

March 4, 2019

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

**Re: Actuarial Analysis of Proposed Pension Reform Legislation SB 10 (cessation window for quasi-governmental agencies) and its Financial Impact on the Kentucky Employees Retirement System Systems
AA Statement 1 of 1**

Dear Mr. Eager:

The purpose of this letter is to provide an actuarial analysis of proposed legislation SB 10 (original version) as it applies to the Kentucky Employees Retirement Systems (non-hazardous and hazardous). **Note this proposed legislation includes a provision that requires a decrease in the employer installments if general appropriations to the regional medical health services and health districts decreased in a future year. We are unable to determine a fiscal cost to this provision, but believe this has material financial risk to KERS given the long-term installment period that would result from this cessation window.**

Summary of Proposed Legislation

This proposed legislation will provide a window for approximately 118 quasi-governmental agencies (e.g. health districts, regional mental health services, Non P1 agencies, and universities) that are currently participating employers in KERS to voluntarily elect to cease participation in KERS using different provisions than those currently in effect in State Statute (KRS 61.522 as amended by HB 351). Collectively, these employers represent approximately 25% of the covered payroll and 20% of the actuarial accrued liability in the KERS Non-Hazardous System.

The effective cessation date will be June 30, 2020 and the eligible entity must make their election by January 1, 2020 to withdraw under the cessation window.

- 1) Employees will contribute to the system and continue to earn service and benefits up to June 30, 2020. Beginning July 1, 2020 all employees of these electing employers will earn future retirement benefits in a defined contribution plan maintained by the employer. Employees are not provided an option to continue earning benefits in KERS.

Employers who do not elect to cease participation will continue to contribute the actuarially determined contribution rate and their current and future employees will continue earning benefits in KERS.

- 2) The cessation liability in the actuarial cost calculation will be determined using an interest rate equal to the greater of 3.50% and the yield on 30-year Treasuries as of June 30, 2020.
- 3) The required dollar contribution for fiscal year 2019/2020 for employers electing to withdraw will be equal to the dollar amount the employer actually contributed in fiscal year 2018/2019.
- 4) Employers electing to withdraw will then begin contributing in fiscal year 2020/2021 the same amount contributed in fiscal year 2019/2020. This contribution each subsequent year will increase at the rate of 1.50% per year until the outstanding balance has been fully paid. The employer has discretion to contribute more than the required amount.

If the ceasing employer is receiving a general fund appropriation to assist paying retirement contributions and that appropriation is reduced on or after July 1, 2020, from the amount currently appropriated, then the required employer cessation payment will be reduced on a dollar for dollar basis.

- 5) The proposed legislation specifies the System will only collect interest on the outstanding balance of unpaid cessation cost equal to annual increase in CPI-U for the prior year (subject to a minimum interest rate of 1.50% per year).
- 6) The Board is unable to deny an employer's election to cease participation under this cessation window.

Summary of Cost Impact

The following summarizes the fiscal impact of the key provisions in the proposed legislation:

- 1) The use of a minimum 3.50% discount rate for cessation liability on the yield on 30-year Treasuries will result in decrease the present value of the contributions from the quasi employers by \$262 million dollars (\$259 million for the non-hazardous system and \$3 million for the hazardous system). If these lower contributions are not immediately appropriated by the Commonwealth, then the actuarially determined contribution rate for the remaining participating employers in KERS will increase by approximately 1.9% of pay for the Non-Hazardous System (pension and insurance) and by approximately 0.1% of pay for the Hazardous System (pension and insurance) in fiscal year 2022/2023 (and for the remaining 21 years of the funding period).

Note, this 3.50% minimum currently creates a cost to the system because current yields on 30-year Treasuries are approximately 0.5% lower than 3.50%. The actual fiscal cost can be less (or more) than the amount shown depending on the actual yield on 30-year Treasury securities at June 30, 2020.

- 2) The combination of relatively low annual installments and the specified interest rate has the most significant cost to the system. We have determined the fiscal impact of these two provisions together as they are inter-dependent (e.g. increasing the installments will decrease the fiscal impact of using a low loan rate). Compared to paying the actuarial cost, determined at a 3.50% discount rate, as a lump-sum the specified dollar amount of the installments and loan interest rate will result a \$922 million decrease in present value of employer contributions from these agencies. As a result of this provision, the actuarially determined contribution rate for the remaining participating employers will increase by approximately 6.4% of pay for the Non-Hazardous System (pension and insurance) and by approximately 0.2% of pay for the Hazardous System (pension and insurance) in fiscal year 2022/2023 (and for the remaining 21 years of the funding period).
- 3) Employers electing to withdraw from the Non-Hazardous system may pay less than the actuarially required contribution in fiscal year 2019/2020 (an amount equal to their currently subsidized contribution for fiscal year 2018/2019). This provision has a fiscal impact of \$121 million and would increase the actuarially determined contribution for the remaining employers in fiscal year 2020/2021 (and for the remaining 23 years of the funding period) by approximately 0.7% of pay for the Non-Hazardous System (pension and insurance).
- 4) There is a provision requiring a dollar-for-dollar reduction in the employer's required installment if the general fund appropriation to assist with the employer retirement contributions ever decreases below the amount appropriated in fiscal year 2019/2020, which is \$23 million for the regional mental health services and \$25 million for the health districts. If the State decreased these appropriations in any future year, there would be a direct decrease in the installments from these employers, which would significantly increase the time-period required for these employers to finance their liability, resulting in increased actuarial cost to the remaining employers in KERS. However, due to the uncertainty in future State budgeting we are unable to quantify the financial impact of this risk.
- 5) The KRS Board will not be permitted to deny an employer electing to cease participation under this window. We believe this introduces additional financial risk as there may be some employers that will elect to cease participation and become financially stressed resulting in a partial or complete default on their installments before being fully paid. This is another risk we are unable to quantify as this assessment would require a detailed financial review of each employer's financial statements.

