GRS Retirement Consulting

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March 6, 2018

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

Re: **BR 427 SB 1 SCS**
AA Statement 1 of 4
KERS and CERS Non-Hazardous Systems

Dear Mr. Eager:

We have reviewed and analyzed the summary of proposed changes in the proposed pension reform legislation SB 1 Sub 1. The purpose of this letter is to communicate to the fiscal analysis of this proposed legislation on the retirement and insurance funds maintained by the Kentucky Retirement System (KRS) as it applies to the Non-Hazardous Systems (i.e. KERS Non-Hazardous and CERS Non-Hazardous).

The provisions of this legislation are similar to that proposed in SB 1, with a notable difference of resetting the amortization period for financing the unfunded actuarial accrued to a closed 30-year period beginning with the July 1, 2019 actuarial valuation. In addition, compared to the original SB 1, this proposed legislation, SB 1 Sub 1, requires Tier I members who became participating on or after July 1, 2003 (but prior to September 1, 2008) to contribute 1% of pay to the Health Insurance Fund.

Principal Provisions of Proposed Legislation

Exhibit 1 provides a summary of the provisions in the pension reform bill that have a fiscal impact on the retirement system. In summary, the Tier 3 Hybrid Plan will be the default plan for providing benefits to future members, but beginning January 1, 2019 there will be a new optional defined contribution plan that members may make a one-time irrevocable election to earn future retirement benefits in the defined contribution plan, in lieu of the defined benefit plan. The amortization of the unfunded actuarial accrued liability will be determined on a level-dollar basis beginning with the 2019 actuarial valuation, and the funding period will reset to a closed 30-year period. Finally, active Tier I members who became participants on or after July 1, 2003 (but prior to September 1, 2008) will contribute 1% of pay.

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. Specifically, these exhibits show the projected impact on the:

(1) unfunded actuarial accrued liability, (2) funded ratio, (3) total employer contribution dollars, and (4) projected composite employer contribution rates, for each of the funds (retirement and health insurance). Section 2 provides additional detail regarding each projection under the current plan and Section 3 provides similar information under the proposed legislation. Section 4 provides the fiscal impact under an alternative assumption scenario for the KERS Non-Hazardous System that assumes a decreasing active membership count consistent with recent trends. Below are comments regarding the cost projection for each fund.

KERS Non-Hazardous Retirement Fund

The changes in the benefit provisions have a minimal impact on the actuarial accrued liability (and unfunded actuarial accrued liability) as of June 30, 2017. The savings in the projected employer contributions beginning with FY 20/21 for the retirement fund is due to resetting the amortization period to 30 years for the 2019 actuarial valuation. However, this savings is offset by the fact that the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049 in SB 1 Sub versus 2043 in the current plan).

The change in the interest-crediting rate for the Tier 3 hybrid plan will slightly decrease the ongoing liability and cost for this benefit tier. However, the slight decrease in the employer cost is partially offset by the employer cost for members who elect to earn benefits in the optional defined contribution plan. As described later in this letter, we project the long-term cost of this defined contribution plan to be 3.5% of payroll, which is slightly higher than the cost of providing benefits in the Tier 3 hybrid plan. As Tier 3 and defined contribution plan members become a larger percentage of the active population, this will gradually have a larger impact on total employer contributions.

KERS Non-Hazardous Insurance Fund

The changes in the benefit provisions have a minimal impact on the projected actuarial accrued liability. The initial savings in the projected employer contributions is attributable to resetting the amortization period to 30 years for the 2019 actuarial valuation. However, this savings is offset by the fact that the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049 in SB 1 Sub versus 2043 in the current plan). There is also some employer savings due to the increase in the member contribution requirement Tier 1 members.

CERS Non-Hazardous Retirement Fund

Similar to the KERS non-hazardous retirement fund, there is minimal change in the actuarial accrued liability (and unfunded actuarial accrued liability) as of June 30, 2017 due to changes in the benefit provisions. The contribution rate for FY 20/21 is slightly higher in the proposed legislation because the increase due to using a level dollar amortization is greater than the saving due to resetting the amortization period to 30 years for the 2019 actuarial valuation, but these methods also results in the projected savings beginning in July 1, 2025 through June 30, 2043. However, the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049 in SB 1 Sub versus 2043 in the current plan).

The change in the interest-crediting rate for the Tier 3 hybrid plan will slightly decrease the ongoing liability and cost for this benefit tier. However, the slight decrease in the employer cost is offset by the employer cost for members who elect to earn benefits in the optional defined contribution plan. As described later in this letter, we project the long-term cost of this defined contribution plan to be 3.5% of payroll, which is slightly higher than the cost of providing benefits in the Tier 3 hybrid plan. As Tier 3 and defined contribution plan members become a larger percentage of the active population, this will gradually have a larger impact on total employer contributions.

CERS Non-Hazardous Insurance Fund

The change in the benefit provisions had a minimal impact on the projected actuarial accrued liability. The contribution rate for FY 20/21 is slightly higher in the proposed legislation because the increase due to using a level dollar amortization is greater than the saving due to resetting the amortization period to 30 years for the 2019 actuarial valuation. However, the proposed method results in savings beginning in July 1, 2022 through June 30, 2043 because the amortization period is reset to a closed 30 years. However, this savings is offset by the fact that the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2043 in the current plan versus the year 2049 in SB 1 Sub 1). There is also some employer savings due to the increase in the member contribution requirement for certain Tier 1 members.

GRS Comments on Proposed Legislation

Below are comments on certain provisions in the proposed legislation.

New Optional Defined Contribution Plan

The proposed legislation would provide a new optional defined contribution plan to members in the KERS and CERS nonhazardous retirement systems that would allow all current and future members a one-time irrevocable election to earn future retirement benefits in a defined contribution plan that provides a 4.00% of pay employer contribution (the member contribution requirement will remain unchanged at 5.00% of pay). This new defined contribution plan will not decrease the employer cost, but will shift the risks, such as investment risk and longevity risk, from the participating employers to the members with respect to the members earning benefits in the defined contribution plan.

For the fiscal impact analysis, we project the long-term cost of this defined contribution plan to be 3.5% of payroll, after reflecting the effects of forfeitures in the employer matching contributions when employees separate from service prior to becoming vested.

The proposed legislation also allows all current members the opportunity to make a one-time irrevocable election to freeze their benefits earning in the defined benefit plan and earn future benefits in the new defined contribution plan. Please note that the Tier 1 and Tier 2 benefits are more valuable than the benefit provided in the new defined contribution plan. Thus allowing all current members in the KERS and CERS nonhazardous retirement systems to elect to switch to the defined contribution plan provides an opportunity for Tier 1 and Tier 2 members to adversely select against themselves. Limiting the election opportunity to current Tier 3 members hired after January 1, 2014 would limit possible of adverse selection.

The proposed legislation requires employers to make a normal cost contribution as a percentage of pay that is an annual amount sufficient, when combined with employee contributions, to fund benefits earned during the year, including costs for those members who elect to participate in the optional defined contribution plan (Tier IV). Tier I, Tier II, Tier III, and Tier IV have different normal cost rates because the benefits vary by tier. We interpret this provision to require each employer contribute a single "blended" normal cost rate that will slightly vary year-to-year as the demographics of the plan changes. This method is relatively simple and would reduce possible anti-selection due to differences in the normal cost of the Tier III and Tier IV benefit plans. However, it may be difficult for the retirement system to administer, as it would require a process of identifying the Tier IV contributions that must be directed to the members' accounts. We suggest the General Assembly seek input from the Retirement System regarding this process and whether it would be preferable to charge employers different normal cost rates depending on the retirement benefit tier of their employee, or an alternative method that is cost neutral and administratively feasible.

Change in the Interest Crediting Rate Formula in the Tier 3 Hybrid Plan

The change in the interest crediting rate formula to 85% of the 10-year geometric average will result in greater "risk-sharing" in the funds actual investment performance. Compared to the current formula, the proposed formula will generally provide a lower interest credit during times when the average return is less than 10.00% and a higher interest credit when the average return is in excess of 10.00%. Over time, we expect the new formula to provide an interest credit that is 0.40% to 0.50% less in annual interest credits compared to the current formula. Increasing the averaging period from 5 years to 10 years is not projected to have a fiscal impact but will reduce the short-term volatility in the year-to-year change in the interest-crediting rate provided at each June 30.

Allocation of Amortization Payment to Participating Employers in CERS and Agencies Participating in KERS

The employers' (and agencies) allocation percentage will be based on the average covered payroll during the last three fiscal years (FY 14/15, FY 15/16, and FY 16/17) to the average total covered payroll for the system. This allocation percentage would remain unchanged in future years (albeit, minor adjustments if employers cease participating in the system). There are some favorable characteristics with this method as each employer's contribution effort to finance the unfunded actuarial accrued liability will remain relatively constant and eliminates incentives for employers to pursue the use of "contract" employees to reduce their covered payroll (and required contribution). Employers that are increasing in size will not be burdened to pay a greater share of the unfunded actuarial accrued liability on the covered payroll for those additional employees. Rather, the marginal change in the employer's pension contribution effort will be the normal cost rate on the change in covered payroll.

We have not analyzed the change in covered payroll for the participating employers in the systems or how the average of the fiscal years identified in the proposed legislation compare to the distribution of covered payroll among employers in other years, such as the 12/13 and 13/14 fiscal years. Given the declining covered payroll experienced by some of the systems over the last several years, it is possible that using a 5-year average period or the currently proposed 3-year averaging period using different fiscal years may be more representative of the allocated share of each employer's share of the unfunded actuarial accrued liability. There will not be a fiscal impact to the system if the averaging method is changed, but there would be a cost increase or decrease for individual participating employers. We recommend the Legislative Research Commission seek input from Kentucky Retirement Systems regarding the fiscal years and the averaging period used in the calculation.

Further to this point, using a static allocation may gradually drift from mirroring the employer participation demographics in future years (some employers are growing and other entities are decreasing their workforce). Also, while this proposed method may be appropriate for allocating the existing unfunded liability, it may not be appropriate for allocating unfunded liabilities that may be incurred in a future year. Note, if this issue does occur, then it could be easily addressed by the General Assembly in a future year by using a layered amortization base.

Modification in the Reemployment after Retirement Provisions

If a member retires after January 1, 2019 and becomes reemployed by a participating employer in KRS or TRS on a full-time basis between a three-month and a twelve-month time period following the member's initial retirement date, then the member's retirement allowance will be suspended until the first anniversary of the member's initial retirement date. This would be between a one-month and a nine-month suspension of the member's retirement allowance. This provision will result in some reduced financial benefit (when considering their total income from all sources) for members to commence their retirement benefit at an earlier age and seek reemployment. However, we do not believe the reduction in the member's financial benefit due to this suspension is significant enough to change retirement behavior. As a result, we have not adjusted, or delayed, the anticipated age members will commence their retirement due to this modification. However, this modification may still be important and relevant for policy reasons.

Resetting the Amortization Period to a Closed 30 Years for the July 1, 2019 Actuarial Valuation

The recent change in assumptions did materially increase the contribution requirements beginning with the FY 18/19 fiscal year. Resetting the amortization period to a closed 30 years for the July 1, 2019 actuarial valuation will somewhat reduce those contribution requirements for the years 2020 through the year 2043. However, the participating employers will also be required to continue to finance the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049).

Distribution of the Actuarial Accrued Liability Among Membership Status

The proposed legislation would make certain changes to retirement and health insurance benefits to active members after January 1, 2019 as well as future active members in these Non-Hazardous Retirement Systems. For educational and informational purposes, the actuarial accrued liability attributable to the current retirees and inactive members (vested and non-vested) in the KERS Non-Hazardous Retirement System is approximately 75% of the total actuarial accrued liability. (Similarly, the retiree and inactive member liability is approximately 60% of the total actuarial accrued liability for the CERS Non-Hazardous Retirement System). As a result, while the proposed changes may have a material impact on the actuarial accrued liability attributable to the current active members in the Retirement System, the changes have a much smaller impact as a percentage of the total actuarial accrued liability attributable of the entire Retirement System.

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 participating employers in each Retirement System will maintain the current workforce in each future year and that as current active members terminate or retire from a covered position in the Retirement System, the employer would replace them with a new employee. We have assumed that all current active members earning Tier 1 and Tier 2 retirement benefits will not elect to earn future benefits in the optional defined contribution plan. However, we have assumed that 25% of all active members currently in Tier 3 and 25% of all future members will elect to earn retirement benefits in the defined contribution plan.

We have assumed the new interest credit formula for the Tier 3 hybrid plan will provide 0.50% less in annual interest credits for the KERS (non-hazardous and hazardous) and SPRS systems and 0.40% less in annual interest credits for the CER (non-hazardous and hazardous) systems.

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 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

Exhibit 1. Summary of Proposed Changes

Section 1. Comparison of Fiscal Impact

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

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

Section 4. Alternative Projection Scenario for KERS Non-Hazardous System

Exhibit 1. Summary of Changes in Benefit Provisions and Employer Funding for the KERS and CERS Non-Hazardous Systems

Retirement Formulas

Tier 1:
- No change to the basic formula.
- For retirements on or after January 1, 2019, the highest five years of pay used to determine the member's final average compensation must be complete fiscal years and must contain at least 60 months.

Tier 2:
- No change to the basic formula.

Tier 3:
- Interest credits on or after June 30, 2018 will be 85% of the fund's geometric 10-year net investment return (0% for those not participating in the Hybrid plan).
- Removal of the $5,000 post-retirement death benefit for all members hired on and after January 1, 2014.

Optional 401(a) Defined Contribution Plan:
- Future employees can elect participate in the new defined contribution plan that requires 5.00% of pay contributions from the member and 4.00% of pay contributions from the employer rather than the Tier 3 hybrid defined benefit plan. The members become 100% vested in the employer provided benefit upon attaining 5 years of service.
- Tier 1, 2, and 3 members can make a one-time election by January 1, 2021 to prospectively earn future benefits in the new optional 401(a) defined contribution plan.

Member Contribution Rates
- Member contribution rates to the retirement fund for Tier 1, Tier 2, and Tier 3 members remain unchanged at 5.00% of pay. Contributions to the health insurance funds for Tier 1 members who began participation on or after July 1, 2003 (but prior to September 1, 2008) will increase to 1.00% of pay.
    - The contributions to the health insurance funds are classified as 401(h) contributions and are not refundable to the member.

Pension Anti-Spiking Provisions

Compensatory time payments upon termination for Tier I members
- The payment of compensatory time upon termination of employment will be excluded in creditable compensation (which is used in the calculation of the member's final average compensation) for Tier I members retiring after July 1, 2023.

Equipment and Other Expense Allowances:
- Excluded from creditable compensation earned on or after January 1, 2019.

Exhibit 1. Summary of Changes in Benefit Provisions and Employer Funding for the KERS and CERS Non-Hazardous Systems (Continued)

Sick Leave

- Converted sick service cannot exceed amount for accumulated sick leave as of January 1, 2019.
- Sick leave service credit does not count towards retirement eligibility for those retiring on or after January 1, 2019.

Retiree Health Accessibility

- No change.

Line of Duty Death

- The surviving spouse (if any) shall supersede all previous beneficiary designations for members that die in the line of duty.

Reemployment After Retirement

The following reemployment after retirement provisions apply to members who retire on or after January 1, 2019 in order to continue to receive their retirement allowance during their reemployment:

- Must have a three (3) month break in employment and no prearranged reemployment agreement.
- After required employment break, the retired member can return to work in a part-time or full-time position.
  - Monthly pension will not be suspended for the duration of reemployment in a part-time position or for the duration of reemployment in a full-time position if the member has not returned to reemployment for at least a twelve (12) month period following initial retirement.
  - If a member returns to full-time reemployment prior to the twelve-month period, the monthly pension will be suspended until twelve months have passed following initial retirement.
  - The retiree will not earn additional retirement benefits.
- Employer required to make normal cost contributions (both pension and retiree health) on the payroll of the reemployed retiree.

Exhibit 1. Summary of Changes in Benefit Provisions and Employer Funding for the KERS and CERS Non-Hazardous Systems (Continued)

Employer Funding

The Board will continue to have the authority to change the contribution rates for CERS on an annual basis and will have the authority to change contribution rates for KERS on an annual basis after the fiscal year ending June 30, 2020.

Actuarially Determined Contributions (ADC) for actuarial valuations performed on and after June 30, 2019 are based on normal cost plus an amortization payment to finance the unfunded actuarial accrued liability:

- Normal cost determined using entry age normal cost method paid as a percentage of payroll.
- Unfunded liability payment determined in the June 30, 2019 actuarial valuation will be based on a closed 30-year amortization period.
- Allocation of amortization payment for the unfunded liability to participating employers in KERS, and CERS is based on a level-dollar amortization
  - The dollar amount of the amortization payment will be allocated to each participating employer in proportion to their average percentage of the total compensation for years (FY 14/15, FY 15/16, and FY 16/17), adjusted for any employers who cease participation in the System.
    - Each employer's proportionate share of the amortization payment will remain a relatively constant percentage each future year.

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

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			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	$ 13,468	$ 13,465	$ (3)	14%	14%	0%	$ 629	$ 629	$ -	41.1%	41.1%	0.0%
2018	13,591	13,593	2	13%	13%	0%	1,101	1,085	(16)	71.0%	70.0%	-1.1%
2019	13,349	13,366	17	15%	14%	-1%	1,118	1,087	(31)	71.0%	69.0%	-2.0%
2020	13,042	13,090	48	17%	16%	-1%	1,097	981	(116)	68.5%	61.3%	-7.3%
2021	12,700	12,867	167	19%	17%	-2%	1,116	979	(137)	68.5%	60.1%	-8.4%
2022	12,334	12,650	316	21%	18%	-3%	1,086	974	(112)	65.5%	58.8%	-6.7%
2023	11,979	12,423	444	23%	20%	-3%	1,105	969	(136)	65.5%	57.5%	-8.1%
2024	11,580	12,185	605	25%	21%	-4%	1,075	966	(109)	62.6%	56.2%	-6.3%
2025	11,190	11,934	744	27%	22%	-5%	1,095	963	(132)	62.6%	55.0%	-7.6%
2026	10,755	11,672	917	30%	23%	-7%	1,064	960	(104)	59.6%	53.8%	-5.8%
2027	10,327	11,395	1,068	32%	24%	-8%	1,084	956	(128)	59.6%	52.6%	-7.0%
2028	9,853	11,105	1,252	35%	25%	-10%	1,052	953	(99)	56.7%	51.4%	-5.3%
2029	9,385	10,800	1,415	37%	26%	-11%	1,072	950	(122)	56.7%	50.3%	-6.5%
2030	8,868	10,478	1,610	40%	28%	-12%	1,040	948	(92)	53.9%	49.1%	-4.8%
2031	8,355	10,142	1,787	43%	29%	-14%	1,062	945	(117)	53.9%	48.0%	-5.9%
2032	7,791	9,787	1,996	46%	30%	-16%	1,028	942	(86)	51.1%	46.8%	-4.3%
2033	7,229	9,415	2,186	49%	32%	-17%	1,051	940	(111)	51.1%	45.7%	-5.4%
2034	6,614	9,023	2,409	53%	33%	-20%	1,015	938	(77)	48.3%	44.7%	-3.7%
2035	6,000	8,612	2,612	57%	35%	-22%	1,038	936	(102)	48.3%	43.6%	-4.7%
2036	5,331	8,180	2,849	61%	37%	-24%	1,003	934	(69)	45.6%	42.5%	-3.1%
2037	4,661	7,726	3,065	65%	40%	-25%	1,028	934	(94)	45.6%	41.5%	-4.2%
2038	3,931	7,248	3,317	70%	42%	-28%	987	934	(53)	42.8%	40.4%	-2.3%
2039	3,204	6,746	3,542	76%	45%	-31%	1,012	934	(78)	42.8%	39.4%	-3.3%
2040	2,414	6,217	3,803	81%	48%	-33%	963	934	(29)	39.7%	38.5%	-1.2%
2041	1,634	5,661	4,027	87%	52%	-35%	987	935	(52)	39.7%	37.6%	-2.1%
2042	788	5,076	4,288	94%	56%	-38%	897	936	39	35.2%	36.8%	1.5%
2043	-	4,460	4,460	100%	61%	-39%	76	937	861	2.9%	35.9%	33.0%
2044	-	3,810	3,810	100%	66%	-34%	77	938	861	2.9%	35.2%	32.3%
2045	-	3,127	3,127	100%	71%	-29%	78	940	862	2.9%	34.4%	31.6%
2046	-	2,408	2,408	100%	78%	-22%	79	941	862	2.8%	33.7%	30.8%
2047	-	1,650	1,650	100%	84%	-16%	81	944	863	2.8%	33.0%	30.2%
2048	-	850	850	100%	92%	-8%	82	948	866	2.8%	32.4%	29.6%
2049	-	-	-	100%	100%	0%	83	80	(3)	2.8%	2.7%	-0.1%
2050	-	-	-	100%	100%	0%	85	82	(3)	2.8%	2.7%	-0.1%
2051	-	-	-	100%	100%	0%	87	83	(4)	2.8%	2.7%	-0.1%

Notes and assumptions:

