County Employees Retirement System
Actuarial Committee – Special Called Meeting
April 12, 2023 at 2:00 PM ET (1:00 PM CT)
Live Video Conference/Facebook Live

AGENDA

1.	**Call to Order**	**Michael Foster**
2.	**Opening Statement**	**Legal Services**
3.	**Roll Call**	**Sherry Rankin**
4.	**Public Comment**	**Sherry Rankin**
5.	**Approval of Minutes* -- November 2, 2022**	**Michael Foster**
6.	**Forward-Looking Return Expectations***	
	a. Capital Market Analysis	**David Lindberg** **Craig Morton**
	b. Current Portfolio Performance	**Steve Willer**
	c. Preliminary 2023 Assumptions	**David Lindberg** **Craig Morton**
7.	**Actuarial Assumptions***	
	a. Demographics	**Danny White, GRS**
	i. Mortality Trends	**Janie Shaw, GRS**
	ii. Payroll growth	
	iii. Preliminary 2023 Assumptions	
8.	**Discount Rate Change***	**Michael Foster**
9.	**ADJOURN***	**Michael Foster**

Committee Action May Be Taken

MINUTES OF MEETING
COUNTY EMPLOYEES RETIREMENT SYSTEM
SPECIAL CALLED ACTUARIAL COMMITTEE MEETING
NOVEMBER 2, 2022, AT 2:00 P.M.
VIA LIVE VIDEO TELECONFERENCE

At the special called meeting of the Actuarial Committee of the County Employees Retirement System Board of Trustees held on November 2, 2022, the following members were present: Michael Foster (Chair), Dr. Merl Hackbart, and Dr. Patricia Carver. Staff members present were CERS CEO Ed Owens, III, David Eager, Erin Surratt, Michael Board, Victoria Hale, Connie Davis, Steve Willer, Ashley Gabbard, Phillip Cook, Katie Park, and Sherry Rankin. Others present included Janie Shaw with GRS and David Lindberg, Craig Morton, and Chris Tessman with Wilshire.

Mr. Foster called the meeting to order.

Ms. Hale read the Opening Legal Statement.

Ms. Rankin took Roll Call.

There being no *Public Comment* submitted, Mr. Foster introduced agenda item *Approval of Minutes – March 14, 2022.* A motion was made by Dr. Hackbart and seconded by Dr. Carver to approve the minutes as presented. The motion passed unanimously.

Mr. Foster introduced agenda item *Draft Actuarial Valuation.* Ms. Janie Shaw with GRS presented the 2022 Actuarial Valuation results. She reviewed legislation passed in 2022 and reported that active membership increased across both funds. Non-hazardous increased by 6.4% and hazardous increased by 7.4% in covered payroll. Contributions are collected based on covered payroll; therefore, an increase in covered payroll results in increased contributions in the fund, said Ms. Shaw. Ms. Shaw reported that there was a negative 6% return on market value. Fund assets for CERS were $1,943 million less than expected; however, $110 million in asset gains were recognized this year. Further, retirement liability was higher than expected. There was a $482 million loss for non-hazardous and a $92 million loss for the hazardous fund. Ms. Shaw stated that this loss was due to salaries being higher than the assumptions and retirees who receive a benefit from both non-hazardous and hazardous from the CERS fund. The valuation was not including the non-hazardous portion of the benefit for this group of retirees, said Ms. Shaw. Insurance liability came in less than expected. There was a $1,582 million gain for both CERS insurance funds combined. Ms. Shaw advised that this gain was driven by significant decreases in Medicare premiums from 2022 to 2023. Trend assumptions were reviewed, and it was determined that Medicare premiums will now increase at a higher rate than in the past. Ms. Shaw commented that the 2022 valuation as of June 30, 2022, set the contributions for 2024 and are effective July 1, 2023. Next, she reviewed the required employer contributions and the change in required employer contributions for CERS non-hazardous and hazardous funds. The investment experience decreased the contribution rate by about 25 basis points and the demographic experience decreased by about 4.5% of pay for CERS non-hazardous, said Ms. Shaw. Additionally, Senate Bill 209 provided an increase of about 36 basis points. CERS hazardous saw a decrease of about 42 basis points and 6.5% of pay due to the demographic experience. Next, Ms. Shaw reviewed the unfunded actuarial accrued liability with the Committee. She stated that liability increased slightly in the pension funds due to the liability being higher than expected and there was a significant decrease in the unfunded liability for insurance. Ms. Shaw further reviewed the active membership count and covered payroll. She reported that there was an increase in active membership count and that the count has remained level over the last ten years. There was also an increase in covered payroll; 6.4% in Non-hazardous and 7.4% for hazardous. Ms. Shaw stated that increases in covered payroll have remained close to the 2% assumption over the last ten years. Steady increases in retired membership count were also reported and is increasing as expected for a mature plan. Ms. Shaw stated that there was also an increase in pension fund benefits being paid out; however, she advised that pension benefit distributions will likely level-off in the future as more Tier 3 retirees are taking the place of Tier 1 retirees since those benefits are not as rich. Dr. Hackbart asked if the retired membership is also projected to increase or stabilize in the future. Ms. Shaw believed that the retired membership count will continue to increase unless active membership were to change. The overall funding results for the CERS pension and insurance funds were briefly reviewed with the CERS Actuarial Committee. Lastly, Ms. Shaw presented the projection assumptions for CERS non-hazardous and hazardous. Ms. Pendergrass asked for clarification regarding a slight drop in the CERS non-hazardous pension unfunded liability and funded ratio graph presented. Ms. Shaw stated that the dip is due to the lack of gains to offset the investment loss that was seen this year. She advised that this may change based on investment returns in the next year. Ms. Shaw closed her presentation by reminding the Committee that it is imperative that participating employers continue contributing the actuarially determined contributions in each future year to improve the system's financial security. Mr. Eager asked Ms. Shaw to comment on the best practices for funding insurance plans; pay as you go versus funding. She advised that most funds are pay as you go and that it is somewhat rare for a fund to be funded, fully funded or over 100% funded. Ms. Shaw praised the Committee and the CERS Board of Trustees for their efforts in maintaining the insurance funds. Ms. Pendergrass stated that most of the reports that she reviews are pay as you go and underfunded. Mr. Eager added that there is not enough recognition of this positive achievement. Dr. Carver made a motion to approve the Draft 2022 Actuarial Valuation. Dr. Hackbart seconded the motion and the motion passed unanimously.

Mr. Foster introduced agenda item *Discount Rate Discussion.* Mr. Owens stated that the current CERS discount rate is 6.25% which is substantially low in comparison to the median discount rate which is 7.10%. He advised the Committee that Ms. Pendergrass submitted a memo to Mr. Foster with a historical summary of investment earnings and the actuarial discount rate. It was requested that GRS review past economic assumptions and report a sensitivity analysis of what would happen to the portfolio should the Board of Trustees decide to increase or decrease the discount rate by 25 or 50 basis points. In addition, Wilshire was asked to provide new forward-looking return expectations, said Mr. Owens. Mr. Owens advised that he wished to begin this process early to allow the Committee and the CERS Board of Trustees have an opportunity to review a several quarters of data and make an informed decision. Ms. Janie Shaw with GRS presented additional sensitivity scenarios based on the results of the June 30, 2021, actuarial valuation. Mr. Foster asked if there was information available regarding why the discount rate was reduced despite returns being stable. Ms. Pendergrass stated that the reduction occurred in 2016 and was due to a change in asset allocation. Mr. David Lindberg and Mr. Craig Morton with Wilshire presented a capital market return assumptions update. Dr. Hackbart asked Mr. Lindberg if he had read the comments from the Federal Reserve regarding raising rates by 75 basis points. Mr. Lindberg stated that he had yet to review the comments but would soon.

Mr. Foster introduced agenda item *Strategic Planning Process.* Mr. Foster stated that the Strategic Plan continues to be a topic of discussion and asked the Committee if they had any questions or comments regarding the Strategic Plan. Ms. Pendergrass advised that she discovered a new performance tool for pension analysis while attending the recent NCPERS Conference in Nashville, Tennessee. She reported that those who developed the tool have agreed to give a presentation to the CERS Board of Trustees on how the tool may assist in identifying strengths and weaknesses within the System. Ms. Pendergrass stated that she will be scheduling this education presentation for January of 2023. She requested that all efforts regarding the Strategic Plan be paused until after the presentation. Ms. Pendergrass and Mr. Foster wished to continue with the vote on the presented Actuarial Committee Strategic Plan as it may be modified later, if needed. A motion was made by Dr. Hackbart to approve the Actuarial Committee Strategic Plan as presented. The motion was seconded by Dr. Carver and passed unanimously.

Mr. Foster introduced agenda item *Committee Meeting Date.* Mr. Foster stated that a date for the next meeting of the CERS Actuarial Committee was needed. He asked if there were any date suggestions. Ms. Pendergrass advised that meeting dates for the CERS Actuarial Committee were included in the meeting calendar which was approved in June of 2022. Mr. Owens agreed and stated that the next CERS Actuarial Committee is scheduled for February 8, 2023. He advised that the Committee may wish to reschedule to discuss the new economic assumptions which would be received from GRS at the end of February or early March. Therefore, Mr. Owens stated that it may be prudent to select a date in March of 2023. He suggested March 6th or 7th to meet before the CERS Board of Trustees meeting which is scheduled for March 9, 2023. Ms. Pendergrass advised that all meeting materials are due a week prior to the meeting; therefore, the suggested March dates are unfavorable. She suggested that the CERS Actuarial Committee meet on or before March 2nd to meet this deadline. Mr. Owens stated that the CERS Board of Trustees would need to review and approve discount rate matters prior to June 30, 2023; therefore, the Actuarial Committee could meet on April 12th or 13th and would still fall before the CERS Annual Committee meeting which is scheduled for April 19th and prior to the June CERS Board of Trustees meeting. Ms. Janie Shaw with GRS confirmed that a later date would ensure that all information would be available to present the capital market assumptions and that as long as assumptions are set around June or July, GRS would be ready for the valuations. Mr. Foster asked if there was a consensus on a new meeting date. Mr. Owens reiterated that April 12th or 13th would be the best date. Ms. Pendergrass added that the CERS Actuarial Committee would need to make a recommendation to the CERS Board of Trustees for ratification at the next Board meeting. Dr. Carver made a motion to recommend to the CERS Board of Trustees that the next meeting of the Actuarial Committee be moved to April 12, 2023, at 2:00 p.m. EST. Dr. Hackbart seconded the motion and the motion passed unanimously.

Dr. Hackbart made a motion and was seconded by Dr. Carver to adjourn the meeting. The motion passed unanimously.

Copies of all documents presented are incorporated as part of the Minutes of the Board of Trustees held on November 2, 2022, 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 November 2, 2022, were approved on April 12, 2023.

____
Chair of the Board of Trustees

I have reviewed the Minutes of the November 2, 2022 Board of Trustees Meeting for content, form, and legality.

