City of Phoenix Employees' Retirement System

ACTUARIAL VALUATION REPORT AS OF

June 30, 2024

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October 1, 2024

Mr. Scott Steventon
Retirement Program Administrator
City of Phoenix Employees' Retirement System
200 W. Washington Street, 10th Floor
Phoenix, Arizona 85003

Re: Actuarial Valuation of the City of Phoenix Employees' Retirement System as of June 30, 2024

Dear Scott:

The results of the June 30, 2024 Annual Actuarial Valuation of the City of Phoenix Employees' Retirement System ("COPERS") are presented in this report.

This report was prepared at the request of the Board and is intended for use by COPERS and those designated or approved by the Board. This report may be provided to parties other than COPERS only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the COPERS's funding progress, to determine the employer contribution rate, and analyze changes in this rate. In addition, the report provides various summaries of the data. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different. Accounting information for purposes of complying with Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68 is provided in a separate report.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section G of this report. This report includes risk metrics in Section H, but 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 valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. All actuarial assumptions and methods used in the valuation follow the guidance in the applicable Actuarial Standards of Practice.

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This report was prepared using our proprietary valuation model 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.

We certify that the information contained in this report is accurate and fairly presents the actuarial position of COPERS as of the valuation date.

Financing Objectives

The Actuarially Determined Contribution (ADC) is determined by taking the sum of the normal cost, a component to amortize the unfunded liability and a component to cover administrative expenses. The Board's current funding policy is to contribute an amount each year based on the most recently calculated Actuarially Determined Contribution.

The unfunded accrued liability is comprised of experience gains and losses, assumption changes and benefit changes. A base is established in each year for changes in the unfunded accrued liability arising from these sources. In September 2013, the Board adopted amortization payment methods that amortize the pre-assumption changes of July 1, 2013 over a closed 25-year period as a level percentage of payroll; amortizes the assumption change liability as of July 1, 2013 over a closed 25-year period as a level percentage of payroll with a four-year phase in, and amortizes future gains and losses over a closed 20-year period. Future gains cannot be amortized over a period shorter than the period remaining on the 25-year amortization schedule. The actuarially determined contribution has decreased from 33.96% of pay to 33.02% of pay. The decrease is primarily due to an increase in the contributory payroll and the contribution experience. If the contributions made are equal to the ADC, and if all actuarial assumptions are met, there will not be an unfunded accrued liability at the end of the 20-year period. Accordingly, the Actuarially Determined Contribution under the Board funding policy can be considered a "Reasonable Actuarially Determined Contribution" as required by the Actuarial Standards of Practice.

Assuming all actuarial assumptions are met, this method of payment of the unfunded liability will result in full funding in 20 years. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. A schedule of each year's initial base and remaining outstanding balance is illustrated in Exhibit B.6.

Progress Toward Realization of Financing Objectives

The unfunded actuarial accrued liability and the funded ratio (ratio of the actuarial value of assets to the actuarial accrued liability) illustrate the progress toward the realization of certain financing objectives. Based on the actuarial valuation as of June 30, 2024, COPERS has an unfunded liability of $1,409 million and a funded ratio of 72.62%.

The funded ratio increased from 72.02% to 72.62% on an actuarial value of assets basis and increased from 69.29% to 70.25% on a market value of assets basis. These increases are primarily attributable to anticipated funding progress based on the funding policy and the contribution experience. A funded ratio less than 100% indicates an actuarially determined contribution that will require a normal cost and an amortization payment. If the contributions equal the ADC, and if all assumptions are met, the funded ratio should improve over time.

Benefit Provisions

All of the benefit provisions reflected in this valuation are those which were in effect on June 30, 2024. The benefit provisions are summarized in Section E of this Report.

Assumptions and Methods

The assumptions and methods used in this valuation are those that were adopted by the Board during 2020 based on the most recent experience study that analyzed data from July 1, 2014 through June 30, 2019. The assumptions and methods are detailed in Section G of this Report. The Board has sole authority to determine the actuarial assumptions used for COPERS. In our opinion, the actuarial assumptions used are reasonable.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: 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 COPERS's funded status); and changes in plan provisions or applicable law. The actuarial calculations presented in this report are intended to provide information for rational decision making.

Data

The findings in this report are based on data and other information through June 30, 2024. The valuation was based upon information furnished by the City of Phoenix Employees' Retirement System staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by City of Phoenix Employees' Retirement System staff.

Certification

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the City of Phoenix Employees' Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Paul Wood and Bill Detweiler are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and Report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Senior Consultant

Bill Detweiler, ASA, EA, FCA, MAAA
Consultant

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SECTION A

EXECUTIVE SUMMARY

Actuarial Valuation

Valuations are prepared annually, as of June 30 of each year. The primary purposes of the valuation report are to measure the plan's liabilities, to determine the contribution rate and to analyze changes in the City of Phoenix Employees' Retirement System actuarial position.

In addition, the report provides summaries of the member data, financial data, plan provisions, and actuarial assumptions and methods.

Financing Objectives

The employer contributions are intended to be sufficient to pay the normal cost and administrative expenses and to amortize the Unfunded Actuarial Accrued Liability (UAAL) as described on page B-6 of this report.

The contribution rate shown on pages B-4 and B-5 may be considered as a minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to COPERS in excess of those presented in this report be considered.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section G of this report. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

Assumption Changes

There were no changes to assumptions since the prior valuation. The assumptions are summarized in Section G of the report.

Experience During the Year

The plan experienced a contribution gain of $46.1 million and a liability loss of $119.2 million during fiscal year 2024. Details on the liability gain can be found on page B-8.

The plan experienced an asset loss of $6.9 million during fiscal year 2024. As of June 30, 2024, the amount of outstanding asset losses not yet recognized in the actuarial value of assets was $122.3 million.

Benefit Provision Changes

There were no changes to benefit provisions since the prior valuation. The benefit provisions are summarized in Section E of the report.

Financial Position and Summary of Results

The funded ratio increased on both an actuarial value of assets basis and on a market value of assets basis from June 30, 2023 to June 30, 2024.

Exhibit A.1
City of Phoenix Employees' Retirement System
Executive Summary

	June 30, 2024	June 30, 2023
1. **Total Actuarially Determined Contribution**		
a. Dollar Amount	$ 253,860,541	$ 227,381,527
b. As a % of Payroll	33.02%	33.96%
2. **Funded Status**		
a. Actuarial Accrued Liability	$ 5,147,293,773	$ 4,884,161,894
b. Actuarial Value of Assets (AVA)	3,738,075,318	3,517,450,807
c. Unfunded Liability (AVA-basis)	1,409,218,455	1,366,711,087
d. Funded Ratio (AVA-basis)	72.62%	72.02%
e. Market Value of Assets (MVA)	$ 3,615,814,139	$ 3,384,094,555
f. Unfunded Liability (MVA-basis)	1,531,479,634	1,500,067,339
g. Funded Ratio (MVA-basis)	70.25%	69.29%
3. **Summary of Census Data**		
a. Actives		
i.(a) Tier 1 Count	3,545	3,769
i.(b) Tier 2 Count	509	521
i.(c) Tier 3 Count	4,712	4,117
i.(d) Total Active Count	8,766	8,407
ii. Total Annual Compensation	$ 751,455,022	$ 653,605,811
iii. Average Projected Compensation	85,724	77,745
iv. Average Age	46.0	46.2
v. Average Service	10.9	11.0
b. Deferred Vested Member Counts	1,144	1,149
c. Retiree Counts	6,620	6,547
d. Beneficiary and Alternate Payee Counts	1,222	1,226
e. Disability Counts	223	213
f. Refunds Due Counts	3,013	N/A
g. Total Members Included in Valuation	20,988	17,542

The funded ratio may not be appropriate for assessing the need for future contributions. The funded ratio is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

SECTION B

VALUATION RESULTS

Exhibit B.1
City of Phoenix Employees' Retirement System
Actuarial Valuation Results
Actuarial Accrued Liability

