TEACHERS' RETIREMENT SYSTEM OF KENTUCKY

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November 8, 2017

Senator Robert Stivers
Senate President
Capitol Annex
Frankfort, KY 40601

Representative David Osborne
Speaker Pro Tem
Capitol Annex
Frankfort, KY 40601

RE: Actuarial Analysis – 17 SS Bill Request 10

Gentlemen:

Attached is a copy of the actuarial analysis conducted by the independent actuary for Teachers' Retirement System of the State of Kentucky regarding 17 SS Bill Request 10.

Please let us know if you have any questions.

Sincerely,

Beau Barnes

Robert B. Barnes
Deputy Executive Secretary and
General Counsel

C: Mr. John Chilton
State Budget Director
Capitol Annex
Frankfort, KY 40601

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November 8, 2017

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

Actuarial Impact – 17 SS Bill Request 10 – Impact on Pension Plan

Dear Beau:

We have prepared an actuarial analysis of the impact of 17 SS Bill Request 10 (Act) on the Teachers' Retirement System of the State of Kentucky (TRS). This actuarial analysis relates to the pension plan only. An analysis of the retiree health plan will be submitted separately. The Act changes all aspects of TRS effective July 1, 2018, including benefit provisions for all current and future members of TRS, employee and employer contribution requirements, actuarial funding, participation requirements, actuarial assumptions, and closes the defined benefit structure of TRS to new members. The major provisions of the Act are summarized below and the cost impacts are provided in the attached Exhibits.

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

All new members hired on or after July 1, 2018 will be automatically enrolled in a 401(a) Defined Contribution Plan (TRS 401(a)) and/or a Deferred Compensation (PERS) Plan. Each member will have the same investment options as provided in the current Deferred Compensation Plan for TRS. The benefit at retirement will be based on the account balance which includes employee and employer contributions and an individual's return on investments.

The Plan has the option of offering annuitization of a member's account balance through private companies. Employee contributions and investment earnings on employee contributions will vest immediately but employer contributions and investment earnings on employer contributions will vest after 5 years of service.

For new members after July 1, 2018, there will be no sick leave credit or service purchases. Also, the Personnel Cabinet under this new plan will establish optional disability and death benefits for members participating in the TRS 401(a) or PERS plans, including short-term disability, long-term disability, life insurance and disability or death in the line of duty. The cost of this optional benefit will be paid by the employee.

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The following table shows the employee and employer contributions for this new plan:

Contribution	Non-University	University
Employee TRS 401(a)	9.00%	N/A
Employee PERS	Voluntary, auto-enrolled at 3.00%	Mandatory 3.00% plus Voluntary, auto-enrolled at 6.00%
Employee Retiree Health	6.75%	5.775%
Employer TRS 401(a)	6.00%	N/A
Employer PERS	None	2.00% plus 50% match on employee voluntary contributions up to 3%
Employer Retiree Health	Normal Cost	Normal Cost

The Plan will also keep the current Retiree Health Benefits but new members must:

1) be at least age 59 ½ to receive a subsidy,
2) be receiving a monthly distribution or annuitized payment from the TRS 401(a) or PERS plan,
3) have participated in the state retirement system within 24 months before applying for health benefits.

Benefit Provisions for Current Members as of July 1, 2018

Cost-of-Living Adjustments (COLA)

For current retirees, the Act suspends the COLA for the next five years, then returns to 1.50% annually. Therefore, retirees as of July 1, 2018 will not receive a COLA for fiscal years 2018 through 2022.

For future retirees, the Act suspends the COLA for the first five years of retirement then provides an annual 1.50% increase thereafter.

The suspension of COLAs for current and future retired members reduces the liabilities under this legislation in the first year by approximately $2.6 Billion.

Maximum Accrual Threshold

For active members as of June 30, 2018, the maximum TRS pension benefit accrual is the benefit at unreduced retirement eligibility, 27 years of service or age 60 with 5 years of service. Once an active member reaches this eligibility, the accruals in the current defined benefit (DB) plan will cease and the member will participate in a defined contribution (DC) 401(a) type plan for the remainder of active service. Non-university members who have exceeded the retirement eligibility threshold as of July 1, 2018 may elect to contribute into the current DB plan for an additional 3 years.

Final Average Salary

For active members as of June 30, 2018, provided the member retires on or before July 1, 2023, the final average salary will still be based on the average of the highest 3 years of salary if the member is at least age 55 with at least 27 years of service. If the member does not retire prior to July 1, 2023, the final average salary will be based on the average of the highest 5 years of salary.

Sick Leave

For teachers, the statutory minimum requirements for sick leave policies will be removed from statute. School districts can still pay up to 30% of sick leave but will only be included in the retirement calculation if the member retires on or before July 1, 2023.