GRS Comments on Proposed Legislation

Determination of the Actuarial Cost for an Employer Withdrawing from KERS

The current cessation provisions in State Statute provide a financially fair basis for the System and participating employer in determining an actuarial cost for withdrawing employers to exit KERS and are not expected to result in increased fiscal cost or financial risk to the remaining participating employers (and members) in the System.

The use of an interest rate that is 0.50% higher than the current yield on 30-year Treasuries has a much smaller fiscal impact to KRS compared to the use of an alternative basis, such as the valuation interest rate. However, this legislation could start a precedent for other participating employers to lobby for the enactment of similar type legislation on a temporary or permanent basis for them. Enactment of any such similar type legislation will result in continual increased cost and risk for the remaining participating employers in the System.

Determining the Installment Payment Amount and Specified Interest Rate on Outstanding Balance

Currently, a withdrawing employer in KRS must pay their cessation liability as a one-time lump-sum payment. Installment payments are not currently permitted. This legislation would require KRS to be a creditor to these employers without control of the terms and conditions of the financial arrangement. This will expose KRS to increased financial risk if these entities were to become financially troubled and did not completely finance their actuarial cost.

This proposed legislation specifies the dollar contribution for a withdrawing employer for fiscal year 2020/2021 be equal to the dollar amount of their actual contribution for fiscal year 2018/2019. The minimum required contribution each subsequent year is equal to the prior year's contribution increased by 1.50% until their actual cost has been fully financed. Under this payment schedule on a collective basis, approximately 35% of the original actuarial cost will be financed in 10 years (i.e. 65% of original balance remaining) and approximately 75% of the actuarial cost will be financed in 20 years (i.e. 25% of the original balance remaining). When reviewing this on an employer basis, only 57 of the 118 quasi employers will have fully financed their actuarial cost within the same 20-year period under this installment provision.

Also, there were four employers with a total cessation liability of \$189 million (based on a 3.50% discount rate) that did not make any contributions during the 2018/2019 fiscal year. There would be no employer contribution requirements under this cessation provision for these employers if they elected to withdrawal from the System.

The stipulation of a low rate of interest rate loan used in combination of low installment payments results in a significant cost to the system. The fiscal cost would decrease if the interest rate on the loan was increased to the valuation interest rate, but without a corresponding increase in the annual installment payments only 15% of the original balance of the actuarial cost would have been paid in 20 years (i.e. 85% of the original actuarial cost is still remaining) and only 42 of the 118 employers would have fully financed their actuarial cost within the same 20-year period.

Also, given the KERS Non-Hazardous System has \$2 billion in plan assets and distributes approximately \$1 billion in benefit payments each future year, a proposed change that would delay contributions to the system (versus the current provisions) results in increased financial risk to the System. As such we believe the legislation would significantly improve the sustainability of the System if the provisions required the electing employers to pay their actuarial cost as a lump-sum payment and there were separate arrangements made that provided these employers the financial assistance from a source other than the Retirement System (which may include the State) to make that lump-sum payment.

Board Required Acceptance of Agency Election

Currently the Board may currently reject an employer's request to withdrawal from KRS the Board believes such request will financially harm the System. Requiring KRS to become a creditor, without control of the financial terms introduces financial risk to KRS as some of these employers may become financially stressed resulting in a default on their installments before being fully paid.

Basis of Calculations

GRS based the calculations and analysis in this letter on the member and financial data provided by KRS 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 actuarial valuation report. 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.

This fiscal analysis assumes that all the eligible employers will elect to cease participation in KERS under this window, as this results in the largest measurable fiscal impact. However, if enacted, the actual fiscal impact could be significantly greater as our analysis ignores the likelihood that future general fund appropriations to these entities will decrease and the default risk on the employers eligible to withdrawal.

The enclosed exhibits assume these employers will cease participation at June 30, 2020 under both the baseline and proposed fiscal analysis. The baseline analysis assumes the employers withdraw under the current cessation provisions and the proposed analysis assumes the employers withdraw under the proposed provisions of SB 10.

For the purposes of determining the full actuarial cost of withdrawing employers, we have assumed a discount rate equal to 3.50% under the proposed legislation and 3.00% under the current provisions. For purposes of determining the fiscal impact of the loan rate indexed to inflation, the analysis assumed that the applicable inflation rate would be equal to 2.30% per year, which is equal to the price inflation assumption used in the actuarial valuation.

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 the 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, all 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

