

Kentucky Employees Retirement System (KERS)

Actuarial Valuation Report
as of June 30, 2021





December 2, 2021

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

Subject: Actuarial Valuation as of June 30, 2021

Dear Trustees of the Board:

This report describes the current actuarial condition of the Kentucky Employees Retirement System (KERS) and provides the actuarially determined employer contribution rates for fiscal years ending June 30, 2023 and June 30, 2024. In addition, the report analyzes changes in KERS's financial condition and 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 KERS. 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 Kentucky Public Pensions Authority (KPPA) staff and those designated or approved by the Board.

FINANCING OBJECTIVES AND FUNDING POLICY

The contribution rates determined by these actuarial valuations are intended to become effective twelve months after the valuation date and, as such, are intended to be used by the Board for recommending required contribution rates effective July 1, 2022, as well as the subsequent fiscal year beginning July 1, 2023 and ending June 30, 2024.

The employer contribution is determined in accordance with Section 61.565 of Kentucky Statute. As specified by the Statute, the employer contribution is comprised of a normal cost contribution and an actuarial accrued liability contribution. The actuarial accrued liability contribution is calculated by amortizing the unfunded accrued liability as of June 30, 2019 over a closed 30-year amortization period (28 years remaining as of June 30, 2021). Gains and losses incurring in years after June 30, 2019 are amortized as separate closed 20-year amortization bases.

House Bill 8 passed during the 2021 legislative session and changed how employer contributions are allocated and collected from the participating employers in the KERS Non-Hazardous Fund. Each employer will pay a normal cost contribution on the payroll of their covered employees and contribute to the fund an allocated share of the cost required to amortize the unfunded liability.

ASSUMPTIONS AND METHODS

The Board of Trustees, in consultation with the actuary, sets the actuarial assumptions and methods used in the actuarial valuation. Except where noted in this report, the assumptions used in this actuarial valuation were adopted by the Board for first use in the June 30, 2019 actuarial valuation and are based on an experience study conducted with experience through June 30, 2018. There were no changes in actuarial assumptions or methods since the prior valuation.

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.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

BENEFIT PROVISIONS

The benefit provisions reflected in these valuations are those which were in effect on June 30, 2021. Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for certain members who become “totally and permanently disabled” in the line of duty or as a result of a duty-related disability. There were no other material benefit provision changes since the prior valuation.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2021, by KPPA staff. The staff also supplied asset information as of June 30, 2021. 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 KPPA.



CERTIFICATION


We certify that the information presented herein is accurate and fairly portrays the actuarial position of KERS as of June 30, 2021.

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. Both of the undersigned are Enrolled Actuaries, Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. Both of the undersigned are experienced in performing valuations for large public retirement systems. This communication shall not be construed to provide tax advice, legal advice or investment advice.

Sincerely,

Gabriel, Roeder, Smith & Company



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



Janie Shaw, ASA, EA, 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, 2021	June 30, 2020	June 30, 2021	June 30, 2020	June 30, 2021	June 30, 2020
Contribution Rate, payable on covered payroll¹:						
Retirement	7.82%	7.90%	31.82%	33.43%		
Insurance	<u>2.15%</u>	<u>2.20%</u>	<u>0.00%</u>	<u>0.00%</u>		
Total	9.97%	10.10%	31.82%	33.43%	N/A	N/A
Amortization Cost to be allocated amongst employers²	\$994,422	\$1,022,725	N/A	N/A	N/A	N/A
Assets:						
Retirement						
• Actuarial value (AVAR)	\$2,735,876	\$2,323,298	\$782,496	\$709,587	\$3,518,372	\$3,032,885
• Market value (MVAR)	\$3,018,660	\$2,308,080	\$866,140	\$690,350	\$3,884,800	\$2,998,430
• Ratio of actuarial to market value of assets	90.6%	100.7%	90.3%	102.8%	90.6%	101.1%
Insurance						
• Actuarial value (AVAI)	\$1,291,472	\$1,095,959	\$575,025	\$539,251	\$1,866,497	\$1,635,210
• Market value (MVAI)	\$1,419,477	\$1,060,649	\$633,677	\$521,755	\$2,053,154	\$1,582,404
• Ratio of actuarial to market value of assets	91.0%	103.3%	90.7%	103.4%	90.9%	103.3%
Funded Status:						
Retirement						
• Actuarial accrued liability	\$16,321,372	\$16,348,961	\$1,295,243	\$1,283,769	\$17,616,615	\$17,632,730
• Unfunded accrued liability on AVAR	\$13,585,496	\$14,025,663	\$512,747	\$574,182	\$14,098,243	\$14,599,845
• Funded ratio on AVAR	16.8%	14.2%	60.4%	55.3%	20.0%	17.2%
• Unfunded accrued liability on MVAR	\$13,302,712	\$14,040,881	\$429,103	\$593,419	\$13,731,815	\$14,634,300
• Funded ratio on MVAR	18.5%	14.1%	66.9%	53.8%	22.1%	17.0%
Insurance						
• Actuarial accrued liability	\$2,574,112	\$2,564,788	\$424,455	\$427,977	\$2,998,567	\$2,992,765
• Unfunded accrued liability on AVAI	\$1,282,640	\$1,468,829	(\$150,570)	(\$111,274)	\$1,132,070	\$1,357,555
• Funded ratio on AVAI	50.2%	42.7%	135.5%	126.0%	62.2%	54.6%
• Unfunded accrued liability on MVAI	\$1,154,635	\$1,504,139	(\$209,222)	(\$93,778)	\$945,413	\$1,410,361
• Funded ratio on MVAI	55.1%	41.4%	149.3%	121.9%	68.5%	52.9%
Membership:						
• Number of						
- Active Members	30,186	31,703	3,827	4,094	34,013	35,797
- Retirees and Beneficiaries	47,700	47,333	4,726	4,628	52,426	51,961
- Inactive Members	<u>54,522</u>	<u>53,499</u>	<u>7,680</u>	<u>6,941</u>	<u>62,202</u>	<u>60,440</u>
- Total	132,408	132,535	16,233	15,663	148,641	148,198
• Projected payroll of active members	\$1,349,330	\$1,387,761	\$162,836	\$170,826	\$1,512,166	\$1,558,587
• Average salary of active members	\$44,701	\$43,774	\$42,549	\$41,726	\$44,458	\$43,540

¹ Reflects contribution rate payable as a percentage of covered payroll. For the non-hazardous fund, this includes the normal cost portion of the contribution requirement only. For the hazardous fund, this includes both the normal cost and unfunded liability portion of the contribution requirement.

² Amortization cost shown for the June 30, 2020 valuation excludes amortization cost payable by employers that ceased participation after June 30, 2020.



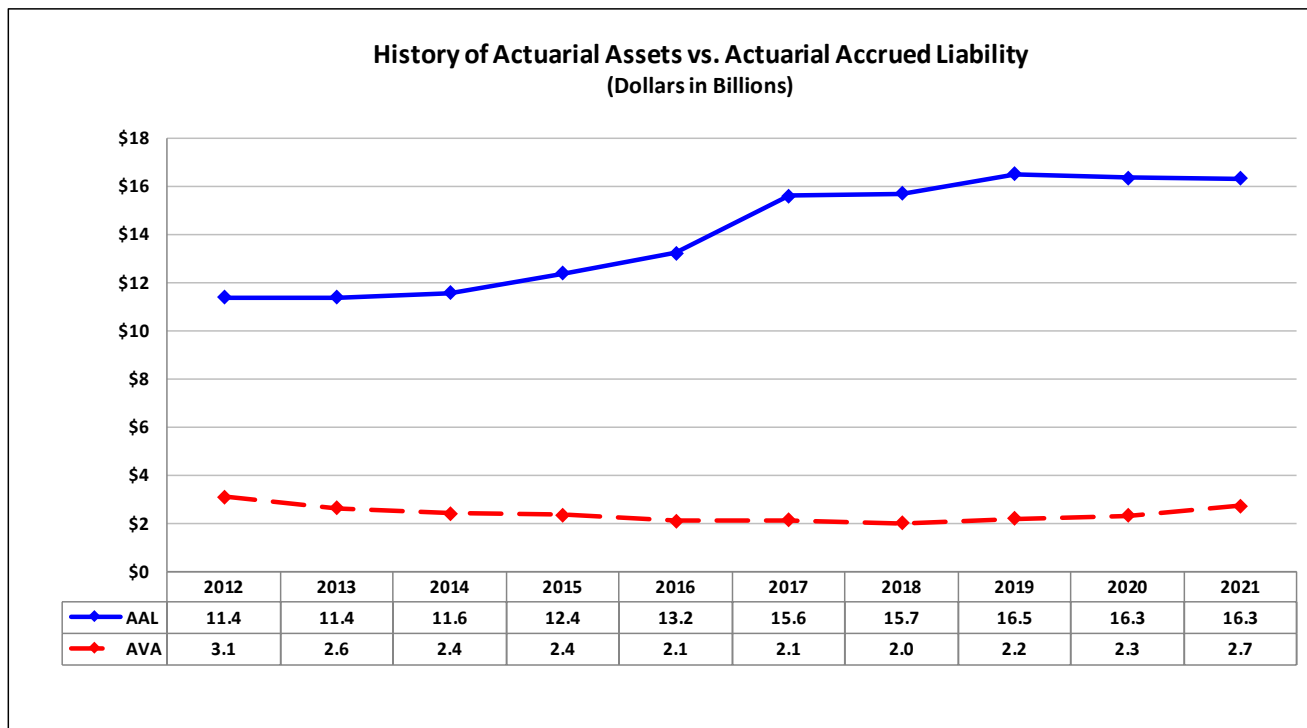
Executive Summary (Continued)

Non-Hazardous Retirement Fund

The unfunded actuarial accrued liability of the non-hazardous retirement fund decreased by \$440 million since the prior year's valuation to \$13.585 billion. This decrease was approximately \$104 million more than expected, primarily due to favorable investment experience in the past year.

For FYE 2021, the non-hazardous retirement fund distributed \$1,030 million in benefit payments and administrative expenses, and received \$1,224 million in employer and employee contributions. As of June 30, 2021, plan assets for this system were \$3,019 million (excluding assets in the 401(h) account). To stabilize the financial condition of this system, it is imperative that contributions to the system continue to exceed the benefit payments.

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 ten years has generally been due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) decreases in the assumed rate of return between 2015 and 2017.

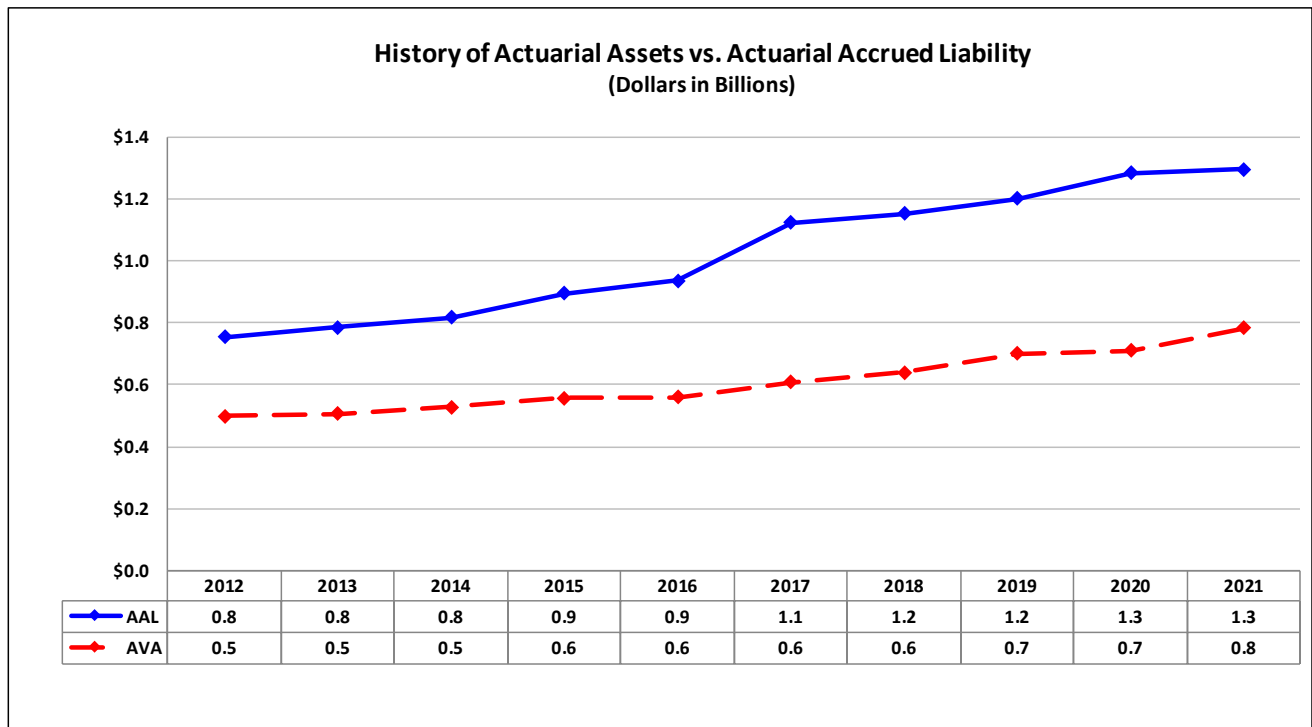


Executive Summary (Continued)

Hazardous Retirement Fund

The unfunded actuarial accrued liability of the hazardous retirement fund decreased by \$61 million since the prior year’s valuation to \$513 million. This decrease was approximately \$42 million more than expected, primarily due to favorable investment experience in the past year and liability gains due to the mortality experience for retired members and salary experience for active members.

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 ten years has generally been due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) decreases in the assumed rate of return between 2015 and 2017.



Executive Summary (Continued)

Summary of Change in Financial Condition of the Insurance Funds

Both the 2022 non-Medicare and Medicare premiums were lower than expected based on the prior year's actuarial assumptions, which resulted in lower than expected accrued liability for the insurance fund.

Specifically, the non-Medicare premiums were expected to increase by 6.4% from calendar year 2021 to calendar year 2022 (i.e. the medical trend assumption for non-Medicare premiums) and the actual premiums increased by approximately 2.4%. The Medicare premiums were expected to increase by 2.9% from calendar year 2021 to calendar year 2022, which was based on the "Not to Exceed" 2022 Medicare premiums that Humana provided in 2021. Actual Medicare premiums increased by approximately 2.0%.

Non-Hazardous Insurance Fund

Since the prior year's valuation, the unfunded actuarial accrued liability of the non-hazardous insurance fund decreased by \$186 million since the prior year's valuation to \$1,283 million. This decrease was approximately \$116 million more than expected, which includes a \$36 million gain due to favorable investment experience and a \$39 million gain due to the favorable premium experience. The corresponding funded ratio increased from 42.7% at June 30, 2020 to 50.3% at June 30, 2021.

Hazardous Insurance Fund

Since the prior year's valuation, the plan assets in excess of the actuarial accrued liability of the hazardous insurance fund increased by \$39 million since the prior year's valuation to a \$151 million surplus. This increase was approximately \$38 million more than expected, which includes a \$19 million gain due to favorable investment experience and a \$8 million gain due to the favorable premium experience. The corresponding funded ratio increased from 126.0% at June 30, 2020 to 135.5% at June 30, 2021.

SECTION 2

DISCUSSION

Discussion

The Kentucky Employees Retirement System (KERS) is a defined benefit pension plan that provides 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 results of the June 30, 2021 actuarial funding valuation for both the Retirement Funds and Insurance Funds.

The primary purposes of the valuation report are to describe the current actuarial condition of KERS and provide the actuarially determined employer contributions for fiscal years ending June 30, 2023 and June 30, 2024. In addition, the report analyzes changes in KERS's financial condition and provides various summaries of the data.

The actuarially determined contribution 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 that it should cost to provide the benefits for an average 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. The amortization cost is the amount 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 additional details related to the calculation of the amortization of the unfunded actuarial accrued liability. Section 5 provides member data and statistical information. Section 6 provides a discussion of various risk measures, which are intended to aid stakeholders in understanding the effects of future experience differing from the assumptions used in performing an actuarial valuation. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Appendix C provides a glossary of technical terms that are used throughout this report. Finally, Appendix D provides the allocation of the amortization cost amongst KERS Non-Hazardous employers for fiscal year ending June 30, 2023. This appendix was added to the report this year due to the passing of House Bill 8 during the 2021 legislation session, which changed how the amortization cost component of the actuarially determined employer contribution would be collected and allocated to employers.

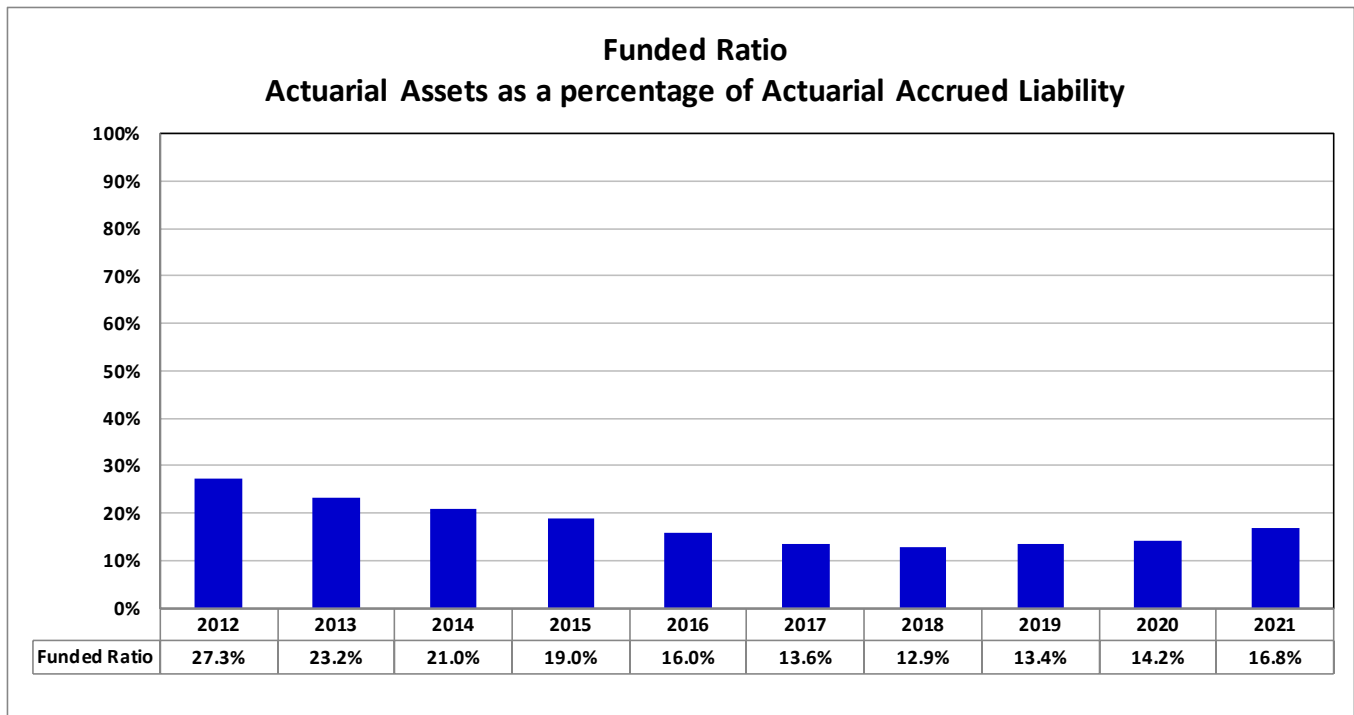


Funding Progress

The following charts provide a ten-year history of the retirement 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 ten years has generally been due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) decreases in the assumed rate of return between 2015 and 2017.

