697	1,092	395	76%	62%	-14%	9.28%	8.41%	-0.87%	9.28%	15.94%	6.66%	132	202	70
2037	614	961	347	79%	67%	-12%	9.28%	8.41%	-0.87%	9.28%	15.94%	6.66%	133	203	70
2038	525	822	297	82%	71%	-11%	9.08%	8.41%	-0.67%	9.08%	15.63%	6.55%	131	200	69
2039	431	676	245	85%	76%	-9%	9.08%	8.41%	-0.67%	9.08%	15.63%	6.55%	131	201	70
2040	331	518	187	88%	82%	-6%	8.87%	8.41%	-0.46%	8.87%	15.24%	6.37%	129	198	69
2041	226	355	129	92%	87%	-5%	8.87%	8.41%	-0.46%	8.87%	15.24%	6.37%	130	199	69
2042	115	180	65	96%	94%	-2%	8.60%	8.41%	-0.19%	8.60%	14.69%	6.09%	126	193	67
2043	-	-	-	100%	100%	0%	0.50%	0.50%	0.00%	0.50%	0.50%	0.00%	7	7	-
2044	-	-	-	100%	100%	0%	0.50%	0.50%	0.00%	0.50%	0.50%	0.00%	7	7	-
2045	-	-	-	100%	100%	0%	0.48%	0.48%	0.00%	0.48%	0.48%	0.00%	7	7	-
2046	-	-	-	100%	100%	0%	0.47%	0.47%	0.00%	0.47%	0.47%	0.00%	7	7	-
2047	-	-	-	100%	100%	0%	0.46%	0.46%	0.00%	0.46%	0.46%	0.00%	7	7	-

Gabriel Roeder Smith & Company

HB 2

Section 2.

**Projected Cost of the Retirement and Insurance
Current Plan**

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Current Plan
Exhibit 2-1
(\$ in Millions)

Contribution Provisions: All Employers Pay the Biannual Actuarially Determined Contribution
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi	Non-Quasi	Total	Employer	Annual Cash Flow Analysis															
										Employer	Employer	Employer	Actuarial	Member and	Benefit	Net	Investment												
										Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Determined Contribution Rate	Employer Contributions	Payments and Expenses	External Cash Flow		Income											
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)												
2018	\$	15,675	\$	2,019	\$	13,656	13%	\$	145	\$	795	\$	940	\$	74	\$	1,471	41.06%	71.03%	63.86%	71.03%	\$	1,014	\$	(994)	\$	20	\$	106
2019		16,375		2,106		14,269	13%		251		798		1,049		74		1,477	71.03%	71.03%	71.03%	78.01%		1,123		(1,009)		114		115
2020		16,392		2,324		14,068	14%		279		887		1,166		75		1,493	78.11%	78.11%	78.11%	78.11%		1,241		(1,024)		217		130
2021		16,392		2,696		13,696	16%		282		898		1,180		76		1,511	78.11%	78.11%	78.11%	77.01%		1,256		(1,038)		218		148
2022		16,376		3,070		13,306	19%		277		880		1,157		77		1,531	75.55%	75.55%	75.55%	75.55%		1,234		(1,052)		182		166
2023		16,343		3,417		12,926	21%		281		893		1,174		78		1,554	75.55%	75.55%	75.55%	74.26%		1,252		(1,065)		187		184
2024		16,294		3,788		12,506	23%		275		874		1,149		79		1,578	72.81%	72.81%	72.81%	72.81%		1,228		(1,077)		151		203
2025		16,230		4,142		12,088	26%		279		889		1,168		80		1,604	72.81%	72.81%	72.81%	71.47%		1,248		(1,089)		159		222
2026		16,149		4,523		11,626	28%		273		868		1,141		82		1,631	69.96%	69.96%	69.96%	69.96%		1,223		(1,099)		124		241
2027		16,053		4,887		11,166	30%		278		882		1,160		83		1,659	69.96%	69.96%	69.96%	68.58%		1,243		(1,110)		133		260
2028		15,941		5,280		10,661	33%		271		861		1,132		84		1,688	67.06%	67.06%	67.06%	67.06%		1,216		(1,112)		104		280
2029		15,821		5,665		10,156	36%		276		877		1,153		86		1,719	67.06%	67.06%	67.06%	65.69%		1,239		(1,119)		120		301
2030		15,687		6,085		9,602	39%		269		855		1,124		88		1,752	64.14%	64.14%	64.14%	64.14%		1,212		(1,125)		87		322
2031		15,542		6,494		9,048	42%		274		873		1,147		89		1,788	64.14%	64.14%	64.14%	62.74%		1,236		(1,127)		109		344
2032		15,387		6,947		8,440	45%		267		849		1,116		91		1,825	61.14%	61.14%	61.14%	61.14%		1,207		(1,128)		79		367
2033		15,225		7,392		7,833	49%		273		866		1,139		93		1,864	61.14%	61.14%	61.14%	59.72%		1,232		(1,128)		104		391
2034		15,057		7,888		7,169	52%		265		841		1,106		95		1,904	58.09%	58.09%	58.09%	58.09%		1,201		(1,126)		75		416
2035		14,883		8,379		6,504	56%		270		861		1,131		97		1,947	58.09%	58.09%	58.09%	56.68%		1,228		(1,121)		107		443
2036		14,709		8,929		5,780	61%		262		834		1,096		100		1,993	55.01%	55.01%	55.01%	55.01%		1,196		(1,112)		84		471
2037		14,538		9,484		5,054	65%		269		854		1,123		102		2,041	55.01%	55.01%	55.01%	53.57%		1,225		(1,101)		124		501
2038		14,372		10,109		4,263	70%		259		823		1,082		105		2,092	51.75%	51.75%	51.75%	51.75%		1,187		(1,087)		100		533
2039		14,216		10,742		3,474	76%		265		844		1,109		107		2,144	51.75%	51.75%	51.75%	50.28%		1,216		(1,073)		143		568
2040		14,071		11,454		2,617	81%		253		806		1,059		110		2,197	48.19%	48.19%	48.19%	48.19%		1,169		(1,057)		112		604
2041		13,939		12,169		1,770	87%		259		825		1,084		113		2,250	48.19%	48.19%	48.19%	46.61%		1,197		(1,041)		156		643
2042		13,821		12,968		853	94%		236		752		988		115		2,305	42.87%	42.87%	42.87%	42.87%		1,103		(1,026)		77		683
2043		13,716		13,716		-	100%		24		77		101		118		2,360	4.26%	4.26%	4.26%	4.26%		219		(1,010)		(791)		700
2044		13,627		13,627		-	100%		24		78		102		121		2,416	4.23%	4.23%	4.23%	4.23%		223		(995)		(772)		696
2045		13,554		13,554		-	100%		25		79		104		124		2,472	4.21%	4.21%	4.21%	4.21%		228		(980)		(752)		692
2046		13,496		13,496		-	100%		25		81		106		126		2,530	4.19%	4.19%	4.19%	4.19%		232		(966)		(734)		689
2047		13,456		13,456		-	100%		26		82		108		129		2,589	4.17%	4.17%	4.17%	4.17%		237		(952)		(715)		688

