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March 19, 2018

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

Re: **BR 908 HB 539**
AA Statement 1 of 2
Kentucky Retirement Systems

Dear Mr. Eager:

We have reviewed and analyzed the summary of proposed structural and benefit changes in the draft legislation, HB 539. The purpose of this letter is to communicate the fiscal analysis of the draft legislation on the benefits provided to members in the CERS Non-Hazardous funds.

Provisions of Proposed Legislation

The draft legislation includes numerous administrative, authoritative, and provisional changes. However, we have limited our comments and analysis to the provisions that have a fiscal impact to the retirement systems maintained by the Kentucky Retirement Systems (KRS). Based on our interpretation of the proposal, this legislation only impacts the CERS Non-Hazardous Funds. If the intent of the legislation is to include similar changes to the KERS Non-Hazardous Funds then we can follow-up with that information.

In summary, the draft legislation creates a one-time option for Tier 3 Hybrid Plan members (current and future) in the CERS non-hazardous retirement funds (i.e. employees who became member in the CERS non-hazardous system on and after January 1, 2014) to elect to earn Tier 2 retirement benefits in lieu of the retirement benefits provided by Tier 3.

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. Since the CERS non-hazardous retirement fund is the only fund maintained by KRS that is fiscally impacted by this draft legislation, we are only providing the impact on this fund. 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.

GRS Comments on Proposed Legislation

Election to Earn Tier 2 or Tier 3 Benefits

The draft legislation provides the option for employees who become members on and after January 1, 2014 to earn Tier 2 or Tier 3 retirement benefits. While Tier 2 benefits are subject to certain cost and risk control measures, members will receive a larger retirement benefit in Tier 2. As a result, providing members an option to elect Tier 2 or Tier 3 benefits presents an opportunity for the member to make an irrevocable election to adversely select the less generous Tier 3 benefit.

While this is a policy matter, the proposed legislation could alternatively provide all the post January 1, 2014 members Tier 2 benefits that are subject to the cost and risk control measures, without requiring a member election. For fiscal analysis purposes, we have assumed that all current applicable members and all future members will elect to earn the Tier 2 benefit. Stated differently, we are assuming that each current and future member will elect the most valuable retirement benefit, which also results in the largest possible fiscal cost.

Risk Control Measures

The draft legislation includes cost and risk control measures on the new alternative benefit structure providing a vital way to manage the employer's risk and cost. Having the control measures explicitly stated in the State Statutes also provides an important transparency to all the stakeholders.

The two cost control measures include a funded ratio (i.e. ratio of the actuarial value of assets over the actuarial accrued liability) that is less than 95% or if the employer contribution rate exceeds the contribution rate in effect for FY 2017/2018. For this period, the rates are 41.06% of pay for the KERS Non-Hazardous retirement fund and 14.48% of pay for the CERS Non-Hazardous retirement fund. From a practical standpoint, the 95% funded ratio risk measure will become effective before the employer contribution rate measure in almost every scenario.

In order to monitor and measure these cost controls, it is necessary to separate the liability and assets attributable to this new benefit into a separate "risk pool" that will consist of a funded ratio and employer contribution rate attributable to these benefits. The liability and assets not attributable to this new benefit tier will remain in a separate risk pool.

Financing the Unfunded Liability Attributable to Tier 1 and Tier 2 benefits

As mentioned above, the cost control measures will require maintenance of two separate risk pools. Since the risk pool for Tier I and Tier 2 members consists of a closed active membership group, it is essential that there continues to be a source of revenue to finance the benefits and unfunded actuarial accrued liability in this risk pool. As a result, there must continue to be an amortization cost on Tier 3 payroll with the money attributable to this amortization charge allocated to the Tier 1 and Tier 2 risk pool.

Said another way, the contribution rate for the Tier 1 and Tier 2 risk pool will consist of the normal cost rate and an amortization rate where the amortization rate is based on the unfunded liability attributable to Tier 1 and Tier 2, but financed over the covered payroll of Tier 1, Tier 2, and Tier 3 members. Similarly, the contribution rate for Tier 3 members will be equal to the normal cost rate, plus an amortization cost due to the unfunded actuarial accrued liability attributable to Tier 3 benefits, plus the Tier 1 and Tier 2 amortization cost.

Anti-Pension Spiking Provisions

For purposes of determining retirement benefits, creditable compensation earned by employees in KERS, CERS, or the State Police Retirement System on or after January 1, 2018 is subject to a 10% increase compared to the compensation earned in the prior year, subject to certain exceptions such as promotions, certain sick leave payments, and certain overtime compensation. While this provision is important for policy reasons, this provision is expected to have a minimal fiscal impact on the retirement systems.