It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 1-2
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	$ 6,034	$ (5)	53%	53%	0%	$ 355	$ 355	$ -	14.5%	14.5%	0.0%
2018	6,219	6,225	6	53%	52%	-1%	546	534	(12)	21.8%	21.4%	-0.5%
2019	6,299	6,317	18	53%	53%	0%	548	544	(4)	21.5%	21.4%	-0.1%
2020	6,292	6,316	24	54%	54%	0%	558	596	38	21.5%	23.0%	1.5%
2021	6,165	6,151	(14)	56%	56%	0%	563	593	30	21.3%	22.5%	1.1%
2022	6,099	6,054	(45)	57%	57%	0%	561	583	22	20.9%	21.7%	0.8%
2023	6,026	5,956	(70)	58%	58%	0%	565	578	13	20.6%	21.1%	0.5%
2024	5,941	5,855	(86)	59%	60%	1%	570	574	4	20.4%	20.6%	0.1%
2025	5,840	5,746	(94)	61%	61%	0%	575	569	(6)	20.2%	20.0%	-0.2%
2026	5,725	5,633	(92)	62%	62%	0%	580	565	(15)	20.0%	19.5%	-0.5%
2027	5,595	5,512	(83)	63%	63%	0%	585	562	(23)	19.8%	19.1%	-0.8%
2028	5,446	5,385	(61)	64%	64%	0%	591	558	(33)	19.7%	18.6%	-1.1%
2029	5,280	5,250	(30)	66%	65%	-1%	597	554	(43)	19.5%	18.1%	-1.4%
2030	5,094	5,108	14	67%	66%	-1%	604	551	(53)	19.3%	17.6%	-1.7%
2031	4,885	4,958	73	68%	67%	-1%	611	549	(62)	19.2%	17.2%	-2.0%
2032	4,654	4,798	144	70%	68%	-2%	619	546	(73)	19.0%	16.8%	-2.3%
2033	4,397	4,631	234	72%	69%	-3%	627	544	(83)	18.9%	16.4%	-2.5%
2034	4,115	4,453	338	74%	70%	-4%	636	542	(94)	18.7%	16.0%	-2.8%
2035	3,803	4,263	460	76%	71%	-5%	645	540	(105)	18.6%	15.6%	-3.0%
2036	3,462	4,064	602	78%	72%	-6%	655	538	(117)	18.5%	15.2%	-3.3%
2037	3,087	3,853	766	80%	73%	-7%	666	537	(129)	18.4%	14.8%	-3.6%
2038	2,677	3,628	951	83%	75%	-8%	678	538	(140)	18.3%	14.5%	-3.8%
2039	2,230	3,390	1,160	86%	76%	-10%	690	538	(152)	18.1%	14.2%	-4.0%
2040	1,742	3,138	1,396	89%	78%	-11%	703	539	(164)	18.0%	13.8%	-4.2%
2041	1,211	2,870	1,659	92%	79%	-13%	715	539	(176)	17.9%	13.5%	-4.4%
2042	634	2,585	1,951	96%	81%	-15%	730	540	(190)	17.9%	13.2%	-4.6%
2043	-	2,283	2,283	100%	83%	-17%	78	542	464	1.9%	13.0%	11.1%
2044	-	1,961	1,961	100%	85%	-15%	79	543	464	1.9%	12.7%	10.8%
2045	-	1,618	1,618	100%	88%	-12%	80	545	465	1.8%	12.5%	10.6%
2046	-	1,254	1,254	100%	91%	-9%	82	548	466	1.8%	12.2%	10.4%
2047	-	866	866	100%	93%	-7%	83	551	468	1.8%	12.0%	10.2%
2048	-	452	452	100%	97%	-3%	84	556	472	1.8%	11.9%	10.1%
2049	-	-	-	100%	100%	0%	86	97	11	1.8%	2.0%	0.2%
2050	-	-	-	100%	100%	0%	88	99	11	1.8%	2.0%	0.2%
2051	-	-	-	100%	100%	0%	89	101	12	1.8%	2.0%	0.2%

Notes and assumptions:

It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 1-3
KERS Non-Hazardous Insurance Fund
Summary 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	$ 1,859	$ 1,859	$ -	31%	31%	0%	$ 128	$ 128	$ -	8.4%	8.4%	0.0%
2018	1,886	1,886	-	32%	32%	0%	191	191	-	12.4%	12.4%	0.0%
2019	1,862	1,859	(3)	34%	34%	0%	194	194	-	12.4%	12.4%	0.0%
2020	1,820	1,814	(6)	37%	38%	1%	188	169	(19)	11.8%	10.6%	-1.2%
2021	1,770	1,780	10	40%	40%	0%	191	167	(24)	11.8%	10.3%	-1.5%
2022	1,721	1,754	33	43%	42%	-1%	182	164	(18)	11.1%	10.0%	-1.1%
2023	1,674	1,725	51	46%	44%	-2%	186	163	(23)	11.1%	9.7%	-1.4%
2024	1,621	1,696	75	48%	46%	-2%	178	161	(17)	10.4%	9.4%	-1.0%
2025	1,570	1,665	95	51%	48%	-3%	181	159	(22)	10.4%	9.2%	-1.3%
2026	1,510	1,632	122	53%	49%	-4%	173	157	(16)	9.8%	8.9%	-0.9%
2027	1,454	1,597	143	55%	51%	-4%	176	156	(20)	9.8%	8.6%	-1.1%
2028	1,390	1,561	171	57%	52%	-5%	168	154	(14)	9.1%	8.4%	-0.8%
2029	1,327	1,521	194	59%	53%	-6%	171	151	(20)	9.1%	8.0%	-1.1%
2030	1,255	1,480	225	62%	55%	-7%	162	149	(13)	8.5%	7.8%	-0.7%
2031	1,187	1,437	250	64%	56%	-8%	166	148	(18)	8.5%	7.6%	-0.9%
2032	1,109	1,391	282	66%	57%	-9%	158	147	(11)	7.9%	7.4%	-0.6%
2033	1,033	1,343	310	68%	58%	-10%	162	146	(16)	7.9%	7.2%	-0.8%
2034	947	1,292	345	71%	60%	-11%	155	145	(10)	7.4%	7.0%	-0.5%
2035	863	1,238	375	73%	61%	-12%	158	144	(14)	7.4%	6.8%	-0.7%
2036	769	1,181	412	76%	63%	-13%	151	144	(7)	6.9%	6.6%	-0.3%
2037	675	1,119	444	79%	65%	-14%	155	144	(11)	6.9%	6.4%	-0.5%
2038	572	1,055	483	82%	66%	-16%	149	144	(5)	6.5%	6.3%	-0.2%
2039	469	986	517	85%	68%	-17%	152	144	(8)	6.5%	6.1%	-0.4%
2040	355	914	559	89%	71%	-18%	145	144	(1)	6.0%	6.0%	0.0%
2041	242	836	594	92%	73%	-19%	149	144	(5)	6.0%	5.8%	-0.2%
2042	118	753	635	96%	76%	-20%	135	145	10	5.4%	5.7%	0.4%
2043	-	666	666	100%	79%	-21%	13	145	132	0.5%	5.6%	5.1%
2044	-	571	571	100%	82%	-18%	13	145	132	0.5%	5.5%	5.0%
2045	-	472	472	100%	85%	-15%	13	145	132	0.5%	5.4%	4.9%
2046	-	366	366	100%	89%	-11%	13	145	132	0.5%	5.2%	4.8%
2047	-	253	253	100%	92%	-8%	14	146	132	0.5%	5.1%	4.7%
2048	-	132	132	100%	96%	-4%	14	147	133	0.5%	5.1%	4.6%
2049	-	-	-	100%	100%	0%	12	12	-	0.4%	0.4%	0.0%
2050	-	-	-	100%	100%	0%	12	12	-	0.4%	0.4%	0.0%
2051	-	-	-	100%	100%	0%	12	12	-	0.4%	0.4%	0.0%

Kentucky Retirement Systems
Exhibit 1-4
CERS Non-Hazardous Insurance Fund
Summary 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	$ 1,128	$ 1,128	$ -	66%	66%	0%	$ 114	$ 114	$ -	4.7%	4.7%	0.0%
2018	1,171	1,171	-	67%	67%	0%	154	154	-	6.2%	6.2%	0.0%
2019	1,192	1,188	(4)	67%	68%	1%	153	148	(5)	6.1%	5.9%	-0.2%
2020	1,190	1,185	(5)	69%	69%	0%	154	156	2	6.0%	6.1%	0.1%
2021	1,153	1,143	(10)	71%	71%	0%	153	154	1	5.8%	5.9%	0.0%
2022	1,140	1,123	(17)	72%	72%	0%	150	149	(1)	5.6%	5.6%	0.0%
2023	1,125	1,104	(21)	73%	74%	1%	149	147	(2)	5.5%	5.4%	-0.1%
2024	1,109	1,085	(24)	74%	75%	1%	148	144	(4)	5.4%	5.2%	-0.2%
2025	1,089	1,065	(24)	75%	76%	1%	147	142	(5)	5.2%	5.0%	-0.2%
2026	1,067	1,043	(24)	76%	77%	1%	146	139	(7)	5.1%	4.8%	-0.2%
2027	1,042	1,021	(21)	77%	78%	1%	145	137	(8)	5.0%	4.7%	-0.3%
2028	1,013	996	(17)	78%	79%	1%	144	133	(11)	4.8%	4.5%	-0.4%
2029	982	971	(11)	79%	80%	1%	144	131	(13)	4.7%	4.3%	-0.4%
2030	947	945	(2)	80%	80%	0%	143	129	(14)	4.6%	4.2%	-0.4%
2031	908	918	10	81%	81%	0%	143	127	(16)	4.5%	4.0%	-0.5%
2032	865	888	23	82%	82%	0%	143	126	(17)	4.4%	3.9%	-0.5%
2033	818	858	40	84%	83%	-1%	144	125	(19)	4.4%	3.8%	-0.6%
2034	766	826	60	85%	83%	-2%	144	124	(20)	4.3%	3.7%	-0.6%
2035	709	793	84	86%	84%	-2%	146	123	(23)	4.2%	3.6%	-0.7%
2036	646	757	111	87%	85%	-2%	147	123	(24)	4.2%	3.5%	-0.7%
2037	578	720	142	89%	86%	-3%	150	123	(27)	4.2%	3.4%	-0.7%
2038	503	680	177	90%	87%	-3%	151	123	(28)	4.1%	3.3%	-0.8%
2039	421	637	216	92%	88%	-4%	155	124	(31)	4.1%	3.3%	-0.8%
2040	330	591	261	94%	89%	-5%	157	124	(33)	4.1%	3.2%	-0.9%
2041	231	543	312	96%	90%	-6%	160	124	(36)	4.0%	3.1%	-0.9%
2042	123	491	368	98%	91%	-7%	166	125	(41)	4.1%	3.1%	-1.0%
2043	-	435	435	100%	92%	-8%	41	126	85	1.0%	3.0%	2.1%
2044	-	376	376	100%	93%	-7%	41	127	86	1.0%	3.0%	2.0%
2045	-	313	313	100%	94%	-6%	42	127	85	1.0%	2.9%	2.0%
2046	-	245	245	100%	96%	-4%	42	129	87	1.0%	2.9%	2.0%
2047	-	172	172	100%	97%	-3%	43	130	87	0.9%	2.9%	1.9%
2048	-	92	92	100%	98%	-2%	43	133	90	0.9%	2.9%	1.9%
2049	-	-	-	100%	100%	0%	43	43	-	0.9%	0.9%	0.0%
2050	-	-	-	100%	100%	0%	43	43	-	0.9%	0.9%	0.0%
2051	-	-	-	100%	100%	0%	44	44	-	0.9%	0.9%	0.0%

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

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)	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	$ 15,592	$ 2,124	$ 13,468	14%	$ 629	$ 77	$ 1,532	41.06%	41.98%
2018	15,629	2,038	13,591	13%	1,101	78	1,551	71.03%	71.03%
2019	15,645	2,296	13,349	15%	1,118	79	1,574	71.03%	69.79%
2020	15,643	2,601	13,042	17%	1,097	80	1,601	68.54%	68.54%
2021	15,624	2,924	12,700	19%	1,116	81	1,628	68.54%	67.18%
2022	15,587	3,253	12,334	21%	1,086	83	1,656	65.54%	65.54%
2023	15,535	3,556	11,979	23%	1,105	84	1,686	65.54%	64.13%
2024	15,466	3,886	11,580	25%	1,075	86	1,718	62.57%	62.57%
2025	15,383	4,193	11,190	27%	1,095	88	1,751	62.57%	61.15%
2026	15,285	4,530	10,755	30%	1,064	89	1,785	59.60%	59.60%
2027	15,172	4,845	10,327	32%	1,084	91	1,819	59.60%	58.21%
2028	15,052	5,199	9,853	35%	1,052	93	1,854	56.71%	56.71%
2029	14,918	5,533	9,385	37%	1,072	95	1,891	56.71%	55.37%
2030	14,769	5,901	8,868	40%	1,040	96	1,929	53.90%	53.90%
2031	14,609	6,254	8,355	43%	1,062	99	1,970	53.90%	52.59%
2032	14,440	6,649	7,791	46%	1,028	101	2,012	51.10%	51.10%
2033	14,262	7,033	7,229	49%	1,051	103	2,056	51.10%	49.82%
2034	14,077	7,463	6,614	53%	1,015	105	2,101	48.33%	48.33%
2035	13,884	7,884	6,000	57%	1,038	107	2,147	48.33%	47.09%
2036	13,689	8,358	5,331	61%	1,003	110	2,198	45.62%	45.62%
2037	13,496	8,835	4,661	65%	1,028	113	2,253	45.62%	44.35%
2038	13,309	9,378	3,931	70%	987	115	2,310	42.75%	42.75%
2039	13,132	9,928	3,204	76%	1,012	118	2,368	42.75%	41.48%
2040	12,967	10,553	2,414	81%	963	121	2,427	39.68%	39.68%
2041	12,815	11,181	1,634	87%	987	124	2,487	39.68%	38.35%
2042	12,675	11,887	788	94%	897	127	2,547	35.22%	35.22%
2043	12,549	12,549	0	100%	76	130	2,608	2.93%	2.93%
2044	12,436	12,436	0	100%	77	133	2,669	2.89%	2.89%
2045	12,338	12,338	0	100%	78	137	2,731	2.86%	2.86%
2046	12,254	12,254	0	100%	79	140	2,794	2.84%	2.84%
2047	12,184	12,184	0	100%	81	143	2,858	2.82%	2.82%
2048	12,130	12,130	0	100%	82	146	2,924	2.80%	2.80%
2049	12,092	12,092	0	100%	83	150	2,990	2.79%	2.79%
2050	12,069	12,069	0	100%	85	153	3,058	2.79%	2.79%
2051	12,064	12,064	0	100%	87	156	3,127	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.

Kentucky Retirement Systems
Exhibit 2-2
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 2-3
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)	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	$ 2,683	$ 824	$ 1,859	31%	$ 128	$ 5	$ 1,524	8.41%	8.41%
2018	2,760	874	1,886	32%	191	6	1,541	12.40%	12.40%
2019	2,837	975	1,862	34%	194	7	1,564	12.40%	12.09%
2020	2,907	1,087	1,820	37%	188	8	1,590	11.81%	11.81%
2021	2,972	1,202	1,770	40%	191	9	1,617	11.81%	11.50%
2022	3,032	1,311	1,721	43%	182	10	1,645	11.09%	11.09%
2023	3,085	1,411	1,674	46%	186	10	1,675	11.09%	10.77%
2024	3,133	1,512	1,621	48%	178	11	1,706	10.44%	10.44%
2025	3,174	1,604	1,570	51%	181	12	1,738	10.44%	10.12%
2026	3,208	1,698	1,510	53%	173	13	1,772	9.76%	9.76%
2027	3,235	1,781	1,454	55%	176	14	1,806	9.76%	9.47%
2028	3,254	1,864	1,390	57%	168	15	1,841	9.13%	9.13%
2029	3,264	1,937	1,327	59%	171	15	1,877	9.13%	8.82%
2030	3,265	2,010	1,255	62%	162	16	1,915	8.48%	8.48%
2031	3,259	2,072	1,187	64%	166	17	1,956	8.48%	8.23%
2032	3,248	2,139	1,109	66%	158	18	1,998	7.92%	7.92%
2033	3,233	2,200	1,033	68%	162	19	2,041	7.92%	7.68%
2034	3,215	2,268	947	71%	155	20	2,085	7.42%	7.42%
2035	3,195	2,332	863	73%	158	20	2,132	7.42%	7.20%
2036	3,175	2,406	769	76%	151	21	2,183	6.94%	6.94%
2037	3,156	2,481	675	79%	155	22	2,237	6.94%	6.74%
2038	3,141	2,569	572	82%	149	23	2,293	6.48%	6.48%
2039	3,129	2,660	469	85%	152	23	2,351	6.48%	6.28%
2040	3,122	2,767	355	89%	145	24	2,410	6.02%	6.02%
2041	3,120	2,878	242	92%	149	25	2,469	6.02%	5.83%
2042	3,122	3,004	118	96%	135	25	2,529	5.35%	5.35%
2043	3,131	3,131	0	100%	13	26	2,589	0.49%	0.49%
2044	3,144	3,144	0	100%	13	26	2,650	0.49%	0.49%
2045	3,162	3,162	0	100%	13	27	2,712	0.48%	0.48%
2046	3,184	3,184	0	100%	13	28	2,774	0.48%	0.48%
2047	3,208	3,208	0	100%	14	28	2,838	0.48%	0.48%
2048	3,233	3,233	0	100%	14	29	2,903	0.48%	0.48%
2049	3,260	3,260	0	100%	12	30	2,969	0.42%	0.42%
2050	3,287	3,287	0	100%	12	30	3,036	0.41%	0.41%
2051	3,315	3,315	0	100%	12	31	3,105	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.

Kentucky Retirement Systems
Exhibit 2-4
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)	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	$ 3,355	$ 2,227	$ 1,128	66%	$ 114	$ 10	$ 2,429	4.70%	4.70%
2018	3,514	2,343	1,171	67%	154	11	2,477	6.21%	6.21%
2019	3,667	2,475	1,192	67%	153	13	2,524	6.06%	6.06%
2020	3,813	2,623	1,190	69%	154	14	2,572	5.98%	5.98%
2021	3,951	2,798	1,153	71%	153	15	2,619	5.84%	5.84%
2022	4,081	2,941	1,140	72%	150	17	2,668	5.62%	5.62%
2023	4,202	3,077	1,125	73%	149	18	2,718	5.48%	5.48%
2024	4,315	3,206	1,109	74%	148	19	2,768	5.35%	5.35%
2025	4,419	3,330	1,089	75%	147	20	2,820	5.21%	5.21%
2026	4,514	3,447	1,067	76%	146	22	2,873	5.08%	5.08%
2027	4,600	3,558	1,042	77%	145	23	2,926	4.96%	4.96%
2028	4,676	3,663	1,013	78%	144	24	2,982	4.83%	4.83%
2029	4,745	3,763	982	79%	144	26	3,040	4.72%	4.72%
2030	4,807	3,860	947	80%	143	27	3,102	4.60%	4.60%
2031	4,862	3,954	908	81%	143	28	3,166	4.51%	4.51%
2032	4,912	4,047	865	82%	143	29	3,232	4.42%	4.42%
2033	4,958	4,140	818	84%	144	31	3,301	4.35%	4.35%
2034	5,002	4,236	766	85%	144	32	3,372	4.28%	4.28%
2035	5,045	4,336	709	86%	146	33	3,445	4.23%	4.23%
2036	5,089	4,443	646	87%	147	34	3,522	4.18%	4.18%
2037	5,135	4,557	578	89%	150	35	3,605	4.15%	4.15%
2038	5,184	4,681	503	90%	151	36	3,691	4.10%	4.10%
2039	5,235	4,814	421	92%	155	37	3,780	4.09%	4.09%
2040	5,289	4,959	330	94%	157	38	3,872	4.06%	4.06%
2041	5,347	5,116	231	96%	160	39	3,965	4.04%	4.04%
2042	5,409	5,286	123	98%	166	40	4,059	4.08%	4.08%
2043	5,475	5,475	0	100%	41	41	4,156	0.98%	0.98%
2044	5,545	5,545	0	100%	41	42	4,253	0.97%	0.97%
2045	5,619	5,619	0	100%	42	43	4,352	0.97%	0.97%
2046	5,696	5,696	0	100%	42	44	4,453	0.95%	0.95%
2047	5,775	5,775	0	100%	43	46	4,555	0.94%	0.94%
2048	5,855	5,855	0	100%	43	47	4,660	0.92%	0.92%
2049	5,937	5,937	0	100%	43	48	4,766	0.91%	0.91%
2050	6,019	6,019	0	100%	43	49	4,874	0.89%	0.89%
2051	6,102	6,102	0	100%	44	50	4,985	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.

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

Kentucky Retirement Systems
Exhibit 3-1
KERS Non-Hazardous Retirement Fund
Proposed Legislation
($ 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	DC Plan Covered Payroll	Employer Contribution DC Plan	Member Contribution DC Plan	Total Employer Contributions (6) + (10)	Total Employer Contribution Rate (12) / [(8)+(9)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	$ 15,589	$ 2,124	$ 13,465	14%	$ 629	$ 77	$ 1,532	$ 0	$ 0	$ 0	$ 629	41.06%
2018	15,614	2,021	13,593	13%	1,082	73	1,452	99	3	5	1,085	69.97%
2019	15,621	2,255	13,366	14%	1,083	73	1,453	121	4	6	1,087	69.04%
2020	15,607	2,517	13,090	16%	976	73	1,457	143	5	7	981	61.29%
2021	15,574	2,707	12,867	17%	973	73	1,463	165	6	8	979	60.13%
2022	15,521	2,871	12,650	18%	967	73	1,469	187	7	9	974	58.80%
2023	15,449	3,026	12,423	20%	962	74	1,477	210	7	10	969	57.46%
2024	15,358	3,173	12,185	21%	958	74	1,486	232	8	12	966	56.24%
2025	15,249	3,315	11,934	22%	954	75	1,497	254	9	13	963	55.01%
2026	15,123	3,451	11,672	23%	950	75	1,509	276	10	14	960	53.80%
2027	14,979	3,584	11,395	24%	946	76	1,521	298	10	15	956	52.56%
2028	14,825	3,720	11,105	25%	942	77	1,534	320	11	16	953	51.40%
2029	14,652	3,852	10,800	26%	938	77	1,548	343	12	17	950	50.25%
2030	14,461	3,983	10,478	28%	935	78	1,564	365	13	18	948	49.14%
2031	14,256	4,114	10,142	29%	931	79	1,583	387	14	19	945	47.96%
2032	14,037	4,250	9,787	30%	928	80	1,603	409	14	20	942	46.81%
2033	13,807	4,392	9,415	32%	925	81	1,625	431	15	22	940	45.72%
2034	13,564	4,541	9,023	33%	922	82	1,647	454	16	23	938	44.66%
2035	13,311	4,699	8,612	35%	919	84	1,671	476	17	24	936	43.59%
2036	13,050	4,870	8,180	37%	917	85	1,701	497	17	25	934	42.49%
2037	12,787	5,061	7,726	40%	916	87	1,735	517	18	26	934	41.46%
2038	12,526	5,278	7,248	42%	915	89	1,772	537	19	27	934	40.44%
2039	12,272	5,526	6,746	45%	915	91	1,811	557	19	28	934	39.44%
2040	12,024	5,807	6,217	48%	914	93	1,851	576	20	29	934	38.48%
2041	11,785	6,124	5,661	52%	914	95	1,891	596	21	30	935	37.60%
2042	11,555	6,479	5,076	56%	914	97	1,931	615	22	31	936	36.75%
2043	11,335	6,875	4,460	61%	915	99	1,973	635	22	32	937	35.93%
2044	11,124	7,314	3,810	66%	915	101	2,015	654	23	33	938	35.15%
2045	10,924	7,797	3,127	71%	916	103	2,058	673	24	34	940	34.42%
2046	10,736	8,328	2,408	78%	917	105	2,103	691	24	35	941	33.68%
2047	10,559	8,909	1,650	84%	919	107	2,149	710	25	35	944	33.03%
2048	10,395	9,545	850	92%	923	110	2,196	728	25	36	948	32.43%
2049	10,245	10,245	-	100%	54	112	2,245	746	26	37	80	2.68%
2050	10,109	10,109	-	100%	55	115	2,294	763	27	38	82	2.68%
2051	9,989	9,989	-	100%	56	117	2,346	781	27	39	83	2.65%