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The 63.86% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Current Plan
Exhibit 2-2
(\$ in Millions)

Contribution Provisions: All Employers Pay the Biannual Actuarially Determined Contribution
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi	Non-Quasi	Total	Employer	Annual Cash Flow Analysis			
										Employer	Employer	Employer	Actuarial	Member and	Benefit	Net	Investment
										Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Determined Contribution Rate	Employer Contributions	Payments and Expenses	External Cash Flow	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 167	\$ 6	\$ 1,461	8.41%	12.40%	11.45%	12.40%	\$ 173	\$ (130)	\$ 43	\$ 57
2019	2,611	978	1,633	37%	44	138	182	6	1,469	12.40%	12.40%	12.40%	11.17%	188	(134)	54	64
2020	2,677	1,096	1,581	41%	39	123	162	7	1,488	10.90%	10.90%	10.90%	10.90%	169	(141)	28	70
2021	2,739	1,206	1,533	44%	39	125	164	8	1,508	10.90%	10.90%	10.90%	10.66%	172	(148)	24	76
2022	2,796	1,309	1,487	47%	38	120	158	9	1,529	10.31%	10.31%	10.31%	10.31%	167	(155)	12	82
2023	2,849	1,403	1,446	49%	38	122	160	9	1,553	10.31%	10.31%	10.31%	10.01%	169	(163)	6	88
2024	2,897	1,498	1,399	52%	37	116	153	10	1,578	9.72%	9.72%	9.72%	9.72%	163	(171)	(8)	93
2025	2,938	1,584	1,354	54%	37	119	156	11	1,605	9.72%	9.72%	9.72%	9.44%	167	(179)	(12)	99
2026	2,973	1,671	1,302	56%	36	113	149	12	1,632	9.13%	9.13%	9.13%	9.13%	161	(187)	(26)	104
2027	3,002	1,749	1,253	58%	36	116	152	13	1,661	9.13%	9.13%	9.13%	8.84%	165	(195)	(30)	108
2028	3,022	1,826	1,196	60%	35	110	145	13	1,691	8.55%	8.55%	8.55%	8.55%	158	(203)	(45)	113
2029	3,035	1,894	1,141	62%	35	112	147	14	1,723	8.55%	8.55%	8.55%	8.27%	161	(210)	(49)	117
2030	3,040	1,962	1,078	65%	33	107	140	15	1,756	7.97%	7.97%	7.97%	7.97%	155	(215)	(60)	121
2031	3,040	2,022	1,018	67%	34	109	143	16	1,792	7.97%	7.97%	7.97%	7.72%	159	(219)	(60)	124
2032	3,035	2,086	949	69%	33	103	136	16	1,829	7.45%	7.45%	7.45%	7.45%	152	(222)	(70)	128
2033	3,028	2,145	883	71%	33	106	139	17	1,868	7.45%	7.45%	7.45%	7.21%	156	(224)	(68)	132
2034	3,017	2,209	808	73%	32	101	133	18	1,909	6.95%	6.95%	6.95%	6.95%	151	(225)	(74)	136
2035	3,005	2,270	735	76%	32	104	136	18	1,952	6.95%	6.95%	6.95%	6.73%	154	(224)	(70)	140
2036	2,993	2,340	653	78%	31	99	130	19	1,998	6.49%	6.49%	6.49%	6.49%	149	(222)	(73)	144
2037	2,983	2,410	573	81%	32	101	133	20	2,046	6.49%	6.49%	6.49%	6.29%	153	(220)	(67)	149
2038	2,976	2,492	484	84%	30	97	127	20	2,097	6.04%	6.04%	6.04%	6.04%	147	(217)	(70)	154
2039	2,971	2,576	395	87%	31	99	130	21	2,149	6.04%	6.04%	6.04%	5.85%	151	(213)	(62)	159
2040	2,970	2,673	297	90%	29	94	123	22	2,202	5.57%	5.57%	5.57%	5.57%	145	(210)	(65)	165
2041	2,974	2,772	202	93%	30	96	126	22	2,256	5.57%	5.57%	5.57%	5.35%	148	(206)	(58)	171
2042	2,981	2,886	95	97%	27	85	112	23	2,310	4.84%	4.84%	4.84%	4.84%	135	(202)	(67)	178
2043	2,994	2,994	-	100%	3	8	11	24	2,366	0.48%	0.48%	0.48%	0.48%	35	(199)	(164)	182
2044	3,011	3,011	-	100%	3	8	11	24	2,421	0.46%	0.46%	0.46%	0.46%	35	(197)	(162)	183
2045	3,033	3,033	-	100%	3	8	11	25	2,478	0.45%	0.45%	0.45%	0.45%	36	(196)	(160)	185
2046	3,057	3,057	-	100%	3	8	11	25	2,536	0.44%	0.44%	0.44%	0.44%	36	(196)	(160)	186
2047	3,083	3,083	-	100%	3	8	11	26	2,595	0.43%	0.43%	0.43%	0.43%	37	(197)	(160)	188