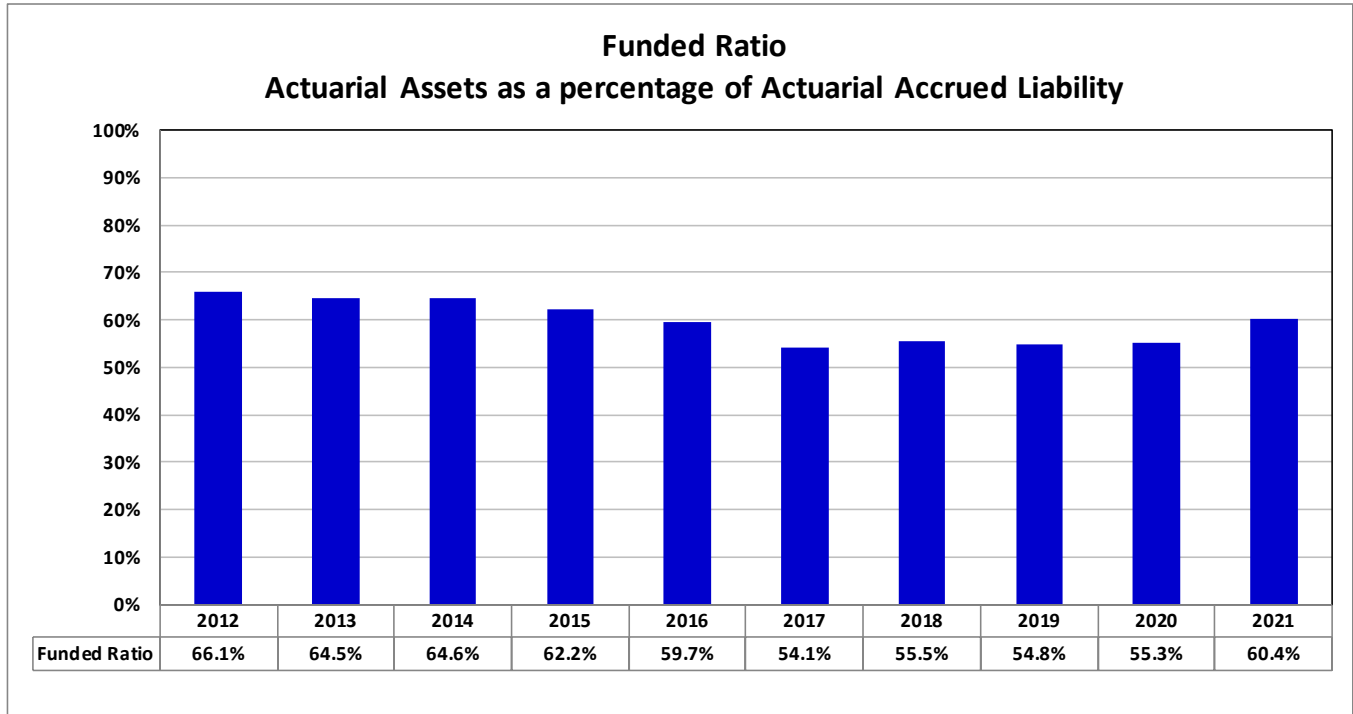
The funded ratio increased from 2020 to 2021 for both the non-hazardous and hazardous funds. Assuming the full actuarially determined contributions are paid in future years and absent future unfavorable experience, the funded ratio is expected to continue improving. Also, the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, is also expected to continue decreasing. Table 9, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement Funds.

Non-Hazardous Retirement Fund



Funding Progress (Continued)

Hazardous Retirement Fund



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 return is computed net of investment expenses.

Non-Hazardous Retirement Fund

The actuarial value of assets for the retirement fund increased from \$2.323 billion to \$2.736 billion since the prior valuation. The rate of return on the market value of assets on a dollar-weighted basis for the prior fiscal year was 21.5% which is greater than the 5.25% expected annual return. The return on an actuarial (smoothed) asset value was 9.0%, which resulted in a \$91.1 million gain for the fiscal year. 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 \$283 million greater than the actuarial value of assets, which signifies that the retirement fund is in a position of deferred gains to be realized in future years.

Hazardous Retirement Fund

Likewise, the actuarial value of assets for the hazardous retirement fund increased from \$710 million to \$782 million since the prior valuation. The rate of return on the market value of assets on a dollar-weighted basis for the prior fiscal year was 25.0% which is greater than the 6.25% expected annual return. The return on an actuarial (smoothed) asset value was 9.9%, which resulted in a \$25.8 million gain for the fiscal year. The market value of assets is \$84 million greater than the actuarial value of assets, which signifies that the retirement fund is in a position of deferred gains to be realized in future years.

Table 6 in the following section of this report provides asset information that was included in the annual financial statements of the funds, as well as the estimated yield on a market value basis. Tables 7 and 8 provide the development of the actuarial value of assets and the estimated yield on an actuarial value basis.

Actuarial Gains/ (Losses)

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the funds 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 a 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 unfunded liability 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, and changes in plan provisions.

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	\$ 14,025,663	\$ 574,182
2. Normal cost and administrative expenses	179,021	28,767
3. Less: contributions for the year	(1,224,433)	(82,161)
4. Interest accrual	708,905	34,218
5. Expected UAAL (Sum of Items 1 - 4)	\$ 13,689,156	\$ 555,006
6. Actual UAAL as of June 30, 2021	\$ 13,585,496	\$ 512,747
7. Total gain (loss) for the year (Item 5 - Item 6)	\$ 103,660	\$ 42,259
B. Source of gains and losses		
8. Asset gain (loss) for the year	\$ 91,146	\$ 25,840
9. Liability experience gain (loss) for the year	14,605	16,445
10. Plan Change	(2,091)	(26)
11. Assumption change	—	—
12. Total	\$ 103,660	\$ 42,259

The contributions shown above for the non-hazardous fund include \$175.6 million in payments made by employers ceasing participation from the fund. The accrued liability was approximately 0.1% and 1.3% less than expected for the non-hazardous and hazardous funds, respectively, resulting in the liability experience gains shown above. This experience for the hazardous fund was primarily due to the mortality experience for retired members and salary experience for active members.



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	\$ 1,468,829	\$ (111,274)
2. Normal cost and administrative expenses	36,348	7,993
3. Less: contributions for the year	(192,993)	(2,467)
4. Interest accrual	86,907	(6,782)
5. Expected UAAL (Sum of Items 1 - 4)	\$ 1,399,091	\$ (112,530)
6. Actual UAAL as of June 30, 2021	\$ 1,282,640	\$ (150,570)
7. Total gain (loss) for the year (Item 5 - Item 6)	\$ 116,451	\$ 38,040
B. Source of gains and losses		
8. Asset gain (loss) for the year	\$ 36,248	\$ 18,901
9. Liability experience gain (loss) for the year	81,438	19,184
10. Plan Change	(1,235)	(45)
11. Assumption change	—	—
12. Total	\$ 116,451	\$ 38,040

The contributions shown above for the non-hazardous fund include \$28.4 million in payments made by employers ceasing participation from the fund. The liability experience gains shown above include a \$39 million gain for the non-hazardous fund and a \$8.4 million gain for the hazardous fund due to the funds' favorable premium experience. See the discussion in the Executive Summary for additional information.



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. The Board of Trustees, in consultation with the actuary, sets the actuarial assumptions and methods used in the actuarial valuation.

In conjunction with the review of the healthcare per capita claims cost, the assumed increase in future healthcare costs, or trend assumption, is reviewed on an annual basis. The trend assumption was last updated at the June 30, 2020 valuation. All other assumptions were adopted by the Board for first use in the June 30, 2019 actuarial valuation and are based on an experience study conducted with experience through June 30, 2018. There were no changes in actuarial assumptions or methods since the prior valuation.

It is our opinion that the assumptions are internally consistent, reasonable, and reflect anticipated future experience of the System. Appendix A includes a summary of the actuarial assumptions and methods used in this valuation.

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 major benefit provisions for System.

Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for qualified members who become “totally and permanently disabled” in the line of duty or as a result of a duty-related disability. The minimum disability benefit increased from 25% of the member’s monthly final rate of pay to 75% of the member’s monthly average pay. The insurance premium for the member, the member’s spouse, and the member’s dependent children shall also be paid in full by the System. For non-hazardous members to be eligible for this benefit, they must be working in a position that could be certified as a hazardous position.

There were no other material plan provision changes since the prior valuation.

SECTION 3

ACTUARIAL TABLES

Actuarial Tables

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RETIREMENT BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability Retirement Benefits

(Dollar amounts expressed in thousands)

	June 30, 2021	
	Non-Hazardous (1)	Hazardous (2)
1. Projected payroll of active members	\$ 1,349,330	\$ 162,836
2. Present value of future pay	\$ 10,485,622	\$ 1,227,325
3. Normal cost rate		
a. Total normal cost rate	11.96%	16.01%
b. Less: member contribution rate	-5.00%	-8.00%
c. Employer normal cost rate	<u>6.96%</u>	<u>8.01%</u>
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 5,086,196	\$ 566,017
b. Less: present value of future normal costs	<u>(1,190,775)</u>	<u>(187,205)</u>
c. Actuarial accrued liability	\$ 3,895,421	\$ 378,812
5. Total actuarial accrued liability		
a. Retirees and beneficiaries	\$ 11,736,267	\$ 864,939
b. Inactive members	689,684	51,492
c. Active members (Item 4c)	<u>3,895,421</u>	<u>378,812</u>
d. Total	\$ 16,321,372	\$ 1,295,243
6. Actuarial value of assets	\$ 2,735,876	\$ 782,496
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 13,585,496	\$ 512,747
8. Funded Ratio	16.8%	60.4%



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

	June 30, 2021	
	Non-Hazardous (1)	Hazardous (2)
1. Active members		
a. Service retirement	\$ 4,525,329	\$ 504,241
b. Deferred termination benefits and refunds	335,876	39,364
c. Survivor benefits	69,495	5,208
d. Disability benefits	155,496	17,204
e. Total	<u>\$ 5,086,196</u>	<u>\$ 566,017</u>
2. Retired members		
a. Service retirement	\$ 10,727,024	\$ 794,207
b. Disability retirement	260,039	17,472
c. Beneficiaries	749,204	53,260
d. Total	<u>\$ 11,736,267</u>	<u>\$ 864,939</u>
3. Inactive members		
a. Vested terminations	\$ 642,278	\$ 40,608
b. Nonvested terminations	47,406	10,884
c. Total	<u>\$ 689,684</u>	<u>\$ 51,492</u>
4. Total actuarial present value of future benefits	<u>\$ 17,512,147</u>	<u>\$ 1,482,448</u>



Development of Actuarially Determined Contribution Rate Retirement Benefits

	June 30, 2021	
	Non-Hazardous (1)	Hazardous (2)
1. Total normal cost rate		
a. Service retirement	8.14%	11.38%
b. Deferred termination benefits and refunds	2.86%	3.62%
c. Survivor benefits	0.34%	0.30%
d. Disability benefits	<u>0.62%</u>	<u>0.71%</u>
e. Total	11.96%	16.01%
2. Less: member contribution rate	<u>-5.00%</u>	<u>-8.00%</u>
3. Total employer normal cost rate	6.96%	8.01%
4. Administrative expenses	<u>0.86%</u>	<u>0.77%</u>
5. Net employer normal cost rate	7.82%	8.78%
6. UAAL amortization contribution rate	<u>N/A</u>	<u>23.04%</u>
7. Total calculated employer contribution payable as a percentage of covered payroll	7.82%	31.82%
8. Total amortization cost to be allocated amongst employers	\$ 906,020	N/A

Note: Per House Bill 8 (passed during the 2021 legislative session), amortization cost for the KERS Non-Hazardous fund is allocated amongst employers based on their 2019 Actuarial Accrued Liability. See appendix D for more information. Amortization cost for the hazardous fund is included in the contribution rate, payable as a percentage of payroll.

Actuarial Balance Sheet
Non-Hazardous Members Retirement
(Dollar amounts expressed in thousands)

	<u>June 30, 2021</u>	<u>June 30, 2020</u>
	(1)	(2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	\$ 2,735,876	\$ 2,323,298
b. Present value of future member contributions	\$ 524,281	\$ 542,793
c. Present value of future employer contributions		
i. Normal cost contributions	\$ 666,494	\$ 702,916
ii. Unfunded accrued liability contributions	13,585,496	14,025,663
iii. Total future employer contributions	\$ 14,251,990	\$ 14,728,579
d. Total assets	\$ 17,512,147	\$ 17,594,670
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	\$ 1,190,775	\$ 1,245,709
ii. Accrued liability	3,895,421	3,881,439
iii. Total present value of future benefits	\$ 5,086,196	\$ 5,127,148
b. Present value of benefits payable on account of current retired members and beneficiaries	\$ 11,736,267	\$ 11,810,296
c. Present value of benefits payable on account of current inactive members	\$ 689,684	\$ 657,226
d. Total liabilities	\$ 17,512,147	\$ 17,594,670



Actuarial Balance Sheet
Hazardous Members Retirement
(Dollar amounts expressed in thousands)

	<u>June 30, 2021</u>	<u>June 30, 2020</u>
	(1)	(2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	\$ 782,496	\$ 709,587
b. Present value of future member contributions	\$ 98,186	\$ 102,792
c. Present value of future employer contributions		
i. Normal cost contributions	\$ 89,019	\$ 95,352
ii. Unfunded accrued liability contributions	<u>512,747</u>	<u>574,182</u>
iii. Total future employer contributions	\$ 601,766	\$ 669,534
d. Total assets	\$ 1,482,448	\$ 1,481,913
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	\$ 187,205	\$ 198,144
ii. Accrued liability	<u>378,812</u>	<u>385,641</u>
iii. Total present value of future benefits	\$ 566,017	\$ 583,785
b. Present value of benefits payable on account of current retired members and beneficiaries	\$ 864,939	\$ 849,773
c. Present value of benefits payable on account of current inactive members	\$ 51,492	\$ 48,355
d. Total liabilities	\$ 1,482,448	\$ 1,481,913



Reconciliation of Retirement Net Assets

(Dollar amounts expressed in thousands)¹

	Year Ending	
	June 30, 2021	June 30, 2021
	(1)	(2)
	Non-Hazardous	Hazardous
1. Value of assets at beginning of year	\$ 2,308,080	\$ 690,350
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 90,202	\$ 19,961
ii. Employer contributions	958,580	62,181
iii. Other contributions (less 401h)	175,652	18
iv. Total	\$ 1,224,433	\$ 82,161
b. Income		
i. Interest, dividends, and other income	\$ 69,710	\$ 21,559
ii. Investment expenses	(19,080)	(7,617)
iii. Net	\$ 50,630	\$ 13,943
c. Net realized and unrealized gains (losses)	465,592	159,210
d. Total revenue	\$ 1,740,656	\$ 255,314
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 8,953	\$ 4,380
ii. Regular annuity benefits	1,009,502	73,888
iii. Other benefit payments	0	0
iv. Transfers to other systems	0	0
v. Total	\$ 1,018,454	\$ 78,268
b. Administrative expenses and depreciation	11,622	1,255
c. Total expenditures	\$ 1,030,076	\$ 79,524
4. Increase in net assets (Item 2. - Item 3.)	\$ 710,580	\$ 175,791
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 3,018,660	\$ 866,140
6. Net external cash flow		
a. Dollar amount	\$ 194,357	\$ 2,637
b. Percentage of market value	7.3%	0.3%
7. Estimated annual return on net assets	21.5%	25.0%

¹ Amounts may not add due to rounding

¹ Excludes 401h assets



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

Year Ending	June 30, 2021																												
1. Actuarial value of assets at beginning of year	\$ 2,323,298																												
2. Market value of assets at beginning of year	\$ 2,308,080																												
3. Net new investments																													
a. Contributions	\$ 1,224,433																												
b. Benefit payments	(1,018,454)																												
c. Administrative expenses	(11,622)																												
d. Subtotal	\$ 194,357																												
4. Market value of assets at end of year	\$ 3,018,660																												
5. Net earnings (Item 4. - Item 2. - Item 3.d.)	\$ 516,223																												
6. Assumed investment return rate for fiscal year	5.25%																												
7. Expected return for immediate recognition	\$ 126,276																												
8. Excess return for phased recognition	\$ 389,946																												
9. Phased-in recognition, 20% of excess return on assets for prior years:																													
	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="text-align: center; border-bottom: 1px solid black;">Fiscal Year Ending June 30,</th> <th style="text-align: center; border-bottom: 1px solid black;">Excess Return</th> <th style="text-align: center; border-bottom: 1px solid black;">Recognized Amount</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">a.</td> <td style="text-align: center;">2021</td> <td style="text-align: right;">\$ 389,946</td> <td style="text-align: right;">\$ 77,989</td> </tr> <tr> <td style="padding-left: 20px;">b.</td> <td style="text-align: center;">2020</td> <td style="text-align: right;">(65,343)</td> <td style="text-align: right;">(13,069)</td> </tr> <tr> <td style="padding-left: 20px;">c.</td> <td style="text-align: center;">2019</td> <td style="text-align: right;">4,070</td> <td style="text-align: right;">814</td> </tr> <tr> <td style="padding-left: 20px;">d.</td> <td style="text-align: center;">2018</td> <td style="text-align: right;">42,022</td> <td style="text-align: right;">8,404</td> </tr> <tr> <td style="padding-left: 20px;">e.</td> <td style="text-align: center;">2017</td> <td style="text-align: right;">89,028</td> <td style="text-align: right;">17,806</td> </tr> <tr> <td style="padding-left: 20px;">f.</td> <td style="text-align: center;">Total</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">\$ 91,945</td> </tr> </tbody> </table>		Fiscal Year Ending June 30,	Excess Return	Recognized Amount	a.	2021	\$ 389,946	\$ 77,989	b.	2020	(65,343)	(13,069)	c.	2019	4,070	814	d.	2018	42,022	8,404	e.	2017	89,028	17,806	f.	Total		\$ 91,945
	Fiscal Year Ending June 30,	Excess Return	Recognized Amount																										
a.	2021	\$ 389,946	\$ 77,989																										
b.	2020	(65,343)	(13,069)																										
c.	2019	4,070	814																										
d.	2018	42,022	8,404																										
e.	2017	89,028	17,806																										
f.	Total		\$ 91,945																										
10. Actuarial value of assets as of June 30, 2021 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	\$ 2,735,876																												
11. Ratio of actuarial value to market value	90.6%																												
12. Estimated annual return on actuarial value of assets	9.0%																												

