

Actuarial Analysis Summary

BR or Bill Ref. HB 169
AA Statement 1 and 2 of 2

Date: 1/19/2022

Actuary: GRS

Actuarial Analysis Conducted For:

☐ KERS NH ☒ KERS Haz ☒ SPRS ☐ TRS

☐ CERS NH ☒ CERS Haz ☐ LRP ☐ JRP

Section I: Executive Summary

In the opinion of the actuary, this bill would make the affected state-administered retirement system(s) actuarially:

☐ **MORE SOUND** ☒ **LESS SOUND** (CERS Haz) ☒ **NO IMPACT** (KERS Haz, SPRS)

If actuarially **MORE SOUND OR LESS SOUND**, please summarize the factors leading to the actuary's opinion:

The actuarially determined contribution rates increase by 1.70% of pay, 2.00% of pay and 2.76% of pay for the CERS Hazardous, KERS Hazardous, and SPRS pension funds, respectively. The required contribution rate for the KERS Hazardous fund after incorporating the proposed legislation is still less than 0% of pay so no contributions continue to be required for the KERS Hazardous fund. As long as employer contribution rates are increased accordingly for the CERS Hazardous and SPRS funds, we do not believe this benefit change will impact the current actuarial soundness of the funds.

However, under current statutes, the CERS Hazardous fund is expected to receive the full actuarially determined contribution rate (ADEC) of 49.59% of pay for FYE 2023. This proposed legislation increases the ADEC above the maximum rate of 49.65% of pay, allowed under the CERS phase-in provisions. Given that the phase-in provisions were designed to phase-in the assumption changes adopted by the Board, legislators may want to consider amending the phase-in provisions so that the increase associated with this proposed legislation be immediately recognized in the employer contribution rate.

Does this bill increase or decrease employer costs? ☒ **INCREASE** ☐ **DECREASE** ☐ **NO IMPACT**

Does this bill increase or decrease benefits? ☒ **INCREASE** ☐ **DECREASE** ☐ **NO IMPACT**

Does this bill increase or decrease benefit participation? ☐ **INCREASE** ☐ **DECREASE** ☒ **NO IMPACT**

If the bill impacts employer costs, benefits, or benefit participation, please explain and estimate the impact in Sections II and VI.

Section II: Financial Projections

	Combined Pension and Retiree Health Plan					
	CERS Hazardous*		KERS Hazardous*		SPRS*	
	Current	Proposed	Current	Proposed	Current	Proposed
Projected Employer Cost* (\$ in Millions)						
30-Yr Nominal \$	\$8,604	\$8,937	\$1,212	\$1,212	\$1,572	\$1,603
30-Yr Net Present Value \$	\$3,855	\$4,003	\$586	\$586	\$836	\$852
Proj. Normal Cost for New Hire	7.75% of pay	8.69% of pay	6.87% of pay	7.69% of pay	9.96% of pay	11.40% of pay

*Projected costs are for all employers and all fund sources for entire 30-year period.

Proj. normal cost is the normal cost for new hires after subtracting employee contributions and do not include administrative expenses

	Pension Plan					
	CERS Hazardous*		KERS Hazardous*		SPRS*	
	Current	Proposed	Current	Proposed	Current	Proposed
Projected UAL (\$ in Millions)						
Baseline (Year 1)	\$3,000	\$3,000	\$513	\$513	\$730	\$730
5 Years	\$2,662	\$2,662	\$377	\$377	\$638	\$638
10 Years	\$2,535	\$2,535	\$339	\$339	\$561	\$561
20 Years	\$1,800	\$1,800	\$242	\$242	\$344	\$344
30 Years	\$0	\$0	\$0	\$0	\$0	\$0
Projected Funding Ratio (%)						
Baseline (Year 1)	47%	47%	60%	60%	31%	31%
5 Years	57%	57%	73%	73%	39%	39%
10 Years	63%	63%	78%	78%	45%	45%
20 Years	78%	78%	86%	86%	63%	63%
30 Years	100%	100%	100%	100%	100%	100%
	Retiree Health Plan					
	CERS Hazardous*		KERS Hazardous*		SPRS*	
	Current	Proposed	Current	Proposed	Current	Proposed
Projected UAL (\$ in Millions)						
Baseline (Year 1)	\$275	\$336	\$(151)	\$(132)	\$49	\$56
5 Years	\$84	\$160	\$(241)	\$(211)	\$15	\$23
10 Years	\$104	\$167	\$(303)	\$(254)	\$17	\$22
20 Years	\$196	\$206	\$(512)	\$(399)	\$26	\$27
30 Years	\$0	\$0	\$(898)	\$(671)	\$0	\$0
Projected Funding Ratio (%)						
Baseline (Year 1)	84%	82%	136%	130%	82%	80%
5 Years	96%	92%	152%	143%	95%	92%
10 Years	95%	92%	163%	148%	94%	93%
20 Years	90%	91%	199%	168%	90%	90%
30 Years	100%	100%	255%	200%	100%	100%

* if necessary or plan administers more than one plan/system.

Section III: Brief Summary of Bill

The proposed legislation increases the insurance dollar contribution for members hired on or after July 1, 2003 from \$21.30 to \$40.00 as of January 1, 2023 for members receiving pre-Medicare benefits. This benefit only applies to career hazardous employees, which is defined as SPRS or hazardous CERS or KERS members who, upon retirement, have attained 20 years of service if a Tier 1 member or 25 years of service if a Tier 2 or Tier 3 member.

Section IV: Statement of Assumptions and Methods

Did the analysis rely solely upon the same assumptions & methods previously established and utilized by the actuary in the retirement system's most recent actuarial valuation?

☒ **YES** ☐ **NO**

If **NO**, please describe each new assumption or method utilized, the basis for selecting the revised assumption or method, and whether each new assumption or method increased or decreased projected employer costs:

N/A

Section V: Comment from Actuary

Please see the attached actuarial analysis.

Section VI: Detailed Actuarial Analysis and Projections *(May be attached as Appendix)*

Please see attached.



January 19, 2022

Mr. David Eager
Executive Director
Kentucky Public Pensions Authority
1260 Louisville Road
Frankfort, KY 40601

**Re: Actuarial Analysis of Proposed Legislation HB 169 and its Financial Impact
on the Systems Operated by the Kentucky Public Pensions Authority**

Dear Mr. Eager:

We have reviewed the proposed legislation HB 169 and the purpose of this letter is to communicate the actuarial analysis of this proposed legislation in regards to the County Employees Retirement System (CERS), the Kentucky Employees Retirement System (KERS), and the State Police Retirement System (SPRS).

Summary of Provisions of Proposed Legislation and Cost Impact

The proposed legislation increases the insurance dollar contribution for members hired on or after July 1, 2003 from \$21.30 to \$40.00 as of January 1, 2023 for members receiving pre-Medicare benefits. This benefit only applies to career hazardous employees, which is defined as SPRS or hazardous CERS or KERS members who, upon retirement, have attained 20 years of service if a Tier 1 member or 25 years of service if a Tier 2 or Tier 3 member. The impact of the proposed legislation on the employer contribution requirements are shown in the table below.

Impact on the FYE 2023 Actuarially Determined Employer Contribution (Pension and Insurance)

Plan	Current based on June 30, 2021 Valuation	Proposed Legislation	Impact on FYE 2023 Contribution Rate	Increase in Annual Contribution
CERS Hazardous	49.59%	51.29% ¹	1.70% ¹	\$10,029,000 ¹
KERS Hazardous	31.82%	31.82%	0.00% ²	\$ 0 ²
SPRS	140.51%	143.27%	2.76%	\$ 1,251,000

¹ Actual contributions for the CERS Hazardous fund will be limited by the CERS phase-in provisions or 49.65% of pay for FYE2023.