Separation of CERS from KERS

The separation of CERS from KERS to form a more autonomous System may result in certain value and benefits to CERS, but we would also expect there to be additional administrative and investment costs due to loss synergies, duplication of effort, and the loss of asset scale leverage. We are not certain how much these costs would increase so we did not incorporate those in our fiscal impact projections. Also, creating a new and separate retirement system may increase the difficulty in identifying qualified personnel to staff each of these large systems (i.e. CERS, KERS, and TRS).

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. Since Tier 2 benefits are more valuable than the benefits provided by Tier 3, we have assumed that all post January 1, 2014 members (current employees and future employees) will elect to earn Tier 2 benefits. This assumption also provides the largest possible fiscal impact. For establishing the initial asset balance in the new risk-pool, we have assumed that assets will be such that the funded ratio of the new risk pool will be 100% (i.e. the actuarial value of assets will equal to the actuarial accrued liability as of July 1, 2018).

The projections assume that the number of participating members in the CERS non-hazardous system 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 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.

General Comments

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. It may be prudent to consult with the Retirement System's counsel before enacting any such changes. Finally, no statement in this letter is intended to be interpreted as a recommendation in favor of or in opposition to the changes studied herein.

Mr. White and Mr. Newton are Enrolled Actuaries. All the of the undersigned are also members of the American Academy of Actuaries and that 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. If you have any questions, or require any additional or clarifying information, please do not hesitate to contact us.

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 Fund – Current Plan

Section 3. Projected Cost of the Retirement Fund – Proposed Legislation

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

Fiscal Year Beginning July 1,	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			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)
2017	$ 6,039	$ 6,039	$ -	53%	53%	0%	$ 355	$ 355	$ -	14.5%	14.5%	0.0%
2018	6,219	6,219	-	53%	53%	0%	546	567	21	21.8%	22.7%	0.8%
2019	6,299	6,300	1	53%	53%	0%	548	573	25	21.5%	22.5%	1.0%
2020	6,292	6,296	4	54%	54%	0%	558	586	28	21.5%	22.6%	1.1%
2021	6,165	6,172	7	56%	56%	0%	563	596	33	21.3%	22.6%	1.2%
2022	6,099	6,108	9	57%	57%	0%	561	597	36	20.9%	22.2%	1.3%
2023	6,026	6,038	12	58%	59%	1%	565	606	41	20.6%	22.1%	1.5%
2024	5,941	5,956	15	59%	60%	1%	570	614	44	20.4%	22.0%	1.6%
2025	5,840	5,859	19	61%	61%	0%	575	622	47	20.2%	21.9%	1.7%
2026	5,725	5,750	25	62%	63%	1%	580	632	52	20.0%	21.8%	1.8%
2027	5,595	5,625	30	63%	64%	1%	585	640	55	19.8%	21.7%	1.9%
2028	5,446	5,482	36	64%	65%	1%	591	650	59	19.7%	21.7%	2.0%
2029	5,280	5,323	43	66%	67%	1%	597	660	63	19.5%	21.6%	2.1%
2030	5,094	5,142	48	67%	68%	1%	604	671	67	19.3%	21.5%	2.2%
2031	4,885	4,941	56	68%	70%	2%	611	683	72	19.2%	21.4%	2.3%
2032	4,654	4,716	62	70%	71%	1%	619	694	75	19.0%	21.4%	2.3%
2033	4,397	4,466	69	72%	73%	1%	627	708	81	18.9%	21.3%	2.5%
2034	4,115	4,191	76	74%	75%	1%	636	721	85	18.7%	21.3%	2.5%
2035	3,803	3,885	82	76%	77%	1%	645	734	89	18.6%	21.2%	2.6%
2036	3,462	3,549	87	78%	79%	1%	655	752	97	18.5%	21.3%	2.8%
2037	3,087	3,177	90	80%	82%	2%	666	768	102	18.4%	21.2%	2.8%
2038	2,677	2,767	90	83%	84%	1%	678	786	108	18.3%	21.2%	3.0%
2039	2,230	2,319	89	86%	87%	1%	690	805	115	18.1%	21.2%	3.1%
2040	1,742	1,824	82	89%	90%	1%	703	826	123	18.0%	21.3%	3.2%
2041	1,211	1,282	71	92%	93%	1%	715	849	134	17.9%	21.3%	3.4%
2042	634	687	53	96%	96%	0%	730	879	149	17.9%	21.6%	3.7%
2043	-	-	-	100%	100%	0%	78	188	110	1.9%	4.5%	2.6%
2044	-	-	-	100%	100%	0%	79	192	113	1.9%	4.5%	2.6%
2045	-	-	-	100%	100%	0%	80	197	117	1.8%	4.5%	2.7%
2046	-	-	-	100%	100%	0%	82	201	119	1.8%	4.5%	2.7%
2047	-	-	-	100%	100%	0%	83	205	122	1.8%	4.5%	2.7%
2048	-	-	-	100%	100%	0%	84	210	126	1.8%	4.5%	2.7%
2049	-	-	-	100%	100%	0%	86	214	128	1.8%	4.5%	2.7%
2050	-	-	-	100%	100%	0%	88	219	131	1.8%	4.5%	2.7%
2051	-	-	-	100%	100%	0%	89	225	136	1.8%	4.5%	2.7%

Notes and assumptions:
All Tier 3 members are assumed to choose to receive Tier 2 benefits at June 30, 2018.

