



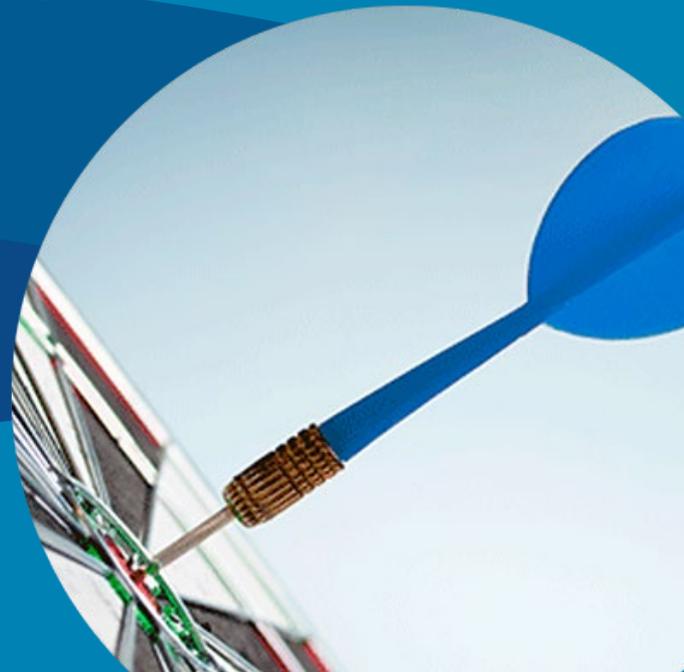
Kentucky Retirement System

2021 Actuarial Valuation Results

November 16, 2021

Janie Shaw, ASA, EA, MAAA

Danny White, FSA, EA, MAAA



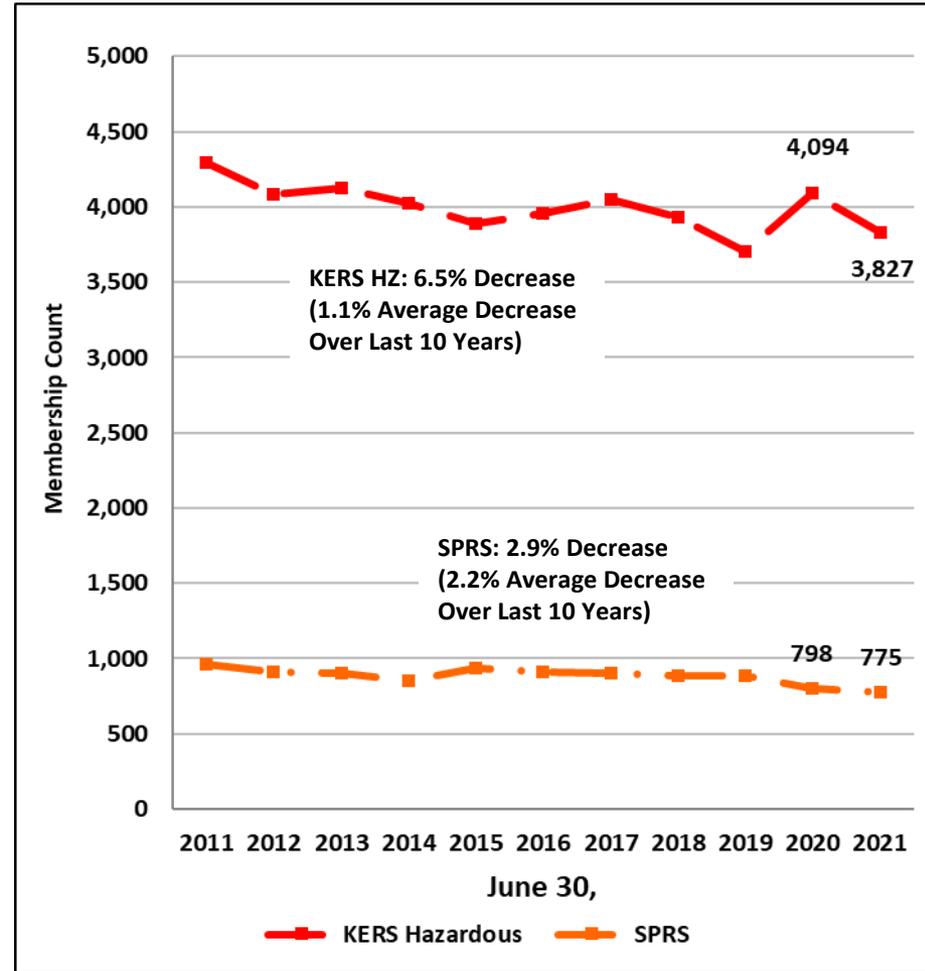
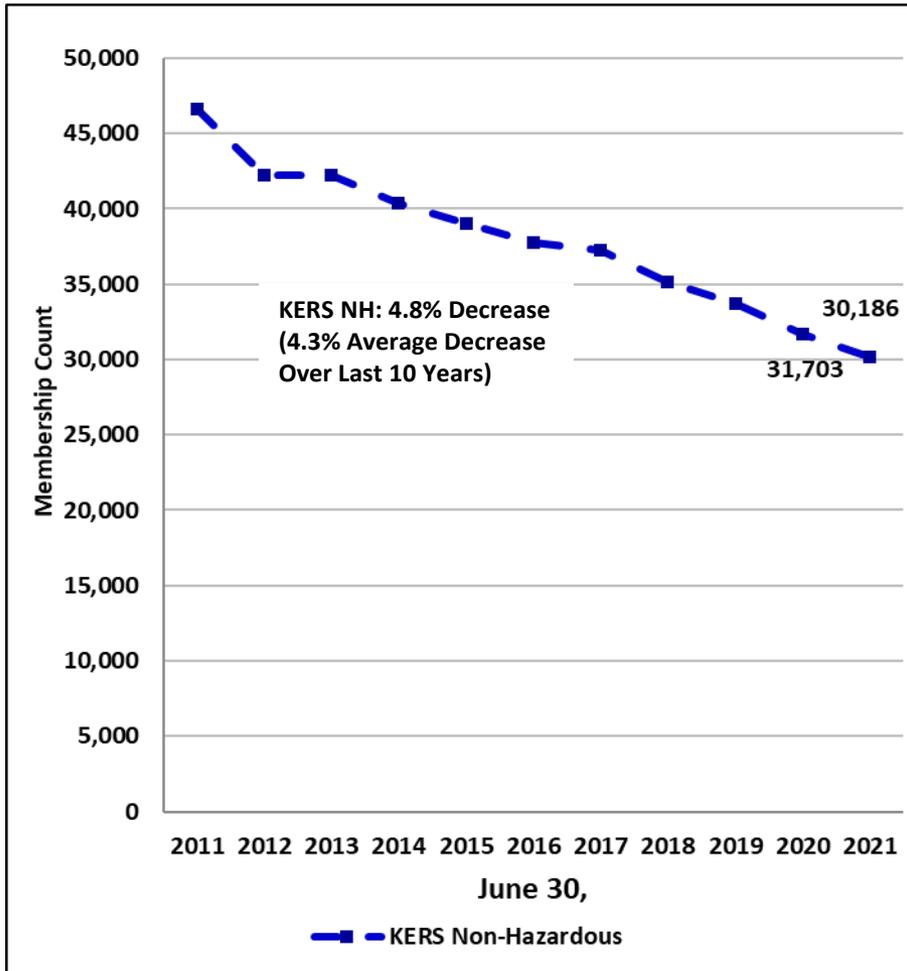
Comments on Valuation Results

- FYE 2021 Investment Experience
 - 21% to 25% return on market value (varies by fund)
 - Assumed rate of return: 5.25% for KERS Non-Hazardous and SPRS retirement funds
 - Assumed rate of return: 6.25% for KERS Hazardous retirement fund and Insurance funds
 - Fund assets \$902M more than expected for KERS and SPRS (\$566M pension and \$336M insurance)
 - \$191M in asset gains recognized this year (\$128M pension and \$63M insurance)