² The proposed legislation increases the actuarially determined contribution for the KERS Hazardous insurance fund by 2.00% of pay for FYE 2023; however, the actuarially determined contribution is still less than 0% of pay so the net impact is 0% of pay.

Sections 1., 2., and 3. provide 30-year projections of the liability and contribution requirements of the pension and insurance funds under the current and proposed funding, as well as a summary of the fiscal impact of the proposed legislation.

Comments regarding CERS Contribution Phase-In

Under current statutes, the CERS Hazardous fund is expected to receive the full actuarially determined employer contribution for FYE 2023 of 49.59% of pay, as it is less than the maximum rate allowed under the CERS phase-in provisions, or 49.65% of pay. Under the proposed legislation, the actuarially determined contribution rate would increase from 49.59% of pay to 51.29% of pay, which would be limited by the current phase-in provisions. Given that the phase-in provisions were designed to phase-in the assumption changes adopted by the Board, legislators may want to consider amending the phase-in provisions so that the increase associated with this proposed legislation be immediately recognized in the employer contribution rate.

Additional Comments Regarding the Proposed Legislation

The proposed legislation will provide increased retiree insurance benefits to applicable retirees. However, we do not believe the change in insurance benefits will materially change the anticipated retirement pattern for these employee groups. Therefore, we continue to use the same retirement assumptions in the 2021 actuarial valuation which will also result in no cost impact on the valuation of the applicable pension funds.

Basis of Calculations

GRS based the calculations and analysis in this letter on the member and financial data provided by KPPA for use in performing the actuarial valuation as of June 30, 2021. The projections assume no actuarial gains or losses will occur in the future, and that members will terminate, retire, become disabled, or die as anticipated by the actuarial assumptions used to perform the June 30, 2021 actuarial valuation. Our calculations are based upon assumptions regarding future events, which may or may not materialize. Depending on actual plan experience, actual results could deviate significantly from our projections.



Closing

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

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

Sincerely,



Daniel J. White, FSA, EA, MAAA



Janie Shaw, ASA, EA, MAAA

Enclosures

**Actuarial Analysis of HB 169
Section 1.**

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

Kentucky Public Pensions Authority
Exhibit 1-1
CERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ 3,000	\$ 3,000	\$ -	47%	47%	0%	\$ 206	\$ 206	\$ -	35.6%	35.6%	0.0%
2022	2,950	2,950	-	49%	49%	0%	253	253	-	42.8%	42.8%	0.0%
2023	2,862	2,862	-	52%	52%	0%	247	247	-	41.0%	41.0%	0.0%
2024	2,775	2,775	-	54%	54%	0%	243	243	-	39.6%	39.6%	0.0%
2025	2,662	2,662	-	57%	57%	0%	240	240	-	38.3%	38.3%	0.0%
2026	2,639	2,639	-	58%	58%	0%	234	234	-	36.7%	36.7%	0.0%
2027	2,619	2,619	-	59%	59%	0%	237	237	-	36.3%	36.3%	0.0%
2028	2,597	2,597	-	60%	60%	0%	239	239	-	36.0%	36.0%	0.0%
2029	2,568	2,568	-	62%	62%	0%	242	242	-	35.7%	35.7%	0.0%
2030	2,535	2,535	-	63%	63%	0%	245	245	-	35.4%	35.4%	0.0%
2031	2,495	2,495	-	64%	64%	0%	248	248	-	35.2%	35.2%	0.0%
2032	2,450	2,450	-	65%	65%	0%	252	252	-	35.0%	35.0%	0.0%
2033	2,398	2,398	-	66%	66%	0%	256	256	-	34.9%	34.9%	0.0%
2034	2,339	2,339	-	68%	68%	0%	260	260	-	34.7%	34.7%	0.0%
2035	2,272	2,272	-	69%	69%	0%	264	264	-	34.6%	34.6%	0.0%
2036	2,197	2,197	-	71%	71%	0%	268	268	-	34.5%	34.5%	0.0%
2037	2,113	2,113	-	72%	72%	0%	272	272	-	34.3%	34.3%	0.0%
2038	2,020	2,020	-	74%	74%	0%	277	277	-	34.2%	34.2%	0.0%
2039	1,915	1,915	-	76%	76%	0%	281	281	-	34.0%	34.0%	0.0%
2040	1,800	1,800	-	78%	78%	0%	272	272	-	32.3%	32.3%	0.0%
2041	1,686	1,686	-	79%	79%	0%	279	279	-	32.4%	32.4%	0.0%
2042	1,560	1,560	-	81%	81%	0%	294	294	-	33.6%	33.6%	0.0%
2043	1,409	1,409	-	83%	83%	0%	309	309	-	34.5%	34.5%	0.0%
2044	1,234	1,234	-	86%	86%	0%	323	323	-	35.5%	35.5%	0.0%
2045	1,036	1,036	-	88%	88%	0%	341	341	-	36.7%	36.7%	0.0%
2046	806	806	-	91%	91%	0%	348	348	-	36.7%	36.7%	0.0%
2047	558	558	-	94%	94%	0%	355	355	-	36.7%	36.7%	0.0%
2048	287	287	-	97%	97%	0%	362	362	-	36.7%	36.7%	0.0%
2049	-	-	-	100%	100%	0%	59	59	-	5.9%	5.9%	0.0%
2050	-	-	-	100%	100%	0%	61	61	-	5.9%	5.9%	0.0%

Kentucky Public Pensions Authority
Exhibit 1-2
KERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ 513	\$ 513	\$ -	60%	60%	0%	\$ 54	\$ 54	\$ -	33.4%	33.4%	0.0%
2022	477	477	-	64%	64%	0%	52	52	-	31.8%	31.8%	0.0%
2023	446	446	-	67%	67%	0%	52	52	-	31.8%	31.8%	0.0%
2024	412	412	-	70%	70%	0%	46	46	-	28.2%	28.2%	0.0%
2025	377	377	-	73%	73%	0%	46	46	-	28.2%	28.2%	0.0%
2026	366	366	-	74%	74%	0%	40	40	-	24.7%	24.7%	0.0%
2027	360	360	-	75%	75%	0%	40	40	-	24.7%	24.7%	0.0%
2028	353	353	-	76%	76%	0%	39	39	-	24.2%	24.2%	0.0%
2029	346	346	-	77%	77%	0%	39	39	-	24.2%	24.2%	0.0%
2030	339	339	-	78%	78%	0%	39	39	-	23.8%	23.8%	0.0%
2031	332	332	-	78%	78%	0%	39	39	-	23.8%	23.8%	0.0%
2032	323	323	-	79%	79%	0%	38	38	-	23.6%	23.6%	0.0%
2033	316	316	-	80%	80%	0%	38	38	-	23.6%	23.6%	0.0%
2034	307	307	-	81%	81%	0%	38	38	-	23.5%	23.5%	0.0%
2035	297	297	-	82%	82%	0%	38	38	-	23.5%	23.5%	0.0%
2036	288	288	-	82%	82%	0%	38	38	-	23.3%	23.3%	0.0%
2037	277	277	-	83%	83%	0%	38	38	-	23.3%	23.3%	0.0%
2038	266	266	-	84%	84%	0%	38	38	-	23.1%	23.1%	0.0%
2039	254	254	-	85%	85%	0%	38	38	-	23.1%	23.1%	0.0%
2040	242	242	-	86%	86%	0%	36	36	-	21.9%	21.9%	0.0%
2041	230	230	-	87%	87%	0%	36	36	-	21.9%	21.9%	0.0%
2042	218	218	-	88%	88%	0%	43	43	-	26.3%	26.3%	0.0%
2043	198	198	-	89%	89%	0%	43	43	-	26.3%	26.3%	0.0%
2044	176	176	-	90%	90%	0%	47	47	-	29.1%	29.1%	0.0%
2045	148	148	-	92%	92%	0%	47	47	-	29.1%	29.1%	0.0%
2046	118	118	-	94%	94%	0%	50	50	-	31.0%	31.0%	0.0%
2047	84	84	-	96%	96%	0%	50	50	-	31.0%	31.0%	0.0%
2048	47	47	-	98%	98%	0%	50	50	-	31.0%	31.0%	0.0%
2049	-	-	-	100%	100%	0%	10	10	-	6.3%	6.3%	0.0%
2050	-	-	-	100%	100%	0%	10	10	-	6.3%	6.3%	0.0%

