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TEACHERS' Retirement System
TRS
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GASB Statement No. 74 Report for the Teachers' Retirement System of the State of Kentucky

Retiree Medical and Life Insurance Plans

Prepared as of June 30, 2019

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November 4, 2019

Board of Trustees
Teachers' Retirement System of the
State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:

Presented in this report is information to assist the Teachers' Retirement System of the State of Kentucky (System) in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 74 for the Retiree Medical Plan funded by the Medical Insurance Fund (MIF) and the Life Insurance Plan funded by the Life Insurance Fund (LIF). The information is presented for the one-year period ending June 30, 2019. These calculations have been made on a basis that is consistent with our understanding of the accounting standard.

The annual actuarial valuation performed as of June 30, 2018 was used as the basis for much of the information presented as of June 30, 2019 in this report. The valuation was based upon data furnished by the System concerning active, inactive, and retired members along with pertinent claims data and financial information. This information was reviewed for completeness and internal consistency, but was not audited. The valuation results depend on the integrity of the data. If any of the information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

To the best of our knowledge, the information contained in this report is complete and accurate. These calculations were performed by, and under the supervision of, independent consulting actuaries with experience in performing valuations for public retirement systems. In addition, the valuation was prepared in accordance with generally accepted actuarial principles and practices as well as with Actuarial Standards of Practice prescribed by the Actuarial Standards Board.

Our calculation of the liabilities associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement No. 74. The calculation of the MIF and LIF liabilities for this report may not be applicable for funding purposes of the MIF and LIF. A calculation of the MIF's and LIF's liabilities for purposes other than satisfying the requirements of GASB No. 74 may produce significantly different results.

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This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuations were prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the medical plans and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of each plan.

Respectfully submitted,

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Section I – Introduction

The Governmental Accounting Standards Board issued Statement No. 74 (GASB 74), *"Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans,"* in June 2015. For the purposes of reporting under GASB 74, the MIF and LIF are assumed to be cost-sharing, multiple-employer, defined benefit OPEB plans with a special funding situation, where assets are accumulated in trusts or equivalent arrangements that meet the criteria in paragraph 3 of GASB 74.

This report, prepared as of June 30, 2019 (Measurement Date or MD), presents information to assist the System in meeting the requirements of GASB 74. Much of the material provided in this report is based on the data, assumptions and results of the annual actuarial valuation of the MIF and LIF, as of June 30, 2018 (Valuation Date or VD). The results of that valuation were detailed in a report dated November 12, 2018.

GASB 74 requires the determination of the Total OPEB Liability (TOL) utilizing the Entry Age Normal (EAN) actuarial cost method. If the valuation date at which the TOL is determined is before the measurement date, as is the case here, the TOL must be rolled forward to the measurement date. The Net OPEB Liability (NOL) is then set equal to the rolled forward TOL minus the plan's Fiduciary Net Position (FNP) (basically the market value of assets as of the Measurement Date). The plan provisions recognized in the calculation of the TOL of the MIF and LIF are summarized in Schedule B. The development of the roll-forward of the TOL of the MIF and LIF is shown in the table on page 9 and page 10.

Among the assumptions needed for the liability calculation is the discount rate, as defined by GASB, or a Single Equivalent Interest Rate (SEIR). To determine the SEIR, the FNP must be projected into the future for as long as there are anticipated benefits payable under the plan's provisions applicable to the membership and beneficiaries of the Plan on the Measurement Date. Future contributions are to be projected in accordance with a plan's funding policy and/or the application of professional judgment to consider the recent contribution history of the employers and non-employer contributing entities. If the FNP is not projected to be depleted at any point in the future, the long term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the SEIR.

If, however, at a future measurement date, the FNP is projected to be depleted, the SEIR is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long-term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate (Municipal Bond Index Rate). The Municipal Bond Index Rate used for this purpose is the June average of the Bond Buyer General Obligation 20-year Municipal Bond Index published weekly by the Board of Governors of the Federal Reserve System. Our calculations indicated the FNP is <u>not</u> projected to be depleted, so the Municipal Bond Index Rate was not used in the determination of the SEIR. Please see Paragraph 35(b) in the GASB 74 section for more explanation into the development of the SEIR.

Section I – Introduction (continued)

The FNP projections are based upon the Plan's financial status on the Valuation Date, the indicated set of methods and assumptions, and the requirements of GASB 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing plan basis, reflecting the impact of future members. Therefore, the results of this test do not necessarily indicate whether or not the fund will actually run out of money, the financial condition of the Plan, or the Plan's ability to make benefit payments in future years.

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 74, for note disclosure and Required Supplementary Information (RSI).

Section II – Financial Statement Notes

The material presented herein will follow the order presented in GASB 74. There are non-actuarial items required which are not included in this report. Paragraph numbers are provided for ease of reference.

Paragraphs 34(a)(1)-(3): CMC was not expected to supply this information.

Paragraph 34(a)(4): The data required regarding the membership of the MIF and LIF were furnished by the System. The following table summarizes the membership of the Plan as of June 30, 2018, the Valuation Date.

Membership

	Number	
	MIF	LIF
Inactive Members or Their Beneficiaries Currently Receiving Benefits	41,232	49,422
Inactive Members Entitled to but not yet Receiving Benefits	7,337	8,814
Active Members	72,205	72,205
Total Membership	120,774	130,441

Paragraphs 34(a)(5)-(6) and 34(b)-(e): CMC was not expected to supply this information.

Paragraph 35(a)(1)-(4): The information is provided in the following table. As stated previously, the NOL is equal to the TOL minus the FNP. That result as of June 30, 2019, the Measurement Date, is presented in the table below.

