Annual Comprehensive Financial Report
FISCAL YEARS ENDING
JUNE 30, 2021 AND 2020

City of Phoenix, Arizona

EMPLOYEES' RETIREMENT PLAN

COPERS

Setting a path forward for a sustainable Phoenix

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

SEVENTY-FIFTH
ANNUAL COMPREHENSIVE FINANCIAL REPORT
FOR THE FISCAL YEARS ENDED
JUNE 30, 2021 and 2020

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Phoenix, Arizona 85003
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Prepared by:
City of Phoenix
Employees' Retirement System
and
City of Phoenix
Finance Department

COPERS

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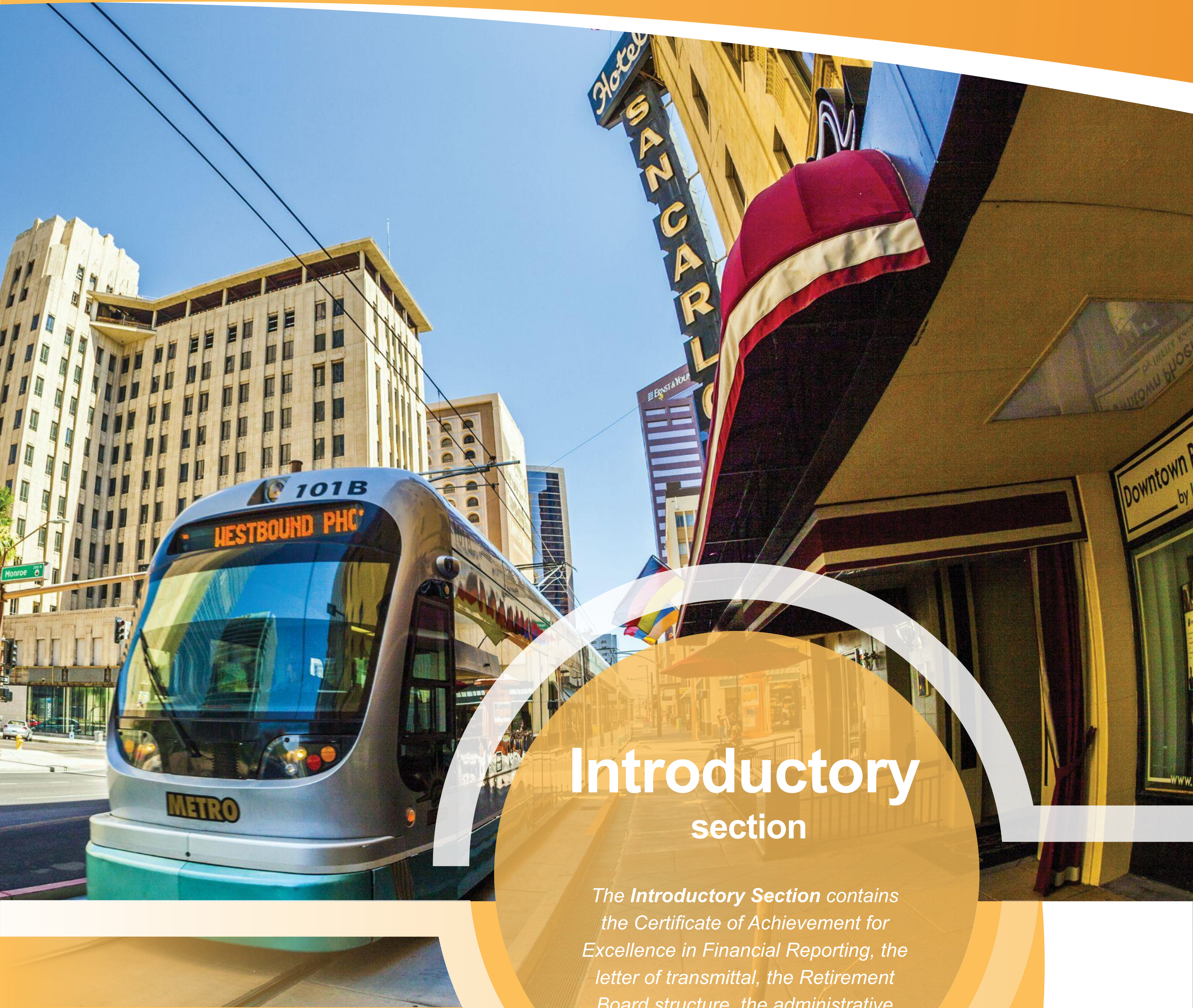
ACTUARIAL SECTION

STATISTICAL SECTION



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 Comprehensive Annual Financial Report
For the Fiscal Year Ended

June 30, 2020

Christopher P. Morrill

Executive Director/CEO

Public Pension Coordinating Council

Public Pension Standards Award For Funding and Administration 2021

Presented to

City of Phoenix Employees' 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

City of Phoenix
RETIREMENT SYSTEM

November 24, 2021

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, 2021 and 2020. 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 23, which provides a narrative analysis and highlights of our financial condition and activities for the fiscal years ended June 30, 2021 and 2020.

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 $2.047 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 $16.735 million for the fiscal year ended June 30, 2021. These costs represented 0.47% 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 (formerly Alignium) provides consultative services to COPERS regarding its real estate investments. COPERS' financial statements are audited by BKD, LLP and reviews of operations are performed by the City Auditor's Department. Managed Medical Review Organization, Inc., provides independent medical evaluation services related to disability retirement applications.

The City Attorney's office provides legal representation. COPERS also uses outside legal services in the event the City Attorney's office has a conflict or for specialized legal work. Those firms are Ice Miller and Ryan, Rapp, Underwood & Pacheco, P.L.C.

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, Gabriel, Roeder, Smith & Company (GRS), 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, 2021 reflects a funded ratio of 70.7% using a smoothed market value of plan assets. This is a 7.0% improvement from the prior fiscal year. The unfunded actuarial accrued liability will be amortized as a level percent of payroll over future years. If all actuarial assumptions are met, the plan will be fully funded in 19 years.

Investment Activities

As of June 30, 2021, COPERS' net position is $3.438 billion. The fiscal year net return for the Plan is 22.8%, which is 15.8% above the assumed rate of return of 7.00%. The funded ratio on a market value of assets basis increased from 60.74% to 75.70%. The Board considered and approved three contracts for investment managers during the year to implement the approved asset allocation.

For more information on COPERS' investment policies and performance, please refer to the Investment section in this report, beginning on page 55.

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 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 and second 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.

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, 2020. 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 35th 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 eleventh year the Plan has applied for and received this award.

