KENTUCKY RETIREMENT SYSTEMS
BOARD OF TRUSTEES
REGULARLY SCHEDULED MEETING
NOVEMBER 13, 2017 AT 10:00 A.M., ET
1270 LOUISVILLE ROAD, FRANKFORT, KENTUCKY 40601

1. Roll Call
2. Introduction and Swearing in of New Trustee
3. Public Comment
4. Approval of Minutes- September 14, 2017*
5. Actuarial Valuation for year end June 30, 2017- Danny White and Joe Newton (GRS)
6. Actuarial Analysis of Pension Reform Bill
7. Other Business- David Eager
8. Adjourn

**Board Action required*

MINUTES OF MEETING #412
BOARD OF TRUSTEES KENTUCKY RETIREMENT SYSTEMS
QUARTERLY MEETING SEPTEMBER 14, 2017 AT 10:00A.M.
1270 LOUISVILLE ROAD, FRANKFORT, KENTUCKY 40601

At the Quarterly Meeting of the Board of Trustees held on September 14, 2017, the following members were present: John Farris (Chair), John Chilton, William Cook, Thomas Elliott (non-voting), Kelly Downard, JT Fulkerson, David Gallagher, Vince Lang, Matthew Monteiro, Keith Peercy, Betty Pendergrass, Mary Helen Peter, Jerry Powell, Neil Ramsey (arrived at 10:22 a.m.), David Rich, and Secretary Thomas Stephens. Staff members present were David Eager, Karen Roggenkamp, Erin Surratt, Rich Robben, Connie Davis, Connie Pettyjohn, Shawn Sparks, Katherine Rupinen, Joseph Bowman, Shaun Case, Ann Case, Brian Huffman, and Alane Foley. Also present were Larry Totten, Russell Wright, James Brannen, Raymond "Campbell" Connell, Gretchen Marshall, Glenda France, Cary Bishop, Sherry Kremer, Becky Stephens, Eva Smith-Carroll, Rebecca Heckler, Doug Price, Michael Kurtsinger, Pat Walsh, Pat Johnston, Paul Fitch, Tracey Garrison, Steve Starkweather, Kevin Wheatley, Tom Loftus, Michile Hill, Bryanna Carroll, Jim Carroll, Mark Iverson, Jerry Bailey, Fred Nett and Rose Nett.

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Mr. Farris introduced agenda item *Approval of Minutes – July12, 2017.* Mr. Chilton advised that a correction needed to be made to show the yes/no count for the motion to accept the Asset Allocation Policy recommendations should reflect fourteen (14) in favor and two (2) opposed. The minutes will be amended to show the correct number of votes. Sec. Stephens moved and was seconded by Mr. Rich to approve the minutes as typed after the numerical typo was corrected. The motion passed unanimously.

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Mr. Farris took a moment to speak to the Board and meeting attendees to outline several accomplishments made by KRS staff and Board over the past year. He then introduced agenda item *Public Comment.* Mr. Jim Carroll made comments concerning the inviolable contract, Mr. Mark Iverson made comments concerning assumptions, and Mr. Jerry Bailey made general comments about how the retirement income affects families.

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Mr. Farris introduced the new Trustee, Mr. David Gallagher. He provided a brief personal introduction. Ms. Alane Foley, as Notary, administered the Oath of Office to Mr. Gallagher.

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Mr. Farris introduced agenda item *Employer Voluntary Cessation Approval; Kentucky Association of Children's Advocacy Centers*. Mr. Joe Bowman provided details regarding the cessation request. Ms. Mary Helen Peter moved and was seconded by Sec. Stephens to approve the cessation request. The motion passed unanimously.

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Mr. Farris introduced agenda item *Retiree Health Care Committee Report and Recommendations*. Mr. Vince Lang acknowledged Tracey Garrison, Larry Loew and Carla Whaley who were present from Humana and then introduced Ms. Connie Pettyjohn to discuss the recommendations from the Health Care Committee. Ms. Jenny Goins also joined the conversation to answer questions presented by the Board. Mr. Lang moved and was seconded by Sec. Stephens to ratify the actions of the Retiree Health Care Committee. The motion carried with three (3) opposed; Mr. Gallagher, Mr. Rich and Ms. Pendergrass.

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Mr. Farris introduced agenda item *Bylaws and Transparency*. Mr. Mark Blackwell provided a summary of the key revisions being recommended to the Bylaws. Mr. Rich moved and was seconded by Sec. Stephens to approve the recommended revisions. The motion passed unanimously.

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Mr. Farris introduced agenda item *Conflict of Interest and Confidentiality Policy*. Mr. Mark Blackwell provided a summary of key revisions being recommended to the Conflict of Interest and Confidentiality Policy. Mr. Powell moved and was seconded by Mr. Chilton to approve the recommended revisions. The motion passed unanimously.

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Mr. Farris called for a short recess.

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Mr. Farris called the meeting back in session and introduced agenda item *Investment Committee Report and Recommendations.* Mr. Rich Robben provided an investment performance update to the Board. The Investment Committee had approved two new investments, $150 million with Benefit Street Partners and $150 million with White Oak. The Investment Procurement Policy was sent to the Office of Finance and Administration on July 24, 2017, no additional comment having been made, the policy is now submitted to the Board for adoption. Sec. Stephens moved and was seconded by Mr. Cook to accept the Investment Committee's Recommendations. The motion passed unanimously.

***

Mr. Farris introduced agenda item *KERS Board Nominations.* Mr. Brian Huffman allowed the KERS nominees to stand and introduce themselves to the Board. There were ten (10) nominees present; Mary Helen Peter, Vince Lang, Larry Totten, Russell Wright, James Brannen, Raymond "Campbell" Connell, Gretchen Marshall, Glenda France, Cary Bishop and Sherry Kremer. Mr. Huffman then explained the voting process, each Board Member is allowed two (2) votes. There can only be six (6) potential candidates. Mr. Huffman then passed out the ballots to the Board Members for their votes. More than six (6) nominees received votes, the nominees that received no votes were removed from the ballot and the Board Members voted again. The second vote resulted in the same outcome, with seven (7) nominees receiving votes. Ms. Pendergrass moved and was seconded by Mr. Downard to take the top six (6) vote getters instead of taking all vote getters. The motion passed unanimously. The votes were calculated resulting in a first place, second place and five (5) nominees were tied for third place. Ms. Pendergrass moved and was seconded by Mr. Powell to place the five (5) tied nominees on the ballot and allow Members to cast two (2) votes. The motion passed unanimously. The Board voted again. The third vote resulted in a tie for the sixth available spot. Mr. Powell moved and was seconded by Ms. Pendergrass to allow the Board Members to cast one (1) vote between the two (2) nominees tied for the sixth spot. The motion passed unanimously. The Board voted again. The final six (6) nominees that will be on the ballot are: Vince Lang, Cary Bishop, Sherry Kremer, Mary Helen Peter, Larry Totten and Raymond "Campbell" Connell.

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Mr. Farris introduced agenda item *Hazardous Position Request*. Ms. Roggenkamp provided details on several agencies that are requesting Hazardous Duty Coverage. Mr. Lang moved and was seconded by Mr. Powell to approve this Hazardous Duty Coverage request. The motion passed unanimously.

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Mr. Farris introduced agenda item *Audit Committee Report*. Mr. Huffman provided an overview of items discussed at the Audit Committee meeting on 08/24/2017. Ms. Pendergrass moved and was seconded by Ms. Peter to ratify the actions taken by the Audit Committee on that day. The motion passed unanimously.

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Mr. Farris introduced agenda item *Financial Statements.* Ms. Roggenkamp provided FY 2017 Financial Highlights and Cash Flow Analysis. This was provided for informational purposes only.

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Mr. Farris introduced agenda item *KRS Update*. Mr. Eager provided a brief update on KRS, retirement rates, website enhancements and employee transitions. This was provided for informational purposes only.

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Mr. Farris introduced agenda item *New Business, CERS Participation Approval*. Ms. Roggenkamp provided an overview of a CERS participation request. Mr. Rich moved and was seconded by Mr. Powell to approve the participation request. The motion passed unanimously.

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Mr. Farris introduced agenda item *New Business, Other* and addressed the Board Members regarding the suspension of per diem payments during June 2016-March 2017. In specific regard to the committee members on Disability Appeals and Administrative Appeals Committees (DAC/AAC) as these members spend a considerable amount of time preparing for these meetings. It is a decision to be made by the Board to allow reimbursement to the Committee Members for this specific time frame. The Members are: Mr. Ed Davis, Mr. Vince Lang, Mr. Keith Peercy, Mr. David Rich and Ms. Mary Helen Peter. The total reimbursement would be $9,284.59. Mr. Ramsey moved and was seconded by Sec. Stephens to approve reimbursement in that amount to the above listed committee members. The motion passed unanimously.

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Mr. Jerry Powell addressed the Board stating that he had prepared a resolution that he is requesting the Board consider. The resolution was then read aloud to the Board Members. Mr. Powell made a motion to adopt this resolution was seconded by Ms. Pendergrass. After further discussion, Sec. Stephens made a motion to amend the initial motion to state that KRS legal department will review the resolution and advise the Board accordingly. This was seconded by Mr. Farris. The motion passed unanimously.

Mr. Farris introduced agenda item *Closed Session*. Mr. Rich moved and was seconded by Mr. Monteiro to enter closed session; the motion passed unanimously. Mr. Farris read the following statement and the meeting moved into closed session: A motion having been made in open session to move into a closed session for a specific purpose, and such motion having carried by majority vote in open, public session, the Board shall now enter closed session to consider litigation, pursuant to KRS 61.810(1)(c), because of the necessity of protecting the confidentiality of the Systems' litigation strategy and preserving any available attorney-client privilege.

All public attendees exited the meeting.

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There being no further business, the meeting adjourned at 12:38 a.m. to meet on November 13, 2017 or upon the call of the Interim Executive Director or the Chair of the Board of Trustees.

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Copies of all documents presented are incorporated as part of the Minutes of the Board of Trustees as of September 14, 2017.

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CERTIFICATION

I do certify that I was present at this meeting, and I have recorded the above actions of the Directors on the various items considered by it at this meeting. Further, I certify that all requirements of KRS 61.805-61.850 were met in conjunction with this meeting.

Recording Secretary

We, the Chair of the Board of Directors of the Kentucky Retirement Systems and Executive Director of the Kentucky Retirement Systems, do certify that the Minutes of Meeting Number 412, held on September 14, 2017, were approved on November 13, 2017.

Chair of the Board of Directors

Interim Executive Director

I have reviewed the Minutes of the September 14, 2017 Annual Board of Trustees Meeting for content, form, and legality.

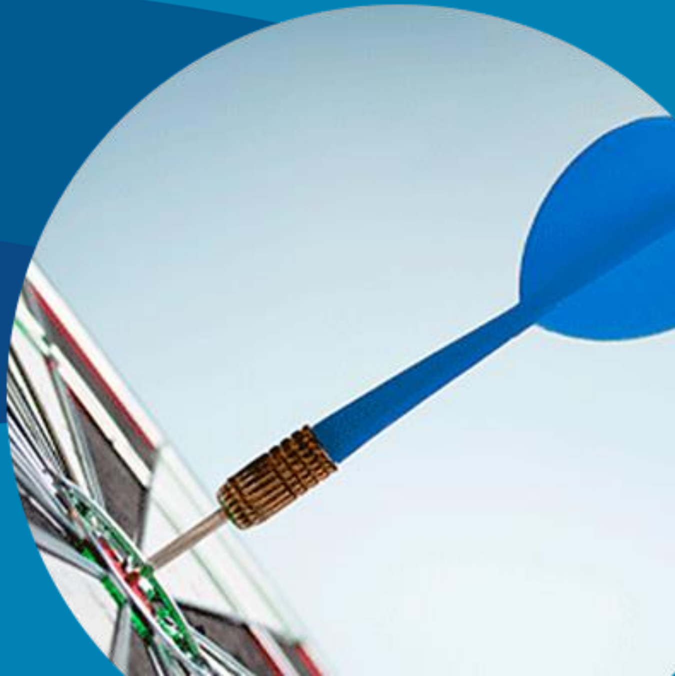
Executive Director
Office of Legal Services

Kentucky Retirement Systems

2017 Actuarial Valuation Results

November 13, 2017

Joe Newton, FSA, EA, MAAA
Janie Shaw, ASA, MAAA
Danny White, FSA, EA, MAAA



Agenda

- Summary of Valuation Results
  - Comments on valuation results
  - Contribution rates
  - Funded status
- Projection Information for Pension Funds
  - Unfunded liability and funded ratio
  - Contribution dollars and rate of pay
- Closing Remarks

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Comments on Valuation Results

- Imperative for the employer contribution rate for the KERS Non-Hazardous Retirement Fund to increase to the amount disclosed in the 2017 valuation report.
- Current assets cover two years of benefit payments
  - June 30, 2017 assets were $2,057 million (excluding the 401(h) assets)
  - Benefit payments for the 2017 fiscal year were $960 million
- Contribution rate for the 2019 fiscal year is expected to result in the fund being external cash flow positive (*slightly*)
  - Total Projected member and employer contributions are $1,164 million for the 2019 fiscal year.

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Comments on Valuation Results (continued)

- There were no benefit changes since the prior valuation
- The 2017 valuation based on updated economic assumptions (inflation, investment return, and payroll growth rate)
  - Comparison to the prior year is difficult for certain measures
- Investment return was 12.9% to 13.8% (return varies by fund)
  - $887 million more in plan assets than expected (all funds combined)
  - Recognized in the contribution rates over the next five-years

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Comments on Valuation Results (continued)

- Covered payroll for the KERS Hazardous and CERS Hazardous systems increase by approximately 10% and SPRS increased by 6.6%
  – Resulted in some larger than expected liability increases, but also lowered the contribution rate (expressed as a percentage of payroll)
- Health insurance premiums for 2018 were lower than expected
  – resulting in liability gains and slightly lower than forecasted contribution rates

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Employer Contribution Rates – Comparison to the FY 2019 Budget

Item	2017 Valuation Effective for FY 2018/2019			FY 2018/2019 Budget Forecast[1]		
	Pension	Insurance	Combined	Pension	Insurance	Combined
(1)	(2)	(3)	(4)	(5)	(6)	(7)
KERS Non-Hazardous	71.03%	12.40%	**83.43%**	70.68%	13.38%	**84.06%**
KERS Hazardous	34.39%	2.46%	**36.85%**	36.52%	4.60%	**41.12%**
CERS Non-Hazardous	21.84%	6.21%	**28.05%**	21.82%	7.04%	**28.86%**
CERS Hazardous	35.69%	12.17%	**47.86%**	35.76%	14.91%	**50.67%**
SPRS	119.05%	27.23%	**146.28%**	119.95%	34.15%	**154.10%**

[1] Letters dated August 11 and August 23.

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Employer Contribution Rates – Comparison to the 2016 Actuarial Valuation

Item	2017 Valuation Effective FY 2018/2019			2016 Valuation Effective FY 2017/2018[1]		
	Pension	Insurance	Combined	Pension	Insurance	Combined
(1)	(2)	(3)	(4)	(5)	(6)	(7)
KERS Non-Hazardous	71.03%	12.40%	**83.43%**	41.98%	8.41%	**50.39%**
KERS Hazardous	34.39%	2.46%	**36.85%**	20.48%	1.34%	**21.82%**
CERS Non-Hazardous	21.84%	6.21%	**28.05%**	14.48%	4.70%	**19.18%**
CERS Hazardous	35.69%	12.17%	**47.86%**	22.20%	9.35%	**31.55%**
SPRS	119.05%	27.23%	**146.28%**	71.57%	18.10%	**89.67%**

[1] Effective for FY 2017/2018 for CERS only. KERS and SPRS are on a biennial contribution rate schedule.

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Unfunded Actuarial Accrued Liability – Actuarial Value of Asset Basis ($ in Billions)

Item	2017 Valuation			2016 Valuation			
	Pension	Insurance	Combined	Pension	Insurance	Combined	Change In UAAL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
KERS Non-Hazardous	$13.47	$1.86	$15.33	$11.11	$1.71	$12.83	**$2.50**
KERS Hazardous	0.51	(0.07)	0.44	0.38	(0.10)	0.28	**$0.16**
CERS Non-Hazardous	6.04	1.13	7.17	4.54	0.91	5.44	**$1.73**
CERS Hazardous	2.41	0.59	3.00	1.57	0.42	1.99	**$1.01**
SPRS	0.71	0.10	0.81	0.54	0.09	0.63	**$0.18**
Total	**$23.14**	**$3.61**	**$26.75**	**$18.14**	**$3.03**	**$21.17**	**$5.58**

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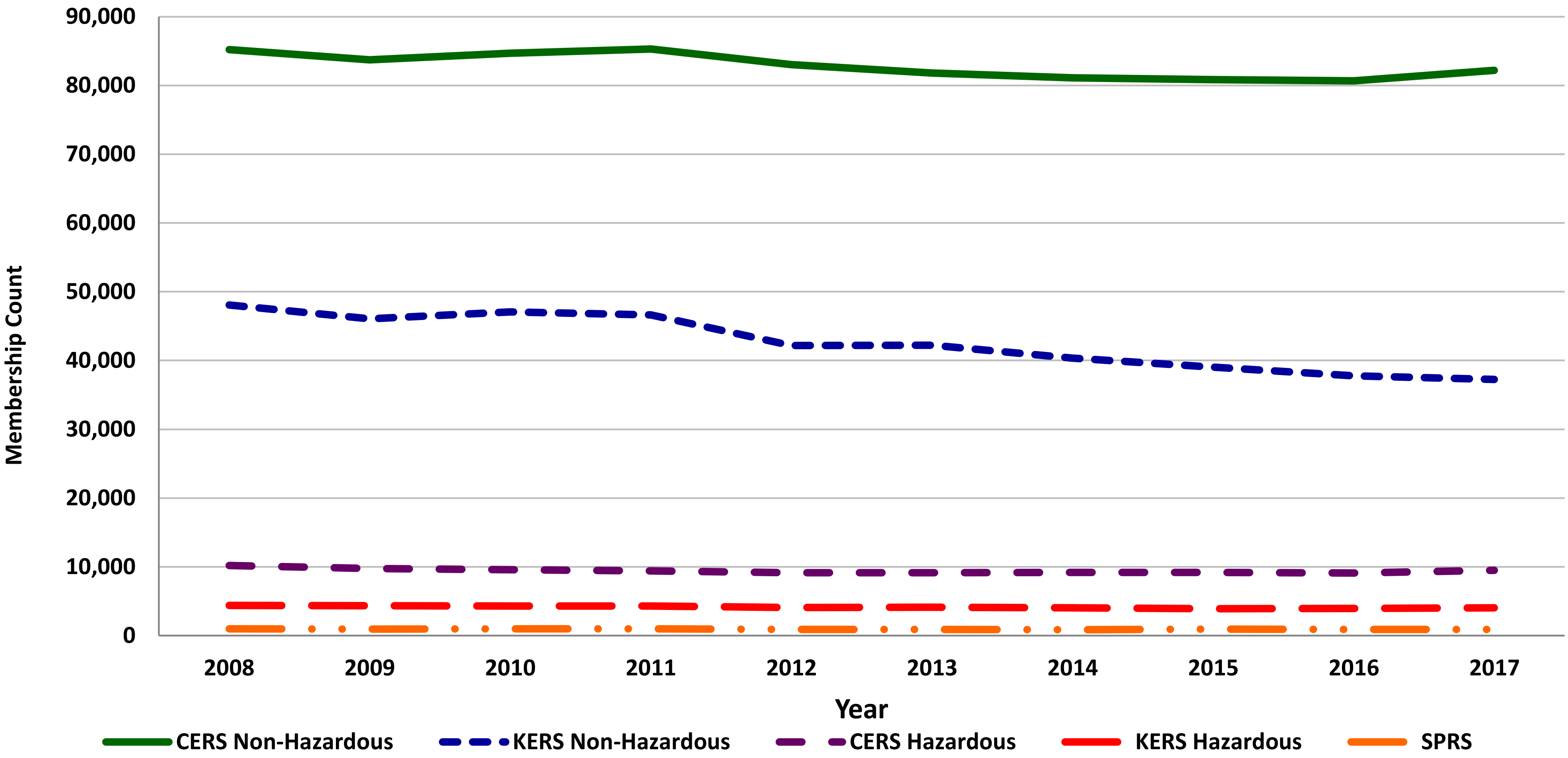
Active Membership Count



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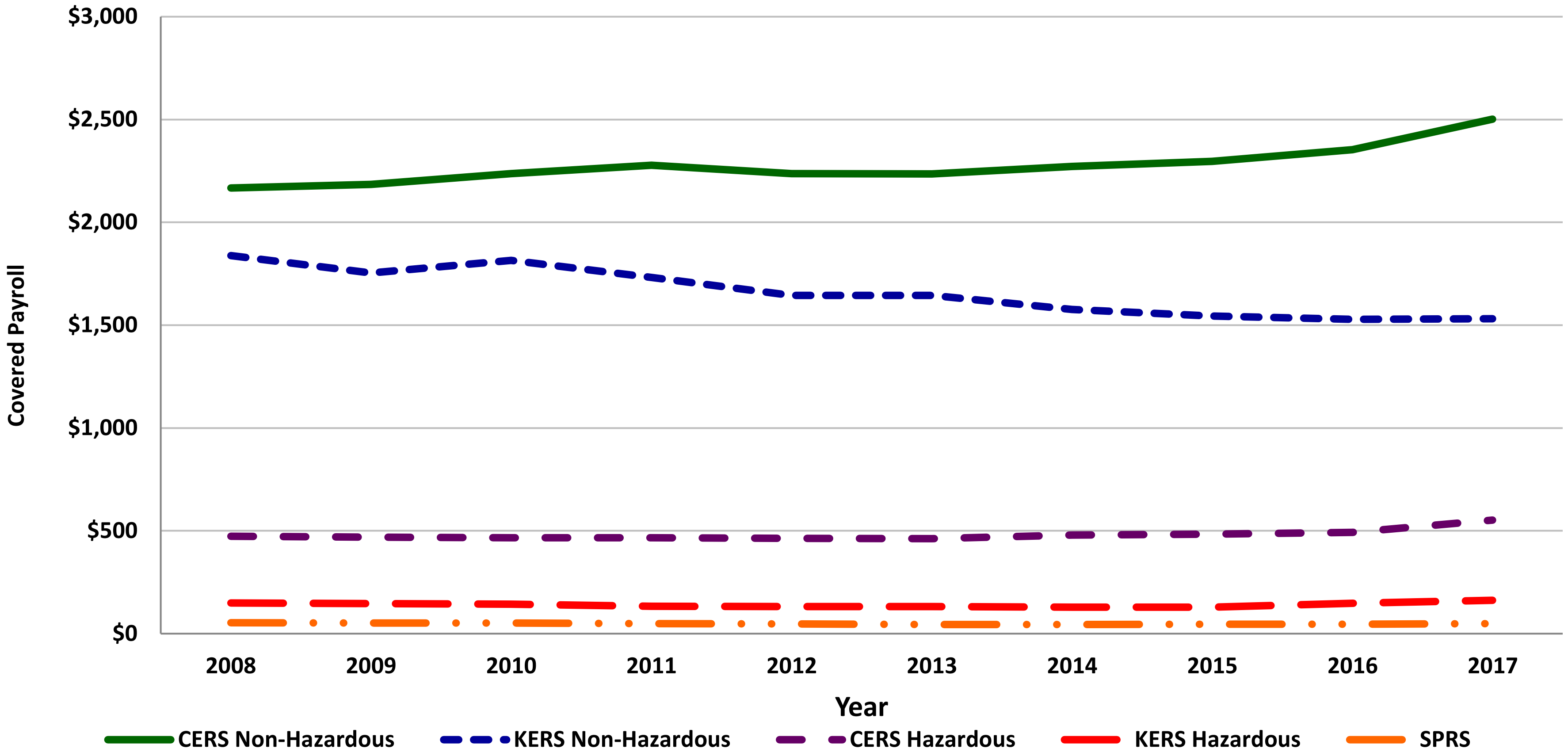
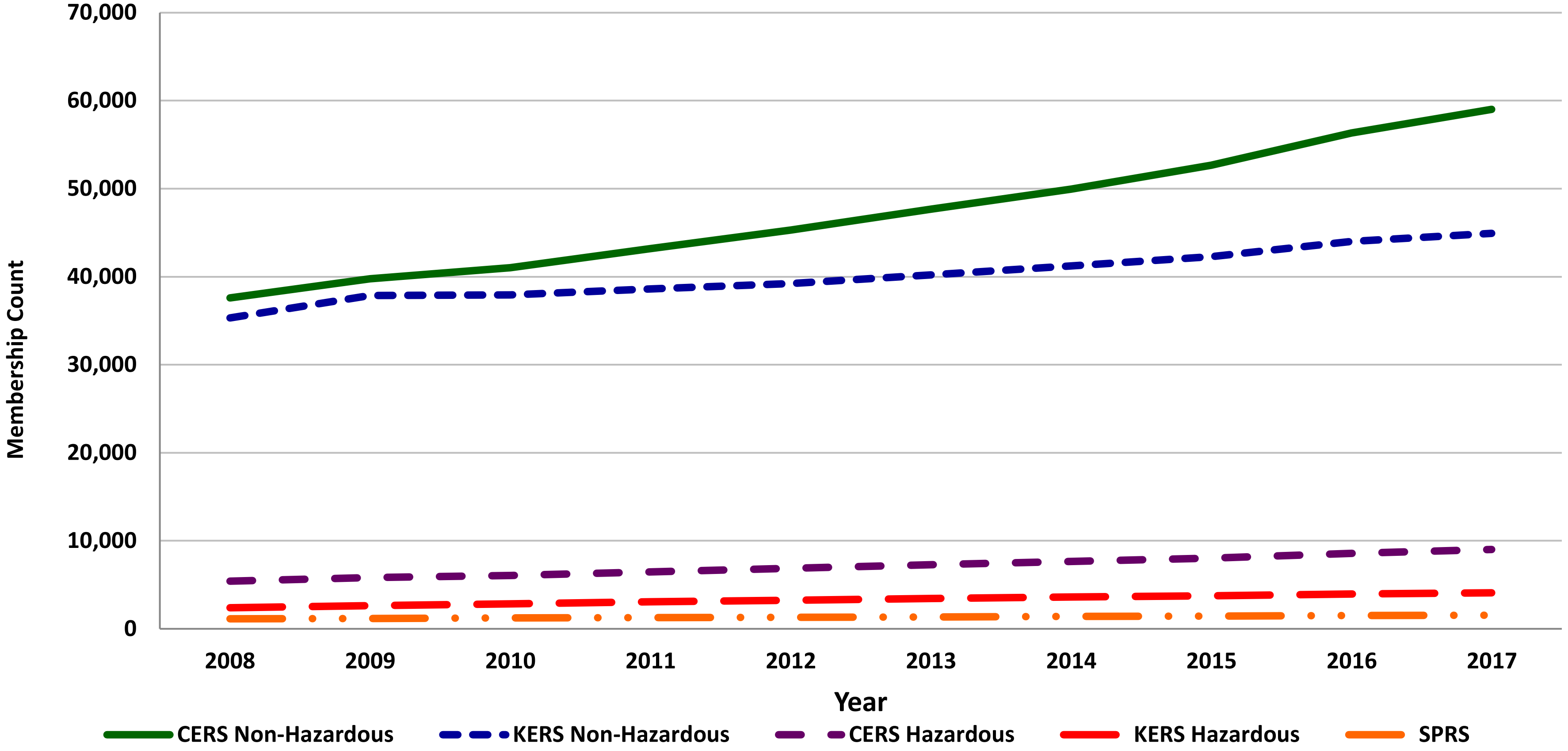
Covered Payroll ($ in Millions)



Retired Membership Count



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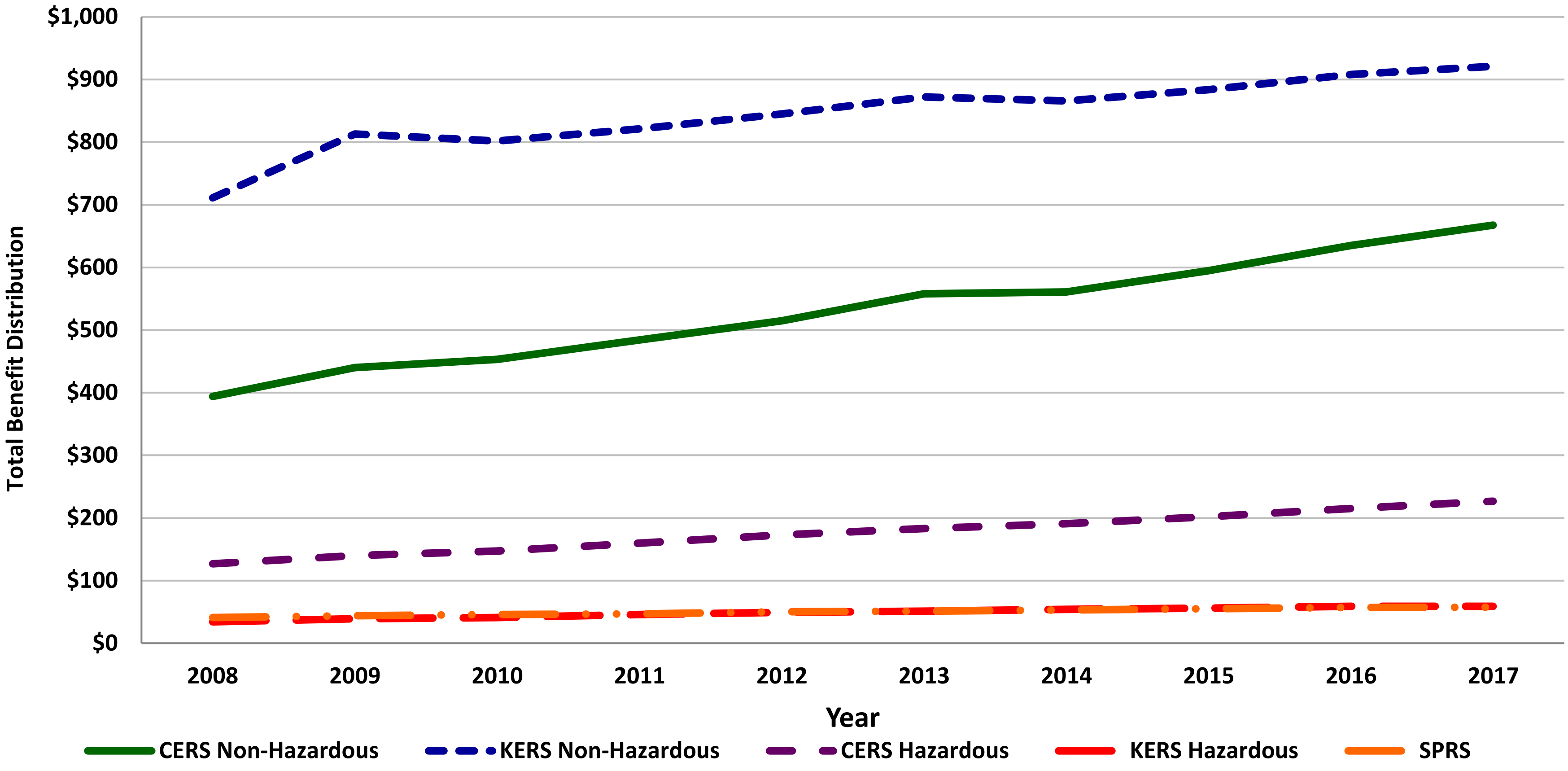
Benefit Distributions ($ in Millions)



Funding Results – KERS Non-Hazardous

Item	Pension		Insurance	
	2017	2016	2017	2016
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	12.45%	9.25%	3.06%	2.51%
Member Rate	(5.00%)	(5.00%)	(0.35%)	(0.32%)
Employer Normal Cost Rate	7.45%	4.25%	2.71%	2.19%
Administrative Expenses	0.72%	0.68%	0.06%	0.05%
Amortization Cost	62.86%	37.05%	9.63%	6.17%
Total Employer Contribution Rate	**71.03%**	**41.98%**	**12.40%**	**8.41%**
Actuarial Accrued Liability	$15,592	$13,225	$2,683	$2,457
Actuarial Value of Assets	2,124	2,112	824	743
Unfunded Actuarial Accrued Liability	**$13,468**	**$11,113**	**$1,860**	**$1,714**
Funded Ratio	**13.6%**	**16.0%**	**30.7%**	**30.3%**

$ in millions

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Funding Results – KERS Hazardous

Item	Pension		Insurance	
	2017	2016	2017	2016
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	17.1%	13.85%	6.40%	5.29%
Member Rate	(8.00%)	(8.00%)	(0.52%)	(0.46%)
Employer Normal Cost Rate	9.10%	5.85%	5.88%	4.83%
Administrative Expenses	0.57%	0.59%	0.06%	0.07%
Amortization Cost	24.72%	14.04%	(3.48%)	(3.56%)
Total Employer Contribution Rate	**34.39%**	**20.48%**	**2.46%**	**1.34%**
Actuarial Accrued Liability	$1,121	$937	$419	$378
Actuarial Value of Assets	607	559	493	473
Unfunded Actuarial Accrued Liability	**$514**	**$378**	**($74)**	**($95)**
Funded Ratio	**54.1%**	**59.7%**	**117.6%**	**125.3%**

$ in millions

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Funding Results – CERS Non-Hazardous

Item	Pension 2017	Pension 2016	Insurance 2017	Insurance 2016
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	10.01%	7.92%	3.57%	2.90%
Member Rate	(5.00%)	(5.00%)	(0.41%)	(0.36%)
Employer Normal Cost Rate	5.05%	2.92%	3.16%	2.54%
Administrative Expenses	0.80%	0.78%	0.03%	0.03%
Amortization Cost	15.99%	10.78%	3.02%	2.13%
Total Employer Contribution Rate	**21.84%**	**14.48%**	**6.21%**	**4.70%**
Actuarial Accrued Liability	$12,804	$11,076	$3,355	$2,988
Actuarial Value of Assets	6,765	6,535	2,227	2,080
Unfunded Actuarial Accrued Liability	**$6,039**	**$4,541**	**$1,128**	**$908**
Funded Ratio	**52.8%**	**59.0%**	**66.4%**	**69.6%**

$ in millions

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Funding Results – CERS Hazardous

Item	Pension 2017	Pension 2016	Insurance 2017	Insurance 2016
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	14.52%	12.13%	5.38%	4.85%
Member Rate	(8.00%)	(8.00%)	(0.35%)	(0.30%)
Employer Normal Cost Rate	6.52%	4.13%	5.03%	4.55%
Administrative Expenses	0.26%	0.27%	0.07%	0.07%
Amortization Cost	28.91%	17.80%	7.07%	4.73%
Total Employer Contribution Rate	**35.69%**	**22.20%**	**12.17%**	**9.35%**
Actuarial Accrued Liability	$4,649	$3,704	$1,788	$1,559
Actuarial Value of Assets	2,238	2,139	1,197	1,136
Unfunded Actuarial Accrued Liability	**$2,411**	**$1,565**	**$592**	**$423**
Funded Ratio	**48.1%**	**57.7%**	**66.9%**	**72.9%**

$ in millions

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Funding Results – SPRS

Item	Pension		Insurance	
	2017	2016	2017	2016
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	23.84%	18.79%	11.48%	8.01%
Member Rate	(8.00%)	(8.00%)	(0.30%)	(0.27%)
Employer Normal Cost Rate	15.84%	10.79%	11.18%	7.74%
Administrative Expenses	0.37%	0.37%	0.14%	0.14%
Amortization Cost	102.84%	60.41%	15.91%	10.22%
Total Employer Contribution Rate	**119.05%**	**71.57%**	**27.23%**	**18.10%**
Actuarial Accrued Liability	$967	$775	277	257
Actuarial Value of Assets	261	235	180	173
Unfunded Actuarial Accrued Liability	**$706**	**$540**	**$96**	**$84**
Funded Ratio	**27.0%**	**30.3%**	**65.2%**	**67.1%**

