County Employees Retirement System
Board of Trustees – Regular Meeting
November 4, 2024, at 2:00 pm ET (1:00 pm CT)
Live Video Conference/Facebook Live

AGENDA

1.	Call to Order	Lisle Cheatham
2.	Opening Statement	Eric Branco
3.	Roll Call	Sherry Rankin
4.	Public Comment	Sherry Rankin
5.	Chairman's Corner	Lisle Cheatham
6.	Approval of Meeting Minutes* - September 9, 2024 and September 17, 2024	Lisle Cheatham
7.	Actuarial Committee Report a. 2024 Actuarial Valuation*	Mike Foster Danny White, GRS Janie Shaw, GRS
8.	Joint Retiree Health Plan Committee Report	Jerry Powell Connie Pettyjohn
9.	Investment Committee Report a. Kayne Anderson Energy Fund Recap	Dr. Merl Hackbart Steve Willer Anthony Chiu
10.	Closed Session*	Eric Branco
11.	Adjourn	Lisle Cheatham

***Board May Take Action**

MINUTES OF MEETING
COUNTY EMPLOYEES RETIREMENT SYSTEM
BOARD OF TRUSTEES MEETING
September 9, 2024, AT 2:00 P.M. ET
VIA LIVE VIDEO TELECONFERENCE

At the Regular Meeting of the County Employees Retirement System Board of Trustees held on September 9, 2024, the following members were present: George Cheatham, Dr. Patricia Carver, Michael Foster, JT Fulkerson, and Jerry Powell. Staff members present were CERS CEO Ed Owens, III, Ryan Barrow, Michael Board, Rebecca Adkins, Erin Surratt, Victoria Hale, Michael Lamb, Steve Willer, Leigh Ann Davis, Connie Pettyjohn, D'Juan Surratt, Brian Caldwell, Anthony Chiu, Joe Gilbert, Phillip Cook, Shaun Case, Ashley Gabbard, Kristen Coffey, Connie Davis, and Sherry Rankin. Others present included Eric Branco with Johnson Branco & Brennan, LLP; David Lindberg, Craig Morton, and Chris Tessman with Wilshire; Danny White, Kristi Kiesel, and Janie Shaw with GRS; and Tracey Garrison and Larry Loew with Humana.

1. Mr. Cheatham called the meeting to order.

2. Mr. Branco read the ***Opening Statement***.

3. Ms. Rankin took ***Roll Call***.

4. Mr. Cheatham introduced the agenda item ***Public Comment*** *(Video 00:06:15 to 00:10:01).* Ms. Rankin indicated that one public comment was received for this meeting from Andrew Parrish and read as follows:

   "Good morning, I hope you all are doing well, and I appreciate your commitment to the Commonwealth and the ones you serve. I would like to briefly introduce myself. My name is A.J. Parrish, and I currently serve as the night shift sergeant for the Paducah Police Department and am under the Tier 3 system as I joined the force in May of 2014. I am submitting this comment to you all because I want to bring to light an issue with retention among law enforcement that you are likely all too familiar with. While this issue is affecting

agencies nationwide, I want to focus on our issues specifically here in Kentucky. Currently, the Commonwealth offers three Tiers for retirement, but I will focus on the one that is currently in effect as of January 1, 2014, which is Tier 3. Essentially, peace officers are no longer under a pension style retirement but rather a 401K. Unlike the other retirement Tiers prior to 2014, under Tier 3 the participant has the option to leave law enforcement and take their 401K balance with them. Specifically, they are vested after 60 months (or 5 years) of employment. What this means is that instead of staying in law enforcement for 25 years, officers can now leave law enforcement at 5 years of service and go to work in the private sector with their 401K. This is causing a massive strain on law enforcement agencies across the commonwealth to retain seasoned, veteran officers. Instead, agencies are now forced to cycle through hiring young officers, send them to the academy to get trained and then hope that they will stay faithful to law enforcement for 25 years. While this seems grim, I do have a solution to this issue. In January, House Bill 143 was introduced which would afford Tier 3 participants the option of going to Tier 2. This would greatly benefit the safety and security of the communities within our Commonwealth by retaining law enforcement professionals for 25 years to reach full retirement under the pension system. I humbly request you take some time to fully research this issue and support the efforts to afford us the opportunity to go from a Tier 3 retirement system to Tier 2. I would be happy to discuss this issue further and can be reached via e -mail or phone at xxx-xxx-xxxx. Again, thank you for time and support in this matter." Mr. Cheatham ensured that the CERS Board does take public comments seriously and asked Mr. Owens, III, to contact Mr. Parrish regarding his concerns."

5. Mr. Cheatham introduced agenda item ***Approval of Minutes – June 10, 2024, and July 17, 2024*** *(Video 00:11:20 to 00:12:25).* Mr. Fulkerson made a motion to approve the June 10, 2024, minutes as presented. The motion was seconded by Mr. Powell and passed unanimously. Mr. Powell made a motion to approve the July 17, 2024, minutes as presented. The motion was seconded by Mr. Fulkerson and passed unanimously.

6. Mr. Cheatham introduced agenda item ***Chairman's Corner*** *(Video 00:09:17 to 00:11:25).* On behalf of the Board, Mr. Cheatham offered his condolences to Betty Pendergrass and

family for the death of Betty's father. Also, Mr. Cheatham reported that he and Mr. Owens, III, have been working together on some positive undertakings and will update everyone soon.

7. Mr. Cheatham introduced agenda item ***CERS Board of Election Ballot*** *(Video 00:12:26 to 00:16:10)*. Ms. Kristen Coffey explained that up to (6) six nonhazardous and (3) three hazardous candidates can be placed on the official ballot, which is the number of applications received. Sherry Rankin called roll. Mr. Cheatham, Dr. Carver, Mr. Foster, Mr. Fulkerson, and Mr. Powell of the CERS Board voted for all the applicants who submitted an application to be placed on the official the ballot. Then Mr. Powell made the motion that all candidates who received at least one vote be placed on the official ballot. The motion was seconded by Mr. Fulkerson and passed unanimously.

8. Mr. Cheatham introduced agenda item ***Joint Retiree Health Plan Committee Report*** *(Video 00:16:05 to 00:33:47).*

    a. Mr. Powell stated that The Joint CERS and KRS Retiree Health Plan Committee met on September 3, 2024, to discuss and make recommendations regarding the non-Medicare and Medicare eligible health plans for retirees of the systems operated by the KPPA. He provided an overview of these recommendations.

       Mr. Powell made the motion to accept the recommendations of the Joint CERS and KRS Retiree Health Plan Committee for the 2025 KEHP Plan for the non-Medicare eligible retirees. The motion was seconded by Mr. Fulkerson and passed unanimously.

    b. For the Medicare eligible health plans, Ms. Tracey Garrison from Humana explained how the 2025 KPPA pharmacy benefits are being adjusted to account for the Inflation Reduction Act.

       Mr. Powell made the motion to accept the recommendations of the Joint CERS and KRS Retiree Health Plan Committee for the 2025 Humana Medicare Plan for the

Medicare-eligible members. The motion was seconded by Mr. Fulkerson and passed unanimously.

9. Mr. Cheatham introduced agenda item ***Actuary Committee Report*** *(Video 00:35:16 to 00:49:30).* Mr. Foster reported the Actuary Committee met on June 26, 2024, and considered the recommendations made by GRS for the Economic Assumptions. Ms. Janie Shaw then presented to the CERS Board of Trustees the GRS Economic Assumption recommendations. Mr. Foster made the motion to adopt the Economic Assumptions as recommended by the Actuary Committee. The motion was seconded by Mr. Powell and passed unanimously.

   Regarding the Actuary Committee Strategic Planning Process, Mr. Owens, III, noted that the Investment Committee held a special meeting on August 15, 2024. Mr. Owens, III, stated each CERS committee has approved their strategic planning goals, and the Investment Committee indicated that all committee work should be rolled into a single process. The committee took note of the strategic planning process being implemented by KPPA, and the CERS plan should not conflict with the KPPA plan. However, there could be a little overlap. Mr. Foster made the motion to approve the Actuary Committee's Strategic Plan components as presented. The motion was seconded by Mr. Powell and passed unanimously.

10. Mr. Cheatham introduced agenda item ***Investment Committee Report*** *(Video 00:49:30 to 01:12:28).* Since Dr. Hackbart was not present, Mr. Cheatham asked Mr. Steve Willer, KPPA Chief Investment Officer, to present their quarterly and fiscal year investment reports. Mr. Willer provided a detailed summary of the quarterly and fiscal year reports that were presented to the CERS Investment Committee.

    Since there were no questions regarding the investment reports, Mr. Cheatham then presented the Proposed Asset Allocation Guidelines. noting the Investment Committee is in the process of revising its Investment Policy Statement. In one of the previous meetings, the overall target asset allocation ranges were adjusted. The targets reflect adoption of the new strategic asset allocation. The minimum and maximum ranges proposed have been adjusted to maintain consistency of ranges relative to the target of each asset class. Mr. Willer thoroughly reviewed the Proposed Asset Allocation Guidelines. Mr. Willer discussed the asymmetry, especially around public equity and core fixed income, that is noted in the information presented. David Lindberg and Chris Tessman from Wilshire further reviewed the asset allocations, and Mr. Tessman made comments regarding risk tolerance. Mr. Powell made the motion to adopt the asset allocation range with an effective date of July 1, 2024, as recommended by the Investment Committee. The motion was seconded by Dr. Carver and passed unanimously.

11. Mr. Cheatham introduced agenda item ***Finance Committee Report*** *(Video 01:12:28 to 01:361:00).*

    a. Mr. Mike Lamb presented the ***Year End Financials*** and discussed the new presentation of the quarterly reports. Mr. Lamb then briefly reviewed the Combining Statement of Fiduciary Net Position for the twelve-month period ending June 30, 2024, and the Combining Statement of Changes in Fiduciary Net Position for the twelve-month period ending June 30, 2024. Mr. Lamb went on to present the CERS Pension and Insurance Funds Contribution Reports for the twelve-month period ending June 30, 2024. Mr. Lamb also presented the KPPA Administrative Budget and Budget-to-Actual Summary Analysis for the fiscal year ending June 30, 2024, with comparative totals for the fiscal year ending June 30, 2023. Next, Mr. Lamb reviewed the JP Morgan Chase Earnings and Fees and Hard Interest Earned for the fiscal year ending June 30, 2024. Lastly, the CERS Outstanding Invoices by Type and Employer and Penalty Invoices Reports were presented to the CERS Board of Trustees.

    b. Next, Mr. Lamb presented the draft ***Memo on Outstanding Employer Invoices.*** Mr. Lamb reviewed the details of the memorandum and presented a list of outstanding penalty invoices. There were some questions and discussion regarding the penalty invoices. Ms. Kristen Coffey agreed to send copies of the Internal Audit Report to the CERS Board of Trustees. Due to the need for to discuss pending litigation, the matter of what to do with the outstanding penalty invoices was tabled for discussion in closed session.

    c. Mr. Cheatham next asked Mr. D'Juan Surratt to present the ***Hazardous Duty Requests***.

Mr. Surratt stated that the Finance Committee approved the (16) sixteen requests for hazardous duty coverage that the KPPA staff received, reviewed, and determined that they met statutory guidelines for hazardous coverage. In addition, the CERS Finance did approve these positions to be presented to the CERS Board of Trustees for final approval. Mr. Fulkerson made the motion to approve the Hazardous Duty Request as recommended by the Finance Committee. The motion was seconded by Mr. Powell and passed unanimously.

12. Mr. Cheatham introduced agenda item ***Closed Session*** *(Video 01:36:00 to 01:36:37).* Mr. Powell made a motion to enter closed session to discuss pending litigation pursuant to KRS 61.810(1)(c). The motion was seconded by Mr. Foster and passed unanimously.

Mr. Cheatham read the following closed session statement: A motion having been made in open session to move into a closed session for a specific purpose, and such motion having carried by majority vote in open, public session, the Board shall now enter closed session to consider litigation,pursuant to KRS 61.810(1)(c), because of the necessity of protecting the confidentiality of the Systems' litigation strategy and preserving any available attorney-client privilege.

****Mr. Fulkerson exited the meeting prior to the start of Closed Session****

Closed Session *(Video - Part 2 - 00:00:25 to 00:02:04).*

Coming back into open session, Mr. Cheatham requested a motion to come out of Closed Session. Mr. Foster made a motion to return to open session and was seconded by Mr. Powell. The motion passed unanimously. Mr. Cheatham stated that no action was taken as a result of the closed session discussions.

13. There being no further business, Mr. Cheatham **adjourned** the meeting.

Copies of all documents presented are incorporated as part of the Minutes of the Board of Trustees held September 9, 2024, except documents provided during a closed session conducted pursuant to the open meetings act and exempt under the Open Records Act.

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CERTIFICATION

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

Recording Secretary

I, the Chair of the Board of Trustees of the County Employees Retirement System, do certify that the Minutes of Meeting held on September 9, 2024, were approved on November 4, 2024.

Chair of the Board of Trustees

I have reviewed the Minutes of the September 9, 2024, Board of Trustees Meeting for content, form, and legality.

Executive Director
Office of Legal Services

MINUTES OF MEETING
COUNTY EMPLOYEES RETIREMENT SYSTEM
BOARD OF TRUSTEES SPECIAL CALLED MEETING
SEPTMEBER 17, 2024, AT 3:30 P.M. ET
VIA LIVE VIDEO TELECONFERENCE

At the Special Called Meeting of the County Employees Retirement System Board of Trustees held on September 17, 2024, the following members were present: George Cheatham, Michael Foster, JT Fulkerson, Dr. Merl Hackbart, William O'Mara, Betty Pendergrass, and Jerry Powell. Staff members present were CERS CEO Ed Owens, III, Ryan Barrow, Rebecca Adkins, Erin Surratt, Michael Lamb, Michael Board, Steve Willer, Shaun Case, and Sherry Rankin. Others present included Patrick Brennan with Johnson Branco & Brennan, LLP.

1. Mr. Cheatham called the meeting to order.

2. Mr. Brennan read the Opening Statement.

3. Ms. Rankin called Roll.

4. Ms. Rankin noted no ***Public Comments*** were received.

5. Mr. Cheatham introduced agenda item ***Closed Session*** *(Video 00:08:35 to 00:09:45)*. Mr. Fulkerson made a motion to enter closed session to discuss pending litigation pursuant to KRS 61.810(1)(c). The motion was seconded by Ms. Pendergrass and passed unanimously.

   Mr. Board read the following closed session statement: A motion having been made in open session to move into a closed session for a specific purpose, and such motion having carried by majority vote in open, public session, the Board shall now enter closed session to consider litigation,pursuant to KRS 61.810(1)(c), because of the necessity of protecting the confidentiality of the Systems' litigation strategy and preserving any available attorney-client privilege.

Closed Session *(Video - Part 2 - 00:00:22 to 00:01:30).*

****Dr. Carver entered the meeting during Closed Session****

Coming back into open session, Mr. Cheatham requested a motion to come out of Closed Session. Mr. O'Mara made a motion to return to open session and was seconded by Mr. Powell. The motion passed unanimously. Mr. Cheatham stated that no action was taken as a result of the closed session discussions.

6. There being no further business, Mr. Cheatham requested a motion to **adjourn.** Mr. Fulkerson made a motion to adjourn and was seconded by Mr. Hackbart. The motion was passed unanimously.

Copies of all documents presented are incorporated as part of the Minutes of the Board of Trustees held September 17, 2024, except documents provided during a closed session conducted pursuant to the open meetings act and exempt under the Open Records Act.

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CERTIFICATION

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

____
Recording Secretary

I, the Chair of the Board of Trustees of the County Employees Retirement System, do certify that the Minutes of Meeting held on September 17, 2024, were approved on November 4, 2024.

____
Chair of the Board of Trustees

I have reviewed the Minutes of the September 17, 2024, Board of Trustees Meeting for content, form, and legality.

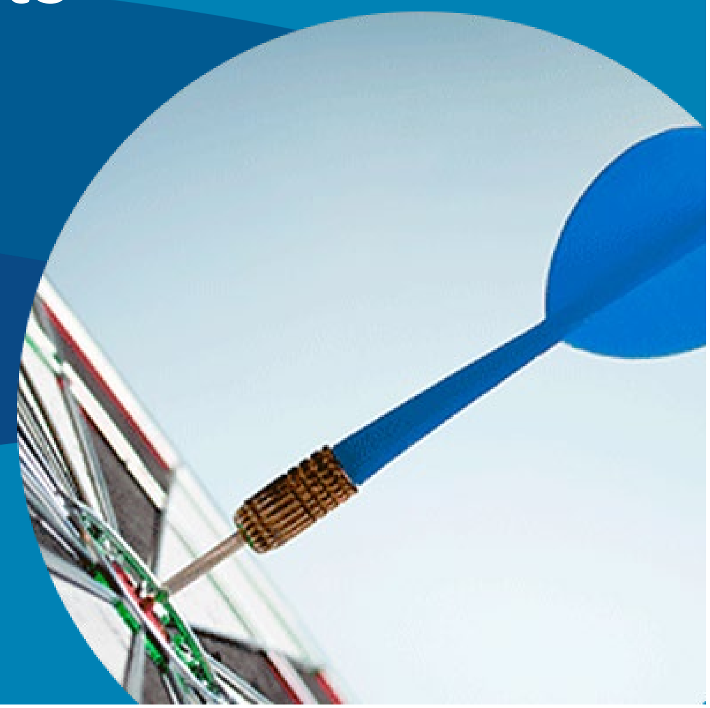
____
Executive Director
Office of Legal Services

County Employees Retirement System

2024 Actuarial Valuation Results

November 4, 2024

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



Comments on Valuation Results

- Change in active membership and payroll
  - Active membership increased across both funds
  - Non-Hazardous: 8% increase in membership payroll
  - Hazardous: 10% increase in membership payroll

Comments on Valuation Results

- FYE 2024 Investment Experience
  - 11% return on market value
    - Assumed rate of return: 6.50%
  - Fund assets $841M more than expected for CERS ($584M pension and $257M insurance)
  - $261M in asset gains recognized this year ($184M pension and $77M insurance)

Comments on Valuation Results

- Retirement Fund Liability Experience
  - $284M loss for both retirement funds combined
  - Primarily attributed to salary increases greater than expected for individual active members
- Insurance Fund Liability Experience
  - $254M loss for both insurance funds combined
  - 2025 Medicare premiums significantly higher than expected
  - 2025 non-Medicare premiums lower than expected

Salary Experience

Review of Salary Increase for Members Who Were Active in FY 2023 and FY 2024
($ in Thousands)

NonHazardous

Beginning of Year Service	**Count**	**FY 2023 Pay**	**FY 2024 Pay**	**% Increase**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
1 - 5	26,061	$ 812,014	$ 905,199	11%
6 - 10	14,144	543,629	589,174	8%
11 - 15	8,637	363,586	392,403	8%
16 - 20	7,912	362,332	388,834	7%
21 - 25	5,921	287,781	307,663	7%
26 - 30	2,014	109,919	117,145	7%
Over 30	544	33,338	35,444	6%
Total	65,233	2,512,599	2,735,862	9%

Hazardous

Beginning of Year Service	**Count**	**FY 2023 Pay**	**FY 2024 Pay**	**% Increase**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
1 - 5	3,007	$ 176,887	$ 200,654	13%
6 - 10	1,986	145,517	155,820	7%
11 - 15	1,406	115,747	124,352	7%
16 - 20	1,476	131,533	139,664	6%
21 - 25	379	38,419	40,817	6%
26 - 30	104	11,452	12,174	6%
Over 30	29	3,629	3,670	1%
Total	8,387	623,184	677,151	9%

Required Employer Contributions

	CERS Non-Hazardous		CERS Hazardous	
	2023 Val	2024 Val	2023 Val	2024 Val
(1)	(2)	(3)	(4)	(5)
Pension Fund	19.71%	18.62%	36.49%	34.00%
Insurance Fund	0.00%	0.00%	2.12%	1.73%
Actuarially Determined Contribution Rate, payable as a percentage of payroll	**19.71%**	**18.62%**	**38.61%**	**35.73%**
Difference		**-1.09%**		**-2.88%**

Note: 2023 Valuation set the contribution rates for FYE2025.
2024 Valuation will be used to set the contribution rates for FYE2026.

Required Employer Contributions ($millions)

	CERS Non-Hazardous		CERS Hazardous	
	2023 Val	2024 Val	2023 Val	2024 Val
(1)	(2)	(3)	(4)	(5)
Pension Fund	$583	$596	$252	$258
Insurance Fund	0	0	15	13
Total Actuarially Determined Employer Contribution	**$583**	**$596**	**$267**	**$271**
Change in Actuarially Determined Employer Contribution		**$13**		**$4**

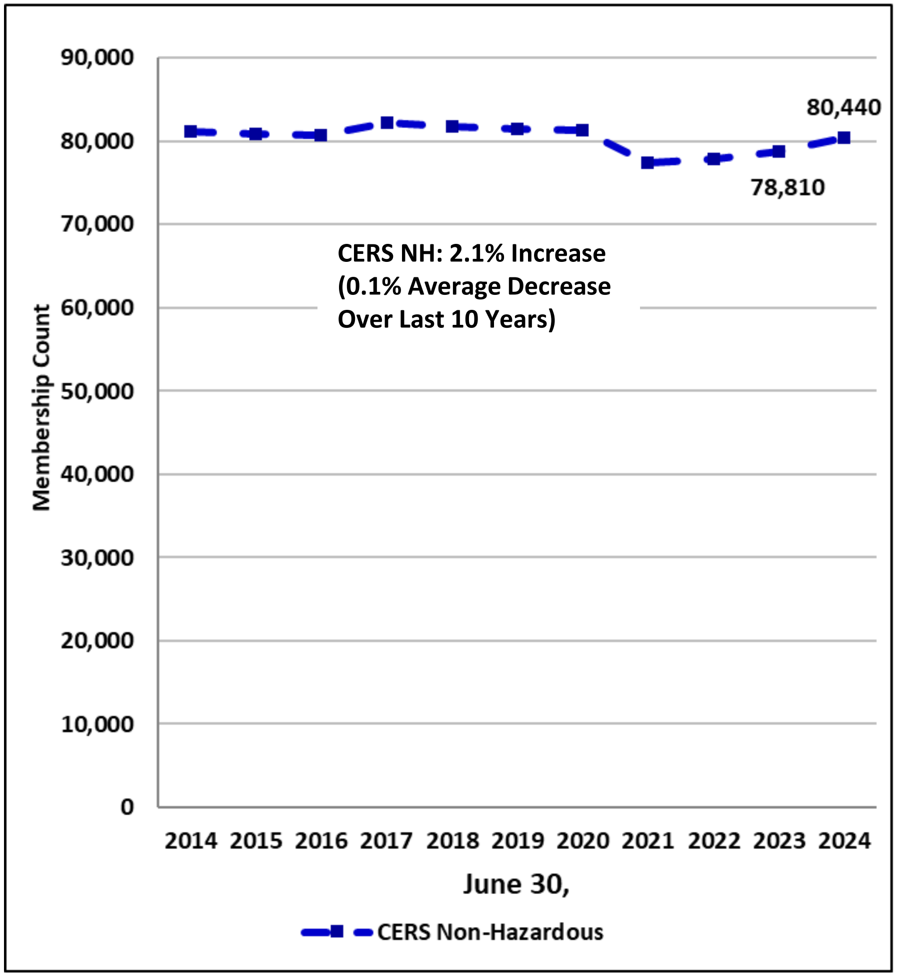
Note: 2022 Valuation set the contribution rates for FYE2024.
2023 Valuation will be used to set the contribution rates for FYE2025.