Kentucky Public Pensions Authority
Exhibit 1-3
SPRS Retirement Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ 730	\$ 730	\$ -	31%	31%	0%	\$ 58	\$ 58	\$ -	128.0%	128.0%	0.0%
2022	707	707	-	33%	33%	0%	57	57	-	126.4%	126.4%	0.0%
2023	684	684	-	35%	35%	0%	57	57	-	126.4%	126.4%	0.0%
2024	662	662	-	37%	37%	0%	55	55	-	120.7%	120.7%	0.0%
2025	638	638	-	39%	39%	0%	55	55	-	120.7%	120.7%	0.0%
2026	622	622	-	41%	41%	0%	52	52	-	115.4%	115.4%	0.0%
2027	608	608	-	42%	42%	0%	52	52	-	115.4%	115.4%	0.0%
2028	593	593	-	43%	43%	0%	52	52	-	113.9%	113.9%	0.0%
2029	578	578	-	44%	44%	0%	52	52	-	113.9%	113.9%	0.0%
2030	561	561	-	45%	45%	0%	51	51	-	112.6%	112.6%	0.0%
2031	544	544	-	46%	46%	0%	51	51	-	112.6%	112.6%	0.0%
2032	526	526	-	47%	47%	0%	51	51	-	111.8%	111.8%	0.0%
2033	507	507	-	49%	49%	0%	51	51	-	111.8%	111.8%	0.0%
2034	487	487	-	50%	50%	0%	50	50	-	111.2%	111.2%	0.0%
2035	466	466	-	52%	52%	0%	50	50	-	111.2%	111.2%	0.0%
2036	444	444	-	54%	54%	0%	50	50	-	110.5%	110.5%	0.0%
2037	421	421	-	56%	56%	0%	50	50	-	110.5%	110.5%	0.0%
2038	397	397	-	58%	58%	0%	50	50	-	109.7%	109.7%	0.0%
2039	371	371	-	60%	60%	0%	50	50	-	109.7%	109.7%	0.0%
2040	344	344	-	63%	63%	0%	49	49	-	107.8%	107.8%	0.0%
2041	316	316	-	65%	65%	0%	49	49	-	107.8%	107.8%	0.0%
2042	287	287	-	68%	68%	0%	51	51	-	112.5%	112.5%	0.0%
2043	253	253	-	71%	71%	0%	51	51	-	112.5%	112.5%	0.0%
2044	219	219	-	75%	75%	0%	52	52	-	115.8%	115.8%	0.0%
2045	179	179	-	79%	79%	0%	52	52	-	115.8%	115.8%	0.0%
2046	140	140	-	83%	83%	0%	53	53	-	117.8%	117.8%	0.0%
2047	96	96	-	88%	88%	0%	53	53	-	117.8%	117.8%	0.0%
2048	50	50	-	94%	94%	0%	53	53	-	117.7%	117.7%	0.0%
2049	-	-	-	100%	100%	0%	4	4	-	7.8%	7.8%	0.0%
2050	-	-	-	100%	100%	0%	4	4	-	7.8%	7.8%	0.0%

Kentucky Public Pensions Authority
Exhibit 1-4
CERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ 275	\$ 336	\$ 61	84%	82%	-2%	\$ 50	\$ 50	\$ -	8.7%	8.7%	0.0%
2022	219	288	69	88%	85%	-3%	40	40	-	6.8%	6.8%	0.0%
2023	176	256	80	90%	87%	-3%	34	45	11	5.6%	7.5%	1.9%
2024	137	214	77	93%	89%	-4%	29	40	11	4.7%	6.6%	1.9%
2025	84	160	76	96%	92%	-4%	24	36	12	3.9%	5.8%	1.9%
2026	83	158	75	96%	92%	-4%	19	31	12	2.9%	4.9%	2.0%
2027	88	160	72	95%	92%	-3%	17	30	13	2.7%	4.7%	2.0%
2028	93	161	68	95%	92%	-3%	16	29	13	2.5%	4.5%	2.0%
2029	97	164	67	95%	92%	-3%	16	29	13	2.3%	4.3%	2.0%
2030	104	167	63	95%	92%	-3%	15	29	14	2.2%	4.2%	2.0%
2031	110	170	60	94%	92%	-2%	15	28	13	2.1%	4.1%	2.0%
2032	117	173	56	94%	92%	-2%	14	28	14	2.0%	4.0%	2.0%
2033	125	176	51	94%	92%	-2%	14	28	14	1.9%	3.9%	2.0%
2034	133	180	47	93%	92%	-1%	14	29	15	1.9%	3.9%	2.0%
2035	141	184	43	93%	92%	-1%	14	29	15	1.9%	3.8%	1.9%
2036	151	188	37	92%	92%	0%	14	29	15	1.8%	3.8%	2.0%
2037	161	192	31	92%	91%	-1%	14	30	16	1.8%	3.8%	2.0%
2038	172	196	24	91%	91%	0%	14	30	16	1.8%	3.7%	1.9%
2039	184	201	17	91%	91%	0%	14	30	16	1.8%	3.7%	1.9%
2040	196	206	10	90%	91%	1%	20	36	16	2.4%	4.3%	1.9%
2041	204	205	1	90%	91%	1%	32	41	9	3.8%	4.8%	1.0%
2042	200	199	(1)	90%	92%	2%	39	47	8	4.5%	5.4%	0.9%
2043	188	188	-	91%	92%	1%	44	52	8	5.0%	5.9%	0.9%
2044	171	171	-	92%	93%	1%	49	58	9	5.5%	6.4%	0.9%
2045	148	147	(1)	93%	94%	1%	57	65	8	6.1%	7.0%	0.9%
2046	114	114	-	95%	96%	1%	58	66	8	6.1%	7.0%	0.9%
2047	79	79	-	97%	97%	0%	59	67	8	6.1%	7.0%	0.9%
2048	40	39	(1)	98%	99%	1%	60	68	8	6.1%	7.0%	0.9%
2049	-	-	-	100%	100%	0%	16	25	9	1.6%	2.5%	0.9%
2050	-	-	-	100%	100%	0%	16	25	9	1.6%	2.5%	0.9%

