

November 14, 2017

Mr. John E. Chilton
Budget Director
Office of State Budget Director (OSBD)
Frankfort, KY 40601

Re: Actuarial Analysis of Proposed Pension Reform Legislation and its Financial Impact on KERS and CERS Non-Hazardous Systems

Dear Mr. Chilton:

We have reviewed and analyzed the summary of proposed benefit changes in the proposed pension reform legislation. The purpose of this letter is to communicate to the General Assembly the fiscal analysis of the proposed legislation on the retirement and insurance funds providing benefits to members in the Non-Hazardous Systems maintained by KRS (i.e. KERS Non-Hazardous and CERS Non-Hazardous). The information provided in this document satisfies all the analysis and disclosure requirements specified in Section 6.350 of Kentucky Statute (Actuarial analysis required for bill before General Assembly to increase benefits or participation in a state-administered retirement system).

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, current Tier 3 members and future active members will earn benefits in a defined contribution plan. Benefit accruals for Tier 1 and Tier 2 members will cease once the member reaches unreduced retirement eligibility. The amortization of the unfunded actuarial accrued liability will be determined on a level-dollar basis with the amortization period reset to 30 years in 2017, decreasing by one each future year. There will also be a four-year phase-in to the contribution effort for participating employers in CERS. There will be a 3% of pay increase in the member contribution effort to the Health Insurance Funds.

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 net combination of changes causes an initial decrease in the actuarial accrued liability (and unfunded actuarial accrued liability). The primary provisions in the change in the actuarial accrued liability are the change in the return to work provisions and the elimination of benefit accruals after a member becomes eligible for an unreduced retirement benefit and the member begins earning benefits in the defined contribution plan. However, it is unlikely that most of the potential savings will be realized as it is likely the System will experience an increase in the number of retirements when a member becomes first eligible for an unreduced retirement benefit as the new provisions provide a large economic incentive for the member to retire at first eligibility and seek other employment.

The employer contribution requirements are projected to be lower in initial years due to resetting the period for amortization the unfunded actuarial accrued liability from 26 years to 30 years, but this is offset by significantly higher contributions during years 27 through 30. In addition, the difference between the projected employer contribution requirements between the current plan and proposed legislation is projected to converge over the next 20 years because the defined contribution plan has a slightly higher ongoing cost compared to the current hybrid cash balance plan (i.e. expected long-term 4% of pay employer cost for the defined contribution plan versus 3% of pay long-term employer cost for the hybrid cash balance plan).

CERS Non-Hazardous Retirement Fund

The actuarial accrued liability for the CERS non-hazardous retirement fund decreased due to the same reasons that decreased the liability for the KERS non-hazardous retirement fund. The employer contribution requirements are projected to be initially lower due to the four-year phase-in of the actuarially determined contributions, but eventually become slightly greater than the projected contribution requirements in the current plan because the amortization payments are determined as a level dollar (versus use of a 2% payroll growth assumption).

All Health Insurance Funds

The actuarial accrued liability (and unfunded actuarial accrued liability) decreased as of June 30, 2017 for each of the health insurance funds, due to the changes in eligibility provisions that become effective July 1, 2018. The employer contribution requirement to the health insurance funds decreased because of the change in the liability, the member contribution rate will increase by 3% of pay (for all benefit tiers), and the amortization period was reset from 26 years to 30 years at June 30, 2017.

Note, the proposed plan changes include a four-year phase in to the employer contribution rate for the CERS non-hazardous health insurance fund. However, the change in the eligibility provisions and the increase in the 3% of pay increase in the member contribution rate results in the FY 2018/2019 employer contribution rate being less than the employer contribution rate currently in effect for FY 2017/2018. As a result, we modeled the future employer contribution effort to this fund without regard to the four-year phase-in.

GRS Comments on Proposed Legislation

Below are comments on certain provisions in the proposed legislation.

New Defined Contribution Plan

The new defined contribution plan will shift the investment and longevity risk from the participating employer to the members and retirees. The employers' cost will be limited to the employer matching contributions to the employee's defined contribution account. The projected cost of the defined contribution plan assumes that the employer's long-term cost to the defined contribution plan will be approximately 4% of payroll, after reflecting auto-enrollment, anticipated behavior in employee participation, and effects of forfeitures in employer matching contributions when employees separate from service prior to becoming vested in the employer provided benefit.

Transfer Tier 3 Balance to Defined Contribution Plan

The proposed legislation would transfer the entire Tier 3 account balance to the defined contribution plan at July 1, 2018. The majority of the Tier 3 members will not have earned sufficient service to be vested in their entire hybrid plan account balance at July 1, 2018. As of July 1, 2017, the accumulated Tier 3 account balance in the KERS non-hazardous system is \$36 million with \$16 million of that amount being an employer provided benefit. Similarly, the accumulated Tier 3 account balance in the CERS non-hazardous system was \$69 million with \$31 million of that amount being employer provided. The General Assembly may want to consider the policy issues associated with transferring the member's total accumulated balance, including the employer provided benefit they are not currently vested in. As a possible alternative, the employer provided benefit could be transferred to the member's defined contribution account upon satisfying the vesting requirements.

Ceasing Pension Benefit Accruals Upon Becoming Eligible for Unreduced Retirement Benefits

Ceasing benefit accruals in the pension plan when a member becomes eligible for an unreduced retirement benefit with future benefits earned in the new defined contribution plan will encourage more employees to commence their retirement benefit shortly after they become eligible for unreduced benefits as there is a significant economic incentive for members to seek other employment. For purposes of analyzing the fiscal impact of the non-hazardous retirement funds, we have assumed that the retirement rates will increase by 10% (i.e. add 10%) during the first and second year a member becomes eligible for an unreduced retirement benefit. The possible outcomes from this provision are rather wide. If the new provision does not change retirement behavior, then the savings could be material. However, if more members actually retire than assumed after first becoming eligible for an unreduced retirement benefit, then the actual savings due to this provision will be smaller than expected in this analysis. Also, it is possible there could be some anti-selection behavior that may lead to an increase in cost due to this provision.

The anticipated change in retirement behavior may be partially muted due to the increase in the break in service requirement for working retirees. The change to the working retirees rules would create material savings if implemented on their own. The combination of the two provisions (change to working retiree rules and the freezing of the accrued benefit at retirement eligibility)

potentially creates a scenario where the savings generated from either individually would be greater than the combination. It is likely the change to the return to work provisions alone (without ceasing benefit accruals at unreduced normal retirement age) would result in greater cost savings due to the anticipated change in retirement behaviors.

Increase in Member Contribution to the Health Insurance Plan

The 3% increase in contribution requirement for the Tier 2 members and members in the defined contribution plan will result in a member contribution effort that exceeds the value of their health insurance benefit (value measured as the normal cost rate). In addition, there are many members who would be impacted by this increase and would never receive a retiree health benefit. We are not aware of any IRS violations if the proposed contribution rate becomes effective, but are commenting on this so the General Assembly can make an informed policy decision regarding this provision change.

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 contribution effort during the last three fiscal years (FY15-FY17) and their allocation percentage would remain unchanged in future years (albeit, minor adjustments if employers cease participation). 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 requirement 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.

However, 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 addressed by the General Assembly in a future year by using a layered amortization base.

Four-Year Phase-in of the CERS Contributions

The proposed legislation would provide a four-year phase-in of the contribution requirements for the CERS Non-Hazardous Retirement and Insurance Funds. Under the proposed provisions, the participating employers' contribution requirement for FY 2018/2019 would be equal to their covered payroll times the contribution rate in effect for FY 2017/2018. The contribution requirement for FY 2019/2020 and FY 2020/2021 would phase-in to the new funding policy by 1/3 and 2/3 respectively, each subsequent year.

However, since current Tier 3 employees will be moved to the new defined contribution plan on July 1, 2018, the covered payroll in the retirement fund will decrease from \$2,500 million to \$1,824 million, which results in the employers contributing, on a collective basis, less money in FY 2018/2019 than the prior fiscal year. We believe this may have been an unintended outcome and recommend the phase-in provisions be changed from a "0/3, 1/3, 2/3, 3/3" phase-in to a "1/4, 2/4, 3/4, 4/4" phase-in approach so the employer contribution effort in FY 2018/2019 does not decrease.

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 July 1, 2018 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.

Implications of Closing the Pension System to New Hires

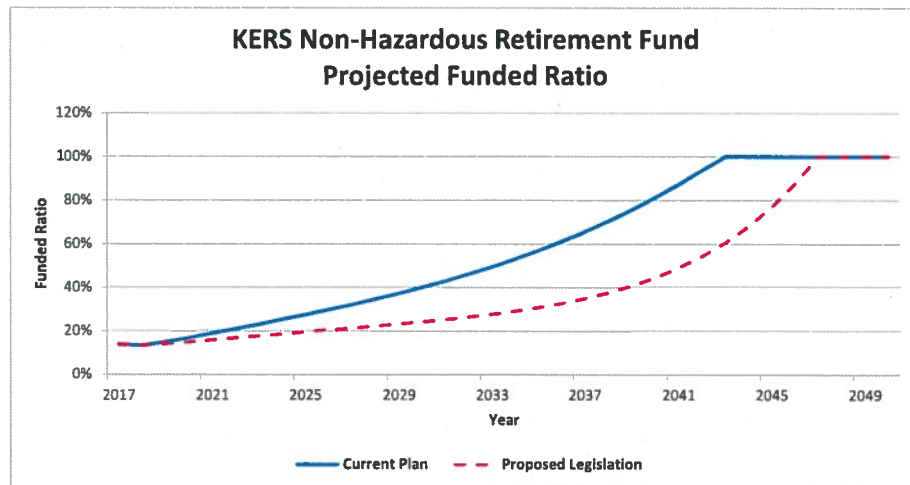
Sometimes there can be some unexpected financial implications when a retirement system is closed to new members and the purpose of this discussion is to explain this investigation. Specifically, we analyzed certain key actuarial measurements that assess the funding implications and how those measurements are expected to change if the proposed legislation became enacted. These actuarial measurements include the following:

- (A) Projected funded ratio (i.e., ratio of actuarial value of assets to actuarial accrued liability);
- (B) Projected trust fund payout ratio (i.e., ratio of beginning of fiscal year actuarial value of assets to benefit payments expected to be paid during the fiscal year); and
- (C) Projected net cash flow (i.e. total employer and member contributions minus benefit payments) as a percentage of beginning of fiscal year actuarial value of assets

The discussion below walks through the details with the KERS non-hazardous retirement fund, but we have also performed a separate analysis for the CERS non-hazardous retirement fund plan and are only providing the results of that analysis.

A. Projected Funded Ratio

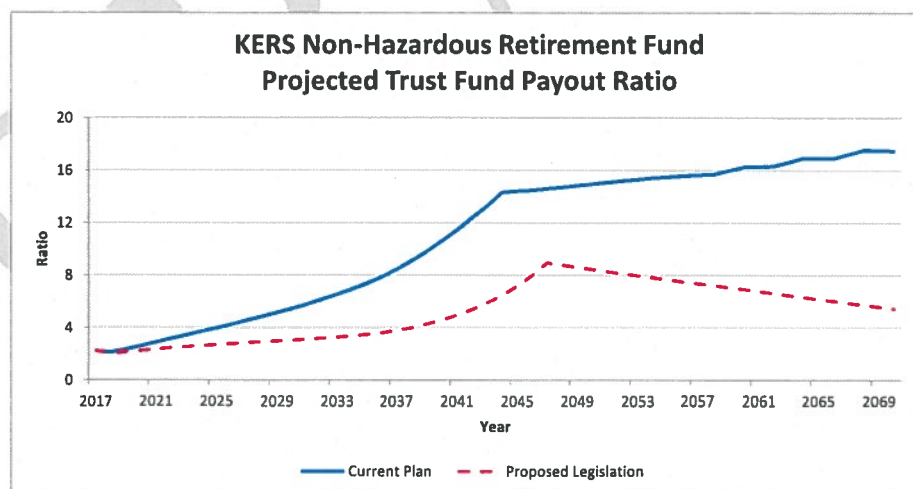
Presented on the following page is a graph that shows the projected funded ratio for the KERS Non-Hazardous Retirement System if the plan based on current provisions and under the proposed legislation.



As the graph shows, resetting the amortization period to 30 years at June 30, 2017, and eliminating the employer normal cost contributions and member contributions on Tier 3 members and future hires results in a much slower projected improvement in the funded ratio in future years.

B. Trust Fund Payout Ratio

The trust fund payout ratio, or the ratio of the beginning of fiscal year actuarial value of assets to the benefit payments expected to be paid during the fiscal year, represents the approximate number of years that a plan could be expected to pay out benefit payments in the absence of any additional contributions or investment income. The following graph shows the projected trust fund ratio for the KERS non-hazardous retirement fund based on current and proposed provisions.



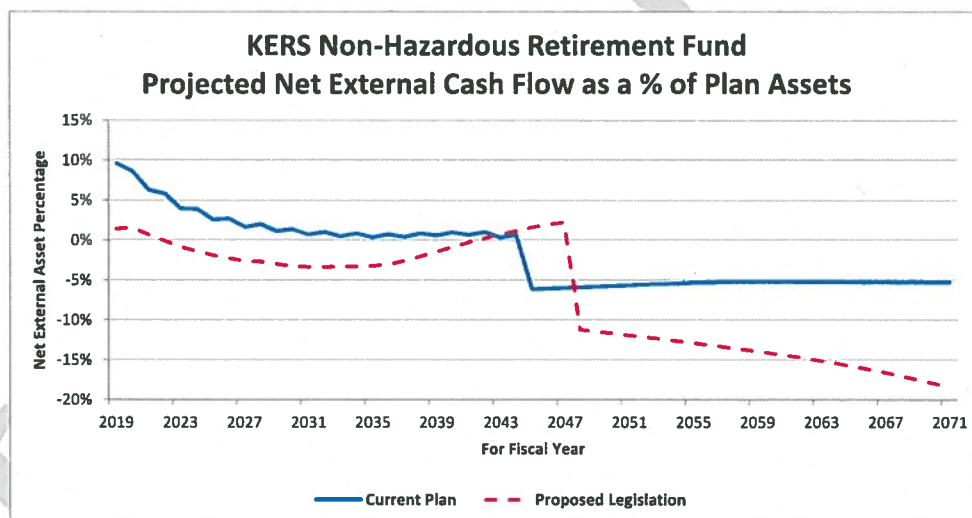
As shown by the graph, the current trust fund ratio for KRS is at a critical low of 2.0, meaning the trust assets today can only provide benefit payments for 2 years (absent future contributions or investment earnings), but is projected to improve in future years, although at a much slower rate under the proposed legislation. *Note, if this metric is not projected to consistently improve in future*

years during the amortization of the unfunded actuarial accrued liability, we would have recommended a stronger funding policy to finance the existing unfunded actuarial accrued liability.

For reference, if the KERS non-hazardous retirement fund had a 100% funded ratio as of June 30, 2017, then the trust fund payout ratio would be approximately 15. Also, if the plan were to remain open to new members, the trust fund payout ratio is projected to increase to over 18 in years after the plan attains a 100% funded ratio. This is an expected result when using a strong prospective funding policy and a 5.25% investment return assumption (both of which provides greater benefit security for the members).

C. Projected Net Cash Flow as a Percentage of Assets

Finally, an important measure of a plan's ability to maintain its current investment policy is to review the projected net cash flow as a percentage of plan assets, which shows the portion of beginning of year assets that are expected to be needed to provide the benefit payments in the current year that are not covered by expected contributions during that year. The following graph shows the projected net cash flow as a percentage of assets for the KERS non-hazardous retirement fund under the current plan and under the proposed legislative changes.



As the graph shows, the plan is expected to be in a positive net cash flow position for the current plan in the years 2019 through 2043, which means that the plan is not depending on any cash from investments or assets sales to provide benefit payments. Even if the plan is closed to new hires, the net external cash flow, while negative, remains a very manageable 3% to 4% during the time period the unfunded actuarial accrued liability is being amortized. Therefore, we don't expect that closing the plan to new entrants will require a significant change in the plan's investment policy during the time period the unfunded actuarial accrued liability is being amortized.

