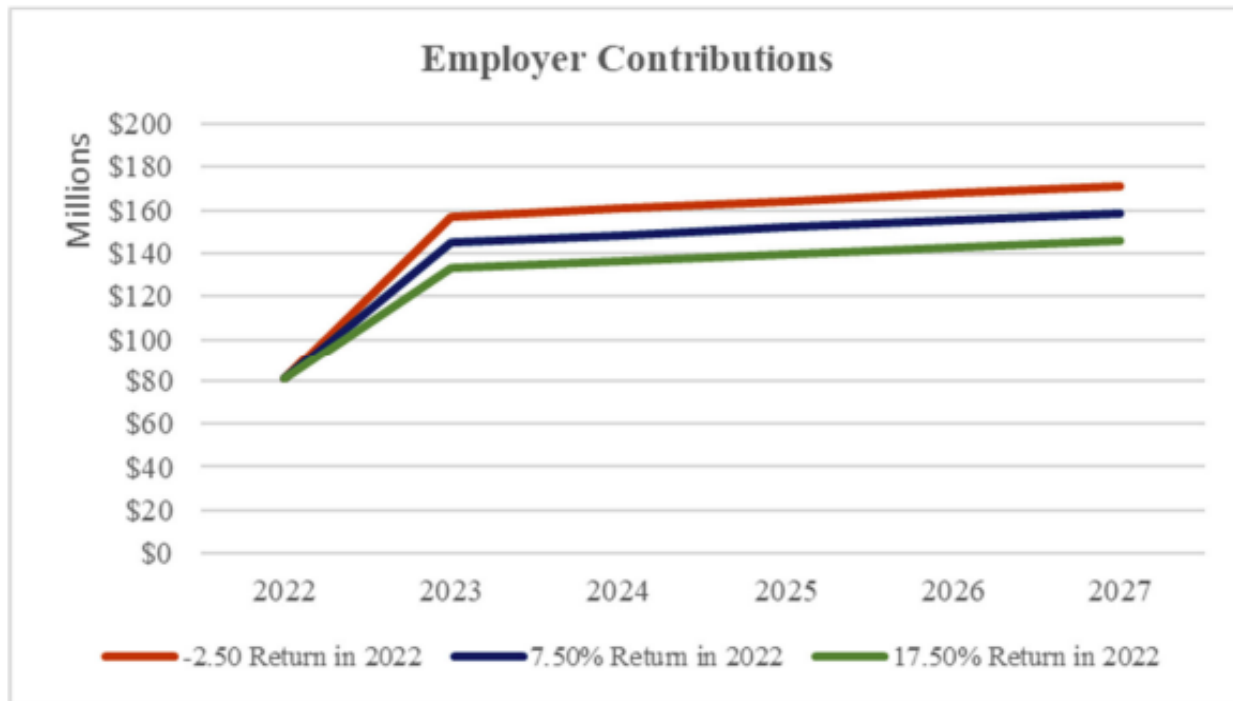

Employees' Retirement System

October 26, 2022

City's Stake in Success of ERS Investment Portfolio

- Inputs
 - Membership Data
 - Asset Data
 - Benefit Provisions
 - Assumptions
 - Funding Methodology
- ↓
- Results
 - Actuarial Value of Assets
 - Actuarial Accrued Liability
 - UAAL/Funded Ratio
 - Net Actuarial Gain or Loss
 - Employer Contributions
 - Projections



This graph shows the projected dollar amount of aggregate employer contributions in the future under alternate investment return scenarios for 2022. Investment returns for 2023+ are assumed to be 7.50% in all scenarios.

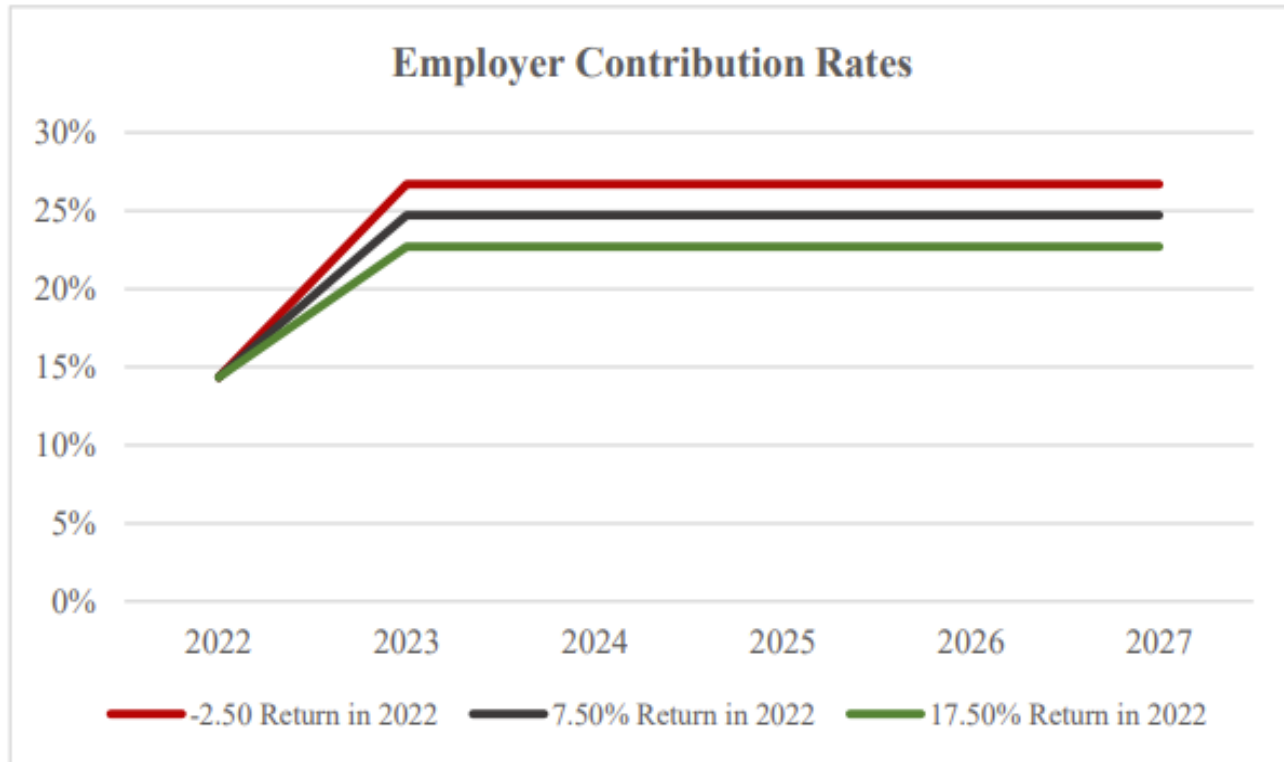
City's Stake in Success of ERS Investment Portfolio

Inputs
Membership Data
Asset Data
Benefit Provisions
Assumptions
Funding Methodology

↓

Results
Actuarial Value of Assets
Actuarial Accrued Liability
UAAL/Funded Ratio
Net Actuarial Gain or Loss
Employer Contributions

Projections



This graph shows the projected employer contribution rates under the Stable Contribution Policy, resulting from different investment returns during 2022 (returns for 2023+ are assumed to be 7.50%).

