

SCHEDULE B (continued)

Code	Employer	Deferred Inflows of Resources					Net Employer Pension Expense	Revenue State Support	Proportionate Share of Pension Expense	Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions		Total Pension Expense
		Differences Between Expected and Actual Experience	Change of Assumptions	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources				Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Pension Expense	
230	Pikeville City Schools						-	(3,365,779)	(3,365,779)	-	(3,365,779)	
231	Pineville City Schools						-	(1,029,603)	(1,029,603)	-	(1,029,603)	
235	Raceland City Schools						-	(2,273,689)	(2,273,689)	-	(2,273,689)	
238	Russell City Schools						-	(5,188,957)	(5,188,957)	-	(5,188,957)	
239	Russellville City Schools						-	(2,259,593)	(2,259,593)	-	(2,259,593)	
240	Science Hill City Schools						-	(902,303)	(902,303)	-	(902,303)	
245	Silver Grove City Schools						-	(548,766)	(548,766)	-	(548,766)	
246	Somerset City Schools						-	(3,766,869)	(3,766,869)	-	(3,766,869)	
247	Southgate City Schools						-	(591,384)	(591,384)	-	(591,384)	
258	Walton-Verona Independent Schools						-	(3,898,425)	(3,898,425)	-	(3,898,425)	
259	West Point City Schools						-	(345,105)	(345,105)	-	(345,105)	
260	Williamsburg City Schools						-	(1,670,092)	(1,670,092)	-	(1,670,092)	
261	Williamstown City Schools						-	(1,616,685)	(1,616,685)	-	(1,616,685)	
870	Ohio Valley Educational Cooperative						-	(920,163)	(920,163)	-	(920,163)	
871	West Kentucky Educational Cooperative						-	(458,452)	(458,452)	-	(458,452)	
872	Southeast South-Central Educational Cooperative						-	(115,246)	(115,246)	-	(115,246)	
890	Green River Regional Educational Cooperative						-	(427,208)	(427,208)	-	(427,208)	
891	Central KY Special Education Cooperative						-	(261,071)	(261,071)	-	(261,071)	
892	KY Valley Educational Cooperative						-	(405,219)	(405,219)	-	(405,219)	
894	KY Educational Development Corporation						-	(808,081)	(808,081)	-	(808,081)	
895	Northern KY Cooperative for Educational Services						-	(775,097)	(775,097)	-	(775,097)	
	Total - Local School Districts						\$ 0	\$ (1,545,216,883)	\$ (1,545,216,883)	\$ -	\$ (1,545,216,883)	
	Total Non University	\$ 2,102,630	\$ 117,890,196	\$ 4,721,852	\$ 166,115,150	\$ 290,829,828	\$ (15,895,284)	\$ (1,566,065,207)	\$ (1,581,960,491)	\$ (66,855,369)	\$ (1,648,815,860)	
	State's Proportionate Share of Outflow s/Inflow s	\$ 234,362,395	\$ 11,830,398,530	\$ 471,887,617	\$ 22,468,528	\$ 12,559,117,070				\$ 97,285,312		



SECTION C
Teachers' Retirement System of the State of Kentucky
Schedules of Remaining Deferred Outflows and (Inflows)