____
Executive Director
Office of Legal Services

Wilshire

Capital Market Return Assumptions Update

December 31, 2022

Wilshire

Summary Changes for 4Q 2022

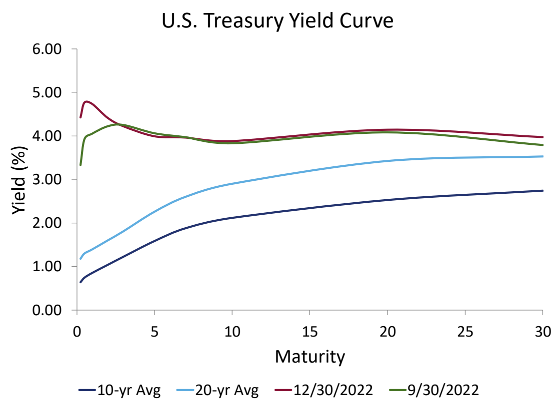
- Capital market return assumptions are updated on a quarterly basis for new asset allocation studies - the full assumption methodology is available in Wilshire's annual paper
- Yield curve up in the short end, but largely unchanged and relatively flat at 5-years and beyond
  - Curve movements resulted in modest changes for government bond fixed income segments
  - Credit spreads tightened for investment grade and high yield bonds, resulting in lower forward-looking assumptions
- Yields on public real asset securities are generally down; continued volatility in breakeven inflation during the quarter
- Equity assumptions are down on lower current income and higher current valuations
- Equity risk premium continues to fall

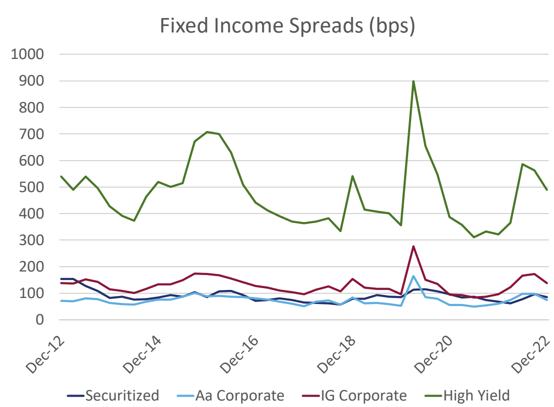
Asset Class Assumption	Total Return (%) Sep 2022	Change	Dec 2022	Risk (%)
Inflation	2.25	0.00	2.25	1.75
Cash Equivalents	3.65	0.35	4.00	0.75
Treasuries	4.20	0.10	4.30	5.00
Core Bonds	4.90	0.00	4.90	4.70
LT Core Bonds	5.10	-0.20	4.90	9.80
High Yield Bonds	6.85	-0.30	6.55	10.00
Private Credit *	8.60	0.25	8.85	12.75
Global RE Securities	5.80	0.00	5.80	16.45
Private Real Estate	6.35	-0.15	6.20	14.00
U.S. Stocks	6.75	-0.25	6.50	17.00
Dev. ex-U.S. Stocks	7.50	-0.25	7.25	18.00
Emerging Market Stocks	7.75	-0.25	7.50	26.00
Private Equity *	10.10	-0.20	9.90	29.00
Global 60/40 (ACWI/U.S. Core)	6.65	-0.15	6.50	10.80

Implied Risk Premia	Relative Return (%) Sep 2022	Change	Dec 2022
Cash - Inflation	1.40	0.35	1.75
Treasury - Cash	0.55	-0.25	0.30
Core - Treasury	0.70	-0.10	0.60
Long-Term Core - Core	0.20	-0.20	0.00
High Yield - Core	1.95	-0.30	1.65
Global RESI - Core	0.90	0.00	0.90
U.S. Stocks - Core	1.85	-0.25	1.60
Private Equity - U.S. Stocks	3.35	0.05	3.40
Implied Real Return (ACA - CPI)			
U.S. Stocks	4.50	-0.25	4.25
U.S. Bonds	2.65	0.00	2.65
Cash Equivalents	1.40	0.35	1.75

* September 2022 Private Credit and Private Equity return assumptions are based on a revised methodology but inputs representative of quarter-end 9/30/2022

Fixed Income



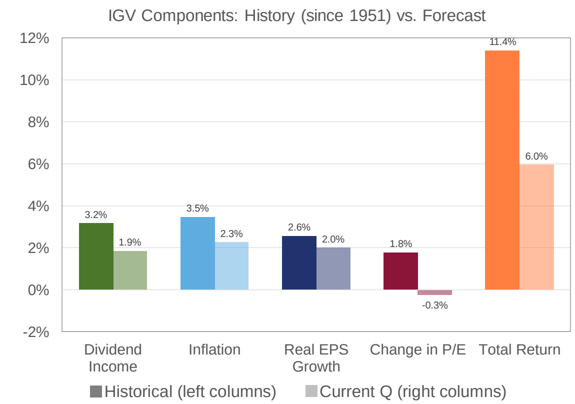


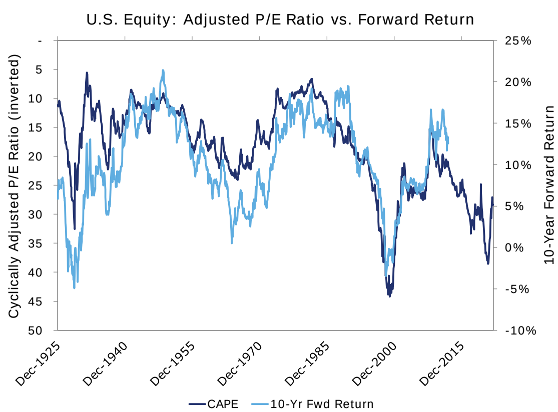
Inflation & Fixed Income		Sep 2022	Change	Dec 2022
Inflation	10-Year Treasury Yield	3.83	0.05	3.88
	10-Year Real Yield	1.68	(0.10)	1.58
	Breakeven Inflation	2.15	0.15	2.30
	Inflation Forecast	**2.25**	**0.00**	**2.25**
Cash	91-Day T-Bill Yield	3.33	1.09	4.42
	T-Bill Yield in 10 Yrs	3.65	0.20	3.85
	Cash Forecast	**3.65**	**0.35**	**4.00**
Treasury	U.S. Treasury Idx Yield	4.13	0.05	4.18
	Treasury Idx Yield in 10 Yrs	4.30	0.15	4.45
	Treasury Idx Forecast	**4.20**	**0.10**	**4.30**
	U.S. LT Treasury Idx Yield	4.00	0.08	4.08
	LT Treasury Idx Yield in 10 Yrs	3.88	0.27	4.15
	LT Treasury Idx Forecast	**4.05**	**0.00**	**4.05**
Spread	U.S. Corporate Idx OAS	1.72	(0.34)	1.38
	Corporate Idx OAS in 10 Yrs	1.55	(0.01)	1.54
	Corporate Idx Forecast	**5.65**	**(0.20)**	**5.45**
	U.S. Core Bond Forecast	**4.90**	**0.00**	**4.90**
	U.S. LT Core Bond Forecast	**5.10**	**(0.20)**	**4.90**
	U.S. High Yield Idx OAS	5.62	(0.73)	4.89
	High Yield Idx OAS in 10 Yrs	5.46	(0.06)	5.40
	High Yield Bond Forecast	**6.85**	**(0.30)**	**6.55**

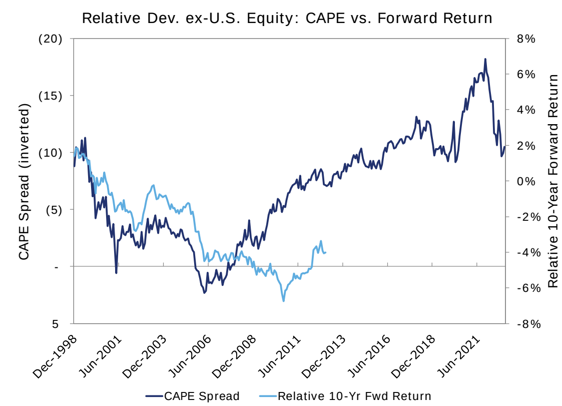
Wilshire

Equity Markets

Equity: Public & Private		Sep 2022	Change	Dec 2022
Equity	DDM	7.25	(0.40)	6.85
	IGV	6.50	(0.55)	5.95
	CAPE	6.70	0.25	6.95
	U.S. Equity Forecast	**6.75**	**(0.25)**	**6.50**
	Dev-ex-US Equity Forecast	**7.50**	**(0.25)**	**7.25**
	EM Equity Forecast	**7.75**	**(0.25)**	**7.50**
Private	Cost of Debt (Public)	5.65	0.00	5.65
	Cost of Debt (Private)	7.60	0.35	7.95
	Private Market Basket Forecast	**10.25**	**(0.35)**	**9.90**







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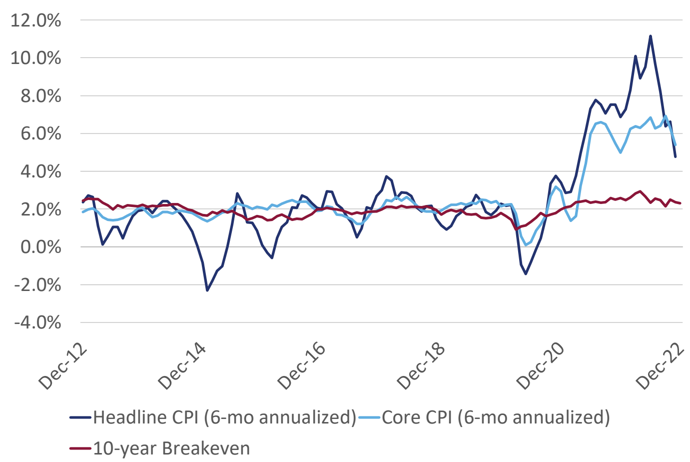
Real Assets

- Inflation assumption of 2.25% is unchanged, but just below breakeven, given the volatility in the signal during the quarter
- Real asset yields are generally lower
- Commodity assumption is up on higher cash

Asset Class Assumption	Total Return (%) Sep 2022	Change	Dec 2022	Risk (%)
U.S. TIPS	4.05	-0.10	3.95	6.00
Global RE Securities	5.80	0.00	5.80	16.45
Private Real Estate	6.35	-0.15	6.20	14.00
Commodities	5.90	0.35	6.25	16.00
Inflation	2.25	0.00	2.25	1.75

Inflation: Actual & Expected



	Real Assets	Sep 2022	Change	Dec 2022
Listed	Inflation Capture (75%)	1.70	0.00	1.70
	REIT Yield	3.95	0.02	3.97
	Midstream Energy Yield	6.25	(0.31)	5.94
	Global Infrastructue Yield	3.71	(0.13)	3.58
Private	Real Estate Cap Rate	4.00	(0.10)	3.90
	Cost of Debt (Private)	6.10	0.10	6.20
	Infra. v RE Cap Rate Differential	(0.24)	(0.15)	(0.39)
	Infra. Leverage / RE Leverage	2.5	0.0	2.5

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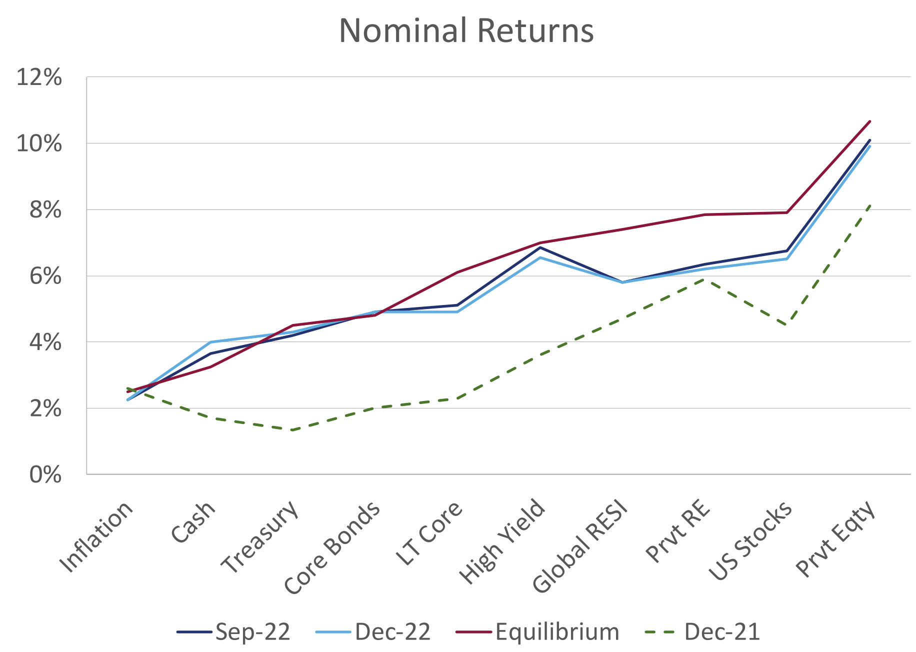
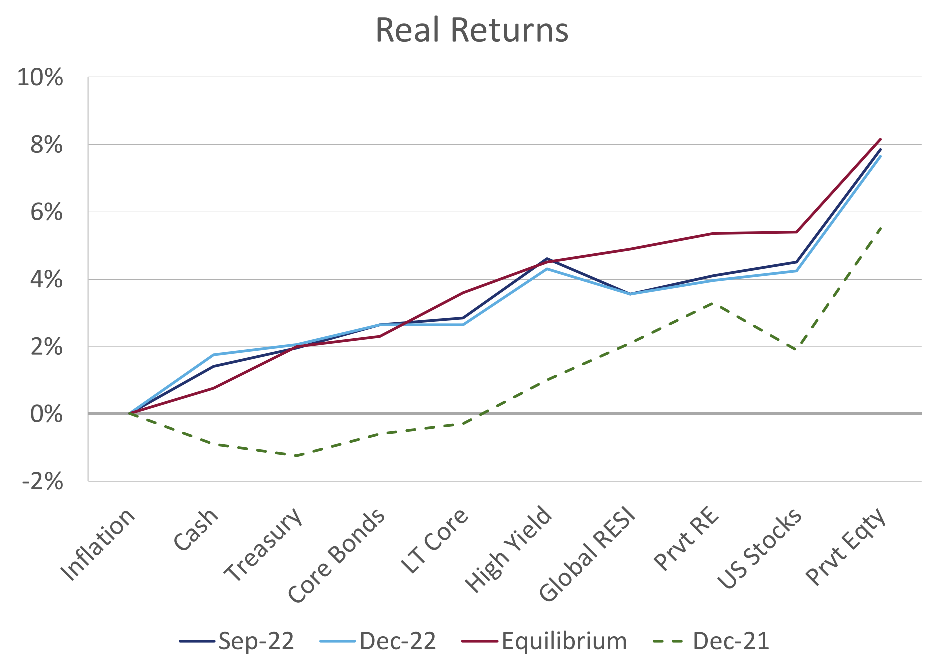
Equilibrium Assumptions