Kentucky Retirement Systems
Exhibit 2
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)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2017	$ 12,804	$ 6,765	$ 6,039	53%	$ 355	$ 123	$ 2,452	14.48%	14.48%
2018	13,121	6,902	6,219	53%	546	125	2,500	21.84%	21.84%
2019	13,421	7,122	6,299	53%	548	127	2,547	21.50%	21.50%
2020	13,704	7,412	6,292	54%	558	130	2,594	21.53%	21.53%
2021	13,970	7,805	6,165	56%	563	132	2,642	21.33%	21.33%
2022	14,218	8,119	6,099	57%	561	135	2,690	20.86%	20.86%
2023	14,445	8,419	6,026	58%	565	137	2,740	20.64%	20.64%
2024	14,652	8,711	5,941	59%	570	140	2,790	20.43%	20.43%
2025	14,836	8,996	5,840	61%	575	142	2,842	20.22%	20.22%
2026	14,998	9,273	5,725	62%	580	145	2,894	20.03%	20.03%
2027	15,136	9,541	5,595	63%	585	147	2,948	19.84%	19.84%
2028	15,259	9,813	5,446	64%	591	150	3,003	19.67%	19.67%
2029	15,359	10,079	5,280	66%	597	153	3,062	19.50%	19.50%
2030	15,438	10,344	5,094	67%	604	156	3,124	19.34%	19.34%
2031	15,496	10,611	4,885	68%	611	159	3,187	19.18%	19.18%
2032	15,536	10,882	4,654	70%	619	163	3,254	19.03%	19.03%
2033	15,558	11,161	4,397	72%	627	166	3,323	18.88%	18.88%
2034	15,565	11,450	4,115	74%	636	170	3,394	18.74%	18.74%
2035	15,556	11,753	3,803	76%	645	173	3,467	18.61%	18.61%
2036	15,535	12,073	3,462	78%	655	177	3,545	18.49%	18.49%
2037	15,507	12,420	3,087	80%	666	181	3,628	18.37%	18.37%
2038	15,478	12,801	2,677	83%	678	186	3,714	18.25%	18.25%
2039	15,451	13,221	2,230	86%	690	190	3,803	18.14%	18.14%
2040	15,428	13,686	1,742	89%	703	195	3,895	18.04%	18.04%
2041	15,413	14,202	1,211	92%	715	199	3,988	17.94%	17.94%
2042	15,406	14,772	634	96%	730	204	4,083	17.87%	17.87%
2043	15,409	15,409	0	100%	78	209	4,179	1.87%	1.87%
2044	15,423	15,423	0	100%	79	214	4,277	1.85%	1.85%
2045	15,449	15,449	0	100%	80	219	4,377	1.83%	1.83%
2046	15,488	15,488	0	100%	82	224	4,478	1.82%	1.82%
2047	15,540	15,540	0	100%	83	229	4,581	1.81%	1.81%
2048	15,606	15,606	0	100%	84	234	4,686	1.80%	1.80%
2049	15,687	15,687	0	100%	86	240	4,792	1.79%	1.79%
2050	15,783	15,783	0	100%	88	245	4,901	1.79%	1.79%
2051	15,895	15,895	0	100%	89	251	5,012	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.