Code	Employer	NPL Sensitivity		Recognition of Existing Deferred Outflows (Inflows) of Resources for Future Plan Years Ending June 30,					
		Less 1% - 6.50%	Plus 1% - 8.50%	2020	2021	2022	2023	2024	Thereafter
		Employer's Proportionate Share of Net Pension Liability	Employer's Proportionate Share of Net Pension Liability						
University Employers									
263	Eastern Kentucky University	\$ 124,568,033	\$ 74,137,640	\$ (40,976,655)	\$ (44,752,171)	\$ (29,973,611)	\$ (9,155,121)	\$ -	\$ -
266	Kentucky State University	28,993,190	17,255,524	(10,910,300)	(10,170,307)	(6,455,298)	(1,737,444)	-	-
269	Morehead State University	67,425,209	40,128,641	(23,228,680)	(24,864,086)	(16,174,872)	(4,851,398)	-	-
270	Murray State University	75,489,276	44,928,034	(26,987,677)	(29,162,162)	(18,553,360)	(5,287,069)	-	-
273	Western Kentucky University	134,914,645	80,295,506	(46,846,421)	(49,028,088)	(32,342,588)	(9,705,086)	-	-
500	KCTCS Central Office - University	33,720,882	20,069,247	(14,313,120)	(14,549,878)	(8,881,953)	(2,417,518)	-	-
	Total University	\$ 465,111,235	\$ 276,814,592	\$ (163,262,853)	\$ (172,526,692)	\$ (112,381,682)	\$ (33,153,636)	\$ -	\$ -
	State's Proportionate Share of NPL - University	\$ 346,039,102	\$ 205,947,881	\$ 40,456,378	\$ 36,449,157	\$ (40,199,007)	\$ (27,980,656)	\$ -	\$ -
Non-University Employers									
400	KCTCS CENTRAL OFFICE	\$ 36,248,217	\$ 21,573,412	\$ (27,970,466)	\$ (26,567,916)	\$ (14,034,432)	\$ (3,218,028)	\$ -	\$ -
801	KY High School Athletic Association	1,523,679	906,829	(666,822)	(700,966)	(420,427)	(117,561)	-	-
805	KY School Boards Association	3,513,122	2,090,862	(1,686,701)	(1,791,034)	(1,006,833)	(274,093)	-	-
806	KY Education Association	425,818	253,429	(210,141)	(216,196)	(119,895)	(33,804)	-	-
807	KY Academic Association	273,584	162,826	(129,542)	(135,081)	(79,083)	(21,802)	-	-
809	Jefferson County Teachers' Association	125,547	74,720	(56,236)	(58,714)	(34,588)	(9,788)	-	-
		\$ 42,109,967	\$ 25,062,078	\$ (30,719,908)	\$ (29,469,907)	\$ (15,695,258)	\$ (3,675,076)	\$ -	\$ -
State Agencies									
301	Technical Education District - Madisonville	\$ 14,686,600	\$ 8,740,845	\$ (3,289,368)	\$ (4,508,405)	\$ (3,212,465)	\$ (1,023,781)	\$ -	\$ -
302	Technical Education District - Bowling Green	14,421,911	8,583,313	(4,562,670)	(4,947,121)	(3,382,797)	(1,077,035)	-	-
303	Technical Education District - Elizabethtown	-	-	(5,898,078)	(6,159,412)	(1,984,808)	(8,673)	-	-
304	Technical Education District - Frankfort	11,291,639	6,720,307	(6,697,295)	(6,089,387)	(3,343,010)	(866,948)	-	-
305	Technical Education District - Hazard	13,544,092	8,060,873	(5,705,947)	(5,507,889)	(3,402,617)	(1,003,848)	-	-
308	Adult Council on Post Secondary Education	908,366	540,621	(714,170)	(695,601)	(354,306)	(74,471)	-	-
316	Office of Career and Technical Education	3,504,394	2,085,668	(196,436)	(1,552,469)	(1,112,013)	(347,297)	-	-
317	Office of Secretary of Workforce Investment	181,438	107,984	(146,302)	(97,370)	(48,765)	(13,317)	-	-
318	Department for Vocational Rehabilitation	18,575,858	11,055,567	(11,188,619)	(11,780,321)	(6,579,904)	(1,669,412)	-	-
320	School for the Blind	6,429,898	3,826,804	(3,186,890)	(3,277,449)	(1,730,220)	(419,644)	-	-
330	School for the Deaf	7,664,887	4,561,818	(4,522,072)	(4,476,179)	(2,569,267)	(667,293)	-	-
345	Department of Education	32,831,775	19,540,086	(15,362,541)	(16,053,243)	(9,415,823)	(2,576,593)	-	-
728	Department of Corrections	169,186	100,692	(86,961)	(64,182)	(37,695)	(12,513)	-	-
896	Education Professional Standards Board	2,325,969	1,384,318	(1,050,060)	(1,183,468)	(743,822)	(176,013)	-	-
		\$ 126,536,013	\$ 75,308,896	\$ (62,607,409)	\$ (66,392,496)	\$ (37,917,512)	\$ (9,936,838)	\$ -	\$ -
	State's Proportionate Share of NPL - Non-University	\$ 16,615,655,687	\$ 9,888,937,554	\$ (2,541,263,600)	\$ (2,801,531,675)	\$ (3,213,522,456)	\$ (1,348,538,244)	\$ -	\$ -