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.
The employer contribution amount shown does not include the $87 million additional contribution budgeted to be paid in fiscal year beginning 2017.
It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 3-2
CERS Non-Hazardous Retirement Fund
Proposed Legislation
($ 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	DC Plan Covered Payroll	Employer Contribution DC Plan	Member Contribution DC Plan	Total Employer Contributions (6) + (10)	Total Employer Contribution Rate (12) / [(8)+(9)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	$ 12,799	$ 6,765	$ 6,034	53%	$ 355	$ 123	$ 2,452	$ 0	$ 0	$ 0	$ 355	14.48%
2018	13,096	6,871	6,225	52%	527	115	2,310	190	7	10	534	21.36%
2019	13,381	7,064	6,317	53%	536	116	2,321	226	8	11	544	21.36%
2020	13,646	7,330	6,316	54%	587	117	2,333	261	9	13	596	22.98%
2021	13,890	7,739	6,151	56%	583	117	2,346	296	10	15	593	22.45%
2022	14,112	8,058	6,054	57%	571	118	2,360	331	12	17	583	21.67%
2023	14,309	8,353	5,956	58%	565	119	2,374	366	13	18	578	21.10%
2024	14,482	8,627	5,855	60%	560	119	2,389	401	14	20	574	20.57%
2025	14,628	8,882	5,746	61%	554	120	2,406	436	15	22	569	20.02%
2026	14,748	9,115	5,633	62%	549	121	2,423	471	16	24	565	19.52%
2027	14,838	9,326	5,512	63%	544	122	2,441	506	18	25	562	19.07%
2028	14,909	9,524	5,385	64%	539	123	2,462	541	19	27	558	18.58%
2029	14,951	9,701	5,250	65%	534	124	2,487	576	20	29	554	18.09%
2030	14,967	9,859	5,108	66%	530	126	2,514	610	21	30	551	17.64%
2031	14,957	9,999	4,958	67%	526	127	2,544	644	23	32	549	17.22%
2032	14,923	10,125	4,798	68%	522	129	2,576	677	24	34	546	16.78%
2033	14,867	10,236	4,631	69%	519	131	2,612	711	25	36	544	16.37%
2034	14,789	10,336	4,453	70%	516	132	2,650	744	26	37	542	15.97%
2035	14,689	10,426	4,263	71%	513	134	2,689	777	27	39	540	15.58%
2036	14,572	10,508	4,064	72%	510	137	2,735	810	28	40	538	15.18%
2037	14,442	10,589	3,853	73%	508	139	2,786	841	29	42	537	14.80%
2038	14,304	10,676	3,628	75%	507	142	2,842	872	31	44	538	14.49%
2039	14,163	10,773	3,390	76%	506	145	2,901	902	32	45	538	14.15%
2040	14,021	10,883	3,138	78%	506	148	2,962	933	33	47	539	13.84%
2041	13,880	11,010	2,870	79%	505	151	3,025	963	34	48	539	13.52%
2042	13,742	11,157	2,585	81%	505	155	3,091	992	35	50	540	13.23%
2043	13,610	11,327	2,283	83%	506	158	3,158	1,022	36	51	542	12.97%
2044	13,483	11,522	1,961	85%	506	161	3,227	1,051	37	53	543	12.69%
2045	13,364	11,746	1,618	88%	507	165	3,297	1,080	38	54	545	12.45%
2046	13,254	12,000	1,254	91%	509	168	3,370	1,108	39	55	548	12.24%
2047	13,154	12,288	866	93%	511	172	3,444	1,137	40	57	551	12.03%
2048	13,065	12,613	452	97%	515	176	3,520	1,166	41	58	556	11.87%
2049	12,987	12,987	-	100%	55	180	3,598	1,194	42	60	97	2.02%
2050	12,923	12,923	-	100%	56	184	3,678	1,223	43	61	99	2.02%
2051	12,873	12,873	-	100%	57	188	3,761	1,251	44	63	101	2.02%

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.
It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 3-3
KERS Non-Hazardous Insurance Fund
Proposed Legislation
($ 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	$ 2,683	$ 824	$ 1,859	31%	$ 128	$ 5	$ 1,524	8.41%	8.41%
2018	2,760	874	1,886	32%	191	9	1,541	12.40%	12.40%
2019	2,837	978	1,859	34%	194	10	1,564	12.40%	11.89%
2020	2,907	1,093	1,814	38%	169	11	1,590	10.63%	10.63%
2021	2,972	1,192	1,780	40%	167	11	1,617	10.33%	10.33%
2022	3,032	1,278	1,754	42%	164	12	1,645	9.97%	9.97%
2023	3,085	1,360	1,725	44%	163	13	1,675	9.73%	9.73%
2024	3,133	1,437	1,696	46%	161	14	1,706	9.44%	9.44%
2025	3,174	1,509	1,665	48%	159	14	1,738	9.15%	9.15%
2026	3,208	1,576	1,632	49%	157	15	1,772	8.86%	8.86%
2027	3,235	1,638	1,597	51%	156	16	1,806	8.64%	8.64%
2028	3,254	1,693	1,561	52%	154	17	1,841	8.37%	8.37%
2029	3,264	1,743	1,521	53%	151	17	1,877	8.04%	8.04%
2030	3,265	1,785	1,480	55%	149	18	1,915	7.78%	7.78%
2031	3,259	1,822	1,437	56%	148	19	1,956	7.57%	7.57%
2032	3,248	1,857	1,391	57%	147	19	1,998	7.36%	7.36%
2033	3,233	1,890	1,343	58%	146	20	2,041	7.15%	7.15%
2034	3,215	1,923	1,292	60%	145	21	2,085	6.95%	6.95%
2035	3,195	1,957	1,238	61%	144	21	2,132	6.75%	6.75%
2036	3,175	1,994	1,181	63%	144	22	2,183	6.60%	6.60%
2037	3,156	2,037	1,119	65%	144	22	2,237	6.44%	6.44%
2038	3,141	2,086	1,055	66%	144	23	2,293	6.28%	6.28%
2039	3,129	2,143	986	68%	144	24	2,351	6.13%	6.13%
2040	3,122	2,208	914	71%	144	24	2,410	5.98%	5.98%
2041	3,120	2,284	836	73%	144	25	2,469	5.83%	5.83%
2042	3,122	2,369	753	76%	145	25	2,529	5.73%	5.73%
2043	3,131	2,465	666	79%	145	26	2,589	5.60%	5.60%
2044	3,144	2,573	571	82%	145	26	2,650	5.47%	5.47%
2045	3,162	2,690	472	85%	145	27	2,712	5.35%	5.35%
2046	3,184	2,818	366	89%	145	28	2,774	5.23%	5.23%
2047	3,208	2,955	253	92%	146	28	2,838	5.14%	5.14%
2048	3,233	3,101	132	96%	147	29	2,903	5.06%	5.06%
2049	3,260	3,260	-	100%	12	30	2,969	0.42%	0.42%
2050	3,287	3,287	-	100%	12	30	3,036	0.41%	0.41%
2051	3,315	3,315	-	100%	12	31	3,105	0.40%	0.40%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation.

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

Kentucky Retirement Systems
Exhibit 3-4
CERS Non-Hazardous Insurance Fund
Proposed Legislation
($ 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	$ 3,355	$ 2,227	$ 1,128	66%	$ 114	$ 10	$ 2,429	4.70%	4.70%
2018	3,514	2,343	1,171	67%	154	16	2,477	6.21%	6.21%
2019	3,667	2,479	1,188	68%	148	17	2,524	5.86%	5.86%
2020	3,813	2,628	1,185	69%	156	18	2,572	6.07%	6.07%
2021	3,951	2,808	1,143	71%	154	19	2,619	5.88%	5.88%
2022	4,081	2,958	1,123	72%	149	21	2,668	5.58%	5.58%
2023	4,202	3,098	1,104	74%	147	22	2,718	5.41%	5.41%
2024	4,315	3,230	1,085	75%	144	23	2,768	5.20%	5.20%
2025	4,419	3,354	1,065	76%	142	24	2,820	5.04%	5.04%
2026	4,514	3,471	1,043	77%	139	25	2,873	4.84%	4.84%
2027	4,600	3,579	1,021	78%	137	26	2,926	4.68%	4.68%
2028	4,676	3,680	996	79%	133	27	2,982	4.46%	4.46%
2029	4,745	3,774	971	80%	131	29	3,040	4.31%	4.31%
2030	4,807	3,862	945	80%	129	29	3,102	4.16%	4.16%
2031	4,862	3,944	918	81%	127	31	3,166	4.01%	4.01%
2032	4,912	4,024	888	82%	126	31	3,232	3.90%	3.90%
2033	4,958	4,100	858	83%	125	32	3,301	3.79%	3.79%
2034	5,002	4,176	826	83%	124	33	3,372	3.68%	3.68%
2035	5,045	4,252	793	84%	123	34	3,445	3.57%	3.57%
2036	5,089	4,332	757	85%	123	35	3,522	3.49%	3.49%
2037	5,135	4,415	720	86%	123	36	3,605	3.41%	3.41%
2038	5,184	4,504	680	87%	123	37	3,691	3.33%	3.33%
2039	5,235	4,598	637	88%	124	38	3,780	3.28%	3.28%
2040	5,289	4,698	591	89%	124	39	3,872	3.20%	3.20%
2041	5,347	4,804	543	90%	124	40	3,965	3.13%	3.13%
2042	5,409	4,918	491	91%	125	41	4,059	3.08%	3.08%
2043	5,475	5,040	435	92%	126	42	4,156	3.03%	3.03%
2044	5,545	5,169	376	93%	127	43	4,253	2.99%	2.99%
2045	5,619	5,306	313	94%	127	44	4,352	2.92%	2.92%
2046	5,696	5,451	245	96%	129	45	4,453	2.90%	2.90%
2047	5,775	5,603	172	97%	130	46	4,555	2.85%	2.85%
2048	5,855	5,763	92	98%	133	47	4,660	2.85%	2.85%
2049	5,937	5,937	-	100%	43	48	4,766	0.91%	0.91%
2050	6,019	6,019	-	100%	43	49	4,874	0.89%	0.89%
2051	6,102	6,102	-	100%	44	50	4,985	0.88%	0.88%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation.

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

Section 4:

<u>Alternative Scenario for KERS Non-Hazardous</u>

Projected Cost of the Retirement and Insurance

Current Plan with Projected Population Decrease

Kentucky Retirement Systems
Exhibit 4-1 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS 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	$ 13,468	$ 13,465	$ (3)	14%	14%	0%	$ 629	$ 629	$ 0	41.1%	41.1%	0.0%
2018	13,590	13,593	3	13%	13%	0%	1,085	1,083	(2)	71.0%	70.9%	-0.2%
2019	13,364	13,366	2	15%	14%	-1%	1,084	1,071	(13)	71.0%	70.2%	-0.9%
2020	13,089	13,104	15	16%	16%	0%	1,081	978	(103)	70.9%	64.1%	-6.8%
2021	12,763	12,882	119	18%	17%	-1%	1,081	976	(105)	70.9%	64.0%	-6.9%
2022	12,433	12,664	231	20%	18%	-2%	1,071	969	(102)	70.3%	63.6%	-6.7%
2023	12,092	12,437	345	22%	19%	-3%	1,071	965	(106)	70.3%	63.3%	-7.0%
2024	11,729	12,199	470	24%	20%	-4%	1,063	961	(102)	69.7%	63.0%	-6.7%
2025	11,351	11,949	598	26%	21%	-5%	1,063	957	(106)	69.7%	62.8%	-7.0%
2026	10,950	11,686	736	28%	22%	-6%	1,054	952	(102)	69.1%	62.4%	-6.7%
2027	10,532	11,409	877	30%	23%	-7%	1,054	949	(105)	69.1%	62.3%	-6.9%
2028	10,089	11,118	1,029	32%	25%	-7%	1,045	944	(101)	68.6%	62.0%	-6.6%
2029	9,628	10,812	1,184	35%	26%	-9%	1,045	941	(104)	68.6%	61.8%	-6.8%
2030	9,140	10,491	1,351	37%	27%	-10%	1,037	936	(101)	68.1%	61.5%	-6.7%
2031	8,630	10,152	1,522	40%	28%	-12%	1,038	933	(105)	68.1%	61.2%	-6.9%
2032	8,089	9,797	1,708	43%	29%	-14%	1,031	929	(102)	67.6%	60.9%	-6.7%
2033	7,525	9,424	1,899	46%	31%	-15%	1,032	926	(106)	67.6%	60.6%	-6.9%
2034	6,927	9,031	2,104	49%	32%	-17%	1,023	923	(100)	66.9%	60.4%	-6.6%
2035	6,302	8,617	2,315	53%	34%	-19%	1,025	919	(106)	66.9%	60.0%	-6.9%
2036	5,641	8,184	2,543	57%	36%	-21%	1,019	917	(102)	66.3%	59.7%	-6.6%
2037	4,951	7,728	2,777	62%	38%	-24%	1,023	915	(108)	66.3%	59.3%	-7.0%
2038	4,217	7,248	3,031	67%	40%	-27%	1,014	913	(101)	65.4%	58.9%	-6.5%
2039	3,453	6,744	3,291	72%	43%	-29%	1,019	912	(107)	65.4%	58.5%	-6.9%
2040	2,643	6,215	3,572	78%	46%	-32%	1,005	911	(94)	64.2%	58.1%	-6.0%
2041	1,803	5,657	3,854	85%	49%	-36%	1,010	910	(100)	64.2%	57.8%	-6.3%
2042	914	5,070	4,156	92%	53%	-39%	988	909	(79)	62.5%	57.5%	-5.0%
2043	-	4,452	4,452	100%	58%	-42%	46	908	862	2.9%	57.3%	54.4%
2044	-	3,801	3,801	100%	63%	-37%	46	907	861	2.9%	57.1%	54.2%
2045	-	3,117	3,117	100%	69%	-31%	46	907	861	2.9%	56.9%	54.1%
2046	-	2,398	2,398	100%	75%	-25%	45	906	861	2.8%	56.8%	53.9%
2047	-	1,640	1,640	100%	83%	-17%	45	906	861	2.8%	56.6%	53.8%
2048	-	842	842	100%	91%	-9%	45	906	861	2.8%	56.5%	53.7%
2049	-	-	-	100%	100%	0%	45	43	(2)	2.8%	2.7%	-0.1%
2050	-	-	-	100%	100%	0%	45	43	(2)	2.8%	2.7%	-0.1%
2051	-	-	-	100%	100%	0%	45	43	(2)	2.8%	2.7%	-0.1%

<u>Notes and assumptions:</u>
The active membership population count is assumed to decrease by 2% per year each future year.
It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 4-2 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Insurance Fund
Summary 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	$ 1,859	$ 1,859	$ -	31%	31%	0%	$ 128	$ 128	$ 0	8.4%	8.4%	0.0%
2018	1,886	1,886	-	32%	32%	0%	188	188	-	12.4%	12.4%	0.0%
2019	1,864	1,861	(3)	34%	34%	0%	188	188	-	12.4%	12.4%	0.0%
2020	1,828	1,822	(6)	37%	37%	0%	185	168	(17)	12.2%	11.1%	-1.1%
2021	1,781	1,789	8	40%	40%	0%	185	167	(18)	12.2%	11.0%	-1.2%
2022	1,737	1,761	24	43%	42%	-1%	180	164	(16)	11.9%	10.8%	-1.1%
2023	1,693	1,733	40	45%	44%	-1%	180	162	(18)	11.9%	10.7%	-1.2%
2024	1,646	1,705	59	47%	45%	-2%	176	160	(16)	11.6%	10.6%	-1.1%
2025	1,597	1,673	76	49%	47%	-2%	176	158	(18)	11.6%	10.4%	-1.2%
2026	1,543	1,640	97	52%	49%	-3%	172	156	(16)	11.4%	10.3%	-1.1%
2027	1,489	1,605	116	54%	50%	-4%	172	154	(18)	11.4%	10.2%	-1.2%
2028	1,428	1,568	140	56%	51%	-5%	167	152	(15)	11.1%	10.1%	-1.0%
2029	1,366	1,527	161	58%	53%	-5%	167	150	(17)	11.1%	9.9%	-1.1%
2030	1,299	1,486	187	60%	54%	-6%	163	148	(15)	10.8%	9.8%	-1.0%
2031	1,231	1,442	211	62%	55%	-7%	163	146	(17)	10.8%	9.6%	-1.1%
2032	1,156	1,396	240	64%	56%	-8%	159	145	(14)	10.5%	9.6%	-0.9%
2033	1,079	1,347	268	66%	57%	-9%	159	144	(15)	10.5%	9.5%	-1.0%
2034	996	1,295	299	68%	59%	-9%	156	143	(13)	10.3%	9.4%	-0.9%
2035	910	1,240	330	71%	60%	-11%	156	142	(14)	10.3%	9.3%	-0.9%
2036	817	1,182	365	73%	61%	-12%	154	141	(13)	10.1%	9.3%	-0.9%
2037	720	1,121	401	76%	63%	-13%	155	141	(14)	10.1%	9.2%	-0.9%
2038	616	1,056	440	79%	65%	-14%	153	141	(12)	9.9%	9.2%	-0.8%
2039	506	986	480	83%	67%	-16%	154	140	(14)	9.9%	9.0%	-0.9%
2040	389	913	524	87%	69%	-18%	151	140	(11)	9.7%	9.0%	-0.7%
2041	267	835	568	91%	71%	-20%	152	140	(12)	9.7%	9.0%	-0.8%
2042	136	751	615	95%	74%	-21%	149	140	(9)	9.5%	8.9%	-0.6%
2043	-	663	663	100%	77%	-23%	8	140	132	0.5%	8.9%	8.4%
2044	-	570	570	100%	80%	-20%	8	140	132	0.5%	8.9%	8.4%
2045	-	470	470	100%	83%	-17%	8	140	132	0.5%	8.9%	8.4%
2046	-	363	363	100%	87%	-13%	8	140	132	0.5%	8.8%	8.4%
2047	-	250	250	100%	91%	-9%	8	140	132	0.5%	8.8%	8.3%
2048	-	129	129	100%	95%	-5%	8	140	132	0.5%	8.8%	8.3%
2049	-	-	-	100%	100%	0%	7	7	-	0.4%	0.4%	0.0%
2050	-	-	-	100%	100%	0%	7	7	-	0.4%	0.4%	0.0%
2051	-	-	-	100%	100%	0%	6	6	-	0.4%	0.4%	0.0%

Notes and assumptions:
The active membership population count is assumed to decrease by 2% per year each future year.

Kentucky Retirement Systems
Exhibit 4-3 (Alternative Assumptions that Assume a Decreasing Active Membership)
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)	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	$ 15,592	$ 2,124	$ 13,468	14%	$ 629	$ 77	$ 1,532	41.06%	41.98%
2018	15,628	2,038	13,590	13%	1,085	76	1,528	71.03%	71.03%
2019	15,642	2,278	13,364	15%	1,084	76	1,526	71.03%	70.87%
2020	15,635	2,546	13,089	16%	1,081	76	1,526	70.85%	70.85%
2021	15,610	2,847	12,763	18%	1,081	76	1,526	70.85%	70.65%
2022	15,566	3,133	12,433	20%	1,071	76	1,525	70.27%	70.27%
2023	15,503	3,411	12,092	22%	1,071	76	1,525	70.27%	70.00%
2024	15,421	3,692	11,729	24%	1,063	76	1,525	69.71%	69.71%
2025	15,321	3,970	11,351	26%	1,063	76	1,525	69.71%	69.45%
2026	15,204	4,254	10,950	28%	1,054	76	1,525	69.14%	69.14%
2027	15,068	4,536	10,532	30%	1,054	76	1,525	69.14%	68.87%
2028	14,922	4,833	10,089	32%	1,045	76	1,524	68.60%	68.60%
2029	14,757	5,129	9,628	35%	1,045	76	1,523	68.60%	68.36%
2030	14,574	5,434	9,140	37%	1,037	76	1,523	68.11%	68.11%
2031	14,375	5,745	8,630	40%	1,038	76	1,525	68.11%	67.87%
2032	14,163	6,074	8,089	43%	1,031	76	1,526	67.55%	67.55%
2033	13,937	6,412	7,525	46%	1,032	76	1,528	67.55%	67.27%
2034	13,699	6,772	6,927	49%	1,023	76	1,529	66.93%	66.93%
2035	13,447	7,145	6,302	53%	1,025	77	1,531	66.93%	66.66%
2036	13,187	7,546	5,641	57%	1,019	77	1,536	66.32%	66.32%
2037	12,924	7,973	4,951	62%	1,023	77	1,543	66.32%	65.92%
2038	12,661	8,444	4,217	67%	1,014	78	1,551	65.36%	65.36%
2039	12,401	8,948	3,453	72%	1,019	78	1,559	65.36%	64.85%
2040	12,146	9,503	2,643	78%	1,005	78	1,567	64.15%	64.15%
2041	11,896	10,093	1,803	85%	1,010	79	1,574	64.15%	63.65%
2042	11,652	10,738	914	92%	988	79	1,580	62.54%	62.54%
2043	11,414	11,414	-	100%	46	79	1,585	2.93%	2.93%
2044	11,182	11,182	-	100%	46	79	1,589	2.89%	2.89%
2045	10,956	10,956	-	100%	46	80	1,593	2.86%	2.86%
2046	10,737	10,737	-	100%	45	80	1,596	2.84%	2.84%
2047	10,524	10,524	-	100%	45	80	1,600	2.82%	2.82%
2048	10,318	10,318	-	100%	45	80	1,603	2.80%	2.80%
2049	10,120	10,120	-	100%	45	80	1,606	2.79%	2.79%
2050	9,931	9,931	-	100%	45	80	1,609	2.79%	2.79%
2051	9,750	9,750	-	100%	45	81	1,611	2.78%	2.78%

Notes and assumptions:
The projection is based on the results of the June 30, 2017 actuarial valuation. The active membership population count is assumed to decrease by 2% per year each future year.
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.