Kentucky Public Pensions Authority
Exhibit 1-5
KERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ (151)	\$ (132)	\$ 19	136%	130%	-6%	\$ -	\$ -	\$ -	0.0%	0.0%	0.0%
2022	(171)	(151)	20	139%	133%	-6%	-	-	-	0.0%	0.0%	0.0%
2023	(192)	(167)	25	143%	135%	-8%	-	-	-	0.0%	0.0%	0.0%
2024	(213)	(186)	27	147%	138%	-9%	-	-	-	0.0%	0.0%	0.0%
2025	(241)	(211)	30	152%	143%	-9%	-	-	-	0.0%	0.0%	0.0%
2026	(252)	(218)	34	154%	143%	-11%	-	-	-	0.0%	0.0%	0.0%
2027	(264)	(226)	38	156%	144%	-12%	-	-	-	0.0%	0.0%	0.0%
2028	(276)	(235)	41	158%	145%	-13%	-	-	-	0.0%	0.0%	0.0%
2029	(290)	(244)	46	160%	147%	-13%	-	-	-	0.0%	0.0%	0.0%
2030	(303)	(254)	49	163%	148%	-15%	-	-	-	0.0%	0.0%	0.0%
2031	(319)	(264)	55	166%	149%	-17%	-	-	-	0.0%	0.0%	0.0%
2032	(336)	(277)	59	169%	151%	-18%	-	-	-	0.0%	0.0%	0.0%
2033	(353)	(289)	64	172%	153%	-19%	-	-	-	0.0%	0.0%	0.0%
2034	(371)	(302)	69	175%	155%	-20%	-	-	-	0.0%	0.0%	0.0%
2035	(392)	(315)	77	179%	157%	-22%	-	-	-	0.0%	0.0%	0.0%
2036	(413)	(330)	83	183%	159%	-24%	-	-	-	0.0%	0.0%	0.0%
2037	(436)	(346)	90	187%	161%	-26%	-	-	-	0.0%	0.0%	0.0%
2038	(460)	(363)	97	191%	163%	-28%	-	-	-	0.0%	0.0%	0.0%
2039	(485)	(380)	105	195%	165%	-30%	-	-	-	0.0%	0.0%	0.0%
2040	(512)	(399)	113	199%	168%	-31%	-	-	-	0.0%	0.0%	0.0%
2041	(541)	(420)	121	204%	170%	-34%	-	-	-	0.0%	0.0%	0.0%
2042	(572)	(442)	130	209%	173%	-36%	-	-	-	0.0%	0.0%	0.0%
2043	(604)	(465)	139	213%	176%	-37%	-	-	-	0.0%	0.0%	0.0%
2044	(638)	(489)	149	218%	178%	-40%	-	-	-	0.0%	0.0%	0.0%
2045	(675)	(515)	160	223%	181%	-42%	-	-	-	0.0%	0.0%	0.0%
2046	(714)	(542)	172	229%	184%	-45%	-	-	-	0.0%	0.0%	0.0%
2047	(756)	(571)	185	235%	188%	-47%	-	-	-	0.0%	0.0%	0.0%
2048	(800)	(603)	197	241%	192%	-49%	-	-	-	0.0%	0.0%	0.0%
2049	(847)	(636)	211	248%	196%	-52%	-	-	-	0.0%	0.0%	0.0%
2050	(898)	(671)	227	255%	200%	-55%	-	-	-	0.0%	0.0%	0.0%

Kentucky Public Pensions Authority
Exhibit 1-6
SPRS Insurance Fund
Actuarial Analysis of HB 169
Comparison of Current Plan and Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contributions			Employer Contribution Rate		
	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)
2021	\$ 49	\$ 56	\$ 7	82%	80%	-2%	\$ 8	\$ 8	\$ -	18.1%	18.1%	0.0%
2022	40	48	8	86%	83%	-3%	6	8	2	14.1%	16.9%	2.8%
2023	32	40	8	89%	86%	-3%	6	8	2	14.1%	16.9%	2.8%
2024	24	32	8	92%	89%	-3%	4	6	2	9.4%	12.4%	3.0%
2025	15	23	8	95%	92%	-3%	4	6	2	9.4%	12.4%	3.0%
2026	14	22	8	95%	93%	-2%	2	4	2	5.2%	8.3%	3.1%
2027	15	21	6	95%	93%	-2%	2	4	2	5.2%	8.3%	3.1%
2028	15	21	6	95%	93%	-2%	2	3	1	4.4%	7.5%	3.1%
2029	16	22	6	94%	93%	-1%	2	3	1	4.4%	7.5%	3.1%
2030	17	22	5	94%	93%	-1%	2	3	1	3.9%	7.0%	3.1%
2031	17	22	5	94%	93%	-1%	2	3	1	3.9%	7.0%	3.1%
2032	17	23	6	94%	92%	-2%	2	3	1	3.6%	6.7%	3.1%
2033	19	23	4	93%	92%	-1%	2	3	1	3.6%	6.7%	3.1%
2034	19	24	5	93%	92%	-1%	2	3	1	3.5%	6.6%	3.1%
2035	20	24	4	92%	92%	0%	2	3	1	3.5%	6.6%	3.1%
2036	22	25	3	92%	91%	-1%	2	3	1	3.4%	6.5%	3.1%
2037	23	25	2	91%	91%	0%	2	3	1	3.4%	6.5%	3.1%
2038	24	26	2	91%	91%	0%	2	3	1	3.3%	6.4%	3.1%
2039	25	27	2	90%	90%	0%	2	3	1	3.3%	6.4%	3.1%
2040	26	27	1	90%	90%	0%	2	3	1	4.6%	7.7%	3.1%
2041	27	27	-	89%	90%	1%	2	3	1	4.6%	7.7%	3.1%
2042	28	28	-	89%	90%	1%	5	5	-	10.4%	11.8%	1.4%
2043	26	26	-	89%	91%	2%	5	5	-	10.4%	11.8%	1.4%
2044	25	24	(1)	90%	91%	1%	6	7	1	13.4%	14.7%	1.3%
2045	22	21	(1)	91%	92%	1%	6	7	1	13.4%	14.7%	1.3%
2046	18	17	(1)	93%	94%	1%	7	8	1	15.5%	16.8%	1.3%
2047	13	12	(1)	95%	96%	1%	7	8	1	15.5%	16.8%	1.3%
2048	8	7	(1)	97%	98%	1%	7	8	1	15.5%	16.8%	1.3%
2049	-	-	-	100%	100%	0%	2	2	-	3.4%	4.7%	1.3%
2050	-	-	-	100%	100%	0%	2	2	-	3.4%	4.6%	1.2%

Actuarial Analysis of HB 169
Section 2.
Projected Cost of the Retirement and Insurance
Current Plan

Kentucky Public Pensions Authority
Exhibit 2-1
CERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 5,629	\$ 2,629	\$ 3,000	47%	\$ 206	\$ 46	\$ 578	35.60%	43.23%
2022	5,784	2,834	2,950	49%	253	47	590	42.81%	42.81%
2023	5,929	3,067	2,862	52%	247	48	602	41.04%	41.04%
2024	6,067	3,292	2,775	54%	243	49	614	39.63%	39.63%
2025	6,199	3,537	2,662	57%	240	50	626	38.29%	38.29%
2026	6,324	3,685	2,639	58%	234	51	639	36.70%	36.70%
2027	6,444	3,825	2,619	59%	237	52	651	36.33%	36.33%
2028	6,560	3,963	2,597	60%	239	53	664	36.00%	36.00%
2029	6,671	4,103	2,568	62%	242	54	678	35.68%	35.68%
2030	6,782	4,247	2,535	63%	245	55	691	35.43%	35.43%
2031	6,893	4,398	2,495	64%	248	56	705	35.22%	35.22%
2032	7,008	4,558	2,450	65%	252	58	719	35.04%	35.04%
2033	7,125	4,727	2,398	66%	256	59	733	34.88%	34.88%
2034	7,247	4,908	2,339	68%	260	60	748	34.74%	34.74%
2035	7,371	5,099	2,272	69%	264	61	763	34.60%	34.60%
2036	7,499	5,302	2,197	71%	268	62	778	34.46%	34.46%
2037	7,628	5,515	2,113	72%	272	64	794	34.31%	34.31%
2038	7,757	5,737	2,020	74%	277	65	810	34.15%	34.15%
2039	7,883	5,968	1,915	76%	281	66	826	33.98%	33.98%
2040	8,009	6,209	1,800	78%	272	67	843	32.34%	32.34%
2041	8,134	6,448	1,686	79%	279	69	859	32.43%	32.43%
2042	8,261	6,701	1,560	81%	294	70	877	33.59%	33.59%
2043	8,390	6,981	1,409	83%	309	72	894	34.53%	34.53%
2044	8,522	7,288	1,234	86%	323	73	912	35.45%	35.45%
2045	8,657	7,621	1,036	88%	341	74	930	36.67%	36.67%
2046	8,792	7,986	806	91%	348	76	949	36.67%	36.67%
2047	8,931	8,373	558	94%	355	77	968	36.68%	36.68%
2048	9,072	8,785	287	97%	362	79	987	36.70%	36.70%
2049	9,215	9,215	-	100%	59	81	1,007	5.88%	5.88%
2050	9,361	9,361	-	100%	61	82	1,027	5.90%	5.90%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to remain level throughout the entire projection.

