FISCAL YEARS ENDING
JUNE 30, 2023 AND 2022

CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM

ANNUAL COMPREHENSIVE FINANCIAL REPORT

A COMPONENT UNIT OF THE CITY OF PHOENIX, ARIZONA

COPERS

INVESTING IN THE FUTURE OF PHOENIX

COPERS

CITY OF PHOENIX
EMPLOYEES' RETIREMENT PLAN
(A Component Unit of the City of Phoenix, Arizona)

SEVENTY-SEVENTH
ANNUAL COMPREHENSIVE FINANCIAL REPORT
FOR THE FISCAL YEARS ENDED
JUNE 30, 2023 and 2022

200 West Washington Ave, 10th Floor
Phoenix, Arizona 85003
(602) 534-4400
FAX (602) 495-2008

Prepared by:
City of Phoenix
Employees' Retirement System
and
City of Phoenix
Finance Department

COPERS

Table of Contents

Table of Contents

ACTUARIAL SECTION

STATISTICAL SECTION

COPERS

COPERS

Introductory

section

*The **Introductory Section** contains the Certificate of Achievement for Excellence in Financial Reporting, the letter of transmittal, the Retirement Board structure, the administrative organization and the Chairperson's Report.*

COPERS

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

City of Phoenix Employees' Retirement Plan
Arizona

For its Annual Comprehensive
Financial Report
For the Fiscal Year Ended

June 30, 2022

Christopher P. Morrill

Executive Director/CEO

COPERS

Public Pension Coordinating Council

Public Pension Standards Award For Funding and Administration 2023

Presented to

City of Phoenix Employee's Retirement System

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

Alan H. Winkle
Program Administrator

COPERS

City of Phoenix
RETIREMENT SYSTEM

November 28, 2023

Chairperson and Members of the Retirement Board

City of Phoenix Employees' Retirement System:

I am pleased to submit this Annual Comprehensive Financial Report (ACFR) of the City of Phoenix Employees' Retirement System (COPERS or the Plan) as of and for the years ended June 30, 2023 and 2022. This report consists of the Introductory, Financial, Investment, Actuarial and Statistical sections.

The Plan is governed by the City of Phoenix Employees' Retirement Law of 1953 (Chapter XXIV of the City of Phoenix Charter). This law has been revised over the years, with the latest amendment approved by the City voters on August 25, 2015.

Financial Information

Responsibility for accuracy of the data, completeness, and fairness of the presentation of the ACFR, including all disclosures, rests with the Retirement Board. The Plan's record-keeping, financial statement and investment control responsibilities have been performed by the City's Finance Department. To the best of our knowledge and belief, this report is accurate in all material respects and is reported in a manner designed to present fairly the Fiduciary Net Position and Changes in Fiduciary Net Position. All disclosures necessary to enable the reader to gain an understanding of the Plan's financial activities have been included.

Readers of this ACFR are encouraged to review the Management's Discussion and Analysis starting on page 19, which provides a narrative analysis and highlights of our financial condition and activities for the fiscal years ended June 30, 2023 and 2022.

Internal Controls

Internal controls are procedures designed to accomplish the following: to protect assets from loss, theft or misuse; to check the accuracy and reliability of accounting data; to promote operational efficiency; and, to encourage compliance with managerial policies. The Board and the City of Phoenix (the City) management are responsible for establishing a system of internal controls designed to provide reasonable assurance that these objectives are met. Because the cost of internal controls should not outweigh their benefits, the City's comprehensive framework of internal controls has been designed to provide reasonable, rather than absolute, assurance that the financial statements are free of any material misstatements. Representatives from the City Auditor's Department meet periodically with the Board to review their audit plans and present the results of the audits. Moreover, representatives from the independent auditors meet annually with the Board to review their audit plans and receive input from the Board. The City also maintains budgetary controls designed to ensure compliance with legal provisions of the annual budget adopted by the City Council.

This report has been prepared in conformance with the principles of governmental accounting and reporting as set forth by the Governmental Accounting Standards Board. Transactions of COPERS are reported on the accrual basis of accounting. Revenues are recorded when earned, without regard to the date of collection, and expenses are recorded when incurred. The City's internal accounting and audit controls are designed to provide for the accuracy, reliability and integrity of all financial records.

COPERS History

COPERS was created to provide retirement, survivor and disability benefits to the City of Phoenix general employees. COPERS is a qualified retirement plan under the Internal Revenue Code. The City of Phoenix Employees' Retirement Board (the Board) is the trustee of the Plan.

The Mayor and City Council are covered by the Elected Officials Retirement Plan of Arizona (EORPA). Sworn police and fire employees are covered by the Arizona Public Safety Personnel Retirement System (APSPRS). The EORPA and the APSPRS were created by Arizona State Statute. EORPA and APSPRS benefit payments, investments and overall administration of the Plans are handled by centralized State Boards, and each of the retirement plans publish separate financial reports. However, the administration of the system and responsibility for making the APSPRS provisions effective for each employer are vested in Local Boards. For the City of Phoenix, this responsibility rests with the City of Phoenix Fire Pension Board and the City of Phoenix Police Pension Board. The COPERS Retirement Program Administrator oversees the Local Board Secretary for both Boards, and retirement office staff perform the administrative functions on behalf of those Boards.

Administrative Budget

The City provides an annual budgetary allocation to pay for the general administration of COPERS. The cost paid by the City for COPERS' administration was $2.201 million. Most investment-related expenses, such as investment custody costs, investment manager fees, and consultant fees, are paid directly from the Plan's assets. Certain administrative fees for legal, actuarial and computer services are also paid directly from Plan assets. The investment costs amounted to $18.076 million for the fiscal year ended June 30, 2023. These costs represented 0.52% of total Plan assets.

Professional Services

The Retirement Board retains professional consultants to prudently discharge its fiduciary responsibility for the proper administration of the Plan. Gabriel Roeder Smith & Company (GRS) provides actuarial services and the corresponding certification. BNY Mellon serves as the master custodian. Brokerage trade execution monitoring is compiled by Elkins/McSherry, LLC. Meketa Investment Group provides investment performance analysis, asset allocation review and investment consulting to the Retirement Board. Aksia provides consultative services to COPERS regarding its real estate investments. COPERS' financial statements are audited by FORVIS and reviews of operations are performed by the City Auditor's Department.

The City Attorney's office provides legal representation. COPERS also uses Ice Miller for outside legal services in the event the City Attorney's office has a conflict or for specialized legal work.

The guidance provided by the Retirement Board is greatly appreciated. The preparation of this report is a collaborative effort of many individuals. I would like to acknowledge the hard work of the COPERS staff, the Finance Department and the Retirement Board. This report is intended to provide important information crucial to the understanding of the pension plan.

Funding Status and Progress

COPERS contracts with an independent actuarial firm to conduct an actuarial valuation each year. The purpose of the valuation is to measure COPERS' liability for pension payments and its funding progress, to determine the actuarially determined contribution and to analyze changes in experience. The City of Phoenix has adopted a Pension Funding Policy that serves as a roadmap to a fully funded pension plan. Through the policy the City commits to contributing at least 100% of the actuarially determined contribution, as well as exploring other strategies that would have a positive impact on the security of the Plan.

The actuarial valuation as of June 30, 2023 reflects a funded ratio of 72% using a smoothed fair value of plan assets. This is a 0.8% improvement from the prior fiscal year. The unfunded actuarial accrued liability will be amortized as a level percent of payroll over future years.

Investment Activities

As of June 30, 2023, COPERS' net position is 3.384 billion. The fiscal year net return for the Plan is 5.4%, which is 1.6% below the assumed rate of return of 7.00%. The funded ratio on a fair value of assets basis increased from 68.65% to 69.29%. For more information on COPERS' investment policies and performance, please refer to the Investment section in this report, beginning on page 52.

Major Initiatives Involving Plan Administration

In March of 2017, the Board adopted a revised asset allocation that more closely aligns the Board's risk tolerance with expected returns. The Retirement Board and COPERS staff have worked over the past year to move COPERS' investments within the approved target ranges for each of the asset classes. As of this report, this project is 100 percent completed. During the reporting period, COPERS has continued to work on the new pension administration system project with Levi, Ray & Shoup, Inc. (LRS). The project, scheduled to take approximately three years, is on schedule with the first three design phases completed. The new web-based system will allow greater automation and accuracy for staff, and enhanced member services through a web-based application. The Segal Group continues to serve as consultants for COPERS in assisting with the replacement software project.

In December 2021, oversight and management of the Deferred Compensation Plans (457, 401(a), and Post Employment Health Plan (PEHP) Investment trust was moved to the Retirement Office. This major service enhancement will allow for greater support and tools to ensure our members go into retirement with a better financial future.

Awards And Acknowledgements

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to COPERS for its annual comprehensive financial report for the fiscal year ended June 30, 2023. In order to be awarded a Certificate of Achievement, an organization must conform to the highest standards of fiduciary reporting and full disclosure. This is the 37th year COPERS has received this award.

The Plan also received the Public Pension Standards Award for Funding and Administration. This award was presented by the Public Pension Coordinating Council, a confederation of the National Association of State Retirement Administrators, the National Conference on Public Employee Retirement Systems and the National Council on Teacher Retirement. This is the twelfth year the Plan has applied for and received this award.

Sincerely,

Scott Steventon

Scott Steventon
Retirement Program Administrator

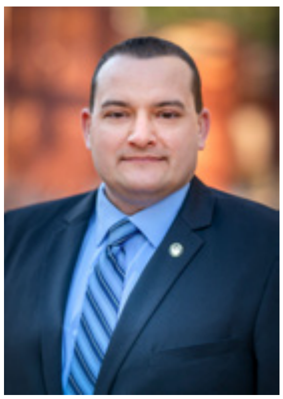
Retirement Board



AARON AVILA
Chairperson, Retirement Board
Elected Board Member

TAMMY RYAN
Vice Chairperson, Retirement Board
Retiree Board Member

INGER ERICKSON
Deputy City Manager
City of Phoenix
Ex-Officio Board Member


JOE JATZKEWITZ
Assistant Finance Director/City Treasurer
City of Phoenix
Ex-Officio Board Member

DAVE MATHEWS
Human Resources Director
City of Phoenix
Ex-Officio Board Member

KATHLEEN GITKIN
Chief Financial Officer
City of Phoenix
Ex-Officio Board Member



STEPHEN HERBERT
Elected Board Member

DAVID URBINATO
Elected Board Member

ALAN MAGUIRE
Citizen Board Member

Retirement Board Committees

Investment Committee

Alan Maguire, Chairperson
Joe Jatzkewitz
Tammy Ryan, Vice Chariperson
Aaron Avila
David Urbinato

Legal Review Committee

Inger Erickson, Chairperson
Alan Maguire
Aaron Avila
David Urbinato

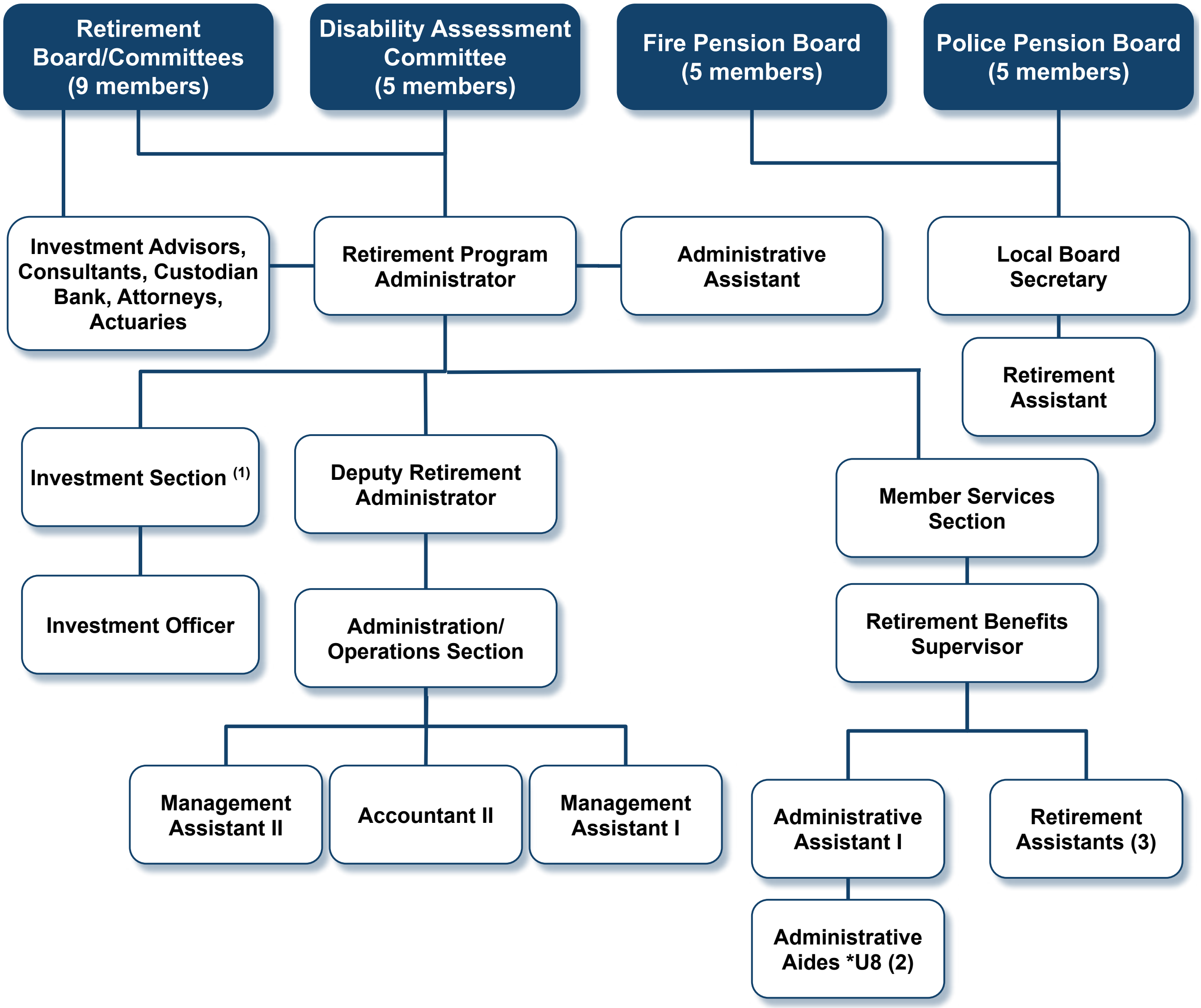
Charter Amendments/ Policies & Procedures Committee

Aaron Avila, Chairperson
Kathleen Gitkin
Tammy Ryan
David Mathews

Disability Assessment Committee

Scott Steventon, Chairperson
Robert Jones, M.D.
Debra Payan
Maria Enriquez

Retirement Department Administrative Organization



(1) Please refer to the Investment Section for a list of Investment Managers on page 62 - 63, the Schedule of Investment Fees on pages 69 - 70 and the Schedule of Commissions of page 72.

Administrative Staff

Scott Steventon	Retirement Program Administrator
Stacy Osborne-Fry	Assistant Retirement Administrator
Tina Esparza	Local Board Secretary
Marissa Hernandez	Retirement Benefits Supervisor
Greg Fitchet	Investment Officer
Jamie Yagodnik	Deferred Compensation Coordinator
Claudya Quintero	Defined Contribution Specialist
Bevey Wilson	Accountant II
Trista Eaden	Management Assistant I
Alejandra Montoya	Administrative Assistant I
Marcia Wilson	Administrative Secretary
Adrianna Rodriguez	Retirement Assistant
Christina Vega	Retirement Assistant
Corrina Apolinar	Retirement Assistant
Janice Holland	Administrative Aide

Accounting

Kathleen Gitkin	Chief Financial Officer, Finance Department

Treasurer

Joe Jatzkewitz	City Treasurer, Finance Department

Legal

Michelle Wood	Assistant City Attorney IV, Law Department

Actuary

Gabriel, Roeder Smith & Company	Denver, CO

Auditor

FORVIS	Dallas, TX Certified Public Accountants

Brokerage

Elkins McSherry LLC	New York, NY

Investment Services

Refer to Investment Section for:	Investment Managers on page 62-63 Schedule of Investment Fees on page 69-70 and Schedule of Commissions on page 72

Legal Services

ICE Miller	Indianapolis, IN
Ryan, Rapp & Underwood	Phoenix, AZ

Master Custodian

BNY Mellon	Pittsburgh, Pennsylvania

Medical Advisors

Integrated Medical Evaluations, Inc	Tempe, AZ

City of Phoenix
RETIREMENT SYSTEM

November 28, 2023

To COPERS Members and Retirees:

On behalf of the Retirement Board, it is my pleasure to present the City of Phoenix Employees' Retirement System (COPERS) Annual Comprehensive Financial Report (ACFR) for the fiscal years ended June 30, 2023 and June 30, 2022. This annual report contains information regarding the COPERS' administration, financial statements, investments, actuarial and statistical data.

COPERS' total fund assets increased from $3.243 billion to $3.384 billion during the year ended June 30, 2023 and net performance for the year was 5.4%. The annualized net return for the past three and five years was 7.2% and 5.8%, respectively. Meketa, provided the Board with analysis of investment issues and portfolio performance measurement.

The Board recently modified the plan's asset allocation with the objective of maximizing returns with the lowest possible risk. The Board continued to oversee a diversified investment portfolio that includes diverse segments of the U.S. and International financial assets. The fixed income and real estate allocations are managed by several external managers. Real estate holdings are diversified across geographic locations and property types.

The COPERS funded ratio on an actuarial value of assets (AVA) as of June 30, 2023 was 72.0%, which was an increase from the June 30, 2022 funded ratio of 71.2%. The Board's independent, actuarial consultant, Gabriel Roeder Smith & Company (GRS), conducted the annual actuarial valuation. The plan's sponsor, the City of Phoenix, remains committed to fully funding their actuarially-computed contribution amount.

COPERS is annually audited by the the City of Phoenix Auditor Department and the Plan's independent external auditors, FORVIS. The Board reviews their audit plans and reviews their findings and results.

COPERS was again recognized by the Government Finance Officers Association for the quality and completeness of its ACFR and the Popular Annual Financial Report (PAFR) for the fiscal year ended June 30, 2022. These reports are accessible through the COPERS' internet site.

The COPERS Board continues to focus on fulfilling its fiduciary obligation to the COPERS' active members, retirees and beneficiaries. Please contact the Retirement Office with any questions or comments. Finally, I would like to thank my fellow Board members and the COPERS staff for their diligent and committed service on behalf of all our members.