Kentucky Retirement Systems

Exhibit 4-4 (Alternative Assumptions that Assume a Decreasing Active Membership)

KERS Non-Hazardous Retirement Fund

Proposed Legislation

($ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution Pension Plan	Member Contribution Pension Plan	Pension Plan Covered Payroll	DC Plan Covered Payroll	Employer Contribution DC Plan	Member Contribution DC Plan	Total Employer Contributions (6) + (10)	Total Employer Contribution Rate (12) / [(8)+(9)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2017	$ 15,589	$ 2,124	$ 13,465	14%	$ 629	$ 77	$ 1,532	$ 0	$ 0	$ 0	$ 629	41.06%
2018	15,614	2,021	13,593	13%	1,080	72	1,435	93	3	5	1,083	70.88%
2019	15,619	2,253	13,366	14%	1,067	71	1,417	109	4	5	1,071	70.17%
2020	15,602	2,498	13,104	16%	974	70	1,401	125	4	6	978	64.09%
2021	15,565	2,683	12,882	17%	971	69	1,386	140	5	7	976	63.98%
2022	15,506	2,842	12,664	18%	964	69	1,370	155	5	8	969	63.55%
2023	15,426	2,989	12,437	19%	959	68	1,356	169	6	8	965	63.29%
2024	15,326	3,127	12,199	20%	955	67	1,341	183	6	9	961	63.03%
2025	15,206	3,257	11,949	21%	950	66	1,328	197	7	10	957	62.76%
2026	15,066	3,380	11,686	22%	945	66	1,314	211	7	11	952	62.42%
2027	14,906	3,497	11,409	23%	941	65	1,300	224	8	11	949	62.25%
2028	14,733	3,615	11,118	25%	936	64	1,286	238	8	12	944	61.95%
2029	14,539	3,727	10,812	26%	932	64	1,272	251	9	13	941	61.78%
2030	14,325	3,834	10,491	27%	927	63	1,259	264	9	13	936	61.45%
2031	14,092	3,940	10,152	28%	923	62	1,249	276	10	14	933	61.20%
2032	13,843	4,046	9,797	29%	919	62	1,238	288	10	14	929	60.88%
2033	13,579	4,155	9,424	31%	916	61	1,228	299	10	15	926	60.62%
2034	13,299	4,268	9,031	32%	912	61	1,218	311	11	16	923	60.38%
2035	13,004	4,387	8,617	34%	908	60	1,209	322	11	16	919	60.04%
2036	12,698	4,514	8,184	36%	905	60	1,204	331	12	17	917	59.70%
2037	12,386	4,658	7,728	38%	903	60	1,203	340	12	17	915	59.30%
2038	12,071	4,823	7,248	40%	901	60	1,204	348	12	17	913	58.86%
2039	11,758	5,014	6,744	43%	900	60	1,205	355	12	18	912	58.49%
2040	11,448	5,233	6,215	46%	898	60	1,206	361	13	18	911	58.14%
2041	11,141	5,484	5,657	49%	897	60	1,206	368	13	18	910	57.83%
2042	10,838	5,768	5,070	53%	896	60	1,206	374	13	19	909	57.54%
2043	10,539	6,087	4,452	58%	895	60	1,206	379	13	19	908	57.30%
2044	10,244	6,443	3,801	63%	894	60	1,205	384	13	19	907	57.08%
2045	9,955	6,838	3,117	69%	893	60	1,205	388	14	19	907	56.94%
2046	9,672	7,274	2,398	75%	892	60	1,204	392	14	20	906	56.76%
2047	9,395	7,755	1,640	83%	892	60	1,205	395	14	20	906	56.64%
2048	9,125	8,283	842	91%	892	60	1,205	398	14	20	906	56.53%
2049	8,863	8,863	-	100%	29	60	1,206	399	14	20	43	2.68%
2050	8,611	8,611	-	100%	29	60	1,208	401	14	20	43	2.67%
2051	8,369	8,369	-	100%	29	60	1,209	402	14	20	43	2.67%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation. The active membership population count is assumed to decrease by 2% per year each future year.

The actuarial determined contribution 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.

It is assumed that the employer cost of defined contribution plan is 3.50% of pay, after reflecting the effects of forfeitures attributable to nonvested members, and that 25% of current Tier 3 members and 25% of future member elect to enter the DC plan.

Kentucky Retirement Systems
Exhibit 4-5 (Alternative Assumptions that Assume a Decreasing Active Membership)
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)	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	$ 2,683	$ 824	$ 1,859	31%	$ 128	$ 5	$ 1,524	8.41%	8.41%
2018	2,760	874	1,886	32%	188	6	1,518	12.40%	12.40%
2019	2,836	972	1,864	34%	188	7	1,516	12.40%	12.28%
2020	2,905	1,077	1,828	37%	185	7	1,516	12.21%	12.21%
2021	2,969	1,188	1,781	40%	185	8	1,515	12.21%	12.09%
2022	3,026	1,289	1,737	43%	180	8	1,514	11.90%	11.90%
2023	3,077	1,384	1,693	45%	180	9	1,514	11.90%	11.77%
2024	3,122	1,476	1,646	47%	176	9	1,514	11.63%	11.63%
2025	3,159	1,562	1,597	49%	176	10	1,514	11.63%	11.50%
2026	3,188	1,645	1,543	52%	172	10	1,514	11.35%	11.35%
2027	3,210	1,721	1,489	54%	172	11	1,514	11.35%	11.21%
2028	3,222	1,794	1,428	56%	167	11	1,513	11.05%	11.05%
2029	3,224	1,858	1,366	58%	167	12	1,512	11.05%	10.91%
2030	3,217	1,918	1,299	60%	163	12	1,512	10.76%	10.76%
2031	3,202	1,971	1,231	62%	163	13	1,514	10.76%	10.63%
2032	3,180	2,024	1,156	64%	159	13	1,515	10.49%	10.49%
2033	3,153	2,074	1,079	66%	159	13	1,517	10.49%	10.39%
2034	3,122	2,126	996	68%	156	14	1,518	10.28%	10.28%
2035	3,087	2,177	910	71%	156	14	1,520	10.28%	10.21%
2036	3,051	2,234	817	73%	154	15	1,525	10.12%	10.12%
2037	3,015	2,295	720	76%	155	15	1,532	10.12%	10.03%
2038	2,980	2,364	616	79%	153	15	1,540	9.93%	9.93%
2039	2,947	2,441	506	83%	154	15	1,548	9.93%	9.84%
2040	2,917	2,528	389	87%	151	15	1,556	9.73%	9.73%
2041	2,890	2,623	267	91%	152	15	1,562	9.73%	9.65%
2042	2,866	2,730	136	95%	149	16	1,568	9.51%	9.51%
2043	2,846	2,846	-	100%	8	16	1,573	0.49%	0.49%
2044	2,829	2,829	-	100%	8	16	1,578	0.49%	0.49%
2045	2,814	2,814	-	100%	8	16	1,582	0.48%	0.48%
2046	2,800	2,800	-	100%	8	16	1,585	0.48%	0.48%
2047	2,787	2,787	-	100%	8	16	1,588	0.48%	0.48%
2048	2,773	2,773	-	100%	8	16	1,591	0.48%	0.48%
2049	2,759	2,759	-	100%	7	16	1,594	0.42%	0.42%
2050	2,743	2,743	-	100%	7	16	1,597	0.41%	0.41%
2051	2,725	2,725	-	100%	6	16	1,600	0.40%	0.40%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation. The active membership population count is assumed to decrease by 2% per year each future year.
The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

Kentucky Retirement Systems
Exhibit 4-6 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Insurance Fund
Proposed Legislation
($ 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	$ 2,683	$ 824	$ 1,859	31%	$ 128	$ 5	$ 1,524	8.41%	8.41%
2018	2,760	874	1,886	32%	188	9	1,518	12.40%	12.40%
2019	2,836	975	1,861	34%	188	9	1,516	12.40%	12.07%
2020	2,905	1,083	1,822	37%	168	10	1,516	11.08%	11.08%
2021	2,969	1,180	1,789	40%	167	10	1,515	11.02%	11.02%
2022	3,026	1,265	1,761	42%	164	11	1,514	10.83%	10.83%
2023	3,077	1,344	1,733	44%	162	11	1,514	10.70%	10.70%
2024	3,122	1,417	1,705	45%	160	12	1,514	10.57%	10.57%
2025	3,159	1,486	1,673	47%	158	12	1,514	10.44%	10.44%
2026	3,188	1,548	1,640	49%	156	13	1,514	10.30%	10.30%
2027	3,210	1,605	1,605	50%	154	13	1,514	10.17%	10.17%
2028	3,222	1,654	1,568	51%	152	13	1,513	10.05%	10.05%
2029	3,224	1,697	1,527	53%	150	14	1,512	9.92%	9.92%
2030	3,217	1,731	1,486	54%	148	14	1,512	9.79%	9.79%
2031	3,202	1,760	1,442	55%	146	14	1,514	9.64%	9.64%
2032	3,180	1,784	1,396	56%	145	15	1,515	9.57%	9.57%
2033	3,153	1,806	1,347	57%	144	15	1,517	9.49%	9.49%
2034	3,122	1,827	1,295	59%	143	15	1,518	9.42%	9.42%
2035	3,087	1,847	1,240	60%	142	15	1,520	9.34%	9.34%
2036	3,051	1,869	1,182	61%	141	15	1,525	9.25%	9.25%
2037	3,015	1,894	1,121	63%	141	15	1,532	9.20%	9.20%
2038	2,980	1,924	1,056	65%	141	15	1,540	9.16%	9.16%
2039	2,947	1,961	986	67%	140	15	1,548	9.04%	9.04%
2040	2,917	2,004	913	69%	140	16	1,556	9.00%	9.00%
2041	2,890	2,055	835	71%	140	16	1,562	8.96%	8.96%
2042	2,866	2,115	751	74%	140	16	1,568	8.93%	8.93%
2043	2,846	2,183	663	77%	140	16	1,573	8.90%	8.90%
2044	2,829	2,259	570	80%	140	16	1,578	8.87%	8.87%
2045	2,814	2,344	470	83%	140	16	1,582	8.85%	8.85%
2046	2,800	2,437	363	87%	140	16	1,585	8.83%	8.83%
2047	2,787	2,537	250	91%	140	16	1,588	8.82%	8.82%
2048	2,773	2,644	129	95%	140	16	1,591	8.80%	8.80%
2049	2,759	2,759	-	100%	7	16	1,594	0.42%	0.42%
2050	2,743	2,743	-	100%	7	16	1,597	0.41%	0.41%
2051	2,725	2,725	-	100%	6	16	1,600	0.40%	0.40%

Notes and assumptions:
The projection is based on the results of the June 30, 2017 actuarial valuation. The active membership population count is assumed to decrease by 2% per year each future year.
The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

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March 6, 2018

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

Re: **BR 427 SB 1 SCS**
AA Statement 1 of 4
KERS Hazardous, CERS Hazardous, and SPRS Retirement Systems

Dear Mr. Eager:

We have reviewed and analyzed the proposed changes in the proposed pension reform legislation SB 1 Sub 1. The purpose of this letter is to communicate the fiscal analysis of this proposed legislation on the retirement and insurance funds maintained by the Kentucky Retirement System (KRS) as it applies to the Hazardous Systems (i.e. KERS Hazardous, CERS Hazardous, and SPRS).

The provisions of this legislation are similar to that proposed in SB 1, with a notable difference of resetting the amortization period for financing the unfunded actuarial accrued to a closed 30 year period beginning with the July 1, 2019 actuarial valuation. Also, compared to the original SB 1, this proposed legislation, SB 1 Sub 1, the employee contribution requirement for the Health Insurance funds for active Tier I members who became participating on or after July 1, 2003 (but prior to September 1, 2008) is 1% of pay.

Provisions of Proposed Legislation

Exhibit 1 provides a summary of the principle provisions in the pension reform bill that have a fiscal impact on the retirement system. In summary, the current Tier 3 Hybrid Plan Benefit will continue to be provided to future members. The amortization of the unfunded actuarial accrued liability will be determined on a level-dollar basis beginning with the 2019 actuarial valuation and the funding period will reset to a closed 30-year period. Finally, active Tier I members who became participants on or after July 1, 2003 (but prior to September 1, 2008) will contribute 1% of pay.

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. Specifically, these exhibits show the projected impact on the:

(1) unfunded actuarial accrued liability, (2) funded ratio, (3) total employer contribution dollars, and (4) projected composite employer contribution rates, for each of the funds (retirement and health insurance). 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 for each fund.

KERS Hazardous and SPRS Retirement and Insurance Funds

The change in the benefit provisions had a minimal impact on the projected actuarial accrued liability for both retirement and health insurance funds.

The initial savings in the projected employer contributions for the retirement and insurance funds is due to resetting the amortization period to 30 years for the 2019 actuarial valuation. However, these initial savings is offset by the fact that the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2043 in the current plan versus the year 2049 in SB 1 Sub 1).

There is also some employer savings in the insurance fund due to the increase in the member contribution requirement for certain Tier 1 members.

CERS Hazardous Retirement and Insurance Funds

Similar to the KERS hazardous and SPRS retirement funds, there is minimal change in the projected actuarial accrued liability due to the provision changes.

The contribution rate for FY 20/21 for the retirement fund is slightly higher in the proposed legislation because the increase due to using a level dollar amortization is greater than the saving due to resetting the amortization period to 30 years for the 2019 actuarial valuation. However, the proposed method results in savings beginning in July 1, 2025 through June 30, 2043 because of the use of a level dollar amortization and the longer amortization period. However, the participating employers will be financing the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049 in SB 1 Sub versus 2043 in the current plan).

The fiscal impact to the projected cost of the CERS health insurance fund is similar as the retirement fund, but of a different magnitude and different cross-over years. There is also initial savings for the employers for the insurance fund is due to the increase in the Tier I member contribution requirement.

GRS Comments on Proposed Legislation

Allocation of Amortization Payment to Participating Employers in CERS, and Agencies Participating in KERS, and SPRS

The employers' (and agencies) allocation percentage will be based on the average covered payroll during the last three fiscal years (FY 14/15, FY 15/16, and FY 16/17) to the average total covered payroll for the system. This allocation percentage would remain unchanged in future years (albeit, minor adjustments if employers cease participating in the system). There are some favorable characteristics with this method as each employer's contribution effort to finance the unfunded actuarial accrued liability will remain relatively constant and eliminates incentives for employers to pursue the use of "contract" employees to reduce their covered payroll (and required contribution). Employers that are increasing in size will not be burdened to pay a greater share of the unfunded actuarial accrued liability on the covered payroll for those additional employees. Rather, the marginal change in the employer's pension contribution effort will be the normal cost rate on the change in covered payroll.

We have not analyzed the change in covered payroll for the participating employers in the systems or how the average of the fiscal years identified in the proposed legislation compare to the distribution of covered payroll among employers in other years, such as the 12/13 and 13/14 fiscal years. Given the declining covered payroll experienced by some of the systems over the last several years, it is possible that using a 5-year average period or the currently proposed 3-year averaging period using different fiscal years may be more representative of the allocated share of each employer's share of the unfunded actuarial accrued liability. There will not be a fiscal impact to the system if the averaging method is changed, but there would be a cost increase or decrease for individual participating employers. We recommend the Legislative Research Commission seek input from Kentucky Retirement Systems regarding the fiscal years and the averaging period used in the calculation.

Further to this point, using a static allocation may gradually drift from mirroring the employer participation demographics in future years (some employers are growing and other entities are decreasing their workforce). Also, while this proposed method may be appropriate for allocating the existing unfunded liability, it may not be appropriate for allocating unfunded liabilities that may be incurred in a future year. Note, if this issue does occur, then it could be easily addressed by the General Assembly in a future year by using a layered amortization base.

<u>Resetting the Amortization Period to a Closed 30 Years for the July 1, 2019 Actuarial Valuation</u>

The recent change in assumptions did materially increase the contribution requirements beginning with the FY 18/19 fiscal year. Resetting the amortization period to a closed 30 years for the July 1, 2019 actuarial valuation will somewhat reduce those contribution requirements for the years 2020 through the year 2043. However, the participating employers will also be required to continue to finance the unfunded actuarial accrued liability an additional six years (i.e. to the year 2049).

<u>Distribution of the Actuarial Accrued Liability among Membership Status</u>

The proposed legislation would make certain changes to retirement and health insurance benefits to active members after July 1, 2018 as well as future active members in these Hazardous Retirement Systems. For educational and informational purposes, the actuarial accrued liability attributable to the current retirees and inactive members (vested and non-vested) in the KERS Hazardous Retirement System is approximately 66% of the total actuarial accrued liability (Similarly, the retiree and inactive member liability is approximately 63% and 80% of the total actuarial accrued liability for the CERS Hazardous Retirement System and SPRS Retirement System, respectively). As a result, while the proposed changes may have a material impact on the actuarial accrued liability attributable to the current active members in the Retirement System, the changes have a much smaller impact as a percentage of the total actuarial accrued liability attributable of the entire Retirement System.

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 participating employers in each Retirement System will maintain the current workforce in each future year and that as current active members terminate or retire from a covered position in the Retirement System, the employer would replace them with a new employee.

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

Exhibit 1. Summary of Proposed Changes

Section 1. Comparison of Fiscal Impact

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

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

Exhibit 1. Summary of Changes in Benefit Provisions and Employer Funding for the KERS and CERS Hazardous Systems & SPRS

Retirement Formulas

Tier 1:

- No change to the basic formula.
- For retirements on or after January 1, 2019, the highest three years of pay used to determine the member's final average compensation must be complete fiscal years and must contain at least 36 months.

Tier 2:

- No change to the basic formula.

Tier 3:

- No change to the interest crediting formula.
- Removal of the $5,000 post-retirement death benefit for all members hired on and after January 1, 2014.

Future Hires:

- Future employees will participate in the hybrid cash balance plan. Participants do not have an option to earn retirement benefits in the defined contribution plan

Member Contribution Rates

- Member contribution rates to the retirement fund for Tier 1, Tier 2, and Tier 3 members remain unchanged at 8% of pay. Contributions to the health insurance funds for Tier 1 members who began participation on or after July 1, 2003 (but prior to September 1, 2008) will increase to 1.00% of pay.
    - The contributions to the health insurance funds are classified as 401(h) contributions and are not refundable to the member.

Pension Anti-Spiking Provisions

Equipment and Other Expense Allowances:

- Excluded from creditable compensation earned on or after January 1, 2019.

Sick Leave

- Converted sick service cannot exceed amount for accumulated sick leave as of January 1, 2019.
- Tier 1 sick leave service credit does not count towards retirement eligibility for those retiring on or after January 1, 2019.

Retiree Health Accessibility

- No change.

Line of Duty Death

- The surviving spouse (if any) shall supersede all previous beneficiary designations for members that die in the line of duty.

Reemployment After Retirement

The following reemployment after retirement provisions apply to members who retire on or after January 1, 2019 in order to continue to receive their retirement allowance during their reemployment with a participating employer in KERS, CERS, SPRS, or TRS:

- Must have a one (1) month break in employment and no prearranged reemployment agreement.
- After required employment break, the retired member can return to work in part-time or full-time position, but does not earn additional retirement benefit accruals.
  - Monthly pension will not be suspended for the duration of reemployment and the retiree will not earn additional retirement benefits.
- Employer required to make normal cost contributions (both pension and retiree health) on the payroll of the reemployed retiree.

Employer Funding

The Board will continue to have the authority to change the contribution rates for CERS on an annual basis and will have the authority to change contribution rates for KERS and SPRS on an annual basis after the fiscal year ending June 30, 2020.

Actuarially Determined Contributions (ADC) for actuarial valuations performed on and after June 30, 2019 are based on normal cost plus an amortization payment to finance the unfunded actuarial accrued liability:

- Normal cost determined using entry age normal cost method paid as a percentage of payroll.
- Unfunded liability payment determined in the January 1, 2019 actuarial valuation will be based on a closed 30-year amortization period.
- Allocation of amortization payment for the unfunded liability to participating employers in KERS, CERS, and SPRS is based on a level-dollar amortization
  - The dollar amount of the amortization payment will be allocated to each participating employer in proportion to their average percentage of the total compensation for years (FY 14/15, FY 15/16, and FY 16/17), adjusted for any employers who ceases participation in the System.
  - Each employer's proportionate share of the amortization payment will remain a relatively constant percentage each future year.