	June 30, 2024				June 30, 2023
	Tier 1	**Tier 2**	**Tier 3**	**Total**	**Total**
1. **Active Members**					
a. Retirement Benefits	$ 1,576,818,491	$ 73,258,800	$ 153,480,879	$ 1,803,558,170	$ 1,612,960,229
b. Withdrawal Benefits	9,043,382	2,040,762	5,554,687	16,638,831	16,781,632
c. Disability Benefits	5,129,275	568,905	1,079,201	6,777,381	6,158,240
d. Death Benefits	12,527,196	1,320,560	2,585,615	16,433,371	14,942,038
e. Total	$ 1,603,518,344	$ 77,189,027	$ 162,700,382	$ 1,843,407,753	$ 1,650,842,139
2. **Members with Deferred Benefits**				$ 122,237,153	$ 110,804,799
3. **Members Receiving Benefits**				$ 3,181,648,867	$ 3,122,514,956
4. **Total**				$ 5,147,293,773	$ 4,884,161,894
5. **Actuarial Value of Assets**				$ 3,738,075,318	$ 3,517,450,807
6. **Unfunded Actuarial Accrued Liability**				$ 1,409,218,455	$ 1,366,711,087

Tier 1: Hired before July 1, 2013

Tier 2: Hired between July 1, 2013 and December 31, 2015

Tier 3: Hired on or after January 1, 2016

Exhibit B.2
City of Phoenix Employees' Retirement System
Actuarial Valuation Results
Normal Cost for Fiscal Year Ending June 30, 2026

	Tier 1	Tier 2	Tier 3	Total	Prior Year
1. **Dollar Normal Cost**					
a. Retirement Benefits	$ 39,827,212	$ 6,145,933	$ 37,602,686	$ 83,575,831	$ 73,675,967
b. Withdrawal Benefits	6,282,053	1,133,275	7,931,423	15,346,751	13,095,913
c. Disability Benefits	434,502	66,411	388,832	889,745	779,997
d. Death Benefits	721,852	131,882	800,713	1,654,447	1,463,996
e. Total	$ 47,265,619	$ 7,477,501	$ 46,723,654	$ 101,466,774	$ 89,015,873
2. **Normal Cost as a Percentage of Pay**	13.55%	16.36%	13.14%	13.53%	13.63%
3. **Projected Payroll for FYE June 30, 2026**	$ 357,608,037	$ 46,843,050	$ 364,474,620	$ 768,925,707	$ 669,594,954
4. **Dollar Normal Cost for FYE June 30, 2026**	$ 48,447,259	$ 7,664,438	$ 47,891,746	$ 104,003,443	$ 91,241,270

Tier 1: Hired before July 1, 2013

Tier 2: Hired between July 1, 2013 and December 31, 2015

Tier 3: Hired on or after January 1, 2016

Exhibit B.3
City of Phoenix Employees' Retirement System
Actuarial Valuation Results
Present Value of Projected Benefits

	June 30, 2024				June 30, 2023
	Tier 1	Tier 2	Tier 3	Total	Total
1. **Active Members**					
a. Retirement Benefits	$ 1,775,913,736	$ 126,018,067	$ 523,598,263	$ 2,425,530,066	$ 2,158,447,104
b. Withdrawal Benefits	41,992,543	13,767,762	95,049,080	150,809,385	129,488,087
c. Disability Benefits	7,343,038	1,223,974	5,369,266	13,936,278	12,361,634
d. Death Benefits	16,068,343	2,503,927	10,691,304	29,263,574	26,196,953
e. Total	$ 1,841,317,660	$ 143,513,730	$ 634,707,913	$ 2,619,539,303	$ 2,326,493,778
2. **Members with Deferred Benefits**				$ 122,237,153	$ 110,804,799
3. **Members Receiving Benefits**					
a. Healthy Retirees				$ 2,881,727,765	$ 2,834,623,372
b. Disabled Retirees				45,479,396	43,747,176
c. Beneficiaries				254,441,706	244,144,408
d. Total				$ 3,181,648,867	$ 3,122,514,956
4. **Total**				$ 5,923,425,323	$ 5,559,813,533

Tier 1: Hired before July 1, 2013

Tier 2: Hired between July 1, 2013 and December 31, 2015

Tier 3: Hired on or after January 1, 2016

Exhibit B.4
City of Phoenix Employees' Retirement System
Development of the Actuarially Determined Contribution

	June 30, 2024	June 30, 2023
1. Present Value of Projected Benefits		
a. Retirees and Beneficiaries	$3,181,648,867	$3,122,514,956
b. Deferred vested members	122,237,153	110,804,799
c. Active members	2,619,539,303	2,326,493,778
d. Total [(a) + (b) + (c)]	$5,923,425,323	$5,559,813,533
2. Present Value of Future Normal Costs	$ 776,131,550	$ 675,651,639
3. Entry Age Normal Accrued Liability [(1) - (2)]	$5,147,293,773	$4,884,161,894
4. Actuarial Value of Assets	3,738,075,318	3,517,450,807
5. Unfunded Actuarial Accrued Liability [(3) - (4)]	$1,409,218,455	$1,366,711,087

Development of the Actuarially Determined Contribution

Fiscal Year Ending	June 30, 2026	June 30, 2025
6. Entry Age Normal Cost	$ 104,003,443	$ 91,241,270
7. Administrative Expenses	5,116,581	1,442,042
8. Amortization of UAAL	144,740,517	134,698,215
9. Actuarially Determined Contribution [(6) + (7) + (8)]	$ 253,860,541	$ 227,381,527
10. Projected Payroll	$ 768,925,707	$ 669,594,954
11. Actuarially Determined Contribution as a Percent of Compensation	33.015%	33.958%

Exhibit B.5
City of Phoenix Employees' Retirement System
Actuarial Valuation Results
Summary of Contribution Rates and Estimated Amounts

Fiscal Year Ending	June 30, 2026	June 30, 2025
1. **Total Contribution Rate**		
a. Total Normal Cost Rate	13.53%	13.63%
b. Administrative Expense Rate	0.67%	0.21%
c. Total UAL Contribution Rate	18.82%	20.12%
d. Total Projected Rate	**33.02%**	**33.96%**
2. **Member Contribution Rates**		
a. Tier 1	5.00%	5.00%
b. Tier 2	11.00%	11.00%
c. Tier 3	11.00%	11.00%
3. **City Contribution Rates**		
a. Tier 1	28.02%	28.96%
b. Tier 2	22.02%	22.96%
c. Tier 3	22.02%	22.96%
4. **Projected Payroll**		
a. Tier 1	$ 357,608,037	$ 345,482,604
b. Tier 2	46,843,050	42,644,293
c. Tier 3	364,474,620	281,468,057
d. Total	**$ 768,925,707**	**$ 669,594,954**
5. **Estimated Contribution Amounts**		
a. Members	$ 63,125,346	$ 52,926,489
b. City	190,773,923	174,467,958
c. Total	**$ 253,899,269**	**$ 227,394,447**

Development of Actuarially Determined Contribution (Continued)

The Actuarially Determined Contribution (ADC) is calculated in accordance with the Funding Policy adopted by the Board. The unfunded accrued liability is amortized according to the following schedule. Please see Section G of this report for a full description of the funding policy.

Exhibit B.6
City of Phoenix Employees' Retirement System
Amortization of Unfunded Actuarial Liability as of June 30, 2024

Base Year	Remaining Base as of June 30, 2024	Years Remaining as of June 30, 2024	Remaining Base as of June 30, 2025	Years Remaining as of June 30, 2025	Amortization Payment For FYE June 30, 2026
2013 UAL	$ 1,029,064,795	14	$ 998,653,718	13	$ 101,513,860
2013 Assumption Changes	438,798,013	14	425,830,588	13	43,285,982
2014 Experience Gain	(54,295,329)	14	(52,690,786)	13	(5,356,056)
2015 Experience Gain	(2,774,921)	14	(2,692,916)	13	(273,737)
2015 Assumption Changes	254,283,210	11	241,701,681	10	30,105,033
2016 Experience Gain	(30,745,578)	14	(29,836,980)	13	(3,032,950)
2016 Plan Changes	(3,175,421)	14	(3,081,580)	13	(313,245)
2016 Assumption Changes	(68,265,569)	14	(66,248,174)	13	(6,734,174)
2017 Experience Loss	9,272,859	13	8,946,933	12	966,157
2017 Assumption Changes	2,326,634	13	2,244,856	12	242,417
2018 Experience Gain	(69,877,611)	14	(67,812,577)	13	(6,893,197)
2019 Experience Loss	70,506,742	15	68,763,613	14	6,617,858
2020 Assumption Changes	(64,050,256)	16	(62,736,166)	15	(5,744,879)
2020 Experience Gain	(51,368,697)	16	(50,314,787)	15	(4,607,428)
2021 Additional City Contributions	(187,226,441)	17	(184,076,693)	16	(16,107,753)
2021 Experience Gain	(61,412,112)	17	(60,378,964)	16	(5,283,501)
2022 Additional City Contributions	(11,090,362)	18	(10,940,007)	17	(918,251)
2022 Experience Loss	94,124,646	18	92,848,580	17	7,793,260
2023 Additional City Contributions	(14,466,181)	19	(14,312,103)	18	(1,156,100)
2023 Experience Loss	49,580,850	19	49,052,766	18	3,962,374
2024 Additional City Contributions	(18,162,676)	20	(19,434,063)	19	(1,515,239)
2024 Experience Loss	98,171,862	20	105,043,892	19	8,190,086
Total	**$ 1,409,218,455**		**$ 1,368,530,830**		**$ 144,740,517**

The payment of the 2015 assumption changes was phased-in over four years. The first year payment was one-fourth of the regularly calculated amortization payment, increasing each year until the end of the phase-in period. The outstanding balance at the end of the phase-in period is then amortized such that the full amount is paid off by the end of the remaining period.