Current versus Equilibrium Asset Class Assumptions





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CERS Policy

Wilshire

CERS Capital Market Assumptions as of 12/31/22

	Equity		Fixed Income			Inflation Protected	
	Public Equity	Private Equity	Core Fixed Income	Specialty Credit	Cash	Real Estate	Real Return
10-Yr Expected Return (%)	7.05	10.04	4.90	7.61	4.00	6.19	6.95
20-Yr Expected Return (%)	7.31	10.20	4.88	7.43	3.81	6.60	7.17
30-Yr Expected Return (%)	7.58	10.37	4.85	7.26	3.63	7.01	7.39
Expected Risk (%)	17.10	27.78	4.70	9.06	0.75	13.93	10.67
Cash Yield (%)	2.25	0.00	5.10	9.90	4.00	2.25	3.49
Correlations							
Public Equity	1.00						
Private Equity	0.74	1.00					
Core Fixed Income	0.20	0.31	1.00				
Specialty Credit	0.57	0.31	0.15	1.00			
Cash	-0.06	0.00	0.18	-0.09	1.00		
Real Estate	0.54	0.52	0.19	0.63	-0.05	1.00	
Real Return	0.50	0.44	0.15	0.58	0.01	0.49	1.00

Wilshire's asset class return, risk, and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends.

Public Market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

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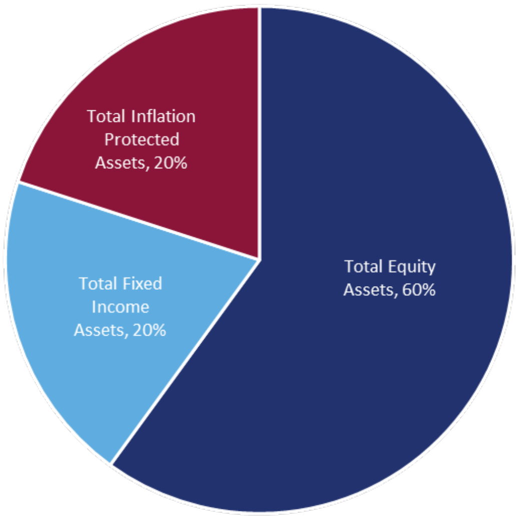
Current Policy

Asset Class	Weight
Public Equity	50%
Private Equity	10%
Total Equity Assets	60%
Core Fixed Income	10%
Specialty Credit	10%
Cash	0%
Total Fixed Income Assets	20%
Real Estate	7%
Real Return	13%
Total Inflation Protected Assets	20%



Using Wilshire's December 31, 2022 Capital Market Assumptions

- Expected Return
  - 10-Years: 7.53%
  - 20-Years: 7.71%
  - 30 Years: 7.90%
- Expected Risk: 12.82%

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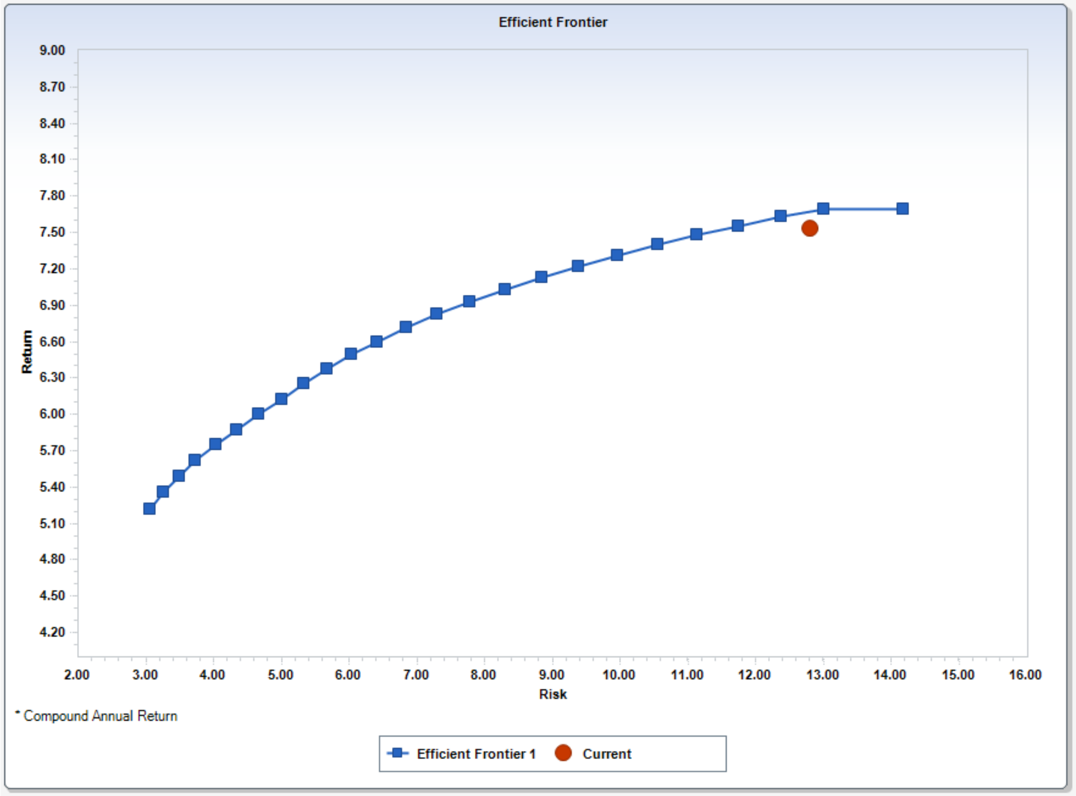
Efficient Frontier

- Current allocation has significant exposure to growth, and particularly equity markets
- Higher interest rates provide an opportunity to move to a lower risk portfolio while still achieving expected returns above the current discount rate
- The efficient frontier to the right shows that the portfolio can also improve efficiency from current targets – higher return at the same risk level, or similar return at lower risk



Frontier uses asset classes and assumptions shown on side 8 – Total Illiquid limited to 30% of portfolio (PE and RE 100% illiquid, Credit and RR 50% illiquid)

Wilshire

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February 2023	KPPA MONTHLY PERFORMANCE UPDATE	CERS/CERS-H

What's going on in the marketplace?
During the month of February, investors' hopes that central banks would slow or even temper the fight against inflation were dashed as economic data came in stronger-than-expected. In response, both stocks and bonds fell as markets anticipated additional interest rate hikes and the potential that rates could remain higher for longer increasing the risk of recession. International developed markets held up better than domestic markets, while emerging markets significantly underperformed. Bond prices declined in response to increased yields and credit spreads widened on rising economic uncertainty.

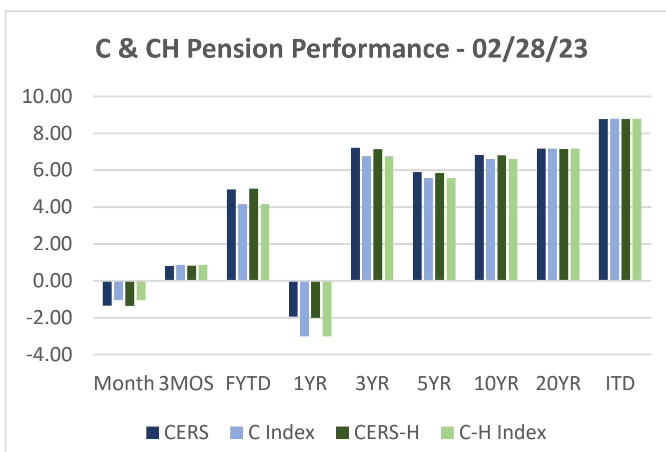
The KPPA Pension Trust portfolio returned -1.24% during the month of February, underperforming its blended benchmark return of -1.04%. The CERS Pension Composite produced a -1.36% return during the month. The CERS and CERS-H Pension portfolios returned -1.35% and -1.36% respectively, while their benchmark fell -1.06%. Both funds underperformed their respective benchmark with similar drivers of attribution. Performance was weaker within the private equity portfolio in terms of selection. Additionally, the underweight to real return, one of the better performing asset classes weighed on relative performance. Offsetting some of the relative weakness was the solid selection within the core fixed income and public equity portfolios.

For the fiscal year, the KPPA Pension Trust portfolio gained 4.58%, outperforming the benchmark return 3.98%, while the CERS Pension Composite returned 4.96%. The CERS and CERS-H Pension portfolios returned 4.95% and 5.01%, against a benchmark return of 4.16%.

Global equity markets were weaker during the month, as evidenced by the MSCI ACWI Index falling -2.87%. US markets outpaced their international market counterparts (R3000: -2.34% versus MSCI ACWI Ex-US: -3.38%). This brought the fiscal year return for global equity markets to 6.47% (KPPA global equity portfolio: 8.90%).

US equity markets fell -2.34% during the month (Russell 3000), while the KPPA portfolio slightly underperformed, returning -2.41%. All market segments were weaker (LC: -2.44%, MC: -1.81%, SC: -1.69%); with growth holding up better than value (R3000G: -1.18% versus R3000V: -3.45%). For the fiscal year, the KPPA US Equity portfolio has gained 7.50% compared with its benchmark return of 6.89%. Relative outperformance has been driven by the portfolio's slight overweight down market cap and to value.

NonUS equity markets returned -3.38% (MSCI ACWI Ex-US) during the month. Developed markets returned -2.32% (MSCI World Ex-US) during the period while emerging markets fell -6.48% (MSCI EM). The KPPA portfolio returned -2.31% during the month, providing 107bps of downside protection. Relative outperformance was driven by stock selection, as all individual mandates bested their respective benchmarks. The fiscal year return now stands at 10.79% versus 7.56%.



The specialty credit portfolio outperformed its benchmark during the month, returning -0.13% versus

-0.35%. The high yield market fell -1.29%, driven by the impact of rising rates which was partially offset by modestly tighter spreads. Leveraged loans were able to gain 0.58% during the period attributable to their lower rate sensitivity. For the fiscal year to date, the portfolio has underperformed its benchmark, gaining 3.50% versus 6.76%. The reported relative underperformance is largely driven by the issues associated with timing differences between the private market mandates and the public market benchmarks which tend to be exacerbated during periods of larger moves in the public markets. Individual strategy relative performance has been mixed fiscal year to date (though tilted positively), especially with private market pricing playing catch-up, but continues to produce strong relative performance over longer periods.

The core fixed income portfolio fell -87bps compared to the Bloomberg Aggregate Index return of -2.59% as signs that inflation continued to remain stubbornly high and economic data strengthened despite central bank efforts to date shifted market expectations toward even higher rates. Relative outperformance continues to be attributable to positioning within the allocation; the portfolios have remained underweight overall duration given the potential for higher rates and continued volatility. This underweight is slowing being reduced given the magnitude and pace of the tightening already realized and the elevated uncertainty of the outlook. Both shorter-term and intermediate credit market segments held up better. For the fiscal year, the portfolio has returned 0.24% compared to the benchmark return of -2.57%.

The private equity allocation fell -15bps during the month, bringing the fiscal year to date return to -6.04%. Trailing public marks have significantly affected the overall performance of the portfolio, and the portfolio's 1-year return crossed into negative territory recently coming in at -0.70% at the end of February.

The real return portfolio fell -39bps during the month, compared to its benchmark return of 1.03%. As with several of the previous months, performance was driven by the MLP portion of the portfolio (approximately 40% of the allocation); which lost -1.08%. For the fiscal year, the portfolio has returned 9.63% versus the benchmark return of 4.32%.