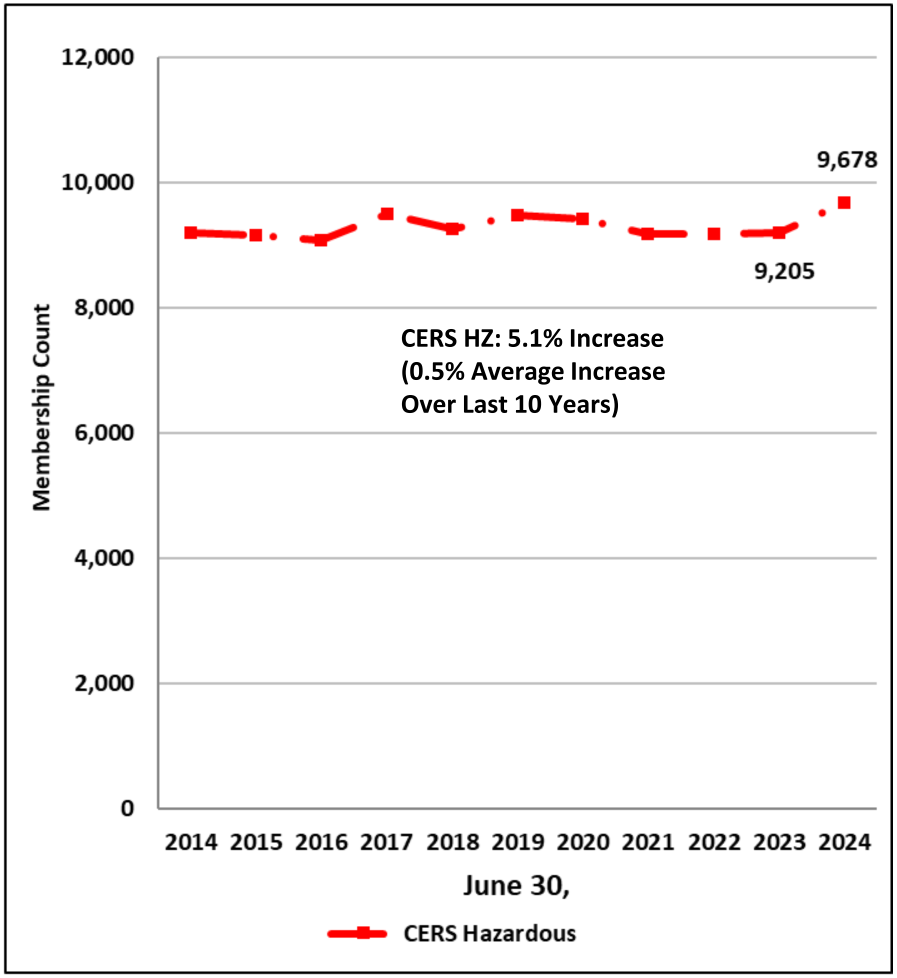
Unfunded Actuarial Accrued Liability – Actuarial Value of Asset Basis ($ in Billions)

	CERS Non-Hazardous		CERS Hazardous	
	2023 Val	2024 Val	2023 Val	2024 Val
(1)	(2)	(3)	(4)	(5)
Pension Fund	$6.71	$6.56	$2.84	$2.79
Insurance Fund	(0.81)	(0.65)	(0.01)	(0.01)
Total Unfunded Actuarial Accrued Liability	**$5.91**	**$5.92**	**$2.83**	**$2.78**
Change in Unfunded Actuarial Accrued Liability		**$0.01**		**$(0.05)**

Note: Amounts may not add due to rounding

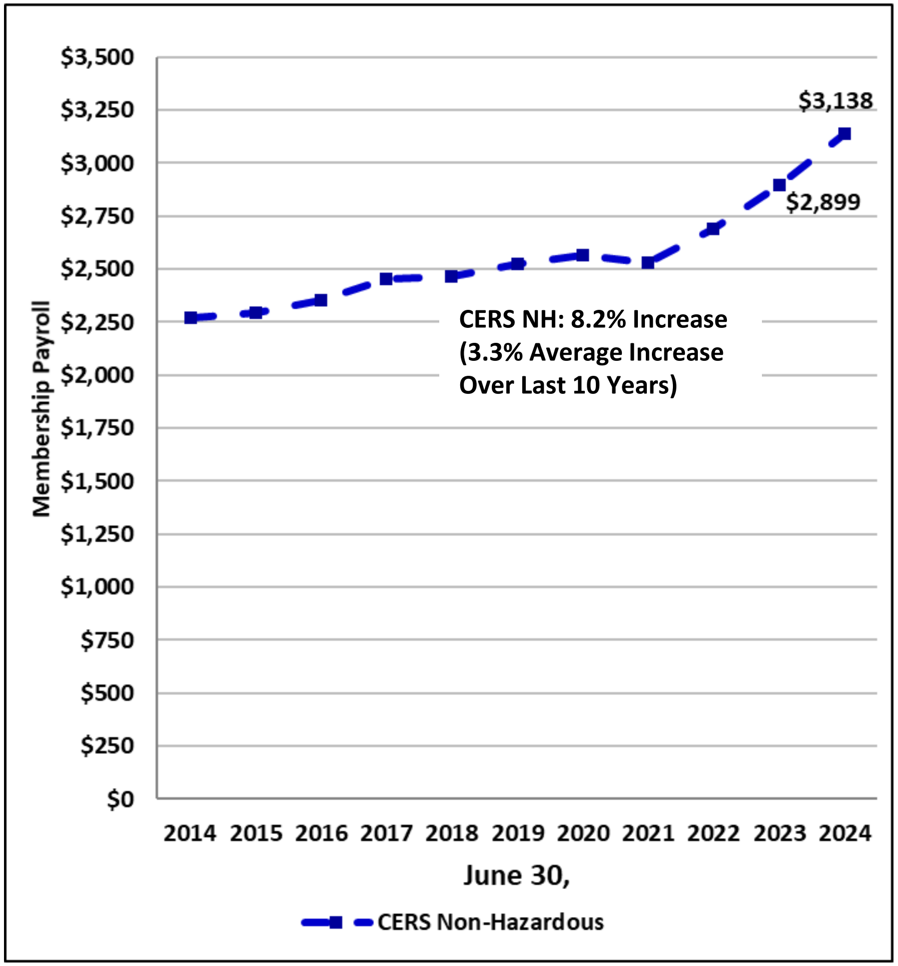
Active Membership Count

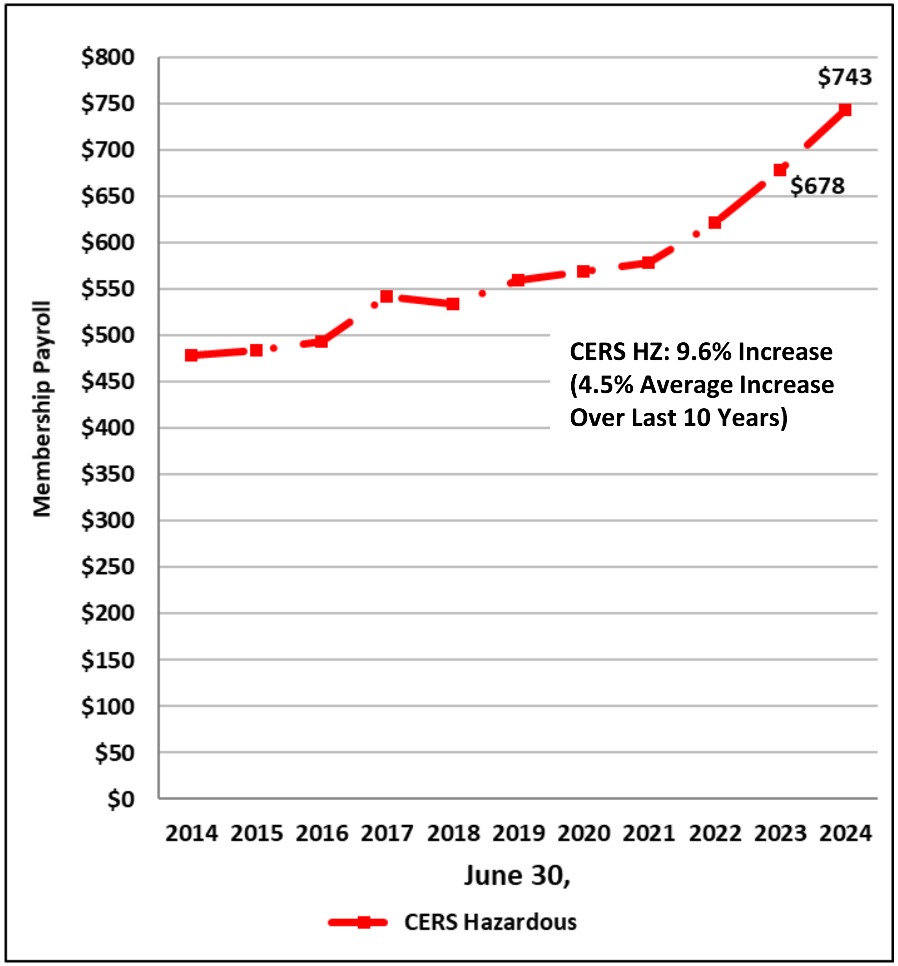




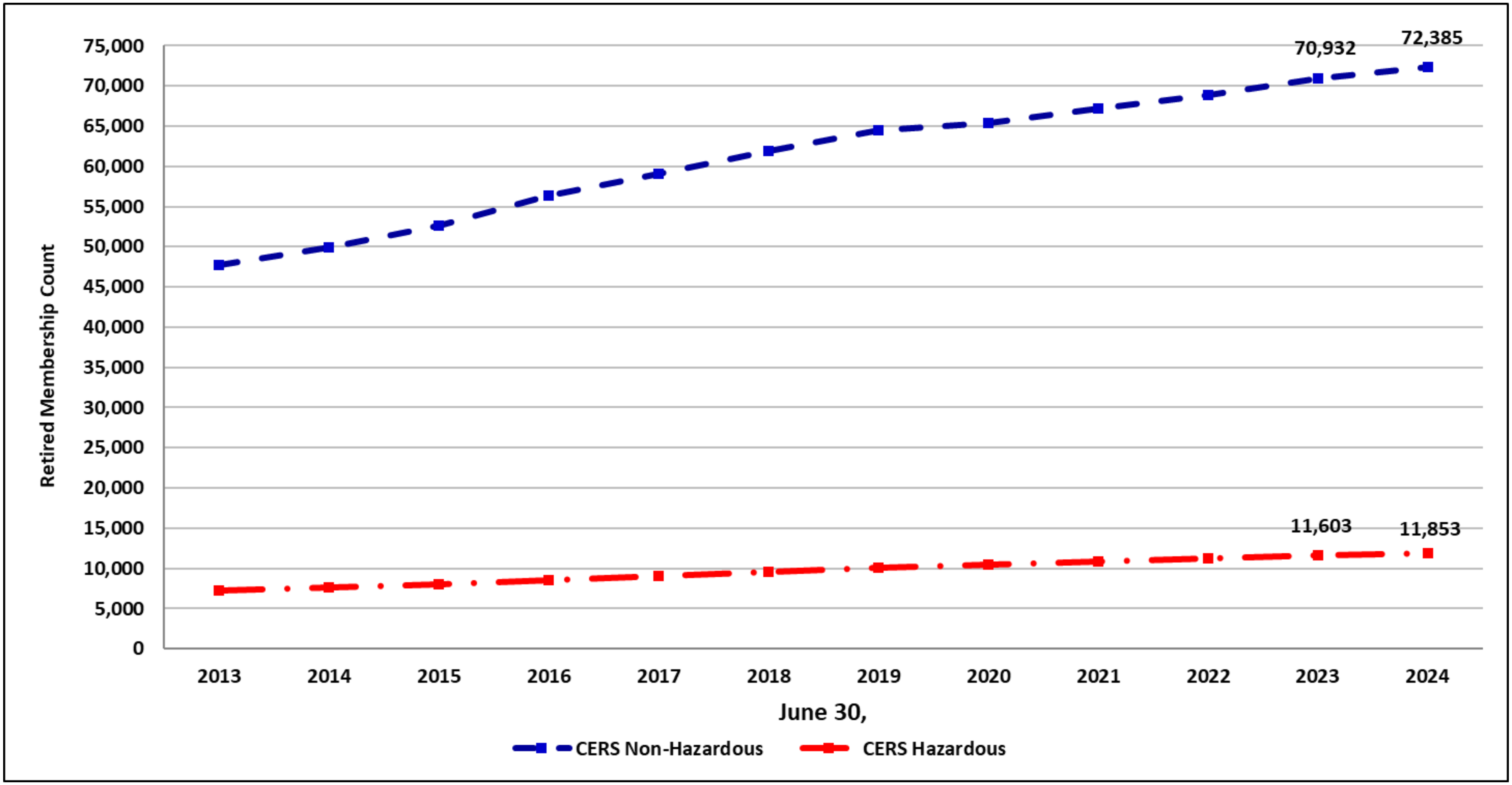
GRS

Membership Payroll ($ in Millions)

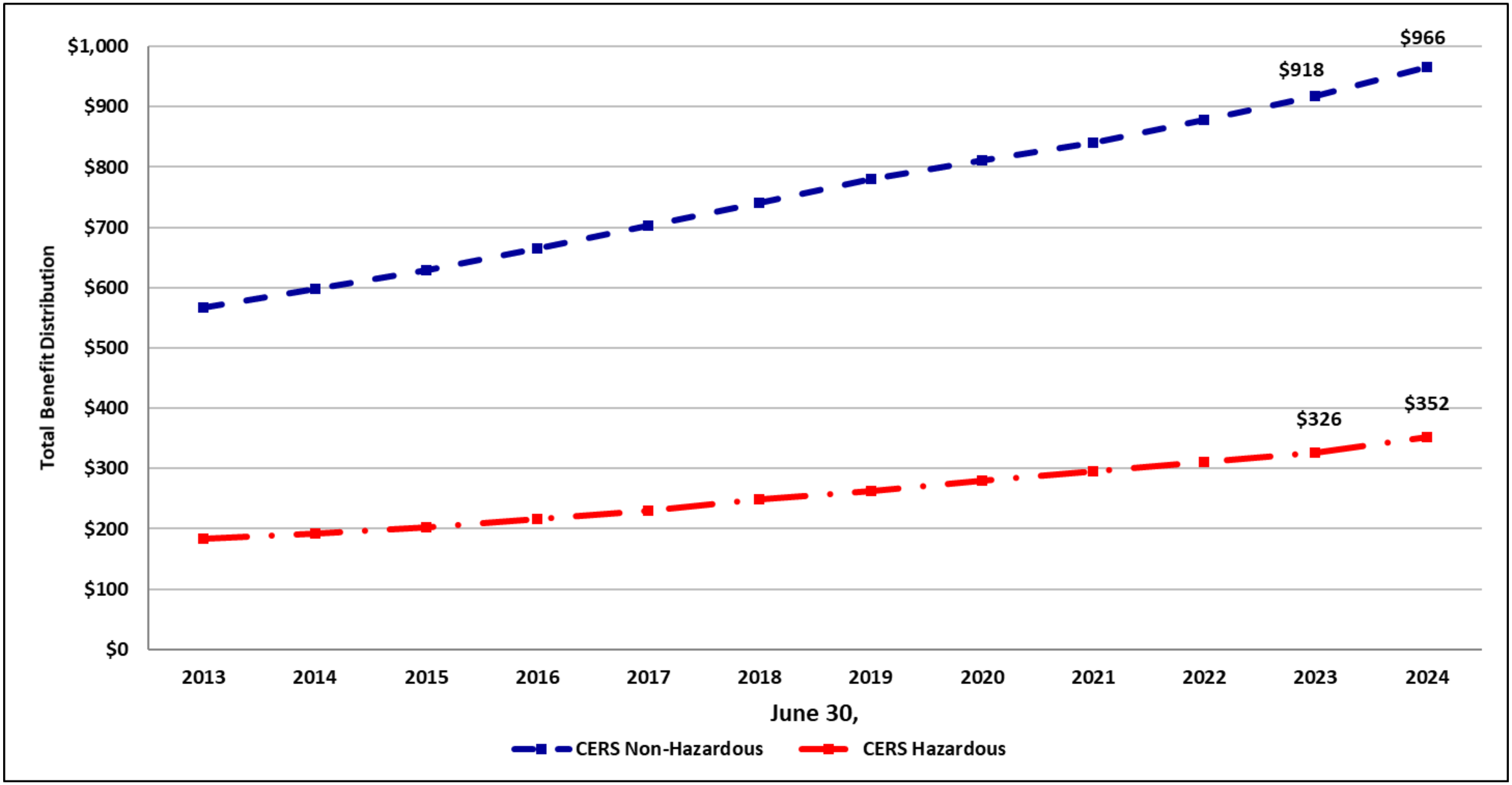




Retired Membership Count



Pension Benefit Distributions ($ in Millions)



Funding Results – CERS ($ in millions)

Item	Non-Hazardous System Pension 2023	Non-Hazardous System Pension 2024	Non-Hazardous System Insurance 2023	Non-Hazardous System Insurance 2024	Hazardous System Pension 2023	Hazardous System Pension 2024	Hazardous System Insurance 2023	Hazardous System Insurance 2024
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total Normal Cost Rate	9.46%	9.37%	2.35%	2.15%	17.46%	17.17%	3.77%	3.40%
Member Rate	(5.00)%	(5.00)%	(0.63)%	(0.67)%	(8.00)%	(8.00)%	(0.64)%	(0.69)%
Employer Normal Cost Rate	4.46%	4.37%	1.72%	1.48%	9.46%	9.17%	3.13%	2.71%
Administrative Expenses	0.83%	0.85%	0.03%	0.03%	0.31%	0.31%	0.08%	0.07%
Amortization Cost	14.42%	13.40%	(2.85)%	(2.37)%	26.72%	24.52%	(1.09)%	(1.05)%
Total Actuarially Determined Rate	**19.71%**	**18.62%**	**0.00%**	**0.00%**	**36.49%**	**34.00%**	**2.12%**	**1.73%**
Actuarial Accrued Liability (AAL)	$15,296	$15,776	$2,560	$2,901	$5,850	$6,070	$1,604	$1,668
Actuarial Value of Assets	$8,585	$9,212	$3,366	$3,549	$3,008	$3,280	$1,615	$1,676
Unfunded AAL	**$6,711**	**$6,565**	**$(806)**	**$(648)**	**$2,842**	**$2,791**	**$(11)**	**$(8)**
Funded Ratio	**56.1%**	**58.4%**	**131.5%**	**122.3%**	**51.4%**	**54.0%**	**100.7%**	**100.5%**

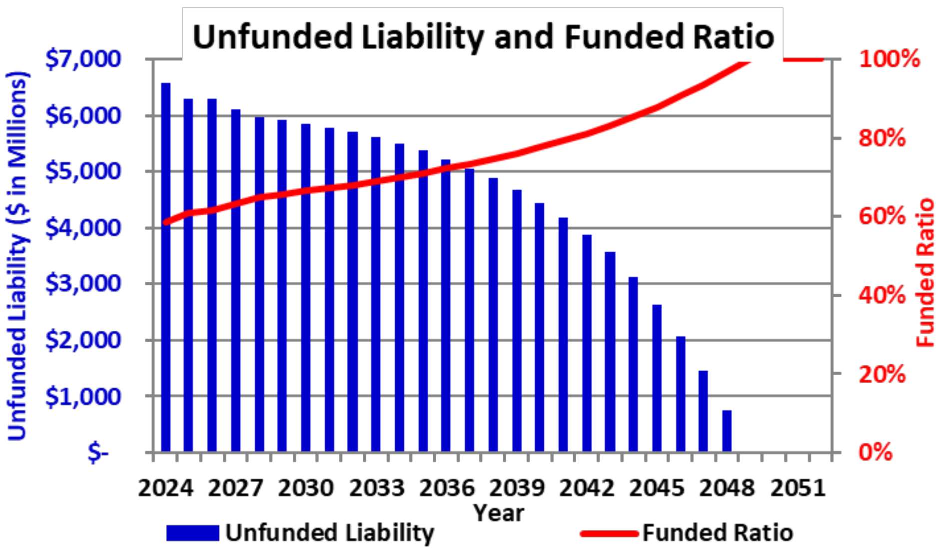
PROJECTION INFORMATION
PENSION AND INSURANCE

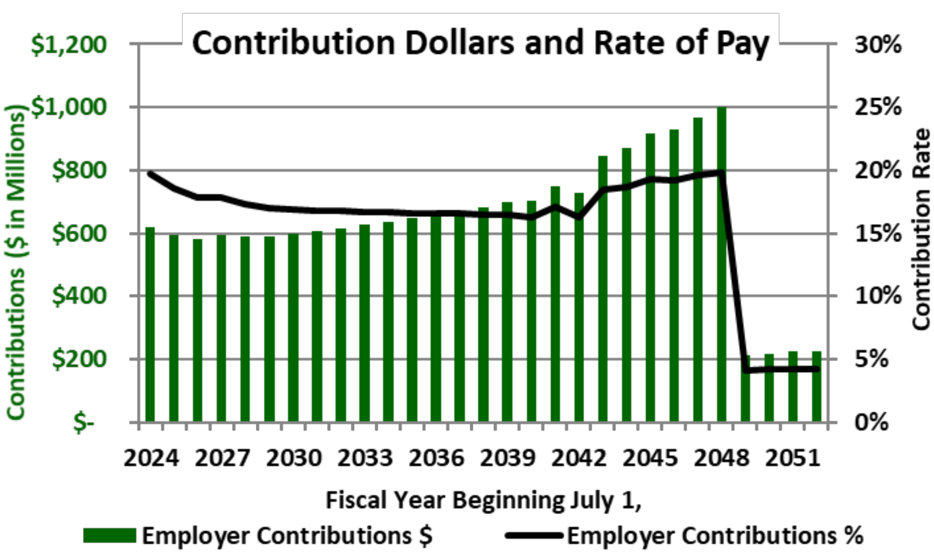
Projection Assumptions

- Assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.50%
- Full actuarially determined contribution paid each year
- Membership payroll assumed to increase by 2% each year
  - Total active population assumed to remain level

