

Schedule D – Outline of Actuarial Assumptions and Methods

DEATHS AFTER RETIREMENT:

Mortality Assumption: All mortality rates use Pub-2010 benefit-weighted tables.

Mortality Projection: All mortality rates are projected from 2010 using generational improvement with Scale MP-2020 adjusted to 75% of the standard rates.

Service Retirements: Mortality rates are based on the Teachers Mortality Table for Retirees. Rates for male members are set forward 2 years and multiplied by 102%. Rates for female members are set forward 2 years and multiplied by 98%.

Survivors of Deceased Members: Mortality rates are based on the Teachers Mortality Table for Contingent Survivors. Rates for male members are set forward 2 years and multiplied by 101%.

Disabled Members at Retirement: Mortality rates are based on the Teachers Mortality Table for Disabled Retirees. Rates for male members are set forward 1 year and multiplied by 96%. Rates for female members are set back 2 years and multiplied by 94%.

Representative values of the assumed annual rates of death after service retirement, disability retirement, and survivors of deceased members are shown below:

Age	Annual Rate of Death After*					
	Service Retirement		Disability Retirement		Survivors of Deceased Members	
	Male	Female	Male	Female	Male	Female
45	0.0836%	0.0568%	1.0646%	0.7755%	0.6020%	0.2620%
50	0.1357	0.0843	1.6435	1.1910	0.7545	0.3200
55	0.2744	0.2215	2.1130	1.5416	0.8959	0.4460
60	0.4427	0.3322	2.4806	1.7616	1.1413	0.6220
65	0.7579	0.5351	3.0653	1.9834	1.6443	0.8990
70	1.4066	0.9682	3.9485	2.4149	2.5876	1.3530
75	2.6816	1.8649	5.3155	3.2562	4.1006	2.1510
80	5.0500	3.5819	7.6118	4.7705	6.5630	3.5730
85	9.4585	6.8071	11.2109	7.3423	10.7717	6.3160
90	16.9116	12.6077	16.9738	11.1653	17.7306	11.3290
95	26.9423	21.5110	24.2170	15.7356	26.8670	18.5900

*Base Rates.



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ASSETS: Five-year market related actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the ultimate assumed valuation rate of return of 7.10%. The amount recognized each year is 20% of the difference between market value and expected actuarial value.

ADMINISTRATIVE EXPENSE LOAD: 0.32% of payroll added to the normal cost rate.

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

UNUSED SICK LEAVE LOAD: 3% of active liability at the time of retirement for members other than TRS 4.

LEVEL PERCENTAGE OF PAYROLL GROWTH ASSUMPTION: 2.75%



Schedule E – Actuarial Cost Method

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future, of each active member's expected benefit at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability or survivor's benefit. Future salary increases and post-retirement cost-of-living adjustments are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries and inactive members to obtain the present value of all expected benefits payable from the system on account of the present group of members and beneficiaries.
2. The employer contributions required to support the benefits of the system are determined following a level funding approach and consist of a normal contribution and an actuarial accrued liability contribution.
3. Under the entry age normal cost method, the actuarial present value of each member's projected benefits is allocated on a level basis over the member's compensation between the entry age of the member and the assumed exit ages. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The actuarial present value of benefits allocated to prior years of service is called the actuarial liability. The unfunded actuarial liability represents the difference between the actuarial liability and the actuarial value of assets as of the valuation date. The unfunded actuarial liability is calculated each year and reflects experience gains/losses. The accrued liability contribution amortizes the balance of the unfunded actuarial accrued liability over a period of years from the valuation date.



Schedule F – Summary of Main System Provisions

AS INTERPRETED FOR 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, 2023. 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

TRS 1 and TRS 2 Members

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: <ul style="list-style-type: none"> (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 F – Summary of Main System Provisions

- (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.

TRS 3 Members

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 F – Summary of Main System Provisions

TRS 4 Members

Condition for Retirement

Attainment of age 57 and 10 years of service or attainment of age 65 and 5 years of service.

Amount of Allowance

Foundational Benefit

The annual foundational benefit for members is equal to service times a multiplier times final average salary.

The multiplier for non-university members is shown in the following table:

Age	Years of Service			
	5-9.99	10-19.99	20-29.99	30 or more
57-60	-	1.70%	1.95%	2.20%
61	-	1.74%	1.99%	2.24%
62	-	1.78%	2.03%	2.28%
63	-	1.82%	2.07%	2.32%
64	-	1.86%	2.11%	2.36%
65 & over	1.90%	1.90%	2.15%	2.40%

The multiplier for university members is shown in the following table:

Age	Years of Service			
	5-9.99	10-19.99	20-29.99	30 or more
57-60	-	0.70%	0.95%	1.20%
61	-	0.74%	0.99%	1.24%
62	-	0.78%	1.03%	1.28%
63	-	0.82%	1.07%	1.32%
64	-	0.86%	1.11%	1.36%
65 & over	0.90%	0.90%	1.15%	1.40%

The annual foundational benefit is reduced by 6% per year from the earlier of age 60 or the date the member would have completed 30 years of service.