For other employees, the same as above will apply but the level of sick leave for all members will be frozen at June 30, 2018.

Maximum Retirement Compensation

Effective July 1, 2018, all compensation for benefit accruals will be limited to the maximum taxable earnings under Social Security (currently $127,400). Employee contributions in excess of this limit will be refunded to the members but employer contributions will remain in the fund.

Annual Leave Payments

Annual leave payments for those in TRS prior to July 1, 2008 may be included in the Final Average Salary calculation but only if the member retires on or before July 1, 2023.

Benefit Formula

The Act eliminates the 3% benefit multiplier for years of service in excess of 30 years for all future accruals, except for those non-university members who elect to participate in the DB plan through July 1, 2021.

DC Plan Options

For active members with 5 years of service or more as of July 1, 2018, the member will remain in the DB plan until they meet the maximum accrual threshold.

For active members with less than 5 years of service as of July 1, 2018, the member will have an option to participate in the DB Plan or the new DC 401(a) plan. If the member opts into the DC plan, their accumulated employee contributions will be transferred to the new plan.

Contribution Requirements

Employee Contribution Rates
While still in the current DB plan, members will continue to contribute the same percentage of salary to the pension plan but will contribute an additional 3% to the retiree health plan. The table below is the proposed contribution requirements:

Item	Non-University	University
Pension	9.105%	7.625%
Retiree Health	6.750%	5.775%
Total	15.855%	13.400%

Non-University members who have exceeded the maximum accrual threshold on July 1, 2018 shall discontinue contributing to the DB plan and shall contribute a mandatory 10% of pay to the TRS 401(a) plan. Non-University members who exceed the maximum accrual threshold after July 1, 2018 must contribute a mandatory 9% of pay into the TRS 401(a) plan and have the option to make additional voluntary employee contributions into the PERS plan.

University members who exceed the maximum accrual threshold on or after July 1, 2018 shall discontinue contributing to the DB plan and must contribute a mandatory 3% of pay into the PERS plan and have the option to make additional voluntary employee contributions into the PERS plan.

Retiree health contributions at the levels in the table on page 2, which are 3% higher than current levels, will continue until retirement.

Employer Contributions
Employers will contribute a mandatory 8% to the TRS 401(a) Plan for Non-University members who have exceeded the maximum accrual threshold as of July 1, 2018. For members exceeding the threshold after July 1, 2018, employers will contribute in the same manner as for new members.

For DB Plan members, employers will continue to pay a fixed base statutory contribution rate of 13.105% of pay for non-university employers and 13.65% of pay for universities to fund pension and retiree health benefits.

Effective July 1, 2018, school districts will pay an additional 2% of pay for new members and for those members whose accruals exceed the maximum accrual threshold. In addition, the 3% of pay currently required from the school districts to fund the retiree medical plan will now instead be required to be made to the pension plan to help fund pension benefits.

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

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

Actuarial Funding

Annual Required Contribution (ARC)

Prospectively, the ARC will be referred to as the Actuarially Determined Contribution (ADC). While fixed based statutory employer contribution rates will still be provided by employers and/or the State, the determination of the ADC will be specified in statute and will be calculated as follows:

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

Section V - Participation Requirements

Agency Voluntary Cessation of Participation

The Act provides a 2-year window for non-school/non-state agency employers to voluntarily cease participation in TRS by paying the full actuarial cost (by July 1, 2020). The Act also allows TRS to require an agency to involuntarily cease participation if the agency fails to pay contributions. If an agency does cease participation in TRS, it may only establish a Defined Contribution plan.

Section VI - Actuarial Assumptions
The projections for the proposed legislation use the June 30, 2016 actuarial valuation of TRS as a baseline. However, since the DB plan would be closed and retirement patterns altered, leading to changes in cash flow requirements, TRS would need to alter its asset allocation and invest in more conservative options. Therefore, we have performed these proposed legislation projections using a 6.00% assumed discount rate. Below are additional or alternative actuarial assumptions that are used in the determination of this legislation:

- Actual asset values as of June 30, 2017 (the TRS fund's investment return was 15.02% for the 2017 fiscal year). For all future years, we have assumed a 6.00% investment return.

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

- For those active members who have met the Maximum Accrual Threshold as of July 1, 2018, we have assumed that an increase in retirement patterns will occur over the three year period and all remaining members will retire immediately in 2021.

- For those active members who have 2 years of service or less as of July 1, 2018, we have assumed they will make an election to participate in the TRS 401(a) Plan for non-university members and the PERS plan for university members.

- For those active members who have more than 2 years of service and have not met the Maximum Accrual Threshold as of July 1, 2018, we have assumed that once a member reaches the threshold, all will retire.

- We assumed that Non-University members <u>will not</u> voluntarily contribute to the PERS Plan and University members <u>will</u> voluntarily contribute 2% into the PERS Plan.