Measurement Date of June 30, 2019 ($ in Thousands)		
	MIF	LIF
TOL*	$ 4,340,807	$ 116,830
FNP	1,414,020	85,758
NOL	$ 2,926,787	$ 31,072
Ratio of FNP to TOL	32.58%	73.40%

**For the MIF, the TOL includes the additional consideration for the current treatment of KEHP implicit subsidies that may be needed in the future. This is an additional liability from our funding MIF accrued liabilities.*

Section II – Financial Statement Notes (continued)

Paragraph 35(b): Listed below is the information to be disclosed regarding the actuarial assumptions and other inputs used to measure the TOL. The complete set of actuarial assumptions and other inputs utilized in developing the TOL are outlined in Schedule C. The TOL was determined by an actuarial valuation as of June 30, 2018, using the following key actuarial assumptions and other inputs:

Inflation	3.00%
Real wage growth	0.50%
Wage inflation	3.50%
Salary increases, including wage inflation	3.50% - 7.20%
Long-term Investment Rate of Return, net of OPEB plan investment expense, including inflation	
MIF	8.00%
LIF	7.50%
Municipal Bond Index Rate	3.50%
Year FNP is projected to be depleted	
MIF	n/a
LIF	n/a
Single Equivalent Interest Rate, net of OPEB plan investment expense, including price inflation	
MIF	8.00%
LIF	7.50%
MIF Health Care Cost Trends	
Under Age 65	7.50% for FYE 2019 decreasing to an ultimate rate of 5.00% by FYE 2024
Ages 65 and Older	5.50% for FYE 2019 decreasing to an ultimate rate of 5.00% by FYE 2021
Medicare Part B Premiums	2.63% for FYE 2019 with an ultimate rate of 5.00% by 2031

Mortality rates were based on the RP-2000 Combined Mortality Table projected to 2025 with projection scale BB and set forward two years for males and one year for females is used for the period after service retirement and for dependent beneficiaries. The RP-2000 Disabled Mortality Table set forward two years for males and seven years for females is used for the period after disability retirement.

Section II – Financial Statement Notes (continued)

The demographic actuarial assumptions for retirement, disability incidence, withdrawal, rates of plan participation, and rates of plan election used in the June 30, 2018 valuation were based on the results of the most recent actuarial experience studies for the System, which covered the five-year period ending June 30, 2015.

The remaining actuarial assumptions (e.g., initial per capita costs, health care cost trends) used in the June 30, 2018 valuation of the MIF were based on a review of recent plan experience done concurrently with the June 30, 2018 valuation. The health care cost trend assumption was updated for the June 30, 2018 valuation and was shown as an assumption change in the TOL roll forward while the change in initial per capita claims costs were included with experience in the TOL roll forward.

The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The target asset allocation and best estimates of arithmetic real rates of return for each major asset class, as provided by TRS's investment consultant, are summarized in the following table:

MIF		
Asset Class	Target Allocation	Expected Geometric Real Rate of Return
Global Equity	58.0%	5.1%
Fixed Income	9.0%	1.2%
Real Estate	6.5%	3.8%
Private Equity	8.5%	6.3%
Other Additional Categories	17.0%	3.2%
Cash (LIBOR)	1.0%	0.9%
Total	100.0%	

Section II – Financial Statement Notes (continued)

LIF		
Asset Class	Target Allocation	Expected Geometric Real Rate of Return
U.S. Equity	40.0%	4.3%
International Equity	23.0%	5.2%
Fixed Income	18.0%	1.2%
Real Estate	6.0%	3.8%
Private Equity	5.0%	6.3%
Other Additional Categories	6.0%	3.2%
Cash (LIBOR)	2.0%	0.9%
Total	100.0%	

MIF Discount rate (SEIR). The discount rate used to measure the TOL as of the Measurement Date was 8.00%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB 74. The projection's basis was an actuarial valuation performed as of June 30, 2018. In addition to the actuarial methods and assumptions of the June 30, 2018 actuarial valuation, the following actuarial methods and assumptions were used in the projection of cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the Valuation Date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.50%.
- The pre-65 retiree health care costs for members retired on or after July 1, 2010 were assumed to be paid by either the State or the retirees themselves.
- As administrative expenses, other than the administrative fee of $7.44 PMPM paid to KEHP by TRS, were assumed to be paid in all years by the employer as they come due, they were not considered.
- Cash flows occur mid-year.

- Future contributions to the MIF were based upon the contribution rates defined in statute and the projected payroll of active employees. Per KRS 161.540(1)(c).3 and 161.550(5), when the MIF achieves a sufficient prefunded status, as determined by the retirement system's actuary, the following MIF statutory contributions are to be decreased, suspended, or eliminated:
    - Employee contributions
    - School District/University Contributions
    - State Contributions for KEHP premium subsidies payable to retirees who retire after June 30, 2010

  To reflect these adjustments, open group projections were used and assumed an equal, pro rata reduction to the current statutory amounts in the years if/when the MIF is projected to achieve a Funded Ratio of 100% or more. Here, the current statutory amounts are adjusted to achieve total contributions equal to the Actuarially Determined Contribution (ADC), as determined by the prior year's valuation and in accordance with the MIF's funding policy (Schedule E). As the specific methodology to be used for the adjustments has yet to be determined, there may be differences between the projected results and future experience. This may also include any changes to retiree contributions for KEHP coverage pursuant to KRS 161.675(4)(b).

- In developing the adjustments to the statutory contributions in future years, the following was assumed:
    - Liabilities and cash flows are net of expected retiree contributions and any implicit subsidies attributable to coverage while participating in KEHP.
    - For the purposes of developing estimates for new entrants, active headcounts were assumed to remain flat for all future years.

Based on these assumptions, the MIF's FNP was <u>not</u> projected to be depleted.

LIF Discount rate (SEIR). The discount rate used to measure the TOL as of the Measurement Date was 7.50%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB 74. The projection's basis was an actuarial valuation performed as of June 30, 2018. In addition to the actuarial methods and assumptions of the June 30, 2018 actuarial valuation, the following actuarial methods and assumptions were used in the projection of the LIF's cash flows:

- Total payroll for the initial projection year consists of the payroll of the active membership present on the Valuation Date. In subsequent projection years, total payroll was assumed to increase annually at a rate of 3.50%.
- The employer will contribute the Actuarially Determined Contribution (ADC) in accordance with the LIF's funding policy (Schedule E) determined by a valuation performed on a date two years prior to the beginning of the fiscal year in which the ADC applies.
- As administrative expenses were assumed to be paid in all years by the employer as they come due, they were not considered.
- Active employees do not contribute to the plan.
- Cash flows occur mid-year.

Based on these assumptions, the LIF's FNP was <u>not</u> projected to be depleted.

