



April 3, 2018

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

**Re: BR 1201 HB 362 SCS  
AA Statement 1 of 1**

Dear Mr. Eager:

We have reviewed the proposed changes in the proposed pension reform legislation HB 362. The purpose of this letter is to communicate the fiscal analysis of the draft legislation on the CERS and KERS retirement and insurance funds. We have also included some suggested alternative provisions for the General Assembly to consider that are principal based and reduce KRS's cash-flow mismatch and default risk on the installments made by ceasing employers.

### **Provisions of Proposed Legislation**

In summary, this proposed legislation would provide approximately 215 participating employers in KRS a brief window that will allow them to withdrawal from KRS under terms that are significantly more favorable than under the cessation provisions that are currently in State Statute (KRS 61.522 as amended by HB 351). This proposed legislation also provides a phase-in for the contribution requirements for the CERS Systems (retirement and insurance) that limit an annual increase in contribution requirements to 12% per year for the next ten years.

### **Summary of Cost Impact**

Section 1 includes exhibits that show a comparison of the fiscal impact of the proposed legislation to the current plan over the next 35 years on the: (1) unfunded actuarial accrued liability, (2) funded ratio, (3) total employer contribution dollars, and (4) projected composite employer contribution rates. Section 2 provides additional detail regarding each projection under the current plan and Section 3 provides similar information under the proposed legislation. Below are comments regarding the cost projection.

Most notably, requiring KRS to finance the ceasing employers' annual installments with a 0.0% interest rate is a significant benefit to those withdrawing employers and could potentially be a \$2.0 billion subsidy that must be financed by the remaining participating employers in the Systems. The potential subsidy for employers ceasing participation in the KERS Non-Hazardous System alone is \$1.7 billion and could result in a 6.00% to 8.00% increase in the actuarially determined contribution rate for the remaining participating employers, including the State.

#### KERS Retirement and Insurance Plans

Employers eligible to withdrawal from the KERS Non-Hazardous System account for approximately 25% of the covered payroll for the plan. If these employers do not withdraw from the System, they are expected to pay approximately \$4.0 billion of the retirement and insurance funds' unfunded accrued liability as of June 30, 2018. If all eligible employers withdraw from the system, the present value of their cessation installments to the retirement and insurance funds would be \$2.3 billion, which is significantly less than the present value of their total cessation liability, which will result in a 6.00% to 8.00% of pay increase in the actuarially determined contribution rate (retirement and insurance combined) for the remaining participating employers for the duration of the plan's 25-year funding period.

Employers eligible to withdrawal from the KERS Hazardous System account for approximately 2% of the covered payroll the plan, and therefore, the effect of the withdrawal provisions is of a smaller magnitude than seen for the Non-Hazardous System.

#### CERS Retirement and Insurance Plans

For business making decisions, the fiscal impact for the retirement and insurance plans for the Non-Hazardous and Hazardous systems is primarily attributable to the phase-in of the actuarially determined contributions. Specifically, the phase-in provisions result in a lower initial contribution rate and a slightly higher contribution requirement after the phase-in period in order to finance the unfunded actuarial accrued liability over the same time-period. Given the magnitude of the currently scheduled increase in the contribution rates for the participating employers in CERS from FY 17/18 to FY 18/19, legislation like this provides those participating employers increased ability to budget for the increased contribution requirements to KRS.

There is also a cost subsidy for the employers eligible to withdrawal from the CERS System under HB 362, but the fiscal impact is significantly smaller than the KERS System because there are fewer employers in the CERS System that are eligible to withdrawal under HB 362 and those eligible employers are relatively smaller in membership size. Specifically, employers eligible to withdrawal account for approximately 6% of the covered payroll for the Non-Hazardous System and 3% of the covered payroll for the Hazardous System

### **Principal Proposed Employer Cessation Provisions**

Under this proposed legislation, approximately 120 of the 350 participating employers in the KERS Non-Hazardous System and 95 of the 1,140 participating employers in the CERS Non-Hazardous System have a brief window to elect to withdrawal from KRS. These employers primarily include local and district health departments and state colleges and universities. If an employer elects to withdrawal during the window then:

- 1) The effective date of the withdrawal will be June 30, 2019. Employees will contribute and earn service through that date. The employer is prohibited from setting up a new defined benefit plan to provide their employees ongoing retirement benefits.
- 2) The individual employer's assigned withdrawal liability will be equal to their full actuarial cost based on the same provisions that are currently in State Code that prescribe the method and assumptions to be used to identify the cessation liability for a withdrawing employer (KRS 61.522 as amended by HB 351), which include the use of a discount rate equal to the current yield on 30-year Treasuries.
- 3) The employer's annual cost for the withdrawal will be based on a 30-year installment plan beginning July 1, 2019, using a zero interest (0%). The annual installments are also limited to the employer's dollar contributions made during FY 17/18.

If these installments do not result in the withdrawal liability being fully financed (with 0% interest) over the 30-year period, then the dollar amount of the installments may be increased by up to 5% per year after FY 20/21 in order to finance the cost over a 30-year period. In the event the withdrawal liability cannot be financed over the 30-year period based on these increased annual installments then the installment period is extended 10 additional years to a maximum 40-year period.

- 4) KRS is prohibited from applying interest on the outstanding balance of the unfunded liability as the employers make installments to the system.

Employer's electing to withdrawal from KRS are to provide their employees an alternative defined contribution retirement program effective July 1, 2019.

### **GRS Comments on Proposed Employer Cessation Provisions**

#### Determination and Allocation with Withdrawal Liability by Employer

The use of the current provisions in State Statute provide a reasonable and financially fair basis for determining a cessation liability for withdrawing employers to exit KRS and are not expected to result in increased fiscal cost or financial risk to the remaining participating employers in KRS.

### Installment Payments

Currently, a withdrawing employer in KRS must pay their cessation liability to KRS in a one-time lump-sum payment and installment payments are not currently permitted. HB 362 prescribes the withdrawing employer's annual cessation installment (up to a maximum of 40 installments) as being equal to their FY 17/18 contribution. Under these provisions, more than half of the withdrawing employers will have more than 20 years of annual, non-increasing, installments. Installment payments of a large duration can result in a cash flow mismatch as the benefit payments will likely exceed the installments paid by the employer. Also, there is increased financial risk to KRS that entities may become financially troubled or cease existence before they have completely financed all their unfunded liability (i.e. increased default risk).

Also, requiring KRS to finance the annual installments for the participating employers using a 0.0% interest rate is a significant benefit to the employers that are eligible to withdraw from KRS. **This provision is potentially a \$2.0 billion subsidy for the withdrawing employers in the Systems (\$1.5 retirement funds and \$0.5 insurance funds). The potential subsidy for employers ceasing their participation in the KERS Non-Hazardous System alone is \$1.7 billion and will result in a 6.00% to 8.00% increase in the actuarially determined contribution rate (retirement plus insurance) for the remaining participating employers, including the State.**

For example, Northern Kentucky University is one of the larger employers eligible to withdrawal from KERS has an estimated withdrawal liability of \$176 million in the Retirement Fund. But the present value of the University's installments would only be \$132 million based on the 5.25% valuation interest rate, resulting in a \$44 million subsidy to be financed by the remaining participating employers in the system due to the 0.0% interest rate.

To eliminate the interest rate subsidy and reduce KRS's cash flow mismatch and installation payment default risk, we suggest the General Assembly consider adopting alternative provisions that require the annual installments be determined using the valuation discount rate (5.25% for the KERS Systems and 6.25% for the CERS Systems) and an installment period that does not exceed ten years and that this installment period is applied uniformly to all withdrawing employers.

### **Basis of Calculations**

GRS based the calculations and analysis in this letter on the member and financial data provided by KRS and used to perform the actuarial valuation as of June 30, 2017. 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, 2017 actuarial valuation report.

These projections also do not reflect the actual investment experience of the retirement system after the measurement date of June 30, 2017. The projections assume that the number of participating members in the CERS non-hazardous and KERS non-hazardous systems will remain

constant each future year and that new members will enter the system to replace current active members who terminate or retire in future years. Our fiscal analysis assumes that all eligible employers will elect to cease their participation in KRS. This assumption also provides the largest possible fiscal impact. The 30-year treasury rate used to determine the withdrawal liability for employers was assumed to be 3.00%, as the actual rate as of July 1, 2019 is not yet known. 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.

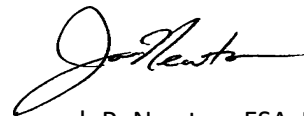
Also, this analysis does not reflect the effects of other legislation that may be enacted during the 2018 legislative session.

### Closing

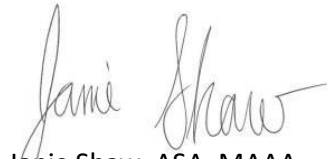
We are not attorneys, and we cannot provide a legal opinion regarding the changes in this proposed legislation. Nothing in this letter should be construed as providing legal, investment or tax advice.

Mr. White and Mr. Newton are Enrolled Actuaries. All the of the undersigned are also 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.

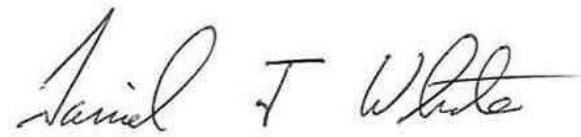
Sincerely,



Joseph P. Newton, FSA, MAAA, EA  
Senior Consultant



Janie Shaw, ASA, MAAA  
Consultant



Daniel J. White, FSA, MAAA, EA  
Senior Consultant

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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

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

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability				Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference		Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 13,468	\$ 13,468	\$ -		14%	14%	0%	\$ 472	\$ 472	\$ -	41%	41%	0%
2018	13,591	13,329	(262)		13%	13%	0%	826	827	1	71%	71%	0%
2019	13,349	13,155	(194)		15%	14%	-1%	839	839	-	71%	71%	0%
2020	13,042	12,924	(118)		17%	15%	-2%	823	924	101	69%	77%	8%
2021	12,700	12,555	(145)		19%	17%	-2%	838	940	102	69%	77%	8%
2022	12,334	12,168	(166)		21%	19%	-2%	815	915	100	66%	74%	8%
2023	11,979	11,782	(197)		23%	21%	-2%	830	931	101	66%	74%	8%
2024	11,580	11,359	(221)		25%	23%	-2%	807	906	99	63%	70%	8%
2025	11,190	10,937	(253)		27%	25%	-2%	822	923	101	63%	70%	8%
2026	10,755	10,474	(281)		30%	27%	-3%	799	897	98	60%	67%	7%
2027	10,327	10,011	(316)		32%	30%	-2%	813	914	101	60%	67%	7%
2028	9,853	9,505	(348)		35%	32%	-3%	789	887	98	57%	64%	7%
2029	9,385	9,001	(384)		37%	35%	-2%	804	905	101	57%	64%	7%
2030	8,868	8,450	(418)		40%	38%	-2%	780	878	98	54%	61%	7%
2031	8,355	7,908	(447)		43%	41%	-2%	797	897	100	54%	61%	7%
2032	7,791	7,344	(447)		46%	44%	-2%	771	869	98	51%	58%	6%
2033	7,229	6,783	(446)		49%	48%	-1%	788	887	99	51%	58%	6%
2034	6,614	6,177	(437)		53%	51%	-2%	761	858	97	48%	54%	6%
2035	6,000	5,571	(429)		57%	55%	-2%	778	877	99	48%	54%	6%
2036	5,331	4,925	(406)		61%	60%	-1%	752	848	96	46%	51%	6%
2037	4,661	4,284	(377)		65%	64%	-1%	771	869	98	46%	51%	6%
2038	3,931	3,612	(319)		70%	69%	-1%	740	835	95	43%	48%	5%
2039	3,204	2,954	(250)		76%	74%	-2%	758	856	98	43%	48%	5%
2040	2,414	2,250	(164)		81%	80%	-1%	722	814	92	40%	45%	5%
2041	1,634	1,555	(79)		87%	86%	-1%	740	834	94	40%	45%	5%
2042	788	807	19		94%	93%	-1%	672	757	85	35%	40%	4%
2043	-	-	-		100%	100%	0%	57	57	-	3%	3%	0%
2044	-	-	-		100%	100%	0%	58	57	(1)	3%	3%	0%
2045	-	-	-		100%	100%	0%	58	58	-	3%	3%	0%
2046	-	-	-		100%	100%	0%	59	59	-	3%	3%	0%
2047	-	-	-		100%	100%	0%	61	60	(1)	3%	3%	0%
2048	-	-	-		100%	100%	0%	61	61	-	3%	3%	0%
2049	-	-	-		100%	100%	0%	62	62	-	3%	3%	0%
2050	-	-	-		100%	100%	0%	64	63	(1)	3%	3%	0%
2051	-	-	-		100%	100%	0%	65	65	-	3%	3%	0%