Section 1.
Comparison of Fiscal Impact
Current Plan vs. Proposed Changes

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Exhibit 1-1
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 13,656	\$ 13,656	\$ -	13%	13%	0%	\$ 145	\$ 145	\$ -	\$ 795	\$ 795	\$ -	63.9%	63.9%	0.0%
2019	13,571	13,571	-	13%	13%	0%	253	146	(107)	805	805	-	71.0%	63.9%	-7.1%
2020	13,067	13,177	110	15%	14%	-1%	2,975	144	(2,831)	850	857	7	73.7%	74.3%	0.6%
2021	9,888	12,902	3,014	35%	16%	-19%	-	146	146	865	872	7	73.7%	74.3%	0.6%
2022	9,596	12,611	3,015	37%	17%	-20%	-	148	148	842	928	86	70.5%	77.7%	7.2%
2023	9,318	12,251	2,933	38%	18%	-20%	-	150	150	857	945	88	70.5%	77.7%	7.2%
2024	9,009	11,852	2,843	39%	20%	-19%	-	152	152	833	918	85	67.3%	74.2%	6.9%
2025	8,706	11,455	2,749	41%	22%	-19%	-	153	153	849	936	87	67.3%	74.2%	6.9%
2026	8,369	11,017	2,648	42%	24%	-18%	-	154	154	825	910	85	64.2%	70.8%	6.6%
2027	8,037	10,579	2,542	44%	26%	-18%	-	156	156	840	927	87	64.2%	70.8%	6.6%
2028	7,669	10,095	2,426	46%	28%	-18%	-	158	158	816	900	84	61.1%	67.5%	6.4%
2029	7,305	9,610	2,305	47%	31%	-16%	-	159	159	832	918	86	61.1%	67.5%	6.4%
2030	6,905	9,079	2,174	49%	33%	-16%	-	160	160	807	891	84	58.2%	64.2%	6.0%
2031	6,506	8,544	2,038	51%	36%	-15%	-	162	162	824	910	86	58.2%	64.2%	6.0%
2032	6,069	7,959	1,890	54%	39%	-15%	-	162	162	799	882	83	55.2%	61.0%	5.8%
2033	5,632	7,370	1,738	56%	43%	-13%	-	145	145	816	901	85	55.2%	61.0%	5.8%
2034	5,154	6,747	1,593	59%	47%	-12%	-	130	130	789	872	83	52.3%	57.8%	5.5%
2035	4,677	6,136	1,459	62%	50%	-12%	-	126	126	806	891	85	52.3%	57.8%	5.5%
2036	4,157	5,476	1,319	66%	55%	-11%	-	125	125	780	862	82	49.5%	54.7%	5.2%
2037	3,636	4,812	1,176	69%	59%	-10%	-	118	118	799	883	84	49.5%	54.7%	5.2%
2038	3,067	4,098	1,031	74%	65%	-9%	-	117	117	769	849	80	46.4%	51.3%	4.9%
2039	2,501	3,383	882	78%	70%	-8%	-	101	101	788	871	83	46.4%	51.3%	4.9%
2040	1,885	2,625	740	83%	76%	-7%	-	86	86	751	829	78	43.2%	47.6%	4.4%
2041	1,277	1,886	609	88%	83%	-5%	-	66	66	769	849	80	43.2%	47.6%	4.4%
2042	618	1,109	491	94%	90%	-4%	-	65	65	701	772	71	38.4%	42.3%	3.9%
2043	-	370	370	100%	96%	-4%	-	61	61	59	59	-	3.2%	3.2%	0.0%
2044	-	331	331	100%	97%	-3%	-	48	48	59	59	-	3.1%	3.1%	0.0%
2045	-	302	302	100%	97%	-3%	-	45	45	60	60	-	3.1%	3.1%	0.0%
2046	-	276	276	100%	97%	-3%	-	38	38	61	61	-	3.0%	3.0%	0.0%
2047	-	255	255	100%	97%	-3%	-	36	36	62	62	-	3.0%	3.0%	0.0%

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Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Exhibit 1-2
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 1,549	\$ 1,549	\$ -	36%	36%	0%	\$ 29	\$ 29	\$ -	\$ 138	\$ 138	\$ -	11.5%	11.5%	0.0%
2019	1,519	1,519	-	39%	39%	0%	44	30	(14)	139	139	-	12.4%	11.5%	-0.9%
2020	1,433	1,448	15	43%	43%	0%	564	30	(534)	118	119	1	10.3%	10.4%	0.1%
2021	834	1,400	566	68%	46%	-22%	-	30	30	120	121	1	10.3%	10.4%	0.1%
2022	786	1,355	569	70%	48%	-22%	-	30	30	92	113	21	7.7%	9.5%	1.8%
2023	764	1,316	552	71%	50%	-21%	-	31	31	93	115	22	7.7%	9.5%	1.8%
2024	739	1,271	532	72%	52%	-20%	-	31	31	89	110	21	7.2%	8.9%	1.7%
2025	715	1,227	512	73%	54%	-19%	-	31	31	90	112	22	7.2%	8.9%	1.7%
2026	687	1,177	490	74%	56%	-18%	-	31	31	86	107	21	6.7%	8.3%	1.6%
2027	661	1,127	466	75%	58%	-17%	-	32	32	87	109	22	6.7%	8.3%	1.6%
2028	630	1,071	441	77%	60%	-17%	-	32	32	82	103	21	6.2%	7.8%	1.6%
2029	602	1,016	414	78%	62%	-16%	-	31	31	84	105	21	6.2%	7.8%	1.6%
2030	569	955	386	79%	64%	-15%	-	30	30	79	99	20	5.7%	7.2%	1.5%
2031	537	896	359	80%	66%	-14%	-	29	29	81	102	21	5.7%	7.2%	1.5%
2032	501	831	330	81%	68%	-13%	-	28	28	76	96	20	5.3%	6.7%	1.4%
2033	467	768	301	82%	71%	-11%	-	26	26	78	99	21	5.3%	6.7%	1.4%
2034	428	699	271	83%	73%	-10%	-	23	23	74	94	20	4.9%	6.3%	1.4%
2035	389	632	243	85%	75%	-10%	-	21	21	76	96	20	4.9%	6.3%	1.4%
2036	347	562	215	86%	78%	-8%	-	16	16	72	92	20	4.6%	5.9%	1.3%
2037	305	496	191	88%	80%	-8%	-	16	16	74	94	20	4.6%	5.9%	1.3%
2038	259	424	165	90%	83%	-7%	-	15	15	71	90	19	4.3%	5.5%	1.2%
2039	212	352	140	91%	86%	-5%	-	14	14	73	93	20	4.3%	5.5%	1.2%
2040	161	275	114	93%	89%	-4%	-	12	12	69	88	19	4.0%	5.1%	1.1%
2041	110	198	88	95%	92%	-3%	-	10	10	71	90	19	4.0%	5.1%	1.1%
2042	54	118	64	98%	95%	-3%	-	9	9	65	83	18	3.6%	4.6%	1.0%
2043	-	41	41	100%	98%	-2%	-	7	7	9	9	-	0.5%	0.5%	0.0%
2044	-	38	38	100%	98%	-2%	-	5	5	9	9	-	0.5%	0.5%	0.0%
2045	-	36	36	100%	99%	-1%	-	4	4	9	9	-	0.5%	0.5%	0.0%
2046	-	35	35	100%	99%	-1%	-	3	3	9	9	-	0.5%	0.5%	0.0%
2047	-	34	34	100%	99%	-1%	-	3	3	9	9	-	0.5%	0.5%	0.0%