- No impact to the Retiree Health Benefit Plan of TRS has been valued in this letter. We are still performing some projections to develop this impact.

Section VII - Conclusion

As shown in Exhibits 1 and 2, there is cost for this legislation for the first fifteen years of the twenty-year projection. While the legislation does result in a decrease in liabilities due to COLA suspensions to current and future retirees ($2.6 billion in the first year), there are increases in liabilities due to a more conservative discount rate assumption and an expected increase in the number of earlier retirements for current active members. In addition, there are increases in contributions due to a change to the level dollar amortization methodology.

Projections are designed to identify anticipated trends rather than predicting some future state of events. The projections are based on TRS' estimated financial status on June 30, 2016, and project future events using one set of assumptions out of a range of many possibilities. The projections do not predict TRS' financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the DB Plan. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, the duration of the benefit payments, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain at the time the projections were made. Because actual experience will not unfold exactly as expected, actual results can be expected to differ from the projections. To the extent that actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse that indicated in this study.

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

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

Sincerely,

Edward J. Koebel

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

Cathy Turcot

Cathy Turcot
Principal and Managing Director

Exhibit 1
Teachers' Retirement System of the State of Kentucky
Current Funding Status for Open Defined Benefit Plan
($ in thousands)

Fiscal Year	Non-University Payroll (1)	University Payroll (2)	Total Payroll (3)	Unfunded Accrued Liability (4)	Funding Ratio (5)	Actuarially Determined Contribution in Dollars for Open DB Plan (6)	Actuarially Determined Contribution for Non-University as a Percentage of Payroll (7)	Actuarially Determined Contribution for University as a Percentage of Payroll (8)
FY 2018-19	$3,577,650	$219,332	$3,796,982	$14,426,593	58.1%	$1,112,459	29.025%	27.545%
FY 2019-20	3,665,980	225,514	3,891,494	14,621,519	58.5%	1,107,230	29.285%	27.805%
FY 2020-21	3,756,638	232,572	3,989,210	14,497,181	59.9%	1,127,929	29.005%	27.525%
FY 2021-22	3,847,930	240,508	4,088,438	14,587,243	60.5%	1,172,337	29.155%	27.675%
FY 2022-23	3,941,012	248,934	4,189,946	14,647,199	61.3%	1,213,491	29.305%	27.825%
FY 2023-24	4,037,801	258,487	4,296,288	14,696,314	62.0%	1,233,303	29.475%	27.995%
FY 2024-25	4,135,600	269,309	4,404,909	14,713,888	62.8%	1,272,475	29.655%	28.175%
FY 2025-26	4,235,670	281,042	4,516,712	14,696,436	63.6%	1,312,741	29.825%	28.345%
FY 2026-27	4,337,673	293,748	4,631,421	14,639,028	64.5%	1,355,275	30.015%	28.535%
FY 2027-28	4,445,433	307,193	4,752,626	14,536,987	65.4%	1,399,618	30.175%	28.695%
FY 2028-29	4,559,298	320,753	4,880,051	14,385,214	66.4%	1,445,923	30.325%	28.845%
FY 2029-30	4,678,836	334,912	5,013,748	14,176,743	67.5%	1,495,562	30.465%	28.985%
FY 2030-31	4,805,683	349,061	5,154,744	13,906,618	68.7%	1,546,183	30.575%	29.095%
FY 2031-32	4,939,968	363,133	5,303,101	13,568,057	69.9%	1,599,038	30.665%	29.185%
FY 2032-33	5,081,410	378,259	5,459,669	13,153,746	71.3%	1,654,151	30.735%	29.255%
FY 2033-34	5,234,387	392,987	5,627,374	12,656,764	72.9%	1,710,681	30.775%	29.295%
FY 2034-35	5,398,312	408,082	5,806,394	12,068,323	74.5%	1,769,957	31.645%	30.165%
FY 2035-36	5,571,446	424,188	5,995,634	11,379,070	76.3%	1,831,956	30.885%	29.405%
FY 2036-37	5,753,411	440,655	6,194,066	10,580,618	78.3%	1,895,412	32.185%	30.705%
FY 2037-38	5,944,472	457,829	6,402,301	9,609,138	80.6%	2,013,144	32.655%	31.175%

Exhibit 2
Teachers' Retirement System of the State of Kentucky
Funding Status for Closed Defined Benefit Plan
($ in thousands)