However, if the KERS non-hazardous retirement fund were closed to new to members, then the fund's cash flow requirements are projected to significantly change in fiscal years 2049 and thereafter, when contributions to finance the amortization payments projected to cease. In those years, the net external cash flow percentage decreases to approximately -11% and trends lower in

future years as the fund matures with only retired members. Based on brief discussions with the KRS staff, it is our understanding that the current investment policy can handle net -10% external cash flows. Therefore, as some point, fund's investment policy will need to shift to even more to less volatile, lower yielding investments.

If the change in allocation can be reasonably anticipated to lower the investment earnings for years after FY 2049, then it is reasonable to conclude that the employer contributions would need to increase to offset the lost earnings. We attempted to quantify the amount of additional contributions as a one-time present value amount that KERS would need as of June 30, 2018. The table below shows the present value of the additional contributions (i.e., a lump sum value in today's dollars) under three scenarios:

- Scenario 1 – Major shift to very low volatile assets after fiscal year 2049: 5.25% return assumption for fiscal years 2017 through 2048, and a 3.75% return assumption for fiscal years 2049 and thereafter.
- Scenario 2 – Modest shift to lower volatile assets after fiscal year 2049: 5.25% return assumption for fiscal years 2017 through 2048, and a 4.50% return assumption for fiscal years 2049 and thereafter.
- Scenario 3 – No shift in current investment allocation: 5.25% return assumption for all future fiscal years, including fiscal years beyond 2049.

Scenario	Present Value of Expected Decrease In Investment Income	Estimated Impact On Annual Cost Over next 30 years
1 – Major Shift	\$163 million	\$11 million
2 – Modest Shift	77 million	5 million
3 – No Change	0 million	0 million

Below is a similar analysis for the CERS non-hazardous retirement fund. The present value of the expected decrease in investment income is greater for this fund because the fund is currently invested differently than KERS and has higher expected investment earnings.

Scenario	Present Value of Expected Decrease In Investment Income	Estimated Impact On Annual Cost Over next 30 years
1 – Major Shift	\$221 million	\$16 million
2 – Modest Shift	147 million	11 million
3 – No Change	80 million	6 million

We believe a reasonable estimate for the potential impact would be the second scenario, which represents an expected modest shift in the future investment policy, and have included this cost in the fiscal impact scenarios. We have provided the higher and lower scenarios to give policy makers a sense of the range of possible outcomes.

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. At the time this analysis was prepared, the 2017 actuarial valuation results have been delivered to KRS, but have not yet been adopted by the Board of Trustees. For purposes of analyzing the fiscal impact of the non-hazardous retirement funds, we have assumed that the retirement rates will increase by 10% (i.e. add 10%) during the first and second year a member becomes eligible for an unreduced retirement benefit. It is also assumed that the probability that a member who is currently eligible for an unreduced retirement benefit will increase by 10% the next two years.

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. However, since the KERS Non-Hazardous retirement system has been experiencing a steady decrease in active membership, we have prepared a separate, alternative scenario analysis that shows the projected fiscal impact if it is assumed that active membership will decrease at the rate of 2% per year, for each of the next 35 years.

The projected cost of the defined contribution plan assumes that the employer's long-term cost to the defined contribution plan will be approximately 4% of payroll, after reflecting anticipated behavior in employee participation and effects of forfeitures in employer matching contributions when employees separate from service prior to becoming vested in the employer provided benefit. Since the defined contribution plan will auto-enroll at 9%, we believe our modeling assumption is reasonable and a valid assumption.

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.

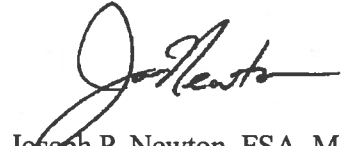
General Comments

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.

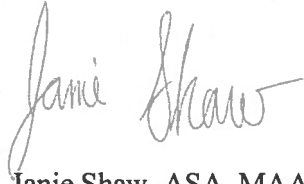
Mr. John Chilton
November 14, 2017
Page 10

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

cc: Mr. David L. Eager, KRS
Ms. Karen D. Roggenkamp, KRS

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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 B Summary of Change in Benefit Provisions and
Employer Funding to be Effective July 1, 2018
KERS and CERS Non-Hazardous Systems
(Continued)**

Retirement Formulas

Tier 1:

- Benefit accruals in the defined benefit retirement fund will cease at first unreduced retirement eligibility (i.e. 27 years of service, or age 65 with 4 years of service).
 - The maximum accrual does not apply to: (1) service purchased made prior to July 1, 2018, (2) sick leave service credit at retirement, and (3) Comp. time paid to members who retire on or before July 1, 2023
- Members who continue active membership beyond first unreduced retirement eligibility will earn future benefits in the new defined contribution plan.
- For retirements on or after July 1, 2018, 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:

- Benefit accruals in the defined benefit retirement fund will cease at first unreduced retirement eligibility (i.e. Rule of 87 with a minimum age of 57, or age 65 with 5 years of service).
 - The maximum accrual does not apply to: (1) service purchases made prior to July 1, 2018, or (2) sick leave service credit at retirement.
- Members who continue active membership beyond first unreduced retirement eligibility will earn future benefits in the new defined contribution plan.

Tier 3:

- All current members will participate in the new defined contribution plan maintained by PERS. Their Tier 3 account balance (member and employer) will rollover into the PERS plan, regardless of vesting.

Future Hires:

- Future employees will participate in the new defined contribution plan maintained by PERS.

DC Plan:

- The defined contribution plan provides a 3% mandatory member contributions and 2% employer contributions. Members may voluntarily contribute an additional 6% of pay and receive a 50% match on those voluntary contributions (up to 3% of pay in matching employer contributions).
 - Compensation for benefits earned in the defined contribution is not subject to the maximum creditable compensation limit that applies to compensation in the defined benefit plan that is earned after July 1, 2018.

Member Contribution Rates

- Member contribution rates to the retirement fund for Tier 1 and Tier 2 members remain unchanged at 5% of pay. Member contributions to the health insurance funds will increase by 3.00% on July 1, 2018 (i.e. Tier 1 member contribution rate will increase from 0% to 3% of pay, and the member rate in Tier 2 and the new defined contribution plan will increase from 1% to 4% of pay).
- The contributions to the health insurance funds are classified as 401(h) contributions and are not refundable to the member.

**Exhibit Summary of Change in Benefit Provisions and
Employer Funding to be Effective July 1, 2018
KERS and CERS Non-Hazardous Systems
(Continued)**

Pension Anti-Spiking Provisions

Maximum Creditable Compensation:

- Creditable compensation earned on or after July 1, 2018 limited to the maximum taxable earnings under Social Security (\$127,200 for 2017). Member contributions refunded on excess compensation, but employer normal cost contributions remain in fund to finance the unfunded actuarial accrued liability.

Comp. time payments upon termination for Tier I members

- The payment of comp. 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/Uniform Allowances:

- Excluded from creditable compensation earned on or after July 1, 2018.

Sick Leave

- Converted sick service cannot exceed amount for accumulated sick leave as of June 30, 2018.
- Tier 1 sick leave service credit does not count towards retirement eligibility for those retiring on or after July 1, 2018.

Retiree Health Accessibility

- Members retiring on or after July 1, 2018 must have contributed to a state administered retirement system in the last 24 months prior to have access to the health insurance benefit.
- Members earning benefits in the defined contribution plan will be eligible for health insurance benefits upon attaining age 59½ and having 15 years of earned service at retirement.

Line of Duty Death

- The surviving spouse (if any) shall supersede all previous beneficiary designations for members that die in the line of duty on and after January 1, 2017.

Reemployment After Retirement

The following reemployment after retirement provisions apply to members who retire on or after July 1, 2018 in order to continue to receive their retirement allowance during their reemployment:

- Must have a six (6) 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 be suspended for the duration of reemployment in a full-time position.
- Member cannot earn additional retirement benefits during their reemployment.
- No employee or employer contributions are required during reemployment.

**Exhibit Summary of Change in Benefit Provisions and
Employer Funding to be Effective July 1, 2018
KERS and CERS Non-Hazardous Systems
(Continued)**

Employer Funding

Contribution rates for KERS and CERS will change every year.

Actuarially Determined Contributions (ADC) for actuarial valuations performed on and after June 30, 2017 are based on a 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. Payroll for employer normal cost contributions is not limited to the Compensation Limit used for determining benefits.
- Unfunded liability payment determined using a closed 30-year amortization period (reset to 30 years starting in the 2017 valuation)
 - Level dollar amortization method

Four-Year Phase-In for CERS

- The contribution requirement for fiscal year 2018/2019 will remain unchanged from the Fiscal Year 2017/2018 contribution requirement.
- Fiscal Year 2019/2020 contribution requirement is equal to 2/3 times the 2018/2019 contribution requirement plus 1/3 times the actuarially determined contribution determined by the 2018 actuarial valuation.
- Fiscal Year 2020/2021 contribution requirement is equal to 1/3 times the 2018/2019 contribution requirement plus 2/3 times the actuarially determined contribution determined by the 2019 actuarial valuation.
- Contribution requirements for fiscal year 2021/2022 and beyond are equal to the actuarially determined contribution rates determined by the actuarial valuations.

Allocation of amortization payment for the unfunded liability to participating employers in CERS Non-Hazardous

- Dollar amount of the amortization payment will be allocated to each participating employer in proportion to their share of the total payroll in FY 2015, 2016, and 2017, adjusted for any employer 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 Non-Hazardous Retirement Fund
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 13,468	\$ 13,345	\$ (123)	14%	14%	0%	\$ 629	\$ 629	\$ 0	41%	41%	0%
2018	13,591	13,431	(160)	13%	13%	0%	1,101	1,015	(86)	71%	65%	-6%
2019	13,349	13,255	(94)	15%	14%	-1%	1,118	1,003	(115)	71%	64%	-7%
2020	13,042	13,049	7	17%	15%	-2%	1,097	1,004	(93)	69%	63%	-6%
2021	12,700	12,791	91	19%	16%	-3%	1,116	1,002	(114)	69%	62%	-7%
2022	12,334	12,539	205	21%	17%	-4%	1,086	998	(88)	66%	60%	-5%
2023	11,979	12,274	295	23%	18%	-5%	1,105	995	(110)	66%	59%	-7%
2024	11,580	11,998	418	25%	19%	-6%	1,075	993	(82)	63%	58%	-5%
2025	11,190	11,708	518	27%	20%	-7%	1,095	990	(105)	63%	57%	-6%
2026	10,755	11,404	649	30%	21%	-9%	1,064	989	(75)	60%	55%	-4%
2027	10,327	11,083	756	32%	22%	-10%	1,084	987	(97)	60%	54%	-5%
2028	9,853	10,748	895	35%	23%	-12%	1,052	984	(68)	57%	53%	-4%
2029	9,385	10,395	1,010	37%	24%	-13%	1,072	982	(90)	57%	52%	-5%
2030	8,868	10,025	1,157	40%	25%	-15%	1,040	980	(60)	54%	51%	-3%
2031	8,355	9,637	1,282	43%	26%	-17%	1,062	979	(83)	54%	50%	-4%
2032	7,791	9,229	1,438	46%	27%	-19%	1,028	977	(51)	51%	49%	-3%
2033	7,229	8,802	1,573	49%	28%	-21%	1,051	976	(75)	51%	47%	-4%
2034	6,614	8,353	1,739	53%	30%	-23%	1,015	976	(39)	48%	46%	-2%
2035	6,000	7,881	1,881	57%	32%	-25%	1,038	974	(64)	48%	45%	-3%
2036	5,331	7,387	2,056	61%	34%	-27%	1,003	974	(29)	46%	44%	-1%
2037	4,661	6,868	2,207	65%	36%	-29%	1,028	974	(54)	46%	43%	-2%
2038	3,931	6,325	2,394	70%	39%	-31%	987	975	(12)	43%	42%	-1%
2039	3,204	5,753	2,549	76%	42%	-34%	1,012	976	(36)	43%	41%	-2%
2040	2,414	5,153	2,739	81%	46%	-35%	963	977	14	40%	40%	1%
2041	1,634	4,521	2,887	87%	50%	-37%	987	979	(8)	40%	39%	0%
2042	788	3,857	3,069	94%	55%	-39%	897	980	83	35%	38%	3%
2043	0	3,160	3,160	100%	62%	-38%	76	981	905	3%	38%	35%
2044	0	2,426	2,426	100%	69%	-31%	77	982	905	3%	37%	34%
2045	0	1,656	1,656	100%	78%	-22%	78	982	904	3%	36%	33%
2046	0	846	846	100%	88%	-12%	79	982	903	3%	35%	32%
2047	0	0	0	100%	100%	0%	81	115	34	3%	4%	1%
2048	0	0	0	100%	100%	0%	82	117	35	3%	4%	1%
2049	0	0	0	100%	100%	0%	83	120	37	3%	4%	1%
2050	0	0	0	100%	100%	0%	85	123	38	3%	4%	1%
2051	0	0	0	100%	100%	0%	87	125	38	3%	4%	1%

Notes and assumptions:
The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and that employers contribute 4% of pay.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 6,039	\$ 5,920	\$ (119)	53%	53%	0%	\$ 355	\$ 355	\$ 0	14%	14%	0%
2018	6,219	6,046	(173)	53%	53%	0%	546	291	(255)	22%	12%	-10%
2019	6,299	6,367	68	53%	51%	-2%	548	390	(158)	22%	15%	-6%
2020	6,292	6,522	230	54%	51%	-3%	558	511	(47)	22%	20%	-2%
2021	6,165	6,455	290	56%	52%	-4%	563	637	74	21%	24%	3%
2022	6,099	6,331	232	57%	53%	-4%	561	629	68	21%	23%	3%
2023	6,026	6,206	180	58%	54%	-4%	565	628	63	21%	23%	2%
2024	5,941	6,075	134	59%	55%	-4%	570	627	57	20%	22%	2%
2025	5,840	5,937	97	61%	57%	-4%	575	624	49	20%	22%	2%
2026	5,725	5,792	67	62%	58%	-4%	580	624	44	20%	22%	2%
2027	5,595	5,639	44	63%	58%	-5%	585	623	38	20%	21%	1%
2028	5,446	5,477	31	64%	59%	-5%	591	621	30	20%	21%	1%
2029	5,280	5,308	28	66%	60%	-6%	597	620	23	20%	20%	0%
2030	5,094	5,129	35	67%	61%	-6%	604	619	15	19%	20%	0%
2031	4,885	4,941	56	68%	62%	-6%	611	620	9	19%	19%	0%
2032	4,654	4,743	89	70%	63%	-7%	619	619	-	19%	19%	0%
2033	4,397	4,534	137	72%	64%	-8%	627	620	(7)	19%	19%	0%
2034	4,115	4,314	199	74%	65%	-9%	636	620	(16)	19%	18%	0%
2035	3,803	4,082	279	76%	66%	-10%	645	621	(24)	19%	18%	-1%
2036	3,462	3,836	374	78%	67%	-11%	655	622	(33)	18%	18%	-1%
2037	3,087	3,578	491	80%	69%	-11%	666	624	(42)	18%	17%	-1%
2038	2,677	3,305	628	83%	70%	-13%	678	627	(51)	18%	17%	-1%
2039	2,230	3,017	787	86%	72%	-14%	690	629	(61)	18%	17%	-2%
2040	1,742	2,711	969	89%	74%	-15%	703	632	(71)	18%	16%	-2%
2041	1,211	2,386	1,175	92%	76%	-16%	715	635	(80)	18%	16%	-2%
2042	634	2,044	1,410	96%	79%	-17%	730	637	(93)	18%	16%	-2%
2043	0	1,680	1,680	100%	82%	-18%	78	640	562	2%	15%	13%
2044	0	1,295	1,295	100%	85%	-15%	79	643	564	2%	15%	13%
2045	0	887	887	100%	89%	-11%	80	647	567	2%	15%	13%
2046	0	455	455	100%	94%	-6%	82	648	566	2%	14%	13%
2047	0	0	0	100%	100%	0%	83	183	100	2%	4%	2%
2048	0	0	0	100%	100%	0%	84	187	103	2%	4%	2%
2049	0	0	0	100%	100%	0%	86	191	105	2%	4%	2%
2050	0	0	0	100%	100%	0%	88	196	108	2%	4%	2%
2051	0	0	0	100%	100%	0%	89	200	111	2%	4%	2%