* 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, 2021																												
1. Actuarial value of assets at beginning of year	\$ 709,587																												
2. Market value of assets at beginning of year	\$ 690,350																												
3. Net new investments																													
a. Contributions	\$ 82,161																												
b. Benefit payments	(78,268)																												
c. Administrative expenses	(1,255)																												
d. Subtotal	\$ 2,637																												
4. Market value of assets at end of year	\$ 866,140																												
5. Net earnings (Item 4. - Item 2. - Item 3.d.)	\$ 173,153																												
6. Assumed investment return rate for fiscal year	6.25%																												
7. Expected return for immediate recognition	\$ 43,229																												
8. Excess return for phased recognition	\$ 129,924																												
9. Phased-in recognition, 20% of excess return on assets for prior years:																													
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="text-align: center;"><u>Fiscal Year</u> <u>Ending June 30,</u></th> <th style="text-align: center;"><u>Excess</u> <u>Return</u></th> <th style="text-align: center;"><u>Recognized</u> <u>Amount</u></th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">a.</td> <td style="text-align: center;">2021</td> <td style="text-align: right;">\$ 129,924</td> <td style="text-align: right;">\$ 25,985</td> </tr> <tr> <td style="padding-left: 20px;">b.</td> <td style="text-align: center;">2020</td> <td style="text-align: right;">(35,903)</td> <td style="text-align: right;">(7,181)</td> </tr> <tr> <td style="padding-left: 20px;">c.</td> <td style="text-align: center;">2019</td> <td style="text-align: right;">(3,933)</td> <td style="text-align: right;">(787)</td> </tr> <tr> <td style="padding-left: 20px;">d.</td> <td style="text-align: center;">2018</td> <td style="text-align: right;">14,102</td> <td style="text-align: right;">2,820</td> </tr> <tr> <td style="padding-left: 20px;">e.</td> <td style="text-align: center;">2017</td> <td style="text-align: right;">31,023</td> <td style="text-align: right;">6,205</td> </tr> <tr> <td style="padding-left: 20px;">f.</td> <td style="text-align: center;">Total</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">\$ 27,043</td> </tr> </tbody> </table>		<u>Fiscal Year</u> <u>Ending June 30,</u>	<u>Excess</u> <u>Return</u>	<u>Recognized</u> <u>Amount</u>	a.	2021	\$ 129,924	\$ 25,985	b.	2020	(35,903)	(7,181)	c.	2019	(3,933)	(787)	d.	2018	14,102	2,820	e.	2017	31,023	6,205	f.	Total		\$ 27,043
	<u>Fiscal Year</u> <u>Ending June 30,</u>	<u>Excess</u> <u>Return</u>	<u>Recognized</u> <u>Amount</u>																										
a.	2021	\$ 129,924	\$ 25,985																										
b.	2020	(35,903)	(7,181)																										
c.	2019	(3,933)	(787)																										
d.	2018	14,102	2,820																										
e.	2017	31,023	6,205																										
f.	Total		\$ 27,043																										
10. Actuarial value of assets as of June 30, 2021 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	\$ 782,496																												
11. Ratio of actuarial value to market value	90.3%																												
12. Estimated annual return on actuarial value of assets	9.9%																												

* 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						
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	9,126,153	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%
2018	2,019,278	15,675,232	13,655,954	12.9%	1,471,477	928.0%
2019	2,206,280	16,466,428	14,260,148	13.4%	1,437,647	991.9%
2020	2,323,298	16,348,961	14,025,663	14.2%	1,387,761	1010.7%
2021	2,735,876	16,321,372	13,585,496	16.8%	1,349,330	1006.8%
Hazardous Members						
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	338,745	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%
2018	639,262	1,151,923	512,661	55.5%	158,213	324.0%
2019	671,647	1,226,195	554,548	54.8%	150,446	368.6%
2020	709,587	1,283,769	574,182	55.3%	170,826	336.1%
2021	782,496	1,295,243	512,747	60.4%	162,836	314.9%
Total KERS Members						
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%
2018	2,658,540	16,827,155	14,168,615	15.8%	1,629,690	869.4%
2019	2,877,927	17,692,623	14,814,696	16.3%	1,588,093	932.9%
2020	3,032,885	17,632,730	14,599,845	17.2%	1,558,587	936.7%
2021	3,518,372	17,616,615	14,098,243	20.0%	1,512,166	932.3%



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 June 30, 2021	Hazardous June 30, 2021
Valuation date:	June 30, 2021	June 30, 2021
Actuarial cost method:	Entry Age Normal	Entry Age Normal
Amortization method:	Level percentage of payroll (0% payroll growth assumed)	Level percentage of payroll (0% payroll growth assumed)
Amortization period for contribution rate:	30-year closed period at June 30, 2019 Gains/losses incurring after 2019 will be amortized over separate closed 20-year amortization bases	30-year closed period at June 30, 2019 Gains/losses incurring after 2019 will be amortized over separate closed 20-year amortization bases
Asset valuation method:	5-Year Smoothed Market	5-Year Smoothed Market
Actuarial assumptions:		
Investment rate of return	5.25%	6.25%
Projected salary increases	3.30% to 15.30% (varies by service)	3.55% to 20.05% (varies by service)
Inflation	2.30%	2.30%
Post-retirement benefit adjustments	0.00%	0.00%
Retiree Mortality	System-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019.	System-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019.

Solvency Test
Retirement Benefits
(Dollar amounts expressed in thousands)

June 30,	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
	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							
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%
2018	892,033	11,929,019	2,854,180	2,019,278	100.0%	9.4%	0.0%
2019	881,020	12,513,231	3,072,177	2,206,280	100.0%	10.6%	0.0%
2020	869,196	12,467,522	3,012,243	2,323,298	100.0%	11.7%	0.0%
2021	877,142	12,425,951	3,018,279	2,735,876	100.0%	15.0%	0.0%
Hazardous Members							
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%
2018	89,106	810,311	252,506	639,262	100.0%	67.9%	0.0%
2019	86,663	879,818	259,714	671,647	100.0%	66.5%	0.0%
2020	95,528	898,128	290,113	709,587	100.0%	68.4%	0.0%
2021	97,559	916,431	281,253	782,496	100.0%	74.7%	0.0%



INSURANCE BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability Insurance Benefits

(Dollar amounts expressed in thousands)

	June 30, 2021	
	Non-Hazardous (1)	Hazardous (2)
1. Projected payroll of active members	\$ 1,349,330	\$ 162,836
2. Present value of future pay	\$ 9,758,517	\$ 1,224,582
3. Normal cost rate		
a. Total normal cost rate	2.54%	4.46%
b. Less: member contribution rate	-0.45%	-0.66%
c. Employer normal cost rate	<u>2.09%</u>	<u>3.80%</u>
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 1,186,423	\$ 182,132
b. Less: present value of future normal costs	<u>(222,086)</u>	<u>(45,691)</u>
c. Actuarial accrued liability	\$ 964,337	\$ 136,441
5. Total actuarial accrued liability		
a. Retirees and beneficiaries	\$ 1,461,617	\$ 276,981
b. Inactive members	148,158	11,033
c. Active members (Item 4c)	<u>964,337</u>	<u>136,441</u>
d. Total	\$ 2,574,112	\$ 424,455
6. Actuarial value of assets	\$ 1,291,472	\$ 575,025
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 1,282,640	\$ (150,570)
8. Funded Ratio	50.2%	135.5%



Development of Actuarially Determined Contribution Rate Insurance Benefits

	June 30, 2021	
	Non-Hazardous (1)	Hazardous (2)
1. Total normal cost rate	2.54%	4.46%
2. Less: member contribution rate	<u>-0.45%</u>	<u>-0.66%</u>
3. Total employer normal cost rate	2.09%	3.80%
4. Administrative expenses	<u>0.06%</u>	<u>0.07%</u>
5. Net employer normal cost rate	2.15%	3.87%
6. UAAL amortization contribution rate	<u>N/A</u>	<u>-7.59%</u>
7. Total calculated employer contribution payable as a percentage of covered payroll Max (0%, item 5. + item6.)	2.15%	0.00%
8. Total amortization cost to be allocated amongst employers	\$ 88,402	N/A

Note: Per House Bill 8 (passed during the 2021 legislative session), amortization cost for the KERS Non-Hazardous fund is allocated amongst employers based on their 2019 Actuarial Accrued Liability. See appendix D for more information. Amortization cost for the hazardous fund is included in the contribution rate, payable as a percentage of payroll.

Actuarial Balance Sheet
Non-Hazardous Members Insurance
(Dollar amounts expressed in thousands)

	<u>June 30, 2021</u>	<u>June 30, 2020</u>
	(1)	(2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	\$ 1,291,472	\$ 1,095,959
b. Present value of future member contributions	\$ 54,640	\$ 53,935
c. Present value of future employer contributions		
i. Normal cost contributions	\$ 167,446	\$ 182,067
ii. Unfunded accrued liability contributions	<u>1,282,640</u>	<u>1,468,829</u>
iii. Total future employer contributions	\$ 1,450,086	\$ 1,650,896
d. Total assets	\$ 2,796,198	\$ 2,800,790
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	\$ 222,086	\$ 236,002
ii. Accrued liability	<u>964,337</u>	<u>975,045</u>
iii. Total present value of future benefits	\$ 1,186,423	\$ 1,211,047
b. Present value of benefits payable on account of current retired members and beneficiaries	\$ 1,461,617	\$ 1,445,401
c. Present value of benefits payable on account of current inactive members	\$ 148,158	\$ 144,342
d. Total liabilities	\$ 2,796,198	\$ 2,800,790



Actuarial Balance Sheet
Hazardous Members Insurance
(Dollar amounts expressed in thousands)

	<u>June 30, 2021</u>	<u>June 30, 2020</u>
	(1)	(2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	\$ 575,025	\$ 539,251
b. Present value of future member contributions	\$ 9,821	\$ 9,956
c. Present value of future employer contributions		
i. Normal cost contributions	\$ 35,870	\$ 38,918
ii. Unfunded accrued liability contributions	<u>(150,570)</u>	<u>(111,274)</u>
iii. Total future employer contributions	\$ (114,700)	\$ (72,356)
d. Total assets	\$ 470,146	\$ 476,851
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	\$ 45,691	\$ 48,874
ii. Accrued liability	<u>136,441</u>	<u>146,053</u>
iii. Total present value of future benefits	\$ 182,132	\$ 194,927
b. Present value of benefits payable on account of current retired members and beneficiaries	\$ 276,981	\$ 271,249
c. Present value of benefits payable on account of current inactive members	\$ 11,033	\$ 10,675
d. Total liabilities	\$ 470,146	\$ 476,851



Reconciliation of Insurance Net Assets

(Dollar amounts expressed in thousands)¹

	Year Ending	
	June 30, 2021	June 30, 2021
	(1)	(2)
	Non-Hazardous	Hazardous
1. Value of assets at beginning of year	\$ 1,060,649	\$ 521,755
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 6,318	\$ 1,167
ii. Employer contributions	153,570	23
iii. Other contributions (less 401h)	33,105	1,277
iv. Total	\$ 192,993	\$ 2,467
b. Income		
i. Interest, dividends, and other income	\$ 29,358	\$ 15,205
ii. Investment expenses	(10,880)	(6,832)
iii. Net	\$ 18,478	\$ 8,373
c. Net realized and unrealized gains (losses)	252,333	119,870
d. Total revenue	\$ 463,805	\$ 130,710
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 0	\$ 0
ii. Healthcare premium subsidies	119,897	19,800
iii. Other benefit payments ²	(15,740)	(1,129)
iv. Transfers to other systems	0	0
v. Total	\$ 104,157	\$ 18,670
b. Administrative expenses and depreciation	819	118
c. Total expenditures	\$ 104,976	\$ 18,788
4. Increase in net assets (Item 2. - Item 3.)	\$ 358,829	\$ 111,922
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 1,419,477	\$ 633,677
6. Net external cash flow		
a. Dollar amount	\$ 88,017	\$ (16,321)
b. Percentage of market value	7.1%	-2.8%
7. Estimated annual return on net assets	24.5%	25.0%

¹ Amounts may not add due to rounding and include 401h assets

² Benefit payments have been offset by Medicare Drug Reimbursements, Insurance Premiums, and Humana Gain Share Payments



Development of Actuarial Value of Assets
Non-Hazardous Members Insurance
(Dollar amounts expressed in thousands)*

Year Ending	June 30, 2021																												
1. Actuarial value of assets at beginning of year	\$ 1,095,959																												
2. Market value of assets at beginning of year	\$ 1,060,649																												
3. Net new investments																													
a. Contributions	\$ 192,993																												
b. Benefit payments	(104,157)																												
c. Administrative expenses	(819)																												
d. Subtotal	\$ 88,017																												
4. Market value of assets at end of year	\$ 1,419,477																												
5. Net earnings (Item 4. - Item 2. - Item 3.d.)	\$ 270,811																												
6. Assumed investment return rate for fiscal year	6.25%																												
7. Expected return for immediate recognition	\$ 69,041																												
8. Excess return for phased recognition	\$ 201,770																												
9. Phased-in recognition, 20% of excess return on assets for prior years:																													
	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="text-align: center; border-bottom: 1px solid black;">Fiscal Year Ending June 30,</th> <th style="text-align: center; border-bottom: 1px solid black;">Excess Return</th> <th style="text-align: center; border-bottom: 1px solid black;">Recognized Amount</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">a.</td> <td style="text-align: center;">2021</td> <td style="text-align: right;">\$ 201,770</td> <td style="text-align: right;">\$ 40,354</td> </tr> <tr> <td style="padding-left: 20px;">b.</td> <td style="text-align: center;">2020</td> <td style="text-align: right;">(52,052)</td> <td style="text-align: right;">(10,410)</td> </tr> <tr> <td style="padding-left: 20px;">c.</td> <td style="text-align: center;">2019</td> <td style="text-align: right;">(11,768)</td> <td style="text-align: right;">(2,354)</td> </tr> <tr> <td style="padding-left: 20px;">d.</td> <td style="text-align: center;">2018</td> <td style="text-align: right;">12,636</td> <td style="text-align: right;">2,527</td> </tr> <tr> <td style="padding-left: 20px;">e.</td> <td style="text-align: center;">2017</td> <td style="text-align: right;">41,687</td> <td style="text-align: right;">8,337</td> </tr> <tr> <td style="padding-left: 20px;">f.</td> <td style="text-align: center;">Total</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">\$ 38,455</td> </tr> </tbody> </table>		Fiscal Year Ending June 30,	Excess Return	Recognized Amount	a.	2021	\$ 201,770	\$ 40,354	b.	2020	(52,052)	(10,410)	c.	2019	(11,768)	(2,354)	d.	2018	12,636	2,527	e.	2017	41,687	8,337	f.	Total		\$ 38,455
	Fiscal Year Ending June 30,	Excess Return	Recognized Amount																										
a.	2021	\$ 201,770	\$ 40,354																										
b.	2020	(52,052)	(10,410)																										
c.	2019	(11,768)	(2,354)																										
d.	2018	12,636	2,527																										
e.	2017	41,687	8,337																										
f.	Total		\$ 38,455																										
10. Actuarial value of assets as of June 30, 2021 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	\$ 1,291,472																												
11. Ratio of actuarial value to market value	91.0%																												
12. Estimated annual return on actuarial value of assets	9.4%																												

* 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, 2021																												
1. Actuarial value of assets at beginning of year	\$ 539,251																												
2. Market value of assets at beginning of year	\$ 521,755																												
3. Net new investments																													
a. Contributions	\$ 2,467																												
b. Benefit payments	(18,670)																												
c. Administrative expenses	(118)																												
d. Subtotal	\$ (16,321)																												
4. Market value of assets at end of year	\$ 633,677																												
5. Net earnings (Item 4. - Item 2. - Item 3.d.)	\$ 128,243																												
6. Assumed investment return rate for fiscal year	6.25%																												
7. Expected return for immediate recognition	\$ 32,100																												
8. Excess return for phased recognition	\$ 96,144																												
9. Phased-in recognition, 20% of excess return on assets for prior years:																													
	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="text-align: center; border-bottom: 1px solid black;">Fiscal Year Ending June 30,</th> <th style="text-align: center; border-bottom: 1px solid black;">Excess Return</th> <th style="text-align: center; border-bottom: 1px solid black;">Recognized Amount</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">a.</td> <td style="text-align: center;">2021</td> <td style="text-align: right;">\$ 96,144</td> <td style="text-align: right;">\$ 19,229</td> </tr> <tr> <td style="padding-left: 20px;">b.</td> <td style="text-align: center;">2020</td> <td style="text-align: right;">(32,268)</td> <td style="text-align: right;">(6,454)</td> </tr> <tr> <td style="padding-left: 20px;">c.</td> <td style="text-align: center;">2019</td> <td style="text-align: right;">(3,651)</td> <td style="text-align: right;">(730)</td> </tr> <tr> <td style="padding-left: 20px;">d.</td> <td style="text-align: center;">2018</td> <td style="text-align: right;">12,794</td> <td style="text-align: right;">2,559</td> </tr> <tr> <td style="padding-left: 20px;">e.</td> <td style="text-align: center;">2017</td> <td style="text-align: right;">26,956</td> <td style="text-align: right;">5,391</td> </tr> <tr> <td style="padding-left: 20px;">f.</td> <td style="text-align: center;">Total</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">\$ 19,995</td> </tr> </tbody> </table>		Fiscal Year Ending June 30,	Excess Return	Recognized Amount	a.	2021	\$ 96,144	\$ 19,229	b.	2020	(32,268)	(6,454)	c.	2019	(3,651)	(730)	d.	2018	12,794	2,559	e.	2017	26,956	5,391	f.	Total		\$ 19,995
	Fiscal Year Ending June 30,	Excess Return	Recognized Amount																										
a.	2021	\$ 96,144	\$ 19,229																										
b.	2020	(32,268)	(6,454)																										
c.	2019	(3,651)	(730)																										
d.	2018	12,794	2,559																										
e.	2017	26,956	5,391																										
f.	Total		\$ 19,995																										
10. Actuarial value of assets as of June 30, 2021 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	\$ 575,025																												
11. Ratio of actuarial value to market value	90.7%																												
12. Estimated annual return on actuarial value of assets	9.8%																												

* 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						
2012	\$ 446,081	\$ 3,125,330	\$ 2,679,249	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%
2018	887,121	2,435,505	1,548,384	36.4%	1,471,477	105.2%
2019	991,427	2,733,065	1,741,638	36.3%	1,437,647	121.1%
2020	1,095,959	2,564,788	1,468,829	42.7%	1,387,761	105.8%
2021	1,291,472	2,574,112	1,282,640	50.2%	1,349,330	95.1%
Hazardous Members						
2012	\$ 345,574	\$ 384,592	\$ 39,018	89.9%	\$ 131,977	29.6%
2013	370,774	385,518	14,744	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%
2018	511,441	393,481	(117,960)	130.0%	158,213	-74.6%
2019	525,315	426,704	(98,611)	123.1%	150,446	-65.5%
2020	539,251	427,977	(111,274)	126.0%	170,826	-65.1%
2021	575,025	424,455	(150,570)	135.5%	162,836	-92.5%
Total KERS Members						
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%
2018	1,398,562	2,828,986	1,430,424	49.4%	1,629,690	87.8%
2019	1,516,742	3,159,769	1,643,027	48.0%	1,588,093	103.5%
2020	1,635,210	2,992,765	1,357,555	54.6%	1,558,587	87.1%
2021	1,866,497	2,998,567	1,132,070	62.2%	1,512,166	74.9%



Solvency Test
Insurance Benefits
(Dollar amounts expressed in thousands)

June 30, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets			
	Active Member Contributions (2)	Retired Members & Beneficiaries (3)	Active Members (Employer Financed) (4)		Active (6)	Retired (7)	ER Financed (8)	
Non-Hazardous Members								
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%	
2018	-	1,475,953	959,552	887,121	100.0%	60.1%	0.0%	
2019	-	1,686,604	1,046,461	991,427	100.0%	58.8%	0.0%	
2020	-	1,589,743	975,045	1,095,959	100.0%	68.9%	0.0%	
2021	-	1,609,775	964,337	1,291,472	100.0%	80.2%	0.0%	
Hazardous Members								
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%	
2018	-	248,775	144,706	511,441	100.0%	100.0%	100.0%	
2019	-	282,069	144,635	525,315	100.0%	100.0%	100.0%	
2020	-	281,924	146,053	539,251	100.0%	100.0%	100.0%	
2021	-	288,014	136,441	575,025	100.0%	100.0%	100.0%	



SECTION 4

AMORTIZATION BASES

Amortization of Unfunded Liability

Non-Hazardous Members Retirement

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2021	Payments for FYE 2023	Funding Period at June 30, 2021
June 30, 2019	\$ 14,260,148	\$ 13,960,514	\$ 938,364	28
June 30, 2020	(153,145)	(32,895)	(2,708)	19
June 30, 2021	(342,123)	(342,123)	(29,636)	20
Total		\$ 13,585,496	\$ 906,020	
Projected Payroll for FYE 2023			N/A	
Amortization Payments as a Percentage of Payroll			N/A	

Hazardous Members Retirement

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2021	Payments for FYE 2023	Funding Period at June 30, 2021
June 30, 2019	\$ 554,548	\$ 542,997	\$ 40,306	28
June 30, 2020	24,023	19,248	1,706	19
June 30, 2021	(49,498)	(49,498)	(4,491)	20
Total		\$ 512,747	\$ 37,521	
Projected Payroll for FYE 2023			\$ 162,836	
Amortization Payments as a Percentage of Payroll			23.04%	

Note:

Budgeted contribution rates for FYE 2022 were known at the time of the June 30, 2021 Valuation. Amortization bases established at this valuation date were adjusted accordingly.