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Kentucky Retirement Systems
KERS Hazardous Retirement Fund
Exhibit 1-3
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
2018	\$ 513	\$ 513	\$ -	55%	55%	0%	\$ 1	\$ 1	\$ -	\$ 53	\$ 53	\$ -	34.4%	34.4%	0.0%
2019	510	510	-	57%	57%	0%	1	1	-	55	55	-	34.4%	34.4%	0.0%
2020	496	496	-	59%	59%	0%	16	1	(15)	55	55	-	33.5%	33.5%	0.0%
2021	460	474	14	63%	62%	-1%	-	1	1	56	56	-	33.5%	33.5%	0.0%
2022	442	457	15	65%	64%	-1%	-	1	1	52	52	-	30.3%	30.6%	0.3%
2023	431	445	14	66%	65%	-1%	-	1	1	53	54	1	30.3%	30.6%	0.3%
2024	417	430	13	68%	67%	-1%	-	1	1	51	52	1	28.2%	28.4%	0.2%
2025	405	416	11	70%	69%	-1%	-	1	1	52	53	1	28.2%	28.4%	0.2%
2026	390	400	10	71%	71%	0%	-	1	1	50	51	1	26.4%	26.6%	0.2%
2027	376	386	10	73%	72%	-1%	-	-	-	51	52	1	26.4%	26.6%	0.2%
2028	360	369	9	74%	74%	0%	-	-	-	49	49	-	24.7%	24.9%	0.2%
2029	344	353	9	76%	75%	-1%	-	-	-	50	51	1	24.7%	24.9%	0.2%
2030	327	335	8	77%	77%	0%	-	1	1	48	49	1	23.1%	23.4%	0.3%
2031	309	317	8	79%	78%	-1%	-	1	1	50	50	-	23.1%	23.4%	0.3%
2032	290	298	8	80%	80%	0%	-	1	1	48	49	1	21.8%	22.0%	0.2%
2033	271	278	7	82%	82%	0%	-	-	-	50	50	-	21.8%	22.0%	0.2%
2034	250	257	7	84%	83%	-1%	-	-	-	48	49	1	20.5%	20.8%	0.3%
2035	228	235	7	85%	85%	0%	-	-	-	50	50	-	20.5%	20.8%	0.3%
2036	204	210	6	87%	87%	0%	-	-	-	48	49	1	19.4%	19.6%	0.2%
2037	181	186	5	89%	88%	-1%	-	-	-	49	50	1	19.4%	19.6%	0.2%
2038	154	158	4	91%	90%	-1%	-	-	-	48	48	-	18.3%	18.5%	0.2%
2039	128	132	4	92%	92%	0%	-	-	-	49	49	-	18.3%	18.5%	0.2%
2040	98	102	4	94%	94%	0%	-	-	-	47	48	1	17.4%	17.6%	0.2%
2041	68	72	4	96%	96%	0%	-	-	-	48	49	1	17.4%	17.6%	0.2%
2042	36	39	3	98%	98%	0%	-	-	-	48	48	-	17.0%	17.1%	0.1%
2043	-	-	-	100%	100%	0%	-	-	-	12	12	-	4.1%	4.1%	0.0%
2044	-	-	-	100%	100%	0%	-	-	-	12	12	-	4.1%	4.1%	0.0%
2045	-	-	-	100%	100%	0%	-	-	-	12	12	-	4.1%	4.1%	0.0%
2046	-	-	-	100%	100%	0%	-	-	-	12	12	-	4.1%	4.1%	0.0%
2047	-	-	-	100%	100%	0%	-	-	-	13	13	-	4.1%	4.1%	0.0%

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
KERS Hazardous Insurance Fund
Exhibit 1-4
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Quasi Employer Contribution			Non-Quasi Employer Contribution			Employer Contribution Rate		
	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	\$ (118)	\$ (118)	\$ -	130%	130%	0%	<\$1	<\$1	\$ -	\$ 4	\$ 4	\$ -	2.5%	2.5%	0.0%
2019	(117)	(117)	-	129%	129%	0%	<\$1	<\$1	-	4	4	-	2.5%	2.5%	0.0%
2020	(124)	(124)	-	130%	130%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2021	(132)	(132)	-	131%	131%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2022	(136)	(136)	-	131%	131%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2023	(137)	(137)	-	130%	130%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2024	(139)	(139)	-	130%	130%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2025	(141)	(141)	-	130%	130%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2026	(144)	(144)	-	131%	131%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2027	(147)	(147)	-	131%	131%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2028	(150)	(150)	-	132%	132%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2029	(154)	(154)	-	132%	132%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2030	(157)	(157)	-	133%	133%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2031	(161)	(161)	-	133%	133%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2032	(165)	(165)	-	134%	134%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2033	(169)	(169)	-	134%	134%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2034	(174)	(174)	-	135%	135%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2035	(177)	(177)	-	135%	135%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2036	(182)	(182)	-	136%	136%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2037	(187)	(187)	-	136%	136%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2038	(192)	(192)	-	137%	137%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2039	(198)	(198)	-	137%	137%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2040	(204)	(204)	-	138%	138%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2041	(209)	(209)	-	138%	138%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2042	(216)	(216)	-	138%	138%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2043	(223)	(223)	-	139%	139%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2044	(230)	(230)	-	139%	139%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2045	(237)	(237)	-	140%	140%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2046	(245)	(245)	-	140%	140%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%
2047	(253)	(253)	-	141%	141%	0%	-	-	-	-	-	-	0.0%	0.0%	0.0%