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

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 514	\$ 514	\$ -	54%	54%	0%	\$ 34	\$ 34	\$ -	21%	21%	0%
2018	518	515	(3)	55%	55%	0%	56	56	-	34%	34%	0%
2019	517	515	(2)	56%	56%	0%	57	57	-	34%	34%	0%
2020	508	504	(4)	58%	58%	0%	56	55	(1)	33%	33%	0%
2021	490	486	(4)	61%	61%	0%	57	57	-	33%	33%	0%
2022	475	472	(3)	63%	63%	0%	54	54	-	30%	30%	0%
2023	464	459	(5)	64%	65%	1%	56	55	(1)	30%	30%	0%
2024	449	444	(5)	66%	66%	0%	54	53	(1)	28%	28%	0%
2025	435	430	(5)	68%	68%	0%	55	54	(1)	28%	28%	0%
2026	419	414	(5)	70%	70%	0%	52	52	-	26%	26%	0%
2027	403	398	(5)	71%	72%	1%	54	53	(1)	26%	26%	0%
2028	386	380	(6)	73%	73%	0%	51	51	-	25%	25%	0%
2029	369	364	(5)	75%	75%	0%	52	52	-	25%	25%	0%
2030	350	343	(7)	76%	77%	1%	50	50	-	23%	23%	0%
2031	331	325	(6)	78%	78%	0%	52	52	-	23%	23%	0%
2032	310	304	(6)	80%	80%	0%	50	50	-	22%	22%	0%
2033	289	284	(5)	81%	81%	0%	52	51	(1)	22%	22%	0%
2034	266	261	(5)	83%	83%	0%	50	50	-	20%	20%	0%
2035	243	238	(5)	85%	85%	0%	51	51	-	20%	20%	0%
2036	217	213	(4)	87%	87%	0%	50	50	-	19%	19%	0%
2037	192	188	(4)	88%	89%	1%	51	51	-	19%	19%	0%
2038	163	160	(3)	90%	90%	0%	49	49	-	18%	18%	0%
2039	134	132	(2)	92%	92%	0%	50	50	-	18%	18%	0%
2040	103	101	(2)	94%	94%	0%	48	48	-	17%	17%	0%
2041	72	70	(2)	96%	96%	0%	49	49	-	17%	17%	0%
2042	37	37	-	98%	98%	0%	48	48	-	17%	17%	0%
2043	-	-	-	100%	100%	0%	13	12	(1)	4%	4%	0%
2044	-	-	-	100%	100%	0%	13	12	(1)	4%	4%	0%
2045	-	-	-	100%	100%	0%	13	13	-	4%	4%	0%
2046	-	-	-	100%	100%	0%	13	13	-	4%	4%	0%
2047	-	-	-	100%	100%	0%	14	13	(1)	4%	4%	0%
2048	-	-	-	100%	100%	0%	14	14	-	4%	4%	0%
2049	-	-	-	100%	100%	0%	14	14	-	4%	4%	0%
2050	-	-	-	100%	100%	0%	15	14	(1)	4%	4%	0%
2051	-	-	-	100%	100%	0%	15	15	-	4%	4%	0%



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

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability				Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference		Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 6,039	\$ 6,039	\$	-	53%	53%	0%	\$ 332	\$ 332	\$ -	14%	14%	0%
2018	6,219	6,145		(74)	53%	53%	0%	513	381	(132)	22%	16%	-6%
2019	6,299	6,356		57	53%	52%	-1%	516	436	(80)	22%	18%	-3%
2020	6,292	6,435		143	54%	53%	-1%	526	497	(29)	22%	20%	-1%
2021	6,165	6,347		182	56%	54%	-2%	531	551	20	21%	22%	1%
2022	6,099	6,272		173	57%	55%	-2%	529	549	20	21%	22%	1%
2023	6,026	6,191		165	58%	56%	-2%	533	553	20	21%	21%	1%
2024	5,941	6,096		155	59%	58%	-1%	538	557	19	20%	21%	1%
2025	5,840	5,987		147	61%	59%	-2%	542	562	20	20%	21%	1%
2026	5,725	5,864		139	62%	60%	-2%	547	567	20	20%	21%	1%
2027	5,595	5,723		128	63%	61%	-2%	552	573	21	20%	21%	1%
2028	5,446	5,564		118	64%	63%	-1%	557	579	22	20%	20%	1%
2029	5,280	5,387		107	66%	64%	-2%	563	585	22	20%	20%	1%
2030	5,094	5,189		95	67%	66%	-1%	570	592	22	19%	20%	1%
2031	4,885	4,970		85	68%	67%	-1%	576	600	24	19%	20%	1%
2032	4,654	4,728		74	70%	69%	-1%	584	608	24	19%	20%	1%
2033	4,397	4,460		63	72%	70%	-2%	592	616	24	19%	20%	1%
2034	4,115	4,167		52	74%	72%	-2%	600	625	25	19%	20%	1%
2035	3,803	3,848		45	76%	74%	-2%	609	634	25	19%	19%	1%
2036	3,462	3,501		39	78%	77%	-1%	618	644	26	18%	19%	1%
2037	3,087	3,121		34	80%	79%	-1%	628	654	26	18%	19%	1%
2038	2,677	2,708		31	83%	82%	-1%	640	666	26	18%	19%	1%
2039	2,230	2,259		29	86%	85%	-1%	651	678	27	18%	19%	1%
2040	1,742	1,769		27	89%	88%	-1%	663	690	27	18%	19%	1%
2041	1,211	1,239		28	92%	92%	0%	675	703	28	18%	19%	1%
2042	634	663		29	96%	96%	0%	689	718	29	18%	19%	1%
2043	-	-		-	100%	100%	0%	74	74	-	2%	2%	0%
2044	-	-		-	100%	100%	0%	75	75	-	2%	2%	0%
2045	-	-		-	100%	100%	0%	76	76	-	2%	2%	0%
2046	-	-		-	100%	100%	0%	77	77	-	2%	2%	0%
2047	-	-		-	100%	100%	0%	78	78	-	2%	2%	0%
2048	-	-		-	100%	100%	0%	79	79	-	2%	2%	0%
2049	-	-		-	100%	100%	0%	81	81	-	2%	2%	0%
2050	-	-		-	100%	100%	0%	83	82	(1)	2%	2%	0%
2051	-	-		-	100%	100%	0%	84	84	-	2%	2%	0%



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

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability				Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference		Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 2,411	\$ 2,411	\$ -		48%	48%	0%	\$ 117	\$ 117	\$ -	22%	22%	0%
2018	2,478	2,474	(4)		48%	48%	0%	187	130	(57)	36%	25%	-11%
2019	2,504	2,559	55		49%	47%	-2%	188	146	(42)	36%	28%	-8%
2020	2,500	2,604	104		50%	48%	-2%	192	165	(27)	36%	31%	-5%
2021	2,456	2,597	141		52%	49%	-3%	194	186	(8)	36%	35%	-2%
2022	2,433	2,591	158		53%	49%	-4%	194	208	14	36%	39%	2%
2023	2,405	2,561	156		54%	51%	-3%	196	210	14	36%	38%	3%
2024	2,372	2,525	153		55%	52%	-3%	197	212	15	36%	38%	3%
2025	2,333	2,484	151		56%	53%	-3%	199	214	15	36%	38%	3%
2026	2,288	2,435	147		57%	54%	-3%	202	216	14	35%	38%	3%
2027	2,236	2,380	144		59%	56%	-3%	204	219	15	35%	38%	3%
2028	2,178	2,317	139		60%	57%	-3%	207	222	15	35%	38%	3%
2029	2,111	2,246	135		61%	58%	-3%	210	225	15	35%	38%	3%
2030	2,037	2,167	130		63%	60%	-3%	213	229	16	35%	37%	3%
2031	1,954	2,077	123		64%	62%	-2%	217	233	16	35%	37%	3%
2032	1,861	1,979	118		66%	64%	-2%	220	237	17	34%	37%	3%
2033	1,759	1,869	110		68%	66%	-2%	224	241	17	34%	37%	3%
2034	1,646	1,748	102		70%	68%	-2%	228	245	17	34%	36%	3%
2035	1,522	1,616	94		72%	70%	-2%	233	249	16	34%	36%	3%
2036	1,385	1,470	85		75%	73%	-2%	236	254	18	34%	36%	3%
2037	1,235	1,310	75		78%	76%	-2%	241	259	18	33%	36%	2%
2038	1,071	1,136	65		81%	79%	-2%	245	264	19	33%	36%	2%
2039	892	947	55		84%	83%	-1%	250	269	19	33%	36%	2%
2040	697	741	44		87%	86%	-1%	255	274	19	33%	35%	2%
2041	484	516	32		91%	91%	0%	261	280	19	33%	35%	2%
2042	254	272	18		95%	95%	0%	266	286	20	33%	35%	2%
2043	-	-	-		100%	100%	0%	12	12	-	1%	1%	0%
2044	-	-	-		100%	100%	0%	12	12	-	1%	1%	0%
2045	-	-	-		100%	100%	0%	12	12	-	1%	1%	0%
2046	-	-	-		100%	100%	0%	13	12	(1)	1%	1%	0%
2047	-	-	-		100%	100%	0%	13	13	-	1%	1%	0%
2048	-	-	-		100%	100%	0%	13	13	-	1%	1%	0%
2049	-	-	-		100%	100%	0%	14	13	(1)	1%	1%	0%
2050	-	-	-		100%	100%	0%	14	13	(1)	1%	1%	0%
2051	-	-	-		100%	100%	0%	14	14	-	1%	1%	0%