Sincerely,

Aaron Avila

Aaron Avila
Chairperson, Retirement Board

200 West Washington Street, 10th Floor Phoenix, Arizona 85003 602-534-4400 Fax: 602-495-2008 7-1-1 Relay Friendly

COPERS

Financial
section

*The **Financial Section** contains the opinion of the independent auditors, management's discussion and analysis, the audited financial statements, notes to the financial statements, and relevant supplemental information.*

COPERS

FORVIS

14241 Dallas Parkway, Suite 1100 / Dallas, TX 75254
P 972.702.8262 / F 972.702.0673
forvis.com

Independent Auditor's Report

Honorable Mayor and Members of the City Council
City of Phoenix Employees' Retirement System Retirement Board
Phoenix, Arizona

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of the City of Phoenix Employees' Retirement System (Plan), a fiduciary fund of the City of Phoenix, Arizona, as of and for the years ended June 30, 2023 and 2022, and the related notes to the financial statements, which collectively comprise the Plan's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Plan as of June 30, 2023 and 2022, and the changes in fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the "Auditor's Responsibilities for the Audit of the Financial Statements" section of our report. We are required to be independent of the Plan, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Plan's ability to continue as a going concern for 12 months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Honorable Mayor and Members of the City Council
City of Phoenix Employees' Retirement System Retirement Board

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Plan's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and pension information be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Honorable Mayor and Members of the City Council
City of Phoenix Employees' Retirement System Retirement Board

Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Plan's basic financial statements. The schedule of investment expenses, schedule of administrative expenditures and encumbrances, schedule of administrative expenses and schedule of payments to consultants are presented for purposes of additional analysis and are not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of investment expenses, schedule of administrative expenditures and encumbrances, schedule of administrative expenses and schedule of payments to consultants are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Other Information

Management is responsible for the other information included in the annual comprehensive financial report. The other information comprises the introductory, investment, actuarial and statistical sections but does not include the basic financial statements and our auditor's report thereon. Our opinion on the basic financial statements does not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audits of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

FORVIS, LLP

Dallas, Texas
November 28, 2023

Management's Discussion and Analysis (unaudited)

Dear Members and Retirees:

The City of Phoenix Employees' Retirement System ("COPERS" or the "Plan") is pleased to provide the following analysis of the financial activities for the fiscal years ended June 30, 2023 and 2022. This discussion is presented as a narrative overview only. Readers are encouraged to consider the information presented in this analysis in conjunction with the Transmittal Letter in the Introductory Section, the financial statements and the other information provided in this report.

Financial Highlights:
(in thousands)

- The Plan's Net Position Restricted for Pensions increased by $141,409 or approximately 4.4% to $3,384,096 as of June 30, 2023 as reflected in the Statement of Fiduciary Net Position on page 25. The Net Position Restricted for Pensions as of June 30, 2022, was $3,242,687. The increase during fiscal year 2023 was primarily attributable to favorable investment performance.
- Total additions to the Net Position Restricted for Pensions, as reported in the Statement of Changes in Fiduciary Net Position on page 26, for the fiscal year ended June 30, 2023 was $418,486 compared to $72,007 for fiscal year ended June 30, 2022. The increase for the current year was primarily attributable to favorable investment performance. Total additions include employer and employee contributions of $240,885 and total net investment gain of $175,400 for the fiscal year ending June 30, 2023 compared to $231,669 and an investment loss of $-161,784 in the prior year.
- The recent actuarial valuation prepared as of June 30, 2023 reported the funded ratio to be 72.0%, up from 71.2% the prior fiscal year. This is based on a total pension liability of $4,884,162 and the smoothed actuarial value of assets.
- On a fair value basis, the investment rate of return for this fiscal year was 5.4% compared with -4.70% in fiscal year 2022.
- Retirement benefits paid to retirees and beneficiaries increased 4.3% to $268,868 for fiscal year 2023, compared to $257,782 in fiscal year 2022.

Using This Annual Report:

This report is prepared to provide information as a means for making management decisions, complying with statutory provisions, and demonstrating the responsible stewardship of the assets of the Plan. The financial statements starting on page 25 in the Financial Section identify the Net Position Restricted for Pensions and provide a comparison of the current fiscal year to the prior year.

Overview of Financial Statements:

The Financial Section includes the following:

- Statement of Fiduciary Net Position (Page 25)
- Statement of Changes in Fiduciary Net Position (Page 26)
- Notes to the Financial Statements (Page 27)
- Required Supplementary Information (Page 44)
- Supplementary Information (Page 47)

Statement of Fiduciary Net Position:

This statement presents information on all of the assets and liabilities of the Plan with the difference reported as Net Position Restricted for Pensions available to retirees and survivors. The current year information is provided in comparison to the previous year to assist the reader in evaluating the progress of the Plan.

Statement of Changes in Fiduciary Net Position:

The Statement of Changes in Fiduciary Net Position presents information showing how the Plan's net position changed during the stated fiscal year.

Notes to the Financial Statements:

The Notes to the Financial Statements are an integral part of the financial statements. The information provides the reader additional information that is essential to a full understanding of the data presented in the financial statements to further evaluate the financial condition and operation of the Plan.

Required Supplementary Information:

The Schedule of Changes in Net Pension Liability and Related Ratios provides the Plan's funding progress for the last ten years and the funding ratio that indicates the Plan's ability to meet its current and future benefit obligations. The Schedule of Employer Contributions reflects the City's Actuarial Determined Contribution and Actual Contributions for the last ten years. The Notes to the Required Supplementary Information provide additional information regarding actuarial assumptions and factors affecting trends.

Supplementary Information:

The Supplementary Information includes investment expenses and administrative expenditures for the current and previous fiscal years. The Schedule of Investment Expenses provides the reader with the cost to the Plan for managing and monitoring the Plan's assets.

Financial Analysis
(in thousands)

The evaluation of the Plan's net position provides a measurement tool in assessing the progress and performance of the Plan. COPERS' Net Position Restricted for Pensions as of June 30, 2023 was $3,384,096. This amount represents an increase of 4.4% from Net Position Restricted for Pensions of $3,242,687 as of June 30, 2022.

Uninvested cash is reflected as Cash & Cash Equivalents on the Statement of Fiduciary Net Position and may fluctuate due to the timing of investments, pension payroll and other transactions. Cash & Cash Equivalents decreased from $183,915 as of June 30, 2022 to $104,316 as of June 30, 2023, a decrease of $79,599.

The Plan had liabilities of $62,876 on June 30, 2023 compared to $91,533 on June 30, 2022. This change was primarily attributable to a decrease in payables related to securities lending collateral, unsettled investment broker transactions and amounts owed to the City of Phoenix.

The overall return on investments for fiscal years 2023, 2022 and 2021 was 5.4%, -4.70% and 22.80%, respectively. The chart below illustrates the performance of major asset classes over the last three fiscal years.

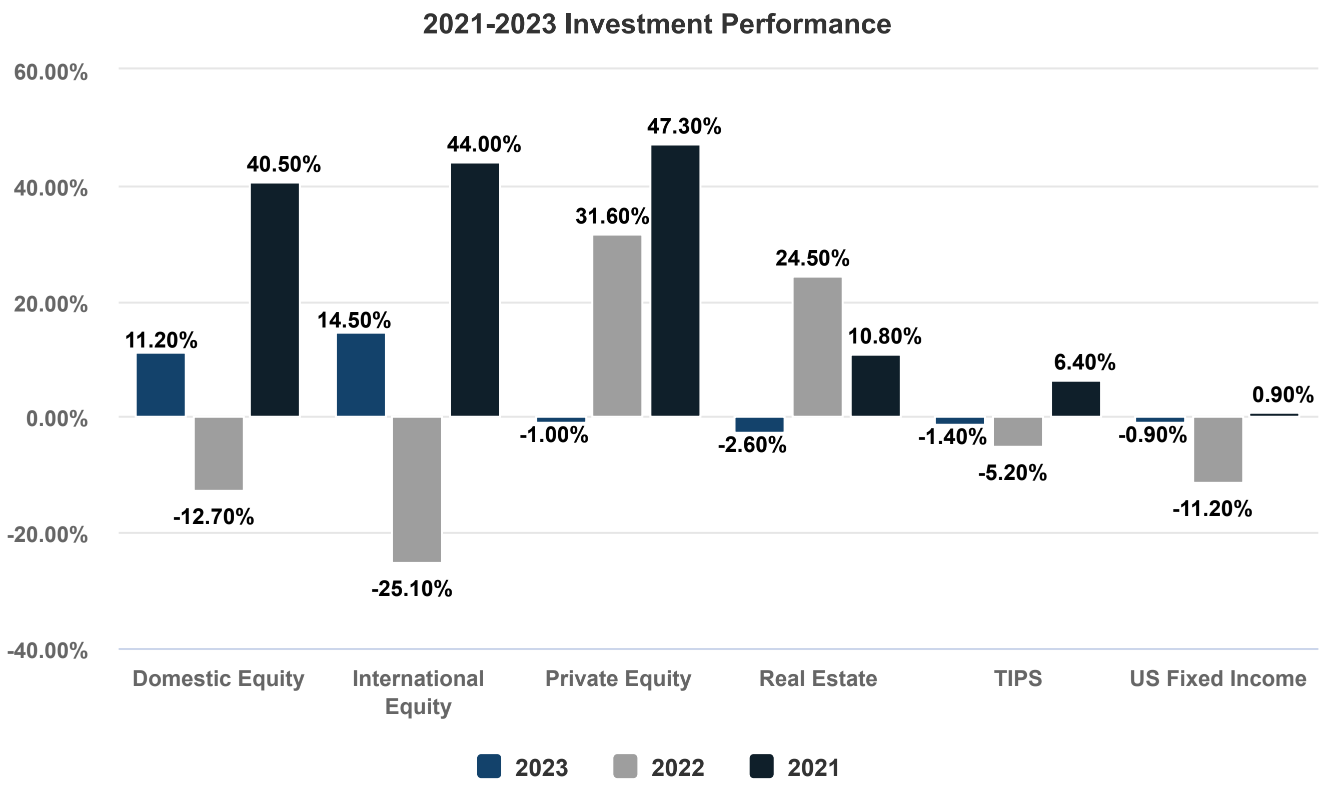

2021-2023 Investment Performance
60.00%
40.00%
20.00%
0.00%
-20.00%
-40.00%
11.20%
-12.70%
40.50%
14.50%
-25.10%
44.00%
-1.00%
31.60%
47.30%
-2.60%
24.50%
10.80%
-1.40%
-5.20%
6.40%
-0.90%
-11.20%
0.90%
Domestic Equity
International Equity
Private Equity
Real Estate
TIPS
US Fixed Income
2023
2022
2021

Table 1: COPERS Fiduciary Net Position for Benefits for June 30, 2023 and 2022 (in thousands)

	2023	2022	Change	% Change
Cash & Cash Equivalents	$ 104,316	$ 183,915	$ (79,599)	(43.3)%
Total Receivables	27,320	33,588	(6,268)	(18.7)
Total Investments	3,315,336	3,116,717	198,619	6.4
Total Assets	3,446,972	3,334,220	112,752	3.4
Total Liabilities	62,876	91,533	(28,657)	(31.3)
COPERS Net Position	**$ 3,384,096**	**$ 3,242,687**	**$ 141,409**	**4.4%**

Table 2: COPERS Fiduciary Net Position for Benefits for June 30, 2022 and 2021 (in thousands)

	2022	2021	Change	% Change
Cash & Cash Equivalents	$ 183,915	$ 143,738	$ 40,177	28.0%
Total Receivables	33,588	98,633	(65,045)	(65.9)
Total Investments	3,116,717	3,319,034	(202,317)	(6.1)
Total Assets	3,334,220	3,561,405	(227,185)	(6.4)
Total Liabilities	91,533	123,378	(31,845)	(25.8)
COPERS Net Position	**$ 3,242,687**	**$ 3,438,027**	**$ (195,340)**	**(5.7)%**

Reserves:

COPERS maintains five reserve funds to separately account for various transactions of the Plan. Additions to the reserves come from employer and member contributions, and investment income. Deductions from the reserves include monthly pension benefits and payments to investment managers. A schedule of reserve account balances is included in Note 3 to the Financial Statements.

COPERS' Activities:

(in thousands)

COPERS provides retirement pensions, survivor benefits and disability benefits to qualified members and their beneficiaries. These benefits are financed by income on COPERS investments and employer and member contributions.

Total net investment income, which includes net appreciation or depreciation in fair value of investments, bond interest, dividend income, net securities lending income and investment expenses for the fiscal year ended June 30, 2023 was positive $175,400. This compares to net investment loss for June 30, 2022 of $-161,784 and net investment gain of $610,554 for June 30, 2021 respectively.

Total employer contributions were $193,136 in fiscal year 2023, compared to $178,319 in fiscal year 2022 and $357,382 in fiscal year 2021. In 2021, the City used available cash (over $175 million) from an enterprise fund to decrease the Unfunded Accrued Actuarial Liability, which caused the large increase in employer contributions. The City contributed $13,520 in excess of the Actuarially Determined Contribution in fiscal year 2023 and $10,476 in excess in fiscal year 2022 . Benefit payments for the fiscal years 2023, 2022 and 2021 were $268,868, $257,782 and $246,214, respectively. Total deductions increased by 3.6% over the prior fiscal year, primarily as a result of an increase in the number of retirees.

The summary of COPERS revenues (additions) and expenses (deductions) for the fiscal years ended June 30, 2023, 2022 and 2021 are provided in Table 3 and Table 4:

Table 3: Summary Statement of Changes in Net Position (in thousands)

	2023	2022	Change	% Change
Additions				
Employer Contributions	$ 193,136	$ 178,319	$ 14,817	8.3%
Members' Contributions	47,749	53,350	(5,601)	(10.5)
Retirement Office Administration	2,201	2,122	79	3.7
Net Investment Income	175,211	(161,872)	337,083	(208.2)
Net Securities Lending Income	189	88	101	114.8
Total Additions	**$ 418,486**	**$ 72,007**	**$ 346,479**	**481.2%**
Deductions				
Benefit Payments	$ 268,868	$ 257,782	$ 11,086	4.3%
Refunds	4,120	4,436	(316)	(7.1)
Inter-System Transfers	514	443	71	16.0
Retirement Office Administration	2,201	2,122	79	3.7
Administrative Expense	1,373	2,564	(1,191)	(46.5)
Total Deductions	**$ 277,077**	**$ 267,347**	**$ 9,729**	**3.6%**
Net Increase (Decrease)	**$ 141,409**	**-$195,340**	**$ 336,750**	**(172.4)%**

Table 4: Summary Statement of Changes in Net Position (in thousands)

	2022	2021	Change	% Change
Additions				
Employer Contributions	$ 178,319	$ 357,382	$ (179,063)	(50.1)%
Members' Contributions	53,350	40,561	12,789	31.5
Retirement Office Administration	2,122	2,047	75	3.7
Net Investment Income	(161,872)	610,422	(772,294)	(126.5)
Net Securities Lending Income	88	132	(44)	(33.3)
Total Additions	**$ 72,007**	**$ 1,010,544**	**$ (938,537)**	**(92.9)%**
Deductions				
Benefit Payments	$ 257,782	$ 246,214	$ 11,568	4.7%
Refunds	4,436	3,047	1,389	45.6
Inter-System Transfers	442	452	(10)	(2.2)
Retirement Office Administration	2,122	2,047	75	3.7
Administrative Expense	2,564	1,930	634	32.8
Total Deductions	**$ 267,346**	**$ 253,690**	**$ 13,656**	**5.4%**
Net Increase (Decrease)	**-$195,340**	**$ 756,854**	**-$952,193**	**(125.8)%**

Requests for Information:

This report is prepared to provide the Retirement Board, members, retirees and citizens with an overview of the plan, to assess COPERS' financial position and to show accountability for funds received. Questions regarding the information provided in this financial report or requests for additional information may be addressed to:

COPERS

200 W. Washington, 10th Floor

Phoenix, AZ 85003

(602) 534-4400

www.phoenix.gov/copers

Statement of Fiduciary Net Position as of June 30, 2023 and 2022 (in thousands)

	2023	2022
Assets		
Cash and Cash Equivalents	$ 104,316	$ 183,915
Receivables		
City of Phoenix Contributions	15,536	19,253
Member Contributions	557	2,179
Interest and Dividends	4,303	4,044
Unsettled Broker Transactions - Sales	6,924	8,112
Total Receivables	**27,320**	**33,588**
Investments		
Temporary Investments from Securities Lending Collateral	44,117	52,712
Fixed Income	511,900	487,948
Domestic Equities	823,012	781,752
Private Equity	401,370	347,164
Global Commingled	296,651	263,181
International Equities	605,731	532,661
Hedge Funds	142,648	140,952
Real Estate	489,907	510,347
Total Investments	**3,315,336**	**3,116,717**
Total Assets	**3,446,972**	**3,334,220**
Liabilities		
Payable for Securities Lending Collateral	44,117	52,712
Unsettled Broker Transactions - Purchases	428	10,888
Due to the City of Phoenix	735	22,450
Investment Management Fees Payable	3,008	2,999
Other Payables	14,588	2,484
Total Liabilities	**62,876**	**91,533**
Net Position Restricted for Pensions	**$ 3,384,096**	**$ 3,242,687**

The accompanying notes are an integral part of these financial statements.

Statement of Changes in Fiduciary Net Position for fiscal years ended June 30, 2023 and 2022 (in thousands)

	2023	2022
Additions		
Contributions		
City of Phoenix	$ 193,136	$ 178,319
Member	47,749	53,350
Retirement Office Administration	2,201	2,122
Total Contributions	**243,086**	**233,791**
Net Investment Income (Loss)		
Net Appreciation/(Depreciation) in Fair Value of Investments	136,469	(198,029)
Interest	27,924	17,501
Dividends	15,612	19,732
Other	13,283	16,959
Total Income from Investing Activities	193,287	(143,837)
Less Investing Activities Expense	(18,076)	(18,035)
Net Income/(Loss) from Investing Activities	175,211	(161,872)
Securities Lending Gross Income	2,131	201
Less Agent Fees	(81)	(38)
Less Broker Rebates/Collateral Management Fees	(1,861)	(75)
Net Securities Lending Expenses	(1,942)	(113)
Net Income from Securities Lending Activities	189	88
Total Net Investment Income/(Loss)	175,400	(161,784)
Total Additions	**418,486**	**72,007**
Deductions		
Benefit Payments	268,868	257,782
Refunds of Contributions	4,120	4,436
Retirement Office Administration	2,201	2,122
Inter-System Transfers	515	443
Administrative Expenses	1,373	2,564
Total Deductions	**277,077**	**267,347**
Increase/(Decrease) In Net Position	141,409	(195,340)
Net Position Restricted for Pensions		
Beginning of Year	3,242,687	3,438,027
End of Year	**$ 3,384,096**	**$ 3,242,687**

The accompanying notes are an integral part of these financial statements.