Section II – Financial Statement Notes (continued)

The FNP projections are based upon the MIF's and the LIF's financial statuses on the Valuation Date, the indicated set of methods and assumptions, and the requirements of GASB 74. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing basis, reflecting the impact of future members. Therefore, the results of these tests do not necessarily indicate whether or not the MIF and the LIF will actually run out of money, the financial condition of the MIF and the LIF, or the MIF's and the LIF's ability to make benefit payments in future years.

Paragraphs 35(b)(1) and 35(b)(2)(g): These paragraphs require disclosure of the sensitivity of the NOL to changes in the health care cost trend rates for the MIF and the discount rate for the MIF and the LIF. The following exhibit presents the NOL of the MIF, calculated using the health care cost trend rates, as well as what the MIF's NOL would be if it were calculated using a health care cost trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate. Similarly, the exhibit presents the NOL of the MIF and LIF, calculated using the Single Equivalent Interest Rate, as well as what the MIF's and LIF's NOL would be if they were calculated using a Discount Rate that is 1-percentage-point lower or 1-percentage-point higher than the current Single Equivalent Interest Rate:

Net OPEB Liability MIF ($ in Thousands)			
	Health Care Cost Trend Rates		
Discount Rate	1% Decrease	Current	1% Increase
1% Increase (9.00%)		$ 2,474,190	
Current (8.00%)	$ 2,382,551	$ 2,926,787	$ 3,596,018
1% Decrease (7.00%)		$ 3,467,106	

Discount Rate	Net OPEB Liability - LIF ($ in Thousands)
1% Increase (8.50%)	$ 18,868
Current (7.50%)	$ 31,072
1% Decrease (6.50%)	$ 45,921

Section II – Financial Statement Notes (continued)

Paragraph 35(c): The TOL of the MIF and LIF is based upon an actuarial valuation performed as of the Valuation Date, June 30, 2018. An expected TOL is determined as of June 30, 2019 using standard roll-forward techniques. The roll-forward calculation begins with the TOL, as of June 30, 2018, subtracts the actual benefit payments (net of retiree contributions, if applicable) for the year, applies interest at the discount rate for the year, and then adds the annual normal cost (also called the Service Cost). If applicable, actuarial gains and losses arising from the difference between estimates and actual experience (excluding amounts related to benefit changes and changes in assumptions or other inputs) are reconciled to the TOL as of the Measurement Date. Last, any changes of assumptions or other inputs are reflected. The procedure used to determine the TOL of the MIF and LIF, as of June 30, 2019, is shown in the following tables:

TOL Roll-Forward – MIF
($ in Thousands)

		Expected		Actual
(a) TOL as of June 30, 2018*	$	4,659,996	$	4,047,748
(b) Actual Benefit Payments and Refunds for the Year July 1, 2018 – June 30, 2019		(163,666)		(163,666)
(c) Interest on TOL = [(a) x (0.080)] + [(b) x (0.040)]		366,254		317,274
(d) Service Cost for the Year July 1, 2018 – June 30, 2019 at the End of the Year		93,792		93,792
(e) Changes of Benefit Terms		0		0
(f) Changes of Assumptions (updated health care trend)		45,659		45,659
(g) TOL Rolled Forward to June 30, 2019 = (a) + (b) + (c) + (d) + (e) + (f)	$	5,002,035	$	4,340,807
(h) Difference between Expected and Actual Experience (Gain)/Loss			$	(661,228)

* The TOL used in the roll-forward as of June 30, 2018 is calculated using the discount rate as of the Prior Measurement Date.

Section II – Financial Statement Notes (continued)

TOL Roll-Forward – LIF ($ in Thousands)				
		Expected		Actual
(a) TOL as of June 30, 2018*	$	112,660	$	112,471
(b) Actual Benefit Payments and Refunds for the Year July 1, 2018 – June 30, 2019		(5,153)		(5,153)
(c) Interest on TOL = [(a) x (0.075)] + [(b) x (0.0375)]		8,256		8,241
(d) Service Cost for the Year July 1, 2018 – June 30, 2019 at the End of the Year		1,271		1,271
(e) Changes of Benefit Terms		0		0
(f) Changes of Assumptions (updated health care trend)		0		0
(g) TOL Rolled Forward to June 30, 2019 = (a) + (b) + (c) + (d) + (e) + (f)	$	117,034	$	116,830
(h) Difference between Expected and Actual Experience (Gain)/Loss			$	(204)

* The TOL used in the roll-forward as of June 30, 2018 is calculated using the discount rate as of the Prior Measurement Date.

Section III – Required Supplementary Information

There are several tables of Required Supplementary Information (RSI) that need to be included in the Plan's financial statements:

Paragraphs 36(a)-(c): The required tables of schedules are provided in Appendix A.

Paragraph 36(d): The required schedule presenting the annual money-weighted rates of return is to be supplied by the System.

Paragraph 38: Information regarding changes to benefit terms and changes to assumptions or other inputs should be noted regarding the RSI. The information should be listed by the date for which the indicated change was first reflected in reported amounts.

Changes to benefit terms:

June 30, 2019 (Valuation Date: June 30, 2018)

MIF

- None

LIF

- None

Changes to assumptions or other inputs:

None.

Methods and assumptions used in calculations of Actuarially Determined Contributions. The Actuarially Determined Contribution rates, as a percentage of payroll, used to determine the Actuarially Determined Contribution amounts in the Schedule of Employer Contributions (Schedule A) are calculated as of the indicated Valuation Date. The following actuarial methods and assumptions (from the indicated actuarial valuations) were used to determine contribution rates reported in that schedule for the year ending June 30, 2019:

Valuation Date	
MIF	June 30, 2018
LIF	June 30, 2016
Actuarial cost method	Entry Age Normal
Amortization method	Level Percent of Payroll
Amortization period	22 years MIF 30 years LIF
Asset valuation method	
MIF	Five-year smoothed value
LIF	Five-year smoothed value
Inflation	
MIF	3.00%
LIF	3.00%
Real wage growth	0.50%
Wage Inflation	
MIF	3.50%
LIF	3.50%
Salary increases, including wage inflation	
MIF	3.50% - 7.20%
LIF	3.50% - 7.45%
Discount Rate	
MIF	8.00%
LIF	7.50%
MIF Health Care Cost Trends	
Under Age 65	7.50% for FYE 2018 decreasing to an ultimate rate of 5.00% by FYE 2024
Ages 65 and Older	5.50% for FYE 2018 decreasing to an ultimate rate of 5.00% by FYE 2021
Medicare Part B Premiums	0.00% for FYE 2018 with an ultimate rate of 5.00% by 2030
MIF Under Age 65 Claims	The current premium charged by KEHP is used as the base cost and is projected forward using only the health care trend assumption (no implicit rate subsidy is recognized).