**Kentucky Retirement Systems**  
**Exhibit 1-5**  
**KERS Non-Hazardous Insurance Fund**  
**Comparison of Fiscal Impact**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability				Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference		Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 1,859	\$ 1,859	\$ -		31%	31%	0%	\$ 96	\$ 96	\$ -	8%	8%	0%
2018	1,886	1,868	(18)		32%	32%	0%	143	143	-	12%	12%	0%
2019	1,862	1,846	(16)		34%	34%	0%	145	145	-	12%	12%	0%
2020	1,820	1,810	(10)		37%	37%	0%	141	144	3	12%	12%	0%
2021	1,770	1,759	(11)		40%	39%	-1%	143	147	4	12%	12%	0%
2022	1,721	1,711	(10)		43%	42%	-1%	136	140	4	11%	11%	0%
2023	1,674	1,664	(10)		46%	44%	-2%	140	143	3	11%	11%	0%
2024	1,621	1,611	(10)		48%	46%	-2%	133	137	4	10%	11%	0%
2025	1,570	1,559	(11)		51%	48%	-3%	136	139	3	10%	11%	0%
2026	1,510	1,500	(10)		53%	50%	-3%	130	133	3	10%	10%	0%
2027	1,454	1,443	(11)		55%	52%	-3%	132	136	4	10%	10%	0%
2028	1,390	1,377	(13)		57%	55%	-2%	126	129	3	9%	9%	0%
2029	1,327	1,313	(14)		59%	57%	-2%	128	132	4	9%	9%	0%
2030	1,255	1,242	(13)		62%	59%	-3%	121	125	4	8%	9%	0%
2031	1,187	1,171	(16)		64%	61%	-3%	124	128	4	8%	9%	0%
2032	1,109	1,092	(17)		66%	63%	-3%	118	122	4	8%	8%	0%
2033	1,033	1,017	(16)		68%	65%	-3%	121	124	3	8%	8%	0%
2034	947	934	(13)		71%	68%	-3%	116	119	3	7%	8%	0%
2035	863	852	(11)		73%	70%	-3%	118	121	3	7%	8%	0%
2036	769	762	(7)		76%	73%	-3%	113	117	4	7%	7%	0%
2037	675	670	(5)		79%	76%	-3%	116	119	3	7%	7%	0%
2038	572	575	3		82%	79%	-3%	112	114	2	6%	7%	0%
2039	469	481	12		85%	82%	-3%	114	117	3	6%	7%	0%
2040	355	379	24		89%	86%	-3%	109	111	2	6%	6%	0%
2041	242	276	34		92%	90%	-2%	112	114	2	6%	6%	0%
2042	118	170	52		96%	94%	-2%	101	104	3	5%	5%	0%
2043	-	-	-		100%	100%	0%	10	9	(1)	0%	0%	0%
2044	-	-	-		100%	100%	0%	10	9	(1)	0%	0%	0%
2045	-	-	-		100%	100%	0%	10	9	(1)	0%	0%	0%
2046	-	-	-		100%	100%	0%	10	10	-	0%	0%	0%
2047	-	-	-		100%	100%	0%	11	10	(1)	0%	0%	0%
2048	-	-	-		100%	100%	0%	10	10	-	0%	0%	0%
2049	-	-	-		100%	100%	0%	9	9	-	0%	0%	0%
2050	-	-	-		100%	100%	0%	9	9	-	0%	0%	0%
2051	-	-	-		100%	100%	0%	9	9	-	0%	0%	0%

**Kentucky Retirement Systems**  
**Exhibit 1-6**  
**KERS Hazardous Insurance Fund**  
**Comparison of Fiscal Impact**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ (74)	\$ (74)	\$ -	118%	118%	0%	\$ 4	\$ 4	\$ -	2%	2%	0%
2018	(71)	(72)	(1)	116%	117%	1%	4	4	-	2%	2%	0%
2019	(63)	(64)	(1)	114%	114%	0%	4	4	-	2%	2%	0%
2020	(61)	(62)	(1)	113%	113%	0%	4	3	(1)	2%	2%	0%
2021	(66)	(67)	(1)	114%	114%	0%	4	3	(1)	2%	2%	0%
2022	(65)	(67)	(2)	113%	114%	1%	2	2	-	1%	1%	0%
2023	(64)	(65)	(1)	113%	113%	0%	2	2	-	1%	1%	0%
2024	(62)	(64)	(2)	112%	113%	1%	1	1	-	1%	0%	0%
2025	(61)	(62)	(1)	112%	112%	0%	1	1	-	1%	0%	0%
2026	(60)	(61)	(1)	111%	112%	1%	1	-	(1)	0%	0%	0%
2027	(57)	(58)	(1)	111%	111%	0%	1	-	(1)	0%	0%	0%
2028	(55)	(56)	(1)	110%	111%	1%	-	-	-	0%	0%	0%
2029	(53)	(54)	(1)	110%	110%	0%	-	-	-	0%	0%	0%
2030	(50)	(50)	-	109%	109%	0%	-	-	-	0%	0%	0%
2031	(47)	(48)	(1)	109%	109%	0%	-	-	-	0%	0%	0%
2032	(44)	(45)	(1)	108%	108%	0%	-	-	-	0%	0%	0%
2033	(40)	(41)	(1)	107%	108%	1%	-	-	-	0%	0%	0%
2034	(37)	(38)	(1)	107%	107%	0%	1	-	(1)	0%	0%	0%
2035	(33)	(34)	(1)	106%	106%	0%	1	-	(1)	0%	0%	0%
2036	(29)	(30)	(1)	105%	105%	0%	1	-	(1)	0%	0%	0%
2037	(25)	(26)	(1)	104%	105%	1%	1	-	(1)	0%	0%	0%
2038	(21)	(22)	(1)	104%	104%	0%	1	1	-	0%	0%	0%
2039	(17)	(17)	-	103%	103%	0%	1	1	-	0%	0%	0%
2040	(12)	(12)	-	102%	102%	0%	2	1	(1)	1%	0%	0%
2041	(8)	(8)	-	101%	101%	0%	2	1	(1)	1%	0%	0%
2042	(4)	(3)	1	101%	100%	-1%	3	2	(1)	1%	1%	0%
2043	-	-	-	100%	100%	0%	7	6	(1)	2%	2%	0%
2044	-	-	-	100%	100%	0%	7	6	(1)	2%	2%	0%
2045	-	-	-	100%	100%	0%	7	6	(1)	2%	2%	0%
2046	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%
2047	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%
2048	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%
2049	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%
2050	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%
2051	-	-	-	100%	100%	0%	7	7	-	2%	2%	0%

**Kentucky Retirement Systems**  
**Exhibit 1-7**  
**CERS Non-Hazardous Insurance Fund**  
**Comparison of Fiscal Impact**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability				Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference		Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 1,128	\$ 1,128	\$ -		66%	66%	0%	\$ 106	\$ 106	\$ -	5%	5%	0%
2018	1,171	1,166	(5)		67%	67%	0%	144	122	(22)	6%	5%	-1%
2019	1,192	1,208	16		67%	67%	0%	143	139	(4)	6%	6%	0%
2020	1,190	1,209	19		69%	68%	-1%	144	146	2	6%	6%	0%
2021	1,153	1,170	17		71%	70%	-1%	143	145	2	6%	6%	0%
2022	1,140	1,154	14		72%	71%	-1%	140	142	2	6%	6%	0%
2023	1,125	1,137	12		73%	73%	0%	139	141	2	5%	6%	0%
2024	1,109	1,117	8		74%	74%	0%	138	140	2	5%	5%	0%
2025	1,089	1,096	7		75%	75%	0%	137	139	2	5%	5%	0%
2026	1,067	1,071	4		76%	76%	0%	136	138	2	5%	5%	0%
2027	1,042	1,043	1		77%	77%	0%	135	137	2	5%	5%	0%
2028	1,013	1,012	(1)		78%	78%	0%	134	136	2	5%	5%	0%
2029	982	978	(4)		79%	79%	0%	134	135	1	5%	5%	0%
2030	947	940	(7)		80%	80%	0%	134	135	1	5%	5%	0%
2031	908	900	(8)		81%	81%	0%	134	135	1	5%	5%	0%
2032	865	855	(10)		82%	82%	0%	134	135	1	4%	4%	0%
2033	818	807	(11)		84%	83%	-1%	135	136	1	4%	4%	0%
2034	766	754	(12)		85%	84%	-1%	134	136	2	4%	4%	0%
2035	709	696	(13)		86%	86%	0%	136	138	2	4%	4%	0%
2036	646	634	(12)		87%	87%	0%	137	139	2	4%	4%	0%
2037	578	566	(12)		89%	89%	0%	140	141	1	4%	4%	0%
2038	503	491	(12)		90%	90%	0%	141	143	2	4%	4%	0%
2039	421	410	(11)		92%	92%	0%	145	146	1	4%	4%	0%
2040	330	322	(8)		94%	94%	0%	147	148	1	4%	4%	0%
2041	231	228	(3)		96%	96%	0%	150	152	2	4%	4%	0%
2042	123	124	1		98%	98%	0%	155	156	1	4%	4%	0%
2043	-	-	-		100%	100%	0%	38	38	-	1%	1%	0%
2044	-	-	-		100%	100%	0%	38	39	1	1%	1%	0%
2045	-	-	-		100%	100%	0%	39	40	1	1%	1%	0%
2046	-	-	-		100%	100%	0%	39	40	1	1%	1%	0%
2047	-	-	-		100%	100%	0%	40	40	-	1%	1%	0%
2048	-	-	-		100%	100%	0%	40	41	1	1%	1%	0%
2049	-	-	-		100%	100%	0%	40	41	1	1%	1%	0%
2050	-	-	-		100%	100%	0%	40	41	1	1%	1%	0%
2051	-	-	-		100%	100%	0%	41	41	-	1%	1%	0%

**Kentucky Retirement Systems**  
**Exhibit 1-8**  
**CERS Hazardous Insurance Fund**  
**Comparison of Fiscal Impact**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Remaining Employer Contribution			Remaining Employer Contribution Rate		
	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference	Current	Proposed	Difference
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	\$ 591	\$ 591	\$ -	67%	67%	0%	\$ 50	\$ 50	\$ -	9%	9%	0%
2018	610	607	(3)	67%	67%	0%	63	55	(8)	12%	10%	-2%
2019	622	628	6	67%	67%	0%	62	61	(1)	12%	12%	0%
2020	619	627	8	68%	68%	0%	62	63	1	12%	12%	0%
2021	600	607	7	70%	70%	0%	61	62	1	12%	12%	0%
2022	592	599	7	71%	70%	-1%	59	60	1	11%	11%	0%
2023	583	591	8	72%	71%	-1%	57	59	2	11%	11%	0%
2024	574	581	7	72%	72%	0%	57	58	1	10%	11%	0%
2025	564	570	6	73%	72%	-1%	56	57	1	10%	10%	0%
2026	552	559	7	73%	73%	0%	57	57	-	10%	10%	0%
2027	540	545	5	74%	73%	-1%	55	57	2	10%	10%	0%
2028	525	530	5	74%	74%	0%	56	57	1	10%	10%	0%
2029	509	514	5	75%	75%	0%	56	57	1	9%	10%	0%
2030	491	496	5	76%	75%	-1%	58	58	-	9%	9%	0%
2031	471	475	4	76%	76%	0%	57	59	2	9%	9%	0%
2032	448	452	4	77%	77%	0%	58	60	2	9%	9%	0%
2033	424	427	3	78%	78%	0%	59	60	1	9%	9%	0%
2034	397	400	3	79%	79%	0%	60	62	2	9%	9%	0%
2035	367	369	2	80%	80%	0%	61	63	2	9%	9%	0%
2036	334	336	2	82%	82%	0%	62	64	2	9%	9%	0%
2037	298	299	1	84%	83%	-1%	64	65	1	9%	9%	0%
2038	259	261	2	86%	85%	-1%	65	66	1	9%	9%	0%
2039	216	217	1	88%	88%	0%	66	67	1	9%	9%	0%
2040	168	171	3	91%	90%	-1%	67	69	2	9%	9%	0%
2041	118	119	1	93%	93%	0%	69	70	1	9%	9%	0%
2042	62	63	1	97%	96%	-1%	70	72	2	9%	9%	0%
2043	-	-	-	100%	100%	0%	10	9	(1)	1%	1%	0%
2044	-	-	-	100%	100%	0%	10	9	(1)	1%	1%	0%
2045	-	-	-	100%	100%	0%	10	9	(1)	1%	1%	0%
2046	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%
2047	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%
2048	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%
2049	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%
2050	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%
2051	-	-	-	100%	100%	0%	10	10	-	1%	1%	0%