Note 1 - Summary of Significant Accounting Policies

The City of Phoenix Employees' Retirement Plan ("COPERS" or the "Plan") is a defined benefit single-employer public employees' retirement system for the City of Phoenix ("City") general municipal employees. The accounting policies of COPERS conform to accounting principles generally accepted in the United States of America ("GAAP") as applicable to governmental retirement plans.

A. Reporting Entity

COPERS prepares and distributes separate financial statements as required by the Charter of the City of Phoenix (Chapter XXIV, Article II, Employees' Retirement Law of 1953) ("Charter"). Its financial statements are also included as a component unit of the City due to the significance of COPERS' operational and financial relationships with the City. The cost of administering the Retirement Office is reflected as offsetting contributions and deductions on the Statement of Changes in Fiduciary Net Position although the costs are borne solely by the City. The City is the only non-employee contributor to the pension plan. Not all employees of the City are covered under COPERS. Police officers and firefighters are covered under the Arizona Public Safety Personnel Retirement System ("APSPRS") and elected officials are covered under the Elected Officials Retirement Plan of Arizona ("EORPA"). APSPRS and EORPA were established by Arizona State Statute and are administered by an independent Board of Trustees. The City's involvement with these plans is limited to the administration of benefits for APSPRS through the City of Phoenix Fire and Police Local Boards and making the required annual contributions.

B. Basis of Accounting

The accompanying financial statements have been prepared using the accrual basis of accounting in conformity with United States generally accepted accounting principles as prescribed by the Governmental Accounting Standards Board. COPERS' transactions are accounted for using the flow of economic resources measurement focus. Employee contributions are recognized as revenue in the period in which employee services are rendered and the contributions are therefore earned. Employer contributions are recognized at the same time, as the City is formally committed to contributing the actuarially determined amount each year. Pension payments and refunds are recognized when due and payable and expenses are recorded when the corresponding liabilities are incurred, regardless of when payments are made.

C. Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make a number of estimates and assumptions that affect the reported amounts of net position restricted for pensions and changes therein. Actual results could differ from those estimates.

D. Investments

Equity securities and fixed-income securities are reported at fair value (Note 14). Interest and dividends are recognized on the accrual basis as earned. Purchases and sales of investments are recorded on a trade-date basis. Cash equivalents are determined by using a maturity of no more than 90 days at time of purchase. The fair value of an investment is the price that would be received to sell an asset in an orderly transaction between market participants at the measurement date. The fair values of investments are generally based on published market prices and quotations obtained from major investment firms. Certain investments are reported at the net asset values calculated by the investment manager as a practical expedient.

In March of 2017, the Board significantly revised the Investment Policy Statement that was more than 10 years old. The Board considered it necessary to:

- Update the objectives and guidelines that govern the investment of COPERS' assets;
- Establish a long-term target asset allocation with a high likelihood of meeting COPERS' objectives; and
- Protect the financial health of COPERS through the implementation of a stable, long-term investment policy.

Significant areas of revision include modifying the asset allocation, reflecting the changes in the Phoenix City Charter that previously limited the types of investments COPERS could make, and adding prudent investor language. In consultation with their investment manager and consulting actuary, the Board believes the revised asset allocation will have a greater probability of realizing the assumed rate of return. The revised asset allocation was adopted during fiscal year 2017, was implemented in phases and completed in 2020. An update to the asset allocation plan became effective March 2023.

Note 1 - Summary of Significant Accounting Policies (Continued)

The table below reflects the target and actual allocation of the portfolio and the expected return on those asset classes:

Asset Class	FY 2023 Target Allocation	FY 2023 Actual Allocation	10-Year Expected Real Return
U.S. Equity	16.00%	21.00%	9.10%
Developed Market Equity (non-U.S.)	9.0	13.0	11.5
Emerging Market Equity	8.0	5.0	12.4
Private Equity	9.0	8.0	12.5
Investment Grade Bonds	-	11.0	4.9
TIPS	6.0	4.0	4.5
Private Debt	10.0	-	-
High Yield Bonds	5.0	4.0	8.5
Bank Loans	3.0	3.0	8.0
Emerging Market Bonds	3.0	2.0	7.3
Infrastructure	4.0	3.0	7.2
Natural Resources	4.0	2.0	10.9
Hedge Funds	-	4.0	5.6
Real Estate	12.0	15.0	7.0
Risk Mitigating Strategies	5.0	-	-
Short Duration Bonds	6.0	-	-
GTAA	-	3.0	6.0
Cash	-	2.0	3.1

Note 2 - Description of Plan

A. Purpose

COPERS is a single-employer, defined benefit pension plan established by the City Charter. Its purpose is to provide retirement, disability retirement and survivor benefits for its members. Members are full-time employees on a work schedule which consists of the number of full-time hours per week designated for the class of employment for the employee's classification with a work schedule intended to be continuous over a period of twelve months. All full-time classified civil service employees and full-time appointive officials of the City are required, as a condition of employment, to contribute to COPERS.

B. Administration

The general administration, management and operation of COPERS are vested in a nine-member Retirement Board consisting of three elected employee members, four statutory members, a citizen member and a retiree member. The Retirement Board appoints the Retirement Program Administrator, a civil service position, and contracts other services necessary to properly administer the Plan.

C. Plan Amendment and Termination

COPERS is administered in accordance with the Charter and can be amended or repealed only by a vote of the people. There are no provisions for termination of COPERS. Voters approved changes to the City of Phoenix retirement system in an election held on August 25, 2015. New employees hired on or after January 1, 2016 were placed in Tier 3. The employee contribution rate for Tier 3 is based on 50% of the actuarially determined rate or 11% whichever is lower.

D. Membership Data

	June 30	
	2023	2022
Retirees, beneficiaries and survivors	7,793	7,596
Alternate payees	193	184
Terminated vested members	1,149	1,109
Active members:		
Tier 1	3,769	4,110
Tier 2	521	541
Tier 3	4,117	3,287
Total Members	**17,542**	**16,827**

Note 2 - Description of Plan (Continued)

E. Pension Benefits

Benefits are calculated on the basis of a given rate, final average salary and service credit. Members are eligible for retirement benefits at age 60 plus ten or more years of service credit, age 62 with five or more years of service credit, or where age and service credits equal 80 for Tier 1 employees and 87 for Tier 2 and 3 employees. The below table outlines the benefits for each tier.

Tier 1	Tier 2	Tier 3
• Up to 32.5 yrs service @ 2.0%	• Less than 20 yrs service @ 2.10%	• Less than 10 yrs service @1.85%
• 32.5 to 35.5 yrs service @ 1.0%	• 20 yrs but less than 25 yrs service @ 2.15%	• 10 yrs but less than 20 yrs service @ 1.9%
• 35.5 yrs service & over @ 0.5%	• 25 yrs but less than 30 yrs service @ 2.20%	• 20 yrs but less than 30 yrs service @ 2.0%
	• 30 yrs or more @ 2.30%	• 30 yrs or more @ 2.1%

A deferred pension is available at age 62 to members who end their City employment with five or more years of service credit and leave their accumulated contributions in COPERS.

A supplemental post-retirement payment and a permanent benefit increase (under the Pension Equalization Program) may be provided to Tier 1 and Tier 2 retirees if sufficient reserves are available at the end of the fiscal year. The reserve is funded if the five-year average investment return exceeds 8%.

F. Disability Benefits

A member who becomes permanently disabled for the performance of duty is eligible for a disability benefit if the disability is 1) due to a personal injury or disease and the member has ten or more years of service credit or 2) due to injuries sustained on the job, regardless of service credit.

G. Survivor Benefits

Dependents of deceased members may qualify for survivor benefits if the deceased member had ten or more years of service credit or if the member's death was in the line of duty with the City and compensable under the Workmen's Compensation Act of the State of Arizona. Chapter XXIV, Section 25 of the Charter of the City of Phoenix specifies conditions for eligibility of survivor benefits.

H. Refunds

Upon separation from employment, a member or beneficiary not entitled to a pension may withdraw the member's contribution plus applicable interest. Acceptance of a refund revokes the individual's rights and benefits in COPERS. Employer contributions to COPERS are not refundable. An interest rate of 3.75%, the rate cap imposed by the City Charter, was granted by the Retirement Board to be applied effective June 30, 2023 to the members' mean account balances during the fiscal year. The interest rate granted in fiscal year 2022 was also 3.75%.

I. Tax Exempt Status of Member Contributions

COPERS has received a favorable letter of determination of qualification from the Internal Revenue Service under Section 401(a) of the Internal Revenue Code. Continued tax-exempt status of COPERS is contingent on future operations remaining in compliance with Section 401(a).

Under Internal Revenue Code Section 414(h)(2) and Revenue Ruling 81-36, effective January 1, 1985 the City of Phoenix authorized that a portion of its contributions be earmarked as being made by the members of COPERS, and "picked up" that portion of the designated active member contributions. The member contribution that is picked up by the City of Phoenix is treated as an employer contribution for federal and state income tax purposes and excluded from the member's gross income until distributed by COPERS.

Note 3 – Net Position Restricted for Pensions

Five reserve funds have been established to separately account for transactions of the Plan:

- The Income Account is used to account for COPERS' investment income and loss, including net appreciation or depreciation in fair value and miscellaneous income. At year-end, the Income Account is closed to the Employees' Savings Account, the Pension Accumulation Account, the Pension Reserve Account and the Pension Equalization Reserve Account, which results in no fund balance in the Income Account.
- The Employees' Savings Account is used to account for member contributions, member refunds, and the member portion of investment income. As a condition of employment, a member hired before July 1, 2013 is required to contribute 5% of his/her covered compensation; a member hired after this date is required to contribute 50% of the actuarially determined rate, while the City contributes the other 50%. Effective with the election on August 25, 2015, the employee contribution for Tiers 2 and 3 cannot exceed 11%. Accumulated contributions receive regular interest that is computed at the end of each fiscal year on the mean balance in the members' accounts during the year. The rate of interest is established each year by the Board and is capped at 3.75% by the City Charter. Transfers are made from the Employees' Savings Account to the Pension Reserve Account when a member retires or becomes eligible for disability benefits.
- The Pension Accumulation Account is used to account for employer contributions and for a portion of investment income. The Charter requires the City to contribute an amount that is determined annually by COPERS' retained actuaries. Contributions are based upon a level percentage of payroll. The Pension Accumulation Account may carry a negative balance as the City contribution rate includes a component for the unfunded actuarial liability (UAL). Transfers are made from the Pension Accumulation Account to the Pension Reserve Account when a member retires or becomes eligible for disability benefits.
- The Pension Reserve Account is used to account for distributions to retirees and the balance receives regular interest that is computed at the end of each fiscal year on the mean balance during the year. The rate of interest is the actuarial assumed rate.
- The Pension Equalization Reserve Account is used for funding increases to eligible pensions under the Pension Equalization Program and the "13th Check." The Pension Equalization Program was established on October 1, 1991, when voters of the City of Phoenix approved an amendment to the City Charter, allowing pension adjustments to be paid to retired members of COPERS. These adjustments are to be made exclusively from COPERS' investment earnings in excess of 8% (per Charter) over the preceding 5-year period and may not exceed the Phoenix Area Consumer Price Index (CPI). This amendment was effective January 1, 1992, and will benefit only retirees who, as of January 1 of each year, have received at least 36 pension payments.

Following are the fiscal year-end reserve balances as of June 30, 2023 and 2022 respectively, based on amortized cost for fixed income investments and cost for equity investments (in thousands):

	2023	2022
Employees' Savings	$ 563,855	$ 552,132
Pension Accumulation	(2,620,503)	(2,430,526)
Pension Reserve	4,841,456	4,619,139
Pension Equalization Reserve	-	-
Convert to Fair Value	599,288	501,942
Total Based on Fair Value	**$ 3,384,096**	**$ 3,242,687**

Note 4 - Investment Fees (in thousands)

The investment costs paid from Plan assets were $18,076 and $18,035 for the fiscal years 2023 and 2022, respectively. This information is provided in greater detail in the Supplementary Information section of this document.

Employer contributions are actuarially determined amounts, which together with member contributions are sufficient to cover both (i) normal costs of the plan and (ii) financing of unfunded actuarial costs over a selected period of future years (See Note 6).

Note 5 - Funding Requirement Determinations and Actual Contributions (in thousands)

City of Phoenix contributions for fiscal year 2023 were $193,136, which is equivalent to 29.56% of the estimated annual active member payroll, compared to $178,319 or 29.95% for the fiscal year 2022. Member contributions for the fiscal years 2023 and 2022 were $47,749 and $53,350, respectively. The Tier 1 employee contribution rate is 5%. The Tier 2 and Tier 3 employee contribution rate is 11%.

Note 6 – Funded Status and Funding Progress (as of most recent valuation)

Unfunded actuarial liabilities are determined annually by the consulting actuary, applying actuarial assumptions to reflect the time value of money (through discounts for interest) and the probability of payment (by means of decrements, such as for death, disability, withdrawal or retirement) between the valuation date and the expected date of payment.

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the date indicated. Additional information as of the latest actuarial valuation follows:

	Methods/Assumptions	
Description Valuation Date	**June 30, 2023**	**June 30, 2022**
Actuarial Cost Method	Individual Entry Age Normal	Individual Entry Age Normal
Amortization Method	Level Percentage of Payroll	Level Percentage of Payroll
Amortization Method	• The UAL of June 30, 2013 is amortized over a closed 25-year period. • The impact of September 2013 assumption changed is amortized over a closed 25-year period. • The impact of August 2015 assumption changed is amortized over a closed 25-year period with a four-year phase-in. • Future gains and losses are amortized over closed 20year period.	
Actuarial Assumptions		
Investment Rate of Return	7.00%	7.00%
Projected Salary Increases	2.8%-7.0%	2.8%-7.0%
Cost-of-Living Adjustments	0.5% to 1.25%	0.5% to 1.25%
Wage Inflation	2.80%	2.80%
Payroll Growth Rate	2.50%	2.50%

The actuarial assumptions used for the June 30, 2023 valuation, include the following:

1. Salary Scale – Salary increases are composed of a price inflation component, a real wage growth component and a merit or longevity component that varies by age. Growth in total payroll is assumed to be 2.50%.
2. Multiple Decrement Tables:
   a. Death - For determination of member, retiree and beneficiary mortality, the Pub-2010.
   b. Disability – Based on 20% of the Arizona State Retirement System disability table.
   c. Withdrawal - Based upon COPERS' experience, measures the probability of members terminating employment for reasons other than retirement, death or disability.

The foregoing actuarial assumptions are based on the presumption that COPERS will continue as presently chartered. If COPERS is amended, different actuarial assumptions and other factors might be applicable in determining actuarial present values.

Discount Rate

A single discount rate of 7.00% was used to measure the total pension liability as of June 30, 2023 and June 30, 2022. This single discount rate was based on the expected rate of return on pension plan investments. The projection of cash flows used to determine the discount rate assumed that Tier 1 member contributions remain at 5% of payroll, Tier 2 and 3 member contributions are set equal to half of the total actuarially determined contribution rate, not to exceed 11%, and City contributions will be made at rates equal to the difference between the actuarially

Note 6 – Funded Status and Funding Progress (as of most recent valuation) (Continued)

determined contribution rates and the member rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be sufficient to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Net Position Liability to Changes in the Discount Rate

The table below presents the net pension liability of the Plan calculated using the discount rate of 7.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1.0% lower (6.00%) or 1.0% higher (8.00%) than the rates at June 30, 2023 and June 30, 2022. Changes in the discount rate affect the measurement of the TPL (Total Pension Liability). Lower discount rates produce a higher TPL and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the NPL (Net Pension Liability) can be significant for a relatively small change in the discount rate. A 1.0% decrease in the discount rate increases the TPL by approximately 12.0% and increases the NPL by approximately 39.2% . A 1.0% increase in the discount rate decreases the TPL by approximately 10.0%,and decreases the NPL by approximately 32.7%. The table below shows the sensitivity of the NPL to the discount rate.

Sensitivity of Net Pension Liability to Changes in Discount Rate (in thousands):

Sensitivity as of June 30, 2023	**1% Decrease 6.00%**	**Discount Rate 7.00%**	**1% Increase 8.00%**
Total Pension Liability	$ 5,471,455	$ 4,884,162	$ 4,394,356
Plan Fiduciary Net Position	3,384,095	3,384,095	3,384,095
Net Pension Liability	**2,087,360**	**1,500,067**	**1,010,261**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	61.9%	69.3%	77.0%

Sensitivity as of June 30, 2022	**1% Decrease 6.00%**	**Discount Rate 7.00%**	**1% Increase 8.00%**
Total Pension Liability	$ 5,297,458	$ 4,723,291	$ 4,249,305
Plan Fiduciary Net Position	3,242,687	3,242,687	3,242,687
Net Pension Liability	**2,054,771**	**1,480,604**	**1,006,618**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	61.2%	68.7%	76.3%

Note 7 - Funding Policy

The City has formally adopted a pension funding policy that requires payment of at least 100 percent of the actuarially determined contribution every year. Under current actuarial calculations and amortization periods COPERS will be fully funded by June 30, 2044.

As a condition of employment, COPERS members are also required to contribute a percentage of their salary as provided in Chapter XXIV, Section 27, of the City Charter. The table below outlines the contribution rates for Tiers 1, 2, and 3.

Tier	Contribution Rate
Tier 1	5%
Tier 2	Capped at 11%
Tier 3	Capped at 11%

Present members' accumulated contributions at June 30, 2023 were $563,855, including interest compounded annually, compared to $552,132 at June 30, 2022, and are included in the Employee Savings Account as discussed on page 30.

Note 8 – Investments

The Board has a fiduciary duty to invest and manage the assets of the Plan solely in the interests of members and beneficiaries. The Board invests and manages trust assets as a prudent investor would, considering the purposes, terms, distribution requirements, and other circumstances of the Plan. In satisfying this standard, the Board exercises reasonable care, skill, and caution.

In fulfilling its responsibilities, the Board has contracted with various investment management firms and a master global custodian. The Board's investment policy addresses permissible investment categories and appropriate allocation.

A summary of investments at June 30, 2023 and 2022 is as follows (in thousands):

	2023		2022	
	Fair Value	Amortized Cost	Fair Value	Amortized Cost
Temporary Investments from Securities Lending Collateral (Note 9)	$ 44,117	$ 44,117	$ 52,712	$ 52,712
Fixed Income	511,900	554,810	487,948	541,761
Domestic Equity	823,012	651,400	781,752	641,602
Private Equity	401,370	271,870	347,164	210,013
International Equities	605,731	513,876	532,661	510,299
Global Commingled	296,651	195,740	263,181	190,154
Hedge Funds	142,648	107,666	140,952	107,666
Real Estate	489,907	376,571	510,347	360,569
Total Investments	**$ 3,315,336**	**$ 2,716,050**	**$ 3,116,717**	**$ 2,614,776**
Cash and Cash Equivalents	104,316	104,316	183,915	183,915
Total	**$ 3,419,652**	**$ 2,820,366**	**$ 3,300,632**	**$ 2,798,690**

COPERS investments are managed by professional fund managers and are held by a global master custodian who acts as COPERS' agent.