Sincerely,

Scott Steventon

Scott Steventon
Retirement Program Administrator

Retirement Board



ALAN MAGUIRE
Chairperson, Retirement Board
Citizen Board Member

TAMMY RYAN
Vice Chairperson, Retirement Board
Retiree Board Member

CHARLENE REYNOLDS
Elected Board Member



LORI BAYS
Human Resources Director
City of Phoenix
Ex-Officio Board Member

TONI MACCARONE
Deputy City Manager
City of Phoenix
Ex-Officio Board Member

KATHLEEN GITKIN
City Treasurer
City of Phoenix
Ex-Officio Board Member



JASON STOKES
Elected Board Member

DENISE OLSON
Chief Financial Officer
City of Phoenix
Ex-Officio Board Member

AARON AVILA
Elected Board Member

Retirement Board Committees

Investment Committee

Alan Maguire, Chairperson
Kathleen Gitkin
Tammy Ryan
Jason Stokes

Charter Amendments/ Policies & Procedures Committee

Lori Bays, Chairperson
Denise Olson
Tammy Ryan
Charlene Reynolds
Jason Stokes

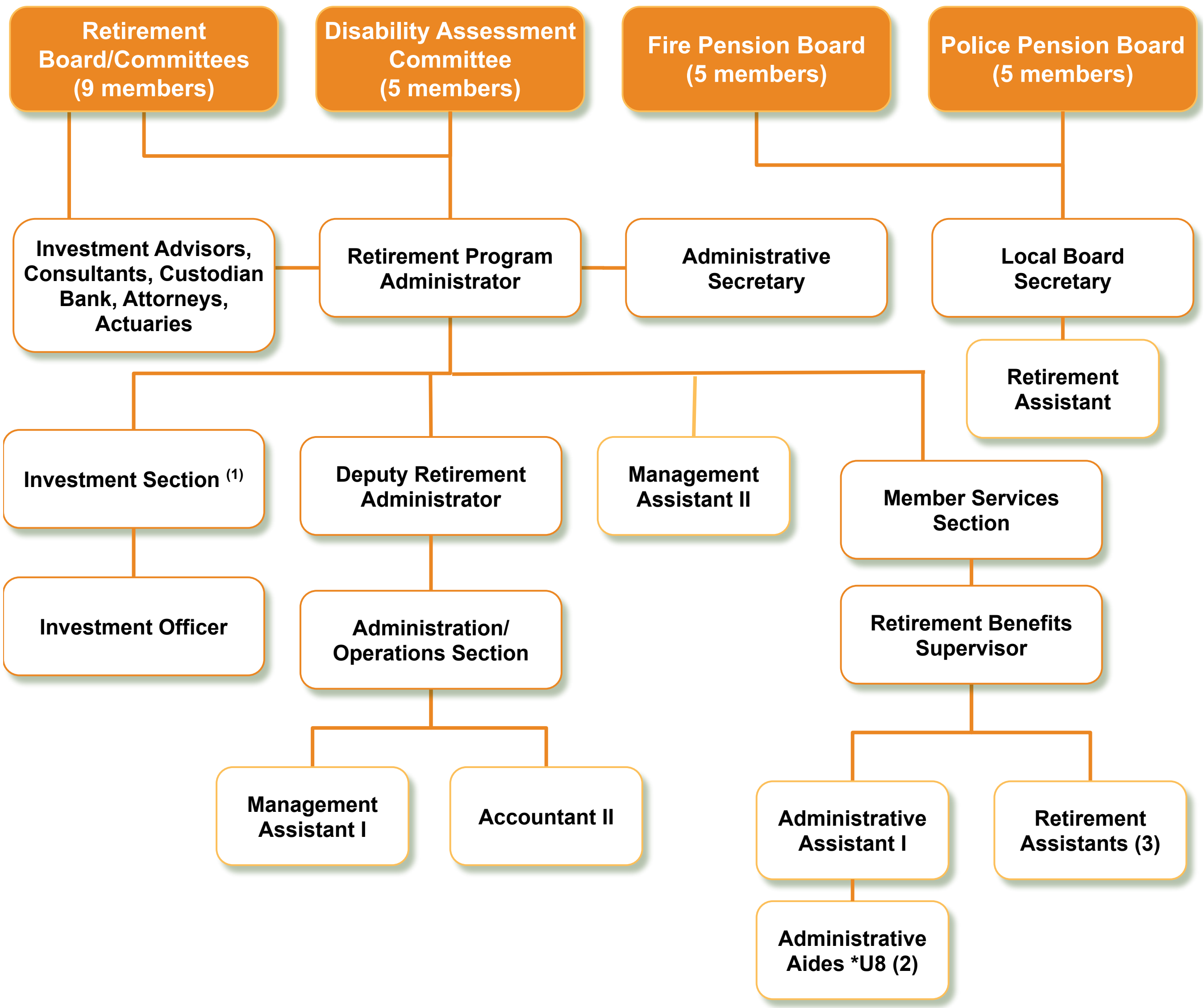
Legal Review Committee

Toni Maccarone, Chairperson
Alan Maguire
Charlene Reynolds

Disability Assessment Committee

Scott Steventon, Chairperson
Robert Jones, M.D.
Jennifer Shoop
Debra Payan
Ron Ramirez

Retirement Department Administrative Organization



(1) Please refer to the Investment Section for a list of Investment Managers on page 63 - 64, the Schedule of Investment Fees on pages 70 - 71 and the Schedule of Commissions of page 73.

Administrative Staff

Scott Steventon	Retirement Program Administrator
Jenifer Padilla	Accountant II
Alejandra Montoya	Administrative Aide
Christina Vega	Administrative Aide
Kyle Corbin	Administrative Assistant I
Stacy Osborne-Fry	Management Assistant II
Barbara Trollope	Assistant Retirement Administrator
Greg Fitchet	Investment Officer
Tina Esparza	Local Board Secretary
Trista Eaden	Management Assistant I
Bobbie Gonzalez	Retirement Assistant
Marissa Hernandez	Retirement Assistant
Josie Romero	Retirement Assistant
Misty Escamilla	Retirement Assistant
Vacant	Retirement Benefits Supervisor
Marcia Wilson	Administrative Secretary

Accounting

Denise Olson	Chief Financial Officer, Finance Department

Treasurer

Kathleen Gitkin	City Treasurer, Finance Department

Legal

Michelle Wood	Assistant City Attorney IV, Law Department

Actuary

Gabriel, Roeder Smith & Company	Denver, CO

Auditor

BKD, LLP	Dallas, TX Certified Public Accountants under contract with the City Auditor

Brokerage

Elkins McSherry LLC	New York, NY

Investment Services

Refer to Investment Section for:	Investment Managers on page 63-64 Schedule of Investment Fees on page 70-71 and Schedule of Commissions on page 73

Legal Services

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

Master Custodian

BNY Mellon	Pittsburgh, Pennsylvania

Medical Advisors

Managed Medical Review Organization, Inc	Novi, MI

City of Phoenix
RETIREMENT SYSTEM

November 24, 2021

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, 2021 and June 30, 2020. This annual report contains information regarding the COPERS administration, financial statements, investments, actuarial and statistical data.

COPERS' total fund assets increased from $2.681 billion to $3.438 billion during the year ended June 30, 2021 and net performance for the year was 22.8%. The annualized net return for the past three and five years was 9.7% and 9.5%, 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, 2021 was 70.7%, an increase from the June 30, 2020 funded ratio of 63.7%. 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, BKD, LLP. 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, 2020. These reports are accessible through the COPERS' internet site.

The COPERS Board continues to focus on fulfilling its fiduciary obligation to the COPERS's 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.

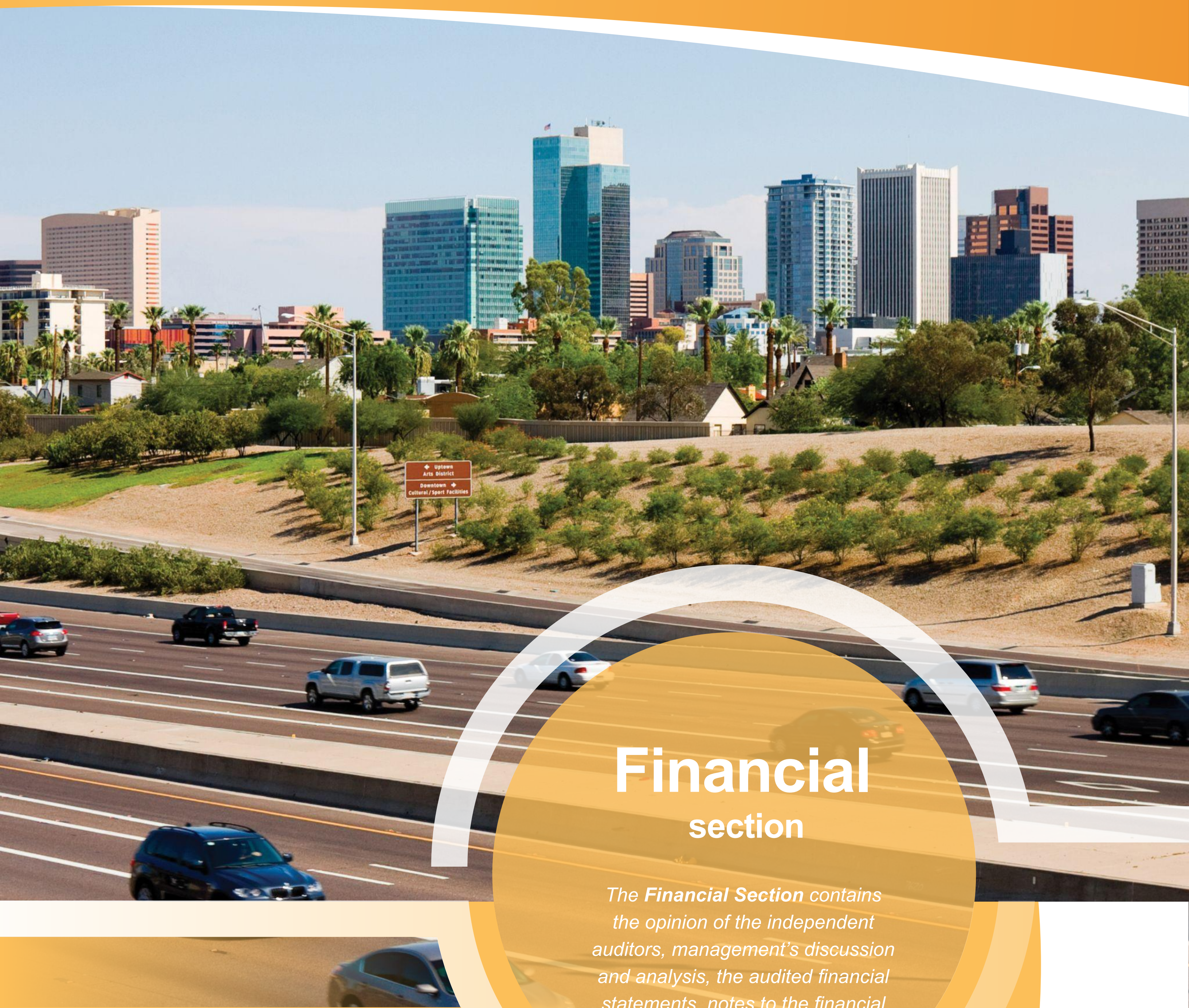
Sincerely,

Alan E. Maguire

Alan E. Maguire
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

BKD
CPAs & Advisors

14241 Dallas Parkway, Suite 1100 | Dallas, TX 75254-2961
972.702.8262 | Fax 972.702.0673 | bkd.com

Independent Auditor's Report

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

We have audited the accompanying 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, 2021 and 2020, and the related notes to financial statements, which collectively comprise the Plan's basic financial statement as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes 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.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements 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 entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Honorable Mayor and Members of the City Council
City of Phoenix Employees' Retirement System Retirement Board
Page 2

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Plan as of June 30, 2021 and 2020, and the changes in its fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and pension information as listed in the table of contents be presented to supplement the basic financial statements. Such information, 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.

Other 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 introductory section, supplementary information, investment section, actuarial section, and statistical section as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The supplementary information including the schedule of investment expenses, schedule of administrative expenditures and encumbrances, schedule of administrative expenses and schedule of payments to consultants 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. Such information has been subjected to the auditing procedures applied in the audits 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 supplementary information noted above is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introductory section, investment section, actuarial section, and statistical section have not been subjected to the auditing procedures applied in the audits of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

BKD, LLP

Dallas, Texas
November 19, 2021

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, 2021 and 2020. 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 $756,854 or approximately 28.2% to $3,438,027 as of June 30, 2021 as reflected in the Statement of Fiduciary Net Position on page 29. The Net Position Restricted for Pensions as of June 30, 2020, was $2,681,173. The increase during fiscal year 2021 was attributable to exceptional investment performance as well as increased employer contributions to the Plan.
- Total additions to the Net Position Restricted for Pensions, as reported in the Statement of Changes in Fiduciary Net Position on page 30, for the fiscal year ended June 30, 2021 was $1,010,544 compared to $267,826 for fiscal year ended June 30, 2020. The increase for the current year was attributable to exceptional investment performance and an additional employer contribution of $180,000. Total additions include employer and employee contributions of $397,943 and total net investment income of $610,554 for the fiscal year ending June 30, 2021 compared to $215,303 and $50,389 in the prior year.
- The recent actuarial valuation prepared as of June 30, 2021 reported the funded ratio to be 70.7%, up from 63.7% the prior fiscal year. This is based on a total pension liability of $4,541,799 and the smoothed actuarial value of assets.
- On a market value basis, the investment rate of return for this fiscal year was 22.8% compared with 1.40% in fiscal year 2020.
- Monthly retirement benefits paid to retirees and beneficiaries increased 2.8% to $246,214 for fiscal year 2021, compared to $239,407 in fiscal year 2020.