Successful Implementation of Complex ERS Strategic Investment Policy Requires Oversight of Seasoned Professional Institutional Investors Aligned with Retirement System Interests

- \$6.8 Billion of pension liabilities
- Multiple asset class strategies, including both publicly traded and private asset classes (e.g. Private Equity, Private Real Estate, Hedge Funds)
- Due diligence oversight of 20 investment management firms with \$83 Million in 2021 fees
- Asset-liability modelling and rebalancing to strategic targets

ERS Investment Engine

ERS Annuity
and Pension
Board

Investment
Committee

Investment Staff
(CIO, DCIO,
Analyst)

Investment
Policy

Investment
Portfolio

Investment
Consultant

Employer Contrib.
Employee Contrib.
Approx. \$200M / yr

Benefit Payments
Trust Expenses
Approx. \$500M / yr

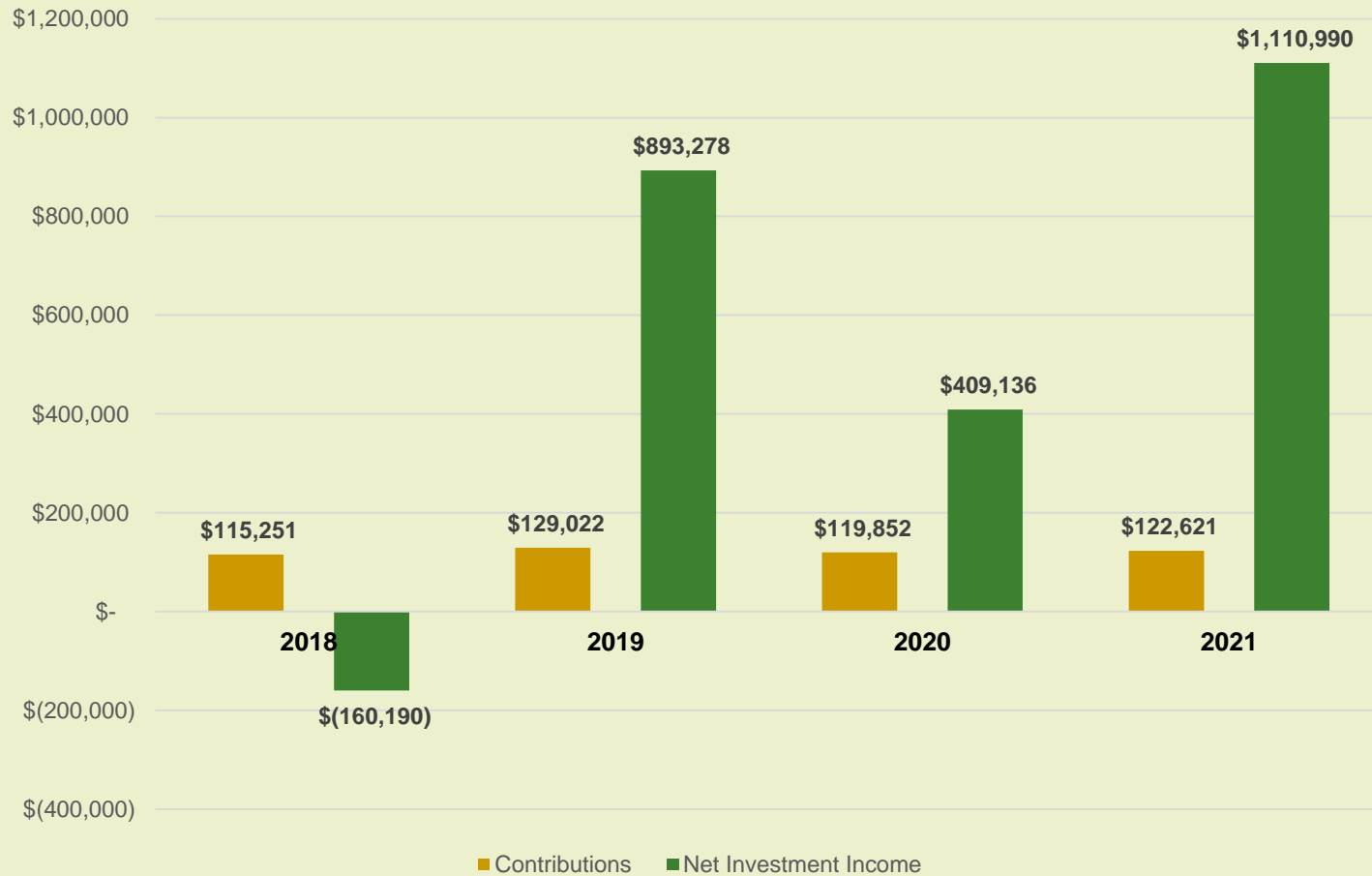
Universal Retirement Funding Equation



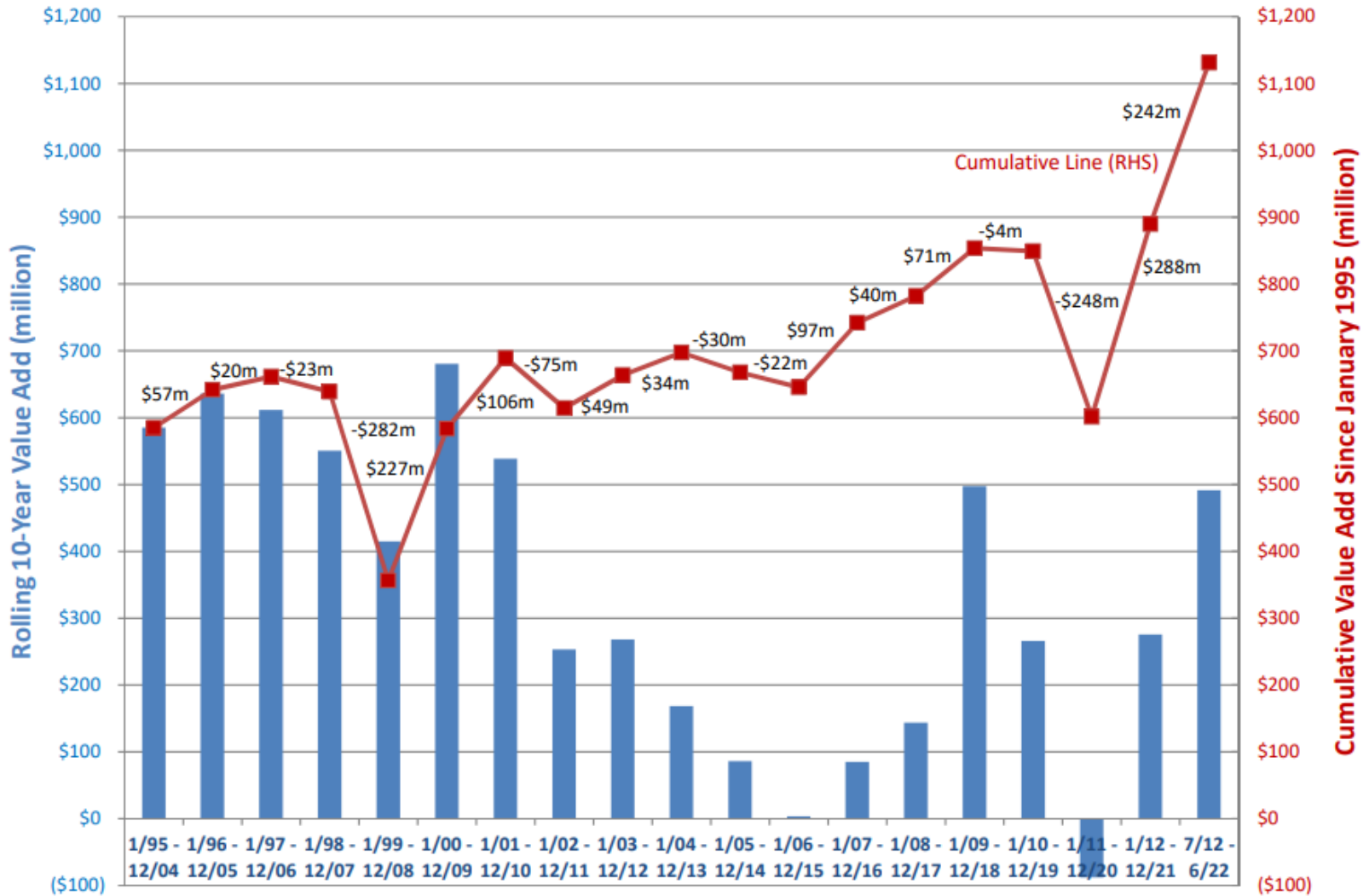
$$\text{Contributions} + \text{Investment Income} = \text{Benefits Paid} + \text{Expenses}$$

Investment Income is 82% of CMERS' Revenue from 2018 - 2021

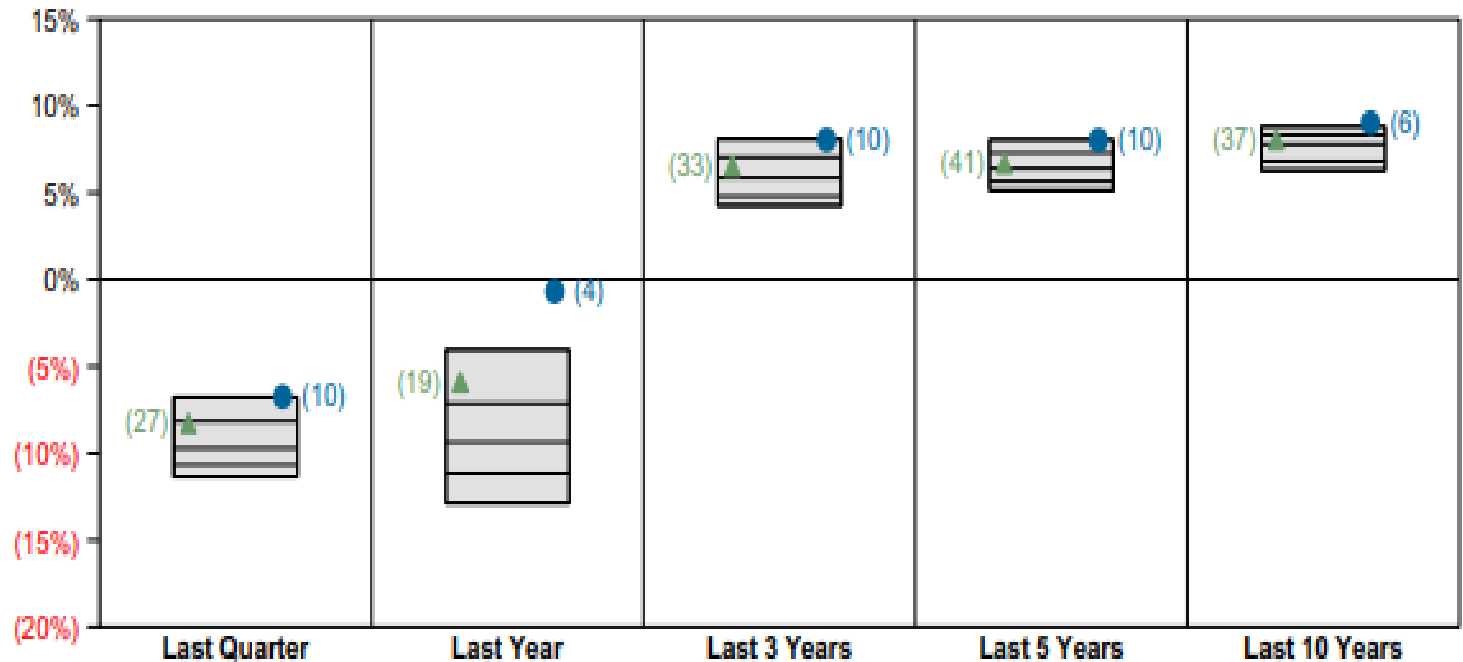
CMERS Revenues (in thousands)



