

# Kentucky County Employees Retirement System

GASB No. 74 Accounting Valuation Report  
As of June 30, 2017



October 4, 2017

Board of Trustees  
Kentucky Retirement Systems  
Perimeter Park West  
1260 Louisville Road  
Frankfort, KY 40601

**Re: GASB 74 Reporting – Actuarial Information – Kentucky County Employees’ Retirement System**

Dear Members of the Board:

This report provided herein contains certain information for the Kentucky County Employees’ Retirement System (CERS) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 74, “Financial Reporting for Postemployment Benefit Plans Other than Pension Plans” for the fiscal year ending June 30, 2017.

The liability calculations presented in this report were performed for the purpose of satisfying the requirements of GASB No. 74 and are not applicable for other purposes, such as determining the plans’ funding requirements. The plan’s liability for other purposes may produce significantly different results. This report may be provided to parties other than the Board of Trustees of the Kentucky Retirement Systems only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The total OPEB liability, net OPEB liability, and sensitivity information shown in this report are based on an actuarial valuation date of June 30, 2016. The total OPEB liability was rolled-forward from the valuation date to the plan’s fiscal year ending June 30, 2017 using generally accepted actuarial principles. Gabriel Roeder Smith and Company (GRS) did not conduct the June 30, 2016 actuarial valuation; however, GRS did replicate the prior actuary’s valuation results on the same assumptions, methods, and data, as of that date. The roll-forward is based on the results of our replication.

There was no legislation enacted during the 2017 legislative session that had a material change in benefit provisions for any of the systems. However, subsequent to the actuarial valuation date, but prior to the measurement date, the KRS Board of Trustees adopted updated actuarial assumptions which will be used in performing the actuarial valuations as of June 30, 2017. Specifically, the Total OPEB Liability as of June 30, 2017 was determined using a 2.30% price inflation assumption and an assumed rate of return of 6.25%. It is our opinion that this procedure is reasonable, appropriate, and complies with applicable requirements under GASB Statement No. 74.

The fully-insured premiums KRS pays for the Kentucky Employees' Health Plan are blended rates based on the combined experience of active and retired members. Because the average cost of providing health care benefits to retirees under age 65 is higher than the average cost of providing health care benefits to active employees, there is an implicit employer subsidy for the non-Medicare eligible retirees. GASB 74 requires that the liability associated with this implicit subsidy be included in the calculation of the Total OPEB Liability.

The single discount rates of 5.84% for Non-Hazardous and 5.96% for Hazardous were used to measure the total OPEB liability as of June 30, 2017. For both Hazardous and Non-Hazardous groups, the single discount rate is based on the expected rate of return on OPEB plan investments of 6.25% and a municipal bond rate of 3.56%, as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2017. Future contributions are projected in accordance with the Board's current funding policy, which includes the requirement that each participating employer in the System contribute the actuarially determined contribution rate, which is determined using a closed funding period (26 years as of June 30, 2017) and the actuarial assumptions and methods adopted by the Board of Trustees. Current assets, future contributions, and investment earnings are projected to be sufficient to pay the projected benefit payments from the retirement system. However, the cost associated with the implicit employer subsidy is not currently being included in the calculation of the System's actuarial determined contributions, and it is our understanding that any cost associated with the implicit subsidy will not be paid out of the System's trust. Therefore, the municipal bond rate was applied to future expected benefit payments associated with the implicit subsidy.

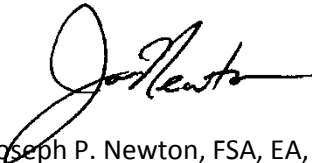
This report is based upon information, furnished to us by the Retirement System, which includes benefit provisions, membership information, and financial data. We did not audit this data and information, but we did apply a number of tests and concluded that it was reasonable and consistent. GRS is not responsible for the accuracy or completeness of the information provided by the Retirement System. Please see the appendices of this report for a discussion of the basis of the calculations, including information related to economic and demographic assumptions and benefit provisions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

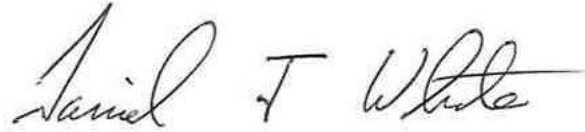
Based on guidance issued by GASB in connection with this new accounting standard, the 1% of pay member contributions for Tier 2 and Tier 3 members to a 401(h) subaccount is considered as an OPEB asset. As a result, the reported fiduciary net position as of June 30, 2016 and as of June 30, 2017 includes these 401(h) assets. Additionally, these member contributions and associated investment income are included in the reconciliation of the fiduciary net position.

