



CERS

County Employees Retirement System

CERS ASSUMED RATE OF RETURN

Public Pension Oversight Board

May 22, 2023

Ed Owens III, Chief Executive Officer

CERS Trustees Were Deliberate in their Decision-Making

- The Actuarial Committee Laid the groundwork
 - March 14, 2022 – Committee initiated the process
 - November 2, 2022 – Committee meeting dedicated to Actuarial Assumptions and Forward-Looking Return Expectations
 - April 12, 2023 – Committee meeting dedicated to Actuarial Assumptions and Forward-Looking Return Expectations
- Board of Trustees changed the assumed rate of return at their May 9, 2023 meeting.

Implementation of New Assumed Rate of Return

1. Actuarial Assumptions will be used to prepare the June 30, 2023 Valuation.
2. Valuation will be presented in November 2023 and December 2023
 - Contribution rates will be adopted by the CERS Board for FY 2025.
3. Contribution rates adopted by CERS Board for Fiscal Year 2024 remain unchanged.

Historical Performance

CERS Historical Actuarial Summary

Note: To simplify the summary, the data is only the nonhazardous pension information. Investment asset allocation for the hazardous and nonhazardouse system are basically the same and the discount rates have also been the same for both plans.

FYE 6/30	Discount Rate Assumption	Total Actuarial Accrued Liability	Actuarial Value of Assets (1)	Funded Status	Actual Investment Earnings			
					Investment Market Value	10-yr returns	20-yr returns	30-yr returns
1990	N/A	\$ 1,432,323,666	\$ 1,270,066,267	88.67%				
1991	N/A	\$ 1,654,338,706	\$ 1,396,227,005	84.40%				
1992	N/A	\$ 1,861,978,403	\$ 1,735,038,908	93.18%				
1993	N/A	\$ 2,079,930,047	\$ 1,985,680,709	95.47%				
1994	N/A	\$ 2,330,344,241	\$ 2,173,354,772	93.26%				
1995	N/A	\$ 2,603,575,921	\$ 2,454,128,060	94.26%				
1996	N/A	\$ 2,778,316,473	\$ 2,880,028,538	103.66%				
1997	N/A	\$ 3,144,928,093	\$ 3,514,025,868	111.74%				
1998	N/A	\$ 3,529,912,902	\$ 4,273,262,495	121.06%				
1999	N/A	\$ 3,955,132,659	\$ 5,196,878,921	131.40%				
2000	8.25%	\$ 4,453,154,831	\$ 6,729,576,328	151.12%		13.33%		
2001	8.25%	\$ 4,900,142,654	\$ 6,910,500,565	141.03%		11.81%		
2002	8.25%	\$ 5,492,646,422	\$ 6,883,298,951	125.32%	\$ 4,126,756,301	10.10%		
2003	8.25%	\$ 4,417,597,802	\$ 5,286,580,047	119.67%	\$ 4,174,881,117	9.30%		
2004	8.25%	\$ 4,936,459,488	\$ 5,187,851,530	105.09%	\$ 4,613,335,957	10.59%	11.30%	
2005	8.25%	\$ 5,385,156,690	\$ 5,059,208,687	93.95%	\$ 4,893,599,997	9.65%	10.40%	
2006	7.75%	\$ 6,179,569,267	\$ 5,162,894,136	83.55%	\$ 5,191,376,948	8.88%	9.76%	
2007	7.75%	\$ 6,659,446,126	\$ 5,467,824,480	82.11%	\$ 5,812,935,251	8.08%	9.91%	
2008	7.75%	\$ 7,304,217,691	\$ 5,731,502,438	78.47%	\$ 5,431,735,605	5.60%	9.61%	
2009	7.75%	\$ 7,912,913,512	\$ 5,650,789,991	71.41%	\$ 4,330,593,934	2.25%	7.91%	
2010	7.75%	\$ 8,459,022,280	\$ 5,546,857,291	65.57%	\$ 4,819,933,717	3.11%	8.10%	
2011	7.75%	\$ 8,918,085,025	\$ 5,629,611,183	63.13%	\$ 5,577,252,295	5.49%	8.60%	
2012	7.75%	\$ 9,139,567,695	\$ 5,547,235,599	60.69%	\$ 5,372,769,813	5.99%	8.01%	9.36% *
2013	7.75%	\$ 9,378,876,114	\$ 5,637,094,483	60.10%	\$ 5,780,830,355	6.60%	8.60%	9.40% *
2014	7.75%	\$ 9,772,522,616	\$ 6,117,133,692	62.60%	\$ 6,507,300,157	6.78%	8.01% (2)	9.60% *
2015	7.50%	\$ 10,740,325,421	\$ 6,474,848,513	60.29%	\$ 6,416,853,506	6.05%	7.94% (2)	9.35% *
2016	7.50%	\$ 11,076,456,794	\$ 6,535,372,347	59.00%	\$ 6,106,186,908	5.01%	6.94% (2)	9.02%
2017	6.25%	\$ 12,803,510,000	\$ 6,764,873,000	52.84%	\$ 6,687,237,000	4.88%	6.47% (2)	9.27%
2018	6.25%	\$ 13,191,505,000	\$ 695,225,000	5.27%	\$ 7,018,963,000	6.22%	5.91% (2)	9.15%
2019	6.25%	\$ 14,356,113,000	\$ 7,049,527,000	49.10%	\$ 7,159,921,000	8.86%	5.50% (2)	9.05%
2020	6.25%	\$ 14,610,868,000	\$ 7,220,607,000	49.42%	\$ 7,027,327,000	7.37%	5.22% (2)	8.82%
2021	6.25%	\$ 14,894,906,000	\$ 7,715,883,000	51.80%	\$ 8,565,652,000	7.98%	(2)	9.24%
2022	6.25%	\$ 15,674,220,000	\$ 8,148,912,000	51.99%	\$ 7,963,586,000	7.32%	6.64% (2)	8.82%