Notes and assumptions:

The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and that employers contribute 4% of pay.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 1,859	\$ 1,763	\$ (96)	31%	32%	1%	\$ 128	\$ 128	\$ 0	8%	8%	0%
2018	1,886	1,775	(111)	32%	33%	1%	191	113	(78)	12%	7%	-5%
2019	1,862	1,765	(97)	34%	35%	1%	194	113	(81)	12%	7%	-5%
2020	1,820	1,742	(78)	37%	37%	0%	188	111	(77)	12%	7%	-5%
2021	1,770	1,705	(65)	40%	39%	-1%	191	108	(83)	12%	7%	-5%
2022	1,721	1,675	(46)	43%	41%	-2%	182	104	(78)	11%	6%	-5%
2023	1,674	1,645	(29)	46%	42%	-4%	186	101	(85)	11%	6%	-5%
2024	1,621	1,612	(9)	48%	44%	-4%	178	98	(80)	10%	6%	-5%
2025	1,570	1,578	8	51%	45%	-6%	181	95	(86)	10%	6%	-5%
2026	1,510	1,542	32	53%	47%	-6%	173	92	(81)	10%	5%	-4%
2027	1,454	1,504	50	55%	48%	-7%	176	89	(87)	10%	5%	-5%
2028	1,390	1,463	73	57%	49%	-8%	168	85	(83)	9%	5%	-4%
2029	1,327	1,420	93	59%	51%	-8%	171	82	(89)	9%	5%	-5%
2030	1,255	1,374	119	62%	52%	-10%	162	79	(83)	8%	4%	-4%
2031	1,187	1,327	140	64%	53%	-11%	166	76	(90)	8%	4%	-4%
2032	1,109	1,276	167	66%	54%	-12%	158	73	(85)	8%	4%	-4%
2033	1,033	1,222	189	68%	55%	-13%	162	70	(92)	8%	4%	-4%
2034	947	1,165	218	71%	57%	-14%	155	68	(87)	7%	3%	-4%
2035	863	1,105	242	73%	58%	-15%	158	65	(93)	7%	3%	-4%
2036	769	1,040	271	76%	60%	-16%	151	63	(88)	7%	3%	-4%
2037	675	972	297	79%	62%	-17%	155	60	(95)	7%	3%	-4%
2038	572	900	328	82%	64%	-18%	149	58	(91)	6%	3%	-4%
2039	469	823	354	85%	66%	-19%	152	56	(96)	6%	3%	-4%
2040	355	741	386	89%	69%	-20%	145	54	(91)	6%	2%	-4%
2041	242	655	413	92%	72%	-20%	149	52	(97)	6%	2%	-4%
2042	118	563	445	96%	76%	-20%	135	50	(85)	5%	2%	-3%
2043	0	464	464	100%	80%	-20%	13	48	35	0%	2%	1%
2044	0	360	360	100%	84%	-16%	13	46	33	0%	2%	1%
2045	0	248	248	100%	89%	-11%	13	44	31	0%	2%	1%
2046	0	130	130	100%	94%	-6%	13	43	30	0%	2%	1%
2047	0	3	3	100%	100%	0%	14	0	(14)	0%	0%	0%
2048	0	(91)	(91)	100%	104%	4%	14	0	(14)	0%	0%	0%
2049	0	(191)	(191)	100%	109%	9%	12	0	(12)	0%	0%	0%
2050	0	(302)	(302)	100%	115%	15%	12	0	(12)	0%	0%	0%
2051	0	(420)	(420)	100%	120%	20%	12	0	(12)	0%	0%	0%

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-4
CERS Non-Hazardous Insurance Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 1,128	\$ 1,053	\$ (75)	66%	68%	2%	\$ 114	\$ 114	\$ 0	5%	5%	0%
2018	1,171	1,072	(99)	67%	69%	2%	154	61	(93)	6%	3%	-4%
2019	1,192	1,089	(103)	67%	69%	2%	153	62	(91)	6%	3%	-4%
2020	1,190	1,079	(111)	69%	70%	1%	154	59	(95)	6%	2%	-4%
2021	1,153	1,036	(117)	71%	72%	1%	153	55	(98)	6%	2%	-4%
2022	1,140	1,016	(124)	72%	74%	2%	150	49	(101)	6%	2%	-4%
2023	1,125	997	(128)	73%	75%	2%	149	44	(105)	5%	2%	-4%
2024	1,109	977	(132)	74%	76%	2%	148	40	(108)	5%	1%	-4%
2025	1,089	956	(133)	75%	77%	2%	147	35	(112)	5%	1%	-4%
2026	1,067	934	(133)	76%	77%	1%	146	30	(116)	5%	1%	-4%
2027	1,042	911	(131)	77%	78%	1%	145	26	(119)	5%	1%	-4%
2028	1,013	886	(127)	78%	79%	1%	144	21	(123)	5%	1%	-4%
2029	982	861	(121)	79%	80%	1%	144	17	(127)	5%	1%	-4%
2030	947	833	(114)	80%	81%	1%	143	12	(131)	5%	0%	-4%
2031	908	805	(103)	81%	81%	0%	143	8	(135)	5%	0%	-4%
2032	865	776	(89)	82%	82%	0%	143	4	(139)	4%	0%	-4%
2033	818	744	(74)	84%	83%	-1%	144	0	(144)	4%	0%	-4%
2034	766	711	(55)	85%	83%	-2%	144	0	(144)	4%	0%	-4%
2035	709	672	(37)	86%	84%	-2%	146	0	(146)	4%	0%	-4%
2036	646	626	(20)	87%	85%	-2%	147	0	(147)	4%	0%	-4%
2037	578	575	(3)	89%	87%	-2%	150	0	(150)	4%	0%	-4%
2038	503	517	14	90%	88%	-2%	151	0	(151)	4%	0%	-4%
2039	421	452	31	92%	89%	-3%	155	0	(155)	4%	0%	-4%
2040	330	379	49	94%	91%	-3%	157	0	(157)	4%	0%	-4%
2041	231	299	68	96%	93%	-3%	160	0	(160)	4%	0%	-4%
2042	123	209	86	98%	95%	-3%	166	0	(166)	4%	0%	-4%
2043	0	112	112	100%	97%	-3%	41	0	(41)	1%	0%	-1%
2044	0	5	5	100%	100%	0%	41	0	(41)	1%	0%	-1%
2045	0	(112)	(112)	100%	103%	3%	42	0	(42)	1%	0%	-1%
2046	0	(240)	(240)	100%	106%	6%	42	0	(42)	1%	0%	-1%
2047	0	(379)	(379)	100%	109%	9%	43	0	(43)	1%	0%	-1%
2048	0	(531)	(531)	100%	113%	13%	43	0	(43)	1%	0%	-1%
2049	0	(695)	(695)	100%	117%	17%	43	0	(43)	1%	0%	-1%
2050	0	(873)	(873)	100%	121%	21%	43	0	(43)	1%	0%	-1%
2051	0	(1,066)	(1,066)	100%	125%	25%	44	0	(44)	1%	0%	-1%

Gabriel Roeder Smith & Company

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 Liability	Actuarial Value of Assets	Unfunded Actuarial 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.

Gabriel Roeder Smith & Company

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.

Gabriel Roeder Smith & Company

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.

Gabriel Roeder Smith & Company

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 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.

Gabriel Roeder Smith & Company

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, (1)	Actuarial Liability (2)	Actuarial Value of Assets (3)	Unfunded Actuarial Liability (4)	Funded Ratio (3)/(2) (5)	Employer Contribution Pension Plan (6)	Member Contribution Pension Plan (7)	Pension Plan Covered Payroll (8)	Employer Contribution as % of Covered Payroll (9)	Employer Actuarial Determined Contribution Rate (10)	DC Plan Covered Payroll (11)	Employer Contribution DC Plan (12)	Member Contribution DC Plan (13)	Total Employer Contributions (6)+(12) (14)	Total Employer Contribution Rate (14)/[(8)+(11)] (15)
2017	\$ 15,469	\$ 2,124	\$ 13,345	14%	\$ 629	\$ 77	\$ 1,532	41.06%	41.98%	\$ 0	\$ 0	\$ 0	\$ 0	41.06%
2018	15,469	2,038	13,431	13%	1,001	54	1,196	83.69%	83.69%	355	14	25	1,015	65.44%
2019	15,384	2,129	13,255	14%	985	51	1,126	87.44%	87.44%	448	18	31	1,003	63.68%
2020	15,308	2,259	13,049	15%	982	48	1,062	92.48%	92.48%	539	22	38	1,004	62.67%
2021	15,209	2,418	12,791	16%	977	44	999	97.73%	97.73%	629	25	44	1,002	61.54%
2022	15,086	2,547	12,539	17%	969	41	938	103.32%	103.32%	719	29	50	998	60.24%
2023	14,939	2,665	12,274	18%	963	39	879	109.55%	109.55%	807	32	57	995	59.02%
2024	14,770	2,772	11,998	19%	957	36	822	116.50%	116.50%	896	36	63	993	57.80%
2025	14,579	2,871	11,708	20%	951	33	766	124.21%	124.21%	985	39	69	990	56.59%
2026	14,365	2,961	11,404	21%	946	30	711	132.99%	132.99%	1,073	43	75	989	55.40%
2027	14,128	3,045	11,083	22%	940	27	656	143.40%	143.40%	1,163	47	81	987	54.24%
2028	13,876	3,128	10,748	23%	934	25	600	155.68%	155.68%	1,254	50	88	984	53.09%
2029	13,599	3,204	10,395	24%	928	22	546	170.10%	170.10%	1,345	54	94	982	51.95%
2030	13,299	3,274	10,025	25%	923	20	495	186.63%	186.63%	1,435	57	100	980	50.82%
2031	12,980	3,343	9,637	26%	918	18	448	205.14%	205.14%	1,523	61	107	979	49.69%
2032	12,643	3,414	9,229	27%	913	16	401	227.72%	227.72%	1,611	64	113	977	48.58%
2033	12,288	3,486	8,802	28%	908	13	356	254.90%	254.90%	1,700	68	119	976	47.49%
2034	11,915	3,562	8,353	30%	904	11	311	290.41%	290.41%	1,789	72	125	976	46.42%
2035	11,523	3,642	7,881	32%	899	9	268	335.05%	335.05%	1,879	75	132	974	45.36%
2036	11,118	3,731	7,387	34%	895	8	234	382.31%	382.31%	1,964	79	138	974	44.28%
2037	10,707	3,839	6,868	36%	892	8	207	431.80%	431.80%	2,046	82	143	974	43.23%
2038	10,295	3,970	6,325	39%	890	7	183	485.27%	485.27%	2,126	85	149	975	42.21%
2039	9,882	4,129	5,753	42%	888	6	162	547.04%	547.04%	2,206	88	154	976	41.22%
2040	9,470	4,317	5,153	46%	886	5	142	622.92%	622.92%	2,285	91	160	977	40.26%
2041	9,059	4,538	4,521	50%	884	4	123	720.70%	720.70%	2,364	95	165	979	39.34%
2042	8,650	4,793	3,857	55%	882	3	104	849.65%	849.65%	2,443	98	171	980	38.46%
2043	8,244	5,084	3,160	62%	880	2	86	1026.71%	1026.71%	2,522	101	177	981	37.61%
2044	7,840	5,414	2,426	69%	878	2	69	1272.89%	1272.89%	2,600	104	182	982	36.78%
2045	7,442	5,786	1,656	78%	875	1	54	1615.86%	1615.86%	2,677	107	187	982	35.97%
2046	7,050	6,204	846	88%	872	1	41	2130.00%	2130.00%	2,753	110	193	982	35.16%
2047	6,665	6,665	0	100%	2	0	30	5.91%	5.91%	2,828	113	198	115	4.02%
2048	6,289	6,289	0	100%	1	0	21	5.76%	5.76%	2,903	116	203	117	4.01%
2049	5,877	5,877	0	100%	1	0	15	5.64%	5.64%	2,976	119	208	120	4.01%
2050	5,479	5,479	0	100%	1	0	10	5.56%	5.56%	3,048	122	213	123	4.01%
2051	5,094	5,094	0	100%	0	0	7	5.54%	5.54%	3,120	125	218	125	4.00%

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.

Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).

Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.

Covered Payroll for the defined contribution plan is not subject to an earnings limit.

Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributes 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 3-2
CERS Non-Hazardous Retirement Fund
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	(1)	Actuarial Liability	(2)	Actuarial Value of Assets	(3)	Unfunded Actuarial Accrued Liability	(4)	Funded Ratio	(5)	Employer Contribution Pension Plan	(6)	Member Contribution Pension Plan	(7)	Pension Plan Covered Payroll	(8)	Employer Contribution as % of Covered Payroll	(9)	Employer Actual Determined Contribution Rate	(10)	DC Plan Covered Payroll	(11)	Employer Contribution DC Plan	(12)	Member Contribution DC Plan	(13)	Total Employer Contributions (6) + (12)	(14)	Total Employer Contribution Rate (14) / ((8)+(11))	(15)
2017		\$ 12,685		\$ 6,765		\$ 5,920		53%		\$ 355		\$ 123		\$ 2,452		14.48%		14.48%		\$ 0		\$ 0		\$ 0		\$ 355		14.48%	
2018		12,950		6,904		6,046		53%		264		82		1,824		14.48%		31.05%		676		27		47		291		11.64%	
2019		13,086		6,719		6,367		51%		357		76		1,722		20.73%		33.22%		825		33		58		390		15.31%	
2020		13,258		6,736		6,522		51%		472		71		1,625		29.03%		36.30%		969		39		68		511		19.68%	
2021		13,400		6,945		6,455		52%		593		66		1,529		38.80%		38.80%		1,112		44		78		637		24.15%	
2022		13,512		7,181		6,331		53%		579		61		1,436		40.34%		40.34%		1,255		50		88		629		23.40%	
2023		13,592		7,386		6,206		54%		572		57		1,343		42.59%		42.59%		1,397		56		98		628		22.91%	
2024		13,640		7,565		6,075		55%		565		52		1,251		45.14%		45.14%		1,539		62		108		627		22.44%	
2025		13,655		7,718		5,937		57%		557		48		1,161		48.02%		48.02%		1,681		67		118		624		21.98%	
2026		13,636		7,844		5,792		58%		551		43		1,071		51.40%		51.40%		1,823		73		128		624		21.54%	
2027		13,581		7,942		5,639		58%		544		39		982		55.32%		55.32%		1,965		79		138		623		21.11%	
2028		13,500		8,023		5,477		59%		537		35		897		59.81%		59.81%		2,106		84		147		621		20.68%	
2029		13,385		8,077		5,308		60%		530		31		817		64.94%		64.94%		2,245		90		157		620		20.25%	
2030		13,237		8,108		5,129		61%		524		28		740		70.84%		70.84%		2,383		95		167		619		19.84%	
2031		13,059		8,118		4,941		62%		519		25		667		77.72%		77.72%		2,520		101		176		620		19.44%	
2032		12,851		8,108		4,743		63%		513		22		598		85.86%		85.86%		2,656		106		186		619		19.04%	
2033		12,614		8,080		4,534		64%		508		19		532		95.62%		95.62%		2,791		112		195		620		18.66%	
2034		12,348		8,034		4,314		65%		503		16		468		107.57%		107.57%		2,926		117		205		620		18.28%	
2035		12,054		7,972		4,082		66%		499		13		407		122.63%		122.63%		3,060		122		214		621		17.91%	
2036		11,733		7,897		3,836		67%		494		11		354		139.81%		139.81%		3,191		128		223		622		17.54%	
2037		11,396		7,818		3,578		69%		491		10		309		158.97%		158.97%		3,319		133		232		624		17.20%	
2038		11,046		7,741		3,305		70%		489		9		270		180.98%		180.98%		3,444		138		241		627		16.86%	
2039		10,687		7,670		3,017		72%		486		7		235		206.62%		206.62%		3,568		143		250		629		16.54%	
2040		10,320		7,609		2,711		74%		484		6		204		237.37%		237.37%		3,691		148		258		632		16.22%	
2041		9,947		7,561		2,386		76%		482		5		175		275.58%		275.58%		3,813		153		267		635		15.91%	
2042		9,571		7,527		2,044		79%		480		4		148		323.42%		323.42%		3,935		157		275		637		15.61%	
2043		9,193		7,513		1,680		82%		478		3		124		384.35%		384.35%		4,055		162		284		640		15.32%	
2044		8,815		7,520		1,295		85%		476		2		103		463.73%		463.73%		4,175		167		292		643		15.04%	
2045		8,440		7,553		887		89%		475		2		84		566.45%		566.45%		4,293		172		301		647		14.77%	
2046		8,070		7,615		455		94%		472		1		67		704.28%		704.28%		4,411		176		309		648		14.49%	
2047		7,706		7,706		0		100%		2		1		53		3.12%		3.12%		4,528		181		317		183		3.99%	
2048		7,349		7,349		0		100%		1		0		40		3.03%		3.03%		4,645		186		325		187		3.99%	
2049		6,875		6,875		0		100%		1		0		30		2.95%		2.95%		4,762		190		333		190		3.99%	
2050		6,413		6,413		0		100%		1		0		22		2.85%		2.85%		4,879		195		342		196		3.99%	
2051		5,965		5,965		0		100%		0		0		16		2.79%		2.79%		4,996		200		350		200		4.00%	

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.

Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).

Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.

Covered Payroll for the defined contribution plan is not subject to an earnings limit.

Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributions 4% of pay.

Gabriel Roeder Smith & Company

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 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	\$ 2,587	\$ 824	\$ 1,763	32%	\$ 128	\$ 5	\$ 1,524	8.41%	8.41%
2018	2,648	873	1,775	33%	113	52	1,541	7.40%	7.40%
2019	2,703	938	1,765	35%	113	53	1,564	7.34%	7.34%
2020	2,751	1,009	1,742	37%	111	55	1,590	7.10%	7.10%
2021	2,792	1,087	1,705	39%	108	57	1,617	6.82%	6.82%
2022	2,827	1,152	1,675	41%	104	58	1,645	6.47%	6.47%
2023	2,855	1,210	1,645	42%	101	60	1,675	6.17%	6.17%
2024	2,876	1,264	1,612	44%	98	62	1,706	5.89%	5.89%
2025	2,890	1,312	1,578	45%	95	64	1,738	5.61%	5.61%
2026	2,897	1,355	1,542	47%	92	65	1,772	5.34%	5.34%
2027	2,897	1,393	1,504	48%	89	67	1,806	5.06%	5.06%
2028	2,887	1,424	1,463	49%	85	69	1,841	4.77%	4.77%
2029	2,869	1,449	1,420	51%	82	71	1,877	4.50%	4.50%
2030	2,842	1,468	1,374	52%	79	73	1,915	4.25%	4.25%
2031	2,808	1,481	1,327	53%	76	75	1,956	4.01%	4.01%
2032	2,769	1,493	1,276	54%	73	77	1,998	3.79%	3.79%
2033	2,727	1,505	1,222	55%	70	79	2,041	3.59%	3.59%
2034	2,681	1,516	1,165	57%	68	82	2,085	3.39%	3.39%
2035	2,632	1,527	1,105	58%	65	84	2,132	3.21%	3.21%
2036	2,582	1,542	1,040	60%	63	86	2,183	3.02%	3.02%
2037	2,533	1,561	972	62%	60	89	2,237	2.84%	2.84%
2038	2,485	1,585	900	64%	58	91	2,293	2.69%	2.69%
2039	2,438	1,615	823	66%	56	94	2,351	2.53%	2.53%
2040	2,393	1,652	741	69%	54	96	2,410	2.38%	2.38%
2041	2,351	1,696	655	72%	52	98	2,469	2.23%	2.23%
2042	2,312	1,749	563	76%	50	101	2,529	2.09%	2.09%
2043	2,275	1,811	464	80%	48	103	2,589	1.97%	1.97%
2044	2,242	1,882	360	84%	46	106	2,650	1.86%	1.86%
2045	2,211	1,963	248	89%	44	108	2,712	1.75%	1.75%
2046	2,183	2,053	130	94%	43	110	2,774	1.67%	1.67%
2047	2,156	2,153	3	100%	0	113	2,838	0.00%	0.00%
2048	2,129	2,220	(91)	104%	0	115	2,903	0.00%	0.00%
2049	2,104	2,295	(191)	109%	0	118	2,969	0.00%	0.00%
2050	2,078	2,380	(302)	115%	0	121	3,036	0.00%	0.00%
2051	2,054	2,474	(420)	120%	0	123	3,105	0.00%	0.00%

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.

Gabriel Roeder Smith & Company

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	\$ 3,280	\$ 2,227	\$ 1,053	68%	\$ 114	\$ 10	\$ 2,429	4.70%	4.70%
2018	3,414	2,342	1,072	69%	61	84	2,477	2.52%	2.52%
2019	3,539	2,450	1,089	69%	62	87	2,524	2.52%	2.52%
2020	3,655	2,576	1,079	70%	59	90	2,572	2.37%	2.37%
2021	3,761	2,725	1,036	72%	55	93	2,619	2.17%	2.17%
2022	3,857	2,841	1,016	74%	49	95	2,668	1.87%	1.87%
2023	3,943	2,946	997	75%	44	98	2,718	1.68%	1.68%
2024	4,019	3,042	977	76%	40	101	2,768	1.49%	1.49%
2025	4,085	3,129	956	77%	35	104	2,820	1.29%	1.29%
2026	4,142	3,208	934	77%	30	107	2,873	1.11%	1.11%
2027	4,188	3,277	911	78%	26	110	2,926	0.93%	0.93%
2028	4,224	3,338	886	79%	21	112	2,982	0.74%	0.74%
2029	4,252	3,391	861	80%	17	116	3,040	0.60%	0.60%
2030	4,272	3,439	833	81%	12	119	3,102	0.43%	0.43%
2031	4,284	3,479	805	81%	8	122	3,166	0.29%	0.29%
2032	4,291	3,515	776	82%	4	125	3,232	0.17%	0.17%
2033	4,292	3,548	744	83%	0	128	3,301	0.05%	0.05%
2034	4,290	3,579	711	83%	0	132	3,372	0.00%	0.00%
2035	4,284	3,612	672	84%	0	135	3,445	0.00%	0.00%
2036	4,276	3,650	626	85%	0	139	3,522	0.00%	0.00%
2037	4,269	3,694	575	87%	0	142	3,605	0.00%	0.00%
2038	4,260	3,743	517	88%	0	146	3,691	0.00%	0.00%
2039	4,251	3,799	452	89%	0	150	3,780	0.00%	0.00%
2040	4,242	3,863	379	91%	0	153	3,872	0.00%	0.00%
2041	4,234	3,935	299	93%	0	157	3,965	0.00%	0.00%
2042	4,225	4,016	209	95%	0	161	4,059	0.00%	0.00%
2043	4,218	4,106	112	97%	0	165	4,156	0.00%	0.00%
2044	4,212	4,207	5	100%	0	169	4,253	0.00%	0.00%
2045	4,207	4,319	(112)	103%	0	173	4,352	0.00%	0.00%
2046	4,202	4,442	(240)	106%	0	177	4,453	0.00%	0.00%
2047	4,198	4,577	(379)	109%	0	181	4,555	0.00%	0.00%
2048	4,194	4,725	(531)	113%	0	185	4,660	0.00%	0.00%
2049	4,191	4,886	(695)	117%	0	189	4,766	0.00%	0.00%
2050	4,187	5,060	(873)	121%	0	193	4,874	0.00%	0.00%
2051	4,184	5,250	(1,066)	125%	0	198	4,985	0.00%	0.00%

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.

Gabriel Roeder Smith & Company

Section 4:

Alternative Scenario for KERS Non-Hazardous Projected Cost of the Retirement and Insurance Current Plan with Projected Population Decrease

Kentucky Retirement Systems
Exhibit 1-1 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Retirement Fund
Comparison of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 13,468	\$ 13,345	\$ (123)	14%	14%	0%	\$ 629	\$ 629	\$ 0	41%	41%	0%
2018	13,590	13,431	(159)	13%	13%	0%	1,085	1,014	(71)	71%	66%	-5%
2019	13,364	13,255	(109)	15%	14%	-1%	1,084	1,001	(83)	71%	66%	-5%
2020	13,089	13,049	(40)	16%	15%	-1%	1,081	1,001	(80)	71%	66%	-5%
2021	12,763	12,791	28	18%	16%	-2%	1,081	998	(83)	71%	65%	-5%
2022	12,433	12,539	106	20%	17%	-3%	1,071	992	(79)	70%	65%	-5%
2023	12,092	12,274	182	22%	18%	-4%	1,071	989	(82)	70%	65%	-5%
2024	11,729	11,998	269	24%	19%	-5%	1,063	985	(78)	70%	65%	-5%
2025	11,351	11,708	357	26%	20%	-6%	1,063	981	(82)	70%	64%	-5%
2026	10,950	11,404	454	28%	21%	-7%	1,054	979	(75)	69%	64%	-5%
2027	10,532	11,083	551	30%	22%	-8%	1,054	975	(79)	69%	64%	-5%
2028	10,089	10,748	659	32%	23%	-9%	1,045	971	(74)	69%	64%	-5%
2029	9,628	10,395	767	35%	24%	-11%	1,045	967	(78)	69%	64%	-5%
2030	9,140	10,025	885	37%	25%	-12%	1,037	964	(73)	68%	63%	-5%
2031	8,630	9,637	1,007	40%	26%	-14%	1,038	961	(77)	68%	63%	-5%
2032	8,089	9,229	1,140	43%	27%	-16%	1,031	958	(73)	68%	63%	-5%
2033	7,525	8,802	1,277	46%	28%	-18%	1,032	955	(77)	68%	63%	-5%
2034	6,927	8,353	1,426	49%	30%	-19%	1,023	953	(70)	67%	62%	-5%
2036	5,641	7,387	1,746	57%	34%	-23%	1,019	947	(72)	66%	62%	-5%
2037	4,951	6,868	1,917	62%	36%	-26%	1,023	945	(78)	66%	61%	-5%
2038	4,217	6,325	2,108	67%	39%	-28%	1,014	945	(69)	65%	61%	-4%
2039	3,453	5,753	2,300	72%	42%	-30%	1,019	944	(75)	65%	61%	-5%
2040	2,643	5,153	2,510	78%	46%	-32%	1,005	943	(62)	64%	60%	-4%
2041	1,803	4,521	2,718	85%	50%	-35%	1,010	942	(68)	64%	60%	-4%
2042	914	3,857	2,943	92%	55%	-37%	988	941	(47)	63%	60%	-3%
2043	0	3,160	3,160	100%	62%	-38%	46	940	894	3%	59%	56%
2044	0	2,426	2,426	100%	69%	-31%	46	939	893	3%	59%	56%
2045	0	1,656	1,656	100%	78%	-22%	46	937	891	3%	59%	56%
2046	0	846	846	100%	88%	-12%	45	934	889	3%	59%	56%
2047	0	0	0	100%	100%	0%	45	65	20	3%	4%	1%
2048	0	0	0	100%	100%	0%	45	64	19	3%	4%	1%
2049	0	0	0	100%	100%	0%	45	65	20	3%	4%	1%
2050	0	0	0	100%	100%	0%	45	65	20	3%	4%	1%
2051	0	0	0	100%	100%	0%	45	64	19	3%	4%	1%

Notes and assumptions:

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

The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and the employer match 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-2 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Insurance Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio		Employer Contribution			Employer Contribution Rate			
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 1,859	\$ 1,763	\$ (96)	31%	32%	1%	\$ 128	\$ 128	\$ 0	8%	8%	0%
2018	1,886	1,775	(111)	32%	33%	1%	188	113	(75)	12%	7%	-5%
2019	1,864	1,766	(98)	34%	35%	1%	188	114	(74)	12%	8%	-5%
2020	1,828	1,743	(85)	37%	37%	0%	185	113	(72)	12%	7%	-5%
2021	1,781	1,706	(75)	40%	39%	-1%	185	111	(74)	12%	7%	-5%
2022	1,737	1,677	(60)	43%	41%	-2%	180	108	(72)	12%	7%	-5%
2023	1,693	1,647	(46)	45%	42%	-3%	180	106	(74)	12%	7%	-5%
2024	1,646	1,614	(32)	47%	44%	-3%	176	104	(72)	12%	7%	-5%
2025	1,597	1,580	(17)	49%	45%	-4%	176	102	(74)	12%	7%	-5%
2026	1,543	1,544	1	52%	47%	-5%	172	100	(72)	11%	7%	-5%
2027	1,489	1,505	16	54%	48%	-6%	172	98	(74)	11%	6%	-5%
2028	1,428	1,465	37	56%	49%	-7%	167	96	(71)	11%	6%	-5%
2029	1,366	1,421	55	58%	50%	-8%	167	93	(74)	11%	6%	-5%
2030	1,299	1,375	76	60%	51%	-9%	163	91	(72)	11%	6%	-5%
2031	1,231	1,327	96	62%	52%	-10%	163	90	(73)	11%	6%	-5%
2032	1,156	1,276	120	64%	53%	-11%	159	88	(71)	10%	6%	-5%
2033	1,079	1,223	144	66%	54%	-12%	159	87	(72)	10%	6%	-5%
2034	996	1,165	169	68%	56%	-12%	156	86	(70)	10%	6%	-5%
2036	817	1,040	223	73%	59%	-14%	154	84	(70)	10%	6%	-5%
2037	720	972	252	76%	60%	-16%	155	83	(72)	10%	5%	-5%
2038	616	899	283	79%	62%	-17%	153	82	(71)	10%	5%	-5%
2039	506	822	316	83%	65%	-18%	154	81	(73)	10%	5%	-5%
2040	389	740	351	87%	68%	-19%	151	81	(70)	10%	5%	-5%
2041	267	653	386	91%	71%	-20%	152	80	(72)	10%	5%	-4%
2042	136	561	425	95%	74%	-21%	149	80	(69)	10%	5%	-4%
2043	0	462	462	100%	78%	-22%	8	80	72	0%	5%	5%
2044	0	358	358	100%	83%	-17%	8	79	71	0%	5%	5%
2045	0	247	247	100%	88%	-12%	8	80	72	0%	5%	5%
2046	0	128	128	100%	94%	-6%	8	80	72	0%	5%	5%
2047	0	1	1	100%	100%	0%	8	0	(8)	0%	0%	0%
2048	0	(51)	(51)	100%	103%	3%	8	0	(8)	0%	0%	0%
2049	0	(107)	(107)	100%	106%	6%	7	0	(7)	0%	0%	0%
2050	0	(165)	(165)	100%	109%	9%	7	0	(7)	0%	0%	0%
2051	0	(228)	(228)	100%	113%	13%	6	0	(6)	0%	0%	0%

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

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 2-1 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Retirement Fund

Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Actuarial Accrued Liability (2)	Actuarial Value of Assets (3)	Unfunded Actuarial Accrued Liability (4)	Funded Ratio (3)/(2) (5)	Employer Contribution (6)	Member Contribution (7)	Covered Payroll (8)	Employer Contribution as % of Covered Payroll (9)	Employer Actuarially Determined Contribution Rate (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%
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	0	100%	46	79	1,585	2.93%	2.93%
2044	11,182	11,182	0	100%	46	79	1,589	2.89%	2.89%
2045	10,956	10,956	0	100%	46	80	1,593	2.86%	2.86%
2046	10,737	10,737	0	100%	45	80	1,596	2.84%	2.84%
2047	10,524	10,524	0	100%	45	80	1,600	2.82%	2.82%
2048	10,318	10,318	0	100%	45	80	1,603	2.80%	2.80%
2049	10,120	10,120	0	100%	45	80	1,606	2.79%	2.79%
2050	9,931	9,931	0	100%	45	80	1,609	2.79%	2.79%
2051	9,750	9,750	0	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.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 3-1 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Retirement Fund
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1,	(1)	Actuarial Liability	(2)	Actuarial Value of Assets	(3)	Unfunded Actuarial Accrued Liability	(4)	Funded Ratio (3)/(2)	(5)	Employer Contribution Pension Plan	(6)	Member Contribution Pension Plan	(7)	Pension Plan Covered Payroll	(8)	Employer Contribution as % of Covered Payroll	(9)	Employer Determined Contribution Rate	(10)	DC Plan Covered Payroll	(11)	Employer Contribution DC Plan	(12)	Member Contribution DC Plan	(13)	Total Employer Contributions (6) + (12)	(14)	Total Employer Contribution Rate (14) / ((8)+(11))	(15)
2017		\$ 15,469	\$	2,124	\$	13,345		14%		\$ 629	\$	77	\$	77	\$ 1,532		41.06%		41.98%	\$	0	\$	0	\$	0	\$	629		41.06%
2018		15,469		2,038		13,431		13%		1,001		54		54	1,196		83.69%		83.69%		332		13		23		1,014		66.35%
2019		15,384		2,129		13,255		14%		985		51		51	1,126		87.44%		87.44%		400		16		28		1,001		65.56%
2020		15,308		2,259		13,049		15%		982		48		48	1,062		92.48%		92.48%		464		19		33		1,001		65.55%
2021		15,209		2,418		12,791		16%		977		44		44	999		97.73%		97.73%		526		21		37		998		65.41%
2022		15,086		2,547		12,539		17%		969		41		41	938		103.32%		103.32%		587		23		41		992		65.09%
2023		14,939		2,665		12,274		18%		963		39		39	879		109.55%		109.55%		646		26		45		989		64.85%
2024		14,770		2,772		11,998		19%		957		36		36	822		116.50%		116.50%		703		28		49		985		64.62%
2025		14,579		2,871		11,708		20%		951		33		33	766		124.21%		124.21%		759		30		53		981		64.38%
2026		14,365		2,961		11,404		21%		946		30		30	711		132.99%		132.99%		814		33		57		979		64.15%
2027		14,128		3,045		11,083		22%		940		27		27	656		143.40%		143.40%		869		35		61		975		63.94%
2028		13,876		3,128		10,748		23%		934		25		25	600		155.68%		155.68%		924		37		65		971		63.73%
2029		13,599		3,204		10,395		24%		928		22		22	546		170.10%		170.10%		977		39		68		967		63.53%
2030		13,299		3,274		10,025		25%		923		20		20	495		186.63%		186.63%		1,029		41		72		964		63.30%
2031		12,980		3,343		9,637		26%		918		18		18	448		205.14%		205.14%		1,077		43		75		961		63.04%
2032		12,643		3,414		9,229		27%		913		16		16	401		227.72%		227.72%		1,125		45		79		958		62.80%
2033		12,288		3,486		8,802		28%		908		13		13	356		254.90%		254.90%		1,171		47		82		955		62.53%
2034		11,915		3,562		8,353		30%		904		11		11	311		290.41%		290.41%		1,218		49		85		953		62.29%
2036		11,118		3,731		7,387		34%		895		8		8	234		382.31%		382.31%		1,302		52		91		947		61.65%
2037		10,707		3,839		6,868		36%		892		7		7	207		431.80%		431.80%		1,336		53		94		945		61.27%
2038		10,295		3,970		6,325		39%		890		7		7	183		485.27%		485.27%		1,368		55		96		945		60.89%
2039		9,882		4,129		5,753		42%		888		6		6	162		547.04%		547.04%		1,397		56		98		944		60.51%
2040		9,470		4,317		5,153		46%		886		5		5	142		622.92%		622.92%		1,425		57		100		943		60.16%
2041		9,059		4,538		4,521		50%		884		4		4	123		720.70%		720.70%		1,451		58		102		942		59.84%
2042		8,650		4,793		3,857		55%		882		3		3	104		849.65%		849.65%		1,476		59		103		941		59.56%
2043		8,244		5,084		3,160		62%		880		2		2	86		1026.71%		1026.71%		1,499		60		105		940		59.30%
2044		7,840		5,414		2,426		69%		878		2		2	69		1272.89%		1272.89%		1,520		61		106		939		59.06%
2045		7,442		5,786		1,656		78%		875		1		1	54		1615.86%		1615.86%		1,539		62		108		937		58.82%
2046		7,050		6,204		846		88%		872		1		1	41		2130.00%		2130.00%		1,555		62		109		934		58.54%
2047		6,665		6,665		0		100%		2		0		0	30		5.91%		5.91%		1,570		63		110		934		58.24%
2048		6,289		6,289		0		100%		1		0		0	21		5.76%		5.76%		1,582		63		111		934		58.02%
2049		5,877		5,877		0		100%		1		0		0	15		5.64%		5.64%		1,591		64		111		934		57.79%
2050		5,479		5,479		0		100%		1		0		0	10		5.56%		5.56%		1,599		64		112		934		57.54%
2051		5,094		5,094		0		100%		0		0		0	7		5.54%		5.54%		1,605		64		112		934		57.30%

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.
Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).
Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.
Covered Payroll for the defined contribution plan is not subject to an earnings limit.
Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributes 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 2-2 (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%
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	0	100%	8	16	1,573	0.49%	0.49%
2044	2,829	2,829	0	100%	8	16	1,578	0.49%	0.49%
2045	2,814	2,814	0	100%	8	16	1,582	0.48%	0.48%
2046	2,800	2,800	0	100%	8	16	1,585	0.48%	0.48%
2047	2,787	2,787	0	100%	8	16	1,588	0.48%	0.48%
2048	2,773	2,773	0	100%	8	16	1,591	0.48%	0.48%
2049	2,759	2,759	0	100%	7	16	1,594	0.42%	0.42%
2050	2,743	2,743	0	100%	7	16	1,597	0.41%	0.41%
2051	2,725	2,725	0	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.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 3-2 (Alternative Assumptions that Assume a Decreasing Active Membership)
KERS Non-Hazardous Insurance Fund
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Actuarial Accrued Liability (2)	Actuarial Value of Assets (3)	Unfunded Actuarial Accrued Liability (4)	Funded Ratio (3) / (2) (5)	Employer Contribution (6)	Member Contribution (7)	Covered Payroll (8)	Employer Contribution as % of Covered Payroll (9)	Employer Actuarially Determined Contribution Rate (10)
2017	\$ 2,587	\$ 824	\$ 1,763	32%	\$ 128	\$ 5	\$ 1,524	8.41%	8.41%
2018	2,648	873	1,775	33%	113	51	1,518	7.40%	7.40%
2019	2,703	937	1,766	35%	114	51	1,516	7.50%	7.50%
2020	2,750	1,007	1,743	37%	113	52	1,516	7.43%	7.43%
2021	2,790	1,084	1,706	39%	111	53	1,515	7.31%	7.31%
2022	2,824	1,147	1,677	41%	108	53	1,514	7.11%	7.11%
2023	2,851	1,204	1,647	42%	106	54	1,514	7.00%	7.00%
2024	2,870	1,256	1,614	44%	104	54	1,514	6.85%	6.85%
2025	2,882	1,302	1,580	45%	102	55	1,514	6.73%	6.73%
2026	2,886	1,342	1,544	47%	100	55	1,514	6.60%	6.60%
2027	2,882	1,377	1,505	48%	98	56	1,514	6.45%	6.45%
2028	2,869	1,404	1,465	49%	96	56	1,513	6.32%	6.32%
2029	2,846	1,425	1,421	50%	93	57	1,512	6.17%	6.17%
2030	2,814	1,439	1,375	51%	91	57	1,512	6.04%	6.04%
2031	2,775	1,448	1,327	52%	90	57	1,514	5.92%	5.92%
2032	2,730	1,454	1,276	53%	88	58	1,515	5.82%	5.82%
2033	2,681	1,458	1,223	54%	87	58	1,517	5.74%	5.74%
2034	2,627	1,462	1,165	56%	86	59	1,518	5.65%	5.65%
2036	2,511	1,471	1,040	59%	84	60	1,525	5.51%	5.51%
2037	2,452	1,480	972	60%	83	61	1,532	5.43%	5.43%
2038	2,393	1,494	899	62%	82	61	1,540	5.36%	5.36%
2039	2,334	1,512	822	65%	81	61	1,548	5.30%	5.30%
2040	2,277	1,537	740	68%	81	62	1,556	5.22%	5.22%
2041	2,221	1,568	653	71%	80	62	1,562	5.18%	5.18%
2042	2,167	1,606	561	74%	80	62	1,568	5.14%	5.14%
2043	2,115	1,653	462	78%	80	62	1,573	5.08%	5.08%
2044	2,065	1,707	358	83%	79	63	1,578	5.06%	5.06%
2045	2,017	1,770	247	88%	80	63	1,582	5.07%	5.07%
2046	1,970	1,842	128	94%	80	63	1,585	5.07%	5.07%
2047	1,923	1,922	1	100%	0	63	1,588	0.00%	0.00%
2048	1,877	1,928	(51)	103%	0	63	1,591	0.00%	0.00%
2049	1,830	1,937	(107)	106%	0	63	1,594	0.00%	0.00%
2050	1,784	1,949	(165)	109%	0	63	1,597	0.00%	0.00%
2051	1,737	1,965	(228)	113%	0	63	1,600	0.00%	0.00%

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.

Gabriel Roeder Smith & Company

November 14, 2017

Mr. John E. Chilton
Budget Director
Office of State Budget Director (OSBD)
Frankfort, KY 40601

Re: Actuarial Analysis of Proposed Pension Reform Legislation and its Financial Impact on the KERS Hazardous, CERS Hazardous, and SPRS Retirement Systems

Dear Mr. Chilton:

We have reviewed and analyzed the summary of proposed benefit changes in the proposed pension reform legislation. The purpose of this letter is to communicate to the General Assembly the fiscal analysis of the proposed legislation on the retirement and insurance funds providing benefits to members in the Hazardous Systems maintained by KRS (i.e. KERS Hazardous, CERS Hazardous, and SPRS). The information provided in this document satisfies all the analysis and disclosure requirements specified in Section 6.350 of Kentucky Statute (Actuarial analysis required for bill before General Assembly to increase benefits or participation in a state-administered retirement system).

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, current Tier 3 members and future active members will have the option to earn benefits in a defined contribution plan. The amortization of the unfunded actuarial accrued liability will be determined on a level-dollar basis with the amortization period reset to 30 years in 2017, decreasing by one each future year. There will also be a four-year phase-in to the contribution effort for participating employers in CERS. There will be a 3% of pay increase in the member contribution effort to the Health Insurance Funds.

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 Retirement Fund

There is minimal change in the actuarial accrued liability (and unfunded actuarial accrued liability) as of June 30, 2017 due to the provision changes. The unfunded liability in future years becomes larger under the proposed legislative change due to the funding period being reset from 26 years to 30 years.

The initial savings in the employer contribution requirement is due to the reset of the amortization period to 30 years. However, the projected employer contribution requirements under the proposed legislation are very similar to the projections of the current plan in later years.

CERS Hazardous Retirement Fund

Similar to the KERS hazardous retirement fund, there is minimal change in the actuarial accrued liability (and unfunded actuarial accrued liability) as of June 30, 2017 due to the provision changes.

The initial savings in the employer contribution requirement is due to the four-year phase-in to the actuarially determined contributions and resetting the amortization period to 30 years. However, the projected employer contribution requirements under the proposed legislation become slightly larger in fiscal years 2021/2022 through 2029/2030 after the phase-in period due to the use of a level-dollar amortization (versus a 2% payroll growth assumption). Finally, the projected contribution requirements are lower in the proposed legislation after fiscal year 2030/2031 because the contributions as a percentage of pay decrease due to use of a level dollar amortization method in the proposed legislation.

SPRS Hazardous Retirement Fund

Similar to the KERS hazardous retirement fund, there is minimal change in the actuarial accrued liability (and unfunded actuarial accrued liability) as of June 30, 2017 due to the provision changes.

The initial savings in the employer contribution requirement is due to the reset of the amortization period to 30 years. However, the projected employer contribution requirements under the proposed legislation are very similar to the projections of the current plan in later years.

All Health Insurance Funds

The actuarial accrued liability (and unfunded actuarial accrued liability) decreased as of June 30, 2017 for each of the health insurance funds, due to the changes in eligibility provisions that become effective July 1, 2018. The employer contribution requirement to the health insurance funds decreased because of the change in the liability, the member contribution rate will increase by 3% of pay (for all benefit tiers), and the amortization period was reset from 26 years to 30 years at June 30, 2017.

Note, the proposed plan changes include a four-year phase in to the employer contribution rate for the CERS hazardous health insurance fund. However, the change in the eligibility provisions and the increase in the 3% of pay increase in the member contribution rate results in the FY 2018/2019 employer contribution rate being less than the employer contribution rate currently in effect for FY 2017/2018. As a result, we modeled the future employer contribution effort to this fund without regard to the four-year phase-in.

GRS Comments on Proposed Legislation

Optional Defined Contribution Plan

Based on observations in other statewide retirement systems, employee selection to earn benefits in the hybrid cash balance plan or the optional defined contribution plan will depend significantly on the default option, largely because the default option is perceived to be the most valuable option.

Benefits provided in the new defined contribution plan will shift the investment and longevity risk from the participating employer to the members and retirees. The employers' cost will be limited to the employer matching contributions to the employee's defined contribution account. The projected cost of the defined contribution plan assumes that the employer's long-term cost to the defined contribution plan will be approximately 4% of payroll, after reflecting auto-enrollment, anticipated behavior in employee participation, and effects of forfeitures in employer matching contributions when employees separate from service prior to becoming vested in the employer provided benefit.

Increase in Member Contribution to the Health Insurance Plan

The 3% increase in contribution requirement for the Tier 2 members and members in the defined contribution plan will result in a member contribution effort that exceeds the value of their health insurance benefit (value measured as the normal cost rate). We are not aware of any IRS violations if the proposed contribution rate becomes effective, but are commenting on this so the General Assembly can make an informed policy decision regarding this provision change.

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 contribution effort during the last three fiscal years (FY15-FY17) and their allocation percentage would remain unchanged in future years (albeit, minor adjustments if employers cease participation). 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 requirement 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.

However, 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 addressed by the General Assembly in a future year by using a layered amortization base.

Four-Year Phase-In of the CERS Contributions

The proposed legislation would provide a four-year phase-in of the contribution requirements for the CERS Hazardous Retirement and Insurance Funds. Under the proposed provisions, the participating employers contribution requirement for FY 2018/2019 would be equal to their covered payroll times the contribution rate in effect for FY 2017/2018. The contribution requirement for FY 2019/2020 and FY 2020/2021 would phase-in to the new funding policy by 1/3 and 2/3 respectively, each subsequent year.

However, since we assume that some of the current Tier 3 employees will elect to earn retirement benefits in the new defined contribution plan on July 1, 2018, the covered payroll in the retirement fund is projected to decrease from \$537 million to \$511 million, which results in the employers contributing, on a collective basis, \$4 million less money FY 2018/2019 than the prior fiscal year. Then the employer contribution effort will increase in each of the subsequent fiscal years. We believe this may have been an unintended outcome and recommend the phase-in provisions be changed from a "0/3, 1/3, 2/3, 3/3" phase-in to a "1/4, 2/4, 3/4, 4/4" phase-in approach so the employer contribution effort in FY 2018/2019 does not decrease.

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 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. At the time this analysis was prepared, the 2017 actuarial valuation results have been delivered to KRS, but have not yet been adopted by the Board of Trustees.

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.

Current Tier 3 members and future members in the KERS Hazardous and CERS Hazardous may make an election to participate in the same defined contribution plan maintained by PERS for non-hazardous members. This analysis assumes that 20% of current Tier 3 members and future members in the KERS and CERS Hazardous funds will elect to participate in the defined contribution plan. This assumption is based on our experience working with other statewide retirement systems that provide alternative, optional, defined contribution programs to members. We have also assumed the long-term employer cost of the optional defined contribution to be 4% of pay.

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. John Chilton
November 14, 2017
Page 6

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

cc: Mr. David L. Eager, KRS
Ms. Karen D. Roggenkamp, KRS

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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 Change in Benefit Provision and
Employer Funding to be Effective July 1, 2018
KERS and CERS Hazardous Systems & SPRS**

Retirement Formulas

Tier 1:

- No change to the basic formula.
- For retirements on or after July 1, 2018, 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 current hybrid cash balance plan.
- Current Tier 3 members may elect to participate in the defined contribution plan applicable for non-hazardous members and have their cash balance account rolled into in their defined contribution plan.