Note 8 - Investments (Continued)

The following schedule provides the fair value of each investment category at June 30, 2023 and 2022 (in thousands):

Investment Categories	2023 Fair Value	2022 Fair Value
Cash	$ 1,429	$ 1,021
Short-Term Investment Fund	102,887	182,894
Cash and Cash Equivalents	$ 104,316	$ 183,915
Temporary Investments from Securities Lending Collateral	$ 44,117	$ 52,712
Fixed Income:		
Derivatives	$ 463	$ 975
U S Government Guaranteed Securities	46,977	42,314
Government Agencies Securities	308	882
Mortgage Backed Securities-Residential	72,165	60,630
Asset Backed Securities	16,672	18,434
Municipal Bonds	3,802	5,763
Corporate Bonds	288,508	282,798
Foreign Commingled	83,005	76,152
	$ 511,900	$ 487,948
Domestic Equities	$ 823,012	$ 781,752
Global Commingled	$ 296,651	$ 263,181
International Equities	$ 605,731	$ 532,661
Private Equity	$ 401,370	$ 347,164
Hedge Funds	$ 142,648	$ 140,952
Real Estate Funds	$ 489,907	$ 510,347
Total with Securities Lending Collateral	**$ 3,419,652**	**$ 3,300,632**

Note 8 - Investments (Continued)

Custodial Credit Risk – Deposits

Custodial credit risk for deposits is the risk that in the event of a depository institution failure, a government will not be able to recover deposits or collateral held by an outside party. As of June 30, 2023, COPERS did not realize any losses related to custodial credit risk for deposits.

Annual Money-Weighted Rate of Return

The rate of return for the year ended June 30, 2023, which is the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 5.4%, compared to -4.70% for the prior year. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Custodial Credit Risk – Investments

Custodial credit risk for investments is the risk that in the event of a failure of a counterparty to a transaction, a government will not be able to recover the value of investment or collateral securities that are in the possession of an outside party. As of June 30, 2023, COPERS did not realize any losses due to custodial credit risk for investments or securities lending arrangements. Note 9 on page 39 provides detailed information regarding securities lending. COPERS' policy requires all investments to be collateralized and registered in COPERS' or its nominee's name.

Concentration of Credit Risk

Concentration of Credit Risk is the risk of loss attributed to the magnitude of a government's investment in a single issuer. COPERS' investment policy does not allow for an investment in any one issuer in excess of 5% of COPERS' total investments which includes futures, options and swaps, except investments issued or explicitly guaranteed by the U.S. government. As of June 30, 2023, COPERS did not have any investments with any one issuer in excess of 5%.

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates may adversely affect the fair value of an investment or a deposit. COPERS' investment in foreign fixed income is managed by Longfellow and Western Asset. The managers' report dollar and non-dollar denominated holdings and provide for direct ownership of the underlying security. The following table presents the foreign currency exposure for the Plan's fixed income investments.

Foreign Currency Exposure June 30, 2023 and 2022 (in thousands):

Currency	2023	2022
British Pound	-	8
Canadian Dollar	28	(37)
Chinese Renminbi	-	252
Euro	18	151
Japanese Yen	-	(54)
Mexican Peso	-	12
Totals	**$ 46**	**$ 332**

Commitments (in thousands)

In connection with the purchase of various real estate investments, COPERS had unfunded commitments totaling $737,200 as of June 30, 2023 and $356,018 as of June 30, 2022. Remaining unfunded commitments for real estate were $163,200 as of June 30, 2023. COPERS is not in any redemption queues. All non-core real estate is

Note 8 - Investments (Continued)

self-liquidating. COPERS also had $574,000 in other unfunded alternative investment commitments as of June 30, 2023.

Credit Risk

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. COPERS' investment policy permits purchasing securities included in the Barclays Capital US Aggregate Index and relies on the methodology used by Barclays Capital to determine if a security is investment grade. For fixed income securities and their futures or options derivatives, emphasis is on high-quality securities.

COPERS currently has two managers responsible for fixed income investments. Longfellow Investment Management and Western Asset Management Company ("Western") are active bond managers. As part of their portfolios, Longfellow and Western may enter into futures, options, and swap contracts for hedging purposes and/or as a part of the overall portfolio strategy and will be incidental to its securities trading activities for the account. COPERS also invests in index funds SSgA U.S. Aggregate Bond Index and SSgA U.S. TIPS.

The table on page 37 provides fixed income investments as of June 30, 2023 subject to credit risk along with current credit ratings.

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Typically, the longer the maturity of an investment, the greater the sensitivity of its fair value to interest rate changes. COPERS' contract with Western directs them to maintain an average weighted duration of portfolio security holdings including futures and options positions within +/- 20% of the Barclays Capital US Aggregate Index. COPERS' contract with Longfellow specifies a weighted average duration of +/- 20% of the Barclays Capital US Aggregate Index. The contracts with Brigade and DDJ Capital Management require a weighted average duration of +/- two years of the Barclays Capital US Aggregate Index.

Information about the interest rate risk exposure of COPERS is provided in the table on page 37. COPERS assets include several collateralized mortgage obligations and mortgage-backed securities, which could be considered as highly sensitive to interest rate changes, depending upon the exercise of prepayment options.

COPERS' investment policy permits the following investments, which include investments that are considered to be highly sensitive to interest rate changes due to long maturities, prepayment options, coupon multipliers, reset dates and similar terms:

- Obligations issued or guaranteed by the U.S. Federal Government, U.S. Federal Agencies or U.S. government-sponsored corporations and agencies.
- Obligations of U.S. and non-U.S. corporations such as mortgage bonds, convertible and non-convertible notes and debentures.
- Mortgage-backed and asset-backed securities, swaps, forwards, options on swaps, and options on forwards.
- Obligations denominated in U.S. dollars of international agencies, supranational entities and foreign governments (or their subdivisions or agencies).
- Securities defined under Rule 144A and Commercial paper defined under Section 4(2) of the Securities Act of 1933.
- Bank Loans, TBA Securities and Mortgage Dollar Rolls.
- General obligation bonds, revenue bonds, improvement district bonds, or other evidences of indebtedness of any state of the United States, or any of the counties or incorporated cities, towns and duly organized school districts in the State of Arizona which are not in default as to principal and interest.

Note 8 – Investments (Continued)

Credit Rating and Maturity for COPERS' Fixed Income Investments (in thousands)

	2023			2022		
	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years)	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years)
Derivatives	Not Rated	$ 463	24.332	Not Rated	$ 975	31.416
Total Derivatives		**463**			**975**	
U.S. Government Guaranteed	AAA	$ 41,244	17.000	AAA	41,678	15
U.S. Government Guaranteed	B	1,140	11.000	B	10	1
U.S. Government Guaranteed	Not Rated	4,593	13.910	Not Rated	626	27.374
Total U. S. Government Guaranteed		**46,977**			**42,314**	
Government Agency	AAA	-	-	AAA	490	-
Government Agency	AA	-	-	AA	0	-
Government Agency	Not Rated	308	4.666	Not Rated	392	4.666
Total Government Agency		**308**			**882**	
Mortgage Backed	AAA	$ 3,461	19.952	AAA	$ 3,882	22.776
Mortgage Backed	AA	938	18.664	AA	2,053	21.400
Mortgage Backed	A	1,049	22.192	A	64	24.961
Mortgage Backed	BBB	36	14.984	BBB	-	-
Mortgage Backed	BB	49	12.162	BB		
Mortgage Backed	B	30	13.669	B	475	13.844
Mortgage Backed	CCC	165	19.858	CCC	-	-
Mortgage Backed	CC	9	14	CC	-	-
Mortgage Backed	C	-	-	C	325	15
Mortgage Backed	Not Rated	66,428	26.754	Not Rated	53,831	25.636
Total Mortgage Backed		**72,165**			**60,630**	
Asset Backed	AAA	$ 1,954	13.262	AAA	$ 3,444	15.034
Asset Backed	AA	2,021	13.512	AA	1,676	9.558
Asset Backed	A	-	-	A	0.00	-
Asset Backed	BBB	-	-	BBB	807	27.786
Asset Backed	B	679	10.371	B	819	11.352
Asset Backed	CC	269	14.912	CC		
Asset Backed	Not Rated	11,749	15.864	Not Rated	11,688	16.043
Total Asset Backed		**16,672**			**18,434**	
Municipal Bonds	AAA	-	-	AAA	$ 623	16.603
Municipal Bonds	AA	2,511	16.089	AA	2,235	16.297
Municipal Bonds	A	668	23.377	A	699	23.392
Municipal Bonds	B	623	12.096	B	1,589	18.288
Municipal Bonds	Not Rated	-	-	Not Rated	617	29.361
Total Municipal Bonds		**3,802**			**5,763**	

Note 8 – Investments (Continued)

Credit Rating and Maturity for COPERS' Fixed Income Investments (in thousands)

	2023			2022		
	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years)	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years)
Corporate Bonds	AAA	$ 12,318	10.240	AAA	$ 18,965	10.410
Corporate Bonds	AA	8,940	9.596	AA	7,060	9.587
Corporate Bonds	A	20,382	9.552	A	18,045	10.195
Corporate Bonds	BBB	26,526	9.257	BBB	-	-
Corporate Bonds	BB	14,034	6.718	BB	-	-
Corporate Bonds	B	28,860	5.903	B	53,900	7.812
Corporate Bonds	CCC	24,915	4.836	CCC	1,005	3.099
Corporate Bonds	CC	868	4.255	CC	-	-
Corporate Bonds	C	312	3.877	C	19,142	4.715
Corporate Bonds	D	-	-	D	-	-
Corporate Bonds	Not Rated	151,353	5.902	Not Rated	164,681	6.587
Total Corporate Bonds		**288,508**			**282,798**	
Foreign	AAA	$ 447	13.880	AAA	532	26.800
Foreign	AA	-	-	AA	-	-
Foreign	A	1,126	21.223	A	1,308	19.258
Foreign	BBB	1,300	21.584	BBB	475	22.725
Foreign	BB	-	-	BB	498	17.170
Foreign	B	408	5.692	B	1,342	9.517
Foreign	C	-	-	C	310	2
Foreign	Not Rated	79,724	10.469	Not Rated	71,687	4.614
Total Foreign		**83,005**			**76,152**	
Total Fixed Income Investments		**$ 511,900**			**$ 487,948**	

Note 9 – Securities Lending Program

State statutes and City Charter do not prohibit COPERS from participating in securities lending transactions, and COPERS has, via a Securities Lending Authorization Agreement effective May 6, 2015, authorized Bank of New York Mellon ("BNY") to lend its securities to broker-dealers and banks pursuant to a form of loan agreement.

During 2023 and 2022, BNY lent, on behalf of COPERS, certain securities held by BNY as custodian and received cash (United States and foreign currency), securities issued or guaranteed by the United States government and irrevocable letters of credit as collateral. BNY did not have the ability to pledge or sell collateral securities delivered absent a borrower default. Borrowers were required to deliver collateral for each loan equal to: (i) in the case of loaned securities denominated in United States dollars or whose primary trading market was located in the United States or sovereign debt issued by foreign governments, 102% of the fair value of the loaned securities; and (ii) in the case of loaned securities not denominated in United States dollars or whose primary trading market was not located in the United States, 105% of the fair value of the loaned securities.

At June 30, 2023 and 2022, COPERS had the following securities out-on-loan (in thousands).

June 30, 2023	Fair Value of Securities Lent	Cash Collateral Value	Non-Cash Collateral Value
U.S. Equities	$ 21,337	$ 21,325	$ 12
U.S. Corporate Securities	19,191	17,634	1,557
U.S. Government Securities	3,589	2,924	665
Total	**$ 44,117**	**$ 41,883**	**$ 2,234**

June 30, 2022	Fair Value of Securities Lent	Cash Collateral Value	Non-Cash Collateral Value
U.S. Equities	$ 27,126	$ 24,631	$ 2,495
U.S. Corporate Securities	14,591	14,254	337
U.S. Government Securities	10,995	10,699	296
Total	**$ 52,712**	**$ 49,584**	**$ 3,128**

During 2023 and 2022, COPERS and the borrowers maintained the right to terminate all securities lending transactions on demand. The cash collateral received on each loan was invested, together with the cash collateral of other qualified tax-exempt plan lenders, in a liquidity pool and a duration pool. As of June 30, 2023, the collateral pool had a weighted average maturity (WAM) of 3 days and a weighted average life (WAL) of 68 days. Because the loans were terminable at will, their duration did not generally match the duration of the investments made with cash collateral.

Note 10 – Risk and Uncertainties

COPERS invest in various investment securities. Investment securities are exposed to various risks such as interest rate, market and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and such changes could materially affect the amounts reported in the statement of fiduciary net position. Because the values of individual investments fluctuate with market conditions, the amount of investment gains or losses that COPERS will recognize in its future financial statements cannot be determined.

Note 11 – Funds To/From Other Systems

Under the provisions of Arizona Revised Statutes, Sections 38-730 and 38-922 as amended, transfers between COPERS and the Arizona State Retirement System ("ASRS") are allowed when the City hires an employee who

Note 11 – Funds To/From Other Systems (Continued)

was formerly covered by ASRS, or a COPERS member who separates from City of Phoenix employment goes to work for an entity whose employees are covered under ASRS. Effective July 2011, an amendment in statute changed the calculation method of retirement service credit transfers between COPERS and ASRS. Previously, retirement service credits (time) were transferred between systems without possible service reduction or member cost. Beginning July 2011, retirement service credit transfers are based on an actuarial present value (APV) methodology to the extent the prior retirement system is funded on a fair value basis. With this calculation method a member may have to pay for a portion of the transferred service or accept a reduced transfer of service credits.

Also, City employees previously employed by other government entities may purchase prior service credits.

Note 12 – Interfund Balances

Because COPERS does not have a local bank account, the City of Phoenix Payroll Section acts as a paying and collecting agent for COPERS. Payroll issues pension payments and employee retirement contribution refunds from the City's bank account and handles payment reclamations through the City's bank account. This type of activity, if any, is reflected in the Statement of Fiduciary Net Position as a liability or receivable, as applicable.

Note 13 – Contingent Liabilities

Management is not aware of any pending or threatened claims against COPERS.

Note 14 – Fair Value Measurements (in thousands)

Investment valuation

COPERS categorizes the fair value measurements of its investments based on the hierarchy established by generally accepted accounting principles. The fair value hierarchy, which has three levels, is based on the valuation inputs used to measure an asset's fair value: Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs.

Investments

Investments, including derivative instruments that are not hedging derivatives, are measured at fair value on a recurring basis. Recurring fair value measurements are those that Governmental Accounting Standards Board (GASB) Statements require or permit in the statement of fiduciary net position at the end of each reporting period. Fair value investments measurements are as follows at June 30, 2023 and 2022 (in thousands).

Note 14 – Fair Value Measurements (in thousands) (Continued)

	Fair Value June 30, 2023	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by Fair Value Level				
Domestic Equities	$ 823,012	$ 299,379	$ -	$ 523,633
International Equities	605,731	255,081	-	350,650
Fixed Income				
Derivatives	463	(136)	599	-
US Government and Agency	47,285	46,977	308	-
Mortgage Backed - Residential	72,165	-	72,165	-
Asset Backed	16,672	-	16,672	-
Municipal Bonds	3,802	-	3,802	-
Corporate Bonds	288,508	93,568	150,629	44,311
Foreign	83,005	76,649	6,356	-
Global Commingled	100,104	100,104	-	-
Temporary Investments from Securities Lending	2,234	2,234	-	-
Total Investments by Fair Value Level	**$ 2,042,981**	**$ 873,856**	**$ 250,531**	**$ 918,594**
Investments measured at net asset value (NAV)				
Private Equity	401,370			
Hedge Funds	142,648			
Global Commingled	196,547			
Real Estate Funds	489,907			
Total Investments Measured at NAV	**$ 1,230,472**			
Cash Equivalents in Securities Lending	41,883			
Total Investments	**$ 3,315,336**			

Note 14 – Fair Value Measurements (in thousands) (Continued)

	Fair Value June 30, 2022	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by Fair Value Level				
Domestic Equities	$ 781,752	$ 266,395	$ -	$ 515,357
International Equities	532,661	353,570	-	179,091
Fixed Income				
Derivatives	975	(702)	1,677	-
US Government and Agency	43,196	43,196	-	-
Mortgage Backed - Residential	60,630	-	60,630	-
Asset Backed	18,434	-	18,434	-
Municipal Bonds	5,763	-	5,763	-
Corporate Bonds	282,798	-	167,784	115,014
Foreign	76,152	69,446	6,706	-
Global Commingled	95,632	95,632	-	-
Temporary Investments from Securities Lending	3,128	3,128	-	-
Total Investments by Fair Value Level	**$ 1,901,121**	**$ 830,665**	**$ 260,994**	**$ 809,462**
Investments measured at net asset value (NAV)				
Private Equity	347,164			
Hedge Funds	140,952			
Global Commingled	167,549			
Real Estate Funds	510,347			
Total Investments Measured at NAV	**$ 1,166,012**			
Cash Equivalents in Securities Lending	49,584			
Total Investments	**$ 3,116,717**			

Note 14 – Fair Value Measurements (in thousands) (Continued)

Alternative investments measured at NAV include private equity funds, hedge funds, real estate, opportunistic and global fixed income. Below is a description of the various investment strategies:

- COPERS has one private equity fund manager that focuses on limited partnership arrangements.
- COPERS invests in four direct hedge funds which all have a global macro strategy.
- COPERS' portfolio consists of one commingled fixed income fund and five fixed income separate accounts. These accounts have a core-plus strategy.
- COPERS has two global commingled funds, one with a global large cap growth mandate and the second fund with a large cap value mandate.
- COPERS' real estate investments consist of three core real estate funds and 18 non-core real estate partnerships. The core funds permit redemptions with a 90-day notice, the non-core fund investments have a limited liquidity and redemptions are restricted.