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)									
2017	\$	15,592	\$	2,124	\$	13,468	14%	\$	472	\$	58	\$	1,150	\$	157	\$	19	\$	382	41.06%	41.98%
2018		15,629		2,038		13,591	13%		826		59		1,164		275		19		387	71.03%	71.03%
2019		15,645		2,296		13,349	15%		839		59		1,181		279		20		393	71.03%	69.79%
2020		15,643		2,601		13,042	17%		823		60		1,201		274		20		400	68.54%	68.54%
2021		15,624		2,924		12,700	19%		838		61		1,222		278		20		406	68.54%	67.18%
2022		15,587		3,253		12,334	21%		815		62		1,243		271		21		413	65.54%	65.54%
2023		15,535		3,556		11,979	23%		830		63		1,266		275		21		420	65.54%	64.13%
2024		15,466		3,886		11,580	25%		807		65		1,290		268		21		428	62.57%	62.57%
2025		15,383		4,193		11,190	27%		822		66		1,315		273		22		436	62.57%	61.15%
2026		15,285		4,530		10,755	30%		799		67		1,340		265		22		445	59.60%	59.60%
2027		15,172		4,845		10,327	32%		813		68		1,365		271		23		454	59.60%	58.21%
2028		15,052		5,199		9,853	35%		789		70		1,391		263		23		463	56.71%	56.71%
2029		14,918		5,533		9,385	37%		804		71		1,419		268		24		472	56.71%	55.37%
2030		14,769		5,901		8,868	40%		780		72		1,447		260		24		482	53.90%	53.90%
2031		14,609		6,254		8,355	43%		797		74		1,478		265		25		492	53.90%	52.59%
2032		14,440		6,649		7,791	46%		771		76		1,509		257		25		503	51.10%	51.10%
2033		14,262		7,033		7,229	49%		788		77		1,542		263		26		514	51.10%	49.82%
2034		14,077		7,463		6,614	53%		761		79		1,576		254		26		525	48.33%	48.33%
2035		13,884		7,884		6,000	57%		778		80		1,610		260		27		537	48.33%	47.09%
2036		13,689		8,358		5,331	61%		752		82		1,648		251		28		550	45.62%	45.62%
2037		13,496		8,835		4,661	65%		771		85		1,689		257		28		564	45.62%	44.35%
2038		13,309		9,378		3,931	70%		740		86		1,732		247		29		578	42.75%	42.75%
2039		13,132		9,928		3,204	76%		758		88		1,775		254		30		593	42.75%	41.48%
2040		12,967		10,553		2,414	81%		722		91		1,819		241		30		608	39.68%	39.68%
2041		12,815		11,181		1,634	87%		740		93		1,864		247		31		623	39.68%	38.35%
2042		12,675		11,887		788	94%		672		95		1,908		225		32		639	35.22%	35.22%
2043		12,549		12,549		0	100%		57		97		1,954		19		33		654	2.93%	2.93%
2044		12,436		12,436		0	100%		58		99		1,999		19		34		670	2.89%	2.89%
2045		12,338		12,338		0	100%		58		103		2,046		20		34		685	2.86%	2.86%
2046		12,254		12,254		0	100%		59		105		2,093		20		35		701	2.84%	2.84%
2047		12,184		12,184		0	100%		61		107		2,141		20		36		717	2.82%	2.82%
2048		12,130		12,130		0	100%		61		109		2,190		21		37		734	2.80%	2.80%
2049		12,092		12,092		0	100%		62		112		2,240		21		38		750	2.79%	2.79%
2050		12,069		12,069		0	100%		64		115		2,291		21		38		767	2.79%	2.79%
2051		12,064		12,064		0	100%		65		117		2,342		22		39		785	2.78%	2.78%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

The employer contribution amount shown does not include the \$87 million additional contribution budgeted to be paid in fiscal year beginning 2017.

**Gabriel Roeder Smith & Company**

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability		Funded Ratio (3) / (2)		Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
									Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)		(3)		(4)		(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$	1,121	\$	607	\$	514	54%		\$ 34	\$ 13	\$ 158	\$ 1	\$ 0	\$ 4	21.44%	20.48%
2018		1,155		637		518	55%		56	13	162	1	0	4	34.39%	34.39%
2019		1,186		669		517	56%		57	14	166	1	0	4	34.39%	33.30%
2020		1,217		709		508	58%		56	14	170	1	0	4	32.60%	32.60%
2021		1,247		757		490	61%		57	14	175	1	0	4	32.60%	31.64%
2022		1,276		801		475	63%		54	15	179	1	0	4	30.23%	30.23%
2023		1,305		841		464	64%		56	15	184	1	0	4	30.23%	29.28%
2024		1,333		884		449	66%		54	15	188	1	0	5	28.30%	28.30%
2025		1,360		925		435	68%		55	16	192	1	0	5	28.30%	27.39%
2026		1,386		967		419	70%		52	16	197	1	0	5	26.47%	26.47%
2027		1,410		1,007		403	71%		54	16	201	1	0	5	26.47%	25.63%
2028		1,434		1,048		386	73%		51	17	206	1	0	5	24.72%	24.72%
2029		1,456		1,087		369	75%		52	17	211	1	0	5	24.72%	23.96%
2030		1,478		1,128		350	76%		50	18	217	1	0	5	23.16%	23.16%
2031		1,500		1,169		331	78%		52	18	224	1	0	5	23.16%	22.48%
2032		1,524		1,214		310	80%		50	19	231	1	0	5	21.75%	21.75%
2033		1,549		1,260		289	81%		52	19	237	1	0	5	21.75%	21.14%
2034		1,576		1,310		266	83%		50	20	243	1	0	6	20.47%	20.47%
2035		1,605		1,362		243	85%		51	20	250	1	0	6	20.47%	19.91%
2036		1,634		1,417		217	87%		50	21	257	1	0	6	19.29%	19.29%
2037		1,665		1,473		192	88%		51	22	263	1	0	6	19.29%	18.78%
2038		1,695		1,532		163	90%		49	22	270	1	0	6	18.16%	18.16%
2039		1,725		1,591		134	92%		50	23	276	1	0	6	18.16%	17.71%
2040		1,755		1,652		103	94%		48	23	282	1	0	6	17.15%	17.15%
2041		1,785		1,713		72	96%		49	23	287	1	0	6	17.15%	16.91%
2042		1,813		1,776		37	98%		48	23	292	1	1	7	16.55%	16.55%
2043		1,841		1,841		0	100%		13	23	298	0	1	7	4.10%	4.10%
2044		1,869		1,869		0	100%		13	24	304	0	1	7	4.10%	4.10%
2045		1,897		1,897		0	100%		13	24	311	0	1	7	4.10%	4.10%
2046		1,925		1,925		0	100%		13	25	318	0	1	7	4.10%	4.10%
2047		1,953		1,953		0	100%		14	26	326	0	1	7	4.10%	4.10%
2048		1,982		1,982		0	100%		14	26	332	0	1	8	4.10%	4.10%
2049		2,011		2,011		0	100%		14	27	340	0	1	8	4.10%	4.10%
2050		2,040		2,040		0	100%		15	27	348	0	1	8	4.10%	4.10%
2051		2,070		2,070		0	100%		15	28	356	0	1	8	4.10%	4.10%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

The employer contribution amount shown does not include the \$10 million additional contribution budgeted to be paid in fiscal year beginning 2017.

**Gabriel Roeder Smith & Company**



**Kentucky Retirement Systems**  
**Exhibit 2-3**  
**CERS Non-Hazardous Retirement Fund**  
**Current Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)									
2017	\$	12,804	\$	6,765	\$	6,039	53%	\$	332	\$	115	\$	2,292	\$	23	\$	8	\$	160	14.48%	14.48%
2018		13,121		6,902		6,219	53%		513		118		2,351		33		7		149	21.84%	21.84%
2019		13,421		7,122		6,299	53%		516		120		2,400		32		7		147	21.50%	21.50%
2020		13,704		7,412		6,292	54%		526		123		2,445		32		7		149	21.53%	21.53%
2021		13,970		7,805		6,165	56%		531		124		2,491		32		8		151	21.33%	21.33%
2022		14,218		8,119		6,099	57%		529		127		2,536		32		8		154	20.86%	20.86%
2023		14,445		8,419		6,026	58%		533		129		2,583		32		8		157	20.64%	20.64%
2024		14,652		8,711		5,941	59%		538		132		2,631		32		8		159	20.43%	20.43%
2025		14,836		8,996		5,840	61%		542		134		2,680		33		8		162	20.22%	20.22%
2026		14,998		9,273		5,725	62%		547		137		2,729		33		8		165	20.03%	20.03%
2027		15,136		9,541		5,595	63%		552		139		2,780		33		8		168	19.84%	19.84%
2028		15,259		9,813		5,446	64%		557		141		2,832		34		9		171	19.67%	19.67%
2029		15,359		10,079		5,280	66%		563		144		2,887		34		9		175	19.50%	19.50%
2030		15,438		10,344		5,094	67%		570		147		2,946		34		9		178	19.34%	19.34%
2031		15,496		10,611		4,885	68%		576		150		3,006		35		9		181	19.18%	19.18%
2032		15,536		10,882		4,654	70%		584		154		3,069		35		9		185	19.03%	19.03%
2033		15,558		11,161		4,397	72%		592		157		3,135		35		9		188	18.88%	18.88%
2034		15,565		11,450		4,115	74%		600		160		3,202		36		10		192	18.74%	18.74%
2035		15,556		11,753		3,803	76%		609		163		3,271		36		10		196	18.61%	18.61%
2036		15,535		12,073		3,462	78%		618		167		3,345		37		10		200	18.49%	18.49%
2037		15,507		12,420		3,087	80%		628		171		3,423		38		10		205	18.37%	18.37%
2038		15,478		12,801		2,677	83%		640		176		3,505		38		10		209	18.25%	18.25%
2039		15,451		13,221		2,230	86%		651		179		3,589		39		11		214	18.14%	18.14%
2040		15,428		13,686		1,742	89%		663		184		3,676		40		11		219	18.04%	18.04%
2041		15,413		14,202		1,211	92%		675		188		3,764		40		11		224	17.94%	17.94%
2042		15,406		14,772		634	96%		689		193		3,854		41		11		229	17.87%	17.87%
2043		15,409		15,409		0	100%		74		197		3,945		4		12		234	1.87%	1.87%
2044		15,423		15,423		0	100%		75		202		4,038		4		12		239	1.85%	1.85%
2045		15,449		15,449		0	100%		76		207		4,133		4		12		244	1.83%	1.83%
2046		15,488		15,488		0	100%		77		211		4,228		5		13		250	1.82%	1.82%
2047		15,540		15,540		0	100%		78		216		4,326		5		13		255	1.81%	1.81%
2048		15,606		15,606		0	100%		79		221		4,425		5		13		261	1.80%	1.80%
2049		15,687		15,687		0	100%		81		227		4,525		5		13		267	1.79%	1.79%
2050		15,783		15,783		0	100%		83		231		4,628		5		14		273	1.79%	1.79%
2051		15,895		15,895		0	100%		84		237		4,732		5		14		280	1.78%	1.78%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**Gabriel Roeder Smith & Company**