Future Hires:

- Future employees will have a choice to participate in the hybrid cash balance plan or the defined contribution plan applicable for non-hazardous members.

DC Plan:

- The defined contribution plan provides a 3% mandatory member contributions and 2% employer contributions. Members may voluntarily contribute an additional 6% of pay and receive a 50% match on those voluntary contributions (up to 3% of pay in matching employer contributions).
 - Compensation for benefits earned in the defined contribution is not subject to the maximum creditable compensation limit that applies to compensation in the defined benefit plan that is earned after July 1, 2018.

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. Member contributions to the health insurance funds will increase by 3.00% on July 1, 2018 (i.e. Tier 1 member contribution rate will increase from 0% to 3% of pay, and the member rate in Tier 2 and the new defined contribution plan will increase from 1% to 4% of pay).
- The contributions to the health insurance funds are classified as 401(h) contributions and are not refundable to the member.

**Exhibit 1. Summary of Change in Benefit Provisions and
Employer Funding to be Effective July 1, 2018
KERS and CERS Hazardous Systems & SPRS
(Continued)**

Pension Anti-Spiking Provisions

Maximum Creditable Compensation:

- Creditable compensation earned on or after July 1, 2018 limited to the maximum taxable earnings under Social Security (\$127,200 for 2017).
 - Member contributions refunded on excess compensation, but employer normal cost contributions remain in fund to finance the unfunded actuarial accrued liability.
 - Compensation limit does not apply to members earning benefits in the new defined contribution plan.

Equipment/Uniform Allowances:

- Excluded from creditable compensation earned on or after July 1, 2018.

Sick Leave

- Converted sick service cannot exceed amount for accumulated sick leave as of June 30, 2018.
- Tier 1 sick leave service credit does not count towards retirement eligibility for those retiring on or after July 1, 2018.

Retiree Health Accessibility

- Members retiring on or after July 1, 2018 must have contributed to a state administered retirement system in the last 24 months prior to have access to the health insurance benefit.
- Members earning benefits in the defined contribution plan will be eligible for health insurance benefits upon attaining age 59½ and having 15 years of earned service at retirement.

Line of Duty Death

- The surviving spouse (if any) shall supersede all previous beneficiary designations for members that die in the line of duty on and after January 1, 2017.

Reemployment After Retirement

The following reemployment after retirement provisions apply to members who retire on or after July 1, 2018 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.
- Member and employer normal cost contributions required during reemployment and paid to system the member retired from.

**Exhibit 1. Summary of Change in Benefit Provisions and
Employer Funding to be Effective July 1, 2018
KERS and CERS Hazardous Systems & SPRS
(Continued)**

Employer Funding

Contribution rates for KERS, CERS, and SPRS will change every year.

Actuarially Determined Contributions (ADC) for actuarial valuations performed on and after June 30, 2017 are based on a 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. Payroll for employer normal cost contributions is not limited to the Compensation Limit used for determining benefits.
- Unfunded liability payment determined using a closed 30-year amortization period (reset to 30 years starting in the 2017 valuation).
 - Level dollar amortization method.

Four-Year Phase-In for CERS

- The contribution requirement for fiscal year 2018/2019 will remain unchanged from the Fiscal Year 2017/2018 contribution requirement.
- Fiscal Year 2019/2020 contribution requirement is equal to 2/3 times the 2018/2019 contribution requirement plus 1/3 times the actuarially determined contribution determined by the 2018 actuarial valuation.
- Fiscal Year 2020/2021 contribution requirement is equal to 1/3 times the 2018/2019 contribution requirement plus 2/3 times the actuarially determined contribution determined by the 2019 actuarial valuation.
- Contribution requirements for fiscal year 2021/2022 and beyond are equal to the actuarially determined contribution rates determined by the actuarial valuations.

Allocation of amortization payment for the unfunded liability to participating employers in CERS Hazardous

- Dollar amount of the amortization payment will be allocated to each participating employer in proportion to their share of the total payroll in FY 2015, 2016, and 2017, adjusted for any employer 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 I-1
KERS Hazardous Retirement Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 514	\$ 514	\$ 0	54%	54%	0%	\$ 35	\$ 35	\$ 0	21%	21%	0%
2018	518	518	0	55%	55%	0%	57	53	(4)	34%	32%	-2%
2019	517	521	4	56%	56%	0%	58	54	(4)	34%	31%	-3%
2020	508	516	8	58%	57%	-1%	57	54	(3)	33%	31%	-2%
2021	490	501	11	61%	59%	-2%	58	54	(4)	33%	30%	-3%
2022	475	491	16	63%	61%	-2%	55	53	(2)	30%	29%	-2%
2023	464	482	18	64%	63%	-1%	57	52	(5)	30%	28%	-2%
2024	449	473	24	66%	64%	-2%	55	52	(3)	28%	27%	-1%
2025	435	463	28	68%	65%	-3%	56	52	(4)	28%	26%	-2%
2026	419	452	33	70%	67%	-3%	53	51	(2)	26%	25%	-1%
2027	403	440	37	71%	68%	-3%	55	50	(5)	26%	25%	-2%
2028	386	429	43	73%	69%	-4%	52	50	(2)	25%	24%	-1%
2029	369	415	46	75%	70%	-5%	53	49	(4)	25%	23%	-2%
2030	350	402	52	76%	72%	-4%	51	49	(2)	23%	22%	-1%
2031	331	388	57	78%	73%	-5%	53	49	(4)	23%	22%	-2%
2032	310	374	64	80%	74%	-6%	51	49	(2)	22%	21%	-1%
2033	289	358	69	81%	76%	-5%	53	50	(3)	22%	20%	-1%
2034	266	342	76	83%	77%	-6%	51	50	(1)	20%	20%	-1%
2035	243	325	82	85%	78%	-7%	52	50	(2)	20%	19%	-1%
2036	217	305	88	87%	80%	-7%	51	50	(1)	19%	19%	0%
2037	192	285	93	88%	82%	-6%	52	50	(2)	19%	18%	-1%
2038	163	264	101	90%	83%	-7%	50	50	-	18%	18%	0%
2039	134	241	107	92%	85%	-7%	51	50	(1)	18%	18%	-1%
2040	103	218	115	94%	86%	-8%	49	50	1	17%	17%	0%
2041	72	192	120	96%	88%	-8%	50	50	-	17%	17%	0%
2042	37	165	128	98%	90%	-8%	49	50	1	17%	17%	0%
2043	0	136	136	100%	92%	-8%	13	50	37	4%	16%	12%
2044	0	105	105	100%	94%	-6%	13	50	37	4%	16%	12%
2045	0	72	72	100%	96%	-4%	13	51	38	4%	16%	12%
2046	0	38	38	100%	98%	-2%	13	51	38	4%	16%	12%
2047	0	0	0	100%	100%	0%	14	13	(1)	4%	4%	0%
2048	0	0	0	100%	100%	0%	14	13	(1)	4%	4%	0%
2049	0	0	0	100%	100%	0%	14	13	(1)	4%	4%	0%
2050	0	0	0	100%	100%	0%	15	13	(2)	4%	4%	0%
2051	0	0	0	100%	100%	0%	15	14	(1)	4%	4%	0%

Notes and assumptions:

The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and that employers contribute 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-2
CERS Hazardous Retirement Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability		Funded Ratio		Employer Contribution		Employer Contribution Rate	
	Current (2)	Proposed (3)	Current (4)	Proposed (5)	Current (7)	Proposed (8)	Current (10)	Proposed (11)
		Difference (3)		Difference (6)		Difference (9)		Difference (12)
2017	\$ 2,411	\$ 2,409	48%	48%	\$ 120	\$ 120	22%	22%
2018	2,478	2,479	48%	48%	192	114	36%	21%
2019	2,504	2,583	49%	47%	193	150	36%	28%
2020	2,500	2,628	50%	47%	197	191	36%	35%
2021	2,456	2,600	52%	48%	199	230	36%	42%
2022	2,433	2,553	53%	50%	199	226	36%	41%
2023	2,405	2,505	54%	52%	201	223	36%	40%
2024	2,372	2,454	55%	53%	202	222	36%	39%
2025	2,333	2,401	56%	54%	204	220	36%	38%
2026	2,288	2,344	57%	56%	207	218	35%	38%
2027	2,236	2,286	59%	57%	209	217	35%	37%
2028	2,178	2,223	60%	58%	212	216	35%	36%
2029	2,111	2,157	61%	60%	215	214	35%	35%
2030	2,037	2,087	63%	61%	218	213	35%	34%
2031	1,954	2,014	64%	62%	222	212	35%	33%
2032	1,861	1,936	66%	64%	225	213	34%	32%
2033	1,759	1,855	68%	65%	229	212	34%	32%
2034	1,646	1,768	70%	67%	233	212	34%	31%
2035	1,522	1,675	72%	68%	238	211	34%	30%
2036	1,385	1,577	75%	70%	242	211	34%	29%
2037	1,235	1,473	78%	72%	247	212	33%	29%
2038	1,071	1,363	81%	74%	251	212	33%	28%
2039	892	1,245	84%	76%	256	212	33%	27%
2040	697	1,121	87%	78%	261	212	33%	27%
2041	484	988	91%	81%	267	212	33%	26%
2042	254	848	95%	83%	272	212	33%	26%
2043	0	698	100%	86%	12	213	1%	25%
2044	0	539	100%	89%	12	213	1%	25%
2045	0	370	100%	93%	12	214	1%	24%
2046	0	191	100%	96%	13	214	1%	24%
2047	0	0	100%	100%	13	17	1%	2%
2048	0	0	100%	100%	13	18	1%	2%
2049	0	0	100%	100%	14	19	1%	2%
2050	0	0	100%	100%	14	19	1%	2%
2051	0	0	100%	100%	14	19	1%	2%

Notes and assumptions:

The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and that employers contribute 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-3
SPRS Retirement Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 706	\$ 706	\$ -	27%	27%	0%	\$ 35	\$ 35	\$ 0	72%	72%	0%
2018	706	706	-	27%	27%	0%	58	54	(4)	119%	111%	-8%
2019	697	700	3	28%	28%	0%	59	54	(5)	119%	109%	-10%
2020	682	691	9	30%	29%	-1%	58	54	(4)	116%	108%	-8%
2021	664	676	12	32%	30%	-2%	59	54	(5)	116%	106%	-10%
2022	645	664	19	34%	31%	-3%	58	54	(4)	111%	104%	-8%
2023	626	651	25	35%	33%	-2%	59	53	(6)	111%	102%	-10%
2024	606	636	30	37%	34%	-3%	57	53	(4)	106%	99%	-7%
2025	586	621	35	39%	35%	-4%	58	53	(5)	106%	97%	-9%
2026	563	605	42	41%	36%	-5%	56	52	(4)	101%	94%	-7%
2027	541	589	48	43%	37%	-6%	58	52	(6)	101%	92%	-9%
2028	515	572	57	45%	39%	-6%	56	52	(4)	95%	89%	-6%
2029	490	553	63	47%	40%	-7%	57	52	(5)	95%	87%	-9%
2030	463	534	71	50%	41%	-9%	55	52	(3)	89%	84%	-5%
2031	437	514	77	52%	43%	-9%	57	52	(5)	89%	82%	-8%
2032	406	493	87	55%	45%	-10%	55	52	(3)	84%	80%	-4%
2033	378	470	92	58%	47%	-11%	56	52	(4)	84%	77%	-6%
2034	344	448	104	61%	49%	-12%	54	52	(2)	78%	75%	-3%
2035	313	422	109	64%	51%	-13%	55	52	(3)	78%	73%	-5%
2036	277	397	120	68%	53%	-15%	53	51	(2)	73%	71%	-2%
2037	243	369	126	72%	56%	-16%	55	51	(4)	73%	70%	-4%
2038	205	340	135	76%	59%	-17%	52	51	(1)	69%	68%	-1%
2039	168	310	142	80%	62%	-18%	54	52	(2)	69%	66%	-2%
2040	126	279	153	85%	66%	-19%	51	53	2	64%	65%	1%
2041	86	245	159	90%	69%	-21%	52	53	1	64%	64%	0%
2042	42	210	168	95%	73%	-22%	49	53	4	58%	62%	4%
2043	0	172	172	100%	78%	-22%	5	53	48	6%	61%	55%
2044	0	133	133	100%	83%	-17%	5	53	48	6%	60%	54%
2045	0	92	92	100%	88%	-12%	5	53	48	6%	59%	53%
2046	0	48	48	100%	94%	-6%	5	54	49	6%	58%	52%
2047	0	0	0	100%	100%	0%	5	6	1	6%	6%	0%
2048	0	0	0	100%	100%	0%	6	6	0	6%	6%	0%
2049	0	0	0	100%	100%	0%	6	6	0	6%	5%	0%
2050	0	0	0	100%	100%	0%	6	6	0	6%	5%	0%
2051	0	0	0	100%	100%	0%	6	6	0	6%	5%	0%

Notes and assumptions:

The projected employer contribution dollar amount and the composite employer contribution rate assume that members earning benefits in the defined contribution plan contribute 7% of pay and that employers contribute 4% of pay.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference
2017	\$ (74)	\$ (88)	\$ (14)	118%	122%	4%	\$ 4	\$ 4	\$ 0	2%	2%	0%
2018	(71)	(88)	(17)	116%	121%	5%	4	0	(4)	2%	0%	-2%
2019	(63)	(85)	(22)	114%	120%	6%	4	0	(4)	2%	0%	-2%
2020	(61)	(88)	(27)	113%	120%	7%	4	0	(4)	2%	0%	-2%
2021	(66)	(99)	(33)	114%	122%	8%	4	0	(4)	2%	0%	-2%
2022	(65)	(105)	(40)	113%	123%	10%	2	0	(2)	1%	0%	-1%
2023	(64)	(112)	(48)	113%	124%	11%	2	0	(2)	1%	0%	-1%
2024	(62)	(121)	(59)	112%	126%	14%	1	0	(1)	1%	0%	-1%
2025	(61)	(129)	(68)	112%	127%	15%	1	0	(1)	1%	0%	-1%
2026	(60)	(139)	(79)	111%	129%	18%	1	0	(1)	0%	0%	0%
2027	(57)	(150)	(93)	111%	132%	21%	1	0	(1)	0%	0%	0%
2028	(55)	(162)	(107)	110%	134%	24%	0	0	0	0%	0%	0%
2029	(53)	(175)	(122)	110%	137%	27%	0	0	0	0%	0%	0%
2030	(50)	(189)	(139)	109%	141%	32%	0	0	0	0%	0%	0%
2031	(47)	(205)	(158)	109%	145%	36%	0	0	0	0%	0%	0%
2032	(44)	(220)	(176)	108%	148%	40%	0	0	0	0%	0%	0%
2033	(40)	(238)	(198)	107%	152%	45%	0	0	0	0%	0%	0%
2034	(37)	(257)	(220)	107%	157%	50%	1	0	(1)	0%	0%	0%
2035	(33)	(276)	(243)	106%	161%	55%	1	0	(1)	0%	0%	0%
2036	(29)	(298)	(269)	105%	167%	62%	1	0	(1)	0%	0%	0%
2037	(25)	(321)	(296)	104%	172%	68%	1	0	(1)	0%	0%	0%
2038	(21)	(345)	(324)	104%	177%	73%	1	0	(1)	0%	0%	0%
2039	(17)	(371)	(354)	103%	183%	80%	1	0	(1)	0%	0%	0%
2040	(12)	(398)	(386)	102%	188%	86%	2	0	(2)	1%	0%	-1%
2041	(8)	(427)	(419)	101%	194%	93%	2	0	(2)	1%	0%	-1%
2042	(4)	(458)	(454)	101%	199%	98%	3	0	(3)	1%	0%	-1%
2043	0	(489)	(489)	100%	204%	104%	7	0	(7)	2%	0%	-2%
2044	0	(524)	(524)	100%	210%	110%	7	0	(7)	2%	0%	-2%
2045	0	(560)	(560)	100%	215%	115%	7	0	(7)	2%	0%	-2%
2046	0	(598)	(598)	100%	220%	120%	7	0	(7)	2%	0%	-2%
2047	0	(639)	(639)	100%	226%	126%	7	0	(7)	2%	0%	-2%
2048	0	(683)	(683)	100%	232%	132%	7	0	(7)	2%	0%	-2%
2049	0	(730)	(730)	100%	239%	139%	7	0	(7)	2%	0%	-2%
2050	0	(780)	(780)	100%	245%	145%	7	0	(7)	2%	0%	-2%
2051	0	(833)	(833)	100%	252%	152%	7	0	(7)	2%	0%	-2%