Per House Bill 8 (passed during the 2021 legislative session), amortization cost for the KERS Non-Hazardous fund is allocated amongst employers based on their 2019 Actuarial Accrued Liability. See appendix D for more information. Amortization cost for the hazardous fund is included in the contribution rate, payable as a percentage of payroll.

Amortization of Unfunded Liability

Non-Hazardous Members Insurance

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2021	Payments for FYE 2023	Funding Period at June 30, 2021
June 30, 2019	\$ 1,741,638	\$ 1,693,386	\$ 125,697	28
June 30, 2020	(246,890)	(251,598)	(22,305)	19
June 30, 2021	(159,148)	(159,148)	(14,990)	20
Total		\$ 1,282,640	\$ 88,402	
Projected Payroll for FYE 2023			N/A	
Amortization Payments as a Percentage of Payroll			N/A	

Hazardous Members Insurance

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2021	Payments for FYE 2023	Funding Period at June 30, 2021
June 30, 2019	\$ (98,611)	\$ (100,442)	\$ (7,456)	28
June 30, 2020	(9,508)	(10,670)	(946)	19
June 30, 2021	(39,458)	(39,458)	(3,911)	20
Total		\$ (150,570)	\$ (12,313)	
Projected Payroll for FYE 2023			\$ 162,117	
Amortization Payments as a Percentage of Payroll			-7.59%	

Note:

Budgeted contribution rates for FYE 2022 were known at the time of the June 30, 2021 Valuation. Amortization bases established at this valuation date were adjusted accordingly.

Per House Bill 8 (passed during the 2021 legislative session), amortization cost for the KERS Non-Hazardous fund is allocated amongst employers based on their 2019 Actuarial Accrued Liability. See appendix D for more information. Amortization cost for the hazardous fund is included in the contribution rate, payable as a percentage of payroll.

SECTION 5

MEMBERSHIP INFORMATION

Membership Tables

<u>TABLE NUMBER</u>	<u>PAGE</u>	<u>CONTENT OF TABLE</u>
23	44	SUMMARY OF MEMBERSHIP DATA
24	45	SUMMARY OF HISTORICAL ACTIVE MEMBERSHIP
25	46	DISTRIBUTION OF ACTIVE MEMBERS BY AGE AND SERVICE – NON-HAZARDOUS MEMBERS
26	47	DISTRIBUTION OF ACTIVE MEMBERS BY AGE AND SERVICE – HAZARDOUS MEMBERS
27	48	SCHEDULE OF ANNUITANTS BY AGE – NON-HAZARDOUS MEMBERS
28	49	SCHEDULE OF ANNUITANTS BY AGE – HAZARDOUS MEMBERS
29	50	SCHEDULE OF ANNUITANTS BY BENEFIT TYPE – NON-HAZARDOUS RETIREES
30	51	SCHEDULE OF ANNUITANTS BY BENEFIT TYPE – HAZARDOUS RETIREES
31	52	SCHEDULE OF ANNUITANTS BY BENEFIT TYPE – NON-HAZARDOUS BENEFICIARIES
32	53	SCHEDULE OF ANNUITANTS BY BENEFIT TYPE – HAZARDOUS BENEFICIARIES
33	54	SCHEDULE OF ANNUITANTS ADDED TO AND REMOVED FROM ROLLS

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

	Non-Hazardous June 30, 2021 (1)	Hazardous June 30, 2021 (2)	Total June 30, 2021 (3)	Total June 30, 2020 (4)
1. Active members				
a. Males	11,586	2,627	14,213	14,993
b. Females	18,600	1,200	19,800	20,804
c. Total members	30,186	3,827	34,013	35,797
d. Total annualized prior year salaries	\$ 1,349,330	\$ 162,836	\$ 1,512,165	\$ 1,558,587
e. Average salary ²	\$ 44,701	\$ 42,549	\$ 44,458	\$ 43,540
f. Average age	46.0	40.1	45.4	45.0
g. Average service	11.6	7.7	11.2	10.8
h. Member contributions with interest	\$ 877,142	\$ 97,559	\$ 974,701	\$ 964,724
i. Average contributions with interest ²	\$ 29,058	\$ 25,492	\$ 28,657	\$ 26,950
2. Vested inactive members ¹				
a. Number	31,661	2,192	33,853	34,030
b. Total annual deferred benefits	\$ 88,519	\$ 4,662	\$ 93,181	\$ 91,158
c. Average annual deferred benefit ²	\$ 2,796	\$ 2,127	\$ 2,753	\$ 2,679
d. Average age at the valuation date	52.5	47.9	52.2	51.6
3. Nonvested inactive members ¹				
a. Number	22,861	5,488	28,349	26,410
b. Total member contributions with interest	\$ 45,703	\$ 10,777	\$ 56,480	\$ 48,829
c. Average contributions with interest ²	\$ 1,999	\$ 1,964	\$ 1,992	\$ 1,849
4. Service retirees				
a. Number	40,846	4,061	44,907	44,532
b. Total annual benefits	\$ 871,149	\$ 64,134	\$ 935,283	\$ 932,062
c. Average annual benefit ²	\$ 21,328	\$ 15,793	\$ 20,827	\$ 20,930
d. Average age at the valuation date	70.0	65.4	69.6	69.2
5. Disabled retirees				
a. Number	1,777	154	1,931	1,989
b. Total annual benefits	\$ 23,555	\$ 1,488	\$ 25,043	\$ 25,791
c. Average annual benefit ²	\$ 13,255	\$ 9,662	\$ 12,969	\$ 12,967
d. Average age at the valuation date	66.5	60.4	66.0	65.6
6. Beneficiaries				
a. Number	5,077	511	5,588	5,440
b. Total annual benefits	\$ 77,730	\$ 5,181	\$ 82,911	\$ 79,192
c. Average annual benefit ²	\$ 15,310	\$ 10,139	\$ 14,837	\$ 14,557
d. Average age at the valuation date	70.5	66.7	70.1	70.1

¹ Vested inactive member section includes Tier 1 members eligible for a benefit equal to the actuarially equivalent of two times the member's contribution balance.

² Average dollar amounts shown are expressed to the dollar.



Summary of Historical Active Membership

June 30, (1)	Active Members		Covered Payroll ¹		Average Annual Pay	
	Number (2)	Percent Increase /(Decrease) (3)	Amount in Thousands (4)	Percent Increase /(Decrease) (5)	Amount (6)	Percent Increase /(Decrease) (7)
Non-Hazardous Members						
2012	42,196		\$ 1,644,897		\$ 38,982	
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%
2018	35,139	-5.6%	1,471,477	-3.9%	41,876	1.8%
2019	33,696	-4.1%	1,437,647	-2.3%	42,665	1.9%
2020	31,703	-5.9%	1,387,761	-3.5%	43,774	2.6%
2021	30,186	-4.8%	1,349,330	-2.8%	44,701	2.1%
Hazardous Members						
2012	4,086		\$ 131,977		\$ 32,300	
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%
2018	3,929	-2.9%	158,213	-2.6%	40,268	0.3%
2019	3,705	-5.7%	150,446	-4.9%	40,606	0.8%
2020	4,094	10.5%	170,826	13.5%	41,726	2.8%
2021	3,827	-6.5%	162,836	-4.7%	42,549	2.0%

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	Years of Credited Service												Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 20	8 \$21,876	1 \$17,917	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	9 \$21,436
20-24	325 \$24,712	196 \$31,733	102 \$32,576	26 \$31,931	15 \$34,219	5 \$42,641	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	669 \$28,596
25-29	397 \$27,294	482 \$34,303	389 \$35,356	284 \$36,440	213 \$37,957	339 \$38,973	7 \$43,380	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2,111 \$34,615
30-34	225 \$29,488	288 \$35,790	272 \$36,905	260 \$39,452	304 \$38,872	1,163 \$41,914	228 \$43,950	2 \$62,616	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	2,742 \$39,368
35-39	204 \$27,922	258 \$38,614	251 \$37,894	229 \$39,155	216 \$39,955	1,091 \$44,131	1,010 \$47,103	277 \$48,595	19 \$49,573	0 \$0	0 \$0	0 \$0	0 \$0	3,555 \$43,007
40-44	195 \$29,089	247 \$37,324	213 \$39,380	155 \$41,044	167 \$41,817	873 \$44,704	1,010 \$48,424	1,080 \$50,204	497 \$49,953	44 \$53,678	0 \$0	0 \$0	0 \$0	4,481 \$45,965
45-49	148 \$28,585	197 \$38,563	189 \$40,292	165 \$39,992	147 \$41,023	725 \$41,613	777 \$46,877	880 \$51,410	1,037 \$53,501	284 \$58,636	16 \$77,201	0 \$0	0 \$0	4,565 \$47,595
50-54	133 \$31,565	144 \$39,189	172 \$38,539	126 \$36,572	154 \$38,895	710 \$42,678	682 \$46,643	740 \$51,124	912 \$50,545	500 \$58,230	90 \$59,254	9 \$56,129	9 \$56,129	4,372 \$47,590
55-59	90 \$32,028	148 \$36,953	124 \$37,037	97 \$42,901	104 \$38,135	541 \$41,066	629 \$45,824	667 \$47,282	648 \$52,202	365 \$56,683	116 \$65,344	43 \$68,581	43 \$68,581	3,572 \$47,227
60-64	45 \$33,094	66 \$50,858	72 \$41,108	89 \$38,311	87 \$38,945	391 \$41,688	522 \$45,113	564 \$46,493	509 \$50,068	221 \$52,427	81 \$58,537	39 \$67,749	39 \$67,749	2,686 \$46,586
65 & Over	18 \$35,272	29 \$59,583	19 \$47,201	41 \$47,023	49 \$44,439	220 \$44,722	317 \$47,610	319 \$48,331	218 \$52,492	97 \$54,974	47 \$62,131	50 \$71,236	50 \$71,236	1,424 \$49,840
Total	1,788 \$28,233	2,056 \$36,992	1,803 \$37,552	1,472 \$39,043	1,456 \$39,547	6,058 \$42,617	5,182 \$46,798	4,529 \$49,471	3,840 \$51,589	1,511 \$56,742	350 \$62,313	141 \$68,497	141 \$68,497	30,186 \$44,701



Distribution of Active Members by Age and by Years of Service
Hazardous Members

Attained Age	Years of Credited Service												Total	
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over		
	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	Count & Avg. Comp.	
Under 20	0 \$0	1 \$32,493	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	1 \$32,493
20-24	131 \$29,344	76 \$39,498	27 \$42,052	6 \$36,027	4 \$48,361	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	244 \$34,389
25-29	139 \$28,781	140 \$37,277	81 \$39,857	76 \$39,574	59 \$41,300	69 \$47,378	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	564 \$37,520
30-34	74 \$28,027	91 \$36,416	61 \$41,190	47 \$40,734	58 \$42,893	250 \$46,034	33 \$44,460	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	614 \$41,170
35-39	40 \$26,933	43 \$38,527	32 \$38,705	38 \$41,173	29 \$39,666	153 \$45,461	154 \$47,736	42 \$50,053	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	531 \$43,496
40-44	41 \$27,271	36 \$37,759	21 \$39,510	24 \$43,701	28 \$39,439	106 \$45,839	101 \$48,100	143 \$50,433	17 \$50,160	1 \$67,728	0 \$0	0 \$0	0 \$0	518 \$45,000
45-49	24 \$21,985	24 \$40,493	25 \$40,706	22 \$40,570	17 \$41,281	84 \$41,573	91 \$47,377	114 \$49,726	53 \$54,622	4 \$59,968	0 \$0	0 \$0	0 \$0	458 \$45,237
50-54	23 \$31,391	30 \$42,082	18 \$44,853	12 \$39,825	20 \$49,324	83 \$45,449	80 \$45,155	102 \$50,359	35 \$50,232	7 \$63,516	0 \$0	0 \$0	0 \$0	410 \$46,293
55-59	10 \$27,939	19 \$41,199	15 \$44,005	10 \$43,948	14 \$40,127	76 \$41,723	57 \$44,313	61 \$48,174	24 \$52,114	4 \$51,852	4 \$66,680	0 \$0	0 \$0	294 \$44,503
60-64	2 \$29,347	4 \$46,881	10 \$45,622	5 \$33,331	5 \$43,215	35 \$41,276	34 \$46,394	31 \$47,359	12 \$50,959	1 \$89,450	0 \$0	0 \$0	0 \$0	139 \$45,153
65 & Over	1 \$20,357	2 \$24,675	0 \$0	2 \$38,904	3 \$50,301	11 \$55,830	17 \$40,107	11 \$48,424	4 \$41,578	3 \$71,466	0 \$0	0 \$0	0 \$0	54 \$46,440
Total	485 \$28,293	466 \$38,277	290 \$40,986	242 \$40,521	237 \$42,150	867 \$45,082	567 \$46,535	504 \$49,720	145 \$51,961	20 \$63,174	4 \$66,680	0 \$0	0 \$0	3,827 \$42,549



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

Current Age	Retirement		Disability		Survivors & Beneficiaries		Total	
	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	400	\$ 9,209	73	\$ 991	497	\$ 5,880	970	\$ 16,080
50 - 54	1,451	36,965	141	2,084	207	2,692	1,799	41,741
55 - 59	3,308	81,720	233	3,534	287	3,764	3,828	89,018
60 - 64	6,124	142,309	329	4,564	496	7,371	6,949	154,243
65 - 69	9,526	201,875	372	4,946	702	10,975	10,600	217,796
70 - 74	9,551	204,366	308	3,793	771	13,855	10,630	222,014
75 - 79	5,204	105,331	155	1,768	727	12,285	6,086	119,385
80 - 84	3,038	55,743	115	1,296	619	10,607	3,772	67,646
85 - 89	1,476	23,178	44	538	445	6,510	1,965	30,226
90 And Over	768	10,452	7	42	326	3,790	1,101	14,284
Total	40,846	\$ 871,149	1,777	\$ 23,555	5,077	\$ 77,730	47,700	\$ 972,434

*Amounts may not add due to rounding



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

Current Age (1)	Retirement		Disability		Survivors & Beneficiaries		Total	
	Number of Annuitants (2)	Total Annual Benefit Amount (3)	Number of Annuitants (4)	Total Annual Benefit Amount (5)	Number of Annuitants (6)	Total Annual Benefit Amount (7)	Number of Annuitants (8)	Total Annual Benefit Amount (9)
Under 50	282	\$ 5,639	23	\$ 289	64	\$ 606	369	\$ 6,535
50 - 54	389	7,448	22	265	27	346	438	8,060
55 - 59	516	9,259	30	286	35	397	581	9,942
60 - 64	668	11,893	34	302	64	676	766	12,871
65 - 69	819	12,086	20	152	92	1,092	931	13,331
70 - 74	811	11,435	13	127	79	874	903	12,436
75 - 79	361	4,465	6	43	69	611	436	5,119
80 - 84	151	1,449	4	17	44	344	199	1,810
85 - 89	50	316	2	6	26	147	78	470
90 And Over	14	143	0	0	11	87	25	230
Total	4,061	\$ 64,134	154	\$ 1,488	511	\$ 5,181	4,726	\$ 70,803

*Amounts may not add due to rounding



Non-Hazardous Retired Lives Summary

Form of Payment (1)	Male Lives		Female Lives		Total	
	Number (2)	Monthly Benefit Amount (3)	Number (4)	Monthly Benefit Amount (5)	Number (6)	Monthly Benefit Amount (7)
Basic	4,495	\$ 7,915,623	13,390	\$ 19,233,861	17,885	\$ 27,149,483
Joint & Survivor:						
100% to Beneficiary	2,832	5,078,749	1,592	2,009,943	4,424	7,088,692
66 2/3% to Beneficiary	805	2,215,402	622	1,165,353	1,427	3,380,755
50% to Beneficiary	1,102	2,771,419	1,587	3,076,109	2,689	5,847,528
Pop-up Option	4,080	9,791,103	3,958	7,622,422	8,038	17,413,525
Social Security Option:						
Age 62 Basic	377	778,518	917	1,529,221	1,294	2,307,739
Age 62 Survivorship	725	1,459,118	579	925,176	1,304	2,384,294
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	0	0	0	0	0	0
10 Years Certain & Life	986	1,716,693	2,332	3,520,903	3,318	5,237,596
15 Years Certain & Life	446	712,301	684	1,009,307	1,130	1,721,608
20 Years Certain & Life	440	963,155	674	1,064,297	1,114	2,027,452
Total:	16,288	\$ 33,402,081	26,335	\$ 41,156,590	42,623	\$ 74,558,672



Hazardous Retired Lives Summary

Form of Payment (1)	Male Lives		Female Lives		Total	
	Number (2)	Monthly Benefit Amount (3)	Number (4)	Monthly Benefit Amount (5)	Number (6)	Monthly Benefit Amount (7)
Basic	739	\$ 817,226	611	\$ 672,693	1,350	\$ 1,489,919
Joint & Survivor:						
100% to Beneficiary	469	575,102	82	95,586	551	670,688
66 2/3% to Beneficiary	127	171,334	33	38,810	160	210,145
50% to Beneficiary	176	285,901	78	118,718	254	404,620
Pop-up Option	986	1,551,252	213	297,805	1,199	1,849,057
Social Security Option:						
Age 62 Basic	59	63,169	34	28,878	93	92,048
Age 62 Survivorship	136	160,205	19	15,506	155	175,711
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	55	95,267	16	24,624	71	119,891
10 Years Certain & Life	112	140,458	80	73,270	192	213,728
15 Years Certain & Life	55	67,228	29	25,982	84	93,210
20 Years Certain & Life	68	96,595	38	52,948	106	149,543
Total:	2,982	\$ 4,023,737	1,233	\$ 1,444,822	4,215	\$ 5,468,559



Non-Hazardous Beneficiary Lives Summary

Form of Payment (1)	Male Lives		Female Lives		Total	
	Number (2)	Monthly Benefit Amount (3)	Number (4)	Monthly Benefit Amount (5)	Number (6)	Monthly Benefit Amount (7)
Basic	28	\$ 20,376	51	\$ 71,991	79	\$ 92,367
Joint & Survivor:						
100% to Beneficiary	373	321,489	1,597	1,870,021	1,970	2,191,510
66 2/3% to Beneficiary	70	77,741	294	402,153	364	479,894
50% to Beneficiary	170	146,305	483	425,850	653	572,155
Pop-up Option	239	366,149	863	1,554,106	1,102	1,920,255
Social Security Option:						
Age 62 Basic	1	1,293	11	12,803	12	14,096
Age 62 Survivorship	78	110,298	340	594,996	418	705,294
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	2	611	2	611
5 Years Certain	37	47,554	50	46,538	87	94,093
10 Years Certain	76	67,581	91	65,115	167	132,695
10 Years Certain & Life	38	41,100	47	45,005	85	86,105
15 Years Certain & Life	21	23,508	43	38,862	64	62,369
20 Years Certain & Life	20	36,036	54	89,979	74	126,015
Total:	1,151	\$ 1,259,430	3,926	\$ 5,218,029	5,077	\$ 6,477,459