SCHEDULE D

**SUMMARY OF MAIN PLAN PROVISIONS
AS INTERPRETED FOR ACCOUNTING AND REPORTING VALUATION PURPOSES**

The Teachers' Retirement System of the State of Kentucky was established on July 1, 1940. The valuation took into account amendments to the System effective through June 30, 2018. The following summary describes the main benefit and contribution provisions of the System as interpreted for the valuation.

1 - DEFINITIONS

"Final average salary" means the average of the five highest annual salaries which the member has received for service in a covered position and on which the member has made contributions or on which the public board, institution or agency has picked up the member contributions. For a member who retires after attaining age 55 with 27 years of service, "final average salary" means the average of the three highest annual salaries.

2 - BENEFITS

Service Retirement Allowance

Members Before 7/1/2008

Condition for Allowance

Completion of 27 years of service or attainment of age 55 and 5 years of service.

Amount of Allowance

The annual retirement allowance for non-university members is equal to:

- (a) 2.0% of final average salary multiplied by service before July 1, 1983, plus
- (b) 2.5% of final average salary multiplied by service after July 1, 1983.
- (c) For individuals who become members of the Retirement System on or after July 1, 2002 and have less than 10 years of service at retirement, the retirement allowance is 2.0% of final average salary multiplied by service. If, however, they have 10 or more years, they receive a benefit percentage of 2.5% for all years of service up to 30 years.



SCHEDULE D (continued)

- (d) For members retiring on or after July 1, 2004, the retirement allowance formula is 3.0% of final average salary for each year of service credit earned in excess of 30 years.

The annual retirement allowance for university members is equal to 2.0% of final average salary multiplied by all years of service.

For all members, the annual allowance is reduced by 5% per year from the earlier of age 60 or the date the member would have completed 27 years of service.

The minimum annual service allowance for all members is \$440 multiplied by credited service.

Members on and after 7/1/2008

Condition for Retirement

Completion of 27 years of service, attainment of age 60 and 5 years of service or attainment of age 55 and 10 years of service.

Amount of Allowance

The annual retirement allowance for non-university members is equal to:

- 1.7% of final average salary if service is 10 years or less.
- 2.0% of final average salary if service is greater than 10 years and no more than 20 years.
- 2.3% of final average salary if service is greater than 20 years but no more than 26 years.
- 2.5% of final average salary if service is greater than 26 years but no more than 30 years.
- 3.0% of final average salary for years of service greater than 30 years.

The annual retirement allowance for university members is equal to:

- 1.5% of final average salary if service is 10 years or less.
- 1.7% of final average salary if service is greater than 10 years and no more than 20 years.
- 1.85% of final average salary if service is greater than 20 years but less than 27 years.
- 2.0% of final average salary if service is greater than or equal to 27 years.

For all members, the annual allowance is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 27 years of service.



SCHEDULE D (continued)

Disability Retirement Allowance

Condition for Allowance

Totally and permanently incapable of being employed as a teacher and under age 60 but after completing 5 years of service.