Schedule A – Required Supplementary Information Tables

SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
GASB 74 Paragraph 36(a)
($ in Thousands)

Medical Insurance Fund (MIF)										
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost at end of year	$ 93,792	$ 95,382	$ 95,625							
Interest	366,254	355,491	333,990							
Change of benefit terms	0	0	8,926							
Difference betw een expected and actual experience	(661,228)	(210,450)	0							
Changes of Assumptions	45,659	56,483	0							
Benefit Payments	(163,666)	(161,082)	(178,500)							
Net change in Total OPEB Liability	$ (319,189)	$ 135,824	$ 260,041							
Total OPEB Liability - beginning	$4,659,996	$4,524,172	$4,264,131							
Total OPEB Liability - ending (a)	$4,340,807	$4,659,996	$4,524,172							
Plan Net Position										
Contributions - State of Kentucky	$ 76,382	$ 80,959	$ 75,497							
Contributions - Other Employers	106,764	106,143	104,879							
Contributions - Active Member	131,677	130,778	128,819							
Net investment income	74,385	76,841	95,453							
Benefit payments	(163,666)	(161,082)	(178,500)							
Administrative expense	(1,803)	(1,748)	(1,539)							
Other	0	0	0							
Net change in Plan Net Position	$ 223,739	$ 231,891	$ 224,609							
Plan Net Position - beginning	$1,190,281	$ 958,390	$ 733,781							
Plan Net Position - ending (b)	$1,414,020	$1,190,281	$ 958,390							
Net OPEB Liability - ending (a) - (b)	$2,926,787	$3,469,715	$3,565,782							

Schedule A – Required Supplementary Information Tables (continued)

SCHEDULE OF CHANGES IN THE NET OPEB LIABILITY
GASB 74 Paragraph 36(a)
($ in Thousands)

Life Insurance Fund (LIF)										
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability										
Service Cost at end of year	$ 1,271	$ 1,068	$ 1,067							
Interest	8,256	8,026	7,761							
Change of benefit terms	0	0	0							
Difference between expected and actual experience	(204)	(717)	0							
Changes of Assumptions	0	0	0							
Benefit Payments	(5,153)	(5,453)	(5,151)							
Net change in Total OPEB Liability	$ 4,170	$ 2,924	$ 3,677							
Total OPEB Liability - beginning	$ 112,660	$ 109,736	$ 106,059							
Total OPEB Liability - ending (a)	$ 116,830	$ 112,660	$ 109,736							
Plan Net Position										
Contributions - State of Kentucky	$ 1,209	$ 897	$ 882							
Contributions - Other Employers	212	161	168							
Contributions - Active Member	0	0	0							
Net investment income	5,058	1,111	915							
Benefit payments	(5,153)	(5,453)	(5,151)							
Administrative expense	(30)	(31)	(28)							
Other	0	0	0							
Net change in Plan Net Position	$ 1,296	$ (3,315)	$ (3,214)							
Plan Net Position - beginning	$ 84,462	$ 87,777	$ 90,991							
Plan Net Position - ending (b)	$ 85,758	$ 84,462	$ 87,777							
Net OPEB Liability - ending (a) - (b)	$ 31,072	$ 28,198	$ 21,959							

Schedule A – Required Supplementary Information Tables (continued)

SCHEDULE OF THE NET OPEB LIABILITY
GASB 74 Paragraph 36(b)
($ in Thousands)

Medical Insurance Fund (MIF)										
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	$4,340,807	4,659,996	4,524,172							
Plan Fiduciary Net Position	1,414,020	1,190,281	958,390							
Net OPEB Liability	$2,926,787	3,469,715	3,565,782							
Plan Fiduciary Net Position as a percentage of the Total OPEB Liability	32.58%	25.54%	21.18%							
Covered payroll	$ 3,497,216	$ 3,455,660	$ 3,415,432							
Net OPEB Liability as a percentage of covered payroll	83.69%	100.41%	104.40%							

Schedule A – Required Supplementary Information Tables (continued)

SCHEDULE OF THE NET OPEB LIABILITY
GASB 74 Paragraph 36(b)
($ in Thousands)

Life Insurance Fund (LIF)										
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total OPEB Liability	$ 116,830	112,660	109,736							
Plan Fiduciary Net Position	85,758	84,462	87,777							
Net OPEB Liability	$ 31,072	28,198	21,959							
Plan Fiduciary Net Position as a percentage of the Total OPEB Liability	73.40%	74.97%	79.99%							
Covered payroll	$ 3,497,216	$ 3,455,660	$ 3,415,432							
Net OPEB Liability as a percentage of covered payroll	0.89%	0.82%	0.64%							

Schedule A – Required Supplementary Information Tables (continued)

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 74 Paragraph 36(c)
($ in Thousands)

Medical Insurance Fund (MIF)										
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially Determined Employer Contribution	$ 76,597	$ 118,837	$ 102,854	$ 97,983	$ 106,606	$ 159,583	$ 186,726	$ 470,217	$ 477,723	$ 457,054
Contributions in relation to the Actuarially Determined Contribution	183,146	187,102	180,376	221,967	168,084	162,568	166,611	177,748	188,735	173,380
Annual contribution deficiency (excess)	$ (106,549)	$ (68,265)	$ (77,522)	$ (123,984)	$ (61,478)	$ (2,985)	$ 20,115	$ 292,469	$ 288,988	$ 283,674
Covered Payroll	$3,497,216	$3,455,660	$3,415,432	$3,390,539	$3,455,008	$3,317,422	$3,310,710	$3,310,176	$3,283,749	$3,321,614
Actual contributions as a percentage of covered payroll	5.24%	5.41%	5.28%	6.55%	4.86%	4.90%	5.03%	5.37%	5.75%	5.22%