Kentucky Retirement Systems
Exhibit 3
CERS Non-Hazardous Retirement Fund
Proposed Legislation HB 539 - Tier 1 and Tier 2 Members
($ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution on Tier 1/2 Pay	Member Contribution	Covered Payroll	Tier 1/2 Employer Normal Cost as a % of Covered Payroll	Amortization Rate of Tier 1/2 UAAL as a % of Total Covered Payroll	Tier 1/2 Employer Contribution as % of Payroll
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2017	$ 12,804	$ 6,765	$ 6,039	53%	$ 355	$ 123	$ 2,452	3.70%	10.78%	14.48%
2018	13,036	6,817	6,219	52%	424	91	1,824	6.84%	15.99%	22.83%
2019	13,291	6,992	6,299	53%	399	86	1,722	6.77%	16.01%	22.78%
2020	13,518	7,226	6,292	53%	380	82	1,625	6.72%	16.33%	23.05%
2021	13,715	7,550	6,165	55%	358	76	1,529	6.67%	16.41%	23.08%
2022	13,881	7,782	6,099	56%	333	72	1,436	6.62%	16.20%	22.82%
2023	14,012	7,986	6,026	57%	311	67	1,343	6.57%	16.22%	22.79%
2024	14,109	8,168	5,941	58%	290	63	1,251	6.52%	16.24%	22.76%
2025	14,169	8,329	5,840	59%	269	58	1,161	6.46%	16.25%	22.71%
2026	14,191	8,466	5,725	60%	248	54	1,071	6.41%	16.27%	22.68%
2027	14,173	8,578	5,595	61%	227	49	982	6.34%	16.28%	22.62%
2028	14,124	8,678	5,446	61%	207	45	897	6.27%	16.30%	22.57%
2029	14,034	8,754	5,280	62%	187	41	817	6.20%	16.31%	22.51%
2030	13,906	8,812	5,094	63%	169	37	740	6.12%	16.32%	22.44%
2031	13,739	8,854	4,885	64%	152	33	667	6.04%	16.31%	22.35%
2032	13,535	8,881	4,654	66%	135	30	598	5.95%	16.30%	22.25%
2033	13,295	8,898	4,397	67%	120	26	532	5.85%	16.28%	22.13%
2034	13,020	8,905	4,115	68%	105	24	468	5.74%	16.26%	22.00%
2035	12,710	8,907	3,803	70%	90	20	407	5.61%	16.24%	21.85%
2036	12,368	8,906	3,462	72%	78	17	354	5.47%	16.22%	21.69%
2037	12,000	8,913	3,087	74%	67	15	309	5.33%	16.18%	21.51%
2038	11,611	8,934	2,677	77%	59	14	270	5.20%	16.13%	21.33%
2039	11,205	8,975	2,230	80%	51	12	235	5.07%	16.07%	21.14%
2040	10,785	9,043	1,742	84%	44	10	204	4.94%	16.02%	20.96%
2041	10,353	9,142	1,211	88%	37	8	175	4.82%	15.97%	20.79%
2042	9,913	9,279	634	94%	32	7	148	4.70%	15.94%	20.64%
2043	9,465	9,465	-	100%	6	6	124	4.58%	0.00%	4.58%
2044	9,013	9,013	-	100%	5	5	103	4.46%	0.00%	4.46%
2045	8,559	8,559	-	100%	4	4	84	4.34%	0.00%	4.34%
2046	8,106	8,106	-	100%	3	3	67	4.24%	0.00%	4.24%
2047	7,653	7,653	-	100%	2	3	53	4.15%	0.00%	4.15%
2048	7,205	7,205	-	100%	2	2	40	4.07%	0.00%	4.07%
2049	6,763	6,763	-	100%	1	2	30	4.01%	0.00%	4.01%
2050	6,330	6,330	-	100%	1	1	22	3.95%	0.00%	3.95%
2051	5,906	5,906	-	100%	1	1	16	3.91%	0.00%	3.91%

Notes and assumptions:
The projection is based on the results of the June 30, 2017 actuarial valuation.
The actuarial determined contribution is determined by the prior year's actuarial valuation.
Normal cost rate reflects the normal cost for only Tier 1 and Tier 2 members.
Amortization rates reflect the amortization of the unfunded accrued liability of the entire plan divided by total covered payroll (i.e. Tier 1, Tier 2, and Tier 3 payroll).