Covered payroll is assumed to increase 2% each year throughout the entire projection.

The Board certified contribution rate paid by employers is assumed to be equal to the full actuarially determined contribution rate, except as allowed by

House Bill 362 (passed during the 2018 legislative session), which limits the certified contribution rate to a 12% increase over the prior year rate for the period of July 1, 2018 to June 30, 2028.

Kentucky Public Pensions Authority
Exhibit 2-2
KERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,295	\$ 782	\$ 513	60%	\$ 54	\$ 13	\$ 163	33.43%	33.43%
2022	1,325	848	477	64%	52	13	163	31.82%	31.82%
2023	1,353	907	446	67%	52	13	163	31.82%	29.92%
2024	1,378	966	412	70%	46	13	163	28.18%	28.18%
2025	1,403	1,026	377	73%	46	13	163	28.18%	26.67%
2026	1,426	1,060	366	74%	40	13	163	24.68%	24.68%
2027	1,448	1,088	360	75%	40	13	163	24.68%	24.43%
2028	1,468	1,115	353	76%	39	13	163	24.16%	24.16%
2029	1,486	1,140	346	77%	39	13	163	24.16%	23.95%
2030	1,505	1,166	339	78%	39	13	163	23.79%	23.79%
2031	1,524	1,192	332	78%	39	13	163	23.79%	23.68%
2032	1,544	1,221	323	79%	38	13	163	23.58%	23.58%
2033	1,566	1,250	316	80%	38	13	163	23.58%	23.52%
2034	1,589	1,282	307	81%	38	13	163	23.45%	23.45%
2035	1,612	1,315	297	82%	38	13	163	23.45%	23.39%
2036	1,637	1,349	288	82%	38	13	163	23.31%	23.31%
2037	1,661	1,384	277	83%	38	13	163	23.31%	23.22%
2038	1,686	1,420	266	84%	38	13	163	23.11%	23.11%
2039	1,710	1,456	254	85%	38	13	163	23.11%	23.01%
2040	1,734	1,492	242	86%	36	13	163	21.86%	21.86%
2041	1,758	1,528	230	87%	36	13	163	21.86%	24.55%
2042	1,782	1,564	218	88%	43	13	163	26.28%	26.28%
2043	1,807	1,609	198	89%	43	13	163	26.28%	27.70%
2044	1,832	1,656	176	90%	47	13	163	29.07%	29.07%
2045	1,857	1,709	148	92%	47	13	163	29.07%	30.81%
2046	1,881	1,763	118	94%	50	13	163	30.97%	30.97%
2047	1,905	1,821	84	96%	50	13	163	30.97%	31.00%
2048	1,928	1,881	47	98%	50	13	163	31.01%	31.01%
2049	1,950	1,950	-	100%	10	13	163	6.29%	6.29%
2050	1,971	1,971	-	100%	10	13	163	6.29%	6.29%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.

Kentucky Public Pensions Authority
Exhibit 2-3
SPRS Retirement Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,053	\$ 323	\$ 730	31%	\$ 58	\$ 4	\$ 45	127.99%	127.99%
2022	1,055	348	707	33%	57	4	45	126.40%	126.40%
2023	1,055	371	684	35%	57	4	45	126.40%	123.44%
2024	1,054	392	662	37%	55	4	45	120.71%	120.71%
2025	1,051	413	638	39%	55	4	45	120.71%	118.30%
2026	1,046	424	622	41%	52	4	45	115.39%	115.39%
2027	1,040	432	608	42%	52	4	45	115.39%	114.66%
2028	1,034	441	593	43%	52	4	45	113.93%	113.93%
2029	1,026	448	578	44%	52	4	45	113.93%	113.26%
2030	1,018	457	561	45%	51	4	45	112.61%	112.61%
2031	1,009	465	544	46%	51	4	45	112.61%	112.16%
2032	1,000	474	526	47%	51	4	45	111.75%	111.75%
2033	990	483	507	49%	51	4	45	111.75%	111.46%
2034	981	494	487	50%	50	4	45	111.19%	111.19%
2035	972	506	466	52%	50	4	45	111.19%	110.91%
2036	962	518	444	54%	50	4	45	110.54%	110.54%
2037	952	531	421	56%	50	4	45	110.54%	110.14%
2038	942	545	397	58%	50	4	45	109.66%	109.66%
2039	931	560	371	60%	50	4	45	109.66%	109.17%
2040	920	576	344	63%	49	4	45	107.78%	107.78%
2041	908	592	316	65%	49	4	45	107.78%	110.49%
2042	896	609	287	68%	51	4	45	112.45%	112.45%
2043	883	630	253	71%	51	4	45	112.45%	114.18%
2044	871	652	219	75%	52	4	45	115.75%	115.75%
2045	857	678	179	79%	52	4	45	115.75%	117.70%
2046	844	704	140	83%	53	4	45	117.76%	117.76%
2047	830	734	96	88%	53	4	45	117.76%	117.73%
2048	816	766	50	94%	53	4	45	117.70%	117.70%
2049	801	801	-	100%	4	4	45	7.77%	7.77%
2050	787	787	-	100%	4	4	45	7.77%	7.77%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.

Kentucky Public Pensions Authority
Exhibit 2-4
CERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,751	\$ 1,476	\$ 275	84%	\$ 50	\$ 3	\$ 573	8.73%	8.73%
2022	1,797	1,578	219	88%	40	3	585	6.78%	6.78%
2023	1,836	1,660	176	90%	34	4	597	5.62%	5.62%
2024	1,868	1,731	137	93%	29	4	609	4.71%	4.71%
2025	1,892	1,808	84	96%	24	5	621	3.88%	3.88%
2026	1,912	1,829	83	96%	19	5	633	2.93%	2.93%
2027	1,928	1,840	88	95%	17	5	646	2.68%	2.68%
2028	1,939	1,846	93	95%	16	6	659	2.48%	2.48%
2029	1,945	1,848	97	95%	16	6	672	2.31%	2.31%
2030	1,950	1,846	104	95%	15	6	685	2.18%	2.18%
2031	1,952	1,842	110	94%	15	6	699	2.08%	2.08%
2032	1,952	1,835	117	94%	14	7	713	2.00%	2.00%
2033	1,953	1,828	125	94%	14	7	727	1.94%	1.94%
2034	1,954	1,821	133	93%	14	7	742	1.88%	1.88%
2035	1,956	1,815	141	93%	14	7	757	1.85%	1.85%
2036	1,961	1,810	151	92%	14	8	772	1.82%	1.82%
2037	1,970	1,809	161	92%	14	8	787	1.79%	1.79%
2038	1,983	1,811	172	91%	14	8	803	1.78%	1.78%
2039	1,998	1,814	184	91%	14	8	819	1.75%	1.75%
2040	2,018	1,822	196	90%	20	8	835	2.36%	2.36%
2041	2,041	1,837	204	90%	32	9	852	3.77%	3.77%
2042	2,067	1,867	200	90%	39	9	869	4.45%	4.45%
2043	2,097	1,909	188	91%	44	9	887	4.97%	4.97%
2044	2,130	1,959	171	92%	49	9	904	5.47%	5.47%
2045	2,166	2,018	148	93%	57	9	922	6.14%	6.14%
2046	2,202	2,088	114	95%	58	9	941	6.13%	6.13%
2047	2,240	2,161	79	97%	59	10	960	6.11%	6.11%
2048	2,278	2,238	40	98%	60	10	979	6.11%	6.11%
2049	2,316	2,316	-	100%	16	10	998	1.62%	1.62%
2050	2,354	2,354	-	100%	16	10	1,018	1.61%	1.61%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to remain level throughout the entire projection.