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)		(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)							
2017	\$	4,649	\$	2,238	\$	2,411	48%	\$	117	\$	42	\$	529	\$	3	\$	1	\$	13	22.20%	22.20%
2018		4,771		2,293		2,478	48%		187		42		524		5		1		13	35.69%	35.69%
2019		4,880		2,376		2,504	49%		188		42		525		5		1		13	35.95%	35.95%
2020		4,978		2,478		2,500	50%		192		42		529		5		1		13	36.42%	36.42%
2021		5,066		2,610		2,456	52%		194		43		533		5		1		13	36.48%	36.48%
2022		5,145		2,712		2,433	53%		194		43		538		5		1		13	36.06%	36.06%
2023		5,214		2,809		2,405	54%		196		44		545		5		1		13	35.95%	35.95%
2024		5,274		2,902		2,372	55%		197		44		552		5		1		13	35.81%	35.81%
2025		5,325		2,992		2,333	56%		199		45		560		5		1		13	35.66%	35.66%
2026		5,367		3,079		2,288	57%		202		46		568		5		1		14	35.49%	35.49%
2027		5,400		3,164		2,236	59%		204		46		578		5		1		14	35.32%	35.32%
2028		5,426		3,248		2,178	60%		207		47		588		5		1		14	35.14%	35.14%
2029		5,444		3,333		2,111	61%		210		48		600		5		1		14	34.96%	34.96%
2030		5,457		3,420		2,037	63%		213		49		613		5		1		15	34.75%	34.75%
2031		5,466		3,512		1,954	64%		217		50		627		5		1		15	34.54%	34.54%
2032		5,472		3,611		1,861	66%		220		52		642		5		1		15	34.33%	34.33%
2033		5,478		3,719		1,759	68%		224		53		657		5		1		15	34.12%	34.12%
2034		5,483		3,837		1,646	70%		228		54		672		5		1		16	33.92%	33.92%
2035		5,489		3,967		1,522	72%		233		55		689		5		1		16	33.73%	33.73%
2036		5,495		4,110		1,385	75%		236		57		704		6		1		17	33.56%	33.56%
2037		5,502		4,267		1,235	78%		241		58		721		6		1		17	33.40%	33.40%
2038		5,510		4,439		1,071	81%		245		59		738		6		1		17	33.26%	33.26%
2039		5,519		4,627		892	84%		250		61		755		6		1		18	33.13%	33.13%
2040		5,528		4,831		697	87%		255		62		773		6		1		18	33.02%	33.02%
2041		5,540		5,056		484	91%		261		63		790		6		2		19	32.94%	32.94%
2042		5,555		5,301		254	95%		266		64		809		6		2		19	32.89%	32.89%
2043		5,573		5,573		0	100%		12		66		829		0		2		19	1.41%	1.41%
2044		5,595		5,595		0	100%		12		67		847		0		2		20	1.40%	1.40%
2045		5,619		5,619		0	100%		12		69		867		0		2		20	1.40%	1.40%
2046		5,646		5,646		0	100%		13		71		886		0		2		21	1.40%	1.40%
2047		5,674		5,674		0	100%		13		72		906		0		2		21	1.40%	1.40%
2048		5,704		5,704		0	100%		13		74		926		0		2		22	1.40%	1.40%
2049		5,736		5,736		0	100%		14		76		948		0		2		22	1.40%	1.40%
2050		5,769		5,769		0	100%		14		77		969		0		2		23	1.40%	1.40%
2051		5,803		5,803		0	100%		14		79		991		0		2		23	1.40%	1.40%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 2-5**  
**KERS Non-Hazardous Insurance Fund**  
**Current Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 2,683	\$ 824	\$ 1,859	31%	\$ 96	\$ 4	\$ 1,143	\$ 32	\$ 1	\$ 381	8.41%	8.41%
2018	2,760	874	1,886	32%	143	4	1,155	48	2	386	12.40%	12.40%
2019	2,837	975	1,862	34%	145	5	1,172	49	2	392	12.40%	12.09%
2020	2,907	1,087	1,820	37%	141	6	1,191	47	2	399	11.81%	11.81%
2021	2,972	1,202	1,770	40%	143	7	1,212	48	2	405	11.81%	11.50%
2022	3,032	1,311	1,721	43%	136	8	1,233	46	2	412	11.09%	11.09%
2023	3,085	1,411	1,674	46%	140	7	1,256	46	3	419	11.09%	10.77%
2024	3,133	1,512	1,621	48%	133	8	1,279	45	3	427	10.44%	10.44%
2025	3,174	1,604	1,570	51%	136	9	1,303	45	3	435	10.44%	10.12%
2026	3,208	1,698	1,510	53%	130	10	1,329	43	3	443	9.76%	9.76%
2027	3,235	1,781	1,454	55%	132	11	1,354	44	3	452	9.76%	9.47%
2028	3,254	1,864	1,390	57%	126	11	1,380	42	4	461	9.13%	9.13%
2029	3,264	1,937	1,327	59%	128	11	1,407	43	4	470	9.13%	8.82%
2030	3,265	2,010	1,255	62%	121	12	1,435	41	4	480	8.48%	8.48%
2031	3,259	2,072	1,187	64%	124	13	1,466	42	4	490	8.48%	8.23%
2032	3,248	2,139	1,109	66%	118	14	1,497	40	4	501	7.92%	7.92%
2033	3,233	2,200	1,033	68%	121	14	1,529	41	5	512	7.92%	7.68%
2034	3,215	2,268	947	71%	116	15	1,562	39	5	523	7.42%	7.42%
2035	3,195	2,332	863	73%	118	15	1,597	40	5	535	7.42%	7.20%
2036	3,175	2,406	769	76%	113	16	1,635	38	5	548	6.94%	6.94%
2037	3,156	2,481	675	79%	116	17	1,675	39	5	562	6.94%	6.74%
2038	3,141	2,569	572	82%	112	17	1,717	37	6	576	6.48%	6.48%
2039	3,129	2,660	469	85%	114	17	1,760	38	6	591	6.48%	6.28%
2040	3,122	2,767	355	89%	109	18	1,804	36	6	606	6.02%	6.02%
2041	3,120	2,878	242	92%	112	19	1,848	37	6	621	6.02%	5.83%
2042	3,122	3,004	118	96%	101	19	1,893	34	6	636	5.35%	5.35%
2043	3,131	3,131	0	100%	10	19	1,937	3	7	652	0.49%	0.49%
2044	3,144	3,144	0	100%	10	19	1,983	3	7	667	0.49%	0.49%
2045	3,162	3,162	0	100%	10	20	2,029	3	7	683	0.48%	0.48%
2046	3,184	3,184	0	100%	10	21	2,075	3	7	699	0.48%	0.48%
2047	3,208	3,208	0	100%	11	21	2,123	3	7	715	0.48%	0.48%
2048	3,233	3,233	0	100%	10	22	2,172	4	7	731	0.48%	0.48%
2049	3,260	3,260	0	100%	9	23	2,221	3	7	748	0.42%	0.42%
2050	3,287	3,287	0	100%	9	22	2,271	3	8	765	0.41%	0.41%
2051	3,315	3,315	0	100%	9	23	2,323	3	8	782	0.40%	0.40%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 2-6**  
**KERS Hazardous Insurance Fund**  
**Current Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability		Funded Ratio (3) / (2)		Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
									Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)		(3)		(4)		(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$	419	\$	493	\$	(74)	118%		\$ 4	\$ 1	\$ 158	\$ 0	\$ 0	\$ 4	2.26%	1.34%
2018		436		507		(71)	116%		4	1	161	0	0	4	2.46%	2.46%
2019		453		516		(63)	114%		4	1	165	0	0	4	2.46%	2.15%
2020		468		529		(61)	113%		4	1	170	0	0	4	2.11%	2.11%
2021		482		548		(66)	114%		4	1	174	0	0	4	2.11%	1.84%
2022		494		559		(65)	113%		2	1	178	0	0	5	1.21%	1.21%
2023		504		568		(64)	113%		2	1	182	0	0	5	1.21%	0.91%
2024		513		575		(62)	112%		1	1	187	0	0	5	0.65%	0.65%
2025		520		581		(61)	112%		1	2	192	0	0	5	0.65%	0.50%
2026		525		585		(60)	111%		1	2	196	0	0	5	0.35%	0.35%
2027		530		587		(57)	111%		1	2	201	0	0	5	0.35%	0.25%
2028		534		589		(55)	110%		0	2	205	0	0	5	0.14%	0.14%
2029		537		590		(53)	110%		0	2	211	0	0	5	0.14%	0.09%
2030		540		590		(50)	109%		0	2	217	0	0	5	0.07%	0.07%
2031		543		590		(47)	109%		0	2	223	0	0	5	0.07%	0.10%
2032		546		590		(44)	108%		0	2	230	0	0	5	0.15%	0.15%
2033		550		590		(40)	107%		0	2	236	0	0	6	0.15%	0.20%
2034		554		591		(37)	107%		1	2	243	0	0	6	0.25%	0.25%
2035		559		592		(33)	106%		1	3	249	0	0	6	0.25%	0.31%
2036		565		594		(29)	105%		1	3	256	0	0	6	0.39%	0.39%
2037		572		597		(25)	104%		1	3	263	0	0	6	0.39%	0.43%
2038		580		601		(21)	104%		1	3	269	0	0	6	0.49%	0.49%
2039		588		605		(17)	103%		1	3	275	0	0	6	0.49%	0.54%
2040		598		610		(12)	102%		2	3	280	0	0	7	0.63%	0.63%
2041		608		616		(8)	101%		2	3	285	0	0	7	0.63%	0.68%
2042		618		622		(4)	101%		3	3	291	0	0	7	0.86%	0.86%
2043		629		629		0	100%		7	3	297	0	0	7	2.14%	2.14%
2044		640		640		0	100%		7	3	304	0	0	7	2.11%	2.11%
2045		651		651		0	100%		7	3	311	0	0	7	2.07%	2.07%
2046		662		662		0	100%		7	3	318	0	0	7	2.05%	2.05%
2047		673		673		0	100%		7	3	324	0	0	8	2.02%	2.02%
2048		685		685		0	100%		7	3	332	0	0	8	1.99%	1.99%
2049		696		696		0	100%		7	3	340	0	0	8	1.97%	1.97%
2050		707		707		0	100%		7	4	347	0	0	8	1.95%	1.95%
2051		718		718		0	100%		7	4	356	0	0	8	1.92%	1.92%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 2-7**  
**CERS Non-Hazardous Insurance Fund**  
**Current Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 3,355	\$ 2,227	\$ 1,128	66%	\$ 106	\$ 9	\$ 2,268	\$ 8	\$ 1	\$ 161	4.70%	4.70%
2018	3,514	2,343	1,171	67%	144	10	2,313	10	1	164	6.21%	6.21%
2019	3,667	2,475	1,192	67%	143	12	2,357	10	1	167	6.06%	6.06%
2020	3,813	2,623	1,190	69%	144	13	2,402	10	1	170	5.98%	5.98%
2021	3,951	2,798	1,153	71%	143	14	2,446	10	1	173	5.84%	5.84%
2022	4,081	2,941	1,140	72%	140	16	2,492	10	1	176	5.62%	5.62%
2023	4,202	3,077	1,125	73%	139	17	2,538	10	1	180	5.48%	5.48%
2024	4,315	3,206	1,109	74%	138	18	2,585	10	1	183	5.35%	5.35%
2025	4,419	3,330	1,089	75%	137	19	2,633	10	1	187	5.21%	5.21%
2026	4,514	3,447	1,067	76%	136	21	2,682	10	1	191	5.08%	5.08%
2027	4,600	3,558	1,042	77%	135	21	2,732	10	2	194	4.96%	4.96%
2028	4,676	3,663	1,013	78%	134	22	2,784	10	2	198	4.83%	4.83%
2029	4,745	3,763	982	79%	134	24	2,838	10	2	202	4.72%	4.72%
2030	4,807	3,860	947	80%	134	25	2,897	9	2	205	4.60%	4.60%
2031	4,862	3,954	908	81%	134	26	2,957	9	2	209	4.51%	4.51%
2032	4,912	4,047	865	82%	134	27	3,018	9	2	214	4.42%	4.42%
2033	4,958	4,140	818	84%	135	29	3,083	9	2	218	4.35%	4.35%
2034	5,002	4,236	766	85%	134	30	3,150	10	2	222	4.28%	4.28%
2035	5,045	4,336	709	86%	136	31	3,218	10	2	227	4.23%	4.23%
2036	5,089	4,443	646	87%	137	32	3,290	10	2	232	4.18%	4.18%
2037	5,135	4,557	578	89%	140	33	3,368	10	2	237	4.15%	4.15%
2038	5,184	4,681	503	90%	141	34	3,448	10	2	243	4.10%	4.10%
2039	5,235	4,814	421	92%	145	35	3,532	10	2	248	4.09%	4.09%
2040	5,289	4,959	330	94%	147	35	3,619	10	3	253	4.06%	4.06%
2041	5,347	5,116	231	96%	150	36	3,706	10	3	259	4.04%	4.04%
2042	5,409	5,286	123	98%	155	37	3,794	11	3	265	4.08%	4.08%
2043	5,475	5,475	0	100%	38	38	3,885	3	3	271	0.98%	0.98%
2044	5,545	5,545	0	100%	38	39	3,976	3	3	277	0.97%	0.97%
2045	5,619	5,619	0	100%	39	40	4,069	3	3	283	0.97%	0.97%
2046	5,696	5,696	0	100%	39	41	4,164	3	3	289	0.95%	0.95%
2047	5,775	5,775	0	100%	40	43	4,260	3	3	295	0.94%	0.94%
2048	5,855	5,855	0	100%	40	44	4,358	3	3	302	0.92%	0.92%
2049	5,937	5,937	0	100%	40	45	4,458	3	3	308	0.91%	0.91%
2050	6,019	6,019	0	100%	40	46	4,559	3	3	315	0.89%	0.89%
2051	6,102	6,102	0	100%	41	47	4,663	3	3	322	0.88%	0.88%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.