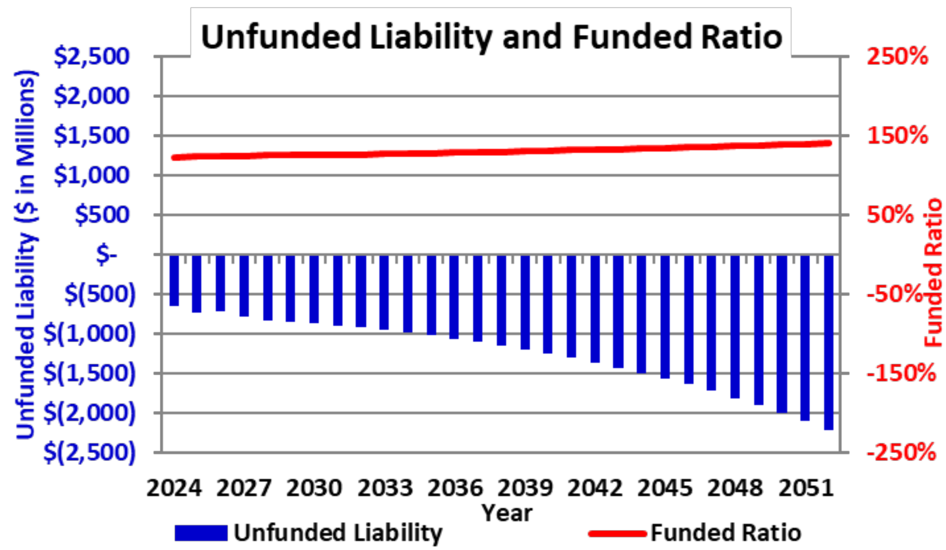
CERS Non-Hazardous Projection

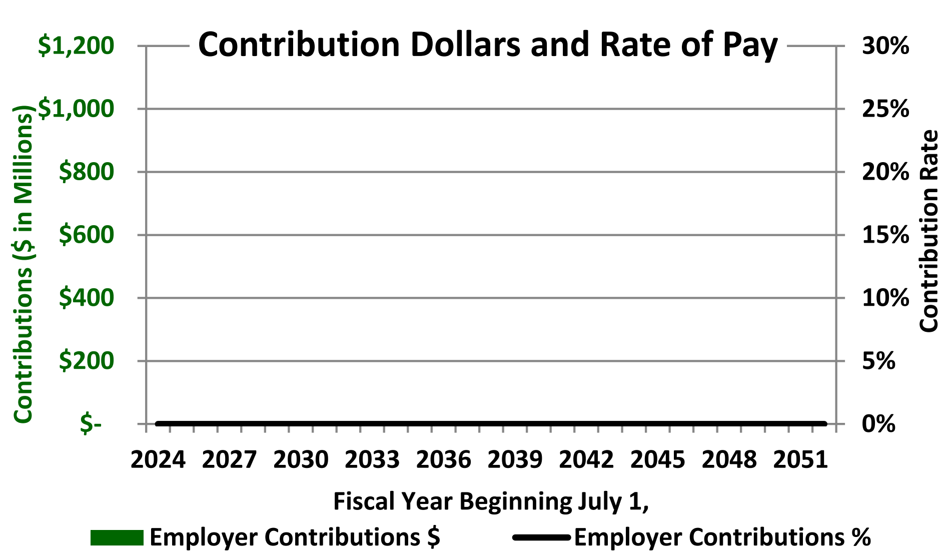
Pension





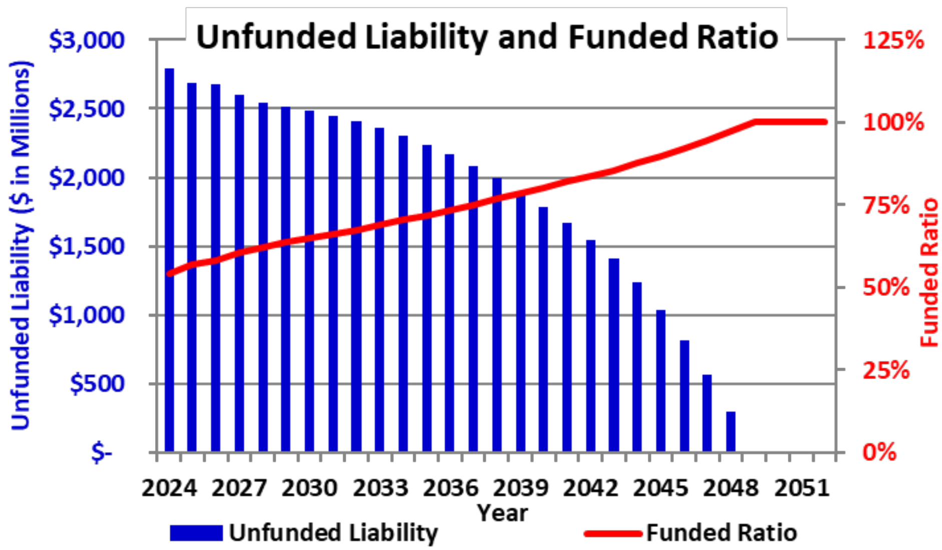
Insurance

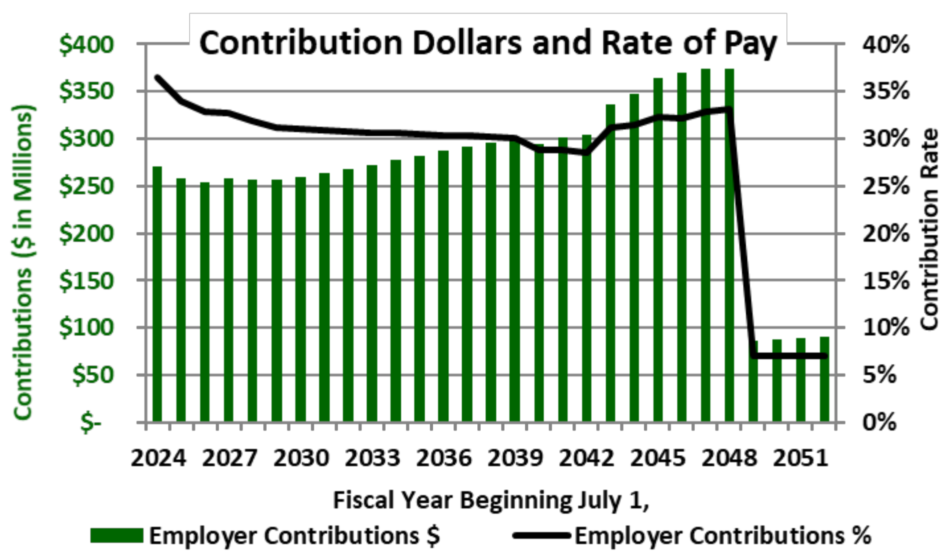




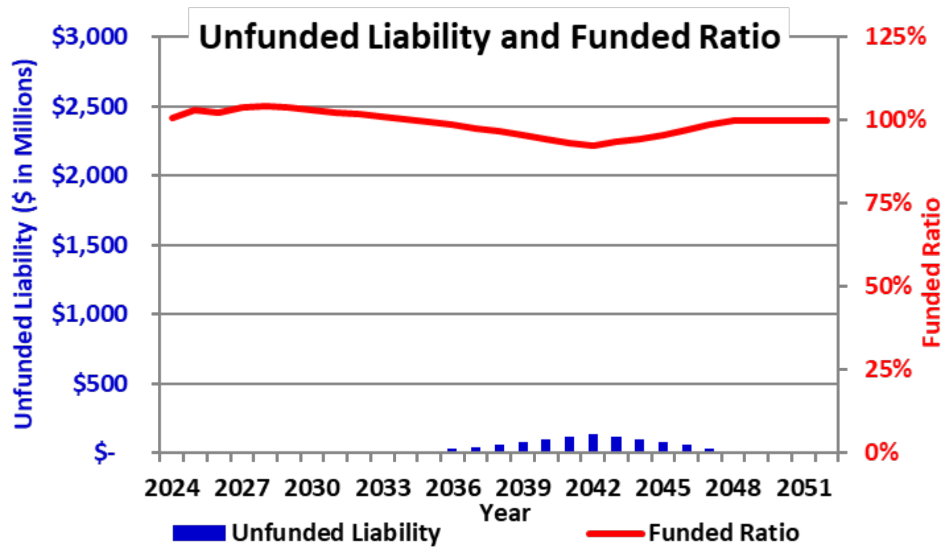
CERS Hazardous Projection

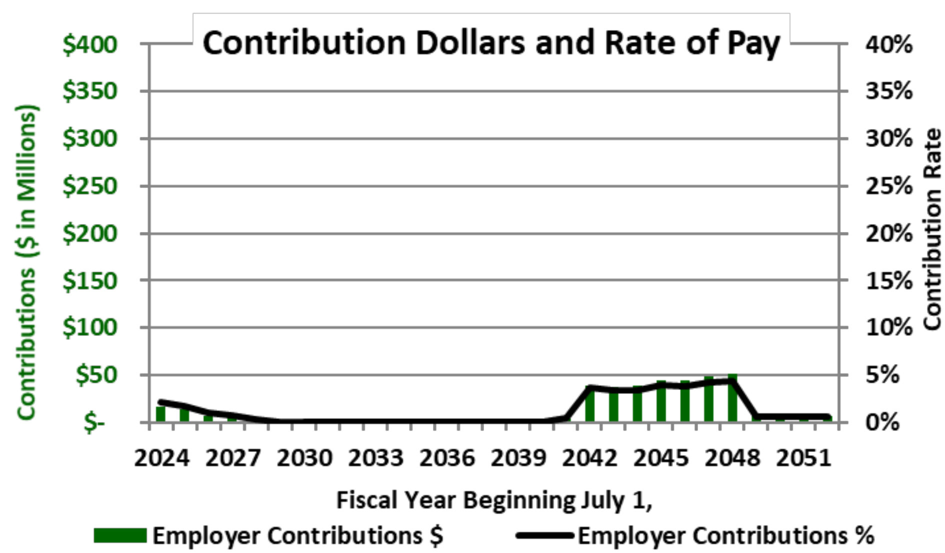
Pension





Insurance





Closing Comments on 2024 Valuation Results

- Last year's increase in active membership and payroll is a positive signal for the System and its participating employers
- It is imperative the current funding policy be maintained as it will continue to improve the System's financial security

Disclaimers

- This presentation is intended to be used in conjunction with the actuarial valuation as of June 30, 2024. This presentation should not be relied on for any purpose other than the purpose described in the valuation report.
- This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- Readers are cautioned to examine original source materials and to consult with subject matter experts before making decisions related to the subject matter of this presentation.

P: 469.524.0000 | www.grsconsulting.com

October 30, 2024

Boards of Trustees
County Employees Retirement System
1260 Louisville Road
Frankfort, KY 40601

Re: Certification for the Actuarial Results as of June 30, 2024

Dear Board of Trustees:

Actuarial valuations are prepared annually as of June 30, for the County Employees Retirement System (CERS). These reports describe the current actuarial condition of the System and document the calculated employer contribution requirements as well as the changes in the financial condition since the prior actuarial valuation.

The Board of Trustees of the County Employees Retirement System must certify the employer contribution rates for CERS for the fiscal year beginning July 1, 2025 and ending June 30, 2026. The contribution requirements determined by June 30, 2024 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 these required contributions effective July 1, 2025.

These contributions are calculated based on the membership data and plan assets as of June 30, 2024. These calculations are also based on the benefit provisions in effect as of June 30, 2024.

Financing Objectives and Funding Policy

The Kentucky Public Pensions Authority (KPPA) administers pension and health insurance funds to provide for monthly retirement income and retiree health insurance benefits. The total employer contribution requirement is comprised of a contribution to each respective fund.

The employer contribution for CERS is determined in accordance with Section 78.635 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 (25 years remaining as of June 30, 2024). Gains and losses incurring in years after June 30, 2019 are amortized as separate, closed 20-year amortization bases.

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If the contributions made are equal to the Actuarially Determined Contribution (ADC), and if all actuarial assumptions are met, there will not be an unfunded accrued liability at the end of the 25-year period remaining from the original closed 30-year amortization base. Accordingly, the ADC under the funding policy can be considered a "Reasonable Actuarially Determined Contribution" as required by the Actuarial Standards of Practice.

PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, assumption changes, or actuarial losses, it should increase over time, until it reaches at least 100%. As of June 30, 2024, the funded ratios for the pension and health insurance funds are as follows:

	Funded Ratio	
System	**Pension**	**Health Insurance**
CERS Non-Hazardous	58.4%	122.3%
CERS Hazardous	54.0%	100.5%

ASSUMPTIONS AND METHODS

The Boards of Trustees, in consultation with the actuary, set the actuarial assumptions and methods used in the actuarial valuation. In general, the assumptions used in the June 30, 2024 actuarial valuations were adopted for first use in the June 30, 2023 actuarial valuations and are based on the experience study conducted through June 30, 2022.

In our opinion, all the assumptions and methods used for funding purposes adopted by the Board's Trustees satisfy the requirements in the Actuarial Standards of Practice that are applicable for actuarial valuations of public retirement systems.

It is our opinion that the actuarial assumptions used to perform these valuations are internally consistent and reasonably reflect the anticipated future experience of the Systems. 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 requirements, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

Boards of Trustees
October 30, 2024
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ADDITIONAL DISCLOSURES

The benefit structure is outlined in this section of the annual report. GRS prepared the following schedules in the actuarial section: *Summary of Actuarial Valuation Results*, *Recommended Employer Contribution Rates, Summary of Actuarial Unfunded Liabilities, the Solvency Test, the Summary of Active Member Valuation Data, the Summary of Retired Member Valuation Data, Summary of the Assumptions and Methods, and the Summary of the Benefit Provisions*.

In addition, GRS prepared the following schedules in the financial section in accordance with GASB Statement No. 67: *Net Pension Liability Schedule*, *Discount Rate Sensitivity Analysis*, *Schedule of Changes in the Employers' Net Pension Liability*, *Schedule of Employers' Net Pension Liability*, and the *Schedule of Employers' Contributions*.

DATA

Member data for retired, active and inactive members was supplied as of June 30, 2024, by KPPA staff. The staff also supplied asset information as of June 30, 2024. 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 the Retirement Systems as of June 30, 2024. All of our work conforms with generally accepted actuarial principles and practices, and 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.

Boards of Trustees
October 30, 2024
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To the best of our knowledge, this report is complete and accurate and is in accordance with generally recognized actuarial practices and methods. Mr. White and Ms. Shaw are Enrolled Actuaries. All three of the undersigned are members of the American Academy of Actuaries and meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. In addition, all three are independent of KPPA and 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

Krysti Kiesel, ASA, MAAA
Consultant

County Employees Retirement System (CERS)

Actuarial Valuation Report as of June 30, 2024

P: 469.524.0000 | www.grsconsulting.com

October 30, 2024

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

Subject: Actuarial Valuation as of June 30, 2024

Dear Trustees of the Board:

This report describes the current actuarial condition of the County Employees Retirement System (CERS) and provides the actuarially determined employer contribution rates for fiscal year ending June 30, 2026. In addition, the report analyzes changes in CERS'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 CERS. This report was prepared at the request of the Board of Trustees of the County Employees 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, 2025 and ending June 30, 2026.

The employer contribution rate is determined in accordance with Section 78.635 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 (25 years remaining as of June 30, 2024). Gains and losses incurring in years after June 30, 2019 are amortized as separate closed 20-year amortization bases.

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October 30, 2024
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If the contributions made are equal to the Actuarially Determined Contribution (ADC), and if all actuarial assumptions are met, there will not be an unfunded accrued liability at the end of the 25-year period remaining from the original closed 30-year amortization base. Accordingly, the ADC under the funding policy can be considered a "Reasonable Actuarially Determined Contribution" as required by the Actuarial Standards of Practice.

House Bill 362 passed during the 2018 legislative session and limited the increases to the employer contribution rates to 12% over the prior fiscal year through June 30, 2028. This legislation does not impact the contribution rates calculated in this actuarial valuation. The recommended certified contribution rates are equal to the actuarially determined rates.

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 are based on an experience study conducted with experience through June 30, 2022, adopted by the Board of Trustees on May 9, 2023.

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

Benefit Provisions

The benefit provisions reflected in these valuations are those which were in effect on June 30, 2024. There were no material benefit provision changes since the prior valuation.

Data

Member data for retired, active and inactive members was supplied as of June 30, 2024, by KPPA staff. The staff also supplied asset information as of June 30, 2024. 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.

Board of Trustees
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CERTIFICATION

We certify that the information presented herein is accurate and fairly portrays the actuarial position of CERS as of June 30, 2024.

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.

To the best of our knowledge, this report is complete and accurate and is in accordance with generally recognized actuarial practices and methods. Mr. White and Ms. Shaw are Enrolled Actuaries. All three of the undersigned are members of the American Academy of Actuaries and meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. In addition, all three are independent of KPPA and 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

Krysti Kiesel, ASA, MAAA
Consultant

Table of Contents

SECTION 1

EXECUTIVE SUMMARY

Summary of Principal Results

(Dollar amounts expressed in thousands)

	Non-Hazardous		Hazardous		Total	
	June 30, 2024	June 30, 2023	June 30, 2024	June 30, 2023	June 30, 2024	June 30, 2023
Actuarially Determined Contribution:						
Retirement	18.62%	19.71%	34.00%	36.49%		
Insurance	0.00%	0.00%	1.73%	2.12%		
Total	18.62%	19.71%	35.73%	38.61%	N/A	N/A
Contribution Rate for Next Fiscal Year[1]	18.62%	19.71%	35.73%	38.61%		
Assets:						
Retirement						
• Actuarial value (AVAR)	$9,211,735	$8,585,073	$3,279,623	$3,008,147	$12,491,358	$11,593,220
• Market value (MVAR)	$9,596,244	$8,672,597	$3,416,897	$3,035,192	$13,013,141	$11,707,789
• Ratio of actuarial to market value of assets	96.0%	99.0%	96.0%	99.1%	96.0%	99.0%
Insurance						
• Actuarial value (AVAI)	$3,549,422	$3,366,332	$1,676,141	$1,615,349	$5,225,563	$4,981,681
• Market value (MVAI)	$3,707,277	$3,398,375	$1,752,366	$1,634,192	$5,459,643	$5,032,567
• Ratio of actuarial to market value of assets	95.7%	99.1%	95.7%	98.8%	95.7%	99.0%
Funded Status:						
Retirement						
• Actuarial accrued liability	$15,776,491	$15,296,429	$6,070,201	$5,849,995	$21,846,692	$21,146,424
• Unfunded accrued liability on AVAR	$6,564,756	$6,711,356	$2,790,578	$2,841,848	$9,355,334	$9,553,204
• Funded ratio on AVAR	58.4%	56.1%	54.0%	51.4%	57.2%	54.8%
• Unfunded accrued liability on MVAR	$6,180,247	$6,623,832	$2,653,304	$2,814,803	$8,833,551	$9,438,635
• Funded ratio on MVAR	60.8%	56.7%	56.3%	51.9%	59.6%	55.4%
Insurance						
• Actuarial accrued liability	$2,901,345	$2,560,387	$1,668,057	$1,604,146	$4,569,402	$4,164,533
• Unfunded accrued liability on AVAI	($648,077)	($805,945)	($8,084)	($11,203)	($656,161)	($817,148)
• Funded ratio on AVAI	122.3%	131.5%	100.5%	100.7%	114.4%	119.6%
• Unfunded accrued liability on MVAI	($805,932)	($837,988)	($84,309)	($30,046)	($890,241)	($868,034)
• Funded ratio on MVAI	127.8%	132.7%	105.1%	101.9%	119.5%	120.8%
Membership:						
• Number of						
- Active Members	80,440	78,810	9,678	9,205	90,118	88,015
- Retirees and Beneficiaries	72,385	70,932	11,853	11,603	84,238	82,535
- Inactive Members	115,789	111,086	4,418	4,287	120,207	115,373
- Total	268,614	260,828	25,949	25,095	294,563	285,923
• Projected payroll of active members	$3,137,814	$2,898,813	$743,133	$677,988	$3,880,947	$3,576,801
• Average salary of active members	$39,008	$36,782	$76,786	$73,654	$43,065	$40,639

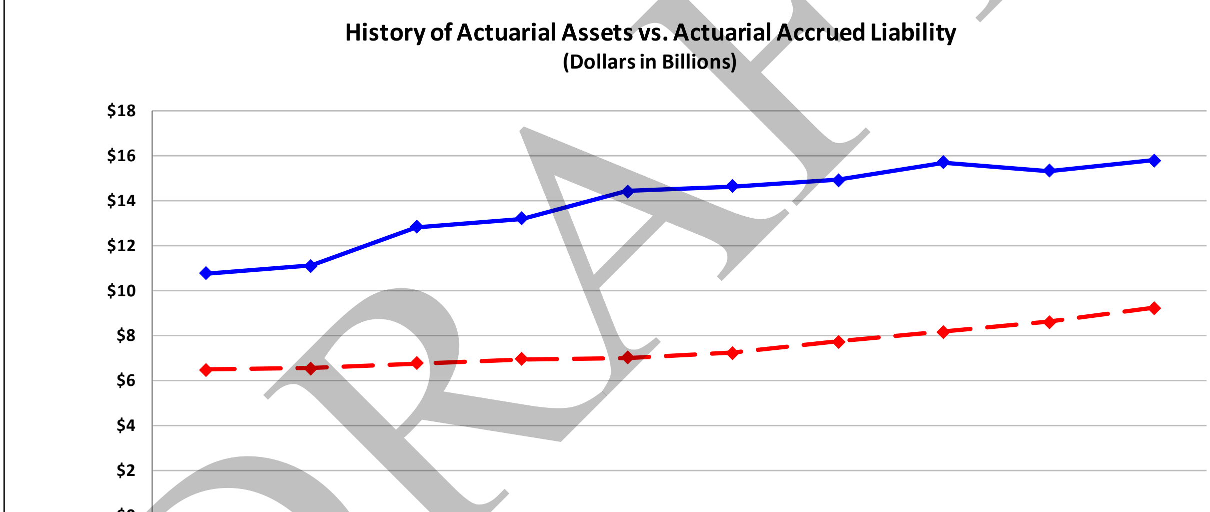
[1] Contribution rates calculated with the June 30, 2024 valuation (June 30, 2023 valuation) are effective for fiscal year ending June 30, 2026 (June 30, 2025).

Executive Summary (Continued)

Non-Hazardous Retirement Fund

The unfunded actuarial accrued liability of the non-hazardous retirement fund decreased by $147 million since the prior year's valuation to $6.565 billion. This decrease was approximately $65 million less than expected, primarily due to liability losses as a result of salary increases for individual members being greater than assumed. These liability losses were partially offset by favorable investment experience.

Below is a chart with the historical actuarial value of assets and actuarial accrued liability. The divergence in the assets and liability at the beginning of the ten-year period was due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) assumption changes.



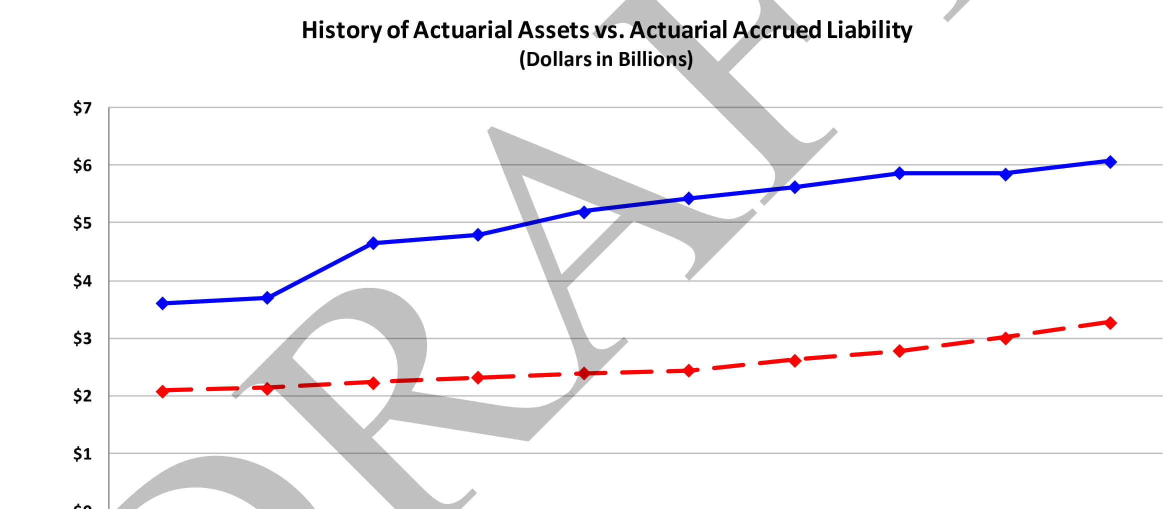
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AAL	10.7	11.1	12.8	13.2	14.4	14.6	14.9	15.7	15.3	15.8
AVA	6.5	6.5	6.8	7.0	7.0	7.2	7.7	8.1	8.6	9.2

Executive Summary (Continued)

Hazardous Retirement Fund

The unfunded actuarial accrued liability of the hazardous retirement fund decreased by $51 million since the prior year's valuation to $2.791 billion. This decrease was approximately $35 million less than expected, primarily due to liability losses as a result of salary increases for individual members being greater than assumed. These liability losses were partially offset by favorable investment experience.

Below is a chart with the historical actuarial value of assets and actuarial accrued liability. The divergence in the assets and liability at the beginning of the ten-year period was due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) assumption changes.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
AAL	3.6	3.7	4.6	4.8	5.2	5.4	5.6	5.9	5.8	6.1
AVA	2.1	2.1	2.2	2.3	2.4	2.4	2.6	2.8	3.0	3.3

Executive Summary (Continued)

Summary of Change in Financial Condition of the Insurance Funds

The funding surplus (assets in excess of actuarial accrued liability) of the non-hazardous insurance fund decreased by $158 million since the prior year's valuation to $648 million. The funding surplus was expected to increase by $14 million; therefore, the funding surplus was $172 million lower than expected. This was primarily due to liability losses related to the 2025 premium experience.

The funding surplus of the hazardous insurance fund decreased by $3 million since the prior year's valuation to $8 million. The funding surplus was expected to increase by $2 million; therefore, the funding surplus was a $5 million lower than expected.

On average, pre-Medicare premiums were approximately 5% lower than expected and Medicare premiums were approximately 38% higher than expected. In conjunction with the review of the healthcare per capita claims cost, the assumed increase in future healthcare costs, or trend assumption, is also reviewed on an annual basis. As a result of our review, the ultimate annual trend assumption was increased for pre-Medicare and Medicare Plans from 4.05% to 4.25%. Additionally, the trend assumption for the pre-Medicare Plans was increased during the select period. The updates to the trend assumption increased the liability for the non-hazardous and hazardous insurance funds by approximately $49 million and $48 million, respectively.

SECTION 2

DISCUSSION

Discussion

The County Employees Retirement System (CERS) is a cost-sharing, multiple-employer defined benefit pension plan that provides coverage for regular full-time members employed by positions of each participating county, city, and school board, and any additional eligible local agencies electing to participate in CERS. CERS includes both non-hazardous and hazardous duty benefits. This report presents the results of the June 30, 2024 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 CERS and provide the actuarially determined employer contribution rates for fiscal year ending June 30, 2026. In addition, the report analyzes changes in CERS'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 cost 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 78.635 of Kentucky Statute.

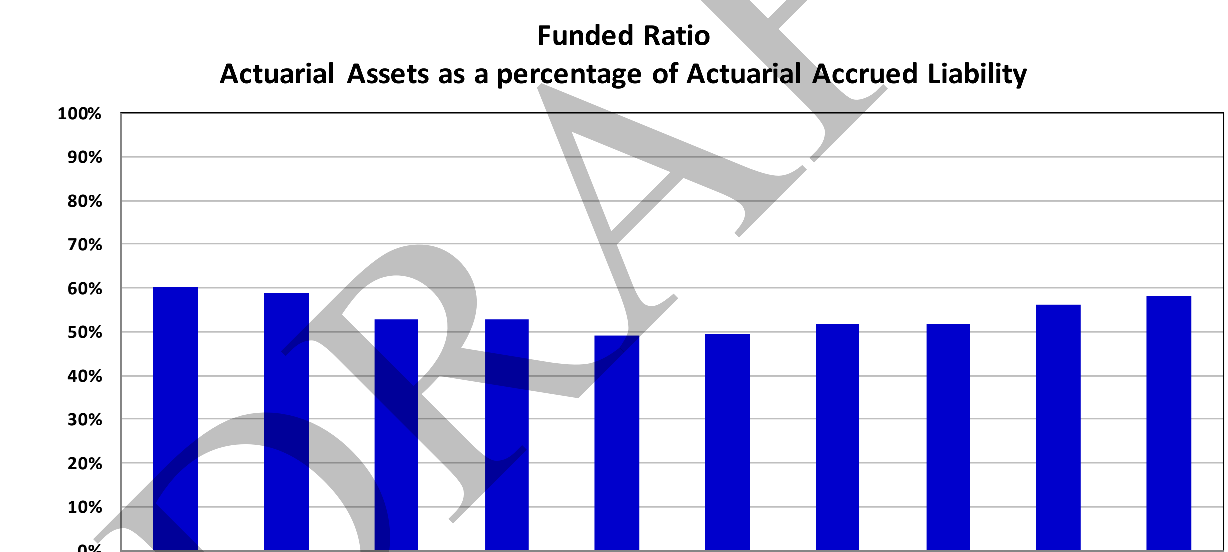
All of the actuarial and financial tables referenced by the other sections of this report appear in Section 3. Section 4 provides additional details related to the calculation of the amortization of the unfunded actuarial accrued liability. Section 5 provides member data and statistical information. 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. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

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 from 2015 through 2019 was generally due to: (1) actual contributions being insufficient to finance the unfunded actuarial accrued liability, and (2) assumption changes.