Schedule A – Required Supplementary Information Tables (continued)

SCHEDULE OF EMPLOYER CONTRIBUTIONS
GASB 74 Paragraph 36(c)
($ in Thousands)

Life Insurance Fund (LIF)	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially Determined Employer Contribution	$ 1,082	$ 1,075	$ 1,065	$ 1,058	$ 1,050	$ 1,045	$ 1,740	$ 1,733	$ 1,726	$ 1,993
Contributions in relation to the Actuarially Determined Contribution	1,421	1,058	1,050	1,038	1,020	1,006	1,680	1,685	1,669	1,967
Annual contribution deficiency (excess)	$ (339)	$ 17	$ 15	$ 20	$ 30	$ 39	$ 60	$ 48	$ 57	$ 26
Covered Payroll	$3,497,216	$3,455,660	$3,415,432	$3,390,539	$3,455,008	$3,317,422	$3,310,710	$3,310,176	$3,283,749	$3,321,614
Actual contributions as a percentage of covered payroll	0.04%	0.03%	0.03%	0.03%	0.03%	0.03%	0.05%	0.05%	0.05%	0.06%

Schedule B – Summary of Main Benefit Provisions

ELIGIBILITY FOR ACCESS TO RETIREE MEDICAL PLAN COVERAGE:

Service Retirement: For employees hired prior to July 1, 2008, Retiree Medical Plan coverage eligibility is attained when an employee retires, which is possible after the completion of 27 years of service or attainment of age 55 and 5 years of service with reduced pension benefits. For employees hired on or after July 1, 2008, employees may retire after the completion of 27 years of service, the attainment of age 55 and 10 years of service with reduced pension benefits, or the attainment of age 60 and 5 years of service with unreduced pension benefits, but must complete a minimum of 15 years of service to be eligible for Retiree Medical Plan coverage.

Disability Retirement: Disabled employees hired prior to July 1, 2008 with at least 5 years of service, who are totally and permanently incapable of being employed as a teacher, are eligible for Retiree Medical Plan coverage upon approval for TRS disability retirement benefits. Disabled employees hired after July 1, 2008 must have 15 years of service to be eligible for Retiree Medical Plan coverage upon approval for TRS disability retirement benefits.

Members and dependents under age 65 and eligible for Medicare due to a disability after January 1, 2013 are only eligible to enroll in the MEHP. Under age 65 members who retired prior to Jan. 1, 2013, are grandfathered from this requirement and allowed a choice of KEHP or MEHP coverage. Actual census data and current plan elections were used for current disabled retirees. All future disabled members under the age of 65 with Medicare are placed on the MEHP and not the KEHP. This has been consistently applied since 2013.

Survivors: Spouses of employees who die in service while eligible to retire, as well as survivors of service and disabled retirees, are eligible for Retiree Medical Plan coverage if elected within 30 days of the employee's/retiree's death with no future remarriage. Otherwise, survivor is not eligible for Retiree Medical Plan coverage.

Spousal Shared Risk Waiver for MEHP: Beginning in 2013, eligible spouses who waive the MEHP coverage, will no longer have the opportunity to enroll during any annual MEHP open enrollment so most spousal waivers on the MEHP are now permanent waivers unless a KTRS specific qualifying event is met. This does not apply to the KEHP. This MEHP eligibility rule became necessary to mitigate spousal adverse selection with zero premium Medicare Advantage plans on the individual and open market.

Termination: For employees hired prior to July 1, 2008 and who terminated with at least 5 years of service, Retiree Medical Plan coverage eligibility is attained at age 60 with unreduced pension benefits. For employees hired on or after July 1, 2008 and who terminated with at least 15 years of service, Retiree Medical Plan coverage eligibility is attained at age 60 with unreduced pension benefits.

Reemployed Retirees: Effective January 01, 2019 and because of the Affordable Care Act (ACA) and Medicare secondary payer (MSP) federal rules, if a TRS retiree returns to work and is offered the same health insurance coverage as any full time employee (whether the KEHP, MEHP, or another plan), then the member must waive coverage through TRS. For valuation purposes, active employees identified as currently receiving retiree health care through the System are valued as retirees.

COVERED MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS:

Under Age 65 Retiree Shared Responsibility Contribution: Effective July 1, 2010, retirees under the age of 65 began a three-year phase-in of the Shared Responsibility Contribution. This contribution reduces the applicable amount of the full contribution provided by the System to retirees, by adjusting the Shared Responsibility Contribution amount by 100% less the appropriate percentage from the Retiree Percentage Contribution table below. Effective July 1, 2012, the full Shared Responsibility Contribution equals the Standard Medicare Part B premium paid by retirees ages 65 and older.

Monthly Under Age 65 Shared Responsibility Contribution Timeline			
Effective Date	Medicare Part B Monthly Cost	Formula	Shared Responsibility Contribution
July 1, 2010	$110.50	(1/3 x $110.50)	$ 37.00
January 1, 2011	115.40	(1/3 x 115.40)	39.00
July 1, 2011	115.40	(2/3 x 115.40)	77.00
January 1, 2012	99.90	(2/3 x 99.90)	66.00
July 1, 2012	99.90	99.90	99.90
January 1, 2013	104.90	104.90	104.90
January 1, 2014	104.90	104.90	104.90
January 1, 2015	104.90	104.90	104.90
January 1, 2016	121.80	121.80	121.80
January 1, 2017	134.00	134.00	134.00
January 1, 2018	134.00	134.00	134.00
January 1, 2019	135.50	135.50	135.50

Retiree Years of Service Percentage Contribution: Retirees contribute the following percentages based on years of service at retirement, which are then applied to the Retiree Contribution Rate Basis:

Retiree Percentage Contribution*				
	Entered System Before 7/1/2002			
Year of Service	Age 65 or Older and Covered Before 1/1/2005	Age 65 After or Covered After 12/31/2004	Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
5 – 9.99	30%	75%	90%	Not Eligible
10 – 14.99	20	50	75	Not Eligible
15 – 19.99	10	25	55	55%
20 – 24.99	0	0	35	35
25 – 25.99	0	0	10	10
26 – 26.99	0	0	5	5
27 or more	0	0	0	0

**0% for disabled retirees that retired prior to 1/1/2002*

Schedule B – Summary of Main Benefit Provisions (continued)