The real estate portfolio fell -0.25% during the month of February. The 1-year return now stands at 10.03% versus the 20.96% return of its benchmark. This benchmark will fall to 6.5% next quarter as the negative impact of higher interest rates on 4Q 2022 valuations show up in the quarterly lagged returns. However, for calendar year 2022, all three of KPPA's open-end real estate funds (approximately 75% of the allocation) outperformed the benchmark by at least 250bps.

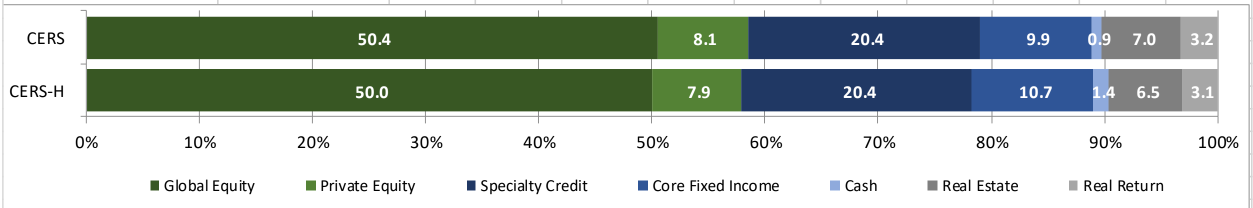
The cash portfolio returned 0.28% during the month compared with the 3-month T-bill's 0.35%. This brought the fiscal year return to 1.99%, slightly trailing the benchmark return of 2.06%. The relative underperformance of the cash portfolio is most attributable to lower rates offered by overnight repurchase agreements relative to the yields of the 3-month T-bill.

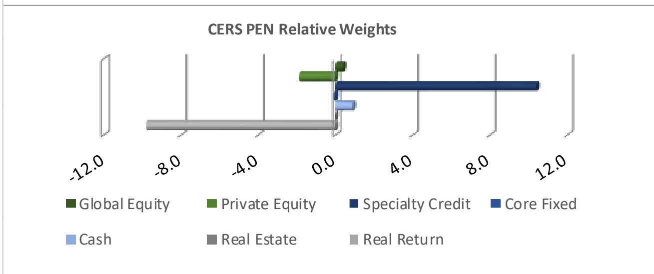
CERS & CERS-HAZ - PENSION FUND PLAN NET RETURNS - 02/28/23

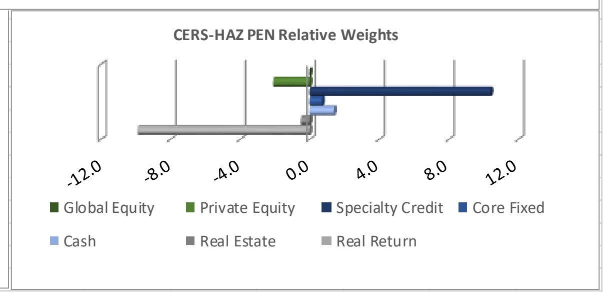
Plan	Market Value	Month	3 Months	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
CERS	**8,255,255,658.48**	**-1.35**	**0.81**	**4.95**	**-1.94**	**7.23**	**5.91**	**6.84**	**7.17**	**7.63**	**8.79**
KY Ret. CKERS Plan IPS Index		-1.06	0.87	4.16	-3.02	6.76	5.59	6.61	7.17	7.55	8.80
CERS- H	**2,844,521,258.09**	**-1.36**	**0.83**	**5.01**	**-2.01**	**7.14**	**5.85**	**6.81**	**7.16**	**7.62**	**8.79**
KY Ret. CERS Haz Plan IPS Index		-1.06	0.87	4.16	-3.02	6.76	5.59	6.61	7.17	7.55	8.80

KPPA PENSION FUND UNIT - NET RETURNS - 02/28/23 - PROXY PLAN ASSET PERFORMANCE

Structure	Month	QTD	Fiscal YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	ITD
PUBLIC EQUITY	**-2.37**	**5.02**	**8.90**	**-6.78**	**8.94**	**5.79**	**7.93**	**8.33**	**8.43**	**10.08**
MSCI ACWI	-2.87	4.10	6.47	-8.61	8.35	5.34	7.62	8.23	8.19	9.88
PRIVATE EQUITY	**-0.15**	**-0.05**	**-6.04**	**-0.70**	**16.09**	**14.16**	**13.38**	**12.72**		**11.77**
Russell 3000 + 3%(Qtr Lag)	5.32	13.16	-7.77	-7.80	13.32	13.35	16.15	12.65		11.90
SPECIALTY CREDIT	**-0.13**	**1.18**	**3.50**	**1.61**	**4.86**	**4.99**				**5.39**
50% BB US HY / 50% SP LSTA Leveraged Loan	-0.35	2.87	6.76	-1.40	2.64	3.31				3.42
CORE FIXED INCOME	**-0.87**	**0.78**	**0.24**	**-3.55**	**-0.33**	**2.09**				**2.37**
Bloomberg Barclays US Aggregate	-2.59	0.41	-2.57	-9.72	-3.77	0.53				1.40
CASH	**0.28**	**0.56**	**1.99**	**2.19**	**0.84**	**1.44**	**1.08**	**1.65**	**2.70**	**3.30**
Citigroup Treasury Bill-3 Month	0.35	0.72	2.06	2.22	0.86	1.35	0.81	1.24	2.31	2.90
REAL ESTATE	**-0.25**	**-2.71**	**1.08**	**10.03**	**13.09**	**12.34**	**10.79**	**8.50**	**6.69**	**6.81**
NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^	0.00	0.00	4.87	20.96	11.38	9.26	9.91	7.78	7.85	6.77
REAL RETURN	**-0.39**	**1.79**	**9.63**	**9.23**	**8.71**	**5.87**	**3.85**			**4.72**
US CPI +3%	1.03	0.97	4.32	9.61	8.83	5.94	4.01			4.03

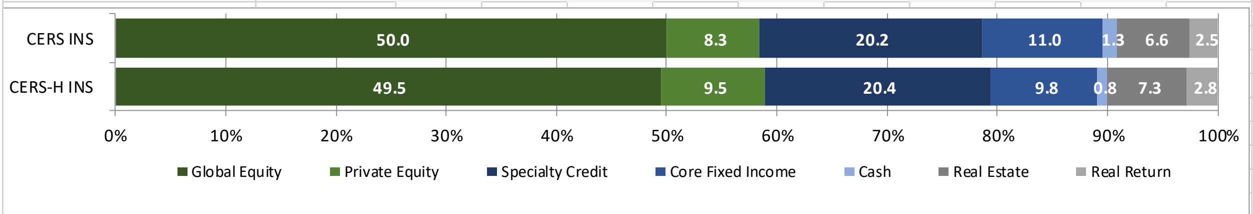


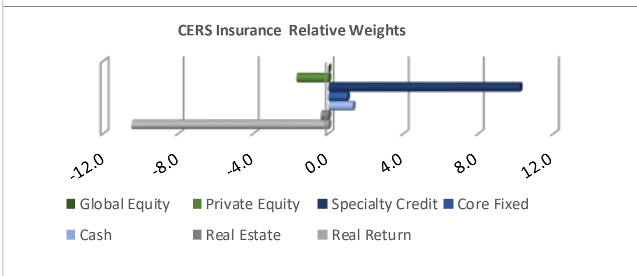


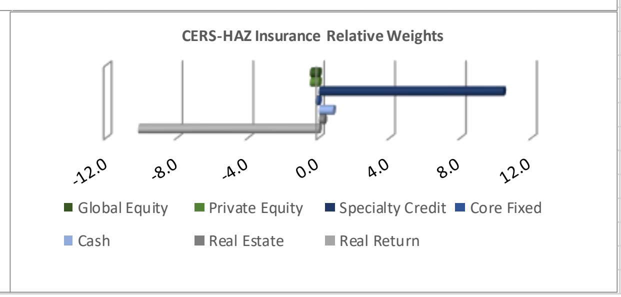


CERS INS & CERS HAZ INS - INSURANCE FUND - PLAN NET RETURNS - 02/28/23											
Plan	**Market Value**	**Month**	**3 Months**	**Fiscal YTD**	**1 Year**	**3 Years**	**5 Years**	**10 Years**	**20 Years**	**30 Years**	**ITD**
CERS INS	**3,154,367,462.50**	**-1.37**	**0.83**	**5.03**	**-1.74**	**7.07**	**5.83**	**6.75**	**7.09**	**6.75**	**7.29**
KY Ins. CERS Plan IPS Index		-1.06	0.87	4.16	-3.02	6.45	5.39	6.58	7.38	6.96	7.48
CERS - H INS	**1,554,699,622.37**	**-1.33**	**0.78**	**4.83**	**-1.71**	**7.17**	**5.93**	**6.82**	**7.12**	**6.77**	**7.31**
KY Ins. CERS Haz Plan IPS Index		-1.06	0.87	4.16	-3.02	6.45	5.39	6.58	7.38	6.96	7.48

KPPA INSURANCE FUND UNIT - NET RETURNS - 02/28/23 - PROXY PLAN ASSET PERFORMANCE											
Structure		**Month**	**QTD**	**Fiscal YTD**	**1 Year**	**3 Years**	**5 Years**	**10 Years**	**20 Years**	**30 Years**	**ITD**
PUBLIC EQUITY		**-2.38**	**5.03**	**8.88**	**-6.74**	**8.99**	**5.77**	**7.97**	**8.21**		**8.39**
MSCI ACWI		-2.87	4.10	6.47	-8.62	8.32	5.30	7.59	7.89		8.14
PRIVATE EQUITY		**-0.13**	**-0.04**	**-2.58**	**5.43**	**16.26**	**14.18**	**14.48**	**12.29**		**10.90**
Russell 3000 + 3%(Qtr Lag)		5.32	13.16	-7.77	-7.80	13.32	13.35	16.15	12.45		11.45
SPECIALTY CREDIT		**-0.09**	**1.22**	**3.69**	**2.04**	**4.85**	**4.93**				**5.26**
50% BB US HY / 50% SP LSTA Leveraged Loan		-0.35	2.87	6.76	-1.40	2.64	3.31				3.42
CORE FIXED INCOME		**-0.94**	**0.73**	**0.10**	**-3.90**	**-0.58**	**1.89**				**2.07**
Bloomberg Barclays US Aggregate		-2.59	0.41	-2.57	-9.72	-3.77	0.53				1.40
CASH		**0.28**	**0.56**	**1.96**	**2.16**	**0.82**	**1.33**	**0.90**	**1.48**		**2.44**
Citigroup Treasury Bill-3 Month		0.35	0.72	2.06	2.22	0.86	1.35	0.81	1.24		2.33
REAL ESTATE		**-0.25**	**-2.68**	**1.03**	**9.92**	**12.97**	**12.31**	**10.70**			**10.17**
NCREIF NFI-ODCE Net 1 Qtr in Arrears Index^		0.00	0.00	4.87	20.96	11.38	9.26	9.91			7.01
REAL RETURN		**-0.32**	**0.96**	**7.43**	**7.55**	**7.99**	**5.60**	**3.58**			**4.43**
US CPI +3%		1.03	0.97	4.32	9.28	8.56	5.94	4.06			4.07







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)
2022	$ 15,674	$ 8,149	$ 7,525	52%	$ 630	$ 135	$ 2,691	23.40%	23.40%
2023	16,017	8,466	7,551	53%	641	137	2,745	23.34%	23.34%
2024	16,335	8,783	7,552	54%	647	140	2,800	23.12%	23.12%
2025	16,632	9,168	7,464	55%	656	143	2,856	22.96%	22.96%
2026	16,908	9,277	7,631	55%	658	146	2,913	22.60%	22.60%
2027	17,162	9,578	7,584	56%	683	149	2,971	22.99%	22.99%
2028	17,394	9,888	7,506	57%	691	152	3,031	22.80%	22.80%
2029	17,605	10,192	7,413	58%	700	155	3,091	22.63%	22.63%
2030	17,797	10,493	7,304	59%	709	158	3,153	22.47%	22.47%
2031	17,972	10,794	7,178	60%	718	161	3,216	22.32%	22.32%
2032	18,134	11,101	7,033	61%	729	164	3,281	22.21%	22.21%
2033	18,294	11,426	6,868	63%	739	167	3,346	22.09%	22.09%
2034	18,444	11,763	6,681	64%	751	171	3,413	21.99%	21.99%
2035	18,586	12,115	6,471	65%	763	174	3,481	21.91%	21.91%
2036	18,722	12,488	6,234	67%	775	178	3,551	21.82%	21.82%
2037	18,859	12,887	5,972	68%	788	181	3,622	21.76%	21.76%
2038	19,001	13,321	5,680	70%	802	185	3,694	21.70%	21.70%
2039	19,152	13,794	5,358	72%	816	188	3,768	21.66%	21.66%
2040	19,315	14,313	5,002	74%	823	192	3,844	21.42%	21.42%
2041	19,493	14,875	4,618	76%	873	196	3,921	22.28%	22.28%
2042	19,688	15,527	4,161	79%	854	200	3,999	21.35%	21.35%
2043	19,902	16,205	3,697	81%	867	204	4,079	21.25%	21.25%
2044	20,137	16,943	3,194	84%	881	208	4,160	21.17%	21.17%
2045	20,393	17,747	2,646	87%	904	212	4,244	21.31%	21.31%
2046	20,673	18,630	2,043	90%	896	216	4,329	20.70%	20.70%
2047	20,977	19,564	1,413	93%	914	221	4,415	20.70%	20.70%
2048	21,307	20,579	728	97%	933	225	4,503	20.71%	20.71%
2049	21,664	21,664	-	100%	167	230	4,594	3.63%	3.63%
2050	22,048	22,048	-	100%	170	234	4,685	3.63%	3.63%
2051	22,461	22,461	-	100%	173	239	4,779	3.63%	3.63%

<u>Notes and assumptions:</u>

The projection is based on the results of the June 30, 2022 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

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

The total active population is assumed to remain level throughout the entire projection.