Certain investments are reported at the net asset values calculated by the investment manager as a practical expedient and are not classified by level in the fair value hierarchy. The fair value amounts included above are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the statement of fiduciary net position. These investments (in thousands), at June 30, 2023, detailed in the following table, are subject to capital calls and specific redemption terms:

	6/30/2023	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Hedge Funds	142,648	-	Quarterly	90 Days
Global Commingled	196,547	-	Monthly	30 Days
Private Equity	401,370	574,000	Quarterly	0-90 Days
Real Estate Funds	489,907	163,200	Quarterly	0 - 90 Days

Debt and equity securities categorized as Level 1 are valued based on prices quoted in active markets for those debts and securities. Debt and equity securities categorized as Level 2 are valued using matrix pricing techniques maintained by the various pricing vendors for these securities. Matrix pricing is used to value securities based on the relationship to benchmark quoted prices. Investment derivative instruments categorized as Level 2 are valued using market approaches that consider, as applicable, benchmark interest rates or foreign exchange rates. Mortgage-backed securities categorized as Level 2 are valued using discounted cash flow techniques. Debt and equity securities categorized as Level 3 are debt and securities whose stated market price is unobservable by the marketplace, many of these securities are priced by the issuers or industry groups for these securities. Collateralized debt obligations categorized as Level 3 are valued using consensus pricing. The fair value of international equity funds and related short-term investments classified as Level 3 represent the value of unit positions in funds that are not publicly traded on an exchange. Fair value of these securities can be impacted by redemption restrictions imposed by the fund managers.

Required Supplementary Information

The schedule below shows the changes in Net Pension Liability and related ratios required by GASB. As more information becomes available, additional years will be presented.

Schedule of Changes in Net Pension Liability and Related Ratios (in thousands) *

Total Pension Liability	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Service cost	$ 81,561	$ 79,869	$ 78,643	$ 81,119	$ 73,255	$ 73,072	$ 72,876	$ 80,757	$ 75,310	$ 78,331
Interest on total pension liability	324,026	311,636	303,102	313,397	300,543	293,883	293,258	293,206	266,355	257,219
Changes of benefit terms	-	-	-	-	-	-	-	(3,229)	-	-
Difference between expected and actual experience	28,788	52,647	(4,347)	(77,698)	39,370	(42,785)	429	(76,891)	(31,009)	(20,336)
Changes of assumptions	-	-	-	(62,386)	-	-	2,420	(69,420)	254,870	-
Benefit payments, including refunds of member contributions	(273,504)	(262,660)	(249,713)	(242,143)	(237,389)	(227,576)	(223,667)	(216,193)	(204,403)	(179,877)
Net change in pension liability	**$ 160,871**	**$ 181,492**	**$ 127,685**	**$ 12,289**	**$ 175,779**	**$ 96,594**	**$ 145,315**	**$ 8,230**	**$ 361,123**	**$ 135,337**
Total Pension liability - beginning	**$ 4,723,291**	**$ 4,541,799**	**$ 4,414,114**	**$ 4,401,825**	**$ 4,226,046**	**$ 4,129,452**	**$ 3,984,137**	**$ 3,975,907**	**$ 3,614,784**	**$ 3,479,447**
Total Pension liability - ending	**$ 4,884,162**	**$ 4,723,291**	**$ 4,541,799**	**$ 4,414,114**	**$ 4,401,825**	**$ 4,226,046**	**$ 4,129,452**	**$ 3,984,137**	**$ 3,975,907**	**$ 3,614,784**
Plan Fiduciary Net Position										
Contributions - employer	193,136	178,319	357,382	175,947	165,796	229,006	152,153	119,844	117,092	110,629
Contributions - member	47,749	53,350	40,561	39,356	35,042	33,340	30,870	29,523	27,861	27,760
Net investment income/(loss)	175,400	(161,785)	610,554	50,389	142,964	166,514	243,210	9,171	47,148	298,736
Benefit payments, including refunds of member contributions and transfer outs	(273,504)	(262,660)	(249,713)	(242,143)	(237,389)	(227,576)	(223,667)	(216,409)	(204,403)	(179,877)
Administrative Expenses	(1,373)	(2,564)	(1,930)	(2,509)	(793)	(377)	(380)	(234)	(414)	(628)
Net change in plan fiduciary net position	**$ 141,409**	**$ (195,340)**	**$ 756,854**	**$ 21,039**	**$ 105,620**	**$ 200,907**	**$ 202,186**	**$ (58,105)**	**$ (12,716)**	**$ 256,620**
Plan fiduciary net position - beginning	**$ 3,242,687**	**$ 3,438,027**	**$ 2,681,173**	**$ 2,660,134**	**$ 2,554,514**	**$ 2,353,607**	**$ 2,151,421**	**$ 2,209,526**	**$ 2,222,242**	**$ 1,965,622**
Plan fiduciary net position - ending	**$ 3,384,096**	**$ 3,242,687**	**$ 3,438,027**	**$ 2,681,173**	**$ 2,660,134**	**$ 2,554,514**	**$ 2,353,607**	**$ 2,151,421**	**$ 2,209,526**	**$ 2,222,242**
Net Pension Liability	**$ 1,500,066**	**$ 1,480,604**	**$ 1,103,772**	**$ 1,732,941**	**$ 1,741,691**	**$ 1,671,532**	**$ 1,775,845**	**$ 1,832,716**	**$ 1,766,381**	**$ 1,392,542**
Plan fiduciary net position as a percentage of the total pension liability	**69.29%**	**68.65%**	**75.70%**	**60.74%**	**60.43%**	**60.45%**	**57.00%**	**54.00%**	**55.57%**	**61.48%**
Covered payroll	**$ 653,263**	**$ 595,304**	**$ 580,451**	**$ 568,089**	**$ 561,938**	**$ 526,667**	**$ 521,295**	**$ 473,974**	**$ 460,441**	**$ 485,227**
Net pension liability as a percentage of covered payroll	**229.63%**	**248.71%**	**190.16%**	**305.05%**	**309.94%**	**317.38%**	**340.66%**	**386.67%**	**383.63%**	**286.99%**

* May not sum due to rounding

Required Supplementary Information (Continued)

Schedule of Employer Contributions – Last 10 Fiscal Years (in thousands)

Schedule of Employer Contributions	Actuarial Determined Contribution	Actual Contributions	Contribution Deficiency (Excess)	Covered Payroll	Actual Contributions As A Percentage of Covered Payroll
2022-23	$ 179,616	$ 193,136	$ (13,520)	$ 653,263	29.56%
2021-22	167,843	178,319	(10,476)	595,304	29.95%
2020-21	178,090	357,382	(179,292)	580,451	61.57%
2019-20	175,947	175,947	-	568,089	30.97%
2018-19	165,796	165,796	-	561,938	29.50%
2017-18	159,006	229,006	(70,000)	526,667	43.48%
2016-17	152,153	152,153	-	521,295	29.19%
2015-16	119,844	119,844	-	473,974	25.28%
2014-15	117,092	117,092	-	484,309 *	24.18%
2013-14	110,629	110,629	-	518,746 *	21.33%

* For fiscal years 2013-14 and 2014-15, the Plan's actuary was calculating covered payroll based on their assumption this was an estimated amount. For subsequent reports, the actuary began using actual amounts which slightly changed the amounts previously reported.

Schedule of Investment Returns

	2023	2022	2021	2020	2019
Annual money-weighted rate of return, net of investment expenses	5.40%	-4.70%	22.80%	1.40%	6.20%

	2018	2017	2016	2015	2014
Annual money-weighted rate of return, net of investment expenses	7.10%	7.30%	0.60%	2.19%	15.42%

Notes to the Required Supplementary Information

In July 2020, the COPERS Board adopted several new actuarial assumptions based upon the recommendations from its actuary, GRS, for the purpose of determining contribution rates. The 2020 adopted changes are:

1. The discount rate was lowered to 7.00%.
2. The rate of inflation was lowered to 2.30%.
3. The payroll growth rate lowered to 2.50%.
4. Pension Equalization Reserve (PER) was valued for future benefits payable through the PER as a 1.25% annual compound cost-of-living adjustment (COLA).
5. Wage inflation was lowered to 2.80%.
6. Individual merit/promotion increases were changed to be service based rates ranging from 4.20% to 0.00%.
7. Unused sick leave, vacation time and compensation time was updated to be valued explicitly with a 1.50% load included for adverse experience.
8. Post-retirement, active life and disable life mortality was updated to be based on the Pub-2010 tables with multipliers for healthy annuitant mortality and projected with the ultimate rates from the MP projection scales.
9. Rates of disability, retirement and termination were updated to reflect recent experience.

In July and August 2017, the COPERS Board adopted several new actuarial assumptions based upon the recommendations from its actuary, GRS, for the purpose of determining contribution rates. The 2017 adopted changes were:

1. The discount rate was lowered to 7.25%.
2. The rate of inflation was lowered to 2.50%.
3. The payroll growth rate lowered to 3.00%.
4. Pension Equalization Reserve (PER) was valued for future benefits payable through the PER as a 1.5% annual compound cost-of-living adjustment (COLA).

In August and October 2015, the COPERS Board adopted new actuarial assumptions and methods, based upon the recommendations from its actuary, Cheiron, for the purpose of determining contributions and to meet the GASB 67 implementation requirements to be applied to the financial reporting for the fiscal year ending June 30, 2015. The 2015 adopted changes were the following:

1. PER was valued for future benefits payable through the PER as a 1.5% annual compound COLA. Amortization method for the unfunded actuarial liability (UAL) was amortized over a 20-year period as a level percentage of payroll with a four-year phase-in to the full amortization rate. 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. For Tier 1, members contribute 5% of pay and the City contributes the remainder of the total contribution rate. For the Tier 2, the members and the City each pay half of the total contribution rate.
2. Revised data tables for merit/salary increases, retirement rates, termination rates, disability incidence rates, and mortality rates.

In September 2013, the COPERS Board adopted new assumptions and methods, based upon the recommendations from its actuary, Cheiron, for the purpose of determining contributions and to meet the GASB 67 implementation requirements to be applied to the financial reporting for the fiscal year ending June 30, 2014. The September 2013 adopted changes were the following:

1. Discount rate was lowered to 7.5% based on the expected return on assets.
2. Salary increase rate was changed for price inflation to 3.00%, real wage growth to 0.50% and wage inflation to 3.5%.
3. Amortization method for the unfunded actuarial liability (UAL) was amortized over a 25-year period as a level percentage of payroll with a four-year phase-in to the full amortization rate. 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. For Tier 1, members contribute 5% of pay and the City contributes the remainder of the total contribution rate. For the Tier 2, the members and the City each pay half of the total contribution rate.
4. The administrative expense assumption was added. In prior years, the discount rate was assumed to be net of administrative expenses.

Supplementary Information

Schedule of Investment Expenses for the Fiscal Years Ended June 30, 2023 and 2022 (in thousands)

Payee	Fees 2023	Fees 2022	Nature of Services
Adler	$ 367		Investment Management
American Landmark	208	-	Investment Management
Artisan Global Opportunities	1,665	1,665	Investment Management
Ascentris Value Add Fund III	179	176	Investment Management
Ascentris Fund B III	194	-	Investment Management
Baillie Gifford	883	1,056	Investment Management
BH-DG	483	367	Investment Management
BNY Mellon	222	113	Master Custodian
Brevan Howard (BH-DG)	-	-	Investment Management
Brigade Capital Management	308	446	Investment Management
Carlson Capital	748	707	Investment Management
Cramer Rosenthal McGlynn	346	462	Investment Management
DDJ Capital Management	388	411	Investment Management
Driehaus	163	198	Investment Management
Eagle Asset Management	264	421	Investment Management
Fir Tree	662	791	Investment Management
First Eagle	548	573	Investment Management
FOCUS Healthcare Partners	216	252	Investment Management
GQG	458	619	Investment Management
Hammes Partners III	311	350	Investment Management
Hammes Partners IV	140	-	Investment Management
HSI Real Estate V	8	36	Investment Management
J P Morgan	824	826	Investment Management
JDM Partners	-	-	Investment Management
Logan Circle (MetLife)	528	528	Investment Management
Longfellow	288	288	Investment Management
LSV Asset Management	973	437	Investment Management
Morgan Stanley	749	760	Investment Management
Neuberger Fund LP	-	-	Investment Management
Neuberger Sonoran A	156	594	Investment Management
Neuberger Sonoran B	612	363	Investment Management
Neuberger Sonoran C	513	300	Investment Management
Neuberger Sonoran D	751	300	Investment Management
Northwood GP, LLC IV	178	195	Investment Management
Northwood Series V	239	253	Investment Management
PAAMCO	313	-	Investment Management
Pacific Asset Management	313	312	Investment Management
PIMCO All Asset	843	913	Investment Management
Realterm Logistics	180	180	Investment Management
RECAP III	-	16	Investment Management
RECAP IV	154	197	Investment Management
RECAP V	123	375	Investment Management
Robeco Investment Management	485	644	Investment Management
SC Core Fund	289	246	Investment Management
SSgA FTSE RAFI Developed ex-U.S. Low Volatility	78	80	Investment Management

Supplementary Information (Continued)

Schedule of Investment Expenses for the Fiscal Years Ended June 30, 2023 and 2022 (in thousands) (continued)

Payee	Fees 2023	Fees 2022	Nature of Services
SSgA FTSE RAFI U.S. Low Volatility	96	125	Investment Management
SSgA U.S. TIPS	35	50	Investment Management
SSgA US Aggregate Bond	30	44	Investment Management
Western Asset	223	318	Investment Management
Wheelock Partners	3	-	Investment Management
Wheelock I	-	3	Investment Management
Wheelock II	96	89	Investment Management
Wheelock V	-	217	Investment Management
Wheelock VI	243	245	Investment Management
Total	**$ 18,076**	**$ 18,035**	
Net Securities Lending Expenses	$ 1,942	$ 113	Agent Fees/Broker Rebates

Supplementary Information (Continued)

Schedule of Administrative Expenditures and Encumbrances (Non-GAAP Budgetary Basis) Paid by the City of Phoenix for the Fiscal Years Ended June 30, 2023 and 2022

	2023		2022	
	Original Budget	Actual	Original Budget	Actual
Personal Services				
Staff Salaries and Benefits	$ 1,415,934	$ 1,317,235	$ 1,411,457	$ 1,277,331
Insurance	274,222	225,745	278,081	237,225
Social Security and Medicare	100,158	86,863	94,680	87,161
Retirement Contributions	457,886	468,898	431,131	440,295
Total Personal Services	**$ 2,248,200**	**$ 2,098,741**	**$ 2,215,349**	**$ 2,042,012**
Professional Services				
Consultants	$ 980	$ 1,208	$ 980	$ 615
Audit and Accounting	134,000	108,541	127,000	58,607
Medical Advisors	-		-	4,271
Total Professional Services	**$ 134,980**	**$ 109,749**	**$ 127,980**	**$ 63,493**
Communications				
Printing	$ 14,000	$ 17,315	$ 12,225	$ 14,562
Postage and Mailing	15,300	20,708	15,300	20,403
Telephone	1,700	2,428	3,700	5,240
Subscriptions and Memberships	2,190	4,515	2,680	2,080
Total Communications	**$ 33,190**	**$ 44,966**	**$ 33,905**	**$ 42,285**
Miscellaneous				
Supplies	$ 7,600	$ 5,157	$ 10,555	$ 4,295
Office Furniture		4,114		
Computer Equipment	-	513	-	1,319
Other	(11,937)	(62,140)	2,631	(31,012)
Total Miscellaneous	**$ (4,337)**	**$ (52,356)**	**$ 13,186**	**$ (25,398)**
Total Administrative Expenditures and Encumbrances	**$ 2,412,033**	**$ 2,201,100**	**$ 2,390,420**	**$ 2,122,392**

Note: The schedule above represents administrative expenditures of COPERS that are budgeted and paid by the City of Phoenix through the general fund. They are recognized as offsetting contributions and deductions on the Statement of Changes in Fiduciary Net Position.

Schedule of Administrative Expenses (Plan Assets) for the Fiscal Years Ended June 30, 2023 and 2022

	Fees Paid	
Expense Category	**2023**	**2022**
Technology	$ 776,175	$ 1,976,503
Consulting	357,595	384,034
Actuarial Consulting	57,663	45,093
Legal Services	39,738	46,092
Administrative - Other	141,385	112,458
Total	**$ 1,372,556**	**$ 2,564,180**

Supplementary Information (Continued)

Schedule of Payments to Consultants (Plan Assets) for the Fiscal Years Ended June 30, 2023 and 2022

Consultant	2023	2022
Alignium/Aksia	$ 117,258	$ 110,869
Elkins Mc Sherry	10,000	10,000
Meketa Investment Group	230,337	263,165
Total	**$ 357,595**	**$ 384,034**

COPERS

Investment
section

*The **Investment Section** contains the Plan's report on investment activity, its investment policies, schedules of investment results and related information.*

COPERS

MEKETA | 45 CELEBRATING A MILESTONE YEARS

5796 Armada Drive
Suite 110
Carlsbad, CA 92008

760.795.3450
Meketa.com

MEMORANDUM

October 25, 2023

Board of Trustees
City of Phoenix Employees' Retirement System
c/o Scott Steventon
Retirement Program Administrator
200 W. Washington Street, 10th Floor
Phoenix, AZ 85003

Dear Board Members,

Please find below a summary of the market environment and System performance for the 2023 fiscal year.

Fiscal 2023 Year in Review

We began fiscal year 2023 with positive performance across global markets, especially in the US. Investor optimism at the time was driven by a decline in inflation measures, as the CPI ticked down from 9.1% to 8.5% and came in below expectations.[1] This led to longer-dated yields falling as investors reconsidered economic growth prospects and the possibility that yields had reached their peak for this economic cycle. Shorter dated yields rose on near-term monetary policy actions and messaging that policy officials intended to remain aggressive in fighting inflation pressures into early 2023.

It was also at the start of July 2022, when we first saw an inversion in the US yield curve. The yield spread between two-year and ten-year Treasuries, finished July at -0.23%.[1] Inversions in the yield curve have historically signaled building recessionary pressures.

The Federal Reserve raised interest rates by an additional 75 basis points[1] in July 2022, and again by the same amount in September. The European Central Bank also notably started increasing rates, moving off 0%. They increased rates by 50 basis points in July 2022, followed by a surprise 75 basis point increase in September.

Federal Reserve messaging about policy going forward, combined with outsized interest rate hikes due to the slow rate of decline in inflation and a strong labor market resulted in significant equity market declines in both August and September 2022. The September CPI release showed prices that increased 8.2% over the trailing twelve months, which was lower than the peak of 9.1%[2] but still above the pace of market expectations at the time. The US bond market (Bloomberg Aggregate) declined in the first fiscal quarter (-4.5%[1]) as did the US Equity Market (Russell 3000), which returned -3.2% fiscal year-to-date through September.