Historical Value Add - 1995 - June 30, 2022 CMERS Total Fund (everything except Real Assets)



Performance vs Callan Public Fund Sponsor Database (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(6.78)	(4.04)	8.09	8.06	8.82
25th Percentile	(8.15)	(7.13)	7.03	7.28	8.32
Median	(9.71)	(9.35)	5.85	6.40	7.79
75th Percentile	(10.66)	(11.14)	4.81	5.65	6.81
90th Percentile	(11.34)	(12.87)	4.26	5.13	6.29
Total Fund ●	(6.75)	(0.68)	8.04	8.02	9.02
Total Fund Reference Index ▲	(8.29)	(5.89)	6.51	6.69	8.05

Historical Value Add - 1995 - June 30, 2022 CMERS Total Fund (everything except Real Assets)

<u>MERS' decision to hire some active managers versus hiring only passive managers</u>							
		<u>Time Weighted Returns</u>			<u>Dollar Weighted Estimates (Net of fees)</u>		
		<u>Annualized MERS Asset Class</u>		<u>Annualized Index</u>	<u>Value of a Dollar Invested in</u>		<u>Active Management Impact^(c)</u>
<u>MERS Asset Class</u>	<u>Index</u>	<u>Gross</u>	<u>Net of fees</u>	<u>Net of fees^(a)</u>	<u>MERS Asset Class</u>	<u>Index</u>	<u>\$Millions</u>
Domestic Equity	Russell 3000	10.23%	9.97%	9.94%	\$ 13.64	\$ 13.56	\$ 115.2
International Equity ^(b)	MSCI EAFE	6.53%	6.11%	4.08%	\$ 4.70	\$ 2.84	\$ 394.3
Global Equity ^(b)	MSCI World / ACWI	8.77%	8.40%	7.97%	\$ 2.69	\$ 2.56	\$ 30.4
Fixed Income	Bloomberg US Aggregate	5.96%	5.85%	4.84%	\$ 4.77	\$ 3.66	\$ 256.4
Private Equity ^{(b)(d)}	Russell 3000	N/A	15.93%	16.30%	\$ 5.48	\$ 5.68	\$ 209.8
Absolute Return ^(b)	Bloomberg US Aggregate	N/A	5.41%	1.46%	\$ 1.52	\$ 1.12	\$ 125.2
Estimate of Fund's benefit from its decision to hire active managers over past 27.5 years							\$ 1,131.3

^(a) Manager Fees for indices are assumed to be:

Russell 3000 Index - 2 basis points
 MSCI EAFE Index - 5 basis points
 MSCI World / ACWI Index - 5 basis points
 Bloomberg US Aggregate Index - 2 basis points

^(b) Inception Dates if less than 27.5 years:

International Equity Composite is May 1, 1996
 Global Equity Composite is April 1, 2010
 Private Equity Composite is July 1, 2010
 Absolute Return Composite is July 1, 2014

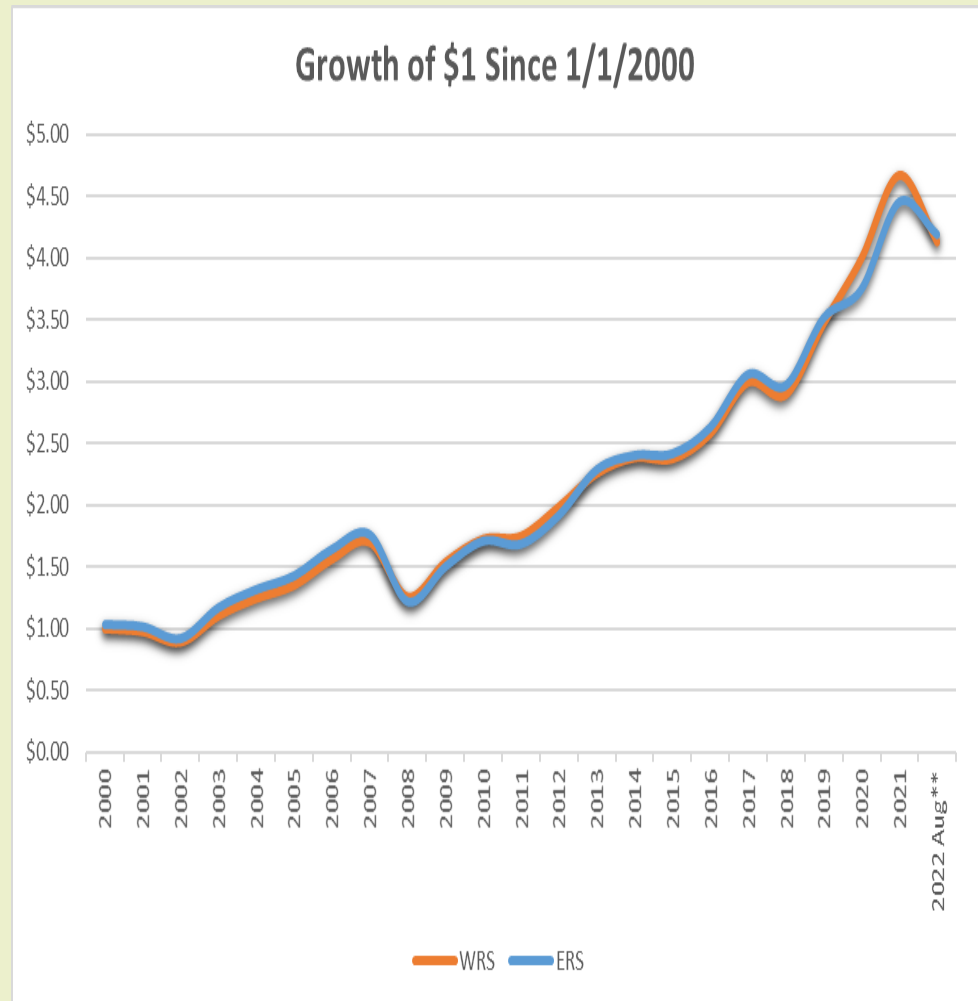
^(c) Active Management Impact \$Millions Estimate is based on monthly ERS asset class balances.

^(d) Private Equity data in analysis reflects what was shown on December 31, 2021 Value Add analysis. The Private Equity data would be significantly higher as of June 30, 2022 given the lagged nature of Private Equity reporting compared to the Russell 3000 benchmark Private Equity is being compared to.