Covered payroll is assumed to increase 2% each year throughout the entire projection.

The Board certified contribution rate paid by employers is assumed to be equal to the full actuarially determined contribution rate, except as allowed by House Bill 362 (passed during the 2018 legislative session), which limits the certified contribution rate to a 12% increase over the prior year rate for the period of July 1, 2018 to June 30, 2028.

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)
2022	$ 5,862	$ 2,789	$ 3,073	48%	$ 266	$ 50	$ 621	42.81%	42.81%
2023	6,023	2,951	3,072	49%	260	51	633	41.11%	41.11%
2024	6,174	3,103	3,071	50%	263	52	646	40.77%	40.77%
2025	6,319	3,279	3,040	52%	267	53	659	40.50%	40.50%
2026	6,457	3,365	3,092	52%	268	54	672	39.92%	39.92%
2027	6,589	3,520	3,069	53%	277	55	686	40.44%	40.44%
2028	6,715	3,680	3,035	55%	280	56	699	40.10%	40.10%
2029	6,838	3,843	2,995	56%	284	57	713	39.79%	39.79%
2030	6,958	4,011	2,947	58%	288	58	728	39.53%	39.53%
2031	7,080	4,188	2,892	59%	292	59	742	39.31%	39.31%
2032	7,205	4,374	2,831	61%	296	61	757	39.13%	39.13%
2033	7,334	4,574	2,760	62%	301	62	772	38.97%	38.97%
2034	7,467	4,787	2,680	64%	306	63	787	38.82%	38.82%
2035	7,604	5,014	2,590	66%	311	64	803	38.68%	38.68%
2036	7,744	5,254	2,490	68%	316	66	819	38.54%	38.54%
2037	7,885	5,507	2,378	70%	321	67	836	38.39%	38.39%
2038	8,025	5,772	2,253	72%	326	68	852	38.21%	38.21%
2039	8,164	6,048	2,116	74%	331	70	869	38.05%	38.05%
2040	8,301	6,337	1,964	76%	324	71	887	36.48%	36.48%
2041	8,438	6,627	1,811	79%	331	72	905	36.56%	36.56%
2042	8,578	6,937	1,641	81%	334	74	923	36.21%	36.21%
2043	8,721	7,263	1,458	83%	339	75	941	36.00%	36.00%
2044	8,867	7,608	1,259	86%	344	77	960	35.83%	35.83%
2045	9,015	7,972	1,043	88%	353	78	979	36.01%	36.01%
2046	9,164	8,358	806	91%	351	80	999	35.12%	35.12%
2047	9,316	8,759	557	94%	358	81	1,019	35.14%	35.14%
2048	9,471	9,185	286	97%	365	83	1,039	35.15%	35.15%
2049	9,629	9,629	-	100%	62	85	1,060	5.88%	5.88%
2050	9,790	9,790	-	100%	64	86	1,081	5.90%	5.90%
2051	9,955	9,955	-	100%	65	88	1,103	5.91%	5.91%

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.

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Covered payroll is assumed to increase 2% each year 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)
2022	$ 2,392	$ 3,160	$ (768)	132%	$ 90	$ 16	$ 2,663	3.39%	3.39%
2023	2,513	3,345	(832)	133%	-	17	2,716	0.00%	0.00%
2024	2,633	3,446	(813)	131%	-	18	2,770	0.00%	0.00%
2025	2,751	3,575	(824)	130%	-	20	2,826	0.00%	0.00%
2026	2,866	3,606	(740)	126%	-	21	2,882	0.00%	0.00%
2027	2,976	3,710	(734)	125%	-	23	2,940	0.00%	0.00%
2028	3,082	3,810	(728)	124%	-	24	2,999	0.00%	0.00%
2029	3,183	3,907	(724)	123%	-	25	3,059	0.00%	0.00%
2030	3,279	4,002	(723)	122%	-	27	3,120	0.00%	0.00%
2031	3,372	4,093	(721)	121%	-	28	3,182	0.00%	0.00%
2032	3,462	4,183	(721)	121%	-	29	3,246	0.00%	0.00%
2033	3,550	4,272	(722)	120%	-	31	3,311	0.00%	0.00%
2034	3,639	4,362	(723)	120%	-	32	3,377	0.00%	0.00%
2035	3,729	4,454	(725)	119%	-	33	3,445	0.00%	0.00%
2036	3,822	4,550	(728)	119%	-	34	3,514	0.00%	0.00%
2037	3,920	4,651	(731)	119%	-	35	3,584	0.00%	0.00%
2038	4,023	4,756	(733)	118%	-	36	3,655	0.00%	0.00%
2039	4,132	4,869	(737)	118%	-	37	3,729	0.00%	0.00%
2040	4,249	4,988	(739)	117%	-	38	3,803	0.00%	0.00%
2041	4,372	5,115	(743)	117%	-	38	3,879	0.00%	0.00%
2042	4,501	5,247	(746)	117%	4	39	3,957	0.09%	0.09%
2043	4,638	5,389	(751)	116%	4	40	4,036	0.10%	0.10%
2044	4,780	5,538	(758)	116%	5	41	4,117	0.13%	0.13%
2045	4,927	5,694	(767)	116%	10	42	4,199	0.24%	0.24%
2046	5,078	5,859	(781)	115%	5	43	4,283	0.12%	0.12%
2047	5,233	6,022	(789)	115%	9	44	4,369	0.21%	0.21%
2048	5,390	6,193	(803)	115%	15	45	4,456	0.33%	0.33%
2049	5,550	5,550	-	100%	-	45	4,545	0.00%	0.00%
2050	5,710	5,710	-	100%	-	46	4,636	0.00%	0.00%
2051	5,870	5,870	-	100%	-	47	4,729	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)
2022	$ 1,538	$ 1,554	$ (16)	101%	$ 42	$ 4	$ 617	6.78%	6.78%
2023	1,569	1,597	(28)	102%	16	4	629	2.58%	2.58%
2024	1,592	1,610	(18)	101%	15	4	642	2.29%	2.29%
2025	1,609	1,632	(23)	101%	13	5	654	2.06%	2.06%
2026	1,618	1,597	21	99%	11	5	668	1.65%	1.65%
2027	1,624	1,593	31	98%	13	5	681	1.90%	1.90%
2028	1,627	1,588	39	98%	12	6	695	1.70%	1.70%
2029	1,626	1,578	48	97%	11	6	708	1.55%	1.55%
2030	1,623	1,565	58	96%	10	7	723	1.42%	1.42%
2031	1,617	1,548	69	96%	10	7	737	1.32%	1.32%
2032	1,610	1,530	80	95%	9	7	752	1.23%	1.23%
2033	1,604	1,510	94	94%	9	7	767	1.17%	1.17%
2034	1,598	1,490	108	93%	9	8	782	1.13%	1.13%
2035	1,593	1,471	122	92%	9	8	798	1.08%	1.08%
2036	1,593	1,454	139	91%	8	8	814	1.04%	1.04%
2037	1,597	1,440	157	90%	8	8	830	1.02%	1.02%
2038	1,605	1,430	175	89%	8	8	847	1.00%	1.00%
2039	1,618	1,423	195	88%	8	9	864	0.98%	0.98%
2040	1,636	1,419	217	87%	14	9	881	1.55%	1.55%
2041	1,659	1,424	235	86%	26	9	898	2.88%	2.88%
2042	1,685	1,444	241	86%	60	9	916	6.55%	6.55%
2043	1,717	1,504	213	88%	60	9	935	6.47%	6.47%
2044	1,753	1,570	183	90%	61	10	953	6.41%	6.41%
2045	1,792	1,641	151	92%	64	10	973	6.55%	6.55%
2046	1,833	1,719	114	94%	60	10	992	6.07%	6.07%
2047	1,875	1,797	78	96%	61	10	1,012	6.06%	6.06%
2048	1,918	1,879	39	98%	62	10	1,032	6.04%	6.04%
2049	1,962	1,962	-	100%	19	11	1,053	1.79%	1.79%
2050	2,006	2,006	-	100%	19	11	1,074	1.76%	1.76%
2051	2,049	2,049	-	100%	19	11	1,095	1.73%	1.73%

<u>Notes and assumptions:</u>

The projection is based on the results of the June 30, 2022 actuarial valuation and assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%.

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

The total active population is assumed to remain level throughout the entire projection.

Covered payroll is assumed to increase 2% each year throughout the entire projection.

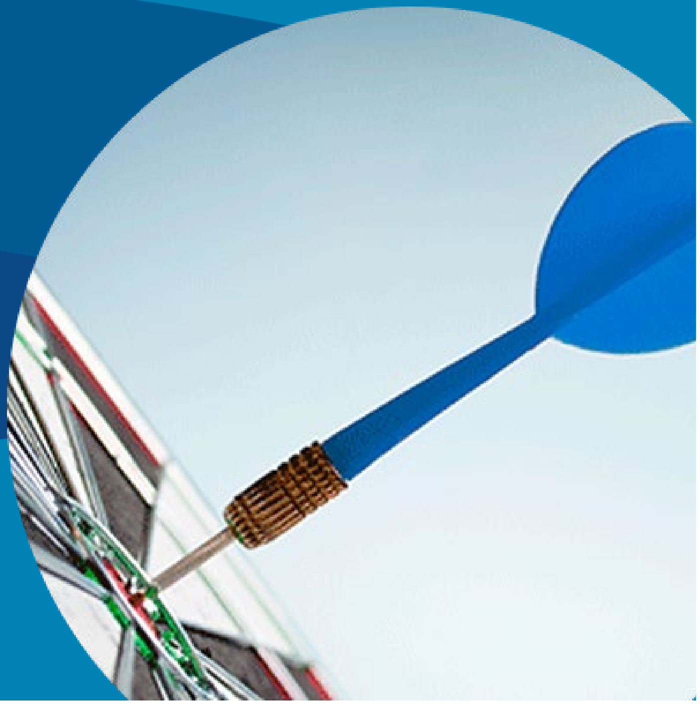
The Board certified contribution rate paid by employers is assumed to be equal to the full actuarially determined contribution rate, except as allowed by House Bill 362 (passed during the 2018 legislative session), which limits the certified contribution rate to a 12% increase over the prior year rate for the period of July 1, 2018 to June 30, 2028.

County Employees Retirement System

2022 Actuarial Valuation Results

December 5, 2022

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



Comments on Valuation Results

- Overview of legislation passed in 2022
  - SB 209: increased health insurance benefits to members hired after July 1, 2003

- Change in active membership and covered payroll
  - Active membership increased across both funds
  - Non-Hazardous: 6.4% increase in covered payroll
  - Hazardous: 7.4% increase in covered payroll

Comments on Valuation Results

- FYE 2022 Investment Experience
  - -6% return on market value
    - Assumed rate of return: 6.25%
  - Fund assets $1,943M less than expected for CERS ($1,382M pension and $561M insurance)
  - $110M in asset gains recognized this year ($80M pension and $30M insurance)

Comments on Valuation Results

- Retirement Fund Liability Experience
  - $482M loss for non-hazardous fund
  - $92M loss for hazardous fund
- Insurance Fund Liability Experience
  - $1,582M gain for both CERS insurance funds combined
  - Medicare premiums significantly decreased from 2022 to 2023.