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-5
CERS Hazardous Insurance Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 591	\$ 544	\$ (47)	67%	69%	2%	\$ 51	\$ 51	\$ 0	9%	9%	0%
2018	610	549	(61)	67%	69%	2%	65	41	(24)	12%	8%	-5%
2019	622	557	(65)	67%	70%	3%	64	41	(23)	12%	8%	-4%
2020	619	550	(69)	68%	71%	3%	64	40	(24)	12%	7%	-4%
2021	600	527	(73)	70%	72%	2%	63	38	(25)	12%	7%	-5%
2022	592	516	(76)	71%	73%	2%	61	35	(26)	11%	6%	-5%
2023	583	506	(77)	72%	74%	2%	59	33	(26)	11%	6%	-5%
2024	574	495	(79)	72%	74%	2%	59	31	(28)	10%	6%	-5%
2025	564	485	(79)	73%	75%	2%	58	30	(28)	10%	5%	-5%
2026	552	473	(79)	73%	75%	2%	58	29	(29)	10%	5%	-5%
2027	540	461	(79)	74%	76%	2%	57	28	(29)	10%	5%	-5%
2028	525	449	(76)	74%	76%	2%	58	27	(31)	10%	5%	-5%
2029	509	436	(73)	75%	76%	1%	58	26	(32)	9%	4%	-5%
2030	491	423	(68)	76%	76%	0%	59	25	(34)	9%	4%	-5%
2031	471	408	(63)	76%	77%	1%	59	24	(35)	9%	4%	-5%
2032	448	393	(55)	77%	77%	0%	60	24	(36)	9%	4%	-5%
2033	424	377	(47)	78%	77%	-1%	61	23	(38)	9%	4%	-5%
2034	397	360	(37)	79%	78%	-1%	62	23	(39)	9%	3%	-6%
2035	367	341	(26)	80%	79%	-1%	63	23	(40)	9%	3%	-6%
2036	334	322	(12)	82%	79%	-3%	64	22	(42)	9%	3%	-6%
2037	298	301	3	84%	80%	-4%	66	22	(44)	9%	3%	-6%
2038	259	279	20	86%	81%	-5%	67	22	(45)	9%	3%	-6%
2039	216	256	40	88%	82%	-6%	68	21	(47)	9%	3%	-6%
2040	168	231	63	91%	84%	-7%	69	21	(48)	9%	3%	-6%
2041	118	205	87	93%	86%	-7%	71	21	(50)	9%	3%	-6%
2042	62	176	114	97%	87%	-10%	72	20	(52)	9%	3%	-6%
2043	0	146	146	100%	90%	-10%	10	20	10	1%	2%	1%
2044	0	114	114	100%	92%	-8%	10	20	10	1%	2%	1%
2045	0	79	79	100%	94%	-6%	10	20	10	1%	2%	1%
2046	0	41	41	100%	97%	-3%	10	20	10	1%	2%	1%
2047	0	1	1	100%	100%	0%	10	0	(10)	1%	0%	-1%
2048	0	(21)	(21)	100%	102%	2%	10	0	(10)	1%	0%	-1%
2049	0	(46)	(46)	100%	103%	3%	10	0	(10)	1%	0%	-1%
2050	0	(73)	(73)	100%	105%	5%	10	0	(10)	1%	0%	-1%
2051	0	(103)	(103)	100%	107%	7%	10	0	(10)	1%	0%	-1%

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 1-6
SPRS Insurance Fund
Summary of Fiscal Impact
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Unfunded Actuarial Accrued Liability			Funded Ratio			Employer Contribution			Employer Contribution Rate		
	Current (2)	Proposed (3)	Difference (3)	Current (4)	Proposed (5)	Difference (6)	Current (7)	Proposed (8)	Difference (9)	Current (10)	Proposed (11)	Difference (12)
2017	\$ 97	\$ 93	\$ (4)	65%	66%	1%	\$ 9	\$ 9	\$ 0	19%	19%	0%
2018	100	94	(6)	65%	66%	1%	13	9	(4)	27%	19%	-9%
2019	100	95	(5)	66%	67%	1%	13	9	(4)	27%	18%	-9%
2020	97	94	(3)	68%	68%	0%	13	9	(4)	26%	18%	-8%
2021	93	90	(3)	70%	70%	0%	13	8	(5)	26%	17%	-9%
2022	90	88	(2)	71%	71%	0%	12	8	(4)	23%	16%	-7%
2023	88	86	(2)	72%	72%	0%	12	8	(4)	23%	15%	-8%
2024	84	85	1	74%	72%	-2%	11	7	(4)	20%	14%	-6%
2025	81	83	2	75%	73%	-2%	11	7	(4)	20%	13%	-7%
2026	78	81	3	76%	73%	-3%	10	7	(3)	18%	13%	-6%
2027	74	79	5	77%	73%	-4%	10	6	(4)	18%	12%	-6%
2028	71	76	5	78%	74%	-4%	9	6	(3)	16%	11%	-5%
2029	67	74	7	79%	74%	-5%	10	6	(4)	16%	11%	-6%
2030	64	71	7	79%	75%	-4%	9	6	(3)	15%	10%	-5%
2031	60	69	9	80%	75%	-5%	9	6	(3)	15%	10%	-5%
2032	56	66	10	81%	75%	-6%	9	6	(3)	14%	9%	-4%
2033	52	64	12	82%	75%	-7%	9	6	(3)	14%	9%	-5%
2034	47	61	14	84%	76%	-8%	9	6	(3)	13%	8%	-4%
2035	44	57	13	84%	77%	-7%	9	5	(4)	13%	8%	-4%
2036	39	54	15	86%	77%	-9%	8	5	(3)	12%	8%	-4%
2037	34	51	17	88%	78%	-10%	9	5	(4)	12%	8%	-4%
2038	29	47	18	89%	79%	-10%	8	5	(3)	11%	7%	-4%
2039	24	42	18	91%	81%	-10%	8	5	(3)	11%	7%	-4%
2040	18	39	21	93%	82%	-11%	8	5	(3)	10%	7%	-3%
2041	12	34	22	95%	84%	-11%	8	5	(3)	10%	7%	-3%
2042	6	30	24	98%	86%	-12%	8	5	(3)	10%	7%	-3%
2043	0	24	24	100%	88%	-12%	2	5	3	2%	7%	5%
2044	0	19	19	100%	91%	-9%	2	5	3	2%	7%	5%
2045	0	12	12	100%	94%	-6%	2	5	3	2%	6%	5%
2046	0	7	7	100%	97%	-3%	2	5	3	2%	6%	4%
2047	0	0	0	100%	100%	0%	2	0	(2)	2%	0%	-2%
2048	0	(2)	(2)	100%	101%	1%	2	0	(2)	2%	0%	-2%
2049	0	(3)	(3)	100%	101%	1%	2	0	(2)	2%	0%	-2%
2050	0	(5)	(5)	100%	102%	2%	2	0	(2)	2%	0%	-2%
2051	0	(7)	(7)	100%	103%	3%	2	0	(2)	2%	0%	-2%

Gabriel Roeder Smith & Company

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.

Gabriel Roeder Smith & Company

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.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 2-3
SPRS Retirement Fund
Current Plan
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial 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	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.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1,	Actuarial 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 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%

Notes and assumptions:

The projection is based on the results of the June 30, 2017 actuarial valuation and assumes constant active membership count in all future years.
The employer actuarially determined contribution rate for a particular year is determined by the prior year's actuarial valuation.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1,	Actual Liability	Actual 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.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1,	Actual Liability	Actual 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	0	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.

Gabriel Roeder Smith & Company

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,	(1)	Actuarial Liability	(2)	Actuarial Value of Assets	(3)	Unfunded Actuarial Accrued Liability	(4)	Funded Ratio	(5)	Employer Contribution Pension Plan	(6)	Member Contribution Pension Plan	(7)	Pension Plan Covered Payroll	(8)	Employer Contribution as % of Covered Payroll	(9)	Employer Actual Determined Rate	(10)	DC Plan Covered Payroll	(11)	Employer Contribution DC Plan	(12)	Member Contribution DC Plan	(13)	Total Employer Contributions (6) + (12)	(14)	Total Employer Contribution Rate (14) / (8)+(11)	(15)
2017		\$ 1,121	\$	607	\$	514	54%	35	13	\$ 162	21.44%	0	\$	0	\$	20.48%	0	\$	0	\$	0	\$	0	\$	0	\$	35	21.44%	
2018		1,151		633		518	55%	53	12	153	34.47%	0		12		34.47%	0		12		34.47%	0		1		53	32.18%		
2019		1,181		660		521	56%	53	12	156	33.78%	0		14		33.78%	1		14		33.78%	1		1		54	31.32%		
2020		1,209		693		516	57%	53	13	159	33.36%	0		16		33.36%	1		16		33.36%	1		1		54	30.73%		
2021		1,236		735		501	59%	53	13	161	32.63%	0		17		32.63%	1		17		32.63%	1		1		54	29.87%		
2022		1,261		770		491	61%	52	13	164	31.46%	0		19		31.46%	1		19		31.46%	1		1		53	28.64%		
2023		1,286		804		482	63%	51	13	167	30.67%	0		20		30.67%	1		20		30.67%	1		1		52	27.76%		
2024		1,310		837		473	64%	51	14	171	29.84%	0		22		29.84%	1		22		29.84%	1		2		52	26.89%		
2025		1,333		870		463	65%	51	14	173	29.16%	0		24		29.16%	1		24		29.16%	1		2		52	26.12%		
2026		1,354		902		452	67%	50	14	176	28.42%	0		26		28.42%	1		26		28.42%	1		2		51	25.32%		
2027		1,372		932		440	68%	49	14	179	27.71%	0		28		27.71%	1		28		27.71%	1		2		50	24.54%		
2028		1,390		961		429	69%	49	15	181	26.95%	0		30		26.95%	1		30		26.95%	1		2		50	23.74%		
2029		1,405		990		415	70%	48	15	185	26.18%	0		31		26.18%	1		31		26.18%	1		2		49	22.97%		
2030		1,420		1,018		402	72%	48	15	189	25.45%	0		33		25.45%	1		33		25.45%	1		2		49	22.27%		
2031		1,435		1,047		388	73%	48	16	194	24.76%	0		35		24.76%	1		35		24.76%	1		2		49	21.63%		
2032		1,451		1,077		374	74%	48	16	199	24.10%	0		36		24.10%	1		36		24.10%	1		3		49	21.02%		
2033		1,467		1,109		358	76%	48	16	205	23.47%	0		38		23.47%	2		38		23.47%	2		3		50	20.46%		
2034		1,485		1,143		342	77%	48	17	210	22.91%	0		39		22.91%	2		39		22.91%	2		3		50	19.94%		
2035		1,504		1,179		325	78%	48	17	215	22.39%	0		41		22.39%	2		41		22.39%	2		3		50	19.46%		
2036		1,522		1,217		305	80%	48	18	220	21.84%	0		43		21.84%	2		43		21.84%	2		3		50	18.95%		
2037		1,541		1,256		285	82%	48	18	225	21.35%	0		44		21.35%	2		44		21.35%	2		3		50	18.49%		
2038		1,560		1,296		264	83%	48	18	229	20.87%	0		46		20.87%	2		46		20.87%	2		3		50	18.03%		
2039		1,577		1,336		241	85%	48	19	234	20.41%	0		48		20.41%	2		48		20.41%	2		3		50	17.59%		
2040		1,594		1,376		218	86%	48	19	238	19.98%	0		50		19.98%	2		50		19.98%	2		3		50	17.23%		
2041		1,609		1,417		192	88%	48	19	242	19.63%	0		50		19.63%	2		50		19.63%	2		4		50	16.94%		
2042		1,624		1,459		165	90%	48	20	248	19.28%	0		51		19.28%	2		51		19.28%	2		4		50	16.66%		
2043		1,638		1,502		136	92%	48	20	253	18.95%	0		52		18.95%	2		52		18.95%	2		4		50	16.40%		
2044		1,652		1,547		105	94%	48	21	258	18.67%	0		53		18.67%	2		53		18.67%	2		4		50	16.17%		
2045		1,666		1,594		72	96%	49	21	264	18.42%	0		54		18.42%	2		54		18.42%	2		4		51	15.96%		
2046		1,681		1,643		38	98%	49	22	270	18.24%	0		55		18.24%	2		55		18.24%	2		4		51	15.82%		
2047		1,696		1,696		0	100%	11	22	276	3.86%	0		57		3.86%	2		57		3.86%	2		4		13	3.88%		
2048		1,711		1,711		0	100%	11	23	282	3.86%	0		58		3.86%	2		58		3.86%	2		4		13	3.88%		
2049		1,726		1,726		0	100%	11	23	289	3.86%	0		59		3.86%	2		59		3.86%	2		4		13	3.88%		
2050		1,743		1,743		0	100%	11	24	296	3.86%	0		60		3.86%	2		60		3.86%	2		4		13	3.88%		
2051		1,759		1,759		0	100%	12	24	302	3.86%	0		62		3.86%	2		62		3.86%	2		4		14	3.88%		

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.

Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).

Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.

Covered Payroll for the defined contribution plan is not subject to an earnings limit.

It is assumed that 20% of the current Tier 3 members and future new hires will elect to participate in the optional defined contribution plan maintained by PERS.

Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributes 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems
Exhibit 3-2
CERS Hazardous Retirement Fund
Proposed Legislation
(\$ in Millions)