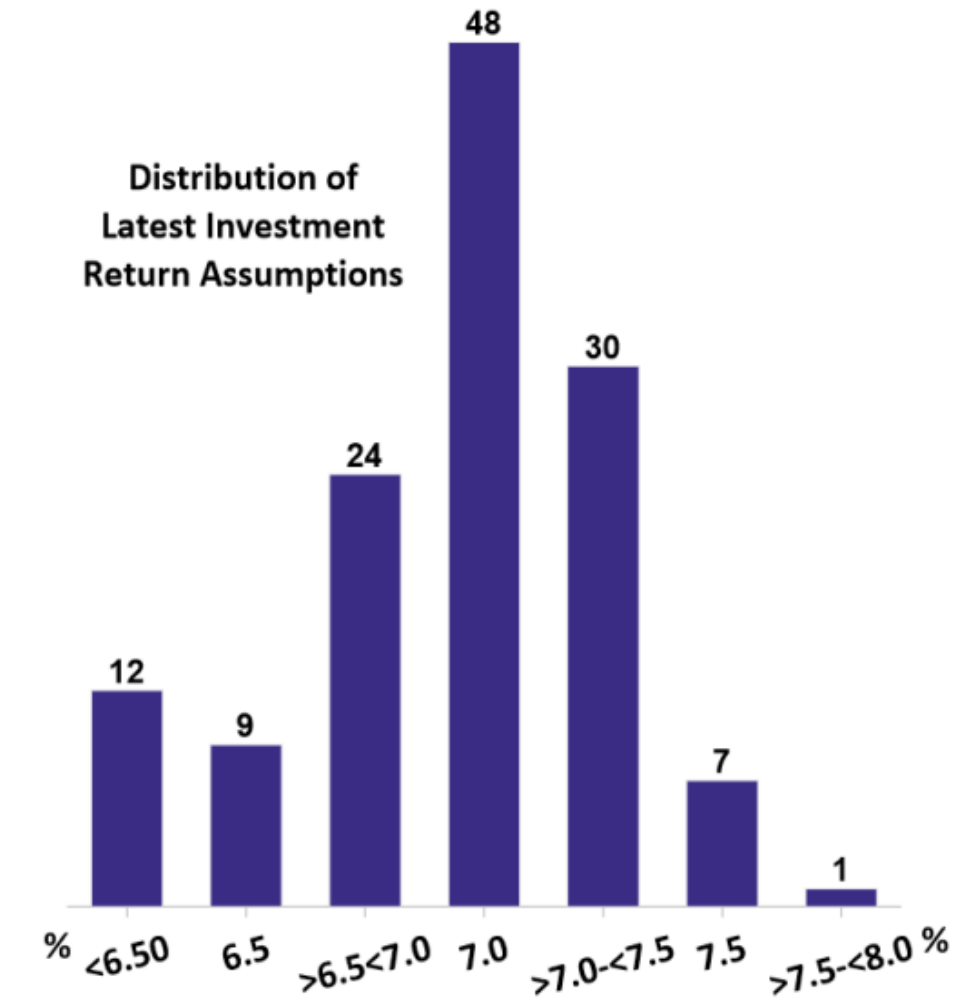
Growth of \$1 Since 2000 (ERS and WRS*)

Year	Rates of Return			Growth of \$1		
	ERS	WRS	Higher	ERS	WRS	Higher
2000	2.84%	-0.80%	ERS	\$ 1.03	\$ 0.99	ERS
2001	-1.68%	-2.30%	ERS	\$ 1.01	\$ 0.97	ERS
2002	-9.44%	-8.80%	WRS	\$ 0.92	\$ 0.88	ERS
2003	27.34%	24.20%	ERS	\$ 1.17	\$ 1.10	ERS
2004	12.61%	12.80%	WRS	\$ 1.31	\$ 1.24	ERS
2005	8.46%	8.60%	WRS	\$ 1.42	\$ 1.34	ERS
2006	15.13%	15.80%	WRS	\$ 1.64	\$ 1.56	ERS
2007	7.21%	8.80%	WRS	\$ 1.76	\$ 1.69	ERS
2008	-30.84%	-26.20%	WRS	\$ 1.22	\$ 1.25	WRS
2009	23.30%	22.40%	ERS	\$ 1.50	\$ 1.53	WRS
2010	13.86%	12.30%	ERS	\$ 1.71	\$ 1.72	WRS
2011	-1.43%	1.40%	WRS	\$ 1.68	\$ 1.74	WRS
2012	13.88%	13.70%	ERS	\$ 1.92	\$ 1.98	WRS
2013	19.29%	13.60%	ERS	\$ 2.29	\$ 2.25	ERS
2014	5.09%	5.70%	WRS	\$ 2.40	\$ 2.38	ERS
2015	0.54%	-0.40%	ERS	\$ 2.41	\$ 2.37	ERS
2016	8.83%	8.60%	ERS	\$ 2.63	\$ 2.57	ERS
2017	16.38%	16.20%	ERS	\$ 3.06	\$ 2.99	ERS
2018	-2.91%	-3.30%	ERS	\$ 2.97	\$ 2.89	ERS
2019	18.44%	19.90%	WRS	\$ 3.52	\$ 3.47	ERS
2020	6.62%	15.20%	WRS	\$ 3.75	\$ 3.99	WRS
2021	18.90%	16.89%	ERS	\$ 4.46	\$ 4.67	WRS
2022 Aug**	-5.92%	-11.54%	ERS	\$ 4.19	\$ 4.13	ERS

* WRS core fund rates of return used for this comparison
 Values are net of fees
 **2022 returns are preliminary / unaudited values



Distribution of Latest Investment Return Assumptions



NASRA
July-22



SECTION VII: RISK CONSIDERATIONS

TABLE 32

Comparison of Valuation Results for the Combined Fund Under Alternate Investment Return Assumptions
(Dollars in thousands)

This exhibit compares the key January 1, 2022 valuation results for the Combined Fund under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	6.50%	7.00%	7.50%	8.00%	8.50%
Contributions					
- Total Normal Cost	\$112,871	\$100,641	\$90,123	\$81,043	\$73,185
- Member Contributions	(32,190)	(32,190)	(32,190)	(32,190)	(32,190)
- Employer Normal Cost	\$80,681	\$68,451	\$57,933	\$48,853	\$40,995
- Projected Administrative Expenses	\$6,083	\$6,083	\$6,083	\$6,083	\$6,083
- Unfunded Actuarial Accrued Liability	\$135,422	\$112,648	\$90,094	\$67,730	\$45,534
Total Employer Contribution	\$222,186	\$187,182	\$154,110	\$122,666	\$92,612
Actuarial Determined Employer Rate	38.46%	32.40%	26.68%	21.24%	16.03%
Actuarial Value of Assets	\$5,673,797	\$5,673,797	\$5,673,797	\$5,673,797	\$5,673,797
Actuarial Accrued Liability	7,679,982	7,253,004	6,864,666	6,510,645	6,187,127
Unfunded Actuarial Accrued Liability	\$2,006,185	\$1,579,207	\$1,190,869	\$836,848	\$513,330
Funded Ratio	73.9%	78.2%	82.7%	87.1%	91.7%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.