Comments on KERS Non-Haz Retirement Fund

- Imperative to maintain or increase contribution effort for the KERS Non-Hazardous Retirement Fund
 - June 30, 2021 plan assets were \$3,019 million
 - Fund distributed \$1,030 million in benefit payments and administrative expenses in FYE 2021
 - Actuarially determined employer contribution for FYE 2023 is \$1,129 million

Active Membership Count



Required Employer Contributions

	KERS Non-Hazardous		KERS Hazardous		SPRS	
	2020 Val	2021 Val	2020 Val	2021 Val	2020 Val	2021 Val
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pension Fund	7.90%	7.82%	33.43%	31.82%	127.99%	126.44%
Insurance Fund	<u>2.20%</u>	<u>2.15%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>18.07%</u>	<u>14.11%</u>
Actuarially Determined Contribution Rate, payable as a percentage of payroll	10.10%	9.97%	33.43%	31.82%	146.06%	140.55%
Difference		(0.13)%		(1.61)%		(5.51)%
Amortization Cost – Pension	\$ 920M	\$ 906M				
Amortization Cost – Insurance	<u>103M</u>	<u>88M</u>				
Amortization Cost - Total	\$ 1,023M²	\$ 994M	N/A	N/A	N/A	N/A
Difference		\$ (29)				

¹ 2020 Valuation set the contribution rates for FYE2022. 2021 Valuation will be used to set the contribution rates for FYE2023 and FYE2024.

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



Required Employer Contributions (\$millions)

	KERS Non-Hazardous		KERS Hazardous		SPRS	
	2020 Val FYE2022	2021 Val FYE2023	2020 Val FYE2022	2021 Val FYE2023	2020 Val FYE2022	2021 Val FYE2023
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pension Fund	\$ 1,030	\$ 1,012	\$ 57	\$ 52	\$ 59	\$ 57
Insurance Fund	<u>133</u>	<u>117</u>	<u>0</u>	<u>0</u>	<u>8</u>	<u>6</u>
Total Actuarially Determined Employer Contribution	\$ 1,163	\$ 1,129	\$ 57	\$ 52	\$ 67	\$ 63
Change in Actuarially Determined Employer Contribution		\$ (34)		\$ (5)		\$ (4)

Funding Results – KERS (\$ in millions)

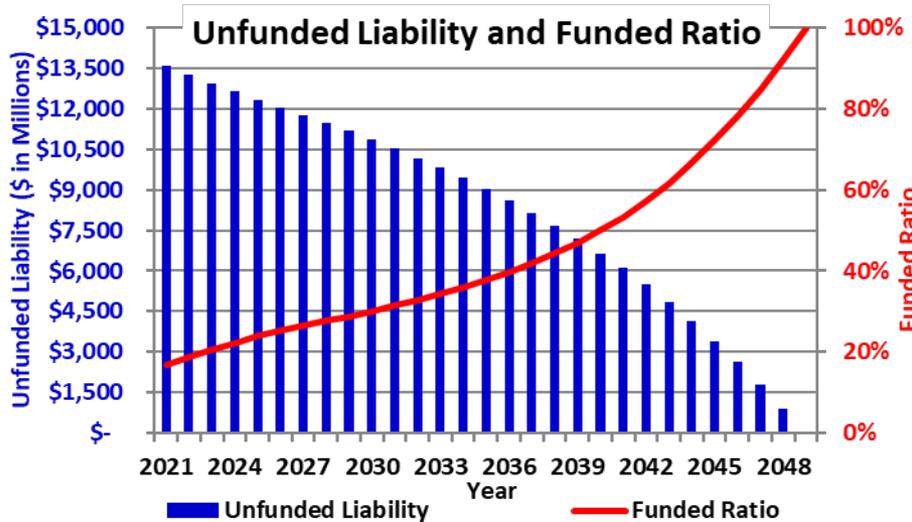
Item	Non-Hazardous System				Hazardous System			
	Pension		Insurance		Pension		Insurance	
	2020	2021	2020	2021	2020	2021	2020	2021
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total Normal Cost Rate	12.04%	11.96%	2.58%	2.54%	16.15%	16.01%	4.63%	4.46%
Member Rate	<u>(5.00%)</u>	<u>(5.00%)</u>	<u>(0.44%)</u>	<u>(0.45%)</u>	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>(0.64%)</u>	<u>(0.66%)</u>
Employer Normal Cost Rate	7.04%	6.96%	2.14%	2.09%	8.15%	8.01%	3.99%	3.80%
Administrative Expenses	0.86%	0.86%	0.06%	0.06%	0.69%	0.77%	0.07%	0.07%
Amortization Cost	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>24.59%</u>	<u>23.04%</u>	<u>(4.94%)</u>	<u>(7.59%)</u>
Total Actuarially Determined Rate	7.90%	7.82%	2.20%	2.15%	33.43%	31.82%	0.00%	0.00%
Amortization Cost to be Allocated	\$920	\$906	\$103	\$88	N/A	N/A	N/A	N/A
Actuarial Accrued Liability (AAL)	\$16,349	\$16,321	\$2,565	\$2,574	\$1,284	\$1,295	\$428	\$424
Actuarial Value of Assets	<u>2,323</u>	<u>2,736</u>	<u>1,096</u>	<u>1,296</u>	<u>710</u>	<u>782</u>	<u>539</u>	<u>575</u>
Unfunded AAL	\$14,026	\$13,585	\$1,469	\$1,278	\$574	\$513	(\$111)	(\$151)
Funded Ratio	14.2%	16.8%	42.7%	50.3%	55.3%	60.4%	126.0%	135.5%