Hazardous Beneficiary Lives Summary

Form of Payment (1)	Male Lives		Female Lives		Total	
	Number (2)	Monthly Benefit Amount (3)	Number (4)	Monthly Benefit Amount (5)	Number (6)	Monthly Benefit Amount (7)
Basic	1	\$ 1,046	12	\$ 9,554	13	\$ 10,600
Joint & Survivor:						
100% to Beneficiary	17	12,258	176	130,262	193	142,520
66 2/3% to Beneficiary	1	481	21	10,358	22	10,839
50% to Beneficiary	4	2,769	41	15,480	45	18,249
Pop-up Option	12	12,515	139	152,253	151	164,768
Social Security Option:						
Age 62 Basic	0	0	1	18	1	18
Age 62 Survivorship	1	313	47	48,730	48	49,044
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	0	0	5	3,360	5	3,360
10 Years Certain	2	2,253	9	8,744	11	10,997
10 Years Certain & Life	0	0	5	2,647	5	2,647
15 Years Certain & Life	3	3,903	3	1,548	6	5,451
20 Years Certain & Life	2	4,048	9	9,181	11	13,229
Total:	43	\$ 39,587	468	\$ 392,135	511	\$ 431,722



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

Year Ended	Added to	Removed	Rolls End of the Year		% Increase in Annual Benefit	Average Annual Benefit
	Rolls	from Rolls	Number	Annual Benefits		
(1)	Number	Number	(4)	(5)	(6)	(7)
Non-Hazardous						
2012	1,707	1,078	39,226	\$ 844,881		\$ 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
2018	2,853	1,243	46,526	952,951	3.4%	20,482
2019	2,226	1,342	47,410	968,706	1.7%	20,433
2020	1,806	1,883	47,333	967,963	-0.1%	20,450
2021	2,026	1,659	47,700	972,434	0.5%	20,386
Hazardous						
2012	243	54	3,253	\$ 49,231		\$ 15,134
2013	229	52	3,430	51,122	3.8%	14,905
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%	14,455
2018	321	44	4,370	64,050	8.3%	14,657
2019	227	60	4,537	67,523	5.4%	14,883
2020	214	123	4,628	69,081	2.3%	14,927
2021	263	165	4,726	70,803	2.5%	14,982



SECTION 6

ASSESSMENT AND DISCLOSURE OF RISK

Risks Associated with Measuring the Accrued Liability And Actuarially Determined Contribution

(As Required by ASOP No. 51)

The determination of KERS's accrued liability and actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. The risk measures illustrated in this section are intended to aid stakeholders in understanding the effects of future experience differing from the assumptions used in performing an actuarial valuation. These risk measures may also help with illustrating the potential volatility in the funded status and actuarially determined contributions that result from differences between actual experience and the expected experience based on the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience (economic and demographic) differing from the assumptions, changes in assumptions due to changing conditions, changes in contribution requirements due to modifications to the funding policy, and changes in the liability and cost due to changes in plan provisions or applicable law. The scope of this actuarial valuation does not include any analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the System's future financial condition include:

- Investment risk – actual investment returns may differ from expected returns;
- Longevity risk – members may live longer or shorter than expected and receive pensions for a time period different than assumed;
- Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future contributions differing from expected;
- Salary and payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liabilities or contributions differing from expected;
- Asset/Liability mismatch – changes in assets may be inconsistent with changes in liabilities, thereby altering the relative difference between the assets and liabilities which may alter the funded status and contribution requirements;
- Contribution risk – actual contributions may differ from expected future contributions (for example, actual contributions not being paid in accordance with the System's funding policy, withdrawal liability assessments or other anticipated payments to the plan are not being paid, or material changes occurring in the anticipated number of covered employees, covered payroll, or another relevant contribution base).

Effects of certain experience can generally be anticipated. For example, if investment returns since the most recent actuarial valuation are less (or more) than the assumed rate of return, then the funded status of the plan can be expected to decrease (or increase) more than anticipated.

The required contributions in this report were established in accordance with applicable Statutes and assumptions adopted by the Board. However, stakeholders should be aware that the scheduled contributions specified in State Code do not necessarily guarantee that the contribution requirements will not increase in a future year.



Employer Risk with Contribution Rates

Currently contributions for the hazardous fund are collected from participating employers based on the employer's total payroll of employees who are earning benefits in KERS (i.e. covered payroll). The actuarially determined contribution rate is comprised of two components - the normal cost rate (to pay for the benefits accruing in the next year) and the unfunded amortization (to pay for the benefits accrued by members in previous years). The unfunded amortization is calculated by first determining the dollar amount necessary to pay for the unfunded liability based on KERS's funding policy, and then by dividing that dollar amount by expected covered payroll to convert that contribution requirement to a percentage of payroll (i.e. a contribution rate).

As the contribution requirement, as a percentage of payroll, increases then there is increased incentive for participating employers to make deliberate business action to reduce their payroll reported to the System in order to reduce their pension cost. House Bill 8 passed during the 2021 legislative session and changed how the amortization cost would be collected and allocated amongst employers in the non-hazardous fund. This portion of the contribution requirement is no longer collected as a percentage of payroll for the non-hazardous fund.

Plan Specific Risk Measures

Risks faced by a pension plan evolve over time. A relatively new plan with virtually no assets and paying few benefits will experience lower investment risk than a mature plan with a significant amount of assets and large number of members receiving benefits. There are a few measures that can assist stakeholders in understanding and comparing the maturity of a plan to other systems, which include:

- **Ratio of market value of assets to payroll**: The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. If assets are approximately the same as covered payroll, an investment return that is 5% different than assumed would equal 5% of payroll. In another example, if the assets are approximately twice as large as covered payroll, an investment return that is 5% different than assumed would equal 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- **Ratio of actuarial accrued liability to payroll**: The ratio of actuarial accrued liability to payroll can be used as a measure to indicate the potential volatility of contributions due to volatility in the liability experience. For instance, if the actuarial accrued liability is 5 times the size of the covered payroll, then a change in the liability that is 2% different than expected would be a change in magnitude that is 10% of payroll. A ratio that increases over time generally indicates the potential of an increasing volatility in employer contribution rates as a percentage of payroll.
- **Percentage of Expected Contributions Actually Received**: This measure identifies the percentage difference between the contributions the fund expects to receive during the fiscal year to and actual contributions received by the fund during the fiscal year. A percentage that is less than 100% means that actual contributions the fund received were less than the expected contributions determined by a prior actuarial valuation. On the other hand, a percentage that is greater than 100% means that actual contributions the fund received were more than the expected contributions.



- **Ratio of active to retired members:** A relatively mature open plan is likely to have close to the same number of actives to retirees resulting in a ratio that is around 1.0. On the other hand, a super-mature plan, or a plan that is closed to new entrants will have more retirees than active members resulting in a ratio below 1.0. As this ratio declines, a larger portion of the total actuarial accrued liability in the System is attributable to retirees. This metric also typically moves in tandem with the liability to payroll metric, which provides an indication of potential contribution volatility.

The following tables provide a summary of these measures for KERS Non-Hazardous and Hazardous Funds for the current year and the prior four years so stakeholders can identify how these measures are trending. While ASOP No. 51 requires this disclosure with respect to only the retirement funds, we have included this information for the insurance funds for completeness.

KERS Non-Hazardous										
	Retirement Fund					Insurance Fund				
	June 30,					June 30,				
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017
Ratio of the market value of assets to total payroll	2.24	1.66	1.55	1.36	1.34	1.05	0.76	0.69	0.61	0.53
Ratio of actuarial accrued liability to payroll	12.10	11.78	11.45	10.65	10.18	1.91	1.85	1.90	1.66	1.75
Ratio of net cash flow to market value of assets	7.3%	1.0%	5.5%	-9.7%	-5.7%	7.1%	5.2%	6.2%	1.1%	3.6%
Percentage of Expected Contribution Actually Received	94% ¹	93%	91%	93%	104%	99% ¹	96%	95%	99%	100%
Ratio of actives to retirees and beneficiaries	0.63	0.67	0.71	0.76	0.83					

¹ Expected contribution for FYE2021 based on the actuarially determined contribution rate of 84.43% from the June 30, 2019 valuation, as amended by SB249, which reset the amortization period to 30 years, and expected compensation based on census data from the June 30, 2020 valuation.

KERS Hazardous										
	Retirement Fund					Insurance Fund				
	June 30,					June 30,				
	2021	2020	2019	2018	2017	2021	2020	2019	2018	2017
Ratio of the market value of assets to total payroll	5.32	4.04	4.53	4.08	3.70	3.89	3.05	3.55	3.28	3.01
Ratio of actuarial accrued liability to payroll	7.95	7.52	8.15	7.28	6.90	2.61	2.51	2.84	2.49	2.58
Ratio of net cash flow to market value of assets	0.3%	0.4%	-0.1%	-1.2%	1.1%	-2.8%	-2.5%	-2.5%	-2.5%	-2.4%
Percentage of Expected Contribution Actually Received	101% ¹	114%	102%	95%	116%	N/A ¹	N/A ¹	96%	190%	111%
Ratio of actives to retirees and beneficiaries	0.81	0.88	0.82	0.90	0.99					

¹ Expected contribution for FYE2021 based on the actuarially determined contribution rate of 36.00% from the June 30, 2019 valuation, as amended by SB249, which reset the amortization period to 30 years, and expected compensation based on census data from the June 30, 2020 valuation. As of the 2018 valuation (FYE2020), the required employer contribution was 0% of pay for the insurance fund.



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, 2018 and adopted by the Board in April 2019.

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%

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

Assumed annual rate of 0.00%

Rates of Annual Salary Increase:

Assumed rates of annual salary increases are shown below.

Service Years	Annual Rates of Salary					
	Merit & Seniority		Price Inflation & Productivity		Total Increase	
	Non-Hazardous	Hazardous	Non-Hazardous	Hazardous	Non-Hazardous	Hazardous
0	12.00%	16.50%	3.30%	3.55%	15.30%	20.05%
1	3.50%	4.00%	3.30%	3.55%	6.80%	7.55%
2	2.75%	3.00%	3.30%	3.55%	6.05%	6.55%
3	2.50%	3.00%	3.30%	3.55%	5.80%	6.55%
4	2.00%	2.00%	3.30%	3.55%	5.30%	5.55%
5	1.50%	1.50%	3.30%	3.55%	4.80%	5.05%
6	1.25%	1.00%	3.30%	3.55%	4.55%	4.55%
7	1.00%	0.50%	3.30%	3.55%	4.30%	4.05%
8	0.75%	0.50%	3.30%	3.55%	4.05%	4.05%
9	0.50%	0.00%	3.30%	3.55%	3.80%	3.55%
10	0.50%	0.00%	3.30%	3.55%	3.80%	3.55%
11 & Over	0.00%	0.00%	3.30%	3.55%	3.30%	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.

Age	Non-Hazardous				Service	Hazardous			
	Normal Retirement		Early Retirement ¹			Members participating before 9/1/2008 ²		Members participating between 9/1/2008 and 1/1/2014 ³	Members participating after 1/1/2014 ³
	Male	Female	Male	Female		Age 55-61	Age 62+		
Under 45	20.0%	33.0%			5	10.0%	35.0%		
45	21.0%	33.0%			6	10.0%	35.0%		
46	22.0%	33.0%			7	10.0%	35.0%		
47	23.0%	33.0%			8	10.0%	35.0%		
48	24.0%	33.0%			9	10.0%	35.0%		
49	25.0%	33.0%			10	10.0%	35.0%		
50	26.0%	33.0%			11	10.0%	35.0%		
51	27.0%	33.0%			12	10.0%	35.0%		
52	28.0%	33.0%			13	10.0%	35.0%		
53	29.0%	33.0%			14	10.0%	35.0%		
54	30.0%	33.0%			15	10.0%	35.0%		
55	30.0%	33.0%	5.0%	5.0%	16	10.0%	35.0%		
56	30.0%	33.0%	5.0%	5.0%	17	10.0%	35.0%		
57	30.0%	33.0%	5.0%	5.0%	18	10.0%	35.0%		
58	30.0%	33.0%	5.0%	5.0%	19	10.0%	35.0%		
59	30.0%	33.0%	5.0%	5.0%	20	50.0%	50.0%		
60	30.0%	33.0%	5.0%	8.0%	21	32.0%	32.0%		
61	30.0%	33.0%	8.0%	9.0%	22	32.0%	32.0%		
62	35.0%	35.0%	15.0%	20.0%	23	32.0%	32.0%		
63	30.0%	33.0%	15.0%	18.0%	24	32.0%	32.0%		
64	30.0%	33.0%	15.0%	16.0%	25	32.0%	32.0%	25.6%	16.0%
65	30.0%	33.0%			26	32.0%	32.0%	25.6%	16.0%
66	30.0%	33.0%			27	32.0%	32.0%	25.6%	16.0%
67	30.0%	33.0%			28	32.0%	32.0%	25.6%	16.0%
68	30.0%	33.0%			29	32.0%	32.0%	25.6%	16.0%
69	30.0%	33.0%			30+	32.0%	32.0%	25.6%	100.0%
70	30.0%	33.0%							
71	30.0%	33.0%							
72	30.0%	33.0%							
73	30.0%	33.0%							
74	30.0%	33.0%							
75	100.0%	100.0%							

¹ The annual rate of retirement is 12% for male members and 14% for female members with 25-26 years of service.

² The annual rate of retirement is 100% at age 65.

³ The annual rate of retirement is 100% at age 60.

Non-Hazardous System: For members hired after 7/1/2003, the rates shown above are multiplied by 80% if the member is under age 65 to reflect the different retiree health insurance benefit.

Hazardous System: For members hired after 7/1/2003 and prior to 9/1/2008, the rates shown above are multiplied by 80% if the member is under age 65 to reflect the different retiree health insurance benefit.



Disability rates:

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

Age	Non-Hazardous		Hazardous	
	Male	Female	Male	Female
20	0.03%	0.03%	0.05%	0.05%
30	0.06%	0.06%	0.08%	0.08%
40	0.12%	0.12%	0.18%	0.18%
50	0.34%	0.34%	0.50%	0.50%
60	0.88%	0.88%	1.32%	1.32%

Withdrawal rates (for causes other than disability and retirement):

Assumed annual rates of withdrawal are shown below and include pre-retirement mortality rates as described on the next page.

Service Years	Annual Rates of Withdrawal	
	Non-Hazardous	Hazardous
1	20.00%	25.00%
2	16.45%	19.68%
3	13.39%	15.12%
4	11.61%	12.45%
5	10.34%	10.56%
6	9.35%	9.09%
7	8.55%	7.89%
8	7.87%	6.87%
9	7.28%	5.99%
10	6.76%	5.22%
11	6.30%	4.53%
12	5.88%	3.90%
13	5.49%	3.33%
14	5.14%	2.80%
15	4.81%	2.31%
16	4.51%	1.86%
17	4.22%	1.43%
18	3.96%	1.03%
19	3.70%	0.66%
20	3.47%	0.30%
21	3.24%	0.00%
22	3.02%	0.00%
23	2.82%	0.00%
24	2.62%	0.00%
25	2.43%	0.00%
26 & Over	0.00%	0.00%

Mortality Assumption:

Pre-retirement mortality: PUB-2010 General Mortality table, for the Non-Hazardous System, and the PUB-2010 Public Safety Mortality table for the Hazardous System, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010.

Post-retirement mortality (non-disabled): System-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019.

The following table provides the life expectancy for a non-disabled retiree in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Gender	Year of Retirement				
	2020	2025	2030	2035	2040
Male	21.0	21.4	21.8	22.2	22.6
Female	24.0	24.4	24.8	25.2	25.6

Post-retirement mortality (disabled): PUB-2010 Disabled Mortality table, with a 4-year set-forward for both male and female rates, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010.

Marital status:

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

Line of Duty/Duty-Related Disability

Non-Hazardous: 2% of disabilities are assumed to be duty-related (100% of which are assumed to be “total and permanent”)

Hazardous: 10% of disabilities are assumed to occur in the line of duty (10% of which are assumed to be “total and permanent”)

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 or disability 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:

Year	Non-Medicare Plans ¹	Medicare Plans ¹	Dollar Contribution ²
2023	6.30%	6.30%	1.50%
2024	6.20%	6.20%	1.50%
2025	6.10%	6.10%	1.50%
2026	6.00%	6.00%	1.50%
2027	5.80%	5.80%	1.50%
2028	5.60%	5.60%	1.50%
2029	5.40%	5.40%	1.50%
2030	5.20%	5.20%	1.50%
2031	5.00%	5.00%	1.50%
2032	4.80%	4.80%	1.50%
2033	4.60%	4.60%	1.50%
2034	4.40%	4.40%	1.50%
2035	4.20%	4.20%	1.50%
2036 & Beyond	4.05%	4.05%	1.50%

¹All increases are assumed to occur on January 1. The 2022 premiums were known at the time of the valuation and were incorporated into the liability measurement

²Applies to members participating on or after July 1, 2003. All increases are assumed to occur on July 1.

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 – 2036

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:

- Active 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 after 7/1/2003
Under 10	50%	100%
10-14	75%	100%
15-19	90%	100%
Over 20	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	Participation Percentage	Non-Medicare Plan	Participation Percentage
Medical Only ¹	6%	LivingWell Limited	4%
Essential Plan	8%	LivingWell Basic	2%
Premium Plan	86%	LivingWell CDHP	33%
		LivingWell PPO	61%

¹ Includes Medicare Advantage Mirror Plans

- 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 receiving insurance benefits from the non-hazardous fund are assumed to begin health coverage at age 55 for members participating before September 1, 2008, at age 60 for members participating on or after September 1, 2008 but before January 1, 2014, and at age 65 for members participating on or after January 1, 2014.
- Deferred vested members receiving insurance benefits from the hazardous fund are assumed to begin health coverage at age 50 for members participating before January 1, 2014 and at age 60 for members participating on or after January 1, 2014.
- 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.

Other Assumptions

1. Valuation payroll (used for determining the amortization contribution rate): Current fiscal year payroll.
2. Individual salaries used to project benefits: For salary amounts prior to the valuation date, the salary from the last fiscal year is projected backward with the valuation salary scale assumption. For future salaries, the salary from the last fiscal year is projected forward with one year's salary scale.
3. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported salaries represent amounts paid to members during the year ending on the valuation date.
4. Current active members that terminated employment (for reasons other than retirement, disability, or death) are assumed to commence their retirement benefits at first unreduced retirement eligibility. Members are assumed to elect a refund of member contributions if the value of their account balance exceeds the present value of the deferred benefit. Members participating in the Cash Balance plan are assumed to elect to receive a lump sum of their cash balance account if their account balance exceeds the present value of the deferred benefit and the member is not eligible for insurance benefits at termination.
5. The beneficiaries of current active members that die while active are assumed to commence their survivor benefits at the member's first unreduced retirement eligibility. Beneficiaries are assumed to elect a refund of member contributions if the value of the member's account balance exceeds the present value of the survivor benefit. Beneficiaries of active members that die while in the line of duty are assumed to commence their survivor benefits immediately at the death of the member.
6. There will be no recoveries once disabled.
7. Cash Balance Provisions: The cash balance interest crediting rate while a member is an active employee is assumed to equal 4.9375% (based upon the 5.25% assumed investment return) for the Non-Hazardous Fund and 5.6875% (based upon the 6.25% assumed investment return) for the Hazardous Fund. The interest crediting rate after a member terminates employment is 4% for all plans.
8. Decrement timing: Decrements of all types are assumed to occur mid-year. Decrement rates are used as described in this report, without adjustment for multiple decrement table effects.
9. Service: All members are assumed to accrue 1 year of benefit and eligibility service each year.
10. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
11. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.



12. Current Inactive Population (Retirement Funds): All non-vested members are assumed to take an immediate refund of member contributions. Vested members are assumed to elect an immediate refund of member contributions at the valuation date if the value of their account balance exceeds the present value of their deferred benefit. Non-hazardous members are assumed to retire at age 65. Hazardous members hired prior to September 1, 2008 are assumed to retire at age 55 and hazardous members hired on or after September 1, 2008 are assumed to retire at age 60.