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The 11.45% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Current Plan
Exhibit 2-3
(\$ in Millions)

Contribution Provisions: All Employers Pay the Biannual Actuarially Determined Contribution
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi	Non-Quasi	Total	Employer	Annual Cash Flow Analysis															
										Employer	Employer	Employer	Actuarial	Member and	Benefit	Net	Investment												
										Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Contribution as % of Covered Payroll	Determined Contribution Rate	Employer Contributions	Payments and Expenses	External Cash Flow													
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)												
2018	\$	15,675	\$	2,019	\$	13,656	13%	\$	145	\$	795	\$	940	\$	74	\$	1,471	41.06%	71.03%	63.86%	71.03%	\$	1,014	\$	(994)	\$	20	\$	106
2019		16,374		2,106		14,268	13%		247		788		1,035		73		1,456	71.03%	71.03%	71.03%	78.01%		1,108		(1,009)		99		114
2020		16,389		2,308		14,081	14%		275		873		1,148		72		1,450	79.22%	79.22%	79.22%	79.22%		1,220		(1,023)		197		128
2021		16,385		2,660		13,725	16%		274		870		1,144		72		1,443	79.22%	79.22%	79.22%	79.35%		1,216		(1,037)		179		145
2022		16,363		2,992		13,371	18%		273		867		1,140		72		1,438	79.27%	79.27%	79.27%	79.27%		1,212		(1,050)		162		161
2023		16,322		3,315		13,007	20%		272		864		1,136		72		1,433	79.27%	79.27%	79.27%	79.27%		1,208		(1,063)		145		178
2024		16,261		3,638		12,623	22%		271		862		1,133		71		1,430	79.27%	79.27%	79.27%	79.27%		1,204		(1,074)		130		194
2025		16,183		3,962		12,221	24%		270		861		1,131		71		1,426	79.27%	79.27%	79.27%	79.25%		1,202		(1,085)		117		211
2026		16,085		4,290		11,795	27%		270		857		1,127		71		1,423	79.20%	79.20%	79.20%	79.20%		1,198		(1,096)		102		228
2027		15,968		4,620		11,348	29%		269		855		1,124		71		1,419	79.20%	79.20%	79.20%	79.16%		1,195		(1,106)		89		245
2028		15,832		4,955		10,877	31%		268		853		1,121		71		1,416	79.13%	79.13%	79.13%	79.13%		1,192		(1,107)		85		262
2029		15,685		5,302		10,383	34%		268		851		1,119		71		1,414	79.13%	79.13%	79.13%	79.10%		1,190		(1,114)		76		280
2030		15,519		5,657		9,862	36%		267		849		1,116		71		1,413	79.03%	79.03%	79.03%	79.03%		1,187		(1,119)		68		299
2031		15,337		6,025		9,312	39%		267		850		1,117		71		1,413	79.03%	79.03%	79.03%	78.93%		1,188		(1,121)		67		318
2032		15,142		6,409		8,733	42%		266		847		1,113		71		1,413	78.74%	78.74%	78.74%	78.74%		1,184		(1,121)		63		338
2033		14,934		6,810		8,124	46%		266		848		1,114		71		1,414	78.74%	78.74%	78.74%	78.55%		1,185		(1,120)		65		359
2034		14,715		7,233		7,482	49%		265		844		1,109		71		1,416	78.31%	78.31%	78.31%	78.31%		1,180		(1,117)		63		381
2035		14,485		7,678		6,807	53%		266		845		1,111		71		1,418	78.31%	78.31%	78.31%	78.09%		1,182		(1,111)		71		405
2036		14,249		8,154		6,095	57%		265		842		1,107		71		1,423	77.76%	77.76%	77.76%	77.76%		1,178		(1,101)		77		430
2037		14,010		8,661		5,349	62%		266		845		1,111		71		1,429	77.76%	77.76%	77.76%	77.38%		1,182		(1,088)		94		457
2038		13,770		9,212		4,558	67%		264		840		1,104		72		1,436	76.82%	76.82%	76.82%	76.82%		1,176		(1,073)		103		486
2039		13,533		9,801		3,732	72%		265		844		1,109		72		1,444	76.82%	76.82%	76.82%	76.31%		1,181		(1,057)		124		518
2040		13,301		10,443		2,858	79%		262		835		1,097		73		1,451	75.58%	75.58%	75.58%	75.58%		1,170		(1,040)		130		552
2041		13,073		11,124		1,949	85%		264		838		1,102		73		1,458	75.58%	75.58%	75.58%	75.03%		1,175		(1,022)		153		588
2042		12,852		11,864		988	92%		258		821		1,079		73		1,464	73.74%	73.74%	73.74%	73.74%		1,152		(1,005)		147		627
2043		12,637		12,637		-	100%		15		48		63		73		1,469	4.31%	4.31%	4.31%	4.31%		136		(987)		(851)		641
2044		12,429		12,429		-	100%		15		48		63		74		1,473	4.27%	4.27%	4.27%	4.27%		137		(969)		(832)		631
2045		12,228		12,228		-	100%		15		48		63		74		1,478	4.24%	4.24%	4.24%	4.24%		137		(952)		(815)		621
2046		12,035		12,035		-	100%		15		47		62		74		1,481	4.21%	4.21%	4.21%	4.21%		136		(934)		(798)		611
2047		11,849		11,849		-	100%		15		47		62		74		1,485	4.18%	4.18%	4.18%	4.18%		136		(916)		(780)		601