The funded ratios for both the non-hazardous and hazardous funds have been slowly trending upward since 2019. Now that the full actuarially determined contributions have been fully phased-in and absent significant future unfavorable experience, the funded ratio is expected to continue trending upward. Also, the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, is expected to continue a decreasing trend. Table 9, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement Funds.

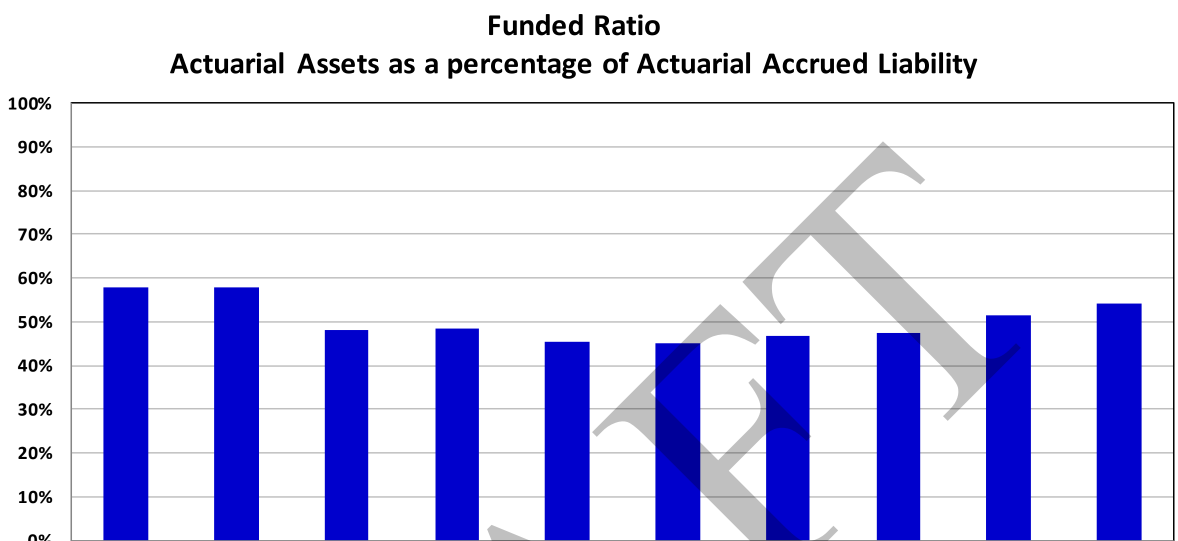
Non-Hazardous Retirement Fund



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Funded Ratio	60.3%	59.0%	52.8%	52.7%	49.1%	49.4%	51.8%	52.0%	56.1%	58.4%

Funding Progress (Continued)

Hazardous Retirement Fund



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Funded Ratio	58.0%	57.7%	48.1%	48.4%	45.3%	45.1%	46.7%	47.6%	51.4%	54.0%

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 non-hazardous retirement fund increased from $8.585 billion to $9.212 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 11.5% which is greater than the 6.50% expected annual return. The return on an actuarial (smoothed) asset value was 8.1%, which resulted in a $137 million gain for the fiscal year. The market value of assets is $385 million more than the actuarial value of assets, which signifies that the retirement fund is in a position of net deferred investment gains to be realized in future years.

Hazardous Retirement Fund

Likewise, the actuarial value of assets for the hazardous retirement fund increased from $3.008 billion to $3.280 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 11.6% which is greater than the 6.50% expected annual return. The return on an actuarial (smoothed) asset value was 8.0%, which resulted in a $47 million gain for the fiscal year. The market value of assets is $137 million more than the actuarial value of assets, which signifies that the retirement fund is in a position of net deferred investment 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. See the discussion in the Executive Summary for additional information related to the liability experience and additional information in this section of the report related to the asset experience, plan changes, and assumption changes.

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	$ 6,711,356	$ 2,841,848
2. Normal cost and administrative expenses	298,288	120,478
3. Less: contributions for the year	(925,953)	(382,730)
4. Interest accrual	415,839	176,197
5. Expected UAAL (Sum of Items 1 - 4)	$ 6,499,530	$ 2,755,793
6. Actual UAAL as of June 30,2024	$ 6,564,756	$ 2,790,578
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (65,226)	$ (34,785)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ 137,164	$ 46,758
9. Liability experience gain (loss) for the year	(202,390)	(81,543)
10. Plan Change	—	—
11. Assumption change	—	—
12. Total	$ (65,226)	$ (34,785)

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	$ (805,945)	$ (11,203)
2. Normal cost and administrative expenses	68,263	25,941
3. Less: contributions for the year	(30,794)	(27,624)
4. Interest accrual	(51,169)	(783)
5. Expected UAAL (Sum of Items 1 - 4)	$ (819,645)	$ (13,669)
6. Actual UAAL as of June 30,2024	$ (648,077)	$ (8,084)
7. Total gain (loss) for the year (Item 5 - Item 6)	$ (171,568)	$ (5,585)
B. Source of gains and losses		
8. Asset gain (loss) for the year	$ 51,252	$ 25,643
9. Liability experience gain (loss) for the year	(222,820)	(31,228)
10. Plan Change	—	—
11. Assumption change	—	—
12. Total	$ (171,568)	$ (5,585)

Note, the liability experience gain (loss) shown above includes the impact of any trend assumption changes made in conjunction with the review of the healthcare per capita claims cost, as described in the Executive Summary.

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 increased as a result of our review. All other assumptions were adopted by the Board and are based on an experience study conducted based on experience through June 30, 2022. 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.

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

Appendix B of this report includes a summary of the major benefit provisions for System. There have been no material plan provision changes since the prior valuation.

SECTION 3

ACTUARIAL TABLES

Actuarial Tables

Retirement Benefits

Actuarial Tables

Development of Unfunded Actuarial Accrued Liability
Retirement Benefits

(Dollar amounts expressed in thousands)

		June 30, 2024	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 3,137,814	$ 743,133
2.	Present value of future pay	$ 23,045,773	$ 6,919,809
3.	Normal cost rate		
	a. Total normal cost rate	9.37%	17.17%
	b. Less: member contribution rate	-5.00%	-8.00%
	c. Employer normal cost rate	4.37%	9.17%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 7,786,023	$ 3,175,359
	b. Less: present value of future normal costs	(2,065,567)	(1,124,256)
	c. Actuarial accrued liability	$ 5,720,456	$ 2,051,103
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 9,342,394	$ 3,935,492
	b. Inactive members	713,641	83,606
	c. Active members (Item 4c)	5,720,456	2,051,103
	d. Total	$ 15,776,491	$ 6,070,201
6.	Actuarial value of assets	$ 9,211,735	$ 3,279,623
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ 6,564,756	$ 2,790,578
8.	Funded Ratio	58.4%	54.0%

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

		June 30, 2024	
		Non-Hazardous (1)	Hazardous (2)
1.	Active members		
	a. Service retirement	$ 6,709,865	$ 2,836,643
	b. Deferred termination benefits and refunds	652,479	168,533
	c. Survivor benefits	125,880	26,809
	d. Disability benefits	297,799	143,374
	e. Total	$ 7,786,023	$ 3,175,359
2.	Retired members		
	a. Service retirement	$ 8,317,034	$ 3,568,023
	b. Disability retirement	426,221	110,503
	c. Beneficiaries	599,139	256,966
	d. Total	$ 9,342,394	$ 3,935,492
3.	Inactive members		
	a. Vested terminations	$ 608,998	$ 71,669
	b. Nonvested terminations	104,643	11,937
	c. Total	$ 713,641	$ 83,606
4.	Total actuarial present value of future benefits	$ 17,842,058	$ 7,194,457

Development of Actuarially Determined Contribution Rate
Retirement Benefits

		June 30, 2024	
		Non-Hazardous (1)	Hazardous (2)
1.	Total normal cost rate		
	a. Service retirement	5.85%	13.16%
	b. Deferred termination benefits and refunds	2.62%	2.56%
	c. Survivor benefits	0.32%	0.26%
	d. Disability benefits	0.58%	1.19%
	e. Total	9.37%	17.17%
2.	Less: member contribution rate	-5.00%	-8.00%
3.	Total employer normal cost rate	4.37%	9.17%
4.	Administrative expenses	0.85%	0.31%
5.	Net employer normal cost rate	5.22%	9.48%
6.	UAAL amortization contribution rate	13.40%	24.52%
7.	Total calculated employer contribution	18.62%	34.00%

Actuarial Balance Sheet

Non-Hazardous Members Retirement

(Dollar amounts expressed in thousands)

	June 30, 2024 (1)	June 30, 2023 (2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	$ 9,211,735	$ 8,585,073
b. Present value of future member contributions	$ 1,152,289	$ 1,059,126
c. Present value of future employer contributions		
i. Normal cost contributions	$ 913,278	$ 853,551
ii. Unfunded accrued liability contributions	6,564,756	6,711,356
iii. Total future employer contributions	$ 7,478,034	$ 7,564,907
d. Total assets	$ 17,842,058	$ 17,209,106
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	$ 2,065,567	$ 1,912,677
ii. Accrued liability	5,720,456	5,504,824
iii. Total present value of future benefits	$ 7,786,023	$ 7,417,501
b. Present value of benefits payable on account of current retired members and beneficiaries	$ 9,342,394	$ 9,117,883
c. Present value of benefits payable on account of current inactive members	$ 713,641	$ 673,722
d. Total liabilities	$ 17,842,058	$ 17,209,106

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

		June 30, 2024 (1)	June 30, 2023 (2)
1.	Assets - Present and Expected Future Resources		
	a. Current assets (actuarial value)	$ 3,279,623	$ 3,008,147
	b. Present value of future member contributions	$ 553,585	$ 493,334
	c. Present value of future employer contributions		
	i. Normal cost contributions	$ 570,671	$ 523,334
	ii. Unfunded accrued liability contributions	2,790,578	2,841,848
	iii. Total future employer contributions	$ 3,361,249	$ 3,365,182
	d. Total assets	$ 7,194,457	$ 6,866,663
2.	Liabilities - Present Value of Expected Future Benefit Payments		
	a. Active members		
	i. Present value of future normal costs	$ 1,124,256	$ 1,016,668
	ii. Accrued liability	2,051,103	1,944,013
	iii. Total present value of future benefits	$ 3,175,359	$ 2,960,681
	b. Present value of benefits payable on account of current retired members and beneficiaries	$ 3,935,492	$ 3,824,666
	c. Present value of benefits payable on account of current inactive members	$ 83,606	$ 81,316
	d. Total liabilities	$ 7,194,457	$ 6,866,663

Reconciliation of Retirement Net Assets

(Dollar amounts expressed in thousands)[1]

	Year Ending			
	June 30, 2024		June 30, 2024	
	(1)		(2)	
	Non-Hazardous		**Hazardous**	
1. Value of assets at beginning of year	$	8,672,597	$	3,035,192
2. Revenue for the year				
a. Contributions				
i. Member contributions	$	161,176	$	61,438
ii. Employer contributions		764,747		321,224
iii. Other contributions (less 401h)		31		68
iv. Total	$	925,953	$	382,730
b. Income				
i. Interest, dividends, and other income	$	297,706	$	105,081
ii. Investment expenses		(80,327)		(27,154)
iii. Net	$	217,380	$	77,927
c. Net realized and unrealized gains (losses)		772,641		275,508
d. Total revenue	$	1,915,974	$	736,166
3. Expenditures for the year				
a. Disbursements				
i. Refunds	$	25,267	$	8,540
ii. Regular annuity benefits		940,514		343,583
iii. Other benefit payments		0		0
iv. Transfers to other systems		0		0
v. Total	$	965,781	$	352,123
b. Administrative expenses and depreciation		26,547		2,338
c. Total expenditures	$	992,328	$	354,461
4. Increase in net assets (Item 2. - Item 3.)	$	923,646	$	381,705
5. Value of assets at end of year (Item 1. + Item 4.)	$	9,596,244	$	3,416,897
6. Net external cash flow				
a. Dollar amount	$	(66,374)	$	28,270
b. Percentage of market value		-0.7%		0.9%
7. Estimated annual return on net assets		11.5%		11.6%

[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, 2024
1.	Actuarial value of assets at beginning of year	$	8,585,073
2.	Market value of assets at beginning of year	$	8,672,597
3.	Net new investments		
	a. Contributions	$	925,953
	b. Benefit payments		(965,781)
	c. Administrative expenses		(26,547)
	d. Subtotal	$	(66,374)
4.	Market value of assets at end of year	$	9,596,244
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	990,021
6.	Assumed investment return rate for fiscal year		6.50%
7.	Expected return for immediate recognition	$	561,562
8.	Excess return for phased recognition	$	428,459

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

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2024	$	428,459	$	85,692
b.	2023		310,590		62,118
c.	2022		(1,026,802)		(205,360)
d.	2021		1,330,544		266,109
e.	2020		(385,418)		(77,084)
f.	Total			$	131,475

10.	Actuarial value of assets as of June 30, 2024 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	9,211,735
11.	Ratio of actuarial value to market value		96.0%
12.	Estimated annual return on actuarial value of assets		8.1%

* Amounts may not add due to rounding

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

	Year Ending		June 30, 2024
1.	Actuarial value of assets at beginning of year	$	3,008,147
2.	Market value of assets at beginning of year	$	3,035,192
3.	Net new investments		
	a. Contributions	$	382,730
	b. Benefit payments		(352,123)
	c. Administrative expenses		(2,338)
	d. Subtotal	$	28,270
4.	Market value of assets at end of year	$	3,416,897
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	353,435
6.	Assumed investment return rate for fiscal year		6.50%
7.	Expected return for immediate recognition	$	198,206
8.	Excess return for phased recognition	$	155,229

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

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2024	$	155,229	$	31,046
b.	2023		108,990		21,798
c.	2022		(355,681)		(71,136)
d.	2021		449,846		89,969
e.	2020		(133,383)		(26,677)
f.	Total			$	45,000

10.	Actuarial value of assets as of June 30, 2024 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	3,279,623
11.	Ratio of actuarial value to market value		96.0%
12.	Estimated annual return on actuarial value of assets		8.0%

* 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						
2015	$ 6,474,849	$ 10,740,325	$ 4,265,476	60.3%	$ 2,296,716	185.7%
2016	6,535,372	11,076,457	4,541,085	59.0%	2,352,762	193.0%
2017	6,764,873	12,803,510	6,038,637	52.8%	2,452,407	246.2%
2018	6,950,225	13,191,505	6,241,280	52.7%	2,466,801	253.0%
2019	7,049,527	14,356,113	7,306,586	49.1%	2,521,860	289.7%
2020	7,220,607	14,610,868	7,390,261	49.4%	2,565,391	288.1%
2021	7,715,883	14,894,906	7,179,023	51.8%	2,528,735	283.9%
2022	8,148,912	15,674,220	7,525,308	52.0%	2,691,171	279.6%
2023	8,585,073	15,296,429	6,711,356	56.1%	2,898,813	231.5%
2024	9,211,735	15,776,491	6,564,756	58.4%	3,137,814	209.2%
Hazardous Members						
2015	$ 2,096,783	$ 3,613,308	$ 1,516,525	58.0%	$ 483,641	313.6%
2016	2,139,119	3,704,456	1,565,337	57.7%	492,851	317.6%
2017	2,238,320	4,649,047	2,410,727	48.1%	541,633	445.1%
2018	2,321,721	4,792,548	2,470,827	48.4%	533,618	463.0%
2019	2,375,106	5,245,365	2,870,259	45.3%	559,353	513.1%
2020	2,447,885	5,431,299	2,983,414	45.1%	568,558	524.7%
2021	2,628,621	5,629,458	3,000,837	46.7%	578,355	518.9%
2022	2,788,714	5,861,691	3,072,977	47.6%	620,934	494.9%
2023	3,008,147	5,849,995	2,841,848	51.4%	677,988	419.2%
2024	3,279,623	6,070,201	2,790,578	54.0%	743,133	375.5%
Total CERS Members						
2015	$ 8,571,632	$ 14,353,633	$ 5,782,001	59.7%	$ 2,780,357	208.0%
2016	8,674,491	14,780,913	6,106,422	58.7%	2,845,613	214.6%
2017	9,003,193	17,452,557	8,449,364	51.6%	2,994,040	282.2%
2018	9,271,946	17,984,053	8,712,107	51.6%	3,000,419	290.4%
2019	9,424,633	19,601,478	10,176,845	48.1%	3,081,213	330.3%
2020	9,668,492	20,042,167	10,373,675	48.2%	3,133,949	331.0%
2021	10,344,504	20,524,364	10,179,860	50.4%	3,107,090	327.6%
2022	10,937,626	21,535,911	10,598,285	50.8%	3,312,105	320.0%
2023	11,593,220	21,146,424	9,553,204	54.8%	3,576,801	267.1%
2024	12,491,358	21,846,692	9,355,334	57.2%	3,880,947	241.1%

Summary of Principal Assumptions and Methods

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

	Non-Hazardous	Hazardous
Valuation date:	June 30, 2024	June 30, 2024
Actuarial cost method:	Entry Age Normal	Entry Age Normal
Amortization method:	Level percentage of payroll (2% payroll growth assumed)	Level percentage of payroll (2% payroll growth assumed)
Amortization period for contribution rate:	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	6.50%	6.50%
Projected salary increases	3.30% to 10.30% (varies by service)	3.55% to 19.05% (varies by service)
Inflation	2.50%	2.50%
Post-retirement benefit adjustments	0.00%	0.00%
Retiree Mortality	System-specific mortality table based on mortality experience from 2013 to 2022, projected with the ultimate rates from MP-2020 mortality improvement scale using a base year of 2023.	System-specific mortality table based on mortality experience from 2013 to 2022, projected with the ultimate rates from MP-2020 mortality improvement scale using a base year of 2023.

Solvency Test
Retirement Benefits
(Dollar amounts expressed in thousands)

	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
June 30,	Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Hazardous Members							
2015	$ 1,216,585	$ 6,489,863	$ 3,033,878	$ 6,474,849	100.0%	81.0%	0.0%
2016	1,231,027	6,785,530	3,059,900	6,535,372	100.0%	78.2%	0.0%
2017	1,277,432	7,731,682	3,794,396	6,764,873	100.0%	71.0%	0.0%
2018	1,269,287	8,196,719	3,725,499	6,950,225	100.0%	69.3%	0.0%
2019	1,280,679	8,905,544	4,169,890	7,049,527	100.0%	64.8%	0.0%
2020	1,312,554	9,088,237	4,210,077	7,220,607	100.0%	65.0%	0.0%
2021	1,324,826	9,397,968	4,172,112	7,715,883	100.0%	68.0%	0.0%
2022	1,335,758	10,021,345	4,317,117	8,148,912	100.0%	68.0%	0.0%
2023	1,341,594	9,791,605	4,163,230	8,585,073	100.0%	74.0%	0.0%
2024	1,384,947	10,056,035	4,335,509	9,211,735	100.0%	77.8%	0.0%
Hazardous Members							
2015	$ 422,359	$ 2,297,703	$ 893,246	$ 2,096,783	100.0%	72.9%	0.0%
2016	428,713	2,388,712	887,031	2,139,119	100.0%	71.6%	0.0%
2017	458,808	2,910,601	1,279,638	2,238,320	100.0%	61.1%	0.0%
2018	442,637	3,151,058	1,198,853	2,321,721	100.0%	59.6%	0.0%
2019	458,559	3,399,954	1,386,852	2,375,106	100.0%	56.4%	0.0%
2020	454,801	3,606,091	1,370,407	2,447,885	100.0%	55.3%	0.0%
2021	457,391	3,777,313	1,394,754	2,628,621	100.0%	57.5%	0.0%
2022	468,325	3,915,964	1,477,402	2,788,714	100.0%	59.3%	0.0%
2023	476,005	3,905,982	1,468,008	3,008,147	100.0%	64.8%	0.0%
2024	509,070	4,019,098	1,542,033	3,279,623	100.0%	68.9%	0.0%

INSURANCE BENEFITS

ACTUARIAL TABLES

Development of Unfunded Actuarial Accrued Liability
Insurance Benefits

(Dollar amounts expressed in thousands)

		June 30, 2024	
		Non-Hazardous (1)	Hazardous (2)
1.	Projected payroll of active members	$ 3,137,814	$ 743,133
2.	Present value of future pay	$ 22,389,999	$ 6,973,325
3.	Normal cost rate		
	a. Total normal cost rate	2.15%	3.40%
	b. Less: member contribution rate	-0.67%	-0.69%
	c. Employer normal cost rate	1.48%	2.71%
4.	Actuarial accrued liability for active members		
	a. Present value of future benefits	$ 1,848,657	$ 627,070
	b. Less: present value of future normal costs	(458,274)	(196,556)
	c. Actuarial accrued liability	$ 1,390,383	$ 430,514
5.	Total actuarial accrued liability		
	a. Retirees and beneficiaries	$ 1,343,043	$ 1,219,648
	b. Inactive members	167,919	17,895
	c. Active members (Item 4c)	1,390,383	430,514
	d. Total	$ 2,901,345	$ 1,668,057
6.	Actuarial value of assets	$ 3,549,422	$ 1,676,141
7.	Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	$ (648,077)	$ (8,084)
8.	Funded Ratio	122.3%	100.5%

Development of Actuarially Determined Contribution Rate
Insurance Benefits

		June 30, 2024	
		Non-Hazardous (1)	Hazardous (2)
1.	Total normal cost rate	2.15%	3.40%
2.	Less: member contribution rate	-0.67%	-0.69%
3.	Total employer normal cost rate	1.48%	2.71%
4.	Administrative expenses	0.03%	0.07%
5.	Net employer normal cost rate	1.51%	2.78%
6.	UAAL amortization contribution rate	-2.37%	-1.05%
7.	Total calculated employer contribution	0.00%	1.73%

Actuarial Balance Sheet

Non-Hazardous Members Insurance

(Dollar amounts expressed in thousands)

	June 30, 2024 (1)	June 30, 2023 (2)
1. Assets - Present and Expected Future Resources		
a. Current assets (actuarial value)	$ 3,549,422	$ 3,366,332
b. Present value of future member contributions	$ 171,473	$ 149,485
c. Present value of future employer contributions		
i. Normal cost contributions	$ 286,801	$ 307,220
ii. Unfunded accrued liability contributions	(648,077)	(805,945)
iii. Total future employer contributions	$ (361,276)	$ (498,725)
d. Total assets	$ 3,359,619	$ 3,017,092
2. Liabilities - Present Value of Expected Future Benefit Payments		
a. Active members		
i. Present value of future normal costs	$ 458,274	$ 456,705
ii. Accrued liability	1,390,383	1,303,858
iii. Total present value of future benefits	$ 1,848,657	$ 1,760,563
b. Present value of benefits payable on account of current retired members and beneficiaries	$ 1,343,043	$ 1,063,114
c. Present value of benefits payable on account of current inactive members	$ 167,919	$ 193,415
d. Total liabilities	$ 3,359,619	$ 3,017,092

Actuarial Balance Sheet

Hazardous Members Insurance

(Dollar amounts expressed in thousands)

		June 30, 2024 (1)	June 30, 2023 (2)
1.	Assets - Present and Expected Future Resources		
a.	Current assets (actuarial value)	$ 1,676,141	$ 1,615,349
b.	Present value of future member contributions	$ 59,830	$ 50,990
c.	Present value of future employer contributions		
	i. Normal cost contributions	$ 136,726	$ 137,624
	ii. Unfunded accrued liability contributions	(8,084)	(11,203)
	iii. Total future employer contributions	$ 128,642	$ 126,421
d.	Total assets	$ 1,864,613	$ 1,792,760
2.	Liabilities - Present Value of Expected Future Benefit Payments		
a.	Active members		
	i. Present value of future normal costs	$ 196,556	$ 188,614
	ii. Accrued liability	430,514	440,832
	iii. Total present value of future benefits	$ 627,070	$ 629,446
b.	Present value of benefits payable on account of current retired members and beneficiaries	$ 1,219,648	$ 1,139,168
c.	Present value of benefits payable on account of current inactive members	$ 17,895	$ 24,146
d.	Total liabilities	$ 1,864,613	$ 1,792,760

Reconciliation of Insurance Net Assets

(Dollar amounts expressed in thousands)[1]

	Year Ending June 30, 2024 (1) Non-Hazardous	Year Ending June 30, 2024 (2) Hazardous
1. Value of assets at beginning of year	$ 3,398,375	$ 1,634,192
2. Revenue for the year		
a. Contributions		
i. Member contributions	$ 20,651	$ 4,979
ii. Employer contributions	2,765	20,557
iii. Other contributions (less 401h)	7,378	2,088
iv. Total	$ 30,794	$ 27,624
b. Income		
i. Interest, dividends, and other income	$ 112,270	$ 53,857
ii. Investment expenses	(30,571)	(16,082)
iii. Net	$ 81,699	$ 37,776
c. Net realized and unrealized gains (losses)	311,438	148,048
d. Total revenue	$ 423,931	$ 213,448
3. Expenditures for the year		
a. Disbursements		
i. Refunds	$ 0	$ 0
ii. Healthcare premium subsidies	122,209	96,052
iii. Other benefit payments[2]	(8,109)	(1,301)
iv. Transfers to other systems	0	0
v. Total	$ 114,100	$ 94,751
b. Administrative expenses and depreciation	930	522
c. Total expenditures	$ 115,030	$ 95,273
4. Increase in net assets (Item 2. - Item 3.)	$ 308,902	$ 118,174
5. Value of assets at end of year (Item 1. + Item 4.)	$ 3,707,277	$ 1,752,366
6. Net external cash flow		
a. Dollar amount	$ (84,236)	$ (67,649)
b. Percentage of market value	-2.4%	-4.0%
7. Estimated annual return on net assets	11.7%	11.6%