Gabriel Roeder Smith & Company

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

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Exhibit 2-1
Current Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 15,675	\$ 2,019	\$ 13,656	13%	\$ 145	\$ 795	\$ 74	\$ 1,471	63.86%	71.03%
2019	15,677	2,106	13,571	13%	253	805	74	1,490	71.03%	74.54%
2020	15,404	2,337	13,067	15%	2,975	850	58	1,153	73.71%	73.71%
2021	15,287	5,399	9,888	35%	-	865	59	1,174	73.71%	72.36%
2022	15,156	5,560	9,596	37%	-	842	60	1,194	70.50%	70.50%
2023	15,011	5,693	9,318	38%	-	857	61	1,216	70.50%	68.92%
2024	14,853	5,844	9,009	39%	-	833	62	1,238	67.26%	67.26%
2025	14,681	5,975	8,706	41%	-	849	63	1,262	67.26%	65.77%
2026	14,496	6,127	8,369	42%	-	825	64	1,286	64.15%	64.15%
2027	14,298	6,261	8,037	44%	-	840	65	1,310	64.15%	62.69%
2028	14,086	6,417	7,669	46%	-	816	67	1,335	61.13%	61.13%
2029	13,866	6,561	7,305	47%	-	832	68	1,360	61.13%	59.73%
2030	13,635	6,730	6,905	49%	-	807	69	1,388	58.17%	58.17%
2031	13,394	6,888	6,506	51%	-	824	71	1,417	58.17%	56.80%
2032	13,146	7,077	6,069	54%	-	799	72	1,446	55.24%	55.24%
2033	12,891	7,259	5,632	56%	-	816	74	1,477	55.24%	53.88%
2034	12,631	7,477	5,154	59%	-	789	75	1,508	52.32%	52.32%
2035	12,367	7,690	4,677	62%	-	806	77	1,541	52.32%	51.01%
2036	12,101	7,944	4,157	66%	-	780	79	1,577	49.47%	49.47%
2037	11,839	8,203	3,636	69%	-	799	81	1,616	49.47%	48.12%
2038	11,584	8,517	3,067	74%	-	769	83	1,656	46.42%	46.42%
2039	11,339	8,838	2,501	78%	-	788	85	1,697	46.42%	45.07%
2040	11,105	9,220	1,885	83%	-	751	87	1,739	43.15%	43.15%
2041	10,884	9,607	1,277	88%	-	769	89	1,781	43.15%	41.74%
2042	10,676	10,058	618	94%	-	701	91	1,824	38.42%	38.42%
2043	10,481	10,481	-	100%	-	59	93	1,867	3.16%	3.16%
2044	10,301	10,301	-	100%	-	59	96	1,910	3.11%	3.11%
2045	10,134	10,134	-	100%	-	60	98	1,954	3.08%	3.08%
2046	9,982	9,982	-	100%	-	61	100	1,999	3.04%	3.04%
2047	9,845	9,845	-	100%	-	62	102	2,045	3.02%	3.02%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the current cessation provisions.

The Quasi employer contributions shown for FY 20/21 reflect the cessation payments made by these employers.

Except where noted above, the projection is based on the results of the June 30, 2018 actuarial valuation and 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 total active population is assumed to remain flat through the entire projection.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarial determined contribution rate.

The 63.86% 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, Community Colleges and any other agency eligible to voluntarily cease participating in the KERS 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
Exhibit 2-2
Current Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 6	\$ 1,461	11.45%	12.40%
2019	2,497	978	1,519	39%	44	139	7	1,480	12.40%	10.65%
2020	2,530	1,097	1,433	43%	564	118	6	1,145	10.28%	10.28%
2021	2,570	1,736	834	68%	-	120	6	1,165	10.28%	8.26%
2022	2,602	1,816	786	70%	-	92	7	1,186	7.74%	7.74%
2023	2,629	1,865	764	71%	-	93	7	1,208	7.74%	7.49%
2024	2,651	1,912	739	72%	-	89	8	1,230	7.21%	7.21%
2025	2,668	1,953	715	73%	-	90	8	1,253	7.21%	6.97%
2026	2,680	1,993	687	74%	-	86	9	1,277	6.71%	6.71%
2027	2,686	2,025	661	75%	-	87	10	1,301	6.71%	6.47%
2028	2,686	2,056	630	77%	-	82	10	1,326	6.21%	6.21%
2029	2,680	2,078	602	78%	-	84	11	1,352	6.21%	5.97%
2030	2,668	2,099	569	79%	-	79	12	1,379	5.72%	5.72%
2031	2,650	2,113	537	80%	-	81	12	1,408	5.72%	5.51%
2032	2,629	2,128	501	81%	-	76	13	1,437	5.29%	5.29%
2033	2,605	2,138	467	82%	-	78	13	1,468	5.29%	5.12%
2034	2,578	2,150	428	83%	-	74	14	1,500	4.93%	4.93%
2035	2,549	2,160	389	85%	-	76	15	1,532	4.93%	4.77%
2036	2,521	2,174	347	86%	-	72	15	1,568	4.60%	4.60%
2037	2,494	2,189	305	88%	-	74	16	1,607	4.60%	4.46%
2038	2,470	2,211	259	90%	-	71	16	1,647	4.30%	4.30%
2039	2,448	2,236	212	91%	-	73	17	1,688	4.30%	4.17%
2040	2,430	2,269	161	93%	-	69	17	1,730	3.99%	3.99%
2041	2,415	2,305	110	95%	-	71	18	1,772	3.99%	3.88%
2042	2,405	2,351	54	98%	-	65	18	1,814	3.59%	3.59%
2043	2,399	2,399	-	100%	-	9	19	1,857	0.49%	0.49%
2044	2,398	2,398	-	100%	-	9	19	1,900	0.48%	0.48%
2045	2,400	2,400	-	100%	-	9	19	1,944	0.47%	0.47%
2046	2,406	2,406	-	100%	-	9	20	1,989	0.46%	0.46%
2047	2,413	2,413	-	100%	-	9	20	2,035	0.45%	0.45%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the current cessation provisions.

The Quasi employer contributions shown for FY 20/21 reflect the cessation payments made by these employers.

Except where noted above, the projection is based on the results of the June 30, 2018 actuarial valuation and 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 total active population is assumed to remain flat through the entire projection.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarial determined contribution rate.