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active membership population is assumed to decrease by 2% each future year.

The 63.86% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Current Plan
Exhibit 2-4
(\$ in Millions)

Contribution Provisions: All Employers Pay the Biannual Actuarially Determined Contribution
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi Employer Contribution as % of Covered Payroll	Non-Quasi Employer Contribution as % of Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate	Annual Cash Flow Analysis			
														Member and Employer Contributions	Benefit Payments and Expenses	Net External Cash Flow	Investment Income
														(15)	(16)	(17)	(18)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 167	\$ 6	\$ 1,461	8.41%	12.40%	11.45%	12.40%	\$ 173	\$ (130)	\$ 43	\$ 57
2019	2,611	978	1,633	37%	43	137	180	6	1,449	12.40%	12.40%	12.40%	11.17%	186	(134)	52	64
2020	2,677	1,094	1,583	41%	38	122	160	7	1,444	11.07%	11.07%	11.07%	11.07%	167	(141)	26	70
2021	2,738	1,200	1,538	44%	38	121	159	7	1,440	11.07%	11.07%	11.07%	10.98%	166	(148)	18	76
2022	2,794	1,298	1,496	46%	37	118	155	8	1,435	10.82%	10.82%	10.82%	10.82%	163	(155)	8	81
2023	2,845	1,387	1,458	49%	37	118	155	8	1,432	10.82%	10.82%	10.82%	10.71%	163	(163)	0	87
2024	2,891	1,474	1,417	51%	36	115	151	9	1,429	10.60%	10.60%	10.60%	10.60%	160	(171)	(11)	92
2025	2,930	1,556	1,374	53%	36	115	151	9	1,427	10.60%	10.60%	10.60%	10.50%	160	(178)	(18)	97
2026	2,962	1,634	1,328	55%	35	113	148	10	1,424	10.37%	10.37%	10.37%	10.37%	158	(187)	(29)	101
2027	2,986	1,706	1,280	57%	35	112	147	10	1,421	10.37%	10.37%	10.37%	10.26%	157	(195)	(38)	105
2028	3,002	1,774	1,228	59%	34	110	144	11	1,418	10.13%	10.13%	10.13%	10.13%	155	(203)	(48)	109
2029	3,009	1,835	1,174	61%	34	110	144	11	1,417	10.13%	10.13%	10.13%	10.01%	155	(210)	(55)	113
2030	3,008	1,893	1,115	63%	33	107	140	11	1,416	9.89%	9.89%	9.89%	9.89%	151	(215)	(64)	116
2031	3,001	1,946	1,055	65%	33	107	140	12	1,416	9.89%	9.89%	9.89%	9.77%	152	(219)	(67)	119
2032	2,989	1,998	991	67%	33	104	137	12	1,416	9.65%	9.65%	9.65%	9.65%	149	(221)	(72)	123
2033	2,972	2,048	924	69%	33	104	137	13	1,418	9.65%	9.65%	9.65%	9.55%	150	(224)	(74)	126
2034	2,951	2,099	852	71%	32	102	134	13	1,419	9.46%	9.46%	9.46%	9.46%	147	(225)	(78)	129
2035	2,928	2,151	777	73%	32	103	135	13	1,422	9.46%	9.46%	9.46%	9.38%	148	(224)	(76)	132
2036	2,904	2,207	697	76%	32	100	132	13	1,427	9.28%	9.28%	9.28%	9.28%	145	(222)	(77)	136
2037	2,880	2,266	614	79%	32	101	133	14	1,433	9.28%	9.28%	9.28%	9.19%	147	(219)	(72)	139
2038	2,858	2,333	525	82%	31	100	131	14	1,440	9.08%	9.08%	9.08%	9.08%	145	(216)	(71)	144
2039	2,837	2,406	431	85%	31	100	131	14	1,447	9.08%	9.08%	9.08%	9.00%	145	(212)	(67)	148
2040	2,818	2,487	331	88%	31	98	129	14	1,454	8.87%	8.87%	8.87%	8.87%	143	(208)	(65)	153
2041	2,802	2,576	226	92%	31	99	130	14	1,460	8.87%	8.87%	8.87%	8.80%	144	(205)	(61)	159
2042	2,789	2,674	115	96%	30	96	126	15	1,466	8.60%	8.60%	8.60%	8.60%	141	(201)	(60)	165
2043	2,779	2,779	-	100%	2	5	7	15	1,472	0.50%	0.50%	0.50%	0.50%	22	(197)	(175)	168
2044	2,771	2,771	-	100%	2	5	7	15	1,476	0.50%	0.50%	0.50%	0.50%	22	(195)	(173)	168
2045	2,766	2,766	-	100%	2	5	7	15	1,481	0.48%	0.48%	0.48%	0.48%	22	(193)	(171)	168
2046	2,762	2,762	-	100%	2	5	7	15	1,485	0.47%	0.47%	0.47%	0.47%	22	(193)	(171)	167
2047	2,758	2,758	-	100%	2	5	7	15	1,489	0.46%	0.46%	0.46%	0.46%	22	(193)	(171)	167

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active membership population is assumed to decrease by 2% each future year.