Amount of Allowance

The disability allowance is equal to the greater of the service retirement allowance or 60% of the member's final average salary. The disability allowance is payable over an entitlement period equal to 25% of the service credited to the member at the date of disability or five years, whichever is longer. After the disability entitlement period has expired and if the member remains disabled, he will be retired under service retirement. The service retirement allowance will be computed with service credit given for the period of disability retirement. The allowance will not be less than \$6,000 per year. The service retirement allowance will not be reduced for commencement of the allowance before age 60 or the completion of 27 years of service.

Benefits Payable on Separation from Service

Any member who ceases to be in service is entitled to receive his contributions with allowable interest. A member who has completed 5 years of creditable service and leaves his contributions with the System may be continued in the membership of the System after separation from service, and file application for service retirement after the attainment of age 60.

Life Insurance

A separate Life Insurance fund has been created as of June 30, 2000 to pay benefits on behalf of deceased TRS active and retired members.



SCHEDULE D (continued)

Death Benefits

A surviving spouse of an active member with less than 10 years of service may elect to receive an annual allowance of \$2,880 except that if income from other sources exceeds \$6,600 per year the annual allowance will be \$2,160.

A surviving spouse of an active member with 10 or more years of service may elect to receive an allowance which is the actuarial equivalent of the allowance the deceased member would have received upon retirement. The allowance will commence on the date the deceased member would have been eligible for service retirement and will be payable during the life of the spouse.

If the deceased member is survived by unmarried children under age 18 the following schedule of annual allowances applies:

<u>Number of Children</u>	<u>Annual Allowance</u>
1	\$ 2,400
2	4,080
3	4,800
4 or more	5,280

The allowances are payable until a child attains age 18, or age 23 if a full-time student.

If the member has no eligible survivor, a refund of his accumulated contributions is payable to his estate.

Options

In lieu of the regular Option 1, a retirement allowance payable in the form of a life annuity with refundable balance, any member before retirement may elect to receive a reduced allowance which is actuarially equivalent to the full allowance, in one of the following forms:

Option 2. A single life annuity payable during the member's lifetime with payments for 10 years certain.

Option 3. At the death of the member his allowance is continued throughout the life of his beneficiary.

Option 3(a). At the death of the beneficiary designated by the member under Option 3, the member's benefit will revert to what would have been paid had he not selected an option.

Option 4. At the death of the member one half of his allowance is continued throughout the life of his beneficiary.

Option 4(a). At the death of the beneficiary designated by the member under Option 4, the member's benefit will revert to what would have been paid had he not selected an option.



SCHEDULE D (continued)

Post-Retirement Adjustments

The retirement allowance of each retired member and of each beneficiary shall be increased by 1.50% each July 1.

3 - CONTRIBUTIONS

Member Contributions

University members contribute 7.625% of salary to the Retirement System. Non-university members contribute 9.105% of salary to the Retirement System. Member contributions are picked up by the employer.



SCHEDULE E

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuation were selected based on the actuarial experience study prepared as of June 30, 2015, submitted to and adopted by the Board on September 19, 2016.

INVESTMENT RATE OF RETURN: 7.50% per annum, compounded annually, including price inflation at 3.00% per annum.

SALARY INCREASES: Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 3.50% per annum:

<u>Age</u>	<u>Annual Rate</u>
20	7.20%
25	6.40
30	5.40
35	4.70
40	4.20
45	3.80
50	3.70
55	3.50
60	3.50
65	3.50

SEPARATIONS FROM SERVICE: Representative values of the assumed annual rates of death, disability, withdrawal, service retirement and early retirement are as follows:

Males

Age	Annual Rate of							
	DEATH	DISABILITY	WITHDRAWAL			RETIREMENT		
			Service			Before 27 Years of Service	After 27 Years of Service*	
			0 – 4	5 – 9	10+			
20	0.019%	0.01%	11.00%					
25	0.021	0.01	11.00		3.00%			
30	0.025	0.01	11.00		3.00	3.00%		
35	0.043	0.04	12.00		3.50	1.40		
40	0.060	0.09	12.00		4.50	1.40		
45	0.084	0.20	12.00		4.50	1.30		17.0%
50	0.119	0.30	14.00		4.50	1.90		17.0
55	0.202	0.58	15.00		4.50	2.40	5.0%	45.0
60	0.340	0.75	15.00		4.00	2.40	13.0	35.0
62	0.419	0.75	15.00		3.80	2.40	15.0	25.0
65	0.565	0.75	15.00		3.50	2.40	20.0	25.0
70	0.913	0.75	20.00		0.00	0.00	20.0	20.0
75	1.556	0.75	20.00		0.00	0.00	100.0	100.0

*Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.



SCHEDULE E (continued)

Females

Age	Annual Rate of						
	DEATH	DISABILITY	WITHDRAWAL			RETIREMENT	
			Service			Before 27 Years of Service	After 27 Years of Service*
			0 – 4	5 – 9	10+		
20	0.007%	0.01%	9.00%				
25	0.008	0.01	9.00	4.00%			
30	0.010	0.03	12.00	4.00	1.65%		
35	0.018	0.06	12.00	4.00	1.50		
40	0.026	0.12	12.00	4.00	1.30		
45	0.042	0.25	13.00	4.00	1.20		15.0%
50	0.062	0.44	13.00	5.00	1.50		18.0
55	0.096	0.65	15.00	5.00	2.00	5.5%	50.0
60	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	0.831	0.85	15.00	0.00	0.00	100.0	100.0

*Plus 7.5% in year when first eligible for unreduced retirement with 27 years of service.

DEATHS AFTER RETIREMENT: The RP-2000 Combined Mortality Table projected to 2025 using scale BB (set forward two years for males and one year for females) is used for death after service retirement and beneficiaries. The RP-2000 Disabled Mortality Table (set forward two years for males and seven years for females) is used for death after disability retirement. There is a margin for future mortality improvement in the tables used by the System. Based on the results of the most recent experience study adopted by the Board on September 19, 2016, the numbers of expected future deaths are 15-19% less than the actual number of deaths that occurred during the study period for healthy retirees and 13-17% less than expected under the selected table for disabled retirees. Representative values of the assumed annual rates of death after service retirement and after disability retirement are shown below:

Age	Annual Rate of Death After			
	Service Retirement		Disability Retirement	
	Male	Female	Male	Female
45	0.1609%	0.1135%	2.3306%	1.2482%
50	0.2474	0.1718	2.9279	1.5650
55	0.4246	0.2658	3.4400	1.7807
60	0.6985	0.4409	3.5881	2.3164
65	1.1300	0.8100	3.8275	3.1687
70	1.8697	1.3739	4.7566	4.4032
75	3.2147	2.2899	6.3153	6.0857
80	5.5160	3.7551	8.3527	8.4679
85	9.5631	6.3873	10.9122	12.7572
90	17.2787	11.2476	17.2787	19.4718
95	27.1263	18.1190	27.1263	24.2074



SCHEDULE E (continued)

ASSETS: Market Value

EXPENSE LOAD: None.

PERCENT MARRIED: 100%, with females 3 years younger than males.

LOADS: Unused sick leave: 2% of active liability



SCHEDULE F
BOARD FUNDING POLICY

Introduction

Pursuant to the provisions of KRS 161.250, the Board of Trustees (“Board”) of the Kentucky Teachers’ Retirement Systems (“TRS”) is vested with the responsibility for the general administration and management of the retirement system. The Board may adopt procedures necessary to conduct the business of the retirement system as needed. The applicable provisions of the Kentucky Revised Statutes (“state law”) shall control if any inconsistency exists between state law and this policy.