**Kentucky Retirement Systems**  
**Exhibit 2-8**  
**CERS Hazardous Insurance Fund**  
**Current Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)		(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)							
2017	\$	1,788	\$	1,197	\$	591	67%	\$	50	\$	2	\$	526	\$	1	\$	0	\$	15	9.35%	9.35%
2018		1,853		1,243		610	67%		63		2		522		2		0		14	12.17%	12.17%
2019		1,912		1,290		622	67%		62		3		523		2		0		15	11.97%	11.97%
2020		1,962		1,343		619	68%		62		3		526		2		0		15	11.83%	11.83%
2021		2,005		1,405		600	70%		61		3		531		2		0		15	11.52%	11.52%
2022		2,038		1,446		592	71%		59		4		536		2		0		15	11.00%	11.00%
2023		2,061		1,478		583	72%		57		4		543		2		0		15	10.66%	10.66%
2024		2,075		1,501		574	72%		57		4		550		2		0		15	10.37%	10.37%
2025		2,081		1,517		564	73%		56		5		558		2		0		15	10.12%	10.12%
2026		2,078		1,526		552	73%		57		5		567		1		0		15	9.89%	9.89%
2027		2,068		1,528		540	74%		55		5		575		2		0		16	9.71%	9.71%
2028		2,052		1,527		525	74%		56		5		586		2		0		16	9.57%	9.57%
2029		2,031		1,522		509	75%		56		6		598		2		0		16	9.43%	9.43%
2030		2,008		1,517		491	76%		58		6		611		1		0		16	9.33%	9.33%
2031		1,982		1,511		471	76%		57		6		624		2		0		17	9.24%	9.24%
2032		1,954		1,506		448	77%		58		6		639		2		0		17	9.16%	9.16%
2033		1,927		1,503		424	78%		59		7		654		2		0		18	9.09%	9.09%
2034		1,899		1,502		397	79%		60		7		670		2		0		18	9.03%	9.03%
2035		1,873		1,506		367	80%		61		7		686		2		0		18	8.98%	8.98%
2036		1,849		1,515		334	82%		62		7		702		2		0		19	8.93%	8.93%
2037		1,828		1,530		298	84%		64		7		719		2		0		19	8.89%	8.89%
2038		1,811		1,552		259	86%		65		8		735		2		0		20	8.85%	8.85%
2039		1,796		1,580		216	88%		66		8		752		2		0		20	8.82%	8.82%
2040		1,785		1,617		168	91%		67		8		769		2		0		21	8.79%	8.79%
2041		1,779		1,661		118	93%		69		8		788		2		0		21	8.77%	8.77%
2042		1,776		1,714		62	97%		70		8		806		2		0		22	8.75%	8.75%
2043		1,777		1,777		0	100%		10		8		825		0		0		22	1.13%	1.13%
2044		1,782		1,782		0	100%		10		9		843		0		0		23	1.11%	1.11%
2045		1,789		1,789		0	100%		10		9		863		0		0		23	1.10%	1.10%
2046		1,799		1,799		0	100%		10		9		882		0		0		24	1.08%	1.08%
2047		1,811		1,811		0	100%		10		9		902		0		0		24	1.07%	1.07%
2048		1,823		1,823		0	100%		10		9		922		0		0		25	1.06%	1.06%
2049		1,836		1,836		0	100%		10		10		944		0		0		25	1.04%	1.04%
2050		1,847		1,847		0	100%		10		10		965		0		0		26	1.03%	1.03%
2051		1,859		1,859		0	100%		10		10		987		0		0		26	1.01%	1.01%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**Gabriel Roeder Smith & Company**

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)		(3)		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)							
2017	\$	15,592	\$	2,124	\$	13,468	14%	\$	472	\$	58	\$	1,150	\$	157	\$	19	\$	382	41.06%	41.98%
2018		15,367		2,038		13,329	13%		827		59		1,164		164		19		387	71.03%	71.03%
2019		15,320		2,165		13,155	14%		839		59		1,181		164		0		0	71.03%	77.61%
2020		15,234		2,310		12,924	15%		924		60		1,201		164		0		0	76.93%	76.93%
2021		15,128		2,573		12,555	17%		940		61		1,222		164		0		0	76.93%	75.43%
2022		15,009		2,841		12,168	19%		915		62		1,243		164		0		0	73.57%	73.57%
2023		14,875		3,093		11,782	21%		931		63		1,266		163		0		0	73.57%	71.99%
2024		14,730		3,371		11,359	23%		906		65		1,290		162		0		0	70.26%	70.26%
2025		14,572		3,635		10,937	25%		923		66		1,315		162		0		0	70.26%	68.69%
2026		14,403		3,929		10,474	27%		897		67		1,340		162		0		0	66.98%	66.98%
2027		14,222		4,211		10,011	30%		914		68		1,365		160		0		0	66.98%	65.44%
2028		14,038		4,533		9,505	32%		887		70		1,391		159		0		0	63.77%	63.77%
2029		13,843		4,842		9,001	35%		905		71		1,419		158		0		0	63.77%	62.30%
2030		13,638		5,188		8,450	38%		878		72		1,447		147		0		0	60.66%	60.66%
2031		13,423		5,515		7,908	41%		897		74		1,478		121		0		0	60.66%	59.20%
2032		13,201		5,857		7,344	44%		869		76		1,509		115		0		0	57.54%	57.54%
2033		12,971		6,188		6,783	48%		887		77		1,542		112		0		0	57.54%	56.12%
2034		12,735		6,558		6,177	51%		858		79		1,576		107		0		0	54.46%	54.46%
2035		12,492		6,921		5,571	55%		877		80		1,610		96		0		0	54.46%	53.08%
2036		12,247		7,322		4,925	60%		848		82		1,648		86		0		0	51.44%	51.44%
2037		12,004		7,720		4,284	64%		869		85		1,689		64		0		0	51.44%	50.01%
2038		11,766		8,154		3,612	69%		835		86		1,732		49		0		0	48.21%	48.21%
2039		11,536		8,582		2,954	74%		856		88		1,775		40		0		0	48.21%	46.78%
2040		11,316		9,066		2,250	80%		814		91		1,819		39		0		0	44.74%	44.74%
2041		11,108		9,553		1,555	86%		834		93		1,864		32		0		0	44.74%	43.23%
2042		10,910		10,103		807	93%		757		95		1,908		30		0		0	39.67%	39.67%
2043		10,725		10,725		0	100%		57		97		1,954		29		0		0	2.91%	2.91%
2044		10,553		10,553		0	100%		57		99		1,999		26		0		0	2.87%	2.87%
2045		10,393		10,393		0	100%		58		103		2,046		22		0		0	2.84%	2.84%
2046		10,247		10,247		0	100%		59		105		2,093		19		0		0	2.82%	2.82%
2047		10,115		10,115		0	100%		60		107		2,141		17		0		0	2.80%	2.80%
2048		9,998		9,998		0	100%		61		109		2,190		16		0		0	2.79%	2.79%
2049		9,896		9,896		0	100%		62		112		2,240		0		0		0	2.78%	2.78%
2050		9,810		9,810		0	100%		63		115		2,291		0		0		0	2.77%	2.77%
2051		9,740		9,740		0	100%		65		117		2,342		0		0		0	2.76%	2.76%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

The employer contribution amount shown does not include the \$87 million additional contribution budgeted to be paid in fiscal year beginning 2017.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**



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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 1,121	\$ 607	\$ 514	54%	\$ 34	\$ 13	\$ 158	\$ 1	\$ 0	\$ 4	21.44%	20.48%
2018	1,152	637	515	55%	56	13	162	1	0	4	34.39%	34.39%
2019	1,183	668	515	56%	57	14	166	1	0	0	34.39%	33.30%
2020	1,212	708	504	58%	55	14	170	1	0	0	32.61%	32.61%
2021	1,241	755	486	61%	57	14	175	1	0	0	32.61%	31.66%
2022	1,269	797	472	63%	54	15	179	1	0	0	30.23%	30.23%
2023	1,296	837	459	65%	55	15	184	1	0	0	30.23%	29.27%
2024	1,323	879	444	66%	53	15	188	1	0	0	28.28%	28.28%
2025	1,349	919	430	68%	54	16	192	1	0	0	28.28%	27.38%
2026	1,374	960	414	70%	52	16	197	1	0	0	26.45%	26.45%
2027	1,397	999	398	72%	53	16	201	1	0	0	26.45%	25.61%
2028	1,419	1,039	380	73%	51	17	206	1	0	0	24.70%	24.70%
2029	1,441	1,077	364	75%	52	17	211	1	0	0	24.70%	23.94%
2030	1,461	1,118	343	77%	50	18	217	1	0	0	23.13%	23.13%
2031	1,483	1,158	325	78%	52	18	224	0	0	0	23.13%	22.47%
2032	1,505	1,201	304	80%	50	19	231	0	0	0	21.73%	21.73%
2033	1,530	1,246	284	81%	51	19	237	0	0	0	21.73%	21.13%
2034	1,556	1,295	261	83%	50	20	243	0	0	0	20.46%	20.46%
2035	1,583	1,345	238	85%	51	20	250	0	0	0	20.46%	19.90%
2036	1,612	1,399	213	87%	50	21	257	0	0	0	19.29%	19.29%
2037	1,641	1,453	188	89%	51	22	263	0	0	0	19.29%	18.78%
2038	1,671	1,511	160	90%	49	22	270	0	0	0	18.14%	18.14%
2039	1,700	1,568	132	92%	50	23	276	0	0	0	18.14%	17.70%
2040	1,729	1,628	101	94%	48	23	282	0	0	0	17.15%	17.15%
2041	1,757	1,687	70	96%	49	23	287	0	0	0	17.15%	16.90%
2042	1,785	1,748	37	98%	48	23	292	0	0	0	16.52%	16.52%
2043	1,812	1,812	0	100%	12	23	298	0	0	0	4.10%	4.10%
2044	1,839	1,839	0	100%	12	24	304	0	0	0	4.09%	4.09%
2045	1,866	1,866	0	100%	13	24	311	0	0	0	4.09%	4.09%
2046	1,893	1,893	0	100%	13	25	318	0	0	0	4.09%	4.09%
2047	1,920	1,920	0	100%	13	26	326	0	0	0	4.10%	4.10%
2048	1,947	1,947	0	100%	14	26	332	0	0	0	4.10%	4.10%
2049	1,976	1,976	0	100%	14	27	340	0	0	0	4.10%	4.10%
2050	2,004	2,004	0	100%	14	27	348	0	0	0	4.10%	4.10%
2051	2,033	2,033	0	100%	15	28	356	0	0	0	4.10%	4.10%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