$ in millions

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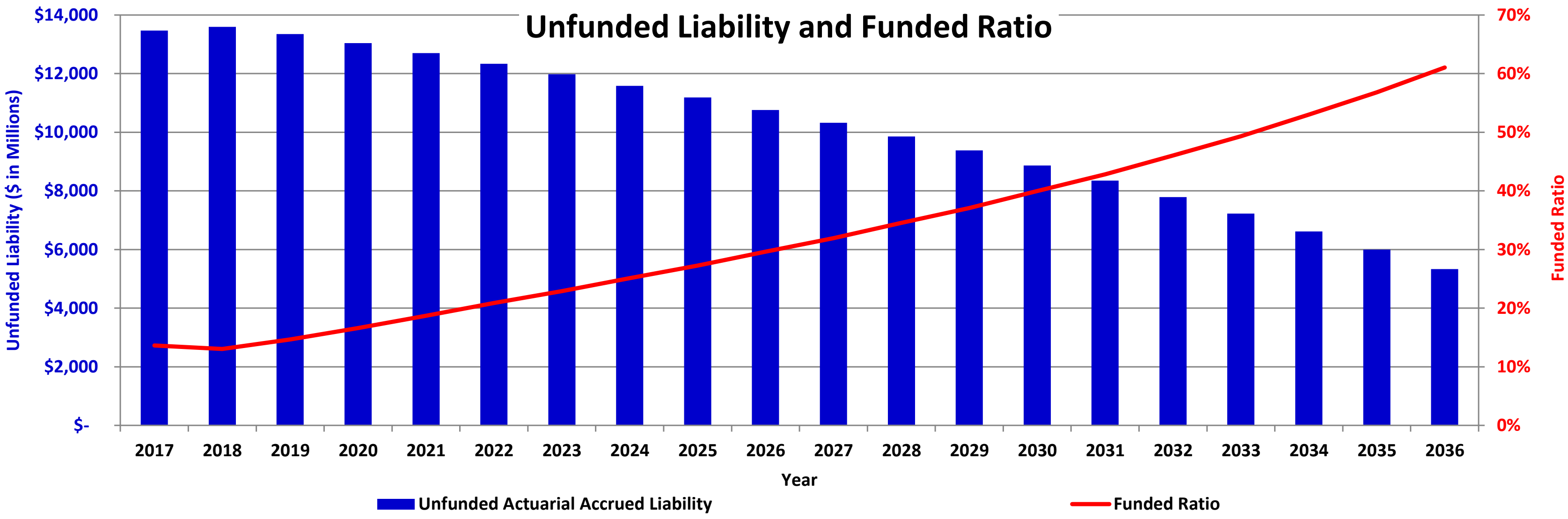
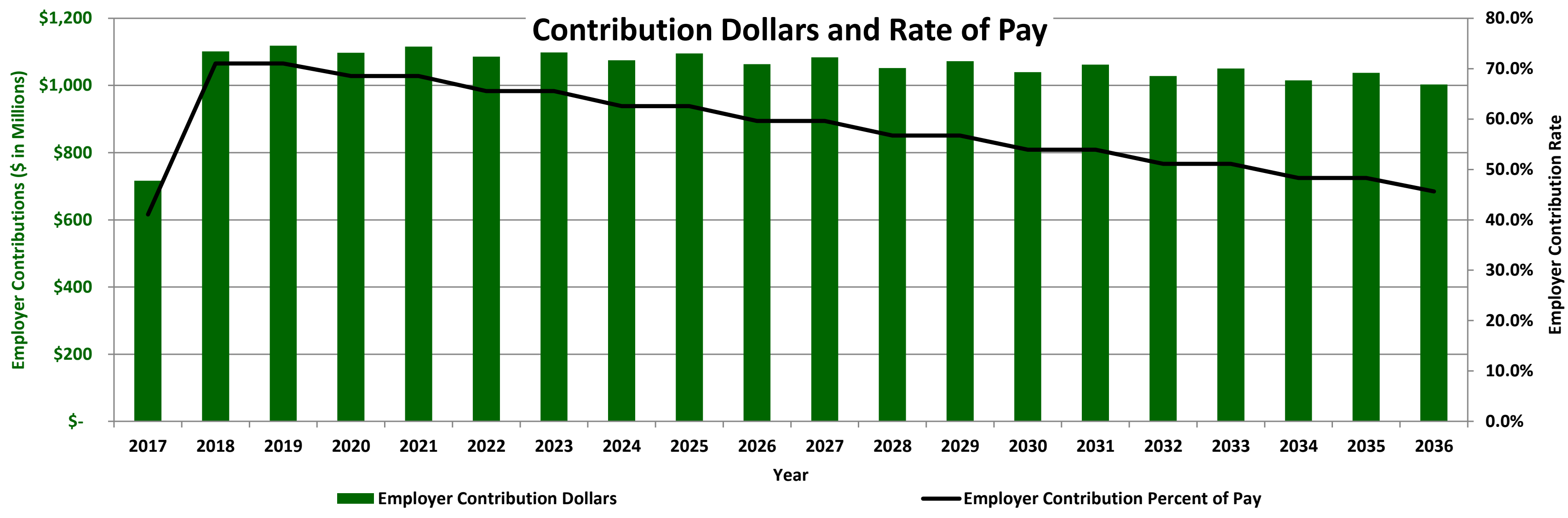
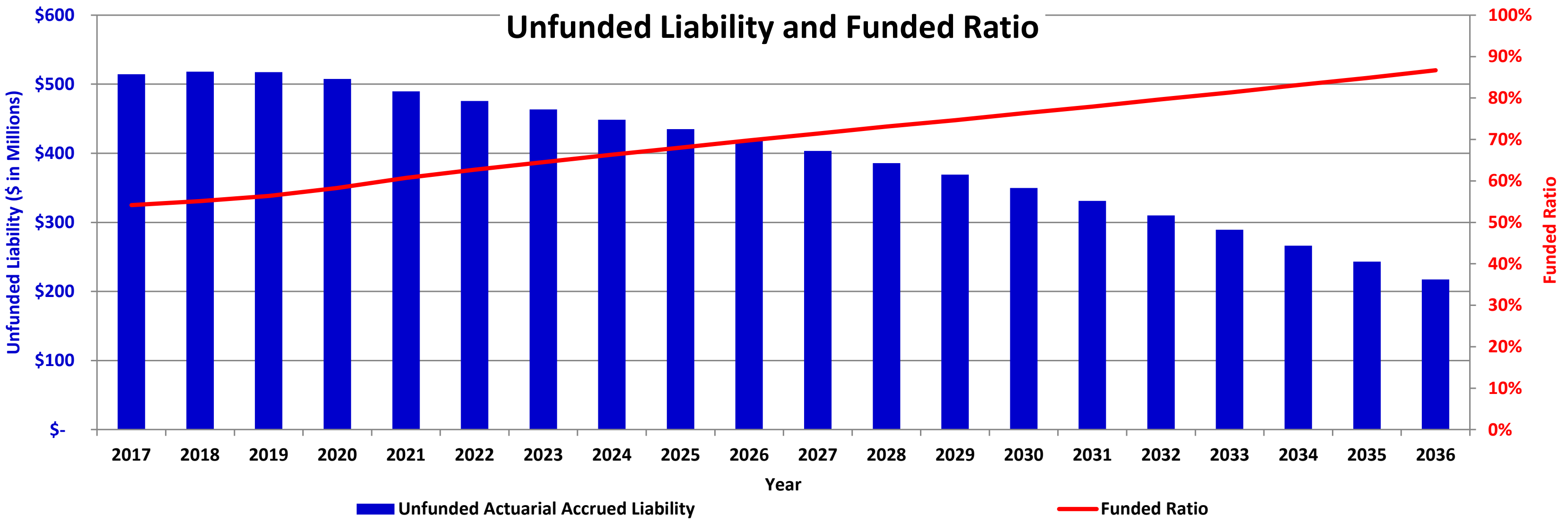
Projection Information
Pension Funds

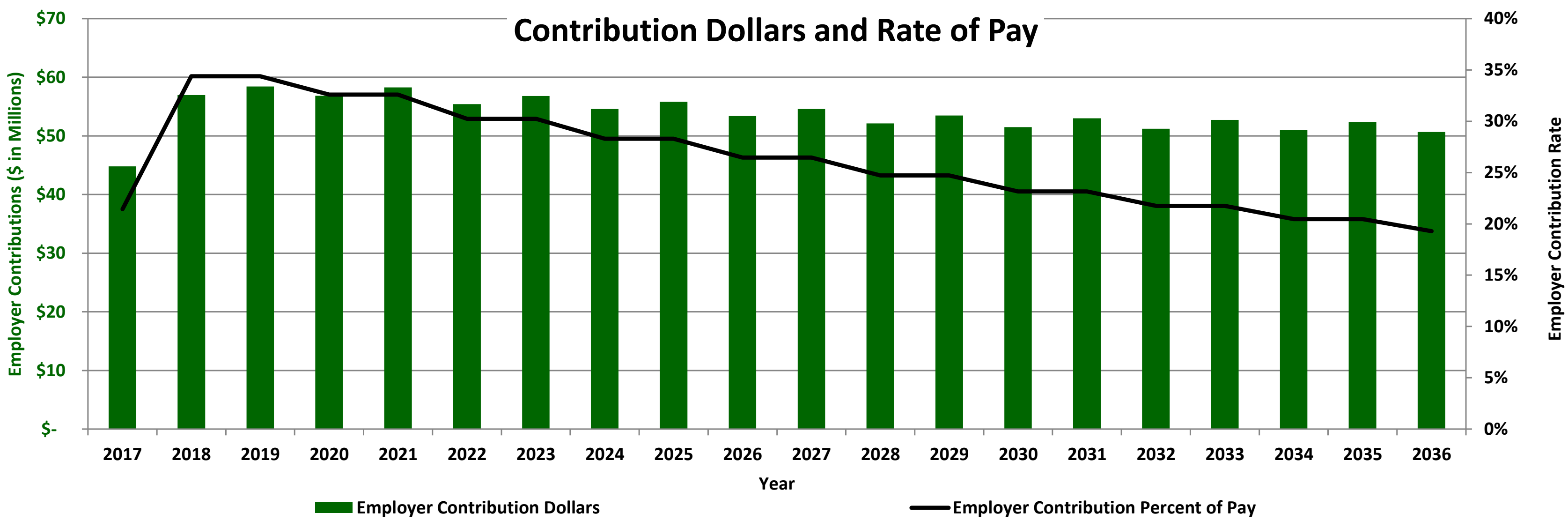
KERS Non-Hazardous - Pension



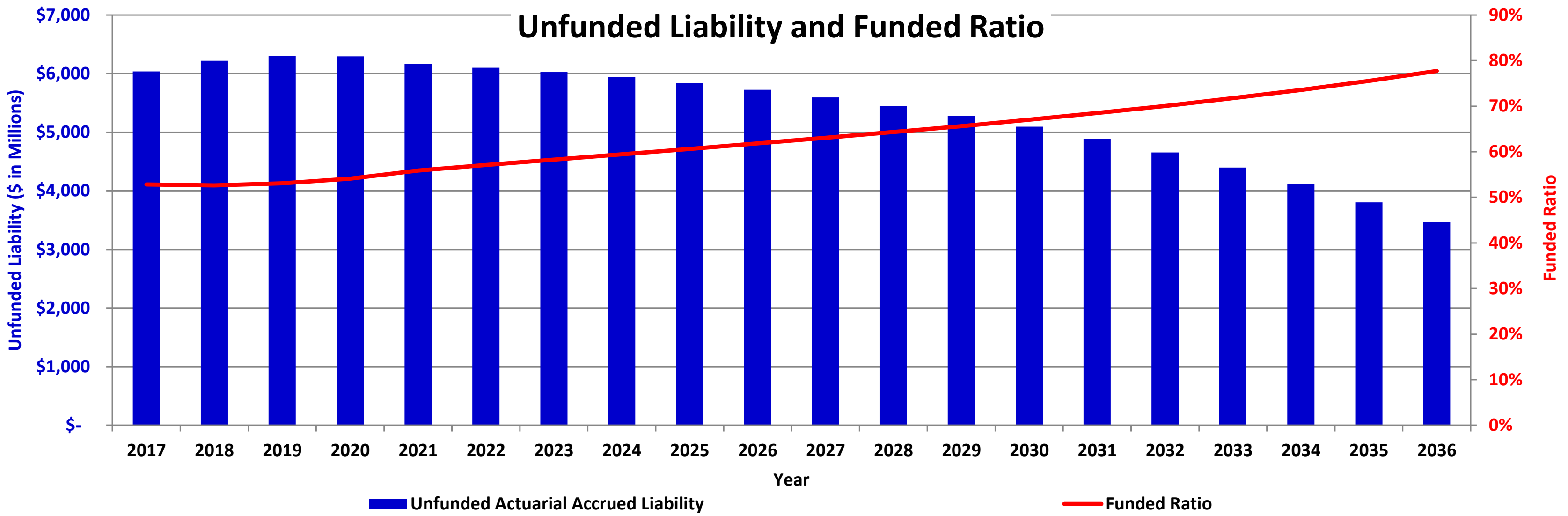


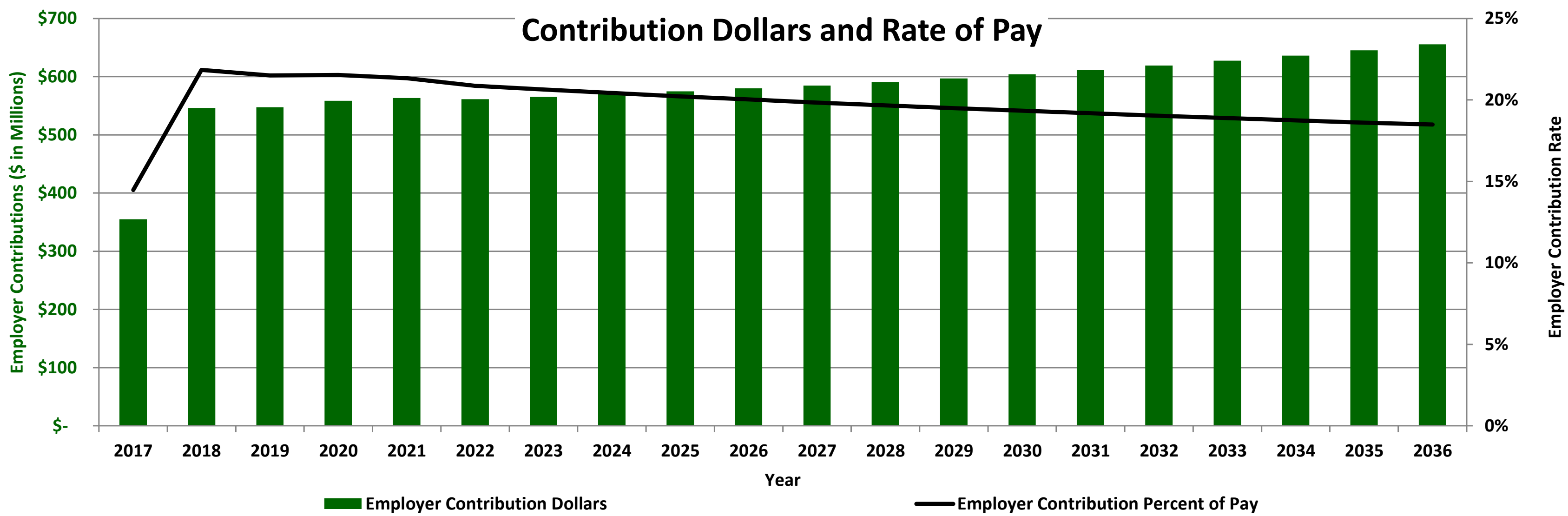
KERS Hazardous - Pension



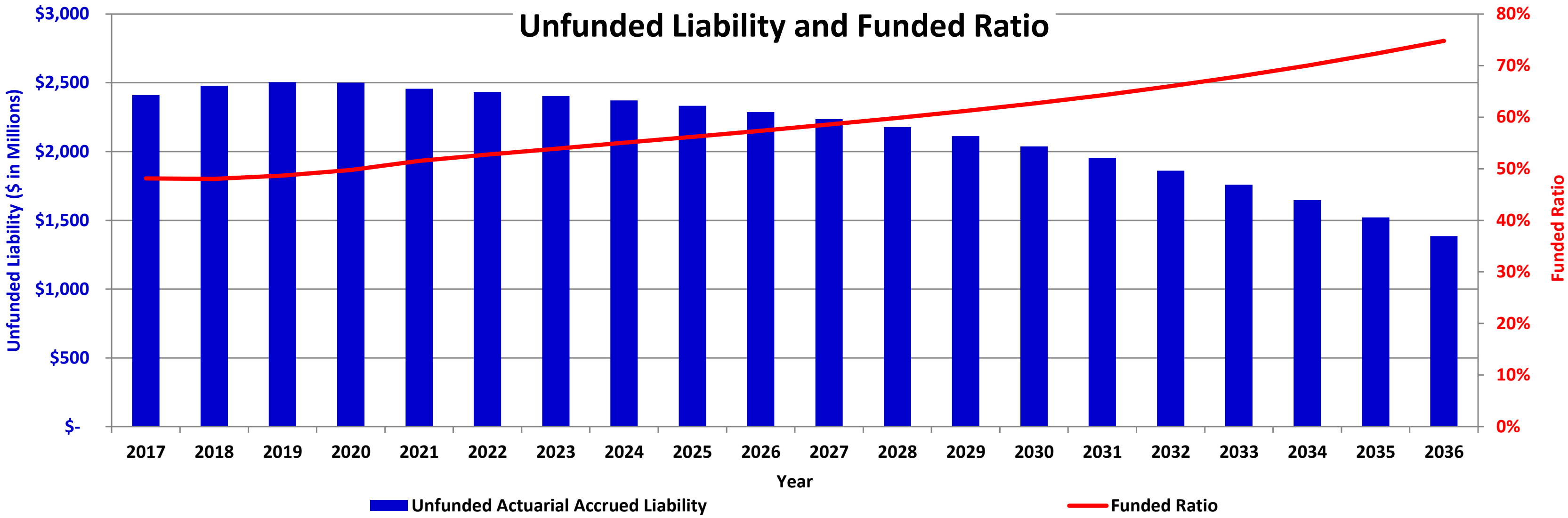


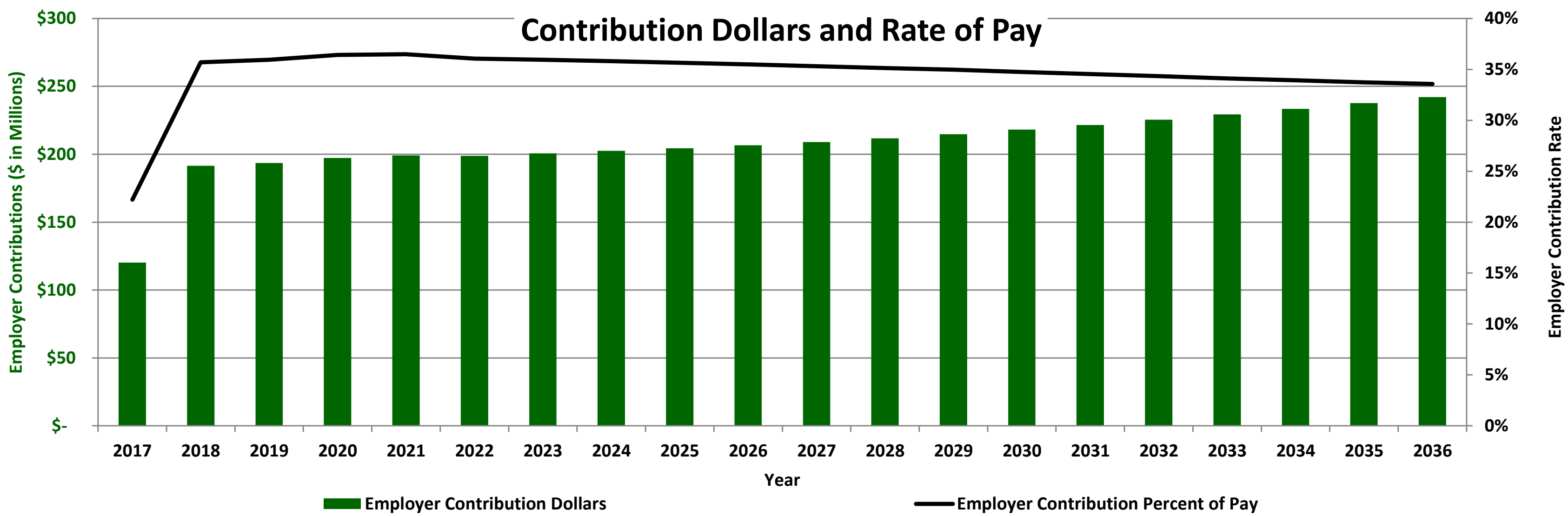
CERS Non-Hazardous - Pension



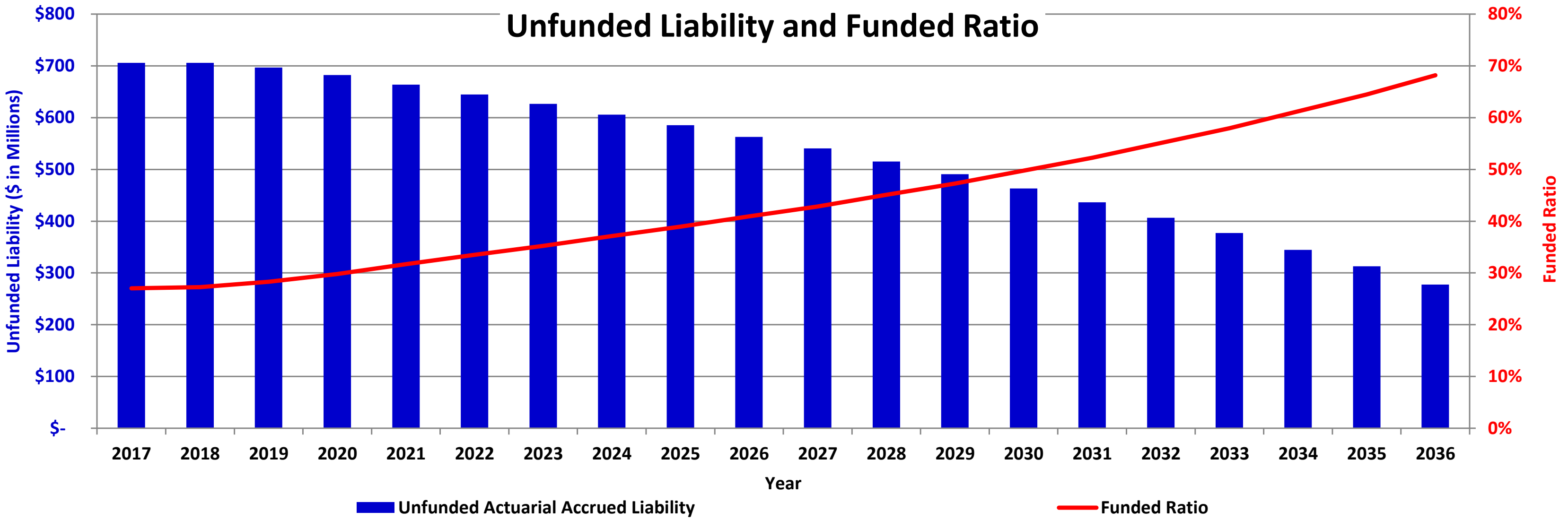


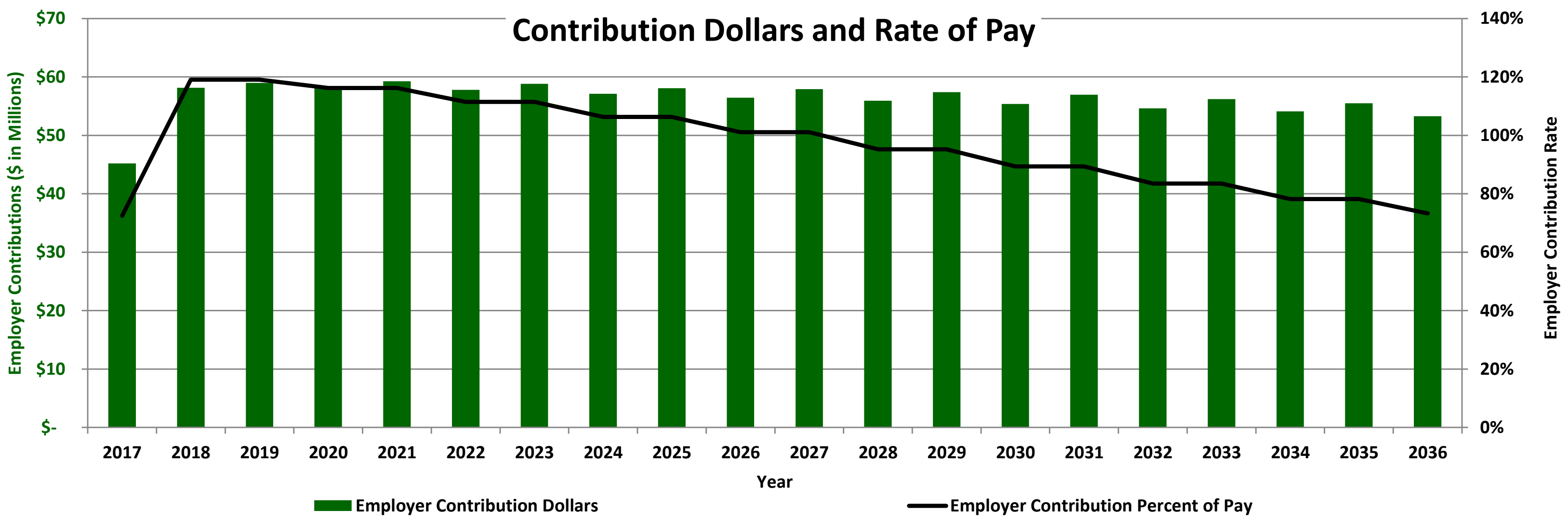
CERS Hazardous - Pension





SPRS - Pension





Closing Comments

- It is imperative the State and participating employers in the Systems contribute the actuarial determined contribution in future years to improve the financial security of the systems
- The economic assumptions that were adopted for use in the 2017 actuarial valuation will increase the likelihood that contribution requirements will remain more stable in future years (due to investment and covered payroll growth experience)
- An experience study will be conducted for the 5-year period ending June 30, 2018 which will determine actuarial assumptions for use in the June 30, 2019 valuation

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Disclaimers

- This presentation is intended to be used in conjunction with the actuarial valuations as of June 30, 2017. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- Readers are cautioned to examine original source materials and to consult with subject matter experts before making decisions related to the subject matter of this presentation.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.

GRS Retirement Consulting

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October 30, 2017

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

Subject: Certification of the June 30, 2017 Actuarial Valuation Results

Dear Trustees of the Board:

Enclosed are the June 30, 2017 actuarial valuation reports for the Kentucky Employees Retirement System (KERS), the County Employees Retirement System (CERS), and the State Police Retirement System (SPRS). These reports provide the current actuarial and financial condition of the Kentucky Retirement Systems (KRS), as well as communicate the actuarially determined employer contribution rates.

Under Kentucky Statute, the Board of Trustees must approve the employer contribution rates. For KERS and CERS, these certified contribution rates will be effective for the two-year period beginning July 1, 2018 and ending June 30, 2020. The certified contribution rates for CERS will be effective for the fiscal year beginning July 1, 2018 and ending June 30, 2019.

These contribution rates are calculated based on the membership data and plan assets as of June 30, 2017. These calculations are also based on the benefit provisions in effect as of June 30, 2017. If new legislation is enacted between the valuation date and the date the contribution rates become effective, the Board may adjust the calculated rates to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

Financing Objectives and Funding Policy

KRS administers a pension and health insurance fund to provide for monthly retirement income and retiree health insurance benefits. The total employer contribution rate is comprised of a contribution to each respective fund.

The contribution rate for each fund consists of a normal cost that is net of employee contributions and an amortization payment on the unfunded actuarial accrued liability (UAAL). In accordance with Section 61.565 of Kentucky Statute, the amortization payment is based on a closed thirty-year amortization period beginning July 1, 2013. As a result, the amortization period used in the 2017 actuarial valuation is 26 years. The amortization period used in subsequent actuarial valuations will decrease by one each future year.

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Due to changes in certain economic assumptions adopted by the Board for use in the June 30, 2017 actuarial valuation, the contribution rates for the retirement and health insurance funds have sustainably increased from those in currently in effect. However, the contribution rates determined under these new assumptions are more likely to remain stable, as a percentage of payroll in future years (absent benefit improvements and experience losses).

PROGRESS TOWARDS REALIZATION OF FUNDING OBJECTIVES

One way to measure the progress towards achieving the intended funding objective is to measure the relationship between the actuarial value of assets and the actuarial accrued liabilities for each fund. This relationship is referred to as the funded ratio and should increase over time (absence of benefit improvements) with the goal of attaining 100%.

The funded ratio as June 30, 2016 for the retirement and health insurance funds of each System are as follows:

	Funded Ratio (AVA / AAL)	
System	Retirement Fund	Health Insurance Fund
KERS Non-Hazardous	13.6%	30.7%
KERS Hazardous	54.1%	117.6%
CERS Non-Hazardous	52.8%	66.4%
CERS Hazardous	48.1%	66.9%
SPRS	27.0%	65.2%

The funding levels for the retirement funds have decreased since the prior year primarily due to the decrease in the assumed rate of return assumption (discussed in more detail later) for use in the June 30, 2017 actuarial valuation. The future improvement of the financial health of these systems will be very dependent on the employers paying the actuarially determined contribution rates in all future years.

In particular, during the last fiscal year KERS non-hazardous pension fund distributed $960 million in benefit payments and received $858 million in employer and employee contributions (excluding contributions to the 401(h)). As of June 30, 2017, the market value of assets for this system was $2,057 million (excluding assets in the 401(h)). To stabilize the financial condition of this system and reduce the likelihood that plan assets will become exhausted, it is imperative that contributions to the system exceed the benefit payments. The employer contribution rate to the retirement fund that is documented in the KERS is projected increase the total employer and member contributions to $1,164 million for each of the next two fiscal years (i.e. FY 2018-19 and FY 2019-20). If these employer contributions are not made to this system, then the financial condition of this retirement system is expected to continue to deteriorate and there will be a significant risk of plan assets being exhausted.

ASSUMPTIONS AND METHODS

Kentucky Statutes requires that an actuarial investigation be performed at least every five years to review the economic and demographic assumptions. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study.

Since the last actuarial valuation the Board adopted changes to certain economic assumptions for KERS, CERS and SPRS. Specifically, the Board decreased the price inflation assumption to 2.30% for all funds. The assumed rate of return was decreased to 5.25% for the KERS non-hazardous retirement fund and the SPRS retirement fund. The assumed rate of return was decreased to 6.25% for the KERS hazardous retirement fund, CERS (non-hazardous and hazardous) retirement funds, and all the insurance funds for KERS, CERS, and SPRS. Furthermore, the Board decreased the payroll growth assumption to 2.00% for all the CERS funds (retirement and health insurance) and adopted a level-dollar amortization (i.e. a 0.00% payroll growth assumption) for calculating the amortization payment for all the KERS and SPRS funds (retirement and health insurance).

It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on June 30, 2017. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2017, by the KRS staff. The staff also supplied asset information as of June 30, 2017. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by KRS.

CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of KERS as of June 30, 2017.All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Kentucky Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries. All three of the undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. All of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.

Joseph P. Newton, FSA, MAAA, EA
Senior Consultant

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

Janie Shaw, ASA, MAAA
Consultant

Summary of June 30, 2017 Actuarial Valuation Results

	KERS Non-Hazardous	KERS Hazardous	CERS Non-Hazardous	CERS Hazardous	SPRS
Contributions for next fiscal year:					
Pension Fund Contribution	71.03%	34.39%	21.84%	35.69%	119.05%
Insurance Fund Contribution	12.40%	2.46%	6.21%	12.17%	27.23%
Total Recommended Employer Contribution	83.43%	36.85%	28.05%	47.86%	146.28%
Assets:					
Retirement					
• Actuarial value (AVAR)	$2,123,623,157	$607,158,871	$6,764,873,113	$2,238,320,330	$261,320,225
• Market value (MVAR)	$2,056,869,899	$601,528,922	$6,687,237,095	$2,217,996,136	$255,736,583
• Ratio of actuarial to market value of assets	103.2%	100.9%	101.2%	100.9%	102.2%
Insurance					
• Actuarial value (AVAI)	$823,917,560	$493,458,367	$2,227,401,268	$1,196,779,877	$180,463,820
• Market value (MVAI)	$817,369,841	$488,838,463	$2,212,535,662	$1,189,001,387	$178,838,260
• Ratio of actuarial to market value of assets	100.8%	100.9%	100.7%	100.7%	100.9%
Funded Status:					
Retirement					
• Actuarial accrued liability	$15,591,641,083	$1,121,419,836	$12,803,509,449	$4,649,046,764	$967,144,667
• Unfunded accrued liability on AVAR	$13,468,017,926	$514,260,965	$6,038,636,336	$2,410,726,434	$705,824,442
• Funded ratio on AVAR	13.6%	54.1%	52.8%	48.1%	27.0%
• Unfunded accrued liability on MVAR	$13,534,771,184	$519,890,914	$6,116,272,354	$2,431,050,628	$711,408,084
• Funded ratio on MVAR	13.2%	53.6%	52.2%	47.7%	26.4%
Insurance					
• Actuarial accrued liability	$2,683,496,055	$419,439,652	$3,355,151,286	$1,788,432,768	$276,641,361
• Unfunded accrued liability on AVAI	$1,859,578,495	($74,018,715)	$1,127,750,018	$591,652,891	$96,177,541
• Funded ratio on AVAI	30.7%	117.6%	66.4%	66.9%	65.2%
• Unfunded accrued liability on MVAI	$1,866,126,214	($69,398,811)	$1,142,615,624	$599,431,381	$97,803,101
• Funded ratio on MVAI	30.5%	116.5%	65.9%	66.5%	64.6%
Membership:					
• Number of					
- Active Members	37,234	4,047	82,198	9,495	903
- Retirees and Beneficiaries	44,916	4,093	59,013	8,998	1,536
- Inactive Members	49,658	5,298	85,031	3,198	480
- Total	131,808	13,438	226,242	21,691	2,919
• Projected payroll of active members	$1,531,534,820	$162,418,070	$2,452,407,113	$541,632,946	$48,598,296
• Average salary of active members	$41,133	$40,133	$29,835	$57,044	$53,819

Kentucky Employees Retirement System (KERS)

Actuarial Valuation Report as of June 30, 2017

GRS Retirement Consulting

P: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

October 30, 2017

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

Subject: Actuarial Valuation as of June 30, 2017

Dear Trustees of the Board:

This report describes the current actuarial condition of the Kentucky Employees Retirement System (KERS), determines the required employer contribution rates, and analyzes changes in the System's financial condition. In addition, the report provides various summaries of the data. Separate reports are issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67, 68, 74 and 75. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of June 30, the first day of the plan year for KRS. This report was prepared at the request of the Board of Trustees of the Kentucky Retirement System (Board) and is intended for use by the KRS staff and those designated or approved by the Board.

Financing Objectives and Funding Policy

The employer contribution rate is determined in accordance with Section 61.565 of Kentucky Statute. As specified by the Statute, the employer contribution rate is determined based on a closed thirty-year amortization period beginning July 1, 2013. As a result, the amortization period used in the 2017 actuarial valuation is 26 years. The contribution rate determined by this actuarial valuation becomes effective twelve months after the valuation date and is effective for two fiscal years. In other words, the contribution rate determined by this June 30, 2017 actuarial valuation will be used by the Board to certify the Commonwealth's contribution rates for the biennium period beginning July 1, 2018 and ending June 30, 2020.

If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

Assumptions and Methods

Kentucky Statutes also requires that an actuarial investigation be performed at least every five years to review the economic and demographic assumptions. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Subsequent to the last actuarial valuation the Board decreased the price inflation assumption to 2.30% and changed the amortization of the unfunded actuarial accrued liability for the KERS Non-Hazardous and Hazardous Systems (Retirement and Health Insurance) to be on a level dollar basis, but continued to be communicated as a percentage of expected covered payroll. Additionally, the assumed rate of return was decreased to 6.25% for the KERS Hazardous Retirement and both KERS Health Insurance Funds, and the assumed rate of return was decreased to 5.25% for the KERS Non-Hazardous Retirement Fund. It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on June 30, 2017. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2017, by the KRS staff. The staff also supplied asset information as of June 30, 2017. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by KRS.

CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of KERS as of June 30, 2017.

All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Kentucky Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries. All three of the undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. All of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.

Joseph P. Newton, FSA, MAAA, EA
Senior Consultant

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

Janie Shaw, ASA, MAAA
Consultant

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SECTION 1

EXECUTIVE SUMMARY

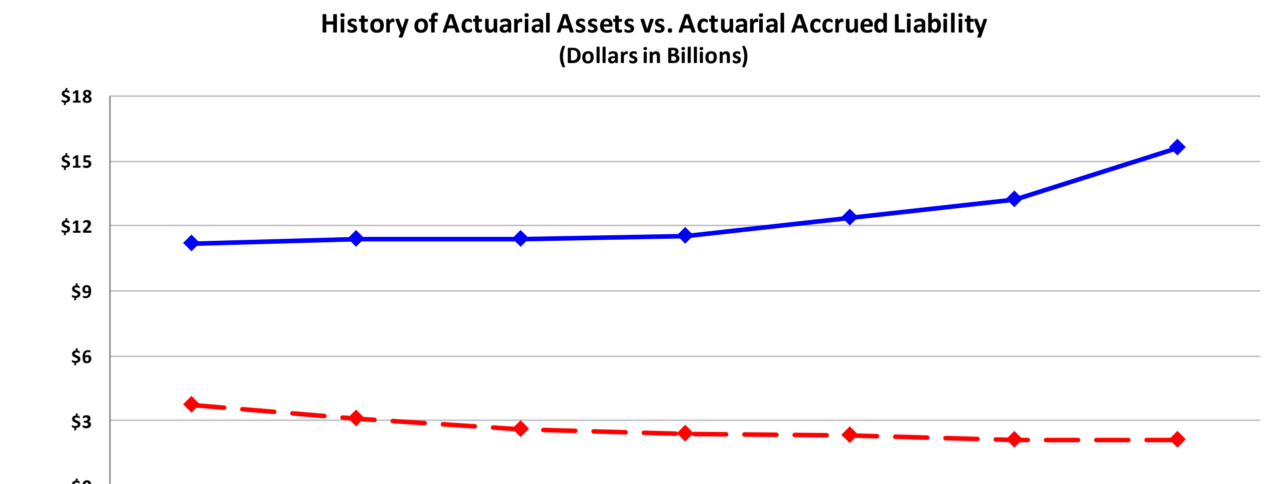
Summary of Principal Results

(Dollar amounts expressed in thousands)

	Non-Hazardous		Hazardous		Total	
	June 30, 2017	June 30, 2016	June 30, 2017	June 30, 2016	June 30, 2017	June 30, 2016
Contributions for next fiscal year:						
Retirement	71.03%	41.98%	34.39%	20.48%		
Insurance	12.40%	8.41%	2.46%	1.34%		
Total	83.43%	50.39%	36.85%	21.82%	N/A	N/A
Assets:						
Retirement						
• Actuarial value (AVAR)	$2,123,623	$2,112,286	$607,159	$559,487	$2,730,782	$2,671,774
• Market value (MVAR)	$2,056,870	$1,953,422	$601,529	$524,679	$2,658,399	$2,478,101
• Ratio of actuarial to market value of assets	103.2%	108.1%	100.9%	106.6%	102.7%	107.8%
Insurance						
• Actuarial value (AVAI)	$823,918	$743,270	$493,458	$473,160	$1,317,376	$1,216,430
• Market value (MVAI)	$817,370	$695,189	$488,838	$440,596	$1,306,208	$1,135,785
• Ratio of actuarial to market value of assets	100.8%	106.9%	100.9%	107.4%	100.9%	107.1%
Funded Status:						
Retirement						
• Actuarial accrued liability	$15,591,641	$13,224,698	$1,121,420	$936,706	$16,713,061	$14,161,405
• Unfunded accrued liability on AVAR	$13,468,018	$11,112,412	$514,261	$377,219	$13,982,279	$11,489,631
• Funded ratio on AVAR	13.6%	16.0%	54.1%	59.7%	16.3%	18.9%
• Unfunded accrued liability on MVAR	$13,534,771	$11,271,276	$519,891	$412,027	$14,054,662	$11,683,304
• Funded ratio on MVAR	13.2%	14.8%	53.6%	56.0%	15.9%	17.5%
Insurance						
• Actuarial accrued liability	$2,683,496	$2,456,678	$419,439	$377,745	$3,102,935	$2,834,423
• Unfunded accrued liability on AVAI	$1,859,578	$1,713,408	($74,019)	($95,415)	$1,785,559	$1,617,993
• Funded ratio on AVAI	30.7%	30.3%	117.6%	125.3%	42.5%	42.9%
• Unfunded accrued liability on MVAI	$1,866,126	$1,761,489	($69,399)	($62,851)	$1,796,727	$1,698,638
• Funded ratio on MVAI	30.5%	28.3%	116.5%	116.6%	42.1%	40.1%
Membership:						
• Number of						
- Active Members	37,234	37,779	4,047	3,959	41,281	41,738
- Retirees and Beneficiaries	44,916	44,004	4,093	3,966	49,009	47,970
- Inactive Members	49,658	49,040	5,298	4,925	54,956	53,965
- Total	131,808	130,823	13,438	12,850	145,246	143,673
• Projected payroll of active members	$1,531,535	$1,529,249	$162,418	$147,563	$1,693,953	$1,676,812
• Average salary of active members	$41,133	$40,479	$40,133	$37,273	$41,035	$40,175

Non-Hazardous Retirement Fund

The unfunded actuarial accrued liability for the non-hazardous retirement fund increased by $2.356 billion since the prior year's valuation to $13.468 billion. The largest source of this increase is the $2.158 billion due to a decrease in the assumed rate of investment return. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for the non-hazardous fund. The divergence in the assets and liability over the last seven years has generally been due to a combination of: (i) actual contribution rates being insufficient to completely finance the interest on the unfunded actuarial accrued liability, (ii) the actual investment experience being less than the return assumption, and (iii) a decrease in the assumed rate of return in 2015, 2016 and again in 2017.