Participant Data

Participant data was supplied in electronic text files. There were separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active and terminated members included date of birth, gender, date of participation, benefit tier indicator, service with the current system, total vesting service, salary, employee contribution account balances, and employer pay credits for members participating in the cash balance plan. For retired members and beneficiaries, the data included date of birth, gender, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and form of payment code.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.

Changes in assumptions since the prior valuation:

None

Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were based on the plan premiums effective January 1, 2022, 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 \$926.73 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 paid to 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 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 which include the liabilities associated with the implicit rate subsidy.

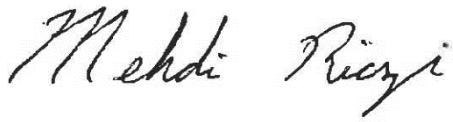
FOR THOSE NOT ELIGIBLE FOR MEDICARE		
AGE	MEMBER	SPOUSE/DEPENDENTS
<65	\$ 758.99	\$ 926.73

For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2022, 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	\$188.91	\$178.18
75	221.03	215.67
85	233.72	236.47

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, FSA, EA, FCA, 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	<p>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.</p> <p>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.</p> <p>Final average compensation is based on the member's highest 5 years of compensation.</p>
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.



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

Early Retirement Eligibility	N/A
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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 65 th 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.

Duty-Related 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 final rate of pay. If the disability is deemed to be Total and Permanent (and the member is working in a non-hazardous position that could be certified as a hazardous position), then this benefit shall not be less than 75% of the member's monthly average pay.
Child Benefit	Additionally, each eligible dependent child will receive 10% of the member's monthly average pay up to a maximum of 40%. Member and dependent payment shall not exceed 100% of member's monthly average pay.

Pre-Retirement Death Benefit

Eligibility	Eligible for early or normal retirement; or Under age 65 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.



KERS Non-Hazardous Employees (continued)

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 75% of the deceased member's final monthly average pay. Each dependent child will receive 10% of the final monthly average pay (not to exceed a total child benefit of 25% while the spouse is alive). A spouse may also elect the non-line of duty death benefit.
Child Benefit	In the event there is no surviving spouse, the benefit is 50% of final monthly average pay for one child, 65% of final monthly average pay for two children, or 75% of final monthly average pay for three or more eligible children.

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 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

Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for qualified members who become "totally and permanently disabled" as a result of a duty-related disability. The minimum disability benefit increased from 25% of the member's monthly final rate of pay to 75% of the member's monthly average pay. For non-hazardous members to be eligible for this benefit, they must be working in a position that could be certified as a hazardous position.



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 55 th 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 final rate of pay. If the disability is deemed to be Total and Permanent, then this benefit shall not be less than 75% of the member's monthly average pay.
Child Benefit	Additionally, each eligible dependent child will receive 10% of the member's monthly average pay up to a maximum of 40%. Member and dependent payment shall not exceed 100% of member's monthly average pay.

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.



KERS Hazardous Employees (continued)

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 75% of the deceased member's final monthly average pay. Each dependent child will receive 10% of the final monthly average pay (not to exceed a total child benefit of 25% while the spouse is alive). 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	In the event there is no surviving spouse, the benefit is 50% of final monthly average pay for one child, 65% of final average pay for two children, or 75% of final average pay for three or more eligible children.

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 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

Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for qualified members who become "totally and permanently disabled" in the line of duty. The minimum disability benefit increased from 25% of the member's monthly final rate of pay to 75% of the member's monthly average pay.



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 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 a fully subsidized health insurance benefit. 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 non-hazardous service. The monthly contribution is increased by 1.5% each July 1. As of July 1, 2021, the Non-Hazardous monthly contribution was \$13.99/year of service. Upon the retiree's death, the surviving spouse may continue coverage (if in receipt of a retirement allowance) but will be 100% responsible for the premiums.
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, 2021, the Hazardous monthly contribution was \$20.99/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of \$10 (\$13.99 as of July 1, 2021) for each year of hazardous service.
Duty Disability Retirement	<p>If disability was a result of injuries sustained while in the line of duty or was duty-related, the member receives a benefit based on at least 20 years of service. This benefit is provided to members in the Non-Hazardous and Hazardous plans alike.</p> <p>If the disability is deemed to be Total and Permanent, the insurance premium for the member, the member's spouse, and the member's dependent children shall also be paid in full by the System. For non-hazardous members to be eligible for this benefit, they must be working in a position that could be certified as a hazardous position.</p>
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 fully subsidized health insurance benefit. 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, 2022

Plan Option	Non-Medicare Plan Options				
	Single	Parent Plus	Couple	Family	Family X-Ref
LivingWell PPO ¹	\$772.16	\$1,101.08	\$1,691.64	\$1,883.60	\$929.70
LivingWell CDHP	750.30	1,036.40	1,453.30	1,623.94	866.72
LivingWell Basic	721.54	994.72	1,537.72	1,713.58	846.38
Living Well Limited	642.02	914.78	1,407.32	1,566.78	772.32

Medicare Plan Options	
Medical Only Plan	\$186.87
Medicare Advantage Mirror Essential Plan	228.12
Medicare Advantage Mirror Premium Plan	327.97
Kentucky Retirement Systems – Essential Plan ²	49.25
Kentucky Retirement Systems – Premium Plan ³	227.03

¹ Contribution plan selected by the Board was the LivingWell PPO plan option for non-Medicare retirees.

² Contribution rate for retirees selected by the Board remains at \$75.56.

³ Contribution rate for retirees selected by the Board remains at \$252.51.

Dollar Contribution Amount for Insurance Tier 2 and Tier 3

Monthly contribution amounts per year of service as of July 1, 2021.

Non-Hazardous Service	Hazardous Service
\$13.99	\$20.99

Changes since the Prior Valuation

Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for qualified members who become “totally and permanently disabled” in the line of duty or as a result of a duty-related disability. The insurance premium for the member, the member’s spouse, and the member’s dependent children shall be paid in full by the System. For non-hazardous members to be eligible for this benefit, they must be working in a position that could be certified as a hazardous position.



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.



APPENDIX D

KERS NON-HAZARDOUS EMPLOYER CONTRIBUTION BY AGENCY

Appendix D
Kentucky Employees Retirement System (Non-Hazardous) - Retirement and Insurance Combined
Employer Contribution by Agency

Agency Name ¹	Agency Classification ¹	Fixed Percentage of the Total Amortization Cost				Components of Required Contribution for FYE 2023	
		Accrued Liability based on June 30, 2019 Valuation ²	Fixed Allocation of Amortization Cost	Amortization Cost for prior year (FYE2022) adjusted for Appeals ³	Amortization Cost Remains Level until Actuarial Investigation ⁴	Normal Cost (% of Pay)	Amortization Cost
		(3)	(4) = (3) / \$18,813M	(5)	(6), per KRS 61.565(1)(d)1d	(7) = 9.97% of pay for all employers	(8) = (4) x \$994M ⁵
LEGISLATIVE BRANCH AGENCIES	LEGISLATIVE BRANCH	343,338,931	1.82505%	18,665,294	No	9.97%	18,070,756
JUDICIAL BRANCH AGENCIES	JUDICIAL BRANCH	471,819,378	2.50801%	25,650,066	No	9.97%	24,833,094
EXECUTIVE BRANCH AGENCIES	EXECUTIVE BRANCH	14,661,188,769	77.93303%	797,041,531	No	9.97%	772,046,864
LEX FAYETTE CO HLTH DEPT	Health Departments	87,677,599	0.46606%	4,766,461	Yes	9.97%	4,766,461
LAKE CUMBERLAND DISTRICT	Health Departments	73,620,021	0.39134%	4,002,276	Yes	9.97%	4,002,276
BARREN RVR DIST HLTH DEPT	Health Departments	68,379,065	0.36348%	3,717,357	Yes	9.97%	3,717,357
GREEN RVR DIST HLTH DEPT	Health Departments	81,739,718	0.43450%	4,443,692	Yes	9.97%	4,443,692
NORTHERN KY DIST HLTH DEP	Health Departments	54,194,473	0.28808%	2,946,205	Yes	9.97%	2,946,205
LINCOLN TRL DIST HLTH DEP	Health Departments	66,500,206	0.35349%	3,615,244	Yes	9.97%	3,615,244
KY RIVER DIST HEALTH DEPT	Health Departments	70,220,607	0.37327%	3,817,495	Yes	9.97%	3,817,495
MADISON CO HEALTH DEP	Health Departments	53,457,239	0.28416%	2,906,171	Yes	9.97%	2,906,171
CUMBERLAND VLY DIST HEALT	Health Departments	89,949,862	0.47814%	4,889,995	Yes	9.97%	4,889,995
WEDCO DIST HEALTH DEPT	Health Departments	28,173,710	0.14976%	1,531,594	Yes	9.97%	1,531,594
FRANKLIN CO HEALTH DEPT	Health Departments	22,299,718	0.11854%	1,212,256	Yes	9.97%	1,212,256
WHITLEY CO HEALTH DEPT	Health Departments	28,890,387	0.15357%	1,570,588	Yes	9.97%	1,570,588
PIKE CO HEALTH DEPT	Health Departments	24,182,977	0.12855%	1,314,681	Yes	9.97%	1,314,681
THREE RIVERS DIST HLTH	Health Departments	22,852,018	0.12147%	1,242,308	Yes	9.97%	1,242,308
KNOX CO HEALTH DEPT	Health Departments	28,079,768	0.14926%	1,526,499	Yes	9.97%	1,526,499
PURCHASE DIST HLTH DEPT	Health Departments	43,960,371	0.23368%	2,389,886	Yes	9.97%	2,389,886
CLARK CO HEALTH DEPT	Health Departments	16,463,623	0.08751%	894,998	Yes	9.97%	894,998
GATEWAY DIST HEALTH DEPT	Health Departments	29,474,251	0.15667%	1,602,304	Yes	9.97%	1,602,304
N CENTRAL DIST HLTH DEPT	Health Departments	21,562,812	0.11462%	1,172,222	Yes	9.97%	1,172,222
BREATHITT CO HEALTH DEPT	Health Departments	18,123,824	0.09634%	985,257	Yes	9.97%	985,257
PENNYRILE DIST HLTH DEPT	Health Departments	15,661,674	0.08325%	851,429	Yes	9.97%	851,429
MARSHALL CO HEALTH DEPT	Health Departments	15,263,463	0.08113%	829,800	Yes	9.97%	829,800
CHRISTIAN CO HEALTH DEPT	Health Departments	13,360,854	0.07102%	726,335	Yes	9.97%	726,335
MONTGOMERY CO HEALTH DEPT	Health Departments	10,699,698	0.05688%	581,692	Yes	9.97%	581,692
HOPKINS CO HEALTH DEPT	Health Departments	17,815,060	0.09470%	968,516	Yes	9.97%	968,516
JOHNSON CO HEALTH DEPT	Health Departments	15,484,079	0.08231%	841,758	Yes	9.97%	841,758
FLOYD CO HEALTH CENTER	Health Departments	12,298,013	0.06537%	668,519	Yes	9.97%	668,519
ASHLAND BOYD CO HEALTH DP	Health Departments	17,566,824	0.09338%	954,998	Yes	9.97%	954,998
LAUREL CO HEALTH DEPT	Health Departments	14,475,341	0.07695%	786,958	Yes	9.97%	786,958
BULLITT CO HEALTH DEPT	Health Departments	13,823,739	0.07348%	751,499	Yes	9.97%	751,499
BELL CO HEALTH DEPT	Health Departments	10,731,667	0.05705%	583,459	Yes	9.97%	583,459
GREENUP CO HLTH DEPT	Health Departments	11,509,071	0.06118%	625,677	Yes	9.97%	625,677
JESSAMINE CO HEALTH DEPT	Health Departments	8,409,539	0.04470%	457,222	Yes	9.97%	457,222
GRAVES CO HEALTH CENTER	Health Departments	6,110,503	0.03248%	332,232	Yes	9.97%	332,232
HARLAN CO HEALTH DEPT	Health Departments	7,218,470	0.03837%	392,439	Yes	9.97%	392,439
OLDHAM CO HEALTH DEPT	Health Departments	10,480,598	0.05571%	569,733	Yes	9.97%	569,733
ALLEN CO HEALTH DEPT	Health Departments	7,911,333	0.04205%	430,082	Yes	9.97%	430,082
BUFFALO TRACE HEALTH DEPT	Health Departments	10,788,599	0.05735%	586,475	Yes	9.97%	586,475
MUHLENBERG CO.HEALTH DEPT	Health Departments	7,886,100	0.04192%	428,730	Yes	9.97%	428,730
MERCER CO HEALTH DEPT	Health Departments	8,877,255	0.04719%	482,594	Yes	9.97%	482,594
LAWRENCE CO HEALTH DEPT	Health Departments	3,868,705	0.02056%	210,362	Yes	9.97%	210,362
WOODFORD CO HEALTH DEPT	Health Departments	5,453,322	0.02899%	296,461	Yes	9.97%	296,461
CALLOWAY CO HEALTH DEPT	Health Departments	4,137,638	0.02199%	224,919	Yes	9.97%	224,919
MAGOFFIN CO HEALTH DEPT	Health Departments	6,467,092	0.03438%	351,573	Yes	9.97%	351,573
MARTIN CO HEALTH DEPT	Health Departments	5,286,010	0.02810%	287,414	Yes	9.97%	287,414
BOYLE CO HEALTH DEPT	Health Departments	6,346,920	0.03374%	345,022	Yes	9.97%	345,022
BOURBON CO HEALTH CENTER	Health Departments	7,775,901	0.04133%	422,699	Yes	9.97%	422,699
ANDERSON CO HEALTH DEPT	Health Departments	5,076,042	0.02698%	275,976	Yes	9.97%	275,976
LEWIS CO HEALTH DEPT	Health Departments	3,061,131	0.01627%	166,376	Yes	9.97%	166,376
ESTILL CO HEALTH DEPT	Health Departments	5,579,547	0.02966%	303,324	Yes	9.97%	303,324
LINCOLN CO HEALTH DEPT	Health Departments	4,897,375	0.02603%	266,201	Yes	9.97%	266,201
BRECKINRIDGE CO HEALTH BD	Health Departments	7,704,261	0.04095%	418,851	Yes	9.97%	418,851
GRAYSON COUNTY HEALTH DEPT	Health Departments	4,598,067	0.02444%	249,980	Yes	9.97%	249,980
GARRARD COUNTY HEALTH DPT	Health Departments	3,926,271	0.02087%	213,481	Yes	9.97%	213,481
TODD CO HEALTH DEPT	Health Departments	4,687,868	0.02492%	254,867	Yes	9.97%	254,867
FLEMING CO HEALTH DEP	Health Departments	4,386,549	0.02332%	238,437	Yes	9.97%	238,437
MONROE CO HEALTH DEPT	Health Departments	3,137,459	0.01668%	170,535	Yes	9.97%	170,535
BRACKEN CO HEALTH DEPT	Health Departments	2,410,616	0.01281%	131,021	Yes	9.97%	131,021
POWELL CO HEALTH DEPT	Health Departments	4,200,545	0.02233%	228,351	Yes	9.97%	228,351
CARTER CO HEALTH DEPT	Health Departments	5,555,239	0.02953%	301,972	Yes	9.97%	301,972
KY HIGHER ED STUD LN CORP	Non-P1 State Assoc/Corp.	81,896,904	0.43533%	4,452,219	No	9.97%	4,310,426
CSG HEADQUARTERS	Non-P1 State Assoc/Corp.	19,274,916	0.10246%	1,047,856	No	9.97%	1,014,509
KET FOUNDATION	Non-P1 State Assoc/Corp.	15,066,238	0.08009%	819,089	No	9.97%	793,012
ASST OF COMMONWEALTH ATTY	Non-P1 State Assoc/Corp.	5,807,856	0.03087%	315,698	No	9.97%	305,660
HIGHSCHOOL ATHLETIC ASSOC	Non-P1 State Assoc/Corp.	1,413,847	0.00752%	76,845	No	9.97%	74,459



Appendix D
Kentucky Employees Retirement System (Non-Hazardous) - Retirement and Insurance Combined
Employer Contribution by Agency