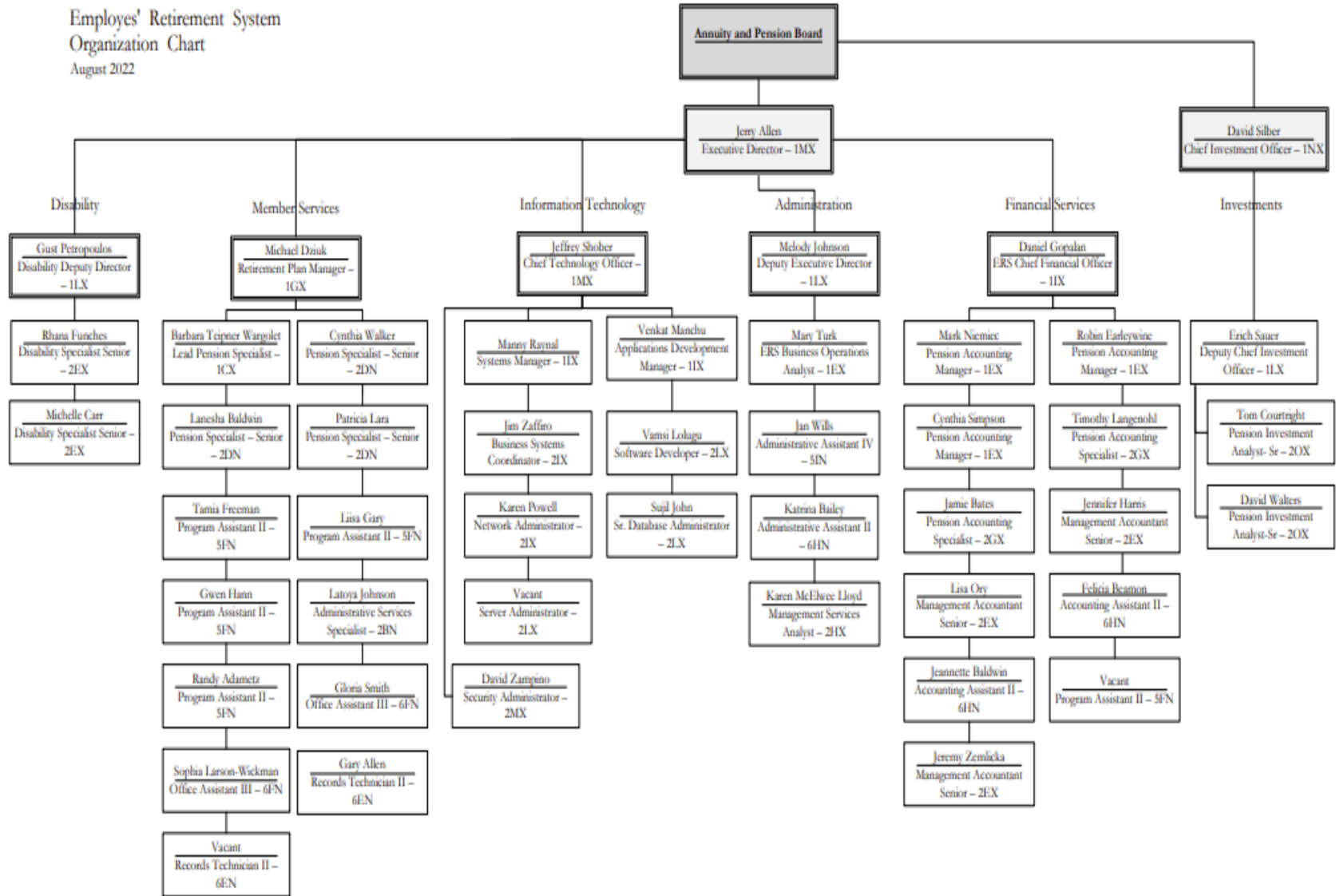
"Unless ERS dramatically improves the cash compensation of its investment staff, it should be prepared to deal with recurring staff vacancies. ERS should not use any investment strategy whose success depends on uninterrupted support from a high quality investment staff, unless it also has the ability to exit the strategy quickly."