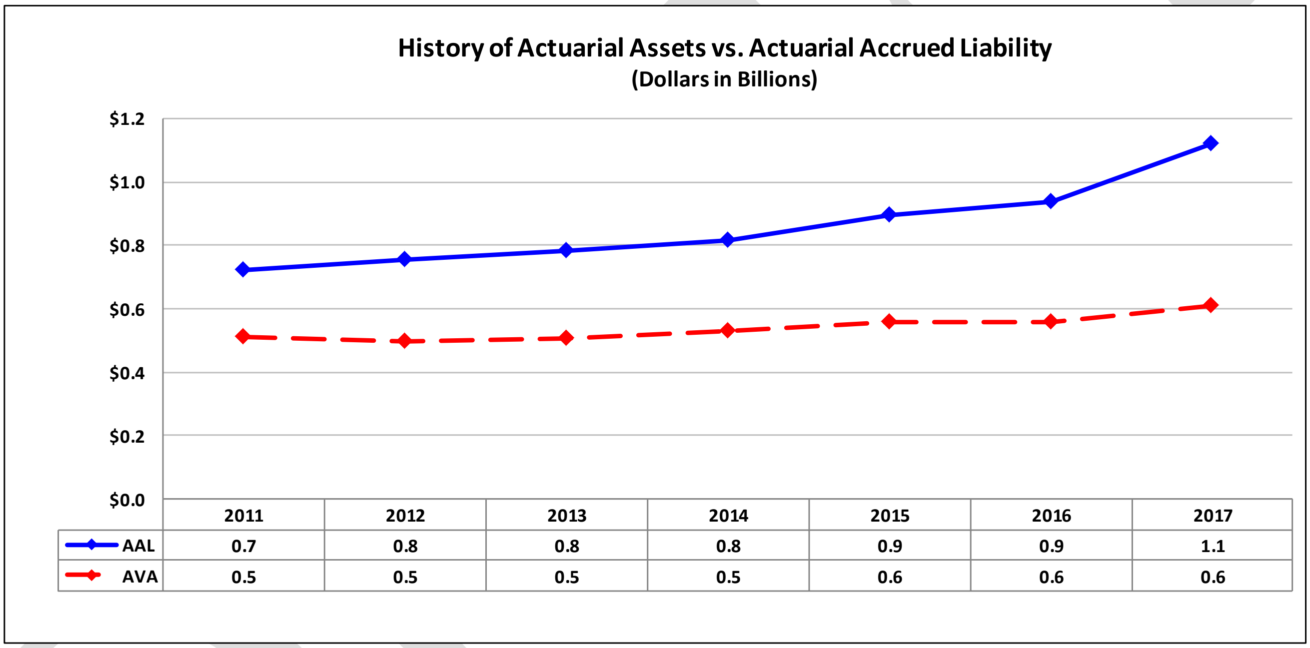


	2011	2012	2013	2014	2015	2016	2017
AAL	11.2	11.4	11.4	11.6	12.4	13.2	15.6
AVA	3.7	3.1	2.6	2.4	2.4	2.1	2.1

For FY2016-17, the KERS non-hazardous pension system distributed $960 million in benefit payments and received $858 million in employer and employee contributions (excluding contributions to the 401(h)). As of June 30, 2017, the market value of assets for this system was $2,057 million (excluding assets in the 401(h)). To stabilize the financial condition of this system and reduce the likelihood that plan assets will become exhausted, it is imperative that contributions to the system exceed the benefit payments. The 71.03% of pay employer contribution rate to the pension plan that is documented in this report is projected to increase the total employer and member contributions to $1,164 million for each of the next two fiscal years (i.e. FY 2018-19 and FY 2019-20). If these employer contributions are not made to this system, then the financial condition of this retirement system is expected to continue to deteriorate and there will be a significant risk of plan assets being exhausted.

Hazardous Retirement Fund

The unfunded actuarial accrued liability for the hazardous retirement fund increased by $137 million since the prior year's valuation to $514 million. The largest source of this increase is the $130 million due to a decrease in the assumed rate of investment return. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for the hazardous retirement fund. The divergence in the assets and liability over the last seven years has generally been due to a combination of: (i) actual contribution rates being insufficient to finance, or pay down the unfunded actuarial accrued liability, (ii) the actual investment experience being less than the fund's expected investment return assumption, and (iii) a decrease in the assumed rate of return in 2015 and again in 2017.



SECTION 2

DISCUSSION

Discussion

The Kentucky Employees Retirement System (KERS) is a defined benefit pension fund that provides pensions and health care coverage for employees of state government, non-teaching staff at regional state supported universities, local health departments, regional mental health/mental retardation agencies, and other quasi-state agencies. KERS includes both non-hazardous and hazardous duty benefits. This report presents the result of the June 30, 2017 actuarial funding valuation for both the Retirement and Insurance Funds.

The primary purposes of the valuation report are to depict the current financial condition of the System, determine the annual required contribution, and analyze changes in the System's financial condition. In addition, the report provides various summaries of the data.

The actuarially determined contribution rates consist of two components: a normal cost rate and an amortization cost to finance the unfunded actuarial accrued liability. The normal cost rate is the theoretical amount which would be required to pay the members' benefits, based on the current plan provisions, if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. This is the amount is should cost to provide the benefits for an average new member. Since members contribute to the fund, only the excess of the normal rate over the member contribution rate is included in the employer contribution rate. The amortization cost is the amount, expressed as a percentage of payroll, necessary to amortize the unfunded actuarial accrued liability. The payroll growth rate and discount rate assumptions are selected by the Board. The funding period is specified in Section 61.565 of Kentucky Statute.

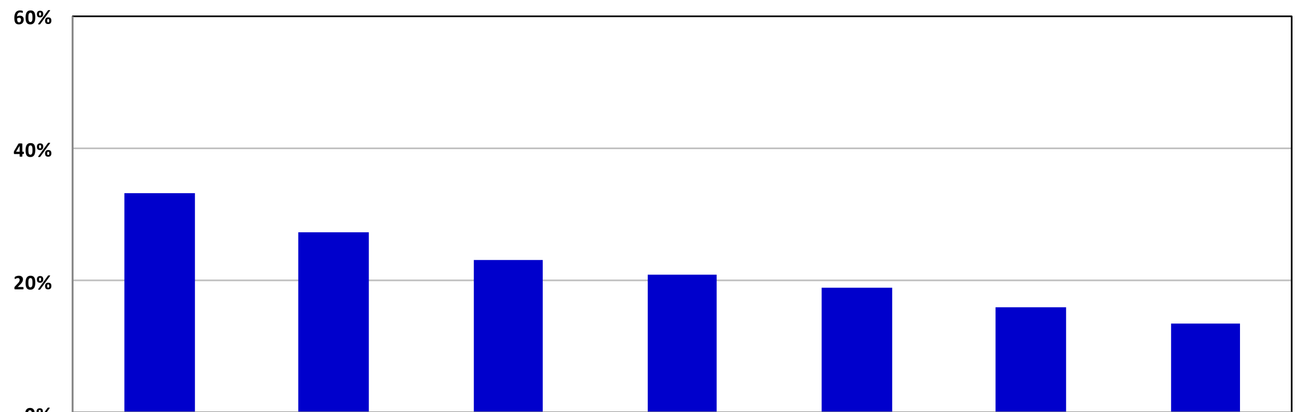
All of the actuarial and financial tables referenced by the other sections of this Report appear in Section 3. Section 4 provides member data and statistical information. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

Funding Progress

The following charts provide a seven-year history of the funds' funded ratio (i.e. the Actuarial Value of Assets divided by the Actuarial Accrued Liability). The decline in the funded ratio over the last seven years for the retirement funds has generally been due to a combination of: (i) actual contribution rates being insufficient to completely finance, or pay down, the unfunded actuarial accrued liability, (ii) the actual investment experience being less than assumed, and (iii) a decrease in the assumed rate of return in 2015, 2016 and again in 2017.

Non-Hazardous Retirement Fund

Funded Ratio
Actuarial Assets as a percentage of Actuarial Accrued Liability

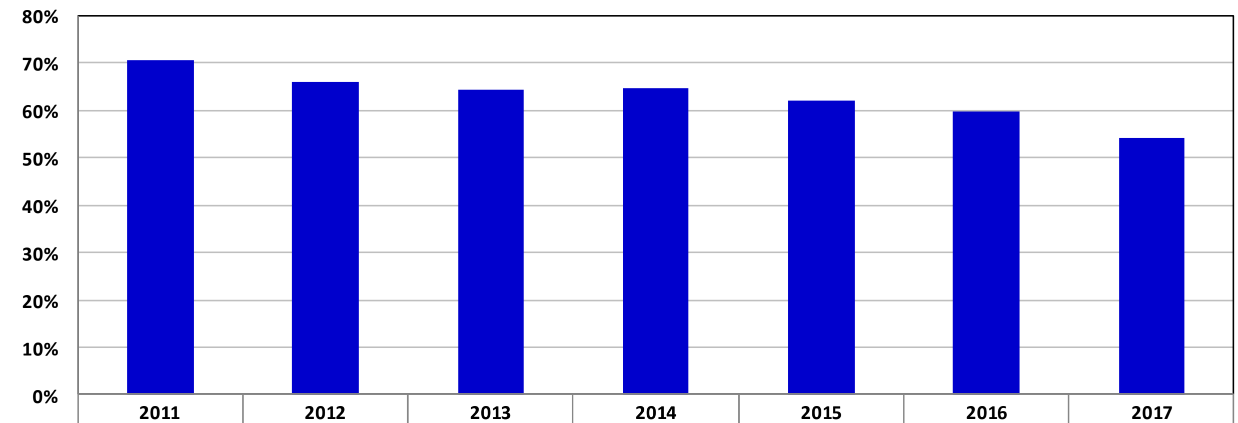


	2011	2012	2013	2014	2015	2016	2017
Funded Ratio	33.3%	27.3%	23.2%	21.0%	19.0%	16.0%	13.6%

Funding Progress (Continued)

Hazardous Retirement Fund

Funded Ratio
Actuarial Assets as a percentage of Actuarial Accrued Liability



	2011	2012	2013	2014	2015	2016	2017
Funded Ratio	70.8%	66.1%	64.5%	64.6%	62.2%	59.7%	54.1%

Assuming the actuarial determined contributions are actually paid in future years, then absent future unfavorable investment or demographic experience, or legislative changes, we expect the funded ratio to begin improving. Also, the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, is expected to decrease after those higher contribution rates become effective. Table 9, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.

Asset Gains/ (Losses)

The actuarial value of assets ("AVA") is based on a smoothed market value of assets, using a systematic approach to phase-in the difference between the actual and expected investment return on the market value of assets (adjusted for receipts and disbursements during the year). This is appropriate because it dampens the short-term volatility inherent in investment markets. The returns are computed net of investment expenses. The actuarial value of assets for the non-hazardous retirement fund slightly increased from $2.112 billion to $2.124 billion since the prior valuation. Table 7 in the following section of the report provides the development of the actuarial value of assets.

The rate of return on the market value of assets on a dollar-weighted basis for fiscal year 2017 was 11.4% for the non-hazardous retirement fund which is greater than the 6.75% expected annual return during that fiscal year. The return on an actuarial (smoothed) asset value was 6.1%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

The market value of assets is $0.067 billion less than the actuarial value of assets, which signifies that the retirement system is in a position of deferred losses. Therefore, unless the System experiences investment returns in excess of the assumed rate of return, the future recognition of these deferred losses is expected to increase the unfunded actuarial accrued liability.

Table 6 in the following section of this report provides asset information that was included in the annual financial statements of the System. Also, Tables 6 and 7 show the estimated yield on a market value basis and on the actuarial asset valuation method.

Actuarial Gains/ (Losses)

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the System as of the first day of the plan year. In any one fiscal year, the experience can be better or worse from that which is assumed or expected. The actuarial assumptions do not necessarily attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience over many years. Therefore, as long as the actual experience of the retirement system is reasonably close to the current assumptions, the long-term funding requirements of the System will remain relatively consistent.

Below are tables that separately show a reconciliation of the actuarial gains / (loss) since the prior actuarial valuation for the retirement and health insurance funds, which include the effect of asset and liability gains and losses, changes in assumptions, changes in plan provisions, etc.

Retirement Experience Gain or (Loss)
(Dollar amounts expressed in thousands)

	Non-Hazardous	Hazardous
A. Calculation of total actuarial gain or loss		
1. Unfunded actuarial accrued liability (UAAL), previous year	$ 11,112,412	$ 377,219
2. Normal cost and administrative expenses	157,499	22,423
3. Less: contributions for the year	(857,664)	(70,498)
4. Interest accrual	726,457	26,489
5. Expected UAAL (Sum of Items 1 - 4)	$ 11,138,704	$ 355,633
6. Actual UAAL as of June 30,2017	$ 13,468,018	$ 514,261
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (2,329,314)	$ (158,628)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ (13,806)	$ (765)
9. Liability experience gain (loss) for the year	(157,852)	(27,643)
10. Assumption change	(2,157,656)	(130,220)
11. Total	$ (2,329,314)	$ (158,628)

The accrued liability for the non-hazardous retirement fund was about 1% higher than expected, resulting in a $158 million liability loss. The accrued liability for the hazardous retirement fund was about 3% higher than expected, resulting in a $28 million liability loss, primarily due to higher than expected salary increases during the past year.

Actuarial Gains/ (Losses) (Continued)

Insurance Experience Gain or (Loss)
(Dollar amounts expressed in thousands)

	Non-Hazardous	Hazardous
A. Calculation of total actuarial gain or loss		
1. Unfunded actuarial accrued liability (UAAL), previous year	$ 1,713,408	$ (95,415)
2. Normal cost and administrative expenses	39,632	8,539
3. Less: contributions for the year	(157,511)	(6,431)
4. Interest accrual	124,085	(7,077)
5. Expected UAAL (Sum of Items 1 - 4)	$ 1,719,614	$ (100,384)
6. Actual UAAL as of June 30,2017	$ 1,859,578	$ (74,019)
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (139,964)	$ (26,365)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ (3,451)	$ (3,431)
9. Liability experience gain (loss) for the year	139,085	26,833
10. Assumption change	(275,598)	(49,767)
11. Total	$ (139,964)	$ (26,365)

The 2018 premiums were known at the time of the valuation and were incorporated into the liability measurement. Premiums were lower than expected and resulted in a $132 million liability experience gain for the non-hazardous insurance fund and a $24 million liability experience gain for the hazardous insurance fund.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an annual investment return assumption. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Since the last actuarial valuation, the Board made the following changes in assumptions:

- Decrease the assumed rate of return to 5.25% for the non-hazardous retirement fund.
- Decrease the assumed rate of return to 6.25% for the hazardous retirement fund and both health insurance funds.
- Decrease the price inflation assumption to 2.30% for the retirement and health insurance funds.
- Amortize the unfunded accrued liability for the retirement and health insurance funds on a level dollar basis, converted to a percentage of the expected covered payroll.
- Decrease in the individual salary increase assumption and health care trend assumption that corresponds with the 0.95% decrease in the price inflation assumption.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. It is our opinion that the assumptions are internally consistent, reasonable, and reflect anticipated future experience of the System. The next experience study will be conducted no later than as of June 30, 2018.

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 (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

Benefit Provisions

Appendix B of this report includes a summary of the benefit provisions for KERS. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

This valuation reflects all benefits promised to KERS members, either by the statutes or by the Board. There are no ancillary benefits that might be deemed a KERS liability if continued beyond the availability of funding by the current funding source.

SECTION 3

ACTUARIAL TABLES

Actuarial Tables

Retirement Benefits

Actuarial Tables

Development of Unfunded Actuarial Accrued Liability
Retirement Benefits

(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 1,531,535	$ 162,418
2.	Present value of future pay	$ 12,869,356	$ 1,364,081
3.	Normal cost rate		
	a. Total normal cost rate	12.45%	17.10%
	b. Less: member contribution rate	-5.00%	-8.00%
	c. Employer normal cost rate	7.45%	9.10%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 5,514,500	$ 592,881
	b. Less: present value of future normal costs	(1,531,205)	(217,811)
	c. Actuarial accrued liability	$ 3,983,295	$ 375,070
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 11,120,669	$ 712,284
	b. Inactive members	487,677	34,066
	c. Active members (Item 4c)	3,983,295	375,070
	d. Total	$ 15,591,641	$ 1,121,420
6.	Actuarial value of assets	$ 2,123,623	$ 607,159
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 13,468,018	$ 514,261
8.	Funded Ratio	13.6%	54.1%

Actuarial Present Value of Future Benefits
Retirement Benefits
(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Active members		
	a. Service retirement	$ 5,027,645	$ 538,918
	b. Deferred termination benefits and refunds	355,339	41,227
	c. Survivor benefits	28,322	3,260
	d. Disability benefits	103,194	9,476
	e. Total	$ 5,514,500	$ 592,881
2.	Retired members		
	a. Service retirement	$ 10,203,322	$ 656,827
	b. Disability retirement	292,992	16,391
	c. Beneficiaries	624,355	39,066
	d. Total	$ 11,120,669	$ 712,284
3.	Inactive members		
	a. Vested terminations	$ 422,927	$ 26,360
	b. Nonvested terminations	64,750	7,706
	c. Total	$ 487,677	$ 34,066
4.	Total actuarial present value of future benefits	$ 17,122,846	$ 1,339,231

Development of Required Contribution Rate
Retirement Benefits

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Total normal cost rate		
	a. Service retirement	9.82%	13.98%
	b. Deferred termination benefits and refunds	2.18%	2.57%
	c. Survivor benefits	0.07%	0.15%
	d. Disability benefits	0.38%	0.40%
	e. Total	12.45%	17.10%
2.	Less: member contribution rate	-5.00%	-8.00%
3.	Total employer normal cost rate	7.45%	9.10%
4.	Administrative expenses	0.72%	0.57%
5.	Net employer normal cost rate	8.17%	9.67%
6.	UAAL amortization contribution	62.86%	24.72%
7.	Total recommended employer contribution	71.03%	34.39%

Actuarial Balance Sheet

Non-Hazardous Members Retirement

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)		June 30, 2016 (2)
1. Assets - Present and Expected Future Resources				
a. Current assets (actuarial value)	$	2,123,623	$	2,112,286
b. Present value of future member contributions	$	643,468	$	695,862
c. Present value of future employer contributions				
i. Normal cost contributions	$	887,737	$	556,170
ii. Unfunded accrued liability contributions		13,468,018		11,112,412
iii. Total future employer contributions	$	14,355,755	$	11,668,582
d. Total assets	$	17,122,846	$	14,476,730
2. Liabilities - Present Value of Expected Future Benefit Payments				
a. Active members				
i. Present value of future normal costs	$	1,531,205	$	1,252,032
ii. Accrued liability		3,983,295		3,214,530
iii. Total present value of future benefits	$	5,514,500	$	4,466,562
b. Present value of benefits payable on account of current retired members and beneficiaries	$	11,120,669	$	9,600,528
c. Present value of benefits payable on account of current inactive members	$	487,677	$	409,640
d. Total liabilities	$	17,122,846	$	14,476,730

Actuarial Balance Sheet

Hazardous Members Retirement

(Dollar amounts expressed in thousands)

	June 30, 2017 (1)	June 30, 2016 (2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	$ 607,159	$ 559,487
b. Present value of future member contributions	$ 109,126	$ 107,587
c. Present value of future employer contributions		
i. Normal cost contributions	$ 108,685	$ 71,148
ii. Unfunded accrued liability contributions	514,261	377,219
iii. Total future employer contributions	$ 622,946	$ 448,367
d. Total assets	$ 1,339,231	$ 1,115,441
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	$ 217,811	$ 178,735
ii. Accrued liability	375,070	288,224
iii. Total present value of future benefits	$ 592,881	$ 466,959
b. Present value of benefits payable on account of current retired members and beneficiaries	$ 712,284	$ 618,592
c. Present value of benefits payable on account of current inactive members	$ 34,066	$ 29,890
d. Total liabilities	$ 1,339,231	$ 1,115,441

Reconciliation of Retirement Net Assets
(Dollar amounts expressed in thousands)

		Year Ending	
		June 30, 2017	June 30, 2017
		(1)	(2)
		Non-Hazardous	**Hazardous**
1.	Value of assets at beginning of year	$ 1,953,422	$ 524,679
2.	Revenue for the year		
	a. Contributions		
	i. Member contributions	$ 100,543	$ 17,524
	ii. Employer contributions	644,804	37,630
	iii. Other contributions (less 401h)	112,317	15,344
	iii. Total	$ 857,664	$ 70,498
	b. Income		
	i. Interest, dividends, and other income	$ 66,528	$ 16,321
	ii. Investment expenses	(15,600)	(4,267)
	iii. Net	$ 50,928	$ 12,054
	c. Net realized and unrealized gains (losses)	166,122	58,554
	d. Total revenue	$ 1,074,714	$ 141,106
3.	Expenditures for the year		
	a. Disbursements		
	i. Refunds	$ 11,819	$ 2,106
	ii. Regular annuity benefits	948,490	61,231
	iii. Other benefit payments	0	0
	iv. Transfers to other systems	0	0
	v. Total	$ 960,309	$ 63,338
	b. Administrative expenses and depreciation	10,957	919
	c. Total expenditures	$ 971,266	$ 64,257
4.	Increase in net assets (Item 2. - Item 3.)	$ 103,447	$ 76,850
5.	Value of assets at end of year (Item 1. + Item 4.)	$ 2,056,870	$ 601,529
6.	Net external cash flow		
	a. Dollar amount	$ (113,602)	$ 6,242
	b. Percentage of market value	-5.7%	1.1%
7.	Estimated annual return on net assets	11.4%	13.4%

Development of Actuarial Value of Assets

Non-Hazardous Members Retirement

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	2,112,286
2.	Market value of assets at beginning of year	$	1,953,422
3.	Net new investments		
	a. Contributions	$	857,664
	b. Benefit payments		(960,309)
	c. Administrative expenses		(10,957)
	d. Subtotal	$	(113,602)
4.	Market value of assets at end of year	$	2,056,870
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	217,050
6.	Assumed investment return rate for fiscal year		6.75%
7.	Expected return for immediate recognition	$	128,022
8.	Excess return for phased recognition	$	89,028

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	89,028	$	17,806
b.	2016		(183,443)		(36,689)
c.	2015		(142,444)		(28,489)
d.	2014		145,338		29,068
e.	2013		76,106		15,221
f.	Total			$	(3,083)

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	2,123,623
11.	Ratio of actuarial value to market value		103.2%
12.	Estimated annual return on actuarial value of assets		6.1%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets
Hazardous Members Retirement
(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	559,487
2.	Market value of assets at beginning of year	$	524,679
3.	Net new investments		
	a. Contributions	$	70,498
	b. Benefit payments		(63,338)
	c. Administrative expenses		(919)
	d. Subtotal	$	6,242
4.	Market value of assets at end of year	$	601,529
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	70,608
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	39,585
8.	Excess return for phased recognition	$	31,023

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	31,023	$	6,205
b.	2016		(42,195)		(8,439)
c.	2015		(33,972)		(6,794)
d.	2014		42,286		8,457
e.	2013		12,081		2,416
f.	Total			$	1,845

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	607,159
11.	Ratio of actuarial value to market value		100.9%
12.	Estimated annual return on actuarial value of assets		7.4%

* Amounts may not add due to rounding

Schedule of Funding Progress
Retirement Benefits
(Dollar amounts expressed in thousands)

June 30,	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Covered Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Non-Hazardous Members			
2011	$ 3,726,986	$ 11,182,142	$ 7,455,156	33.3%	$ 1,731,633	430.5%
2012	3,101,317	11,361,048	8,259,731	27.3%	1,644,897	502.1%
2013	2,636,123	11,386,602	8,750,479	23.2%	1,644,409	532.1%
2014	2,423,957	11,550,110	9,126,154	21.0%	1,577,496	578.5%
2015	2,350,990	12,359,673	10,008,683	19.0%	1,544,234	648.1%
2016	2,112,286	13,224,698	11,112,412	16.0%	1,529,249	726.7%
2017	2,123,623	15,591,641	13,468,018	13.6%	1,531,535	879.4%
			Hazardous Members			
2011	$ 510,749	$ 721,293	$ 210,545	70.8%	$ 133,054	158.2%
2012	497,226	752,699	255,473	66.1%	131,977	193.6%
2013	505,657	783,981	278,324	64.5%	132,015	210.8%
2014	527,897	816,850	288,953	64.6%	129,076	223.9%
2015	556,688	895,433	338,746	62.2%	128,680	263.2%
2016	559,487	936,706	377,219	59.7%	147,563	255.6%
2017	607,159	1,121,420	514,261	54.1%	162,418	316.6%
			Total KERS Members			
2011	$ 4,237,735	$ 11,903,435	$ 7,665,700	35.6%	$ 1,864,687	411.1%
2012	3,598,543	12,113,747	8,515,204	29.7%	1,776,874	479.2%
2013	3,141,780	12,170,583	9,028,803	25.8%	1,776,424	508.3%
2014	2,951,854	12,366,960	9,415,106	23.9%	1,706,572	551.7%
2015	2,907,678	13,255,106	10,347,428	21.9%	1,672,914	618.5%
2016	2,671,773	14,161,404	11,489,631	18.9%	1,676,812	685.2%
2017	2,730,782	16,713,061	13,982,279	16.3%	1,693,953	825.4%

Summary of Principal Assumptions and Methods

Below is a summary of the principal economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

	Non-Hazardous	Hazardous
Valuation date:	June 30, 2017	June 30, 2017
Actuarial cost method:	Entry Age Normal	Entry Age Normal
Amortization method:	Level dollar expressed as a percentage of expected coverred payroll	Level dollar expressed as a percentage of expected coverred payroll
Amortization period for contribution rate:	26-year closed period	26-year closed period
Asset valuation method:	5-Year Smoothed Market	5-Year Smoothed Market
Actuarial assumptions:		
Investment rate of return	5.25%	6.25%
Projected salary increases	3.55% to 15.55% (varies by service)	3.55% to 19.55% (varies by service)
Inflation	2.30%	2.30%
Post-retirement benefit adjustments	0.00%	0.00%
Retiree Mortality	RP-2000 Combined Mortality Table for Males and Females, projected using scale BB to 2013 (set back one year for females).	RP-2000 Combined Mortality Table for Males and Females, projected using scale BB to 2013 (set back one year for females).

Solvency Test
Retirement Benefits
(Dollar amounts expressed in thousands)

	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
June 30,	Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Hazardous Members							
2008	$ 875,178	$ 7,162,497	$ 2,092,015	$ 5,318,793	100.0%	62.0%	0.0%
2009	793,575	8,205,156	1,659,819	4,794,611	100.0%	48.8%	0.0%
2010	869,484	8,329,758	1,805,553	4,210,216	100.0%	40.1%	0.0%
2011	916,569	8,482,714	1,782,859	3,726,986	100.0%	33.1%	0.0%
2012	885,137	8,708,536	1,767,375	3,101,317	100.0%	25.4%	0.0%
2013	922,928	8,709,324	1,754,351	2,636,123	100.0%	19.7%	0.0%
2014	928,558	8,870,693	1,750,860	2,423,957	100.0%	16.9%	0.0%
2015	925,934	9,437,468	1,996,271	2,350,990	100.0%	15.1%	0.0%
2016	920,120	10,010,168	2,294,410	2,112,286	100.0%	11.9%	0.0%
2017	934,559	11,608,346	3,048,736	2,123,623	100.0%	10.2%	0.0%
Hazardous Members							
2008	$ 89,591	$ 355,772	$ 172,648	$ 502,132	100.0%	100.0%	32.9%
2009	87,780	413,972	172,659	502,503	100.0%	100.0%	0.4%
2010	88,511	441,657	157,981	502,729	100.0%	93.8%	0.0%
2011	86,614	490,395	144,284	510,749	100.0%	86.5%	0.0%
2012	82,101	521,689	148,910	497,226	100.0%	79.6%	0.0%
2013	82,146	545,597	156,238	505,657	100.0%	77.6%	0.0%
2014	83,664	581,231	151,955	527,897	100.0%	76.4%	0.0%
2015	83,606	633,189	178,638	556,688	100.0%	74.7%	0.0%
2016	86,705	648,482	201,519	559,487	100.0%	72.9%	0.0%
2017	93,350	746,350	281,720	607,159	100.0%	68.8%	0.0%

INSURANCE BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability
Insurance Benefits

(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 1,531,535	$ 162,418
2.	Present value of future pay	$ 11,971,740	$ 1,360,355
3.	Normal cost rate		
	a. Total normal cost rate	3.06%	6.40%
	b. Less: member contribution rate	-0.35%	-0.52%
	c. Employer normal cost rate	2.71%	5.88%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 1,444,863	$ 246,482
	b. Less: present value of future normal costs	(336,661)	(70,859)
	c. Actuarial accrued liability	$ 1,108,202	$ 175,623
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 1,452,876	$ 233,808
	b. Inactive members	122,418	10,008
	c. Active members (Item 4c)	1,108,202	175,623
	d. Total	$ 2,683,496	$ 419,439
6.	Actuarial value of assets	$ 823,918	$ 493,458
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 1,859,578	$ (74,019)
8.	Funded Ratio	30.7%	117.6%

Development of Required Contribution Rate
Insurance Benefits

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Total normal cost rate	3.06%	6.40%
2.	Less: member contribution rate	-0.35%	-0.52%
3.	Total employer normal cost rate	2.71%	5.88%
4.	Administrative expenses	0.06%	0.06%
5.	Net employer normal cost rate	2.77%	5.94%
6.	UAAL amortization contribution	9.63%	-3.48%
7.	Total recommended employer contribution	12.40%	2.46%

Actuarial Balance Sheet

Non-Hazardous Members Insurance

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources		
a.	Current assets (actuarial value)	$ 823,918	$ 743,270
b.	Present value of future member contributions	$ 53,847	$ 48,293
c.	Present value of future employer contributions		
	i. Normal cost contributions	$ 282,814	$ 243,915
	ii. Unfunded accrued liability contributions	1,859,578	1,713,408
	iii. Total future employer contributions	$ 2,142,392	$ 1,957,323
d.	Total assets	$ 3,020,157	$ 2,748,886
2.	Liabilities - Present Value of Expected Future Benefit Payments		
a.	Active members		
	i. Present value of future normal costs	$ 336,661	$ 292,208
	ii. Accrued liability	1,108,202	973,042
	iii. Total present value of future benefits	$ 1,444,863	$ 1,265,250
b.	Present value of benefits payable on account of current retired members and beneficiaries	$ 1,452,876	$ 1,352,227
c.	Present value of benefits payable on account of current inactive members	$ 122,418	$ 131,409
d.	Total liabilities	$ 3,020,157	$ 2,748,886

Actuarial Balance Sheet

Hazardous Members Insurance

(Dollar amounts expressed in thousands)

			June 30, 2017 (1)		June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources				
	a. Current assets (actuarial value)	$	493,458	$	473,160
	b. Present value of future member contributions	$	9,088	$	7,276
	c. Present value of future employer contributions				
	i. Normal cost contributions	$	61,771	$	47,365
	ii. Unfunded accrued liability contributions		(74,019)		(95,415)
	iii. Total future employer contributions	$	(12,248)	$	(48,050)
	d. Total assets	$	490,298	$	432,386
2.	Liabilities - Present Value of Expected Future Benefit Payments				
	a. Active members				
	i. Present value of future normal costs	$	70,859	$	54,641
	ii. Accrued liability		175,623		149,384
	iii. Total present value of future benefits	$	246,482	$	204,025
	b. Present value of benefits payable on account of current retired members and beneficiaries	$	233,808	$	217,753
	c. Present value of benefits payable on account of current inactive members	$	10,008	$	10,608
	d. Total liabilities	$	490,298	$	432,386

Reconciliation of Insurance Net Assets
(Dollar amounts expressed in thousands)

	Year Ending	
	June 30, 2017	June 30, 2017
	(1)	(2)
	Non-Hazardous	**Hazardous**
1. Value of assets at beginning of year	$ 695,189	$ 440,596
2. Revenue for the year		
a. Contributions		
i. Member contributions	$ 5,156	$ 811
ii. Employer contributions	133,024	4,688
iii. Other contributions	19,332	932
iii. Total	$ 157,511	$ 6,431
b. Income		
i. Interest, dividends, and other income	$ 19,834	$ 13,191
ii. Investment expenses	(4,227)	(3,402)
iii. Net	$ 15,608	$ 9,789
c. Net realized and unrealized gains (losses)	79,244	49,786
d. Total revenue	$ 252,363	$ 66,006
3. Expenditures for the year		
a. Disbursements		
i. Refunds	$ 0	$ 0
ii. Healthcare premium subsidies	127,648	17,562
iii. Other benefit payments	1,673	97
iv. Transfers to other systems	0	0
v. Total	$ 129,321	$ 17,659
b. Administrative expenses and depreciation	861	105
c. Total expenditures	$ 130,182	$ 17,764
4. Increase in net assets (Item 2. - Item 3.)	$ 122,181	$ 48,242
5. Value of assets at end of year (Item 1. + Item 4.)	$ 817,370	$ 488,838
6. Net external cash flow		
a. Dollar amount	$ 27,330	$ (11,333)
b. Percentage of market value	3.6%	-2.4%
7. Estimated annual return on net assets	13.4%	13.7%

Development of Actuarial Value of Assets

Non-Hazardous Members Insurance

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	743,270
2.	Market value of assets at beginning of year	$	695,189
3.	Net new investments		
	a. Contributions	$	157,511
	b. Benefit payments		(129,321)
	c. Administrative expenses		(861)
	d. Subtotal	$	27,330
4.	Market value of assets at end of year	$	817,370
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	94,851
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	53,164
8.	Excess return for phased recognition	$	41,687
9.	Phased-in recognition, 20% of excess return on assets for prior years:		

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	41,687	$	8,337
b.	2016		(55,901)		(11,180)
c.	2015		(43,387)		(8,677)
d.	2014		54,989		10,998
e.	2013		3,380		676
f.	Total			$	154

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	823,918
11.	Ratio of actuarial value to market value		100.8%
12.	Estimated annual return on actuarial value of assets		7.0%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets

Hazardous Members Insurance

(Dollar amounts expressed in thousands)*

	Year Ending	June 30, 2017
1.	Actuarial value of assets at beginning of year	$ 473,160
2.	Market value of assets at beginning of year	$ 440,596
3.	Net new investments	
	a. Contributions	$ 6,431
	b. Benefit payments	(17,659)
	c. Administrative expenses	(105)
	d. Subtotal	$ (11,333)
4.	Market value of assets at end of year	$ 488,838
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$ 59,575
6.	Assumed investment return rate for fiscal year	7.50%
7.	Expected return for immediate recognition	$ 32,619
8.	Excess return for phased recognition	$ 26,956

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,	Excess Return	Recognized Amount
a.	2017	$ 26,956	$ 5,391
b.	2016	(33,995)	(6,799)
c.	2015	(25,896)	(5,179)
d.	2014	22,857	4,571
e.	2013	5,137	1,027
f.	Total		$ (988)

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$ 493,458
11.	Ratio of actuarial value to market value	100.9%
12.	Estimated annual return on actuarial value of assets	6.8%

* Amounts may not add due to rounding

Schedule of Funding Progress
Insurance Benefits
(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Value of Assets (AVA) (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) (4)	Funded Ratio (2)/(3) (5)	Annual Covered Payroll (6)	UAAL as % of Payroll (4)/(6) (7)
Non-Hazardous Members						
2011	$ 451,620	$ 4,280,090	$ 3,828,469	10.6%	$ 1,731,633	221.1%
2012	446,081	3,125,330	2,679,250	14.3%	1,644,897	162.9%
2013	497,584	2,128,754	1,631,170	23.4%	1,644,409	99.2%
2014	621,237	2,226,760	1,605,523	27.9%	1,577,496	101.8%
2015	695,018	2,413,705	1,718,687	28.8%	1,544,234	111.3%
2016	743,270	2,456,678	1,713,408	30.3%	1,529,249	112.0%
2017	823,918	2,683,496	1,859,578	30.7%	1,531,535	121.4%
Hazardous Members						
2011	$ 329,962	$ 507,059	$ 177,097	65.1%	$ 133,054	133.1%
2012	345,574	384,592	39,018	89.9%	131,977	29.6%
2013	370,774	385,518	14,743	96.2%	132,015	11.2%
2014	419,396	396,987	(22,409)	105.6%	129,076	-17.4%
2015	451,514	374,904	(76,610)	120.4%	128,680	-59.5%
2016	473,160	377,745	(95,415)	125.3%	147,563	-64.7%
2017	493,458	419,439	(74,019)	117.6%	162,418	-45.6%
Total KERS Members						
2011	$ 781,582	$ 4,787,149	$ 4,005,567	16.3%	$ 1,864,687	214.8%
2012	791,655	3,509,922	2,718,267	22.6%	1,776,874	153.0%
2013	868,358	2,514,272	1,645,914	34.5%	1,776,424	92.7%
2014	1,040,633	2,623,747	1,583,114	39.7%	1,706,572	92.8%
2015	1,146,532	2,788,609	1,642,077	41.1%	1,672,914	98.2%
2016	1,216,430	2,834,423	1,617,993	42.9%	1,676,812	96.5%
2017	1,317,376	3,102,935	1,785,559	42.5%	1,693,953	105.4%

Solvency Test
Insurance Benefits
(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Accrued Liability: Active Member Contributions (2)	Actuarial Accrued Liability: Retired Members & Beneficiaries (3)	Actuarial Accrued Liability: Active Members (Employer Financed) (4)	Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets: Active (6)	Portion of Aggregate Accrued Liabilities Covered by Assets: Retired (7)	Portion of Aggregate Accrued Liabilities Covered by Assets: ER Financed (8)
Non-Hazardous Members							
2008	$ -	$ 2,788,190	$ 2,643,310	$ 603,198	100.0%	21.6%	0.0%
2009	-	2,861,867	1,645,458	534,173	100.0%	18.7%	0.0%
2010	-	2,744,534	1,721,602	471,342	100.0%	17.2%	0.0%
2011	-	2,568,003	1,712,087	451,620	100.0%	17.6%	0.0%
2012	-	1,924,069	1,201,262	446,081	100.0%	23.2%	0.0%
2013	-	1,338,773	789,981	497,584	100.0%	37.2%	0.0%
2014	-	1,425,605	801,155	621,237	100.0%	43.6%	0.0%
2015	-	1,428,350	985,355	695,018	100.0%	48.7%	0.0%
2016	-	1,483,636	973,042	743,270	100.0%	50.1%	0.0%
2017	-	1,575,294	1,108,202	823,918	100.0%	52.3%	0.0%
Hazardous Members							
2008	$ -	$ 228,835	$ 312,822	$ 288,162	100.0%	100.0%	19.0%
2009	-	242,123	249,009	301,635	100.0%	100.0%	23.9%
2010	-	268,511	224,787	314,427	100.0%	100.0%	20.4%
2011	-	285,540	221,519	329,962	100.0%	100.0%	20.1%
2012	-	196,579	188,013	345,574	100.0%	100.0%	79.2%
2013	-	202,032	183,486	370,774	100.0%	100.0%	92.0%
2014	-	206,477	190,509	419,396	100.0%	100.0%	100.0%
2015	-	221,115	153,789	451,514	100.0%	100.0%	100.0%
2016	-	228,361	149,384	473,160	100.0%	100.0%	100.0%
2017	-	243,816	175,623	493,458	100.0%	100.0%	100.0%

SECTION 4

MEMBERSHIP INFORMATION

Membership Tables

Summary of Membership Data
(Total dollar amounts expressed in thousands)

		Non-Hazardous June 30, 2017 (1)	Hazardous June 30, 2017 (2)	Total June 30, 2017 (3)
1.	Active members			
	a. Males	14,183	2,808	16,991
	b. Females	23,051	1,239	24,290
	c. Total members	37,234	4,047	41,281
	d. Total annualized prior year salaries	$ 1,531,535	$ 162,418	$ 1,693,953
	e. Average salary	$ 41,133	$ 40,133	$ 41,035
	f. Average age	45.4	40.3	44.9
	g. Average service	10.9	7.6	10.6
	h. Member contributions with interest	$ 934,559	$ 93,350	$ 1,027,910
	i. Average contributions with interest	$ 25,100	$ 23,066	$ 24,900
2.	Vested inactive members			
	a. Number	10,794	505	11,299
	b. Total annual deferred benefits	$ 69,704	$ 3,363	$ 73,067
	c. Average annual deferred benefit	$ 6,458	$ 6,659	$ 6,467
	d. Average age at the valuation date	48.8	45.1	N/A
3.	Nonvested inactive members			
	a. Number	38,864	4,793	43,657
	b. Total member contributions with interest	$ 64,750	$ 7,706	$ 72,457
	c. Average contributions with interest	$ 1,666	$ 1,608	$ 1,660
4.	Service retirees			
	a. Number	38,170	3,505	41,675
	b. Total annual benefits	$ 828,249	$ 53,647	$ 881,896
	c. Average annual benefit	$ 21,699	$ 15,306	$ 21,161
	d. Average age at the valuation date	68.8	64.5	68.5
5.	Disabled retirees			
	a. Number	1,978	159	2,137
	b. Total annual benefits	$ 25,776	$ 1,407	$ 27,183
	c. Average annual benefit	$ 13,031	$ 8,849	$ 12,720
	d. Average age at the valuation date	65.2	59.5	64.8
6.	Beneficiaries			
	a. Number	4,768	429	5,197
	b. Total annual benefits	$ 67,277	$ 4,108	$ 71,385
	c. Average annual benefit	$ 14,110	$ 9,576	$ 13,736
	d. Average age at the valuation date	71.0	66.2	70.6

Summary of Historical Active Membership

June 30,	Active Members: Number	Active Members: Percent Increase /(Decrease)	Covered Payroll[1]: Amount in Thousands	Covered Payroll[1]: Percent Increase /(Decrease)	Average Annual Pay: Amount	Average Annual Pay: Percent Increase /(Decrease)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Hazardous Members						
2011	46,617		$ 1,731,633		$ 37,146	-3.6%
2012	42,196	-9.5%	1,644,897	-5.0%	38,982	4.9%
2013	42,226	0.1%	1,644,409	0.0%	38,943	-0.1%
2014	40,365	-4.4%	1,577,496	-4.1%	39,081	0.4%
2015	39,056	-3.2%	1,544,234	-2.1%	39,539	1.2%
2016	37,779	-3.3%	1,529,249	-1.0%	40,479	2.4%
2017	37,234	-1.4%	1,531,535	0.1%	41,133	1.6%
Hazardous Members						
2011	4,291		$ 133,054		$ 31,008	-7.3%
2012	4,086	-4.8%	131,977	-0.8%	32,300	4.2%
2013	4,127	1.0%	132,015	0.0%	31,988	-1.0%
2014	4,024	-2.5%	129,076	-2.2%	32,077	0.3%
2015	3,886	-3.4%	128,680	-0.3%	33,114	3.2%
2016	3,959	1.9%	147,563	14.7%	37,273	12.6%
2017	4,047	2.2%	162,418	10.1%	40,133	7.7%

[1] Covered payroll is the annualized, projected compensation for the following year and does not include payroll attributable to working retirees.