Exhibit B.7
City of Phoenix Employees' Retirement System
Plan Experience for Fiscal Year 2024

	Liabilities	
1.	Actuarial Accrued Liability at June 30, 2023	$ 4,884,161,894
2.	Normal Cost during Fiscal Year 2024	89,015,873
3.	Benefit Payments during Fiscal Year 2024	280,352,201
4.	Interest on Items 1-3 to End of Year	335,307,824
5.	Change in Actuarial Accrued Liability Due to Assumption Changes	0
6.	Change in Actuarial Accrued Liability Due to Provision Changes	0
7.	Expected Actuarial Accrued Liability at June 30, 2024	5,028,133,390
8.	Actual Actuarial Accrued Liability at June 30, 2024	5,147,293,773
9.	Liability (Gain)/Loss	119,160,383
	Assets	
10.	Actuarial Value of Assets at June 30, 2023	$ 3,517,450,807
11.	Benefit Payments and Administrative Expenses during Fiscal Year 2024	285,222,236
12.	Expected Contributions during Fiscal Year 2024	222,627,747
13.	Interest on Items 10-12 to End of Year	244,067,803
14.	Expected Actuarial Value of Assets at June 30, 2024	3,698,924,121
15.	Actual Actuarial Value of Assets at June 30, 2024	3,738,075,318
16.	Total Asset and Contribution (Gain)/Loss	(39,151,197)
	16.(a) Asset (Gain)/Loss	6,917,276
	16.(b) Contribution (Gain)/Loss	(46,068,473)
	Total	
17.	Total (Gain)/Loss [(9) + (16)]	**$ 80,009,186**

Exhibit B.8
City of Phoenix Employees' Retirement System
Plan Experience for Fiscal Year 2024
(Gain)/Loss by Source

1. Liability (Gain)/Loss		
a. Salary (Gain)/Loss		123,495,562
b. New Members and Rehire (Gain)/Loss		6,162,949
c. Withdrawal (Gain)/Loss		11,723,959
d. Retirement (Gain)/Loss		(13,601,275)
e. Annuitant Mortality (Gain)/Loss		1,894,806
f. Difference Between Expected and Actual COLA		(12,158,283)
h. Other Demographic (Gain)/Loss		1,642,665
i. Total		119,160,383
2. Asset (Gain)/Loss	$	6,917,276
3. Contribution (Gain)/Loss	$	(46,068,473)
4. Total (Gain)/Loss	**$**	**80,009,186**

Exhibit B.9
City of Phoenix Employees' Retirement System
Schedule of Funding Progress

Actuarial Valuation Date (1)	Actuarial Value of Assets (2)	Actuarial Accrued Liability (AAL) (3)	Unfunded AAL (UAAL) (4)=(3)-(2)	Funded Ratio (5)=(2)/(3)	Covered Payroll (6)	UAAL as a Percentage of Covered Payroll (7)=(4)/(6)
6/30/2008	$ 1,908,414	$ 2,413,365	$ 504,951	79.1%	$ 566,512	89.1%
6/30/2009	1,895,148	2,518,094	622,946	75.3%	539,468	115.5%
6/30/2010	1,868,093	2,697,288	829,195	69.3%	550,175	150.7%
6/30/2011	1,834,620	2,752,909	918,289	66.7%	513,322	178.9%
6/30/2012	1,827,528	2,939,374	1,111,845	62.2%	506,017	219.7%
6/30/2013	1,961,939	3,055,606	1,093,668	64.2%	508,032	215.3%
6/30/2014	2,120,700	3,614,784	1,494,084	58.7%	509,267	293.4%
6/30/2015	2,202,923	3,975,908	1,772,985	55.4%	484,853	365.7%
6/30/2016	2,283,216	3,984,137	1,700,921	57.3%	496,333	342.7%
6/30/2017	2,402,707	4,129,452	1,726,745	58.2%	521,709	331.0%
6/30/2018	2,562,847	4,226,046	1,663,199	60.6%	527,161	315.5%
6/30/2019	2,677,353	4,401,825	1,724,473	60.8%	562,989	306.3%
6/30/2020	2,811,163	4,414,114	1,602,951	63.7%	568,646	281.9%
6/30/2021	3,211,142	4,541,799	1,330,656	70.7%	580,866	229.1%
6/30/2022	3,361,409	4,723,291	1,361,882	71.2%	595,761	228.6%
6/30/2023	3,517,451	4,884,162	1,366,711	72.0%	653,606	209.1%
6/30/2024	3,738,075	5,147,294	1,409,218	72.6%	751,455	187.5%

Amounts in thousands

Exhibit B.10
City of Phoenix Employees' Retirement System
Solvency Test

	Aggregated Accrued Liabilities for				Portion of Accrued Liabilities Covered by Reported Assets		
Valuation Date	Active Members Contributions	Retirees Beneficiaries and Vested Terminations	Members (Employer Financed Portion)	Actuarial Value of Assets	(5)/(2) Max 100%	[(5)-(2)]/(3) Max 100%	[(5)-(2)-(3)]/ (4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
June 30, 2008	$ 433,742	$ 1,066,886	$ 912,737	$ 1,908,414	100.0%	100.0%	44.7%
June 30, 2009	446,039	1,193,391	878,664	1,895,148	100.0%	100.0%	29.1%
June 30, 2010	445,141	1,311,929	940,217	1,868,093	100.0%	100.0%	11.8%
June 30, 2011	446,456	1,431,877	874,576	1,834,620	100.0%	96.9%	0.0%
June 30, 2012	443,964	1,525,152	970,258	1,827,528	100.0%	90.7%	0.0%
June 30, 2013	396,583	1,881,123	1,201,741	1,962,533	100.0%	83.2%	0.0%
June 30, 2014	393,754	2,099,274	1,121,756	2,120,700	100.0%	82.3%	0.0%
June 30, 2015	383,029	2,465,862	1,127,017	2,202,923	100.0%	73.8%	0.0%
June 30, 2016	393,626	2,522,989	1,067,522	2,283,216	100.0%	74.9%	0.0%
June 30, 2017	406,651	2,638,084	1,084,717	2,402,707	100.0%	75.7%	0.0%
June 30, 2018	417,314	2,704,971	1,103,761	2,562,847	100.0%	79.3%	0.0%
June 30, 2019	420,431	2,804,775	1,176,619	2,677,353	100.0%	80.5%	0.0%
June 30, 2020	437,719	2,857,254	1,119,141	2,811,163	100.0%	83.1%	0.0%
June 30, 2021	453,509	2,945,664	1,142,626	3,211,142	100.0%	93.6%	0.0%
June 30, 2022	456,197	3,124,986	1,142,108	3,361,409	100.0%	93.0%	0.0%
June 30, 2023	472,120	3,233,320	1,178,722	3,517,451	100.0%	94.2%	0.0%
June 30, 2024	512,345	3,303,886	1,331,063	3,738,075	100.0%	97.6%	0.0%

Amounts in thousands

Exhibit B.11
City of Phoenix Employees' Retirement System
Analysis of Financial Experience
Dollar Amounts in Thousands