Kentucky Retirement Systems
Exhibit 3 (Continued)
CERS Non-Hazardous Retirement Fund
Proposed Legislation HB 539 - Tier 3 Members (Earning Tier 2 Benefits)
($ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution to Tier 3	Employer Contribution to Tier 1/2	Member Contribution	Covered Payroll	Employer Tier 3 Contribution Rate as % of Tier 3 Covered Payroll	Amortization Rate of Tier 1/2 UAAL as a % of Total Payroll	Total Employer Contribution as % of Tier 3 Payroll
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2018	85	85	-	100%	35	108	39	676	4.55%	15.99%	20.54%
2019	155	154	1	99%	42	132	46	825	4.55%	16.01%	20.56%
2020	243	239	4	98%	48	158	53	969	4.55%	16.33%	20.88%
2021	349	342	7	98%	55	183	60	1,112	4.57%	16.41%	20.98%
2022	473	464	9	98%	61	203	67	1,255	4.58%	16.20%	20.78%
2023	617	605	12	98%	68	227	74	1,397	4.59%	16.22%	20.81%
2024	782	767	15	98%	74	250	81	1,539	4.61%	16.24%	20.85%
2025	969	950	19	98%	80	273	87	1,681	4.61%	16.25%	20.86%
2026	1,179	1,154	25	98%	87	297	94	1,823	4.62%	16.27%	20.89%
2027	1,412	1,382	30	98%	93	320	101	1,964	4.64%	16.28%	20.92%
2028	1,670	1,634	36	98%	100	343	107	2,105	4.66%	16.30%	20.96%
2029	1,953	1,910	43	98%	107	366	114	2,244	4.69%	16.31%	21.00%
2030	2,261	2,213	48	98%	113	389	120	2,381	4.70%	16.32%	21.02%
2031	2,597	2,541	56	98%	120	411	127	2,517	4.73%	16.31%	21.04%
2032	2,959	2,897	62	98%	127	432	133	2,652	4.76%	16.30%	21.06%
2033	3,350	3,281	69	98%	134	454	140	2,787	4.79%	16.28%	21.07%
2034	3,770	3,694	76	98%	141	475	146	2,920	4.83%	16.26%	21.09%
2035	4,219	4,137	82	98%	148	496	153	3,054	4.86%	16.24%	21.10%
2036	4,698	4,611	87	98%	157	517	159	3,185	4.92%	16.22%	21.14%
2037	5,208	5,118	90	98%	165	536	166	3,311	4.97%	16.18%	21.15%
2038	5,748	5,658	90	98%	173	554	172	3,436	5.04%	16.13%	21.17%
2039	6,320	6,231	89	99%	182	572	178	3,560	5.12%	16.07%	21.19%
2040	6,922	6,840	82	99%	192	590	184	3,683	5.20%	16.02%	21.22%
2041	7,554	7,483	71	99%	204	608	190	3,805	5.35%	15.97%	21.32%
2042	8,216	8,163	53	99%	221	626	196	3,927	5.64%	15.94%	21.58%
2043	8,907	8,907	-	100%	182	-	202	4,048	4.50%	0.00%	4.50%
2044	9,625	9,625	-	100%	187	-	208	4,168	4.49%	0.00%	4.49%
2045	10,367	10,367	-	100%	193	-	214	4,287	4.49%	0.00%	4.49%
2046	11,131	11,131	-	100%	198	-	220	4,406	4.49%	0.00%	4.49%
2047	11,916	11,916	-	100%	203	-	226	4,524	4.49%	0.00%	4.49%
2048	12,717	12,717	-	100%	208	-	232	4,641	4.48%	0.00%	4.48%
2049	13,534	13,534	-	100%	213	-	238	4,759	4.48%	0.00%	4.48%
2050	14,363	14,363	-	100%	218	-	244	4,876	4.48%	0.00%	4.48%
2051	15,201	15,201	-	100%	224	-	250	4,994	4.48%	0.00%	4.48%

Notes and assumptions:
The projection is based on the results of the June 30, 2017 actuarial valuation.
The actuarial determined contribution is determined by the prior year's actuarial valuation.
All Tier 3 members are assumed to choose to receive Tier 2 benefits at June 30, 2018.
Normal cost rate only reflects the normal cost for Tier 3 members.
Column 6 shows the employer contribution requirement (normal cost and amortization of the unfunded liability) attributable to Tier 3 benefits.
Column 7 is the amortization cost attributable to Tier 3 payroll to finance the Tier 1/2 unfunded liability.

TEACHERS' RETIREMENT SYSTEM
of the State of Kentucky

GARY L. HARBIN, CPA
Executive Secretary

ROBERT B. BARNES, JD
Deputy Executive Secretary Operations and General Counsel

J. **ERIC WAMPLER, JD**
Deputy Executive Secretary Finance and Administration

March 12, 2018

Katie Carney Kate Talley
Legislative Research Commission Capitol Annex
Frankfort, KY 40601

RE: BR 908 HB 539
AA Statement 2 of 2

Dear Katie and Kate:

Attached is the actuarial analysis from the independent actuary for the Teachers' Retirement System of the State of Kentucky for House Bill 539. Since legislators and staff requested a breakdown of where the savings come from on previous draft legislation, TRS asked the actuary to provide a similar breakdown for HB 539. That schedule will be transmitted separately as soon as it is completed.

Please let us know if you have any questions. Sincerely,

Robert B. Barnes
Deputy Executive Secretary and General Counsel

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March 12, 2018

Mr. Robert B. Barnes
Deputy Executive Secretary and General Counsel Kentucky Teachers' Retirement System
479 Versailles Road
Frankfort, KY 40601-3800

Actuarial Impact - 18 RS Bill Request 908 (House Bill 539) - Impact on Pension Plan

Dear Beau:

We have prepared an actuarial analysis of the impact of 18 RS Bill Request 908 (House Bill 539) on the Teachers' Retirement System of the State of Kentucky (TRS). This actuarial analysis relates to the pension plan only. House Bill 539 introduces a new tier of benefits for active members hired on or after July 1, 2018 and changes actuarial funding, participation requirements and actuarial assumptions. The major provisions of House Bill 539 are summarized below and the estimated cost impacts are provided in the attached Exhibits.