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, Community Colleges and any other agency eligible to voluntarily cease participating in the KERS 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 Hazardous Retirement Fund
Exhibit 2-3
Current Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 1,152	\$ 639	\$ 513	55%	\$ 1	\$ 53	\$ 13	\$ 158	34.39%	34.39%
2019	1,181	671	510	57%	1	55	13	162	34.39%	34.42%
2020	1,206	710	496	59%	16	55	13	163	33.54%	33.54%
2021	1,233	773	460	63%	-	56	13	167	33.54%	31.96%
2022	1,259	817	442	65%	-	52	14	172	30.27%	30.27%
2023	1,285	854	431	66%	-	53	14	176	30.27%	29.17%
2024	1,310	893	417	68%	-	51	14	181	28.15%	28.15%
2025	1,335	930	405	70%	-	52	15	185	28.15%	27.27%
2026	1,358	968	390	71%	-	50	15	190	26.36%	26.36%
2027	1,380	1,004	376	73%	-	51	16	194	26.36%	25.53%
2028	1,400	1,040	360	74%	-	49	16	199	24.65%	24.65%
2029	1,420	1,076	344	76%	-	50	16	204	24.65%	23.91%
2030	1,440	1,113	327	77%	-	48	17	209	23.13%	23.13%
2031	1,460	1,151	309	79%	-	50	17	216	23.13%	22.48%
2032	1,482	1,192	290	80%	-	48	18	222	21.77%	21.77%
2033	1,505	1,234	271	82%	-	50	18	228	21.77%	21.18%
2034	1,530	1,280	250	84%	-	48	19	235	20.54%	20.54%
2035	1,556	1,328	228	85%	-	50	19	241	20.54%	20.00%
2036	1,583	1,379	204	87%	-	48	20	248	19.41%	19.41%
2037	1,611	1,430	181	89%	-	49	20	254	19.41%	18.92%
2038	1,639	1,485	154	91%	-	48	21	260	18.33%	18.33%
2039	1,668	1,540	128	92%	-	49	21	266	18.33%	17.90%
2040	1,696	1,598	98	94%	-	47	22	272	17.40%	17.40%
2041	1,724	1,656	68	96%	-	48	22	277	17.40%	17.21%
2042	1,752	1,716	36	98%	-	48	23	282	16.99%	16.99%
2043	1,779	1,779	-	100%	-	12	23	288	4.06%	4.06%
2044	1,806	1,806	-	100%	-	12	24	294	4.05%	4.05%
2045	1,833	1,833	-	100%	-	12	24	300	4.05%	4.05%
2046	1,859	1,859	-	100%	-	12	25	307	4.05%	4.05%
2047	1,886	1,886	-	100%	-	13	25	314	4.05%	4.05%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the current cessation provisions.

The Quasi employer contributions shown for FY 20/21 reflect the cessation payments made by these employers.

Except where noted above, the projection is based on the results of the June 30, 2018 actuarial valuation and 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 total active population is assumed to remain flat through the entire projection.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarial determined contribution rate.

Kentucky Retirement Systems
KERS Hazardous Insurance Fund
Exhibit 2-4
Current Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 393	\$ 511	\$ (118)	130%	<\$1	\$ 4	\$ 1	\$ 157	2.46%	2.46%
2019	407	524	(117)	129%	<\$1	4	1	161	2.46%	0.00%
2020	419	543	(124)	130%	-	-	1	162	0.00%	0.00%
2021	431	563	(132)	131%	-	-	1	166	0.00%	0.00%
2022	441	577	(136)	131%	-	-	1	171	0.00%	0.00%
2023	450	587	(137)	130%	-	-	1	175	0.00%	0.00%
2024	457	596	(139)	130%	-	-	1	180	0.00%	0.00%
2025	464	605	(141)	130%	-	-	2	184	0.00%	0.00%
2026	469	613	(144)	131%	-	-	2	189	0.00%	0.00%
2027	473	620	(147)	131%	-	-	2	193	0.00%	0.00%
2028	476	626	(150)	132%	-	-	2	197	0.00%	0.00%
2029	479	633	(154)	132%	-	-	2	203	0.00%	0.00%
2030	482	639	(157)	133%	-	-	2	208	0.00%	0.00%
2031	485	646	(161)	133%	-	-	2	214	0.00%	0.00%
2032	488	653	(165)	134%	-	-	2	221	0.00%	0.00%
2033	492	661	(169)	134%	-	-	2	227	0.00%	0.00%
2034	496	670	(174)	135%	-	-	2	234	0.00%	0.00%
2035	502	679	(177)	135%	-	-	2	240	0.00%	0.00%
2036	508	690	(182)	136%	-	-	2	246	0.00%	0.00%
2037	515	702	(187)	136%	-	-	3	253	0.00%	0.00%
2038	523	715	(192)	137%	-	-	3	259	0.00%	0.00%
2039	532	730	(198)	137%	-	-	3	265	0.00%	0.00%
2040	541	745	(204)	138%	-	-	3	270	0.00%	0.00%
2041	552	761	(209)	138%	-	-	3	276	0.00%	0.00%
2042	563	779	(216)	138%	-	-	3	281	0.00%	0.00%
2043	574	797	(223)	139%	-	-	3	287	0.00%	0.00%
2044	585	815	(230)	139%	-	-	3	293	0.00%	0.00%
2045	597	834	(237)	140%	-	-	3	299	0.00%	0.00%
2046	608	853	(245)	140%	-	-	3	306	0.00%	0.00%
2047	620	873	(253)	141%	-	-	3	313	0.00%	0.00%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the current cessation provisions.

The Quasi employer contributions shown for FY 20/21 reflect the cessation payments made by these employers.

Except where noted above, the projection is based on the results of the June 30, 2018 actuarial valuation and 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 total active population is assumed to remain flat through the entire projection.

The contribution rate established in the Commonwealth's biennium budget is based on the calculated actuarial determined contribution rate.