[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, 2024
1.	Actuarial value of assets at beginning of year	$	3,366,332
2.	Market value of assets at beginning of year	$	3,398,375
3.	Net new investments		
	a. Contributions	$	30,794
	b. Benefit payments		(114,100)
	c. Administrative expenses		(930)
	d. Subtotal	$	(84,236)
4.	Market value of assets at end of year	$	3,707,277
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	393,138
6.	Assumed investment return rate for fiscal year		6.50%
7.	Expected return for immediate recognition	$	218,157
8.	Excess return for phased recognition	$	174,981
9.	Phased-in recognition, 20% of excess return on assets for prior years:		

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2024	$	174,981	$	34,996
b.	2023		123,546		24,709
c.	2022		(380,135)		(76,027)
d.	2021		478,981		95,796
e.	2020		(151,527)		(30,305)
f.	Total			$	49,169

10.	Actuarial value of assets as of June 30, 2024 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	3,549,422
11.	Ratio of actuarial value to market value		95.7%
12.	Estimated annual return on actuarial value of assets		8.0%

* Amounts may not add due to rounding

Development of Actuarial Value of Assets

Hazardous Members Insurance

(Dollar amounts expressed in thousands)*

	Year Ending		June 30, 2024
1.	Actuarial value of assets at beginning of year	$	1,615,349
2.	Market value of assets at beginning of year	$	1,634,192
3.	Net new investments		
	a. Contributions	$	27,624
	b. Benefit payments		(94,751)
	c. Administrative expenses		(522)
	d. Subtotal	$	(67,649)
4.	Market value of assets at end of year	$	1,752,366
5.	Net earnings (Item 4. - Item 2. - Item 3.d.)	$	185,824
6.	Assumed investment return rate for fiscal year		6.50%
7.	Expected return for immediate recognition	$	104,024
8.	Excess return for phased recognition	$	81,800

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

	Fiscal Year Ending June 30,		Excess Return		Recognized Amount
a.	2024	$	81,800	$	16,360
b.	2023		56,727		11,345
c.	2022		(180,610)		(36,122)
d.	2021		244,967		48,993
e.	2020		(80,794)		(16,159)
f.	Total			$	24,418

10.	Actuarial value of assets as of June 30, 2024 (Item 1. + Item 3.d. + Item 7.+ Item 9.f.)	$	1,676,141
11.	Ratio of actuarial value to market value		95.7%
12.	Estimated annual return on actuarial value of assets		8.1%

* Amounts may not add due to rounding

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

June 30,	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Covered Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Hazardous Members						
2015	$ 1,997,456	$ 2,907,827	$ 910,371	68.7%	$ 2,296,716	39.6%
2016	2,079,811	2,988,121	908,310	69.6%	2,352,762	38.6%
2017	2,227,401	3,355,151	1,127,750	66.4%	2,452,407	46.0%
2018	2,371,430	3,092,624	721,194	76.7%	2,466,801	29.2%
2019	2,523,249	3,567,947	1,044,698	70.7%	2,521,860	41.4%
2020	2,661,351	3,392,085	730,734	78.5%	2,565,391	28.5%
2021	2,947,312	3,450,484	503,172	85.4%	2,528,735	19.9%
2022	3,160,084	2,391,990	(768,094)	132.1%	2,691,171	-28.5%
2023	3,366,332	2,560,387	(805,945)	131.5%	2,898,813	-27.8%
2024	3,549,422	2,901,345	(648,077)	122.3%	3,137,814	-20.7%
Hazardous Members						
2015	$ 1,087,707	$ 1,504,015	$ 416,308	72.3%	$ 483,641	86.1%
2016	1,135,784	1,558,818	423,034	72.9%	492,851	85.8%
2017	1,196,780	1,788,433	591,653	66.9%	541,633	109.2%
2018	1,256,306	1,684,028	427,722	74.6%	533,618	80.2%
2019	1,313,659	1,732,879	419,220	75.8%	559,353	74.9%
2020	1,362,028	1,740,971	378,943	78.2%	568,558	66.6%
2021	1,475,635	1,751,203	275,568	84.3%	578,355	47.6%
2022	1,553,761	1,538,131	(15,630)	101.0%	620,934	-2.5%
2023	1,615,349	1,604,146	(11,203)	100.7%	677,988	-1.7%
2024	1,676,141	1,668,057	(8,084)	100.5%	743,133	-1.1%
Total CERS Members						
2015	$ 3,085,163	$ 4,411,842	$ 1,326,679	69.9%	$ 2,780,357	47.7%
2016	3,215,595	4,546,939	1,331,344	70.7%	2,845,613	46.8%
2017	3,424,181	5,143,584	1,719,403	66.6%	2,994,040	57.4%
2018	3,627,736	4,776,652	1,148,916	75.9%	3,000,419	38.3%
2019	3,836,908	5,300,826	1,463,918	72.4%	3,081,213	47.5%
2020	4,023,379	5,133,056	1,109,677	78.4%	3,133,949	35.4%
2021	4,422,947	5,201,687	778,740	85.0%	3,107,090	25.1%
2022	4,713,845	3,930,121	(783,724)	119.9%	3,312,105	-23.7%
2023	4,981,681	4,164,533	(817,148)	119.6%	3,576,801	-22.8%
2024	5,225,563	4,569,402	(656,161)	114.4%	3,880,947	-16.9%

Solvency Test
Insurance Benefits
(Dollar amounts expressed in thousands)

	Actuarial Accrued Liability				Portion of Aggregate Accrued Liabilities Covered by Assets		
June 30,	Active Member Contributions	Retired Members & Beneficiaries	Active Members (Employer Financed)	Valuation Assets	Active	Retired	ER Financed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Non-Hazardous Members				
2015	$ -	$ 1,372,597	$ 1,535,231	$ 1,997,456	100.0%	100.0%	40.7%
2016	-	1,484,937	1,503,184	2,079,811	100.0%	100.0%	39.6%
2017	-	1,603,438	1,751,713	2,227,401	100.0%	100.0%	35.6%
2018	-	1,525,323	1,567,301	2,371,430	100.0%	100.0%	54.0%
2019	-	1,830,692	1,737,255	2,523,249	100.0%	100.0%	39.9%
2020	-	1,746,159	1,645,926	2,661,351	100.0%	100.0%	55.6%
2021	-	1,835,734	1,614,750	2,947,312	100.0%	100.0%	68.8%
2022	-	1,055,375	1,336,615	3,160,084	100.0%	100.0%	100.0%
2023	-	1,256,529	1,303,858	3,366,332	100.0%	100.0%	100.0%
2024	-	1,510,962	1,390,383	3,549,422	100.0%	100.0%	100.0%
			Hazardous Members				
2015	$ -	$ 790,714	$ 713,301	$ 1,087,707	100.0%	100.0%	41.6%
2016	-	879,360	679,458	1,135,784	100.0%	100.0%	37.7%
2017	-	994,764	793,669	1,196,780	100.0%	100.0%	25.5%
2018	-	1,001,717	682,311	1,256,306	100.0%	100.0%	37.3%
2019	-	1,072,861	660,018	1,313,659	100.0%	100.0%	36.5%
2020	-	1,154,389	586,582	1,362,028	100.0%	100.0%	35.4%
2021	-	1,217,527	533,676	1,475,635	100.0%	100.0%	48.4%
2022	-	1,045,022	493,109	1,553,761	100.0%	100.0%	100.0%
2023	-	1,163,314	440,832	1,615,349	100.0%	100.0%	100.0%
2024	-	1,237,543	430,514	1,676,141	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, 2024	Payments for FYE 2026	Funding Period at June 30, 2024
June 30, 2019	$ 7,306,586	$ 7,435,084	$ 500,921	25
June 30, 2020	(43,634)	65,637	5,853	16
June 30, 2021	(333,595)	(303,830)	(25,989)	17
June 30, 2022	327,156	316,686	26,071	18
June 30, 2023	(803,273)	(905,957)	(71,995)	19
June 30, 2024	(42,864)	(42,864)	(5,835)	20
Total		$ 6,564,756	$ 429,026	
Projected Payroll for FYE 2026			$ 3,200,570	
Amortization Payments as a Percentage of Payroll			13.40%	

Hazardous Members Retirement

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2024	Payments for FYE 2026	Funding Period at June 30, 2024
June 30, 2019	$ 2,870,259	$ 2,942,302	$ 198,231	25
June 30, 2020	41,583	106,526	9,499	16
June 30, 2021	(57,337)	(16,100)	(1,377)	17
June 30, 2022	32,971	22,100	1,819	18
June 30, 2023	(215,367)	(247,537)	(19,671)	19
June 30, 2024	(16,713)	(16,713)	(2,666)	20
Total		$ 2,790,578	$ 185,835	
Projected Payroll for FYE 2026			$ 757,995	
Amortization Payments as a Percentage of Payroll			24.52%	

Note:
Budgeted contribution rates for FYE 2025 were known at the time of the June 30, 2024 Valuation. Amortization bases established at this valuation date were adjusted accordingly.

Amortization of Unfunded Liability

Non-Hazardous Members Insurance

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2024	Payments for FYE 2026	Funding Period at June 30, 2024
June 30, 2019	$ 1,044,698	$ 1,063,550	$ 71,654	25
June 30, 2020	(332,646)	(323,726)	(28,866)	16
June 30, 2021	(219,172)	(227,191)	(19,433)	17
June 30, 2022	(1,261,234)	(1,333,873)	(109,811)	18
June 30, 2023	44,464	14,706	1,169	19
June 30, 2024	158,457	158,457	10,197	20
Total		$ (648,077)	$ (75,090)	

Projected Payroll for FYE 2026	$ 3,168,830
Amortization Payments as a Percentage of Payroll	-2.37%

Hazardous Members Insurance

Valuation Year Base Established	Original Amortization Base	Remaining at June 30, 2024	Payments for FYE 2026	Funding Period at June 30, 2024
June 30, 2019	$ 419,220	$ 422,089	$ 28,437	25
June 30, 2020	(43,079)	(44,181)	(3,940)	16
June 30, 2021	(100,257)	(106,019)	(9,068)	17
June 30, 2022	(282,650)	(299,341)	(24,643)	18
June 30, 2023	23,141	19,902	1,582	19
June 30, 2024	(534)	(534)	(254)	20
Total		$ (8,084)	$ (7,886)	

Projected Payroll for FYE 2026	$ 754,131
Amortization Payments as a Percentage of Payroll	-1.05%

Note:
Budgeted contribution rates for FYE 2025 were known at the time of the June 30, 2024 Valuation. Amortization bases established at this valuation date were adjusted accordingly.

SECTION 5

MEMBERSHIP INFORMATION

Membership Tables

Summary of Membership Data

(Total dollar amounts expressed in thousands)

		Non-Hazardous June 30, 2024 (1)	Hazardous June 30, 2024 (2)	Total June 30, 2024 (3)	Total June 30, 2023 (4)
1.	Active members				
	a. Males	29,788	8,587	38,375	37,237
	b. Females	50,652	1,091	51,743	50,778
	c. Total members	80,440	9,678	90,118	88,015
	d. Total annualized prior year salaries	$ 3,137,814	$ 743,133	$ 3,880,947	$ 3,576,801
	e. Average salary[3]	$ 39,008	$ 76,786	$ 43,065	$ 40,639
	f. Average age	47.0	37.7	46.0	46.4
	g. Average service	8.6	9.6	8.7	8.9
	h. Member contributions with interest	$ 1,384,947	$ 509,070	$ 1,894,017	$ 1,817,599
	i. Average contributions with interest[3]	$ 17,217	$ 52,601	$ 21,017	$ 20,651
2.	Vested inactive members[2]				
	a. Number	50,532	1,795	52,327	52,326
	b. Total annual deferred benefits	$ 92,724	$ 8,929	$ 101,653	$ 97,661
	c. Average annual deferred benefit[3]	$ 1,835	$ 4,974	$ 1,943	$ 1,866
	d. Average age at the valuation date	55.1	47.6	54.8	54.3
3.	Nonvested inactive members[2]				
	a. Number	65,257	2,623	67,880	63,047
	b. Total member contributions with interest	$ 101,408	$ 11,525	$ 112,933	$ 101,043
	c. Average contributions with interest[3]	$ 1,554	$ 4,394	$ 1,664	$ 1,603
4.	Service retirees[1]				
	a. Number	61,838	9,720	71,558	70,044
	b. Total annual benefits	$ 768,949	$ 292,354	$ 1,061,303	$ 1,025,813
	c. Average annual benefit[3]	$ 12,435	$ 30,078	$ 14,831	$ 14,645
	d. Average age at the valuation date	71.6	63.3	70.5	70.2
5.	Disabled retirees[1]				
	a. Number	3,716	590	4,306	4,360
	b. Total annual benefits	$ 43,923	$ 10,029	$ 53,952	$ 54,241
	c. Average annual benefit[3]	$ 11,820	$ 16,998	$ 12,529	$ 12,441
	d. Average age at the valuation date	67.8	59.5	66.6	66.2
6.	Beneficiaries[1]				
	a. Number	6,831	1,543	8,374	8,131
	b. Total annual benefits	$ 70,320	$ 26,706	$ 97,026	$ 92,648
	c. Average annual benefit[3]	$ 10,294	$ 17,308	$ 11,587	$ 11,394
	d. Average age at the valuation date	69.1	60.9	67.6	67.2

[1] 4,085 members receiving benefits in both the non-hazardous and hazardous fund. Members' headcounts and hazardous benefits included in the hazardous summary above. Members' additional $30,693,000 in non-hazardous annual benefits not included in summary above.

[2] 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.

[3] Average dollar amounts shown are expressed to the dollar.

Summary of Historical Active Membership

June 30,	Active Members: Number	Active Members: Percent Increase /(Decrease)	Covered Payroll[1]: Amount in Thousands	Covered Payroll[1]: Percent Increase /(Decrease)	Average Annual Pay: Amount	Average Annual Pay: Percent Increase /(Decrease)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-Hazardous Members						
2015	80,852		$ 2,296,716		$ 28,406	
2016	80,664	-0.2%	2,352,762	2.4%	29,167	2.7%
2017	82,198	1.9%	2,452,407	4.2%	29,835	2.3%
2018	81,818	-0.5%	2,466,801	0.6%	30,150	1.1%
2019	81,506	-0.4%	2,521,860	2.2%	30,941	2.6%
2020	81,250	-0.3%	2,565,391	1.7%	31,574	2.0%
2021	77,367	-4.8%	2,528,735	-1.4%	32,685	3.5%
2022	77,849	0.6%	2,691,171	6.4%	34,569	5.8%
2023	78,810	1.2%	2,898,813	7.7%	36,782	6.4%
2024	80,440	2.1%	3,137,814	8.2%	39,008	6.1%
Hazardous Members						
2015	9,172		$ 483,641		$ 52,730	
2016	9,084	-1.0%	492,851	1.9%	54,255	2.9%
2017	9,495	4.5%	541,633	9.9%	57,044	5.1%
2018	9,263	-2.4%	533,618	-1.5%	57,607	1.0%
2019	9,474	2.3%	559,353	4.8%	59,041	2.5%
2020	9,419	-0.6%	568,558	1.6%	60,363	2.2%
2021	9,173	-2.6%	578,355	1.7%	63,050	4.5%
2022	9,184	0.1%	620,934	7.4%	67,610	7.2%
2023	9,205	0.2%	677,988	9.2%	73,654	8.9%
2024	9,678	5.1%	743,133	9.6%	76,786	4.3%

[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

	Years of Credited Service												
Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
Under 20	574	53	2	0	0	0	0	0	0	0	0	0	629
	$13,910	$15,467	$6,660	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,018
20-24	2,009	1,046	506	198	68	27	0	0	0	0	0	0	3,854
	$23,099	$29,425	$32,496	$35,241	$38,138	$44,134	$0	$0	$0	$0	$0	$0	$27,086
25-29	1,585	1,269	877	512	416	719	9	0	0	0	0	0	5,387
	$27,659	$33,614	$36,299	$37,927	$39,153	$44,910	$61,764	$0	$0	$0	$0	$0	$34,691
30-34	1,622	1,260	899	560	546	1,753	368	12	0	1	0	0	7,021
	$26,259	$31,545	$34,063	$35,870	$39,254	$44,686	$53,797	$48,984	$0	$22,263	$0	$0	$36,067
35-39	1,424	1,161	911	521	492	2,009	936	385	9	0	0	0	7,848
	$26,381	$31,965	$33,468	$35,222	$37,294	$43,788	$53,878	$59,549	$69,845	$0	$0	$0	$38,713
40-44	1,176	1,048	798	516	534	2,321	1,125	959	428	23	1	0	8,929
	$27,703	$31,703	$33,856	$36,851	$35,390	$40,777	$49,810	$59,123	$61,268	$70,936	$155,155	$0	$41,004
45-49	1,033	849	713	468	485	2,308	1,373	1,199	996	293	7	0	9,724
	$29,699	$35,538	$35,648	$37,770	$37,473	$40,705	$45,387	$53,933	$61,555	$65,185	$75,195	$0	$43,602
50-54	822	808	583	459	442	2,148	1,593	1,576	1,340	634	82	4	10,491
	$29,245	$35,235	$35,575	$37,556	$37,595	$39,910	$43,992	$48,915	$54,360	$65,859	$78,173	$130,137	$43,993
55-59	719	679	529	395	381	1,908	1,458	1,639	1,541	751	142	33	10,175
	$26,689	$32,133	$34,566	$33,406	$37,253	$41,264	$41,774	$44,482	$46,780	$56,661	$74,635	$74,048	$41,957
60-64	606	552	494	351	316	1,735	1,338	1,484	1,397	746	145	57	9,221
	$23,573	$28,749	$29,775	$31,446	$30,364	$37,092	$41,905	$44,241	$44,996	$48,080	$62,418	$68,992	$39,397
65 & Over	626	575	425	303	331	1,599	1,130	934	638	354	137	109	7,161
	$17,587	$25,110	$24,106	$24,237	$29,303	$31,099	$36,182	$39,467	$44,903	$46,030	$51,563	$60,891	$33,355
Total	12,196	9,300	6,737	4,283	4,011	16,527	9,330	8,188	6,349	2,802	514	203	80,440
	$25,432	$31,732	$33,519	$35,102	$36,360	$40,353	$44,703	$48,533	$51,126	$56,110	$65,768	$66,669	$39,008

Distribution of Active Members by Age and by Years of Service

Hazardous Members

Attained Age	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.	Total Count & Avg. Comp.
	Years of Credited Service												
Under 20	14	3	0	0	0	0	0	0	0	0	0	0	17
	$43,099	$51,906	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$44,653
20-24	296	216	128	45	26	1	0	0	0	0	0	0	712
	$44,729	$57,941	$61,408	$65,254	$69,436	$48,594	$0	$0	$0	$0	$0	$0	$53,940
25-29	222	249	242	211	217	361	5	0	0	0	0	0	1,507
	$50,022	$59,438	$63,285	$68,737	$66,807	$74,144	$65,406	$0	$0	$0	$0	$0	$64,574
30-34	104	126	149	126	136	876	210	2	0	0	0	0	1,729
	$47,793	$58,873	$66,129	$68,785	$68,462	$75,919	$82,977	$92,400	$0	$0	$0	$0	$71,911
35-39	77	88	75	63	73	549	659	214	2	0	0	0	1,800
	$46,417	$60,848	$63,482	$62,896	$67,660	$76,310	$85,706	$88,673	$72,449	$0	$0	$0	$77,826
40-44	42	45	32	39	46	221	372	663	121	5	0	0	1,586
	$53,718	$62,316	$62,118	$66,044	$64,989	$77,259	$85,735	$95,919	$95,654	$137,449	$0	$0	$86,656
45-49	22	25	10	16	18	110	161	419	226	51	2	0	1,060
	$54,109	$58,078	$60,272	$51,936	$65,776	$72,233	$83,242	$93,317	$101,647	$105,116	$113,499	$0	$88,932
50-54	21	15	16	8	15	80	100	211	169	87	15	0	737
	$50,628	$52,588	$67,612	$94,441	$71,815	$68,401	$79,765	$90,245	$99,785	$115,059	$126,260	$0	$89,586
55-59	8	10	7	5	6	40	47	99	64	25	8	3	322
	$46,187	$43,083	$64,010	$84,427	$69,229	$69,678	$76,482	$88,760	$98,340	$104,034	$130,574	$127,927	$85,646
60-64	4	3	4	2	2	19	18	63	21	4	7	5	152
	$47,944	$42,902	$48,932	$54,687	$62,260	$62,823	$66,774	$88,955	$84,801	$106,772	$101,302	$115,677	$80,561
65 & Over	0	0	1	2	1	11	6	17	7	5	4	2	56
	$0	$0	$24,870	$48,162	$35,942	$66,527	$69,149	$91,045	$89,199	$141,341	$69,771	$109,898	$83,600
Total	810	780	664	517	540	2,268	1,578	1,688	610	177	36	10	9,678
	$47,609	$58,780	$63,449	$67,426	$67,369	$75,140	$84,104	$92,912	$98,777	$111,824	$115,380	$118,197	$76,786

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

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	271	$ 6,700	102	$ 1,332	773	$ 6,982	1,146	$ 15,013
50 - 54	1,282	26,886	202	2,512	277	2,568	1,761	31,966
55 - 59	3,624	61,948	382	4,857	430	4,336	4,436	71,141
60 - 64	8,140	125,397	688	9,356	684	8,497	9,512	143,249
65 - 69	13,887	182,278	877	10,234	923	10,277	15,687	202,788
70 - 74	13,938	163,148	667	7,574	1,077	12,192	15,682	182,914
75 - 79	10,471	110,623	453	4,926	1,067	10,597	11,991	126,146
80 - 84	6,117	57,253	231	2,189	832	8,519	7,180	67,961
85 - 89	2,907	25,264	90	753	508	4,503	3,505	30,520
90 And Over	1,201	9,452	24	191	260	1,851	1,485	11,494
Total	**61,838**	**$ 768,949**	**3,716**	**$ 43,923**	**6,831**	**$ 70,320**	**72,385**	**$ 883,192**

*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)

	Retirement		Disability		Survivors & Beneficiaries		Total	
Current Age	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount	Number of Annuitants	Total Annual Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Under 50	877	$ 33,914	100	$ 1,809	335	$ 4,111	1,312	$ 39,833
50 - 54	1,453	52,584	114	1,989	102	1,717	1,669	56,290
55 - 59	1,633	53,743	103	1,939	124	2,253	1,860	57,936
60 - 64	1,612	48,343	103	1,723	153	2,844	1,868	52,910
65 - 69	1,416	37,014	77	1,199	219	4,156	1,712	42,369
70 - 74	1,369	36,505	57	846	216	4,401	1,642	41,752
75 - 79	825	18,993	24	378	180	3,456	1,029	22,827
80 - 84	381	8,008	9	103	133	2,468	523	10,580
85 - 89	126	2,539	2	36	58	1,004	186	3,579
90 And Over	28	711	1	7	23	296	52	1,013
Total	**9,720**	**$ 292,354**	**590**	**$ 10,029**	**1,543**	**$ 26,706**	**11,853**	**$ 329,089**

*Amounts may not add due to rounding

Non-Hazardous Retired Lives Summary

Form of Payment	Male Lives: Number	Male Lives: Monthly Benefit Amount	Female Lives: Number	Female Lives: Monthly Benefit Amount	Total: Number	Total: Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	6,599	$ 7,385,649	25,432	$ 19,976,955	32,031	$ 27,362,604
Joint & Survivor:						
100% to Beneficiary	4,662	5,871,567	3,308	2,417,050	7,970	8,288,617
66 2/3% to Beneficiary	925	1,843,370	873	1,013,087	1,798	2,856,457
50% to Beneficiary	1,294	2,233,782	2,119	2,569,068	3,413	4,802,850
Pop-up Option	4,298	7,373,353	4,576	5,103,904	8,874	12,477,257
Social Security Option:						
Age 62 Basic	225	407,340	573	717,877	798	1,125,217
Age 62 Survivorship	580	1,128,376	398	436,951	978	1,565,326
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	1,622	1,978,439	4,366	3,711,191	5,988	5,689,631
15 Years Certain & Life	772	907,594	1,356	1,062,604	2,128	1,970,198
20 Years Certain & Life	541	781,105	1,035	820,057	1,576	1,601,162
Total:	21,518	$ 29,910,575	44,036	$ 37,828,744	65,554	$ 67,739,319