Section I - Benefit Provisions for New Members on or after July 1, 2018

All new members hired on or after July 1, 2018 will accrue retirement benefits under a new tier within TRS. An annual actuarial valuation will be prepared to assess the funding levels, unfunded liabilities and actuarially required employer contribution rates separately for this new tier. If the new tier funding level falls below 95% or would require an increase in the employer contribution rate, the Board will be required to make the following sequential changes:

a. Increase both the employee contribution rates and the contribution rates payable by the employers in amounts not to exceed 2% of annual compensation.
b. Reduce or suspend annual increases in retirement benefits (COLAs).
c. Reduce the benefit multiplier for future years of service or increase the requirements for unreduced retirement.

The retirement benefit under the new tier will have the same basic benefit formula structure that applies to other members of TRS hired on or after 2008, with the following exceptions:

a. There will be no sick leave credit.
b. All benefits will be determined using a 5-year final average salary.
c. Members will not accrue 3% for service in excess of 30 years.

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The service retirement eligibilities under the new tier are age 60 with 5 years of service or age and service total of at least 85 (Rule of 85). The member may elect to receive a reduced monthly retirement allowance after age and service total at least 70 (Rule of 70). The benefit is reduced by 2% per year from the earlier of age 60 or when the member would have attained Rule of 85.

Section II - Changes to Benefit Provisions for Current Members as of July 1, 2018

Sick Leave

The level of sick leave for retirement purposes will be frozen at June 30, 2018.

Benefit Formula

House Bill 539 provides that the 3% benefit multiplier is available for:

1. Non-university members who retire prior to July 1, 2024 for service years in excess of 30 years.
2. Non-university members who retire on and after July 1, 2024, for service years in excess of 30 years except that the 3% multiplier shall not apply to any service in excess of 30 years occurring on or after July 1, 2024.

Section III - Contribution Requirements

Employee Contribution Rates

Active members hired before July 1, 2018 will continue to contribute the same percentage of salary to the pension and retiree health plans. The table below shows the contribution requirements:

Item	Non-University	University
Pension	9.105%	7.625%
Retiree Health	3.750%	2.775%
Total	12.855%	10.400%

Contribution requirements for active members hired on and after July 1, 2018 are shown in the table below:

Item	Non-University	University
Pension	10.000%	8.520%
Retiree Health	3.750%	2.775%
Total	13.750%	11.295%

Employer Contributions

According to House Bill 539, for active members hired before July 1, 2018, employers will pay a fixed base statutory contribution rate of 16.105% of pay for non-university employers and 13.650% of pay for universities to fund pension, retiree health benefits and life insurance. The table below shows the statutory contribution rates.

Item	Non-University	University
Pension	12.305%	10.825%
Retiree Health	3.750%	2.775%
Life Insurance	0.050%	0.050%
Total	16.105%	13.650%

For active members hired on and after July 1, 2018, employers will pay a fixed base statutory contribution rate of 9.750% of pay for non-university employers and 8.750% of pay for universities to fund pension, retiree health benefits and life insurance. The table below shows the statutory contribution rates.

Item	Non-University	University
Pension	5.950%	5.950%
Retiree Health	3.750%	2.775%
Life Insurance	0.050%	0.050%
Total	9.750%	8.775%

The State will continue to make direct contributions to TRS for amortization payments for past benefit improvements, such as ad hoc COLAs, the cost for including sick leave payments in pension calculations and portion of the "shared solution" for retiree health funding.

In addition for those members who began participating before July 1, 2018, the state appropriations shall pay the additional contributions needed to fund the TRS pension fund and life insurance fund on an actuarially sound basis as determined by the system's actuarial valuation.

Section IV - Actuarial Assumptions

The projections for the proposed legislation use the June 30, 2017 actuarial valuation of TRS as a baseline. Below are additional or alternative actuarial assumptions that are used in the determination of this legislation:

- The plan changes were amortized over a closed 26-year period from June 30, 2018.
- We have revised assumed retirement rates for members of the new tier based on the new retirement eligibility requirements. Actual retirement patterns occurring in the future that are different from those assumed, will impact the ultimate cost of House Bill 539. In addition, other assumptions, such as rates of termination and disability that were determined based on actual experience under the current plan would likely change under House Bill 539 further impacting the ultimate cost.
- We have assumed that the actuarially determined contribution (ADC) will be made for each year of the projection.
- We have credited the portion of the 5.95% employer contribution rate to the new tier equal to the required contribution amount, such that, this tier remains at 100% funded. The remaining portion of the 5.95% is applied to the current tier assets and used to reduce the future contribution requirements for this tier.

Section VII - Conclusion

Exhibit 1 shows a projection of the results of the ongoing TRS plan under the current benefit structure.

Exhibit 2 shows the projection of the results under House Bill 539, along with a comparison with the current plan. The overall impact for House Bill 539 is a savings in the employer contributions for most years of the projection period.