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 29 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:

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 eight 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, 2021 was $3,438,027. This amount represents an increase of 28.2% from Net Position Restricted for Pensions of $2,681,173 as of June 30, 2020.

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 increased from $68,296 as of June 30, 2020 to $143,738 as of June 30, 2021, an increase of $75,442.

The Plan had liabilities of $123,378 on June 30, 2021 compared to $115,432 on June 30, 2020. This change was primarily attributable to an increase in payables related to securities lending collateral and unsettled investment broker transactions.

The overall return on investments for fiscal years 2021, 2020 and 2019 was 22.8%, 1.40% and 6.20%, respectively. The chart below illustrates the performance of major asset classes over the last three fiscal years.

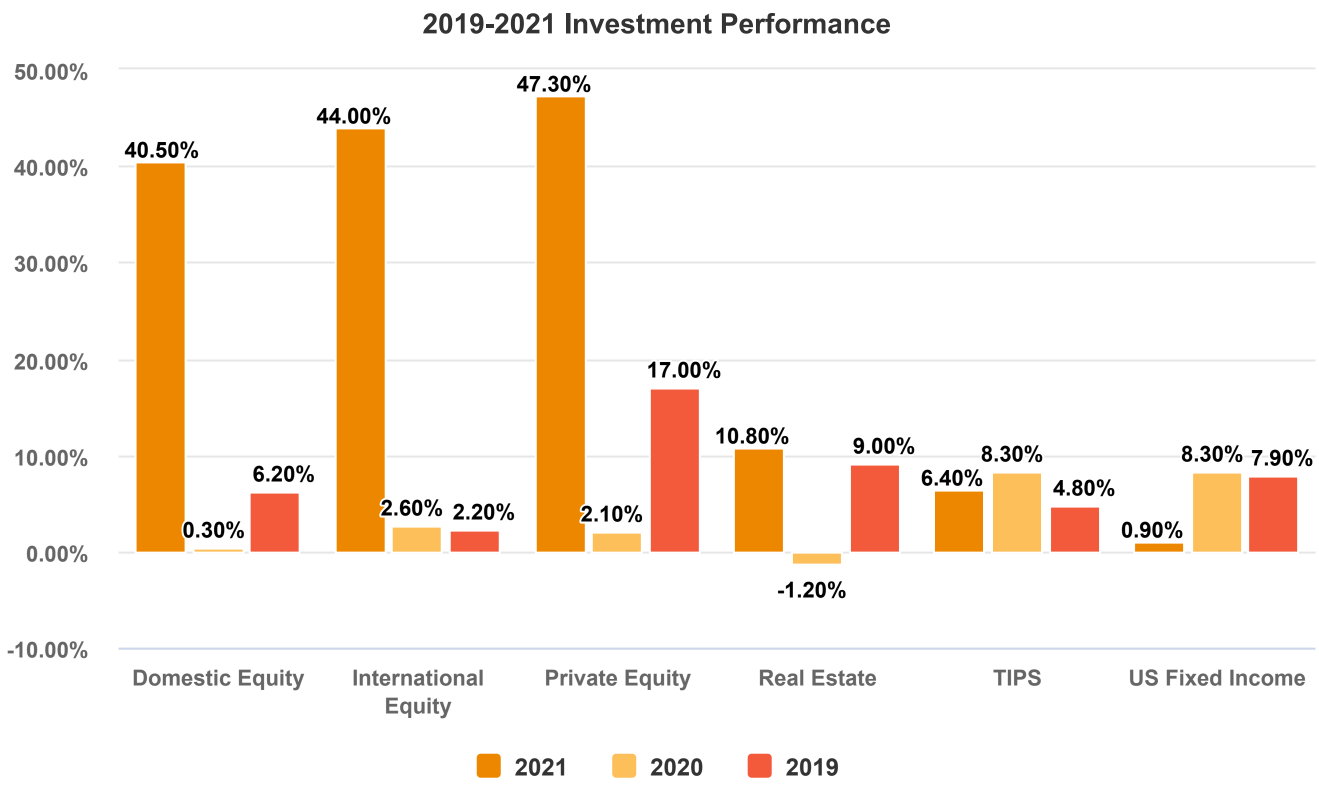

2019-2021 Investment Performance
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
-10.00%
40.50%
0.30%
6.20%
44.00%
2.60%
2.20%
47.30%
2.10%
17.00%
10.80%
-1.20%
9.00%
6.40%
8.30%
4.80%
0.90%
8.30%
7.90%
Domestic Equity
International Equity
Private Equity
Real Estate
TIPS
US Fixed Income
2021
2020
2019

Table 1: COPERS Fiduciary Net Position for Benefits for June 30, 2021 and 2020 (in thousands)

	2021	2020	Change	% Change
Cash & Cash Equivalents	$ 143,738	$ 68,296	$ 75,442	110.5%
Total Receivables	98,633	19,219	79,414	413.2
Total Investments	3,319,034	2,709,090	609,944	22.5
Total Assets	3,561,405	2,796,605	764,800	27.3
Total Liabilities	123,378	115,432	7,946	6.9
COPERS Net Position	**$ 3,438,027**	**$ 2,681,173**	**$ 756,854**	**28.2%**

Table 2: COPERS Fiduciary Net Position for Benefits for June 30, 2020 and 2019 (in thousands)

	2020	2019	Change	% Change
Cash & Cash Equivalents	$ 68,296	$ 46,600	$ 21,696	46.6%
Total Receivables	19,219	34,278	(15,059)	(43.9)
Total Investments	2,709,090	2,717,237	(8,147)	(0.3)
Total Assets	2,796,605	2,798,115	(1,510)	(0.1)
Total Liabilities	115,432	137,981	(22,549)	(16.3)
COPERS Net Position	**$ 2,681,173**	**$ 2,660,134**	**$ 21,039**	**0.8%**

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, 2021 was $610,554. This compares to net investment income for June 30, 2020 and June 30, 2019 of $50,389 and $142,964, respectively.

Total employer contributions were $357,382 in fiscal year 2021, compared to $175,947 in fiscal year 2020 and $165,796 in fiscal year 2019. The City contributed $179,292 in excess of the Actuarially Determined Contribution in fiscal year 2021 . Benefit payments for the fiscal years 2021, 2020 and 2019 were $246,214, $239,407 and $234,301, respectively. Total deductions increased by 2.8% 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, 2021, 2020 and 2019 are provided in Table 3 and Table 4:

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

	2021	2020	Change	% Change
Additions				
Employer Contributions	$ 357,382	$ 175,947	$ 181,435	103.1%
Members' Contributions	40,561	39,356	1,205	3.1
Retirement Office Administration	2,047	2,134	(87)	(4.1)
Net Investment Income	610,422	50,181	560,241	1,116.4
Net Securities Lending Income	132	208	(76)	(36.5)
Total Additions	**$ 1,010,544**	**$ 267,826**	**$ 742,718**	**277.3%**
Deductions				
Benefit Payments	$ 246,214	$ 239,407	$ 6,807	2.8%
Refunds	3,047	2,526	521	20.6
Inter-System Transfers	452	211	241	114.2
Retirement Office Administration	2,047	2,134	(87)	(4.1)
Administrative Expense	1,930	2,509	(579)	(23.1)
Total Deductions	**$ 253,690**	**$ 246,787**	**$ 6,903**	**2.8%**
Net Increase	**756,854**	**21,039**	**735,815**	**3,497.4%**
Net Position Restricted for Pensions	**$ 3,438,027**	**$ 2,681,173**	**$ 756,854**	**28.2%**

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

	2020	2019	Change	% Change
Additions				
Employer Contributions	$ 175,947	$ 165,796	$ 10,151	6.1%
Members' Contributions	39,356	35,042	4,314	12.3
Inter-System Transfers	-	375	(375)	(100.0)
Retirement Office Administration	2,134	1,986	148	7.5
Net Investment Income	50,181	142,674	(92,493)	(64.8)
Net Securities Lending Income	208	290	(82)	(28.3)
Total Additions	**$ 267,826**	**$ 346,163**	**$ (78,337)**	**(22.6)%**
Deductions				
Benefit Payments	$ 239,407	$ 234,301	$ 5,106	2.2%
Refunds	2,526	3,012	(486)	(16.1)
Inter-System Transfers	211	451	(240)	(53.2)
Retirement Office Administration	2,134	1,986	148	7.5
Administrative Expense	2,509	793	1,716	216.4
Total Deductions	**$ 246,787**	**$ 240,543**	**$ 6,244**	**2.6%**
Net Increase	**21,039**	**105,620**	**(84,581)**	**(80.1)%**
Net Position Restricted for Pensions	**$ 2,681,173**	**$ 2,660,134**	**$ 21,039**	**0.8%**

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, 2021 and 2020 (in thousands)