The employer contribution amount shown does not include the \$10 million additional contribution budgeted to be paid in fiscal year beginning 2017.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate							
							Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)									
2017	\$	12,804	\$	6,765	\$	6,039	53%	\$	332	\$	115	\$	2,292	\$	23	\$	8	\$	160	14.48%	14.48%
2018		13,047		6,902		6,145	53%		381		118		2,351		24		7		149	16.22%	21.84%
2019		13,326		6,970		6,356	52%		436		120		2,400		24		0		0	18.16%	21.94%
2020		13,580		7,145		6,435	53%		497		123		2,445		24		0		0	20.34%	22.19%
2021		13,816		7,469		6,347	54%		551		124		2,491		24		0		0	22.13%	22.13%
2022		14,034		7,762		6,272	55%		549		127		2,536		24		0		0	21.64%	21.64%
2023		14,232		8,041		6,191	56%		553		129		2,583		24		0		0	21.42%	21.42%
2024		14,411		8,315		6,096	58%		557		132		2,631		24		0		0	21.19%	21.19%
2025		14,568		8,581		5,987	59%		562		134		2,680		24		0		0	20.99%	20.99%
2026		14,704		8,840		5,864	60%		567		137		2,729		23		0		0	20.79%	20.79%
2027		14,816		9,093		5,723	61%		573		139		2,780		23		0		0	20.61%	20.61%
2028		14,914		9,350		5,564	63%		579		141		2,832		23		0		0	20.44%	20.44%
2029		14,991		9,604		5,387	64%		585		144		2,887		23		0		0	20.27%	20.27%
2030		15,047		9,858		5,189	66%		592		147		2,946		22		0		0	20.11%	20.11%
2031		15,084		10,114		4,970	67%		600		150		3,006		21		0		0	19.96%	19.96%
2032		15,103		10,375		4,728	69%		608		154		3,069		21		0		0	19.80%	19.80%
2033		15,106		10,646		4,460	70%		616		157		3,135		20		0		0	19.65%	19.65%
2034		15,093		10,926		4,167	72%		625		160		3,202		16		0		0	19.51%	19.51%
2035		15,065		11,217		3,848	74%		634		163		3,271		15		0		0	19.37%	19.37%
2036		15,026		11,525		3,501	77%		644		167		3,345		15		0		0	19.24%	19.24%
2037		14,980		11,859		3,121	79%		654		171		3,423		12		0		0	19.12%	19.12%
2038		14,933		12,225		2,708	82%		666		176		3,505		11		0		0	19.00%	19.00%
2039		14,888		12,629		2,259	85%		678		179		3,589		10		0		0	18.89%	18.89%
2040		14,847		13,078		1,769	88%		690		184		3,676		9		0		0	18.78%	18.78%
2041		14,814		13,575		1,239	92%		703		188		3,764		9		0		0	18.67%	18.67%
2042		14,789		14,126		663	96%		718		193		3,854		8		0		0	18.62%	18.62%
2043		14,774		14,774		0	100%		74		197		3,945		7		0		0	1.87%	1.87%
2044		14,770		14,770		0	100%		75		202		4,038		7		0		0	1.85%	1.85%
2045		14,778		14,778		0	100%		76		207		4,133		7		0		0	1.83%	1.83%
2046		14,799		14,799		0	100%		77		211		4,228		5		0		0	1.81%	1.81%
2047		14,834		14,834		0	100%		78		216		4,326		5		0		0	1.80%	1.80%
2048		14,882		14,882		0	100%		79		221		4,425		4		0		0	1.79%	1.79%
2049		14,945		14,945		0	100%		81		227		4,525		0		0		0	1.79%	1.79%
2050		15,023		15,023		0	100%		82		231		4,628		0		0		0	1.78%	1.78%
2051		15,117		15,117		0	100%		84		237		4,732		0		0		0	1.78%	1.78%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 4,649	\$ 2,238	\$ 2,411	48%	\$ 117	\$ 42	\$ 529	\$ 3	\$ 1	\$ 13	22.20%	22.20%
2018	4,767	2,293	2,474	48%	130	42	524	2	1	13	24.86%	35.69%
2019	4,873	2,314	2,559	47%	146	42	525	2	0	0	27.85%	37.02%
2020	4,968	2,364	2,604	48%	165	42	529	2	0	0	31.19%	38.13%
2021	5,053	2,456	2,597	49%	186	43	533	3	0	0	34.93%	38.70%
2022	5,128	2,537	2,591	49%	208	43	538	3	0	0	38.55%	38.55%
2023	5,194	2,633	2,561	51%	210	44	545	3	0	0	38.46%	38.46%
2024	5,251	2,726	2,525	52%	212	44	552	3	0	0	38.33%	38.33%
2025	5,300	2,816	2,484	53%	214	45	560	3	0	0	38.20%	38.20%
2026	5,339	2,904	2,435	54%	216	46	568	3	0	0	38.04%	38.04%
2027	5,370	2,990	2,380	56%	219	46	578	3	0	0	37.88%	37.88%
2028	5,394	3,077	2,317	57%	222	47	588	3	0	0	37.70%	37.70%
2029	5,410	3,164	2,246	58%	225	48	600	3	0	0	37.52%	37.52%
2030	5,421	3,254	2,167	60%	229	49	613	3	0	0	37.32%	37.32%
2031	5,428	3,351	2,077	62%	233	50	627	3	0	0	37.10%	37.10%
2032	5,433	3,454	1,979	64%	237	52	642	3	0	0	36.89%	36.89%
2033	5,436	3,567	1,869	66%	241	53	657	2	0	0	36.66%	36.66%
2034	5,439	3,691	1,748	68%	245	54	672	2	0	0	36.44%	36.44%
2035	5,443	3,827	1,616	70%	249	55	689	2	0	0	36.24%	36.24%
2036	5,447	3,977	1,470	73%	254	57	704	2	0	0	36.06%	36.06%
2037	5,451	4,141	1,310	76%	259	58	721	1	0	0	35.89%	35.89%
2038	5,456	4,320	1,136	79%	264	59	738	1	0	0	35.74%	35.74%
2039	5,462	4,515	947	83%	269	61	755	1	0	0	35.60%	35.60%
2040	5,469	4,728	741	86%	274	62	773	1	0	0	35.49%	35.49%
2041	5,478	4,962	516	91%	280	63	790	1	0	0	35.39%	35.39%
2042	5,490	5,218	272	95%	286	64	809	1	0	0	35.32%	35.32%
2043	5,505	5,505	0	100%	12	66	829	1	0	0	1.40%	1.40%
2044	5,523	5,523	0	100%	12	67	847	1	0	0	1.39%	1.39%
2045	5,544	5,544	0	100%	12	69	867	1	0	0	1.39%	1.39%
2046	5,567	5,567	0	100%	12	71	886	1	0	0	1.39%	1.39%
2047	5,593	5,593	0	100%	13	72	906	1	0	0	1.39%	1.39%
2048	5,619	5,619	0	100%	13	74	926	1	0	0	1.39%	1.39%
2049	5,648	5,648	0	100%	13	76	948	0	0	0	1.39%	1.39%
2050	5,677	5,677	0	100%	13	77	969	0	0	0	1.39%	1.39%
2051	5,708	5,708	0	100%	14	79	991	0	0	0	1.39%	1.39%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 3-5**  
**KERS Non-Hazardous Insurance Fund**  
**Proposed Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 2,683	\$ 824	\$ 1,859	31%	\$ 96	\$ 4	\$ 1,143	\$ 32	\$ 1	\$ 381	8.41%	8.41%
2018	2,742	874	1,868	32%	143	4	1,155	34	2	386	12.40%	12.40%
2019	2,805	959	1,846	34%	145	5	1,172	34	0	0	12.40%	12.36%
2020	2,858	1,048	1,810	37%	144	6	1,191	34	0	0	12.12%	12.12%
2021	2,899	1,140	1,759	39%	147	7	1,212	34	0	0	12.12%	11.80%
2022	2,936	1,225	1,711	42%	140	8	1,233	34	0	0	11.38%	11.38%
2023	2,967	1,303	1,664	44%	143	7	1,256	34	0	0	11.38%	11.05%
2024	2,992	1,381	1,611	46%	137	8	1,279	34	0	0	10.70%	10.70%
2025	3,012	1,453	1,559	48%	139	9	1,303	34	0	0	10.70%	10.37%
2026	3,026	1,526	1,500	50%	133	10	1,329	33	0	0	10.02%	10.02%
2027	3,033	1,590	1,443	52%	136	11	1,354	34	0	0	10.02%	9.70%
2028	3,032	1,655	1,377	55%	129	11	1,380	33	0	0	9.35%	9.35%
2029	3,025	1,712	1,313	57%	132	11	1,407	33	0	0	9.35%	9.04%
2030	3,010	1,768	1,242	59%	125	12	1,435	33	0	0	8.71%	8.71%
2031	2,989	1,818	1,171	61%	128	13	1,466	33	0	0	8.71%	8.43%
2032	2,963	1,871	1,092	63%	122	14	1,497	30	0	0	8.12%	8.12%
2033	2,934	1,917	1,017	65%	124	14	1,529	30	0	0	8.12%	7.88%
2034	2,901	1,967	934	68%	119	15	1,562	29	0	0	7.60%	7.60%
2035	2,866	2,014	852	70%	121	15	1,597	29	0	0	7.60%	7.39%
2036	2,831	2,069	762	73%	117	16	1,635	28	0	0	7.13%	7.13%
2037	2,796	2,126	670	76%	119	17	1,675	24	0	0	7.13%	6.91%
2038	2,764	2,189	575	79%	114	17	1,717	22	0	0	6.66%	6.66%
2039	2,735	2,254	481	82%	117	17	1,760	21	0	0	6.66%	6.44%
2040	2,709	2,330	379	86%	111	18	1,804	21	0	0	6.17%	6.17%
2041	2,687	2,411	276	90%	114	19	1,848	17	0	0	6.17%	5.96%
2042	2,670	2,500	170	94%	104	19	1,893	16	0	0	5.47%	5.47%
2043	2,657	2,657	0	100%	9	19	1,937	16	0	0	0.46%	0.46%
2044	2,648	2,648	0	100%	9	19	1,983	15	0	0	0.46%	0.46%
2045	2,644	2,644	0	100%	9	20	2,029	14	0	0	0.46%	0.46%
2046	2,642	2,642	0	100%	10	21	2,075	13	0	0	0.46%	0.46%
2047	2,643	2,643	0	100%	10	21	2,123	10	0	0	0.46%	0.46%
2048	2,646	2,646	0	100%	10	22	2,172	9	0	0	0.46%	0.46%
2049	2,649	2,649	0	100%	9	23	2,221	0	0	0	0.40%	0.40%
2050	2,654	2,654	0	100%	9	22	2,271	0	0	0	0.39%	0.39%
2051	2,659	2,659	0	100%	9	23	2,323	0	0	0	0.38%	0.38%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 3-6**  
**KERS Hazardous Insurance Fund**  
**Proposed Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability		Actuarial Value of Assets		Unfunded Actuarial Accrued Liability		Funded Ratio (3) / (2)		Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
									Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)		(3)		(4)		(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$	419	\$	493	\$	(74)	118%		\$ 4	\$ 1	\$ 158	\$ 0	\$ 0	\$ 4	2.26%	1.34%
2018		435		507		(72)	117%		4	1	161	0	0	4	2.46%	2.46%
2019		452		516		(64)	114%		4	1	165	0	0	0	2.46%	1.90%
2020		467		529		(62)	113%		3	1	170	0	0	0	1.86%	1.86%
2021		480		547		(67)	114%		3	1	174	0	0	0	1.86%	1.59%
2022		491		558		(67)	114%		2	1	178	0	0	0	0.95%	0.95%
2023		501		566		(65)	113%		2	1	182	0	0	0	0.95%	0.67%
2024		509		573		(64)	113%		1	1	187	0	0	0	0.41%	0.41%
2025		516		578		(62)	112%		1	2	192	0	0	0	0.41%	0.27%
2026		521		582		(61)	112%		0	2	196	0	0	0	0.13%	0.13%
2027		526		584		(58)	111%		0	2	201	0	0	0	0.13%	0.05%
2028		529		585		(56)	111%		0	2	205	0	0	0	0.00%	(0.05%)
2029		532		586		(54)	110%		0	2	211	0	0	0	0.00%	(0.11%)
2030		535		585		(50)	109%		0	2	217	0	0	0	0.00%	(0.11%)
2031		537		585		(48)	109%		0	2	223	0	0	0	0.00%	(0.10%)
2032		540		585		(45)	108%		0	2	230	0	0	0	0.00%	(0.08%)
2033		544		585		(41)	108%		0	2	236	0	0	0	0.00%	(0.02%)
2034		548		586		(38)	107%		0	2	243	0	0	0	0.04%	0.04%
2035		553		587		(34)	106%		0	3	249	0	0	0	0.04%	0.11%
2036		558		588		(30)	105%		0	3	256	0	0	0	0.18%	0.18%
2037		565		591		(26)	105%		0	3	263	0	0	0	0.18%	0.24%
2038		572		594		(22)	104%		1	3	269	0	0	0	0.31%	0.31%
2039		581		598		(17)	103%		1	3	275	0	0	0	0.31%	0.37%
2040		590		602		(12)	102%		1	3	280	0	0	0	0.47%	0.47%
2041		599		607		(8)	101%		1	3	285	0	0	0	0.47%	0.54%
2042		610		613		(3)	100%		2	3	291	0	0	0	0.71%	0.71%
2043		620		620		0	100%		6	3	297	0	0	0	2.15%	2.15%
2044		631		631		0	100%		6	3	304	0	0	0	2.12%	2.12%
2045		641		641		0	100%		6	3	311	0	0	0	2.08%	2.08%
2046		652		652		0	100%		7	3	318	0	0	0	2.05%	2.05%
2047		663		663		0	100%		7	3	324	0	0	0	2.03%	2.03%
2048		674		674		0	100%		7	3	332	0	0	0	2.00%	2.00%
2049		685		685		0	100%		7	3	340	0	0	0	1.98%	1.98%
2050		696		696		0	100%		7	4	347	0	0	0	1.95%	1.95%
2051		707		707		0	100%		7	4	356	0	0	0	1.93%	1.93%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**