Fiscal Year	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
1. UAAL at Start of Year	$ 1,366,711	$ 1,361,882	$ 1,330,656	$ 1,602,951	$1,724,473	1,663,199	1,726,745	1,700,921	1,772,985	1,494,084
2. Normal Cost for Year*	93,886	82,934	82,433	80,573	83,628	74,048	73,449	73,256	80,757	75,310
3. Expected Contributions	(222,628)	(202,152)	(218,122)	(222,103)	(213,142)	(198,860)	(187,324)	(183,023)	(178,288)	(157,314)
4. Assumed Investment Income Accrual on (1), (2) and (3)	91,240	91,230	88,477	107,337	120,412	116,137	121,133	123,527	129,383	109,037
5. Expected UAAL Before Changes	$ 1,329,209	$ 1,333,894	$ 1,283,444	$ 1,568,758	$1,715,371	1,654,524	1,734,003	1,714,681	1,804,836	1,521,117
6. Effect of Assumption/Method Changes	0	0	0	0	(62,386)	0	0	2,420	(69,420)	254,870
7. Effect of Benefit Changes	0	0	0	0	0	0	0	0	(3,229)	0
8. Expected UAAL After Changes	$ 1,329,209	$ 1,333,894	$ 1,283,444	$ 1,568,758	$1,652,985	1,654,524	1,734,003	1,717,101	1,732,187	1,775,987
9. Actual UAAL	1,409,218	1,366,711	1,361,882	1,330,656	1,602,951	1,724,473	1,663,199	1,726,745	1,700,921	1,772,985
10. Gain / (Loss) [8. - 9.]	$ (80,009)	$ (32,817)	$ (78,438)	$ 238,102	$50,034	(69,949)	70,804	(9,644)	31,266	3,002
11. As % of AAL at Start of Year	-1.64%	-0.69%	-1.73%	5.39%	1.14%	-1.66%	1.71%	-0.24%	0.80%	0.10%

* Includes administrative expenses beginning in 2017

SECTION C

PLAN ASSETS

Exhibit C.1
City of Phoenix Employees' Retirement System
Statement of Plan Net Assets

		June 30, 2024
Assets		
Cash and Cash Equivalents	$	164,994,999
Investments, at fair value:		
Fixed income	$	531,304,633
Equity securities		1,462,227,368
Hedge funds		98,983,215
Real estate investments		482,226,426
International equities		809,099,962
Total investments	$	3,383,841,604
Receivables:		
Employer contributions	$	18,162,676
Employee contributions		0
Dividends and Interest		4,940,774
Unsettled transactions		70,982,969
Other		1,990,430
Total receivables	$	96,076,849
Total assets	$	3,644,913,452
Accounts Payable		
Accrued investment expenses	$	824,260
Unsettled transactions		4,882,270
Other		23,392,783
Total payables	$	29,099,313
Net assets held in trust for pension benefits	$	3,615,814,139

Exhibit C.2
City of Phoenix Employees' Retirement System
Statement of Changes in Plan Net Assets

	Year Ended June 30, 2024	Year Ended June 30, 2023
Additions to Net Assets Attributed to:		
Contributions		
Employer contributions	$ 210,701,140	$ 193,135,792
Plan members contributions	57,066,835	47,748,881
Retirement office administration	2,081,165	2,201,176
Other	0	0
Total	$ 269,849,140	$ 243,085,849
Net Investment Income		
Net appreciation in fair value of investments	$ 204,943,808	$ 136,467,774
Interest and dividends	46,329,486	43,535,839
Net income from security lending activities	200,915	188,916
Other	4,936,538	13,283,121
	$ 256,410,747	$ 193,475,650
Less Investment expense	(7,236,902)	(18,076,133)
Net investment income	$ 249,173,845	$ 175,399,517
Total additions	$ 519,022,985	$ 418,485,366
Deductions to Net Assets Attributed to:		
Benefit payments	$ 276,224,209	$ 268,868,038
Refunds	4,000,485	4,120,303
Retirement office administration	2,081,165	2,201,176
Inter-system transfers	127,507	515,676
Administrative expenses	4,870,035	1,372,556
Total deductions	$ 287,303,401	$ 277,077,749
Change in net assets	$ 231,719,584	$ 141,407,617
Net assets held in trust for benefits:		
Beginning of year	$ 3,384,094,555	$ 3,242,686,938
End of year	$ 3,615,814,139	$ 3,384,094,555

Exhibit C.3
City of Phoenix Employees' Retirement System
Development of the Actuarial Value of Assets

	Item		Year Ending June 30, 2024	
1.	Actuarial Value of Assets, Beginning of Year	$	3,517,450,807	
2.	Net Cash Flow	$	(17,454,261)	
3.	Expected return	$	244,996,047	*
4.	Actual Return	$	249,173,845	
5.	Excess return [(4) - (3)]	$	4,177,798	
6.	Gains/(Losses)			
	a. Current Year	$	4,177,798	
	b. Prior Year		(58,264,342)	
	c. 2nd Prior Year		(385,049,426)	
	d. 3rd Prior Year		411,466,870	
	e. Total	$	(27,669,100)	
7.	Phase-In Amount [25% of 6.e.]	$	(6,917,275)	
8.	Actuarial Value of Assets, End of Year [(1) + (2) + (3) + (7)]	$	3,738,075,318	
9.	Estimated Rate of Return		6.80%	
10.	Ratio of Actuarial to Market Value of Assets		103.4%	

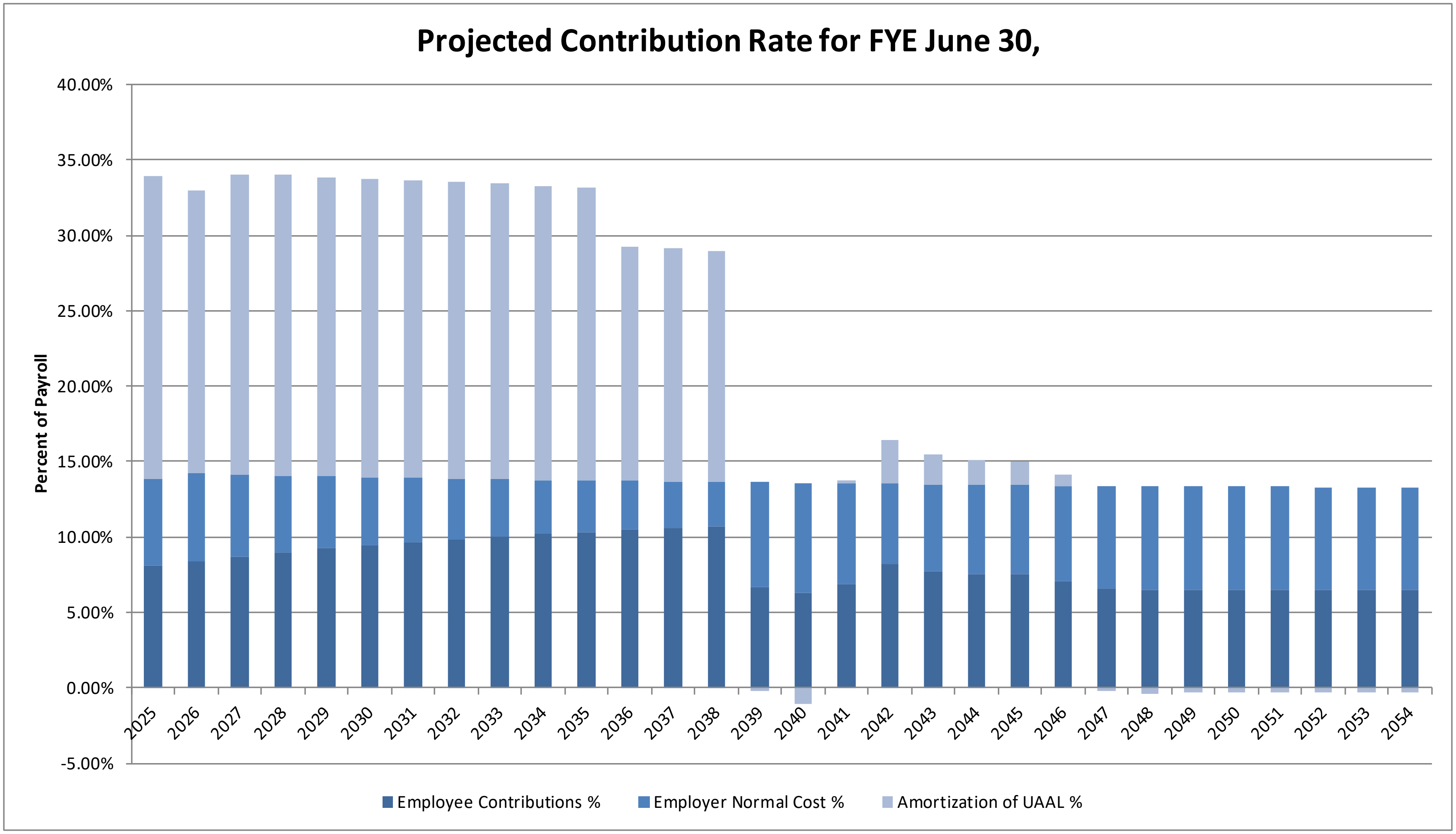
* *The expected return does not include interest on the receivable of $18,162,676.*