	2021	2020
Assets		
Cash and Cash Equivalents	$ 143,738	$ 68,296
Receivables		
City of Phoenix Contributions	87,512	7,545
Member Contributions	1,874	1,661
Interest and Dividends	3,652	3,582
Unsettled Broker Transactions - Sales	5,595	4,678
Other	-	1,753
Total Receivables	**98,633**	**19,219**
Investments		
Temporary Investments from Securities Lending Collateral	85,842	79,589
Fixed Income	546,064	500,218
Domestic Equities	846,629	731,459
Private Equity	274,568	181,889
Global Commingled	334,279	326,796
International Equities	696,558	433,108
Hedge Funds	132,995	108,912
Real Estate	402,099	347,119
Total Investments	**3,319,034**	**2,709,090**
Total Assets	**3,561,405**	**2,796,605**
Liabilities		
Payable for Securities Lending Collateral	85,842	79,589
Unsettled Broker Transactions - Purchases	12,045	10,692
Due to the City of Phoenix	21,046	20,286
Investment Management Fees Payable	2,557	3,100
Other Payables	1,888	1,765
Total Liabilities	**123,378**	**115,432**
Net Position Restricted for Pensions	**$ 3,438,027**	**$ 2,681,173**

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

Statement of Changes in Fiduciary Net Position for fiscal years ended June 30, 2021 and 2020 (in thousands)

	2021	2020
Additions		
Contributions		
City of Phoenix	$ 357,382	$ 175,947
Member	40,561	39,356
Retirement Office Administration	2,047	2,134
Total Contributions	**399,990**	**217,437**
Net Investment Income		
Net Appreciation in Fair Value of Investments	581,813	25,246
Interest	17,689	18,774
Dividends	17,400	18,424
Other	10,255	3,899
Total Income from Investing Activities	627,157	66,343
Less Investing Activities Expense	(16,735)	(16,162)
Net Income from Investing Activities	610,422	50,181
Security Lending Gross Income	165	950
Less Agent Fees	(56)	(89)
Less Broker Rebates/Collateral Management Fees	23	(653)
Net Security Lending Expenses	(33)	(742)
Net Income from Security Lending Activities	132	208
Total Net Investment Income	610,554	50,389
Total Additions	**1,010,544**	**267,826**
Deductions		
Benefit Payments	246,214	239,407
Refunds of Contributions	3,047	2,526
Retirement Office Administration	2,047	2,134
Inter-System Transfers	452	211
Administrative Expenses	1,930	2,509
Total Deductions	**253,690**	**246,787**
Increase In Net Position	756,854	21,039
Net Position Restricted for Pensions		
Beginning of Year	2,681,173	2,660,134
End of Year	**$ 3,438,027**	**$ 2,681,173**

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. Until fully realized, the effect of these changes is not known.

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 2021 Target Allocation	FY 2021 Actual Allocation	10-Year Expected Real Return
U.S. Equity	16.00%	22.10%	6.80%
Developed Market Equity (non-U.S.)	9.0	14.7	8.5
Emerging Market Equity	8.0	6.0	10.4
Private Equity	9.0	6.9	11.9
Investment Grade Bonds	15.0	12.0	1.3
TIPS	7.0	4.7	1.4
High Yield Bonds	5.0	5.0	3.9
Bank Loans	3.0	2.6	3.9
Emerging Market Bonds	3.0	2.5	4.1
Infrastructure	4.0	0.8	8.0
Natural Resources	4.0	0.4	10.5
Hedge Funds	5.0	3.9	3.6
Real Estate	12.0	11.9	7.9
GTAA	-	3.1	3.7
Cash	-	3.7	0.7

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	
	2021	2020
Retirees, beneficiaries and survivors	7,406	7,322
Alternate payees	181	180
Terminated vested members	1,053	1,033
Active members:		
Tier 1	4,522	4,855
Tier 2	587	626
Tier 3	2,860	2,546
Total Members	**16,609**	**16,562**

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, 2021 to the members' mean account balances during the fiscal year. The interest rate granted in fiscal year 2020 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, 2021 and 2020 respectively, based on amortized cost for fixed income investments and cost for equity investments (in thousands):

	2021	2020
Employees' Savings	$ 532,394	$ 512,318
Pension Accumulation	(2,070,205)	(1,893,942)
Pension Reserve	4,156,691	3,751,221
Pension Equalization Reserve	-	(2,042)
Convert to Fair Value	819,147	313,618
Total Based on Fair Value	**$ 3,438,027**	**$ 2,681,173**

Note 4 - Investment Fees (in thousands)

The investment costs paid from Plan assets were $16,735 and $16,162 for the fiscal years 2021 and 2020, 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 2021 were $357,382, which is equivalent to 61.57% of the estimated annual active member payroll, compared to $175,947 or 30.97% for the fiscal year 2020. Member contributions for the fiscal years 2021 and 2020 were $40,561 and $39,356, 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, 2021**	**June 30, 2020**
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 25year 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	1.25%	1.25%
Wage Inflation	2.80%	2.80%
Payroll Growth Rate	2.50%	2.50%

The actuarial assumptions used for the June 30, 2021 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, 2021 and June 30, 2020. 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, 2021 and June 30, 2020. 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. increases the TPL by approximately 12.2% and increases the NPL by approximately 50.1%. decreases the TPL by approximately 10.1%and decreases the NPL by approximately 41.8%. 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, 2021	**1% Decrease 6.00%**	**Discount Rate 7.00%**	**1% Increase 8.00%**
Total Pension Liability	$ 5,095,035	$ 4,541,799	$ 4,080,890
Plan Fiduciary Net Position	3,438,027	3,438,027	3,438,027
Net Pension Liability	**1,657,008**	**1,103,772**	**642,863**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	67.5%	75.7%	84.2%

Sensitivity as of June 30, 2020	**1% Decrease 6.00%**	**Discount Rate 7.00%**	**1% Increase 8.00%**
Total Pension Liability	$ 4,941,321	$ 4,414,114	$ 3,953,274
Plan Fiduciary Net Position	2,681,173	2,681,173	2,681,173
Net Pension Liability	**2,260,148**	**1,732,941**	**1,272,101**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	54.3%	60.7%	67.8%

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, 2041.

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%

Note 7 - Funding Policy (Continued)

Present members' accumulated contributions at June 30, 2021 were $532,394, including interest compounded annually, compared to $512,318 at June 30, 2020, and are included in the Employee Savings Account as discussed on page 34.

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, 2021 and 2020 is as follows (in thousands):

	2021		2020	
	Fair Value	**Amortized Cost**	**Fair Value**	**Amortized Cost**
Temporary Investments from Securities Lending Collateral (Note 9)	$ 85,842	$ 85,842	$ 79,589	$ 79,589
Fixed Income	546,064	530,418	500,218	509,827
Domestic Equity	846,629	625,113	731,459	637,239
Private Equity	274,568	169,984	181,889	141,765
International Equities	696,558	489,653	433,108	386,153
Global Commingled	334,279	181,262	326,796	256,244
Hedge Funds	132,995	107,790	108,912	110,008
Real Estate	402,099	309,826	347,119	274,649
Total Investments	**$ 3,319,034**	**$ 2,499,888**	**$ 2,709,090**	**$ 2,395,474**
Cash and Cash Equivalents	143,738	143,738	68,296	68,296
Total	**$ 3,462,772**	**$ 2,643,626**	**$ 2,777,386**	**$ 2,463,770**

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

Note 7 - Funding Policy (Continued)

The following schedule provides the fair value of each investment category at June 30, 2021 and 2020 (in thousands):

Investment Categories	2021 Fair Value	2020 Fair Value
Cash	$ 654	$ 791
Short-Term Investment Fund	143,084	67,505
Cash and Cash Equivalents	$ 143,738	$ 68,296
Temporary Investments from Securities Lending Collateral	$ 85,842	$ 79,589
Fixed Income:		
Derivatives	$ 933	$ (1,262)
U S Government Guaranteed Securities	45,341	28,337
Government Agencies Securities	991	2,108
Mortgage Backed Securities-Residential	57,948	63,983
Asset Backed Securities	20,536	21,800
Municipal Bonds	7,061	8,456
Corporate Bonds	319,387	288,547
Foreign Commingled	93,867	88,249
	$ 546,064	$ 500,218
Domestic Equities	$ 846,629	$ 731,459
Global Commingled	$ 334,279	$ 326,796
International Equities	$ 696,558	$ 433,108
Private Equity	$ 274,568	$ 181,889
Hedge Funds	$ 132,995	$ 108,912
Real Estate Funds	$ 402,099	$ 347,119
Total with Securities Lending Collateral	**$ 3,462,772**	**$ 2,777,386**

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, 2021, 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, 2021, which is the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 22.8%, compared to 1.40% 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, 2021, COPERS did not realize any losses due to custodial credit risk for investments or securities lending arrangements. Note 9 on page 43 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, 2021, 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, 2021 and 2020 (in thousands):

Currency	2021	2020
British Pound	8	8
Canadian Dollar	(46)	(7)
Chinese Renminbi	252	252
Euro	156	150
Japanese Yen	(54)	(54)
Mexican Peso	12	12
Totals	**$ 328**	**$ 361**

Commitments (in thousands)

In connection with the purchase of various real estate investments, COPERS had commitments totaling $402,099 as of June 30, 2021 and $347,119 as of June 30, 2020. Remaining unfunded commitments for real estate were

Note 8 - Investments (Continued)

$120,845 as of June 30, 2021. COPERS is not in any redemption queues. All non-core real estate is self-liquidating. COPERS also had $289,205 in other unfunded alternative investment commitments as of June 30, 2021 .