Fiscal Year Beginning July 1, (1)	Actuarial Liability (2)	Actuarial Value of Assets (3)	Unfunded Actuarial Liability (4)	Funded Ratio (3)/(2) (5)	Employer Contribution Pension Plan (6)	Member Contribution Pension Plan (7)	Pension Plan Covered Payroll (8)	Employer Contribution as % of Covered Payroll (9)	Employer Actuarial Determined Rate (10)	DC Plan Covered Payroll (11)	Employer Contribution DC Plan (12)	Member Contribution DC Plan (13)	Total Employer Contributions (6) + (12) (14)	Total Employer Contribution Rate (14) / ((8)+(11)) (15)
2017	\$ 4,647	\$ 2,238	\$ 2,409	48%	\$ 120	\$ 43	\$ 542	22.20%	22.20%	\$ 0	\$ 0	\$ 0	\$ 0	22.20%
2018	4,765	2,286	2,479	48%	113	41	511	22.20%	42.37%	26	1	2	2	21.31%
2019	4,870	2,287	2,583	47%	149	40	505	29.45%	43.95%	34	1	2	2	27.86%
2020	4,963	2,335	2,628	47%	189	40	501	37.67%	45.41%	41	2	3	3	35.13%
2021	5,046	2,446	2,600	48%	228	40	498	45.84%	45.84%	48	2	3	3	42.17%
2022	5,118	2,565	2,553	50%	224	40	497	45.05%	45.05%	55	2	4	4	40.96%
2023	5,180	2,675	2,505	52%	221	40	496	44.61%	44.61%	62	2	4	4	40.11%
2024	5,231	2,777	2,454	53%	219	40	497	44.12%	44.12%	68	3	5	5	39.26%
2025	5,273	2,872	2,401	54%	217	40	498	43.58%	43.58%	75	3	5	5	38.40%
2026	5,304	2,960	2,344	56%	215	40	501	43.00%	43.00%	82	3	6	6	37.53%
2027	5,326	3,040	2,286	57%	213	40	504	42.35%	42.35%	88	4	6	6	36.65%
2028	5,338	3,115	2,223	58%	212	41	508	41.65%	41.65%	94	4	7	7	35.77%
2029	5,342	3,185	2,157	60%	210	41	514	40.88%	40.88%	100	4	7	7	34.89%
2030	5,339	3,252	2,087	61%	209	42	522	40.05%	40.05%	105	4	7	7	34.00%
2031	5,331	3,317	2,014	62%	208	42	531	39.22%	39.22%	110	4	8	8	33.15%
2032	5,319	3,383	1,936	64%	207	43	541	38.37%	38.37%	115	5	8	8	32.32%
2033	5,305	3,450	1,855	65%	207	44	552	37.51%	37.51%	120	5	8	8	31.52%
2034	5,289	3,521	1,768	67%	207	45	563	36.68%	36.68%	125	5	9	9	30.76%
2035	5,271	3,596	1,675	68%	206	46	575	35.89%	35.89%	129	5	9	9	30.03%
2036	5,253	3,676	1,577	70%	206	47	587	35.13%	35.13%	134	5	9	9	29.34%
2037	5,233	3,760	1,473	72%	206	48	600	34.38%	34.38%	139	6	10	10	28.67%
2038	5,213	3,850	1,363	74%	206	49	612	33.66%	33.66%	144	6	10	10	28.02%
2039	5,191	3,946	1,245	76%	206	50	625	32.96%	32.96%	148	6	10	10	27.41%
2040	5,169	4,048	1,121	78%	206	51	638	32.25%	32.25%	153	6	11	11	26.80%
2041	5,147	4,159	988	81%	206	52	652	31.58%	31.58%	157	6	11	11	26.22%
2042	5,127	4,279	848	83%	206	53	667	30.89%	30.89%	161	6	11	11	25.65%
2043	5,108	4,410	698	86%	206	55	682	30.23%	30.23%	166	7	12	12	25.10%
2044	5,092	4,553	539	89%	206	56	697	29.59%	29.59%	170	7	12	12	24.58%
2045	5,077	4,707	370	93%	207	57	713	28.97%	28.97%	174	7	12	12	24.08%
2046	5,064	4,873	191	96%	207	58	729	28.39%	28.39%	178	7	12	12	23.61%
2047	5,053	5,053	0	100%	10	60	746	1.40%	1.40%	182	7	13	13	1.91%
2048	5,042	5,042	0	100%	11	61	762	1.40%	1.40%	186	7	13	13	1.91%
2049	5,033	5,033	0	100%	11	62	780	1.40%	1.40%	190	8	13	13	1.91%
2050	5,025	5,025	0	100%	11	64	797	1.40%	1.40%	194	8	14	14	1.91%
2051	5,019	5,019	0	100%	11	65	815	1.40%	1.40%	199	8	14	14	1.91%

Notes and assumptions:

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

The actuarial determined contribution is determined by the prior year's actuarial valuation.

Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).

Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.

Covered Payroll for the defined contribution plan is not subject to an earnings limit.

It is assumed that 20% of the current Tier 3 members and future new hires will elect to participate in the optional defined contribution plan maintained by PERS.

Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributes 4% of pay.

Gabriel Roeder Smith & Company

Kentucky Retirement Systems

Exhibit 3-3

SPRS Retirement Fund

Proposed Legislation

(\$ in Millions)

Fiscal Year Beginning July 1,	(1)	Actuarial Liability	(2)	Actuarial Value of Assets	(3)	Unfunded Actuarial Liability	(4)	Funded Ratio	(5)	Employer Contribution Pension Plan	(6)	Member Contribution Pension Plan	(7)	Pension Plan Covered Payroll	(8)	Employer Contribution as % of Covered Payroll	(9)	Employer Actuarial Determined Contribution Rate	(10)	DC Plan Covered Payroll	(11)	Employer Contribution DC Plan	(12)	Member Contribution DC Plan	(13)	Total Employer Contributions (6) + (12)	(14)	Total Employer Contribution Rate (14) / (8)+(11)	(15)	
2017		\$ 967		\$ 261		\$ 706		27%		\$ 35		\$ 4		\$ 49		72.47%		71.57%		\$ 0		\$ 0		\$ 0		\$ 0		35		72.47%
2018		970		264		706		27%		54		4		47		114.73%		114.73%		1		0		0		0		54		111.39%
2019		971		271		700		28%		54		4		48		113.81%		113.81%		2		0		0		0		54		109.49%
2020		971		280		691		29%		54		4		48		113.71%		113.71%		2		0		0		0		54		108.43%
2021		970		294		676		30%		54		4		48		112.62%		112.62%		3		0		0		0		54		106.39%
2022		968		304		664		31%		54		4		48		110.85%		110.85%		3		0		0		0		54		103.80%
2023		965		314		651		33%		53		4		49		109.40%		109.40%		4		0		0		0		53		101.52%
2024		960		324		636		34%		53		4		49		107.91%		107.91%		4		0		0		0		53		99.22%
2025		954		333		621		35%		53		4		50		106.62%		106.62%		5		0		0		0		53		97.02%
2026		947		342		605		36%		52		4		50		104.69%		104.69%		6		0		0		0		52		94.44%
2027		939		350		589		37%		52		4		51		102.46%		102.46%		6		0		0		0		52		91.73%
2028		931		359		572		39%		52		4		52		100.29%		100.29%		7		0		0		0		52		89.19%
2029		921		368		553		40%		52		4		53		98.08%		98.08%		7		0		0		0		52		86.66%
2030		911		377		534		41%		52		4		54		95.72%		95.72%		8		0		0		0		52		84.12%
2031		901		387		514		43%		52		4		55		93.35%		93.35%		8		0		0		0		52		81.68%
2032		891		398		493		45%		52		5		57		91.34%		91.34%		9		0		0		0		52		79.51%
2033		880		410		470		47%		52		5		58		89.02%		89.02%		10		0		0		0		52		77.23%
2034		870		422		448		49%		52		5		59		86.85%		86.85%		10		0		0		0		52		75.11%
2035		859		437		422		51%		52		5		61		85.03%		85.03%		10		0		0		0		52		73.23%
2036		849		452		397		53%		51		5		62		83.27%		83.27%		11		0		0		0		51		71.42%
2037		838		469		369		56%		51		5		63		81.39%		81.39%		11		0		0		0		51		69.58%
2038		828		488		340		59%		51		5		65		79.76%		79.76%		12		0		0		0		51		67.97%
2039		818		508		310		62%		52		5		66		78.03%		78.03%		12		0		0		0		52		66.29%
2040		809		530		279		66%		52		5		67		76.57%		76.57%		13		1		1		1		53		64.93%
2041		800		555		245		69%		52		5		69		75.17%		75.17%		13		1		1		1		53		63.64%
2042		791		581		210		73%		52		6		70		73.60%		73.60%		14		1		1		1		53		62.22%
2043		782		610		172		78%		52		6		72		72.30%		72.30%		14		1		1		1		53		61.03%
2044		774		641		133		83%		52		6		73		71.04%		71.04%		15		1		1		1		53		59.93%
2045		767		675		92		88%		52		6		75		69.91%		69.91%		15		1		1		1		53		58.93%
2046		760		712		48		94%		53		6		76		69.14%		69.14%		15		1		1		1		54		58.24%
2047		753		753		0		100%		5		6		78		5.83%		5.83%		16		1		1		1		6		5.52%
2048		747		747		0		100%		5		6		80		5.81%		5.81%		16		1		1		1		6		5.51%
2049		741		741		0		100%		5		6		81		5.80%		5.80%		16		1		1		1		6		5.50%
2050		735		735		0		100%		5		7		83		5.79%		5.79%		17		1		1		1		6		5.49%
2051		730		730		0		100%		5		7		85		5.79%		5.79%		17		1		1		1		6		5.49%

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.

Covered Payroll for the pension plan is not limited to the projected Social Security maximum earnings limit (assumed to increase at 2.30% per year).

Employer contribution rate and the actuarially determined contribution rate is equal to the required contribution divided by the unlimited payroll of the members earning benefits in the legacy pension plan.

Covered Payroll for the defined contribution plan is not subject to an earnings limit.

It is assumed that 20% of the current Tier 3 members and future new hires will elect to participate in the optional defined contribution plan maintained by PERS.

Employer and member contributions to the defined contribution plan assume the member contributes 7% of pay and the employer contributes 4% of pay.

Gabriel Roeder Smith & Company

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

Fiscal Year Beginning July 1,	Actuarial Liability	Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio (3) / (2)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarial Determined Contribution Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2017	\$ 405	\$ 493	\$ (88)	122%	\$ 4	\$ 1	\$ 162	2.26%	1.34%
2018	419	507	(88)	121%	0	6	165	0.00%	0.00%
2019	432	517	(85)	120%	0	6	169	0.00%	0.00%
2020	443	531	(88)	120%	0	6	174	0.00%	0.00%
2021	452	551	(99)	122%	0	7	178	0.00%	0.00%
2022	460	565	(105)	123%	0	7	183	0.00%	0.00%
2023	466	578	(112)	124%	0	7	187	0.00%	0.00%
2024	469	590	(121)	126%	0	7	192	0.00%	0.00%
2025	472	601	(129)	127%	0	8	197	0.00%	0.00%
2026	472	611	(139)	129%	0	8	201	0.00%	0.00%
2027	472	622	(150)	132%	0	8	206	0.00%	0.00%
2028	470	632	(162)	134%	0	8	210	0.00%	0.00%
2029	467	642	(175)	137%	0	9	216	0.00%	0.00%
2030	464	653	(189)	141%	0	9	222	0.00%	0.00%
2031	460	665	(205)	145%	0	9	228	0.00%	0.00%
2032	457	677	(220)	148%	0	9	235	0.00%	0.00%
2033	454	692	(238)	152%	0	10	242	0.00%	0.00%
2034	451	708	(257)	157%	0	10	249	0.00%	0.00%
2035	449	725	(276)	161%	0	10	255	0.00%	0.00%
2036	447	745	(298)	167%	0	11	262	0.00%	0.00%
2037	446	767	(321)	172%	0	11	269	0.00%	0.00%
2038	447	792	(345)	177%	0	11	275	0.00%	0.00%
2039	448	819	(371)	183%	0	11	281	0.00%	0.00%
2040	452	850	(398)	188%	0	11	287	0.00%	0.00%
2041	456	883	(427)	194%	0	12	292	0.00%	0.00%
2042	462	920	(458)	199%	0	12	298	0.00%	0.00%
2043	470	959	(489)	204%	0	12	304	0.00%	0.00%
2044	478	1,002	(524)	210%	0	12	311	0.00%	0.00%
2045	487	1,047	(560)	215%	0	13	318	0.00%	0.00%
2046	497	1,095	(598)	220%	0	13	325	0.00%	0.00%
2047	507	1,146	(639)	226%	0	13	332	0.00%	0.00%
2048	517	1,200	(683)	232%	0	14	340	0.00%	0.00%
2049	527	1,257	(730)	239%	0	14	348	0.00%	0.00%
2050	538	1,318	(780)	245%	0	14	355	0.00%	0.00%
2051	548	1,381	(833)	252%	0	15	364	0.00%	0.00%

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.

Gabriel Roeder Smith & Company

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	\$ 1,741	\$ 1,197	\$ 544	69%	\$ 51	\$ 2	\$ 541	9.35%	9.35%
2018	1,792	1,243	549	69%	41	18	536	7.58%	7.58%
2019	1,838	1,281	557	70%	41	18	538	7.55%	7.55%
2020	1,876	1,326	550	71%	40	19	541	7.38%	7.38%
2021	1,905	1,378	527	72%	38	19	546	7.02%	7.02%
2022	1,925	1,409	516	73%	35	20	551	6.42%	6.42%
2023	1,936	1,430	506	74%	33	20	558	6.04%	6.04%
2024	1,936	1,441	495	74%	31	21	565	5.67%	5.67%
2025	1,928	1,443	485	75%	30	21	573	5.34%	5.34%
2026	1,912	1,439	473	75%	29	22	582	5.05%	5.05%
2027	1,888	1,427	461	76%	28	23	591	4.78%	4.78%
2028	1,859	1,410	449	76%	27	23	602	4.55%	4.55%
2029	1,825	1,389	436	76%	26	24	614	4.32%	4.32%
2030	1,788	1,365	423	76%	25	25	627	4.13%	4.13%
2031	1,749	1,341	408	77%	24	25	641	3.95%	3.95%
2032	1,708	1,315	393	77%	24	26	656	3.79%	3.79%
2033	1,667	1,290	377	77%	23	27	672	3.61%	3.61%
2034	1,627	1,267	360	78%	23	27	688	3.48%	3.48%
2035	1,587	1,246	341	79%	23	28	704	3.34%	3.34%
2036	1,550	1,228	322	79%	22	29	721	3.21%	3.21%
2037	1,517	1,216	301	80%	22	29	738	3.09%	3.09%
2038	1,487	1,208	279	81%	22	30	755	2.98%	2.98%
2039	1,460	1,204	256	82%	21	31	772	2.88%	2.88%
2040	1,438	1,207	231	84%	21	31	790	2.77%	2.77%
2041	1,420	1,215	205	86%	21	32	809	2.68%	2.68%
2042	1,405	1,229	176	87%	20	33	828	2.59%	2.59%
2043	1,396	1,250	146	90%	20	34	847	2.49%	2.49%
2044	1,390	1,276	114	92%	20	34	866	2.41%	2.41%
2045	1,387	1,308	79	94%	20	35	886	2.34%	2.34%
2046	1,386	1,345	41	97%	20	36	906	2.29%	2.29%
2047	1,387	1,386	1	100%	0	37	926	0.00%	0.00%
2048	1,389	1,410	(21)	102%	0	38	947	0.00%	0.00%
2049	1,391	1,437	(46)	103%	0	39	969	0.00%	0.00%
2050	1,392	1,465	(73)	105%	0	39	991	0.00%	0.00%
2051	1,393	1,496	(103)	107%	0	40	1,013	0.00%	0.00%

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.

Gabriel Roeder Smith & Company

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 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	\$ 273	\$ 180	\$ 93	66%	\$ 9	\$ 0	\$ 48	18.77%	18.10%
2018	280	186	94	66%	9	2	48	18.68%	18.68%
2019	287	192	95	67%	9	2	49	18.26%	18.26%
2020	292	198	94	68%	9	2	49	17.88%	17.88%
2021	297	207	90	70%	8	2	50	17.11%	17.11%
2022	300	212	88	71%	8	2	51	15.90%	15.90%
2023	302	216	86	72%	8	2	52	14.99%	14.99%
2024	303	218	85	72%	7	2	53	14.09%	14.09%
2025	302	219	83	73%	7	2	54	13.27%	13.27%
2026	300	219	81	73%	7	2	55	12.56%	12.56%
2027	297	218	79	73%	6	2	56	11.89%	11.89%
2028	292	216	76	74%	6	2	57	11.26%	11.26%
2029	287	213	74	74%	6	2	59	10.71%	10.71%
2030	281	210	71	75%	6	2	61	10.18%	10.18%
2031	275	206	69	75%	6	2	62	9.70%	9.70%
2032	268	202	66	75%	6	3	64	9.24%	9.24%
2033	261	197	64	75%	6	3	66	8.83%	8.83%
2034	254	193	61	76%	6	3	68	8.46%	8.46%
2035	246	189	57	77%	5	3	69	8.13%	8.13%
2036	239	185	54	77%	5	3	71	7.88%	7.88%
2037	233	182	51	78%	5	3	73	7.65%	7.65%
2038	227	180	47	79%	5	3	75	7.43%	7.43%
2039	221	179	42	81%	5	3	77	7.23%	7.23%
2040	217	178	39	82%	5	3	78	7.05%	7.05%
2041	212	178	34	84%	5	3	80	6.92%	6.92%
2042	209	179	30	86%	5	3	82	6.80%	6.80%
2043	206	182	24	88%	5	3	84	6.65%	6.65%
2044	204	185	19	91%	5	3	85	6.52%	6.52%
2045	202	190	12	94%	5	4	87	6.39%	6.39%
2046	202	195	7	97%	5	4	89	6.26%	6.26%
2047	201	201	0	100%	0	4	91	0.00%	0.00%
2048	201	203	(2)	101%	0	4	93	0.00%	0.00%
2049	202	205	(3)	101%	0	4	95	0.00%	0.00%
2050	202	207	(5)	102%	0	4	97	0.00%	0.00%
2051	202	209	(7)	103%	0	4	99	0.00%	0.00%

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.

Gabriel Roeder Smith & Company