The 11.45% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

HB 2

Section 3.

**Projected Cost of the Retirement and Insurance
Proposed Legislation**

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Proposed Legislation
Exhibit 3-1
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi	Non-Quasi	Total	Employer	Annual Cash Flow Analysis															
										Employer Contribution as % of Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Contribution as % of Covered Payroll	Actuarial Determined Contribution Rate	Member and Employer Contributions	Benefit Payments and Expenses	Net External Cash Flow	Investment Income												
										(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)												
2018	\$	15,675	\$	2,019	\$	13,656	13%	\$	145	\$	795	\$	940	\$	74	\$	1,471	41.06%	71.03%	63.86%	71.03%	\$	1,014	\$	(994)	\$	20	\$	106
2019		16,375		2,106		14,269	13%		167		913		1,080		74		1,477	47.26%	81.22%	73.10%	78.01%		1,154		(1,009)		145		116
2020		16,392		2,355		14,037	14%		169		1,139		1,308		75		1,493	47.37%	100.29%	87.63%	77.95%		1,383		(1,024)		359		135
2021		16,392		2,875		13,517	18%		172		1,154		1,326		76		1,511	47.47%	100.39%	87.73%	76.08%		1,402		(1,038)		364		161
2022		16,376		3,408		12,968	21%		174		1,124		1,298		77		1,531	47.58%	96.49%	84.79%	73.79%		1,375		(1,052)		323		187
2023		16,343		3,918		12,425	24%		177		1,142		1,319		78		1,554	47.69%	96.60%	84.90%	71.62%		1,397		(1,065)		332		214
2024		16,294		4,464		11,830	27%		155		937		1,092		79		1,578	41.06%	78.06%	69.21%	69.21%		1,171		(1,077)		94		237
2025		16,230		4,795		11,435	30%		158		952		1,110		80		1,604	41.06%	78.06%	69.21%	67.95%		1,190		(1,089)		101		254
2026		16,149		5,151		10,998	32%		160		925		1,085		82		1,631	41.06%	74.51%	66.51%	66.51%		1,167		(1,099)		68		272
2027		16,053		5,490		10,563	34%		163		940		1,103		83		1,659	41.06%	74.51%	66.51%	65.19%		1,186		(1,110)		76		290
2028		15,941		5,857		10,084	37%		166		910		1,076		84		1,688	41.06%	70.88%	63.75%	63.75%		1,160		(1,112)		48		309
2029		15,821		6,214		9,607	39%		169		927		1,096		86		1,719	41.06%	70.88%	63.75%	62.44%		1,182		(1,119)		63		328
2030		15,687		6,605		9,082	42%		172		896		1,068		88		1,752	41.06%	67.22%	60.96%	60.96%		1,156		(1,125)		31		348
2031		15,542		6,983		8,559	45%		176		914		1,090		89		1,788	41.06%	67.22%	60.96%	59.63%		1,179		(1,127)		52		368
2032		15,387		7,404		7,983	48%		179		881		1,060		91		1,825	41.06%	63.46%	58.10%	58.10%		1,151		(1,128)		23		389
2033		15,225		7,816		7,409	51%		183		900		1,083		93		1,864	41.06%	63.46%	58.10%	56.76%		1,176		(1,128)		48		412
2034		15,057		8,276		6,781	55%		187		864		1,051		95		1,904	41.06%	59.66%	55.21%	55.21%		1,146		(1,126)		20		435
2035		14,883		8,731		6,152	59%		191		884		1,075		97		1,947	41.06%	59.66%	55.21%	53.87%		1,172		(1,121)		51		460
2036		14,709		9,242		5,467	63%		196		846		1,042		100		1,993	41.06%	55.81%	52.28%	52.28%		1,142		(1,112)		30		486
2037		14,538		9,757		4,781	67%		200		867		1,067		102		2,041	41.06%	55.81%	52.28%	50.91%		1,169		(1,101)		68		514
2038		14,372		10,340		4,032	72%		205		824		1,029		105		2,092	41.06%	51.75%	49.19%	49.19%		1,134		(1,087)		47		544
2039		14,216		10,930		3,286	77%		211		843		1,054		107		2,144	41.06%	51.75%	49.19%	47.79%		1,161		(1,073)		88		576
2040		14,071		11,595		2,476	82%		216		790		1,006		110		2,197	41.06%	47.32%	45.82%	45.82%		1,116		(1,057)		59		610
2041		13,939		12,265		1,674	88%		221		810		1,031		113		2,250	41.06%	47.32%	45.82%	44.32%		1,144		(1,041)		103		647
2042		13,821		13,014		807	94%		225		715		940		115		2,305	40.79%	40.79%	40.79%	40.79%		1,055		(1,026)		29		684
2043		13,716		13,716		-	100%		24		77		101		118		2,360	4.26%	4.26%	4.26%	4.26%		219		(1,010)		(791)		700
2044		13,627		13,627		-	100%		24		78		102		121		2,416	4.23%	4.23%	4.23%	4.23%		223		(995)		(772)		696
2045		13,554		13,554		-	100%		25		79		104		124		2,472	4.21%	4.21%	4.21%	4.21%		228		(980)		(752)		692
2046		13,496		13,496		-	100%		25		81		106		126		2,530	4.19%	4.19%	4.19%	4.19%		232		(966)		(734)		689
2047		13,456		13,456		-	100%		26		82		108		129		2,589	4.17%	4.17%	4.17%	4.17%		237		(952)		(715)		688