To the best of our knowledge, this report is complete and accurate and is in accordance with generally recognized actuarial practices and methods. Mr. Newton, Mr. White, and Mr. Riazi are Enrolled Actuaries. All of the undersigned are independent actuaries and consultants and members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. They are also experienced in performing valuations for large public retirement systems. This communication shall not be construed to provide tax advice, legal advice or investment advice.

Sincerely,



Joseph P. Newton, FSA, EA, MAAA  
Pension Market Leader and Actuary



Daniel J. White, FSA, EA, MAAA  
Senior Consultant and Actuary



Janie Shaw, ASA, MAAA  
Consultant and Actuary



Mehdi Riazi, FSA, EA, MAAA  
Consultant and Actuary

# Table of Contents

			<b>Page</b>
	<b>COVER LETTER</b>		
<b>SECTION 1</b>	<b>SUPPORTING EXHIBITS</b>		
	EXHIBIT 1	— SCHEDULE OF EMPLOYERS' NET OPEB LIABILITY	2
	EXHIBIT 2	— DEVELOPMENT OF THE SINGLE DISCOUNT RATE	4
	EXHIBIT 3	— SCHEDULE OF CHANGES IN EMPLOYERS' NET OPEB LIABILITY	5
	EXHIBIT 4	— SCHEDULE OF EMPLOYERS' CONTRIBUTIONS	7
	EXHIBIT 5	— SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGES IN THE DISCOUNT RATE AND HEALTHCARE TREND RATE	10
<b>APPENDIX 1</b>	<b>STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS</b>		12
<b>APPENDIX 2</b>	<b>SUMMARY OF PRINCIPAL PLAN PROVISIONS</b>		20
<b>APPENDIX 3</b>	<b>DEVELOPMENT OF BASELINE CLAIMS COSTS</b>		24

**SECTION 1**

---

## EXHIBIT 1a

### Schedule of the Employers' Net OPEB Liability – CERS Non-Hazardous Plan

Year	Total OPEB Liability (1)	Plan Fiduciary Net Position (2)	Net OPEB Liability/(Asset) (1) - (2)	Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability (2) / (1)	Covered Employee Payroll <sup>1</sup> (3)	Net OPEB Liability as a Percentage of Covered Employee Payroll [(1) - (2)] / (3)
2017	\$ 4,222,877,716	\$ 2,212,535,662	\$ 2,010,342,054	52.4%	\$ 2,480,130,249	81.1%

Note:

<sup>1</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.

## EXHIBIT 1b

### Schedule of the Employers' Net OPEB Liability – CERS Hazardous Plan

Year	Total OPEB Liability (1)	Plan Fiduciary Net Position (2)	Net OPEB Liability/(Asset) (1) - (2)	Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability (2) / (1)	Covered Employee Payroll <sup>1</sup> (3)	Net OPEB Liability as a Percentage of Covered Employee Payroll [(1) - (2)] / (3)
2017	\$ 2,015,672,964	\$ 1,189,001,387	\$ 826,671,577	59.0%	\$ 542,709,729	152.3%

Note:

<sup>1</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.



## EXHIBIT 2

### Development of Single Discount Rate - CERS

**Table 1. Development of Single Discount Rate at June 30, 2017**

	<u>CERS Non-Hazardous</u>	<u>CERS Hazardous</u>
Single Discount Rate	5.84%	5.96%
Long-Term Expected Rate of Return	6.25%	6.25%
Long-Term Municipal Bond Rate <sup>1</sup>	3.56%	3.56%

**Table 2. Development of Single Discount Rate at June 30, 2016**

	<u>CERS Non-Hazardous</u>	<u>CERS Hazardous</u>
Single Discount Rate	6.89%	7.37%
Long-Term Expected Rate of Return	7.50%	7.50%
Long-Term Municipal Bond Rate <sup>1</sup>	2.92%	2.92%

Notes:

<sup>1</sup> Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2017 (or as of June 30, 2016).