Distribution of Active Members by Age and by Years of Service

Non-Hazardous Members

Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
	Years of Credited Service												
Under 20	20	0	1	0	0	0	0	0	0	0	0	0	21
	$18,022	$0	$34,204	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,793
20-24	426	224	124	57	7	3	0	0	0	0	0	0	841
	$22,750	$30,422	$30,159	$29,946	$28,139	$31,984	$0	$0	$0	$0	$0	$0	$26,452
25-29	623	657	545	387	283	367	8	0	0	0	0	0	2,870
	$25,204	$31,813	$32,994	$32,931	$34,154	$34,250	$30,421	$0	$0	$0	$0	$0	$31,292
30-34	411	418	429	339	363	1,394	341	15	0	0	0	0	3,710
	$26,132	$35,183	$35,597	$33,933	$36,162	$38,767	$38,951	$39,395	$0	$0	$0	$0	$35,920
35-39	356	336	326	266	267	1,301	1,384	531	35	0	0	0	4,802
	$27,671	$38,151	$34,602	$35,351	$37,439	$39,959	$43,413	$43,161	$50,506	$0	$0	$0	$39,589
40-44	305	304	242	225	192	946	1,175	1,351	405	38	2	0	5,185
	$28,010	$36,398	$34,686	$34,238	$39,015	$39,901	$44,443	$47,258	$49,502	$59,097	$83,546	$0	$42,328
45-49	292	274	243	192	195	916	1,019	1,148	962	336	40	0	5,617
	$28,223	$35,464	$34,656	$34,085	$35,782	$39,998	$44,566	$46,471	$51,721	$53,093	$68,288	$0	$43,729
50-54	187	210	181	211	163	831	929	913	788	516	166	17	5,112
	$28,042	$36,046	$35,598	$35,282	$35,054	$39,806	$42,759	$45,493	$51,399	$54,307	$60,489	$61,460	$44,281
55-59	178	142	118	128	122	728	905	899	619	375	155	31	4,400
	$27,572	$37,687	$35,102	$34,770	$36,529	$38,596	$42,166	$44,802	$47,909	$52,687	$60,243	$65,765	$43,326
60-64	82	84	75	70	93	577	695	690	425	241	95	44	3,171
	$31,260	$54,536	$41,599	$37,602	$39,283	$41,087	$42,090	$45,725	$47,363	$54,107	$60,828	$70,778	$45,135
65 & Over	43	38	37	35	34	268	354	343	164	109	46	34	1,505
	$37,827	$63,557	$36,987	$45,942	$35,558	$39,158	$44,452	$46,968	$50,997	$56,433	$65,165	$71,243	$46,845
Total	2,923	2,687	2,321	1,910	1,719	7,331	6,810	5,890	3,398	1,615	504	126	37,234
	$26,504	$35,705	$34,553	$34,419	$36,350	$39,347	$43,189	$45,870	$50,095	$53,905	$61,615	$68,413	$41,133

Distribution of Active Members by Age and by Years of Service

Hazardous Members

Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
	Years of Credited Service												
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
20-24	148	78	45	2	0	0	0	0	0	0	0	0	273
	$25,971	$38,449	$37,348	$31,005	$0	$0	$0	$0	$0	$0	$0	$0	$31,448
25-29	158	137	109	100	75	52	0	0	0	0	0	0	631
	$27,771	$35,894	$38,425	$38,060	$39,770	$40,278	$0	$0	$0	$0	$0	$0	$35,462
30-34	73	74	69	55	49	201	48	1	0	0	0	0	570
	$28,533	$37,772	$38,989	$38,650	$40,049	$39,919	$45,216	$42,641	$0	$0	$0	$0	$38,409
35-39	48	37	36	24	34	144	186	31	0	0	0	0	540
	$26,832	$39,720	$37,001	$37,922	$37,059	$41,392	$43,673	$43,649	$0	$0	$0	$0	$40,179
40-44	35	40	32	24	29	98	137	140	18	1	0	0	554
	$25,005	$34,889	$38,317	$40,167	$36,700	$43,398	$44,417	$48,122	$55,037	$79,550	$0	$0	$42,727
45-49	36	39	22	19	25	92	127	117	54	12	0	0	543
	$29,765	$36,942	$39,476	$37,459	$38,227	$40,887	$47,659	$48,081	$53,683	$56,652	$0	$0	$44,322
50-54	25	30	31	22	14	84	87	79	29	16	3	0	420
	$25,653	$35,465	$38,463	$36,740	$41,143	$40,670	$43,816	$46,851	$51,542	$64,509	$60,026	$0	$42,663
55-59	13	16	7	17	15	45	49	52	19	5	2	0	240
	$27,350	$40,343	$42,181	$36,343	$32,722	$41,046	$44,804	$47,864	$52,845	$70,328	$82,597	$0	$43,572
60-64	7	4	9	9	14	49	61	45	8	4	1	0	211
	$29,352	$40,919	$34,410	$36,271	$38,805	$40,090	$42,050	$45,678	$50,553	$61,256	$34,006	$0	$41,787
65 & Over	1	2	1	2	3	11	25	13	2	3	2	0	65
	$23,352	$84,786	$26,409	$43,111	$34,256	$35,069	$42,816	$47,927	$72,713	$61,307	$59,686	$0	$45,173
Total	544	457	361	274	258	776	720	478	130	41	8	0	4,047
	$27,160	$37,331	$38,254	$38,023	$38,519	$40,859	$44,548	$47,337	$53,371	$62,734	$62,331	$0	$40,133

Distribution of Annuitant Monthly Benefit by Status and Age
Non-Hazardous Retirees and Beneficiaries
(Dollar amounts expressed in thousands)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	481	$ 11,751	128	$ 1,753	454	$ 5,167	1,063	$ 18,671
50 - 54	1,644	44,975	171	2,547	183	2,216	1,998	49,738
55 - 59	4,011	105,459	281	3,804	323	4,412	4,615	113,675
60 - 64	7,055	172,764	418	5,802	493	7,442	7,966	186,008
65 - 69	9,426	206,490	388	4,926	592	10,133	10,406	221,549
70 - 74	6,810	141,009	253	3,043	646	10,347	7,709	154,399
75 - 79	4,089	75,976	190	2,364	613	9,860	4,892	88,200
80 - 84	2,455	39,493	100	1,063	569	8,209	3,124	48,765
85 - 89	1,440	21,180	38	405	489	5,670	1,967	27,255
90 And Over	759	9,153	11	69	406	3,821	1,176	13,043
Total	**38,170**	**$ 828,249**	**1,978**	**$ 25,776**	**4,768**	**$ 67,277**	**44,916**	**$ 921,302**

Distribution of Annuitant Monthly Benefit by Status and Age
Hazardous Retirees and Beneficiaries
(Dollar amounts expressed in thousands)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	198	$ 3,741	28	$ 354	47	$ 358	273	$ 4,453
50 - 54	347	6,752	25	241	19	226	391	7,219
55 - 59	514	9,387	27	233	44	496	585	10,116
60 - 64	679	11,151	28	235	63	708	770	12,094
65 - 69	880	12,460	31	243	64	711	975	13,414
70 - 74	518	6,864	9	67	69	590	596	7,521
75 - 79	228	2,205	6	14	62	546	296	2,765
80 - 84	97	696	5	21	37	308	139	1,025
85 - 89	36	218	0	-	18	95	54	313
90 And Over	8	174	0	-	6	70	14	244
Total	**3,505**	**$ 53,647**	**159**	**$ 1,407**	**429**	**$ 4,108**	**4,093**	**$ 59,162**

Non-Hazardous Retired Lives Summary

	Male Lives		Female Lives		Total	
Form of Payment	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	4,000	$ 7,199,431	11,597	$ 17,003,936	15,597	$ 24,203,367
Joint & Survivor:						
100% to Beneficiary	2,249	4,141,025	1,028	1,293,678	3,277	5,434,703
66 2/3% to Beneficiary	808	2,294,297	515	1,028,783	1,323	3,323,080
50% to Beneficiary	1,133	2,876,489	1,452	2,898,594	2,585	5,775,084
Pop-up Option	3,958	9,681,044	3,606	7,034,454	7,564	16,715,498
Social Security Option:						
Age 62 Basic	403	860,926	963	1,577,120	1,366	2,438,046
Age 62 Survivorship	795	1,592,322	610	979,920	1,405	2,572,242
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	1	6,328	0	0	1	6,328
10 Years Certain & Life	962	1,690,766	2,183	3,285,276	3,145	4,976,042
15 Years Certain & Life	427	683,208	594	901,118	1,021	1,584,326
20 Years Certain & Life	420	921,839	613	966,051	1,033	1,887,890
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	81	133,879	289	441,461	370	575,340
24 Month Basic	33	40,038	155	199,100	188	239,138
36 Month Basic	141	125,618	396	301,140	537	426,758
12 Month Survivor	102	212,746	102	174,084	204	386,830
24 Month Survivor	79	126,121	76	111,082	155	237,203
36 Month Survivor	222	252,145	155	134,743	377	386,888
Total:	15,814	$ 32,838,222	24,334	$ 38,330,539	40,148	$ 71,168,761

Hazardous Retired Lives Summary

Form of Payment	Male Lives Number	Male Lives Monthly Benefit Amount	Female Lives Number	Female Lives Monthly Benefit Amount	Total Number	Total Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	604	$ 681,533	472	$ 504,082	1,076	$ 1,185,615
Joint & Survivor:						
100% to Beneficiary	305	357,738	36	40,460	341	398,198
66 2/3% to Beneficiary	106	139,673	28	32,358	134	172,032
50% to Beneficiary	159	240,641	63	96,308	222	336,949
Pop-up Option	846	1,267,739	169	218,329	1,015	1,486,069
Social Security Option:						
Age 62 Basic	58	67,088	33	29,788	91	96,877
Age 62 Survivorship	136	179,507	18	15,181	154	194,688
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	47	63,141	12	15,204	59	78,345
10 Years Certain & Life	111	133,256	73	64,413	184	197,669
15 Years Certain & Life	46	57,774	23	23,952	69	81,726
20 Years Certain & Life	58	79,865	32	41,978	90	121,843
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	10	10,601	13	10,878	23	21,479
24 Month Basic	15	15,175	9	7,948	24	23,123
36 Month Basic	44	37,923	23	20,016	67	57,939
12 Month Survivor	20	26,786	6	5,151	26	31,937
24 Month Survivor	19	27,991	9	11,029	28	39,020
36 Month Survivor	46	45,660	15	18,695	61	64,355
Total:	2,630	$ 3,432,092	1,034	$ 1,155,770	3,664	$ 4,587,862

Non-Hazardous Beneficiary Lives Summary

Form of Payment	Male Lives		Female Lives		Total	
	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	15	$ 8,685	31	$ 33,721	46	$ 42,406
Joint & Survivor:						
100% to Beneficiary	411	373,818	1,426	1,526,485	1,837	1,900,303
66 2/3% to Beneficiary	81	101,018	307	358,426	388	459,444
50% to Beneficiary	175	131,945	425	330,193	600	462,137
Pop-up Option	231	395,789	647	1,049,103	878	1,444,892
Social Security Option:						
Age 62 Basic	0	0	10	9,527	10	9,527
Age 62 Survivorship	83	119,325	289	491,116	372	610,441
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	3	1,475	3	1,475
5 Years Certain	43	58,509	41	34,945	84	93,455
10 Years Certain	96	69,175	95	73,455	191	142,630
10 Years Certain & Life	28	24,922	40	37,513	68	62,435
15 Years Certain & Life	12	17,463	44	46,676	56	64,139
20 Years Certain & Life	21	35,928	62	112,428	83	148,356
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	0	0	1	1,792	1	1,792
24 Month Basic	0	0	0	0	0	0
36 Month Basic	0	0	2	3,357	2	3,357
12 Month Survivor	7	14,743	20	34,246	27	48,990
24 Month Survivor	12	13,730	25	23,881	37	37,611
36 Month Survivor	25	17,183	60	55,825	85	73,008
Total:	1,240	$ 1,382,234	3,528	$ 4,224,163	4,768	$ 5,606,397

Hazardous Beneficiary Lives Summary

Form of Payment	Male Lives		Female Lives		Total	
	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	2	$ 1,052	6	$ 4,264	8	$ 5,316
Joint & Survivor:						
100% to Beneficiary	25	17,918	129	92,927	154	110,845
66 2/3% to Beneficiary	1	368	18	8,555	19	8,922
50% to Beneficiary	7	5,153	28	9,884	35	15,037
Pop-up Option	19	18,849	87	84,606	106	103,455
Social Security Option:	0	0	0	0		
Age 62 Basic	0	0	0	0	0	0
Age 62 Survivorship	8	9,889	29	29,500	37	39,389
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	1	635	6	5,089	7	5,723
10 Years Certain	5	5,823	14	12,003	19	17,826
10 Years Certain & Life	6	3,889	3	2,535	9	6,425
15 Years Certain & Life	3	2,044	4	2,627	7	4,670
20 Years Certain & Life	0	0	7	5,460	7	5,460
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):	0	0	0	0		
12 Month Basic	0	0	0	0	0	0
24 Month Basic	0	0	0	0	0	0
36 Month Basic	0	0	1	126	1	126
12 Month Survivor	0	0	4	4,145	4	4,145
24 Month Survivor	1	995	3	2,022	4	3,017
36 Month Survivor	3	1,640	9	10,330	12	11,970
Total:	81	$ 68,254	348	$ 274,072	429	$ 342,327

Schedule of Retirants Added to And Removed from Rolls

(Dollar amounts except average allowance expressed in thousands)

Year Ended	Added to Rolls Number	Removed from Rolls Number	Rolls End of the Year Number	Rolls End of the Year Annual Benefits	% Increase in Annual Benefit	Average Annual Benefit
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Non-Hazardous			
2011	1,592	940	38,597	$ 821,197		$ 21,276
2012	1,707	1,078	39,226	844,881	2.9%	21,539
2013	1,982	1,014	40,194	872,140	3.2%	21,698
2014	2,067	1,038	41,223	866,047	-0.7%	21,009
2015	2,140	1,094	42,269	883,578	2.0%	20,904
2016	2,441	706	44,004	934,930	5.8%	21,246
2017	2,181	1,269	44,916	921,302	-1.5%	20,512
			Hazardous			
2011	288	59	3,064	$ 45,609		$ 14,885
2012	243	54	3,253	49,231	7.9%	15,134
2013	229	52	3,430	51,122	3.8%	14,904
2014	256	66	3,620	54,272	6.2%	14,992
2015	203	65	3,758	56,431	4.0%	15,016
2016	237	29	3,966	59,001	4.6%	14,877
2017	206	79	4,093	59,162	0.3%	14,454

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Methods and Assumptions

The following presents a summary of the actuarial assumptions and methods used in the valuation of the Kentucky Employees Retirement System.

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 5.25% net of investment expenses for the non-hazardous retirement fund
Assumed annual rate of 6.25% net of investment expenses for the hazardous retirement fund, non-hazardous insurance fund, and hazardous insurance fund

Price Inflation:

Assumed annual rate of 2.30%

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	12.50%	16.50%	3.05%	15.55%	19.55%
1	4.50%	4.50%	3.05%	7.55%	7.55%
2	2.00%	2.50%	3.05%	5.05%	5.55%
3	1.50%	2.00%	3.05%	4.55%	5.05%
4	1.50%	1.50%	3.05%	4.55%	4.55%
5	1.50%	1.00%	3.05%	4.55%	4.05%
6	1.00%	0.50%	3.05%	4.05%	3.55%
7	1.00%	0.50%	3.05%	4.05%	3.55%
8	1.00%	0.50%	3.05%	4.05%	3.55%
9	0.50%	0.50%	3.05%	3.55%	3.55%
10 & Over	0.50%	0.50%	3.05%	3.55%	3.55%

Retirement rates:

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

	Non-Hazardous			Hazardous	
Age	Members participating before 9/1/2008[1]	Members participating on or after 9/1/2008[2]	Service	Members participating before 9/1/2008[3]	Members participating on or after 9/1/2008[4]
55	8.0%		20	40.0%	
56	8.0%		21	40.0%	
57	8.0%		22	40.0%	
58	8.0%		23	40.0%	
59	8.0%		24	40.0%	
60	10.0%	10.0%	25	47.0%	40.0%
61	20.0%	20.0%	26	47.0%	40.0%
62	20.0%	20.0%	27	47.0%	40.0%
63	20.0%	20.0%	28	47.0%	40.0%
64	20.0%	20.0%	29	47.0%	40.0%
65	20.0%	25.0%	30	47.0%	47.0%
66	20.0%	25.0%	31	47.0%	47.0%
67	20.0%	25.0%	32	50.0%	47.0%
68	20.0%	25.0%	33	50.0%	47.0%
69	20.0%	25.0%	34	50.0%	47.0%
70	20.0%	25.0%	35	60.0%	47.0%
71	20.0%	25.0%	36	60.0%	47.0%
72	20.0%	25.0%	37	60.0%	50.0%
73	20.0%	25.0%	38	60.0%	50.0%
74	20.0%	25.0%	39	60.0%	50.0%
75	100.0%	100.0%	40	60.0%	60.0%

[1] If service is at least 27 years, the rate is 35%.
[2] If age plus service is at least 87, the rate is 35%.
[3] The annual rate of service retirement is 100% at age 65.
[4] The annual rate of service retirement is 100% at age 60.

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%	0.03%	0.03%
30	0.03%	0.03%	0.05%	0.05%
40	0.07%	0.07%	0.10%	0.10%
50	0.19%	0.19%	0.28%	0.28%
60	0.49%	0.49%	0.73%	0.73%

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	22.50%	25.00%
1	15.50%	10.50%
2	12.50%	7.50%
3	10.50%	6.50%
4	9.00%	5.50%
5	6.50%	4.50%
6	5.50%	3.00%
7	5.00%	3.00%
8	4.50%	3.00%
9	4.50%	2.50%
10	4.00%	2.50%
11-12	4.00%	2.00%
13-14	3.50%	2.00%
15 & Over	3.00%	2.00%

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.

At the time of the last experience study, performed as of June 30, 2013, this mortality assumption provided 37% and 19% margin for future improvement for males and females, respectively.

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

Dependent Children:

For members in the Hazardous Plan who receive a duty-related death benefit, the member is assumed to be survived by two dependent children, each age 6 with payments for 15 years.

Form of Payment:

Members are assumed to elect a life-only annuity at retirement.

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 for Medicare retirees, the valuation relied on the Society of Actuaries' 2013 Study "Health Care Costs – From Birth to Death". Table 4 (Development of Plan Specific Medicare Age Curve) was used to model the impact of aging for ages 65 and over.

Health Care Cost Trend Rates[1]:

January 1	Non-Medicare Plans	Medicare Plans	Dollar Contribution[2]
2019	7.25%	5.10%	1.50%
2020	7.00%	5.00%	1.50%
2021	6.75%	4.90%	1.50%
2022	6.50%	4.80%	1.50%
2023	6.25%	4.70%	1.50%
2024	6.00%	4.60%	1.50%
2025	5.75%	4.50%	1.50%
2026	5.50%	4.40%	1.50%
2027	5.25%	4.30%	1.50%
2028	5.00%	4.20%	1.50%
2029	4.75%	4.10%	1.50%
2030	4.50%	4.05%	1.50%
2031	4.25%	4.05%	1.50%
2032 & Beyond	4.05%	4.05%	1.50%

[1]All increases are assumed to occur on January 1. The 2018 premiums were known at the time of the valuation and were incorporated into the liability measurement using a trend of 1.232% for Non-Medicare plans and a trend of 0.00% for Medicare plans at January 1, 2018.

[2]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.

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, 2017 Participation*
Medical Only	7%
Essential	8%
Premium	84%

* May not add due to rounding

Non-Medicare Plan	June 30, 2017 Participation
Standard PPO	14%
Standard CDHP	2%
LivingWell CDHP	22%
LivingWell PPO	62%

- 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.

- 50% 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.

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 6.75% to 5.25% for the non-hazardous retirement fund and from 7.50% to 6.25% for the hazardous retirement fund and both insurance funds.
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 and a 0.95% decrease in the health care cost trend rates.
3. The amortization method for unfunded accrued liabilities was changed to a level dollar basis (which is then converted to a percentage of expected covered payroll) from a level percentage of pay basis.

Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were based on the plan premiums effective January 1, 2017, 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. The spouse/dependent premium of $862.64 for non-Medicare retirees is based on a blending of Family and Couple premiums for the current retirees that have over 4 years of hazardous service. The fully-insured premiums KRS pays the Kentucky Employees' Health Plan (KEHP) 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 rate subsidy for the non-Medicare eligible retirees. Actuarial Standard of Practice No. 6 (ASOP No. 6) requires aging subsidies (or implicit rate subsidies) to be recognized. However, the KRS health insurance trusts are only used to reimburse KEHP for the employer's portion of the blended premiums. Said another way, the trusts are not used to fund the difference between the underlying retiree claims and the blended KEHP premiums. As a result, the retiree health care liabilities developed in this report for the non-Medicare retirees are based solely on the premiums charged by KEHP, without any age-adjustment. GASB Statements No. 74 and No. 75 prohibit such a deviation from ASOP No. 6. The liabilities developed in this report are solely for the purpose of funding the benefits paid by the health insurance funds and are not appropriate for financial statement disclosures required by GASB. GRS provides separate GASB reports to KRS which include the liabilities associated with the implicit rate subsidy.

For those not eligible for Medicare		
Age	Member	Spouse/Dependents
<65	$711.22	$862.64

For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2017, 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 for retirees over the age of 65. 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 eligible for Medicare		
Age	Male	Female
65	$208.66	$196.81
75	244.13	238.22
85	258.16	261.20

Appendix B of the report provides a full schedule of premiums.

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

Mehdi Riazi, FSA, EA, MAAA

APPENDIX B

BENEFIT PROVISIONS

Summary of Benefit Provisions for Kentucky Employees Retirement System (KERS)

KERS Non-Hazardous Employees

Retirement: Tier 1, Participation before 9/1/2008

Normal Retirement Eligibility	Age 65 with at least 1 month of service credit; or Any age with at least 27 years of service
Benefit Amount	If a member has at least 48 months of service, the monthly benefit is 2.00% times final average compensation times years of service. For members who did not have 13 months of service credit for 1/1/1998-1/1/1999, the monthly benefit is 1.97% times final average compensation times years of service. If a member has less than 48 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest. Final average compensation is based on the member's highest 5 years of compensation.
Early Retirement Eligibility	Any age (prior to age 65) with at least 25 years of service; or Age 55 with at least 5 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement eligibility precedes the member's normal retirement date.

Retirement: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Normal Retirement Eligibility

Age 65 with at least 5 years of service; or
Rule of 87 (Age 57 or older if age plus service equals 87)

Benefit Amount

The monthly benefit is equal to the applicable benefit multiplier times final average compensation times years of service.

Years of Service	Benefit Multiplier
10 or less	1.10%
10-20	1.30%
20-26	1.50%
26-30	1.75%
Greater than 30*	2.00%

* The 2.00% benefit multiplier only applies to service credit in excess of 30 years. If a member has greater than 30 years of service at retirement, service prior to 30 years will be multiplied by the 1.75% benefit multiplier.

Final compensation is based on the member's last 5 years of compensation.

Early Retirement Eligibility

Age 60 with at least 10 years of service

Early Retirement Reduction

Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

Retirement: Tier 3, Participation on or after 1/1/2014

Normal Retirement Eligibility

Age 65 with at least 5 years of service; or
Rule of 87 (Age 57 or older if age plus service equals 87)

Benefit Amount

Each year that the member is active, a 4.00% employer pay credit and the employee's 5.00% contribution will be credited to each member's hypothetical cash balance account. The hypothetical account will earn interest at a minimum rate of 4%, annually. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest in that year equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year.

At retirement, the member's hypothetical account balance may be converted into an annuity based on an actuarial factor.

Early Retirement Eligibility

N/A

KERS Non-Hazardous Employees (continued)

Deferred Vested Benefit: Tier 1, Participation before 9/1/2008

Eligibility	At least 1 month of service credit
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Eligibility	5 years of service
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit Tier 3, Participation on or after 1/1/2014

Eligibility	5 years of service
Benefit Amount	At termination of employment, members may choose to leave their account balance with the System and retire once they are eligible. The hypothetical account balance will earn 4% annual interest after termination. Members may also choose to withdrawal their entire accumulated balance. If a member does not have 5 years of service at termination, the member is eligible to receive a partial refund of their account balance. This refund includes the member's contributions with interest.

Disability Retirement: Participation before 8/1/2004

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	Disability benefits are calculated in the same manner as the normal retirement benefit with years of service and final compensation being determined as of the date of disability, except that service credit shall be added to the person's total service beginning with the last date of paid employment and continuing to the member's 65th birthday, with total service not exceeding 25 years. Total service credit added shall not be greater than the member's actual service at disability. For members with at least 25 years of service on the last day of paid employment but less than 27 years of service, total service shall be 27 years. For members with 27 or more years of service credit, actual service will be used.

KERS Non-Hazardous Employees (continued)

Disability Retirement: Participation on or after 8/1/2004 but before 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 20% of the member's final monthly rate of pay or the member's normal retirement benefit (without reduction for early retirement) with years and final compensation being determined as of the date of disability.

Disability Retirement: Participation on or after 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 20% of the member's final monthly rate of pay or the member's retirement benefit calculated at the member's normal retirement date.

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member's final monthly rate of pay. Additionally, each eligible dependent child will receive 10% of the member's monthly final rate of pay up to a maximum of 40%.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 55 with at least 60 months of service and actively working at the time of death; or At least 144 months of service, if no longer actively working
Spouse Benefit	The member's retirement benefit calculated in the same manner as if the member had retired on the day of the member's death and elected a 100% joint and survivor benefit. The benefit is actuarially reduced if the member dies prior to their normal retirement age.

Pre-Retirement Death Benefit (Death in the Line of Duty)

Eligibility	One month of service credit
Spouse Benefit	A $10,000 lump sum payment plus a monthly payment of 25% of the deceased member's final monthly rate of pay. A spouse may also elect the non-line of duty death benefit.
Child Benefit	Each eligible dependent child will receive 10% of the member's final monthly rate of pay up to a maximum of 40%.

KERS Non-Hazardous Employees (continued)

Post-Retirement Death Benefit

Eligibility	48 months of service, and in receipt of retirement benefits
Death Benefit	A $5,000 lump sum payment

Member Contributions

Tier 1, Participation before 9/1/2008	5% of creditable compensation. Members who do not receive a retirement benefit are entitled to a full refund of contributions with interest. The annual interest rate is set by the KRS board, not less than 2.0%.
Tier 2, Participation on or after 9/1/2008 but before 1/1/2014	5% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest. The annual interest rate is 2.5%.
Tier 3, Participation after 1/1/2014	5% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest.

Changes since the Prior Valuation

None.

KERS Hazardous Employees

Retirement: Tier 1, Participation before 9/1/2008

Normal Retirement Eligibility	Age 55 with at least 1 month of service credit; or Any age with at least 20 years of service
Benefit Amount	If a member has at least 60 months of service, the monthly benefit is 2.49% times final average compensation times years of service. If a member has less than 60 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest. Final average compensation is based on the member's highest 3 years of compensation.
Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

KERS Hazardous Employees (continued)

Retirement: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	The monthly benefit is equal to the applicable benefit multiplier times final average compensation times years of service.

Years of Service	Benefit Multiplier
10 or less	1.30%
10-20	1.50%
20-25	2.25%
Greater than 25	2.50%

Final average compensation is based on the member's highest 3 years of compensation.

Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

Retirement: Tier 3, Participation on or after 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	Each year that the member is active, a 7.50% employer pay credit and the employee's 8.00% contribution will be credited to each member's hypothetical cash balance account. The hypothetical account will earn interest at a minimum rate of 4%, annually. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest in that year equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. At retirement, the member's hypothetical account balance may be converted into an annuity based on an actuarial factor.
Early Retirement Eligibility	N/A

KERS Hazardous Employees (continued)

Deferred Vested Benefit: Tier 1, Participation before 9/1/2008

Eligibility	At least 1 month of service credit
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Eligibility	5 years of service
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit Tier 3, Participation on or after 1/1/2014

Eligibility	5 years of service
Benefit Amount	At termination of employment, members may choose to leave their account balance with the System and retire once they are eligible. The hypothetical account balance will earn 4% annual interest after termination. Members may also choose to withdrawal their entire accumulated balance. If a member does not have 5 years of service at termination, the member is eligible to receive a partial refund of their account balance. This refund includes the member's contributions with interest.

Disability Retirement: Participation before 8/1/2004

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	Disability benefits are calculated in the same manner as the normal retirement benefit with years of service and final compensation being determined as of the date of disability, except that if the member has less than 20 years of service at disability, service credit shall be added to the person's total service beginning with the last date of paid employment and continuing to the member's 55th birthday, with total service not exceeding 20 years. Total service credit added shall not be greater than the member's actual service at disability.

KERS Hazardous Employees (continued)

Disability Retirement: Participation on or after 8/1/2004 but before 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member’s final monthly rate of pay or the member’s normal retirement benefit (without reduction for early retirement) with years and final compensation being determined as of the date of disability.

Disability Retirement: Participation on or after 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member’s final monthly rate of pay or the member’s retirement benefit calculated at the member’s normal retirement date.

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member’s final monthly rate of pay. Additionally, each eligible dependent child will receive 10% of the member’s monthly final rate of pay up to a maximum of 40%.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 55 with at least 60 months of service and actively working at the time of death; or At least 144 months of service, if no longer actively working
Spouse Benefit	The member’s retirement benefit calculated in the same manner as if the member had retired on the day of the member’s death and elected a 100% joint and survivor benefit. The benefit is actuarially reduced if the member dies prior to their normal retirement age.

Pre-Retirement Death Benefit (Death in the Line of Duty)

Eligibility	One month of service credit
Spouse Benefit	A $10,000 lump sum payment plus a monthly payment of 25% of the deceased member’s final monthly rate of pay. A spouse may also elect the non-line of duty death benefit.
Non-Spouse Benefit	If the beneficiary is only one person who is a dependent receiving at least 50% of his or her support from the member, the beneficiary may elect a lump sum payment of$10,000.
Child Benefit	Each eligible dependent child will receive 10% of the member’s final monthly rate of pay up to a maximum of 40%.

KERS Hazardous Employees (continued)

Post-Retirement Death Benefit

Eligibility	48 months of service, and in receipt of retirement benefits
Death Benefit	A $5,000 lump sum payment

Member Contributions

Tier 1, Participation before 9/1/2008	8% of creditable compensation. Members who do not receive a retirement benefit are entitled to a full refund of contributions with interest. The annual interest rate is set by the KRS board, not less than 2.0%.
Tier 2, Participation on or after 9/1/2008 but before 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest. The annual interest rate is 2.5%.
Tier 3, Participation after 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest.

Changes since the Prior Valuation

None.

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.

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

Benefit Eligibility	Recipient of a retirement allowance with at least 120 months of service at retirement
Non-Hazardous Subsidy	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, 2017, the Non-Hazardous monthly contribution was $13.18/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.
Hazardous Subsidy	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, 2017, the Non-Hazardous monthly contribution was $19.77/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of $10 ($13.18 as of July 1, 2017) for each year of hazardous service.
Duty Disability Retirement	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.
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 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.
Non-Duty Death in Service	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.

Monthly Health Plan Premiums – Effective January 1, 2018

Non-Medicare Plan Options					
Plan Option	**Single**	**Parent Plus**	**Couple**	**Family**	**Family X-Ref**
LivingWell PPO*	$729.34	$1,037.08	$1,589.10	$1,767.60	$876.68
LivingWell CDHP	709.46	978.50	1,325.64	1,479.76	818.96
Standard PPO	685.38	975.90	1,497.18	1,666.26	824.54
Standard CDHP	682.80	940.64	1,450.02	1,615.30	800.94

Medicare Plan Options	
Kentucky Retirement Systems - Medical Only Plan	$165.01
Kentucky Retirement Systems – Medicare Advantage/Essential Plan	75.56
Kentucky Retirement Systems – Medicare Advantage/Premium Plan*	252.21

*For 2018, 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, 2017.

Non-Hazardous Service	Hazardous Service
$13.18	$19.77

APPENDIX C

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)

b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and

c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations that provide the financial information of the plan, such as the funded ratio, unfunded actuarial accrued liability and the ADC.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Actuarially Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: The portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is specified in State statute. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on a statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 67 and ***GASB 68***: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting and reporting rules for public retirement systems and the employers that sponsor, participate in, or contribute to them. Statement No. 67 sets the accounting rules for the financial reporting of the retirement systems, while Statement No. 68 sets the rules for the employers that sponsor, participate in, or contribute to public retirement systems.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded

Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but may not decrease by exactly one year in the subsequent year's actuarial valuation. For instance, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

County Employees Retirement System (CERS)

Actuarial Valuation Report as of June 30, 2017

GRS Retirement Consulting
P: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

October 30, 2017

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

Subject: Actuarial Valuation as of June 30, 2017

Dear Trustees of the Board:

This report describes the current actuarial condition of the County Employees Retirement System (CERS), determines the required employer contribution rates, and analyzes changes in the System's financial condition. In addition, the report provides various summaries of the data. Separate reports are issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67, 68, 74 and 75. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of June 30, the first day of the plan year for KRS. This report was prepared at the request of the Board of Trustees of the Kentucky Retirement System (Board) and is intended for use by the KRS staff and those designated or approved by the Board.

FINANCING OBJECTIVES AND FUNDING POLICY

The employer contribution rate is determined in accordance with Section 61.565 of Kentucky Statute. As specified by the Statute, the employer contribution rate is determined based on a closed thirty-year amortization period beginning July 1, 2013. As a result, the amortization period used in the 2017 actuarial valuation is 26 years. The contribution rate determined by this actuarial valuation becomes effective twelve months after the valuation date. In other words, the contribution rate determined by this June 30, 2017 actuarial valuation will be used by the Board to certify the participating employer's contribution rates for the fiscal year July 1, 2018 and ending June 30, 2019.

If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

ASSUMPTIONS AND METHODS

Kentucky Statutes also requires that an actuarial investigation be performed at least every five years to review the economic and demographic assumptions. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Subsequent to the last actuarial valuation the Board decreased the price inflation assumption to 2.30% and the payroll growth assumption to 2.00% for the CERS Non-Hazardous and Hazardous Systems (Retirement and Health Insurance). Additionally, the assumed rate of return was decreased to 6.25% for the CERS Non-Hazardous and Hazardous Systems (Retirement and Health Insurance). It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on June 30, 2017. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2017, by the KRS staff. The staff also supplied asset information as of June 30, 2017. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by KRS.

CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of CERS as of June 30, 2017.

All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Kentucky Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries. All three of the undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. All of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.

Joseph P. Newton, FSA, MAAA, EA
Senior Consultant

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

Janie Shaw, ASA, MAAA
Consultant

Table of Contents

SECTION 1

EXECUTIVE SUMMARY

Summary of Principal Results

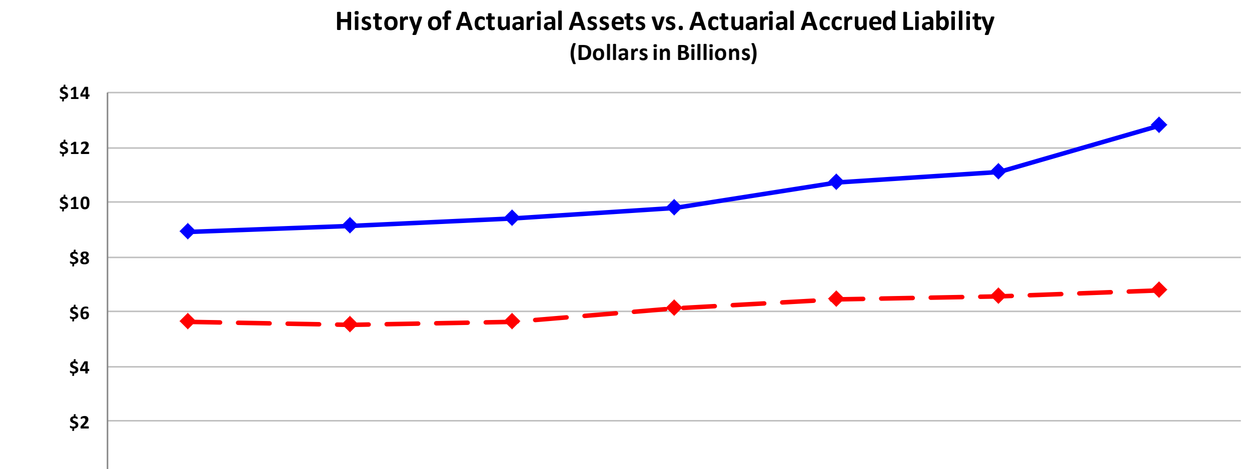
(Dollar amounts expressed in thousands)

	Non-Hazardous		Hazardous		Total	
	June 30, 2017	June 30, 2016	June 30, 2017	June 30, 2016	June 30, 2017	June 30, 2016
Contributions for next fiscal year:						
Retirement	21.84%	14.48%	35.69%	22.20%		
Insurance	6.21%	4.70%	12.17%	9.35%		
Total	28.05%	19.18%	47.86%	31.55%	N/A	N/A
Assets:						
Retirement						
• Actuarial value (AVAR)	$6,764,873	$6,535,372	$2,238,320	$2,139,119	$9,003,193	$8,674,492
• Market value (MVAR)	$6,687,237	$6,106,187	$2,217,996	$2,003,669	$8,905,233	$8,109,856
• Ratio of actuarial to market value of assets	101.2%	107.0%	100.9%	106.8%	101.1%	107.0%
Insurance						
• Actuarial value (AVAI)	$2,227,401	$2,079,811	$1,196,780	$1,135,784	$3,424,181	$3,215,595
• Market value (MVAI)	$2,212,536	$1,943,757	$1,189,001	$1,062,602	$3,401,537	$3,006,359
• Ratio of actuarial to market value of assets	100.7%	107.0%	100.7%	106.9%	100.7%	107.0%
Funded Status:						
Retirement						
• Actuarial accrued liability	$12,803,510	$11,076,457	$4,649,047	$3,704,456	$17,452,557	$14,780,913
• Unfunded accrued liability on AVAR	$6,038,637	$4,541,084	$2,410,727	$1,565,337	$8,449,364	$6,106,421
• Funded ratio on AVAR	52.8%	59.0%	48.1%	57.7%	51.6%	58.7%
• Unfunded accrued liability on MVAR	$6,116,273	$4,970,270	$2,431,051	$1,700,787	$8,547,324	$6,671,057
• Funded ratio on MVAR	52.2%	55.1%	47.7%	54.1%	51.0%	54.9%
Insurance						
• Actuarial accrued liability	$3,355,151	$2,988,121	$1,788,433	$1,558,818	$5,143,584	$4,546,939
• Unfunded accrued liability on AVAI	$1,127,750	$908,310	$591,653	$423,034	$1,719,403	$1,331,344
• Funded ratio on AVAI	66.4%	69.6%	66.9%	72.9%	66.6%	70.7%
• Unfunded accrued liability on MVAI	$1,142,615	$1,044,364	$599,432	$496,216	$1,742,047	$1,540,580
• Funded ratio on MVAI	65.9%	65.0%	66.5%	68.2%	66.1%	66.1%
Membership:						
• Number of						
- Active Members	82,198	80,664	9,495	9,084	91,693	89,748
- Retirees and Beneficiaries	59,013	56,339	8,998	8,563	68,011	64,902
- Inactive Members	85,031	82,292	3,198	2,830	88,229	85,122
- Total	226,242	219,295	21,691	20,477	247,933	239,772
• Projected payroll of active members	$2,452,407	$2,352,762	$541,633	$492,851	$2,994,040	$2,845,612
• Average salary of active members	$29,835	$29,167	$57,044	$54,255	$32,653	$31,707

Executive Summary (Continued)

Non-Hazardous Retirement Fund

The unfunded actuarial accrued liability for the non-hazardous retirement fund increased by $1.498 billion since the prior year's valuation to $6.039 billion. The largest source of this increase is the result of the decrease in the assumed rate of investment return which resulted in a $1.406 billion increase in the unfunded liability. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for the non-hazardous fund. The divergence in the assets and liability over the last seven years has generally been due to a combination of the actual investment experience being less than the fund's expected investment return assumption, and a decrease in the assumed rate of return in 2015 and again in 2017.