Retirement Appropriations:

State law provides that the retirement benefits promised to members of TRS are “...an inviolable contract of the Commonwealth....” (KRS 161.714.) To satisfy this solemn commitment, the Commonwealth of Kentucky (“state”) is required to pay annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. All employers participating in TRS are responsible for paying the fixed employer contribution rate set forth in state law. However, the state—as plan guarantor—is solely responsible for paying the additional annual retirement appropriations necessary to keep the retirement system actuarially sound and able to satisfy the contract with members to provide promised benefits. (KRS 161.550(6).)

Since fiscal year 2008, the state has not paid the recommended annual retirement appropriations necessary to pre-fund the benefit requirements of members of the retirement system as determined by the actuary. Over this period of time, because of the failure to fund, the state's annual retirement appropriations have grown significantly from \$60.5 million (Fiscal Year 2009) to \$520 million (Fiscal Year 2017). The following schedule details the growth of the annual retirement appropriations payable by the state:



SCHEDULE E (continued)

	Cumulative Increase as a % of Payroll	Cumulative Increase of Annual Retirement Appropriations Payable by the State
2009	1.88	\$ 60,499,800
2010	2.46	82,331,200
2011	3.59	121,457,000
2012	5.81	208,649,000
2013	7.27	260,980,000
2014	8.02	299,420,000
2015	10.42	386,400,000
2016	12.97	487,400,000
2017	13.80	520,372,000
2018	13.49	512,883,000
2019	14.61	553,597,000

(Source: TRS Report of the Actuary on the Annual Valuation Prepared as of June 30, 2016).

The Board has always taken action as required by state law and recommended annual retirement appropriations payable by the state that would ensure that the state meets the contractual obligations to members. This policy confirms the Board’s process for recommending annual retirement appropriations payable by the state and the primary actuarial assumptions and methodologies associated with calculating the annual retirement appropriations. Other related actuarial assumptions and methodologies not listed in this policy are reported in annual valuations, the most recent experience study, or resolutions adopted by the Board.

Annual Retirement Appropriations Payable by the State: In each biennial budget request, the Board will recommend annual retirement appropriations payable by the state to meet the benefit requirements of the members of the retirement system. The annual retirement appropriations payable by the state are the sum of the fixed employer contribution rate set by state law and the additional annual retirement appropriations necessary to fund the benefit requirements of members of the retirement system. (KRS 161.550.) The recommended additional annual retirement appropriations payable by the state are calculated by the Board’s actuary based upon the results of an annual valuation preceding the beginning of each biennium. (KRS 161.400.)

Calculation of Annual Retirement Appropriations Payable by the State: The Board will recommend annual retirement appropriations payable by the state, which—if paid—will meet the benefit requirements of the members of the retirement system consistent with generally accepted actuarial principles. Based upon technical advice from



SCHEDULE E (continued)

the Board's actuary, the Board hereby adopts the following principles for calculating the recommended annual retirement appropriations payable by the state:

- Use the Entry Age Normal actuarial cost method;
- Use a five-year asset smoothing method;
- Use a thirty-year closed period to amortize legacy unfunded liability ("legacy unfunded liability" is that unfunded liability recognized as of the valuation prepared for June 30, 2014);
- Use a twenty-year closed period to amortize new sources of unfunded liability ("new sources of unfunded liability" is that unfunded liability consisting of all benefit changes, assumption and method changes, and experience gains and/or losses that have occurred since the previous valuation); and
- Reach a minimum funding ratio of 100 percent within the thirty-year closed amortization period.

The Board also recognizes that, from time to time, the state may desire to contribute lump sum payments toward satisfaction of unfunded liability rather than amortization of the debt. Total unfunded liability is published in every annual valuation of the retirement system and TRS will work with the state to develop reasonable and appropriate plans for receipt of lump sum payments toward the satisfaction of unfunded liability.

This policy will be reviewed regularly and amended or revised as necessary.