## EXHIBIT 3a

### Schedule of the Employers' Net OPEB Liability – CERS Non-Hazardous Plan

Change in the Net OPEB Liability	2017
<b>Total OPEB liability</b>	
Service Cost	\$ 85,468,003
Interest on the total OPEB liability	240,854,088
Benefit Changes	0
Difference between actual and expected experience	(6,641,137)
Assumption Changes	520,285,809
Benefit Payments <sup>1</sup>	<u>(140,120,485)</u>
<b>Net Change in Total OPEB Liability</b>	<b>699,846,278</b>
<b>Total OPEB Liability - Beginning</b>	<b>\$ 3,523,031,438</b>
<b>Total OPEB Liability - Ending (a)</b>	<b><u>\$ 4,222,877,716</u></b>
<b>Plan Fiduciary Net Position</b>	
Contributions - Employer <sup>2</sup>	\$ 133,326,048
Contributions - Member	9,157,707
Benefit Payments <sup>1</sup>	(140,120,485)
OPEB Plan Net Investment Income	264,782,093
OPEB Plan Administrative Expense	<u>(788,794)</u>
<b>Net Change in Plan Fiduciary Net Position</b>	<b>266,356,569</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>\$ 1,946,179,093</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b><u>\$ 2,212,535,662</u></b>
<b>Net OPEB Liability - Ending (a) - (b)</b>	<b>2,010,342,054</b>
<b>Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability</b>	<b>52.4%</b>
<b>Covered Employee Payroll<sup>3</sup></b>	<b>\$ 2,480,130,249</b>
<b>Net OPEB Liability as a Percentage of Covered Employee Payroll</b>	<b>81.1%</b>

Notes:

<sup>1</sup> Includes expected benefits due to the implicit subsidy for members under age 65. Benefit payments are also offset by insurance premiums received from retirees and by Medicare Drug Reimbursements.

<sup>2</sup> Includes expected benefits due to the implicit subsidy for members under age 65.

<sup>3</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.

## EXHIBIT 3b

### Schedule of the Employers' Net OPEB Liability – CERS Hazardous Plan

Change in the Net OPEB Liability	2017
<b>Total OPEB liability</b>	
Service Cost	\$ 20,492,666
Interest on the total OPEB liability	113,166,185
Benefit Changes	0
Difference between actual and expected experience	(2,470,531)
Assumption Changes	391,061,269
Benefit Payments <sup>1</sup>	(63,656,112)
<b>Net Change in Total OPEB Liability</b>	<b>458,593,477</b>
<b>Total OPEB Liability - Beginning</b>	<b>\$ 1,557,079,487</b>
<b>Total OPEB Liability - Ending (a)</b>	<b>\$ 2,015,672,964</b>
<b>Plan Fiduciary Net Position</b>	
Contributions - Employer <sup>2</sup>	\$ 44,325,154
Contributions - Member	1,708,118
Benefit Payments <sup>1</sup>	(63,656,112)
OPEB Plan Net Investment Income	143,891,877
OPEB Plan Administrative Expense	(380,674)
<b>Net Change in Plan Fiduciary Net Position</b>	<b>125,888,363</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>\$ 1,063,113,024</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 1,189,001,387</b>
<b>Net OPEB Liability - Ending (a) - (b)</b>	<b>826,671,577</b>
<b>Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability</b>	59.0%
<b>Covered Employee Payroll<sup>3</sup></b>	\$ 542,709,729
<b>Net OPEB Liability as a Percentage of Covered Employee Payroll</b>	152.3%

Notes:

<sup>1</sup> Includes expected benefits due to the implicit subsidy for members under age 65. Benefit payments are also offset by insurance premiums received from retirees and by Medicare Drug Reimbursements.

<sup>2</sup> Includes expected benefits due to the implicit subsidy for members under age 65.

<sup>3</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.

## EXHIBIT 4a

### Schedule of Employers' Contributions – CERS Non-Hazardous Plan (\$ in thousands)

Fiscal Year Ending <sup>1</sup>	Actuarially Determined Contribution <sup>2</sup>	Total Employer Contributions <sup>3</sup>	Contribution Deficiency (Excess)	Covered Employee Payroll <sup>4</sup>	Actual Contributions as a Percentage of Covered Payroll
2017	\$ 122,270	\$ 120,712	\$ 1,558	\$ 2,480,130	4.87%
2016	110,987	111,836	(849)	2,352,762	4.75%
2015	119,511	119,444	67	2,296,716	5.20%
2014	130,652	123,278	7,374	2,272,270	5.43%
2013	195,561	159,993	35,568	2,236,277	7.15%
2012	214,421	171,925	42,496	2,236,546	7.69%
2011	213,429	186,886	26,543	2,276,596	8.21%
2010	266,331	175,764	90,567	2,236,855	7.86%
2009	264,734	131,476	133,258	2,183,612	6.02%
2008	406,542	202,113	204,429	2,166,613	9.33%

Notes:

<sup>1</sup> Data for years prior to 2017 are based on contribution data provided in the 2016 CAFR, based on calculations provided by the prior actuary.

<sup>2</sup> Actuarially determined contribution for fiscal year ending 2017 is based on the contribution rate calculated with the the June 30, 2015 actuarial valuation.