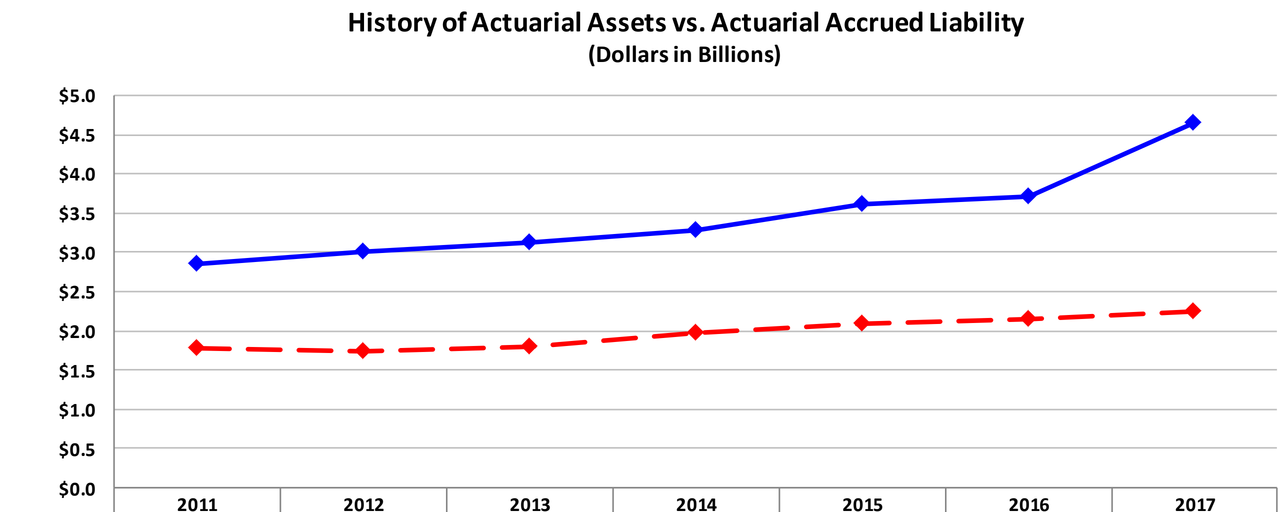


	2011	2012	2013	2014	2015	2016	2017
AAL	8.9	9.1	9.4	9.8	10.7	11.1	12.8
AVA	5.6	5.5	5.6	6.1	6.5	6.5	6.8

Executive Summary (Continued)

Hazardous Retirement Fund

The unfunded actuarial accrued liability for the hazardous retirement fund increased by $0.845 billion since the prior year's valuation to $2.411 billion. The largest source of this increase is the result of the decrease in the assumed rate of investment return which resulted in a $0.540 billion increase in the unfunded liability. Below is a chart with the historical actuarial value of assets and actuarial accrued liability for the hazardous retirement fund. The divergence in the assets and liability over the last seven years has generally been due to a combination of the actual contribution rates being less than the fund's expected investment return assumption, and a decrease in the assumed rate of return in 2015 and again in 2017.



	2011	2012	2013	2014	2015	2016	2017
AAL	2.9	3.0	3.1	3.3	3.6	3.7	4.6
AVA	1.8	1.7	1.8	2.0	2.1	2.1	2.2

SECTION 2

DISCUSSION

Discussion

The County Employees Retirement System (CERS) is a defined benefit pension fund that provides pensions and health care coverage for employees of state government, non-teaching staff at regional state supported universities, local health departments, regional mental health/mental retardation agencies, and other quasi-state agencies. CERS includes both non-hazardous and hazardous duty benefits. This report presents the result of the June 30, 2017 actuarial funding valuation for both the Retirement and Insurance Funds.

The primary purposes of the valuation report are to depict the current financial condition of the System, determine the annual required contribution, and analyze changes in the System's financial condition. In addition, the report provides various summaries of the data.

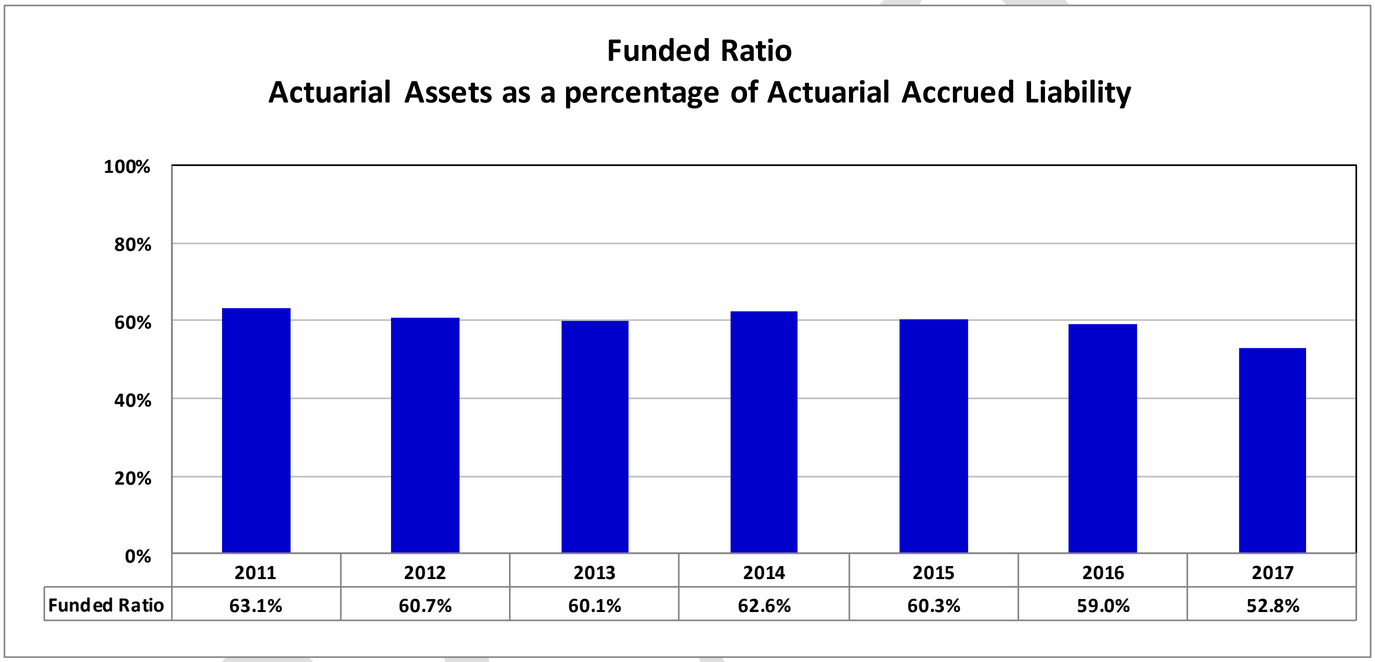
The actuarially determined contribution rates consist of two components: a normal cost rate and an amortization cost to finance the unfunded actuarial accrued liability. The normal cost rate is the theoretical amount which would be required to pay the members' benefits, based on the current plan provisions, if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. This is the amount is should cost to provide the benefits for an average new member. Since members contribute to the fund, only the excess of the normal rate over the member contribution rate is included in the employer contribution rate. The amortization cost is the amount, expressed as a percentage of payroll, necessary to amortize the unfunded actuarial accrued liability. The payroll growth rate and discount rate assumptions are selected by the Board. The funding period is specified in Section 61.565 of Kentucky Statute.

All of the actuarial and financial tables referenced by the other sections of this Report appear in Section 3. Section 4 provides member data and statistical information. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

Funding Progress

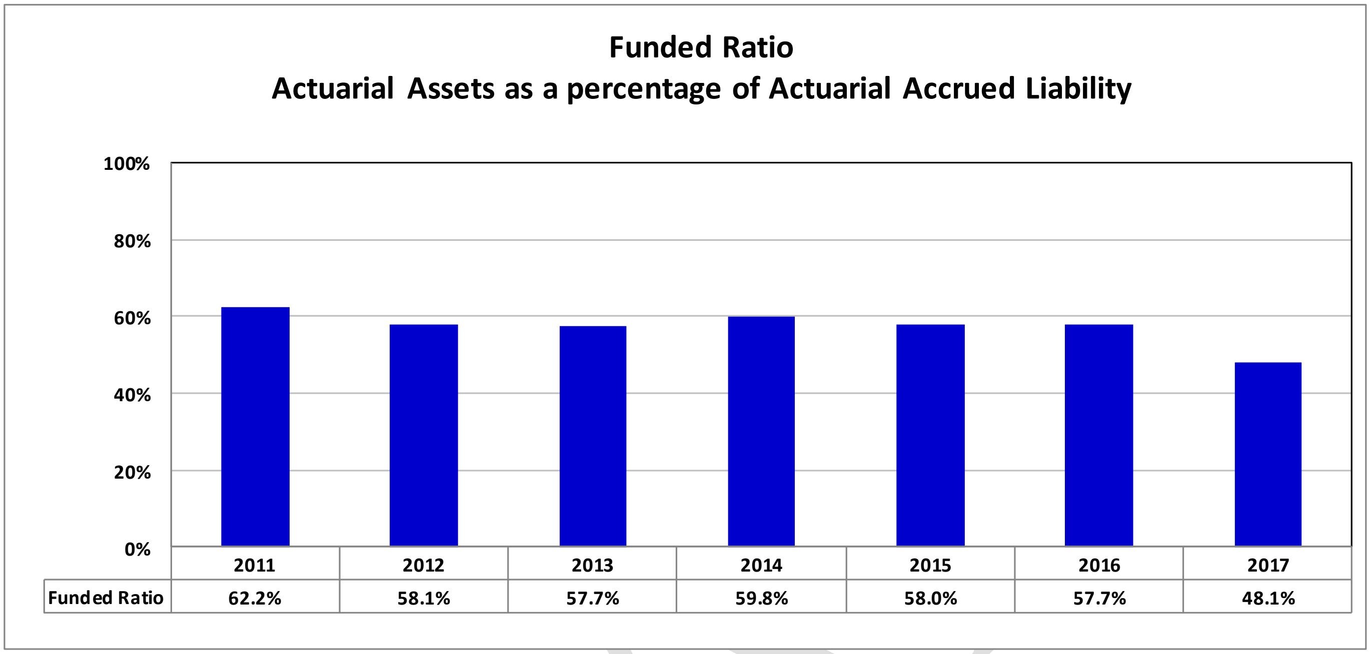
The following charts provide a seven-year history of the funds' funded ratio (i.e. the Actuarial Value of Assets divided by the Actuarial Accrued Liability). The decline in the funded ratio over the last seven years for the retirement funds has generally been due to actual investment experience being less than the investment return assumption, and a decrease in the assumed rate of return in 2015 and again in 2017.

Non-Hazardous Retirement Fund



Funding Progress (Continued)

Hazardous Retirement Fund



Assuming the actuarial determined contributions are actually paid in future years, then absent future unfavorable investment or demographic experience, or legislative changes, we expect the funded ratio to begin improving. Also, the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, is expected to decrease after those higher contribution rates become effective. Table 9, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.

Asset Gains/ (Losses)

The actuarial value of assets ("AVA") is based on a smoothed market value of assets, using a systematic approach to phase-in the difference between the actual and expected investment return on the market value of assets (adjusted for receipts and disbursements during the year). This is appropriate because it dampens the short-term volatility inherent in investment markets. The returns are computed net of investment expenses. The actuarial value of assets for the Non-Hazardous Retirement Fund increased from $6.535 billion to $6.765 billion since the prior valuation. Table 7 in the following section of the report provides the development of the actuarial value of assets.

The rate of return on the market value of assets on a dollar-weighted basis for fiscal year 2017 was a 13.7% for the non-hazardous retirement fund which is greater than the 7.50% expected annual return during that fiscal year. The return on an actuarial (smoothed) asset value was 7.3%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

The market value of assets is $0.078 billion less than the actuarial value of assets, which signifies that the retirement system is in a position of deferred losses. Therefore, unless the System experiences investment returns in excess of the assumed rate of return, the future recognition of these deferred losses is expected to increase the unfunded actuarial accrued liability.

Table 6 in the following section of this report provides asset information that was included in the annual financial statements of the System. Also, Tables 6 and 7 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

Actuarial Gains/ (Losses)

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the System as of the first day of the plan year. In any one fiscal year, the experience can be better or worse from that which is assumed or expected. The actuarial assumptions do not necessarily attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience over many years. Therefore, as long as the actual experience of the retirement system is reasonably close to the current assumptions, the long-term funding requirements of the System will remain relatively consistent.

Below are tables that separately show a reconciliation of the actuarial gains / (loss) since the prior actuarial valuation for the retirement and health insurance funds, which include the effect of asset and liability gains and losses, changes in assumptions, changes in plan provisions, etc.

Retirement Experience Gain or (Loss)
(Dollar amounts expressed in thousands)

	Non-Hazardous	Hazardous
A. Calculation of total actuarial gain or loss		
1. Unfunded actuarial accrued liability (UAAL), previous year	$ 4,541,084	$ 1,565,337
2. Normal cost and administrative expenses	215,394	60,296
3. Less: contributions for the year	(484,268)	(176,048)
4. Interest accrual	330,499	113,060
5. Expected UAAL (Sum of Items 1 - 4)	$ 4,602,709	$ 1,562,645
6. Actual UAAL as of June 30,2017	$ 6,038,637	$ 2,410,727
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (1,435,928)	$ (848,082)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ (14,524)	$ (4,511)
9. Liability experience gain (loss) for the year	(15,568)	(303,768)
10. Assumption change	(1,405,836)	(539,803)
11. Total	$ (1,435,928)	$ (848,082)

The accrued liability for the non-hazardous retirement fund was less than 1% higher than expected, resulting in a $16 million liability loss. This $16 million increase is comprised of a $230 million decrease due to differences in liability calculations between GRS and the fund's prior actuary and a $246 million increase due the fund's experience during the last year. The accrued liability for the hazardous retirement fund was about 8% higher than expected, resulting in a $304 million liability loss. This $304 million increase is comprised of a $113 million increase due to differences in liability calculations between GRS and the fund's prior actuary and a $191 million increase due the fund's experience during the last year. The experience loss for both funds is primarily due to higher than expected salary increases during the past year.

Actuarial Gains/ (Losses) (Continued)

Insurance Experience Gain or (Loss)
(Dollar amounts expressed in thousands)

		Non-Hazardous		Hazardous
A. Calculation of total actuarial gain or loss				
1. Unfunded actuarial accrued liability (UAAL), previous year	$	908,310	$	423,034
2. Normal cost and administrative expenses		71,947		24,437
3. Less: contributions for the year		(129,870)		(53,245)
4. Interest accrual		65,951		30,647
5. Expected UAAL (Sum of Items 1 - 4)	$	916,338	$	424,873
6. Actual UAAL as of June 30,2017	$	1,127,750	$	591,653
7. Total gain (loss) for the year (Item 5 - Item 6)	$	(211,412)	$	(166,780)
B. Source of gains and losses				
8. Asset gain (loss) for the year	$	(10,030)	$	(5,509)
9. Liability experience gain (loss) for the year		157,234		59,536
10. Assumption change		(358,616)		(220,807)
11. Total	$	(211,412)	$	(166,780)

The 2018 premiums were known at the time of the valuation and were incorporated into the liability measurement. Premiums were lower than expected and resulted in a $155 million liability experience gain for the non-hazardous insurance fund and a $118 million liability experience gain for the hazardous insurance fund.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an annual investment return assumption. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Since the last actuarial valuation, the Board made the following changes in assumptions:

- Decrease the assumed rate of return to 6.25% for the retirement and health insurance funds.
- Decrease the price inflation assumption to 2.30% for the retirement and health insurance funds.
- Decrease the payroll growth assumption (used for amortizing the unfunded accrued liability) to 2.00% for retirement and health insurance funds.
- Decrease in the individual salary increase assumption and health care trend assumption that corresponds with the 0.95% decrease in the price inflation assumption.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. It is our opinion that the assumptions are internally consistent, reasonable, and reflect anticipated future experience of the System. The next experience study will be conducted no later than as of June 30, 2018.

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 (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

Benefit Provisions

Appendix B of this report includes a summary of the benefit provisions for CERS. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

This valuation reflects all benefits promised to CERS members, either by the statutes or by the Board. There are no ancillary benefits that might be deemed a CERS liability if continued beyond the availability of funding by the current funding source.

SECTION 3

ACTUARIAL TABLES

Actuarial Tables

RETIREMENT BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability
Retirement Benefits

(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 2,452,407	$ 541,633
2.	Present value of future pay	$ 19,236,003	$ 3,404,412
3.	Normal cost rate		
	a. Total normal cost rate	10.05%	14.52%
	b. Less: member contribution rate	-5.00%	-8.00%
	c. Employer normal cost rate	5.05%	6.52%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 6,904,473	$ 2,204,933
	b. Less: present value of future normal costs	(1,832,645)	(466,487)
	c. Actuarial accrued liability	$ 5,071,828	$ 1,738,446
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 7,313,076	$ 2,851,704
	b. Inactive members	418,606	58,897
	c. Active members (Item 4c)	5,071,828	1,738,446
	d. Total	$ 12,803,510	$ 4,649,047
6.	Actuarial value of assets	$ 6,764,873	$ 2,238,320
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 6,038,637	$ 2,410,727
8.	Funded Ratio	52.8%	48.1%

Actuarial Present Value of Future Benefits
Retirement Benefits
(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Active members		
	a. Service retirement	$ 6,359,838	$ 1,881,864
	b. Deferred termination benefits and refunds	355,125	261,612
	c. Survivor benefits	47,123	10,337
	d. Disability benefits	142,387	51,120
	e. Total	$ 6,904,473	$ 2,204,933
2.	Retired members		
	a. Service retirement	$ 6,424,305	$ 2,588,548
	b. Disability retirement	479,815	108,370
	c. Beneficiaries	408,956	154,786
	d. Total	$ 7,313,076	$ 2,851,704
3.	Inactive members		
	a. Vested terminations	$ 339,599	$ 51,652
	b. Nonvested terminations	79,007	7,245
	c. Total	$ 418,606	$ 58,897
4.	Total actuarial present value of future benefits	$ 14,636,155	$ 5,115,534

Development of Required Contribution Rate
Retirement Benefits

		June 30, 2017	
		Non-Hazardous	Hazardous
		(1)	(2)
1.	Total normal cost rate		
	a. Service retirement	7.91%	8.94%
	b. Deferred termination benefits and refunds	1.72%	4.91%
	c. Survivor benefits	0.08%	0.11%
	d. Disability benefits	0.34%	0.56%
	e. Total	10.05%	14.52%
2.	Less: member contribution rate	-5.00%	-8.00%
3.	Total employer normal cost rate	5.05%	6.52%
4.	Administrative expenses	0.80%	0.26%
5.	Net employer normal cost rate	5.85%	6.78%
6.	UAAL amortization contribution	15.99%	28.91%
7.	Total recommended employer contribution	21.84%	35.69%

Actuarial Balance Sheet

Non-Hazardous Members Retirement

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources		
	a. Current assets (actuarial value)	$ 6,764,873	$ 6,535,372
	b. Present value of future member contributions	$ 961,800	$ 1,002,005
	c. Present value of future employer contributions		
	i. Normal cost contributions	$ 870,845	$ 525,861
	ii. Unfunded accrued liability contributions	6,038,637	4,541,085
	iii. Total future employer contributions	$ 6,909,482	$ 5,066,946
	d. Total assets	$ 14,636,155	$ 12,604,323
2.	Liabilities - Present Value of Expected Future Benefit Payments		
	a. Active members		
	i. Present value of future normal costs	$ 1,832,645	$ 1,527,866
	ii. Accrued liability	5,071,828	4,290,927
	iii. Total present value of future benefits	$ 6,904,473	$ 5,818,793
	b. Present value of benefits payable on account of current retired members and beneficiaries	$ 7,313,076	$ 6,410,537
	c. Present value of benefits payable on account of current inactive members	$ 418,606	$ 374,993
	d. Total liabilities	$ 14,636,155	$ 12,604,323

Actuarial Balance Sheet

Hazardous Members Retirement

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources		
	a. Current assets (actuarial value)	$ 2,238,320	$ 2,139,119
	b. Present value of future member contributions	$ 272,353	$ 281,802
	c. Present value of future employer contributions		
	i. Normal cost contributions	$ 194,134	$ 98,917
	ii. Unfunded accrued liability contributions	2,410,727	1,565,338
	iii. Total future employer contributions	$ 2,604,861	$ 1,664,255
	d. Total assets	$ 5,115,534	$ 4,085,176
2.	Liabilities - Present Value of Expected Future Benefit Payments		
	a. Active members		
	i. Present value of future normal costs	$ 466,487	$ 380,719
	ii. Accrued liability	1,738,446	1,315,745
	iii. Total present value of future benefits	$ 2,204,933	$ 1,696,464
	b. Present value of benefits payable on account of current retired members and beneficiaries	$ 2,851,704	$ 2,338,063
	c. Present value of benefits payable on account of current inactive members	$ 58,897	$ 50,649
	d. Total liabilities	$ 5,115,534	$ 4,085,176

Reconciliation of Retirement Net Assets
(Dollar amounts expressed in thousands)

	Year Ending June 30, 2017 (1) Non-Hazardous		Year Ending June 30, 2017 (2) Hazardous	
1. Value of assets at beginning of year	$	6,106,187	$	2,003,669
2. Revenue for the year				
a. Contributions				
i. Member contributions	$	150,715	$	60,101
ii. Employer contributions		331,492		114,316
iii. Other contributions (less 401h)		2,061		1,632
iii. Total	$	484,268	$	176,048
b. Income				
i. Interest, dividends, and other income	$	185,883	$	60,591
ii. Investment expenses		(48,166)		(15,765)
iii. Net	$	137,717	$	44,825
c. Net realized and unrealized gains (losses)		680,564		224,173
d. Total revenue	$	1,302,550	$	445,047
3. Expenditures for the year				
a. Disbursements				
i. Refunds	$	14,430	$	2,315
ii. Regular annuity benefits		687,461		226,984
iii. Other benefit payments		0		0
iv. Transfers to other systems		0		0
v. Total	$	701,891	$	229,299
b. Administrative expenses and depreciation		19,609		1,421
c. Total expenditures	$	721,500	$	230,720
4. Increase in net assets (Item 2. - Item 3.)	$	581,050	$	214,327
5. Value of assets at end of year (Item 1. + Item 4.)	$	6,687,237	$	2,217,996
6. Net external cash flow				
a. Dollar amount	$	(237,231)	$	(54,672)
b. Percentage of market value		-3.7%		-2.6%
7. Estimated annual return on net assets		13.7%		13.6%

Development of Actuarial Value of Assets

Non-Hazardous Members Retirement

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	6,535,372
2.	Market value of assets at beginning of year	$	6,106,187
3.	Net new investments		
	a. Contributions	$	484,268
	b. Benefit payments		(701,891)
	c. Administrative expenses		(19,609)
	d. Subtotal	$	(237,231)
4.	Market value of assets at end of year	$	6,687,237
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	818,281
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	449,068
8.	Excess return for phased recognition	$	369,213

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	369,213	$	73,843
b.	2016		(515,652)		(103,130)
c.	2015		(386,073)		(77,215)
d.	2014		454,067		90,813
e.	2013		166,764		33,353
f.	Total			$	17,664

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	6,764,873
11.	Ratio of actuarial value to market value		101.2%
12.	Estimated annual return on actuarial value of assets		7.3%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets

Hazardous Members Retirement

(Dollar amounts expressed in thousands)*

	Year Ending	June 30, 2017
1.	Actuarial value of assets at beginning of year	$ 2,139,119
2.	Market value of assets at beginning of year	$ 2,003,669
3.	Net new investments	
	a. Contributions	$ 176,048
	b. Benefit payments	(229,299)
	c. Administrative expenses	(1,421)
	d. Subtotal	$ (54,672)
4.	Market value of assets at end of year	$ 2,217,996
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$ 268,999
6.	Assumed investment return rate for fiscal year	7.50%
7.	Expected return for immediate recognition	$ 148,225
8.	Excess return for phased recognition	$ 120,774

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,	Excess Return	Recognized Amount
a.	2017	$ 120,774	$ 24,155
b.	2016	(162,540)	(32,508)
c.	2015	(122,554)	(24,511)
d.	2014	148,014	29,603
e.	2013	44,546	8,909
f.	Total		$ 5,648

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$ 2,238,320
11.	Ratio of actuarial value to market value	100.9%
12.	Estimated annual return on actuarial value of assets	7.3%

* Amounts may not add due to rounding

Schedule of Funding Progress
Retirement Benefits
(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Value of Assets (AVA) (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) (4)	Funded Ratio (2)/(3) (5)	Annual Covered Payroll (6)	UAAL as % of Payroll (4)/(6) (7)
			Non-Hazardous Members			
2011	$ 5,629,611	$ 8,918,085	$ 3,288,474	63.1%	$ 2,276,596	144.4%
2012	5,547,236	9,139,568	3,592,332	60.7%	2,236,546	160.6%
2013	5,637,094	9,378,876	3,741,782	60.1%	2,236,277	167.3%
2014	6,117,134	9,772,523	3,655,389	62.6%	2,272,270	160.9%
2015	6,474,849	10,740,325	4,265,477	60.3%	2,296,716	185.7%
2016	6,535,372	11,076,457	4,541,084	59.0%	2,352,762	193.0%
2017	6,764,873	12,803,510	6,038,637	52.8%	2,452,407	246.2%
			Hazardous Members			
2011	$ 1,779,545	$ 2,859,041	$ 1,079,496	62.2%	$ 466,964	231.2%
2012	1,747,379	3,009,992	1,262,613	58.1%	464,229	272.0%
2013	1,801,691	3,124,206	1,322,514	57.7%	461,673	286.5%
2014	1,967,640	3,288,826	1,321,186	59.8%	479,164	275.7%
2015	2,096,783	3,613,308	1,516,525	58.0%	483,641	313.6%
2016	2,139,119	3,704,456	1,565,337	57.7%	492,851	317.6%
2017	2,238,320	4,649,047	2,410,727	48.1%	541,633	445.1%
			Total CERS Members			
2011	$ 7,409,156	$ 11,777,126	$ 4,367,970	62.9%	$ 2,743,560	159.2%
2012	7,294,615	12,149,560	4,854,945	60.0%	2,700,775	179.8%
2013	7,438,785	12,503,082	5,064,297	59.5%	2,697,950	187.7%
2014	8,084,774	13,061,349	4,976,575	61.9%	2,751,434	180.9%
2015	8,571,632	14,353,633	5,782,001	59.7%	2,780,357	208.0%
2016	8,674,491	14,780,913	6,106,422	58.7%	2,845,613	214.6%
2017	9,003,193	17,452,557	8,449,364	51.6%	2,994,040	282.2%

Summary of Principal Assumptions and Methods

Below is a summary of the principal economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

	Non-Hazardous	Hazardous
Valuation date:	June 30, 2017	June 30, 2017
Actuarial cost method:	Entry Age Normal	Entry Age Normal
Amortization method:	Level percentage of payroll (2% payroll growth assumed)	Level percentage of payroll (2% payroll growth assumed)
Amortization period for contribution rate:	26-year closed period	26-year closed period
Asset valuation method:	5-Year Smoothed Market	5-Year Smoothed Market
Actuarial assumptions:		
Investment rate of return	6.25%	6.25%
Projected salary increases	3.30% to 11.55% (varies by service)	3.05% to 18.55% (varies by service)
Inflation	2.30%	2.30%
Post-retirement benefit adjustments	0.00%	0.00%
Retiree Mortality	RP-2000 Combined Mortality Table for Males and Females, projected using scale BB to 2013 (set back one year for females).	RP-2000 Combined Mortality Table for Males and Females, projected using scale BB to 2013 (set back one year for females).

Solvency Test
Retirement Benefits
(Dollar amounts expressed in thousands)

	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
June 30,	Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Hazardous Members							
2008	$ 963,214	$ 4,058,767	$ 2,282,237	$ 5,731,502	100.0%	100.0%	31.1%
2009	991,629	4,542,483	2,378,802	5,650,790	100.0%	100.0%	4.9%
2010	1,063,747	4,890,659	2,504,616	5,546,857	100.0%	91.7%	0.0%
2011	1,110,967	5,209,784	2,597,334	5,629,611	100.0%	86.7%	0.0%
2012	1,117,549	5,416,933	2,605,085	5,547,236	100.0%	81.8%	0.0%
2013	1,149,611	5,638,371	2,590,894	5,637,094	100.0%	79.6%	0.0%
2014	1,204,383	5,873,279	2,694,860	6,117,134	100.0%	83.6%	0.0%
2015	1,216,585	6,489,863	3,033,878	6,474,849	100.0%	81.0%	0.0%
2016	1,231,027	6,785,530	3,059,900	6,535,372	100.0%	78.2%	0.0%
2017	1,277,432	7,731,682	3,794,396	6,764,873	100.0%	71.0%	0.0%
Hazardous Members							
2008	$ 338,324	$ 1,406,982	$ 657,815	$ 1,750,867	100.0%	100.0%	0.8%
2009	350,309	1,540,263	687,873	1,751,488	100.0%	91.0%	0.0%
2010	369,613	1,622,684	679,855	1,749,464	100.0%	85.0%	0.0%
2011	382,072	1,768,512	708,457	1,779,545	100.0%	79.0%	0.0%
2012	381,672	1,889,884	738,435	1,747,379	100.0%	72.3%	0.0%
2013	390,471	1,988,030	745,705	1,801,691	100.0%	71.0%	0.0%
2014	415,070	2,077,517	796,239	1,967,640	100.0%	74.7%	0.0%
2015	422,359	2,297,703	893,246	2,096,783	100.0%	72.9%	0.0%
2016	428,713	2,388,712	887,031	2,139,119	100.0%	71.6%	0.0%
2017	458,808	2,910,601	1,279,638	2,238,320	100.0%	61.1%	0.0%

INSURANCE BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability
Insurance Benefits

(Dollar amounts expressed in thousands)

		June 30, 2017	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 2,452,407	$ 541,633
2.	Present value of future pay	$ 19,055,637	$ 3,402,207
3.	Normal cost rate		
	a. Total normal cost rate	3.57%	5.38%
	b. Less: member contribution rate	-0.41%	-0.35%
	c. Employer normal cost rate	3.16%	5.03%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 2,390,844	$ 944,509
	b. Less: present value of future normal costs	(639,131)	(150,840)
	c. Actuarial accrued liability	$ 1,751,713	$ 793,669
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 1,445,497	$ 973,103
	b. Inactive members	157,941	21,661
	c. Active members (Item 4c)	1,751,713	793,669
	d. Total	$ 3,355,151	$ 1,788,433
6.	Actuarial value of assets	$ 2,227,401	$ 1,196,780
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 1,127,750	$ 591,653
8.	Funded Ratio	66.4%	66.9%

Development of Required Contribution Rate
Insurance Benefits

		June 30, 2017	
		Non-Hazardous	Hazardous
		(1)	(2)
1.	Total normal cost rate	3.57%	5.38%
2.	Less: member contribution rate	-0.41%	-0.35%
3.	Total employer normal cost rate	3.16%	5.03%
4.	Administrative expenses	0.03%	0.07%
5.	Net employer normal cost rate	3.19%	5.10%
6.	UAAL amortization contribution	3.02%	7.07%
7.	Total recommended employer contribution	6.21%	12.17%

Actuarial Balance Sheet

Non-Hazardous Members Insurance

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources		
	a. Current assets (actuarial value)	$ 2,227,401	$ 2,079,811
	b. Present value of future member contributions	$ 94,725	$ 79,503
	c. Present value of future employer contributions		
	i. Normal cost contributions	$ 544,406	$ 441,836
	ii. Unfunded accrued liability contributions	1,127,750	908,310
	iii. Total future employer contributions	$ 1,672,156	$ 1,350,146
	d. Total assets	$ 3,994,282	$ 3,509,460
2.	Liabilities - Present Value of Expected Future Benefit Payments		
	a. Active members		
	i. Present value of future normal costs	$ 639,131	$ 521,339
	ii. Accrued liability	1,751,713	1,503,184
	iii. Total present value of future benefits	$ 2,390,844	$ 2,024,523
	b. Present value of benefits payable on account of current retired members and beneficiaries	$ 1,445,497	$ 1,326,305
	c. Present value of benefits payable on account of current inactive members	$ 157,941	$ 158,632
	d. Total liabilities	$ 3,994,282	$ 3,509,460

Actuarial Balance Sheet

Hazardous Members Insurance

(Dollar amounts expressed in thousands)

			June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources			
	a.	Current assets (actuarial value)	$ 1,196,780	$ 1,135,784
	b.	Present value of future member contributions	$ 16,300	$ 13,096
	c.	Present value of future employer contributions		
		i. Normal cost contributions	$ 134,540	$ 124,881
		ii. Unfunded accrued liability contributions	591,653	423,034
		iii. Total future employer contributions	$ 726,193	$ 547,915
	d.	Total assets	$ 1,939,273	$ 1,696,795
2.	Liabilities - Present Value of Expected Future Benefit Payments			
	a.	Active members		
		i. Present value of future normal costs	$ 150,840	$ 137,977
		ii. Accrued liability	793,669	679,458
		iii. Total present value of future benefits	$ 944,509	$ 817,435
	b.	Present value of benefits payable on account of current retired members and beneficiaries	$ 973,103	$ 855,273
	c.	Present value of benefits payable on account of current inactive members	$ 21,661	$ 24,087
	d.	Total liabilities	$ 1,939,273	$ 1,696,795

Reconciliation of Insurance Net Assets
(Dollar amounts expressed in thousands)

	Year Ending June 30, 2017 (1) **Non-Hazardous**	Year Ending June 30, 2017 (2) **Hazardous**
1. Value of assets at beginning of year	$ 1,943,757	$ 1,062,602
2. Revenue for the year		
a. Contributions		
i. Member contributions	$ 9,158	$ 1,708
ii. Employer contributions	117,310	50,743
iii. Other contributions	3,402	794
iii. Total	$ 129,870	$ 53,245
b. Income		
i. Interest, dividends, and other income	$ 58,208	$ 32,002
ii. Investment expenses	(16,245)	(8,992)
iii. Net	$ 41,963	$ 23,010
c. Net realized and unrealized gains (losses)	225,241	121,393
d. Total revenue	$ 397,074	$ 197,648
3. Expenditures for the year		
a. Disbursements		
i. Refunds	$ 0	$ 0
ii. Healthcare premium subsidies	124,573	70,407
iii. Other benefit payments	2,934	461
iv. Transfers to other systems	0	0
v. Total	$ 127,506	$ 70,868
b. Administrative expenses and depreciation	789	381
c. Total expenditures	$ 128,295	$ 71,249
4. Increase in net assets (Item 2. - Item 3.)	$ 268,779	$ 126,399
5. Value of assets at end of year (Item 1. + Item 4.)	$ 2,212,536	$ 1,189,001
6. Net external cash flow		
a. Dollar amount	$ 1,574	$ (18,004)
b. Percentage of market value	0.1%	-1.6%
7. Estimated annual return on net assets	13.7%	13.7%

Development of Actuarial Value of Assets

Non-Hazardous Members Insurance

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	2,079,811
2.	Market value of assets at beginning of year	$	1,943,757
3.	Net new investments		
	a. Contributions	$	129,870
	b. Benefit payments		(127,506)
	c. Administrative expenses		(789)
	d. Subtotal	$	1,574
4.	Market value of assets at end of year	$	2,212,536
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	267,205
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	145,841
8.	Excess return for phased recognition	$	121,364

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	121,364	$	24,273
b.	2016		(147,421)		(29,484)
c.	2015		(110,970)		(22,194)
d.	2014		104,420		20,884
e.	2013		33,482		6,696
f.	Total			$	175

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	2,227,401
11.	Ratio of actuarial value to market value		100.7%
12.	Estimated annual return on actuarial value of assets		7.0%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets

Hazardous Members Insurance

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	1,135,784
2.	Market value of assets at beginning of year	$	1,062,602
3.	Net new investments		
	a. Contributions	$	53,245
	b. Benefit payments		(70,868)
	c. Administrative expenses		(381)
	d. Subtotal	$	(18,004)
4.	Market value of assets at end of year	$	1,189,001
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	144,403
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	79,020
8.	Excess return for phased recognition	$	65,383

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	65,383	$	13,077
b.	2016		(78,507)		(15,701)
c.	2015		(60,152)		(12,030)
d.	2014		55,401		11,080
e.	2013		17,771		3,554
f.	Total			$	(21)

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	1,196,780
11.	Ratio of actuarial value to market value		100.7%
12.	Estimated annual return on actuarial value of assets		7.0%