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

Kentucky Retirement Systems
KERS Non-Hazardous Retirement Fund
Exhibit 3-1
Proposed Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 15,675	\$ 2,019	\$ 13,656	13%	\$ 145	\$ 795	\$ 74	\$ 1,471	63.86%	71.03%
2019	15,677	2,106	13,571	13%	146	805	74	1,490	63.86%	74.54%
2020	15,404	2,227	13,177	14%	144	857	58	1,153	74.27%	74.27%
2021	15,287	2,385	12,902	16%	146	872	59	1,174	74.27%	79.17%
2022	15,156	2,545	12,611	17%	148	928	60	1,194	77.69%	77.69%
2023	15,011	2,760	12,251	18%	150	945	61	1,216	77.69%	75.96%
2024	14,853	3,001	11,852	20%	152	918	62	1,238	74.15%	74.15%
2025	14,681	3,226	11,455	22%	153	936	63	1,262	74.15%	72.53%
2026	14,496	3,479	11,017	24%	154	910	64	1,286	70.76%	70.76%
2027	14,298	3,719	10,579	26%	156	927	65	1,310	70.76%	69.16%
2028	14,086	3,991	10,095	28%	158	900	67	1,335	67.45%	67.45%
2029	13,866	4,256	9,610	31%	159	918	68	1,360	67.45%	65.92%
2030	13,635	4,556	9,079	33%	160	891	69	1,388	64.22%	64.22%
2031	13,394	4,850	8,544	36%	162	910	71	1,417	64.22%	62.72%
2032	13,146	5,187	7,959	39%	162	882	72	1,446	61.01%	61.01%
2033	12,891	5,521	7,370	43%	145	901	74	1,477	61.01%	59.52%
2034	12,631	5,884	6,747	47%	130	872	75	1,508	57.79%	57.79%
2035	12,367	6,231	6,136	50%	126	891	77	1,541	57.79%	56.36%
2036	12,101	6,625	5,476	55%	125	862	79	1,577	54.66%	54.66%
2037	11,839	7,027	4,812	59%	118	883	81	1,616	54.66%	53.16%
2038	11,584	7,486	4,098	65%	117	849	83	1,656	51.29%	51.29%
2039	11,339	7,956	3,383	70%	101	871	85	1,697	51.29%	49.78%
2040	11,105	8,480	2,625	76%	86	829	87	1,739	47.64%	47.64%
2041	10,884	8,998	1,886	83%	66	849	89	1,781	47.64%	46.06%
2042	10,676	9,567	1,109	90%	65	772	91	1,824	42.34%	42.34%
2043	10,481	10,111	370	96%	61	59	93	1,867	3.16%	3.16%
2044	10,301	9,970	331	97%	48	59	96	1,910	3.11%	3.11%
2045	10,134	9,832	302	97%	45	60	98	1,954	3.08%	3.08%
2046	9,982	9,706	276	97%	38	61	100	1,999	3.04%	3.04%
2047	9,845	9,590	255	97%	36	62	102	2,045	3.02%	3.02%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the proposed cessation provisions.

The Quasi employer contributions shown for FY 20/21 and later reflect the cessation payments made by these employers.

Quasi employers are assumed to contribute 41.06% of payroll in each year prior to their cessation date of June 30, 2020.

Kentucky Retirement Systems
KERS Non-Hazardous Insurance Fund
Exhibit 3-2
Proposed Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 2,436	\$ 887	\$ 1,549	36%	\$ 29	\$ 138	\$ 6	\$ 1,461	11.45%	12.40%
2019	2,497	978	1,519	39%	30	139	7	1,480	11.45%	10.65%
2020	2,530	1,082	1,448	43%	30	119	6	1,145	10.37%	10.37%
2021	2,570	1,170	1,400	46%	30	121	6	1,165	10.37%	9.94%
2022	2,602	1,247	1,355	48%	30	113	7	1,186	9.52%	9.52%
2023	2,629	1,313	1,316	50%	31	115	7	1,208	9.52%	9.23%
2024	2,651	1,380	1,271	52%	31	110	8	1,230	8.92%	8.92%
2025	2,668	1,441	1,227	54%	31	112	8	1,253	8.92%	8.64%
2026	2,680	1,503	1,177	56%	31	107	9	1,277	8.34%	8.34%
2027	2,686	1,559	1,127	58%	32	109	10	1,301	8.34%	8.06%
2028	2,686	1,615	1,071	60%	32	103	10	1,326	7.77%	7.77%
2029	2,680	1,664	1,016	62%	31	105	11	1,352	7.77%	7.50%
2030	2,668	1,713	955	64%	30	99	12	1,379	7.21%	7.21%
2031	2,650	1,754	896	66%	29	102	12	1,408	7.21%	6.97%
2032	2,629	1,798	831	68%	28	96	13	1,437	6.71%	6.71%
2033	2,605	1,837	768	71%	26	99	13	1,468	6.71%	6.51%
2034	2,578	1,879	699	73%	23	94	14	1,500	6.28%	6.28%
2035	2,549	1,917	632	75%	21	96	15	1,532	6.28%	6.08%
2036	2,521	1,959	562	78%	16	92	15	1,568	5.87%	5.87%
2037	2,494	1,998	496	80%	16	94	16	1,607	5.87%	5.69%
2038	2,470	2,046	424	83%	15	90	16	1,647	5.49%	5.49%
2039	2,448	2,096	352	86%	14	93	17	1,688	5.49%	5.33%
2040	2,430	2,155	275	89%	12	88	17	1,730	5.09%	5.09%
2041	2,415	2,217	198	92%	10	90	18	1,772	5.09%	4.94%
2042	2,405	2,287	118	95%	9	83	18	1,814	4.55%	4.55%
2043	2,399	2,358	41	98%	7	9	19	1,857	0.49%	0.49%
2044	2,398	2,360	38	98%	5	9	19	1,900	0.48%	0.48%
2045	2,400	2,364	36	99%	4	9	19	1,944	0.47%	0.47%
2046	2,406	2,371	35	99%	3	9	20	1,989	0.46%	0.46%
2047	2,413	2,379	34	99%	3	9	20	2,035	0.45%	0.45%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the proposed cessation provisions.