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

Kentucky Retirement Systems
Exhibit 1-1
KERS Hazardous Retirement Fund
Summary 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	$ 514	$ 514	$ -	54%	54%	0%	$ 35	$ 35	$ -	21.4%	21.4%	0.0%
2018	518	518	-	55%	55%	0%	57	57	-	34.4%	34.4%	0.0%
2019	517	517	-	56%	56%	0%	58	58	-	34.4%	34.4%	0.0%
2020	508	508	-	58%	58%	0%	57	52	(5)	32.6%	29.8%	-2.8%
2021	490	495	5	61%	60%	-1%	58	52	(6)	32.6%	29.0%	-3.6%
2022	475	487	12	63%	62%	-1%	55	51	(4)	30.2%	27.8%	-2.4%
2023	464	480	16	64%	63%	-1%	57	51	(6)	30.2%	27.0%	-3.3%
2024	449	473	24	66%	64%	-2%	55	50	(5)	28.3%	26.2%	-2.2%
2025	435	464	29	68%	66%	-2%	56	50	(6)	28.3%	25.4%	-2.9%
2026	419	456	37	70%	67%	-3%	53	50	(3)	26.5%	24.7%	-1.8%
2027	403	447	44	71%	68%	-3%	55	49	(6)	26.5%	23.9%	-2.5%
2028	386	438	52	73%	69%	-4%	52	49	(3)	24.7%	23.2%	-1.6%
2029	369	427	58	75%	71%	-4%	53	49	(4)	24.7%	22.4%	-2.3%
2030	350	416	66	76%	72%	-4%	51	48	(3)	23.2%	21.8%	-1.4%
2031	331	405	74	78%	73%	-5%	53	48	(5)	23.2%	21.2%	-2.0%
2032	310	393	83	80%	74%	-6%	51	49	(2)	21.8%	20.6%	-1.2%
2033	289	380	91	81%	75%	-6%	53	49	(4)	21.8%	20.1%	-1.7%
2034	266	367	101	83%	77%	-6%	51	49	(2)	20.5%	19.6%	-0.9%
2035	243	352	109	85%	78%	-7%	52	49	(3)	20.5%	19.1%	-1.3%
2036	217	337	120	87%	79%	-8%	51	49	(2)	19.3%	18.7%	-0.6%
2037	192	321	129	88%	81%	-7%	52	49	(3)	19.3%	18.3%	-1.0%
2038	163	303	140	90%	82%	-8%	50	49	(1)	18.2%	17.8%	-0.3%
2039	134	284	150	92%	84%	-8%	51	49	(2)	18.2%	17.4%	-0.7%
2040	103	264	161	94%	85%	-9%	49	49	-	17.2%	17.1%	0.0%
2041	72	242	170	96%	86%	-10%	50	49	(1)	17.2%	16.9%	-0.3%
2042	37	220	183	98%	88%	-10%	49	50	1	16.6%	16.6%	0.1%
2043	-	195	195	100%	89%	-11%	13	50	37	4.1%	16.5%	12.4%
2044	-	169	169	100%	91%	-9%	13	51	38	4.1%	16.3%	12.2%
2045	-	141	141	100%	93%	-7%	13	51	38	4.1%	16.2%	12.1%
2046	-	110	110	100%	94%	-6%	13	52	39	4.1%	16.1%	12.0%
2047	-	78	78	100%	96%	-4%	14	53	39	4.1%	16.1%	12.0%
2048	-	42	42	100%	98%	-2%	14	55	41	4.1%	16.3%	12.2%
2049	-	-	-	100%	100%	0%	14	14	-	4.1%	4.1%	0.0%
2050	-	-	-	100%	100%	0%	15	15	-	4.1%	4.1%	0.0%
2051	-	-	-	100%	100%	0%	15	15	-	4.1%	4.1%	0.0%

Kentucky Retirement Systems
Exhibit 1-2
CERS Hazardous Retirement Fund
Summary 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	$ 2,411	$ 2,411	$ -	48%	48%	0%	$ 120	$ 120	$ -	22.2%	22.2%	0.0%
2018	2,478	2,478	-	48%	48%	0%	192	192	-	35.7%	35.7%	0.0%
2019	2,504	2,504	-	49%	49%	0%	193	193	-	36.0%	36.0%	0.0%
2020	2,500	2,500	-	50%	50%	0%	197	213	16	36.4%	39.4%	3.0%
2021	2,456	2,440	(16)	52%	52%	0%	199	211	12	36.5%	38.7%	2.3%
2022	2,433	2,401	(32)	53%	53%	0%	199	207	8	36.1%	37.6%	1.5%
2023	2,405	2,363	(42)	54%	55%	1%	201	205	4	36.0%	36.7%	0.8%
2024	2,372	2,323	(49)	55%	56%	1%	202	203	1	35.8%	35.9%	0.1%
2025	2,333	2,281	(52)	56%	57%	1%	204	201	(3)	35.7%	35.1%	-0.6%
2026	2,288	2,236	(52)	57%	58%	1%	207	199	(8)	35.5%	34.2%	-1.3%
2027	2,236	2,189	(47)	59%	59%	0%	209	198	(11)	35.3%	33.4%	-1.9%
2028	2,178	2,139	(39)	60%	61%	1%	212	196	(16)	35.1%	32.6%	-2.6%
2029	2,111	2,087	(24)	61%	62%	1%	215	195	(20)	35.0%	31.7%	-3.3%
2030	2,037	2,031	(6)	63%	63%	0%	218	194	(24)	34.8%	30.9%	-3.9%
2031	1,954	1,972	18	64%	64%	0%	222	193	(29)	34.5%	30.1%	-4.4%
2032	1,861	1,911	50	66%	65%	-1%	225	193	(32)	34.3%	29.3%	-5.0%
2033	1,759	1,845	86	68%	66%	-2%	229	192	(37)	34.1%	28.6%	-5.5%
2034	1,646	1,776	130	70%	68%	-2%	233	192	(41)	33.9%	27.9%	-6.0%
2035	1,522	1,702	180	72%	69%	-3%	238	192	(46)	33.7%	27.3%	-6.5%
2036	1,385	1,623	238	75%	70%	-5%	242	192	(50)	33.6%	26.6%	-7.0%
2037	1,235	1,540	305	78%	72%	-6%	247	192	(55)	33.4%	26.0%	-7.4%
2038	1,071	1,451	380	81%	74%	-7%	251	192	(59)	33.3%	25.4%	-7.8%
2039	892	1,357	465	84%	75%	-9%	256	192	(64)	33.1%	24.9%	-8.3%
2040	697	1,256	559	87%	77%	-10%	261	192	(69)	33.0%	24.3%	-8.7%
2041	484	1,150	666	91%	79%	-12%	267	193	(74)	32.9%	23.8%	-9.1%
2042	254	1,037	783	95%	81%	-14%	272	193	(79)	32.9%	23.3%	-9.6%
2043	-	915	915	100%	84%	-16%	12	194	182	1.4%	22.8%	21.4%
2044	-	787	787	100%	86%	-14%	12	194	182	1.4%	22.4%	21.0%
2045	-	650	650	100%	88%	-12%	12	195	183	1.4%	22.0%	20.6%
2046	-	504	504	100%	91%	-9%	13	196	183	1.4%	21.6%	20.2%
2047	-	348	348	100%	94%	-6%	13	197	184	1.4%	21.2%	19.8%
2048	-	182	182	100%	97%	-3%	13	199	186	1.4%	21.0%	19.6%
2049	-	-	-	100%	100%	0%	14	14	-	1.4%	1.4%	0.0%
2050	-	-	-	100%	100%	0%	14	14	-	1.4%	1.4%	0.0%
2051	-	-	-	100%	100%	0%	14	14	-	1.4%	1.4%	0.0%

Kentucky Retirement Systems
Exhibit 1-3
SPRS Retirement Fund
Summary 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	$ 706	$ 706	$ -	27%	27%	0%	$ 35	$ 35	$ -	72.5%	72.5%	0.0%
2018	706	706	-	27%	27%	0%	58	58	-	119.1%	119.0%	0.0%
2019	697	697	-	28%	28%	0%	59	59	-	119.1%	119.0%	0.0%
2020	682	682	-	30%	30%	0%	58	52	(6)	116.2%	104.4%	-11.8%
2021	664	670	6	32%	31%	-1%	59	52	(7)	116.2%	102.5%	-13.8%
2022	645	658	13	34%	32%	-2%	58	52	(6)	111.5%	100.0%	-11.5%
2023	626	646	20	35%	33%	-2%	59	52	(7)	111.5%	97.8%	-13.7%
2024	606	635	29	37%	34%	-3%	57	51	(6)	106.3%	95.6%	-10.7%
2025	586	622	36	39%	35%	-4%	58	51	(7)	106.3%	93.5%	-12.9%
2026	563	608	45	41%	36%	-5%	56	51	(5)	101.1%	91.0%	-10.1%
2027	541	594	53	43%	37%	-6%	58	51	(7)	101.1%	88.4%	-12.7%
2028	515	579	64	45%	38%	-7%	56	50	(6)	95.2%	85.9%	-9.3%
2029	490	563	73	47%	39%	-8%	57	50	(7)	95.2%	83.5%	-11.7%
2030	463	547	84	50%	41%	-9%	55	50	(5)	89.4%	81.1%	-8.3%
2031	437	530	93	52%	42%	-10%	57	50	(7)	89.4%	78.8%	-10.6%
2032	406	512	106	55%	43%	-12%	55	50	(5)	83.5%	76.7%	-6.9%
2033	378	492	114	58%	45%	-13%	56	50	(6)	83.5%	74.5%	-9.1%
2034	344	472	128	61%	47%	-14%	54	50	(4)	78.2%	72.5%	-5.8%
2035	313	451	138	64%	49%	-15%	55	50	(5)	78.2%	70.7%	-7.6%
2036	277	429	152	68%	51%	-17%	53	50	(3)	73.3%	68.9%	-4.4%
2037	243	405	162	72%	53%	-19%	55	50	(5)	73.3%	67.2%	-6.1%
2038	205	381	176	76%	56%	-20%	52	50	(2)	68.6%	65.7%	-3.0%
2039	168	354	186	80%	58%	-22%	54	50	(4)	68.6%	64.1%	-4.6%
2040	126	327	201	85%	61%	-24%	51	50	(1)	64.0%	62.8%	-1.2%
2041	86	298	212	90%	64%	-26%	52	50	(2)	64.0%	61.5%	-2.5%
2042	42	268	226	95%	68%	-27%	49	51	2	58.3%	60.2%	1.9%
2043	-	236	236	100%	71%	-29%	5	51	46	5.9%	59.0%	53.1%
2044	-	202	202	100%	75%	-25%	5	51	46	5.9%	57.9%	52.1%
2045	-	166	166	100%	80%	-20%	5	51	46	5.9%	56.9%	51.1%
2046	-	128	128	100%	84%	-16%	5	51	46	5.8%	56.0%	50.2%
2047	-	89	89	100%	89%	-11%	5	52	47	5.8%	55.2%	49.4%
2048	-	46	46	100%	94%	-6%	6	52	46	5.8%	54.8%	49.0%
2049	-	-	-	100%	100%	0%	6	6	-	5.8%	5.8%	0.0%
2050	-	-	-	100%	100%	0%	6	6	-	5.8%	5.8%	0.0%
2051	-	-	-	100%	100%	0%	6	6	-	5.8%	5.8%	0.0%

Kentucky Retirement Systems
Exhibit 1-4
KERS Hazardous Insurance Fund
Summary 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	$ (74)	$ (74)	$ -	118%	118%	0%	$ 4	$ 4	$ -	2.3%	2.3%	0.0%
2018	(71)	(71)	-	116%	116%	0%	4	4	-	2.5%	2.5%	0.0%
2019	(63)	(63)	-	114%	114%	0%	4	4	-	2.5%	2.5%	0.0%
2020	(61)	(62)	(1)	113%	113%	0%	4	4	-	2.1%	2.3%	0.2%
2021	(66)	(67)	(1)	114%	114%	0%	4	3	(1)	2.1%	1.7%	-0.4%
2022	(65)	(67)	(2)	113%	114%	1%	2	2	-	1.2%	1.1%	-0.1%
2023	(64)	(66)	(2)	113%	113%	0%	2	2	-	1.2%	1.1%	-0.1%
2024	(62)	(65)	(3)	112%	113%	1%	1	2	1	0.7%	1.0%	0.4%
2025	(61)	(64)	(3)	112%	112%	0%	1	1	-	0.7%	0.5%	-0.1%
2026	(60)	(64)	(4)	111%	112%	1%	1	1	-	0.4%	0.5%	0.2%
2027	(57)	(62)	(5)	111%	112%	1%	1	1	-	0.4%	0.5%	0.1%
2028	(55)	(60)	(5)	110%	111%	1%	-	1	1	0.1%	0.5%	0.3%
2029	(53)	(59)	(6)	110%	111%	1%	-	1	1	0.1%	0.5%	0.3%
2030	(50)	(57)	(7)	109%	111%	2%	-	1	1	0.1%	0.5%	0.4%
2031	(47)	(55)	(8)	109%	110%	1%	-	1	1	0.1%	0.4%	0.4%
2032	(44)	(53)	(9)	108%	110%	2%	-	1	1	0.2%	0.4%	0.3%
2033	(40)	(51)	(11)	107%	109%	2%	-	1	1	0.2%	0.4%	0.3%
2034	(37)	(49)	(12)	107%	109%	2%	1	1	-	0.3%	0.4%	0.2%
2035	(33)	(47)	(14)	106%	108%	2%	1	1	-	0.3%	0.4%	0.1%
2036	(29)	(44)	(15)	105%	108%	3%	1	1	-	0.4%	0.4%	0.0%
2037	(25)	(42)	(17)	104%	107%	3%	1	1	-	0.4%	0.4%	0.0%
2038	(21)	(39)	(18)	104%	107%	3%	1	2	1	0.5%	0.7%	0.2%
2039	(17)	(36)	(19)	103%	106%	3%	1	2	1	0.5%	0.7%	0.2%
2040	(12)	(33)	(21)	102%	106%	4%	2	2	-	0.6%	0.7%	0.1%
2041	(8)	(30)	(22)	101%	105%	4%	2	2	-	0.6%	0.7%	0.1%
2042	(4)	(27)	(23)	101%	104%	3%	3	2	(1)	0.9%	0.7%	-0.2%
2043	-	(23)	(23)	100%	104%	4%	7	2	(5)	2.1%	0.7%	-1.5%
2044	-	(19)	(19)	100%	103%	3%	7	2	(5)	2.1%	0.6%	-1.5%
2045	-	(15)	(15)	100%	102%	2%	7	2	(5)	2.1%	0.6%	-1.4%
2046	-	(12)	(12)	100%	102%	2%	7	2	(5)	2.1%	0.6%	-1.4%
2047	-	(8)	(8)	100%	101%	1%	7	2	(5)	2.0%	0.6%	-1.4%
2048	-	(3)	(3)	100%	100%	0%	7	3	(4)	2.0%	0.9%	-1.1%
2049	-	-	-	100%	100%	0%	7	7	-	2.0%	2.0%	0.0%
2050	-	-	-	100%	100%	0%	7	7	-	2.0%	2.0%	0.0%
2051	-	-	-	100%	100%	0%	7	7	-	1.9%	1.9%	0.0%

Kentucky Retirement Systems
Exhibit 1-5
CERS Hazardous Insurance Fund
Summary 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	$ 591	$ 591	$ -	67%	67%	0%	$ 51	$ 51	$ -	9.4%	9.4%	0.0%
2018	610	610	-	67%	67%	0%	65	65	-	12.2%	12.2%	0.0%
2019	622	620	(2)	67%	68%	1%	64	63	(1)	12.0%	11.7%	-0.3%
2020	619	618	(1)	68%	69%	1%	64	67	3	11.8%	12.4%	0.5%
2021	600	594	(6)	70%	70%	0%	63	65	2	11.5%	11.9%	0.4%
2022	592	583	(9)	71%	71%	0%	61	61	-	11.0%	11.1%	0.1%
2023	583	572	(11)	72%	72%	0%	59	59	-	10.7%	10.6%	-0.1%
2024	574	561	(13)	72%	73%	1%	59	58	(1)	10.4%	10.3%	-0.1%
2025	564	550	(14)	73%	74%	1%	58	56	(2)	10.1%	9.8%	-0.4%
2026	552	539	(13)	73%	74%	1%	58	55	(3)	9.9%	9.5%	-0.4%
2027	540	527	(13)	74%	75%	1%	57	54	(3)	9.7%	9.1%	-0.6%
2028	525	515	(10)	74%	75%	1%	58	53	(5)	9.6%	8.8%	-0.8%
2029	509	502	(7)	75%	75%	0%	58	53	(5)	9.4%	8.6%	-0.8%
2030	491	489	(2)	76%	76%	0%	59	52	(7)	9.3%	8.3%	-1.0%
2031	471	475	4	76%	76%	0%	59	52	(7)	9.2%	8.1%	-1.1%
2032	448	459	11	77%	77%	0%	60	52	(8)	9.2%	7.9%	-1.2%
2033	424	444	20	78%	77%	-1%	61	52	(9)	9.1%	7.7%	-1.4%
2034	397	427	30	79%	78%	-1%	62	52	(10)	9.0%	7.6%	-1.5%
2035	367	410	43	80%	78%	-2%	63	52	(11)	9.0%	7.4%	-1.6%
2036	334	391	57	82%	79%	-3%	64	52	(12)	8.9%	7.2%	-1.7%
2037	298	371	73	84%	80%	-4%	66	52	(14)	8.9%	7.1%	-1.8%
2038	259	350	91	86%	81%	-5%	67	52	(15)	8.9%	6.9%	-2.0%
2039	216	327	111	88%	82%	-6%	68	53	(15)	8.8%	6.9%	-2.0%
2040	168	303	135	91%	83%	-8%	69	53	(16)	8.8%	6.7%	-2.1%
2041	118	278	160	93%	84%	-9%	71	53	(18)	8.8%	6.6%	-2.2%
2042	62	251	189	97%	86%	-11%	72	53	(19)	8.8%	6.4%	-2.4%
2043	-	221	221	100%	88%	-12%	10	53	43	1.1%	6.3%	5.1%
2044	-	191	191	100%	89%	-11%	10	53	43	1.1%	6.1%	5.0%
2045	-	157	157	100%	91%	-9%	10	54	44	1.1%	6.1%	5.0%
2046	-	122	122	100%	93%	-7%	10	54	44	1.1%	6.0%	4.9%
2047	-	84	84	100%	95%	-5%	10	54	44	1.1%	5.8%	4.8%
2048	-	44	44	100%	98%	-2%	10	55	45	1.1%	5.8%	4.8%
2049	-	-	-	100%	100%	0%	10	10	-	1.0%	1.0%	0.0%
2050	-	-	-	100%	100%	0%	10	10	-	1.0%	1.0%	0.0%
2051	-	-	-	100%	100%	0%	10	10	-	1.0%	1.0%	0.0%

Kentucky Retirement Systems
Exhibit 1-6
SPRS Insurance Fund
Summary 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	$ 97	$ 97	$ -	65%	65%	0%	$ 9	$ 9	$ -	18.8%	18.8%	0.0%
2018	100	100	-	65%	65%	0%	13	13	-	27.2%	27.2%	0.0%
2019	100	100	-	66%	66%	0%	13	13	-	27.2%	27.2%	0.0%
2020	97	97	-	68%	68%	0%	13	12	(1)	25.6%	24.5%	-1.2%
2021	93	94	1	70%	70%	0%	13	11	(2)	25.6%	22.0%	-3.6%
2022	90	92	2	71%	71%	0%	12	11	(1)	22.9%	21.6%	-1.4%
2023	88	91	3	72%	71%	-1%	12	10	(2)	22.9%	19.2%	-3.7%
2024	84	88	4	74%	73%	-1%	11	10	(1)	20.4%	18.9%	-1.5%
2025	81	86	5	75%	73%	-2%	11	10	(1)	20.4%	18.5%	-1.8%
2026	78	85	7	76%	74%	-2%	10	9	(1)	18.2%	16.4%	-1.8%
2027	74	82	8	77%	74%	-3%	10	9	(1)	18.2%	16.1%	-2.1%
2028	71	81	10	78%	75%	-3%	9	9	-	16.4%	15.8%	-0.6%
2029	67	78	11	79%	75%	-4%	10	9	(1)	16.4%	15.3%	-1.1%
2030	64	76	12	79%	75%	-4%	9	8	(1)	14.9%	13.1%	-1.8%
2031	60	74	14	80%	76%	-4%	9	8	(1)	14.9%	12.9%	-2.0%
2032	56	72	16	81%	76%	-5%	9	8	(1)	13.6%	12.5%	-1.1%
2033	52	69	17	82%	77%	-5%	9	8	(1)	13.6%	12.1%	-1.5%
2034	47	66	19	84%	77%	-7%	9	8	(1)	12.6%	11.8%	-0.8%
2035	44	64	20	84%	77%	-7%	9	8	(1)	12.6%	11.6%	-1.0%
2036	39	61	22	86%	78%	-8%	8	8	-	11.8%	11.3%	-0.5%
2037	34	58	24	88%	79%	-9%	9	8	(1)	11.8%	11.0%	-0.8%
2038	29	55	26	89%	79%	-10%	8	8	-	11.1%	10.7%	-0.4%
2039	24	52	28	91%	80%	-11%	8	8	-	11.1%	10.4%	-0.7%
2040	18	48	30	93%	81%	-12%	8	8	-	10.4%	10.3%	-0.1%
2041	12	43	31	95%	83%	-12%	8	8	-	10.4%	10.0%	-0.4%
2042	6	39	33	98%	85%	-13%	8	8	-	9.6%	9.8%	0.2%
2043	-	34	34	100%	86%	-14%	2	8	6	1.8%	9.5%	7.7%
2044	-	30	30	100%	88%	-12%	2	8	6	1.8%	9.4%	7.6%
2045	-	25	25	100%	90%	-10%	2	8	6	1.8%	9.2%	7.4%
2046	-	19	19	100%	92%	-8%	2	8	6	1.8%	9.0%	7.2%
2047	-	13	13	100%	95%	-5%	2	9	7	1.8%	9.9%	8.1%
2048	-	7	7	100%	97%	-3%	2	9	7	1.7%	9.7%	8.0%
2049	-	-	-	100%	100%	0%	2	2	-	1.7%	1.7%	0.0%
2050	-	-	-	100%	100%	0%	2	2	-	1.7%	1.7%	0.0%
2051	-	-	-	100%	100%	0%	2	2	-	1.7%	1.7%	0.0%

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

Kentucky Retirement Systems
Exhibit 2-1
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)	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	$ 1,121	$ 607	$ 514	54%	$ 35	$ 13	$ 162	21.44%	20.48%
2018	1,155	637	518	55%	57	13	166	34.39%	34.39%
2019	1,186	669	517	56%	58	14	170	34.39%	33.30%
2020	1,217	709	508	58%	57	14	174	32.60%	32.60%
2021	1,247	757	490	61%	58	14	179	32.60%	31.64%
2022	1,276	801	475	63%	55	15	183	30.23%	30.23%
2023	1,305	841	464	64%	57	15	188	30.23%	29.28%
2024	1,333	884	449	66%	55	15	193	28.30%	28.30%
2025	1,360	925	435	68%	56	16	197	28.30%	27.39%
2026	1,386	967	419	70%	53	16	202	26.47%	26.47%
2027	1,410	1,007	403	71%	55	16	206	26.47%	25.63%
2028	1,434	1,048	386	73%	52	17	211	24.72%	24.72%
2029	1,456	1,087	369	75%	53	17	216	24.72%	23.96%
2030	1,478	1,128	350	76%	51	18	222	23.16%	23.16%
2031	1,500	1,169	331	78%	53	18	229	23.16%	22.48%
2032	1,524	1,214	310	80%	51	19	236	21.75%	21.75%
2033	1,549	1,260	289	81%	53	19	242	21.75%	21.14%
2034	1,576	1,310	266	83%	51	20	249	20.47%	20.47%
2035	1,605	1,362	243	85%	52	20	256	20.47%	19.91%
2036	1,634	1,417	217	87%	51	21	263	19.29%	19.29%
2037	1,665	1,473	192	88%	52	22	269	19.29%	18.78%
2038	1,695	1,532	163	90%	50	22	276	18.16%	18.16%
2039	1,725	1,591	134	92%	51	23	282	18.16%	17.71%
2040	1,755	1,652	103	94%	49	23	288	17.15%	17.15%
2041	1,785	1,713	72	96%	50	23	293	17.15%	16.91%
2042	1,813	1,776	37	98%	49	24	299	16.55%	16.55%
2043	1,841	1,841	0	100%	13	24	305	4.10%	4.10%
2044	1,869	1,869	0	100%	13	25	311	4.10%	4.10%
2045	1,897	1,897	0	100%	13	25	318	4.10%	4.10%
2046	1,925	1,925	0	100%	13	26	325	4.10%	4.10%
2047	1,953	1,953	0	100%	14	27	333	4.10%	4.10%
2048	1,982	1,982	0	100%	14	27	340	4.10%	4.10%
2049	2,011	2,011	0	100%	14	28	348	4.10%	4.10%
2050	2,040	2,040	0	100%	15	28	356	4.10%	4.10%
2051	2,070	2,070	0	100%	15	29	364	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.