Projections are designed to identify anticipated trends rather than predicting some future state of events. The projections are based on TRS' estimated financial status on June 30, 2017, and project future events using one set of assumptions out of a range of many possibilities. The projections do not predict TRS' financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the DB Plan. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, the duration of the benefit payments, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain at the time the projections were made. Because actual experience will not unfold exactly as expected, actual results can be expected to differ from the projections. To the extent that actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse that indicated in this study.

The undersigned, Edward **J.** Koebel, is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Edward J. Koebel, EA, FCA, MAAA

Principal and Consulting Actuary

Cathy Turcot

Principal and Managing Director

S:/2018/Kentucky Teachers/Correspondence/Actuarial Impact - 18 BR 908.doc

Exhibit 1

Teachers' Retirement System of the State of Kentucky

~~Current Funding Status for Open Defined~~ Benefit Plan

($ in thousands)

Fiscal Year	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Actuarially Determined Contribution in Dollars for Open DB Plan	Contribution for Non-University as a Percentage of Payroll	Actuarially Determined Contribution for University as a Percentage of Payroll
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FY 2019-20	$3,596,437	$216,293	$3,812,730	$14,585,873	58.5%	$1,105,933	29.675%	28.195%
FY 2020-21	3,681,291	223,016	3,904,307	14,453,417	59.8%	1,122,472	29.395%	27.915%
FY 2021-22	3,767,372	230,498	3,997,870	14,540,632	60.5%	1,161,621	29.585%	28.105%
FY 2022-23	3,853,375	238,437	4,091,812	14,596,454	61.2%	1,202,360	29.765%	28.285%
FY 2023-24	3,942,603	247,461	4,190,064	14,642,255	61.9%	1,220,509	29.985%	28.505%
FY 2024-25	4,032,351	257,984	4,290,335	14,656,174	62.6%	1,259,143	30.195%	28.715%
FY2025-26	4,123,930	269,425	4,393,355	14,635,141	63.4%	1,298,428	30.415%	28.935%
FY2026-27	4,217,517	281,733	4,499,250	14,573,409	64.3%	1,340,752	30.625%	29.145%
FY2027-28	4,315,611	294,764	4,610,375	14,467,053	65.2%	1,384,055	30.835%	29.355%
FY 2028-29	4,419,127	307,957	4,727,084	14,310,400	66.2%	1,429,929	31.025%	29.545%
FY 2029-30	4,527,945	321,866	4,849,811	14,097,960	67.3%	1,477,606	31.205%	29.725%
FY 2030-31	(643,376	335,838	4,979,214	13,823,335	68.5%	1,527,728	31.355%	29.875%
FY 2031-32	4,765,145	349,856	5,115,001	13,480,243	69.7%	1,579,540	31.495%	30.015%
FY 2032-33	4,892,392	364,850	5,257,242	13,061,505	71.1%	1,633,441	31.615%	30.135%
FY 2033-34	5,029,608	379,468	5,409,076	12,560,643	72.7%	1,688,394	31.705%	30.225%
FY 2034-35	5,176,712	394,741	5,571,453	11,968,669	74.3%	1,746,352	32.675%	31.195%
FY 2035-36	5,332,648	411,023	5,743,671	11,276,223	76.2%	1,807,048	31.925%	30.445%
FY 2036-37	5,497,154	427,666	5,924,820	10,474,821	78.2%	1,869,39 1	33.005%	31.525%
FY 2037-38	5,670,412	445,204	6,115,616	9,499,695	80.5%	1,986,904	33.715%	32.235%
FY 2038-39	5,852,888	463,267	6,316,155	8,440,731	82.9%	2,005,891	33.795%	32.315%

Exhibit 2

Teachers' Retirement System of the State of Kentucky

Funding Status for Closed Tiers - Members hired before July 1, 2018

($ in thousands)