The Quasi employer contributions shown for FY 20/21 and later reflect the cessation payments made by these employers.

Quasi employers are assumed to contribute 8.41% of payroll in each year prior to their cessation date of June 30, 2020.

Kentucky Retirement Systems
KERS Hazardous Retirement Fund
Exhibit 3-3
Proposed Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 1,152	\$ 639	\$ 513	55%	\$ 1	\$ 53	\$ 13	\$ 158	34.39%	34.39%
2019	1,181	671	510	57%	1	55	13	162	34.39%	34.42%
2020	1,206	710	496	59%	1	55	13	163	33.54%	33.54%
2021	1,233	759	474	62%	1	56	13	167	33.54%	32.25%
2022	1,259	802	457	64%	1	52	14	172	30.57%	30.57%
2023	1,285	840	445	65%	1	54	14	176	30.57%	29.47%
2024	1,310	880	430	67%	1	52	14	181	28.43%	28.43%
2025	1,335	919	416	69%	1	53	15	185	28.43%	27.54%
2026	1,358	958	400	71%	1	51	15	190	26.62%	26.62%
2027	1,380	994	386	72%	-	52	16	194	26.62%	25.79%
2028	1,400	1,031	369	74%	-	49	16	199	24.91%	24.91%
2029	1,420	1,067	353	75%	-	51	16	204	24.91%	24.15%
2030	1,440	1,105	335	77%	1	49	17	209	23.37%	23.37%
2031	1,460	1,143	317	78%	1	50	17	216	23.37%	22.72%
2032	1,482	1,184	298	80%	1	49	18	222	21.99%	21.99%
2033	1,505	1,227	278	82%	-	50	18	228	21.99%	21.40%
2034	1,530	1,273	257	83%	-	49	19	235	20.75%	20.75%
2035	1,556	1,321	235	85%	-	50	19	241	20.75%	20.21%
2036	1,583	1,373	210	87%	-	49	20	248	19.60%	19.60%
2037	1,611	1,425	186	88%	-	50	20	254	19.60%	19.11%
2038	1,639	1,481	158	90%	-	48	21	260	18.51%	18.51%
2039	1,668	1,536	132	92%	-	49	21	266	18.51%	18.08%
2040	1,696	1,594	102	94%	-	48	22	272	17.58%	17.58%
2041	1,724	1,652	72	96%	-	49	22	277	17.58%	17.37%
2042	1,752	1,713	39	98%	-	48	23	282	17.14%	17.14%
2043	1,779	1,779	-	100%	-	12	23	288	4.06%	4.06%
2044	1,806	1,806	-	100%	-	12	24	294	4.05%	4.05%
2045	1,833	1,833	-	100%	-	12	24	300	4.05%	4.05%
2046	1,859	1,859	-	100%	-	12	25	307	4.05%	4.05%
2047	1,886	1,886	-	100%	-	13	25	314	4.05%	4.05%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the proposed cessation provisions.

The Quasi employer contributions shown for FY 20/21 and later reflect the cessation payments made by these employers.

Kentucky Retirement Systems
KERS Hazardous Insurance Fund
Exhibit 3-4
Proposed Plan
(\$ in Millions)

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	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2018	\$ 393	\$ 511	\$ (118)	130%	<\$1	\$ 4	\$ 1	\$ 157	2.46%	2.46%
2019	407	524	(117)	129%	<\$1	4	1	161	2.46%	0.00%
2020	419	543	(124)	130%	-	-	1	162	0.00%	0.00%
2021	431	563	(132)	131%	-	-	1	166	0.00%	0.00%
2022	441	577	(136)	131%	-	-	1	171	0.00%	0.00%
2023	450	587	(137)	130%	-	-	1	175	0.00%	0.00%
2024	457	596	(139)	130%	-	-	1	180	0.00%	0.00%
2025	464	605	(141)	130%	-	-	2	184	0.00%	0.00%
2026	469	613	(144)	131%	-	-	2	189	0.00%	0.00%
2027	473	620	(147)	131%	-	-	2	193	0.00%	0.00%
2028	476	626	(150)	132%	-	-	2	197	0.00%	0.00%
2029	479	633	(154)	132%	-	-	2	203	0.00%	0.00%
2030	482	639	(157)	133%	-	-	2	208	0.00%	0.00%
2031	485	646	(161)	133%	-	-	2	214	0.00%	0.00%
2032	488	653	(165)	134%	-	-	2	221	0.00%	0.00%
2033	492	661	(169)	134%	-	-	2	227	0.00%	0.00%
2034	496	670	(174)	135%	-	-	2	234	0.00%	0.00%
2035	502	679	(177)	135%	-	-	2	240	0.00%	0.00%
2036	508	690	(182)	136%	-	-	2	246	0.00%	0.00%
2037	515	702	(187)	136%	-	-	3	253	0.00%	0.00%
2038	523	715	(192)	137%	-	-	3	259	0.00%	0.00%
2039	532	730	(198)	137%	-	-	3	265	0.00%	0.00%
2040	541	745	(204)	138%	-	-	3	270	0.00%	0.00%
2041	552	761	(209)	138%	-	-	3	276	0.00%	0.00%
2042	563	779	(216)	138%	-	-	3	281	0.00%	0.00%
2043	574	797	(223)	139%	-	-	3	287	0.00%	0.00%
2044	585	815	(230)	139%	-	-	3	293	0.00%	0.00%
2045	597	834	(237)	140%	-	-	3	299	0.00%	0.00%
2046	608	853	(245)	140%	-	-	3	306	0.00%	0.00%
2047	620	873	(253)	141%	-	-	3	313	0.00%	0.00%

Notes and assumptions:

All eligible employers ("Quasi" employers) are assumed to cease participating from the system effective June 30, 2020 under the proposed cessation provisions.

The Quasi employer contributions shown for FY 20/21 and later reflect the cessation payments made by these employers.