Funding Results – SPRS (\$ in millions)

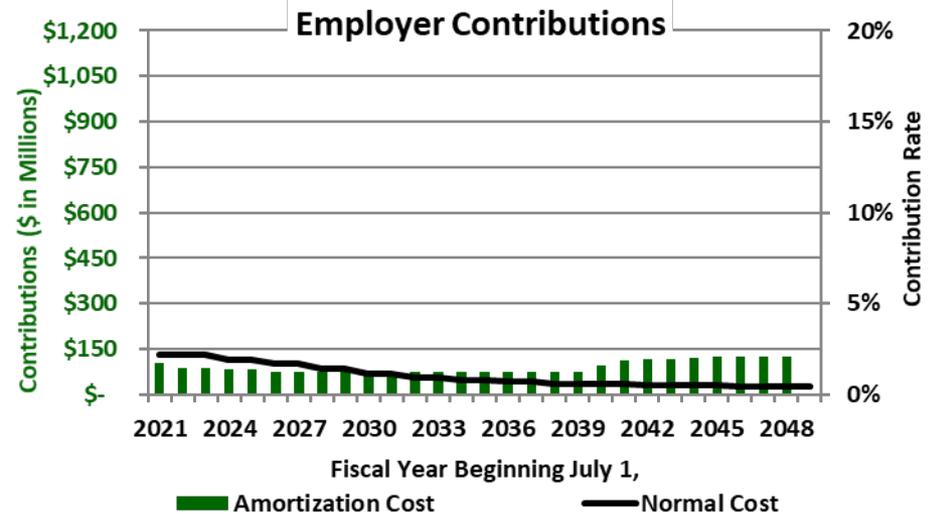
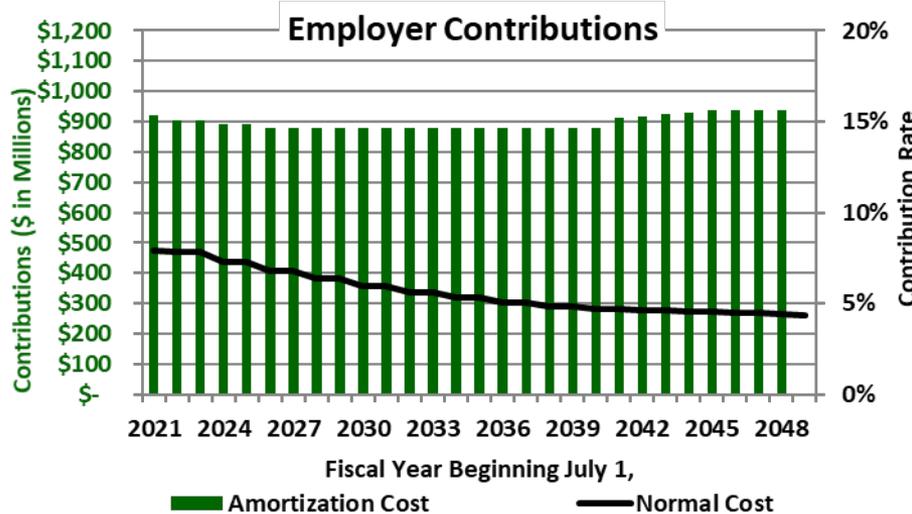
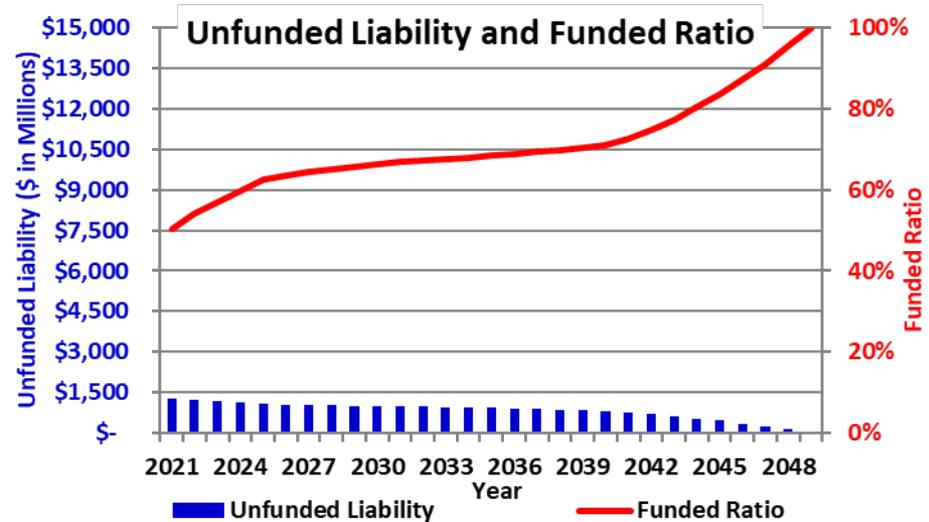
Item	Pension		Insurance	
	2020	2021	2020	2021
(1)	(2)	(3)	(4)	(5)
Total Normal Cost Rate	26.46%	26.13%	7.69%	7.35%
Member Rate	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>(0.44%)</u>	<u>(0.46%)</u>
Employer Normal Cost Rate	18.46%	18.13%	7.25%	6.89%
Administrative Expenses	0.58%	0.50%	0.15%	0.20%
Amortization Cost	<u>108.95%</u>	<u>107.81%</u>	<u>10.67%</u>	<u>7.02%</u>
Total Actuarially Determined Rate	127.99%	126.44%	18.07%	14.11%
Actuarial Accrued Liability (AAL)	\$1,053	\$1,053	\$276	\$272
Actuarial Value of Assets	<u>296</u>	<u>323</u>	<u>207</u>	<u>223</u>
Unfunded AAL	\$757	\$730	\$69	\$49
Funded Ratio	28.1%	30.7%	75.0%	82.0%