Kentucky Retirement Systems
Exhibit 2-2
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)	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	$ 4,649	$ 2,238	$ 2,411	48%	$ 120	$ 43	$ 542	22.20%	22.20%
2018	4,771	2,293	2,478	48%	192	43	537	35.69%	35.69%
2019	4,880	2,376	2,504	49%	193	43	538	35.95%	35.95%
2020	4,978	2,478	2,500	50%	197	43	542	36.42%	36.42%
2021	5,066	2,610	2,456	52%	199	44	546	36.48%	36.48%
2022	5,145	2,712	2,433	53%	199	44	551	36.06%	36.06%
2023	5,214	2,809	2,405	54%	201	45	558	35.95%	35.95%
2024	5,274	2,902	2,372	55%	202	45	565	35.81%	35.81%
2025	5,325	2,992	2,333	56%	204	46	573	35.66%	35.66%
2026	5,367	3,079	2,288	57%	207	47	582	35.49%	35.49%
2027	5,400	3,164	2,236	59%	209	47	592	35.32%	35.32%
2028	5,426	3,248	2,178	60%	212	48	602	35.14%	35.14%
2029	5,444	3,333	2,111	61%	215	49	614	34.96%	34.96%
2030	5,457	3,420	2,037	63%	218	50	628	34.75%	34.75%
2031	5,466	3,512	1,954	64%	222	51	642	34.54%	34.54%
2032	5,472	3,611	1,861	66%	225	53	657	34.33%	34.33%
2033	5,478	3,719	1,759	68%	229	54	672	34.12%	34.12%
2034	5,483	3,837	1,646	70%	233	55	688	33.92%	33.92%
2035	5,489	3,967	1,522	72%	238	56	705	33.73%	33.73%
2036	5,495	4,110	1,385	75%	242	58	721	33.56%	33.56%
2037	5,502	4,267	1,235	78%	247	59	738	33.40%	33.40%
2038	5,510	4,439	1,071	81%	251	60	755	33.26%	33.26%
2039	5,519	4,627	892	84%	256	62	773	33.13%	33.13%
2040	5,528	4,831	697	87%	261	63	791	33.02%	33.02%
2041	5,540	5,056	484	91%	267	65	809	32.94%	32.94%
2042	5,555	5,301	254	95%	272	66	828	32.89%	32.89%
2043	5,573	5,573	0	100%	12	68	848	1.41%	1.41%
2044	5,595	5,595	0	100%	12	69	867	1.40%	1.40%
2045	5,619	5,619	0	100%	12	71	887	1.40%	1.40%
2046	5,646	5,646	0	100%	13	73	907	1.40%	1.40%
2047	5,674	5,674	0	100%	13	74	927	1.40%	1.40%
2048	5,704	5,704	0	100%	13	76	948	1.40%	1.40%
2049	5,736	5,736	0	100%	14	78	970	1.40%	1.40%
2050	5,769	5,769	0	100%	14	79	992	1.40%	1.40%
2051	5,803	5,803	0	100%	14	81	1,014	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.

Kentucky Retirement Systems
Exhibit 2-3
SPRS 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 Contributio n	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2017	$ 967	$ 261	$ 706	27%	$ 35	$ 4	$ 49	72.47%	71.57%
2018	970	264	706	27%	58	4	49	119.05%	119.05%
2019	972	275	697	28%	59	4	50	119.05%	117.69%
2020	972	290	682	30%	58	4	50	116.24%	116.24%
2021	972	308	664	32%	59	4	51	116.24%	114.50%
2022	970	325	645	34%	58	4	52	111.48%	111.48%
2023	967	341	626	35%	59	4	53	111.48%	109.03%
2024	964	358	606	37%	57	4	54	106.31%	106.31%
2025	959	373	586	39%	58	4	55	106.31%	103.75%
2026	953	390	563	41%	56	4	56	101.12%	101.12%
2027	946	405	541	43%	58	5	57	101.12%	98.44%
2028	938	423	515	45%	56	5	59	95.24%	95.24%
2029	930	440	490	47%	57	5	60	95.24%	92.43%
2030	922	459	463	50%	55	5	62	89.36%	89.36%
2031	914	477	437	52%	57	5	64	89.36%	86.61%
2032	905	499	406	55%	55	5	65	83.53%	83.53%
2033	897	519	378	58%	56	5	67	83.53%	81.10%
2034	888	544	344	61%	54	6	69	78.24%	78.24%
2035	880	567	313	64%	55	6	71	78.24%	75.87%
2036	872	595	277	68%	53	6	73	73.29%	73.29%
2037	865	622	243	72%	55	6	75	73.29%	71.26%
2038	857	652	205	76%	52	6	76	68.64%	68.64%
2039	851	683	168	80%	54	6	78	68.64%	66.76%
2040	844	718	126	85%	51	6	80	63.97%	63.97%
2041	839	753	86	90%	52	7	82	63.97%	62.25%
2042	833	791	42	95%	49	7	84	58.27%	58.27%
2043	829	829	0	100%	5	7	86	5.93%	5.93%
2044	825	825	0	100%	5	7	88	5.88%	5.88%
2045	821	821	0	100%	5	7	90	5.85%	5.85%
2046	818	818	0	100%	5	7	92	5.83%	5.83%
2047	815	815	0	100%	5	7	94	5.81%	5.81%
2048	813	813	0	100%	6	8	96	5.80%	5.80%
2049	811	811	0	100%	6	8	98	5.79%	5.79%
2050	810	810	0	100%	6	8	100	5.79%	5.79%
2051	809	809	0	100%	6	8	102	5.79%	5.79%

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.

Kentucky Retirement Systems
Exhibit 2-4
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)	Employer Contributio n	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2017	$ 419	$ 493	$ (74)	118%	$ 4	$ 1	$ 162	2.26%	1.34%
2018	436	507	(71)	116%	4	1	165	2.46%	2.46%
2019	453	516	(63)	114%	4	1	169	2.46%	2.15%
2020	468	529	(61)	113%	4	1	174	2.11%	2.11%
2021	482	548	(66)	114%	4	1	178	2.11%	1.84%
2022	494	559	(65)	113%	2	1	183	1.21%	1.21%
2023	504	568	(64)	113%	2	1	187	1.21%	0.91%
2024	513	575	(62)	112%	1	1	192	0.65%	0.65%
2025	520	581	(61)	112%	1	2	197	0.65%	0.50%
2026	525	585	(60)	111%	1	2	201	0.35%	0.35%
2027	530	587	(57)	111%	1	2	206	0.35%	0.25%
2028	534	589	(55)	110%	0	2	210	0.14%	0.14%
2029	537	590	(53)	110%	0	2	216	0.14%	0.09%
2030	540	590	(50)	109%	0	2	222	0.07%	0.07%
2031	543	590	(47)	109%	0	2	228	0.07%	0.10%
2032	546	590	(44)	108%	0	2	235	0.15%	0.15%
2033	550	590	(40)	107%	0	2	242	0.15%	0.20%
2034	554	591	(37)	107%	1	2	249	0.25%	0.25%
2035	559	592	(33)	106%	1	3	255	0.25%	0.31%
2036	565	594	(29)	105%	1	3	262	0.39%	0.39%
2037	572	597	(25)	104%	1	3	269	0.39%	0.43%
2038	580	601	(21)	104%	1	3	275	0.49%	0.49%
2039	588	605	(17)	103%	1	3	281	0.49%	0.54%
2040	598	610	(12)	102%	2	3	287	0.63%	0.63%
2041	608	616	(8)	101%	2	3	292	0.63%	0.68%
2042	618	622	(4)	101%	3	3	298	0.86%	0.86%
2043	629	629	0	100%	7	3	304	2.14%	2.14%
2044	640	640	0	100%	7	3	311	2.11%	2.11%
2045	651	651	0	100%	7	3	318	2.07%	2.07%
2046	662	662	0	100%	7	3	325	2.05%	2.05%
2047	673	673	0	100%	7	3	332	2.02%	2.02%
2048	685	685	0	100%	7	3	340	1.99%	1.99%
2049	696	696	0	100%	7	3	348	1.97%	1.97%
2050	707	707	0	100%	7	4	355	1.95%	1.95%
2051	718	718	0	100%	7	4	364	1.92%	1.92%

<u>Notes and assumptions:</u>
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 2-5
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)	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	$ 1,788	$ 1,197	$ 591	67%	$ 51	$ 2	$ 541	9.35%	9.35%
2018	1,853	1,243	610	67%	65	2	536	12.17%	12.17%
2019	1,912	1,290	622	67%	64	3	538	11.97%	11.97%
2020	1,962	1,343	619	68%	64	3	541	11.83%	11.83%
2021	2,005	1,405	600	70%	63	3	546	11.52%	11.52%
2022	2,038	1,446	592	71%	61	4	551	11.00%	11.00%
2023	2,061	1,478	583	72%	59	4	558	10.66%	10.66%
2024	2,075	1,501	574	72%	59	4	565	10.37%	10.37%
2025	2,081	1,517	564	73%	58	5	573	10.12%	10.12%
2026	2,078	1,526	552	73%	58	5	582	9.89%	9.89%
2027	2,068	1,528	540	74%	57	5	591	9.71%	9.71%
2028	2,052	1,527	525	74%	58	5	602	9.57%	9.57%
2029	2,031	1,522	509	75%	58	6	614	9.43%	9.43%
2030	2,008	1,517	491	76%	59	6	627	9.33%	9.33%
2031	1,982	1,511	471	76%	59	6	641	9.24%	9.24%
2032	1,954	1,506	448	77%	60	6	656	9.16%	9.16%
2033	1,927	1,503	424	78%	61	7	672	9.09%	9.09%
2034	1,899	1,502	397	79%	62	7	688	9.03%	9.03%
2035	1,873	1,506	367	80%	63	7	704	8.98%	8.98%
2036	1,849	1,515	334	82%	64	7	721	8.93%	8.93%
2037	1,828	1,530	298	84%	66	7	738	8.89%	8.89%
2038	1,811	1,552	259	86%	67	8	755	8.85%	8.85%
2039	1,796	1,580	216	88%	68	8	772	8.82%	8.82%
2040	1,785	1,617	168	91%	69	8	790	8.79%	8.79%
2041	1,779	1,661	118	93%	71	8	809	8.77%	8.77%
2042	1,776	1,714	62	97%	72	8	828	8.75%	8.75%
2043	1,777	1,777	0	100%	10	8	847	1.13%	1.13%
2044	1,782	1,782	0	100%	10	9	866	1.11%	1.11%
2045	1,789	1,789	0	100%	10	9	886	1.10%	1.10%
2046	1,799	1,799	0	100%	10	9	906	1.08%	1.08%
2047	1,811	1,811	0	100%	10	9	926	1.07%	1.07%
2048	1,823	1,823	0	100%	10	9	947	1.06%	1.06%
2049	1,836	1,836	0	100%	10	10	969	1.04%	1.04%
2050	1,847	1,847	0	100%	10	10	991	1.03%	1.03%
2051	1,859	1,859	0	100%	10	10	1,013	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.

Kentucky Retirement Systems
Exhibit 2-6
SPRS 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)	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	$ 277	$ 180	$ 97	65%	$ 9	$ 0	$ 48	18.77%	18.10%
2018	286	186	100	65%	13	0	48	27.23%	27.23%
2019	295	195	100	66%	13	0	49	27.23%	26.34%
2020	302	205	97	68%	13	0	49	25.64%	25.64%
2021	309	216	93	70%	13	0	50	25.64%	24.57%
2022	314	224	90	71%	12	0	51	22.92%	22.92%
2023	319	231	88	72%	12	0	52	22.92%	21.70%
2024	321	237	84	74%	11	0	53	20.35%	20.35%
2025	322	241	81	75%	11	0	54	20.35%	19.25%
2026	322	244	78	76%	10	0	55	18.17%	18.17%
2027	320	246	74	77%	10	0	56	18.17%	17.28%
2028	318	247	71	78%	9	0	57	16.37%	16.37%
2029	314	247	67	79%	10	1	59	16.37%	15.65%
2030	310	246	64	79%	9	1	61	14.90%	14.90%
2031	305	245	60	80%	9	1	62	14.90%	14.30%
2032	300	244	56	81%	9	1	64	13.64%	13.64%
2033	294	242	52	82%	9	1	66	13.64%	13.13%
2034	288	241	47	84%	9	1	68	12.58%	12.58%
2035	283	239	44	84%	9	1	69	12.58%	12.18%
2036	277	238	39	86%	8	1	71	11.77%	11.77%
2037	272	238	34	88%	9	1	73	11.77%	11.45%
2038	267	238	29	89%	8	1	75	11.06%	11.06%
2039	263	239	24	91%	8	1	77	11.06%	10.79%
2040	259	241	18	93%	8	1	78	10.39%	10.39%
2041	255	243	12	95%	8	1	80	10.39%	10.15%
2042	252	246	6	98%	8	1	82	9.59%	9.59%
2043	250	250	0	100%	2	1	84	1.84%	1.84%
2044	249	249	0	100%	2	1	85	1.82%	1.82%
2045	248	248	0	100%	2	1	87	1.80%	1.80%
2046	248	248	0	100%	2	1	89	1.78%	1.78%
2047	248	248	0	100%	2	1	91	1.75%	1.75%
2048	249	249	0	100%	2	1	93	1.73%	1.73%
2049	249	249	0	100%	2	1	95	1.71%	1.71%
2050	250	250	0	100%	2	1	97	1.69%	1.69%
2051	251	251	0	100%	2	1	99	1.66%	1.66%

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.

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

Kentucky Retirement Systems
Exhibit 3-1
KERS Hazardous Retirement Fund
Proposed Legislation
($ 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	$ 1,121	$ 607	$ 514	54%	$ 35	$ 13	$ 162	21.44%	20.48%
2018	1,155	637	518	55%	57	13	166	34.37%	34.37%
2019	1,186	669	517	56%	58	14	170	34.37%	33.26%
2020	1,217	709	508	58%	52	14	174	29.81%	29.81%
2021	1,247	752	495	60%	52	14	179	29.01%	29.01%
2022	1,276	789	487	62%	51	15	183	27.82%	27.82%
2023	1,304	824	480	63%	51	15	188	26.98%	26.98%
2024	1,332	859	473	64%	50	15	193	26.15%	26.15%
2025	1,359	895	464	66%	50	16	197	25.43%	25.43%
2026	1,385	929	456	67%	50	16	202	24.67%	24.67%
2027	1,409	962	447	68%	49	16	206	23.93%	23.93%
2028	1,433	995	438	69%	49	17	211	23.17%	23.17%
2029	1,455	1,028	427	71%	49	17	216	22.43%	22.43%
2030	1,476	1,060	416	72%	48	18	222	21.77%	21.77%
2031	1,499	1,094	405	73%	48	18	229	21.17%	21.17%
2032	1,522	1,129	393	74%	49	19	236	20.60%	20.60%
2033	1,547	1,167	380	75%	49	19	242	20.08%	20.08%
2034	1,574	1,207	367	77%	49	20	249	19.58%	19.58%
2035	1,602	1,250	352	78%	49	20	256	19.14%	19.14%
2036	1,632	1,295	337	79%	49	21	263	18.67%	18.67%
2037	1,662	1,341	321	81%	49	22	269	18.25%	18.25%
2038	1,692	1,389	303	82%	49	22	276	17.82%	17.82%
2039	1,722	1,438	284	84%	49	23	282	17.43%	17.43%
2040	1,752	1,488	264	85%	49	23	288	17.10%	17.10%
2041	1,780	1,538	242	86%	49	23	293	16.87%	16.87%
2042	1,809	1,589	220	88%	50	24	299	16.64%	16.64%
2043	1,836	1,641	195	89%	50	24	305	16.45%	16.45%
2044	1,864	1,695	169	91%	51	25	311	16.30%	16.30%
2045	1,891	1,750	141	93%	51	25	318	16.16%	16.16%
2046	1,918	1,808	110	94%	52	26	325	16.06%	16.06%
2047	1,946	1,868	78	96%	53	27	333	16.05%	16.05%
2048	1,974	1,932	42	98%	55	27	340	16.28%	16.28%
2049	2,003	2,003	-	100%	14	28	348	4.10%	4.10%
2050	2,032	2,032	-	100%	15	28	356	4.10%	4.10%
2051	2,061	2,061	-	100%	15	29	364	4.10%	4.10%

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

Kentucky Retirement Systems
Exhibit 3-2
CERS Hazardous Retirement Fund
Proposed Legislation
($ 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	$ 4,649	$ 2,238	$ 2,411	48%	$ 120	$ 43	$ 542	22.20%	22.20%
2018	4,771	2,293	2,478	48%	192	43	537	35.68%	35.68%
2019	4,880	2,376	2,504	49%	193	43	538	35.95%	35.95%
2020	4,978	2,478	2,500	50%	213	43	542	39.40%	39.40%
2021	5,066	2,626	2,440	52%	211	44	546	38.73%	38.73%
2022	5,144	2,743	2,401	53%	207	44	551	37.56%	37.56%
2023	5,213	2,850	2,363	55%	205	45	558	36.73%	36.73%
2024	5,273	2,950	2,323	56%	203	45	565	35.89%	35.89%
2025	5,324	3,043	2,281	57%	201	46	573	35.06%	35.06%
2026	5,366	3,130	2,236	58%	199	47	582	34.22%	34.22%
2027	5,399	3,210	2,189	59%	198	47	592	33.38%	33.38%
2028	5,425	3,286	2,139	61%	196	48	602	32.55%	32.55%
2029	5,443	3,356	2,087	62%	195	49	614	31.71%	31.71%
2030	5,455	3,424	2,031	63%	194	50	628	30.89%	30.89%
2031	5,464	3,492	1,972	64%	193	51	642	30.10%	30.10%
2032	5,471	3,560	1,911	65%	193	53	657	29.34%	29.34%
2033	5,476	3,631	1,845	66%	192	54	672	28.60%	28.60%
2034	5,481	3,705	1,776	68%	192	55	688	27.90%	27.90%
2035	5,486	3,784	1,702	69%	192	56	705	27.25%	27.25%
2036	5,492	3,869	1,623	70%	192	58	721	26.61%	26.61%
2037	5,499	3,959	1,540	72%	192	59	738	26.00%	26.00%
2038	5,506	4,055	1,451	74%	192	60	755	25.43%	25.43%
2039	5,514	4,157	1,357	75%	192	62	773	24.87%	24.87%
2040	5,523	4,267	1,256	77%	192	63	791	24.33%	24.33%
2041	5,535	4,385	1,150	79%	193	65	809	23.82%	23.82%
2042	5,549	4,512	1,037	81%	193	66	828	23.31%	23.31%
2043	5,566	4,651	915	84%	194	68	848	22.84%	22.84%
2044	5,587	4,800	787	86%	194	69	867	22.40%	22.40%
2045	5,610	4,960	650	88%	195	71	887	21.98%	21.98%
2046	5,636	5,132	504	91%	196	73	907	21.58%	21.58%
2047	5,663	5,315	348	94%	197	74	927	21.23%	21.23%
2048	5,692	5,510	182	97%	199	76	948	20.99%	20.99%
2049	5,722	5,722	-	100%	14	78	970	1.40%	1.40%
2050	5,753	5,753	-	100%	14	79	992	1.40%	1.40%
2051	5,785	5,785	-	100%	14	81	1,014	1.40%	1.40%

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.

Kentucky Retirement Systems
Exhibit 3-3
SPRS Retirement Fund
Proposed Legislation
($ 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	$ 967	$ 261	$ 706	27%	$ 35	$ 4 9	$ 4	72.47%	71.57%
2018	970	264	706	27%	58	4 9	4	119.04%	119.04%
2019	972	275	697	28%	59	4 0	5	119.04%	117.68%
2020	972	290	682	30%	52	4 0	5	104.43%	104.43%
2021	972	302	670	31%	52	4 1	5	102.48%	102.48%
2022	970	312	658	32%	52	4 2	5	99.99%	99.99%
2023	967	321	646	33%	52	4 3	5	97.80%	97.80%
2024	964	329	635	34%	51	4 4	5	95.58%	95.58%
2025	959	337	622	35%	51	4 5	5	93.46%	93.46%
2026	952	344	608	36%	51	4 6	5	90.98%	90.98%
2027	946	352	594	37%	51	5 7	5	88.38%	88.38%
2028	938	359	579	38%	50	5 9	5	85.93%	85.93%
2029	930	367	563	39%	50	5 0	6	83.52%	83.52%
2030	922	375	547	41%	50	5 2	6	81.09%	81.09%
2031	914	384	530	42%	50	5 4	6	78.76%	78.76%
2032	905	393	512	43%	50	5 5	6	76.67%	76.67%
2033	896	404	492	45%	50	5	6	74.48%	74.48%

Kentucky Retirement Systems
Exhibit 3-3
SPRS Retirement Fund
Proposed Legislation
($ in Millions)

									Employer
2034	888	416	472	47%	50	7 6	6	72.46%	72.46%
2035	880	429	451	49%	50	9 6	7	70.67%	70.67%
2036	872	443	429	51%	50	1 6	7	68.94%	68.94%
2037	864	459	405	53%	50	3 6	7	67.19%	67.19%
2038	857	476	381	56%	50	5 6	7	65.66%	65.66%
2039	850	496	354	58%	50	6 6	7	64.05%	64.05%
2040	844	517	327	61%	50	8 6	8	62.75%	62.75%
2041	838	540	298	64%	50	0 7	8	61.51%	61.51%
2042	833	565	268	68%	51	2 7	8	60.15%	60.15%
2043	828	592	236	71%	51	4 7	8	59.01%	59.01%
2044	824	622	202	75%	51	6 7	8	57.93%	57.93%
2045	820	654	166	80%	51	8 7	9	56.90%	56.90%
2046	817	689	128	84%	51	0 7	9	55.99%	55.99%
2047	815	726	89	89%	52	2 7	9	55.21%	55.21%
2048	812	766	46	94%	52	4 8	9	54.76%	54.76%
2049	810	810	-	100%	6	6 8	9	5.79%	5.79%
2050	809	809	-	100%	6	8 8	10	5.79%	5.79%
2051	807	807	-	100%	6	0 8 2	10	5.79%	5.79%

Employer

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.