<sup>3</sup> Employer contributions do not include the expected implicit subsidy included in exhibit 3.

<sup>4</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.

## EXHIBIT 4b

### Schedule of Employers' Contributions – CERS Hazardous Plan (\$ in thousands)

Fiscal Year Ending <sup>1</sup>	Actuarially Determined Contribution <sup>2</sup>	Total Employer Contributions <sup>3</sup>	Contribution Deficiency (Excess)	Covered Employee Payroll <sup>4</sup>	Actual Contributions as a Percentage of Covered Payroll
2017	\$ 53,131	\$ 51,537	\$ 1,594	\$ 542,710	9.50%
2016	64,253	67,619	(3,366)	492,851	13.72%
2015	69,103	71,778	(2,675)	483,641	14.84%
2014	74,360	74,792	(432)	479,164	15.61%
2013	102,011	85,319	16,692	461,673	18.48%
2012	110,763	92,564	18,199	464,229	19.94%
2011	109,227	98,592	10,635	466,964	21.11%
2010	129,227	84,536	44,691	466,549	18.12%
2009	126,757	71,413	55,344	469,315	15.22%
2008	168,724	90,533	78,191	474,241	19.09%

Notes:

<sup>1</sup> Data for years prior to 2017 are based on contribution data provided in the 2016 CAFR, based on calculations provided by the prior actuary.

<sup>2</sup> Actuarially determined contribution for fiscal year ending 2017 is based on the contribution rate calculated with the the June 30, 2015 actuarial valuation.

<sup>3</sup> Employer contributions do not include the expected implicit subsidy included in exhibit 3.

<sup>4</sup> Based on derived compensation for fiscal year ending 2017 using the provided employer insurance contribution information.

## Notes to Schedule of Employers' Contributions

The actuarially determined contribution rates effective for fiscal year ending 2017 that are documented in the schedule on the previous pages are calculated as of June 30, 2015. Based on the June 30, 2015 actuarial valuation report (produced by the prior actuary), the actuarial methods and assumptions used to calculate these contribution rates are below:

Item	CERS Non-Hazardous	CERS Hazardous
Actuarial Cost Method:	Entry Age Normal	Entry Age Normal
Asset Valuation Method:	20% of the difference between the market value of assets and the expected actuarial value of assets is recognized	20% of the difference between the market value of assets and the expected actuarial value of assets is recognized
Amortization Method:	Level Percent of Pay	Level Percent of Pay
Amortization Period:	28 Years, Closed	28 Years, Closed
Payroll Growth Rate:	4.00%	4.00%
Investment Return:	7.50%	7.50%
Inflation:	3.25%	3.25%
Salary Increases:	4.00%, average	4.00%, average
Mortality:	RP-2000 Combined Mortality Table, projected to 2013 with Scale BB (set back 1 year for females)	RP-2000 Combined Mortality Table, projected to 2013 with Scale BB (set back 1 year for females)
Healthcare Trend Rates: Pre-65	Initial trend starting at 7.50% and gradually decreasing to an ultimate trend rate of 5.00% over a period of 5 years.	Initial trend starting at 7.50% and gradually decreasing to an ultimate trend rate of 5.00% over a period of 5 years.
Post-65	Initial trend starting at 5.50% and gradually decreasing to an ultimate trend rate of 5.00% over a period of 2 years.	Initial trend starting at 5.50% and gradually decreasing to an ultimate trend rate of 5.00% over a period of 2 years.

## EXHIBIT 5a

### Sensitivity of the Net OPEB Liability to Changes in the Discount Rate and Healthcare Trend Rate CERS Non-Hazardous Plan

**Table 1. Sensitivity of the Net OPEB Liability to Changes in the Discount Rate**

1.00% Decrease, 4.84%	Current Discount Rate, 5.84%	1.00% Increase, 6.84%
\$ 2,558,048,799	\$ 2,010,342,054	\$ 1,554,563,958

**Table 2. Sensitivity of the Net OPEB Liability to Changes in the Healthcare Cost Trend Rate**

1.00% Decrease	Current Healthcare Cost Trend Rate	1.00% Increase
\$ 1,542,035,819	\$ 2,010,342,054	\$ 2,619,112,624

## EXHIBIT 5b

### Sensitivity of the Net OPEB Liability to Changes in the Discount Rate and Healthcare Trend Rate CERS Hazardous Plan

**Table 1. Sensitivity of the Net OPEB Liability to Changes in the Discount Rate**

1.00% Decrease, 4.96%	Current Discount Rate, 5.96%	1.00% Increase, 6.96%
\$ 1,107,853,197	\$ 826,671,577	\$ 596,618,792