The second quarter of fiscal year 2023 started very strong for developed market equities, on returned signs that inflation may be peaking, monetary policy tightening may relatedly slow, and hopes for a

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October 25, 2023

soft-landing of major economies. However, as the quarter progressed, results were mixed by month and region as the world received differing signals on inflation. Overall, US equities finished the second fiscal quarter of 2023 up (Russell 3000: +7.2%[1]). Equities outside the US (MSCI ACWI ex. US: +14.3%) increased even more versus domestic stocks due in part to the weakening US dollar. The US bond market also finished the calendar quarter in positive territory (Bloomberg Aggregate: +1.9%).[1]

Inflation, as measured by CPI, declined to 6.5% by December of 2022. While progress had been made since the 2022 peak of 9.1%, there was still much work to be done to bring the pace of price increases down to the Federal Reserve's preferred range. Except for Japan, inflation impacted the rest of the developed world as well. Inflation in the Eurozone came in at 9.2% in December, down from a peak of 10.6%.[1] Similarly, inflation in the UK was at 9.2% in December 2022, down from a peak of 9.6%.[2]

The US labor market remained extraordinarily strong throughout the first two quarters of fiscal year 2023, with the unemployment rate declining to 3.5% by December from a starting point of 3.6%.[1] The labor force participation rate remained slightly above 62% as of December. This was an increase from the lows of the pandemic but still below the 63.4%[4] level from before the pandemic. Average hourly earnings declined in December, finishing the calendar year at 4.8%. The strength of the labor market in the US contributed to the Federal Reserve's continued hawkish stance. In Europe and Japan, increases in unemployment were less during the pandemic compared to the US but also improved.

Economic growth in the US rebounded in the first half of fiscal year 2023. The GDP release for the first fiscal quarter of 2022 came in at an annualized rate of 3.2%[2], and the second quarter growth rate was 2.6%.[2] Outside the US, Eurozone growth was positive but below levels in the US, coming in at 2.5% and 1.6%[3], respectively, over the same two quarters. UK growth was nearly flat at -0.2% and 0.0%[4], and Japan grew by -0.3% and 0.2%, respectively, over those same two quarters.

Financial markets were volatile in the third quarter of the fiscal year, driven by investors continuing to adjust their interest rate and inflation expectations and the failure of Silicon Valley Bank and a few other regional banks. Ultimately, however, the swift emergency actions taken by the Federal Reserve, the Treasury, and other government agencies, helped alleviate some of the concerns connected to the banking sector. This, and a focus on slowing inflation and potentially peaking rates, led to most asset classes experiencing positive results for the quarter with riskier assets leading the way.

In the third fiscal quarter, the US equity market (Russell 3000) returned 7.2%[1], and international developed market equities (MSCI EAFE) returned 8.5%. Emerging market equities (MSCI Emerging Markets) were also positive for the quarter, returning 4.0%. Chinese equities (MSCI China) rose 4.7% but generally lagged developed markets as reopening optimism was balanced by increased tensions with the US.

Fixed income markets also posted gains for the quarter, but it was a volatile period for interest rates, particularly for shorter maturities. Overall, the change in monetary policy expectations and anecdotal reports of flight-to-quality flows during the height of the concerns surrounding the banking sector drove most interest rates lower. The broad US investment grade bond market (Bloomberg US Aggregate)

October 25, 2023

and high yield bonds (Bloomberg High Yield) respectively rose 3.0% and 3.6% for the quarter. High yield bonds particularly benefitted from the positive risk sentiment.

Financial markets were mixed in the final quarter of fiscal year 2023 as investors continued to contend with the track of inflation, the path of monetary policy, lingering fears from the regional banking crisis, and an uncertain economic outlook. Most equity markets posted positive returns for the quarter while fixed income markets fell slightly, as rates rose, reflecting expectations for the Federal Reserve to continue tightening policy rates.

Of the major asset classes, the US equity market (Russell 3000) led the way, returning 8.4%[1] for the quarter with most of the gains (6.8%) coming just in the month of June 2023. Notably, relatively few stocks (mainly large technology companies) accounted for most of the gains in the third and fourth quarter of fiscal year 2023 driven by optimism over artificial intelligence ("AI") technology. Looking at the S&P 500, the index was up 16.9% in the final two quarters of fiscal 2023. Without the top performing 44 stocks, the index would have been negative over the same period.[5]

Developed international equities (MSCI EAFE) returned 3.0% for the final quarter of fiscal year 2023 while emerging market equities (MSCI Emerging Markets) lagged, returning just 0.9%. Continued signaling from the central banks in Europe and the UK along with an overall stronger US dollar weighed on relative results in developed markets. Chinese equities weighed on overall results in emerging markets with the MSCI China index falling 9.7% for the quarter. Chinese equities suffered due to a lackluster economic reopening, weak economic data, and heightened tensions with the US.

The broad US investment grade bond market (Bloomberg US Aggregate) fell 0.8%[2] as the Federal Reserve indicated additional rate hikes were needed to combat persistent inflation. High yield bonds (Bloomberg High Yield) benefited from the "risk-on" sentiment, returning 1.7%[2] in the quarter ending June 30th[2]. Commodities (Bloomberg Commodity Index) continued to soften on weakening global growth expectations and developments with China, declining 2.6% for the quarter.[2]

Over the full fiscal year developed market equities posted strong returns with US stocks slightly outperforming developed markets outside the US. Emerging market equities significantly trailed develop market equities over the period. The Russell 3000 (US equities) returned 19.0%[1] for the fiscal year, compared to the MSCI EAFE at 18.8%[1] (developed market equities), and a return of 1.8%[1] for the MSCI Emerging Markets index. The MSCI Emerging Markets index was greatly influenced by returns from China, as the MSCI China index declined by 16.8% over the 12 months ending on June 30th. Within fixed income, declining inflation, and a slightly longer relative duration for the index hurt TIPS' full year relative results. The Bloomberg TIPS index decreased 1.4%[1] over the full year, while the Bloomberg Aggregate index declined by 0.9%[1]. Riskier bonds held up well in the fiscal year, as the Bloomberg High Yield index increased 9.1% over the period.

Remarkably, despite a fiscal year where a recession was forecasted by many economists, GDP growth and unemployment remained unexpectedly robust, and inflation continued to decline. GDP growth in the US was 3.2%, 2.6%, 2.0% and 2.4%[1] for the first, second, third, and fourth quarter, respectively, for fiscal year 2023. Unemployment ticked up to 3.7% during the fiscal year but ultimately settled where it started at 3.6%.[2] All of this occurred while the headline inflation number decreased from 9.1% in June 2022 to 3.0%[2] in June 2023. Finally, the yield curve remained inverted for almost the entire fiscal year, eventually deepening the inversion as the year went on. The yield spread between two-year and ten-year Treasuries finished June 2023, at -1.06%.[1]

Outside the US, unemployment and inflation painted a more mixed picture. The Eurozone ended fiscal year 2023 with unemployment numbers at 6.5%, down from 6.6% at the beginning of the fiscal year.[3] Japan ended with an unemployment figure where it started at 2.6%. Inflation in the Eurozone ended the fiscal year at 6.1%, down from 8.6%[2] a year earlier. Inflation increased in Japan for the first time in many years, ending at 3.2% versus 2.5%[2] at the beginning of the fiscal year. China notably had inflation levels at the end of the fiscal year close to 0% given the weak economic reopening.

Fiscal Year 2024 Outlook

Overall, the US economy has been much more resilient than expected given inflation that remains above the Fed's target and one of the most aggressive policy tightening campaigns in history. As we move forward, investors will be looking for clues on the track of inflation and related monetary policy, monitoring if economies hit recessions or manage "soft landings," and keeping an eye on geopolitical issues. There are several areas that could guide markets, both positively and negatively, in fiscal year 2024. These include:

→ The Federal Reserve and other Central Banks have made solid progress on the inflation fight. However, the possibility remains that the final declines of inflation to central banks' preferred range may be harder to achieve versus the progress made so far.

- While CPI in the US finished the fiscal year at 3.0% over the trailing 12 months (it recently increased slightly to 3.2% in July 2023), the path to 2.0% may be more difficult due to changes in trade, deglobalization, as well as a stronger consumer.[2]
- The Core CPI measure that strips out the more volatile energy and food categories is still far above range, finishing the fiscal year at 4.8%[2] and more recently falling to at 4.7%[2] in July. Because the Federal Reserve focuses on Core measures, and the rate remains above their 2%[2] target, they may continue to fight inflation by keeping rates higher for longer, with the risk of pushing the economy into recession.
- The labor market has remained relatively strong, but questions linger about whether this will persist as the impact of increased interest rates continue to flow through the economy. As consumption makes up most of the growth in the US the strength of the consumer is key. Higher credit balances and rates and the end of the reprieve on student loan payments could also influence spending going forward.

October 25, 2023

→ China has seen a disappointing reopening, ongoing deleveraging, restrictions from the US, and declining trade.
   - China, the second largest economy in the world, waited longer than any other country to reduce or remove COVID-related restrictions on mobility. Many market participants expected above-trend growth which has not occurred.
   - The old methods of stimulating growth in China, such as building and infrastructure projects, may have lesser utility as China continues to mature.
   - The move toward diversifying supply chains is not only happening in the US, but around the world. This has led to less trade with China, both for imports and exports, a trend that could continue to pressure economic growth. Recent legislation, such as the CHIPS Act in the US, is encouraging semiconductor manufacturers to build production plants outside of Asia.
   - Deleveraging, resulting from an overleveraged property sector, will continue to reduce economic growth as well as price increases. China will almost certainly look for ways to contain deflationary pressures to avoid a situation like Japan.

→ Ongoing geopolitical issues, including the war in Ukraine and US-China relations, remain a factor and could always worsen, leading to adverse effects on global economic growth and inflation.
   - The war in Ukraine continues with no immediate end in sight. Despite international condemnation and sanctions, Russia's economy has held up, allowing the country to continue to fund its war effort despite little progress.
   - The war in Ukraine also enlightened the world to a situation where China attempts a takeover of Taiwan. This has resulted in many countries and corporations beginning the process of reducing dependence on Chinese-made goods, while diversifying their supply chains.
   - Relations between the world's two largest economies, US and China, have suffered in recent years. This relationship could continue to worsen, with declining trade and increased tensions.

Retirement System Investment Results

The fair value of the City of Phoenix Employees' Retirement System was $3.37 billion as of June 30, 2023. This reflects an increase of $123.2 million from June 30, 2022 due to positive investment performance of $177.5 million, offset by $54.3 million in net cash outflows. The System's net of fees return was +5.4% over the fiscal year vs. a return of +4.5% for the policy benchmark. Over the most recent three-year period, the System's net of fee return was +7.2%, +5.8% over five years, and +6.5% over ten years. As of June 30, 2023, the System's actuarial assumed rate of return was 7.0%. The System uses a time-weighted rate of return methodology. Returns are calculated by an independent third party (Meketa Investment Group) using data provided by the custodian.

As of June 30, 2023, the System's assets were allocated to equity (47%), rate-sensitive (15%), credit (10%), real assets (19%), hedge funds (4%), GTAA (3%), and cash (2%).

October 25, 2023

In March 2023, the Board adopted a new asset allocation policy with a 20-year expected return of 8.2%, slightly above the actuarial assumed rate of return of 7.0%. During the fiscal year, the System began implementing the approved asset allocation policy, which will be a multi-year process. We look forward to continuing our work with Staff and the Board to move the Retirement System towards its new policy targets, with the ultimate goal of allowing the Retirement System to continue to meet its obligations to participants.

If you have any questions, please contact us at (760) 795-3450.

Sincerely,

Larry Witt, CFA
Managing Principal

Paola Nealon
Managing Principal

Imran Zahid
Investment Analyst

LW/PN/IZ/mp

[1] Source: OECD.
[2] Source: Bloomberg.
[3] Source: Eurostat.
[4] Source: Bureau of Economic Analysis.
[5] Source: S&P Down Jones Indices.

COPERS

COPERS' asset allocation targets (at fair value) as of June 30, 2023 were:

Asset Class	Target Allocation
Domestic Equity	16%
Developed Market Equity	9%
Emerging Market Equities	8%
Private Equity	9%
Investment Grade Bonds	0%
TIPS	6%
Private Debt	10%
High Yield Bonds	5%
Bank Loans	3%
Emerging Market Bonds	3%
Real Estate	12%
Infrastructure	4%
Natural Resources	4%
Hedge Funds	0%
Risk Mitigating Strategies	5%
Short Duration Bonds	6%
GTAA	0%
Cash Equivalents	0%

A. In March 2023, the COPERS Board adopted a new asset allocation that more closely aligns the Board's risk tolerance and expected returns.

B. Each asset class will be broadly diversified to be similar to the market for the asset class. The market for equities shall be represented by the Russell 3000 Value Index, MSCI EAFE Index, MSCI Emerging Markets. The market for bonds shall be represented by the Barclays Capital Aggregate and Barclays High Yield. The market for real estate shall be represented by the NCREIF ODCE Property Index.

C. Multiple managers will be employed. Allocations among the managers will be controlled by the Trustees to maintain both diversification and policy guidelines.

D. Investments will conform to the Phoenix City Charter, Chapter XXIV, Part II, Section 34 (See Note 8).

E. COPERS' main investment objective is to achieve a rate of return that exceeds inflation by at least 3% over time. The actuarial assumed rate of return is 7.00%.

Investment Services Under Contract (as of June 30, 2023)

Equity Managers		
Artisan Partners	Ting Rattanaphasouk	San Francisco, CA
Baillie Gifford	Kathrin Hamilton	Edinburgh, SCT
Cramer Rosenthal McGlynn	Alison Silverman	Greenwich, CT
Driehaus	Sarah Greene	Chicago, IL
Eagle Asset Management	Clay Lindsey	St. Petersburg, FL
First Eagle	Karin Penkala	New York, NY
GQG	Laura Clement	Ft. Lauderdale, FL
LSV	Jason Ciaglo	Chicago, IL
Robeco Investment Management	William Supple	Boston, MA

Fixed Income Managers		
Brigade Capital Management	Lauren Stelzer	New York, NY
DDJ Capital Management (Polen Capital Management)	Matt Hensher	Waltham, MA
MetLife Investment Management	Angus Campbell	Philadelphia, PA
Longfellow Investment Management	Corrine Larson	Boston, MA
Pacific Asset Management	Michael Spitler	Newport Beach, CA
PIMCO	Kerrisha Jenkins	Newport Beach, CA
State Street Global Advisors	Sonya Park	San Francisco, CA
Western Asset Management	Kevin Gore	Pasadena, CA

Hedge Fund Managers		
Brevan Howard US LLC	Janna Keatseangsilp	New York, NY
Carlson Capital	Kaleigh Olsen	Dallas, TX
Fir Tree Partners	Benjamin Ghriskey	New York, NY

Transition Managers		
Russell Implementation Services, Inc	Steve Cauble	Seattle, WA

Private Equity, Infrastructure and Natural Resources		
Neuberger Berman	Kaci Boyer	Dallas, TX

Real Estate Managers		
Adler Real Estate	John Meyer	Miami, FL
American Landmark Apartments	David Tepperman	New York, NY
Ascentris	Rob Toomey	Denver, CO
FOCUS Healthcare Partners	Michael Feinstein	Chicago, IL
Hammes Partners	Patrick Hammes	Milwaukee, WI
JP Morgan	Darren Smith	San Francisco, CA
Hemisferio Sul Investments	Diogo Bustani	Sao Paulo, BRA
Morgan Stanley	Candice Todd	Atlanta, GA

Investment Services Under Contract (as of June 30, 2023) (Continued)

Real Estate Managers (continued)		
Northwood Real Estate Partners	Blair Drossner	New York, NY
Realterm Logistics Income	Sean Mintz	Annapolis, MD
RECAP II, III, IV, SC Core	Chris Van Beek	Singapore, CHN
Wheelock Street Real Estate	Lawrence Settanni	Greenwich, CT

Real Estate Consultant		
Aksia	Dan Krivinksas Mark Bartmann	Chicago, IL

Investment Consultant		
Meketa Investment Group	Larry Witt, Imran Zahid, Paola Nealon	Carlsbad, CA

Schedule of Investment Results
For the Fiscal Year Ended June 30, 2023

	Annualized		
	1-Year	3-Years	5-Years
Total Portfolio:			
COPERS	5.4%	7.2%	5.8%
Policy Benchmark	4.5	7.9	6.3
Meketa All Pension Plans > $1B Net Median	5.3	7.4	6.2
Bank Loans			
Pacific Asset Management [(1)]	11.4	5.9	-
Equity Funds			
Artisan Global Opportunities	17.3	5.2	9.2
MSCI ACWI	16.5	11.0	8.1
Baillie Gifford	17.3	1.3	3.3
MSCI ACWI Ex USA	13.3	4.0	4.1
Cramer Rosenthal McGlynn	12.8	14.2	3.3
Russell 2000 Value Index	6.6	15.4	3.5
Driehaus International [(2)]	11.1	-	-
MSCI ACWI Ex USA Small Cap	10.6	5.2	2.4
Eagle Asset Management	11.6	3.4	5.3
Russell 2000 Growth Index	18.5	6.1	4.2
First Eagle [(10)]	9.6	-	-
MSCI EAFE Value	17.4	11.3	2.9
GQG [(3)]	10.5	6.5	-
MSCI Emerging Markets Growth NR	(0.5)	(1.4)	0.5
LSV [(7)]	12.8	11.4	-
MSCI Emerging Markets Growth NR	4.1	6.3	1.2
Robeco Investment Management	11.5	17.1	9.0
Russell 1000 Value Index	11.5	14.3	8.1
SSgA FTSE RAFI US Low Vol	5.5	13.8	8.8
FTSE RAFI US Low Vol Index	5.6	14.0	9.0
SSgA FTSE RAFI Dev ex-US Low Vol	12.4	10.0	3.1
FTSE RAFI US Dev ex-US Low Vol Index	12.0	9.8	2.8
Fixed Income Funds			
Longfellow Core Fixed Income	(1.1)	(3.3)	0.8
Bloomberg US Aggregate	(0.9)	(4.0)	0.8
SSgA US AGG Bond Index	(0.9)	(4.0)	0.8
Bloomberg US Aggregate	(0.9)	(4.0)	0.8
SSgA US TIPS	(1.4)	(0.2)	2.5
Bloomberg US TIPS	(1.4)	(0.1)	2.5
Western Asset Management	(0.8)	(4.3)	0.7
Bloomberg US Aggregate	(0.9)	(4.0)	0.8
Hedge Fund of Funds			
BH-DG Systematic Trading	(0.3)	18.6	12.0
Carlson	1.0	8.6	4.3
Fir Tree International	3.1	3.6	1.1

Schedule of Investment Results (continued)
For the Fiscal Year Ended June 30,

	Annualized		
	1-Year	3-Years	5-Years
High Yield Bonds			
Brigade Capital Management [(8)]	4.5	5.5	-
Bloomberg US High Yield	9.1	3.1	3.4
Polen Capital Management [(9)]	7.4	6.3	-
Bloomberg US High Yield	9.1	3.1	3.4
MetLife Emerging Markets Debt [(6)]	10.4	(0.5)	-
MetLife Custom Benchmark	7.8	(1.5)	1.3
Private Equity Funds			
Neuberger Berman Sonoran (Tranche A, B & E)	(1.0)	24.3	18.2
Natural Resources			
Neuberger Berman Sonoran (Tranche C) [(4)]	15.3	25.6	-
Infrastructure			
Neuberger Berman Sonoran (Tranche D & F) [(5)]	11.9	8.5	-
Real Estate Funds			
Core	(8.0)	8.2	6.4
Non-Core	2.2	12.1	8.4
Real Return Fund			
PIMCO All Asset	(9.9)	4.5	4.6
All Asset Index	(9.4)	2.0	3.2

[(1)] Pacific Asset Management was added as a bank loan manager effective September 1, 2018. Performance figures would not be representative of the benchmark index.