COVERED MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS (CONTINUED):

Monthly Retiree Contribution Rate Basis Effective January 1, 2019					
	Under Age 65 (KEHP)				
Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	Ages-65 and Older (MEHP)
Single	$ 660.04	$ 646.96	$ 656.60	$ 583.96	$226.00
Parent Plus	851.84	802.26	878.24	808.92	n/a
Couple	1,029.02	1,060.74	1,189.96	1,093.10	n/a
Family	1,131.64	1,105.34	1,303.24	1,196.18	n/a
Family C-R	738.64	719.12	771.84	704.70	n/a

Under Age 65 Retiree Plan Cost Contribution: An additional contribution according to the table below is required to be paid by retirees under the age of 65 based upon the plan elected:

Monthly Under Age 65 Plan Cost Contribution* Effective January 1, 2019				
Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 49.42	$ 82.38	$ 26.20	$ 23.58
Parent Plus	126.66	234.82	62.40	56.16
Couple	304.62	528.36	260.06	234.06
Family	358.12	662.26	312.06	280.86
Family C-R	80.32	157.56	29.10	26.20

** Does not include the additional contribution required to be paid by retirees under the age of 65 who use tobacco ($40 for Single or Family Cross-Reference, and $80 for Parent Plus, Couple or Family). Also, this does not include the additional contribution required to be paid by retirees under the age of 65 who do not complete their LivingWell Promise, which is an additional $40 per month for all levels of coverage—single, parent +, couple, and family. Approximately 600 retirees did not complete their LivingWell Promise for 2017.*

Schedule B – Summary of Main Benefit Provisions (continued)

COVERED MEMBER MEDICAL PLAN CONTRIBUTIONS (CONTINUED):

Spouse Contributions: 100% of the full cost for non-Medicare eligible dependents is paid through a combination of payments from beneficiaries and the State. Spouses of current post-65 retirees and surviving spouses of deceased retirees with a date of death on or after July 1, 2002 pay 100% of the full contribution. Spouses of active members who died while eligible to retire prior to July 1, 2002, are provided the same subsidy by the System that would have been provided to the retiree for the lifetime of the spouse, or until remarriage. Spouses of active members who die while eligible to retire on or after July 1, 2002 or later pay 100% of the full contribution.

Survivors: Spouses of employees who die in service while eligible to retire, as well as survivors of service and disabled retirees, are eligible for Retiree Medical Plan coverage if elected within 30 days of the employee's/retiree's death with no future remarriage. Otherwise, survivor is not eligible for Retiree Medical Plan coverage.

Spousal Shared Risk Waiver for MEHP: Beginning in 2013, eligible spouses who waive the MEHP coverage, will no longer have the opportunity to enroll during any annual MEHP open enrollment so most spousal waivers on the MEHP are now permanent waivers unless a KTRS specific qualifying event is met. This does not apply to the KEHP. This MEHP eligibility rule became necessary to mitigate spousal adverse selection with zero premium Medicare Advantage plans on the individual and open market.

Monthly Surviving Spouse Contribution Effective January 1, 2019					
Tier Elected by Surviving Spouse	Under Age 65 (KEHP)				Ages 65 and Older (MEHP)
	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	
Single	$716.90	$736.78	$690.24	$614.98	$226.00
Parent Plus	985.94	1,044.52	948.08	872.52	n/a

SYSTEM RETIREE MEDICAL PLAN CONTRIBUTIONS: The System Contribution Rate Basis is determined annually by the System; and the full cost is projected based on historical claims data. For retirees, the following percentages are based on years of service at retirement and are then applied to the System Contribution Rate Basis:

Percentage of System Contribution Rate Provided to Retirees*				
Year of Service	Entered System Before 7/1/2002		Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
	Age 65 or Older and Covered Before 1/1/2005	Age 65 After or Covered After 12/31/2004		
5 – 9.99	70%	25%	10%	Not Eligible
10 – 14.99	80	50	25	Not Eligible
15 – 19.99	90	75	45	45%
20 – 24.99	100	100	65	65
25 – 25.99	100	100	90	90
26 – 26.99	100	100	95	95
27 or more	100	100	100	100

**100% for disabled retirees that retired prior to 1/1/2002*

SYSTEM RETIREE MEDICAL PLAN CONTRIBUTIONS:

Monthly System Contribution Rate Basis Effective January 1, 2019					
	Under Age 65 (KEHP)*				Ages-65 and Older (MEHP)
Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP	
Single	$ 660.04	$ 646.96	$ 656.60	$ 583.96	$226.00
Parent Plus	851.84	802.26	878.24	808.92	n/a
Couple	1,029.02	1,060.74	1,189.96	1,093.10	n/a
Family	1,131.64	1,105.34	1,303.24	1,196.18	n/a
Family C-R	738.64	719.12	771.84	704.70	n/a

**Irrespective of a participating retiree's service, an additional $7.44 per month is paid by the System to the Department of Employee Insurance (DEI) for KEHP coverage.*

ACTIVE MEMBER RETIREE MEDICAL PLAN CONTRIBUTIONS: Actively employed members make payroll contributions to the Medical Insurance Fund based upon the following schedule:

Active Member Percentage of Payroll Contribution Made to Medical Insurance Fund

Active Member Percentage of Payroll Contribution Made to Medical Insurance Fund					
University Employees		School District Employees (Non-Federal)		Other Employees	
Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008	Hired Before 7/1/2008	Hired On or After 7/1/2008
2.775	2.775	3.750	3.750	3.750	3.750

Schedule B – Summary of Main Benefit Provisions (continued)

LIFE INSURANCE PLAN BENEFITS:

(1) Effective July 1, 2000, the Teachers' Retirement System shall:

(a) Provide a life insurance benefit in a minimum amount of five thousand dollars ($5,000) for its members who are retired for service or disability. This life insurance benefit shall be payable upon the death of a member retired for service or disability to the member's estate or to a party designated by the member on a form prescribed by the retirement system; and

(b) Provide a life insurance benefit in a minimum amount of two thousand dollars ($2,000) for its active contributing members. This life insurance benefit shall be payable upon the death of an active contributing member to the member's estate or to a party designated by the member on a form prescribed by the retirement system.