(1) Actuarial asset value includes a 5-yr smoothing of investment gains/losses

* KRS Total Fund--separation by system was not reported

(2) From monthly June reports, except 2021 which was not generated

Sources: Annual Actuarial Valuation reports and Annual Comprehensive Financial Reports

Contribution Report - Pension

Pension Funds Contribution Report

For the nine month period ending March 31, 2023, with Comparative Totals for the nine month period ending March 31, 2022 (\$ in Millions)



County Employees Retirement System

	Nonhazardous		Hazardous	
	FY23	FY22	FY23	FY22
Member Contributions	\$142.3	\$135.4	\$54.9	\$51.6
Employer Contributions	461.8	405.4	199.7	157.1
Net Investment Income	133.7	95.2	47.2	34.1
Total Inflows	737.8	636.0	301.8	242.8
Benefit Payments/Refunds	685.9	656.4	242.7	232.6
Administrative Expenses	17.5	17.0	1.5	1.5
Total Outflows	703.4	673.4	244.2	234.1
NET Contributions	34.4	(37.4)	57.6	8.7
Realized Gain/(Loss)	(25.1)	358.0	(10.3)	120.8
Unrealized Gain/(Loss)	423.1	(294.7)	147.3	(103.1)
Change in Net Position	432.4	25.9	194.6	26.4
Beginning of Period	8,062.3	8,670.7	2,736.9	2,934.4
End of Period	\$8,494.7	\$8,696.6	\$2,931.5	\$2,960.8

Differences due to rounding.

Net Contributions*	(\$99.3)	(\$132.6)	\$10.4	(\$25.4)
Cash Flow as % of Assets	(1.17)%	(1.52)%	0.35%	(0.86)%
Net Investment Income	\$133.7	\$95.2	\$47.2	\$34.1
Yield as % of Assets	1.57%	1.09%	1.61%	1.15%

**Net Contributions are less Net Investment Income.*

Contribution Report - Insurance

Insurance Fund Contribution Report

For the nine month period ending March 31, 2023, with Comparative Totals for the nine month period ending March 31, 2022 (\$ in Millions)