KERS Non-Hazardous Projection

Pension



Insurance



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

(1)	Decrease Discount Rate (2)	Valuation Results (3)	Increase Discount Rate (4)
Payroll Growth Rate	0.00%	0.00%	0.00%
Inflation Rate	2.30%	2.30%	2.30%
Discount Rate - Retirement	4.25%	5.25%	6.25%
Discount Rate - Insurance	5.25%	6.25%	7.25%
Retirement			
Actuarial Accrued Liability	\$ 18,344,613	\$ 16,321,372	\$ 14,655,807
Actuarial Value of Assets	2,735,882	2,735,882	2,735,882
Unfunded Actuarial Accrued Liability	15,608,731	13,585,490	11,919,925
Funded Ratio	14.9%	16.8%	18.7%
Normal Cost Rate	11.31%	7.82%	5.41%
Amortization Cost	\$ 969,446	\$ 906,019	\$ 851,816
Insurance			
Actuarial Accrued Liability	\$ 2,922,389	\$ 2,574,112	\$ 2,289,072
Actuarial Value of Assets	1,295,721	1,295,721	1,295,721
Unfunded Actuarial Accrued Liability	1,626,668	1,278,391	993,351
Funded Ratio	44.3%	50.3%	56.6%
Normal Cost Rate	2.96%	2.15%	1.56%
Amortization Cost	\$ 108,436	\$ 88,002	\$ 69,146
Combined			
Actuarial Accrued Liability	\$ 21,267,002	\$ 18,895,484	\$ 16,944,879
Actuarial Value of Assets	4,031,603	4,031,603	4,031,603
Unfunded Actuarial Accrued Liability	17,235,399	14,863,881	12,913,276
Funded Ratio	19.0%	21.3%	23.8%
Normal Cost Rate	14.27%	9.97%	6.97%
Amortization Cost	\$ 1,077,882	\$ 994,021	\$ 920,962

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

(1)	Decrease Inflation Rate (2)	Valuation Results (3)	Increase Inflation Rate (4)
Payroll Growth Rate	-0.25%	0.00%	0.25%
Inflation Rate	2.05%	2.30%	2.55%
Discount Rate - Retirement	5.00%	5.25%	5.50%
Discount Rate - Insurance	6.00%	6.25%	6.50%
Retirement			
Actuarial Accrued Liability	\$ 16,759,612	\$ 16,321,372	\$ 15,903,291
Actuarial Value of Assets	2,735,882	2,735,882	2,735,882
Unfunded Actuarial Accrued Liability	14,023,730	13,585,490	13,167,409
Funded Ratio	16.3%	16.8%	17.2%
Normal Cost Rate	8.29%	7.82%	7.39%
Amortization Cost	\$ 941,717	\$ 906,019	\$ 871,875
Insurance			
Actuarial Accrued Liability	\$ 2,594,161	\$ 2,574,112	\$ 2,555,191
Actuarial Value of Assets	1,295,721	1,295,721	1,295,721
Unfunded Actuarial Accrued Liability	1,298,440	1,278,391	1,259,470
Funded Ratio	49.9%	50.3%	50.7%
Normal Cost Rate	2.23%	2.15%	2.08%
Amortization Cost	\$ 89,702	\$ 88,002	\$ 86,399
Combined			
Actuarial Accrued Liability	\$ 19,353,773	\$ 18,895,484	\$ 18,458,482
Actuarial Value of Assets	4,031,603	4,031,603	4,031,603
Unfunded Actuarial Accrued Liability	15,322,170	14,863,881	14,426,879
Funded Ratio	20.8%	21.3%	21.8%
Normal Cost Rate	10.52%	9.97%	9.47%
Amortization Cost	\$ 1,031,419	\$ 994,021	\$ 958,274