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 41 provides fixed income investments as of June 30, 2021 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 41. 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)

	2021			2020		
	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years) 2	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years) 2
Derivatives	A	-			-	0.066
Derivatives	Not Rated	$ 933	20.337	Not Rated	$ (1,262)	16.387
Total Derivatives		**933**			**(1,262)**	
U.S. Government Guaranteed	AAA	$ -		AAA	$ 18,989	14.400
U.S. Government Guaranteed	B	-		B	3,001	0.792
U.S. Government Guaranteed	CCC	10	2.378	CCC		
U.S. Government Guaranteed	Not Rated	45,331	12.779	Not Rated	6,348	7.500
Total U. S. Government Guaranteed		**45,341**			**28,337**	
Government Agency	AAA	-		AAA	$ 176	9.797
Government Agency	AA	500	1.126	AA	1,371	1.332
Government Agency	Not Rated	491	5.666	Not Rated	560	6.666
Total Government Agency		**991**			**2,108**	
Mortgage Backed	AAA	$ 1,449	23.187	AAA	$ 7,010	23.524
Mortgage Backed	AA	335	22.567	AA	1,655	19.995
Mortgage Backed	A	810	17.916	A	2,493	20.622
Mortgage Backed	BBB	962	7.890	BBB	549	13.518
Mortgage Backed	B	146	23.003	B	20	13.666
Mortgage Backed	CCC	200	14.667	CCC	214	15.687
Mortgage Backed	CC	372	15.912	CC	383	16.912
Mortgage Backed	D	-	-	D	50	25.918
Mortgage Backed	Not Rated	53,674	24.727	Not Rated	51,609	26.127
Total Mortgage Backed		**57,948**			**63,983**	
Asset Backed	AAA	$ 3,234	10.148	AAA	$ 4,342	7.487
Asset Backed	AA	440	27.687	AA	492	14.661
Asset Backed	A	843	0.046	A	1,585.00	12.950
Asset Backed	BBB	2,353	28.214	BBB	2,266	25.736
Asset Backed	B	753	11.063	B	2,069	5.972
Asset Backed	Not Rated	12,913	14.968	Not Rated	11,045	0.346
Total Asset Backed		**20,536**			**21,800**	
Municipal Bonds	AAA	$ 1,363	14.067	AAA	$ 2,463	21.714
Municipal Bonds	AA	2,459	17.547	AA	1,994	11.553
Municipal Bonds	A	1,320	23.311	A	1,730	20.854
Municipal Bonds	BBB	508	17.970	BBB	1,009	19.822
Municipal Bonds	BB	211	16.389	BB	-	-
Municipal Bonds	B	-	-	B	183	17.389
Municipal Bonds	C	1,200	17.093	C	-	7.051
Municipal Bonds	Not Rated	-	-	Not Rated	1,077	
Total Municipal Bonds		**7,061**			**8,456**	

Note 8 – Investments (Continued)

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

	2021			2020		
	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years) 2	Credit Quality Ratings	Fair Value	Weighted Average Maturity (Years) 2
Corporate Bonds	AAA	$ 2,747	21.355	AAA	$ 2,315	18.327
Corporate Bonds	AA	6,472	16.249	AA	9,050	15.600
Corporate Bonds	A	18,537	12.795	A	25,131	14.842
Corporate Bonds	BBB	48,316	12.683	BBB	45,855	11.714
Corporate Bonds	BB	27,089	8.161	BB	21,526	7.990
Corporate Bonds	B	57,660	5.307	B	47,753	4.997
Corporate Bonds	CCC	48,653	4.631	CCC	41,205	4.085
Corporate Bonds	CC	1,332	6.388	CC	2,123	4.586
Corporate Bonds	C	152	3.507	C	196	4.466
Corporate Bonds	D	630	4.850	D	428	4.266
Corporate Bonds	Not Rated	107,799	5.288	Not Rated	92,965	4.769
Total Corporate Bonds		**319,387**			**288,547**	
Foreign	AAA	$ 0	-	AAA	$ 492	0.633
Foreign	AA	1,262	7.780	AA	675	3.926
Foreign	A	1,297	6.523	A	2,151	7.887
Foreign	BBB	4,037	18.480	BBB	6,437	17.228
Foreign	BB	1,142	21.090	BB	-	-
Foreign	B	-	-	B	232	6.877
Foreign	Not Rated	86,129	10.418	Not Rated	78,262	10.434
Total Foreign		**93,867**			**88,249**	
Total Fixed Income Investments		**$ 546,064**			**$ 500,218**	

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 2021 and 2020, 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, 2021 and 2020, COPERS had the following securities out-on-loan (in thousands).

June 30, 2021	Fair Value of Securities Lent	Cash Collateral Value	Non-Cash Collateral Value
U.S. Equities	$ 49,653	$ 35,736	$ 13,917
U.S. Corporate Securities	24,729	23,634	1,095
U.S. Government Securities	11,460	8,224	3,236
Total	**$ 85,842**	**$ 67,594**	**$ 18,248**

June 30, 2020	Fair Value of Securities Lent	Cash Collateral Value	Non-Cash Collateral Value
U.S. Equities	$ 45,973	$ 31,883	$ 14,090
U.S. Corporate Securities	23,622	23,622	-
U.S. Government Securities	9,994	8,041	1,953
Total	**$ 79,589**	**$ 63,546**	**$ 16,043**

During 2021 and 2020, 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, 2021, the collateral pool had a weighted average maturity (WAM) of 34 days and a weighted average life (WAL) of 87 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

COPERS was party to litigation filed several years ago. Final outcome, in favor of the Plan, was reached on October 9, 2020. Management is not aware of any pending or threatened claims.

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, 2021 and 2020 (in thousands).

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

	Fair Value June 30, 2021	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	$ 846,629	$ 313,456	$ -	$ 533,173
International Equities	696,558	301,763	-	394,795
Fixed Income				
Derivatives	933	(56)	989	-
US Government and Agency	46,332	45,341	991	-
Mortgage Backed - Residential	57,948	-	57,948	-
Asset Backed	20,536	-	20,536	-
Municipal Bonds	7,061	-	7,061	-
Corporate Bonds	319,387	29	196,700	122,658
Foreign	93,867	-	8,552	85,315
Global Commingled	106,086	106,086	-	-
Temporary Investments from Securities Lending	18,249	-	18,249	-
Total Investments by Fair Value Level	**$ 2,213,586**	**$ 766,619**	**$ 311,026**	**$ 1,135,941**
Investments measured at net asset value (NAV)				
Private Equity	274,568			
Hedge Funds	132,995			
Global Commingled	228,193			
Real Estate Funds	402,099			
Total Investments Measured at NAV	**$ 1,037,855**			
Cash Equivalents in Securities Lending	67,593			
Total Investments	**$ 3,319,034**			

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

	Fair Value June 30, 2020	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	$ 731,459	$ 208,285	$ -	$ 523,174
International Equities	433,108	224,349	-	208,759
Fixed Income				
Derivatives	(1,262)	3	(1,265)	-
US Government and Agency	30,446	28,338	2,108	-
Mortgage Backed - Residential	63,983	-	63,983	-
Asset Backed	21,799	-	21,799	-
Municipal Bonds	8,456	-	8,456	-
Corporate Bonds	288,547	11	174,232	114,304
Foreign	88,249	-	10,546	77,703
Global Commingled	157,809	157,809	-	-
Temporary Investments from Securities Lending	16,043	-	16,043	-
Total Investments by Fair Value Level	**$ 1,838,637**	**$ 618,795**	**$ 295,902**	**$ 923,940**
Investments measured at net asset value (NAV)				
Private Equity	181,889			
Hedge Funds	108,912			
Global Commingled	168,987			
Real Estate Funds	347,119			
Total Investments Measured at NAV	**$ 806,907**			
Cash Equivalents in Securities Lending	63,546			
Total Investments	**$ 2,709,090**			

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 comingled 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 15 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, 2021, detailed in the following table, are subject to capital calls and specific redemption terms:

	6/30/2021	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Hedge Funds	132,995	-	Quarterly	90 Days
Global Commingled	228,193	-	Monthly	30 Days
Private Equity	274,568	289,205	Quarterly	0-90 Days
Real Estate Funds	402,099	120,845	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	2021	2020	2019	2018	2017	2016	2015	2014
Service cost	$ 78,643	$ 81,119	$ 73,255	$ 73,072	$ 72,876	$ 80,757	$ 75,310	$ 78,331
Interest on total pension liability	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	(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	(249,713)	(242,143)	(237,389)	(227,576)	(223,667)	(216,193)	(204,403)	(179,877)
Net change in pension liability	**$ 127,685**	**$ 12,289**	**$ 175,779**	**$ 96,594**	**$ 145,315**	**$ 8,230**	**$ 361,123**	**$ 135,337**
Total Pension liability - beginning	**$ 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	**$ 4,541,799**	**$ 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	357,382	175,947	165,796	229,006	152,153	119,844	117,092	110,629
Contributions - member	40,561	39,356	35,042	33,340	30,870	29,523	27,861	27,760
Net investment income	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	(249,713)	(242,143)	(237,389)	(227,576)	(223,667)	(216,409)	(204,403)	(179,877)
Administrative Expenses	(1,930)	(2,509)	(793)	(377)	(380)	(234)	(414)	(628)
Net change in plan fiduciary net position	**$ 756,854**	**$ 21,039**	**$ 105,620**	**$ 200,907**	**$ 202,186**	**$ (58,105)**	**$ (12,716)**	**$ 256,620**
Plan fiduciary net position - beginning	**$ 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	**$ 3,438,027**	**$ 2,681,173**	**$ 2,660,134**	**$ 2,554,514**	**$ 2,353,607**	**$ 2,151,421**	**$ 2,209,526**	**$ 2,222,242**
Net Pension Liability	**$ 1,103,772**	**$ 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	**75.70%**	**60.74%**	**60.43%**	**60.45%**	**57.00%**	**54.00%**	**55.57%**	**61.48%**
Covered payroll	**$ 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	**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
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%
2012-13	115,244	115,244	-	524,648	21.97%
2011-12	114,709	114,709	-	540,792	21.21%

* 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

	2021	2020	2019	2018	2017
Annual money-weighted rate of return, net of investment expenses	22.80%	1.40%	6.20%	7.10%	7.30%

	2016	2015	2014	2013	2012
Annual money-weighted rate of return, net of investment expenses	0.60%	2.19%	15.42%	11.35%	-0.20%