Agency Name ¹	Agency Classification ¹	Fixed Percentage of the Total Amortization Cost				Components of Required Contribution for FYE 2023	
		Accrued Liability based on June 30, 2019 Valuation ²	Fixed Allocation of Amortization Cost	Amortization Cost for prior year (FYE2022) adjusted for Appeals ³	Amortization Cost Remains Level until Actuarial Investigation ⁴	Normal Cost (% of Pay)	Amortization Cost
		(3)	(4) = (3) / \$18,813M	(5)	(6), per KRS 61.565(1)(d)1d	(7) = 9.97% of pay for all employers	(8) = (4) x \$994M ⁵
O A S I S	Non-P1 State Agencies	2,304,549	0.01225%	125,302	Yes	9.97%	125,302
KDVA	Non-P1 State Agencies	2,431,059	0.01292%	132,165	Yes	9.97%	132,165
B.R.A.S.S.	Non-P1 State Agencies	2,132,362	0.01133%	115,943	Yes	9.97%	115,943
BLUEGRASS RAPE CRISIS CTR	Non-P1 State Agencies	2,744,493	0.01459%	149,218	Yes	9.97%	149,218
SAFE HARBOR	Non-P1 State Agencies	1,312,696	0.00698%	71,334	Yes	9.97%	71,334
SANCTUARY INC	Non-P1 State Agencies	2,510,255	0.01334%	136,428	Yes	9.97%	136,428
LOTUS	Non-P1 State Agencies	1,074,054	0.00571%	58,440	Yes	9.97%	58,440
BETHANY HOUSE ABUSE SHELTER	Non-P1 State Agencies	1,675,224	0.00890%	91,091	Yes	9.97%	91,091
SPRINGHAVEN INC	Non-P1 State Agencies	1,527,812	0.00812%	83,084	Yes	9.97%	83,084
KASAP	Non-P1 State Agencies	943,862	0.00502%	51,265	Yes	9.97%	51,265
SILVERLEAF	Non-P1 State Agencies	2,017,711	0.01073%	109,704	Yes	9.97%	109,704
WOMEN AWARE	Non-P1 State Agencies	975,811	0.00519%	53,032	Yes	9.97%	53,032
D.O.V.E.S.	Non-P1 State Agencies	1,319,147	0.00701%	71,750	Yes	9.97%	71,750
NURSING HOME OMBUDSMAN	Non-P1 State Agencies	879,808	0.00468%	47,833	No	9.97%	46,339
HOPE HARBOR INC	Non-P1 State Agencies	824,202	0.00438%	44,818	Yes	9.97%	44,818
CHILD WATCH ADVOCACY CTR	Non-P1 State Agencies	718,149	0.00382%	38,994	Yes	9.97%	38,994
FRANKLIN CO COUNCIL AGING	Non-P1 State Agencies	2,147,140	0.01141%	116,775	No	9.97%	112,976
JUDI'S PLACE FOR KIDS, INC.	Non-P1 State Agencies	777,468	0.00413%	42,218	Yes	9.97%	42,218
CUMBERLAND V C A CENTER	Non-P1 State Agencies	821,917	0.00437%	44,714	Yes	9.97%	44,714
KY ASSOC OF REGIONAL PROG	Non-P1 State Agencies	1,817,343	0.00966%	98,786	Yes	9.97%	98,786
BARREN RIVER CHILD ADVOCA	Non-P1 State Agencies	406,450	0.00216%	22,045	Yes	9.97%	22,045
CHILD ADV CTR OF GRN RVR	Non-P1 State Agencies	572,517	0.00304%	31,091	Yes	9.97%	31,091
MUN ELEC POW ASSOC OF KY	Non-P1 State Agencies	1,745,743	0.00928%	94,938	No	9.97%	91,886
KY RIVER CHILD ADVOCACY	Non-P1 State Agencies	290,885	0.00155%	15,806	Yes	9.97%	15,806
PENNYRILE CHILD ADV CTR	Non-P1 State Agencies	460,162	0.00245%	25,060	Yes	9.97%	25,060
LAKE CUMB CHILD ADV CTR	Non-P1 State Agencies	545,959	0.00290%	29,636	Yes	9.97%	29,636
BUFFALO TR CHILD ADV INC	Non-P1 State Agencies	252,189	0.00134%	13,726	Yes	9.97%	13,726
NEW VISTA OF THE BLUEGRASS, INC.	Reg Mental Hlth Units	183,780,745	0.97691%	9,991,080	Yes	9.97%	9,991,080
CUMBERLAND RIVER MHMR	Reg Mental Hlth Units	98,252,502	0.52227%	5,341,394	Yes	9.97%	5,341,394
LIFESKILLS INC	Reg Mental Hlth Units	129,215,562	0.68686%	7,024,702	Yes	9.97%	7,024,702
COMMUNICARE INC	Reg Mental Hlth Units	66,572,026	0.35387%	3,619,091	Yes	9.97%	3,619,091
ADANTA/BEHAVIORAL HLTH SR	Reg Mental Hlth Units	89,012,578	0.47316%	4,839,042	Yes	9.97%	4,839,042
MOUNTAIN COMP CARE CENTER	Reg Mental Hlth Units	45,808,460	0.24350%	2,490,335	Yes	9.97%	2,490,335
GREEN RVR REG MHMR BD	Reg Mental Hlth Units	29,849,717	0.15867%	1,622,789	Yes	9.97%	1,622,789
NORTHERN KY REG MHMR BD	Reg Mental Hlth Units	57,271,755	0.30443%	3,113,517	Yes	9.97%	3,113,517
WESTERN KY REG MHMR ADV	Reg Mental Hlth Units	35,526,557	0.18885%	1,931,416	Yes	9.97%	1,931,416
COMPREHEND INC REG MHMR B	Reg Mental Hlth Units	29,064,447	0.15450%	1,580,051	Yes	9.97%	1,580,051
SEVEN CO SERVICES INC	Reg Mental Hlth Units	154,213,520	0.81974%	8,383,681	Yes	9.97%	8,383,681
KY RIVER COMM CARE INC	Reg Mental Hlth Units	26,687,511	0.14186%	1,450,798	Yes	9.97%	1,450,798
EASTERN KY UNIV	Universities	239,031,382	1.27060%	12,994,684	No	9.97%	12,580,858
KCTCS	Universities	156,197,124	0.83028%	8,491,513	No	9.97%	8,220,992
WESTERN KENTUCKY UNIV	Universities	180,798,950	0.96106%	9,828,967	No	9.97%	9,515,948
MURRAY STATE UNIV	Universities	132,693,175	0.70534%	7,213,746	No	9.97%	6,983,851
MOREHEAD STATE UNIVERSITY	Universities	120,999,617	0.64319%	6,577,982	No	9.97%	6,368,494
KENTUCKY STATE UNIVERSITY	Universities	44,391,511	0.23597%	2,413,282	No	9.97%	2,336,460
ALLEN COUNTY ATTORNEY	County Attorneys	1,658,981	0.00882%	90,155	No	9.97%	87,331
ANDERSON COUNTY ATTORNEY	County Attorneys	1,971,500	0.01048%	107,208	No	9.97%	103,768
BARREN COUNTY ATTORNEY	County Attorneys	2,875,029	0.01528%	156,289	No	9.97%	151,295
BATH COUNTY ATTORNEY	County Attorneys	2,729	0.00001%	104	No	9.97%	99
BELL COUNTY ATTORNEY	County Attorneys	1,931,690	0.01027%	105,025	No	9.97%	101,689
BOONE COUNTY ATTORNEY	County Attorneys	5,092,956	0.02707%	276,912	No	9.97%	268,034
BOYLE COUNTY ATTORNEY	County Attorneys	155,378	0.00083%	8,423	No	9.97%	8,218
BRECKINRIDGE CO ATTORNEY	County Attorneys	1,029,674	0.00547%	55,944	No	9.97%	54,161
BULLITT COUNTY ATTORNEY	County Attorneys	703,350	0.00374%	38,266	No	9.97%	37,032
CALLOWAY COUNTY ATTORNEY	County Attorneys	54,643	0.00029%	3,016	No	9.97%	2,871
CARROLL COUNTY ATTORNEY	County Attorneys	873,614	0.00464%	47,521	No	9.97%	45,943
CASEY COUNTY ATTORNEY	County Attorneys	947,428	0.00504%	51,473	No	9.97%	49,904
CHILD SUPPORT ENFORCEMENT	County Attorneys	255,979	0.00136%	13,934	No	9.97%	13,466
CHRISTIAN COUNTY ATTORNEY	County Attorneys	984,086	0.00523%	53,448	No	9.97%	51,785
CLARK COUNTY ATTORNEY	County Attorneys	1,322,750	0.00703%	71,958	No	9.97%	69,608
CRITTENDEN CO ATTORNEY	County Attorneys	365,437	0.00194%	19,861	No	9.97%	19,209
DAVISS COUNTY ATTORNEY	County Attorneys	1,578,350	0.00839%	85,788	No	9.97%	83,074
EDMONSON COUNTY ATTORNEY	County Attorneys	474,886	0.00252%	25,788	No	9.97%	24,952
FAYETTE CO ATTORNEY OFF	County Attorneys	3,136,743	0.01667%	170,535	No	9.97%	165,058
FLOYD COUNTY ATTORNEY	County Attorneys	1,121,075	0.00596%	60,935	No	9.97%	59,013
FRANKLIN COUNTY ATTORNEY	County Attorneys	4,833,960	0.02570%	262,770	No	9.97%	254,469
GARRARD COUNTY ATTORNEY	County Attorneys	988,761	0.00526%	53,760	No	9.97%	52,082
GRANT COUNTY CHILD SUPPOR	County Attorneys	363,477	0.00193%	19,757	No	9.97%	19,110
GRAVES COUNTY ATTORNEY	County Attorneys	3,272,663	0.01740%	177,918	No	9.97%	172,286



Appendix D
Kentucky Employees Retirement System (Non-Hazardous) - Retirement and Insurance Combined
Employer Contribution by Agency

Agency Name ¹	Agency Classification ¹	Fixed Percentage of the Total Amortization Cost				Components of Required Contribution for FYE 2023	
		Accrued Liability based on June 30, 2019 Valuation ²	Fixed Allocation of Amortization Cost	Amortization Cost for prior year (FYE2022) adjusted for Appeals ³	Amortization Cost Remains Level until Actuarial Investigation ⁴	Normal Cost (% of Pay)	Amortization Cost
		(3)	(4) = (3) / \$18,813M	(5)	(6), per KRS 61.565(1)(d)1d	(7) = 9.97% of pay for all employers	(8) = (4) x \$994M ⁵
HANCOCK COUNTY ATTORNEY	County Attorneys	386,098	0.00205%	21,005	No	9.97%	20,298
HARRISON COUNTY ATTORNEY	County Attorneys	114,873	0.00061%	6,239	No	9.97%	6,040
HICKMAN COUNTY ATTORNEY	County Attorneys	1,028,593	0.00547%	55,944	No	9.97%	54,161
HOPKINS COUNTY ATTORNEY	County Attorneys	1,751,470	0.00931%	95,250	No	9.97%	92,183
JACKSON COUNTY ATTORNEY	County Attorneys	700,551	0.00372%	38,058	No	9.97%	36,834
JEFFERSON CO ATTORNEY	County Attorneys	17,081,131	0.09080%	928,585	No	9.97%	899,042
JOHNSON COUNTY ATTORNEY	County Attorneys	230,506	0.00123%	12,582	No	9.97%	12,179
KENTON COUNTY ATTORNEY	County Attorneys	1,021,997	0.00543%	55,528	No	9.97%	53,765
KNOTT COUNTY ATTORNEY	County Attorneys	900,207	0.00479%	48,977	No	9.97%	47,428
KNOX COUNTY ATTORNEY	County Attorneys	5,454	0.00003%	312	No	9.97%	297
LARUE COUNTY ATTORNEY	County Attorneys	1,041,769	0.00554%	56,672	No	9.97%	54,854
LAUREL COUNTY ATTORNEY	County Attorneys	353,526	0.00188%	19,237	No	9.97%	18,615
LAWRENCE COUNTY ATTORNEY	County Attorneys	144	0.00000%	-	No	9.97%	-
LEE COUNTY ATTORNEY	County Attorneys	888,298	0.00472%	48,249	No	9.97%	46,735
LOGAN COUNTY ATTORNEY	County Attorneys	1,781,059	0.00947%	96,810	No	9.97%	93,767
MADISON COUNTY ATTORNEY	County Attorneys	6,471,517	0.03440%	351,781	No	9.97%	340,612
MAGOFFIN CO ATTORNEY	County Attorneys	195,563	0.00104%	10,606	No	9.97%	10,298
MCCRACKEN COUNTY ATTORNEY	County Attorneys	1,092,697	0.00581%	59,375	No	9.97%	57,528
MCCREARY COUNTY ATTORNEY	County Attorneys	1,920,823	0.01021%	104,401	No	9.97%	101,094
MEADE COUNTY ATTORNEY	County Attorneys	1,485,282	0.00790%	80,796	No	9.97%	78,222
MENIFEE COUNTY ATTORNEY	County Attorneys	568,840	0.00302%	30,884	No	9.97%	29,903
MERCER COUNTY ATTORNEY	County Attorneys	507,084	0.00270%	27,556	No	9.97%	26,734
MONROE CO ATTORNEY	County Attorneys	617,699	0.00328%	33,587	No	9.97%	32,477
MONTGOMERY CO ATTORNEY	County Attorneys	1,684,951	0.00896%	91,611	No	9.97%	88,718
MORGAN COUNTY ATTORNEY	County Attorneys	1,815,404	0.00965%	98,682	No	9.97%	95,550
OLDHAM COUNTY ATTORNEY	County Attorneys	1,690,959	0.00899%	91,923	No	9.97%	89,015
OWEN COUNTY ATTORNEY	County Attorneys	490,212	0.00261%	26,620	No	9.97%	25,843
PENDLETON COUNTY ATTORNEY	County Attorneys	155,600	0.00083%	8,423	No	9.97%	8,218
POWELL COUNTY ATTORNEY	County Attorneys	26,895	0.00014%	1,456	No	9.97%	1,386
PULASKI COUNTY ATTORNEY	County Attorneys	1,602,159	0.00852%	87,139	No	9.97%	84,361
ROCKCASTLE CO ATTORNEY	County Attorneys	774,276	0.00412%	42,114	No	9.97%	40,794
ROWAN COUNTY ATTORNEY	County Attorneys	820,120	0.00436%	44,610	No	9.97%	43,171
SHELBY COUNTY ATTORNEY	County Attorneys	400,120	0.00213%	21,733	No	9.97%	21,090
SIMPSON COUNTY ATTORNEY	County Attorneys	521,989	0.00277%	28,388	No	9.97%	27,427
SPENCER COUNTY ATTORNEY	County Attorneys	1,200,709	0.00638%	65,303	No	9.97%	63,172
TRIGG COUNTY ATTORNEY	County Attorneys	933,350	0.00496%	50,745	No	9.97%	49,112
TRIMBLE COUNTY ATTORNEY	County Attorneys	749,934	0.00399%	40,762	No	9.97%	39,507
UNION COUNTY ATTORNEY	County Attorneys	293,278	0.00156%	15,910	No	9.97%	15,446
WAYNE COUNTY ATTORNEY	County Attorneys	668,657	0.00355%	36,395	No	9.97%	35,150
WEBSTER COUNTY ATTORNEY	County Attorneys	1,413,256	0.00751%	76,845	No	9.97%	74,360
WHITLEY COUNTY ATTORNEY	County Attorneys	2,013,956	0.01071%	109,496	No	9.97%	106,045
Total		18,812,529,777	100.00000%	1,022,724,699	N/A	9.97%	994,421,476
Agencies that have ceased participation in the System:							
KENTUCKY BAR ASSOCIATION	Non-P1 State Agencies	9,726,855	N/A	-	N/A	N/A	N/A
KENTUCKY ASSOCIATION OF CHILDREN'S ADVOC.	Non-P1 State Agencies	14,508	N/A	-	N/A	N/A	N/A
COMMONWEALTH CREDIT UNION	Non-P1 State Agencies	46,950,704	N/A	-	N/A	N/A	N/A
KENTUCKY EMPLOYERS MUTUAL INSURANCE	Non-P1 State Agencies	15,220,243	N/A	-	N/A	N/A	N/A
GATEWAY CHILD ADVOCACY	Non-P1 State Agencies	53,228	N/A	-	N/A	N/A	N/A
NORTHERN KY UNIVERSITY	Universities	216,716,312	N/A	-	N/A	N/A	N/A
KENTUCKY HOUSING CORP	Non-P1 State Assoc/Corp.	98,280,874	N/A	-	N/A	N/A	N/A
Total		19,199,492,501	100.00000%	1,022,724,699	N/A	9.97%	994,421,476

Notes and Assumptions

¹ Agency names and classification information have been provided to GRS by KPPA. We have reviewed this data for consistency but did not audit the data.

² The accrued liability as of June 30, 2019 has been adjusted based on the approved employer appeals. The liability associated with these appeals was compiled by KPPA based on the liability amounts provided by GRS.

³ The amortization cost for FYE 2022 was re-calculated based on the fixed allocation adjusted for approved employer appeals. Per House Bill 8, any adjustments made for employer appeals are effective July 1, 2022; therefore, for agencies whose amortization cost remains level (as allowed per KRS 61.565(1)(d)1d), this amount will first be payable for FYE 2023 and will not be applicable for payments in FYE2022.

⁴ The amortization cost for certain employers (as defined in KRS 61.565(1)(d)1d) will not be adjusted in terms of dollars paid by the individual employer, except for after the completion of an actuarial investigation as provided by KRS 61.670, so long as at least four years have passed since the last adjustment.

⁵ The amortization cost for employers whose amortization cost does not remain level (as allowed per KRS 61.565(1)(d)1d) has been adjusted so that the total amortization cost required by employers is equal to the actuarially determined amount for the System, which is \$994,421,476 for the fiscal year ending 2023.





December 2, 2021

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

Re: Sensitivity Analysis Based on Results of the June 30, 2021 Actuarial Valuation

Dear Members of the Board:

Per Kentucky State Statute 61.670, we are providing this supplemental information regarding the sensitivity of the valuation results to changes in some of the economic assumptions. Specifically, the enclosed tables show the impact for the **Kentucky Employees Retirement System (KERS)** due to changes in the investment return assumption, the inflation rate assumption, and the payroll growth rate assumption.

Background

Investment Assumption

The investment return assumption is used to discount future expected benefit payments to the valuation date in order to determine the liabilities of the plans. The lower the investment return assumption, the less the benefit payments are discounted and the higher the valuation liability. The current investment return assumption is 5.25% for the KERS non-hazardous retirement fund and 6.25% for the KERS hazardous retirement fund and both KERS insurance funds. The sensitivity analysis shows the financial impact of a 1.00% increase and a 1.00% decrease in the investment return assumption. For purposes of this sensitivity analysis, the inflation assumption and payroll growth assumption remain unchanged from the valuation assumption.

Inflation Assumption

The inflation assumption underlies most of the other economic assumptions, including the investment return, salary increases, and payroll growth rate. This is a macroeconomic assumption and as such the same assumption is used in the valuation of each of the retirement systems. The current assumption is 2.30% for all funds. The sensitivity analysis shows the financial impact of a 0.25% increase and a 0.25% decrease in the inflation assumption. Note, the change in the inflation assumption results in a corresponding change in the investment return assumption, the individual salary increase assumption for projecting members' benefit amounts, the payroll growth rate assumption, and the healthcare trend assumption that is used in the valuation of the health insurance funds.

Payroll Growth Assumption

Participating employers of the KERS hazardous fund make contributions to the system as a percentage of the covered payroll. Therefore, as payroll changes over time these amortization payments will also change. If actual covered payroll increases at a rate that is less than assumed, then the retirement system receives fewer contribution dollars than expected to finance the unfunded liability, which means the contribution rate in future years will be required to increase in order to finance the unfunded liability over the same time period. The current payroll growth assumption is 0.00% for all the KERS retirement and insurance funds. The analysis shows the impact of a 1.00% increase and a 1.00% decrease in the payroll growth assumption.

For completeness, we have included this sensitivity for the non-hazardous fund. House Bill 8 passed during the 2021 legislative session and changed how contributions are collected and allocated amongst employers. The portion of the required contribution that amortizes (or pays for) the unfunded liability for the non-hazardous fund is no longer collected as a percentage of payroll. This sensitivity for the non-hazardous fund shows the impact of assuming that the amortization cost contributions paid by employers either decrease by 1% or increase by 1% annually (versus the valuation assumption that they remain level through the end of the funding period).

Please note that the payroll growth assumption does not impact the valuation liabilities, unfunded liability, or funded status of the system. Rather, this assumption only impacts the amortization rate for financing the existing unfunded actuarial accrued liability and the actuarially determined employer contribution. For purposes of this analysis, the investment return assumption and the inflation assumption are held at their current valuation assumptions.

Certification

The information provided in this letter compliments the information provided in the June 30, 2021 actuarial valuation report. Please refer to the June 30, 2021 actuarial valuation report for additional discussion of the actuarial valuation, including the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

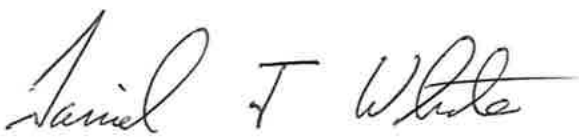
Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making. The purpose of this information is to provide stakeholders the financial sensitivity of the unfunded liability and contribution rates to changes in the inflation, assumed rate of return, and payroll growth assumption.



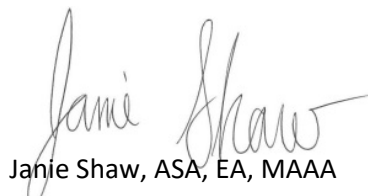
The undersigned are independent actuaries and consultants. Both of the undersigned are Enrolled Actuaries, Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. Both of the undersigned are experienced in performing valuations for large public retirement systems. This communication shall not be construed to provide tax advice, legal advice or investment advice.