**Table 2. Sensitivity of the Net OPEB Liability to Changes in the Healthcare Cost Trend Rate**

1.00% Decrease	Current Healthcare Cost Trend Rate	1.00% Increase
\$ 585,188,103	\$ 826,671,577	\$ 1,125,544,014



**APPENDIX 1**

---

# Appendix 1

## Statement of Actuarial Assumptions and Methods

In general, the assumptions and methods used in the valuation are based on the actuarial experience study for the five-year period ending June 30, 2013, submitted April 30, 2014, and adopted by the Board on December 4, 2014. The investment return, price inflation, and payroll growth assumption were adopted by the Board in May and July 2017 for use with the June 30, 2017 valuation in order to reflect future economic expectations.

*Investment return rate:* Assumed annual rate of 6.25% net of investment expenses

*Discount Rate:* 5.84% for the Non-Hazardous Plan and 5.96% for Hazardous Plan as of the reporting date.

*Price Inflation:* Assumed annual rate of 2.30%

*Payroll Growth Assumption (used for amortization of unfunded accrued liabilities):*

Assumed annual rate of 2.00%

*Rates of Annual Salary Increase:*

Assumed rates of annual salary increases are shown below.

Service Years	Annual Rates of Salary Increases				
	Merit & Seniority		Price Inflation & Productivity	Total Increase	
	Non-Hazardous	Hazardous		Non-Hazardous	Hazardous
0	8.50%	15.50%	3.05%	11.55%	18.55%
1	5.00%	6.00%	3.05%	8.05%	9.05%
2	1.50%	2.00%	3.05%	4.55%	5.05%
3	1.50%	1.25%	3.05%	4.55%	4.30%
4	1.00%	1.00%	3.05%	4.05%	4.05%
5	1.00%	0.50%	3.05%	4.05%	3.55%
6	0.75%	0.00%	3.05%	3.80%	3.05%
7	0.75%	0.00%	3.05%	3.80%	3.05%
8	0.50%	0.00%	3.05%	3.55%	3.05%
9	0.50%	0.00%	3.05%	3.55%	3.05%
10 & Over	0.25%	0.00%	3.05%	3.30%	3.05%

# Appendix 1

## Retirement rates:

Assumed annual rates of retirement are shown below. Rates are only applicable for members who are eligible for a service retirement.

Age	Non-Hazardous		Service	Hazardous	
	Members participating before 9/1/2008 <sup>1</sup>	Members participating on or after 9/1/2008 <sup>2</sup>		Members participating before 9/1/2008 <sup>3</sup>	Members participating on or after 9/1/2008 <sup>4</sup>
55	5.0%		20	22.5%	
56	6.0%		21	22.5%	
57	7.0%		22	22.5%	
58	7.0%		23	22.5%	
59	8.0%		24	30.0%	
60	9.0%	9.0%	25	33.0%	22.5%
61	15.0%	15.0%	26	33.0%	22.5%
62	18.0%	18.0%	27	36.0%	22.5%
63	18.0%	18.0%	28	39.0%	22.5%
64	18.0%	18.0%	29	55.0%	30.0%
65	18.0%	18.0%	30	33.0%	33.0%
66	18.0%	18.0%	31	33.0%	33.0%
67	18.0%	18.0%	32	50.0%	36.0%
68	18.0%	18.0%	33	40.0%	39.0%
69	18.0%	18.0%	34	40.0%	55.0%
70	18.0%	18.0%	35	40.0%	33.0%
71	18.0%	18.0%	36	40.0%	33.0%
72	18.0%	18.0%	37	40.0%	50.0%
73	18.0%	18.0%	38	40.0%	40.0%
74	18.0%	18.0%	39	40.0%	40.0%
75	100.0%	100.0%	40	40.0%	40.0%

<sup>1</sup> If service is at least 27 years, the rate is 30%.

<sup>2</sup> If age plus service is at least 87, the rate is 30%.

<sup>3</sup> The annual rate of service retirement is 100% at age 62.

<sup>4</sup> The annual rate of service retirement is 100% at age 60.

## Appendix 1

*Disability rates:*

An abbreviated table with assumed rates of disability is show below.

Age	Non-Hazardous		Hazardous	
	Male	Female	Male	Female
20	0.02%	0.02%	0.05%	0.05%
30	0.03%	0.03%	0.09%	0.09%
40	0.07%	0.07%	0.20%	0.20%
50	0.19%	0.19%	0.56%	0.56%
60	0.49%	0.49%	1.46%	1.46%

*Withdrawal rates (for causes other than death, disability or retirement):*

Assumed annual rates of withdrawal are shown below.