Covered payroll is assumed to increase 2% each year throughout the entire projection.

The Board certified contribution rate paid by employers is assumed to be equal to the full actuarially determined contribution rate, except as allowed by

House Bill 362 (passed during the 2018 legislative session), which limits the certified contribution rate to a 12% increase over the prior year rate for the period of July 1, 2018 to June 30, 2028.

Kentucky Public Pensions Authority
Exhibit 2-5
KERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 424	\$ 575	\$ (151)	136%	\$ -	\$ 1	\$ 162	0.00%	0.00%
2022	437	608	(171)	139%	-	1	162	0.00%	0.00%
2023	447	639	(192)	143%	-	1	162	0.00%	0.00%
2024	456	669	(213)	147%	-	1	162	0.00%	0.00%
2025	464	705	(241)	152%	-	1	162	0.00%	0.00%
2026	470	722	(252)	154%	-	1	162	0.00%	0.00%
2027	475	739	(264)	156%	-	1	162	0.00%	0.00%
2028	479	755	(276)	158%	-	1	162	0.00%	0.00%
2029	482	772	(290)	160%	-	1	162	0.00%	0.00%
2030	485	788	(303)	163%	-	2	162	0.00%	0.00%
2031	487	806	(319)	166%	-	2	162	0.00%	0.00%
2032	488	824	(336)	169%	-	2	162	0.00%	0.00%
2033	491	844	(353)	172%	-	2	162	0.00%	0.00%
2034	493	864	(371)	175%	-	2	162	0.00%	0.00%
2035	495	887	(392)	179%	-	2	162	0.00%	0.00%
2036	498	911	(413)	183%	-	2	162	0.00%	0.00%
2037	501	937	(436)	187%	-	2	162	0.00%	0.00%
2038	505	965	(460)	191%	-	2	162	0.00%	0.00%
2039	510	995	(485)	195%	-	2	162	0.00%	0.00%
2040	515	1,027	(512)	199%	-	2	162	0.00%	0.00%
2041	520	1,061	(541)	204%	-	2	162	0.00%	0.00%
2042	526	1,098	(572)	209%	-	2	162	0.00%	0.00%
2043	533	1,137	(604)	213%	-	2	162	0.00%	0.00%
2044	540	1,178	(638)	218%	-	2	162	0.00%	0.00%
2045	547	1,222	(675)	223%	-	2	162	0.00%	0.00%
2046	554	1,268	(714)	229%	-	2	162	0.00%	0.00%
2047	561	1,317	(756)	235%	-	2	162	0.00%	0.00%
2048	567	1,367	(800)	241%	-	2	162	0.00%	0.00%
2049	573	1,420	(847)	248%	-	2	162	0.00%	0.00%
2050	578	1,476	(898)	255%	-	2	162	0.00%	0.00%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.

Kentucky Public Pensions Authority
Exhibit 2-6
SPRS Insurance Fund
Actuarial Analysis of HB 169
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 272	\$ 223	\$ 49	82%	\$ 8	\$ -	\$ 45	18.07%	18.07%
2022	278	238	40	86%	6	-	45	14.11%	14.11%
2023	282	250	32	89%	6	-	45	14.11%	11.65%
2024	285	261	24	92%	4	-	45	9.42%	9.42%
2025	286	271	15	95%	4	-	45	9.42%	7.54%
2026	287	273	14	95%	2	-	45	5.17%	5.17%
2027	287	272	15	95%	2	-	45	5.17%	4.75%
2028	286	271	15	95%	2	-	45	4.39%	4.39%
2029	284	268	16	94%	2	-	45	4.39%	4.12%
2030	282	265	17	94%	2	-	45	3.88%	3.88%
2031	279	262	17	94%	2	-	45	3.88%	3.73%
2032	275	258	17	94%	2	-	45	3.59%	3.59%
2033	272	253	19	93%	2	-	45	3.59%	3.51%
2034	268	249	19	93%	2	-	45	3.46%	3.46%
2035	264	244	20	92%	2	-	45	3.46%	3.41%
2036	261	239	22	92%	2	-	45	3.37%	3.37%
2037	258	235	23	91%	2	-	45	3.37%	3.35%
2038	255	231	24	91%	2	-	45	3.33%	3.33%
2039	252	227	25	90%	2	-	45	3.33%	3.31%
2040	250	224	26	90%	2	-	45	4.56%	4.56%
2041	248	221	27	89%	2	-	45	4.56%	8.39%
2042	247	219	28	89%	5	-	45	10.40%	10.40%
2043	246	220	26	89%	5	-	45	10.40%	11.96%
2044	246	221	25	90%	6	-	45	13.40%	13.40%
2045	246	224	22	91%	6	-	45	13.40%	15.27%
2046	246	228	18	93%	7	-	45	15.45%	15.45%
2047	246	233	13	95%	7	-	45	15.45%	15.50%
2048	246	238	8	97%	7	-	45	15.50%	15.50%
2049	246	246	-	100%	2	-	45	3.39%	3.39%
2050	246	246	-	100%	2	-	45	3.37%	3.37%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 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 as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.

Actuarial Analysis of HB 169
Section 3.
Projected Cost of the Retirement and Insurance
Proposed Legislation

Kentucky Public Pensions Authority
Exhibit 3-1
CERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 5,629	\$ 2,629	\$ 3,000	47%	\$ 206	\$ 46	\$ 578	35.60%	43.23%
2022	5,784	2,834	2,950	49%	253	47	590	42.81%	42.81%
2023	5,929	3,067	2,862	52%	247	48	602	41.04%	41.04%
2024	6,067	3,292	2,775	54%	243	49	614	39.63%	39.63%
2025	6,199	3,537	2,662	57%	240	50	626	38.29%	38.29%
2026	6,324	3,685	2,639	58%	234	51	639	36.70%	36.70%
2027	6,444	3,825	2,619	59%	237	52	651	36.33%	36.33%
2028	6,560	3,963	2,597	60%	239	53	664	36.00%	36.00%
2029	6,671	4,103	2,568	62%	242	54	678	35.68%	35.68%
2030	6,782	4,247	2,535	63%	245	55	691	35.43%	35.43%
2031	6,893	4,398	2,495	64%	248	56	705	35.22%	35.22%
2032	7,008	4,558	2,450	65%	252	58	719	35.04%	35.04%
2033	7,125	4,727	2,398	66%	256	59	733	34.88%	34.88%
2034	7,247	4,908	2,339	68%	260	60	748	34.74%	34.74%
2035	7,371	5,099	2,272	69%	264	61	763	34.60%	34.60%
2036	7,499	5,302	2,197	71%	268	62	778	34.46%	34.46%
2037	7,628	5,515	2,113	72%	272	64	794	34.31%	34.31%
2038	7,757	5,737	2,020	74%	277	65	810	34.15%	34.15%
2039	7,883	5,968	1,915	76%	281	66	826	33.98%	33.98%
2040	8,009	6,209	1,800	78%	272	67	843	32.34%	32.34%
2041	8,134	6,448	1,686	79%	279	69	859	32.43%	32.43%
2042	8,261	6,701	1,560	81%	294	70	877	33.59%	33.59%
2043	8,390	6,981	1,409	83%	309	72	894	34.53%	34.53%
2044	8,522	7,288	1,234	86%	323	73	912	35.45%	35.45%
2045	8,657	7,621	1,036	88%	341	74	930	36.67%	36.67%
2046	8,792	7,986	806	91%	348	76	949	36.67%	36.67%
2047	8,931	8,373	558	94%	355	77	968	36.68%	36.68%
2048	9,072	8,785	287	97%	362	79	987	36.70%	36.70%
2049	9,215	9,215	-	100%	59	81	1,007	5.88%	5.88%
2050	9,361	9,361	-	100%	61	82	1,027	5.90%	5.90%