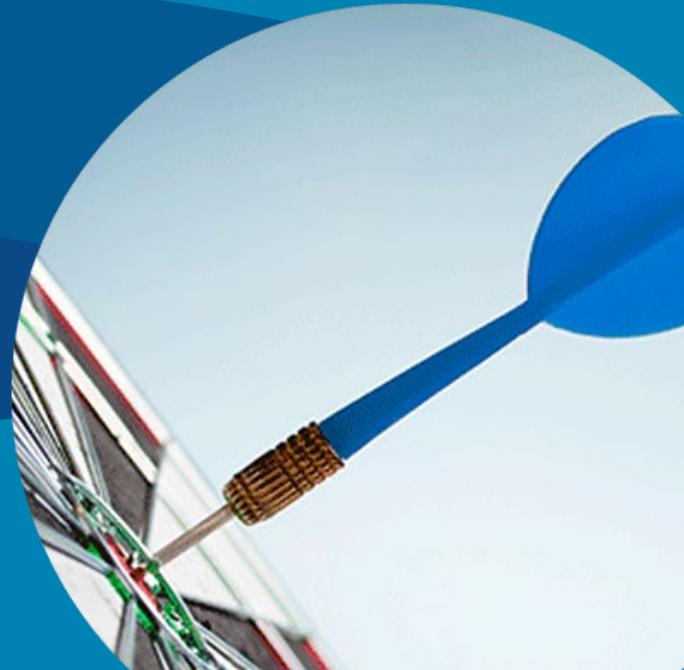
County Employees Retirement System

2021 Actuarial Valuation Results

November 10, 2021

Janie Shaw, ASA, EA, MAAA

Danny White, FSA, EA, MAAA



Comments on Valuation Results

- FYE 2021 Investment Experience
 - 25% return on market value
 - Assumed rate of return: 6.25%
 - Fund assets \$2,504M more than expected for CERS (\$1,780M pension and \$724M insurance)
 - \$511M in asset gains recognized this year (\$367M pension and \$144M insurance)

Funding Results – CERS (\$ in millions)

Item	Non-Hazardous System				Hazardous System			
	Pension		Insurance		Pension		Insurance	
	2020	2021	2020	2021	2020	2021	2020	2021
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total Normal Cost Rate	10.59%	10.44%	3.17%	3.07%	18.65%	18.39%	5.33%	4.83%
Member Rate	<u>(5.00%)</u>	<u>(5.00%)</u>	<u>(0.52%)</u>	<u>(0.55%)</u>	<u>(8.00%)</u>	<u>(8.00%)</u>	<u>(0.51%)</u>	<u>(0.55%)</u>
Employer Normal Cost Rate	5.59%	5.44%	2.65%	2.52%	10.65%	10.39%	4.82%	4.28%
Administrative Expenses	0.87%	0.86%	0.04%	0.04%	0.35%	0.32%	0.08%	0.09%
Amortization Cost	<u>17.42%</u>	<u>17.10%</u>	<u>1.48%</u>	<u>0.83%</u>	<u>32.23%</u>	<u>32.10%</u>	<u>3.83%</u>	<u>2.41%</u>
Total Actuarially Determined Rate	23.88%	23.40%	4.17%	3.39%	43.23%	42.81%	8.73%	6.78%
Actuarial Accrued Liability (AAL)	\$14,611	\$14,895	\$3,392	\$3,450	\$5,431	\$5,629	\$1,741	\$1,751
Actuarial Value of Assets	<u>7,221</u>	<u>7,716</u>	<u>2,661</u>	<u>2,947</u>	<u>2,448</u>	<u>2,629</u>	<u>1,362</u>	<u>1,476</u>
Unfunded AAL	\$7,390	\$7,179	\$731	\$503	\$2,983	\$3,000	\$379	\$276
Funded Ratio	49.4%	51.8%	78.5%	85.4%	45.1%	46.7%	78.2%	84.3%



Required Employer Contributions (\$millions)

	CERS Non-Hazardous		CERS Hazardous	
	2020 Val FYE2022	2021 Val FYE2023	2020 Val FYE2022	2021 Val FYE2023
(1)	(2)	(3)	(4)	(5)
<u>Actuarially Determined Employer Contribution</u>				
Pension Fund	\$ 625	\$ 604	\$ 251	\$ 253
Insurance Fund	<u>108</u>	<u>87</u>	<u>50</u>	<u>40</u>
Total Contribution	\$ 733	\$ 691	\$ 301	\$ 293
Change in Contribution		\$(42)		\$(8)
<u>Actual/Recommended Contribution</u>				
Pension Fund	\$ 596	\$ 604	\$ 206	\$ 253
Insurance Fund	<u>108</u>	<u>87</u>	<u>50</u>	<u>40</u>
Total Contribution	\$ 704	\$ 691	\$ 256	\$ 293
Change in Contribution		\$(13)		\$ 37