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, 2021 and 2020 (in thousands)

Payee	Fees 2021	Fees 2020	Nature of Services
Artisan Global Opportunities	$ 1,543	1,094	Investment Management
Ascentris Value Add Fund III	177	173	Investment Management
Baillie Gifford	910	707	Investment Management
BNY Mellon	225	277	Master Custodian
Brevan Howard (BH-DG)	256	276	Investment Management
Brigade Capital Management	415	368	Investment Management
Carlson Capital	632	589	Investment Management
Cramer Rosenthal McGlynn	408	367	Investment Management
DDJ Capital Management	386	347	Investment Management
Driehaus	52	-	Investment Management
Eagle Asset Management	425	299	Investment Management
Fir Tree	672	594	Investment Management
First Eagle	333	-	Investment Management
FOCUS Healthcare Partners	241	223	Investment Management
GQG	608	238	Investment Management
Hammes Partners III	350	438	Investment Management
HSI Real Estate V	143	228	Investment Management
J P Morgan	722	761	Investment Management
JDM Partners	242	242	Investment Management
Logan Circle	548	425	Investment Management
Longfellow	293	282	Investment Management
LSV Asset Management	390	221	Investment Management
MFS	-	87	Investment Management
Mondrian	-	124	Investment Management
Morgan Stanley	673	772	Investment Management
Neuberger Sonoran A	594	743	Investment Management
Neuberger Sonoran B	363	556	Investment Management
Neuberger Sonoran C	325	253	Investment Management
Neuberger Sonoran D	325	253	Investment Management
Northwood GP, LLC IV	143	196	Investment Management
Northwood Series V	194	171	Investment Management
PAAMCO	4	-	Investment Management
Pacific Asset Management	273	291	Investment Management
PIMCO All Asset	1,096	1,448	Investment Management
Realterm Logistics	54	-	Investment Management
RECAP III	30	39	Investment Management
RECAP IV	212	253	Investment Management
RECAP V	375	979	Investment Management
Robeco Investment Management	547	529	Investment Management
SC Core Fund	233	155	Investment Management
SSgA FTSE RAFI Developed ex-U.S. Low Volatility	73	70	Investment Management
SSgA FTSE RAFI U.S. Low Volatility	107	96	Investment Management
SSgA U.S. TIPS	49	46	Investment Management
SSgA US Aggregate Bond	55	56	Investment Management
Western Asset	324	314	Investment Management

Supplementary Information (Continued)

Schedule of Investment Expenses for the Fiscal Years Ended June 30, 2021 and 2020 (in thousands) (continued)

Payee	Fees 2021	Fees 2020	Nature of Services
Wheelock Partners	-	6	Investment Management
Wheelock I	(74)	18	Investment Management
Wheelock II	217	157	Investment Management
Wheelock V	272	251	Investment Management
Wheelock VI	300	150	Investment Management
Total	**$ 16,735**	**$ 16,162**	
Net Securities Lending Expenses	$ 33	$ 742	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, 2021 and 2020

	2021		2020	
	Original Budget	Actual	Original Budget	Actual
Personal Services				
Staff Salaries and Benefits	$ 1,218,503	$ 1,164,549	$ 1,175,820	$ 1,170,361
Insurance	231,794	241,394	240,519	226,798
Social Security and Medicare	86,003	78,621	80,963	79,631
Retirement Contributions	407,439	432,232	381,905	386,496
Total Personal Services	**$ 1,943,739**	**$ 1,916,796**	**$ 1,879,207**	**$ 1,863,286**
Professional Services				
Consultants	$ 500	$ 371	$ 500	$ 2,786
Audit and Accounting	117,664	136,363	133,100	77,356
Computer Services	-	-	148,328	147,318
Total Professional Services	**$ 118,164**	**$ 136,734**	**$ 281,928**	**$ 227,460**
Communications				
Printing	$ 11,950	$ 19,450	$ 9,600	$ 12,152
Postage and Mailing	9,200	21,749	7,300	12,506
Telephone	1,732	2,355	1,475	1,773
Subscriptions and Memberships	2,580	1,286	2,070	2,034
Total Communications	**$ 25,462**	**$ 44,840**	**$ 20,445**	**$ 28,465**
Miscellaneous				
Supplies	$ 7,965	$ 3,907	$ 7,824	$ 4,852
Computer Equipment	300	-	300	2,391
Other	2,972	(55,019)	2,546	7,173
Total Miscellaneous	**$ 11,237**	**$ (51,112)**	**$ 10,670**	**$ 14,416**
Total Administrative Expenditures and Encumbrances	**$ 2,098,602**	**$ 2,047,258**	**$ 2,192,250**	**$ 2,133,627**

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, 2021 and 2020

	Fees Paid	
Expense Category	**2021**	**2020**
Technology	$ 1,375,896	$ 1,932,897
Consulting	372,846	377,220
Actuarial Consulting	119,801	62,150
Legal Services	57,873	90,841
Administrative - Other	3,826	45,699
Total	**$ 1,930,242**	**$ 2,508,807**

Supplementary Information (Continued)

Schedule of Payments to Consultants (Plan Assets) for the Fiscal Years Ended June 30, 2021 and 2020

Consultant	2021	2020
Alignium	$ 107,346	$ 104,220
Elkins Mc Sherry	10,000	12,500
GEO Advertising	-	35,500
Meketa Investment Group	255,500	225,000
Total	**$ 372,846**	**$ 377,220**

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
INVESTMENT GROUP

5796 Armada Drive
Suite 110
Carlsbad, CA 92008

760.795.3450
Meketa.com

November 8, 2021

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 2021 fiscal year.

Fiscal Year 2021 Year in Review

We entered the fiscal year 2021 that ended June 30 with equity markets continuing to appreciate from their March 2020 market lows, aided by extremely accommodative monetary and fiscal policies enacted across the globe aimed at supporting teetering economies in the face of a pandemic. By fiscal year end, global risk assets produced historically strong returns. Robust stimulus across global developed and emerging economies, news of successful vaccine developments, economies reopening, and a focus on successful vaccine roll-out all contributed to the strong performance of risk assets in the 2021 fiscal year. The notable pickup in economic activity, evident in the latter half of the year, drove inflation higher.

While fiscal year 2021 proved to be a strong market year, it should be noted there are still a considerable amount of uncertainties. Among those are: 1) the path of the pandemic, particularly given the rise of the Delta variant – a highly contagious strain of COVID-19, 2) the health and recovery of the labor market, 3) the related implication for inflation and economic growth and 4) the overall impact of fiscal and monetary measures as they begin to subside.

US equities, as represented by the Russell 3000 Index, finished the fiscal year with a 44.2% return. Emerging markets (MSCI Emerging Markets) delivered 40.9% for the year and the MSCI EAFE Index, representing foreign developed markets, returned 32.4% for the same time horizon.

With fiscal and monetary support and corresponding improvement in investor risk sentiment, expectations of short-term volatility, as measured by the VIX index, declined relatively quickly throughout the course of the year. At the recent height of the pandemic, the VIX index reached 82.7, declining to 30.4 at the start of the fiscal year. By year-end June 30, 2021 the VIX index had settled at a level of 15.8 as continued vaccine distribution and waning inflationary fears led to the continued

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decline of volatility expectations. For much of the fiscal year, most markets embraced a "risk on" appetite. Going forward, the rise of the Delta variant and its potential impact could disrupt market calm.

In the wake of positive vaccine news, we saw a rotation away from growth stocks into value stocks at calendar year-end that, for the most part, continued for the remainder of the fiscal year. By June 30, 2021, the Russell 3000 Value Index (+45.4%) had outpaced the prior leadership of the Russell 3000 Growth Index (+43.0%). Just a year prior, leadership performance of the Russell 1000 Growth Index (+21.9%) versus the Russell 1000 Value Index (-9.4%) held a significant wider spread, that by FY 2021 had all but diminished. Cyclical sectors like energy and financials saw strong results, as investors rotated out of the stay-at-home focused companies in the technology sector that were so previously favored in 2020.

Similarly, but with a drastically more pronounced divergence, we saw a rotation away from large cap stocks and into small cap stocks. The performance dispersion between the Russell 1000 Index (+43.1%) and the Russell 2000 Index (+62.0%) reached nearly 20% by fiscal year end as smaller companies benefited from the re-opening of economies and its pro-cyclical tailwind.

Within international developed markets, the MSCI EAFE, of which Japan, the UK, and the Eurozone are featured most heavily, underperformed relative to the US and emerging markets in part due to the weak footing on which they entered the crisis, the robust spread of COVID-19 and prolonged lockdowns in many of these economies. Within emerging markets, we witnessed a widespread divergence between countries that were able to manage the virus' spread by deploying aggressive countermeasures early on (e.g., China) relative to countries facing already challenging economic circumstances (e.g., Brazil, Mexico, and South Africa). More recently, concerns over the spread of the Delta variant and the ability of emerging countries to manage this has weighed on emerging markets results. Specific to China, fear of tighter monetary policies impacting growth, in addition to the more recent Chinese regulatory crackdown on ADR-listed companies, has been a headwind to the region's performance.

The US Treasury yield curve had declined materially at the onset of COVID-19 (March of 2020) as investors flocked to this safe-haven asset and aggressive Federal Reserve policies were enacted through policy rate cuts and the quantitative easing program. For context, at the end of June 30, 2020 the 10-year yield was at 0.66% with yields remaining below 1.0% through December; by March 2021, the yield nearly doubled to 1.7% on prospects of stronger than expected growth driving negative bond index returns. By the end of the fiscal year, the 10-year yield retreated to 1.4% as concerns about the economic impact of the Delta variant trimmed investor risk appetite.