Fiscal Year	Non-University Closed Payroll (9)	University Closed Payroll (10)	Total Closed Payroll (11)	Unfunded Accrued Liability (12)	Funding Ratio (13)	Actuarially Determined Contribution in Dollars for Closed DB Plan (14)
FY 2018-19	$3,001,921	$160,110	$3,162,031	$19,250,849	50.1%	$1,112,459
FY 2019-20	2,830,345	143,040	2,973,385	19,043,927	51.4%	1,700,012
FY 2020-21	2,699,016	131,591	2,830,607	18,524,494	53.4%	1,664,691
FY 2021-22	2,541,716	118,153	2,659,869	18,224,033	54.7%	1,643,082
FY 2022-23	2,456,643	111,961	2,568,604	17,920,202	56.0%	1,628,709
FY 2023-24	2,369,267	106,838	2,476,105	17,637,753	57.1%	1,580,642
FY 2024-25	2,270,279	101,474	2,371,753	17,321,855	58.2%	1,584,451
FY 2025-26	2,165,461	97,294	2,262,755	16,986,293	59.3%	1,573,091
FY 2026-27	2,046,440	93,023	2,139,463	16,629,918	60.4%	1,559,320
FY 2027-28	1,931,441	88,505	2,019,946	16,254,525	61.4%	1,545,054
FY 2028-29	1,815,732	81,902	1,897,634	15,859,146	62.4%	1,529,901
FY 2029-30	1,689,373	74,985	1,764,358	15,437,309	63.4%	1,517,508
FY 2030-31	1,555,668	68,376	1,624,044	14,988,975	64.3%	1,503,076
FY 2031-32	1,415,258	60,736	1,475,994	14,513,715	65.3%	1,486,315
FY 2032-33	1,267,960	54,365	1,322,325	14,009,668	66.2%	1,469,281
FY 2033-34	1,130,326	45,728	1,176,054	13,478,689	67.2%	1,451,391
FY 2034-35	997,671	37,965	1,035,636	12,918,395	68.1%	1,434,565
FY 2035-36	861,920	32,779	894,699	12,324,204	69.1%	1,420,643
FY 2036-37	728,344	26,541	754,885	11,695,442	70.2%	1,406,138
FY 2037-38	589,631	20,303	609,934	11,028,746	71.3%	1,391,681

Exhibit 2 (continued)
Teachers' Retirement System of the State of Kentucky
Funding Requirements under New Plan and Comparison to Current Plan
($ in thousands)

Fiscal Year	Non-University New Plan Payroll (15)	University New Plan Payroll (16)	Total New Plan Payroll (17)=(15)+(16)	Defined Contributions from Employer (6% from NonUniversity and 3% from University Employers) (18)	Total Employer Contribution for Proposed Bill (19)=(14)+(18)	Total Employer Contribution for Current Plan (20)=(6)	Cost/(Savings) to TRS Employers (21)=(19)-(20)
FY 2018-19	$575,729	$59,222	$634,951	$36,320	$1,148,779	$1,112,459	$36,320
FY 2019-20	835,635	82,474	918,109	52,612	1,752,624	1,107,230	645,394
FY 2020-21	1,057,622	100,981	1,158,603	66,487	1,731,178	1,127,929	603,249
FY 2021-22	1,306,214	122,355	1,428,569	82,043	1,725,125	1,172,337	552,788
FY 2022-23	1,484,369	136,973	1,621,342	93,171	1,721,880	1,213,491	508,389
FY 2023-24	1,668,534	151,649	1,820,183	104,662	1,685,304	1,233,303	452,001
FY 2024-25	1,865,321	167,835	2,033,156	116,954	1,701,405	1,272,475	428,930
FY 2025-26	2,070,209	183,748	2,253,957	129,725	1,702,816	1,312,741	390,075
FY 2026-27	2,291,233	200,725	2,491,958	143,496	1,702,816	1,355,275	347,541
FY 2027-28	2,513,992	218,688	2,732,680	157,400	1,702,454	1,399,618	302,836
FY 2028-29	2,743,566	238,851	2,982,417	171,779	1,701,680	1,445,923	255,757
FY 2029-30	2,989,463	259,927	3,249,390	187,166	1,704,674	1,495,562	209,112
FY 2030-31	3,250,015	280,685	3,530,700	203,421	1,706,497	1,546,183	160,314
FY 2031-32	3,524,710	302,397	3,827,107	220,555	1,706,870	1,599,038	107,832
FY 2032-33	3,813,450	323,894	4,137,344	238,524	1,707,805	1,654,151	53,654
FY 2033-34	4,104,061	347,259	4,451,320	256,661	1,708,052	1,710,681	(2,629)
FY 2034-35	4,400,641	370,117	4,770,758	275,142	1,709,707	1,769,957	(60,250)
FY 2035-36	4,709,526	391,409	5,100,935	294,314	1,714,957	1,831,956	(116,999)
FY 2036-37	5,025,067	414,114	5,439,181	313,927	1,720,065	1,895,412	(175,347)
FY 2037-38	5,354,841	437,526	5,792,367	334,416	1,726,097	2,013,144	(287,047)