SECTION D

PROJECTIONS

City of Phoenix Employees Retirement System
Projection Results Based on June 30, 2024 Actuarial Valuation

Valuation as of June 30,	Contribution for Fiscal Year End June 30,	Market Return for FY Beginning on Valuation Date	Payroll (in Millions)	Employee Contribution (% of Payroll)	Employer Normal Cost (% of Payroll)	Employer Amortization Payment (% of Payroll)	Total Employer Contribution (6)+(7) (% of Payroll)	Total Contribution (5)+(8) (% of Payroll)	Employee Contribution (4)*(5) (in Millions)	Employer Contribution (4)*(8) (in Millions)	Total Contribution (10)+(11) (in Millions)	Actuarial Accrued Liability (AAL, in Millions)	Actuarial Value of Assets (AVA, in Millions)	Unfunded Actuarial Accrued Liability (UAAL, in Millions)	Funded Ratio	Projected Benefit Payments in FY Following Val Date (in Millions)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
2024	2025	7.00%	$750	8.14%	5.70%	20.12%	25.82%	33.96%	$61	$194	$255	$5,147	$3,738	$1,409	72.6%	$294
2025	2026	7.00%	769	8.43%	5.77%	18.82%	24.59%	33.02%	65	189	254	5,306	3,842	1,464	72.4%	311
2026	2027	7.00%	787	8.72%	5.40%	19.89%	25.29%	34.01%	69	199	268	5,460	4,030	1,430	73.8%	328
2027	2028	7.00%	808	8.98%	5.08%	19.99%	25.07%	34.05%	73	202	275	5,609	4,243	1,367	75.6%	344
2028	2029	7.00%	829	9.23%	4.79%	19.87%	24.65%	33.88%	76	204	281	5,756	4,460	1,295	77.5%	359
2029	2030	7.00%	851	9.46%	4.51%	19.81%	24.32%	33.78%	81	207	288	5,899	4,685	1,214	79.4%	375
2030	2031	7.00%	875	9.67%	4.25%	19.75%	24.00%	33.67%	85	210	295	6,038	4,916	1,122	81.4%	391
2031	2032	7.00%	900	9.86%	4.01%	19.66%	23.67%	33.54%	89	213	302	6,174	5,155	1,020	83.5%	406
2032	2033	7.00%	925	10.04%	3.80%	19.59%	23.39%	33.42%	93	216	309	6,307	5,402	906	85.6%	421
2033	2034	7.00%	951	10.20%	3.60%	19.52%	23.12%	33.31%	97	220	317	6,437	5,658	779	87.9%	435
2034	2035	7.00%	977	10.34%	3.43%	19.44%	22.87%	33.20%	101	223	324	6,565	5,926	640	90.3%	448
2035	2036	7.00%	1,004	10.46%	3.27%	15.53%	18.80%	29.26%	105	189	294	6,691	6,206	486	92.7%	461
2036	2037	7.00%	1,033	10.57%	3.13%	15.47%	18.59%	29.17%	109	192	301	6,817	6,461	356	94.8%	473
2037	2038	7.00%	1,062	10.67%	3.00%	15.25%	18.25%	28.92%	113	194	307	6,942	6,729	214	96.9%	484
2038	2039	7.00%	1,092	6.70%	6.94%	-0.25%	6.70%	13.39%	73	73	146	7,068	7,010	59	99.2%	493
2039	2040	7.00%	1,123	6.26%	7.35%	-1.09%	6.26%	12.51%	70	70	141	7,197	7,134	63	99.1%	502
2040	2041	7.00%	1,155	6.88%	6.69%	0.19%	6.88%	13.77%	80	80	159	7,330	7,252	78	98.9%	510
2041	2042	7.00%	1,188	8.20%	5.35%	2.85%	8.20%	16.39%	97	97	195	7,468	7,389	79	98.9%	517
2042	2043	7.00%	1,222	7.74%	5.77%	1.97%	7.74%	15.48%	95	95	189	7,612	7,564	48	99.4%	524
2043	2044	7.00%	1,256	7.54%	5.94%	1.60%	7.54%	15.08%	95	95	189	7,763	7,739	24	99.7%	531
2044	2045	7.00%	1,292	7.51%	5.93%	1.58%	7.51%	15.03%	97	97	194	7,921	7,919	2	100.0%	539
2045	2046	7.00%	1,328	7.09%	6.33%	0.76%	7.09%	14.18%	94	94	188	8,087	8,109	(21)	100.3%	547
2046	2047	7.00%	1,364	6.57%	6.82%	-0.25%	6.57%	13.15%	90	90	179	8,261	8,297	(36)	100.4%	555
2047	2048	7.00%	1,401	6.49%	6.88%	-0.38%	6.49%	12.99%	91	91	182	8,442	8,480	(38)	100.4%	565
2048	2049	7.00%	1,439	6.52%	6.84%	-0.32%	6.52%	13.04%	94	94	188	8,630	8,668	(38)	100.4%	575
2049	2050	7.00%	1,477	6.51%	6.83%	-0.32%	6.51%	13.02%	96	96	192	8,826	8,864	(39)	100.4%	586
2050	2051	7.00%	1,517	6.51%	6.82%	-0.32%	6.51%	13.01%	99	99	197	9,029	9,068	(39)	100.4%	597
2051	2052	7.00%	1,558	6.50%	6.82%	-0.31%	6.50%	13.01%	101	101	203	9,240	9,280	(40)	100.4%	609
2052	2053	7.00%	1,600	6.50%	6.81%	-0.31%	6.50%	13.01%	104	104	208	9,459	9,499	(41)	100.4%	621
2053	2054	7.00%	1,643	6.50%	6.81%	-0.31%	6.50%	13.01%	107	107	214	9,685	9,727	(42)	100.4%	635
2054	2055	7.00%	1,687	6.51%	6.81%	-0.30%	6.51%	13.01%	110	110	220	9,918	9,961	(43)	100.4%	651


Projected Contribution Rate for FYE June 30,
Percent of Payroll
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
-5.00%
2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054
Employee Contributions %
Employer Normal Cost %
Amortization of UAAL %

SECTION E

SUMMARY OF BENEFIT PROVISIONS

SUMMARY OF BENEFIT PROVISIONS

Membership

Full-time employees of the City of Phoenix other than police officers, firefighters, or elected officials who are covered by another retirement system to which the City contributes.

Members who were hired before July 1, 2013, as well as members who join the City after July 1, 2013 who were members of ASRS prior to July 1, 2011 and did not withdraw their contributions are Tier 1 members.

Members hired into employment with the City between July 1, 2013 and December 31, 2015 who are not Tier 1 members are Tier 2 members.

Members hired into employment with the City on or after January 1, 2016 who are not Tier 1 members or Tier 2 members are Tier 3 members.

Final Average Compensation (FAC)

Tier 1/Tier 2

The average of annual compensation for the period of 3 consecutive years producing the highest average contained within the last 10 years immediately preceding retirement.

Tier 3

The average of annual compensation for the period of 5 consecutive years producing the highest average contained within the last 10 years immediately preceding retirement. Annual compensation will be limited to the first $125,000 of compensation, indexed to inflation (Phoenix Area CPI-U) each January 1, commencing on January 1, 2017.

Credited Service

Credited service is determined based on Section 14 of Chapter XXIV of the Phoenix City Charter as well as COPERS administrative policy number 43. In no case is more than a year of service credited to any member for all service rendered in any calendar year. The amount of service credited to members varies by Tier, as detailed below.

Tier 1

A member is credited with a month of service for each calendar month in which the member performs at least 10 days of City service. A member is credited with a year of service for any calendar year in which the member has at least 10 months of credited service. If a member has less than 10 months of credited service for any calendar year, they are credited for the actual number of months.