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The 63.86% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Proposed Legislation
Exhibit 3-2
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #1: Active Headcount Remains Constant (resulting in 2% payroll growth, which is more favorable than valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi Employer Contribution as % of Covered Payroll	Non-Quasi Employer Contribution as % of Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate	Annual Cash Flow Analysis			
														Member and Employer Contributions	Benefit Payments and Expenses	Net External Cash Flow	Investment Income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 167	\$ 6	\$ 1,461	8.41%	12.40%	11.45%	12.40%	\$ 173	\$ (130)	\$ 43	\$ 57
2019	2,611	978	1,633	37%	8	24	32	6	1,469	2.21%	2.21%	2.21%	11.17%	38	(134)	(96)	59
2020	2,677	942	1,735	35%	7	24	31	7	1,488	2.10%	2.10%	2.10%	11.78%	38	(141)	(103)	57
2021	2,739	907	1,832	33%	7	23	30	8	1,508	2.00%	2.00%	2.00%	12.34%	38	(148)	(110)	53
2022	2,796	853	1,943	31%	7	22	29	9	1,529	1.89%	1.89%	1.89%	12.89%	38	(155)	(117)	50
2023	2,849	786	2,063	28%	7	21	28	9	1,553	1.78%	1.78%	1.78%	13.53%	37	(163)	(126)	45
2024	2,897	705	2,192	24%	32	193	225	10	1,578	8.41%	16.13%	14.28%	14.28%	235	(171)	64	46
2025	2,938	816	2,122	28%	32	197	229	11	1,605	8.41%	16.13%	14.28%	13.89%	240	(179)	61	53
2026	2,973	931	2,042	31%	33	187	220	12	1,632	8.41%	15.07%	13.48%	13.48%	232	(187)	45	60
2027	3,002	1,035	1,967	34%	33	191	224	13	1,661	8.41%	15.07%	13.48%	13.11%	237	(195)	42	66
2028	3,022	1,143	1,879	38%	34	181	215	13	1,691	8.41%	14.09%	12.73%	12.73%	228	(203)	25	72
2029	3,035	1,240	1,795	41%	35	184	219	14	1,723	8.41%	14.09%	12.73%	12.37%	233	(210)	23	78
2030	3,040	1,342	1,698	44%	35	175	210	15	1,756	8.41%	13.09%	11.97%	11.97%	225	(215)	10	84
2031	3,040	1,436	1,604	47%	36	179	215	16	1,792	8.41%	13.09%	11.97%	11.63%	231	(219)	12	90
2032	3,035	1,537	1,498	51%	37	169	206	16	1,829	8.41%	12.17%	11.27%	11.27%	222	(222)	-	96
2033	3,028	1,633	1,395	54%	38	173	211	17	1,868	8.41%	12.17%	11.27%	10.93%	228	(224)	4	102
2034	3,017	1,739	1,278	58%	38	164	202	18	1,909	8.41%	11.25%	10.57%	10.57%	220	(225)	(5)	109
2035	3,005	1,842	1,163	61%	39	167	206	18	1,952	8.41%	11.25%	10.57%	10.27%	224	(224)	-	115
2036	2,993	1,958	1,035	65%	40	158	198	19	1,998	8.41%	10.39%	9.92%	9.92%	217	(222)	(5)	122
2037	2,983	2,075	908	70%	41	162	203	20	2,046	8.41%	10.39%	9.92%	9.63%	223	(220)	3	130
2038	2,976	2,208	768	74%	42	152	194	20	2,097	8.41%	9.51%	9.25%	9.25%	214	(217)	(3)	138
2039	2,971	2,344	627	79%	43	156	199	21	2,149	8.41%	9.51%	9.25%	8.96%	220	(213)	7	147
2040	2,970	2,498	472	84%	44	144	188	22	2,202	8.41%	8.57%	8.53%	8.53%	210	(210)	-	156
2041	2,974	2,654	320	89%	45	147	192	22	2,256	8.41%	8.57%	8.53%	8.21%	214	(206)	8	166
2042	2,981	2,828	153	95%	41	131	172	23	2,310	7.45%	7.45%	7.45%	7.45%	195	(202)	(7)	177
2043	2,994	2,994	-	100%	3	8	11	24	2,366	0.48%	0.48%	0.48%	0.48%	35	(199)	(164)	182
2044	3,011	3,011	-	100%	3	8	11	24	2,421	0.46%	0.46%	0.46%	0.46%	35	(197)	(162)	183
2045	3,033	3,033	-	100%	3	8	11	25	2,478	0.45%	0.45%	0.45%	0.45%	36	(196)	(160)	185
2046	3,057	3,057	-	100%	3	8	11	25	2,536	0.44%	0.44%	0.44%	0.44%	36	(196)	(160)	186
2047	3,083	3,083	-	100%	3	8	11	26	2,595	0.43%	0.43%	0.43%	0.43%	37	(197)	(160)	188

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire.