Within fixed income markets, the Bloomberg Barclays US Aggregate produced essentially flat returns delivering -0.3% for the year ending June 30, 2021; the Bloomberg Barclays TIPS returned 6.5% as inflationary concerns proved to be a tailwind, and the Barclays High Yield Index posted the strongest returns at 15.4% as investors searched for yield given the current historically low levels being offered elsewhere. Lastly, long maturity Treasuries were the worst performers, with the Barclays Long US

November 8, 2021

Government returning -10.4% to end the fiscal year 2021. Rising inflation and US economic growth conditions in the second half of the year negatively impacted longer dated fixed income instruments; though we witnessed some recovery as inflation concerns somewhat abated by the end of the fiscal year.

Outside of equity and fixed income markets, we saw strong results from many other asset classes, as they benefited from the recovery and economic expansion. Energy prices saw a dramatic increase, with WTI crude oil trading at $75.23 by June 30, 2021 and returning to pre-COVID levels versus $39.88 just one year ago. At their trough in 2020, the Bloomberg Commodity Index and the S&P Global Natural Resources Indices were both down -23.1% and -44.6%, respectively. At the end of the fiscal year, the Bloomberg Commodities Index and the S&P Global Natural Resources Index recovered with healthy returns and posted 45.6% and 49.4% one year returns respectively. Particularly in the second half of the fiscal year, as economies re-opened, an imbalance in supply (low) and demand (high), caused many raw materials to rise sharply (steel, copper, corn, lumber). The increased demand, made worse by port-container shipping congestion, drove transportation costs to rise, inciting inflationary fears.

One of the hardest hit asset classes in markets in 2020 had been real estate, where fears regarding utilization rates in commercial real estate prevented the asset class from participating in the recovery in the early months. Since then, REITS have handsomely recovered from their 2020 steep losses such that one-year returns ending June 30, 2021 were 38.1% as proxied by the MSCI U.S. REIT Index. US market volatility as measured by the VIX index was approximately 30% at the beginning of the fiscal year and has nearly halved to just below 16% by the end of the fiscal year.

In April 2021, the advent of vaccines and the rise in economic activity led the IMF to materially upgrade its World Economic Outlook for 2021 with advanced economies projected to rise by 5.1%. In June, the Federal Reserve upgraded US 2021 growth forecast to 7%. Growth projections have also been revised higher for emerging markets, with 2021 at 6.7%. China is expected to see significant growth of 8.4% in 2021 and then resume its potential growth level of 5.7% in 2022. Near term, inflation expectations for advanced economies have been revised upwards and are projected to be higher than their 10-year averages.

Fiscal 2022 Outlook

Looking ahead beyond 2021 we see a variety of issues of primary concern impacting the path and speed of a recovering economy:

1) Economies may not achieve herd (vaccination) immunity, resulting in weaker growth and potentially a need to re-deploy lockdown policies or booster shot programs. Meanwhile, developing countries continue to struggle to gain access to vaccines to help mitigate COVID infections. While authorities indicate that vaccination can prevent hospitalization for Delta variant infections, the Delta variant may pose significant public health problems due to its more virulent characteristics. Additionally, supply dynamics and logistical challenges with the vaccine are driving a slower pace of inoculation than

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expected in addition to vaccine hesitancy, particularly here in the US. This confluence of challenges could cause governments to re-impose distancing measures, which would likely depress employment and economic growth. Given some considerable uncertainty on the trajectory of COVID preventative measures, several economic themes flow from this larger global health uncertainty.

2) Consumers may change economic behavior for an extended period. Changing consumer spending and work-environment preferences could limit demand for participation in large events including concerts and sporting events, dining out, travel, and leisure activities. Added concerns here in the US are the eviction moratoriums and the student loan repayment freeze set to expire, with Federal unemployment benefits also ending.

3) Persistently high unemployment due to a significant number of companies not surviving the economic downturn. US unemployment levels stand at 5.9% and have certainly come down from peak rates reached at the height of the pandemic, but these still remain well above pre-pandemic levels.

4) Virus-related fears and outbreaks could continue to exacerbate supply chain disruptions as port, transport, and intermodal workers observe lockdown measures. Global bottlenecks may continue to persist resulting in shortages and higher prices.

5) The potential of a short-term overheating of the US economy. In May and June, the US CPI exceeded 4% year over year, and stoked investor concerns that the US economy may overheat, as strong consumer demand and the economic recovery could potentially create an inflationary spiral. The Biden administration announced its intentions to expand government spending while the US economy is in a robust recovery and this may exacerbate inflationary pressures.

6) As of June 2021, the Federal Reserve was still engaged in its quantitative easing program, purchasing $120 billion in US Treasuries and mortgage-backed securities a month. As the US economy recovers the Federal Reserve may begin to taper their asset purchases resulting in policy tightening.

7) China's recent political interventions in the technology and education sectors could have further repercussions for Chinese US-listed ADRs as well as Chinese company H and A shares. Regulatory tensions between the US and China could force further divestment from listed Chinese companies in the US and in mainland China.

Retirement System Investment Results

The fair value of the City of Phoenix Employees' Retirement System was $3.37 billion as of June 30, 2021. This was an increase of $678.3 million from June 30, 2020 due to positive investment performance of $628.2 million and $50.1 million in net cash inflows. The System's net of fees return was +22.8% over the fiscal year vs. a return of 24.9% for the policy benchmark. Over the most recent three-year period, the System's net of fee return was +9.7%, +9.5% over five years, and +7.5% over ten years.

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As of June 30, 2021, 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, 2021, the System's assets were allocated to equity (49.7%), rate-sensitive (16.7%), credit (9.7%), real assets (13.1%), hedge funds (3.9%), GTAA (3.1%), and cash (3.7%).

In March 2017, the Board approved a new asset allocation policy with an expected return of 7.26%, in line with the actuarial assumed rate of return at the time of 7.25% (the actuarial assumed rate of return was lowered to 7% as of June 30, 2020). During the fiscal year, the System made continued progress towards implementing the approved asset allocation policy. The System funded an international large cap value manager, and an international small cap growth manager within the developed markets equity asset class. 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	Imran Zahid
Managing Principal	Investment Analyst

LW/IZ/sf

COPERS' asset allocation targets (at fair value) as of June 30, 2021 were:

Asset Class	Target Allocation
Domestic Equity	16%
Developed Market Equity	9%
Emerging Market Equities	8%
Private Equity	9%
Investment Grade Bonds	15%
TIPS	7%
High Yield Bonds	5%
Bank Loans	3%
Emerging Market Bonds	3%
Real Estate	12%
Infrastructure	4%
Natural Resources	4%
Hedge Funds	5%
GTAA	0%
Cash Equivalents	0%

A. In March 2017, 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, 2021)

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
GQG	Laura Clement	Ft. Lauderdale, FL
GMO	Ryan Dawley	Berkeley, CA
LSV	Jason Ciaglo	Chicago, IL
Mondrian	Paul Ross	Philadelphia, PA
Robeco Investment Management	William Supple	Boston, MA

Fixed Income Managers

Brigade Capital Management	Lauren Stelzer	New York, NY
DDJ Capital Management	Matt Hensher	Waltham, MA
Logan Circle Partners	Angus Campbell	Philadelphia, PA
Longfellow Investment Management	Corrine Larson	Boston, MA
Pacific Asset Management	Michael Spitler	Newport Beach, CA
PIMCO	Summer Jarret	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 Keaseansilp	New York, NY
Carlson Capital	Brian Hampton	New York, NY
Fir Tree Partners	Benjamin Ghriskey	New York, NY

Transition Managers

Northern Trust Transition Management	Grant Johnsey	Chicago, IL
Russell Implementation Services, Inc	Steve Cauble	Seattle, WA
State Street Global Markets	James Doherty	Irvine, CA

Private Equity

Neuberger Berman	Kaci Boyer	Dallas, TX

Real Estate Managers

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
JDM Partners	Mel Shultz	Phoenix, AZ
JP Morgan	Tom Klugherz	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, 2021) (Continued)

Real Estate Managers (continued)		
Northwood Real Estate Partners	Blair Drossner	New York, NY
Realterm Logistics Income	Peter Lesburg	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	Chicago, IL
	Mark Bartmann	
Investment Consultant		
Meketa Investment Group	Larry Witt	Carlsbad, CA
	Imran Zahid	

Schedule of Investment Results
For the Fiscal Year Ended June 30, 2021

	Annualized		
	1-Year	3-Years	5-Years
Total Portfolio:			
COPERS	22.8%	9.7%	9.5%
Policy Benchmark	24.9	10.5	10.0
Meketa All Pension Plans > $1B Net Median	27.0	10.4	10.4
Bank Loans			
Pacific Asset Management (1)	9.4	-	-
Equity Funds			
Artisan Global Opportunities	35.0	21.7	20.9
MSCI ACWI	39.3	14.6	14.6
Baillie Gifford	34.5	15.0	16.0
MSCI ACWI Ex USA	35.7	9.4	11.1
Cramer Rosenthal McGlynn	55.5	7.1	10.9
Russell 2000 Value Index	73.3	10.3	13.6
Driehaus International (2)	-	-	-
MSCI ACWI Ex USA	-	-	-
Eagle Asset Management	43.9	18.9	20.7
Russell 2000 Growth Index	51.4	15.9	18.8
First Eagle International (11)	-	-	-
MSCI EAFE Value	-	-	-
GQG (3)	43.0	-	-
MSCI Emerging Markets Growth NR	40.1	-	-
LSV (7)	45.1	-	-
MSCI Emerging Markets Growth NR	41.6	-	-
Robeco Investment Management	49.6	12.7	13.7
Russell 1000 Value Index	43.7	12.4	11.9
SSgA FTSE RAFI US Low Vol	34.4	11.7	9.5
FTSE RAFI US Low Vol Index	34.5	11.8	9.5
SSgA FTSE RAFI Dev ex-US Low Vol	27.6	3.7	6.6
FTSE RAFI US Dev ex-US Low Vol Index	27.1	3.4	6.3
Fixed Income Funds			
Longfellow Core Fixed Income (6)	2.4	5.7	-
Barclays US Aggregate	(0.3)	5.3	-
SSgA US AGG Bond Index (5)	(0.3)	5.4	-
Barclays US Aggregate	(0.3)	5.3	-
SSgA US TIPS (4)	6.4	6.5	-
Barclays US TIPS	6.5	6.5	-
Western Asset Management	1.8	6.3	4.5
Barclays US Aggregate	(0.3)	5.3	3.0
Hedge Fund of Funds			
BH-DG Systematic Trading (10)	25.9	10.0	-
Carlson	12.9	2.9	3.4
Fir Tree International	29.9	7.3	5.3

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]	24.5	-	-
DDJ Capital Management [9]	22.3	-	-
Private Equity Funds			
Neuberger Berman Sonoran	46.9	21.1	16.6
Real Estate Funds			
Core [12]	3.0	5.5	6.9
Non-Core [13]	17.7	9.4	11.0
NCREIF ODCE	2.3	4.9	6.2
Real Return Fund			
PIMCO All Asset	29.6	10.0	9.0
All Asset Index	12.7	7.5	6.5

(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) SSgA US TIPS was added as a fixed income manager effective February 1, 2018. Performance figures would not be representative of the benchmark index.