County Employees Retirement System

	Nonhazardous		Hazardous	
	FY23	FY22	FY23	FY22
Employer Contributions	\$72.3	\$118.3	\$34.1	\$52.3
Insurance Premiums	0.3	0.4	(0.4)	(0.3)
Humana Gain Share	5.9	8.9	0.9	1.3
Retired Reemployed Healthcare	3.6	3.5	1.2	1.2
Health Insurance Contributions	12.6	11.4	3.0	2.7
Net Investment Income	54.2	31.3	26.1	15.3
Total Inflows	148.9	173.8	64.9	72.5
Healthcare Premiums	100.5	102.0	70.2	66.5
Administrative Expenses	0.7	0.7	0.4	0.4
Total Outflows	101.2	102.7	70.6	66.9
NET Contributions	47.7	71.1	(5.7)	5.6
Realized Gain/(Loss)	(10.2)	126.9	(3.9)	67.8
Unrealized Gain/(Loss)	161.9	(88.6)	76.7	(42.3)
Change in Net Position	199.4	109.4	67.1	31.1
Beginning of Period	2,981.2	3,141.8	1,504.0	1,607.8
End of Period	\$3,180.6	\$3,251.2	\$1,571.1	\$1,638.9

Differences due to rounding.

Net Contributions*	\$(6.5)	\$39.9	\$(31.8)	\$(9.7)
Cash Flow as % of Assets	(0.20)%	1.23%	(2.03)%	(0.59)%
Net Investment Income	\$54.2	\$31.3	\$26.1	\$15.3
Yield as % of Assets	1.70%	0.96%	1.66%	0.94%

*Net Contributions are less Net Investment Income.

Forward-Looking Assumptions

Wilshire

Capital Market Return
Assumptions Update

December 31, 2022

Forward-Looking Assumptions

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.

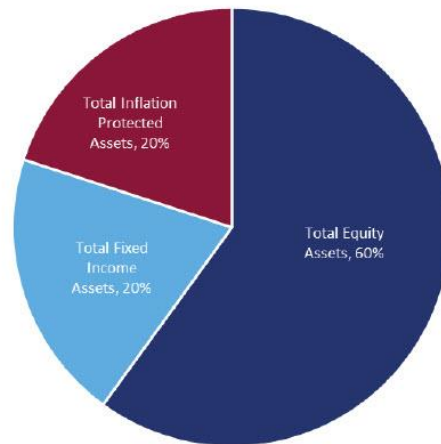
Public Market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

Forward-Looking Assumptions

Wilshire

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

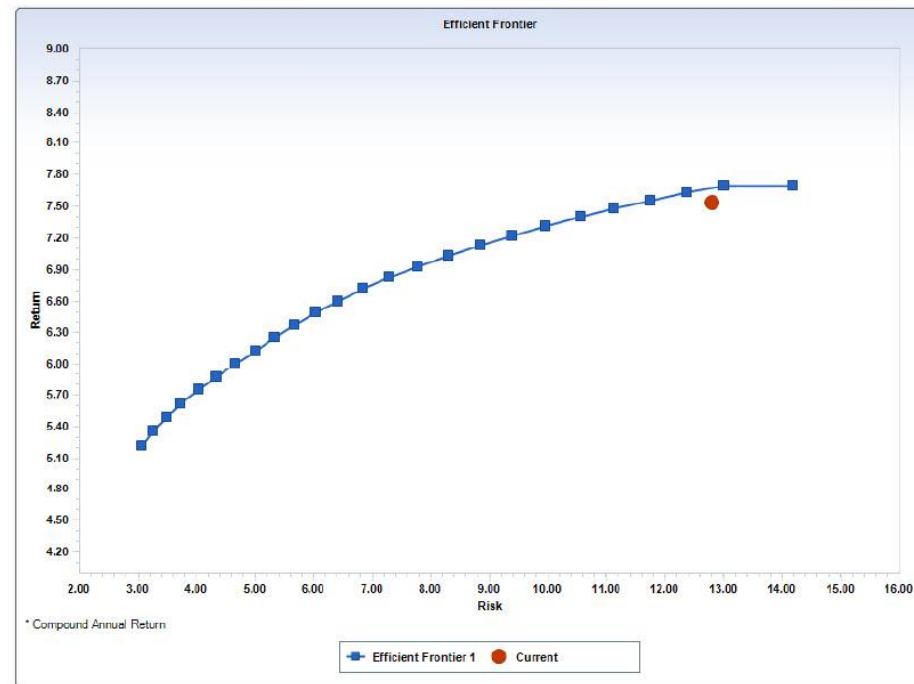
- Expected Return
 - 10-Years: 7.53%
 - 20-Years: 7.71%
 - 30-Years: 7.90%
- Expected Risk: 12.82%