**Kentucky Retirement Systems**  
**Exhibit 3-7**  
**CERS Non-Hazardous Insurance Fund**  
**Proposed Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 3,355	\$ 2,227	\$ 1,128	66%	\$ 106	\$ 9	\$ 2,268	\$ 8	\$ 1	\$ 161	4.70%	4.70%
2018	3,509	2,343	1,166	67%	122	10	2,313	8	1	164	5.26%	6.21%
2019	3,657	2,449	1,208	67%	139	12	2,357	8	0	0	5.90%	6.14%
2020	3,796	2,587	1,209	68%	146	13	2,402	8	0	0	6.07%	6.07%
2021	3,924	2,754	1,170	70%	145	14	2,446	8	0	0	5.93%	5.93%
2022	4,045	2,891	1,154	71%	142	16	2,492	8	0	0	5.70%	5.70%
2023	4,157	3,020	1,137	73%	141	17	2,538	8	0	0	5.56%	5.56%
2024	4,259	3,142	1,117	74%	140	18	2,585	8	0	0	5.41%	5.41%
2025	4,354	3,258	1,096	75%	139	19	2,633	8	0	0	5.27%	5.27%
2026	4,439	3,368	1,071	76%	138	21	2,682	8	0	0	5.14%	5.14%
2027	4,515	3,472	1,043	77%	137	21	2,732	8	0	0	5.02%	5.02%
2028	4,582	3,570	1,012	78%	136	22	2,784	7	0	0	4.89%	4.89%
2029	4,642	3,664	978	79%	135	24	2,838	7	0	0	4.77%	4.77%
2030	4,694	3,754	940	80%	135	25	2,897	6	0	0	4.65%	4.65%
2031	4,741	3,841	900	81%	135	26	2,957	6	0	0	4.56%	4.56%
2032	4,782	3,927	855	82%	135	27	3,018	6	0	0	4.48%	4.48%
2033	4,820	4,013	807	83%	136	29	3,083	5	0	0	4.40%	4.40%
2034	4,855	4,101	754	84%	136	30	3,150	5	0	0	4.33%	4.33%
2035	4,889	4,193	696	86%	138	31	3,218	5	0	0	4.28%	4.28%
2036	4,924	4,290	634	87%	139	32	3,290	5	0	0	4.23%	4.23%
2037	4,961	4,395	566	89%	141	33	3,368	4	0	0	4.20%	4.20%
2038	5,000	4,509	491	90%	143	34	3,448	4	0	0	4.15%	4.15%
2039	5,041	4,631	410	92%	146	35	3,532	3	0	0	4.13%	4.13%
2040	5,085	4,763	322	94%	148	35	3,619	2	0	0	4.10%	4.10%
2041	5,133	4,905	228	96%	152	36	3,706	2	0	0	4.09%	4.09%
2042	5,184	5,060	124	98%	156	37	3,794	2	0	0	4.10%	4.10%
2043	5,240	5,240	0	100%	38	38	3,885	2	0	0	0.99%	0.99%
2044	5,299	5,299	0	100%	39	39	3,976	2	0	0	0.98%	0.98%
2045	5,361	5,361	0	100%	40	40	4,069	1	0	0	0.98%	0.98%
2046	5,426	5,426	0	100%	40	41	4,164	1	0	0	0.96%	0.96%
2047	5,494	5,494	0	100%	40	43	4,260	1	0	0	0.94%	0.94%
2048	5,564	5,564	0	100%	41	44	4,358	1	0	0	0.93%	0.93%
2049	5,635	5,635	0	100%	41	45	4,458	0	0	0	0.91%	0.91%
2050	5,706	5,706	0	100%	41	46	4,559	0	0	0	0.90%	0.90%
2051	5,778	5,778	0	100%	41	47	4,663	0	0	0	0.88%	0.88%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**

**Kentucky Retirement Systems**  
**Exhibit 3-8**  
**CERS Hazardous Insurance Fund**  
**Proposed Plan**  
**(\$ in Millions)**

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Remaining Employers			Ceasing Employers			Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
					Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution	Member Contribution	Covered Payroll		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	\$ 1,788	\$ 1,197	\$ 591	67%	\$ 50	\$ 2	\$ 526	\$ 1	\$ 0	\$ 15	9.35%	9.35%
2018	1,850	1,243	607	67%	55	2	522	1	0	14	10.47%	12.17%
2019	1,908	1,280	628	67%	61	3	523	1	0	0	11.73%	12.11%
2020	1,957	1,330	627	68%	63	3	526	1	0	0	11.99%	11.99%
2021	1,998	1,391	607	70%	62	3	531	1	0	0	11.68%	11.68%
2022	2,030	1,431	599	70%	60	4	536	1	0	0	11.16%	11.16%
2023	2,053	1,462	591	71%	59	4	543	1	0	0	10.82%	10.82%
2024	2,066	1,485	581	72%	58	4	550	1	0	0	10.52%	10.52%
2025	2,070	1,500	570	72%	57	5	558	1	0	0	10.27%	10.27%
2026	2,067	1,508	559	73%	57	5	567	1	0	0	10.05%	10.05%
2027	2,056	1,511	545	73%	57	5	575	1	0	0	9.87%	9.87%
2028	2,039	1,509	530	74%	57	5	586	1	0	0	9.72%	9.72%
2029	2,018	1,504	514	75%	57	6	598	1	0	0	9.58%	9.58%
2030	1,994	1,498	496	75%	58	6	611	1	0	0	9.49%	9.49%
2031	1,967	1,492	475	76%	59	6	624	1	0	0	9.39%	9.39%
2032	1,939	1,487	452	77%	60	6	639	1	0	0	9.33%	9.33%
2033	1,911	1,484	427	78%	60	7	654	1	0	0	9.24%	9.24%
2034	1,883	1,483	400	79%	62	7	670	1	0	0	9.19%	9.19%
2035	1,856	1,487	369	80%	63	7	686	1	0	0	9.13%	9.13%
2036	1,831	1,495	336	82%	64	7	702	1	0	0	9.09%	9.09%
2037	1,809	1,510	299	83%	65	7	719	0	0	0	9.03%	9.03%
2038	1,791	1,530	261	85%	66	8	735	0	0	0	9.01%	9.01%
2039	1,775	1,558	217	88%	67	8	752	0	0	0	8.97%	8.97%
2040	1,764	1,593	171	90%	69	8	769	0	0	0	8.94%	8.94%
2041	1,756	1,637	119	93%	70	8	788	0	0	0	8.91%	8.91%
2042	1,752	1,689	63	96%	72	8	806	0	0	0	8.92%	8.92%
2043	1,752	1,752	0	100%	9	8	825	0	0	0	1.13%	1.13%
2044	1,756	1,756	0	100%	9	9	843	0	0	0	1.11%	1.11%
2045	1,763	1,763	0	100%	9	9	863	0	0	0	1.09%	1.09%
2046	1,772	1,772	0	100%	10	9	882	0	0	0	1.08%	1.08%
2047	1,782	1,782	0	100%	10	9	902	0	0	0	1.06%	1.06%
2048	1,793	1,793	0	100%	10	9	922	0	0	0	1.05%	1.05%
2049	1,805	1,805	0	100%	10	10	944	0	0	0	1.04%	1.04%
2050	1,815	1,815	0	100%	10	10	965	0	0	0	1.02%	1.02%
2051	1,826	1,826	0	100%	10	10	987	0	0	0	1.01%	1.01%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.

The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

**The employer contributions in column (9) do not include the cost of the new retirement plan provided by the employers withdrawing from KRS.**

**Gabriel Roeder Smith & Company**