Notes and assumptions:

The proposed legislation will provide increased retiree insurance benefits to applicable retirees. However, we do not believe the change in insurance benefits will materially change the anticipated retirement pattern for these employee groups. Therefore, we continue to use the same retirement assumptions in the 2021 actuarial valuation which will also result in no impact to the pension fund.

The proposed legislation increases the actuarially determined contribution rate for the CERS Hazardous fund above the maximum allowable rate under the current phase-in provisions.

For the purposes of this analysis, we have kept the pension fund contribution rate at the actuarially determined rate and limited the rate payable from the insurance fund.

Kentucky Public Pensions Authority
Exhibit 3-2
KERS Hazardous Retirement Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,295	\$ 782	\$ 513	60%	\$ 54	\$ 13	\$ 163	33.43%	33.43%
2022	1,325	848	477	64%	52	13	163	31.82%	31.82%
2023	1,353	907	446	67%	52	13	163	31.82%	29.92%
2024	1,378	966	412	70%	46	13	163	28.18%	28.18%
2025	1,403	1,026	377	73%	46	13	163	28.18%	26.67%
2026	1,426	1,060	366	74%	40	13	163	24.68%	24.68%
2027	1,448	1,088	360	75%	40	13	163	24.68%	24.43%
2028	1,468	1,115	353	76%	39	13	163	24.16%	24.16%
2029	1,486	1,140	346	77%	39	13	163	24.16%	23.95%
2030	1,505	1,166	339	78%	39	13	163	23.79%	23.79%
2031	1,524	1,192	332	78%	39	13	163	23.79%	23.68%
2032	1,544	1,221	323	79%	38	13	163	23.58%	23.58%
2033	1,566	1,250	316	80%	38	13	163	23.58%	23.52%
2034	1,589	1,282	307	81%	38	13	163	23.45%	23.45%
2035	1,612	1,315	297	82%	38	13	163	23.45%	23.39%
2036	1,637	1,349	288	82%	38	13	163	23.31%	23.31%
2037	1,661	1,384	277	83%	38	13	163	23.31%	23.22%
2038	1,686	1,420	266	84%	38	13	163	23.11%	23.11%
2039	1,710	1,456	254	85%	38	13	163	23.11%	23.01%
2040	1,734	1,492	242	86%	36	13	163	21.86%	21.86%
2041	1,758	1,528	230	87%	36	13	163	21.86%	24.55%
2042	1,782	1,564	218	88%	43	13	163	26.28%	26.28%
2043	1,807	1,609	198	89%	43	13	163	26.28%	27.70%
2044	1,832	1,656	176	90%	47	13	163	29.07%	29.07%
2045	1,857	1,709	148	92%	47	13	163	29.07%	30.81%
2046	1,881	1,763	118	94%	50	13	163	30.97%	30.97%
2047	1,905	1,821	84	96%	50	13	163	30.97%	31.00%
2048	1,928	1,881	47	98%	50	13	163	31.01%	31.01%
2049	1,950	1,950	-	100%	10	13	163	6.29%	6.29%
2050	1,971	1,971	-	100%	10	13	163	6.29%	6.29%

Notes and assumptions:

The proposed legislation will provide increased retiree insurance benefits to applicable retirees. However, we do not believe the change in insurance benefits will materially change the anticipated retirement pattern for these employee groups. Therefore, we continue to use the same retirement assumptions in the 2021 actuarial valuation which will also result in no impact to the pension fund.

Kentucky Public Pensions Authority
Exhibit 3-3
SPRS Retirement Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,053	\$ 323	\$ 730	31%	\$ 58	\$ 4	\$ 45	127.99%	127.99%
2022	1,055	348	707	33%	57	4	45	126.40%	126.40%
2023	1,055	371	684	35%	57	4	45	126.40%	123.44%
2024	1,054	392	662	37%	55	4	45	120.71%	120.71%
2025	1,051	413	638	39%	55	4	45	120.71%	118.30%
2026	1,046	424	622	41%	52	4	45	115.39%	115.39%
2027	1,040	432	608	42%	52	4	45	115.39%	114.66%
2028	1,034	441	593	43%	52	4	45	113.93%	113.93%
2029	1,026	448	578	44%	52	4	45	113.93%	113.26%
2030	1,018	457	561	45%	51	4	45	112.61%	112.61%
2031	1,009	465	544	46%	51	4	45	112.61%	112.16%
2032	1,000	474	526	47%	51	4	45	111.75%	111.75%
2033	990	483	507	49%	51	4	45	111.75%	111.46%
2034	981	494	487	50%	50	4	45	111.19%	111.19%
2035	972	506	466	52%	50	4	45	111.19%	110.91%
2036	962	518	444	54%	50	4	45	110.54%	110.54%
2037	952	531	421	56%	50	4	45	110.54%	110.14%
2038	942	545	397	58%	50	4	45	109.66%	109.66%
2039	931	560	371	60%	50	4	45	109.66%	109.17%
2040	920	576	344	63%	49	4	45	107.78%	107.78%
2041	908	592	316	65%	49	4	45	107.78%	110.49%
2042	896	609	287	68%	51	4	45	112.45%	112.45%
2043	883	630	253	71%	51	4	45	112.45%	114.18%
2044	871	652	219	75%	52	4	45	115.75%	115.75%
2045	857	678	179	79%	52	4	45	115.75%	117.70%
2046	844	704	140	83%	53	4	45	117.76%	117.76%
2047	830	734	96	88%	53	4	45	117.76%	117.73%
2048	816	766	50	94%	53	4	45	117.70%	117.70%
2049	801	801	-	100%	4	4	45	7.77%	7.77%
2050	787	787	-	100%	4	4	45	7.77%	7.77%

Notes and assumptions:

The proposed legislation will provide increased retiree insurance benefits to applicable retirees. However, we do not believe the change in insurance benefits will materially change the anticipated retirement pattern for these employee groups. Therefore, we continue to use the same retirement assumptions in the 2021 actuarial valuation which will also result in no impact to the pension fund.