Forward-Looking Assumptions

Wilshire

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 slide 8 – Total Illiquid limited to 30% of portfolio (PE and RE 100% illiquid, Credit and RR 50% illiquid)

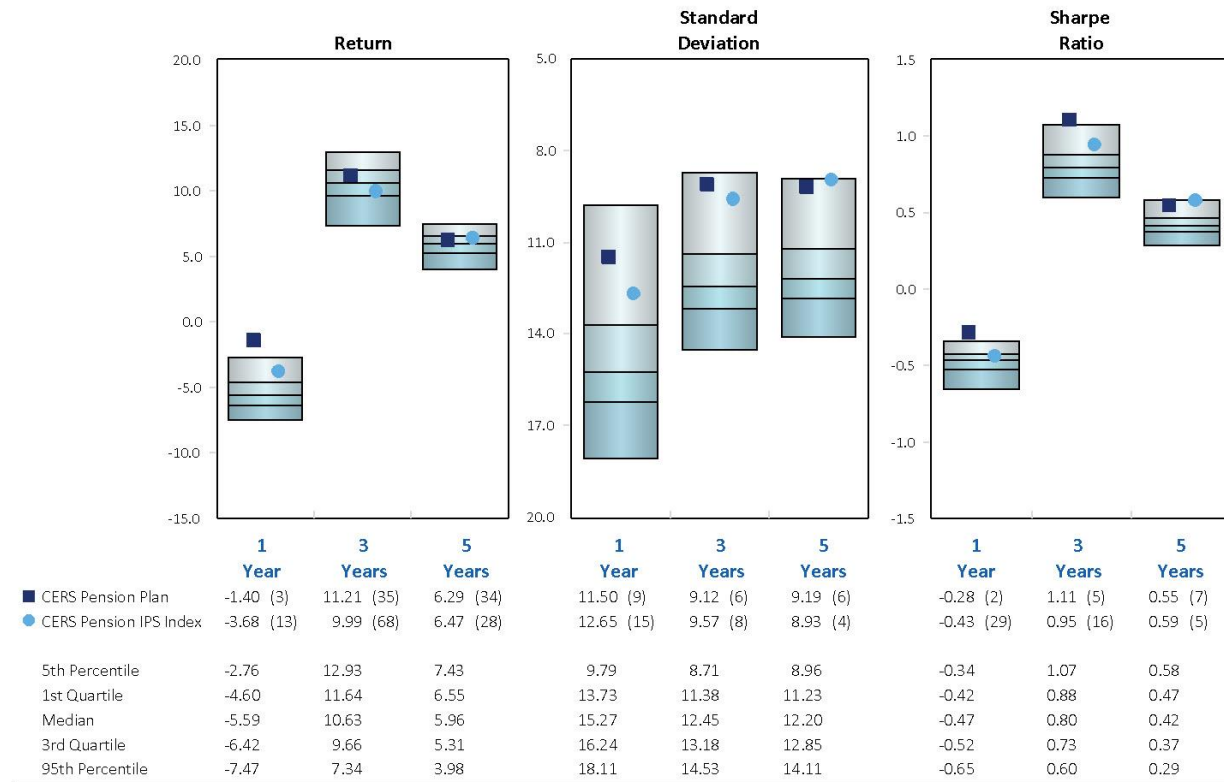
Peer Group Comparison - Pension

Wilshire

Plan Sponsor Peer Group Analysis - Multi Statistics

CERS Pension Plan vs All Public Plans-Total Fund

Periods Ended March 31, 2023



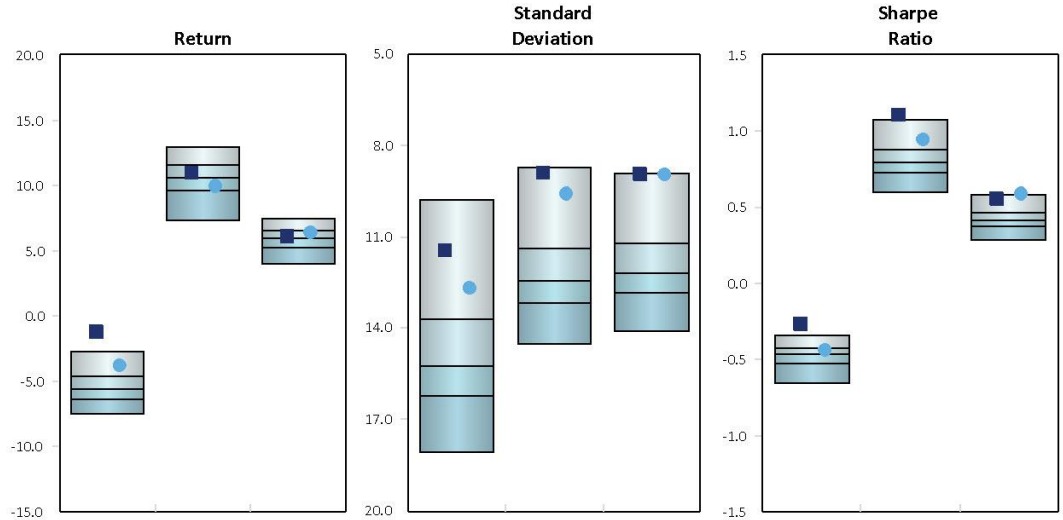
Parentheses contain percentile rankings.
Calculation based on monthly periodicity.

Peer Group Comparison - Insurance

Wilshire

Plan Sponsor Peer Group Analysis - Multi Statistics

CERS Insurance Plan vs All Public Plans-Total Fund
 Periods Ended March 31, 2023



	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
■ CERS Insurance Plan	-1.14 (3)	10.96 (41)	6.20 (38)	11.45 (9)	8.90 (5)	8.95 (4)	-0.26 (1)	1.11 (5)	0.56 (7)
● CERS Insurance IPS Index	-3.68 (13)	9.99 (68)	6.50 (27)	12.65 (15)	9.57 (8)	8.93 (4)	-0.43 (29)	0.95 (16)	0.59 (5)
5th Percentile	-2.76	12.93	7.43	9.79	8.71	8.96	-0.34	1.07	0.58
1st Quartile	-4.60	11.64	6.55	13.73	11.38	11.23	-0.42	0.88	0.47
Median	-5.59	10.63	5.96	15.27	12.45	12.20	-0.47	0.80	0.42
3rd Quartile	-6.42	9.66	5.31	16.24	13.18	12.85	-0.52	0.73	0.37
95th Percentile	-7.47	7.34	3.98	18.11	14.53	14.11	-0.65	0.60	0.29

Parentheses contain percentile rankings.
 Calculation based on monthly periodicity.

Actuarial Experience Study

Actuarial Experience Study

Economic Assumption Recommendations