Supplemental Benefit

The annual supplemental benefit is equal to the account balance which includes member and employer contributions and interest credited annually on June 30. Options include annuitizing the balance or receiving the balance as a lump sum either at the time of retirement or at a later date.



Schedule F – Summary of Main System Provisions

Disability Retirement Allowance

Condition for Allowance

For members hired before January 1, 2022, totally and permanently incapable of being employed as a teacher and under 27 years of service but after completing 5 years of service.

Amount of Allowance

The disability allowance is equal to 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 Trust has been created as of June 30, 2000 to pay benefits on behalf of deceased TRS active and retired members.



Schedule F – Summary of Main System Provisions

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.



Schedule F – Summary of Main System Provisions

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.

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 other than TRS 4 contribute 7.625% of salary to the retirement system.
- Non-university members other than TRS 4 contribute 9.105% of salary to the retirement system.

- University TRS 4 members contribute 7.00% of salary to the retirement system.
- Non-university TRS 4 members contribute 11.00% of salary to the retirement system.
- 2.00% of each is for the supplemental plan.



Schedule G – Tables of Employee Data

TABLE 1
AGE – SERVICE TABLE

Distribution of Active Members as of June 30, 2023 by Age and Service Groups

Attained Age	Completed Years of Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 26	27 to 29	30 to 34	35 & Over	No.	Payroll
Under 25	2,534	2,100	5								4,639	\$ 106,550,341
25 to 29	932	4,814	2,001								7,747	332,977,424
30 to 34	648	2,058	4,198	1,386	3						8,293	419,080,912
35 to 39	602	1,515	2,011	4,081	1,472	2					9,683	555,118,755
40 to 44	635	1,466	1,548	1,948	4,432	1,403	4	1			11,437	717,111,512
45 to 49	409	916	1,103	1,232	1,962	3,977	893	151	3		10,646	728,927,098
50 to 54	643	911	767	963	1,432	2,019	1,326	1,433	382	1	9,877	669,251,901
55 to 59	877	970	467	522	816	1,026	444	417	321	37	5,897	339,713,715
60 to 64	687	1,006	354	316	359	460	162	187	123	56	3,710	169,433,771
65 to 69	558	725	240	110	114	139	67	58	57	33	2,101	66,003,305
70 & Over	446	623	257	78	55	46	23	25	28	33	1,614	34,740,258
Total Count	8,971	17,104	12,951	10,636	10,645	9,072	2,919	2,272	914	160	75,644	\$ 4,138,908,992

Average Age: 43.6

Average Service: 11.1

Retirement Eligible: 9,452



Schedule G – Tables of Employee Data

TABLE 2

SCHEDULE OF ACTIVE MEMBER VALUATION DATA

<u>Valuation Date</u>	<u>Number</u>	<u>Annual Payroll</u>	<u>Annual Average Pay</u>	<u>% Increase in Average Pay</u>
6/30/2023	75,644	\$ 4,138,908,992	\$ 54,716	1.45%
6/30/2022	74,785	4,033,509,178	53,935	(1.30)
6/30/2021	69,256	3,784,400,223	54,644	7.35
6/30/2020	73,151	3,723,481,576	50,901	1.35
6/30/2019	72,647	3,648,427,710	50,221	0.58
6/30/2018	72,205	3,605,115,787	49,929	1.06
6/30/2017	72,130	3,563,584,342	49,405	0.35
6/30/2016	71,848	3,537,226,348	49,232	1.19
6/30/2015	72,246	3,515,113,127	48,655	2.45
6/30/2014	73,407	3,486,326,799	47,493	2.12



Schedule G – Tables of Employee Data

TABLE 3

**NUMBER OF RETIRED MEMBERS AND BENEFICIARIES
AND THEIR BENEFITS BY AGE
AS OF JUNE 30, 2023**

Attained Age	Number of Members	Total Annual Benefits	Average Annual Benefits
49 & Under	803	\$ 9,190,797	\$ 11,446
50 - 54	1,719	72,828,780	42,367
55 - 59	4,541	211,482,877	46,572
60 - 64	6,877	301,218,461	43,801
65 - 69	9,795	412,035,747	42,066
70 - 74	13,279	553,094,189	41,652
75 - 79	11,228	450,370,878	40,111
80 - 84	6,368	245,606,307	38,569
85 - 89	3,137	111,127,842	35,425
90 - 94	1,382	44,637,018	32,299
95 & Over	<u>430</u>	<u>12,266,501</u>	<u>28,527</u>
Total	59,559	\$ 2,423,859,397	\$ 40,697