Kentucky Public Pensions Authority
Exhibit 3-4
CERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,812	\$ 1,476	\$ 336	82%	\$ 50	\$ 3	\$ 573	8.73%	8.73%
2022	1,867	1,579	288	85%	40	3	585	6.84%	8.48%
2023	1,917	1,661	256	87%	45	4	597	7.51%	7.51%
2024	1,959	1,745	214	89%	40	4	609	6.64%	6.64%
2025	1,995	1,835	160	92%	36	5	621	5.83%	5.83%
2026	2,027	1,869	158	92%	31	5	633	4.90%	4.90%
2027	2,055	1,895	160	92%	30	5	646	4.67%	4.67%
2028	2,077	1,916	161	92%	29	6	659	4.47%	4.47%
2029	2,096	1,932	164	92%	29	6	672	4.29%	4.29%
2030	2,112	1,945	167	92%	29	6	685	4.17%	4.17%
2031	2,126	1,956	170	92%	28	6	699	4.06%	4.06%
2032	2,138	1,965	173	92%	28	7	713	3.97%	3.97%
2033	2,151	1,975	176	92%	28	7	727	3.91%	3.91%
2034	2,165	1,985	180	92%	29	7	742	3.86%	3.86%
2035	2,180	1,996	184	92%	29	7	757	3.81%	3.81%
2036	2,199	2,011	188	92%	29	8	772	3.78%	3.78%
2037	2,221	2,029	192	91%	30	8	787	3.75%	3.75%
2038	2,246	2,050	196	91%	30	8	803	3.73%	3.73%
2039	2,275	2,074	201	91%	30	8	819	3.72%	3.72%
2040	2,307	2,101	206	91%	36	8	835	4.31%	4.31%
2041	2,342	2,137	205	91%	41	9	852	4.82%	4.82%
2042	2,380	2,181	199	92%	47	9	869	5.36%	5.36%
2043	2,422	2,234	188	92%	52	9	887	5.88%	5.88%
2044	2,466	2,295	171	93%	58	9	904	6.38%	6.38%
2045	2,512	2,365	147	94%	65	9	922	7.03%	7.03%
2046	2,557	2,443	114	96%	66	9	941	7.02%	7.02%
2047	2,604	2,525	79	97%	67	10	960	6.99%	6.99%
2048	2,650	2,611	39	99%	68	10	979	6.97%	6.97%
2049	2,696	2,696	-	100%	25	10	998	2.47%	2.47%
2050	2,740	2,740	-	100%	25	10	1,018	2.45%	2.45%

Notes and assumptions:

The analysis above is based on the same methods, assumptions, and benefit provisions as the analysis under the Current Plan, except for the proposed benefit provision changes in HB 169.

The proposed legislation increases the actuarially determined contribution rate for the CERS Hazardous fund above the maximum allowable rate under the current phase-in provisions.

For the purposes of this analysis, we have kept the pension fund contribution rate at the actuarially determined rate and limited the rate payable from the insurance fund.

Kentucky Public Pensions Authority
Exhibit 3-5
KERS Hazardous Insurance Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 443	\$ 575	\$ (132)	130%	\$ -	\$ 1	\$ 162	0.00%	0.00%
2022	458	609	(151)	133%	-	1	162	0.00%	0.00%
2023	472	639	(167)	135%	-	1	162	0.00%	0.00%
2024	484	670	(186)	138%	-	1	162	0.00%	0.00%
2025	495	706	(211)	143%	-	1	162	0.00%	0.00%
2026	504	722	(218)	143%	-	1	162	0.00%	0.00%
2027	512	738	(226)	144%	-	1	162	0.00%	0.00%
2028	519	754	(235)	145%	-	1	162	0.00%	0.00%
2029	525	769	(244)	147%	-	1	162	0.00%	0.00%
2030	530	784	(254)	148%	-	2	162	0.00%	0.00%
2031	535	799	(264)	149%	-	2	162	0.00%	0.00%
2032	539	816	(277)	151%	-	2	162	0.00%	0.00%
2033	544	833	(289)	153%	-	2	162	0.00%	0.00%
2034	549	851	(302)	155%	-	2	162	0.00%	0.00%
2035	555	870	(315)	157%	-	2	162	0.00%	0.00%
2036	561	891	(330)	159%	-	2	162	0.00%	0.00%
2037	567	913	(346)	161%	-	2	162	0.00%	0.00%
2038	574	937	(363)	163%	-	2	162	0.00%	0.00%
2039	582	962	(380)	165%	-	2	162	0.00%	0.00%
2040	590	989	(399)	168%	-	2	162	0.00%	0.00%
2041	598	1,018	(420)	170%	-	2	162	0.00%	0.00%
2042	606	1,048	(442)	173%	-	2	162	0.00%	0.00%
2043	615	1,080	(465)	176%	-	2	162	0.00%	0.00%
2044	624	1,113	(489)	178%	-	2	162	0.00%	0.00%
2045	633	1,148	(515)	181%	-	2	162	0.00%	0.00%
2046	642	1,184	(542)	184%	-	2	162	0.00%	0.00%
2047	650	1,221	(571)	188%	-	2	162	0.00%	0.00%
2048	657	1,260	(603)	192%	-	2	162	0.00%	0.00%
2049	663	1,299	(636)	196%	-	2	162	0.00%	0.00%
2050	669	1,340	(671)	200%	-	2	162	0.00%	0.00%

Notes and assumptions:

The analysis above is based on the same methods, assumptions, and benefit provisions as the analysis under the Current Plan, except for the proposed benefit provision changes in HB 169.

Kentucky Public Pensions Authority
Exhibit 3-6
SPRS Insurance Fund
Actuarial Analysis of HB 169
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Total Employer Contribution	Member Contribution	Covered Payroll	Total Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 279	\$ 223	\$ 56	80%	\$ 8	\$ -	\$ 45	18.07%	18.07%
2022	286	238	48	83%	8	-	45	16.87%	16.87%
2023	291	251	40	86%	8	-	45	16.87%	14.53%
2024	295	263	32	89%	6	-	45	12.40%	12.40%
2025	298	275	23	92%	6	-	45	12.40%	10.59%
2026	300	278	22	93%	4	-	45	8.27%	8.27%
2027	301	280	21	93%	4	-	45	8.27%	7.88%
2028	301	280	21	93%	3	-	45	7.53%	7.53%
2029	301	279	22	93%	3	-	45	7.53%	7.25%
2030	300	278	22	93%	3	-	45	7.01%	7.01%
2031	298	276	22	93%	3	-	45	7.01%	6.85%
2032	296	273	23	92%	3	-	45	6.71%	6.71%
2033	293	270	23	92%	3	-	45	6.71%	6.62%
2034	291	267	24	92%	3	-	45	6.56%	6.56%
2035	288	264	24	92%	3	-	45	6.56%	6.50%
2036	286	261	25	91%	3	-	45	6.46%	6.46%
2037	284	259	25	91%	3	-	45	6.46%	6.44%
2038	282	256	26	91%	3	-	45	6.43%	6.43%
2039	281	254	27	90%	3	-	45	6.43%	6.40%
2040	279	252	27	90%	3	-	45	7.65%	7.65%
2041	278	251	27	90%	3	-	45	7.65%	9.93%
2042	278	250	28	90%	5	-	45	11.77%	11.77%
2043	277	251	26	91%	5	-	45	11.77%	13.31%
2044	277	253	24	91%	7	-	45	14.73%	14.73%
2045	278	257	21	92%	7	-	45	14.73%	16.60%
2046	278	261	17	94%	8	-	45	16.77%	16.77%
2047	278	266	12	96%	8	-	45	16.77%	16.80%
2048	278	271	7	98%	8	-	45	16.78%	16.78%
2049	279	279	-	100%	2	-	45	4.67%	4.67%
2050	278	278	-	100%	2	-	45	4.63%	4.63%

Notes and assumptions:

The analysis above is based on the same methods, assumptions, and benefit provisions as the analysis under the Current Plan, except for the proposed benefit provision changes in HB 169.