Service Years	Annual Rates of Withdrawal	
	Non-Hazardous	Hazardous
0	28.00%	20.50%
1	16.00%	13.00%
2	12.00%	10.50%
3	10.00%	9.00%
4	8.00%	8.00%
5	6.00%	7.00%
6	5.00%	7.00%
7	5.00%	6.00%
8-13	4.00%	6.00%
14 & Over	3.00%	6.00%

# Appendix 1

## *Mortality Assumption:*

Pre-retirement mortality: RP-2000 Combined Mortality Table projected with Scale BB to 2013. Male mortality rates are multiplied by 50% and female mortality rates are multiplied by 30%.

Post-retirement mortality (non-disabled): RP-2000 Combined Mortality Table projected with Scale BB to 2013. Female mortality rates are set back one year.

Post-retirement mortality (disabled): RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013. Male mortality rates are set back four years.

These mortality assumptions assume a margin for future mortality improvement.

## *Marital status:*

100% of employees are assumed to be married, with the female spouse 3 years younger than the male spouse.

## *Line of Duty Disability*

0% of disabilities are assumed to occur in the line of duty

## *Line of Duty Death*

25% of deaths are assumed to occur in the line of duty

## *Actuarial Cost Method:*

Entry Age Normal, Level Percentage of Pay. The Entry Age Normal actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of pay necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

## *Health Care Age Related Morbidity/Claims Utilization:*

To model the impact of aging on the underlying health care costs, the valuation relied on the Society of Actuaries' 2013 Study "Health Care Costs – From Birth to Death". Chart 1 (2010 Aggregate Commercial Costs) was used to model the impact of aging for ages less than 65 and Table 4 (Development of Plan Specific Medicare Age Curve) was used to model the impact of aging for ages 65 and over.

# Appendix 1

## Health Care Cost Trend Rates:

Year	Non-Medicare Plans	Medicare Plans	Dollar Contribution*
2017	7.75%	3.38%	1.50%
2018	7.50%	5.20%	1.50%
2019	7.25%	5.10%	1.50%
2020	7.00%	4.90%	1.50%
2021	6.75%	4.80%	1.50%
2022	6.50%	4.70%	1.50%
2023	6.25%	4.60%	1.50%
2024	6.00%	4.50%	1.50%
2025	5.50%	4.40%	1.50%
2026	5.25%	4.30%	1.50%
2027	5.00%	4.20%	1.50%
2028	4.75%	4.10%	1.50%
2029	4.50%	4.05%	1.50%
2030	4.25%	4.05%	1.50%
2031 & Beyond	4.05%	4.05%	1.50%

\* Applies to members participating on or after July 1, 2003

Health care trend assumptions are based on the model issued by the Society of Actuaries "Getzen model of Long-Run Medical Cost Trends for the SOA; Thomas E. Getzen, iHEA and Temple University 2014 © Society of Actuaries.

The underlying assumptions used to develop the health care trend rates include:

- A short run period-this is a period for which anticipated health care trend rates are manually set based on local information as well as plan-specific and carrier information.
- Long term real GDP growth- 1.75%
- Long term rate of inflation- 2.30%
- Long term nominal GDP growth – 4.05%
- Year that excess rate converges to 0- 15 years from the valuation

Health care trend rates are thus the manually set rates for the short run period and rates which decline to an ultimate trend rate which equals the assumed nominal long term GDP growth rate.

All increases are assumed to occur on January 1. The 2017 Non-Medicare premiums were known at of the time of the valuation (0.00% trend for 2017) and were incorporated into the liability measurement. The 7.75% increase shown for 2017 was the assumed growth in the underlying claims costs.

# Appendix 1

## Health Care Participation Assumptions:

- Members are assumed to elect health coverage at retirement at the following participation rates.

Service at Retirement	Members participating before 7/1/2003*	Members participating between 7/1/2003 and 9/1/2008	Members participating after 9/1/2008
Under 10	50%	100%	100%
10-14	75%	100%	100%
15-19	90%	100%	100%
Over 20	100%	100%	100%

\* 100% of members with a duty disability or a duty death (in service) benefit are assumed to elect coverage at retirement.

- Future retirees are assumed to have a similar distribution by plan type as the current retirees.