Average Current Age: 71.2

Average Age at Retirement: 56.3



Schedule G – Tables of Employee Data

TABLE 4

SCHEDULE OF RETIRANTS, BENEFICIARIES AND SURVIVORS ADDED TO AND REMOVED FROM ROLLS

Fiscal Year Ending June 30	ADDED TO ROLLS		REMOVED FROM ROLLS		ROLLS AT END OF YEAR		Increase In Annual Allowances	Average Annual Allowance
	Number	Annual Allowances (in millions)	Number	Annual Allowances (in millions)	Number	Annual Allowances (in millions)		
2014	2,146	\$99.6	976	\$23.4	48,576	\$1,684.9	4.7%	\$34,685
2015	2,917	119.1	1,671	36.3	49,822	1,767.6	4.9%	35,479
2016	2,753	128.2	1,012	26.9	51,563	1,868.9	5.7%	36,244
2017	2,638	119.8	1,235	35.2	52,966	1,953.5	4.5%	36,881
2018	2,499	120.0	1,088	30.0	54,377	2,043.5	4.6%	37,581
2019	2,355	113.8	1,119	32.8	55,613	2,124.5	4.0%	38,201
2020	2,145	107.6	1,129	34.0	56,629	2,198.1	3.5%	38,816
2021	2,137	108.3	1,301	41.1	57,465	2,265.3	3.1%	39,421
2022	2,308	117.2	1,335	42.0	58,438	2,340.5	3.3%	40,051
2023	2,421	125.9	1,300	42.5	59,559	2,423.9	3.6%	40,697



Schedule H – 30-year Baseline Projection of TRS

The results of actuarial valuations are a “snapshot” of the financial position on the valuation date based on the assumed number of active employees and current beneficiaries. Projections simulate future actuarial valuation results over a forecast period (thirty years in this case) by “creating” future new hires and performing valuations using the projected membership. The following items are assumed for the projected results provided on the following page.

- Active Employee Growth Rate: 0.00%
- Valuation Discount Rate: 7.10%
- Investment Rate of Return: 7.10% each year
- Actuarial Value of Assets: 5-year smoothing, No Corridor
- Amortization Method: Level Percent of Payroll, Closed
- Amortization Bases:
 - Legacy amortization from 2014 valuation amortized over closed 30-year period
 - Subsequent bases amortized over closed 20-year period from date of valuation
- Amortization Period: Weighted 20.9-year period as of Valuation Date
- Future Contributions: Based on Expected Actuarially Determined Contributions including the impact of direct-rate smoothing of the impact of the assumption changes over a 5-year period beginning with the 2021 valuation

All other demographic and economic changes are assumed to occur in accordance with the actuarial assumptions used for the actuarial valuation.



Schedule H – 30-year Baseline Projection of TRS

(\$ in millions)

Fiscal Year End	Non-University Payroll	University Payroll	Total Payroll	Unfunded Accrued Liability	Funding Ratio	Direct Rate Smoothing Contribution in Dollars	Salary Percentage Contribution in Dollars	Additional for Unfunded Accrued Liability
	(1)	(2)	(3)=(1)+(2)	(4)	(5)	(6)	(7)	(8)=(6)-(7)
2026	\$4,088	\$190	\$4,278	\$17,455	58.6%	\$1,474	\$525	\$949
2027	4,161	192	4,353	17,622	59.1%	1,587	536	1,051
2028	4,235	194	4,429	17,701	59.8%	1,714	547	1,167
2029	4,311	197	4,508	18,583	58.7%	1,834	559	1,275
2030	4,386	200	4,586	18,427	59.9%	1,880	571	1,309
2031	4,464	204	4,668	18,272	61.0%	1,933	583	1,350
2032	4,546	208	4,754	17,951	62.5%	1,981	596	1,385
2033	4,631	212	4,843	17,558	64.0%	2,030	609	1,421
2034	4,718	216	4,934	17,082	65.5%	2,079	622	1,457
2035	4,809	221	5,030	16,524	67.2%	2,130	636	1,494
2036	4,905	225	5,130	15,874	69.0%	2,184	650	1,534
2037	5,007	231	5,238	15,128	70.9%	2,240	665	1,575
2038	5,115	236	5,351	14,277	73.0%	2,347	681	1,666
2039	5,230	243	5,473	13,311	75.2%	2,365	697	1,668
2040	5,350	250	5,600	12,219	77.5%	2,486	714	1,772
2041	5,478	257	5,735	10,940	80.1%	2,579	732	1,847
2042	5,612	265	5,877	9,554	82.9%	2,647	751	1,896
2043	5,753	274	6,027	7,946	85.9%	2,704	770	1,934
2044	5,901	282	6,183	6,130	89.3%	2,496	790	1,706
2045	6,055	292	6,347	4,118	92.9%	2,550	811	1,739
2046	6,216	303	6,519	1,909	96.8%	2,510	833	1,677
2047	6,383	313	6,696	-	100.0%	-	856	-
2048	6,559	325	6,884	-	100.0%	-	880	-
2049	6,742	336	7,078	-	100.0%	-	905	-
2050	6,931	348	7,279	-	100.0%	-	931	-
2051	7,135	360	7,495	-	100.0%	-	958	-
2052	7,349	372	7,721	-	100.0%	-	985	-
2053	7,572	383	7,955	-	100.0%	-	1,015	-
2054	7,799	394	8,193	-	100.0%	-	1,046	-
2055	8,035	406	8,441	-	100.0%	-	1,078	-