Hazardous Retired Lives Summary

Form of Payment	Male Lives Number		Male Lives Monthly Benefit Amount	Female Lives Number		Female Lives Monthly Benefit Amount	Total Number		Total Monthly Benefit Amount
(1)	(2)		(3)	(4)		(5)	(6)		(7)
Basic	1,449	$	3,132,484	448	$	781,141	1,897	$	3,913,625
Joint & Survivor:									
100% to Beneficiary	1,690		3,906,672	89		128,734	1,779		4,035,406
66 2/3% to Beneficiary	405		1,080,557	31		75,088	436		1,155,645
50% to Beneficiary	578		1,523,875	68		164,448	646		1,688,324
Pop-up Option	3,962		10,834,042	197		456,026	4,159		11,290,068
Social Security Option:									
Age 62 Basic	111		179,872	14		17,912	125		197,784
Age 62 Survivorship	311		603,075	24		40,325	335		643,400
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	124		488,828	7		23,881	131		512,709
10 Years Certain & Life	277		623,036	80		151,117	357		774,153
15 Years Certain & Life	142		310,794	28		61,661	170		372,454
20 Years Certain & Life	237		552,654	38		62,315	275		614,969
Total:	9,286	$	23,235,889	1,024	$	1,962,648	10,310	$	25,198,537

Non-Hazardous Beneficiary Lives Summary

	Male Lives		Female Lives		Total	
Form of Payment	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount	Number	Monthly Benefit Amount
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic	33	$ 12,086	76	$ 69,986	109	$ 82,072
Joint & Survivor:						
100% to Beneficiary	626	392,306	2,193	1,743,899	2,819	2,136,205
66 2/3% to Beneficiary	108	64,312	318	278,485	426	342,797
50% to Beneficiary	236	113,501	464	280,077	700	393,578
Pop-up Option	337	310,844	1,139	1,311,923	1,476	1,622,768
Social Security Option:						
Age 62 Basic	1	860	5	4,294	6	5,154
Age 62 Survivorship	32	29,467	197	260,258	229	289,725
Partial Deferred (Old Plan)	0	0	0	0	0	0
Widows Age 60	0	0	0	0	0	0
5 Years Certain	112	130,942	147	155,719	259	286,661
10 Years Certain	160	109,806	195	180,797	355	290,603
10 Years Certain & Life	61	53,212	101	110,089	162	163,302
15 Years Certain & Life	55	42,811	105	95,252	160	138,063
20 Years Certain & Life	44	23,678	86	85,436	130	109,114
Total:	1,805	$ 1,283,826	5,026	$ 4,576,215	6,831	$ 5,860,041

Hazardous Beneficiary Lives Summary

	Male Lives			Female Lives			Total		
Form of Payment	Number		Monthly Benefit Amount	Number		Monthly Benefit Amount	Number		Monthly Benefit Amount
(1)	(2)		(3)	(4)		(5)	(6)		(7)
Basic	16	$	10,460	99	$	124,968	115	$	135,427
Joint & Survivor:									
100% to Beneficiary	36		31,174	412		573,816	448		604,990
66 2/3% to Beneficiary	2		1,688	83		124,609	85		126,296
50% to Beneficiary	21		18,890	135		135,411	156		154,301
Pop-up Option	48		32,812	465		867,414	513		900,226
Social Security Option:									
Age 62 Basic	0		0	2		1,641	2		1,641
Age 62 Survivorship	1		423	109		144,282	110		144,705
Partial Deferred (Old Plan)	0		0	0		0	0		0
Widows Age 60	0		0	2		1,469	2		1,469
5 Years Certain	3		5,691	5		12,473	8		18,164
10 Years Certain	13		19,507	32		52,243	45		71,750
10 Years Certain & Life	2		6,642	10		11,246	12		17,888
15 Years Certain & Life	6		6,755	11		16,656	17		23,411
20 Years Certain & Life	10		7,048	20		18,200	30		25,248
Total:	158	$	141,089	1,385	$	2,084,426	1,543	$	2,225,515

Schedule of Retirees Added to And Removed from Rolls

(Dollar amounts except average allowance expressed in thousands)

Year Ended	Added to Rolls Number	Removed from Rolls Number	Rolls End of the Year Number	Rolls End of the Year Annual Benefits	% Increase in Annual Benefit	Average Annual Benefit
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Non-Hazardous			
2015	4,020	1,304	52,651	$ 617,551		$ 11,729
2016	4,409	721	56,339	661,217	7.1%	11,736
2017	4,141	1,467	59,013	667,468	0.9%	11,311
2018	4,650	1,725	61,938	710,374	6.4%	11,469
2019	4,472	1,871	64,539	747,117	5.2%	11,576
2020	3,550	2,675	65,414	763,459	2.2%	11,671
2021	4,350	2,558	67,206	791,562	3.7%	11,778
2022	4,693	3,010	68,889	820,678	3.7%	11,913
2023	4,753	2,710	70,932	855,173	4.2%	12,056
2024	4,203	2,750	72,385	883,192	3.3%	12,201
			Hazardous			
2015	526	138	8,034	$ 202,153		$ 25,162
2016	604	75	8,563	215,302	6.5%	25,143
2017	576	141	8,998	226,680	5.3%	25,192
2018	779	190	9,587	245,675	8.4%	25,626
2019	608	172	10,023	258,813	5.3%	25,822
2020	621	192	10,452	274,791	6.2%	26,291
2021	651	245	10,858	288,876	5.1%	26,605
2022	674	301	11,231	301,966	4.5%	26,887
2023	672	300	11,603	317,529	5.2%	27,366
2024	548	298	11,853	329,089	3.6%	27,764

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 CERS'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 are collected from participating employers based on the employer's total payroll of employees who are earning benefits in CERS (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 CERS'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.

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 CERS 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.

CERS Non-Hazardous

	Retirement Fund					Insurance Fund				
	June 30,					June 30,				
	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020
Ratio of the market value of assets to total payroll	3.06	2.99	2.96	3.39	2.74	1.18	1.17	1.14	1.28	1.01
Ratio of actuarial accrued liability to payroll	5.03	5.28	5.82	5.89	5.70	0.92	0.88	0.89	1.36	1.32
Ratio of net cash flow to market value of assets	-0.7%	-1.2%	-1.3%	-2.9%	-2.7%	-2.4%	0.1%	0.3%	0.8%	0.1%
Percentage of Expected Contribution Actually Received	111% [1]	109%	99%	76%	82%	N/A [1]	109%	110%	88%	102%
Ratio of actives to retirees and beneficiaries	1.11	1.11	1.13	1.15	1.24					

[1] Expected contribution for FYE 2024 based on the actuarially determined contribution rate of 23.34% from the June 30, 2022 valuation and expected compensation based on census data from the June 30, 2023 valuation. As of the 2022 valuation (FYE2024), the required employer contribution was 0% of pay for the insurance fund.

CERS Hazardous

	Retirement Fund					Insurance Fund				
	June 30,					June 30,				
	2024	2023	2022	2021	2020	2024	2023	2022	2021	2020
Ratio of the market value of assets to total payroll	4.60	4.48	4.38	5.04	4.19	2.36	2.41	2.45	2.81	2.32
Ratio of actuarial accrued liability to payroll	8.17	8.63	9.44	9.73	9.55	2.24	2.37	2.48	3.03	3.06
Ratio of net cash flow to market value of assets	0.9%	1.3%	-0.8%	-2.3%	-2.1%	-4.0%	-2.5%	-1.6%	-1.4%	-1.6%
Percentage of Expected Contribution Actually Received	113% [1]	114%	87%	71%	80%	115% [1]	114%	113%	102%	104%
Ratio of actives to retirees and beneficiaries	0.82	0.79	0.82	0.84	0.90					

[1] Expected contribution for FYE2024 based on the actuarially determined contribution rate of 43.69% from the June 30, 2022 valuation and expected compensation based on census data from the June 30, 2023 valuation.

Low-Default-Risk Obligation Measure

Introduction

In December 2021, the Actuarial Standards Board (ASB) adopted a revision to Actuarial Standard of Practice (ASOP) No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions. The revised ASOP No. 4 requires the calculation and disclosure of a liability referred to by the ASOP as the "Low-Default-Risk Obligation Measure" (LDROM). The rationale that the ASB cited for the calculation and disclosure of the LDROM was included in the Transmittal Memorandum of ASOP No. 4 and is presented below (emphasis added):

> "The ASB believes that the calculation and disclosure of this measure provides **appropriate, useful information for the intended user regarding the funded status of a pension plan.** The calculation and disclosure of this additional measure is **not intended to suggest that this is the "right" liability measure** for a pension plan. However, the ASB does believe that **this additional disclosure provides a more complete assessment of a plan's funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date."**

Comparing the Accrued Liabilities and the LDROM

One of the fundamental financial objectives of the County Employees' Retirement System (CERS) is to finance each member's retirement benefits over the period from the member's date of hire until the member's projected date of retirement (entry age actuarial cost method) as a level percentage of payroll. To fulfill this objective, the discount rate that is used to value the accrued liabilities is set equal to the **expected return** on each fund's diversified portfolio of assets (referred to sometimes as the investment return assumption). For the retirement funds, the investment return assumption is 6.50%.

The LDROM is meant to approximately represent the lump sum cost to a plan to purchase low-default-risk fixed income securities whose resulting cash flows essentially replicate in timing and amount the benefits earned (or the costs accrued) as of the measurement date. The LDROM is very dependent upon market interest rates at the time of the LDROM measurement. The lower the market interest rates, the higher the LDROM, and vice versa. The LDROM results presented in this report are based on the entry age actuarial cost method and discount rates based upon the intermediate rate from the FTSE Pension Discount Curve and Liability Index published by the Society of Actuaries. This rate is 5.32% as of June 30, 2024. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (Valuation and LDROM) is one illustration of the savings the sponsor anticipates by taking on risk in a diversified portfolio.

Non-Hazardous Retirement Fund

Valuation Accrued Liabilities	LDROM
$15,776,491,221	$17,915,297,262

Hazardous Retirement Fund

Valuation Accrued Liabilities	LDROM
$6,070,200,056	$6,990,398,585

APPENDIX A

ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Methods and Assumptions

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

In general, the assumptions and methods used in the valuation are based on the actuarial experience study as of June 30, 2022 and adopted by the Board in May 2023.

Investment return rate:

Assumed annual rate of 6.50% net of investment expenses for the retirement funds and the insurance funds

Price Inflation:

Assumed annual rate of 2.50%

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

Assumed annual rate of 2.00%

Rates of Annual Salary Increase:

Assumed rates of annual salary increases are shown below.

Service Years	Annual Rates of Salary Increase					
	Merit & seniority		Price Inflation & Productivity		Total Increase	
	Non-Hazardous	Hazardous	Non-Hazardous	Hazardous	Non-Hazardous	Hazardous
0	7.00%	15.50%	3.30%	3.55%	10.30%	19.05%
1	4.00%	5.50%	3.30%	3.55%	7.30%	9.05%
2	3.00%	3.50%	3.30%	3.55%	6.30%	7.05%
3	2.00%	2.50%	3.30%	3.55%	5.30%	6.05%
4	1.75%	2.25%	3.30%	3.55%	5.05%	5.80%
5	1.50%	2.00%	3.30%	3.55%	4.80%	5.55%
6	1.25%	2.00%	3.30%	3.55%	4.55%	5.55%
7	1.00%	1.50%	3.30%	3.55%	4.30%	5.05%
8	0.75%	1.50%	3.30%	3.55%	4.05%	5.05%
9	0.75%	1.00%	3.30%	3.55%	4.05%	4.55%
10	0.50%	1.00%	3.30%	3.55%	3.80%	4.55%
11	0.50%	0.50%	3.30%	3.55%	3.80%	4.05%
12	0.25%	0.50%	3.30%	3.55%	3.55%	4.05%
13	0.25%	0.50%	3.30%	3.55%	3.55%	4.05%
14	0.25%	0.25%	3.30%	3.55%	3.55%	3.80%
15	0.00%	0.25%	3.30%	3.55%	3.30%	3.80%
16 & 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.

	Non-Hazardous					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]
Age	Male	Female	Male	Female	Service			
Under 45	35.0%	27.0%			5	17.0%		
45	35.0%	27.0%			6	17.0%		
46	35.0%	27.0%			7	17.0%		
47	35.0%	27.0%			8	17.0%		
48	35.0%	27.0%			9	17.0%		
49	35.0%	27.0%			10	17.0%		
50	30.0%	27.0%			11	17.0%		
51	30.0%	27.0%			12	17.0%		
52	30.0%	27.0%			13	17.0%		
53	30.0%	27.0%			14	17.0%		
54	30.0%	27.0%			15	17.0%		
55	30.0%	27.0%	4.0%	5.0%	16	17.0%		
56	30.0%	27.0%	4.0%	5.0%	17	17.0%		
57	30.0%	27.0%	4.0%	5.0%	18	17.0%		
58	30.0%	27.0%	4.0%	5.0%	19	17.0%		
59	30.0%	27.0%	4.0%	5.0%	20	30.0%		
60	30.0%	27.0%	4.0%	8.0%	21	22.5%		
61	30.0%	27.0%	4.0%	9.0%	22	18.0%		
62	30.0%	40.0%	15.0%	20.0%	23	21.0%		
63	30.0%	35.0%	15.0%	18.0%	24	24.0%		
64	30.0%	30.0%	15.0%	16.0%	25	27.0%	21.6%	16.0%
65	30.0%	30.0%			26	30.0%	24.0%	16.0%
66	30.0%	27.0%			27	33.0%	26.4%	16.0%
67	30.0%	27.0%			28	36.0%	28.8%	16.0%
68	30.0%	27.0%			29	39.0%	31.2%	16.0%
69	30.0%	27.0%			30+	39.0%	31.2%	100.0%
70	30.0%	27.0%						
71	30.0%	27.0%						
72	30.0%	27.0%						
73	30.0%	27.0%						
74	30.0%	27.0%						
75	100.0%	100.0%						

[1] The annual rate of retirement is 11% for male members and 12% for female members with 25-26 years of service.
[2] The annual rate of retirement is 100% at age 62.
[3] The annual rate of retirement is 100% at age 60.
Non-Hazardous: There is a 1% increase in the first two years a member becomes eligible under the age of 65. 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: 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 62 to reflect the different retiree health insurance benefit.

Disability rates:

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

Age	Non-Hazardous		Hazardous	
	Male	Female	Male	Female
20	0.04%	0.04%	0.06%	0.06%
30	0.06%	0.06%	0.11%	0.11%
40	0.13%	0.13%	0.24%	0.24%
50	0.37%	0.37%	0.67%	0.67%
60	0.97%	0.97%	1.75%	1.75%

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%	20.00%
2	17.92%	10.48%
3	14.35%	8.33%
4	12.26%	7.06%
5	10.78%	6.18%
6	9.63%	5.47%
7	8.69%	4.91%
8	7.90%	4.43%
9	7.21%	4.01%
10	6.60%	3.66%
11	6.06%	3.32%
12	5.57%	3.02%
13	5.12%	2.76%
14	4.70%	2.51%
15	4.32%	2.28%
16	3.97%	2.07%
17	3.63%	1.86%
18	3.32%	1.68%
19	3.04%	1.50%
20	2.75%	1.33%
21	2.48%	0.00%
22	2.23%	0.00%
23	2.00%	0.00%
24	1.77%	0.00%
25	1.55%	0.00%
26 & Over	0.00%	0.00%

Mortality Assumption:

Pre-retirement mortality: PUB-2010 General Mortality table, for the non-hazardous funds, and the PUB-2010 Public Safety Mortality table for the hazardous funds, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010.

Post-retirement mortality (non-disabled): System-specific mortality table based on mortality experience from 2013-2022, projected with the ultimate rates from MP-2020 mortality improvement scale using a base year of 2023.

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**				
	2025	**2030**	**2035**	**2040**	**2045**
Male	19.8	20.2	20.6	21.0	21.3
Female	22.4	22.7	23.1	23.4	23.7

Post-retirement mortality (disabled): PUB-2010 Disabled Mortality table, with rates multiplied by 150% for both male and female rates, projected with the ultimate rates from the MP-2020 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: 50% 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]
2026	7.10%	8.00%	1.50%
2027	7.00%	8.00%	1.50%
2028	6.80%	8.00%	1.50%
2029	6.60%	7.50%	1.50%
2030	6.40%	7.00%	1.50%
2031	6.20%	6.50%	1.50%
2032	6.00%	6.00%	1.50%
2033	5.80%	5.50%	1.50%
2034	5.60%	5.00%	1.50%
2035	5.40%	4.50%	1.50%
2036	5.20%	4.25%	1.50%
2037	5.00%	4.25%	1.50%
2038	4.75%	4.25%	1.50%
2039	4.50%	4.25%	1.50%
2040 & Beyond	4.25%	4.25%	1.50%

[1]All increases are assumed to occur on January 1. The 2025 premiums were known at the time of the valuation and were incorporated into the liability measurement
[2]Applies 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 – 4.25%
- 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]	5%	LivingWell Basic	4%
Essential Plan	7%	LivingWell CDHP	35%
Premium Plan	88%	LivingWell PPO	61%

[1] Includes 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.

- 75% of future retirees, with hazardous service, are assumed to elect spouse health care coverage. No dependent coverage is assumed for members who only have non-hazardous service. 100% of spouses with health care coverage are assumed to continue coverage after the member's death.

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 terminate 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 6.75%. The interest crediting rate after a member terminates employment is 4%.

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 Fund): 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.

13. The additional $5 per year of service insurance dollar subsidy effective January 1, 2023 is assumed to be paid in all applicable years.

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:

In conjunction with the review of 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 increased as a result of our review.

Development of Baseline Claims Cost

For non-Medicare retirees, the initial per capita costs were based on the plan premiums effective January 1, 2025, 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 $1,104.08 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.

2025 Monthly Costs for Those Not Eligible for Medicare		
Age	Member	Spouse/Dependents
<65	$939.54	$1,104.08

For Medicare retirees, the initial per capita costs were estimated based on the plan premiums effective January 1, 2025, 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.

2025 Monthly Costs for Those Eligible for Medicare		
Age	Male	Female
65	$ 121.05	$ 114.17
75	141.62	138.19
85	149.75	151.51

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

The percentage of the insurance premium paid by CERS is calculated based on the Medical Only premium amounts. The majority of CERS Medicare retirees are covered under the Premium Medicare Advantage plan. Because the premiums for the Medical Only plan are higher than the Premium Medical Advantage plan, retirees with less than 20 years of service pay a smaller contribution toward their insurance coverage. To model the impact of the employer contribution being based on the Medical Only Plan rather than the plan selected by the retiree, the employer share for retirees qualifying for percentage-based subsidies was blended to reflect retiree plan selection.

The above assumption implicitly implies that the Medical Only plan premiums will increase at a rate of 4.80% as of January 1, 2025, decreasing over 6 years to an ultimate trend rate of 4.25%, and that the remaining Medicare plan premiums will increase at the Medicare trend assumption used in the actuarial valuation.

Blake Orth 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.

Blake Orth

Blake Orth, FSA, EA, MAAA

APPENDIX B

BENEFIT PROVISIONS

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

CERS Non-Hazardous Employees

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

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

CERS Non-Hazardous Employees (continued)

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

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

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

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

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

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

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

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

CERS Non-Hazardous Employees (continued)

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

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

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

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

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

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

Disability Retirement: Participation before 8/1/2004

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

CERS Non-Hazardous Employees (continued)

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

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

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

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

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.

CERS 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 in Non-Hazardous Retirement Benefits since the Prior Valuation

There have been no changes in benefits since the prior valuation.

CERS Hazardous Employees

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

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

CERS Hazardous Employees (continued)

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

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

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

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

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

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

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

CERS Hazardous Employees (continued)

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

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

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

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

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

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

Disability Retirement: Participation before 8/1/2004

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

CERS Hazardous Employees (continued)

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

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

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

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

Line of Duty Disability Benefit

Disability Benefit	If the disability is a direct result of an act in the line of duty, the benefit shall not be less than 25% of the member's final monthly 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.

CERS 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 in Hazardous Retirement Benefits since the Prior Valuation

There have been no changes in benefits since the prior valuation.

Summary of Main Retiree Insurance Benefit Provisions

Insurance: 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: Participation began on or after 7/1/2003

Benefit Eligibility

Recipient of a retirement allowance with at least 120 months of service at retirement (180 months if participation began on or after 9/1/2008)

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, 2024, the Non-Hazardous monthly contribution was $14.63/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.

Effective January 1, 2023, members will receive an additional dollar contribution of $5 for every year of non-hazardous service a member attains over 27 years. This additional dollar contribution does not increase by 1.5% annually and is only payable for non-Medicare retirees. Also, it is only payable when the applicable insurance fund is at least 90% funded on an actuarial value of asset basis as of the last actuarial valuation.

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, 2024, the Hazardous monthly contribution was $21.94/year of service. Upon the retiree's death, the surviving spouse of a hazardous duty member will receive a monthly contribution of $10 ($14.63 as of July 1, 2024) for each year of hazardous service.

Effective January 1, 2023, members will receive an additional dollar contribution of $5 for every year of hazardous service a Tier 1 member attains over 20 years and a Tier 2 member attains 25 years. This additional dollar contribution does not increase by 1.5% annually and is only payable for non-Medicare retirees. Also, it is only payable when the applicable insurance fund is at least 90% funded on an actuarial value of asset basis as of the last actuarial valuation.

Duty Disability Retirement

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.

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.

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.

Monthly Health Plan Premiums – Effective January 1, 2025

Non-Medicare Plan Options					
Plan Option	Single	Parent Plus	Couple	Family	Family X-Ref
LivingWell PPO	$949.04	$1,320.40	$1,981.62	$2,185.78	$1,126.28
LivingWell CDHP	930.76	1,269.28	1,866.24	2,078.08	1,068.66
LivingWell Basic	901.04	1,234.80	1,863.04	2,069.88	1,057.40
LivingWell HDHP	835.42	1,144.86	1,727.36	1,919.14	980.38

Medicare Plan Options	
Medical Only Plan	$191.95
Essential Mirror Plan	202.69
Premium Mirror Plan	341.59
Essential Medical Advantage Plan	0.00
Premium Medical Advantage Plan	144.91

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

Dollar Contribution Amount for Participation on or after 7/1/2003

Monthly contribution amounts per year of service as of July 1, 2024.

Non-Hazardous Service	Hazardous Service
$14.63	$21.94

Changes in Health Insurance Benefits Since the Prior Valuation

None.

APPENDIX C

GLOSSARY

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GASB: Governmental Accounting Standards Board.

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

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

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

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

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

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

P: 469.524.0000 | www.grsconsulting.com

October 30, 2024

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

Re: Sensitivity Analysis Based on Results of the June 30, 2024 Actuarial Valuation – CERS

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 **County Employees Retirement System (CERS)** 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 6.50% for the non-hazardous and hazardous retirement and 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 2.50% 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.

5605 North MacArthur Boulevard | Suite 870 | Irving, Texas 75038-2631

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October 30, 2024
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Payroll Growth Assumption

Participating employers of CERS make contributions to the system as a percentage of 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 rates 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 2.00% for all the CERS retirement and insurance funds. The analysis shows the impact of a 1.00% increase and a 1.00% decrease in the payroll growth assumption.

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, 2024 actuarial valuation report. Please refer to the June 30, 2024 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.