The 11.45% employer contribution rate for FY 2018 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Actuarial Analysis of HB 2: Proposed Legislation
Exhibit 3-3
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (5.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 5.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi Employer Contribution as % of Covered Payroll	Non-Quasi Employer Contribution as % of Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate	Annual Cash Flow Analysis			
														Member and Employer Contributions	Benefit Payments and Expenses	Net External Cash Flow	Investment Income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2018	\$ 15,675	\$ 2,019	\$ 13,656	13%	\$ 145	\$ 795	\$ 940	\$ 74	\$ 1,471	41.06%	71.03%	63.86%	71.03%	\$ 1,014	\$ (994)	\$ 20	\$ 106
2019	16,374	2,106	14,268	13%	166	899	1,065	73	1,456	47.26%	81.22%	73.10%	78.01%	1,138	(1,009)	129	115
2020	16,389	2,339	14,050	14%	167	1,122	1,289	72	1,450	47.37%	101.97%	88.91%	79.06%	1,361	(1,023)	338	133
2021	16,385	2,837	13,548	17%	167	1,118	1,285	72	1,443	47.47%	102.07%	89.01%	78.41%	1,357	(1,037)	320	158
2022	16,363	3,323	13,040	20%	168	1,112	1,280	72	1,438	47.58%	102.09%	89.05%	77.46%	1,352	(1,050)	302	182
2023	16,322	3,807	12,515	23%	168	1,110	1,278	72	1,433	47.69%	102.20%	89.16%	76.51%	1,350	(1,063)	287	207
2024	16,261	4,302	11,959	26%	145	933	1,078	71	1,430	41.06%	86.22%	75.42%	75.42%	1,149	(1,074)	75	228
2025	16,183	4,605	11,578	28%	145	931	1,076	71	1,426	41.06%	86.22%	75.42%	75.43%	1,147	(1,085)	62	243
2026	16,085	4,910	11,175	31%	145	928	1,073	71	1,423	41.06%	86.17%	75.38%	75.38%	1,144	(1,096)	48	259
2027	15,968	5,217	10,751	33%	145	925	1,070	71	1,419	41.06%	86.17%	75.38%	75.32%	1,141	(1,106)	35	275
2028	15,832	5,527	10,305	35%	145	921	1,066	71	1,416	41.06%	86.04%	75.28%	75.28%	1,137	(1,107)	30	291
2029	15,685	5,848	9,837	37%	146	919	1,065	71	1,414	41.06%	86.04%	75.28%	75.24%	1,136	(1,114)	22	308
2030	15,519	6,177	9,342	40%	146	916	1,062	71	1,413	41.06%	85.89%	75.17%	75.17%	1,133	(1,119)	14	325
2031	15,337	6,515	8,822	42%	146	916	1,062	71	1,413	41.06%	85.89%	75.17%	75.06%	1,133	(1,121)	12	342
2032	15,142	6,869	8,273	45%	146	912	1,058	71	1,413	41.06%	85.49%	74.86%	74.86%	1,129	(1,121)	8	361
2033	14,934	7,238	7,696	48%	145	914	1,059	71	1,414	41.06%	85.49%	74.86%	74.68%	1,130	(1,120)	10	380
2034	14,715	7,628	7,087	52%	145	909	1,054	71	1,416	41.06%	84.93%	74.44%	74.44%	1,125	(1,117)	8	401
2035	14,485	8,036	6,449	55%	145	911	1,056	71	1,418	41.06%	84.93%	74.44%	74.23%	1,127	(1,111)	16	422
2036	14,249	8,475	5,774	59%	145	907	1,052	71	1,423	41.06%	84.24%	73.91%	73.91%	1,123	(1,101)	22	446
2037	14,010	8,942	5,068	64%	145	911	1,056	71	1,429	41.06%	84.24%	73.91%	73.55%	1,127	(1,088)	39	471
2038	13,770	9,453	4,317	69%	145	904	1,049	72	1,436	41.06%	83.06%	73.01%	73.01%	1,121	(1,073)	48	498
2039	13,533	9,997	3,536	74%	145	909	1,054	72	1,444	41.06%	83.06%	73.01%	72.53%	1,126	(1,057)	69	527
2040	13,301	10,593	2,708	80%	145	897	1,042	73	1,451	41.06%	81.52%	71.84%	71.84%	1,115	(1,040)	75	558
2041	13,073	11,226	1,847	86%	145	902	1,047	73	1,458	41.06%	81.52%	71.84%	71.31%	1,120	(1,022)	98	592
2042	12,852	11,916	936	93%	144	882	1,026	73	1,464	41.06%	79.20%	70.08%	70.08%	1,099	(1,005)	94	628
2043	12,637	12,637	-	100%	15	48	63	73	1,469	4.31%	4.31%	4.31%	4.31%	136	(987)	(851)	641
2044	12,429	12,429	-	100%	15	48	63	74	1,473	4.27%	4.27%	4.27%	4.27%	137	(969)	(832)	631
2045	12,228	12,228	-	100%	15	48	63	74	1,478	4.24%	4.24%	4.24%	4.24%	137	(952)	(815)	621
2046	12,035	12,035	-	100%	15	47	62	74	1,481	4.21%	4.21%	4.21%	4.21%	136	(934)	(798)	611
2047	11,849	11,849	-	100%	15	47	62	74	1,485	4.18%	4.18%	4.18%	4.18%	136	(916)	(780)	601

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active membership population is assumed to decrease by 2% each future year.