Fiscal Year	Non-Uniwrsity Closed Tier Payrol	Uniwrsity Closed Tier Payrol	Total Closed Tier Pa roll	Unfunded Accrued Liability for Closed Tier Plan	Funding Ratio for Closed Tier Plan	Actuarially Determined Contribution in Dollars for Closed Tier Plan
	(9)	(10)	(11)	(12)	(13)	(14)
FY2019-20	$3,124,229	$167,794	$3,292,023	$14,392,083	58.7%	$1,095,819
FY2020-21	3,056,654	159,464	3,216,118	14,244,257	60.0%	1,090,654
FY 2021-22	2,989,277	152,023	3,141,300	14,312,483	60.6%	1,124,165
FY 2022-23	2,915,597	144,590	3,060,187	14,346,579	61.2%	1,158,119
FY 2023-24	2,838,905	137,838	2,976,743	14,366,359	61.8%	1,170,354
FY 2024-25	2,752,353	131,761	2,884,114	14,350,384	62.5%	1,202,053
FY 2025-26	2,658,574	125,983	2,784,557	14,294,351	63.2%	1,234,818
FY 2026-27	2,556,348	120,316	2,676,664	14,193,236	63.9%	1,269,125
FY 2027-28	2,449,652	114,767	2,564,419	14,042,565	64.6%	1,304,142
FY 2028-29	2,339,927	108,899	2,448,826	13,837,470	65.5%	1,340,126
FY 2029-30	2,223,494	102,913	2,326,407	13,571,412	66.4%	1,378,252
FY 2030-31	2,103,012	96,393	2,199,405	13,238,757	67.4%	1,417,189
FY 2031-32	1,976,308	89,151	2,065,459	12,832,827	68.5%	1,457,434
FY 2032-33	1,840,413	81,957	1,922,370	12,346,594	69.7%	1,498,777
FY 2033-34	1,702,830	73,803	1,776,633	11,773,702	71.1%	1,540,162
FY 2034-35	1,562,037	65,638	1,627,675	11,105,125	72.7%	1,583,897
FY 2035-36	1,421,235	58,220	1,479,455	10,332,124	74.4%	1,629,139
FY 2036-37	1,278,737	50,706	1,329,443	9,446,213	76.4%	1,675,332
FY 2037-38	1,134,937	43,650	1,178,587	8,383,109	78.9%	1,775,503
FY 2038-39	991,276	36,755	1,028,031	7,232,839	81.6%	1,776,271

Exhibit 2

Teachers' Retirement System of the State of Kentucky

Funding Requirements under New Tier and Comparison to Current Plan

($ in thousands)

Fiscal Year	Non-Unin rsity New Tier Payroll	University New Tier Pa -rol	Total New Tier Payroll	Funding Ratio	New Tier Plan	Funding Ratio	for Proposed Bil	for Current Plan	Cost/Savings toTRS Employers
	(15)	(16)	(17)=(15)+(16)	(18)	(19)	(20)	(21)=(1-t)+(I9)	(22)=(6)	(23)=(21)-(22)
FY2019-20	$472,208	$48,499	$520,707	100.0%	$11,715	58.8%	$1,107,534	$1,105,933	$1,601
FY 2020-21	624,637	63,552	688,189	100.0%	16,919	60.2%	1,107,573	1,122,472	(14,899)
FY2021-22	778,095	78,475	856,570	100.0%	22,034	60.9%	1,146,199	1,161,621	(15,422)
FY 2022-23	937,778	93,847	1,031,625	100.0%	27,133	61.6%	1,185,252	1,202,360	(17,108)
FY 2023-24	1,103,698	109,623	1,213,321	100.0%	32,561	62.3%	1,202,915	1,220,509	(17,594)
FY 2024-25	1,279,997	126,224	1,406,221	100.0%	38,176	63.1%	1,240,229	1,259,143	(18,914)
FY 2025-26	1,465,355	143,442	1,608,797	100.0%	44,103	64.0%	1,278,92 1	1,298,428	(19,507)
FY 2026-27	1,661,168	161,417	1,822,585	100.0%	50,292	64.9%	1,319,417	1,340,752	(21,335)
FY 2027-28	1,865,959	179,997	2,045,956	100.0%	56,777	65.9%	1,360,919	1,384,055	(23,136)
FY 2028-29	2,079,215	199,072	2,278,287	100.0%	63,594	66.9%	1,403,720	1,429,929	(26,209)
FY 2029-30	2,304,479	218,979	2,523,458	100.0%	70,637	68.1%	1,448,889	1,477,606	(28,717)
FY 2030-31	2,540,420	239,508	2,779,928	100.0%	78,010	69.3%	1,495,199	1,527,728	(32,529)
FY 2031-32	2,788,937	260,826	3,049,763	100.0%	85,647	70.7%	1,543,081	1,579,540	(36,459)
FY 2032-33	3,052,113	283,075	3,335,188	100.0%	93,574	72.2%	1,592,351	1,633,441	(41,090)
FY 2033-34	3,326,939	305,907	3,632,846	100.0%	101,806	73.9%	1,641,968	1,688,394	(46,426)
FY 2034-35	3,614,829	329,373	3,944,202	100.0 %	110,213	75.7%	1,694,110	1,746 ,35 2	(52,242)
FY 2035-36	3,911,557	353,098	4,264,655	100.0%	118,746	77.7%	1,747,885	1,807,048	(59,163)
FY 2036-37	4,218,545	377,280	4,595,825	100.0%	127,566	79.8%	1,802,898	1,869,391	(66,493)
FY 2037-38	4,535,521	401,865	4,937,386	100.0%	136,687	82.3%	1,912,190	1,986,904	(74,714)
FY 2038-39	4,861,516	426,782	5,288,298	100.0%	146,115	84.9%	1,922,386	2,005,891	(83,505)