Note: Members employed on a substitute or part-time basis and working at least 69% of a full contract year in a single fiscal year will be eligible for a life insurance benefit for the balance of the fiscal year or the immediately succeeding fiscal year under certain conditions. For non-vested members employed on a substitute or part-time basis, the life insurance benefit is provided if death occurs as the result of a physical injury on the job. For vested members employed on a substitute or part-time basis, death does not have to be the result of a physical injury on the job for life insurance benefits to be provided.

Schedule C – Statement of Actuarial Assumptions and Methods

The rates of retirement, disability, mortality, termination, salary increases, and rates of future benefit participation 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. The health care cost trend rates, and expected plan costs were determined by the actuary based on recent experience.

VALUATION DATE: June 30, 2018

DISCOUNT RATE: 8.0% per annum, compounded annually for the Medical Insurance Fund
7.5% per annum, compounded annually for the Life Insurance Fund

HEALTH CARE COST TREND RATES: Following is a chart detailing health care trend assumptions.

	Annual Trend Rate		
Fiscal Year Ended	Medicare Part B	Under Age 65	Ages 65 and Older
2019	2.63%	7.50%	5.50%
2020	4.70	7.00	5.25
2021	4.63	6.50	5.00
2022	4.88	6.00	5.00
2023	5.88	5.50	5.00
2024	5.71	5.00	5.00
2025	5.00	5.00	5.00
2026	5.41	5.00	5.00
2027	5.93	5.00	5.00
2028	5.62	5.00	5.00
2029	5.37	5.00	5.00
2030	5.12	5.00	5.00
2031 and beyond	5.00	5.00	5.00

AGE RELATED MORBIDITY: For retirees ages 65 and older, per capita health care costs are adjusted to reflect expected health care cost changes related to age. The increase to the net incurred health care claims is assumed to be:

Participant Age	Annual Increase
65 – 69	3.0%
70 – 74	2.5
75 – 79	2.0
80 – 84	1.0
85 - 89	0.5
90 and over	0.0

Schedule C – Statement of Actuarial Assumptions and Methods (continued)

For the retiree health care liabilities of those under age 65, the current premium charged by the Kentucky Employees' Health Plan (KEHP) is used as the base cost and is projected forward using the health care trend assumption. No implicit rate subsidy is calculated or recognized as the implicit rate subsidy is deemed the responsibility of the KEHP. Under Actuarial Standard of Practice No. 6 (ASOP No. 6), aging subsidies (or implicit rate subsidies) should be recognized, as the differences in health care utilization and cost due to age have been demonstrated and well quantified.

The impact of aging on a valuation's results can be as significant as the use of mortality, trend, and discounting. It has been the long-standing position that the responsibility for compliance with GASB Statement No. 43, when it relates to KEHP implicit subsidies, rests with KEHP, not the System, as the System has no operational authority over KEHP. As such, KEHP implicit subsidies are excluded from the OPEB valuation process of the Retiree Medical Plan. As GASB 74 and 75 prohibit such a deviation from ASOP No. 6, additional consideration to the current treatment of KEHP implicit rate subsidies may be needed in the future. The estimated impact of KEHP implicit subsidies to the actuarial accrued liability is an increase of $747,925,573.

Schedule C – Statement of Actuarial Assumptions and Methods (continued)

RETIREE MEDICAL PLAN COSTS: Assumed per capita health care costs were based on past experience and trended based on the assumptions. Following are charts detailing retiree per capita assumptions. These amounts include medical, drug, and administrative costs and represent the amount that the System pays as the full contribution amount. An additional $7.44 per month is paid to the Department of Employee Insurance (DEI) and is not included in the under age 65 costs listed below. For retirees ages 65 and older, the average costs shown are normalized to age 65 and then age adjusted in calculating liabilities.

Monthly Under Age 65 (KEHP) Full Costs as of January 1, 2019				
Tier Elected	LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
Single	$ 709.46	$ 729.34	$ 682.80	$ 607.54
Parent Plus	978.50	1,037.08	940.64	865.08
Couple	1,333.64	1,589.10	1,450.02	1,327.16
Family	1,489.76	1,767.60	1,615.30	1,477.04
Family C-R	818.96	876.68	800.94	730.09

Average Monthly System Full Costs and Contributions			
Year	Under Age-65 (KEHP) Contributions	Ages 65 and Older (MEHP) Full Costs	Ages 65 and Older (MEHP) Contributions
CY 2008	484	278	278
CY 2009	545	301[1]	301
CY 2010	594	373[1]	373
CY 2011	626	289[1]	289
CY 2012	622	270[2]	270
CY 2013	635	294[2]	294
CY 2014	679	290[2]	290
CY 2015	669	240[2]	240
CY 2016	681	260[2]	260
CY 2017	680	252[2]	252
CY 2018	688	258[2]	258
CY 2019	691	226[3]	226

[1] Under GASB 45, cost reductions for the amount of the Medicare Part D Retiree Drug Subsidy cannot be taken into account in the gross cost calculations.

[2] 2,257 current, Medicare-eligible benefit recipients have been identified by the client to be ineligible for premium-free Medicare Part A benefits. For these individuals, the full cost of coverage is, on average, $575 per month. It is assumed 9% of current retirees under the age of 65 who were hired prior to 4/1/1986 will be ineligible for premium-free Medicare Part A benefits upon reaching Medicare eligibility (age 65) and 0% of these retirees will cover a spouse. All active members are assumed to have begun contributing to Medicare as of 4/1/1986 and are assumed eligible for premium-free Medicare Part A benefits.

[3] Blended basis, includes increased costs for retirees without premium-free Medicare Part A. All active members are assumed to have begun contributing to Medicare as of 4/1/1986 and are assumed eligible for premium-free Medicare Part A benefits.

CURRENT RETIREE MEDICAL PLAN PARTICIPATION: Actual census data and current plan elections (including waivers) provided by the System were used for those retirees currently participating in the Retiree Medical Plan. Current participants are assumed to maintain their current Retiree Medical Plan coverage until they are no longer eligible.