Required Employer Contributions

	CERS Non-Hazardous		CERS Hazardous	
	2021 Val	2022 Val	2021 Val	2022 Val
(1)	(2)	(3)	(4)	(5)
Pension Fund	23.40%	23.34%	42.81%	41.11%
Insurance Fund	3.39%	0.00%	6.78%	2.58%
Actuarially Determined Contribution Rate, payable as a percentage of payroll[1]	**26.79%**	**23.34%**	**49.59%**	**43.69%**
Difference		**(3.45)%**		**(5.90)%**

[1] 2021 Valuation set the contribution rates for FYE2023. 2022 Valuation will be used to set the contribution rates for FYE2024.

Required Employer Contributions ($millions)

	CERS Non-Hazardous		CERS Hazardous	
	2021 Val FYE2023	2022 Val FYE2024	2021 Val FYE2023	2022 Val FYE2024
(1)	(2)	(3)	(4)	(5)
Actuarially Determined Employer Contribution				
Pension Fund	$ 604	$ 641	$ 253	$ 260
Insurance Fund	87	0	40	16
Total Contribution	**$ 691**	**$ 641**	**$ 293**	**$ 276**
Change in Contribution		**($50)**		**($17)**

Change in Required Employer Contributions
CERS Non-Haz – Actuarially Determined Contribution Rate

	CERS Non-Hazardous (% of pay)		
	Pension	Insurance	Total
Contribution Rate – 2021 Val	**23.40%**	**3.39%**	**26.79%**
Investment Experience	(0.19)%	(0.06)%	(0.25)%
Demographic Experience	0.13 %	(4.56)%	(4.43)%
Plan Change – SB 209	0.00 %	0.36 %	0.36 %
Total Change	(0.06)%	(4.26)%	(4.32)%
Contribution Rate – 2022 Val	**23.34%**	**0.00%[1]**	**23.34%**

Return on actuarial value of assets 7% pension & insurance

Significant decrease in 2023 Medicare premiums

[1] Contribution rate not less than 0.00%.

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Change in Required Employer Contributions
CERS Haz – Actuarially Determined Contribution Rate

	CERS Hazardous (% of pay)		
	Pension	Insurance	Total
Contribution Rate – 2021 Val	**42.81%**	**6.78%**	**49.59%**
Investment Experience	(0.25)%	(0.17)%	(0.42)%
Demographic Experience	(1.45)%	(5.02)%	(6.47)%
Plan Change – SB 209	0.00 %	0.99 %	0.99 %
Total Change	(1.70)%	(4.20)%	(5.90)%
Contribution Rate – 2022 Val	**41.11%**	**2.58%**	**43.69%**

Return on actuarial value of assets 7% pension & insurance

Significant decrease in 2023 Medicare premiums

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

	CERS Non-Hazardous		CERS Hazardous	
	2021 Val	2022 Val	2021 Val	2022 Val
(1)	(2)	(3)	(4)	(5)
Pension Fund	$ 7.18	$ 7.53	$ 3.00	$ 3.07
Insurance Fund	0.50	(0.77)	0.28	(0.02)
Total Unfunded Actuarial Accrued Liability	**$ 7.68**	**$ 6.76**	**$ 3.28**	**$ 3.05**
Change in Unfunded Actuarial Accrued Liability		**$ (0.92)**		**$ (0.23)**

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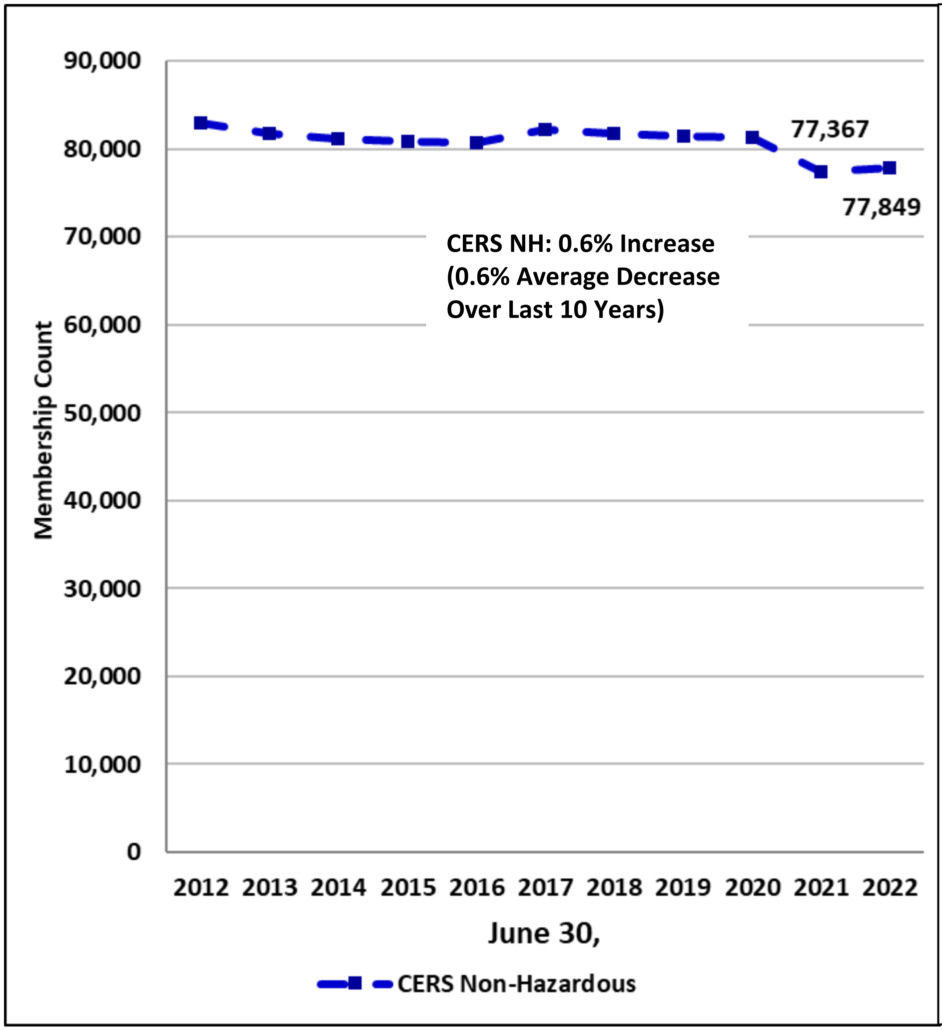
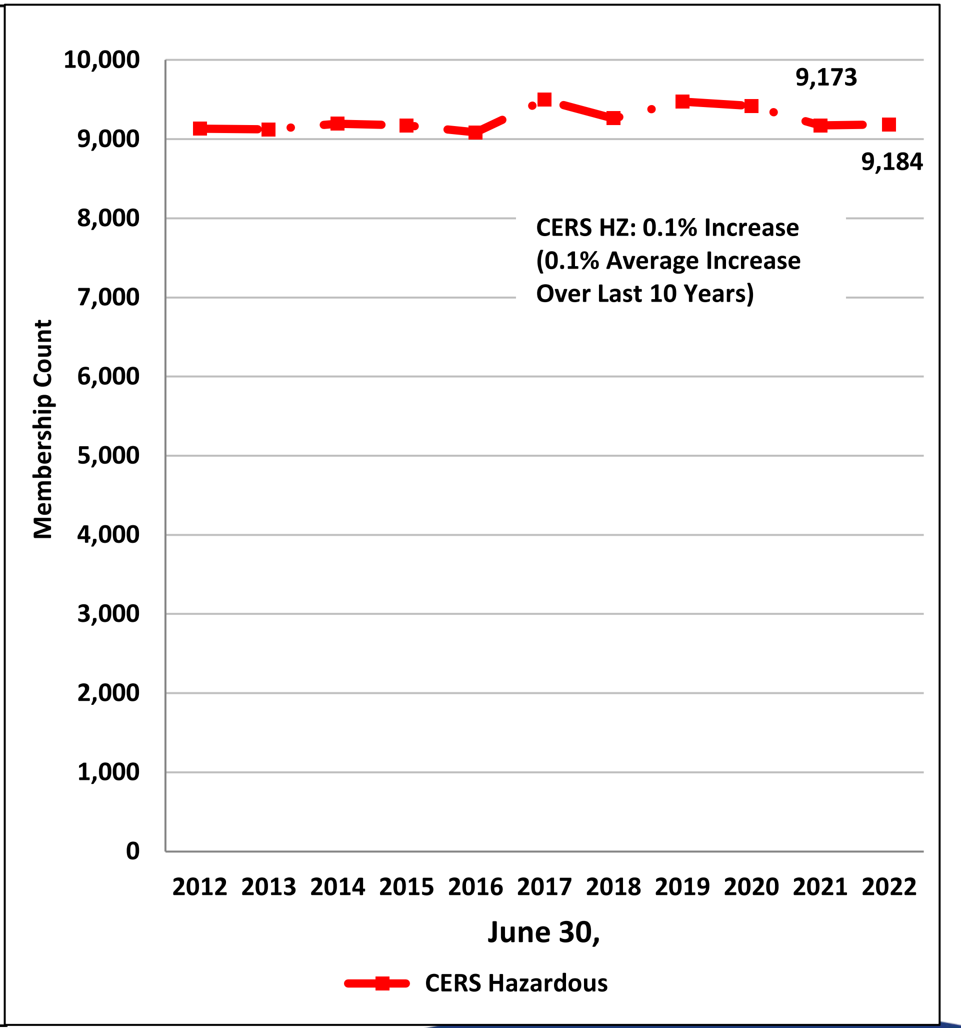
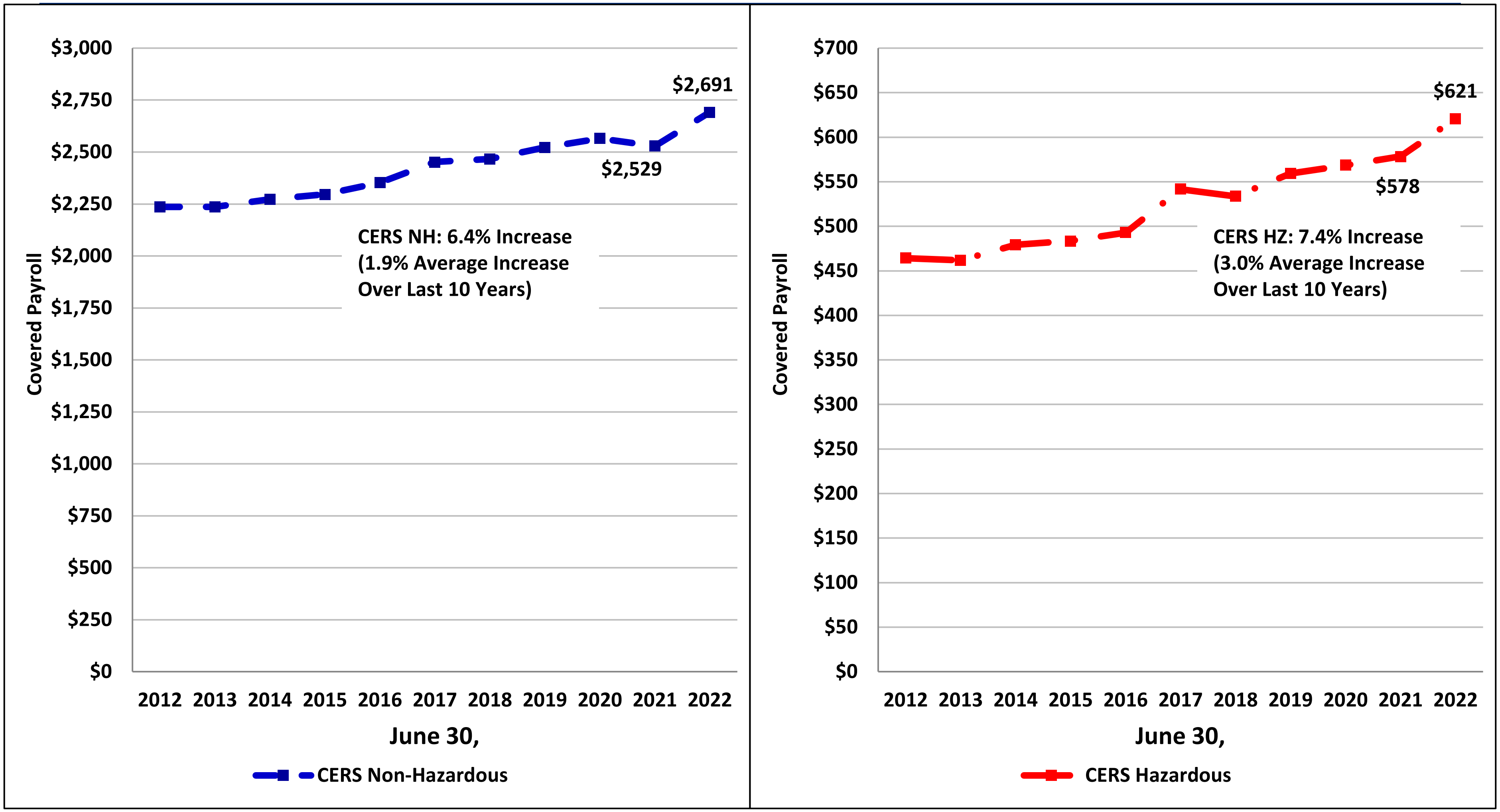
Active Membership Count