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

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

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contributio n	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	$ 419	$ 493	$ (74)	118%	$ 4	$ 1	$ 162	2.26%	1.34%
2018	436	507	(71)	116%	4	1	165	2.46%	2.46%
2019	453	516	(63)	114%	4	1	169	2.46%	1.92%
2020	468	530	(62)	113%	4	1	174	2.30%	2.30%
2021	482	549	(67)	114%	3	2	178	1.69%	1.69%
2022	494	561	(67)	114%	2	2	183	1.09%	1.09%
2023	504	570	(66)	113%	2	2	187	1.07%	1.07%
2024	513	578	(65)	113%	2	2	192	1.04%	1.04%
2025	520	584	(64)	112%	1	2	197	0.51%	0.51%
2026	525	589	(64)	112%	1	2	201	0.50%	0.50%
2027	530	592	(62)	112%	1	2	206	0.49%	0.49%
2028	534	594	(60)	111%	1	2	210	0.48%	0.48%
2029	537	596	(59)	111%	1	2	216	0.46%	0.46%
2030	540	597	(57)	111%	1	2	222	0.45%	0.45%
2031	543	598	(55)	110%	1	2	228	0.44%	0.44%
2032	546	599	(53)	110%	1	2	235	0.43%	0.43%
2033	550	601	(51)	109%	1	2	242	0.41%	0.41%
2034	554	603	(49)	109%	1	2	249	0.40%	0.40%
2035	559	606	(47)	108%	1	3	255	0.39%	0.39%
2036	565	609	(44)	108%	1	3	262	0.38%	0.38%
2037	572	614	(42)	107%	1	3	269	0.37%	0.37%
2038	580	619	(39)	107%	2	3	275	0.73%	0.73%
2039	588	624	(36)	106%	2	3	281	0.71%	0.71%
2040	598	631	(33)	106%	2	3	287	0.70%	0.70%
2041	608	638	(30)	105%	2	3	292	0.68%	0.68%
2042	618	645	(27)	104%	2	3	298	0.67%	0.67%
2043	629	652	(23)	104%	2	3	304	0.66%	0.66%
2044	640	659	(19)	103%	2	3	311	0.64%	0.64%
2045	651	666	(15)	102%	2	3	318	0.63%	0.63%
2046	662	674	(12)	102%	2	3	325	0.62%	0.62%
2047	673	681	(8)	101%	2	3	332	0.60%	0.60%
2048	685	688	(3)	100%	3	3	340	0.88%	0.88%
2049	696	696	-	100%	7	3	348	1.97%	1.97%
2050	707	707	-	100%	7	4	355	1.95%	1.95%
2051	718	718	-	100%	7	4	364	1.92%	1.92%

Kentucky Retirement Systems
Exhibit 3-5
CERS Hazardous Insurance Fund
Proposed Legislation
($ 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	$ 1,788	$ 1,197	$ 591	67%	$ 51	$ 2	$ 541	9.35%	9.35%
2018	1,853	1,243	610	67%	65	4	536	12.17%	12.17%
2019	1,912	1,292	620	68%	63	4	538	11.71%	11.71%
2020	1,962	1,344	618	69%	67	4	541	12.38%	12.38%
2021	2,005	1,411	594	70%	65	4	546	11.90%	11.90%
2022	2,038	1,455	583	71%	61	5	551	11.07%	11.07%
2023	2,061	1,489	572	72%	59	5	558	10.57%	10.57%
2024	2,075	1,514	561	73%	58	5	565	10.27%	10.27%
2025	2,081	1,531	550	74%	56	5	573	9.77%	9.77%
2026	2,078	1,539	539	74%	55	6	582	9.45%	9.45%
2027	2,068	1,541	527	75%	54	6	591	9.14%	9.14%
2028	2,052	1,537	515	75%	53	6	602	8.80%	8.80%
2029	2,031	1,529	502	75%	53	6	614	8.63%	8.63%
2030	2,008	1,519	489	76%	52	6	627	8.29%	8.29%
2031	1,982	1,507	475	76%	52	6	641	8.11%	8.11%
2032	1,954	1,495	459	77%	52	7	656	7.93%	7.93%
2033	1,927	1,483	444	77%	52	7	672	7.74%	7.74%
2034	1,899	1,472	427	78%	52	7	688	7.56%	7.56%
2035	1,873	1,463	410	78%	52	7	704	7.39%	7.39%
2036	1,849	1,458	391	79%	52	7	721	7.21%	7.21%
2037	1,828	1,457	371	80%	52	7	738	7.05%	7.05%
2038	1,811	1,461	350	81%	52	8	755	6.89%	6.89%
2039	1,796	1,469	327	82%	53	8	772	6.87%	6.87%
2040	1,785	1,482	303	83%	53	8	790	6.71%	6.71%
2041	1,779	1,501	278	84%	53	8	809	6.55%	6.55%
2042	1,776	1,525	251	86%	53	8	828	6.40%	6.40%
2043	1,777	1,556	221	88%	53	8	847	6.26%	6.26%
2044	1,782	1,591	191	89%	53	9	866	6.12%	6.12%
2045	1,789	1,632	157	91%	54	9	886	6.09%	6.09%
2046	1,799	1,677	122	93%	54	9	906	5.96%	5.96%
2047	1,811	1,727	84	95%	54	9	926	5.83%	5.83%
2048	1,823	1,779	44	98%	55	9	947	5.81%	5.81%
2049	1,836	1,836	-	100%	10	10	969	1.04%	1.04%
2050	1,847	1,847	-	100%	10	10	991	1.03%	1.03%
2051	1,859	1,859	-	100%	10	10	1,013	1.01%	1.01%

Kentucky Retirement Systems
Exhibit 3-6
SPRS Insurance Fund
Proposed Legislation
($ 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 Contributio n	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2017	$ 277	$ 180	$ 97	65%	$ 9	$ 0	$ 48	18.77%	18.10%
2018	286	186	100	65%	13	0	48	27.23%	27.23%
2019	295	195	100	66%	13	0	49	27.23%	26.10%
2020	302	205	97	68%	12	0	49	24.49%	24.49%
2021	309	215	94	70%	11	0	50	22.00%	22.00%
2022	314	222	92	71%	11	0	51	21.57%	21.57%
2023	319	228	91	71%	10	0	52	19.23%	19.23%
2024	321	233	88	73%	10	0	53	18.87%	18.87%
2025	322	236	86	73%	10	0	54	18.52%	18.52%
2026	322	237	85	74%	9	1	55	16.36%	16.36%
2027	320	238	82	74%	9	1	56	16.07%	16.07%
2028	318	237	81	75%	9	1	57	15.79%	15.79%
2029	314	236	78	75%	9	1	59	15.25%	15.25%
2030	310	234	76	75%	8	1	61	13.11%	13.11%
2031	305	231	74	76%	8	1	62	12.90%	12.90%
2032	300	228	72	76%	8	1	64	12.50%	12.50%
2033	294	225	69	77%	8	1	66	12.12%	12.12%
2034	288	222	66	77%	8	1	68	11.76%	11.76%
2035	283	219	64	77%	8	1	69	11.59%	11.59%
2036	277	216	61	78%	8	1	71	11.27%	11.27%
2037	272	214	58	79%	8	1	73	10.96%	10.96%
2038	267	212	55	79%	8	1	75	10.67%	10.67%
2039	263	211	52	80%	8	1	77	10.39%	10.39%
2040	259	211	48	81%	8	1	78	10.26%	10.26%
2041	255	212	43	83%	8	1	80	10.00%	10.00%
2042	252	213	39	85%	8	1	82	9.76%	9.76%
2043	250	216	34	86%	8	1	84	9.52%	9.52%
2044	249	219	30	88%	8	1	85	9.41%	9.41%
2045	248	223	25	90%	8	1	87	9.20%	9.20%
2046	248	229	19	92%	8	1	89	8.99%	8.99%
2047	248	235	13	95%	9	1	91	9.89%	9.89%
2048	249	242	7	97%	9	1	93	9.68%	9.68%
2049	249	249	0	100%	2	1	95	1.71%	1.71%
2050	250	250	0	100%	2	1	97	1.69%	1.69%
2051	251	251	0	100%	2	1	99	1.66%	1.66%

Kentucky Retirement Systems
Exhibit 3-6
SPRS Insurance Fund
Proposed Legislation
($ in Millions)

Employer

MEMORANDUM REPORT

TO: Donna S. Early

FROM: BPS&M, LLC

DATE: March 6, 2018

RE: BR 427 SB 1 SCS
AA Statement 2 of 4
Kentucky Judicial Retirement Plan

BPS&M, LLC was asked to prepare an actuarial analysis in compliance with KRS 6.350 with regard to the recent proposed legislation ("2018 SB 1 (BR 427) PSS") that makes changes to the Kentucky Judicial Retirement Plan ("KJRP").

It is our understanding that 2018 SB 1 (BR 427) PSS makes the following change(s) to KJRP:

1) Creates a new section of KRS 61.510 to 61.705 to establish a 401(a) Money Purchase Plan for new nonhazardous members who begin participating in the Kentucky Employees Retirement System (KERS) on or after January 1, 2019, that:
    a) Includes 4% employer contributions.
    b) Requires 5-year vesting on employer contributions.
    c) Provides a monthly retirement benefit to a vested retiree based upon the member's accumulated account balance.
    d) In lieu of a monthly retirement benefit, the vested retiree may elect to receive a lump-sum payment of the actuarial equivalent of the retirement benefit, or a refund of his or her account balance.
    e) All current and prospective members of KJRP are eligible to elect participation in the KERS 401(a) Money Purchase Plan on or after January 1, 2019, in lieu of participation in KJRP.
2) Amends KRS 21.402 to change the interest credit for Hybrid Cash Balance Plan to 85% of the Plans geometric average return if the member is contributing to any state-administered retirement system.
3) Amends KRS 21.374 to remove provisions relative to the election to participate in the cash balance plan by existing members.

<u>Comments</u>

Items 1 and 3- It is assumed all members in the current KJRP defined benefit plan and KJRP cash balance tier will continue in the current plans and that all future members, effective January 1, 2019, will participate in new Money Purchase Plan.

Item 2 – Future investment credits in the Hybrid Cash Balance Plan are defined to be 85% of the Plan's geometric average return. However, for purposes of this study, we have made a simplifying assumption that future investment credits will be 4.0%, and have assumed a 4.0% discount rate in valuing cash balance tier liabilities.

Assumptions

Future results will vary from projections to the extent future experience varies from the assumptions used in the projections. The longer the period of the forecast, the more variation is likely to occur and the less likely future results will match projections.

A. Data for projections is as of July 1, 2017.

B. Assets for projections are as of June 30, 2017.

C. A valuation will be performed July 1 of each odd numbered year (2017, 2019, etc.). The dollar amount of recommended contribution will be contributed each year for two plan years beginning one year after the valuation date.

D. Except as mentioned herein, all assumptions are consistent with the assumptions and methods used for the July 1, 2017 valuation report.

E. Future experience assumptions are consistent with the July 1, 2017 valuation assumptions.

F. The total population remains constant over the period of the forecast.

G. The changes under 2018 SB 1 (BR 427) PSS for items 1 and 2 are effective January 1, 2019. Item 2 will be effective the first June 30th following enactment.

H. SB 1 does not address OPEB benefits.

I. 100% of the recommended contribution for 2017 and future years will be made.

J. Certain changes under 2018 SB 1 (BR 427) PSS, may or may not be allowed under state law. Whether or not all changes under 2018 SB 1 (BR 427) PSS are permissible is a legal issue, and we provide no opinion in this regard. For purposes of the attached projections, we have assumed such changes are allowable.

K. This report provides actuarial advice and does not constitute legal advice.

Definitions

Accrued Liability – based on the methods and assumptions used, the amount of assets that would be needed to satisfy future projected benefit payments based on service as of the valuation date.

Normal Cost – cost of benefits earned in the year following the valuation for current active members

Actuarial Asset Value – A smoothed asset value which smoothes in asset gains and losses over a 5 year period (for purposes of this study). For projection years 5 or more years in the future, the actuarial and market value would be the same (assuming assets earn the 6.5% rate of return which is assumed). As the Plan has experienced consistent gains over the past few years, the current Actuarial Asset Value is smaller than the market value since all prior gains have not yet been recognized.

Current – projections reflecting current rules and regulations, without regards to 2018 SB 1 (BR 427) PSS

Proposed – projections reflecting items 1 through 5 above from 2018 SB 1 (BR 427) PSS

Conclusions

Adopting the changes put forth under 2018 SB 1 (BR 427) PSS item 1 will:

1. Have no impact on the pension Accrued Liability for KJRP July 1, 2018,
2. Have no impact on future pension benefit accruals under KJRP,
3. Increase pension recommended employer contributions (as shown on the attached forecast); the contributions for new members will be slightly higher under the proposed rules as the Hybrid Cash Balance Plan contribution rate is approximately 3.6% of payroll versus an employer contribution of 4% of payroll in Money Purchase Plan. While 4% employer contributions were assumed in the Money Purchase Plan, future turnover may create forfeitures which could result in a long-term cost in the MPP similar to the Hybrid Cash Balance Plan.

Actuarially Sound

KRS 6.350 requires us to comment on whether the proposed changes would make KJRP actuarially unsound or, if already actuarially unsound, if such changes would make KJRP "more unsound".

A plan that has adopted a reasonable funding method, uses reasonable assumptions and contributes at a rate at or above the recommended contribution rate (based on these reasonable methods and assumptions), could be considered to be actuarially sound. Whether or not the changes reflected in Item 1 above are or are not adopted, will not necessarily impact the "actuarial soundness" of KJRP.

In order to ensure KJRP is funded in an "actuarially sound manner", we would recommend:

1. Revise the actuarial funding method to amortize all past unfunded as well as new liabilities over a period not more than 30 years (in accordance with currently applicable Governmental Accounting Standards 67 and 68) and amortize future gains and losses over a period not more than 15 years. Item 2 above adopts a closed 30 year closed amortization period. In addition, we would recommend future gains and losses be amortized over a closed period not to exceed 15 years.
2. Contribute at least the minimum recommended contribution each year.

Deviations from these recommendations could result in an "actuarially unsound" approach to funding KJRP and may eventually result in KJRP becoming insolvent – that is, exhausting assets at which time all future benefits would be made on a pay as you go basis. It should be noted that having biennial (rather than annual) actuarial valuations, and delaying funding requirements for a year after the valuation date, can create incongruous results and potential underfunding.

Although the Actuarial Standards of Practice 4 “Measuring Pension Obligations” allows for plan liabilities to be calculated under a legally prescribed method, the statement goes on to say,

> “If, in the actuary’s professional judgment, such an actuarial cost method or amortization method is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming that all actuarial assumptions will be realized and that the plan sponsor or other contributing entity will make contributions when due, the actuary should disclose this.”

It is our professional actuarial opinion that the current legally prescribed method which requires contributions of normal cost plus interest on the unfunded liability plus 1% of the unfunded liability (per KRS 21.525 as currently written) is inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming all actuarial assumptions are realized.

Professional Qualifications

This report has been prepared under the supervision of Alan C. Pennington. He is a member of the American Academy of Actuaries, Fellows of the Society of Actuaries, and a consulting actuary with Bryan, Pendleton, Swats and McAllister, LLC who has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein. To the best of my knowledge this report has been prepared in accordance with generally accepted actuarial standards, including the overall appropriateness of the analysis, assumptions, and results and conforms to appropriate Standards of Practice as promulgated from time to time by the Actuarial Standards Board, which standards form the basis for the actuarial report. I am not aware of any direct or material indirect financial interest or relationship, including investment management or other services that could create, or appear to create, a conflict of interest that would impair the objectivity of my work.

Alan C. Pennington

March 6, 2018
Date

Alan C. Pennington
Fellow, Society of Actuaries
Enrollment No. 17-05458
Phone 615.665.5363

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Kentucky Judicial Retirement Plan
Cost Projections - 2018 SB 1 (BR 427) PSS
Prepared by Bryan, Pendleton, Swats & McAllister, LLC
March 6, 2018
Pension Plan Only (pre-2014 Legacy and post-2014 Hybrid Tier)

	Contribution ($M)										Funded Ratio (Assets/Liabilities)	
		Proposed			Contribution (%)		Accrued Liability ($M)		Unfunded Liability ($M)			
Year Beginning July 1	Current	DB Plans	MPP	Total	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
2017	$ 12.0	$ 12.0	$ 0.0	$ 12.0	39.6%	39.6%	$ 362.8	$ 362.8	$ 84.6	$ 84.6	77%	77%
2018	$ 9.3	$ 9.3	$ 0.4	$ 9.7	30.9%	32.3%	$ 361.3	$ 361.3	$ 72.6	$ 72.6	80%	80%
2019	$ 9.9	$ 9.9	$ 0.5	$ 10.4	32.7%	34.4%	$ 358.7	$ 358.3	$ 66.1	$ 66.1	82%	82%
2020	$ 7.5	$ 7.1	$ 0.6	$ 7.7	24.7%	25.4%	$ 355.3	$ 354.0	$ 60.6	$ 60.3	83%	83%
2021	$ 8.0	$ 7.5	$ 0.7	$ 8.2	26.1%	26.8%	$ 351.5	$ 349.0	$ 55.2	$ 54.9	84%	84%
2022	$ 6.3	$ 5.7	$ 0.8	$ 6.5	19.9%	20.6%	$ 347.2	$ 343.2	$ 52.4	$ 52.0	85%	85%
2023	$ 6.7	$ 6.1	$ 0.9	$ 7.0	20.5%	21.4%	$ 342.2	$ 336.7	$ 51.0	$ 50.7	85%	85%
2024	$ 5.9	$ 5.1	$ 1.0	$ 6.1	17.5%	18.1%	$ 336.7	$ 329.4	$ 49.1	$ 48.8	85%	85%
2025	$ 6.2	$ 5.4	$ 1.0	$ 6.4	17.8%	18.3%	$ 330.9	$ 321.4	$ 47.9	$ 47.6	86%	85%
2026	$ 5.6	$ 4.6	$ 1.1	$ 5.7	15.5%	15.8%	$ 324.5	$ 312.8	$ 46.3	$ 45.9	86%	85%
2027	$ 5.9	$ 4.9	$ 1.2	$ 6.1	15.8%	16.4%	$ 317.7	$ 303.6	$ 45.2	$ 44.8	86%	85%
2028	$ 5.3	$ 4.2	$ 1.3	$ 5.5	13.7%	14.2%	$ 310.8	$ 293.9	$ 43.7	$ 43.3	86%	85%
2029	$ 5.7	$ 4.5	$ 1.4	$ 5.9	14.3%	14.8%	$ 303.4	$ 283.5	$ 42.6	$ 42.3	86%	85%
2030	$ 5.1	$ 3.8	$ 1.5	$ 5.3	12.4%	12.8%	$ 295.8	$ 272.7	$ 41.2	$ 40.8	86%	85%
2031	$ 5.4	$ 4.1	$ 1.6	$ 5.7	12.6%	13.3%	$ 288.0	$ 261.4	$ 40.2	$ 39.9	86%	85%
2032	$ 4.9	$ 3.4	$ 1.6	$ 5.0	11.1%	11.3%	$ 280.0	$ 249.7	$ 38.9	$ 38.5	86%	85%
2033	$ 5.2	$ 3.7	$ 1.7	$ 5.4	11.4%	11.8%	$ 272.3	$ 237.8	$ 38.0	$ 37.7	86%	84%
2034	$ 4.8	$ 3.2	$ 1.8	$ 5.0	10.1%	10.6%	$ 264.8	$ 225.9	$ 36.8	$ 36.5	86%	84%
2035	$ 5.1	$ 3.4	$ 1.9	$ 5.3	10.4%	10.8%	$ 256.5	$ 213.9	$ 36.0	$ 35.7	86%	83%
2036	$ 4.7	$ 3.0	$ 2.0	$ 5.0	9.3%	9.9%	$ 247.9	$ 201.8	$ 34.9	$ 34.6	86%	83%
2037	$ 5.0	$ 3.2	$ 2.0	$ 5.2	9.5%	9.9%	$ 239.1	$ 189.6	$ 34.0	$ 33.9	86%	82%
Sum of Contributions	$ 134.5	$ 114.1	$ 25.0	$ 139.1								

Assumes 6.5% future asset returns beginning July 1, 2017 in the Traditional Defined Benefit plan and 4% interest credit in the Hybrid Defined Benefit plan.
Assumes 100% of the recommended contribution is contributed each year.
Unfunded Liability is calculated as Accrued Liability minus the Actuarial Assets Value
Funded Ratio is calculated as Actuarial Value of Assets divided by Accrued Liability
Contribution(%) is calculated as the Contribution($) divided by total payroll, including participants in both the Traditional and Hybrid Defined Benefit plans and future new entrants, for both Current and Proposed (including new entrants in the Money Purchase Plan)
Assets and Liabilities from the Hybrid Defined Benefit plan under Proposed are assumed to remain in that plan until retirement.
In the Proposed columns, participants currently in the Traditional Defined Benefit plan will remain in that plan until retirement.
All future employees will participant in the 401(a) Money Purchase Plan (MPP). Employer Contributions in this plan are 4.0% of pay.
Contributions to the MPP have been reflected above; however, the liability and assets associated with the MPP has not been included in the projections.

MEMORANDUM REPORT

TO: Donna S. Early

FROM: BPS&M, LLC

DATE: March 6, 2018

RE: BR 427 SB 1 SCS
AA Statement 3 of 4
Kentucky Legislators Retirement Plan

BPS&M, LLC was asked to prepare an actuarial analysis in compliance with KRS 6.350 with regard to the recent proposed legislation (“2018 SB 1 (BR 427) PSS”) that makes changes to the Kentucky Legislators Retirement Plan (“KLRP”).

It is our understanding that 2018 SB 1 (BR 427) PSS makes the following change(s) to KLRP:

1) Creates a new section of KRS 61.510 to 61.705 to establish a 401(a) Money Purchase Plan for new nonhazardous members who begin participating in the Kentucky Employees Retirement System (KERS) on or after January 1, 2019, that:
   a) Includes 4% employer contributions.
   b) Requires 5-year vesting on employer contributions.
   c) Provides a monthly retirement benefit to a vested retiree based upon the member’s accumulated account balance.
   d) In lieu of a monthly retirement benefit, the vested retiree may elect to receive a lump-sum payment of the actuarial equivalent of the retirement benefit, or a refund of his or her account balance.
   e) All current and prospective members of KLRP are eligible to elect participation in the KERS 401(a) Money Purchase Plan on or after January 1, 2019, in lieu of participation in KLRP.
2) Amends KRS 6.525 so that only non-legislative salary earned prior to January 1, 2019 will be recognized in determining final compensation for inclusion in the benefit formula for a KLRP member who participated in KLRP after 2005 and before 2014.
3) Amends KRS 21.402 to change the interest credit for Hybrid Cash Balance Plan to 85% of the Plans geometric average return if the member is contributing to any state-administered retirement system.
4) Amends KRS 21.374 to remove provisions relative to the election to participate in the cash balance plan by existing members.
5) Amends KRS 6.520 to reduce the benefit multiplier of LRP members who began participating prior to January 1, 2014 to 1.97% for service earned after January 1, 2019.

Comments

Items 1 and 4 - It is assumed all members in the current KLRP defined benefit plan and KLRP cash balance tier will continue in the current plans and that all future members, effective January 1, 2019, will participate in new Money Purchase Plan.

Item 2 - Benefit amounts for retirees that have had benefits increased due to non-legislative pay will not be impacted by these changes.

Item 2 – Current valuation assumptions apply a 40% loading factor to capture the potential impact of non-legislative pay. This factor is applied to active liability, active normal cost and terminated vested liability. For purposes of the revised projections, effective July 1, 2018, this loading factor will no longer be applied. Terminated members with non-legislative pay will have their benefits adjusted to reflect non-legislative pay earned through 2017. It is assumed future non-legislative pay for active members will have no material impact (since it would have to be earned prior to January 1, 2019).

Item 3 – Future investment credits in the Hybrid Cash Balance Plan are defined to be 85% of the Plan's geometric average return. However, for purposes of this study, we have made a simplifying assumption that future investment credits will be 4.0%, and have assumed a 4.0% discount rate in valuing cash balance tier liabilities.

Data – 15 active legislative members will not be running for re-election the end of 2018. For both the current and revised projections, these members have been treated as terminated vested members beginning July 1, 2018, and replaced with new members.