The 63.86% employer contribution rate for FY 2019 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Actuarial Analysis of HB 2: Proposed Legislation
Exhibit 3-4
(\$ in Millions)

Proposed Contribution Provisions: Quasi Employers Pay 49.47% & Non-Quasi Employers Pay the Remaining ADEC
Valuation Assumptions: Recently Adopted Experience Study Assumptions (6.25% discount rate and 0% amortization payroll growth)

Projected Experience Scenario #2: Active Headcount Decreases by 2% Each Year (resulting in 0% payroll growth, which aligns with valuation assumptions)
& Assets Earn 6.25% Annually (which aligns with valuation assumptions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Quasi Employer Contribution	Non-Quasi Employer Contribution	Total Employer Contribution	Member Contribution	Covered Payroll	Quasi Employer Contribution as % of Covered Payroll	Non-Quasi Employer Contribution as % of Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate	Annual Cash Flow Analysis			
														Member and Employer Contributions	Benefit Payments and Expenses	Net External Cash Flow	Investment Income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 167	\$ 6	\$ 1,461	8.41%	12.40%	11.45%	12.40%	\$ 173	\$ (130)	\$ 43	\$ 57
2019	2,611	978	1,633	37%	8	24	32	6	1,449	2.21%	2.21%	2.21%	11.17%	38	(134)	(96)	59
2020	2,677	941	1,736	35%	7	23	30	7	1,444	2.10%	2.10%	2.10%	11.95%	37	(141)	(104)	56
2021	2,738	905	1,833	33%	7	22	29	7	1,440	2.00%	2.00%	2.00%	12.69%	36	(148)	(112)	53
2022	2,794	849	1,945	30%	6	21	27	8	1,435	1.89%	1.89%	1.89%	13.48%	35	(155)	(120)	49
2023	2,845	778	2,067	27%	6	19	25	8	1,432	1.78%	1.78%	1.78%	14.40%	33	(163)	(130)	45
2024	2,891	694	2,197	24%	29	192	221	9	1,429	8.41%	17.69%	15.47%	15.47%	230	(171)	59	45
2025	2,930	798	2,132	27%	29	192	221	9	1,427	8.41%	17.69%	15.47%	15.33%	230	(178)	52	52
2026	2,962	901	2,061	30%	29	188	217	10	1,424	8.41%	17.35%	15.21%	15.21%	227	(187)	40	58
2027	2,986	999	1,987	33%	29	187	216	10	1,421	8.41%	17.35%	15.21%	15.11%	226	(195)	31	63
2028	3,002	1,093	1,909	36%	29	184	213	11	1,418	8.41%	17.06%	14.99%	14.99%	224	(203)	21	69
2029	3,009	1,183	1,826	39%	28	184	212	11	1,417	8.41%	17.06%	14.99%	14.89%	223	(210)	13	74
2030	3,008	1,271	1,737	42%	28	181	209	11	1,416	8.41%	16.77%	14.77%	14.77%	220	(215)	5	80
2031	3,001	1,356	1,645	45%	28	181	209	12	1,416	8.41%	16.77%	14.77%	14.66%	221	(219)	2	85
2032	2,989	1,443	1,546	48%	28	178	206	12	1,416	8.41%	16.45%	14.53%	14.53%	218	(221)	(3)	90
2033	2,972	1,529	1,443	51%	29	177	206	13	1,418	8.41%	16.45%	14.53%	14.44%	219	(224)	(5)	95
2034	2,951	1,619	1,332	55%	29	175	204	13	1,419	8.41%	16.20%	14.34%	14.34%	217	(225)	(8)	101
2035	2,928	1,712	1,216	58%	29	175	204	13	1,422	8.41%	16.20%	14.34%	14.25%	217	(224)	(7)	107
2036	2,904	1,812	1,092	62%	29	173	202	13	1,427	8.41%	15.94%	14.14%	14.14%	215	(222)	(7)	113
2037	2,880	1,919	961	67%	29	174	203	14	1,433	8.41%	15.94%	14.14%	14.03%	217	(219)	(2)	120
2038	2,858	2,036	822	71%	29	171	200	14	1,440	8.41%	15.63%	13.90%	13.90%	214	(216)	(2)	127
2039	2,837	2,161	676	76%	29	172	201	14	1,447	8.41%	15.63%	13.90%	13.79%	215	(212)	3	135
2040	2,818	2,300	518	82%	29	169	198	14	1,454	8.41%	15.24%	13.61%	13.61%	212	(208)	4	144
2041	2,802	2,447	355	87%	29	170	199	14	1,460	8.41%	15.24%	13.61%	13.49%	213	(205)	8	153
2042	2,789	2,609	180	94%	30	163	193	15	1,466	8.41%	14.69%	13.19%	13.19%	208	(201)	7	163
2043	2,779	2,779	-	100%	2	5	7	15	1,472	0.50%	0.50%	0.50%	0.50%	22	(197)	(175)	168
2044	2,771	2,771	-	100%	2	5	7	15	1,476	0.50%	0.50%	0.50%	0.50%	22	(195)	(173)	168
2045	2,766	2,766	-	100%	2	5	7	15	1,481	0.48%	0.48%	0.48%	0.48%	22	(193)	(171)	168
2046	2,762	2,762	-	100%	2	5	7	15	1,485	0.47%	0.47%	0.47%	0.47%	22	(193)	(171)	167
2047	2,758	2,758	-	100%	2	5	7	15	1,489	0.46%	0.46%	0.46%	0.46%	22	(193)	(171)	167

Notes and assumptions:

The projection is based on the results of the June 30, 2018 actuarial valuation and the actuarial assumptions documented in the 2018 Experience Study Report adopted by the Board on April 18, 2019.

The projection assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired to replace the current active members as they are assumed to terminate employment or retire, but the total active membership population is assumed to decrease by 2% each future year.

The 11.45% employer contribution rate for FY 2018 is the effective contribution rate after reflecting HB 265 which provided that Regional Mental Health/Mental Retardation

Boards, Local and District Health Departments, State Universities, and Community Colleges to contribute a 49.47% of pay contribution rate for FY 2019. Collectively these entities reflect approximately 25% of the covered payroll in the System.