ANTICIPATED RETIREE MEDICAL PLAN PARTICIPATION: The assumed annual rates of health care plan participation for future retirees are as follows:

	Member Participation		
Years of Service	Entered System Before 7/1/2002	Entered System After 6/30/2002 and Before 7/1/2008	Entered System After 6/30/2008
5-9.99	20%	20%	Not Eligible
10-14.99	49	20	Not Eligible
15-19.99	70	41	41%
20-24.99	91	61	61
25-25.99	91	76	76
26-26.99	91	84	84
27 or more	91	91	91

ANTICIPATED RETIREE MEDICAL PLAN ELECTIONS: The assumed rates of plan election for future retirees participating in the KEHP plans are provided in the following table. As the assumed plan election rates are estimates and actual results may be materially different, this assumption will need to be revised as experience evolves.

LivingWell CDHP	LivingWell PPO	LivingWell Basic CDHP	LivingWell Limited HDP
42%	50%	5%	3%

SPOUSE COVERAGE IN RETIREE MEDICAL PLAN: Actual census data and current plan elections were used for MEHP and KEHP covered spouses (including beneficiaries) of current retirees. For spouses of future retirees, 25% of future male retirees are assumed to cover their spouse and 15% of future female retirees are assumed to cover their spouse. Male retirees are assumed to be three years older than their spouse and female retirees are assumed to be one year younger than their spouse.

DISABLED DEPENDENT CHILDREN IN RETIREE MEDICAL PLAN: The liability associated with disabled dependent children was determined to be de minimis and was therefore excluded from this valuation.

Schedule C – Statement of Actuarial Assumptions and Methods (continued)

WITHDRAWAL ASSUMPTION: Future vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions based upon their age and service at termination of employment as follows:

Rates of Withdrawal Upon Termination of Employment			
Age at Termination of Employment	Years of Service		
	5 - 10	10 - 15	15+
Under Age 55	20%	15%	10%
Ages 55+	10%	10%	10%

All vested members who terminate employment prior to retirement are assumed to elect to withdraw their contributions prior to receiving a pension benefit based upon their service as follows:

Rates of Withdrawal Prior to Receiving a Pension Benefit			
Years of Service			
5 - 10	10 - 15	15 - 27	27+
25%	15%	10%	25%

All vested members who terminate employment prior to retirement and who are assumed to elect to receive a pension benefit are assumed to begin receiving their benefit at age 60.

PAYROLL GROWTH: 3.50% per annum, compounded annually.

PRICE INFLATION: 3.00% per annum, compounded annually.

AFFORDABLE CARE ACT (ACA): The impact of the Affordable Care Act (ACA) was addressed in this valuation. Review of the information currently available did not identify any specific provisions of the ACA that are anticipated to significantly impact results. While the impact of certain provisions such as the excise tax on high-value health insurance plans beginning in 2020 (if applicable), mandated benefits and participation changes due to the individual mandate should be recognized in the determination of liabilities, overall future plan costs and the resulting liabilities are driven by the assumed rate of health care inflation (i.e., trend). The trend assumption forecasts the anticipated increase to initial per capita costs, taking into account health care cost inflation, increases in benefit utilization, government-mandated benefits, and technological advances. Given the uncertainty regarding the ACA's implementation (e.g., the impact of excise tax on high-value health insurance plans, changes in participation resulting from the implementation of state-based health insurance exchanges), continued monitoring of the ACA's impact on the Retiree Medical Plan's liability will be required.

ASSET VALUATION METHOD: Market Value of Assets.

Schedule C – Statement of Actuarial Assumptions and Methods (continued)

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

MALES								
	Annual Rate of							
				WITHDRAWAL			RETIREMENT	
				Years of Service			Before 27 Years of Service	After 27 Years of Service**
Age	SALARY*	DEATH	DISABILITY	0 – 4	5 – 9	10+		
20	7.20%	0.019%	0.01%	11.00%				
25	6.40	0.021	0.01	11.00	3.00%			
30	5.40	0.025	0.01	11.00	3.00	3.00%		
35	4.70	0.043	0.04	12.00	3.50	1.40		
40	4.20	0.060	0.09	12.00	4.50	1.40		
45	3.80	0.084	0.20	12.00	4.50	1.30		17.0%
50	3.70	0.119	0.30	14.00	4.50	1.90		17.0
55	3.50	0.202	0.58	15.00	4.50	2.40	5.0%	45.0
60	3.50	0.340	0.75	15.00	4.00	2.40	13.0	35.0
62	3.50	0.419	0.75	15.00	3.80	2.40	15.0	25.0
65	3.50	0.565	0.75	15.00	3.50	2.40	20.0	25.0
70	3.50	0.913	0.75	20.00	0.00	0.00	20.0	20.0
75	3.50	1.556	0.75	20.00	0.00	0.00	100.0	100.0

FEMALES								
	Annual Rate of							
				WITHDRAWAL			RETIREMENT	
				Years of Service			Before 27 Years of Service	After 27 Years of Service**
Age	SALARY*	DEATH	DISABILITY	0 – 4	5 – 9	10+		
20	7.20%	0.007%	0.01%	9.00%				
25	6.40	0.008	0.01	9.00	4.00%			
30	5.40	0.010	0.03	12.00	4.00	1.65%		
35	4.70	0.018	0.06	12.00	4.00	1.50		
40	4.20	0.026	0.12	12.00	4.00	1.30		
45	3.80	0.042	0.25	13.00	4.00	1.20		15.0%
50	3.70	0.062	0.44	13.00	5.00	1.50		18.0
55	3.50	0.096	0.65	15.00	5.00	2.00	5.5%	50.0
60	3.50	0.157	0.85	15.00	5.00	2.00	14.0	40.0
62	3.50	0.197	0.85	15.00	4.60	2.00	14.0	40.0
65	3.50	0.287	0.85	15.00	4.00	2.00	22.0	35.0
70	3.50	0.495	0.85	15.00	0.00	0.00	20.0	35.0
75	3.50	0.831	0.85	15.00	0.00	0.00	100.0	100.0

** Includes wage inflation at 3.5% per annum.*
*** 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:

	Annual Rate of Death After			
	Service Retirement		Disability Retirement	
Age	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 D – Actuarial Cost Method

The valuations of the MIF and LIF are prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future investment rate of return. The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.

The employer contributions required to support the benefits of the MIF and LIF are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member, if applicable, to meet the cost of all benefits payable on his behalf.

The unfunded accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the MIF and LIF.