Assumptions

Future results will vary from projections to the extent future experience varies from the assumptions used in the projections. The longer the period of the forecast, the more variation is likely to occur and the less likely future results will match projections.

A. Data for projections is as of July 1, 2017.

B. Assets for projections are as of June 30, 2017.

C. A valuation will be performed July 1 of each odd numbered year (2017, 2019, etc.). The dollar amount of recommended contribution will be contributed each year for two plan years beginning one year after the valuation date.

D. Except as mentioned herein, all assumptions are consistent with the assumptions and methods used for the July 1, 2017 valuation report.

E. Future experience assumptions are consistent with the July 1, 2017 valuation assumptions.

F. The total population remains constant over the period of the forecast.

G. The changes under 2018 SB 1 (BR 427) PSS for items 1, 2, 4 and 5 are effective January 1, 2019. Item 3 will be effective the first June 30th following enactment.

H. SB 1 does not address OPEB benefits.

I. 100% of the recommended contribution for 2017 and future years will be made.

J. Certain changes under 2018 SB 1 (BR 427) PSS, may or may not be allowed under state law. Whether or not all changes under 2018 SB 1 (BR 427) PSS are permissible is a legal issue, and we provide no opinion in this regard. For purposes of the attached projections, we have assumed such changes are allowable.

K. This report provides actuarial advice and does not constitute legal advice.

Definitions

Accrued Liability – based on the methods and assumptions used, the amount of assets that would be needed to satisfy future projected benefit payments based on service as of the valuation date.

Normal Cost – cost of benefits earned in the year following the valuation for current active members

Actuarial Asset Value – A smoothed asset value which smoothes in asset gains and losses over a 5 year period (for purposes of this study). For projection years 5 or more years in the future, the actuarial and market value would be the same (assuming assets earn the 6.5% rate of return which is assumed). As the Plan has experienced consistent gains over the past few years, the current Actuarial Asset Value is smaller than the market value since all prior gains have not yet been recognized.

Current – projections reflecting current rules and regulations, without regards to 2018 SB 1 (BR 427) PSS

Proposed – projections reflecting items 1 through 5 above from 2018 SB 1 (BR 427) PSS

Conclusions

Adopting the changes put forth under 2018 SB 1 (BR 427) PSS item 1 will:

1. Reduce the pension Accrued Liability for KLRP by approximately $5.5M as of July 1, 2018,
2. Reduce future pension benefit accruals under KLRP,
3. Decrease future pension recommended employer contributions (as shown on the attached forecast); however, the contributions for new members will be slightly higher under the proposed rules as the Hybrid Cash Balance Plan contribution rate is approximately 3.6% of payroll versus an employer contribution of 4% of payroll in Money Purchase Plan. While 4% employer contributions were assumed in the Money Purchase Plan, future turnover may create forfeitures which could result in a long-term cost in the MPP similar to the Hybrid Cash Balance Plan.
4. As a result of excluding non-legislative pay, combined with lower future pension accruals (1.97% proposed versus 2.75% currently in KRLP), the pension funded ratio increases to 102% as of July 1, 2018 and is projected to be 154% by the end of the 20 year forecast.

Actuarially Sound

KRS 6.350 requires us to comment on whether the proposed changes would make KLRP actuarially unsound or, if already actuarially unsound, if such changes would make KLRP "more unsound".

A plan that has adopted a reasonable funding method, uses reasonable assumptions and contributes at a rate at or above the recommended contribution rate (based on these reasonable methods and assumptions), could be considered to be actuarially sound. Whether or not the changes reflected in Item 1 above are or are not adopted, will not necessarily impact the "actuarial soundness" of KLRP.

In order to ensure KLRP is funded in an "actuarially sound manner", we would recommend:

1. Revise the actuarial funding method to amortize all past unfunded as well as new liabilities over a period not more than 30 years (in accordance with currently applicable Governmental Accounting Standards 67 and 68) and amortize future gains and losses over a period not more than 15 years. Item 2 above adopts a closed 30 year closed amortization period. In addition, we would recommend future gains and losses be amortized over a closed period not to exceed 15 years.
2. Contribute at least the minimum recommended contribution each year.

Deviations from these recommendations could result in an "actuarially unsound" approach to funding KLRP and may eventually result in KLRP becoming insolvent – that is, exhausting assets at which time all future benefits would be made on a pay as you go basis. It should be noted that having biennial (rather than annual) actuarial valuations, and delaying funding requirements for a year after the valuation date, can create incongruous results and potential underfunding.

Although the Actuarial Standards of Practice 4 "Measuring Pension Obligations" allows for plan liabilities to be calculated under a legally prescribed method, the statement goes on to say,

> "If, in the actuary's professional judgment, such an actuarial cost method or amortization method is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming that all actuarial assumptions will be realized and that the plan sponsor or other contributing entity will make contributions when due, the actuary should disclose this."

It is our professional actuarial opinion that the current legally prescribed method which requires contributions of normal cost plus interest on the unfunded liability plus 1% of the unfunded liability (per KRS 21.525 as currently written) is inconsistent with the plan accumulating adequate assets to make benefit payments when due, assuming all actuarial assumptions are realized.

Professional Qualifications

This report has been prepared under the supervision of Alan C. Pennington. He is a member of the American Academy of Actuaries, Fellows of the Society of Actuaries, and a consulting actuary with Bryan, Pendleton, Swats and McAllister, LLC who has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein. To the best of my knowledge this report has been prepared in accordance with generally accepted actuarial standards, including the overall appropriateness of the analysis, assumptions, and results and conforms to appropriate Standards of Practice as promulgated from time to time by the Actuarial Standards Board, which standards form the basis for the actuarial report. I am not aware of any direct or material indirect financial interest or relationship, including investment management or other services that could create, or appear to create, a conflict of interest that would impair the objectivity of my work.

Alan C. Pennington

March 6, 2018
Date

Alan C. Pennington
Fellow, Society of Actuaries
Enrollment No. 17-05458
Phone 615.665.5363

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Kentucky Legislators Retirement Plan
Cost Projections - 2018 SB 1 (BR 427) PSS
Prepared by Bryan, Pendleton, Swats & McAllister, LLC
March 6, 2018
Pension Plan Only (pre-2014 Legacy and post-2014 Hybrid Tier)

	Contribution ($M)				Contribution (%)		Accrued Liability ($M)		Unfunded Liability ($M)		Funded Ratio (Assets/Liabilities)	
		Proposed										
Year Beginning July 1	Current	DB Plans	MPP	Total	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
2017	$ 2.4	$ 2.4	$ 0.0	$ 2.4	54.5%	54.5%	$ 73.2	$ 73.2	$ 8.2	$ 8.2	89%	89%
2018	$ 1.1	$ 1.1	$ 0.1	$ 1.2	25.7%	28.1%	$ 71.7	$ 66.2	$ 4.2	$ (1.6)	94%	102%
2019	$ 1.2	$ 1.2	$ 0.1	$ 1.3	27.9%	30.2%	$ 70.5	$ 64.9	$ 2.8	$ (3.4)	96%	105%
2020	$ 0.6	$ 0.0	$ 0.1	$ 0.1	13.7%	2.3%	$ 69.3	$ 63.4	$ 1.7	$ (5.1)	98%	108%
2021	$ 0.6	$ 0.0	$ 0.1	$ 0.1	13.6%	2.3%	$ 68.0	$ 61.8	$ 0.7	$ (6.2)	99%	110%
2022	$ 0.3	$ 0.0	$ 0.1	$ 0.1	6.6%	2.2%	$ 66.4	$ 60.0	$ 0.4	$ (6.5)	99%	111%
2023	$ 0.4	$ 0.0	$ 0.1	$ 0.1	8.4%	2.1%	$ 64.9	$ 58.2	$ 0.4	$ (6.9)	99%	112%
2024	$ 0.3	$ 0.0	$ 0.1	$ 0.1	6.1%	2.0%	$ 63.4	$ 56.4	$ 0.3	$ (7.2)	100%	113%
2025	$ 0.3	$ 0.0	$ 0.2	$ 0.2	5.9%	3.9%	$ 61.8	$ 54.4	$ 0.3	$ (7.6)	100%	114%
2026	$ 0.3	$ 0.0	$ 0.2	$ 0.2	5.7%	3.8%	$ 60.1	$ 52.4	$ 0.2	$ (8.1)	100%	115%
2027	$ 0.3	$ 0.0	$ 0.2	$ 0.2	5.5%	3.6%	$ 58.4	$ 50.4	$ 0.2	$ (8.6)	100%	117%
2028	$ 0.3	$ 0.0	$ 0.2	$ 0.2	5.3%	3.5%	$ 56.7	$ 48.3	$ 0.1	$ (9.1)	100%	119%
2029	$ 0.3	$ 0.0	$ 0.2	$ 0.2	5.1%	3.4%	$ 55.0	$ 46.3	$ 0.1	$ (9.6)	100%	121%
2030	$ 0.3	$ 0.0	$ 0.2	$ 0.2	4.9%	3.3%	$ 53.3	$ 44.2	$ 0.0	$ (10.2)	100%	123%
2031	$ 0.3	$ 0.0	$ 0.2	$ 0.2	4.8%	3.2%	$ 51.6	$ 42.1	$ 0.0	$ (10.9)	100%	126%
2032	$ 0.3	$ 0.0	$ 0.2	$ 0.2	4.6%	3.1%	$ 49.9	$ 40.0	$ (0.0)	$ (11.6)	100%	129%
2033	$ 0.3	$ 0.0	$ 0.2	$ 0.2	4.4%	3.0%	$ 48.3	$ 37.8	$ (0.0)	$ (12.3)	100%	133%
2034	$ 0.3	$ 0.0	$ 0.3	$ 0.3	4.3%	4.3%	$ 46.6	$ 35.7	$ (0.0)	$ (13.1)	100%	137%
2035	$ 0.3	$ 0.0	$ 0.3	$ 0.3	4.1%	4.1%	$ 44.8	$ 33.6	$ (0.0)	$ (14.0)	100%	142%
2036	$ 0.3	$ 0.0	$ 0.3	$ 0.3	4.0%	4.0%	$ 43.0	$ 31.5	$ (0.1)	$ (14.9)	100%	147%
2037	$ 0.3	$ 0.0	$ 0.3	$ 0.3	3.9%	3.9%	$ 41.2	$ 29.5	$ (0.1)	$ (15.8)	100%	154%
Sum of Contributions	$ 10.8	$ 4.7	$ 3.7	$ 8.4								

Assumes 6.5% future asset returns beginning July 1, 2017 in the Traditional Defined Benefit plan and 4% interest credit in the Hybrid Defined Benefit plan.
Assumes 100% of the recommended contribution is contributed each year.
Unfunded Liability is calculated as Accrued Liability minus the Actuarial Assets Value
Funded Ratio is calculated as Actuarial Value of Assets divided by Accrued Liability
Contribution(%) is calculated as the Contribution($) divided by total payroll, including participants in both the Traditional and Hybrid Defined Benefit plans and future new entrants, for both Current and Proposed (including new entrants in the Money Purchase Plan)
Assets and Liabilities from the Hybrid Defined Benefit plan under Proposed are assumed to remain in that plan until retirement.
In the Proposed columns, participants currently in the Traditional Defined Benefit plan will remain in that plan until retirement. Effective January 1, 2019, the benefit accrual rate for all active employees will drop to 1.97% (for accruals after that date).
In the Proposed columns, current active and terminated vested participants in the Defined Benefit plan will no longer receive increased benefits for non-legislative pay earned after January 1, 2019.
In the Proposed columns, benefits for current retirees will continue to reflect increased benefits due to non-legislative pay.
All future employees will participant in the 401(a) Money Purchase Plan (MPP). Employer Contributions in this plan are 4.0% of pay.
Contributions to the MPP have been reflected above; however, the liability and associated with the MPP has not been included in the projections.

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March 6, 2018

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

BR 427 SB 1 SCS
AA Statement 4 of 4
Kentucky Teacher's Retirement System

Dear Beau:

We have prepared an actuarial analysis of the impact of 18 RS SB 1/PSS 1 (PSS 1) on the Teachers' Retirement System of the State of Kentucky (TRS). This actuarial analysis relates to the pension plan only. PSS 1 introduces a new tier of benefits for active members hired on or after January 1, 2019 and changes actuarial funding, participation requirements and actuarial assumptions. The major provisions of PSS 1, based on our interpretation without a summary of changes, are summarized below and the estimated cost impacts are provided in the attached Exhibits.

<u>Section I - Benefit Provisions for New Members on or after January 1, 2019</u>

All new members hired on or after January 1, 2019 will accrue retirement benefits based on a hybrid cash balance plan under a new tier within TRS.

The retirement benefit determined in the hybrid cash balance plan will be based upon a member's accumulated account balance calculated as follows:

1. Non-University members shall contribute 9.105% of monthly salary and University members shall contribute 7.625% of monthly salary.
2. An employer pay credit equal to 8.00% for Non-University members and 4.00% for University members will be credited to the member's account balance.
3. Regular interest will be added annually as of June 30 to the member's accumulated account balance.

    a) Regular interest shall be determined by multiplying the member's accumulated account balance on June 30 of the preceding fiscal year by a percentage equal to 85% of system's geometric average net investment return over the last 10 fiscal years, but in no case less than 0%.
    b) System's geometric average net investment return shall be the annual average geometric investment return, net of administrative and investment fees and expenses, over the last 10 fiscal years as of the date of regular interest.
4. Once a member meets the service retirement eligibilities (age 65 with 5 years of service or age 57 with age and service total of at least 87), the member may elect to receive a monthly lifetime retirement allowance by annuitizing the accumulated account balance based on the actuarial assumptions and methods adopted by the TRS Board in effect on the member's retirement date.
    a) The member may elect to receive an actuarial equivalent benefit under one of the optional forms of payment as established by the TRS Board,
    b) Or the member may instead take a refund of the accumulated account balance.
5. Upon termination of employment with less than five years of service, the member shall forfeit the accumulated employer credit and shall only receive a refund of his or her accumulated contributions with regular interest.
6. Upon termination of employment with five or more years of service, the member shall receive a full refund of his or her accumulated account balance.

For new members after January 1, 2019, there will be no sick leave credit, and no service purchases unless the member is called to active duty deployment while working. However, under this new plan, some disability and death benefits will continue to new members hired on or after January 1, 2019 in a similar manner as current members.

Section II - Benefit Provisions for Current Members as of January 1, 2019

Cost-of-Living Adjustments (COLA)

For current retirees, PSS 1 provides a 1.00% annual COLA beginning July 1, 2019. If at any point the funding level is at or above 90%, PSS 1 provides 1.50% annual COLAs.

For future retirees, PSS 1 provides a 1.00% annual COLA. If the funding level is at or above 90%, PSS 1 provides 1.50% annual COLAs.

Final Average Salary

For active members with 20 or more years of service as of July 31, 2018 and who retire after age 55 with at least 27 years of service, the final average salary will be based on the average of the highest 3 years of salary.

For active members with less than 20 or more years of service as of July 31, 2018 and who retire after age 60 with at least 35 years of service, the final average salary will be based on the average of the highest 3 years of salary.

For active members who do not meet the above requirements, the final average salary will be based on the average of the highest 5 years of salary.

Sick Leave
For all members, the level of sick leave for retirement purposes will be frozen at December 31, 2018.

Benefit Formula
PSS 1 provides that the 3% benefit multiplier is available for:

1. Service years in excess of 30 years if the member has 20 or more years of service as of July 31, 2018.
2. Service years in excess of 35 years and age above 60 years if the member has less than 20 years of service as of July 31, 2018.

Hybrid Cash Balance Options
For active members with less than 5 years of service as of January 1, 2019, the member will have an option to participate in the DB Plan or the new Hybrid Cash Balance plan. If the member opts into the hybrid cash balance, their accumulated employee contributions will be transferred to the new plan.

Section III - Contribution Requirements

Employee Contribution Rates
Active members 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%

PSS 1 also provides that the board shall increase the employee contribution rate to the retiree health fund, by no more than 1% of compensation annually, if any of the following conditions occur:

1. The funding level falls below twenty-five (25%) funded in any future actuarial valuation occurring after July 1, 2018.
2. The funding level falls for three (3) consecutive actuarial valuations, or
3. The percentage change in the funding level over two (2) consecutive actuarial valuations falls more than ten percent (10%).

Employer Contributions

According to PSS 1, for all members, 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%

Effective January 1, 2019, school districts will pay an additional 2% of pay for new members participating in the Hybrid Cash Balance Plan.

Since the school districts will be making direct contributions to the pension fund, the school districts will be required, similar to Universities, under Government Accounting Standards Board No. 68, to recognize its portion of the plan's net pension liability on their financial statements.

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 its portion of the "shared solution" for retiree health funding.

Section IV - Actuarial Funding

Beginning July 1, 2020, each employer shall pay the additional contribution required to fund TRS on an actuarially sound basis. While fixed based statutory employer contribution rates will still be provided by employers and/or the State, the determination of the Actuarially Determined Contribution (ADC) will be calculated as follows:

- Normal cost plus an amortization payment for the Unfunded Accrued Liability (UAL),
- Normal cost determined using the Entry Age Normal cost method as a percentage of payroll,
- UAL payment methodology will be as follows:
  - Closed 26-year period beginning June 30, 2018
  - Level dollar amortization
  - The UAL payment above the fixed base statutory employer rate will be set as a dollar amount and will be prorated to each employer based upon the employer's share of the total payroll for fiscal years 2015-2017. The state will pay this cost for local school districts.
- 5-year smoothing of assets

Section V - 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:

- We have assumed a Regular Interest Credit assumption of 6.50%, approximately 85% (as set by PSS 1) of the assumed investment return assumption of 7.50% for all years for the Hybrid Cash Balance Plan.

- We have assumed that the actuarially determined contribution will be made for each year of the projection.

- We have assumed that TRS will be 90% funded at or near fiscal year 2038, at which time the annual 1.50% COLA resumes.

- We have revised assumed retirement rates for current active members due to changes in benefits and 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 PSS 1. 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 PSS 1 further impacting the ultimate cost.

- For those active members who have 2 years of service or less as of January 1, 2019, we have assumed they will make an election to participate in the Hybrid Cash Balance Plan. This assumption is our estimate of the number of active members with less than five years of service who may opt into the hybrid cash balance Plan and not remain in the current DB plan. The difference in liability for active members with low service is negligible, so we believe this is a reasonable assumption.

- The benefit provisions proposed in PSS 1 will no longer be subject to the inviolable contract rules of the current plan, and will be subject to future changes. This actuarial analysis has been prepared assuming that no future changes will occur. Any changes to benefits or underlying assumptions will impact the ultimate cost of the legislation.

Section VII - Conclusion

As shown in Exhibits 1 and 2, there is cost for this legislation for the first eight years of the twenty-year projection due to a change to the level dollar amortization methodology. However, the savings in liabilities due to the decrease in benefits for all current and new members, active and retired, eventually lead to savings in the employer contributions after the first eight years.

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

Cathy Turcot

Edward J. Koebel, EA, FCA, MAAA
Principal and Consulting Actuary

Cathy Turcot
Principal and Managing Director

S:/2018/Kentucky Teachers/Correspondence/Actuarial Impact – 18 RSS SB 1/PSS 1

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 (1)	University Payroll (2)	Total Payroll (3)	Unfunded Accrued Liability (4)	Funding Ratio (5)	Actuarially Determined Contribution in Dollars for Open DB Plan (6)	Actuarially Determined Contribution for Non-University as a Percentage of Payroll (7)	Actuarially Determined Contribution for University as a Percentage of Payroll (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%
FY 2025-26	4,123,930	269,425	4,393,355	14,635,141	63.4%	1,298,428	30.415%	28.935%
FY 2026-27	4,217,517	281,733	4,499,250	14,573,409	64.3%	1,340,752	30.625%	29.145%
FY 2027-28	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	4,643,376	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%	1,869,391	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 Requirements under New Plan and Comparison
to Current Plan ($ in thousands)

Fiscal Year	Non-University Payroll (9)	University Payroll (10)	Total Payroll (11)=(9)+(10)	Unfunded Accrued Liability under New Plan (12)	New Plan Funding Ratio (13)	Total Employer Contribution for Proposed Bill (14)	Total Employer Contribution for Current Plan (15)=(6)	Cost/(Savings) to TRS Employers (16)=(14)-(15)
FY 2019-20	$3,596,437	$216,293	$3,812,730	13,138,961	61.0%	1,105,933	$1,105,933	0
FY 2020-21	3,681,291	223,016	3,904,307	12,647,779	63.3%	1,344,863	1,122,472	222,391
FY 2021-22	3,767,372	230,498	3,997,870	12,358,747	64.8%	1,373,550	1,161,621	211,929
FY 2022-23	3,853,375	238,437	4,091,812	12,020,929	66.5%	1,402,427	1,202,360	200,067
FY 2023-24	3,942,555	247,489	4,190,044	11,685,856	68.1%	1,378,267	1,220,509	157,758
FY 2024-25	4,032,198	258,071	4,290,269	11,332,060	69.6%	1,375,025	1,259,143	115,882
FY 2025-26	4,121,184	269,886	4,391,070	10,960,888	71.2%	1,368,907	1,298,428	70,479
FY 2026-27	4,204,444	283,263	4,487,707	10,568,504	72.7%	1,364,611	1,340,752	23,859
FY 2027-28	4,289,582	297,645	4,587,227	10,153,685	74.2%	1,359,418	1,384,055	(24,637)
FY 2028-29	4,381,273	312,294	4,693,567	9,714,701	75.6%	1,354,385	1,429,929	(75,544)
FY 2029-30	4,481,270	327,423	4,808,693	9,250,494	77.1%	1,348,673	1,477,606	(128,933)
FY 2030-31	4,591,688	342,306	4,933,994	8,759,271	78.6%	1,343,171	1,527,728	(184,557)
FY 2031-32	4,710,482	357,234	5,067,716	8,238,801	80.1%	1,337,936	1,579,540	(241,604)
FY 2032-33	4,836,134	373,271	5,209,405	7,686,589	81.7%	1,332,923	1,633,441	(300,518)
FY 2033-34	4,973,957	388,886	5,362,843	7,100,606	83.2%	1,327,626	1,688,394	(360,768)
FY 2034-35	5,125,471	404,702	5,530,173	6,478,176	84.8%	1,322,609	1,746,352	(423,743)
FY 2035-36	5,285,866	421,799	5,707,665	5,816,879	86.5%	1,317,456	1,807,048	(489,592)
FY 2036-37	5,453,986	439,356	5,893,342	5,114,473	88.3%	1,312,413	1,869,391	(556,978)
FY 2037-38	5,628,946	457,830	6,086,776	4,368,636	90.1%	1,307,328	1,986,904	(679,576)
FY 2038-39	5,811,143	477,173	6,288,316	3,576,112	91.9%	1,302,826	2,005,891	(703,065)