- Price inflation: Increase the inflation assumption from 2.3% to 2.5%.
- Investment return: Increase return assumption to 6.50% for all funds. However, due to nonsymmetrical risk it would also be reasonable to maintain the current 6.25% assumption.
- Cash Balance Interest Credit: Increase to 6.75% (return assumption plus 0.25%)
- Individual salary increases: Increase assumption at certain service intervals
- Payroll growth: No change to the 2% payroll growth assumption

Actuarial Experience Study

Demographic Assumption Recommendations

- Mortality: Update the base mortality assumption to reflect recent experience (data dependent). Update the improvement assumption based on more recent published report (anticipated trend).
 - Increase disability mortality. No change to pre-retirement mortality.
- Termination/Withdrawal: Increase the rates of termination prior to retirement age for both non-hazardous and hazardous funds.
- Disability incidence: Decrease the rate of disability incidence for both non-hazardous and hazardous funds.
- Retirement: No change to the retirement assumption

Actuarial Experience Study

Investment Return Assumption

- Used to discount future benefit payments to determine liabilities
- Decreased to 6.25% for all CERS funds in 2017
- Because of economic changes, investment consultants have noticeably increased their forward-looking expectations in 2023.
 - We compared return expectations based on the 2022 and 2023 capital market assumptions for decision making purposes.