Tier 2/Tier 3

A member is credited with a month of service for each calendar month in which the member performs at least 20 days of City service. A member is credited with a year of service for any calendar year in which the member has at least 12 months of credited service. If a member has less than 12 months of credited service for any calendar year, they are credited for the actual number of months.

Voluntary Retirement (no reduction for age)

Tier 1

Eligibility:

Sum of age and credited service equals 80 or more, age 60 with 10 or more years of credited service or age 62 with 5 or more years of credited service.

Annual Benefit:

Unused sick leave service multiplied by 2% of FAC plus 2% of FAC times credited service up to 32.5 years plus 1% of FAC times service in excess of 32.5 years plus 0.5% of FAC times service in excess of 35.5 years. Minimum monthly pension is $250 ($500 if member has 15 or more years of service).

Tier 2/Tier3

Eligibility:

Sum of age and credited service equals 87 or more, age 60 with 10 or more years of credited service or age 62 with 5 or more years of credited service.

Annual Benefit:

Unused sick leave service multiplied by 2% of FAC for Tier 2 members only plus FAC times credited service times the corresponding accrual rate:

Tier 2		Tier 3	
Years of Service	**Accrual Rate**	**Years of Service**	**Accrual Rate**
0<Service≤20	2.10%	0<Service≤10	1.85%
20<Service≤25	2.15%	10<Service≤20	1.90%
25<Service≤30	2.20%	20<Service≤30	2.00%
Service>30	2.30%	Service>30	2.10%

Note that for Tier 2 and Tier 3, the same accrual rate will apply for each year of service based on the total years of service.

Deferred Vested Retirement

Eligibility:

Termination of City employment prior to age 62 with 5 or more years of credited service.

Annual Benefit:

Accrued regular retirement amount based on credited service, unused sick leave service, and FAC at time of termination, payable beginning at age 62.

Duty Disability Retirement

Eligibility:

Total and permanent disability incurred in line of duty with the City.

Annual Benefit:

Computed in the same manner as the regular retirement amount base on FAC and credited service at time of disability retirement. Minimum is 15% of FAC for Tier 1 members and 15.75% for Tier 2 and Tier 3 members. Maximum during worker's compensation period is difference between final compensation and annualized workers compensation. At expiration of worker's compensation period, amount is recomputed to include years during which worker's compensation was paid.

Non-Duty Disability Retirement

Eligibility:

Total and permanent disability after 10 or more years of credited service.

Annual Benefit:

Computed in the same manner as the regular retirement amount base on FAC and credited service at time of disability retirement.

Pre-Retirement Duty Death Benefit

Eligibility:

Death in line of duty with the City and compensable under worker's compensation.

Annual Benefit:

To the spouse: Joint and 100% survivor actuarial equivalent of accrued regular retirement amount based on FAC and credited service and unused sick leave service at time of death. Minimum of 10 years of service is credited. To the children of a deceased member with 10 or more years of credited service: each child shall receive a monthly pension of $200 until adoption, marriage, death or attainment of age 18.

Pre-Retirement Non-Duty Death Benefit

Eligibility:

10 or more years of credited service.

Annual Benefit:

Same as Pre-Retirement Duty Death Benefit.

Refund of Contributions

Eligibility:

Termination of covered service employment prior to eligibility for any other benefits.

Annual Benefit:

Accumulated member contribution with interest at no more than 3.75% annually after July 1, 2016.

Pension Equalization Reserve (PER)

The PER is credited with Excess Earnings, if any, each calendar year. Excess Earnings are defined as the excess over 8.0% of the annual average of the time-weighted rates of return for the immediately preceding five calendar years. The amounts credited to the PER are either used to fund percentage increases to pension amounts or one-time post retirement distribution benefits (13^{th} checks).

On July 1 of each year, persons in receipt of a pension for at least 36 months as of January 1 of that year receive a percentage increase based on the lesser of:

i. Phoenix area Consumer Price Index (CPI) and
ii. The amount the balance in the PER can fully fund

The increase, subject to the availability of funds in the PER, is payable beginning with the April 1 payment each year, retroactive to January 1 of the same year.

Also, after each plan year's return is known, all pensioners (excluding minors) as of the end of the plan year are eligible to receive a one-time post retirement distribution (13^{th} check). The 13^{th} check is a percentage of the pensioner's annual benefits based on the lesser of:

i. One half of the Phoenix area Consumer Price Index (CPI) and
ii. The excess of the rate of return over the assumed interest rate

The percentage cannot be more than three percent, but must be at least one percent and is subject to the availability of funds in the PER. The 13^{th} check is payable on December 1.

The PER is only applicable for Tiers 1 and 2.

Projected Percentage

Actuarially determined normal cost rate plus an amortization rate on the unfunded actuarial liability and a rate for administrative expenses, stated as a percentage of projected member compensation.

Member Contribution Rates

Tier 1:	5% of pay
Tier 2/Tier 3:	50% of the Projected Percentage not to exceed 11% of pay on or after January 1, 2016

City Contribution Rates

Total Projected Percentage less Member Contribution Rates for each Tier.

Note: The summary of plan provisions is designed to outline principal plan benefits. If COPERS should find the plan summary not in accordance with the actual plan provisions, the actuary should immediately be alerted so the proper provisions are valued.

SECTION F

SUMMARY OF PARTICIPANT DATA

Exhibit F.1
City of Phoenix Employees' Retirement System
Summary of Census Data

	June 30, 2024	June 30, 2023
1. Active Members		
a. Counts	8,766	8,407
b. Annual Compensation	$ 751,455,022	$ 653,605,811
c. Average Annual Compensation	$ 85,724	$ 77,745
d. Average Age	46.0	46.2
e. Average Service	10.9	11.0
2. Deferred Vested Members		
a. Counts	1,144	1,149
b. Annual Deferred Benefits	$ 15,703,638	$ 16,206,791
c. Average Benefit	$ 13,727	$ 14,105
3. Retired Members		
a. Counts	6,620	6,547
b. Annual Benefits	$ 246,754,366	$ 242,086,009
c. Average Benefit	$ 37,274	$ 36,977
4. Disability		
a. Counts	223	213
b. Annual Deferred Benefits	$ 3,891,688	$ 3,737,831
c. Average Benefit	$ 17,452	$ 17,549
5. Beneficiaries and QDROs		
a. Counts	1,222	1,226
b. Annual Benefits	$ 27,507,711	$ 26,834,995
c. Average Benefit	$ 22,510	$ 21,888
6. Terminated Members with Refunds Due	3,013	N/A
7. Total Members Included in Valuation	20,988	17,542

Exhibit F.2
Summary of Changes in Participant Status
During Fiscal Year 2024

	Active Participants	With Refunds Due*	With Deferred Benefits	Retirees	Disability	QDROs	Beneficiaries	Total
A. Number as of June 30, 2023	8,407	N/A	1,149	6,547	213	193	1,033	17,542
1. Age Retirements	(200)		(37)	237				0
2. Disability	(2)		(12)		14			0
3. Deceased	(14)		(10)	(156)	(5)		(62)	(247)
4. New Beneficiary						10	70	80
5. Terminated - Vested	(82)		82					0
6. Terminated - Nonvested	(226)	226						0
7. Cashouts	(80)		(23)					(103)
8. Benefits Expired				(12)		(5)	(17)	(34)
9. Rehired as Active	62		(21)					41
10. New Members	901	2,787						3,688
11. Data Corrections			16	4	1			21
B. Number as of June 30, 2024	**8,766**	**3,013**	**1,144**	**6,620**	**223**	**198**	**1,024**	**20,988**

*Data provided prior to June 30, 2024 had incomplete information for members due refunds. As of June 30, 2024 there were 3,013 members provided with refunds of the member account balances due, which increased the plan liability by $5.5 million.