L.R. Wechsler Organizational Review of ERS

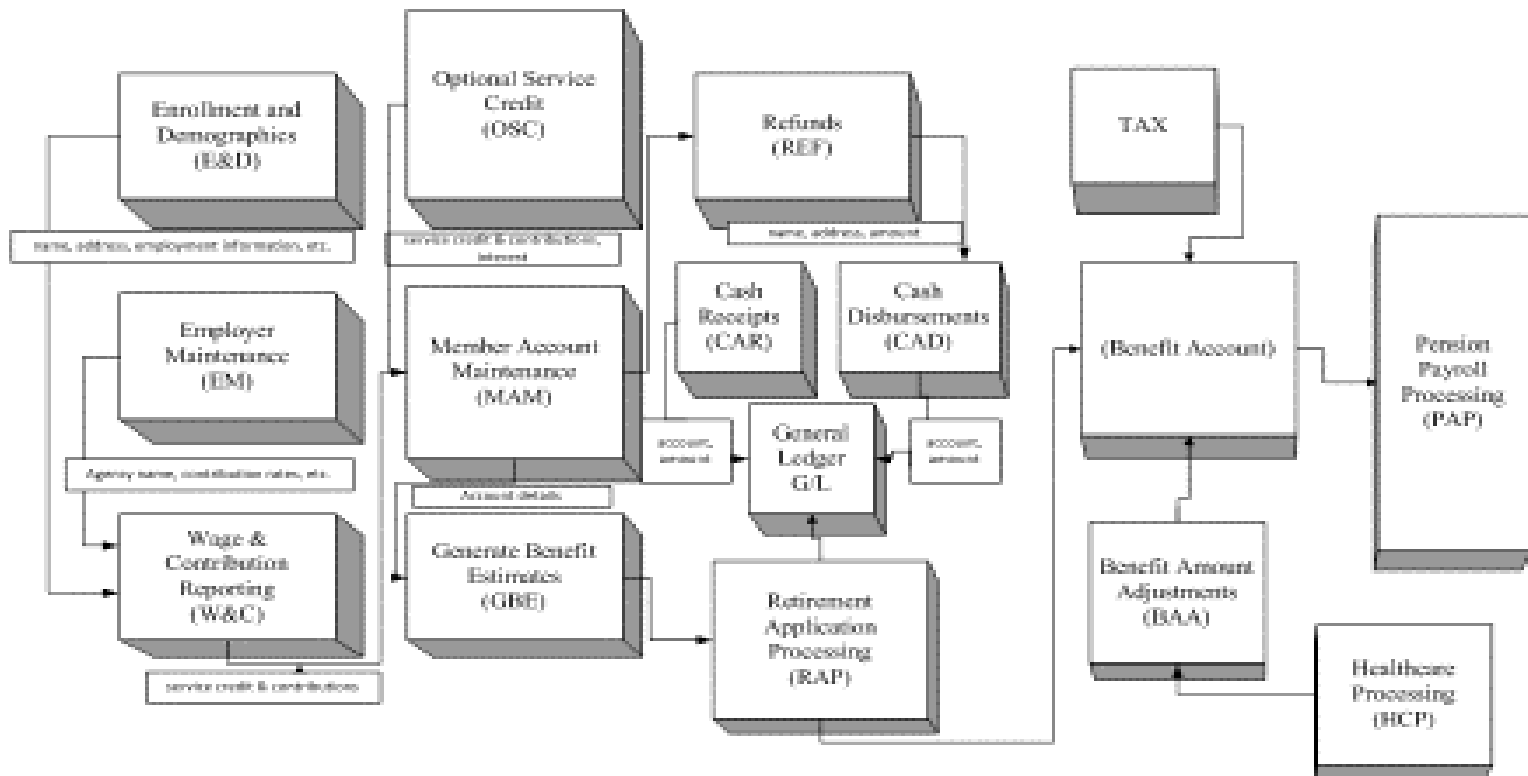
“Astonishing complexity of the business rules governing the calculation and payment of benefits to ERS’ retirees” - L.R. Wechsler Organizational Review of ERS

- Approx. 29,000 members and beneficiaries
- Approx. 44,000 permutations of benefit calculation rules
- Custom state of the art pension record keeping solution
- Data base of over 2,000 City Attorney Opinions advising on plan administration

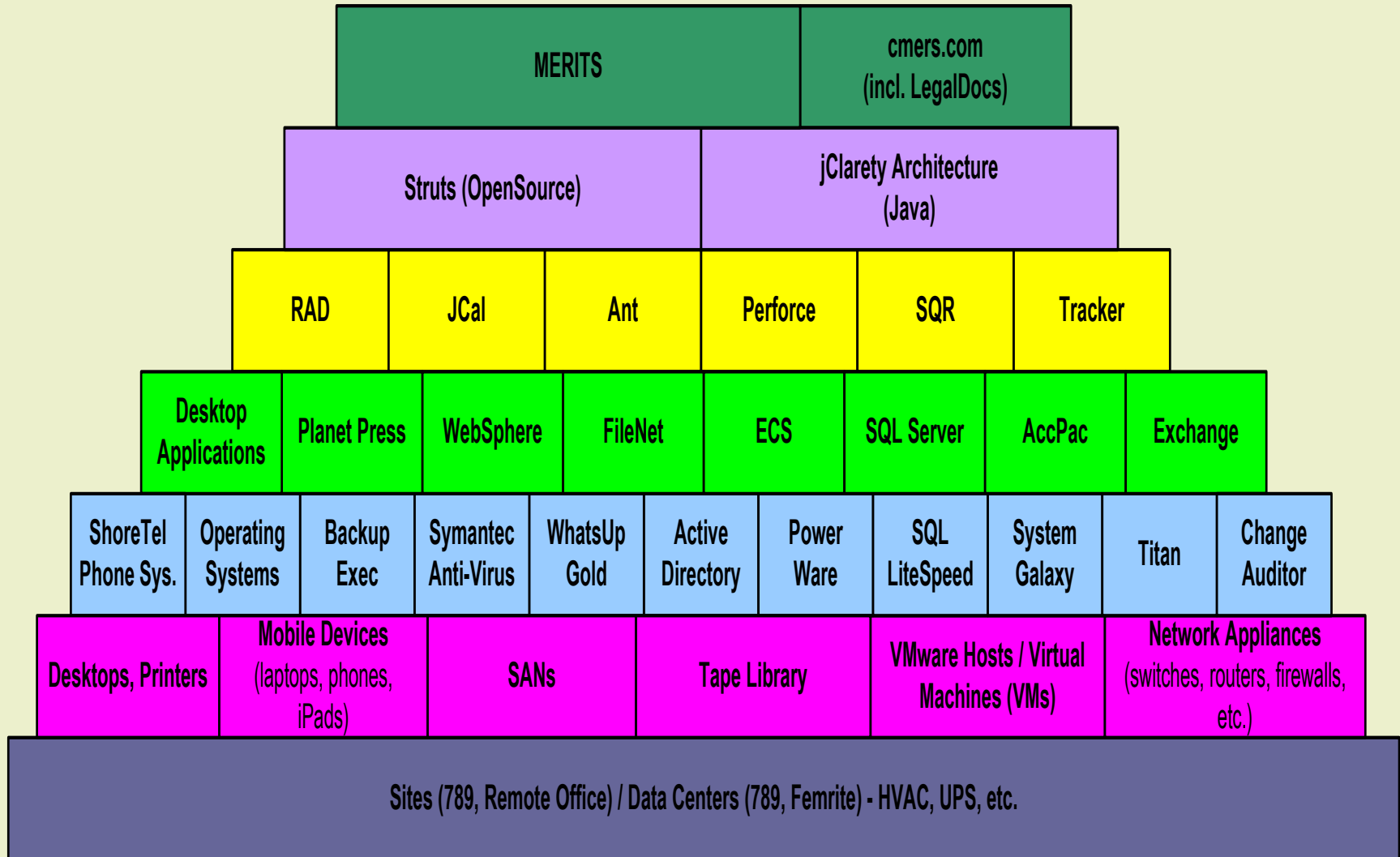
Employees' Retirement System
 Organization Chart
 August 2022