[(2)] Driehaus International was added as an equity manager effective May 1, 2021. Performance figures would not be representative of the benchmark index.

[(3)] GQG was added as an equity manager effective January 1, 2020. Performance figures would not be representative of the benchmark index.

[(4)] Neuberger Berman Sonoran Tranch C was added September 1, 2019.

[(5)] Neuberger Berman Sonoran Tranch D and F were added September 1, 2019.

[(6)] MetLife was added as a high yield bonds manager effective March 27, 2019.

[(7)] LSV was added as an equity manager effective November 1, 2019. Performance figures would not be representative of the benchmark index.

[(8)] Brigade Capital Management was added as a high yield bonds manager effective August 1, 2018.

[(9)] Polen Capital (fka DDJ) was added as a high yield bonds manager effective September 1, 2018. Performance figures would not be representative of the benchmark index.

[(10)] First Eagle was added as an equity manager effective December 1, 2020. Performance figures would not be representative of the benchmark index.

The calculations above were prepared by COPERS' consultant, using a time-weighted rate of return, based on fair value. Core and Non-Core real estate performance is calculated as an IRR.

Asset Allocation by Manager
For the Fiscal Year Ended June 30, 2023

Manager	Style	Management (in thousands)	% of Portfolio
Cash And Cash Equivalents Funds			
Brigade Capital Management	Fixed Income	$ 3,137	0.09%
COPERS Cash Account	Core Plus Fixed Income	83,184	2.46
Cramer Rosenthal McGlynn	Small Cap Growth	2,213	0.07
DDJ Capital Management	Small Cap Growth	4,180	0.12
Eagle Asset Management	Core Plus Fixed Income	2,810	0.08
Longfellow Core Fixed	Core Plus Fixed Income	243	0.01
Robeco Investment Management	Large Cap Value	5,949	0.18
Western Asset Management	Core Plus Fixed Income	2,600	0.08
Total Cash & Cash Equivalent Funds		**104,316**	**3.09**
Domestic Equities Funds			
Brigade Capital Management	Bonds	2,086	0.06
Cramer Rosenthal McGlynn	Small Cap Value	56,899	1.69
DDJ Capital Management	Bonds	1,677	0.05
Eagle Asset Management	Small Cap Growth	64,718	1.92
State St US Low Vol	Large Cap Core	221,677	6.57
Robeco Investment Management	Large Cap Value	173,999	5.15
State St US Ag Bnd Ind	Bonds	154,050	4.56
State St US TIPS Ind	Bonds	147,906	4.38
Total Domestic Equities Funds		**823,012**	**24.38**
Fixed Income Funds			
Brigade Capital Management	Fixed Income	71,805	2.13
DDJ Capital Management	Fixed Income	67,469	2.00
MetLife Investment Management	Fixed Income	76,648	2.27
Longfellow Core Fixed	Core Plus Fixed Income	100,158	2.97
Pacific Asset Management	Bank Loans	93,567	2.77
Western Asset Management	Core Plus Fixed Income	102,253	3.03
Total Fixed Income Funds		**511,900**	**15.17**
Hedge Funds			
BH DG SYS TRD FD	Hedge Fund of Funds	47,056	1.39
Carlson Capital	Hedge Fund of Funds	50,108	1.48
Fir Tree Partners	Hedge Fund of Funds	45,262	1.34
PAAMCO	Hedge Fund of Funds	222	0.01
Total Hedge Funds		**142,648**	**4.23**
Global Commingled Funds			
Artisan Partners	International	196,547	5.82
PIMCO All Asset Custom Index	International	100,104	2.97
Total Global Commingled Funds		**296,651**	**8.79**

Asset Allocation by Manager
For the Fiscal Year Ended June 30, 2023

Manager	Style	Management (in thousands)	% of Portfolio
International Equities Funds			
Baillie Gifford	Large Cap Growth	$ 233,312	6.91%
Driehaus International	International	21,768	0.64
First Eagle	International	77,406	2.29
State St Dev ex-US	Large Cap Core	92,640	2.74
GQG Emerging Market	International	92,877	2.75
LSV Emerging Market	International	87,728	2.60
Total International Equities Funds		**605,731**	**17.94**
Private Equity Funds			
Neuberger	Private Equity	401,370	11.89
Total Private Equity Funds		**401,370**	**11.89**
Real Estate Funds			
Adler	Non-Core Real Estate	3,835	0.11
American Landmark III	Non-Core Real Estate	41,228	1.22
Ascentris Fund A III	Non-Core Real Estate	12,279	0.36
Ascentris Fund B III	Non-Core Real Estate	1,417	0.04
Focus Sh Fund I	Non-Core Real Estate	30,374	0.90
Focus Sh Fund II	Non-Core Real Estate	992	0.03
Hammes Partners III	Non-Core Real Estate	15,880	0.47
HSI Real Estate V	Non-Core Real Estate	434	0.01
JPM Strategic Property	Core Real Estate	83,467	2.47
Morgan Stanley Prime Property	Core Real Estate	90,522	2.68
Northwood IV	Non-Core Real Estate	27,166	0.80
Northwood V	Non-Core Real Estate	35,760	1.06
RealTerm LIF	Core Real Estate	38,611	1.14
RECAP III	Non-Core Real Estate	2,481	0.07
RECAP IV	Non-Core Real Estate	12,032	0.36
RECAP V	Non-Core Real Estate	20,452	0.61
SC Core Fund LP	Non-Core Real Estate	32,083	0.95
Wheelock Street Partners	Non-Core Real Estate	3,073	0.09
Wheelock Street Partners I	Non-Core Real Estate	2,507	0.07
Wheelock Street Partners II	Non-Core Real Estate	8,296	0.25
Wheelock Street Partners V	Non-Core Real Estate	11,238	0.33
Wheelock Street Partners VI	Non-Core Real Estate	15,780	0.47
Total Real Estate Funds		**489,907**	**14.51**
Total Portfolio Before Securities Lending		**$ 3,375,535**	**100.00%**
Securities Lending		44,117	
Total Investments		**$ 3,419,652**	

List of Largest Assets Held
As of June 30, 2023 (in thousands)

Ten Largest Bond Holdings (Fair Value)

Par Value	Description	Interest Rate	Due	Rating	Fair Value
$ 6,088	US Treasury Note	1.38	12/31/2028	AA	$ 5,853
4,973	US Treasury Note	1.50	2/15/2030	AA	4,850
5,232	US Treasury Bond	1.25	5/15/2050	AA	4,395
4,571	US Treasury Bond	2.00	11/15/2041	AA	2,800
2,806	HUB International	7.00	5/01/2026	CCC	2,736
259	US Treasury Note	1.63	5/15/2026	AA	2,686
2,289	Baffinland Iron Mines	8.75	7/15/2026	B	2,484
2,127	US Treasury Note	3.50	2/15/2033	AA	2,028
1,931	Learning Care	8.40	3/13/2025	B3	1,931
1,936	US Treasury Note	1.50	1/31/2027	AA	1,827

Ten Largest Stock Holdings (Fair Value)

Shares	Stock	Fair Value
45,869	JPMorgan Chase & Co	6,671
18,843	Berkshire Hathaway Inc	6,425
46,157	Alphabet Inc	5,525
79,703	Brisol-Myers Squibb Co.	5,097
29,246	Johnson & Johnson	4,841
85,379	Cisco Systems Inc.	4,417
9,144	Wells Fargo & Co.	3,903
42,640	Activision Blizzard Inc.	3,594
6,323	Sanofi	3,413
1,330	Autozone, Inc.	3,316

A complete list of portfolio holdings is available at the COPERS office.

Schedule of Investment Related Fees (in thousands)
For the Fiscal Year Ended June 30, 2023

	Management	Fees
Cash And Cash Equivalents Funds		
Brigade Capital Management	$ 3,137	$ -
COPERS Cash Account	83,184	-
Cramer Rosenthal McGlynn	2,213	-
DDJ Capital Management	4,180	-
Eagle Asset Management	2,810	-
Longfellow Core Fixed	243	-
Robeco Investment Management	5,949	-
Western Asset Management	2,600	-
Total Cash & Cash Equivalent Funds	**$ 104,316**	**-**
Investments		
Domestic Equities Funds		
Brigade Capital Management	2,086	-
Cramer Rosenthal McGlynn	56,899	346
DDJ Capital Management	1,677	-
Eagle Asset Management	64,718	264
State St US Low Vol	221,677	96
Robeco Investment Management	173,999	485
State St US Ag Bond Ind	154,050	30
State St US TIPS Ind	147,907	35
Total Domestic Equities Funds	**823,013**	**1,256**
Fixed Income Funds		
Brigade Capital Management	71,805	308
DDJ Capital Management	67,469	388
MetLife Investment Management	93,567	528
Longfellow Core Fixed	100,158	288
Pacific Asset Management	102,253	313
Western Asset Management	76,648	223
Total Fixed Income Funds	**511,900**	**2,048**
Global Commingled Funds		
Artisan Partners	196,547	1,665
PIMCO All Asset	100,104	843
Total Global Commingled Funds	**296,651**	**2,508**
Hedge Funds		
BH DG Sys Trd FD LP	47,055	483
Carlson Capital	50,108	748
Fir Tree Partners	45,263	662
PAAMCO	222	313
Total Hedge Funds	**142,648**	**2,206**

Schedule of Investment Related Fees (in thousands) (continued)
For the Fiscal Year Ended June 30, 2023

	Management	Fees [1]
International Equities Funds		
Baillie Gifford	233,312	883
Driehaus International	21,768	163
First Eagle	77,406	548
GQG	92,877	458
LSV	87,728	973
State St Dev ex-US	92,640	78
Total International Equities	**605,731**	**3,103**
Private Equity		
Neuberger	401,370	2,032
Total Private Equity Funds	**401,370**	**2,032**
Real Estate Funds		
Adler	3,835	367
American Landmark	41,228	208
Ascentris Fund A III	12,279	179
Ascentris Fund B III	1,417	194
Focus I	30,374	216
Focus II	992	-
Hammes Partners III	15,880	311
Hammes Partners IV	-	140
HSI Real Estate V	434	8
JP Morgan Strategic Property	83,467	824
Morgan Stanley Prime Property	90,522	749
Northwood GP LLC IV	27,166	178
Northwood Series V	35,760	239
RealTerm LIF	38,611	180
RECAP III	2,481	-
RECAP IV	12,032	154
RECAP V	20,452	123
SC Core	32,083	289
Wheelock Street Partners	3,073	3
Wheelock Street Partners I	2,507	-
Wheelock Street Partners II	8,296	96
Wheelock Street Partners V	11,238	-
Wheelock Street Partners VI	15,780	243
Total Real Estate	**489,907**	**4,701**
Master Custodian Fees		
BNY Mellon	-	222
Total Master Custodian Fees	**-**	**222**
Total Securities Lending [1]	44,117	
Total Investments	**$ 3,375,536**	**$ 18,076**
Total Cash & Cash Equivalents And Investments	**$ 3,419,652**	

[1] No separate billing for the securities lending program, the fees are netted from the securities lending income.

Investment Summary by Sector
For the Fiscal Year Ended June 30, 2023

Type of Investment	Fair Value (in thousands)	Percent of Total Fair Value
Cash and Cash Equivalents:		
Cash & Cash Equivalents	$ 104,316	3.09%
Total Cash and Cash Equivalents	**104,316**	**3.09**
Domestic Equities:		
Basic Materials	7,351	0.22
Commingled	523,633	15.51
Consumer Discretionary	7,365	0.22
Consumer Goods	16,833	0.50
Consumer Services	30,322	0.90
Consumer Staples	25,842	0.77
Energy Related	49,392	1.46
Financials	50,626	1.50
Health Care	47,531	1.41
Industrials	7,921	0.23
Information Technology	5,932	0.18
Real Estate Fund	45,236	1.34
Technology	2,339	0.07
Utilities	2,689	0.08
Total Domestic Equities	**823,012**	**24.38**
Fixed Income:		
Asset Backed	16,672	0.49
Corporate Bonds	288,508	8.55
Derivatives	6,357	0.19
Foreign Bonds	308	0.01
Foreign Debt	72,165	2.14
Government Agency	3,801	0.11
Mortgage Backed	46,977	1.39
Municipal Bond	76,649	2.27
US Government Guaranteed	463	0.01
Total Fixed Income	**511,900**	**15.17**
Global Commingled:		
Global Commingled	100,104	2.97
Other	196,547	5.82
Total Global Commingled	**296,651**	**8.79**
Hedge Funds:		
Other	142,648	4.23
Total Hedge Funds	**142,648**	**4.23**
International Equities:		
Commingled	325,953	9.66
International	279,778	8.29
Total International Equities	**605,731**	**17.94**

Investment Summary by Sector (continued)
For the Fiscal Year Ended June 30, 2023

Type of Investment	Fair Value (in thousands)	Percent of Total Fair Value
Private Equity:		
Private Equity	$ 401,370	11.89%
Total Private Equity	**401,370**	**11.89**
Real Estate:		
Real Estate Fund	489,907	14.51
Total Real Estate	**489,907**	**14.51**
Securities Lending	**44,117**	**-**
Total Investments	**$ 3,419,652**	**100%**

Schedule of Commissions
For the Fiscal Year Ended June 30, 2023

Brokerage Firm	Number of Shares Traded	Total Commissions	Commissions Per Share
JP Morgan Securities LLC, NY	564,699	$ 18,086	$ 0.032
Goldman Sachs & Co., NY	615,690	15,816	$ 0.026
RBS Capital Markets, LLC, NY	395,801	12,572	$ 0.032
Jefferies & Co., LLC, NY	468,829	10,667	$ 0.023
Morgan Stanley & Co., LLC, NY	346,424	10,358	$ 0.030
All Other Brokers (1)	2,784,800	93,985	
Total	**5,176,243**	**$ 161,484**	

(1) Includes brokers with total commissions less than $10,000 each.

COPERS

Actuarial
section

*The **Actuarial Section** contains the actuary's certification letter, supporting schedules prepared by the actuary and a summary of plan provisions.*

COPERS

P: 720.274.7270 | www.grsconsulting.com

October 23, 2023

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, 2023

Dear Scott:

The results of the June 30, 2023 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.

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 35.24% of pay to 33.96% of pay. The decrease is primarily due to an increase in the payroll. 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 22 years. The time to full funding currently exceeds the 20-year UAAL amortization period due to future recognition of asset losses in the actuarial value of assets. 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, 2023, COPERS has an unfunded liability of $1,367 million and a funded ratio of 72.02%.

Although there were losses on both the actuarial value and market value of assets, the funded ratio increased from 71.17% to 72.02% on an actuarial value of assets basis and increased from 68.65% to 69.29% on a market value of assets basis. 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, 2023. 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, 2023. 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

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 joined the City between July 1, 2013 and December 31, 2015 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 July 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 (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.

Summary of Benefit Provisions (Continued)

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:

Eligible 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:

Eligible 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.

Summary of Benefit Provisions (Continued)

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 based 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 workers' compensation period is the difference between final compensation and annualized workers' compensation. At expiration of workers' compensation period, amount is recomputed to include years during which workers' 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 based 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.

Summary of Benefit Provisions (Continued)

Refund of Contributions

Eligibility:

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

Annual Benefit:

No 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 8.00% 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 (13th checks).

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

1. Phoenix area Consumer Price Index (CPI) and
2. 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 (13th check). The 13th check is a percentage of the pensioner's annual benefits based on the lesser of:

1. One half of the Phoenix Area Consumer Price Index (CPI) and
2. 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 13th 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.

Summary of Census Data

	2023	2022	2021	2020	2019
Active Members					
Counts	8,407	7,938	7,969	8,027	7,941
Annual Compensation	$ 653,605,811	$ 595,761,181	$ 580,866,220	$ 568,646,484	$ 562,988,925
Average Annual Compensation	$ 77,745	$ 75,052	$ 72,891	$ 70,842	$ 70,896
Change in Average Annual Compensation	3.5%	3.0%	2.9%	-0.1%	7.3%
Average Age	46.2	46.7	46.8	46.8	46.6
Average Service	11.0	11.8	12.2	12.1	12.2
Deferred Vested Members					
Counts	1,149	1,109	1,053	1,033	1,008
Annual Deferred Benefits	$ 16,206,791	$ 15,707,186	$ 14,506,046	$ 14,115,513	$ 13,619,208
Average Benefit	$ 14,105	$ 14,163	$ 13,776	$ 13,665	$ 13,511
Retired Members					
Counts	6,547	6,363	6,183	6,109	6,013
Annual Deferred Benefits	$ 242,086,009	$ 234,156,480	$ 221,252,111	$ 214,952,799	$ 210,707,173
Average Benefit	$ 36,977	$ 36,800	$ 35,784	$ 35,186	$ 35,042
Disability					
Counts	213	222	233	233	245
Annual Deferred Benefits	$ 3,737,831	$ 3,885,565	$ 3,898,236	$ 3,830,503	$ 3,963,226
Average Benefit	$ 17,549	$ 17,503	$ 16,731	$ 16,440	$ 16,176
Beneficiaries and QDROs					
Counts	1,226	1,195	1,171	1,160	1,110
Annual Benefits	$ 26,834,995	$ 25,842,433	$ 24,608,323	$ 23,551,335	$ 22,007,859
Average Benefit	$ 21,888	$ 21,625	$ 21,015	$ 20,303	$ 19,827
Total Members Included in Valuation	**17,542**	**16,827**	**16,609**	**16,562**	**16,317**

	2018	2017	2016	2015	2014
Active Members					
Counts	7,977	8,030	7,783	7,463	7,731
Annual Compensation	$ 527,160,824	$ 521,709,266	$ 496,332,801	$ 484,853,108	$ 509,267,263
Average Annual Compensation	$ 66,085	$ 64,970	$ 63,771	$ 64,968	$ 65,873
Change in Average Annual Compensation	1.7%	1.9%	-1.8%	-1.4%	4.9%
Average Age	46.6	46.5	46.5	46.7	46.8
Average Service	12.4	12.3	12.2	12.6	12.8
Deferred Vested Members					
Counts	943	925	885	901	816
Annual Deferred Benefits	$ 12,167,691	$ 11,638,455	$ 11,080,138	$ 11,207,455	$ 9,956,781
Average Benefit	$ 12,903	$ 12,582	$ 12,520	$ 12,439	$ 12,202
Retired Members					
Counts	5,813	5,661	5,576	5,419	5,080
Annual Deferred Benefits	$ 202,550,837	$ 195,912,247	$ 191,137,835	$ 185,103,085	$ 168,443,463
Average Benefit	$ 34,844	$ 34,607	$ 34,279	$ 34,158	$ 33,158
Disability					
Counts	249	247	249	251	249
Annual Deferred Benefits	$ 4,069,714	$ 4,000,756	$ 3,895,823	$ 3,873,354	$ 3,639,564
Average Benefit	$ 16,344	$ 16,197	$ 15,646	$ 15,432	$ 14,617
Beneficiaries and QDROs					
Counts	1,076	1,072	1,060	1,018	961
Annual Benefits	$ 21,231,243	$ 20,639,481	$ 20,103,429	$ 18,896,049	$ 17,301,146
Average Benefit	$ 19,732	$ 19,253	$ 18,965	$ 18,562	$ 18,003
Total Members Included in Valuation	**16,058**	**15,935**	**15,553**	**15,052**	**14,837**

Summary of Actuarial Cost Methods and Assumptions

The assumptions were adopted by the City of Phoenix Employees' Retirement System based on the most recent experience study covering the period of July 1, 2014 through June 30, 2019. New assumptions, including updated mortality and economic assumption, were adopted in July of 2020 and were first used in the June 30, 2020 valuation.