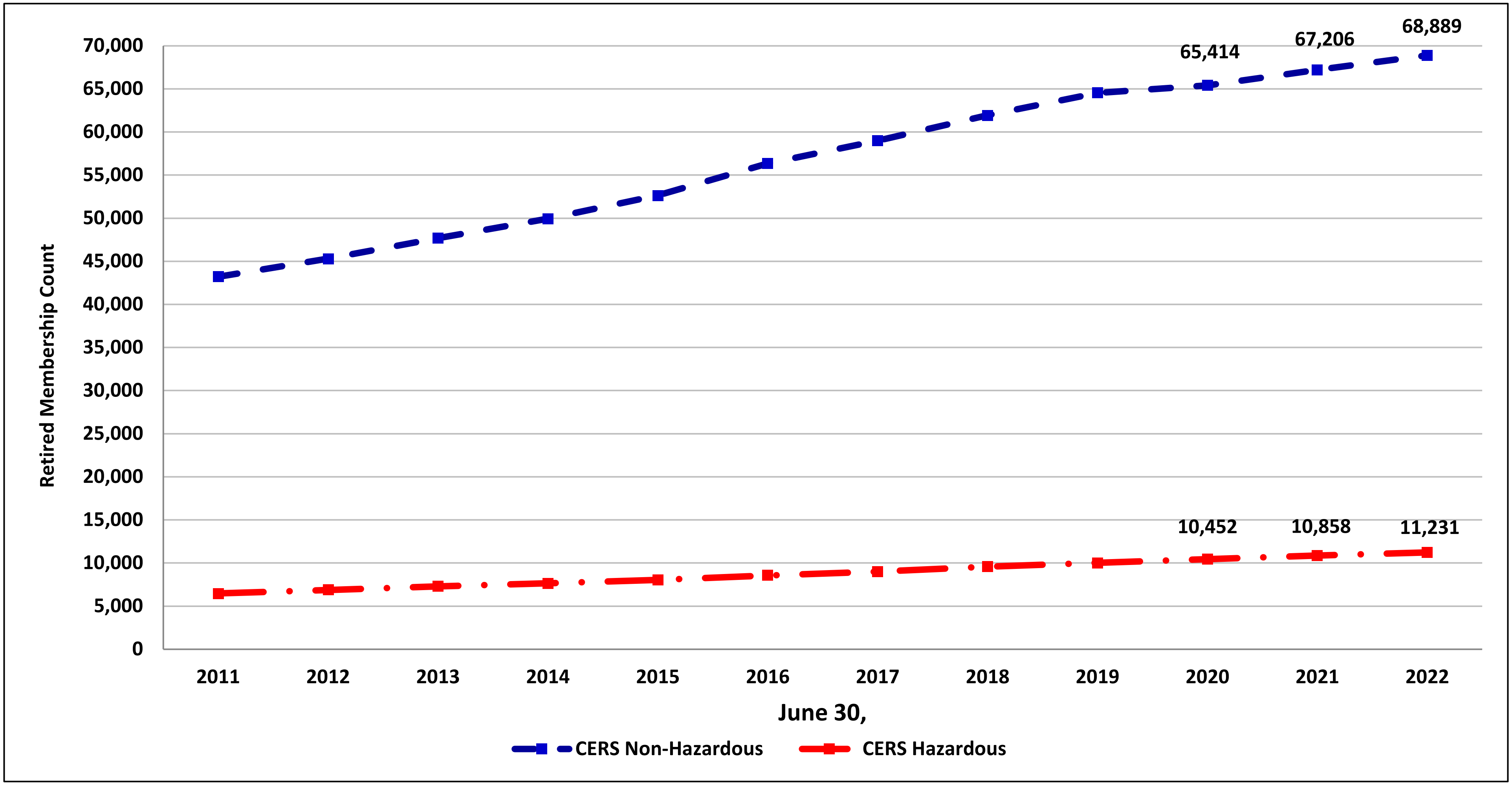




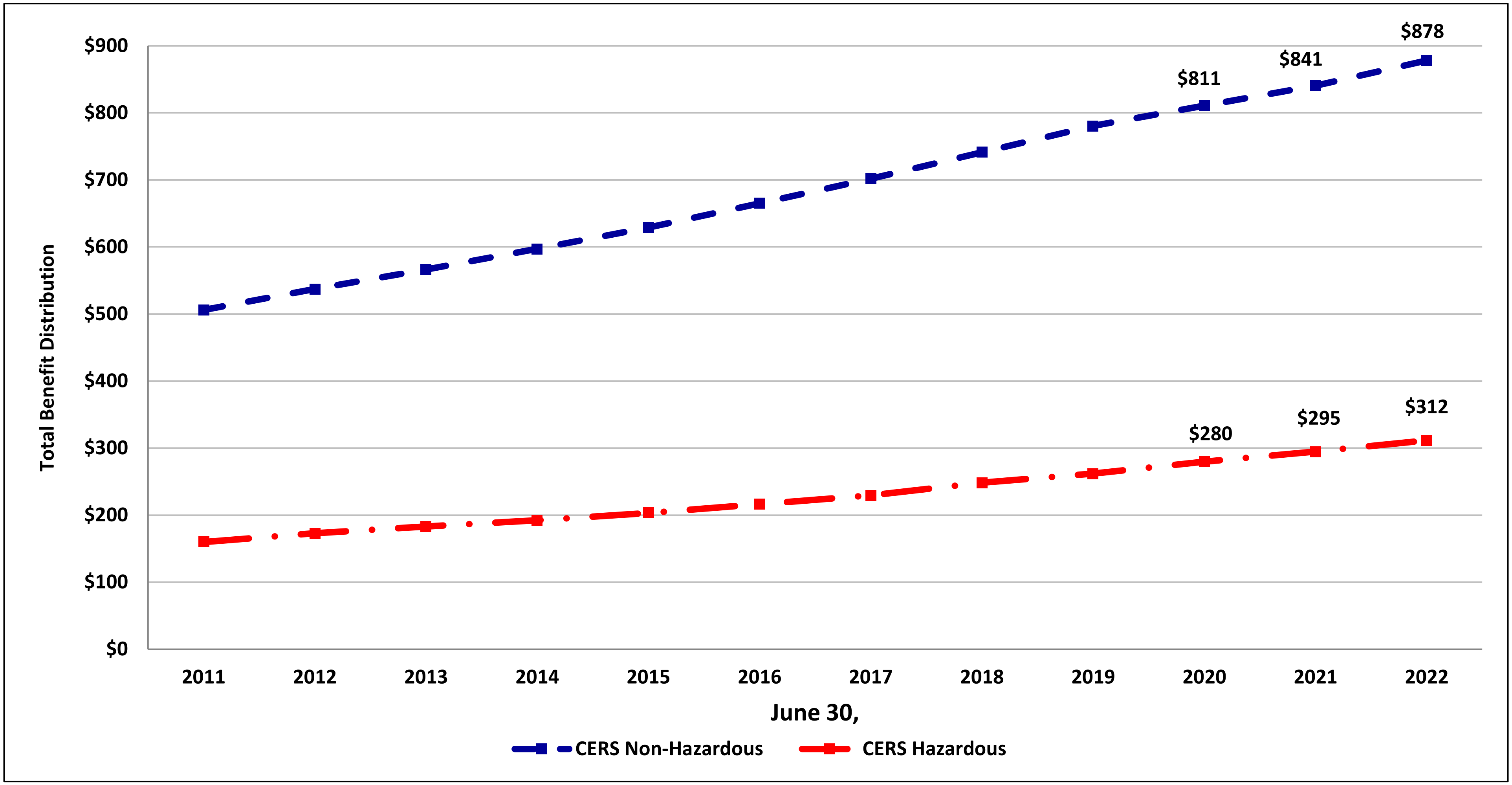
Covered Payroll ($ in Millions)



Retired Membership Count



Pension Benefit Distributions ($ in Millions)



Funding Results – CERS ($ in millions)

	Non-Hazardous System				Hazardous System			
	Pension		Insurance		Pension		Insurance	
Item	2021	2022	2021	2022	2021	2022	2021	2022
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total Normal Cost Rate	10.44%	10.22%	3.07%	2.69%	18.39%	18.02%	4.83%	4.50%
Member Rate	(5.00%)	(5.00%)	(0.55%)	(0.59%)	(8.00%)	(8.00%)	(0.55%)	(0.59%)
Employer Normal Cost Rate	5.44%	5.22%	2.52%	2.10%	10.39%	10.02%	4.28%	3.91%
Administrative Expenses	0.86%	0.84%	0.04%	0.04%	0.32%	0.32%	0.09%	0.08%
Amortization Cost	17.10%	17.28%	0.83%	-3.01%	32.10%	30.77%	2.41%	-1.41%
Total Actuarially Determined Rate	**23.40%**	**23.34%**	**3.39%**	**0.00%**	**42.81%**	**41.11%**	**6.78%**	**2.58%**
Actuarial Accrued Liability (AAL)	$14,895	$15,674	$3,450	$2,392	$5,629	$5,862	$1,751	$1,538
Actuarial Value of Assets	7,716	8,149	2,947	3,160	2,629	2,789	1,476	1,554
Unfunded AAL	**$7,179**	**$7,525**	**$503**	**($768)**	**$3,000**	**$3,073**	**$276**	**($16)**
Funded Ratio	**51.8%**	**52.0%**	**85.4%**	**132.1%**	**46.7%**	**47.6%**	**84.3%**	**101.0%**

GRS

PROJECTION INFORMATION
PENSION AND INSURANCE

Projection Assumptions

- Assumes that all actuarial assumptions are realized, including the assumed annual asset return of 6.25%
- Full actuarially determined contribution paid each year
- Covered payroll assumed to increase by 2% each year
  - Total active population assumed to remain level