Actuarial Experience Study

Investment Return Assumption

Investment Consultant	50th Percentile		Probability of Exceeding 6.25%	
	Expected Return (Geometric)		2023	2022
	2023	2022	2023	2022
(1)	(2)	(3)	(4)	(5)
1	6.2%	4.9%	49%	38%
2	6.4%	5.4%	51%	42%
3	6.9%	5.9%	56%	47%
4	7.1%	5.8%	58%	46%
5	7.5%	6.0%	59%	43%
6	7.3%	5.8%	60%	45%
7	7.4%	6.2%	61%	50%
8	7.5%	6.2%	62%	50%
9	7.8%	5.3%	66%	40%
10	7.9%	5.8%	65%	46%
1	6.2%	5.3%	49%	40%
2	7.1%	6.4%	58%	52%
3	7.3%	6.5%	60%	53%
4	7.8%	6.8%	65%	55%
5	7.8%	6.6%	65%	54%
6	8.6%	6.9%	71%	56%
7-10 Year Expectation Avg:	7.2%	5.7%	59%	45%
20-30 Year Expectation Avg:	7.5%	6.4%	61%	52%

GRS recommends increasing the investment return assumption from 6.25% to 6.50% for all CERS funds (pension and insurance)

Actuarial Experience Study

Fiscal Impact – CERS Non-Hazardous (\$ in thousands)

	Current Assumptions	Proposed Demographic Assumptions	Proposed Assumptions incl Discount Rate
Liability - Pension Fund			
1. Unfunded Liability	\$ 7,525,308	\$ 7,042,639	\$ 6,654,664
2. Funded Ratio	52.0%	53.6%	55.0%
Liability - Insurance Fund			
3. Unfunded Liability	\$ (768,094)	\$ (851,055)	\$ (918,022)
4. Funded Ratio	132.1%	136.9%	140.9%
Actuarially Determined Employer Contribution - Pension Fund			
5. Normal Cost Rate	6.06%	5.88%	5.44%
6. Amortization Cost	17.28%	15.84%	15.08%
7. Pension Employer Contribution Rate	23.34%	21.72%	20.52%
Actuarially Determined Employer Contribution - Insurance Fund			
8. Normal Cost Rate	2.14%	1.92%	1.78%
9. Amortization Cost	-3.01%	-3.28%	-3.55%
10. Insurance Employer Contribution Rate	0.00%	0.00%	0.00%
11. Total Employer Contribution Rate	23.34%	21.72%	20.52%
12. Change in Contribution Rate		-1.62%	-2.82%
13. Estimated Contributions	\$ 640,682	\$ 596,213	\$ 563,273
14. Change in Contributions		\$ (44,469)	\$ (77,409)

Actuarial Experience Study

Fiscal Impact – CERS Hazardous (\$ in thousands)

	Current Assumptions	Proposed Demographic Assumptions	Proposed Assumptions incl Discount Rate
Liability - Pension Fund			
1. Unfunded Liability	\$ 3,072,977	\$ 2,962,119	\$ 2,801,882
2. Funded Ratio	47.6%	48.5%	49.9%
Liability - Insurance Fund			
3. Unfunded Liability	\$ (15,630)	\$ (38,887)	\$ (76,695)
4. Funded Ratio	101.0%	102.6%	105.2%
Actuarially Determined Employer Contribution - Pension Fund			
5. Normal Cost Rate	10.34%	10.97%	10.09%
6. Amortization Cost	30.77%	29.40%	28.05%
7. Pension Employer Contribution Rate	41.11%	40.37%	38.14%
Actuarially Determined Employer Contribution - Insurance Fund			
8. Normal Cost Rate	3.99%	3.88%	3.62%
9. Amortization Cost	-1.41%	-1.71%	-2.24%
10. Insurance Employer Contribution Rate	2.58%	2.17%	1.38%
11. Total Employer Contribution Rate	43.69%	42.54%	39.52%
12. Change in Contribution Rate		-1.15%	-4.17%
13. Estimated Contributions	\$ 276,712	\$ 269,428	\$ 250,301
14. Change in Contributions		\$ (7,284)	\$ (26,411)

Thank You