Exhibit F.3
Active Member Counts by Age and Service
as of June 30, 2024

Age	Service							
	0-4	5-9	10-14	15-19	20-24	25-29	Over 30	Total
Under 20	18							18
20-24	324	2						326
25-29	575	57						632
30-34	493	240	22	2				757
35-39	429	283	75	97	6			890
40-44	411	267	92	238	104	7		1,119
45-49	315	243	104	235	221	114		1,232
50-54	325	236	95	239	303	199	38	1,435
55-59	270	172	75	209	231	137	71	1,165
60-64	191	142	64	140	130	80	82	829
Over 65	58	65	28	68	59	29	56	363
Total	**3,409**	**1,707**	**555**	**1,228**	**1,054**	**566**	**247**	**8,766**

Exhibit F.4
Active Member Average Salary by Age and Service
as of June 30, 2024

Age	Service							
	0-4	5-9	10-14	15-19	20-24	25-29	Over 30	Total
Under 20	$48,535							$48,535
20-24	$56,514	*						$56,513
25-29	$64,002	$69,219						$64,472
30-34	$70,206	$76,973	$89,274	*				$72,970
35-39	$75,023	$85,986	$97,728	$87,615	$100,011			$81,963
40-44	$73,792	$85,720	$99,649	$95,983	$100,459	$101,372		$86,135
45-49	$76,660	$87,925	$104,037	$99,692	$101,582	$105,663		$92,740
50-54	$79,731	$86,913	$99,391	$95,058	$106,912	$110,088	$114,235	$95,629
55-59	$81,237	$89,059	$96,884	$93,339	$95,217	$103,159	$97,409	$91,906
60-64	$81,971	$85,842	$102,882	$88,054	$93,474	$90,944	$95,531	$89,287
Over 65	$91,949	$90,454	$96,587	$91,816	$98,749	$89,067	$101,765	$94,403
Over 70								
Total	**$72,190**	**$84,954**	**$99,601**	**$94,265**	**$100,441**	**$103,629**	**$100,362**	**$85,724**

*Average salary not shown for fields with less than four active members.

Exhibit F.5 Summary of Inactive Vested Members		
Age	**Number of Members**	**Monthly Benefit**
<30	7	$2,971
30-34	44	$26,261
35-39	109	$95,302
40-44	160	$158,883
45-49	204	$256,387
50-54	243	$309,683
55-59	232	$286,283
60-64	124	$151,069
65& Up	21	$21,798

	Service Retirees		Disabled Retirees		Beneficiaries/QDROs	
Age	**Number of Members**	**Annual Benefit**	**Number of Members**	**Annual Benefit**	**Number of Members**	**Annual Benefit**
<55	94	$5,679,751	29	$515,642	82	$1,091,903
55-59	466	$23,475,681	34	$725,081	66	$1,502,090
60-64	1113	$45,342,003	40	$734,071	121	$2,709,679
65-69	1530	$57,510,607	45	$699,037	158	$3,662,975
70-74	1523	$53,986,073	40	$694,374	206	$4,946,277
75-79	1034	$35,404,897	19	$294,099	212	$4,973,196
80-84	516	$15,923,089	8	$103,459	157	$4,044,283
85-89	236	$6,516,709	8	$125,925	112	$2,492,514
90 & Up	108	$2,915,556	0	$0	108	$2,084,794

Exhibit F.7
Schedule of Retired Members Added to and Removed from Rolls
as of June 30, 2024

Year Ended	Added to Rolls		Removed		Total		Average Annual Pensions	% Increase in Pensions
	Count	Annual Pensions*	Count	Annual Pensions*	Count	Annual Pensions*		
6/30/2010	432	$ 15,259	170	$ 3,206	4,931	$ 138,273	$ 28,042	9.5%
6/30/2011	444	15,251	184	3,574	5,191	149,950	28,887	8.4
6/30/2012	448	14,488	161	4,174	5,478	160,264	29,256	6.9
6/30/2013	426	12,574	201	3,996	5,703	168,843	29,606	5.4
6/30/2014	597	21,948	145	3,232	6,155	187,559	30,473	11.1
6/30/2015	578	22,483	192	4,225	6,541	205,816	31,466	9.7
6/30/2016	375	11,573	182	4,329	6,734	213,061	31,640	3.5
6/30/2017	321	9,317	233	4,395	6,822	218,364	32,009	2.5
6/30/2018	370	11,314	218	4,825	6,974	225,644	32,355	3.3
6/30/2019	417	13,109	196	4,398	7,195	234,341	32,570	3.9
6/30/2020	378	12,025	251	6,530	7,322	239,836	32,756	2.3
6/30/2021	396	14,541	312	7,159	7,406	247,218	33,381	3.1
6/30/2022	477	21,208	287	7,196	7,596	261,231	34,391	5.7
6/30/2023	440	14,761	243	6,085	7,793	269,906	34,634	3.3
6/30/2024	326	11,992	252	6,555	7,867	275,342	35,000	2.0

*Amounts shown in thousands

Note: The dollar amounts of the pensions added to and removed from the rolls for years prior to June 30, 2017 were determined by prior actuaries. The amounts added to the rolls includes additions and deletions due to PER increases, in addition to the annual pensions for new retirees.

Exhibit F.8
Schedule of Retired Members by Type
as of June 30, 2024

Monthly Benefit	# of Retirees	Type of Retirement						
		Deferred	Normal or Voluntary	Duty Disability	Non-Duty Disability	Survivor Payment	Death Benefit	Alternate Payee
Deferred	1,144	1,144						
$1 - $300	81		40	0	0	12	15	14
$301 - $400	112		75	4	1	20	0	12
$401 - $500	123		76	5	2	29	0	11
$501 - $600	148		103	5	4	21	2	13
$601 - $700	158		87	3	6	47	3	12
$701 - $800	171		100	1	9	45	4	12
$801 - $900	169		92	2	18	34	6	17
$901 - $1,000	160		105	1	7	30	6	11
$1,001 - $1,100	188		120	3	11	34	6	14
$1,101 - $1,200	205		130	2	12	41	8	12
$1,201 - $1,300	179		121	1	14	32	2	9
$1,301 - $1,400	187		123	0	17	28	8	11
$1,401 - $1,500	182		133	0	13	24	8	4
$1,501 - $2,000	905		672	14	32	127	39	21
$2,001 - $2,500	931		796	1	11	98	16	9
$2,501 - $3,000	929		822	0	12	75	12	8
$3,001 - $4,000	1,383		1,275	0	9	79	17	3
$4,001 - $5,000	870		824	0	3	35	6	2
$5,001 +	984		926	0	0	51	4	3
Total	**9,209**	**1,144**	**6,620**	**42**	**181**	**862**	**162**	**198**

SECTION G

ACTUARIAL COST METHODS AND ASSUMPTIONS

SUMMARY OF ACTUARIAL COST METHODS AND ASSUMPTIONS

I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate including administrative expenses, and (ii) a rate that will amortize the unfunded actuarial liability.

1. The valuation is prepared on the projected benefit basis. The present value of each participant's expected benefit payable at retirement or termination is determined, based on age, service, sex, compensation, and the interest rate assumed to be earned in the future (7.00%). The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.

2. The employer contributions required to support the benefits of the Plan are determined following a level percent of pay funding approach, and consist of a normal cost contribution and an unfunded accrued liability contribution, plus a component to cover administrative expenses.

3. The normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using the individual entry age actuarial cost method having the following characteristics of (i) the annual normal costs for each active member, payable from the date of entry into the system to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement, and (ii) each annual normal cost is constant percentage of the member's year-by-year projected covered pay.

4. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability. Amortization bases are established each year and amortized over periods in accordance with the following amortization methods.

    a. The UAL as of June 30, 2013, developed prior to implementing the September 2013 assumption changes, is amortized over a closed 25-year period as a level percentage of payroll.

b. The impact of the September 2013 assumption changes on the UAL is amortized over a closed 25-year period as a level percentage of payroll with a four-year phase-in to the full amortization rate. The phase-in is calculated by multiplying the first year amortization payment by 25 percent. For the second year, the amortization schedule is recalculated reflecting the 25 percent payment in the first year and the remaining 24-year period and the calculated amortization payment is then multiplied by 50 percent. The process is repeated until the full amortization payment is made beginning in the fourth year of the 25-year period.

c. The impact of the August 2015 assumption changes on the UAL is amortized over a closed 20-year period as a level percentage of payroll with a four-year phase-in to the full amortization rate. The phase-in is calculated by multiplying the first year amortization payment by 25 percent. For the second year, the amortization schedule is recalculated reflecting the 25 percent payment in the first year and the remaining 19-year period and the calculated amortization payment is then multiplied by 50 percent. The process is repeated until the full amortization payment is made beginning in the fourth year of the 20-year period.

d. Future gains and losses are amortized over closed 20-year periods as a level percentage of payroll from the valuation date in which they are first recognized. However, gains will not be amortized over a shorter period than the remaining period on the amortization of the 2013 UAL.