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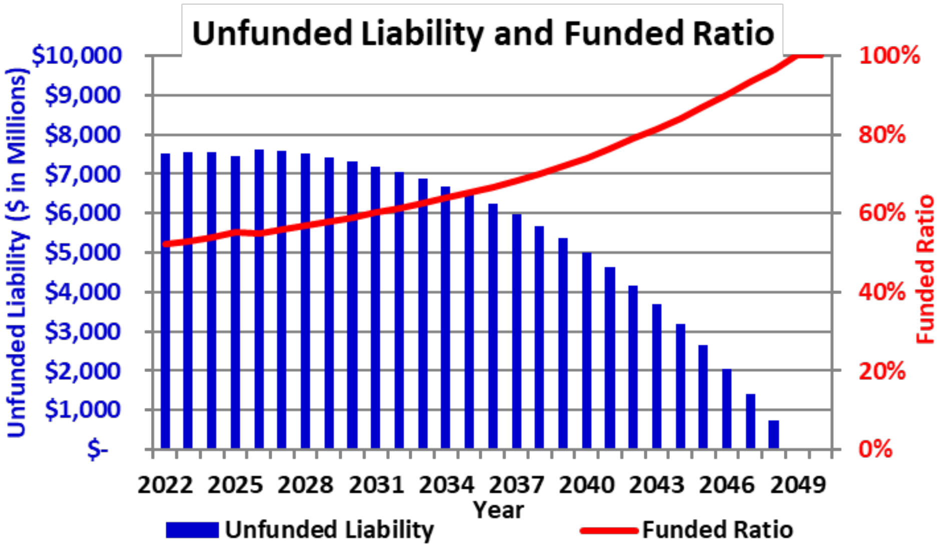
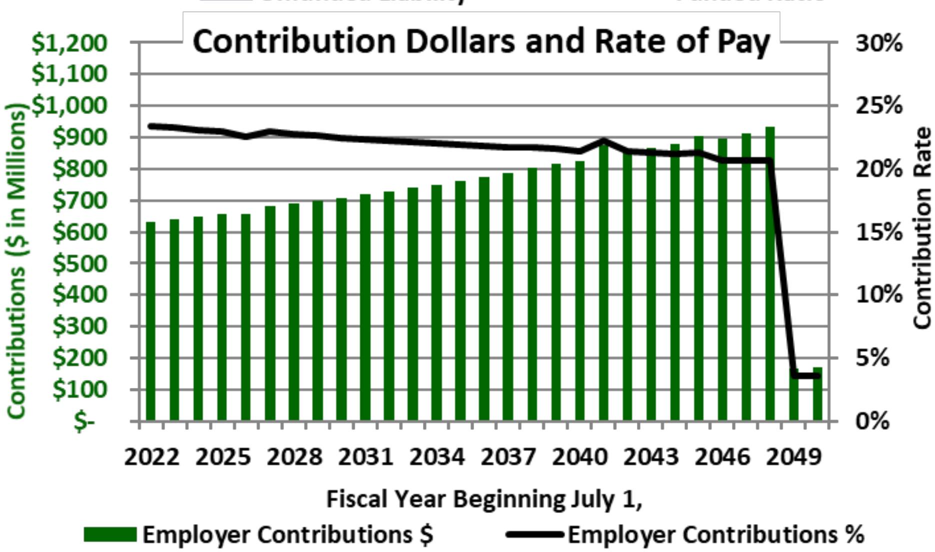
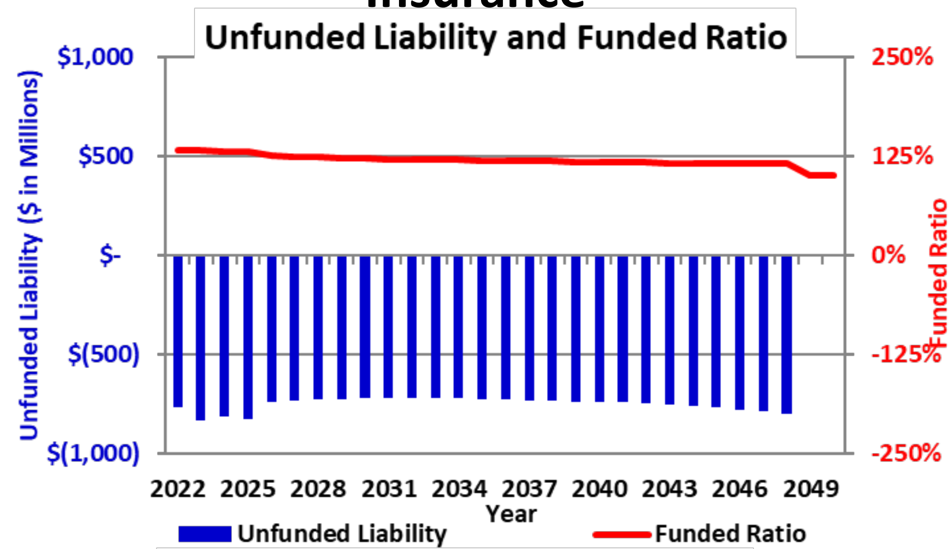
CERS Non-Hazardous Projection

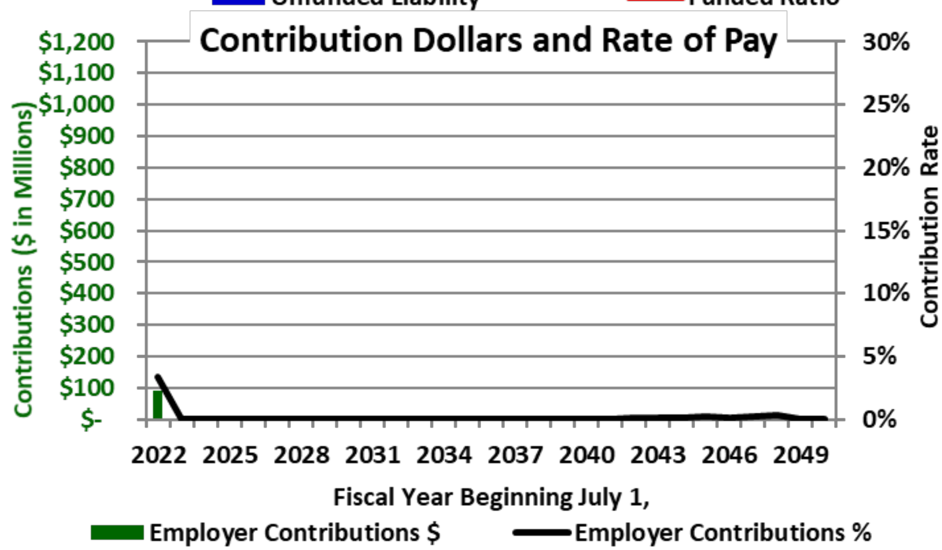
Pension





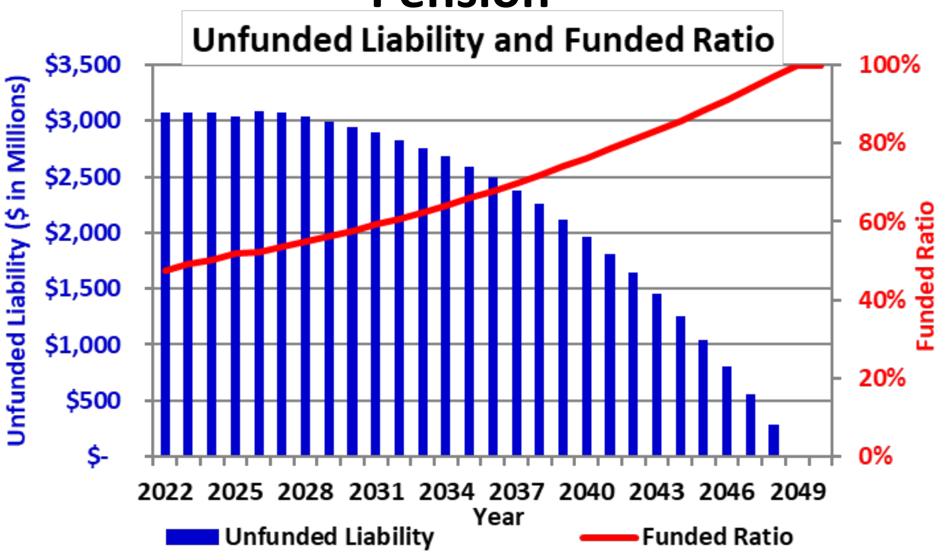
Insurance



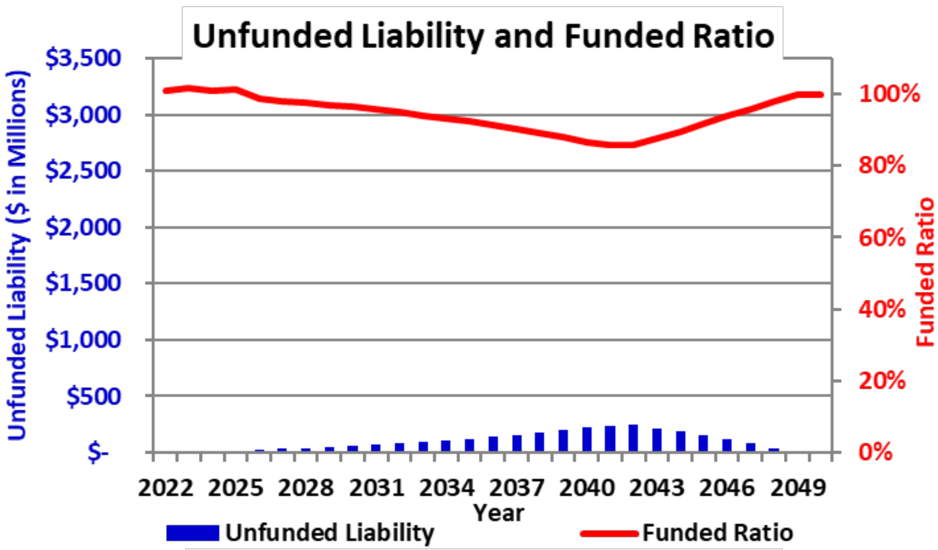


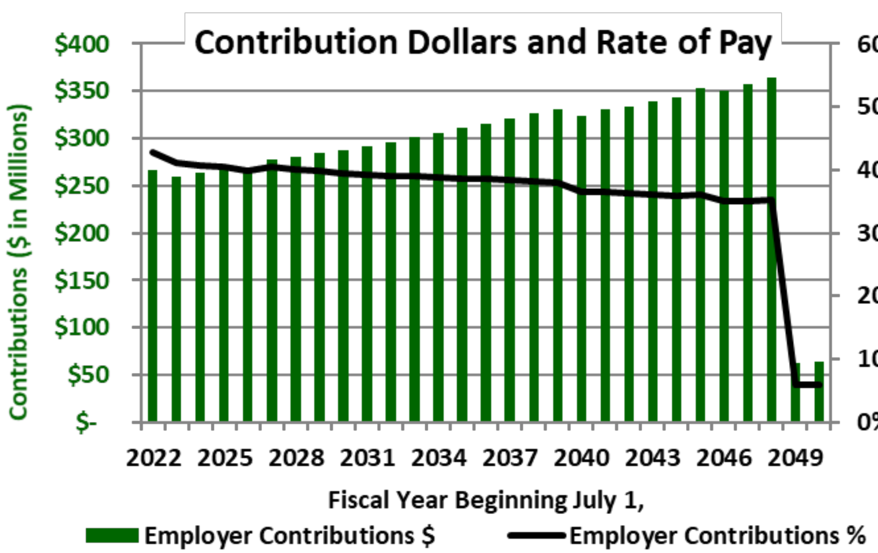
CERS Hazardous Projection

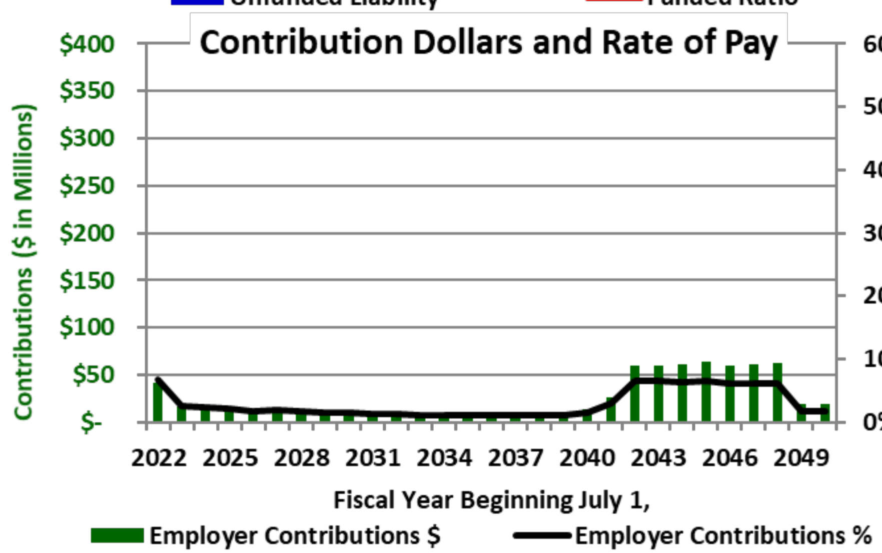
Pension



Insurance







Closing Comments on 2022 Valuation Results

- The decrease in the Medicare premiums from 2022 to 2023 significantly improved the funded status of the insurance funds and lowered the required contribution effort across all funds
- The FYE 2022 investment losses almost offset the FYE 2021 investment gains (compared to the investment return assumption)
- Actuarially determined contribution rates are fully phased in
- It is imperative the participating employers continue contributing the actuarially determined contributions in each future year 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, 2022. 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.