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To the best of our knowledge, this report is complete and accurate and is in accordance with generally recognized actuarial practices and methods. Mr. White and Ms. Shaw are Enrolled Actuaries. All three of the undersigned are members of the American Academy of Actuaries and meet all of the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. In addition, all three are independent of KPPA and 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

Krysti Kiesel, ASA, 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	2.00%	2.00%	2.00%
Inflation Rate	2.50%	2.50%	2.50%
Discount Rate - Retirement	5.50%	6.50%	7.50%
Discount Rate - Insurance	5.50%	6.50%	7.50%
Retirement			
Actuarial Accrued Liability	$ 17,557,775	$ 15,776,491	$ 14,301,282
Actuarial Value of Assets	9,211,735	9,211,735	9,211,735
Unfunded Actuarial Accrued Liability	8,346,040	6,564,756	5,089,547
Funded Ratio	52.5%	58.4%	64.4%
Actuarially Determined Contribution Rate	23.69%	18.62%	14.37%
Insurance			
Actuarial Accrued Liability	$ 3,258,997	$ 2,901,345	$ 2,603,501
Actuarial Value of Assets	3,549,422	3,549,422	3,549,422
Unfunded Actuarial Accrued Liability	(290,425)	(648,077)	(945,921)
Funded Ratio	108.9%	122.3%	136.3%
Actuarially Determined Contribution Rate	0.79%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	$ 20,816,772	$ 18,677,836	$ 16,904,783
Actuarial Value of Assets	12,761,157	12,761,157	12,761,157
Unfunded Actuarial Accrued Liability	8,055,615	5,916,679	4,143,626
Funded Ratio	61.3%	68.3%	75.5%
Actuarially Determined Contribution Rate	24.48%	18.62%	14.37%

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

	Decrease Inflation Rate	Valuation Results	Increase Inflation Rate
(1)	(2)	(3)	(4)
Payroll Growth Rate	1.75%	2.00%	2.25%
Inflation Rate	2.25%	2.50%	2.75%
Discount Rate - Retirement	6.25%	6.50%	6.75%
Discount Rate - Insurance	6.25%	6.50%	6.75%
Retirement			
Actuarial Accrued Liability	$ 16,152,914	$ 15,776,491	$ 15,416,531
Actuarial Value of Assets	9,211,735	9,211,735	9,211,735
Unfunded Actuarial Accrued Liability	6,941,179	6,564,756	6,204,796
Funded Ratio	57.0%	58.4%	59.8%
Actuarially Determined Contribution Rate	19.93%	18.62%	17.39%
Insurance			
Actuarial Accrued Liability	$ 2,943,943	$ 2,901,345	$ 2,861,190
Actuarial Value of Assets	3,549,422	3,549,422	3,549,422
Unfunded Actuarial Accrued Liability	(605,479)	(648,077)	(688,232)
Funded Ratio	120.6%	122.3%	124.1%
Actuarially Determined Contribution Rate	0.00%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	$ 19,096,857	$ 18,677,836	$ 18,277,721
Actuarial Value of Assets	12,761,157	12,761,157	12,761,157
Unfunded Actuarial Accrued Liability	6,335,700	5,916,679	5,516,564
Funded Ratio	66.8%	68.3%	69.8%
Actuarially Determined Contribution Rate	19.93%	18.62%	17.39%

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

	Decrease Payroll Growth	Valuation Results	Increase Payroll Growth
(1)	(2)	(3)	(4)
Payroll Growth Rate	1.00%	2.00%	3.00%
Inflation Rate	2.50%	2.50%	2.50%
Discount Rate - Retirement	6.50%	6.50%	6.50%
Discount Rate - Insurance	6.50%	6.50%	6.50%
Retirement			
Actuarial Accrued Liability	$ 15,776,491	$ 15,776,491	$ 15,776,491
Actuarial Value of Assets	9,211,735	9,211,735	9,211,735
Unfunded Actuarial Accrued Liability	6,564,756	6,564,756	6,564,756
Funded Ratio	58.4%	58.4%	58.4%
Actuarially Determined Contribution Rate	20.10%	18.62%	17.25%
Insurance			
Actuarial Accrued Liability	$ 2,901,345	$ 2,901,345	$ 2,901,345
Actuarial Value of Assets	3,549,422	3,549,422	3,549,422
Unfunded Actuarial Accrued Liability	(648,077)	(648,077)	(648,077)
Funded Ratio	122.3%	122.3%	122.3%
Actuarially Determined Contribution Rate	0.00%	0.00%	0.00%
Combined			
Actuarial Accrued Liability	$ 18,677,836	$ 18,677,836	$ 18,677,836
Actuarial Value of Assets	12,761,157	12,761,157	12,761,157
Unfunded Actuarial Accrued Liability	5,916,679	5,916,679	5,916,679
Funded Ratio	68.3%	68.3%	68.3%
Actuarially Determined Contribution Rate	20.10%	18.62%	17.25%

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	2.00%	2.00%	2.00%
Inflation Rate	2.50%	2.50%	2.50%
Discount Rate - Retirement	5.50%	6.50%	7.50%
Discount Rate - Insurance	5.50%	6.50%	7.50%
Retirement			
Actuarial Accrued Liability	$ 6,835,262	$ 6,070,201	$ 5,453,949
Actuarial Value of Assets	3,279,623	3,279,623	3,279,623
Unfunded Actuarial Accrued Liability	3,555,639	2,790,578	2,174,326
Funded Ratio	48.0%	54.0%	60.1%
Actuarially Determined Contribution Rate	43.69%	34.00%	26.24%
Insurance			
Actuarial Accrued Liability	$ 1,855,592	$ 1,668,057	$ 1,511,995
Actuarial Value of Assets	1,676,141	1,676,141	1,676,141
Unfunded Actuarial Accrued Liability	179,451	(8,084)	(164,146)
Funded Ratio	90.3%	100.5%	110.9%
Actuarially Determined Contribution Rate	4.65%	1.73%	0.00%
Combined			
Actuarial Accrued Liability	$ 8,690,854	$ 7,738,258	$ 6,965,944
Actuarial Value of Assets	4,955,764	4,955,764	4,955,764
Unfunded Actuarial Accrued Liability	3,735,090	2,782,494	2,010,180
Funded Ratio	57.0%	64.0%	71.1%
Actuarially Determined Contribution Rate	48.34%	35.73%	26.24%

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	1.75%	2.00%	2.25%
Inflation Rate	2.25%	2.50%	2.75%
Discount Rate - Retirement	6.25%	6.50%	6.75%
Discount Rate - Insurance	6.25%	6.50%	6.75%
Retirement			
Actuarial Accrued Liability	$ 6,231,596	$ 6,070,201	$ 5,918,928
Actuarial Value of Assets	3,279,623	3,279,623	3,279,623
Unfunded Actuarial Accrued Liability	2,951,973	2,790,578	2,639,305
Funded Ratio	52.6%	54.0%	55.4%
Actuarially Determined Contribution Rate	36.44%	34.00%	31.78%
Insurance			
Actuarial Accrued Liability	$ 1,685,228	$ 1,668,057	$ 1,651,877
Actuarial Value of Assets	1,676,141	1,676,141	1,676,141
Unfunded Actuarial Accrued Liability	9,087	(8,084)	(24,264)
Funded Ratio	99.5%	100.5%	101.5%
Actuarially Determined Contribution Rate	2.10%	1.73%	1.39%
Combined			
Actuarial Accrued Liability	$ 7,916,824	$ 7,738,258	$ 7,570,805
Actuarial Value of Assets	4,955,764	4,955,764	4,955,764
Unfunded Actuarial Accrued Liability	2,961,060	2,782,494	2,615,041
Funded Ratio	62.6%	64.0%	65.5%
Actuarially Determined Contribution Rate	38.54%	35.73%	33.17%

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

	Decrease Payroll Growth	Valuation Results	Increase Payroll Growth
(1)	(2)	(3)	(4)
Payroll Growth Rate	1.00%	2.00%	3.00%
Inflation Rate	2.50%	2.50%	2.50%
Discount Rate - Retirement	6.50%	6.50%	6.50%
Discount Rate - Insurance	6.50%	6.50%	6.50%
Retirement			
Actuarial Accrued Liability	$ 6,070,201	$ 6,070,201	$ 6,070,201
Actuarial Value of Assets	3,279,623	3,279,623	3,279,623
Unfunded Actuarial Accrued Liability	2,790,578	2,790,578	2,790,578
Funded Ratio	54.0%	54.0%	54.0%
Actuarially Determined Contribution Rate	36.62%	34.00%	31.55%
Insurance			
Actuarial Accrued Liability	$ 1,668,057	$ 1,668,057	$ 1,668,057
Actuarial Value of Assets	1,676,141	1,676,141	1,676,141
Unfunded Actuarial Accrued Liability	(8,084)	(8,084)	(8,084)
Funded Ratio	100.5%	100.5%	100.5%
Actuarially Determined Contribution Rate	1.76%	1.73%	1.72%
Combined			
Actuarial Accrued Liability	$ 7,738,258	$ 7,738,258	$ 7,738,258
Actuarial Value of Assets	4,955,764	4,955,764	4,955,764
Unfunded Actuarial Accrued Liability	2,782,494	2,782,494	2,782,494
Funded Ratio	64.0%	64.0%	64.0%
Actuarially Determined Contribution Rate	38.38%	35.73%	33.27%

Kentucky Public Pensions Authority
CERS 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	Employer Actuarially Determined Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2024	$ 15,776	$ 9,212	$ 6,564	58%	$ 618	$ 157	$ 3,138	19.71%	19.71%
2025	16,108	9,819	6,289	61%	596	160	3,201	18.62%	18.62%
2026	16,414	10,119	6,295	62%	583	163	3,265	17.85%	17.85%
2027	16,702	10,595	6,107	63%	594	166	3,330	17.83%	17.83%
2028	16,971	11,006	5,965	65%	588	170	3,396	17.32%	17.32%
2029	17,224	11,311	5,913	66%	589	173	3,464	17.00%	17.00%
2030	17,462	11,607	5,855	67%	598	177	3,534	16.91%	16.91%
2031	17,688	11,902	5,786	67%	607	180	3,604	16.83%	16.83%
2032	17,906	12,202	5,704	68%	617	184	3,676	16.77%	16.77%
2033	18,118	12,511	5,607	69%	626	187	3,750	16.70%	16.70%
2034	18,327	12,831	5,496	70%	637	191	3,825	16.65%	16.65%
2035	18,548	13,179	5,369	71%	648	195	3,901	16.61%	16.61%
2036	18,772	13,549	5,223	72%	659	199	3,980	16.57%	16.57%
2037	19,004	13,945	5,059	73%	671	203	4,059	16.54%	16.54%
2038	19,251	14,377	4,874	75%	684	207	4,140	16.52%	16.52%
2039	19,517	14,849	4,668	76%	697	211	4,223	16.50%	16.50%
2040	19,805	15,368	4,437	78%	702	215	4,308	16.30%	16.30%
2041	20,119	15,930	4,189	79%	751	220	4,394	17.10%	17.10%
2042	20,460	16,583	3,877	81%	729	224	4,482	16.27%	16.27%
2043	20,833	17,261	3,572	83%	846	229	4,571	18.51%	18.51%
2044	21,238	18,109	3,129	85%	871	233	4,663	18.68%	18.68%
2045	21,677	19,041	2,636	88%	917	238	4,756	19.29%	19.29%
2046	22,152	20,085	2,067	91%	930	243	4,851	19.17%	19.17%
2047	22,664	21,213	1,451	94%	969	247	4,948	19.58%	19.58%
2048	23,215	22,456	759	97%	999	252	5,047	19.80%	19.80%
2049	23,806	23,806	-	100%	214	257	5,148	4.15%	4.15%
2050	24,439	24,439	-	100%	218	263	5,251	4.16%	4.16%
2051	25,114	25,114	-	100%	223	268	5,356	4.16%	4.16%
2052	25,833	25,833	-	100%	227	273	5,463	4.16%	4.16%
2053	26,595	26,595	-	100%	232	279	5,572	4.16%	4.16%

Notes and assumptions:

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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 remain level throughout the entire projection.
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Kentucky Public Pensions Authority
CERS 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)
2024	$ 6,070	$ 3,280	$ 2,790	54%	$ 271	$ 59	$ 743	36.49%	36.49%
2025	6,249	3,565	2,684	57%	258	61	758	34.00%	34.00%
2026	6,419	3,741	2,678	58%	254	62	773	32.80%	32.80%
2027	6,584	3,981	2,603	61%	258	63	789	32.66%	32.66%
2028	6,746	4,201	2,545	62%	256	64	804	31.82%	31.82%
2029	6,906	4,389	2,517	64%	256	66	820	31.25%	31.25%
2030	7,067	4,581	2,486	65%	260	67	837	31.07%	31.07%
2031	7,232	4,782	2,450	66%	264	68	854	30.92%	30.92%
2032	7,403	4,995	2,408	68%	268	70	871	30.79%	30.79%
2033	7,582	5,223	2,359	69%	272	71	888	30.67%	30.67%
2034	7,770	5,468	2,302	70%	277	72	906	30.58%	30.58%
2035	7,969	5,730	2,239	72%	282	74	924	30.49%	30.49%
2036	8,175	6,008	2,167	74%	287	75	942	30.40%	30.40%
2037	8,388	6,302	2,086	75%	291	77	961	30.31%	30.31%
2038	8,606	6,611	1,995	77%	296	78	981	30.21%	30.21%
2039	8,826	6,932	1,894	79%	301	80	1,000	30.12%	30.12%
2040	9,051	7,269	1,782	80%	294	82	1,020	28.78%	28.78%
2041	9,282	7,610	1,672	82%	301	83	1,041	28.88%	28.88%
2042	9,520	7,973	1,547	84%	304	85	1,061	28.60%	28.60%
2043	9,767	8,353	1,414	86%	337	87	1,083	31.15%	31.15%
2044	10,022	8,785	1,237	88%	348	88	1,104	31.47%	31.47%
2045	10,284	9,244	1,040	90%	364	90	1,126	32.35%	32.35%
2046	10,551	9,736	815	92%	370	92	1,149	32.21%	32.21%
2047	10,823	10,253	570	95%	385	94	1,172	32.82%	32.82%
2048	11,101	10,804	297	97%	396	96	1,195	33.16%	33.16%
2049	11,385	11,385	-	100%	86	98	1,219	7.03%	7.03%
2050	11,675	11,675	-	100%	88	99	1,244	7.04%	7.04%
2051	11,972	11,972	-	100%	89	101	1,268	7.05%	7.05%
2052	12,276	12,276	-	100%	91	104	1,294	7.06%	7.06%
2053	12,585	12,585	-	100%	93	106	1,320	7.06%	7.06%

Notes and assumptions:

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The total active population is assumed to remain level throughout the entire projection.
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Kentucky Public Pensions Authority
CERS 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	Employer Actuarially Determined Contribution
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2024	$ 2,901	$ 3,549	$ (648)	122%	$ -	$ 21	$ 3,107	0.00%	0.00%
2025	3,009	3,741	(732)	124%	-	22	3,169	0.00%	0.00%
2026	3,109	3,831	(722)	123%	-	24	3,232	0.00%	0.00%
2027	3,201	3,993	(792)	125%	-	25	3,297	0.00%	0.00%
2028	3,284	4,124	(840)	126%	-	27	3,363	0.00%	0.00%
2029	3,360	4,215	(855)	125%	-	29	3,430	0.00%	0.00%
2030	3,428	4,303	(875)	126%	-	30	3,499	0.00%	0.00%
2031	3,489	4,387	(898)	126%	-	31	3,569	0.00%	0.00%
2032	3,545	4,469	(924)	126%	-	33	3,640	0.00%	0.00%
2033	3,599	4,552	(953)	127%	-	34	3,713	0.00%	0.00%
2034	3,652	4,638	(986)	127%	-	36	3,787	0.00%	0.00%
2035	3,706	4,728	(1,022)	128%	-	37	3,863	0.00%	0.00%
2036	3,765	4,826	(1,061)	128%	-	38	3,940	0.00%	0.00%
2037	3,829	4,932	(1,103)	129%	-	39	4,019	0.00%	0.00%
2038	3,898	5,046	(1,148)	130%	-	40	4,099	0.00%	0.00%
2039	3,973	5,169	(1,196)	130%	-	41	4,181	0.00%	0.00%
2040	4,054	5,303	(1,249)	131%	-	42	4,265	0.00%	0.00%
2041	4,142	5,446	(1,304)	132%	-	43	4,350	0.00%	0.00%
2042	4,236	5,599	(1,363)	132%	-	44	4,437	0.00%	0.00%
2043	4,336	5,762	(1,426)	133%	-	45	4,526	0.00%	0.00%
2044	4,443	5,936	(1,493)	134%	-	46	4,616	0.00%	0.00%
2045	4,555	6,120	(1,565)	134%	-	47	4,709	0.00%	0.00%
2046	4,672	6,313	(1,641)	135%	-	48	4,803	0.00%	0.00%
2047	4,792	6,515	(1,723)	136%	-	49	4,899	0.00%	0.00%
2048	4,916	6,727	(1,811)	137%	-	50	4,997	0.00%	0.00%
2049	5,043	6,946	(1,903)	138%	-	51	5,097	0.00%	0.00%
2050	5,172	7,174	(2,002)	139%	-	52	5,199	0.00%	0.00%
2051	5,302	7,409	(2,107)	140%	-	53	5,303	0.00%	0.00%
2052	5,433	7,654	(2,221)	141%	-	54	5,409	0.00%	0.00%
2053	5,566	7,907	(2,341)	142%	-	55	5,517	0.00%	0.00%

Notes and assumptions:

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Kentucky Public Pensions Authority
CERS 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)
2024	$ 1,668	$ 1,676	$ (8)	101%	$ 16	$ 5	$ 739	2.12%	2.12%
2025	1,691	1,740	(49)	103%	13	5	754	1.73%	1.73%
2026	1,709	1,749	(40)	102%	7	6	769	0.95%	0.95%
2027	1,719	1,782	(63)	104%	6	6	785	0.78%	0.78%
2028	1,723	1,796	(73)	104%	2	7	800	0.26%	0.26%
2029	1,723	1,787	(64)	104%	-	7	816	0.00%	0.00%
2030	1,721	1,774	(53)	103%	-	7	833	0.00%	0.00%
2031	1,716	1,757	(41)	102%	-	8	849	0.00%	0.00%
2032	1,707	1,737	(30)	102%	-	8	866	0.00%	0.00%
2033	1,697	1,714	(17)	101%	-	8	884	0.00%	0.00%
2034	1,687	1,691	(4)	100%	-	9	901	0.00%	0.00%
2035	1,676	1,667	9	100%	-	9	919	0.00%	0.00%
2036	1,669	1,645	24	99%	-	9	938	0.00%	0.00%
2037	1,666	1,626	40	98%	-	9	956	0.00%	0.00%
2038	1,666	1,610	56	97%	-	10	976	0.00%	0.00%
2039	1,671	1,597	74	96%	-	10	995	0.00%	0.00%
2040	1,682	1,588	94	94%	-	10	1,015	0.00%	0.00%
2041	1,697	1,583	114	93%	4	10	1,035	0.40%	0.40%
2042	1,717	1,586	131	92%	39	11	1,056	3.65%	3.65%
2043	1,742	1,628	114	94%	37	11	1,077	3.42%	3.42%
2044	1,772	1,674	98	95%	38	11	1,099	3.44%	3.44%
2045	1,806	1,726	80	96%	44	11	1,121	3.92%	3.92%
2046	1,841	1,787	54	97%	44	11	1,143	3.85%	3.85%
2047	1,878	1,851	27	99%	49	12	1,166	4.16%	4.16%
2048	1,915	1,915	-	100%	51	12	1,189	4.31%	4.31%
2049	1,953	1,953	-	100%	7	12	1,213	0.54%	0.54%
2050	1,990	1,990	-	100%	7	12	1,237	0.54%	0.54%
2051	2,027	2,027	-	100%	7	13	1,262	0.54%	0.54%
2052	2,064	2,064	-	100%	7	13	1,287	0.56%	0.56%
2053	2,101	2,101	-	100%	8	13	1,313	0.58%	0.58%

Notes and assumptions:

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KENTUCKY PUBLIC PENSIONS AUTHORITY
Ryan Barrow, Executive Director
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Kentucky Public Pensions Authority

TO: Members of the CERS Board of Trustees

FROM: Joint CERS & KRS Retiree Health Plan Committee

DATE: November 4, 2024

SUBJECT: Joint CERS & KRS Retiree Health Plan Committee Report

The Joint CERS & KRS Retiree Health Plan Committee met on Monday, October 21, 2024, and reviewed an informational presentation from Humana regarding 2025 Pharmacy Review and Pharmacogenomics.

2025 Formulary changes:
- Prior authorization changes impact 8,347 (13.6%) members.
- Negative tier changes impact 1,780 (2.9%) members (253 had no cost impact).
- Positive tier changes impact 1,436 (2.3%) members.
- Step therapy changes impact 425 (0.7%) members.

Humana also presented information on their Medicare Advantage Pharmacogenomics Pilot. The presentation included general information about the pilot, what Medicare covers and does not cover, and discussed the data used to evaluate the value of genetic testing to guide therapy decisions. The pilot evaluated the impact on longer term outcomes such as medication adherence, hospital admissions, readmissions, and cost of care. They sent 11,115 letters with test kits to Humana participants and 1,043 individuals completed the tests which resulted in 9.4% participation rate. The outcomes lacked statistical significance to demonstrate positive impacts and value, therefore, Humana has no current plans to introduce Pharmacogenomics at this time.

The Division of Retiree Health Care (RHC) presented information on 2025 Non-Medicare Open Enrollment (OE) stats through October 13, 2024. This year is not a mandatory enrollment; therefore, members only have to submit an application if they want to change their coverage for 2025. RHC has conducted several member outreach engagements across the state. OE reminder emails were delivered to 22,927 recipients. Additionally, RHC staff has answered 2,235 phone calls and responded to 75 emails, as well as, seeing scheduled in-person visitors and virtual appointments. Online Enrollments are basically flat between this year and last with 1,256 enrollments completed this year. Webinars have continued to be a successful form of communication with members. Medicare OE began Monday, October 21, 2024, and webinars will be provided to retirees enrolled in the Humana Medicare plans during the last week of October and first week of November. RHC is attending retiree group meetings at numerous locations throughout the state during October and November in partnership with Humana.

MEMORANDUM

TO: County Employees Retirement System Board of Trustees

From: Dr. Merl Hackbart, Chair
Investment Committee

Date: November 4, 2024

Subject: Summary of Investment Committee Special Meeting

The County Employees Retirement System Investment Committee held a special meeting on October 22, 2024, to determine whether to invest in the Kayne Anderson Energy Fund Continuation Vehicle are seek redemption of funds from the Kayne Anderson Fund VII of KPPA funds invested.

1. **The following item was approved by the Investment Committee and submitted to the Investment Office for appropriate action.**

   a. **Kayne Anderson Energy Fund Continuation Vehicle-- The Investment Committee approved by unanimous vote the investment of CERS funds in the Kayne Anderson Continuation Vehicle. Given the exigent circumstances presented by the short due diligence period afforded the Committee, the Committee exercised its authority under the IPS to directly approve the recommendation of the Investment Office without CERS Board ratification.**

RECOMMENDATION: The Investment Committee requests the County Employees Retirement System Board of Trustees take notice of the actions taken by the Investment Committee.

2. **During the special meeting the Committee considered the following information.**

   a. The Investment Office recommended, with the support of Wilshire, that the Investment Committee approve the rolling of the KPPA investment into the Continuation Vehicle. The investment originated in 2016 prior to the formation of the CERS Board in 2021. As a result, both CERS and KERS had to agree with the proposed recommendation, or the system would have needed to redeem the entire investment of approximately $25 million. It should be noted that sellers would have been charged a fifteen (15%) separation fee and have been subject to transaction fees to sell their 100% interest in the Fund.

b. There was considerable discussion by the Committee concerning the short time frame that had been given to decide whether to sell CERS' interest or roll into the Continuation Vehicle. Based on the exigent circumstances presented by the truncated timeframe to decide, the Committee decided to exercise its authority granted by the IPS to make a final determination on the recommendation and recap the issues presented to the full CERS Board at the next regularly scheduled meeting.

c. It was determined by the Committee that it would be instructive for the Investment Office to explain the timeline which led to the exigent circumstances to the entire CERS Board and to share the procedures they will implement in the event more private equity investments need expedited review. Thereby informing the CERS Board that due diligence timelines may be reduced when reviewing opportunities in this asset class.

Kentucky Public Pensions Authority

CERS Investment Committee

Kayne Anderson

Kraken Resources, LLC

October 22, 2024

KENTUCKY PUBLIC PENSIONS AUTHORITY

INVESTMENTS

To: CERS Investment Committee - CONFIDENTIAL

From: Anthony Chiu, Deputy CIO

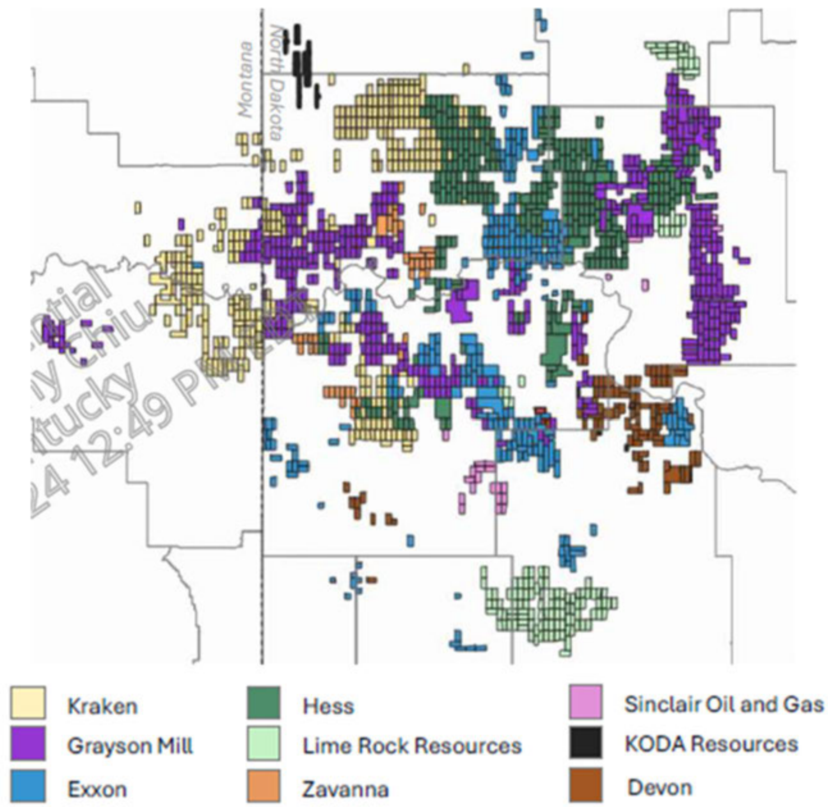
Date: October 22, 2024

Subject: Investment Recommendation – Kraken continuation vehicle

KPPA Investment Staff is proposing an investment with Kayne Anderson ("Kayne" or the "Firm") in a continuation vehicle ("CV") for Kraken Resources, LLC ("Kraken"). As of 2Q 2024, Kraken represents a 40% position in Kayne Anderson Energy Fund VII ("KAEF 7" or "Fund 7"), a 2015 vintage fund with $2.1 billion of committed capital. This includes $100 million from KPPA.