Sincerely,

Gabriel, Roeder, Smith & Company



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



Jamie Shaw, ASA, EA, MAAA
Consultant

Sensitivity Analysis - Discount Rate
Non-Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Discount Rate (2)	Valuation Results (3)	Increase Discount Rate (4)
Payroll Growth Rate	0.00%	0.00%	0.00%
Inflation Rate	2.30%	2.30%	2.30%
Discount Rate - Retirement	4.25%	5.25%	6.25%
Discount Rate - Insurance	5.25%	6.25%	7.25%
Retirement			
Actuarial Accrued Liability	\$ 18,344,613	\$ 16,321,372	\$ 14,655,807
Actuarial Value of Assets	2,735,876	2,735,876	2,735,876
Unfunded Actuarial Accrued Liability	15,608,737	13,585,496	11,919,931
Funded Ratio	14.9%	16.8%	18.7%
Normal Cost Rate	11.31%	7.82%	5.41%
Amortization Cost	\$ 969,447	\$ 906,020	\$ 851,816
Insurance			
Actuarial Accrued Liability	\$ 2,922,389	\$ 2,574,112	\$ 2,289,072
Actuarial Value of Assets	1,291,472	1,291,472	1,291,472
Unfunded Actuarial Accrued Liability	1,630,917	1,282,640	997,600
Funded Ratio	44.2%	50.2%	56.4%
Normal Cost Rate	2.96%	2.15%	1.56%
Amortization Cost	\$ 108,804	\$ 88,402	\$ 69,580
Combined			
Actuarial Accrued Liability	\$ 21,267,002	\$ 18,895,484	\$ 16,944,879
Actuarial Value of Assets	4,027,348	4,027,348	4,027,348
Unfunded Actuarial Accrued Liability	17,239,654	14,868,136	12,917,531
Funded Ratio	18.9%	21.3%	23.8%
Normal Cost Rate	14.27%	9.97%	6.97%
Amortization Cost	\$ 1,078,251	\$ 994,422	\$ 921,396



Sensitivity Analysis - Inflation Rate
Non-Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Inflation Rate (2)	Valuation Results (3)	Increase Inflation Rate (4)
Payroll Growth Rate	-0.25%	0.00%	0.25%
Inflation Rate	2.05%	2.30%	2.55%
Discount Rate - Retirement	5.00%	5.25%	5.50%
Discount Rate - Insurance	6.00%	6.25%	6.50%
Retirement			
Actuarial Accrued Liability	\$ 16,759,612	\$ 16,321,372	\$ 15,903,291
Actuarial Value of Assets	2,735,876	2,735,876	2,735,876
Unfunded Actuarial Accrued Liability	14,023,736	13,585,496	13,167,415
Funded Ratio	16.3%	16.8%	17.2%
Normal Cost Rate	8.29%	7.82%	7.39%
Amortization Cost	\$ 941,717	\$ 906,020	\$ 871,875
Insurance			
Actuarial Accrued Liability	\$ 2,594,161	\$ 2,574,112	\$ 2,555,191
Actuarial Value of Assets	1,291,472	1,291,472	1,291,472
Unfunded Actuarial Accrued Liability	1,302,689	1,282,640	1,263,719
Funded Ratio	49.8%	50.2%	50.5%
Normal Cost Rate	2.23%	2.15%	2.08%
Amortization Cost	\$ 90,101	\$ 88,402	\$ 86,800
Combined			
Actuarial Accrued Liability	\$ 19,353,773	\$ 18,895,484	\$ 18,458,482
Actuarial Value of Assets	4,027,348	4,027,348	4,027,348
Unfunded Actuarial Accrued Liability	15,326,425	14,868,136	14,431,134
Funded Ratio	20.8%	21.3%	21.8%
Normal Cost Rate	10.52%	9.97%	9.47%
Amortization Cost	\$ 1,031,818	\$ 994,422	\$ 958,675

Sensitivity Analysis - Payroll Growth
Non-Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Payroll Growth (2)	Valuation Results (3)	Increase Payroll Growth (4)
Payroll Growth Rate	-1.00%	0.00%	1.00%
Inflation Rate	2.30%	2.30%	2.30%
Discount Rate - Retirement	5.25%	5.25%	5.25%
Discount Rate - Insurance	6.25%	6.25%	6.25%
Retirement			
Actuarial Accrued Liability	\$ 16,321,372	\$ 16,321,372	\$ 16,321,372
Actuarial Value of Assets	2,735,876	2,735,876	2,735,876
Unfunded Actuarial Accrued Liability	13,585,496	13,585,496	13,585,496
Funded Ratio	16.8%	16.8%	16.8%
Normal Cost Rate	7.82%	7.82%	7.82%
Amortization Cost	\$ 999,804	\$ 906,020	\$ 817,234
Insurance			
Actuarial Accrued Liability	\$ 2,574,112	\$ 2,574,112	\$ 2,574,112
Actuarial Value of Assets	1,291,472	1,291,472	1,291,472
Unfunded Actuarial Accrued Liability	1,282,640	1,282,640	1,282,640
Funded Ratio	50.2%	50.2%	50.2%
Normal Cost Rate	2.15%	2.15%	2.15%
Amortization Cost	\$ 97,919	\$ 88,402	\$ 79,350
Combined			
Actuarial Accrued Liability	\$ 18,895,484	\$ 18,895,484	\$ 18,895,484
Actuarial Value of Assets	4,027,348	4,027,348	4,027,348
Unfunded Actuarial Accrued Liability	14,868,136	14,868,136	14,868,136
Funded Ratio	21.3%	21.3%	21.3%
Normal Cost Rate	9.97%	9.97%	9.97%
Amortization Cost	\$ 1,097,723	\$ 994,422	\$ 896,584



Sensitivity Analysis - Discount Rate
Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Discount Rate (2)	Valuation Results (3)	Increase Discount Rate (4)
Payroll Growth Rate	0.00%	0.00%	0.00%
Inflation Rate	2.30%	2.30%	2.30%
Discount Rate - Retirement	5.25%	6.25%	7.25%
Discount Rate - Insurance	5.25%	6.25%	7.25%
Retirement			
Actuarial Accrued Liability	\$ 1,456,984	\$ 1,295,243	\$ 1,163,824
Actuarial Value of Assets	782,496	782,496	782,496
Unfunded Actuarial Accrued Liability	674,488	512,747	381,328
Funded Ratio	53.7%	60.4%	67.2%
Actuarially Determined Contribution Rate	41.89%	31.82%	23.38%
Insurance			
Actuarial Accrued Liability	\$ 482,624	\$ 424,455	\$ 377,419
Actuarial Value of Assets	575,025	575,025	575,025
Unfunded Actuarial Accrued Liability	(92,401)	(150,570)	(197,606)
Funded Ratio	119.1%	135.5%	152.4%
Actuarially Determined Contribution Rate	1.55%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	\$ 1,939,608	\$ 1,719,698	\$ 1,541,243
Actuarial Value of Assets	1,357,521	1,357,521	1,357,521
Unfunded Actuarial Accrued Liability	582,087	362,177	183,722
Funded Ratio	70.0%	78.9%	88.1%
Actuarially Determined Contribution Rate	43.44%	31.82%	23.38%

Sensitivity Analysis - Inflation Rate
Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Inflation Rate (2)	Valuation Results (3)	Increase Inflation Rate (4)
Payroll Growth Rate	-0.25%	0.00%	0.25%
Inflation Rate	2.05%	2.30%	2.55%
Discount Rate - Retirement	6.00%	6.25%	6.50%
Discount Rate - Insurance	6.00%	6.25%	6.50%
Retirement			
Actuarial Accrued Liability	\$ 1,329,512	\$ 1,295,243	\$ 1,262,660
Actuarial Value of Assets	782,496	782,496	782,496
Unfunded Actuarial Accrued Liability	547,016	512,747	480,164
Funded Ratio	58.9%	60.4%	62.0%
Actuarially Determined Contribution Rate	34.35%	31.82%	29.44%
Insurance			
Actuarial Accrued Liability	\$ 428,678	\$ 424,455	\$ 420,489
Actuarial Value of Assets	575,025	575,025	575,025
Unfunded Actuarial Accrued Liability	(146,347)	(150,570)	(154,536)
Funded Ratio	134.1%	135.5%	136.8%
Actuarially Determined Contribution Rate	0.00%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	\$ 1,758,190	\$ 1,719,698	\$ 1,683,149
Actuarial Value of Assets	1,357,521	1,357,521	1,357,521
Unfunded Actuarial Accrued Liability	400,669	362,177	325,628
Funded Ratio	77.2%	78.9%	80.7%
Actuarially Determined Contribution Rate	34.35%	31.82%	29.44%

Sensitivity Analysis - Payroll Growth
Hazardous Members
(Dollar amounts expressed in thousands)

(1)	Decrease Payroll Growth (2)	Valuation Results (3)	Increase Payroll Growth (4)
Payroll Growth Rate	-1.00%	0.00%	1.00%
Inflation Rate	2.30%	2.30%	2.30%
Discount Rate - Retirement	6.25%	6.25%	6.25%
Discount Rate - Insurance	6.25%	6.25%	6.25%
Retirement			
Actuarial Accrued Liability	\$ 1,295,243	\$ 1,295,243	\$ 1,295,243
Actuarial Value of Assets	782,496	782,496	782,496
Unfunded Actuarial Accrued Liability	512,747	512,747	512,747
Funded Ratio	60.4%	60.4%	60.4%
Actuarially Determined Contribution Rate	34.35%	31.82%	29.45%
Insurance			
Actuarial Accrued Liability	\$ 424,455	\$ 424,455	\$ 424,455
Actuarial Value of Assets	575,025	575,025	575,025
Unfunded Actuarial Accrued Liability	(150,570)	(150,570)	(150,570)
Funded Ratio	135.5%	135.5%	135.5%
Actuarially Determined Contribution Rate	0.00%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	\$ 1,719,698	\$ 1,719,698	\$ 1,719,698
Actuarial Value of Assets	1,357,521	1,357,521	1,357,521
Unfunded Actuarial Accrued Liability	362,177	362,177	362,177
Funded Ratio	78.9%	78.9%	78.9%
Actuarially Determined Contribution Rate	34.35%	31.82%	29.45%

Kentucky Retirement System
KERS Non-Hazardous Retirement Fund
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll (Normal Cost)	Employer Contribution (Amortization Cost)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 16,321	\$ 2,736	\$ 13,585	17%	\$ 1,027	\$ 67	\$ 1,349	7.90%	\$ 920
2022	16,319	3,053	13,266	19%	1,012	67	1,349	7.82%	906
2023	16,293	3,337	12,956	21%	1,012	67	1,349	7.82%	906
2024	16,246	3,612	12,634	22%	991	67	1,349	7.29%	893
2025	16,178	3,878	12,300	24%	991	67	1,349	7.29%	893
2026	16,088	4,058	12,030	25%	971	67	1,349	6.82%	879
2027	15,978	4,218	11,760	26%	971	67	1,349	6.82%	879
2028	15,848	4,372	11,476	28%	965	67	1,349	6.38%	879
2029	15,698	4,520	11,178	29%	965	67	1,349	6.38%	879
2030	15,529	4,666	10,863	30%	959	67	1,349	5.97%	879
2031	15,344	4,812	10,532	31%	959	67	1,349	5.97%	879
2032	15,151	4,968	10,183	33%	954	67	1,349	5.62%	879
2033	14,944	5,128	9,816	34%	954	67	1,349	5.62%	879
2034	14,726	5,295	9,431	36%	950	67	1,349	5.31%	879
2035	14,497	5,472	9,025	38%	950	67	1,349	5.31%	879
2036	14,259	5,663	8,596	40%	947	67	1,349	5.05%	879
2037	14,017	5,871	8,146	42%	947	67	1,349	5.05%	879
2038	13,774	6,101	7,673	44%	944	67	1,349	4.86%	879
2039	13,533	6,358	7,175	47%	944	67	1,349	4.86%	879
2040	13,294	6,645	6,649	50%	945	67	1,349	4.72%	881
2041	13,061	6,966	6,095	53%	975	67	1,349	4.72%	911
2042	12,833	7,353	5,480	57%	980	67	1,349	4.62%	917
2043	12,610	7,784	4,826	62%	987	67	1,349	4.62%	924
2044	12,395	8,263	4,132	67%	992	67	1,349	4.52%	931
2045	12,187	8,793	3,394	72%	999	67	1,349	4.52%	938
2046	11,987	9,377	2,610	78%	998	67	1,349	4.45%	938
2047	11,795	10,011	1,784	85%	998	67	1,349	4.45%	938
2048	11,611	10,697	914	92%	997	67	1,349	4.38%	938
2049	11,438	11,438	-	100%	59	67	1,349	4.36%	-
2050	11,276	11,276	-	100%	59	67	1,349	4.34%	-

Notes and assumptions:

The projection is based on the results of the June 30, 2021 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 5.25%.

New active members are assumed to be hired as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the normal cost portion of the actuarially determined contribution.

The full actuarially determined amortization cost is assumed to be allocated amongst employers each biennium.

The second year of a biannual budget is assumed to take into account any expiring amortization bases.



Kentucky Retirement System
KERS Hazardous Retirement Fund
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 1,295	\$ 782	\$ 513	60%	\$ 54	\$ 13	\$ 163	33.43%	33.43%
2022	1,325	848	477	64%	52	13	163	31.82%	31.82%
2023	1,353	907	446	67%	52	13	163	31.82%	29.92%
2024	1,378	966	412	70%	46	13	163	28.18%	28.18%
2025	1,403	1,026	377	73%	46	13	163	28.18%	26.67%
2026	1,426	1,060	366	74%	40	13	163	24.68%	24.68%
2027	1,448	1,088	360	75%	40	13	163	24.68%	24.43%
2028	1,468	1,115	353	76%	39	13	163	24.16%	24.16%
2029	1,486	1,140	346	77%	39	13	163	24.16%	23.95%
2030	1,505	1,166	339	78%	39	13	163	23.79%	23.79%
2031	1,524	1,192	332	78%	39	13	163	23.79%	23.68%
2032	1,544	1,221	323	79%	38	13	163	23.58%	23.58%
2033	1,566	1,250	316	80%	38	13	163	23.58%	23.52%
2034	1,589	1,282	307	81%	38	13	163	23.45%	23.45%
2035	1,612	1,315	297	82%	38	13	163	23.45%	23.39%
2036	1,637	1,349	288	82%	38	13	163	23.31%	23.31%
2037	1,661	1,384	277	83%	38	13	163	23.31%	23.22%
2038	1,686	1,420	266	84%	38	13	163	23.11%	23.11%
2039	1,710	1,456	254	85%	38	13	163	23.11%	23.01%
2040	1,734	1,492	242	86%	36	13	163	21.86%	21.86%
2041	1,758	1,528	230	87%	36	13	163	21.86%	24.55%
2042	1,782	1,564	218	88%	43	13	163	26.28%	26.28%
2043	1,807	1,609	198	89%	43	13	163	26.28%	27.70%
2044	1,832	1,656	176	90%	47	13	163	29.07%	29.07%
2045	1,857	1,709	148	92%	47	13	163	29.07%	30.81%
2046	1,881	1,763	118	94%	50	13	163	30.97%	30.97%
2047	1,905	1,821	84	96%	50	13	163	30.97%	31.00%
2048	1,928	1,881	47	98%	50	13	163	31.01%	31.01%
2049	1,950	1,950	-	100%	10	13	163	6.29%	6.29%
2050	1,971	1,971	-	100%	10	13	163	6.29%	6.29%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.



Kentucky Retirement System
KERS Non-Hazardous Insurance Fund
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll (Normal Cost)	Employer Contribution (Amortization Cost)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 2,574	\$ 1,291	\$ 1,283	50%	\$ 132	\$ 6	\$ 1,339	2.20%	\$ 102
2022	2,641	1,422	1,219	54%	117	7	1,339	2.15%	88
2023	2,706	1,535	1,171	57%	117	7	1,339	2.15%	88
2024	2,764	1,646	1,118	60%	107	8	1,339	1.92%	81
2025	2,816	1,754	1,062	62%	107	8	1,339	1.92%	81
2026	2,860	1,816	1,044	64%	96	9	1,339	1.67%	74
2027	2,896	1,863	1,033	64%	96	9	1,339	1.67%	74
2028	2,923	1,902	1,021	65%	93	10	1,339	1.41%	74
2029	2,941	1,932	1,009	66%	93	10	1,339	1.41%	74
2030	2,950	1,954	996	66%	89	11	1,339	1.16%	74
2031	2,951	1,969	982	67%	89	11	1,339	1.16%	74
2032	2,945	1,978	967	67%	87	11	1,339	0.95%	74
2033	2,934	1,983	951	68%	87	12	1,339	0.95%	74
2034	2,918	1,983	935	68%	85	12	1,339	0.80%	74
2035	2,898	1,980	918	68%	85	12	1,339	0.80%	74
2036	2,876	1,977	899	69%	83	13	1,339	0.68%	74
2037	2,854	1,975	879	69%	83	13	1,339	0.68%	74
2038	2,832	1,974	858	70%	82	13	1,339	0.60%	74
2039	2,810	1,976	834	70%	82	13	1,339	0.60%	74
2040	2,790	1,979	811	71%	103	13	1,339	0.54%	96
2041	2,772	2,009	763	73%	118	13	1,339	0.54%	111
2042	2,755	2,060	695	75%	121	13	1,339	0.50%	115
2043	2,741	2,120	621	77%	125	13	1,339	0.50%	118
2044	2,729	2,191	538	80%	128	13	1,339	0.47%	121
2045	2,718	2,272	446	84%	132	13	1,339	0.47%	126
2046	2,709	2,364	345	87%	132	13	1,339	0.44%	126
2047	2,699	2,462	237	91%	132	13	1,339	0.44%	126
2048	2,688	2,566	122	96%	131	13	1,339	0.43%	126
2049	2,677	2,677	-	100%	6	13	1,339	0.42%	-
2050	2,663	2,663	-	100%	5	13	1,339	0.41%	-

Notes and assumptions:

The projection is based on the results of the June 30, 2021 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the normal cost portion of the actuarially determined contribution.

The full actuarially determined amortization cost is assumed to be allocated amongst employers each biennium.

The second year of a biannual budget is assumed to take into account any expiring amortization bases.



Kentucky Retirement System
KERS Hazardous Insurance Fund
(\$ in Millions)

Fiscal Year Beginning July 1,	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio (3) / (2)	Employer Contribution	Member Contribution	Covered Payroll	Employer Contribution as % of Covered Payroll	Employer Actuarially Determined Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2021	\$ 424	\$ 575	\$ (151)	136%	\$ -	\$ 1	\$ 162	0.00%	0.00%
2022	437	608	(171)	139%	-	1	162	0.00%	0.00%
2023	447	639	(192)	143%	-	1	162	0.00%	0.00%
2024	456	669	(213)	147%	-	1	162	0.00%	0.00%
2025	464	705	(241)	152%	-	1	162	0.00%	0.00%
2026	470	722	(252)	154%	-	1	162	0.00%	0.00%
2027	475	739	(264)	156%	-	1	162	0.00%	0.00%
2028	479	755	(276)	158%	-	1	162	0.00%	0.00%
2029	482	772	(290)	160%	-	1	162	0.00%	0.00%
2030	485	788	(303)	163%	-	2	162	0.00%	0.00%
2031	487	806	(319)	166%	-	2	162	0.00%	0.00%
2032	488	824	(336)	169%	-	2	162	0.00%	0.00%
2033	491	844	(353)	172%	-	2	162	0.00%	0.00%
2034	493	864	(371)	175%	-	2	162	0.00%	0.00%
2035	495	887	(392)	179%	-	2	162	0.00%	0.00%
2036	498	911	(413)	183%	-	2	162	0.00%	0.00%
2037	501	937	(436)	187%	-	2	162	0.00%	0.00%
2038	505	965	(460)	191%	-	2	162	0.00%	0.00%
2039	510	995	(485)	195%	-	2	162	0.00%	0.00%
2040	515	1,027	(512)	199%	-	2	162	0.00%	0.00%
2041	520	1,061	(541)	204%	-	2	162	0.00%	0.00%
2042	526	1,098	(572)	209%	-	2	162	0.00%	0.00%
2043	533	1,137	(604)	213%	-	2	162	0.00%	0.00%
2044	540	1,178	(638)	218%	-	2	162	0.00%	0.00%
2045	547	1,222	(675)	223%	-	2	162	0.00%	0.00%
2046	554	1,268	(714)	229%	-	2	162	0.00%	0.00%
2047	561	1,317	(756)	235%	-	2	162	0.00%	0.00%
2048	567	1,367	(800)	241%	-	2	162	0.00%	0.00%
2049	573	1,420	(847)	248%	-	2	162	0.00%	0.00%
2050	578	1,476	(898)	255%	-	2	162	0.00%	0.00%

Notes and assumptions:

The projection is based on the results of the June 30, 2021 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

New active members are assumed to be hired as current active members are assumed to terminate employment or retire.

The total active population is assumed to decrease 2% each year for each of the next 30 years.

Covered payroll is assumed to remain level throughout the entire projection.

The contribution rate established in the Commonwealth's biennium budget is assumed to be equal to the full actuarially determined contribution rate.