Medicare Plan	June 30, 2016 Participation
Medical Only	8%
Essential	8%
Premium	84%

Non-Medicare Plan	June 30, 2016 Participation
Standard PPO	8%
Standard CDHP	8%
LivingWell CDHP	19%
LivingWell PPO	65%

- 50% of deferred vested members participating before July 1, 2003 are assumed to elect health coverage at retirement. 100% of deferred vested members participating after July 1, 2003 are assumed to elect health coverage at retirement. Deferred vested members with non-hazardous service are assumed to begin health coverage at age 55 for members participating before September 1, 2008, and at age 60 for members participating on or after September 1, 2008. Deferred vested members with hazardous service are assumed to begin health coverage at age 50.
- 75% of future retirees, with hazardous service, are assumed to elect spouse health care coverage. No dependent coverage is assumed for members who only have non-hazardous service. 100% of spouses with health care coverage are assumed to continue coverage after the member's death.

# Appendix 1

## *Excise (“Cadillac”) Tax:*

For taxable years beginning after December 31, 2019, a 40% excise tax will be required to be paid (by the employer and/or insurer) on the aggregate cost of the health plan in excess of certain legislated thresholds. For 2018, the thresholds are \$850 per month for individual coverage and \$2,292 per month for family coverage.

Both Actuarial Standard of Practice No. 6 and GASB Statement Nos. 74 and 75 reference this tax, and, in accordance with these standards an estimate of the impact of the Cadillac tax has been included in this valuation.

Assumptions and methods used to determine the impact of the Cadillac Tax include:

- 2018 thresholds of \$850/\$2,292 were indexed annually by 2.30%.
- Premium data submitted was not adjusted for permissible exclusions to the Cadillac Tax.
- There were no special adjustments to the dollar limit other than those permissible for non-Medicare retirees over 55.

In this valuation, the impact of the Cadillac Tax has been calculated by increasing the employer paid premiums for Non-Medicare retirees, who became participants before July 1, 2003, by 3.6%. Non-Medicare retirees who became participants after July 1, 2003 receive dollar subsidies per year of service, which are not expected to exceed the overall Non-Medicare premiums. As a result, the costs attributable to the Cadillac Tax for members who became participants after July 1, 2003 will be paid by the retirees.

## *Changes in Assumptions since the prior valuation:*

1. The assumed investment return was changed from 7.50% to 6.25%.
2. The price inflation assumption was changed from 3.25% to 2.30%, which also resulted in a 0.95% decrease in the salary increase assumption at all years of service.
3. The payroll growth assumption (applicable for the amortization of unfunded actuarial accrued liabilities) was changed from 4.00% to 2.00%.
4. For the Non-Hazardous Plan, the single discount rate changed from 6.89% to 5.84%. For the Hazardous Plan, the single discount rate changed from 7.37% to 5.96%.



# APPENDIX 2

---

---

## Appendix 2

### Summary of Main Retiree Insurance Benefit Provisions

#### Insurance Tier 1: Participation began before 7/1/2003

**Benefit Eligibility**                      Recipient of a retirement allowance

**Benefit Amount**

Non-Hazardous Service	Percentage of Member Premium Paid by Retirement System	Hazardous Service	Percentage of Member & Dependent Premium Paid by Retirement System
Less than 4 years	0%	Less than 4 years	0%
4 – 9 years	25%	4 – 9 years	25%
10 – 14 years	50%	10 – 14 years	50%
15 – 19 years	75%	15 – 19 years	75%
20 or more years	100%	20 or more years	100%

The percentage paid by the retirement system is applied to the ‘contribution’ plan selected by the KRS Board.

**Duty Disability Retirement**                      If disability was a result of injuries sustained while in the line of duty, the member receives 100% of the maximum contribution for the member and dependents. This benefit is provided to members in the Non-hazardous and Hazardous plans alike.

**Duty Death in Service**                              If an active employee’s death was a result of injuries sustained while in the line of duty, the member’s spouse and children receive 100% of the maximum contribution. This benefit is provided to members in the Non-hazardous and Hazardous plans alike.

**Non-Duty Death in Service**                      If the surviving spouses is in receipt of a pension allowance, he or she is eligible for continued health coverage. The percentage of the premium paid for by the retirement system is based on the member’s years of hazardous service at the time of death.

**Surviving Spouse of a Retiree**                      A surviving spouse of a retiree, who is in receipt of a pension allowance, will receive a premium subsidy based on the member’s years of hazardous service.

**Hazardous employees who retired prior to August 1, 1998**                      System’s contribution for spouse and dependents is based on total service.