Kraken is a private energy and production company operating in the Williston Basin along the border of North Dakota and Montana.

Kayne has created a CV structure as they see compelling value in continuing to own Kraken for several years beyond Fund 7's term, which expires at the end of 2025. They project Kraken's existing assets will generate over [redacted] of cash flow over the next 4.5 years (through 2028) and that the company could be well-positioned for additional growth if it is able to opportunistically acquire additional neighboring asset portfolios that are already for sale or likely to come to market in the near future, as shown in the chart at right.



This investment opportunity is a time-sensitive one that is expected to have significant investor demand. A large institutional investor has committed to anchor the CV with [redacted] transaction price, which represents 85% of 6/30/24 NAV. Kayne's Private Energy Income Fund III (KPEIF III) is also investing in the CV along with Kayne's partners individually. They are rolling their carry proceeds from Kraken into the CV and contributing some additional new capital for a total of approximately [redacted] of internal investment that further aligns their interests with investors.

Staff believes Kraken will provide an attractive risk-adjusted return with low correlation to CERS' existing overall portfolio and provide complementary exposure within the Real Return allocation. Following the recent asset allocation update, CERS's plans are still modestly under their target portfolio weights for Real Return when proxy assets are excluded. This proposed investment would help the plans continue moving toward target weight and will be fully invested before year-end 2024.

However, because this is a continuation vehicle for a 2016 fund that was invested prior to the formation of the CERS board in 2021, KRS and CERS are tied together in the election of whether to reinvest or sell existing exposure to Kraken. If one plan chooses to reinvest and the other chooses to sell, both plans will be forced to sell since Kayne is not accepting any partial elections.

KRS Choice	CERS Choice		KPPA Election
Reinvest	Reinvest	→	Reinvest
Reinvest	Sell	→	Sell
Sell	Reinvest	→	Sell
Sell	Sell	→	Sell

Fund 7 sellers will realize a 2.5x gross multiple on their investment; transact at a price of 85% of 6/30/24 NAV; and bear transaction fees and expenses representing ~2% of NAV. Because of the deferred payment structure of the CV, even those investors electing to sell will not receive all their proceeds until late 2026 under Kayne's base case.

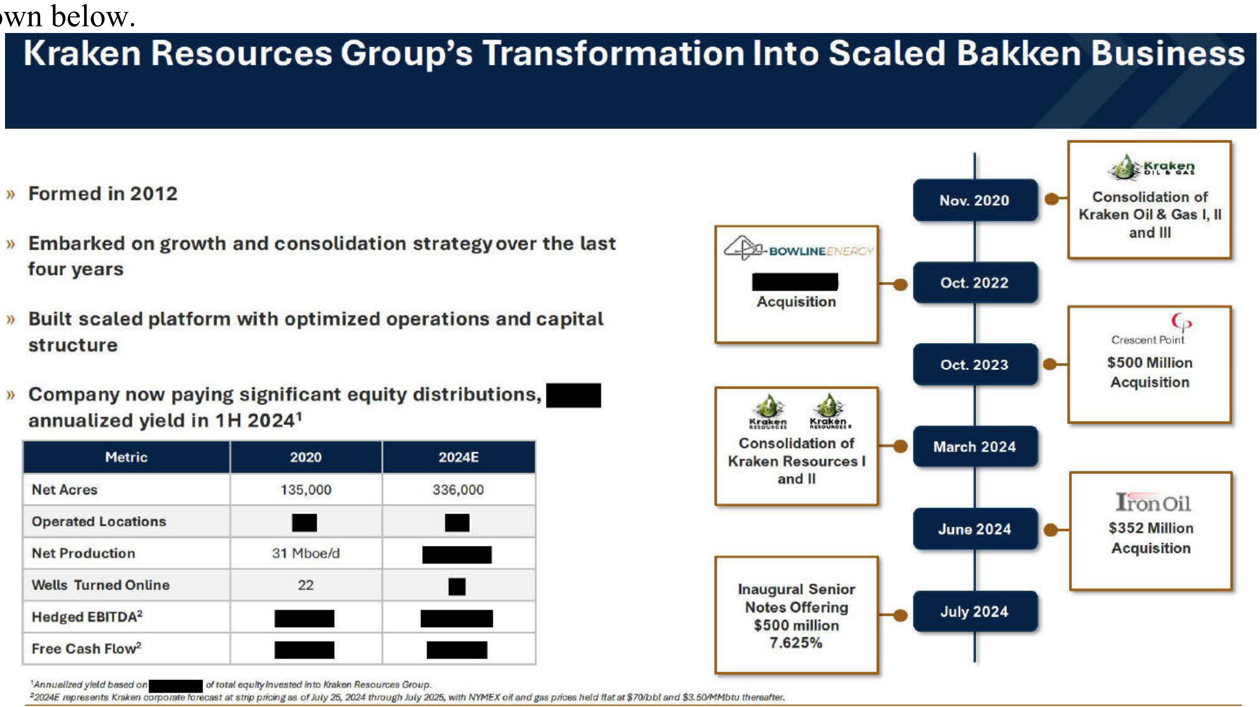
Investment Process and History:

Kraken is the combination of 3 legal companies that was formed in November 2020 amidst the difficult energy investment environment that prevailed during the first year of the COVID-19 pandemic. KPPA's exposure was through KAEF 7 in Kraken Oil and Gas II, which comprises around 40% of the remaining fund value. The company focuses on the acquisition, development, and production of assets in the Williston Basin and is the second time Kayne has partnered with this management team.

Bruce Larsen
President & CEO
24+ years of experience
Ursa · Shell · Legend Natural Gas

Brad Suddarth
Executive Vice President & CFO
25+ years of experience
Ursa · Shell · Legend Natural Gas · FBR Capital Markets

Since 2020, the Kraken team has found multiple opportunistic acquisitions and [redacted] (which they hedge) and free cash flow in just 4 years. The resulting scale that has been achieved has allowed the company to self-fund its capex, production, and significant cash flow return to investors, as shown below.



Metric	2020	2024E
Net Acres	135,000	336,000
Operated Locations	[redacted]	[redacted]
Net Production	31 Mboe/d	[redacted]
Wells Turned Online	22	[redacted]
Hedged EBITDA²	[redacted]	[redacted]
Free Cash Flow²	[redacted]	[redacted]

¹Annualized yield based on [redacted] of total equity invested into Kraken Resources Group.
²2024E represents Kraken corporate forecast at strip pricing as of July 25, 2024 through July 2025, with NYMEX oil and gas prices held flat at $70/bbl and $3.50/MMbtu thereafter.

Performance:

Kraken in KAEF 7	Invested ($ MM)	Realized ($ MM)	Unrealized ($ MM)	Total Value ($ MM)	Gross Multiple	Gross IRR
2023 2Q	$229	$47	$414	$461	2.0x	13%
2023 3Q	$229	$81	$521	$602	2.6x	17%
2023 4Q	$229	$126	$483	$609	2.7x	17%
2024 1Q	$229	$154	$482	$636	2.8x	17%
2024 2Q	$229	$196	$461	$657	2.9x	17%

Conclusion: Given Kraken's attractive cash flows, hedged commodity price risk, and current Real Return allocations, Staff is recommending that CERS rolls its existing investment of $14 million. The investment will be shared among all CERS plans pending successful legal negotiations and represents an additional ~0.1% of plan assets.

<u>Investment and Terms Summary</u>

Type of Investment: Real Return

Structure: Continuation Vehicle

Term: 5 years, with 2 one-year extensions (1 at GP discretion, 1 with Advisory Committee consent)

Management Fee: [redacted] on existing cost basis

Profit Sharing: [redacted] of profits above [redacted] compounded annual return on the increased cost basis that results from the CV

Purpose: Maintain CERS's exposure to an attractive cash flowing asset without having to sell at a 15% discount or bear transaction fees and expenses that are being charged to sellers.

Risks: Commodity price, higher than expected costs, leverage, illiquidity

Exp. Net Return: 10% - 12%

*No placement agents have been involved or will be compensated as a result of this recommendation.

Project Kryptonite - Kraken Resources Continuation Vehicle

Preliminary Diligence

General Partner	Kayne Anderson
Vintage Year	2024
Timing	October 2024
Strategy	Upstream Energy
Sector	Energy
Investment Structure	Continuation Vehicle
Region	North America
Purchase Price – Fund NAV ($M)	[redacted]
Capital Structure	[redacted] Equity
Funds' Equity ($M)	[redacted]
Net Asset Value – Company (Q2 2024)	[redacted]
LTM EBITDA (Q2 2024)	[redacted]
Base Case Returns	[redacted]
Base Case Hold	5 years
Fee* / Carry / Hurdle	Various*[redacted]

*Management fees are modeled to maintain each fund's current management fee rate and basis through the 2-year optional extension for each fund.

General Partner

Founded in 1984 by Richard Kayne, Kayne Anderson ("Kayne" or the "Firm") is a US-based alternative investment management firm specializing in real estate, credit, infrastructure, and energy. The Firm currently manages $36 billion in AUM across asset classes and employs 350 employees across the U.S. and Europe, including 150 investment professionals. Known for its expertise real estate investments, Kayne also has an established energy private equity track record, including $9 billion+ of invested capital across 130+ energy assets since inception. Kayne Energy Private Equity has a successful track record within the upstream oil and gas sector across 11 funds since 1992. The Firm launch its Energy Fund series ("KAEF") in 1998 with Kayne Anderson Energy Fund I and has raised eight funds within this series to date. Kayne launched its first Private Equity Income Funds strategy in 2014/2015, targeting acquisitions of long-life, low-risk onshore oil and gas assets.

Investment Merits

- Low entry multiple for CV investors
- High-quality, cash flowing asset with reasonable base case return assumptions
- GP alignment through GP commitment and rolling of carried interest

Investment Concerns

- KAEF VII is out of the carry and investors are likely to pay carried interest in in the new vehicle
- Extending lock up for a long-dated asset
- Unattractive low case return if oil sustains depressed pricing

Past performance is not indicative of future results.

Company & Transaction

Kraken Oil & Gas LLC was initially acquired by Kayne in May 2012 by Kayne Anderson Energy Fund V ("KAEF V"). Follow-on investments in Kraken Oil & Gas II and III LLC from Kayne Anderson Energy Funds VII and VIII ("KAEF VII" and "KAEF VIII") occurred to provide growth capital and unlever the business, respectively. Kraken Resources, LLC ("Kraken" or the "Company") was formed in November 2020 through an all-equity combination of Kraken Oil & Gas LLC, Kraken Oil & Gas II LLC, and Kraken Oil & Gas III LLC, which were portfolio investments in Kayne Anderson Energy Funds V, VII, and VIII (the "Funds"). Kraken is a lease and drill company located in North Dakota in the Bakken basin and is now the third-largest private E&P operator in the region. In March 2024, Kraken and Kraken Resources II LLC ("Kraken II") merged into Kraken Resources Group LLC, of which Kraken and Kraken II own 65.5% and 34.5% of, respectively.

Having initially launched a competitive process for Kraken in 2022, Kayne was unable to achieve an attractive bid that would appropriately compensate investors. In May 2024, Kayne launched a more targeted process, reaching out to 8 of their highest conviction potential investors. Ultimately, an agreement was reached for interests held by the Funds in Kraken, and Kayne executed definitive documents with [redacted], as a lead investor, at a gross purchase price of [redacted] of total consideration. This represents [redacted] of the Funds' unrealized NAV as of March 31, 2024. The Continuation Vehicle currently has commitments from [redacted], and other third-party investors. Upon approval for the waiver of potential conflicts of interest from the Funds' advisory boards and finalizing documents, Kayne launched the LP election period, giving the Funds' LPs the option to (i) sell 100% of indirect interest in Kraken and receive cash plus a series of deferred payments or (ii) retain 100% of indirect interest in Kraken through an investment in the Continuation Vehicle. This is a realization event for Kraken interests held by the Funds, excluding [redacted]'s interests in Kraken II. Entry multiple for the Continuation Fund is [redacted] EV/EBITDA and Kraken is outperforming YTD budgeted production and hedged EBITDA by [redacted] and [redacted], respectively as of Q2 2024.

Value Creation Plan

Through establishment of the Continuation Vehicle, Kayne is flexible to seek to accrete value to its equity holders, while additionally providing an opportunity for legacy LPs to monetize their investment at a discount to recent mark-to-market valuation. KAEF V's initial term matured in May 2018 and has been subsequently extended five times, with a maturity date of December 31, 2024. Kayne has elected to facilitate a liquidity option for KAEF V, of which Kraken is the only remaining unrealized investment and redeeming LPs would receive approximately a [redacted] gross ROI upon redemption. KAEF VII and VIII are not yet reaching maturity, though unrealized investments are targeted to enter a sale process in the near term. Upon redemption, LPs within these funds will receive approximately a [redacted] and [redacted] gross ROI, respectively. Near-term focuses of Kraken's value creation plan include maintaining low leverage while distributing significant capital to investors and the integration of recent acquisitions to realize synergies and cost savings. Long-term value drivers include utilization of Kraken's liquidity to continue making acquisitions with no incremental equity and to continue growth within Kraken's high-margin water infrastructure midstream business, Hydra, through organic growth and potential acquisitions. Kraken is a cash yielding and fully hedged investment, of which its cash yield will bring the asset to cost in a five-year timeframe. Potential for upside includes potential multiple uplift at exit and a sustained increase in oil prices. Base case assumptions are reasonable, assuming production [redacted] from [redacted] to [redacted] barrels a day and no M&A or drilling on undeveloped land occurs.

Track Record

Since the strategy's inception in 1998, Kayne has raised approximately $7.3 billion in total commitments across eight Kayne Anderson Energy Funds. Funds I-IV have generated strong returns and Funds V-VIII have recovered meaningful value with a path in place to further improve returns.

Fund	Vintage	Size ($M)	Net ROI	Net IRR
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: Kayne Anderson as of June 30, 2024.

Kraken Resources Group's Transformation Into Scaled Bakken Business

- Formed in 2012
- Embarked on growth and consolidation strategy over the last four years
- Built scaled platform with optimized operations and capital structure
- Company now paying significant equity distributions, [redacted] annualized yield in 1H 2024[1]

Metric	2020	2024E
Net Acres	135,000	336,000
Operated Locations	[redacted]	[redacted]
Net Production	31 Mboe/d	[redacted]
Wells Turned Online	22	[redacted]
Hedged EBITDA[2]	[redacted]	[redacted]
Free Cash Flow[2]	[redacted]	[redacted]

Nov. 2020 — Kraken Oil & Gas: Consolidation of Kraken Oil & Gas I, II and III

Oct. 2022 — Bowline Energy: [redacted] Acquisition

Oct. 2023 — Crescent Point: $500 Million Acquisition

March 2024 — Kraken Resources / Kraken Resources II: Consolidation of Kraken Resources I and II

June 2024 — Iron Oil: $352 Million Acquisition

July 2024 — Inaugural Senior Notes Offering $500 million 7.625%

[1]Annualized yield based on [redacted] of total equity invested into Kraken Resources Group.
[2]2024E represents Kraken corporate forecast at strip pricing as of July 25, 2024 through July 2025, with NYMEX oil and gas prices held flat at $70/bbl and $3.50/MMbtu thereafter.

Kayne Energy Private Equity

Transaction overview

Kayne Anderson Capital Advisors, L.P. ("Kayne") is pursuing a single-asset acquisition fund (the "Continuation Fund") transaction (the "Transaction") for certain equity interests held in various funds managed by Kayne of Kraken Resources, LLC ("KR1"), which owns 65.5% of Kraken Resources Group, LLC ("Kraken" or the "Company")

Opportunity Overview

- The Transaction offers an opportunity to invest into one of the **few remaining private E&P companies of significant scale operating in a premier oil-rich basin**
- **Kraken is a leading, oil-weighted E&P operator active in the Williston Basin,** producing [redacted] Mboe/d and expecting to generate over [redacted] of 2024E EBITDA
- The Kraken management team has **decades of deep technical, operational, and commercial expertise** in the Bakken
- Following several investments into the platform over the past 12 years, Kayne formed Kraken through the asset combination of two Kayne-owned predecessor entities in Q1 2024, resulting in a **scaled business with significant operational capabilities and regular, material distributions**
- **Kayne is a leading private equity firm with vast experience investing throughout the energy value chain**, having deployed $9 billion[1] across 10 energy-focused funds since 1998

Transaction Rationale

- The proposed Transaction provides existing LPs in certain legacy funds a liquidity option for their interests in Kraken, while allowing Kayne to continue its stewardship of the business
- Kayne recognizes the significant value creation potential inherent in the Company's distinct combination of a highly experienced **management team with a strong operational track record coupled with a scaled asset base generating meaningful free cash flow**
- Throughout the 5-year projection period, **the Company is projected to generate material distributions to shareholders**

Transaction Structure

- The proposed Transaction involves marketing common equity interests in Kraken that are currently held by Kayne Anderson Energy Fund V ("KAEF V"), Kayne Anderson Energy Fund VII ("KAEF VII"), and Kayne Anderson Energy Fund VIII ("KAEF VIII" and together with KAEF V and KAEF VII, the "Selling KAEF Funds"), which have a combined FMV of nearly [redacted] as of 3/31/2024, representing [redacted] of KR1[2]
- Continuation Fund terms and structure to be provided at a later date

Projected performance is not indicative of future returns. Projections are based on various assumptions and are not intended to predict future performance. Actual results may vary materially and adversely.

[1]Across all Kayne Anderson Energy vehicles, excluding co-investments, as of March 31, 2024.

[2]Ownership does not account for impact of management promote, which may vary depending on investment performance.

Kayne Energy Private Equity

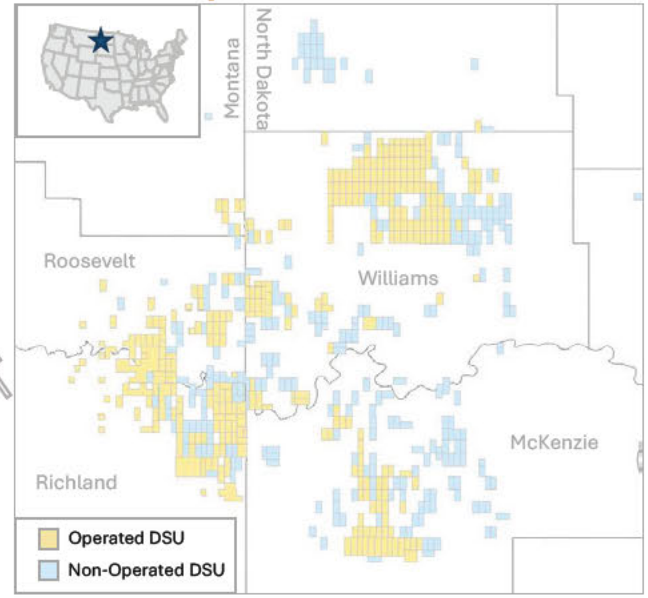
Kraken Resources Group: A leading Williston Basin enterprise

Kraken RESOURCES

Company Overview

- **Kraken is a premier operator with a scaled, oil-weighted business in the Williston Basin in Williams and McKenzie Counties, ND and Richland and Roosevelt Counties, MT**
  - 330,000 net acres in the core of the Bakken
  - 92% operated and 88% HBP asset ensures significant operational control and flexibility
  - [redacted] average 8/8^{ths} NRI and average undeveloped WI of [redacted]
- **Large operated inventory of delineated, long-lateral, high-returning locations**
  - [redacted] modeled gross ([redacted] net) operated undeveloped Bakken locations with an average lateral length [redacted]
  - Over [redacted] gross locations generating returns in excess of 50% IRR
- **Substantial current production, high margin cash flow and strong balance sheet**
  - April 2024 net production of 90 MBoe/d from nearly 1,000 gross operated and 500 gross non-op PDP wells
  - PDP PV-10 of [redacted] [redacted] as of April 1, 2024
  - [redacted]
  - Forecasted cumulative levered FCF of nearly [redacted] billion[1] through 2030
  - Forecasted leverage of [redacted] throughout projection period; 4-year remaining term on credit facility
- **Kraken has established the foundation to efficiently develop its assets**
  - 2-rig development program and dedicated frac crew on multi-well pads
  - Established management team in place at Kraken for more than 12 years with a proven track record of successfully executing large-scale pad development programs with over 400 wells drilled
  - Wholly-owned SWD subsidiaries ensure water takeaway solutions for the majority of the asset
  - Infrastructure and services in place to support near-term development plan

Asset Map



Metric	Total
Net Acres	330,000
Operated Undev. Locations	[redacted]
Net Production (April 2024)	90 Mboe/d
Avg. Undeveloped WI	[redacted]
Avg. 8/8^{ths} NRI	[redacted]
2024E Projected TILs	[redacted]
2024E Hedged EBITDA / FCF[1]	[redacted]

Kraken is the third largest private operator by production in the Williston Basin with nearly [redacted] rig-years of high quality inventory, a leading cost structure and a healthy balance sheet

***Note:** All metrics inclusive of Kraken's recently signed acquisition, which is scheduled to close on June 25, 2024.*
[1]Strip pricing as of May 23, 2024 through May 2025, with NYMEX oil and gas prices held flat at $70/bbl and $3.50/MMbtu thereafter.

Kayne Energy Private Equity

Near-term deals coming to market

Kraken RESOURCES

Potentially Actionable Opportunities

[redacted]

- **Net Acreage:** [redacted]
- **Net Production:** [redacted]
- **Deal Value:** [redacted]
- **Status:** [redacted]

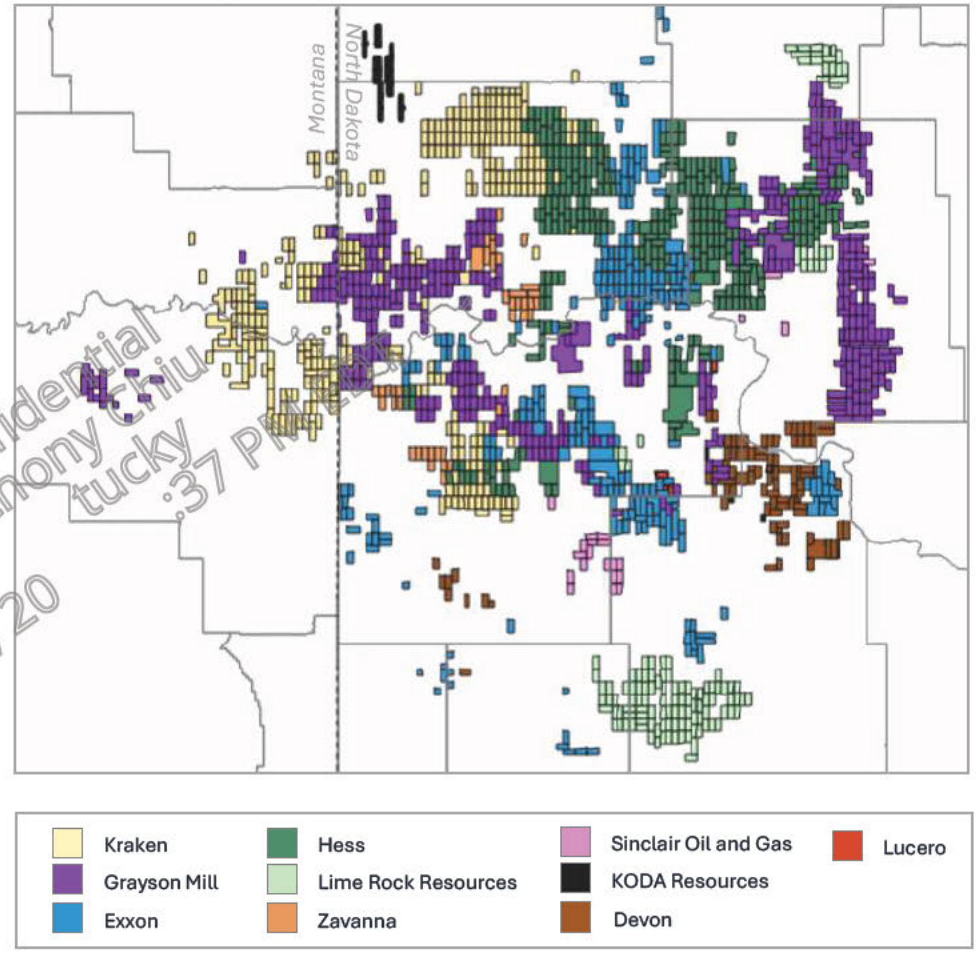
[redacted]

- **Net Acreage:** [redacted]
- **Net Production:** [redacted]
- **Deal Value:** [redacted]
- **Status:** [redacted]

[redacted]

- **Net Acreage:** [redacted]
- **Net Production:** [redacted]
- **Deal Value:** [redacted]
- **Status:** [redacted]

Opportunity Map



Multiple A&D opportunities nearby Kraken's existing acreage provide opportunity to utilize the Company's scale and liquidity to continue creating value for shareholders

Potentially actionable opportunities are for illustrative purposes only. Neither Kraken or Kayne has consummated or entered into an exclusive agreement relating to such potential investments, and there can be no assurance that any of such potential future investments will ever be acquired (on the described terms or otherwise) or, if acquired, lead to investor returns. Actual opportunities effected may differ materially from the potential opportunities and/or estimates discussed herein.

[redacted]