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.

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, 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.

Summary of Actuarial Cost Methods and Assumptions (Continued)

Actuarial Value of Assets

The actuarial value of assets is determined by recognizing fair 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 fair 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 fair value.

Actuarial Assumptions

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 age. The table below combines the various components of salary increases for sample ages. Growth in the total payroll is assumed to be 2.50%.

	Percentage Increase in Salary			
Attained Years of Service	Price Inflation	Real Wage Growth	Merit or Longevity	Total
1-7	2.30%	0.5%	4.20%	7.00%
8-14	2.30%	0.5%	1.30%	4.10%
15+	2.30%	0.5%	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 payable through the PER are valued as an annual compound cost-of-living adjustment (COLA) equal to 0.50% through 2024, 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%.

Demographic Assumptions

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 ultimate rates of the MP projection scales 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

(ii) Healthy Annuitant - Pub-2010, Amount-Weighted, General, Health Retiree Mortality Table

Gender	Adjustment Factor	Base Year
Male	1.090	2010
Female	1.040	2010

Summary of Actuarial Cost Methods and Assumptions (Continued)

(iii) 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 with Projections to 2023 (not including adjustment factors)

	Probability of Death Pre-Retirement		Probability of Death Post-Retirement		Probability of Death Post-Disability	
Age	Men	Women	Men	Women	Men	Women
20	0.032%	0.011%	0.035%	0.012%	0.362%	0.204%
25	0.025	0.008	0.027	0.008	0.244	0.144
30	0.032	0.013	0.034	0.014	0.311	0.226
35	0.041	0.020	0.045	0.021	0.402	0.352
40	0.058	0.032	0.063	0.033	0.566	0.552
45	0.086	0.049	0.105	0.059	0.884	0.864
50	0.131	0.073	0.285	0.203	1.408	1.301
55	0.192	0.108	0.412	0.261	1.855	1.529
60	0.280	0.163	0.588	0.350	2.196	1.716
65	0.411	0.260	0.873	0.559	2.671	1.980
70	0.617	0.429	1.460	0.970	3.423	2.511
75	0.962	0.709	2.555	1.718	4.556	3.513
80	1.518	1.167	4.566	3.066	6.448	5.271
85	6.338	4.680	8.217	5.663	9.490	8.188
90	12.994	10.173	14.163	10.580	14.394	12.102

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

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

Summary of Actuarial Cost Methods and Assumptions (Continued)

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 Years of Service						
Age	**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 Years of Service				
Age	**< 15**	**15-24**	**25-31**	**≥ 32**
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

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 explicitly valued. An additional load of 1.5% is also included as margin for adverse deviation.
4. Member Contribution Crediting Rate: Member contributions are assumed to be credited with interest at 3.75% per annum.

Summary of Actuarial Cost Methods and Assumptions (Continued)

5. Decrement Timing: Middle of the Year.

Schedule of Retired Members Added to and Removed from Rolls

Year Ended	Added to Rolls: Count	Added to Rolls: Annual Pensions*	Removed: Count	Removed: Annual Pensions*	Total: Count	Total: Annual Pensions*	Average Annual Pension	% Increase in Pensions
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	14,487	309	7,105	7,406	247,218	33,367	3.1
6/30/2022	477	21,208	287	7,196	7,599	261,231	34,377	5.7
6/30/2023	440	14,761	243	6,085	7,796	269,906	34,621	3.3

* Represents in thousands

Solvency Test (in thousands)

	Aggregated Accrued Liabilities for				Portion of Actuarial Liability Covered by Reported Assets		
Valuation Date	Active Member Contributions	Retirees and Beneficiaries and Vested Terminations	Members (Employer Financed Portion)	Actuarial Value Assets	(5)/(2)	[(5) - (2)]/(3)	[(5) - (2)] - (3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
6/30/2014	393,754	2,099,274	1,121,756	2,120,700	100.00%	82.3%	0.0
6/30/2015	383,029	2,465,862	1,127,017	2,202,923	100.00%	73.8%	0.0
6/30/2016	393,626	2,522,989	1,067,522	2,283,216	100.00%	74.9%	0.0
6/30/2017	406,651	2,638,084	1,084,717	2,402,707	100.00%	75.7%	0.0
6/30/2018	417,314	2,704,971	1,103,761	2,562,847	100.00%	79.3%	0.0
6/30/2019	420,431	2,804,775	1,176,619	2,677,353	100.00%	80.5%	0.0
6/30/2020	437,719	2,857,254	1,119,141	2,811,163	100.00%	83.1%	0.0
6/30/2021	453,509	2,945,664	1,142,626	3,211,142	100.00%	93.6%	0.0
6/30/2022	456,197	3,124,986	1,142,108	3,361,409	100.00%	93.0%	0.0
6/30/2023	472,120	3,233,320	1,178,722	3,517,451	100.00%	94.2%	0.0

Summary of Actuarial Cost Methods and Assumptions (Continued)

Analysis of Financial Experience (in thousands)

	2023	2022	2021	2020	2019
(1) UAAL at Start of Year	1,361,882	1,330,656	1,602,951	1,724,473	1,663,199
(2) Normal Cost for Year*	82,934	82,433	80,573	83,628	74,048
(3) Expected Contributions	(202,152)	(218,122)	(222,103)	(213,142)	(198,860)
(4) Assumed Investment Income Accrual on (1), (2) and (3)	91,230	88,477	107,337	120,412	116,137
(5) Expected UAAL Before Changes	1,333,894	1,283,444	1,568,758	1,715,371	1,654,524
(6) Effect of Assumption/Method Changes	-	-	-	(62,386)	-
(7) Effect of Benefit Changes	-	-	-	-	-
(8) Expected UAAL After Changes	1,333,894	1,283,444	1,568,758	1,652,985	1,654,524
(9) Actual UAAL	1,366,711	1,361,882	1,330,656	1,602,951	1,724,473
(10) Gain/Loss [8. - 9.]	(32,817)	(78,438)	238,102	50,034	(69,949)
(11) As % of AAL at Start of Year	-0.69%	-1.73%	5.39%	1.14%	-1.66%

	2017	2016	2015	2014	2013
(1) UAAL at Start of Year	1,726,745	1,700,921	1,772,985	1,494,084	1,516,915
(2) Normal Cost for Year	73,449	73,256	80,757	75,310	78,331
(3) Expected Contributions	(187,324)	(183,023)	(178,288)	(157,314)	(153,885)
(4) Assumed Investment Income Accrual on (1), (2) and (3)	121,133	123,527	129,383	109,037	110,987
(5) Expected UAAL Before Changes	1,734,003	1,714,681	1,804,837	1,521,117	1,552,348
(6) Effect of Assumption/Method Changes	-	2,420	(69,420)	254,870	-
(7) Effect of Benefit Changes	-	-	(3,229)	-	-
(8) Expected UAAL After Changes	1,734,003	1,717,101	1,732,188	1,775,987	1,552,348
(9) Actual UAAL	1,663,199	1,726,745	1,700,921	1,772,985	1,494,084
(10) Gain/Loss [8. - 9.]	70,804	(9,644)	31,267	3,002	58,264
(11) As % of AAL at Start of Year	1.71%	-0.24%	0.80%	0.10%	1.70%

*Includes administrative expenses beginning in 2017

COPERS

Statistical
section

*The **Statistical section** provides financial and demographic data pertaining to COPERS.*

Introduction

The purpose of the statistical section is to provide the reader with data which is considered to be pertinent to the financial and economic condition of the retirement plan. Each schedule is defined below with an explanation of the schedule and an identification of the source of the data.

Schedule of Changes in Fiduciary Net Position

This schedule provides the additions and deductions to the plan for the past ten years. The change in net position is provided to illustrate whether the plan's assets are growing or not. This schedule is developed using the Statement of Changes in Fiduciary Net Position for the past ten years.

Schedule of Benefit Expenses by Type

This schedule provides the benefit expenses of the plan by type for the last ten years. COPERS benefits include service retirement payments, disability benefits, death in service benefits, child benefits, payment to alternate payees and survivor benefits. This schedule is developed using reports from the pension administration system. The total expenses can be found in COPERS' Statement of Changes in Fiduciary Net Position for the past ten years.

Schedule of Refunds by Type

This schedule provides the annual amount of refunds issued to employees and beneficiaries upon separation from City employment. This schedule is compiled using information from the pension administration system and the payroll system.

Schedule of Retired Members by Type of Benefit

This schedule provides the number of retired members in each benefit category. COPERS plan benefits include payments for deferred benefits, normal retirement benefits, disability benefits, survivor benefits, death benefits and payments to alternate payees. The schedule is developed using the pension administration system.

Schedule of Average Benefit Payment Amounts

This schedule provides the average benefit payments by years of credited service. This information is provided to illustrate how benefit payments increase as the years of credited service increases. This schedule is developed using the pension administration system.

Schedule of Changes in Fiduciary Net Position (in thousands)
Last Ten Fiscal Years

	2023	2022	2021	2020	2019
Additions					
Employer Contributions	$ 193,136	$ 178,319	$ 357,382	$ 175,947	$ 165,796
Member Contributions	47,749	53,350	40,561	39,356	35,042
Inter-System Transfers	-	-	-	-	375
Retirement Office Administration	2,201	2,122	2,047	2,134	1,986
Net Investment Income (Loss)	175,400	(161,784)	610,554	50,389	142,964
Total Additions	**418,486**	**72,007**	**1,010,544**	**267,826**	**346,163**
Deductions					
Benefit Payments	$ 268,868	$ 257,782	$ 246,214	$ 239,407	$ 234,301
Refunds of Contributions	4,120	4,436	3,047	2,526	3,012
Inter-System Transfers (Note 11)	515	443	452	211	451
Retirement Office Administration	2,201	2,122	2,047	2,134	1,986
Administrative Expenses	1,373	2,564	1,930	2,509	793
Total Deductions	**277,077**	**267,347**	**253,690**	**246,787**	**240,543**
Change In Net Position Restricted For Pensions	**$ 141,409**	**$ (195,340)**	**$ 756,854**	**$ 21,039**	**$ 105,620**

	2018	2017	2016	2015	2014
Additions					
Employer Contributions	$ 229,006	$ 152,153	$ 119,844	$ 117,092	$ 115,244
Member Contributions	33,340	30,870	29,306	27,861	28,815
Funds from Other Systems	-	-	217	199	160
Inter-System Transfers	484	43	-	-	-
Retirement Office Administration	1,863	-	-	-	-
Net Investment Income (Loss)	166,514	243,210	9,171	47,149	298,576
Total Additions	**431,207**	**426,276**	**158,538**	**192,301**	**442,795**
Deductions					
Benefit Payments	$ 224,454	$ 220,276	$ 213,047	$ 201,178	$ 177,447
Refunds of Contributions	3,472	3,227	3,047	3,004	2,192
Inter-System Transfers (Note 11)	134	207	315	-	-
Retirement Office Administration	1,863	-	-	-	-
Funds to Other Systems	-	-	-	421	238
Administrative Expenses	377	380	234	414	628
Total Deductions	**230,300**	**224,090**	**216,643**	**205,017**	**180,505**
Change In Net Position Restricted For Pensions	**$ 200,907**	**$ 202,186**	**$ (58,105)**	**$ (12,716)**	**$ 262,290**

Schedule of Benefit Expenses by Type (in thousands)
Last Ten Fiscal Years

	Age & Service		Death & Disability Benefits (Retirees)						
Fiscal Year	Benefits (Retirees)	Death In Service	Duty	Non-Duty	Survivors	Deferred	Child	Alternate Payee	Total Benefits
2022-2023	$ 234,301	$ 3,651	$ 539	$ 3,235	$ 20,122	$ 4,519	$ 42	$ 3,111	$ 268,868
2021-2022	223,163	3,595	561	3,313	19,212	4,238	42	3,658	257,782
2020-2021	214,074	3,292	587	3,390	18,378	3,979	45	2,469	246,214
2019-2020	209,454	3,341	606	3,278	16,639	3,675	47	2,367	239,407
2018-2019	205,349	3,260	625	3,409	15,985	3,422	51	2,200	234,301
2017-2018	196,573	3,281	642	3,426	15,256	3,085	58	2,133	224,454
2016-2017	193,048	3,271	672	3,311	15,038	2,801	61	2,074	220,276
2015-2016	186,802	3,324	686	3,273	14,150	2,721	62	2,029	213,047
2014-2015	176,699	3,109	710	3,184	12,958	2,582	47	1,889	201,178
2013-2014	154,684	2,921	711	2,898	12,157	2,373	32	1,701	177,477

Schedule Refunds by Type (in thousands)
Last Ten Fiscal Years

Fiscal Year	Beneficiaries	Separation	Total Refunds
2022-2023	$ 1,129	$ 2,991	$ 4,120
2021-2022	1,224	3,212	4,436
2020-2021	942	2,105	3,047
2019-2020	481	2,045	2,526
2018-2019	496	2,516	3,012
2017-2018	332	3,140	3,472
2016-2017	518	2,709	3,227
2015-2016	589	2,413	3,002
2014-2015	725	2,279	3,004
2013-2014	515	1,677	2,192

Schedule of Retired Members by Type of Benefit
For the Fiscal Year ended June 30, 2023

		Type of Retirement						
Monthly Benefit	**Number of Retirees**	**Deferred**	**Normal or Voluntary**	**Duty Disability**	**Non-Duty Disability**	**Survivor Payment**	**Death Benefit**	**Alternate Payee**
Deferred	1,149	1,149	-					
$1 - $300	87		47	0	0	12	15	13
$301 – $400	116		79	4	1	19	-	13
$401 – $500	126		77	5	2	30	0	12
$501 – $600	148		102	5	5	22	3	11
$601 – $700	156		88	3	5	45	3	12
$701 – $800	178		102	1	8	49	6	12
$801 – $900	168		94	2	18	33	7	14
$901 – $1,000	163		107	1	7	31	6	11
$1,001 – $1,100	196		126	3	11	35	7	14
$1,101 – $1,200	204		130	2	9	44	7	12
$1,201 – $1,300	173		118	1	12	32	2	8
$1,301 – $1,400	185		122	0	14	32	7	10
$1,401 – $1,500	186		138	0	13	23	7	5
$1,501 – $2,000	893		658	14	30	134	36	21
$2,001 – $2,500	932		789	1	12	105	16	9
$2,501 – $3,000	915		812	0	13	70	12	8
$3,001 – $4,000	1,364		1,254	0	8	82	17	3
$4,001 – $5,000	855		813	0	3	30	6	3
$5,001+	941		892	0	0	44	3	2
Totals	**9,135**	**1,149**	**6,548**	**42**	**171**	**872**	**160**	**193**

Schedule of Average Benefit Payment Amounts By Year of Retirement (Last Five Fiscal Years)

Retirement Effective Dates	Years of Credited Service					
For Fiscal Years Ending June 30:	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30+**
2023						
Average Monthly Benefit	$ 775.10	$ 1,394.46	$ 2,046.20	$ 2,952.31	$ 3,986.87	$ 4,869.16
Mean Monthly Final Average Compensation	5,984.96	6,003.69	5,923.60	6,583.79	7,315.32	7,530.66
Number of New Retirees	34	22	60	70	102	53
2022						
Average Monthly Benefit	$ 1,032.43	$ 1,332.74	$ 1,957.11	$ 2,856.56	$ 4,119.39	$ 5,022.63
Mean Monthly Final Average Compensation	7,828.58	5,449.40	6,024.17	6,578.22	7,608.57	7,631.67
Number of New Retirees	18	21	57	90	94	64
2021						
Average Monthly Benefit	$ 794.64	$ 1,417.07	$ 1,856.51	$ 2,828.72	$ 3,881.98	$ 4,913.68
Mean Monthly Final Average Compensation	6,229.33	5,603.37	5,495.05	6,477.60	7,131.53	7,595.83
Number of New Retirees	25	37	42	74	75	43
2020						
Average Monthly Benefit	$ 595.25	$ 1,292.48	$ 1,959.94	$ 2,726.63	$ 3,573.48	$ 4,472.53
Mean Monthly Final Average Compensation	4,524.39	5,386.73	5,734.01	6,178.95	6,618.61	6,940.39
Number of New Retirees	27	31	39	69	61	57
2019						
Average Monthly Benefit	$ 779.83	$ 1,412.91	$ 1,850.93	$ 2,783.23	$ 3,804.91	$ 4,162.13
Mean Monthly Final Average Compensation	6,036.56	5,746.03	5,460.68	6,178.63	6,967.71	6,453.55
Number of New Retirees	18	24	44	72	85	65
From July 1, 2019 to June 30, 2023						
Average Monthly Benefit	$ 795.45	$ 1,369.93	$ 1,934.14	$ 2,829.49	$ 3,873.33	$ 4,688.03
Mean Monthly Final Average Compensation	6,120.76	5,637.84	5,727.50	6,399.44	7,128.35	7,230.42
Average Number of New Retirees	24	27	48	75	83	56

City of Phoenix
Employees' Retirement System
200 W. Washington St, 10th Floor
Phoenix, AZ 85003

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INVESTING IN THE FUTURE OF PHOENIX