ERS IT Functional Areas



ERS Software Platform



ERS Summary Information

ERS Member Population	General	Police	Fire	Total
Members	7,768	1,631	695	10,094
Pensionable Payroll Size	\$ 369.31	\$ 148.84	\$ 61.20	\$ 579.35

Retirees	All Groups
Count	13,758
Total Annual Benefits	\$ 434.38

Employer Contribution Rates	General	Police	Fire
Actuarially Determined	15.86%	44.70%	47.91%
Stable Policy	7.48%	25.22%	26.83%

Total Actuarial Accrued Liability **\$ 6,875.93**

Unfunded Actuarial Accrued Liability

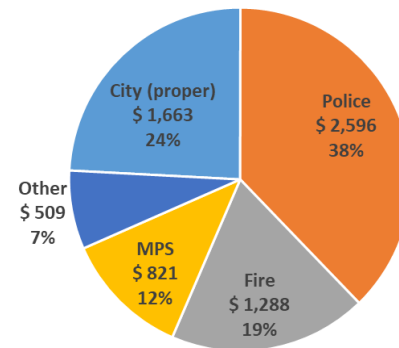
Based on Actuarial Value of Assets	\$ 1,140.94
Based on Market Value of Assets	\$ 444.57

Funded Ratio

Actuarial Value of Assets	83.41%
Market Value of Assets	93.53%

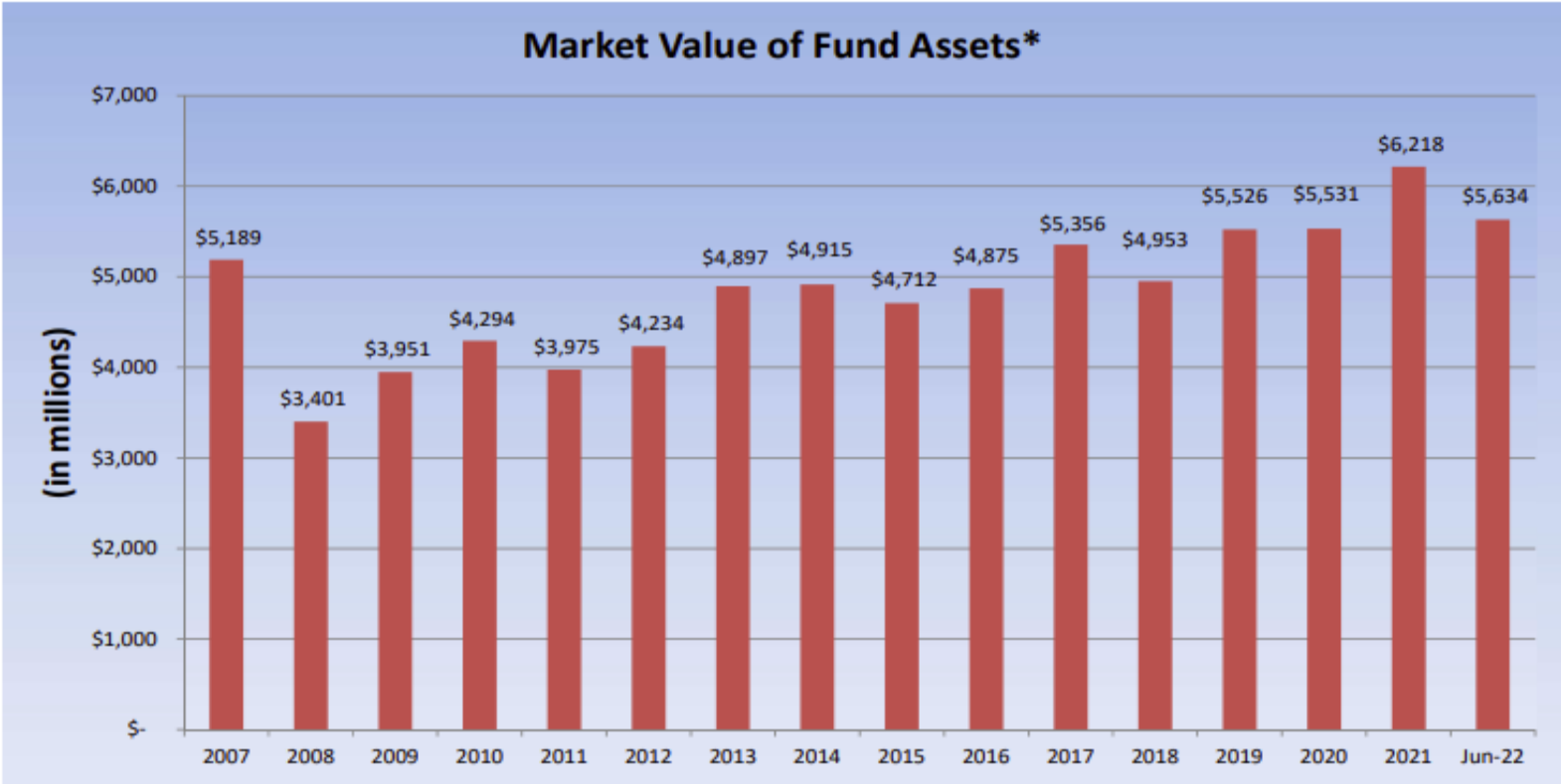
(all amounts in \$ millions)

Total Actuarial Accrued Liability



Fund Value of Assets: 2007 – June 30, 2022

(Year Ended Dates Reflect 12/31 Fund Values)



Most recent Actuarial valuation projects benefit payments to total \$5.3 billion in next 10 years.

Benefit Payments	\$5.0 billion
Expenses	\$254 million
Contributions	\$1.4 billion
Investment Gain	\$4.3 billion

Benefit Payments, Expenses, Contributions, and Investment Gain amounts are calculated using estimates of cash flows into and out of the Fund. These amounts are not audited and may not tie to CMERS Financial Statements.

14 1/2 Year Estimates (1/1/2008 - 6/30/2022)



*Private Equity and some Real Estate values are reported on a 1-quarter lag.