III. Actuarial Value of Assets

The actuarial value of assets is determined by recognizing market value gains and losses over a four-year period. Gain and loss bases to be spread over the four-year period are determined by comparing expected returns based on the market value of assets and cash flows during the year to actual investment returns. The actuarial value of assets must be between 80 and 120% of market value.

IV. Actuarial Assumptions

A. Economic Assumptions

1. Investment return: 7.00% per annum, compounded annually. Inflation is assumed to be 2.30%.

2. Salary increase rate: Individual salary increases are composed of a price inflation component, a real wage growth component, and a merit or longevity component that varies by service. The table below combines the various components of salary increases. Growth in the total payroll is assumed to be 2.50%.

Attained Service	Percentage Increase in Salary			
	Price Inflation	Real Wage Growth	Merit or Longevity	Total
1-7	2.30 %	0.50 %	4.20 %	7.00 %
8-14	2.30	0.50	1.30	4.10
15+	2.30	0.50	0.00	2.80

3. COLA Due to Pension Equalization Reserve (PER): The PER only applies to Tier 1 and Tier 2 benefits. Future benefits payeble through the PER are valued as an annual compound cost-of-living adjustment (COLA) payable January 1, equal to 1.00% from 2025-2029, and then 1.25% thereafter.

4. Administrative expenses are assumed to be equal to the prior year's amount, increased by 2.50%.

B. <u>Demographic Assumptions</u>

1. Rates of Mortality for Healthy and Disabled Lives: Mortality rates are based on the sex-distinct employee and annuitant mortality tables described below, including adjustment factors applied to the published tables for each group. Half of active member deaths are assumed to be duty related. Future mortality improvements are reflected by applying the MP-2019 Ultimate projection scale on a generational basis to the adjusted base tables from the base year shown below.

i) Non-Annuitant – Pub-2010, Amount-Weighted, General, Employee mortality table

Gender	Adjustment Factor	Base Year
Male	1.000	2010
Female	1.000	2010

(i) Healthy Annuitant – Pub-2010, Amount-Weighted, General, Healthy Retiree mortality table

Gender	Adjustment Factor	Base Year
Male	1.090	2010
Female	1.040	2010

(ii) Disabled Annuitant – Pub-2010, Amount-Weighted, General, Disabled Retiree mortality tables

Gender	Adjustment Factor	Base Year
Male	1.000	2010
Female	1.000	2010

Sample rates, including projections to 2024, are shown below (not including adjustment factors).

Sample Attained Ages	Probability of Death Pre-Retirement	
	Men	Women
20	0.032 %	0.011 %
25	0.024	0.008
30	0.031	0.013
35	0.041	0.020
40	0.057	0.031
45	0.085	0.049
50	0.129	0.072
55	0.190	0.107
60	0.277	0.162
65	0.407	0.257
70	0.611	0.425
75	0.952	0.702
80	1.503	1.155
85	6.275	4.633
90	12.873	10.079

Sample Attained Ages	Probability of Death Post-Retirement	
	Men	Women
20	0.035 %	0.012 %
25	0.027	0.008
30	0.034	0.014
35	0.045	0.021
40	0.062	0.033
45	0.104	0.059
50	0.282	0.201
55	0.408	0.258
60	0.582	0.347
65	0.865	0.554
70	1.445	0.960
75	2.529	1.701
80	4.521	3.036
85	8.135	5.606
90	14.032	10.482

Sample Attained Ages	Probability of Death Post-Disability	
	Men	Women
20	0.358 %	0.202 %
25	0.242	0.142
30	0.308	0.223
35	0.398	0.348
40	0.560	0.546
45	0.875	0.856
50	1.394	1.288
55	1.837	1.513
60	2.174	1.699
65	2.644	1.960
70	3.389	2.486
75	4.511	3.478
80	6.384	5.219
85	9.395	8.106
90	14.260	11.989

2. Disability rates. The disability incidence rates are 20% of the Arizona State Retirement Sytem disability table. Half of disabilities are assumed to be duty related. Sample disability rates of active members are provided in the table below. There rates apply to both male and female COPERS member.

Sample Attained Ages	Probability of Disablement
25	0.0100 %
30	0.0121
35	0.0185
40	0.0294
45	0.0454
50	0.0677
55	0.0794
60	0.0863

3. Termination rates (for causes other than death, disability or retirement): Termination rates are based on age and service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown:

Probability of Termination						
Age	Years of Service					
	0	1	2	3	4	5+
20	19.00 %	17.00 %	11.00 %	10.00 %	8.25 %	8.00 %
25	19.00	17.00	11.00	10.00	8.25	8.00
30	17.00	13.25	10.00	8.75	7.25	5.00
35	17.00	10.75	9.00	7.50	6.50	4.00
40	17.00	9.50	8.25	6.50	6.00	3.10
45	17.00	8.50	7.50	6.50	6.00	2.10
50	14.00	9.00	5.00	5.00	4.50	1.50
55	14.00	9.00	5.00	5.00	4.50	1.50
60	14.00	9.00	5.00	5.00	4.50	1.50

4. Retirement rates.

Probability of Retirement				
Age	Years of Service			
	<15	15-24	25-31	>31
50-51	0.00 %	0.00 %	40.00 %	42.50 %
52	0.00	0.00	40.00	35.00
53	0.00	0.00	40.00	27.50
54	0.00	0.00	30.00	27.50
55	0.00	0.00	30.00	27.50
56	0.00	37.50	25.00	27.50
57	0.00	37.50	22.50	22.50
58	0.00	25.00	22.50	22.50
59	0.00	22.50	20.00	22.50
60	10.00	22.50	20.00	22.50
61	10.00	20.00	20.00	22.50
62	13.00	20.00	25.00	32.50
63	13.00	20.00	25.00	37.50
64	10.00	17.50	15.00	25.00
65	20.00	27.50	25.00	35.00
66	25.00	32.50	40.00	37.50
67	25.00	35.00	40.00	37.50
68	25.00	35.00	40.00	37.50
69	25.00	35.00	40.00	47.50
70	100.00	100.00	100.00	100.00

C. Other Assumptions

1. Percent married: 90% of employees are assumed to be married.

2. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

3. Unused Vacation and Compensatory Time: For Tier 1 and Tier 2 members, compensatory service credits and lump sum payments for unused vacation and compensatory time are explicity valued. An additional load of 1.5% is also included as a margin for adverse deviation.

4. Member Contribution Crediting Rate: Member contributions are credited with interest at 3.75% per annum.

5. Non-Vested Terminated Members Due Refuds: Current non-vested terminated members with refunds of the member account balances due are assumed to take the refund at age 65.

6. Decrement Timing : Middle of the Year.

Section H

Risks Associated with Measuring the Accrued Liability

Risks Associated With Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and 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 differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on Exhibit B.5 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	June 30, 2024	June 30, 2023	June 30, 2022	June 30, 2021
Ratio of the market value of assets to total payroll	4.7	5.1	5.3	5.8
Ratio of actuarial accrued liability to payroll	6.7	7.3	7.7	7.6
Ratio of actives to retirees and beneficiaries	1.1	1.1	1.0	1.1
Ratio of net cash flows to market value of assets	0%	-1%	-1%	4%
Duration of the actuarial accrued liability	12.0	12.0	12.2	12.2

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 4.0 times the payroll, a return on assets 5% different than assumed would equal 20% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 5.5 times the payroll, a change in liability 2% other than assumed would equal 11% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability

Risks Measures – 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 City of Phoenix Employees' Retirement System (COPERS) 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 of COPERS is set equal to the **expected return** on the Fund's diversified portfolio of assets (referred to sometimes as the investment return assumption). For COPERS, the investment return assumption is 7.00%.

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.

Valaution Accrued Liabilities	LDROM
$5,147,293,773	$5,846,253,931

Note that the COPERS benefit structure has risk sharing provisions that are contingent on the investment returns of the portfolio and thus if the portfolio was changed to expect lower returns, the expected liabilities that are contingent on those returns would also decrease. If these provisions were not contingent on the investment performance, it would have increased the LDROM by another $414 million, meaning these provisions reduced the impact of lowering the discount rate from 7.00% to 5.32% by about a third, which is an illustration that about a third of the investment risk is currently being borne by the Members and not the City.