* Amounts may not add due to rounding

Schedule of Funding Progress
Insurance Benefits
(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Value of Assets (AVA) (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) (4)	Funded Ratio (2)/(3) (5)	Annual Covered Payroll (6)	UAAL as % of Payroll (4)/(6) (7)
			Non-Hazardous Members			
2011	$ 1,433,451	$ 3,073,973	$ 1,640,522	46.6%	$ 2,276,596	72.1%
2012	1,512,854	2,370,771	857,917	63.8%	2,236,546	38.4%
2013	1,628,244	2,443,894	815,650	66.6%	2,236,277	36.5%
2014	1,831,199	2,616,915	785,715	70.0%	2,272,270	34.6%
2015	1,997,456	2,907,827	910,371	68.7%	2,296,716	39.6%
2016	2,079,811	2,988,121	908,310	69.6%	2,352,762	38.6%
2017	2,227,401	3,355,151	1,127,750	66.4%	2,452,407	46.0%
			Hazardous Members			
2011	$ 770,790	$ 1,647,703	$ 876,912	46.8%	$ 466,964	187.8%
2012	829,041	1,364,843	535,802	60.7%	464,229	115.4%
2013	892,774	1,437,333	544,558	62.1%	461,673	118.0%
2014	997,733	1,493,864	496,131	66.8%	479,164	103.5%
2015	1,087,707	1,504,015	416,308	72.3%	483,641	86.1%
2016	1,135,784	1,558,818	423,034	72.9%	492,851	85.8%
2017	1,196,780	1,788,433	591,653	66.9%	541,633	109.2%
			Total CERS Members			
2011	$ 2,204,241	$ 4,721,676	$ 2,517,435	46.7%	$ 2,743,560	91.8%
2012	2,341,895	3,735,614	1,393,719	62.7%	2,700,775	51.6%
2013	2,521,018	3,881,227	1,360,209	65.0%	2,697,950	50.4%
2014	2,828,932	4,110,779	1,281,847	68.8%	2,751,434	46.6%
2015	3,085,163	4,411,842	1,326,679	69.9%	2,780,357	47.7%
2016	3,215,595	4,546,939	1,331,344	70.7%	2,845,613	46.8%
2017	3,424,181	5,143,584	1,719,403	66.6%	2,994,040	57.4%

Solvency Test
Insurance Benefits
(Dollar amounts expressed in thousands)

June 30,	Actuarial Accrued Liability: Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Portion of Aggregate Accrued Liabilities Covered by Assets: Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Hazardous Members							
2008	$ -	$ 1,521,450	$ 2,061,743	$ 1,168,883	100.0%	76.8%	0.0%
2009	-	1,478,783	1,591,603	1,216,632	100.0%	82.3%	0.0%
2010	-	1,526,533	1,631,807	1,293,039	100.0%	84.7%	0.0%
2011	-	1,460,808	1,613,165	1,433,451	100.0%	98.1%	0.0%
2012	-	1,146,908	1,223,864	1,512,854	100.0%	100.0%	29.9%
2013	-	1,205,599	1,238,295	1,628,244	100.0%	100.0%	34.1%
2014	-	1,318,183	1,298,732	1,831,199	100.0%	100.0%	39.5%
2015	-	1,372,597	1,535,231	1,997,456	100.0%	100.0%	40.7%
2016	-	1,484,937	1,503,184	2,079,811	100.0%	100.0%	39.6%
2017	-	1,603,438	1,751,713	2,227,401	100.0%	100.0%	35.6%
Hazardous Members							
2008	$ -	$ 722,435	$ 1,047,348	$ 613,526	100.0%	84.9%	0.0%
2009	-	725,900	867,648	651,131	100.0%	89.7%	0.0%
2010	-	814,300	860,403	692,770	100.0%	85.1%	0.0%
2011	-	771,631	876,071	770,790	100.0%	99.9%	0.0%
2012	-	575,099	789,744	829,041	100.0%	100.0%	32.2%
2013	-	660,955	776,377	892,774	100.0%	100.0%	29.9%
2014	-	700,312	793,553	997,733	100.0%	100.0%	37.5%
2015	-	790,714	713,301	1,087,707	100.0%	100.0%	41.6%
2016	-	879,360	679,458	1,135,784	100.0%	100.0%	37.7%
2017	-	994,764	793,669	1,196,780	100.0%	100.0%	25.5%

SECTION 4

MEMBERSHIP INFORMATION

Membership Tables

Summary of Membership Data

(Total dollar amounts expressed in thousands)

		Non-Hazardous June 30, 2017 (1)	Hazardous June 30, 2017 (2)	Total June 30, 2017 (3)
1.	Active members			
a.	Males	29,300	8,355	37,655
b.	Females	52,898	1,140	54,038
c.	Total members	82,198	9,495	91,693
d.	Total annualized prior year salaries	$ 2,452,407	$ 541,633	$ 2,994,040
e.	Average salary	$ 29,835	$ 57,044	$ 32,653
f.	Average age	47.9	39.2	47.0
g.	Average service	9.4	10.5	9.5
h.	Member contributions with interest	$ 1,277,432	$ 458,808	$ 1,736,240
i.	Average contributions with interest	$ 15,541	$ 48,321	$ 18,935
2.	Vested inactive members			
a.	Number	14,563	795	15,358
b.	Total annual deferred benefits	$ 61,920	$ 7,090	$ 69,010
c.	Average annual deferred benefit	$ 4,252	$ 8,918	$ 4,493
d.	Average age at the valuation date	51.0	43.5	N/A
3.	Nonvested inactive members			
a.	Number	70,468	2,403	72,871
b.	Total member contributions with interest	$ 79,007	$ 7,245	$ 86,252
c.	Average contributions with interest	$ 1,121	$ 3,015	$ 1,184
4.	Service retirees			
a.	Number	49,575	7,402	56,977
b.	Total annual benefits	$ 574,210	$ 202,267	$ 776,476
c.	Average annual benefit	$ 11,583	$ 27,326	$ 13,628
d.	Average age at the valuation date	70.2	61.8	69.1
5.	Disabled retirees			
a.	Number	4,089	551	4,640
b.	Total annual benefits	$ 45,906	$ 9,102	$ 55,008
c.	Average annual benefit	$ 11,227	$ 16,519	$ 11,855
d.	Average age at the valuation date	64.9	56.1	63.8
6.	Beneficiaries			
a.	Number	5,349	1,045	6,394
b.	Total annual benefits	$ 47,352	$ 15,312	$ 62,664
c.	Average annual benefit	$ 8,852	$ 14,653	$ 9,800
d.	Average age at the valuation date	68.7	57.6	66.9

Summary of Historical Active Membership

June 30,	Active Members: Number	Active Members: Percent Increase /(Decrease)	Covered Payroll: Amount in Thousands	Covered Payroll: Percent Increase /(Decrease)	Average Annual Pay: Amount	Average Annual Pay: Percent Increase /(Decrease)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Hazardous Members						
2011	85,285		$ 2,276,596		$ 26,694	1.1%
2012	83,052	-2.6%	2,236,546	-1.8%	26,929	0.9%
2013	81,815	-1.5%	2,236,277	0.0%	27,333	1.5%
2014	81,115	-0.9%	2,272,270	1.6%	28,013	2.5%
2015	80,852	-0.3%	2,296,716	1.1%	28,406	1.4%
2016	80,664	-0.2%	2,352,762	2.4%	29,167	2.7%
2017	82,198	1.9%	2,452,407	4.2%	29,835	2.3%
Hazardous Members						
2011	9,407		$ 466,964		$ 49,640	1.7%
2012	9,130	-2.9%	464,229	-0.6%	50,847	2.4%
2013	9,123	-0.1%	461,673	-0.6%	50,605	-0.5%
2014	9,194	0.8%	479,164	3.8%	52,117	3.0%
2015	9,172	-0.2%	483,641	0.9%	52,730	1.2%
2016	9,084	-1.0%	492,851	1.9%	54,255	2.9%
2017	9,495	4.5%	541,633	9.9%	57,044	5.1%

Distribution of Active Members by Age and by Years of Service

Non-Hazardous Members

	Years of Credited Service												
Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
Under 20	116	7	1	1	0	0	0	0	0	0	0	0	125
	$14,326	$20,495	$25,247	$15,310	$0	$0	$0	$0	$0	$0	$0	$0	$14,767
20-24	1,351	612	266	123	47	18	3	0	0	0	0	0	2,420
	$17,383	$22,843	$23,709	$26,240	$29,907	$25,874	$16,613	$0	$0	$0	$0	$0	$20,215
25-29	1,582	1,109	790	501	352	582	16	0	1	1	0	0	4,934
	$19,345	$23,682	$27,440	$29,359	$30,263	$33,560	$38,969	$0	$1,200	$81,174	$0	$0	$25,161
30-34	1,283	1,014	818	576	430	1,498	531	15	1	0	0	0	6,166
	$19,226	$23,836	$26,668	$29,352	$30,813	$34,525	$38,953	$41,565	$51,262	$0	$0	$0	$28,201
35-39	1,278	1,020	835	611	516	1,809	1,301	552	20	1	0	0	7,943
	$19,047	$23,701	$24,171	$26,175	$26,741	$33,253	$39,101	$43,592	$51,552	$41,188	$0	$0	$29,542
40-44	1,059	888	857	602	546	2,128	1,651	1,251	402	17	0	0	9,401
	$18,791	$23,316	$24,911	$25,920	$26,785	$30,914	$35,728	$43,282	$49,477	$55,976	$0	$0	$31,054
45-49	1,007	826	760	624	544	2,421	2,273	1,805	934	215	17	0	11,426
	$20,234	$23,468	$25,262	$26,974	$26,008	$29,657	$32,898	$38,637	$46,954	$55,357	$67,469	$0	$31,784
50-54	853	695	630	490	477	2,208	2,395	2,586	1,315	508	116	9	12,282
	$19,382	$23,427	$25,908	$27,947	$27,997	$29,404	$31,373	$32,917	$39,261	$50,616	$59,930	$73,413	$31,454
55-59	661	583	596	432	447	1,926	2,353	2,625	1,812	652	138	48	12,273
	$20,195	$23,952	$25,332	$25,256	$26,217	$29,067	$31,559	$32,162	$35,606	$42,975	$54,148	$62,781	$31,185
60-64	491	361	422	340	353	1,707	1,698	1,777	1,299	586	133	54	9,221
	$16,295	$22,479	$23,690	$25,346	$24,708	$27,935	$32,639	$33,653	$34,327	$40,617	$50,505	$61,433	$30,885
65 & Over	385	295	330	218	248	1,263	1,340	908	528	337	91	64	6,007
	$14,237	$16,715	$20,233	$18,403	$19,458	$23,624	$29,223	$31,674	$32,543	$35,438	$41,754	$53,298	$26,639
Total	10,066	7,410	6,305	4,518	3,960	15,560	13,561	11,519	6,312	2,317	495	175	82,198
	$18,716	$23,227	$25,162	$26,676	$26,894	$30,070	$33,181	$35,305	$38,458	$44,218	$52,703	$59,444	$29,835

Distribution of Active Members by Age and by Years of Service

Hazardous Members

	Years of Credited Service												
Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
Under 20	3	0	0	0	1	0	0	0	0	0	0	0	4
	$32,735	$0	$0	$0	$44,742	$0	$0	$0	$0	$0	$0	$0	$35,737
20-24	218	116	39	12	6	1	0	0	0	0	0	0	392
	$31,003	$39,289	$45,030	$44,626	$40,612	$35,991	$0	$0	$0	$0	$0	$0	$35,427
25-29	225	240	215	214	170	218	2	0	0	0	0	0	1,284
	$33,707	$43,742	$48,733	$47,619	$48,478	$53,071	$47,869	$0	$0	$0	$0	$0	$45,683
30-34	127	115	143	123	166	729	263	1	0	0	0	0	1,667
	$34,262	$44,426	$49,280	$51,712	$50,189	$56,473	$59,511	$78,551	$0	$0	$0	$0	$52,848
35-39	60	46	57	51	75	429	707	225	18	1	0	0	1,669
	$34,233	$45,393	$47,850	$48,995	$53,001	$56,157	$61,242	$65,500	$79,916	$51,518	$0	$0	$58,095
40-44	31	29	23	24	22	228	453	639	198	12	0	0	1,659
	$32,514	$42,658	$48,240	$48,336	$45,818	$54,912	$60,684	$68,155	$75,959	$90,285	$0	$0	$63,416
45-49	26	25	22	15	24	141	280	521	321	55	7	0	1,437
	$29,061	$43,628	$41,978	$48,781	$48,469	$54,823	$57,217	$64,009	$77,251	$85,461	$90,942	$0	$63,952
50-54	17	11	8	13	14	97	163	204	116	103	15	0	761
	$31,956	$40,026	$44,821	$40,538	$48,595	$56,610	$60,409	$64,701	$70,819	$79,994	$89,348	$0	$64,233
55-59	2	12	7	2	6	51	101	92	54	25	13	1	366
	$45,805	$41,635	$42,363	$55,669	$37,587	$55,263	$58,958	$60,316	$62,812	$77,335	$99,484	$116,630	$60,880
60-64	3	3	1	1	1	31	63	34	20	14	6	6	183
	$50,435	$59,964	$59,368	$31,649	$35,411	$52,091	$57,870	$63,589	$69,574	$80,378	$69,058	$98,627	$62,312
65 & Over	1	1	1	1	0	7	31	23	1	3	3	1	73
	$27,189	$39,776	$22,217	$42,993	$0	$45,213	$54,424	$65,878	$44,373	$41,976	$90,783	$121,853	$57,747
Total	713	598	516	456	485	1,932	2,063	1,739	728	213	44	8	9,495
	$32,852	$43,043	$48,019	$48,663	$49,379	$55,567	$59,957	$65,636	$74,614	$81,030	$89,928	$103,781	$57,044

Distribution of Annuitant Monthly Benefit by Status and Age
Non-Hazardous Retirees and Beneficiaries
(Dollar amounts expressed in thousands)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	276	$ 6,258	213	$ 2,578	605	$ 4,743	1,094	$ 13,579
50 - 54	1,208	28,709	313	4,114	240	2,148	1,761	34,971
55 - 59	4,139	72,231	702	8,721	408	4,126	5,249	85,078
60 - 64	8,320	114,696	904	10,600	596	6,021	9,820	131,317
65 - 69	12,190	141,556	821	9,118	764	7,691	13,775	158,365
70 - 74	9,753	96,987	550	5,542	740	7,020	11,043	109,549
75 - 79	6,764	61,869	368	3,508	741	6,511	7,873	71,888
80 - 84	4,007	32,317	166	1,394	568	4,645	4,741	38,356
85 - 89	1,990	14,382	46	291	408	2,856	2,444	17,529
90 And Over	928	5,204	6	39	279	1,591	1,213	6,834
Total	**49,575**	**$ 574,210**	**4,089**	**$ 45,906**	**5,349**	**$ 47,352**	**59,013**	**$ 667,468**

Distribution of Annuitant Monthly Benefit by Status and Age
Hazardous Retirees and Beneficiaries
(Dollar amounts expressed in thousands)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	830	$ 26,495	164	$ 2,943	256	$ 1,918	1,250	$ 31,356
50 - 54	1,167	37,679	99	1,725	68	1,169	1,334	40,573
55 - 59	1,193	34,754	89	1,506	103	1,587	1,385	37,847
60 - 64	1,398	37,634	96	1,391	132	2,087	1,626	41,112
65 - 69	1,387	34,980	66	982	143	2,674	1,596	38,636
70 - 74	806	17,744	27	415	147	2,557	980	20,716
75 - 79	397	8,215	2	25	95	1,751	494	9,991
80 - 84	158	3,217	7	95	60	899	225	4,211
85 - 89	56	1,341	0	-	35	551	91	1,892
90 And Over	10	207	1	20	6	119	17	346
Total	**7,402**	**$ 202,267**	**551**	**$ 9,102**	**1,045**	**$ 15,312**	**8,998**	**$ 226,680**

Non-Hazardous Retired Lives Summary

Form of Payment	Male Lives Number	Male Lives Monthly Benefit Amount	Female Lives Number	Female Lives Monthly Benefit Amount	Total Number	Total Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	5,433	$ 5,654,324	19,324	$ 14,240,228	24,757	$ 19,894,552
Joint & Survivor:						
100% to Beneficiary	3,081	3,496,419	1,680	1,056,228	4,761	4,552,647
66 2/3% to Beneficiary	817	1,516,140	612	653,305	1,429	2,169,445
50% to Beneficiary	1,144	1,857,408	1,603	1,863,468	2,747	3,720,877
Pop-up Option	4,111	6,488,014	3,697	3,906,152	7,808	10,394,165
Social Security Option:						
Age 62 Basic	257	448,542	535	553,209	792	1,001,752
Age 62 Survivorship	598	1,057,324	355	350,888	953	1,408,212
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	1	3,007	1	236	2	3,243
10 Years Certain & Life	1,424	1,460,646	3,480	2,649,787	4,904	4,110,433
15 Years Certain & Life	649	662,254	859	650,927	1,508	1,313,181
20 Years Certain & Life	482	651,052	745	565,567	1,227	1,216,619
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	96	114,040	365	312,783	461	426,822
24 Month Basic	59	40,600	243	194,946	302	235,546
36 Month Basic	253	124,069	708	322,323	961	446,392
12 Month Survivor	144	176,456	92	93,158	236	269,615
24 Month Survivor	89	91,577	60	40,491	149	132,067
36 Month Survivor	390	254,202	277	126,566	667	380,768
Total:	19,028	$ 24,096,075	34,636	$ 27,580,261	53,664	$ 51,676,336

Hazardous Retired Lives Summary

Form of Payment	Male Lives Number	Male Lives Monthly Benefit Amount	Female Lives Number	Female Lives Monthly Benefit Amount	Total Number	Total Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	1,095	$ 2,239,751	328	$ 503,186	1,423	$ 2,742,937
Joint & Survivor:						
100% to Beneficiary	898	1,900,096	39	49,096	937	1,949,192
66 2/3% to Beneficiary	325	816,348	13	27,475	338	843,823
50% to Beneficiary	467	1,129,014	43	96,969	510	1,225,984
Pop-up Option	3,090	7,872,075	147	289,025	3,237	8,161,100
Social Security Option:						
Age 62 Basic	108	173,877	13	13,278	121	187,155
Age 62 Survivorship	292	467,388	19	32,804	311	500,192
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	85	145,525	5	5,333	90	150,858
10 Years Certain & Life	225	469,925	66	119,374	291	589,299
15 Years Certain & Life	91	175,897	17	28,006	108	203,903
20 Years Certain & Life	156	324,566	29	45,859	185	370,425
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	23	37,037	9	12,127	32	49,164
24 Month Basic	20	42,799	6	6,336	26	49,135
36 Month Basic	53	85,377	20	23,431	73	108,808
12 Month Survivor	57	146,314	4	8,080	61	154,394
24 Month Survivor	68	110,450	2	2,220	70	112,670
36 Month Survivor	134	208,725	6	6,249	140	214,973
Total:	7,187	$ 16,345,163	766	$ 1,268,848	7,953	$ 17,614,011

Non-Hazardous Beneficiary Lives Summary

	Male Lives		Female Lives		Total	
Form of Payment	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	16	$ 4,408	42	$ 25,711	58	$ 30,119
Joint & Survivor:						
100% to Beneficiary	534	320,572	1,578	1,073,177	2,112	1,393,748
66 2/3% to Beneficiary	86	54,726	242	189,302	328	244,028
50% to Beneficiary	154	60,896	412	235,493	566	296,389
Pop-up Option	260	232,093	675	682,333	935	914,425
Social Security Option:						
Age 62 Basic	0	0	5	4,806	5	4,806
Age 62 Survivorship	44	49,846	147	176,382	191	226,228
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	94	64,720	109	72,951	203	137,671
10 Years Certain	142	86,298	172	141,416	314	227,714
10 Years Certain & Life	58	39,911	79	59,000	137	98,910
15 Years Certain & Life	41	38,912	68	55,007	109	93,919
20 Years Certain & Life	55	37,304	62	62,091	117	99,395
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	0	0	1	395	1	395
24 Month Basic	0	0	0	0	0	0
36 Month Basic	1	149	1	152	2	301
12 Month Survivor	11	7,150	46	46,720	57	53,869
24 Month Survivor	15	14,462	30	28,682	45	43,144
36 Month Survivor	48	24,467	121	56,451	169	80,918
Total:	1,559	$ 1,035,914	3,790	$ 2,910,068	5,349	$ 3,945,982

Hazardous Beneficiary Lives Summary

	Male Lives			Female Lives			Total		
Form of Payment	Number		Monthly Benefit Amount	Number		Monthly Benefit Amount	Number		Monthly Benefit Amount
(1)	(2)		(3)	(4)		(5)	(6)		(7)
Basic	11	$	5,268	40	$	30,031	51	$	35,299
Joint & Survivor:									
100% to Beneficiary	43		37,391	229		285,889	272		323,280
66 2/3% to Beneficiary	10		9,658	51		70,709	61		80,367
50% to Beneficiary	17		13,273	68		66,619	85		79,892
Pop-up Option	62		75,205	259		415,988	321		491,193
Social Security Option:	0		0	0		0			
Age 62 Basic	0		0	1		310	1		310
Age 62 Survivorship	7		12,994	101		136,037	108		149,031
Partial Deferred (Old Plan)	0		0	0		0	0		0
Widows Age 60	0		0	3		2,669	3		2,669
5 Years Certain	2		2,495	0		0	2		2,495
10 Years Certain	29		24,957	9		7,349	38		32,306
10 Years Certain & Life	5		3,627	7		5,858	12		9,485
15 Years Certain & Life	3		998	5		1,440	8		2,438
20 Years Certain & Life	5		2,742	11		9,683	16		12,424
Refund	0		0	0		0	0		0
Partial Lump Sum Option (PLSO):	0		0	0		0			
12 Month Basic	0		0	1		2,192	1		2,192
24 Month Basic	0		0	1		1,467	1		1,467
36 Month Basic	2		562	3		1,619	5		2,181
12 Month Survivor	1		579	6		4,611	7		5,189
24 Month Survivor	2		1,468	10		7,091	12		8,560
36 Month Survivor	10		8,827	31		26,389	41		35,215
Total:	209	$	200,043	836	$	1,075,951	1,045	$	1,275,994

Schedule of Retirants Added to And Removed from Rolls
(Dollar amounts except average allowance expressed in thousands)

Year Ended	Added to Rolls Number	Removed from Rolls Number	Rolls End of the Year Number	Rolls End of the Year Annual Benefits	% Increase in Annual Benefit	Average Annual Benefit
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Non-Hazardous			
2011	3,250	1,077	43,211	$ 483,594		$ 11,191
2012	3,300	1,207	45,304	515,008	6.5%	11,368
2013	3,570	1,198	47,676	557,979	8.3%	11,704
2014	3,480	1,221	49,935	582,958	4.5%	11,674
2015	4,020	1,304	52,651	617,551	5.9%	11,729
2016	4,409	721	56,339	661,217	7.1%	11,736
2017	4,141	1,467	59,013	667,468	0.9%	11,311
			Hazardous			
2011	502	102	6,468	$ 160,259		$ 24,777
2012	483	73	6,878	173,221	8.1%	25,185
2013	519	104	7,293	182,635	5.4%	25,043
2014	469	116	7,646	191,008	4.6%	24,981
2015	526	138	8,034	202,153	5.8%	25,162
2016	604	75	8,563	215,302	6.5%	25,143
2017	576	141	8,998	226,681	5.3%	25,192

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Methods and Assumptions

The following presents a summary of the actuarial assumptions and methods used in the valuation of the County Employees Retirement System.

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 for the retirement funds and the insurance funds

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%

Retirement rates:

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

	Non-Hazardous			Hazardous	
Age	Members participating before 9/1/2008[1]	Members participating on or after 9/1/2008[2]	Service	Members participating before 9/1/2008[3]	Members participating on or after 9/1/2008[4]
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%

[1] If service is at least 27 years, the rate is 30%.
[2] If age plus service is at least 87, the rate is 30%.
[3] The annual rate of service retirement is 100% at age 62.
[4] The annual rate of service retirement is 100% at age 60.

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%

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.

At the time of the last experience study, performed as of June 30, 2013, this mortality assumption provided 37% and 19% margin for future improvement for males and females, respectively. *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

Dependent Children:

For members in the Hazardous Plan who receive a duty-related death benefit, the member is assumed to be survived by two dependent children, each age 6 with payments for 15 years.

Form of Payment:

Members are assumed to elect a life-only annuity at retirement.

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 for Medicare retirees, the valuation relied on the Society of Actuaries' 2013 Study "Health Care Costs – From Birth to Death". Table 4 (Development of Plan Specific Medicare Age Curve) was used to model the impact of aging for ages 65 and over.

Health Care Cost Trend Rates[1]:

January 1	Non-Medicare Plans	Medicare Plans	Dollar Contribution[2]
2019	7.25%	5.10%	1.50%
2020	7.00%	5.00%	1.50%
2021	6.75%	4.90%	1.50%
2022	6.50%	4.80%	1.50%
2023	6.25%	4.70%	1.50%
2024	6.00%	4.60%	1.50%
2025	5.75%	4.50%	1.50%
2026	5.50%	4.40%	1.50%
2027	5.25%	4.30%	1.50%
2028	5.00%	4.20%	1.50%
2029	4.75%	4.10%	1.50%
2030	4.50%	4.05%	1.50%
2031	4.25%	4.05%	1.50%
2032 & Beyond	4.05%	4.05%	1.50%

[1]All increases are assumed to occur on January 1. The 2018 premiums were known at the time of the valuation and were incorporated into the liability measurement using a trend of 1.232% for Non-Medicare plans and a trend of 0.00% for Medicare plans at January 1, 2018.

[2]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.

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, 2017 Participation*
Medical Only	7%
Essential	8%
Premium	84%

* May not add due to rounding

Non-Medicare Plan	June 30, 2017 Participation
Standard PPO	14%
Standard CDHP	2%
LivingWell CDHP	22%
LivingWell PPO	62%

- 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.

- 50% 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.

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 and a 0.95% decrease in the health care cost trend rates.
3. The payroll growth assumption (used for the amortization of unfunded actuarial accrued liabilities) was changed from 4.00% to 2.00%.

Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were based on the plan premiums effective January 1, 2017, 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. The spouse/dependent premium of $862.64 for non-Medicare retirees is based on a blending of Family and Couple premiums for the current retirees that have over 4 years of hazardous service. The fully-insured premiums KRS pays the Kentucky Employees' Health Plan (KEHP) 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 rate subsidy for the non-Medicare eligible retirees. Actuarial Standard of Practice No. 6 (ASOP No. 6) requires aging subsidies (or implicit rate subsidies) to be recognized. However, the KRS health insurance trusts are only used to reimburse KEHP for the employer's portion of the blended premiums. Said another way, the trusts are not used to fund the difference between the underlying retiree claims and the blended KEHP premiums. As a result, the retiree health care liabilities developed in this report for the non-Medicare retirees are based solely on the premiums charged by KEHP, without any age-adjustment. GASB Statements No. 74 and No. 75 prohibit such a deviation from ASOP No. 6. The liabilities developed in this report are solely for the purpose of funding the benefits paid by the health insurance funds and are not appropriate for financial statement disclosures required by GASB. GRS provides separate GASB reports to KRS which include the liabilities associated with the implicit rate subsidy.

For those not eligible for Medicare		
Age	Member	Spouse/Dependents
<65	$711.22	$862.64

For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2017, 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 for retirees over the age of 65. 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 eligible for Medicare		
Age	Male	Female
65	$208.66	$196.81
75	244.13	238.22
85	258.16	261.20

Appendix B of the report provides a full schedule of premiums.

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

Mehdi Riazi, FSA, EA, MAAA

Appendix B

Benefit Provisions

Summary of Benefit Provisions for County Employees Retirement System (CERS)

CERS Non-Hazardous Employees

Retirement: Tier 1, Participation before 9/1/2008

Normal Retirement Eligibility	Age 65 with at least 1 month of service credit; or Any age with at least 27 years of service
Benefit Amount	If a member has at least 48 months of service, the monthly benefit is 2.00% times final average compensation times years of service. For members who began participating prior to 8/1/2004, the monthly benefit is 2.20% times final average compensation times years of service. If a member has less than 48 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest. Final average compensation is based on the member's highest 5 years of compensation.
Early Retirement Eligibility	Any age (prior to age 65) with at least 25 years of service; or Age 55 with at least 5 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement eligibility precedes the member's normal retirement date.

CERS Non-Hazardous Employees (continued)

Retirement: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Normal Retirement Eligibility	Age 65 with at least 5 years of service; or Rule of 87 (Age 57 or older if age plus service equals 87)
Benefit Amount	The monthly benefit is equal to the applicable benefit multiplier times final average compensation times years of service.

Years of Service	Benefit Multiplier
10 or less	1.10%
10-20	1.30%
20-26	1.50%
26-30	1.75%
Greater than 30*	2.00%

* The 2.00% benefit multiplier only applies to service credit in excess of 30 years. If a member has greater than 30 years of service at retirement, service prior to 30 years will be multiplied by the 1.75% benefit multiplier.

Final compensation is based on the member's last 5 years of compensation.

Early Retirement Eligibility	Age 60 with at least 10 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

Retirement: Tier 3, Participation on or after 1/1/2014

Normal Retirement Eligibility	Age 65 with at least 5 years of service; or Rule of 87 (Age 57 or older if age plus service equals 87)
Benefit Amount	Each year that the member is active, a 4.00% employer pay credit and the employee's 5.00% contribution will be credited to each member's hypothetical cash balance account. The hypothetical account will earn interest at a minimum rate of 4%, annually. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest in that year equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. At retirement, the member's hypothetical account balance may be converted into an annuity based on an actuarial factor.
Early Retirement Eligibility	N/A

CERS Non-Hazardous Employees (continued)

Deferred Vested Benefit: Tier 1, Participation before 9/1/2008

Eligibility	At least 1 month of service credit
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Eligibility	5 years of service
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit Tier 3, Participation on or after 1/1/2014

Eligibility	5 years of service
Benefit Amount	At termination of employment, members may choose to leave their account balance with the System and retire once they are eligible. The hypothetical account balance will earn 4% annual interest after termination. Members may also choose to withdrawal their entire accumulated balance. If a member does not have 5 years of service at termination, the member is eligible to receive a partial refund of their account balance. This refund includes the member's contributions with interest.

Disability Retirement: Participation before 8/1/2004

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	Disability benefits are calculated in the same manner as the normal retirement benefit with years of service and final compensation being determined as of the date of disability, except that service credit shall be added to the person's total service beginning with the last date of paid employment and continuing to the member's 65th birthday, with total service not exceeding 25 years. Total service credit added shall not be greater than the member's actual service at disability. For members with at least 25 years of service on the last day of paid employment but less than 27 years of service, total service shall be 27 years. For members with 27 or more years of service credit, actual service will be used.

CERS Non-Hazardous Employees (continued)

Disability Retirement: Participation on or after 8/1/2004 but before 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 20% of the member's final monthly rate of pay or the member's normal retirement benefit (without reduction for early retirement) with years and final compensation being determined as of the date of disability.

Disability Retirement: Participation on or after 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 20% of the member's final monthly rate of pay or the member's retirement benefit calculated at the member's normal retirement date.

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member's final monthly rate of pay. Additionally, each eligible dependent child will receive 10% of the member's monthly final rate of pay up to a maximum of 40%.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 55 with at least 60 months of service and actively working at the time of death; or At least 144 months of service, if no longer actively working
Spouse Benefit	The member's retirement benefit calculated in the same manner as if the member had retired on the day of the member's death and elected a 100% joint and survivor benefit. The benefit is actuarially reduced if the member dies prior to their normal retirement age.

Pre-Retirement Death Benefit (Death in the Line of Duty)

Eligibility	One month of service credit
Spouse Benefit	A $10,000 lump sum payment plus a monthly payment of 25% of the deceased member's final monthly rate of pay. A spouse may also elect the non-line of duty death benefit.
Child Benefit	Each eligible dependent child will receive 10% of the member's final monthly rate of pay up to a maximum of 40%.

CERS Non-Hazardous Employees (continued)

Post-Retirement Death Benefit

Eligibility	48 months of service, and in receipt of retirement benefits
Death Benefit	A $5,000 lump sum payment

Member Contributions

Tier 1, Participation before 9/1/2008	5% of creditable compensation. Members who do not receive a retirement benefit are entitled to a full refund of contributions with interest. The annual interest rate is set by the KRS board, not less than 2.0%.
Tier 2, Participation on or after 9/1/2008 but before 1/1/2014	5% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest. The annual interest rate is 2.5%.
Tier 3, Participation after 1/1/2014	5% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest.

Changes since the Prior Valuation

None.

CERS Hazardous Employees

Retirement: Tier 1, Participation before 9/1/2008

Normal Retirement Eligibility	Age 55 with at least 1 month of service credit; or Any age with at least 20 years of service
Benefit Amount	If a member has at least 60 months of service, the monthly benefit is 2.50% times final average compensation times years of service. If a member has less than 60 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest. Final average compensation is based on the member's highest 3 years of compensation.
Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

CERS Hazardous Employees (continued)

Retirement: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	The monthly benefit is equal to the applicable benefit multiplier times final average compensation times years of service.

Years of Service	Benefit Multiplier
10 or less	1.30%
10-20	1.50%
20-25	2.25%
Greater than 25	2.50%

Final average compensation is based on the member's highest 3 years of compensation.

Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

Retirement: Tier 3, Participation on or after 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	Each year that the member is active, a 7.50% employer pay credit and the employee's 8.00% contribution will be credited to each member's hypothetical cash balance account. The hypothetical account will earn interest at a minimum rate of 4%, annually. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest in that year equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. At retirement, the member's hypothetical account balance may be converted into an annuity based on an actuarial factor.
Early Retirement Eligibility	N/A

CERS Hazardous Employees (continued)

Deferred Vested Benefit: Tier 1, Participation before 9/1/2008

Eligibility	At least 1 month of service credit
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Eligibility	5 years of service
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit Tier 3, Participation on or after 1/1/2014

Eligibility	5 years of service
Benefit Amount	At termination of employment, members may choose to leave their account balance with the System and retire once they are eligible. The hypothetical account balance will earn 4% annual interest after termination. Members may also choose to withdrawal their entire accumulated balance. If a member does not have 5 years of service at termination, the member is eligible to receive a partial refund of their account balance. This refund includes the member's contributions with interest.

Disability Retirement: Participation before 8/1/2004

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	Disability benefits are calculated in the same manner as the normal retirement benefit with years of service and final compensation being determined as of the date of disability, except that if the member has less than 20 years of service at disability, service credit shall be added to the person's total service beginning with the last date of paid employment and continuing to the member's 55th birthday, with total service not exceeding 20 years. Total service credit added shall not be greater than the member's actual service at disability.

CERS Hazardous Employees (continued)

Disability Retirement: Participation on or after 8/1/2004 but before 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member's final monthly rate of pay or the member's normal retirement benefit (without reduction for early retirement) with years and final compensation being determined as of the date of disability.

Disability Retirement: Participation on or after 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member's final monthly rate of pay or the member's retirement benefit calculated at the member's normal retirement date.

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member's final monthly rate of pay. Additionally, each eligible dependent child will receive 10% of the member's monthly final rate of pay up to a maximum of 40%.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 55 with at least 60 months of service and actively working at the time of death; or At least 144 months of service, if no longer actively working
Spouse Benefit	The member's retirement benefit calculated in the same manner as if the member had retired on the day of the member's death and elected a 100% joint and survivor benefit. The benefit is actuarially reduced if the member dies prior to their normal retirement age.

Pre-Retirement Death Benefit (Death in the Line of Duty)

Eligibility	One month of service credit
Spouse Benefit	A $10,000 lump sum payment plus a monthly payment of 25% of the deceased member's final monthly rate of pay. A spouse may also elect the non-line of duty death benefit.
Non-Spouse Benefit	If the beneficiary is only one person who is a dependent receiving at least 50% of his or her support from the member, the beneficiary may elect a lump sum payment of$10,000.
Child Benefit	Each eligible dependent child will receive 10% of the member's final monthly rate of pay up to a maximum of 40%.

CERS Hazardous Employees (continued)

Post-Retirement Death Benefit

Eligibility	48 months of service, and in receipt of retirement benefits
Death Benefit	A $5,000 lump sum payment

Member Contributions

Tier 1, Participation before 9/1/2008	8% of creditable compensation. Members who do not receive a retirement benefit are entitled to a full refund of contributions with interest. The annual interest rate is set by the KRS board, not less than 2.0%.
Tier 2, Participation on or after 9/1/2008 but before 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest. The annual interest rate is 2.5%.
Tier 3, Participation after 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest.

Changes since the Prior Valuation

None.

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.

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

Benefit Eligibility	Recipient of a retirement allowance with at least 120 months of service at retirement
Non-Hazardous Subsidy	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, 2017, the Non-Hazardous monthly contribution was $13.18/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.
Hazardous Subsidy	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, 2017, the Non-Hazardous monthly contribution was $19.77/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of $10 ($13.18 as of July 1, 2017) for each year of hazardous service.
Duty Disability Retirement	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.
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 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.
Non-Duty Death in Service	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.

Monthly Health Plan Premiums – Effective January 1, 2018

Non-Medicare Plan Options					
Plan Option	Single	Parent Plus	Couple	Family	Family X-Ref
LivingWell PPO*	$729.34	$1,037.08	$1,589.10	$1,767.60	$876.68
LivingWell CDHP	709.46	978.50	1,325.64	1,479.76	818.96
Standard PPO	685.38	975.90	1,497.18	1,666.26	824.54
Standard CDHP	682.80	940.64	1,450.02	1,615.30	800.94

Medicare Plan Options	
Kentucky Retirement Systems - Medical Only Plan	$165.01
Kentucky Retirement Systems – Medicare Advantage/Essential Plan	75.56
Kentucky Retirement Systems – Medicare Advantage/Premium Plan*	252.21

*For 2018, 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, 2017.

Non-Hazardous Service	Hazardous Service
$13.18	$19.77

APPENDIX C

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)

b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and

c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations that provide the financial information of the plan, such as the funded ratio, unfunded actuarial accrued liability and the ADC.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Actuarially Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: The portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period specified in State statute. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on a statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 67 and ***GASB 68***: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting and reporting rules for public retirement systems and the employers that sponsor, participate in, or contribute to them. Statement No. 67 sets the accounting rules for the financial reporting of the retirement systems, while Statement No. 68 sets the rules for the employers that sponsor, participate in, or contribute to public retirement systems.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded

Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but may not decrease by exactly one year in the subsequent year's actuarial valuation. For instance, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

State Police Retirement System (SPRS)

Actuarial Valuation Report as of June 30, 2017

GRS Retirement Consulting
P: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

October 30, 2017

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

Subject: Actuarial Valuation as of June 30, 2017

Dear Trustees of the Board:

This report describes the current actuarial condition of the State Police Retirement System (SPRS), determines the required employer contribution rates, and analyzes changes in the System's financial condition. In addition, the report provides various summaries of the data. Separate reports are issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67, 68, 74 and 75. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of June 30, the first day of the plan year for KRS. This report was prepared at the request of the Board of Trustees of the Kentucky Retirement System (Board) and is intended for use by the KRS staff and those designated or approved by the Board.

FINANCING OBJECTIVES AND FUNDING POLICY

The employer contribution rate is determined in accordance with Section 61.565 of Kentucky Statute. As specified by the Statute, the employer contribution rate is determined based on a closed thirty-year amortization period beginning July 1, 2013. As a result, the amortization period used in the 2017 actuarial valuation is 26 years. The contribution rate determined by this actuarial valuation becomes effective twelve months after the valuation date and is effective for two fiscal years. In other words, the contribution rate determined by this June 30, 2017 actuarial valuation will be used by the Board to certify the Commonwealth's contribution rates for the fiscal year July 1, 2018 and ending June 30, 2020.

If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated rate before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

ASSUMPTIONS AND METHODS

Kentucky Statutes also requires that an actuarial investigation be performed at least every five years to review the economic and demographic assumptions. An experience study was conducted

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as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Subsequent to the last actuarial valuation the Board decreased the price inflation assumption to 2.30%, and decreased the assumed rate of return to 5.25% for the Retirement Fund and to 6.25% for the Health Insurance Fund. Finally, the amortization of the unfunded actuarial accrued liability will be amortized on a level dollar basis for the Retirement and Health Insurance funds, but will continued to be expressed as a percentage of expected covered payroll. It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

BENEFIT PROVISIONS

The benefit provisions reflected in this valuation are those which were in effect on June 30, 2017. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2017, by the KRS staff. The staff also supplied asset information as of June 30, 2017. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by KRS.

CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of SPRS as of June 30, 2017.

All of our work conforms with generally accepted actuarial principles and practices, and is in conformity with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of Kentucky Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries. All three of the undersigned are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. All of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,

Gabriel, Roeder, Smith & Co.

Joseph P. Newton, FSA, MAAA, EA
Senior Consultant

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

Janie Shaw, ASA, MAAA
Consultant

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SECTION 1

EXECUTIVE SUMMARY

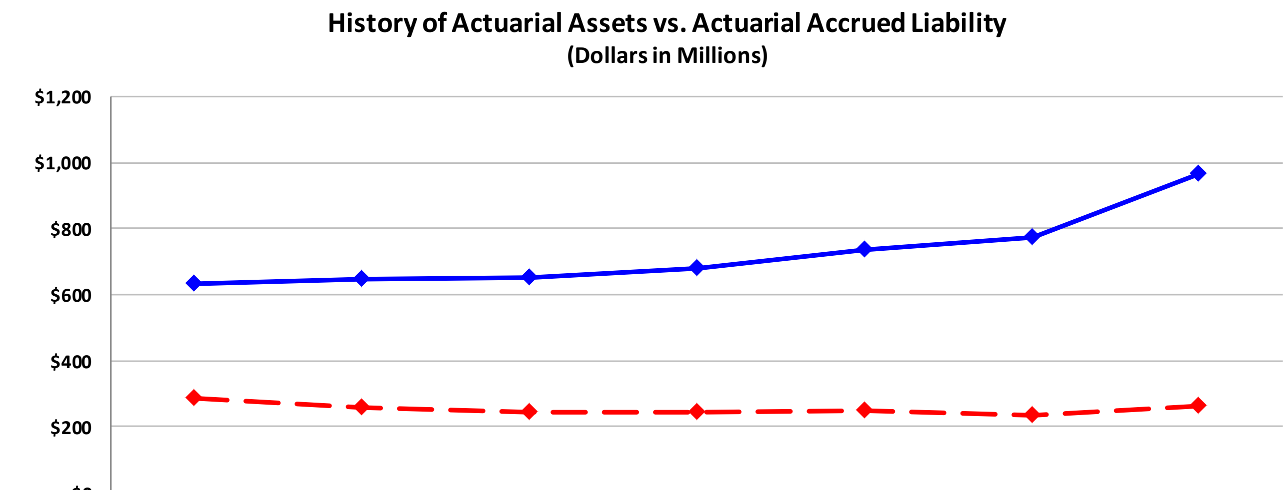
Summary of Principal Results

(Dollar amounts expressed in thousands)

	SPRS	
	June 30, 2017	June 30, 2016
Contributions for next fiscal year:		
Retirement	119.05%	71.57%
Insurance	27.23%	18.10%
Total	146.28%	89.67%
Assets:		
Retirement		
• Actuarial value (AVAR)	$261,320	$234,568
• Market value (MVAR)	$255,737	$217,594
• Ratio of actuarial to market value of assets	102.2%	107.8%
Insurance		
• Actuarial value (AVAI)	$180,464	$172,704
• Market value (MVAI)	$178,838	$161,366
• Ratio of actuarial to market value of assets	100.9%	107.0%
Funded Status:		
Retirement		
• Actuarial accrued liability	$967,145	$775,160
• Unfunded accrued liability on AVAR	$705,825	$540,593
• Funded ratio on AVAR	27.0%	30.3%
• Unfunded accrued liability on MVAR	$711,408	$557,566
• Funded ratio on MVAR	26.4%	28.1%
Insurance		
• Actuarial accrued liability	$276,641	$257,197
• Unfunded accrued liability on AVAI	$96,177	$84,494
• Funded ratio on AVAI	65.2%	67.1%
• Unfunded accrued liability on MVAI	$97,803	$95,831
• Funded ratio on MVAI	64.6%	62.7%
Membership:		
• Number of		
- Active Members	903	908
- Retirees and Beneficiaries	1,536	1,515
- Inactive Members	480	455
- Total	2,919	2,878
• Projected payroll of active members	$48,598	$45,551
• Average salary of active members	$53,818	$50,166

Executive Summary (Continued)

The unfunded actuarial accrued liability increased by $165.2 million since the prior year's valuation to $705.8 million. The largest source of this increase is the result of the decrease in the assumed rate of investment return which resulted in a $136.6 million increase in the unfunded liability. Below is a chart with the historical actuarial value of assets and actuarial accrued liability. The divergence in the assets and liability over the last seven years has generally been due to a combination of the actual investment experience being less than the fund's expected investment return assumption, a decrease in the assumed rate of return in 2015, 2016 and again in 2017, and contributions that were insufficient to amortize the unfunded actuarial accrued liability.



	2011	2012	2013	2014	2015	2016	2017
AAL	634.4	647.7	651.6	681.1	734.2	775.2	967.1
AVA	285.6	259.8	241.8	242.7	248.4	234.6	261.3

SECTION 2

DISCUSSION

Discussion

The State Police Retirement System (SPRS) is a defined benefit pension fund that provides pensions and health care coverage for uniformed state police officers. SPRS includes both non-hazardous and hazardous duty benefits. This report presents the result of the June 30, 2017 actuarial funding valuation for both the Retirement Plan and Insurance Funds.

The primary purposes of the valuation report are to depict the current financial condition of the System, determine the annual required contribution, and analyze changes in the System's financial condition. In addition, the report provides various summaries of the data.

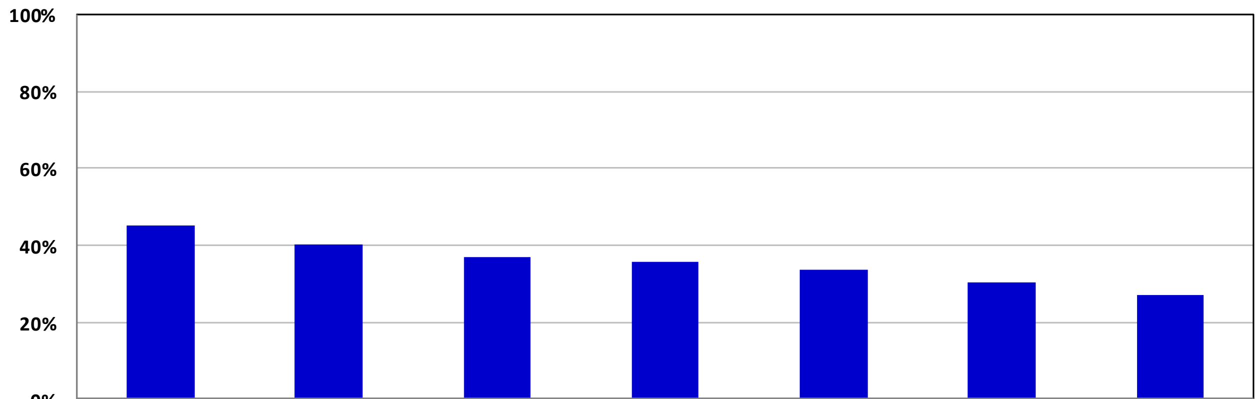
The actuarially determined contribution rates consist of two components: a normal cost rate and an amortization cost to finance the unfunded actuarial accrued liability. The normal cost rate is the theoretical amount which would be required to pay the members' benefits, based on the current plan provisions, if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. This is the amount is should cost to provide the benefits for an average new member. Since members contribute to the fund, only the excess of the normal rate over the member contribution rate is included in the employer contribution rate. The amortization cost is the amount, expressed as a percentage of payroll, necessary to amortize the unfunded actuarial accrued liability. The payroll growth rate and discount rate assumptions are selected by the Board. The funding period is specified in Section 61.565 of Kentucky Statute.

All of the actuarial and financial tables referenced by the other sections of this Report appear in Section 3. Section 4 provides member data and statistical information. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

Funding Progress

The following charts provide a seven-year history of the funds' funded ratio (i.e. the Actuarial Value of Assets divided by the Actuarial Accrued Liability). The decline in the funded ratio over the last seven years for the retirement funds has generally been due to actual contributions being insufficient to finance the unfunded actuarial accrued liability, actual investment experience being less than the investment return assumption, a decrease in the assumed rate of return in 2015, 2016 and again in 2017.

Funded Ratio
Actuarial Assets as a percentage of Actuarial Accrued Liability



	2011	2012	2013	2014	2015	2016	2017
Funded Ratio	45.0%	40.1%	37.1%	35.6%	33.8%	30.3%	27.0%

Assuming the actuarial determined contributions are actually paid in future years, then absent future unfavorable experience, or legislative changes, we expect the funded ratio to begin improving. Also, the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, is expected to decrease after those higher contribution rates become effective. Table 9, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.

Asset Gains/ (Losses)

The actuarial value of assets ("AVA") is based on a smoothed market value of assets, using a systematic approach to phase-in the difference between the actual and expected investment return on the market value of assets (adjusted for receipts and disbursements during the year). This is appropriate because it dampens the short-term volatility inherent in investment markets. The returns are computed net of investment expenses. The actuarial value of assets for the retirement fund increased from $234.6 million to $261.3 million since the prior valuation. Table 7 in the following section of the report provides the development of the actuarial value of assets.

The rate of return on the market value of assets on a dollar-weighted basis for fiscal year 2017 was a 12.0% which is greater than the 6.75% expected annual return during that fiscal year. The return on an actuarial (smoothed) asset value was 6.4%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

The market value of assets is $5.6 million less than the actuarial value of assets, which signifies that the retirement fund is in a position of deferred losses. Therefore, unless the fund experiences investment returns in excess of the assumed rate of return, the future recognition of these deferred losses is expected to increase the unfunded actuarial accrued liability.

Table 6 in the following section of this report provides asset information that was included in the annual financial statements of the System. Also, Tables 6 and 7 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

Actuarial Gains/ (Losses)

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the System as of the first day of the plan year. In any one fiscal year, the experience can be better or worse from that which is assumed or expected. The actuarial assumptions do not necessarily attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience over many years. Therefore, as long as the actual experience of the retirement system is reasonably close to the current assumptions, the long-term funding requirements of the System will remain relatively consistent.

Below are tables that separately show a reconciliation of the actuarial gains / (loss) since the prior actuarial valuation for the retirement and health insurance funds, which include the effect of asset and liability gains and losses, changes in assumptions, changes in plan provisions, etc.

Experience Gain or (Loss)
(Dollar amounts expressed in thousands)

	Retirement	Insurance
A. Calculation of total actuarial gain or loss		
1. Unfunded actuarial accrued liability (UAAL), previous year	$ 540,593	$ 84,494
2. Normal cost and administrative expenses	8,653	4,886
3. Less: contributions for the year	(68,587)	(9,353)
4. Interest accrual	34,467	6,169
5. Expected UAAL (Sum of Items 1 - 4)	$ 515,126	$ 86,196
6. Actual UAAL as of June 30,2017	$ 705,825	$ 96,177
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (190,699)	$ (9,981)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ (914)	$ (839)
9. Liability experience gain (loss) for the year	(53,157)	24,070
10. Assumption change	(136,628)	(33,212)
11. Total	$ (190,699)	$ (9,981)

The accrued liability for the retirement fund was about 7% higher than expected, resulting in a $53 million liability loss. This $53 million increase is comprised of a $29 million increase due to differences in liability calculations between GRS and the fund's prior actuary and a $24 million increase due to the fund's experience during the last year. The experience loss is primarily due to higher than expected salary increases during the past year. The 2018 insurance premiums were known at the time of the valuation and were incorporated into the liability measurement. Premiums were lower than expected and resulted in a $19 million liability experience gain for the insurance fund.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an annual investment return assumption. An experience study was conducted as of June 30, 2013 and the next experience study will be conducted as of June 30, 2018. However, the Board has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. Since the last actuarial valuation, the Board made the following changes in assumptions:

- Decrease the assumed rate of return to 5.25% for the retirement fund and to 6.25% for the health insurance fund.
- Decrease the price inflation assumption to 2.30% for the retirement and health insurance funds.
- Amortize the unfunded actuarial accrued liability for the retirement and health insurance funds on a level dollar basis, converted to a percentage of the expected covered payroll.
- Decrease in the individual salary increase assumption and health care trend assumption that corresponds with the 0.95% decrease in the price inflation assumption.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. It is our opinion that the assumptions are internally consistent, reasonable, and reflect anticipated future experience of the System. The next experience study will be conducted no later than as of June 30, 2018.

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 (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

Benefit Provisions

Appendix B of this report includes a summary of the benefit provisions for SPRS. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

This valuation reflects all benefits promised to SPRS members, either by the statutes or by the Board. There are no ancillary benefits that might be deemed a SPRS liability if continued beyond the availability of funding by the current funding source.

SECTION 3

ACTUARIAL TABLES

Actuarial Tables

Development of Unfunded Actuarial Accrued Liability

(Dollar amounts expressed in thousands)

		June 30, 2017	
		Retirement (1)	Insurance (2)
1.	Projected payroll of active members	$ 48,598	$ 48,164
2.	Present value of future pay	$ 424,190	$ 390,888
3.	Normal cost rate		
	a. Total normal cost rate	23.84%	11.48%
	b. Less: member contribution rate	-8.00%	-0.30%
	c. Employer normal cost rate	15.84%	11.18%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 286,843	$ 122,992
	b. Less: present value of future normal costs	(93,680)	(32,741)
	c. Actuarial accrued liability	$ 193,163	$ 90,251
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 766,899	$ 183,156
	b. Inactive members	7,083	3,234
	c. Active members (Item 4c)	193,163	90,251
	d. Total	$ 967,145	$ 276,641
6.	Actuarial value of assets	$ 261,320	$ 180,464
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 705,825	$ 96,177
8.	Funded Ratio	27.0%	65.2%

Actuarial Present Value of Future Benefits
(Dollar amounts expressed in thousands)

		June 30, 2017	
		Retirement (1)	Insurance (2)
1.	Active members		
	a. Service retirement	$ 264,685	
	b. Deferred termination benefits and refunds	14,923	
	c. Survivor benefits	1,266	
	d. Disability benefits	5,969	
	e. Total	$ 286,843	$ 122,992
2.	Retired members		
	a. Service retirement	$ 701,038	
	b. Disability retirement	12,152	
	c. Beneficiaries	53,709	
	d. Total	$ 766,899	$ 183,156
3.	Inactive members		
	a. Vested terminations	$ 6,563	$ 3,234
	b. Nonvested terminations	520	N/A
	c. Total	$ 7,083	$ 3,234
4.	Total actuarial present value of future benefits	$ 1,060,825	$ 309,382

Development of Required Contribution Rate

		June 30, 2017	
		Retirement (1)	Insurance (2)
1.	Total normal cost rate		
	a. Service retirement	20.08%	
	b. Deferred termination benefits and refunds	2.82%	
	c. Survivor benefits	0.16%	
	d. Disability benefits	0.78%	
	e. Total	23.84%	11.48%
2.	Less: member contribution rate	-8.00%	-0.30%
3.	Total employer normal cost rate	15.84%	11.18%
4.	Administrative expenses	0.37%	0.14%
5.	Net employer normal cost rate	16.21%	11.32%
6.	UAAL amortization contribution	102.84%	15.91%
7.	Total recommended employer contribution	119.05%	27.23%

Actuarial Balance Sheet

Retirement Benefits

(Dollar amounts expressed in thousands)

			June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources			
	a.	Current assets (actuarial value)	$ 261,320	$ 234,568
	b.	Present value of future member contributions	$ 33,935	$ 34,858
	c.	Present value of future employer contributions		
		i. Normal cost contributions	$ 59,745	$ 41,787
		ii. Unfunded accrued liability contributions	705,825	540,592
		iii. Total future employer contributions	$ 765,570	$ 582,379
	d.	Total assets	$ 1,060,825	$ 851,805
2.	Liabilities - Present Value of Expected Future Benefit Payments			
	a.	Active members		
		i. Present value of future normal costs	$ 93,680	$ 76,645
		ii. Accrued liability	193,163	138,661
		iii. Total present value of future benefits	$ 286,843	$ 215,306
	b.	Present value of benefits payable on account of current retired members and beneficiaries	$ 766,899	$ 630,842
	c.	Present value of benefits payable on account of current inactive members	$ 7,083	$ 5,657
	d.	Total liabilities	$ 1,060,825	$ 851,805

Actuarial Balance Sheet

Insurance Benefits

(Dollar amounts expressed in thousands)

		June 30, 2017 (1)	June 30, 2016 (2)
1.	Assets - Present and Expected Future Resources		
	a. Current assets (actuarial value)	$ 180,464	$ 172,704
	b. Present value of future member contributions	$ 1,905	$ 1,699
	c. Present value of future employer contributions		
	i. Normal cost contributions	$ 30,836	$ 21,316
	ii. Unfunded accrued liability contributions	96,177	84,494
	iii. Total future employer contributions	$ 127,013	$ 105,810
	d. Total assets	$ 309,382	$ 280,213
2.	Liabilities - Present Value of Expected Future Benefit Payments		
	a. Active members		
	i. Present value of future normal costs	$ 32,741	$ 23,015
	ii. Accrued liability	90,251	80,103
	iii. Total present value of future benefits	$ 122,992	$ 103,118
	b. Present value of benefits payable on account of current retired members and beneficiaries	$ 183,156	$ 171,155
	c. Present value of benefits payable on account of current inactive members	$ 3,234	$ 5,940
	d. Total liabilities	$ 309,382	$ 280,213

Reconciliation of System Net Assets
(Dollar amounts expressed in thousands)

	June 30, 2017 (1) Retirement	June 30, 2017 (2) Insurance
1. Value of assets at beginning of year	$ 217,594	$ 161,366
2. Revenue for the year		
a. Contributions		
i. Member contributions	$ 5,348	$ 131
ii. Employer contributions	38,029	9,222
iii. Other contributions (less 401h)	25,210	0
iii. Total	$ 68,587	$ 9,353
b. Income		
i. Interest, dividends, and other income	$ 7,263	$ 4,896
ii. Investment expenses	(1,722)	(1,362)
iii. Net	$ 5,540	$ 3,533
c. Net realized and unrealized gains (losses)	21,156	18,135
d. Total revenue	$ 95,284	$ 31,021
3. Expenditures for the year		
a. Disbursements		
i. Refunds	$ 26	$ 0
ii. Regular annuity benefits	56,934	13,405
iii. Other benefit payments	0	78
iv. Transfers to other systems	0	0
v. Total	$ 56,960	$ 13,483
b. Administrative expenses and depreciation	181	66
c. Total expenditures	$ 57,141	$ 13,549
4. Increase in net assets (Item 2. - Item 3.)	$ 38,143	$ 17,472
5. Value of assets at end of year (Item 1. + Item 4.)	$ 255,737	$ 178,838
6. Net external cash flow		
a. Dollar amount	$ 11,446	$ (4,196)
b. Percentage of market value	4.8%	-2.5%
7. Estimated annual return on net assets	12.0%	13.6%

Development of Actuarial Value of Assets

Retirement Benefits

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	234,568
2.	Market value of assets at beginning of year	$	217,594
3.	Net new investments		
	a. Contributions	$	68,587
	b. Benefit payments		(56,960)
	c. Administrative expenses		(181)
	d. Subtotal	$	11,446
4.	Market value of assets at end of year	$	255,737
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	26,697
6.	Assumed investment return rate for fiscal year		6.75%
7.	Expected return for immediate recognition	$	15,074
8.	Excess return for phased recognition	$	11,623

9. Phased-in recognition, 20% of excess return on assets for prior years:

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	11,623	$	2,325
b.	2016		(21,455)		(4,291)
c.	2015		(16,122)		(3,224)
d.	2014		22,202		4,440
e.	2013		4,918		984
f.	Total			$	233

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	261,320
11.	Ratio of actuarial value to market value		102.2%
12.	Estimated annual return on actuarial value of assets		6.4%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets
Insurance Benefits
(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2017
1.	Actuarial value of assets at beginning of year	$	172,704
2.	Market value of assets at beginning of year	$	161,366
3.	Net new investments		
	a. Contributions	$	9,353
	b. Benefit payments		(13,483)
	c. Administrative expenses		(66)
	d. Subtotal	$	(4,196)
4.	Market value of assets at end of year	$	178,838
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	21,668
6.	Assumed investment return rate for fiscal year		7.50%
7.	Expected return for immediate recognition	$	11,945
8.	Excess return for phased recognition	$	9,723
9.	Phased-in recognition, 20% of excess return on assets for prior years:		

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2017	$	9,723	$	1,945
b.	2016		(12,288)		(2,458)
c.	2015		(9,762)		(1,952)
d.	2014		9,368		1,874
e.	2013		3,015		603
f.	Total			$	11

10.	Actuarial value of assets as of June 30, 2017 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	180,464
11.	Ratio of actuarial value to market value		100.9%
12.	Estimated annual return on actuarial value of assets		7.0%

* Amounts may not add due to rounding

Schedule of Funding Progress

(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Value of Assets (AVA) (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) (4)	Funded Ratio (2)/(3) (5)	Annual Covered Payroll (6)	UAAL as % of Payroll (4)/(6) (7)
			Retirement			
2011	$ 285,581	$ 634,379	$ 348,799	45.0%	$ 48,693	716.3%
2012	259,792	647,689	387,897	40.1%	48,373	801.9%
2013	241,800	651,581	409,780	37.1%	45,256	905.5%
2014	242,742	681,118	438,377	35.6%	44,616	982.6%
2015	248,388	734,156	485,769	33.8%	45,765	1061.4%
2016	234,568	775,160	540,593	30.3%	45,551	1186.8%
2017	261,320	967,145	705,825	27.0%	48,598	1452.4%
			Insurance			
2011	$ 123,687	$ 438,428	$ 314,741	28.2%	$ 48,693	646.4%
2012	124,372	333,904	209,532	37.2%	48,373	433.2%
2013	136,321	222,327	86,006	61.3%	45,256	190.0%
2014	155,595	234,271	78,676	66.4%	44,616	176.3%
2015	167,775	254,839	87,064	65.8%	45,765	190.2%
2016	172,704	257,197	84,493	67.1%	45,551	185.5%
2017	180,464	276,641	96,177	65.2%	48,598	197.9%

Summary of Principal Assumptions and Methods

Below is a summary of the principal economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date:	June 30, 2017
Actuarial cost method:	Entry Age Normal
Amortization method:	Level dollar expressed as a percentage of expected coverred payroll
Amortization period for contribution rate:	26-year closed period
Asset valuation method:	5-Year Smoothed Market
Actuarial assumptions:	
Investment rate of return	5.25%
Projected salary increases	3.05% to 15.55% (varies by service)
Inflation	2.30%
Post-retirement benefit adjustments	0.00%
Retiree Mortality	RP-2000 Combined Mortality Table for Males and Females, projected using scale BB to 2013 (set back one year for females).

Solvency Test

(Dollar amounts expressed in thousands)

	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
June 30,	Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Retirement				
2008	$ 41,391	$ 426,311	$ 119,426	$ 350,891	100.0%	72.6%	0.0%
2009	41,664	459,585	101,079	329,967	100.0%	62.7%	0.0%
2010	42,012	475,893	94,541	304,577	100.0%	55.2%	0.0%
2011	43,574	499,194	91,611	285,581	100.0%	48.5%	0.0%
2012	41,139	523,017	83,533	259,792	100.0%	41.8%	0.0%
2013	39,788	535,720	76,072	241,800	100.0%	37.7%	0.0%
2014	41,831	563,011	76,276	242,742	100.0%	35.7%	0.0%
2015	41,567	605,855	86,734	248,388	100.0%	34.1%	0.0%
2016	41,871	636,499	96,791	234,568	100.0%	30.3%	0.0%
2017	44,798	773,982	148,365	261,320	100.0%	28.0%	0.0%
			Insurance				
2008	$ -	$ 178,655	$ 266,452	$ 123,961	100.0%	69.4%	0.0%
2009	-	167,091	196,940	123,527	100.0%	73.9%	0.0%
2010	-	253,581	181,380	121,175	100.0%	47.8%	0.0%
2011	-	252,440	185,988	123,687	100.0%	49.0%	0.0%
2012	-	190,259	143,645	124,372	100.0%	65.4%	0.0%
2013	-	139,509	82,818	136,321	100.0%	97.7%	0.0%
2014	-	143,402	90,869	155,595	100.0%	100.0%	13.4%
2015	-	170,447	84,392	167,775	100.0%	98.4%	0.0%
2016	-	177,094	80,103	172,704	100.0%	97.5%	0.0%
2017	-	186,390	90,251	180,464	100.0%	96.8%	0.0%

SECTION 4

MEMBERSHIP INFORMATION

Membership Tables

Summary of Membership Data
(Total dollar amounts expressed in thousands)

			June 30, 2017
			(1)
1.	Active members		
	a. Males		873
	b. Females		30
	c. Total members		903
	d. Total annualized prior year salaries	$	48,598
	e. Average salary	$	53,819
	f. Average age		37.5
	g. Average service		10.6
	h. Member contributions with interest	$	44,798
	i. Average contributions with interest	$	49,610
2.	Vested inactive members		
	a. Number		86
	b. Total annual deferred benefits	$	762
	c. Average annual deferred benefit	$	8,860
	d. Average age at the valuation date		42.5
3.	Nonvested inactive members		
	a. Number		394
	b. Total member contributions with interest	$	520
	c. Average contributions with interest	$	1,320
4.	Service retirees		
	a. Number		1,279
	b. Total annual benefits	$	50,871
	c. Average annual benefit	$	39,774
	d. Average age at the valuation date		62.7
5.	Disabled retirees		
	a. Number		53
	b. Total annual benefits	$	968
	c. Average annual benefit	$	18,264
	d. Average age at the valuation date		59.2
6.	Beneficiaries		
	a. Number		204
	b. Total annual benefits	$	5,414
	c. Average annual benefit	$	26,539
	d. Average age at the valuation date		65.6

Summary of Historical Active Membership

	Active Members		Covered Payroll		Average Annual Pay	
June 30,	Number	Percent Increase /(Decrease)	Amount in Thousands	Percent Increase /(Decrease)	Amount	Percent Increase /(Decrease)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	965		$ 48,693		$ 50,459	-5.9%
2012	907	-6.0%	48,373	-0.7%	53,333	5.7%
2013	902	-0.6%	45,256	-6.4%	50,173	-5.9%
2014	855	-5.2%	44,616	-1.4%	52,182	4.0%
2015	937	9.6%	45,765	2.6%	48,842	-6.4%
2016	908	-3.1%	45,551	-0.5%	50,166	2.7%
2017	903	-0.6%	48,598	6.7%	53,818	7.3%

Distribution of Active Members by Age and by Years of Service

SPRS Members

Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
	Years of Credited Service												
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
20-24	0	12	6	0	0	0	0	0	0	0	0	0	18
	$0	$40,371	$43,380	$0	$0	$0	$0	$0	$0	$0	$0	$0	$41,374
25-29	25	18	55	0	25	17	0	0	0	0	0	0	140
	$22,825	$40,529	$44,672	$0	$48,998	$51,062	$0	$0	$0	$0	$0	$0	$41,787
30-34	20	6	29	1	22	100	10	0	0	0	0	0	188
	$16,057	$40,948	$45,202	$39,698	$47,655	$51,068	$56,122	$0	$0	$0	$0	$0	$45,925
35-39	9	0	6	0	3	49	80	26	0	0	0	0	173
	$22,827	$0	$45,436	$0	$49,809	$49,915	$56,411	$60,343	$0	$0	$0	$0	$52,920
40-44	2	0	5	0	5	30	51	81	27	2	0	0	203
	$22,149	$0	$45,211	$0	$48,158	$51,595	$56,493	$64,186	$72,557	$69,627	$0	$0	$60,283
45-49	2	0	1	0	0	4	25	51	42	9	0	0	134
	$22,149	$0	$64,883	$0	$0	$50,882	$54,766	$63,631	$75,548	$81,048	$0	$0	$65,892
50-54	0	0	0	0	0	4	8	6	9	6	0	0	33
	$0	$0	$0	$0	$0	$51,067	$58,215	$66,255	$75,995	$77,682	$0	$0	$67,199
55-59	0	0	0	0	0	1	5	3	0	0	1	0	10
	$0	$0	$0	$0	$0	$50,718	$55,218	$57,405	$0	$0	$93,660	$0	$59,268
60-64	0	0	0	0	0	0	0	0	1	0	1	1	3
	$0	$0	$0	$0	$0	$0	$0	$0	$76,333	$0	$93,357	$80,489	$83,393
65 & Over	0	0	0	0	0	0	0	0	0	0	0	1	1
	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$87,068	$87,068
Total	58	36	102	1	55	205	179	167	79	17	2	2	903
	$20,445	$40,546	$45,016	$39,698	$48,428	$50,864	$56,236	$63,371	$74,586	$78,517	$93,509	$83,779	$53,819

Distribution of Annuitant Monthly Benefit by Status and Age
Retirees and Beneficiaries
(Dollar amounts expressed in thousands)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	180	$ 6,808	15	$ 300	31	$ 442	226	$ 7,550
50 - 54	169	6,693	6	92	7	112	182	6,897
55 - 59	159	6,625	6	111	12	278	177	7,014
60 - 64	190	8,004	9	111	22	511	221	8,626
65 - 69	280	11,130	6	135	30	798	316	12,063
70 - 74	151	5,969	6	111	38	1,122	195	7,202
75 - 79	84	2,909	2	45	19	691	105	3,645
80 - 84	41	1,577	3	64	24	784	68	2,425
85 - 89	21	918	0	-	17	580	38	1,498
90 And Over	4	238	0	-	4	95	8	333
Total	**1,279**	**$ 50,871**	**53**	**$ 968**	**204**	**$ 5,414**	**1,536**	**$ 57,253**

Retired Lives Summary

Form of Payment	Male Lives Number	Male Lives Monthly Benefit Amount	Female Lives Number	Female Lives Monthly Benefit Amount	Total Number	Total Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	145	$ 435,328	15	$ 46,122	160	$ 481,450
Joint & Survivor:						
100% to Beneficiary	140	456,888	1	4,814	141	461,702
66 2/3% to Beneficiary	87	332,233	2	7,542	89	339,775
50% to Beneficiary	82	294,980	1	2,605	83	297,585
Pop-up Option	582	2,063,324	4	10,805	586	2,074,130
Social Security Option:						
Age 62 Basic	30	75,359	0	0	30	75,359
Age 62 Survivorship	121	232,365	1	5,287	122	237,652
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	5	16,014	0	0	5	16,014
10 Years Certain & Life	34	112,610	3	6,759	37	119,369
15 Years Certain & Life	17	47,678	1	3,919	18	51,597
20 Years Certain & Life	38	117,233	2	3,979	40	121,211
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	0	0	0	0	0	0
24 Month Basic	0	0	0	0	0	0
36 Month Basic	0	0	2	466	2	466
12 Month Survivor	6	20,781	0	0	6	20,781
24 Month Survivor	4	5,953	0	0	4	5,953
36 Month Survivor	9	16,914	0	0	9	16,914
Total:	1,300	$ 4,227,662	32	$ 92,297	1,332	$ 4,319,959

Beneficiary Lives Summary

Form of Payment	Male Lives Number	Male Lives Monthly Benefit Amount	Female Lives Number	Female Lives Monthly Benefit Amount	Total Number	Total Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	2	$ 820	7	$ 5,405	9	$ 6,225
Joint & Survivor:						
100% to Beneficiary	7	8,333	58	153,735	65	162,068
66 2/3% to Beneficiary	3	2,775	11	22,098	14	24,874
50% to Beneficiary	3	6,341	16	22,951	19	29,292
Pop-up Option	7	19,746	36	96,976	43	116,722
Social Security Option:						
Age 62 Basic	0	0	2	2,281	2	2,281
Age 62 Survivorship	1	3,897	41	80,941	42	84,838
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	0	0	0	0
10 Years Certain	1	2,038	1	2,038	2	4,076
10 Years Certain & Life	0	0	1	389	1	389
15 Years Certain & Life	0	0	1	721	1	721
20 Years Certain & Life	1	6,686	4	5,611	5	12,297
Refund	0	0	0	0	0	0
Partial Lump Sum Option (PLSO):						
12 Month Basic	0	0	0	0	0	0
24 Month Basic	0	0	0	0	0	0
36 Month Basic	0	0	0	0	0	0
12 Month Survivor	0	0	0	0	0	0
24 Month Survivor	0	0	1	7,351	1	7,351
36 Month Survivor	0	0	0	0	0	0
Total:	25	$ 50,636	179	$ 400,499	204	$ 451,135

Schedule of Retirants Added to And Removed from Rolls

(Dollar amounts except average allowance expressed in thousands)

Year Ended	Added to Rolls Number	Removed from Rolls Number	Rolls End of the Year Number	Rolls End of the Year Annual Benefits	% Increase in Annual Benefit	Average Annual Benefit
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	52	12	1,263	$ 47,467		$ 37,583
2012	52	16	1,299	49,887	5.1%	38,404
2013	63	16	1,346	50,906	2.0%	37,820
2014	95	28	1,413	53,432	5.0%	37,815
2015	62	15	1,460	54,930	2.8%	37,623
2016	65	10	1,515	56,650	3.1%	37,393
2017	30	9	1,536	57,253	1.1%	37,274

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Methods and Assumptions

The following presents a summary of the actuarial assumptions and methods used in the valuation of the State Police Retirement System.

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 5.25% net of investment expenses for the retirement fund

Assumed annual rate of 6.25% net of investment expenses for the insurance fund

Price Inflation:

Assumed annual rate of 2.30%

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
0	12.50%	3.05%	15.55%
1	7.50%	3.05%	10.55%
2	5.50%	3.05%	8.55%
3	4.50%	3.05%	7.55%
4	3.50%	3.05%	6.55%
5	2.50%	3.05%	5.55%
6	2.00%	3.05%	5.05%
7	2.00%	3.05%	5.05%
8	1.00%	3.05%	4.05%
9	0.50%	3.05%	3.55%
10 & Over	0.00%	3.05%	3.05%

Retirement rates:

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

Service	Members participating before 9/1/2008[1]	Members participating on or after 9/1/2008[2]
20	22.0%	
21	22.0%	
22	22.0%	
23	28.0%	
24	28.0%	
25	28.0%	22.0%
26	28.0%	22.0%
27	28.0%	22.0%
28	44.0%	28.0%
29	44.0%	28.0%
30	44.0%	28.0%
31	58.0%	28.0%
32	58.0%	28.0%
33	58.0%	44.0%
34	58.0%	44.0%
35	58.0%	44.0%
36	58.0%	58.0%
37	58.0%	58.0%
38	58.0%	58.0%
39	58.0%	58.0%
40	58.0%	58.0%

[1] The annual rate of service retirement is 100% at age 55.

[2] The annual rate of service retirement is 100% at age 60.

Disability rates:

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

	Annual Rates of Disability	
Age	Male	Female
20	0.05%	0.05%
30	0.09%	0.09%
40	0.20%	0.20%
50	0.56%	0.56%
60	1.46%	1.46%

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

Assumed annual rates of withdrawal are shown below.

Service	Annual Rates of Withdrawal
0	20.00%
1	7.00%
2-8	3.00%
9 & Over	2.50%

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.

At the time of the last experience study performed as of June 30, 2013, this mortality assumption provided 37% and 19% margin for future improvement for males and females, respectively.

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

Dependent Children:

For members in the Hazardous Plan who receive a duty-related death benefit, the member is assumed to be survived by two dependent children, each age 6 with payments for 15 years.

Form of Payment:

Members are assumed to elect a life-only annuity at retirement.

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 for Medicare retirees, the valuation relied on the Society of Actuaries' 2013 Study "Health Care Costs – From Birth to Death". Table 4 (Development of Plan Specific Medicare Age Curve) was used to model the impact of aging for ages 65 and over.

Health Care Cost Trend Rates[1]:

Year	Non-Medicare Plans	Medicare Plans	Dollar Contribution[2]
2019	7.25%	5.10%	1.50%
2020	7.00%	5.00%	1.50%
2021	6.75%	4.90%	1.50%
2022	6.50%	4.80%	1.50%
2023	6.25%	4.70%	1.50%
2024	6.00%	4.60%	1.50%
2025	5.75%	4.50%	1.50%
2026	5.50%	4.40%	1.50%
2027	5.25%	4.30%	1.50%
2028	5.00%	4.20%	1.50%
2029	4.75%	4.10%	1.50%
2030	4.50%	4.05%	1.50%
2031	4.25%	4.05%	1.50%
2032 & Beyond	4.05%	4.05%	1.50%

[1]All increases are assumed to occur on January 1. The 2018 premiums were known at the time of the valuation and were incorporated into the liability measurement using a trend of 1.232% for Non-Medicare plans and a trend of 0.00% for Medicare plans at January 1, 2018.

[2]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.

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, 2017Participation*
Medical Only	7%
Essential	8%
Premium	84%

* May not add due to rounding

Non-Medicare Plan	June 30, 2017 Participation
Standard PPO	14%
Standard CDHP	2%
LivingWell CDHP	22%
LivingWell PPO	62%

- 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.

- 50% 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.

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 6.75% to 5.25% for the retirement fund and from 7.50% to 6.25% for the insurance fund.
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 and a 0.95% decrease in the health care cost trend rates.
3. The amortization method for unfunded accrued liabilities was changed to a level dollar basis (which is then converted to a percentage of expected covered payroll) from a level percentage of pay basis.

Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were based on the plan premiums effective January 1, 2017, 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. The spouse/dependent premium of $862.64 for non-Medicare retirees is based on a blending of Family and Couple premiums for the current retirees that have over 4 years of hazardous service. The fully-insured premiums KRS pays the Kentucky Employees' Health Plan (KEHP) 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 rate subsidy for the non-Medicare eligible retirees. Actuarial Standard of Practice No. 6 (ASOP No. 6) requires aging subsidies (or implicit rate subsidies) to be recognized. However, the KRS health insurance trusts are only used to reimburse KEHP for the employer's portion of the blended premiums. Said another way, the trusts are not used to fund the difference between the underlying retiree claims and the blended KEHP premiums. As a result, the retiree health care liabilities developed in this report for the non-Medicare retirees are based solely on the premiums charged by KEHP, without any age-adjustment. GASB Statements No. 74 and No. 75 prohibit such a deviation from ASOP No. 6. The liabilities developed in this report are solely for the purpose of funding the benefits paid by the health insurance funds and are not appropriate for financial statement disclosures required by GASB. GRS provides separate GASB reports to KRS which include the liabilities associated with the implicit rate subsidy.

For those not eligible for Medicare		
Age	Member	Spouse/Dependents
<65	$711.22	$862.64

For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2017, 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 for retirees over the age of 65. 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 eligible for Medicare		
Age	Male	Female
65	$208.66	$196.81
75	244.13	238.22
85	258.16	261.20

Appendix B of the report provides a full schedule of premiums.

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

Mehdi Riazi, FSA, EA, MAAA

APPENDIX B

BENEFIT PROVISIONS

Summary of Benefit Provisions for State Police Retirement System (SPRS)

SPRS Employees

Retirement: Tier 1, Participation before 9/1/2008

Normal Retirement Eligibility	Age 55 with at least 1 month of service credit; or Any age with at least 20 years of service
Benefit Amount	If a member has at least 60 months of service, the monthly benefit is 2.50% times final average compensation times years of service. If a member has less than 60 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest. Final average compensation is based on the member's highest 3 years of compensation.
Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement eligibility precedes the member's normal retirement date.

SPRS Employees (continued)

Retirement: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	The monthly benefit is equal to the applicable benefit multiplier times final average compensation times years of service.

Years of Service	Benefit Multiplier
10 or less	1.10%
10-20	1.30%
20-25	1.50%
Greater than 25*	2.00%

Final compensation is based on the member's highest 3 years of compensation.

Early Retirement Eligibility	Age 50 with at least 15 years of service
Early Retirement Reduction	Normal Retirement benefit reduced 6.5% per year for the first five years and 4.5% per year for the next five years for each year the member's retirement date precedes the member's normal retirement eligibility.