## Appendix 2

### Insurance Tier 2: Participation began on or after 7/1/2003, but before 9/1/2008

<b>Benefit Eligibility</b>	Recipient of a retirement allowance with at least 120 months of service at retirement
<b>Non-Hazardous Subsidy</b>	Monthly contribution of \$10 for each year of earned service. The monthly contribution is increased by 1.5% each July 1. As of July 1, 2016, the Non-Hazardous monthly contribution was \$12.99/year of service. Upon the retiree's death, the surviving spouse may continue coverage (if in receipt of a retirement allowance) but will be 100% responsible for the premiums.
<b>Hazardous Subsidy</b>	Monthly contribution of \$15 for each year of earned hazardous service. The monthly contribution is increased by 1.5% each July 1. As of July 1, 2016, the Non-Hazardous monthly contribution was \$19.48/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of \$10 (\$12.99 as of July 1, 2016) for each year of hazardous service.
<b>Duty Disability Retirement</b>	If disability was a result of injuries sustained while in the line of duty, the member receives a benefit equal to at least 20 times the Non-Hazardous monthly contribution. This benefit is provided to members in the Non-hazardous and Hazardous plans alike.
<b>Duty Death in Service</b>	If an active employee's death was a result of injuries sustained while in the line of duty, the member's spouse and children receive a benefit equal to at least 20 times the Non-Hazardous monthly contribution. This benefit is provided to members in the Non-hazardous and Hazardous plans alike.
<b>Non-Duty Death in Service</b>	If the surviving spouse is in receipt of a pension allowance, he or she is eligible for continued health coverage. The percentage of the premium paid for by the retirement system is based on the member's years of hazardous service at the time of death.

### Insurance Tier 3: Participation began on or after 9/1/2008

Tier 3 insurance benefits are identical to Tier 2, except Tier 3 members are required to have at least 180 months of service in order to be eligible.

## Appendix 2

### Monthly Health Plan Premiums – Effective January 1, 2017

Plan Option	Non-Medicare Plan Options				
	Single	Parent Plus	Couple	Family	Family X-Ref
LivingWell PPO*	\$721.14	\$1,023.04	\$1,564.20	\$1,738.40	\$865.64
LivingWell CDHP	702.10	967.18	1,302.74	1,453.94	810.00
Standard PPO	678.22	964.58	1,477.72	1,644.22	815.50
Standard CDHP	663.80	930.94	1,431.76	1,594.52	793.18

Medicare Plan Options	
Kentucky Retirement Systems - Medical Only Plan	\$162.47
Kentucky Retirement Systems – Medicare Advantage/Essential Plan	77.76
Kentucky Retirement Systems – Medicare Advantage/Premium Plan*	252.51

\*For 2017, the contribution plans selected by the KRS Board were the LivingWell PPO plan option for non-Medicare retirees and the Medicare Advantage Premium plan option for Medicare retirees.

### Dollar Contribution Amount for Insurance Tier 2 and Tier 3

Monthly contribution amounts per year of service as of July 1, 2016.

Non-Hazardous Service	Hazardous Service
\$12.99	\$19.48

# APPENDIX 3

---

---

## Appendix 3

### Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were developed using retiree claims experience for calendar years 2015 and 2016. It is our understanding that no plan changes occurred over this time period; therefore, no adjustments were applied to the claims for plan changes. The claims were projected on an incurred claim basis, adjusted for prescription drug rebates, and loaded for administrative expense. The per capita costs shown in the table below also include a small adjustment for HRA contributions for retirees on the CDHP plans. An inherent assumption in this methodology is that the projected future retirees will have a similar distribution by plan type as the current retirees. The fully-insured premiums KRS pays the Kentucky Employees' Health Plan are blended rates based on the combined experience of active and retired members. Because the average cost of providing health care benefits to retirees under age 65 is higher than the average cost of providing health care benefits to active employees, there is an implicit employer subsidy for the non-Medicare eligible retirees. For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2016, and are used for both current and future retirees. An inherent assumption in this methodology is that the projected future retirees will have a similar distribution by plan type as the current retirees.

Age graded and sex distinct premiums are utilized by this valuation. These costs are appropriate for the unique age and sex distribution currently existing. Over the future years covered by this valuation, the age and sex distribution will most likely change. Therefore, our process "distributes" the average premium over all age/sex combinations and assigns a unique premium for each combination. The age/sex specific costs more accurately reflect the health care utilization and cost at that age.

FOR THOSE NOT ELIGIBLE FOR MEDICARE		
AGE	MALE	FEMALE
40	\$299.03	\$485.90
50	484.72	597.13
60	823.81	811.17
64	1,001.77	945.40

FOR THOSE ELIGIBLE FOR MEDICARE		
AGE	MALE	FEMALE
65	\$200.77	\$189.36
75	234.90	229.21
85	248.39	251.31

## Appendix 3

Mehdi Riazi is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.



---

Mehdi Riazi, FSA, EA, MAAA