Retirement: Tier 3, Participation on or after 1/1/2014

Normal Retirement Eligibility	Age 60 with at least 5 years of service; or Any age with at least 25 years of service
Benefit Amount	Each year that the member is active, a 7.50% employer pay credit and the employee's 5.00% contribution will be credited to each member's hypothetical cash balance account. The hypothetical account will earn interest at a minimum rate of 4%, annually. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest in that year equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. At retirement, the member's hypothetical account balance may be converted into an annuity based on an actuarial factor.
Early Retirement Eligibility	N/A

SPRS Employees (continued)

Deferred Vested Benefit: Tier 1, Participation before 9/1/2008

Eligibility	At least 1 month of service credit
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit: Tier 2, Participation on or after 9/1/2008 but before 1/1/2014

Eligibility	5 years of service
Benefit Amount	Normal retirement benefit deferred to normal retirement age, or a reduced retirement benefit at an early retirement age

Deferred Vested Benefit Tier 3, Participation on or after 1/1/2014

Eligibility	5 years of service
Benefit Amount	At termination of employment, members may choose to leave their account balance with the System and retire once they are eligible. The hypothetical account balance will earn 4% annual interest after termination. Members may also choose to withdrawal their entire accumulated balance. If a member does not have 5 years of service at termination, the member is eligible to receive a partial refund of their account balance. This refund includes the member's contributions with interest.

Disability Retirement: Participation before 8/1/2004

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	Disability benefits are calculated in the same manner as the normal retirement benefit with years of service and final compensation being determined as of the date of disability, except that if the member has less than 20 years of service at disability, service credit shall be added to the person's total service beginning with the last date of paid employment and continuing to the member's 55th birthday, with total service not exceeding 20 years. Total service credit added shall not be greater than the member's actual service at disability.

SPRS Employees (continued)

Disability Retirement: Participation on or after 8/1/2004 but before 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member's final monthly rate of pay or the member's normal retirement benefit (without reduction for early retirement) with years and final compensation being determined as of the date of disability.

Disability Retirement: Participation on or after 1/1/2014

Eligibility	60 months of service (requirement is waived if line of duty disability)
Disability Benefit	The higher of 25% of the member's final monthly rate of pay or the member's retirement benefit calculated at the member's normal retirement date.

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member's final monthly rate of pay. Additionally, each eligible dependent child will receive 10% of the member's monthly final rate of pay up to a maximum of 40%.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 55 with at least 60 months of service and actively working at the time of death; or At least 144 months of service, if no longer actively working
Spouse Benefit	The member's retirement benefit calculated in the same manner as if the member had retired on the day of the member's death and elected a 100% joint and survivor benefit. The benefit is actuarially reduced if the member dies prior to their normal retirement age.

Pre-Retirement Death Benefit (Death in the Line of Duty)

Eligibility	One month of service credit
Spouse Benefit	A $10,000 lump sum payment plus a monthly payment of 25% of the deceased member's final monthly rate of pay. A spouse may also elect the non-line of duty death benefit.
Non-Spouse Benefit	If the beneficiary is only one person who is a dependent receiving at least 50% of his or her support from the member, the beneficiary may elect a lump sum payment of$10,000.
Child Benefit	Each eligible dependent child will receive 10% of the member's final monthly rate of pay up to a maximum of 40%.

SPRS Employees (continued)

Post-Retirement Death Benefit

Eligibility	48 months of service, and in receipt of retirement benefits
Death Benefit	A $5,000 lump sum payment

Member Contributions

Tier 1, Participation before 9/1/2008	8% of creditable compensation. Members who do not receive a retirement benefit are entitled to a full refund of contributions with interest. The annual interest rate is set by the KRS board, not less than 2.0%.
Tier 2, Participation on or after 9/1/2008 but before 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest. The annual interest rate is 2.5%.
Tier 3, Participation after 1/1/2014	8% of creditable compensation plus 1% of creditable compensation, which is deposited into the 401(h) account and is not refundable. Members who do not receive a retirement benefit are entitled to a refund of non-401(h) contributions with interest.

Changes since the Prior Valuation

None.

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.

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.

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.

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

Benefit Eligibility	Recipient of a retirement allowance with at least 120 months of service at retirement
Non-Hazardous Subsidy	Monthly contribution of $10 for each year of earned non-hazardous service. The monthly contribution is increased by 1.5% each July 1. As of July 1, 2017, the Non-Hazardous monthly contribution was $13.18/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.
Hazardous Subsidy	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, 2017, the Non-Hazardous monthly contribution was $19.77/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of $10 ($13.18 as of July 1, 2017) for each year of hazardous service.
Duty Disability Retirement	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.
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 a benefit equal to at least 20 times the Non-Hazardous monthly contribution.
Non-Duty Death in Service	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.

Monthly Health Plan Premiums – Effective January 1, 2018

Non-Medicare Plan Options					
Plan Option	Single	Parent Plus	Couple	Family	Family X-Ref
LivingWell PPO*	$729.34	$1,037.08	$1,589.10	$1,767.60	$876.68
LivingWell CDHP	709.46	978.50	1,325.64	1,479.76	818.96
Standard PPO	685.38	975.90	1,497.18	1,666.26	824.54
Standard CDHP	682.80	940.64	1,450.02	1,615.30	800.94

Medicare Plan Options	
Kentucky Retirement Systems - Medical Only Plan	$165.01
Kentucky Retirement Systems – Medicare Advantage/Essential Plan	75.56
Kentucky Retirement Systems – Medicare Advantage/Premium Plan*	252.21

*For 2018, 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, 2017.

Non-Hazardous Service	Hazardous Service
$13.18	$19.77

Note: Non-Hazardous benefits are applicable to SPRS members with prior service in a Non-Hazardous System.

APPENDIX C

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)

b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and

c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations that provide the financial information of the plan, such as the funded ratio, unfunded actuarial accrued liability and the ADC.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Actuarially Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: The portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is specified in State statute. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on a statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 67 and ***GASB 68***: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting and reporting rules for public retirement systems and the employers that sponsor, participate in, or contribute to them. Statement No. 67 sets the accounting rules for the financial reporting of the retirement systems, while Statement No. 68 sets the rules for the employers that sponsor, participate in, or contribute to public retirement systems.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded

Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but may not decrease by exactly one year in the subsequent year's actuarial valuation. For instance, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

KENTUCKY RETIREMENT SYSTEMS

David L. Eager, Interim Executive Director

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To: Board of Trustees of Kentucky Retirement Systems,
David L. Eager, Interim Executive Director

From: Joseph P. Bowman, Special Detail General Counsel

Re: 2017 Senate Bill 104 modifications to existing pension spiking law requiring amendments to administrative regulation 105 KAR 1:140

Date: November 13, 2017

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Dear Trustees:

As you recall, during the 2017 regular session of the Kentucky General Assembly, Senate Bill 104 passed into law modifying the existing pension spiking provisions of Kentucky Revised Statute 61.598. Under the recent amendments, KERS, CERS, and SPRS members retiring on or after January 1, 2018, with creditable compensation reported for the last five fiscal years of employment exceeding 10% or more from an immediately preceding fiscal year, shall not have that increased compensation included when calculating retirement benefits and shall be refunded those additional employee contributions absent proof that the increase was the direct result of a bona fide promotion or career advancement or other applicable exemption (comp payout at termination, alternate sick leave payout, state or federal grant for overtime hours, overtime due to a state of emergency, unpaid leave/FLMA etc.).

As such, Kentucky Retirement Systems must now modify the existing regulation for pension spiking, 105 KAR 1:140, to reflect these recent statutory changes. Attached for your review is a draft version of the amended regulation to be filed with LRC upon your approval. As with the prior version of the regulation, it is necessary to file this amended regulation under the "emergency" classification in KRS 13A.190 to give immediate effect commensurate with the relevant retirement date provided in the amended statute (January 1, 2018). It shall later be replaced by an ordinary amendment to the regulation, which is identical in all respects to the attached draft regulation.

Thank you.

STATEMENT OF EMERGENCY
105 KAR 1:140E

(1) Pursuant to KRS 13A.190, the proposed amendment to the administrative regulation is an emergency. This emergency amendment to the administrative regulation amends the current regulation to provide for procedures to implement the provisions of 2017 Ky. Acts ch. 125, sec. 3 (Senate Bill 104).

(2) An emergency amendment to the administrative regulation is necessary to provide the procedures to implement 2017 Ky. Acts ch. 125, sec. 3 as of the commencement of the relevant retirement date provided in the statute.

(3) This emergency amendment to the administrative regulation shall be replaced by an ordinary amendment to the administrative regulation. The ordinary amendment to the administrative regulation was filed with the Regulations Compiler on November 15, 2017. The ordinary amendment to the administrative regulation is identical to this emergency amendment to the administrative regulation.

______________________________ DATE: ____________

MATTHEW G. BEVIN, GOVERNOR
COMMONWEALTH OF KENTUCKY

______________________________ DATE: ____________

JOHN R. FARRIS
CHAIR, BOARD OF TRUSTEES
KENTUCKY RETIREMENT SYSTEMS

FINANCE AND ADMINISTRATION CABINET

Kentucky Retirement Systems

(Emergency Amendment)

105 KAR 1:140E. Employer's administrative duties.

RELATES TO: KRS 16.583, 16.645(18), 18A.105, 61.546, 61.552(23), 61.560, 61.565, 61.569, 61.597, 61.598, 61.637(17), 61.675, 61.685, 61.702, 78.545(33), (37), 78.616, 78.625, 78.652, 26 U.S.C. 401(a)(17), (31), 403(b), 408(a), (b), 414(g)(6), 457(b), 3121(b)(10), Pub. L. 104-191, Pub. L. 111-5, Div. A, Title XIII, Div. B, Title IV, 26 C.F.R. 31.3121(b)(10)-2, 29 C.F.R. 519.2(a), 42 C.F.R. 423.504(b)(4)(vi), 45 C.F.R. Parts 160, 162, 164

STATUTORY AUTHORITY: KRS 16.645(18), 61.565, 61.645(9)(g), 61.675, 78.545(33), 78.625

NECESSITY, FUNCTION, AND CONFORMITY: KRS 61.645(9)(g) requires the Board of Trustees of the Kentucky Retirement Systems to promulgate administrative regulations necessary or proper in order to carry out the provisions of KRS 16.505 to 16.652, 61.510 to 61.705, and 78.510 to 78.852. Employers participating in the Kentucky Employees Retirement System, County Employees Retirement System and State Police Retirement System are required by KRS 16.645(18), 61.565, 61.675, 78.545(33), and 78.625 to make contributions to the retirement systems, to report creditable compensation to the retirement systems and other information that the Board of Trustees may require, and perform other duties and responsibilities as participating employers. 26 U.S.C. 401(a)(17) places a limit on the amount of creditable compensation on which contributions may be made. This administrative regulation sets out the reporting requirements for all participating agencies.

Section 1. (1) Each employer shall submit the reports required under KRS 61.675 and KRS 78.625 electronically using the secure Kentucky Retirement Systems' Employer Self Service Web site by:

(a) The Enter Report Details Module; or

(b) Uploading an electronic file that meets the requirements of the Employer Contribution Record Layout. The employer shall submit a test file to the retirement systems, which shall be reviewed for compliance with the requirements of the Employer Contribution Record Layout. If the test file is in compliance with the requirements of the Employer Contribution Record Layout, the retirement systems shall certify the electronic file and inform the employer of the month when the employer may begin using the electronic file for submitting reports. If the test file is not in compliance with the requirements of the Employer Contribution Record Layout, the retirement systems shall inform the employer of the needed corrections to the test file. The employer shall not submit a report by electronic file pursuant to this subsection until the test file is certified by the retirement systems.

(2) The retirement systems shall notify each employer of the Web address of the secure Kentucky Retirement Systems' Employer Self Service Web site and shall notify each employer if the Web address of the secure Kentucky Retirement Systems' Employer Self Service Web site changes.

(3) Each employer shall submit the contributions required by KRS 61.675 and KRS

78.625:

(a) Electronically using the secure Kentucky Retirement Systems' Employer Self Service Web site;

(b) By mailing or hand delivering a check;

(c) By the eMARS system maintained by the Finance and Administration Cabinet; or

(d) By wire transfer.

(4) The employer shall report all creditable compensation paid during a month by the tenth day of the following month.

(a) The employer shall designate the month to which the creditable compensation should be applied if it is not the month for which the employer is reporting and if the month the creditable compensation was earned is the month in which the employee:

1. Became employed;

2. Became eligible to participate in one of the systems administered by Kentucky Retirement Systems;

3. Was transferred to hazardous coverage from nonhazardous participation;

4. Was transferred from hazardous coverage to nonhazardous participation;

5. Terminated from employment; or

6. Became ineligible to participate in one (1) of the systems administered by Kentucky Retirement Systems.

(b) If the employee is paid creditable compensation in a lump sum or nonrecurring payment, the employer shall designate the reason for the lump sum or nonrecurring payment.

1. If the lump sum or nonrecurring payment was earned during a specific time period,

the employer shall designate the time period during which the lump sum or nonrecurring payment was earned.

2. If the employer fails to designate a specific time period during which the lump sum or nonrecurring payment was earned, the payment shall be considered a lump sum bonus pursuant to KRS 16.505(8), 61.510(13), or 78.510(13).

(5) The provisions of subsection (1) of this section shall not apply to the Kentucky Personnel Cabinet or agencies that are reported by the Kentucky Personnel Cabinet.

(6) Each employer shall report employees who are regular full-time employees as defined by KRS 61.510(21) and 78.510(21) and shall remit employer and employee contributions for those employees.

(7) If an employer fails to withhold from an employee's creditable compensation the full amount of contributions due from the employee in accordance with KRS 16.583, 61.560, 61.597, or 61.702:

(a) The retirement systems shall notify the employer of the additional amount of employee contributions due from the employee;

(b) The employer shall withhold the additional contributions due from the employee in accordance with KRS 16.583, 61.560, 61.697, or 61.702 from the employee's creditable compensation and remit the additional contributions to the retirement systems;

(c) If the employee is no longer employed by the employer, the employer shall notify the retirement systems and the retirement systems shall refund the contributions submitted by the employer on behalf of the employee to the employer, which shall withhold the applicable taxes from the contributions and remit the remaining money to the employee; and

(d) If the contributions are refunded in accordance with paragraph (c) of this subsection, then that service credit shall be omitted service in accordance with KRS 61.552(23).

(8) Each employer shall report employees who are not regular full-time employees as defined by KRS 61.510(21) and 78.510(21), but shall not remit employer or employee contributions for those employees unless required to do so pursuant to KRS 61.680(6), except:

(a) Student employees of public universities participating in the Kentucky Employees Retirement System who are enrolled as full-time students in a course of study at the university and who are exempt from FICA withholding pursuant to 26 U.S.C. 3121(b)(10) and 26 C.F.R. 31.3121(b)(10)-2; and

(b) Student employees of public universities participating in the Kentucky Employees Retirement System who are enrolled as full-time students in a course of study at the university and are classified as full-time students throughout the fiscal year pursuant to 29 C.F.R. 519.2(a).

(9)(a) An employer participating in Kentucky Employees Retirement System or County Employees Retirement System shall not classify an employee in more than one (1) non-participating position status during the fiscal year, except an employer participating in the County Employees Retirement System may classify an employee as probationary pursuant to KRS 78.510(21)(c) in the same fiscal year that the employer classifies the employee as seasonal, emergency, or part-time.

(b) An employer participating in the Kentucky Employees Retirement System or the County Employees Retirement System shall not change an employee's position status from full-time to seasonal, temporary, or interim in the same fiscal year.

(c) An employer shall not classify an employee as a seasonal employee pursuant to KRS 61.510(21)(a) or 78.510(21)(a) unless the duties of the job can only be performed during a defined time period during a fiscal or calendar year. If the employer classifies an employee as seasonal and the employee is terminated after the defined time period during a fiscal or calendar year, there shall be a three (3) calendar month break in employment before the employer may again classify the employee as a seasonal employee, except for employers that are school boards. If an employer that is a school board classifies an employee as seasonal and the employee is terminated after the defined time period during a fiscal or calendar year, there shall be a six (6) calendar month break in employment before the employer may again classify the employee as a seasonal employee.

(d) If an employer violates the provisions of this subsection, the retirement systems shall determine if the employee worked or averaged the necessary hours to be in a regular full-time position as provided in KRS 61.510(21) or 78.510(21). If the employee worked or averaged the necessary hours to be in a regular full-time position as defined by KRS 78.510(21), the service credit shall be omitted service in accordance with KRS 61.552(23).

Section 2. (1) Each employer shall submit electronic mail to the retirement systems by logging on to the Kentucky Retirement Systems' secure electronic mail server.

(2)(a) If an employer submits personal information about its employees to the retirement systems in an unsecure electronic format or submits personal information regarding its employees intended to be submitted to the retirement systems to another person or entity by hand delivery, mail, fax, or in an electronic format; the employer shall notify affected employees in writing of the disclosure of personal information and provide information regarding obtaining credit reports.

(b) Personal information includes the member's first name or first initial and last name in combination with the member's:

1. Social Security number;

2. Driver's license number;

3. Personal Identification Number permitting access to the member's account; or

4. Medical Information.

(c) The retirement systems shall notify the employer of a disclosure upon discovery.

(d) The employer shall notify the retirement systems of a disclosure upon discovery.

(e) The employer shall submit a draft of the written notification to be made to affected employees to the retirement systems for approval or denial.

(f) The employer shall submit copies of the written notifications made to affected employees to the retirement systems after the notifications have been made.

(g) If the retirement systems is required by federal or state law to provide notification to affected members about the employer's disclosure of personal information or if the retirement systems determines that it should provide the notification to its affected members because of the nature or magnitude of the employer's disclosure, the employer shall reimburse the retirement systems for its costs in notifying members affected by the employer's disclosure.

(h) In transmitting any medically related personal information, the employer shall comply with all statutes and regulations comprising the Health Insurance Portability and

Accountability Act of 1996 "HIPAA", Pub.L. 104-191 and the Health Information Technology for Economic and Clinical Health Act "HITECH", Pub.L. 111-5.

(i) Each employer shall execute a data use agreement with retirement systems.

Section 3. (1)(a) The retirement systems shall submit an invoice to employers for any payments owed to the retirement systems, which were not paid through the normal monthly reports.

(b) The employer shall remit payment to the retirement systems by the due date provided on the invoice.

(2) The retirement systems may offset funds owed by the employer to the retirement systems with funds owed to the employer by the retirement systems.

Section 4. (1) An employer shall pay interest at the rate adopted by the board for any creditable compensation paid as a result of an order of a court of competent jurisdiction, the Personnel Board, or the Human Rights Commission or for any creditable compensation paid in anticipation or settlement of an action before a court of competent jurisdiction, the Personnel Board, or the Human Rights Commission including notices of violations of state or federal wage and hour statutes or violations of state or federal discrimination statutes.

(2) The interest shall be assessed from the time period for which the creditable compensation has been reinstated.

Section 5. If an employer refuses to provide the retirement systems access to records or information requested in accordance with KRS 61.685 or does not respond to a request for information or records by the retirement systems, the retirement systems may, if appropriate, hold all payments of:

(1) Any funds due to the employer; or

(2) Refunds or initial retirement allowances to any employee or former employee of the employer whose refund or retirement may be affected by the records or information requested by the retirement system.

Section 6. (1) Effective July 1, 1996, and before July 1, 2002, the creditable compensation on which contributions are reported shall not exceed the maximum annual compensation limit contained in 26 U.S.C. 401(a)(17), $150,000, as adjusted for cost-of-living increases under 26 U.S.C. 401(a)(17)(B). The retirement system shall notify employers of the maximum annual compensation limit. Each employer shall report contributions on all creditable compensation up to the maximum annual limit. Once an employee's creditable compensation has reached the maximum annual limit, the employer shall continue to report the employee's creditable compensation but shall not report any further employer or employee contributions on the employee's creditable compensation. If excess contributions are erroneously reported, the retirement system shall refund the excess contributions to the employer for distribution to the employee after making payroll deductions in accordance with federal and state law.

(2) Effective only for the 1996 plan year, in determining the compensation of an employee eligible for consideration under this provision, the rules of 26 U.S.C. 414(g)(6) shall apply, except that in applying these rules, the term "family" shall include only the spouse of the member and any lineal descendants of the employee who have not attained age nineteen (19) before the close of the year.

(3) Effective with respect to plan years beginning on and after July 1, 2002, a plan member's annual compensation that exceeds $200,000 (as adjusted for cost-of-living

increases in accordance with 26 U.S.C. 401(a)(17)(B)) shall not be taken into account in determining benefits or contributions due for any plan year. Annual compensation shall include compensation during the plan year or any other consecutive twelve (12) month period over which compensation is otherwise determined under the plan (the determination period). The cost-of-living adjustment in effect for a calendar year shall apply to annual compensation for the determination period that begins with or within the calendar year. If the determination period consists of fewer than twelve (12) months, the annual compensation limit shall be an amount equal to the otherwise applicable annual compensation limit multiplied by a fraction, the numerator of which is the number of months in the short determination period, and the denominator of which is twelve (12). If the compensation for any prior determination period is taken into account in determining a plan member's contributions or benefits for the current plan year, the compensation for this prior determination period shall be subject to the applicable annual compensation limit in effect for that prior period.

(4) A participating member may pay contributions for the creditable compensation over the maximum annual compensation limit for the years used to determine the member's final compensation for purposes of retirement if:

(a) The member's creditable compensation has exceeded the maximum annual compensation limit contained in 26 U.S.C. 401(a)(17) in years prior to the fiscal year beginning July 1, 2002;

(b) The member has filed a notification of retirement; and

(c) The excess creditable compensation is within the maximum annual compensation limit applicable in 2002-2003. Upon receipt of employee contributions, the retirement systems shall bill the employer for the employer contributions on the excess creditable compensation, and the employer shall remit the employer contributions to the retirement systems. The excess shall only be included in retirement calculations if both the employee and employer have paid their respective contributions.

[~~Section 7. (1) An employer may request that the retirement systems make a determination if a change in position or hiring of an employee is a bona fide promotion or career advancement prior to the employee's change of position or hiring as provided in KRS 61.598.~~

~~(2) An employer may submit a Form 6480, Employer Request for Pre-Determination of Bona Fide Promotion or Career Advancement, describing the proposed change in position or hiring of an employee or potential employee including:~~

~~(a) The employee's or potential employee's full name;~~

~~(b) The employee's or potential employee's Kentucky Retirement Systems Member Identification Number or Social Security Number;~~

~~(c) The potential employee's current employer;~~

~~(d) The employee's current job description;~~

~~(e) The job description for the employee's proposed job;~~

~~(f) Documentation of additional training, skills, education, or expertise gained by the employee or potential employee;~~

~~(g) Employer's organizational chart; and~~

~~(h) Any additional information the employer wants to be considered by the retirement systems.~~

~~(3) The employer shall provide any additional information requested by the retirement~~

~~systems.~~

~~(4) The retirement systems may require the employer to make certifications regarding the information and documentation submitted.~~

~~(5) In determining if a change in position or hiring would be a bona fide promotion or career advancement, the retirement systems shall consider the factors listed in KRS 61.598(1)(a).~~

~~(6) Increases or proposed increases in an employee's creditable compensation caused by overtime, compensatory time other than lump-sum payment made at the time of termination, or bonuses shall not be a bona fide promotion or career advancement.~~

~~(7) The retirement systems shall issue a final administrative decision in writing informing the employer whether the employee's change in position or potential employee's hiring is a bona fide promotion or career advancement. The retirement systems' determination shall be specific to the employee or potential employee and shall be based on the information and documentation provided by the employer. If the information or documentation provided by the employer is not accurate, the final administrative decision of the retirement systems shall not be binding on the retirement systems pursuant to KRS 61.685.~~

~~(8) An employer who disagrees with the retirement systems' final administrative decision may request an administrative hearing in accordance with KRS Chapter 13B. The request for administrative hearing shall be made in writing within thirty (30) days of the date of the final administrative decision of the retirement systems.~~]

Section 7. [~~8.~~] (1) For members retiring on or after January 1, 2018, [~~After the member retires,~~] the retirement systems shall determine if annual increases in a member's creditable compensation greater than ten (10) percent occurred over the member's last five (5) fiscal years of employment.

(a) For each of the member's last five (5) fiscal years of employment, the retirement systems shall multiply the member's creditable compensation for the previous fiscal year by 110 percent. If the member's creditable compensation in any of his or her last five (5) fiscal years of employment is greater than the member's creditable compensation from the previous fiscal year multiplied by 110 percent, the retirement systems shall determine that an annual increase in the member's creditable compensation greater than ten (10) percent has occurred.

(b) The fiscal year immediately preceding the member's last five (5) fiscal years shall be used for comparison to determine if an increase in creditable compensation greater than ten (10) percent occurred in the initial fiscal year of the member's last five (5) fiscal years.

(c) For purposes of performing the calculations in paragraph (a) of this subsection, the member's creditable compensation shall be annualized by dividing the member's creditable compensation for the fiscal year by the number of months of service credit, and multiplying by twelve (12).

(2) If the retirement systems determines [~~determine~~] that the member received annual increases in creditable compensation greater than ten (10) percent over his or her [~~the member's~~] last five (5) fiscal years of employment, the retirement systems shall send written notice to the member [~~member's last participating employer~~] of the retirement systems' determination that any amount of increase in creditable compensation earned on or after July 1, 2017 greater than ten (10) percent from the preceding fiscal year shall

not be used to calculate the member's retirement allowance. [~~the member has experienced annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment, and the amount of the additional actuarial cost to the retirement systems attributable to the increases.~~]

(a) The written notice in subsection two (2) of this section shall inform the member if the retirement systems determined that any exemptions are applicable after review of the Form 6487, Request for Member Pension Spiking Exemption Amounts, as discussed in Section 8(1) of this administrative regulation.

(3) The member shall receive a refund of all pre-tax and post-tax member contributions and interest directly attributable to the reduction in creditable compensation.

(a) Pre-tax member contributions shall be refunded to the member by the employer who picked-up the contributions.

(b) Post-tax member contributions and interest shall be refunded to the member directly from the retirement systems. [~~(3) If the employer believes that the annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment was due to a bona fide promotion or career advancement, the employer shall file a Form 6481, Employer Request for Post-Determination of Bona Fide Promotion or Career Advancement, for a determination that the annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment were due to a bona fide promotion or career advancement. The Form 6481 shall be filed within sixty (60) days of the date of the notice. If the retirement systems had previously provided a determination that a change in position or hiring of the member would be a bona fide promotion or career~~

~~advancement, the employer shall submit the determination and provide documentation that the increase in creditable compensation for that fiscal year was due to the employer implementing the proposed change in position or hiring.]~~

Section 8. (1) If the retirement systems determines that the member received annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment, the retirement systems shall send the member's employer the Form 6487, Request for Member Pension Spiking Exemption Amounts.

(a) Pursuant to KRS 16.645, 61.675, and 78.545, the employer shall furnish the information required by the retirement systems in the discharge of its duties. The employer shall complete the Form 6487 in its entirety and provide supporting documentation.

(b) The Form 6487 shall be filed at the retirement office within sixty (60) days of the date the Form 6487 was issued.

(2) If the employer believes that the annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment was not due to a bona fide promotion or career advancement, a lump-sum payment for compensatory time, a lump-sum payment made pursuant to alternate sick leave, leave without pay, overtime attributable to a state or federally funded grant, or overtime attributable to a state of emergency, the employer shall indicate on the Form 6487 that none of the listed exemptions are applicable.

(a) The employer shall report any increases in creditable compensation directly attributable to a lump-sum payment for compensatory time, a lump-sum payment made pursuant to alternate sick leave, or leave without pay during the employer's normal monthly reporting. If, upon review of the Form 6487, the employer believes that adjustments to the reported salaries are required, then the employer shall make those adjustments during the next monthly reporting cycle pursuant to KRS 16.645, 61.675, and 78.545.

(3) If the employer believes that the annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment was due to a bona fide promotion or career advancement, overtime attributable to a state or federally funded grant, or overtime attributable to a state of emergency, the employer shall include the salary directly attributable to each exemption in Part 2 of the Form 6487.

(a) If the employer believes that any of the salary is directly attributable to a bona fide promotion or career advancement, the employer shall complete Part 3 of the Form 6487.

(b) The employer shall provide an explanation and documentation supporting the assertion that the increase in creditable compensation resulted from a bona fide promotion or career advancement.

(c) In determining if a change in position or hiring was a bona fide promotion or career advancement, the retirement systems shall consider the factors listed in KRS 61.598(1)(a).

(4) The employer shall provide any additional information requested by the retirement systems.

(a) [~~(5)~~] The retirement systems may require the employer to make certifications regarding the information and documentation submitted.

(5) If the increases in creditable compensation are not directly attributable to any of the listed exemptions and no reporting information needs to be corrected, then any annual

increase in creditable compensation greater than ten (10) percent shall not be used to calculate the member's retirement allowance.

(6) The retirement systems shall not issue a refund to the employer for the excess employer contributions. The retirement systems shall utilize any employer contributions directly attributable to the reduction in creditable compensation to pay the unfunded liability of the pension fund in which the retiring member participated. [~~(6) In determining if a change in position or hiring was a bona fide promotion or career advancement, the retirement systems shall consider the factors listed in KRS 61.598(1)(a).~~]

Section 9. (1) [~~(7)~~] The retirement systems shall issue a final administrative decision in writing informing the member [~~employer~~] whether the annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment was [~~were~~] due to a bona fide promotion or career advancement, a lump-sum payment for compensatory time, a lump-sum payment made pursuant to alternate sick leave, leave without pay, overtime attributable to a state or federally funded grant, or overtime attributable to a state of emergency.

(a) In determining if an annual increase in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment was attributable to a specific exemption listed in KRS 61.598(4), the retirement systems shall rely upon employer reporting pursuant to KRS 61.598(8).

(2) [~~(8)~~] If the employer fails to submit a Form 6487, Request for Member Pension Spiking Exemption Amounts [~~6481, Employer Request for Post-Determination of Bona Fide Promotion or Career Advancement~~], within sixty (60) days of the date on [~~of~~] the notice, then the retirement systems shall issue a final administrative decision that the

creditable compensation greater than ten (10) percent from the member's immediately preceding fiscal year shall not be used to calculate the member's retirement allowance. The retirement systems shall timely provide notification to the member of the final administrative decision. [~~the employer shall pay the additional actuarial cost to the retirement systems attributable to annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment.~~]

(3) [~~(9)~~] If the member [~~employer~~] disagrees with the final administrative decision by the retirement systems, the member [~~employer~~] shall file at the retirement office a written request for an administrative hearing pursuant to KRS Chapter 13B within thirty (30) days of the date on [~~of~~] the final administrative decision. The hearing shall be limited to the issue of whether the retirement systems correctly determined that the annual increases in the member's creditable compensation greater than ten (10) percent over his or her last five (5) fiscal years of employment was [~~were~~] not due to a bona fide promotion or career advancement, a lump-sum payment for compensatory time, a lump-sum payment made pursuant to alternate sick leave, leave without pay, overtime attributable to a state or federally funded grant, or overtime attributable to a state of emergency.

(4) [~~(10)~~] If the member [~~employer~~] fails to file a written request for administrative hearing within thirty (30) days of the date on [~~of~~] the final administrative decision, then the creditable compensation greater than ten (10) percent from the member's immediately preceding fiscal year shall not be used to calculate the member's retirement allowance. [~~the employer shall pay the additional actuarial cost to the retirement systems attributable to annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment.~~

~~(11) The retirement systems shall issue an invoice to the last participating employer representing the actuarial cost to the retirement systems attributable to annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment. The employer may request that the retirement systems allow the employer to pay the cost over a period, not to exceed one (1) year, without interest and the retirement systems shall establish a payment plan for the employer.~~

~~(12) If the member was employed by more than one (1) participating employer when the member retired, the actuarial cost to the retirement systems attributable to annual increases in creditable compensation greater than ten (10) percent over the member's last five (5) fiscal years of employment shall be divided equally among the member's last participating employers.~~

~~(13) An employer who is required to pay the additional actuarial cost pursuant to KRS 61.598 shall be treated as a participating employer in the system to which the employer is required to pay the additional actuarial cost solely for purposes of making the payment required pursuant to KRS 61.598.~~]

Section 10. [~~9.~~] Incorporation by Reference. (1) Form 6487, "Request for Member Pension Spiking Exemption Amounts", November 2017, [~~The following material~~] is incorporated by reference. [~~:~~

~~(a) Form 6480, "Employer Request for Pre-Determination of Bona Fide Promotion or Career Advancement", July 2013; and~~

~~(b) Form 6481, "Employer Request for Post-Determination of Bona Fide Promotion or Career Advancement", September 2013.~~]

(2) This material may be inspected, copied, or obtained, subject to applicable

copyright law, at the Kentucky Retirement Systems, Perimeter Park West, 1260 Louisville Road, Frankfort, Kentucky 40601, Monday through Friday, from 8 a.m. to 4:30 p.m.

APPROVED:

____ _______________

DAVE EAGER, INTERIM EXECUTIVE DIRECTOR, FOR JOHN FARRIS, CHAIR
BOARD OF TRUSTEES OF
KENTUCKY RETIREMENT SYSTEMS

DATE

REGULATORY IMPACT ANALYSIS
AND TIERING STATEMENT

Regulation number: 105 KAR 1:140E
Contact person: Joseph P. Bowman
Phone number: 502-696-8800 ext. 5501
Email: joseph.bowman@kyret.ky.gov

(1) Provide a brief summary of:

(a) What this administrative regulation does: This administrative regulation establishes the procedures and requirements for employers to provide reports and contributions to Kentucky Retirement Systems.

(b) The necessity of this administrative regulation: This administrative regulation is necessary to establish the procedures and requirements for employers to provide reports and contributions to Kentucky Retirement Systems.

(c) How this administrative regulation conforms to the content of the authorizing statutes: The authorizing statutes provide that employers must file contributions and reports at the retirement systems. This administrative regulation provides the procedures and requirements for employers to file reports and contributions at the retirement systems.

(d) How this administrative regulation currently assists or will assist in the effective administration of the statutes: This administrative regulation will assist in the effective administration of the statutes by providing the procedures and requirements for employers to file reports and contributions with the retirement systems.

(2) If this is an amendment to an existing administrative regulation, provide a brief summary of:

(a)How the amendment will change this existing administrative regulation: The amendment provides the procedure and documentation an employer will have to demonstrate to show that an increase in creditable compensation greater than ten percent (10%) during a member's last five fiscal years of employment is subject to the listed exemptions and capable of being used to calculate the retiring member's retirement benefits.

(b)The necessity of the amendment to this administrative regulation: The amendment is necessary to provide the procedure and documentation an employer will have to demonstrate to show that an increase in creditable compensation greater than ten percent (10%) during a member's last five fiscal years of employment is subject to the listed exemptions and capable of being used to calculate the retiring member's retirement benefits.

(c) How the amendment conforms to the content of the authorizing statutes: The amendment conforms to the content of the authorizing statutes by providing the procedure and documentation an employer will have to demonstrate to show that an increase in creditable compensation greater than ten percent (10%) during a member's last five fiscal years of employment is subject to the listed exemptions and capable of being used to calculate the retiring member's retirement benefits.

(d) How the amendment will assist in the effective administration of the statutes: The amendment will assist in the effective administration of the statutes by providing the procedure and documentation an employer will have to demonstrate to show that an increase in creditable compensation greater than ten percent (10%) during the member's last five fiscal years of employment is subject to the listed exemptions and capable of being used to calculate the retiring member's retirement benefits.

(3) List the type and number of individuals, businesses, organizations, or state and local governments affected by this administrative regulation: Approximately 1800 participating employers of Kentucky Employees Retirement System, County Employees Retirement System, and State Police Retirement System.

(4) Provide an analysis of how the entities identified in question (3) will be impacted by either the implementation of this administrative regulation, if new, or by the change, if it is an amendment, including:

(a) List the actions that each of the regulated entities identified in question (3) will have to take to comply with this administrative regulation or amendment: Employers shall provide information regarding whether a member's increase in creditable compensation greater than ten percent (10%) during the his or her last five fiscal years of employment is subject to the listed exemptions. Members may request a determination regarding whether or not the increase in creditable compensation greater than ten percent (10%) in their last five fiscal years of employment are subject to one of the listed exemptions and capable of being used to calculate retirement benefits.

(b) In complying with this administrative regulation or amendment, how much will it cost each of the entities identified in question (3): The additional cost to employers should be minimal because they already report electronically. It is within the member's discretion to request a determination or administrative appeal of a determination. Kentucky Retirement Systems will have a cost of staff time and resources to make the determination if a member makes a request for determination.

(c) As a result of compliance, what benefits will accrue to the entities identified in question (3): Member's will know how to request determination or administrative appeal of a determination of bona fide promotion or career advancement and employers will know how to report the required pension spiking exemption amounts.

(5) Provide an estimate of how much it will cost to implement this administrative regulation:

(a) Initially: $0.00

(b) On a continuing basis: $0.00

(6) What is the source of the funding to be used for the implementation and enforcement of this administrative regulation: Administrative expenses of the Kentucky Retirement Systems are paid from the Retirement Allowance Account (trust and agency funds).

(7) Provide an assessment of whether an increase in fees or funding will be necessary to implement this administrative regulation, if new, or by the change if it is an amendment: There is no increase in fees or funding required.

(8) State whether or not this administrative regulation establishes any fees or directly or indirectly increases any fees: This regulation does not establish any fees or directly or indirectly increase any fees.

(9) TIERING: Is tiering applied? (Explain why or why not) Procedures are the same for all members and participating employers; therefore, tiering was not applied.

FISCAL NOTE ON STATE OR LOCAL GOVERNMENT

Regulation number: 105 KAR 1:140E
Contact person: Joseph P. Bowman
Phone number: 502-696-8800 ext. 5501

(1) What units, parts, or divisions of state or local government (including cities, counties, fire departments, or school districts) will be impacted by this administrative regulation? All state and local government employers participating in Kentucky Employees Retirement System, County Employees Retirement System, or State Police Retirement System.

(2) Identify each state or federal statute or federal regulation that requires or authorizes the action taken by the administrative regulation. KRS 16.645(18), 61.565, 61.598(6), 61.645(9)(g), 61.675, 78.545(33), and 78.625.

(3) Estimate the effect of this administrative regulation on the expenditures and revenues of a state or local government agency (including cities, counties, fire departments, or school districts) for the first full year the administrative regulation is to be in effect.

(a) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for the first year? None.

(b) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for subsequent years? None.

(c) How much will it cost to administer this program for the first year? The additional cost to employers should be minimal because they already report electronically. It is within the member's discretion to request a determination or administrative appeal of a determination of whether one of the exemptions applies. Kentucky Retirement Systems will have a cost of staff time and resources to make the determination.

(d) How much will it cost to administer this program for subsequent years? There is no additional cost as employers have always been required by statute to report.

Note: If specific dollar estimates cannot be determined, provide a brief narrative to explain the fiscal impact of the administrative regulation.
Revenues (+/-):
Expenditures (+/-):
Other Explanation:

CONTACT PERSON: Joseph P. Bowman, Special Detail General Counsel, Division of Non-Advocacy, Kentucky Retirement Systems, Perimeter Park West, 1260 Louisville Road, Frankfort, KY 40601, email joseph.bowman@kyret.ky.gov, telephone (502) 696-8800 ext. 5501, facsimile (502) 696-8615.

105 KAR 1:140E

SUMMARY OF
MATERIAL INCORPORATED BY REFERENCE

The material incorporated by reference consists of the following form:

(a) Form 6487, “Request for Member Pension Spiking Exemption Amounts”, October 2017. This is the form an employer completes to assist the retirement systems in determining whether an increase in a member’s creditable compensation greater than ten (10) percent was the result of one of the exemptions listed in KRS 61.598(4).

There are five (5) pages incorporated by reference.