(5) SSgA US AGG Bond Index Fund was added as a fixed income manager effective April 1, 2018. Performance figures would not be representative of the benchmark index.

(6) Longfellow Core Fixed Income was added as a core plus fixed income manager effective May 1, 2018. Performance figures would not be representative of the benchmark index.

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

(10) BH-DG Systematic Trading was added as a hedge fund manager effective March 1, 2018. Performance figures would not be representative of the benchmark index.

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

(12) Core Real Estate performance was reported as the gross time-weighted returns.

(13) Non-Core Real Estate performance was reported as the gross time-weighted returns.

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, 2021

Manager	Style	Management (in thousands)	% of Portfolio
Cash And Cash Equivalents Funds			
Brigade Capital Management	Fixed Income	$ 3,044	0.09%
COPERS Cash Account	Core Plus Fixed Income	124,580	3.69
Cramer Rosenthal McGlynn	Small Cap Growth	705	0.02
DDJ Capital Management	Small Cap Growth	2,759	0.08
Eagle Asset Management	Core Plus Fixed Income	3,457	0.10
Longfellow Core Fixed	Core Plus Fixed Income	1,363	0.04
Robeco Investment Management	Large Cap Value	2,878	0.09
Western Asset Management	Core Plus Fixed Income	4,952	0.15
Total Cash & Cash Equivalent Funds		**143,738**	**4.26**
Domestic Equities Funds			
Brigade Capital Management	Bonds	2,923	0.09
Cramer Rosenthal McGlynn	Small Cap Value	60,274	1.78
DDJ Capital Management	Bonds	1,567	0.05
Eagle Asset Management	Small Cap Growth	84,016	2.49
State St US Low Vol	Large Cap Core	201,735	5.97
Robeco Investment Management	Large Cap Value	164,676	4.88
State St US Ag Bnd Ind	Bonds	173,309	5.13
State St US TIPS Ind	Bonds	158,129	4.68
Total Domestic Equities Funds		**846,629**	**25.07**
Fixed Income Funds			
Brigade Capital Management	Fixed Income	76,739	2.27
DDJ Capital Management	Fixed Income	70,180	2.08
Logan Circle	Fixed Income	112,369	3.33
Longfellow Core Fixed	Core Plus Fixed Income	86,153	2.55
Pacific Asset Management	Bank Loans	115,308	3.41
Western Asset Management	Core Plus Fixed Income	85,315	2.53
Total Fixed Income Funds		**546,064**	**16.17**
Hedge Funds			
BH DG SYS TRD FD	Hedge Fund of Funds	35,551	1.05
Carlson Capital	Hedge Fund of Funds	44,168	1.31
Fir Tree Partners	Hedge Fund of Funds	52,938	1.57
PAAMCO	Hedge Fund of Funds	338	0.01
Total Hedge Funds		**132,995**	**3.94**
Global Commingled Funds			
Artisan Partners	International	228,193	6.76
PIMCO All Asset Custom Index	International	106,086	3.14
Total Global Commingled Funds		**334,279**	**9.90**

Asset Allocation by Manager
For the Fiscal Year Ended June 30, 2021

Manager	Style	Management (in thousands)	% of Portfolio
International Equities Funds			
Baillie Gifford	Large Cap Growth	301,680	8.93%
DDJ Capital Management	Large Cap Growth	84	0.00
Driehaus International	International	26,607	0.79
First Eagle	International	78,509	2.32
State St Dev ex-US	Large Cap Core	88,518	2.62
GQG Emerging Market	International	109,959	3.26
LSV Emerging Market	International	91,201	2.70
Total International Equities Funds		**696,558**	**20.63**
Private Equity Funds			
Neuberger	Private Equity	274,568	8.13
Total Private Equity Funds		**274,568**	**8.13**
Real Estate Funds			
Ascentris	Non-Core Real Estate	14,228	0.42
Focus Sh Fund	Non-Core Real Estate	18,998	0.56
Hammes Partners III	Non-Core Real Estate	8,610	0.25
HSI Real Estate V	Non-Core Real Estate	2,966	0.09
JDM Opportunity Fund	Non-Core Real Estate	22,756	0.67
JPM Strategic Property	Core Real Estate	77,194	2.29
Morgan Stanley Prime Property	Core Real Estate	82,320	2.44
Northwood IV	Non-Core Real Estate	20,782	0.62
Northwood V	Non-Core Real Estate	31,013	0.92
RealTerm LIF	Core Real Estate	28,993	0.86
RECAP III	Non-Core Real Estate	3,665	0.11
RECAP IV	Non-Core Real Estate	16,345	0.48
RECAP V	Non-Core Real Estate	14,720	0.44
SC Core Fund LP	Non-Core Real Estate	31,915	0.95
Wheelock Street Partners I	Non-Core Real Estate	1,740	0.05
Wheelock Street Partners II	Non-Core Real Estate	7,268	0.22
Wheelock Street Partners V	Non-Core Real Estate	15,334	0.45
Wheelock Street Partners VI	Non-Core Real Estate	3,252	0.10
Total Real Estate Funds		**402,099**	**11.91**
Total Portfolio Before Securities Lending		**$ 3,376,930**	**100.00%**
Securities Lending		85,842	
Total Investments		**$ 3,462,772**	

List of Largest Assets Held
As of June 30, 2021 (in thousands)

Ten Largest Bond Holdings (Fair Value)

Par Value	Description	Interest Rate	Due	Rating	Fair Value
$ 5,013	US Treasury Note	0.25	4/15/2023	AAA	$ 5,009
4,521	US Treasury Note	1.25	4/30/2028	AAA	4,558
4,319	US Treasury Note	1.63	11/15/2022	AAA	4,408
3,117	US Treasury Bond	1.38	8/15/2050	AAA	2,750
2,427	US Treasury Bond	3.13	8/15/2044	AAA	2,492
2,293	US Treasury Note	1.38	8/31/2023	AAA	2,283
2,261	Tenet Healthcare Corp	5.13	11/01/2027	B1	2,254
2,581	US Treasury Bond	1.25	5/15/2050	AAA	2,222
2,063	Baffinland Iron Mines	8.75	7/15/2026	CCC	2,151
2,020	NFP Corp	6.88	8/15/2028	CCC	2,095

Ten Largest Stock Holdings (Fair Value)

Shares	Stock	Fair Value
32,738	JPMorgan Chase & Co	$ 5,092
30,882	Johnson & Johnson	5,087
17,158	Berkshire Hathaway Inc	4,769
84,346	Cisco Systems Inc	4,470
59,090	Conoco Phillips	3,599
1,428	Alphabet Inc	3,487
2,295	Autozone Inc	3,424
82,562	Bank of America Corp	3,404
13,524	Cigna Corp	3,206
22,309	Applied Materials Inc	3,176

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, 2021

	Management	Fees
Cash And Cash Equivalents Funds		
Brigade Capital Management	$ 3,044	$ -
COPERS Cash Account	124,580	-
Cramer Rosenthal McGlynn	705	-
DDJ Capital Management	2,759	-
Eagle Asset Management	3,457	-
Longfellow Core Fixed	1,363	-
Robeco Investment Management	2,878	-
Western Asset Management	4,952	-
Total Cash & Cash Equivalent Funds	**143,738**	**-**
Domestic Equities Funds		
Brigade Capital Management	2,923	415
Cramer Rosenthal McGlynn	60,274	408
DDJ Capital Management	1,567	-
Eagle Asset Management	84,016	425
State St US Low Vol	201,735	107
Robeco Investment Management	164,676	547
State St US Ag Bond Ind	173,309	55
State St US TIPS Ind	158,129	49
Total Domestic Equities Funds	**846,629**	**2,006**
Fixed Income Funds		
Brigade Capital Management	76,739	-
DDJ Capital Management	70,180	-
Logan Circle	85,315	549
Longfellow Core Fixed	112,369	293
Pacific Asset Management	86,153	273
Western Asset Management	115,308	324
Total Fixed Income Funds	**546,064**	**1,438**
Global Commingled Funds		
Artisan Partners	228,193	1,543
PIMCO All Asset	106,086	1,096
Total Global Commingled Funds	**334,279**	**2,639**
Hedge Funds		
BH DG Sys Trd FD LP	35,551	256
Carlson Capital	44,168	632
Fir Tree Partners	52,938	672
PAAMCO	338	4
Total Hedge Funds	**132,995**	**1,564**
International Equities Funds		
Baillie Gifford	301,680	910
DDJ Capital Management	84	386
Driehaus International	88,518	52

Schedule of Investment Related Fees (in thousands) (continued)
For the Fiscal Year Ended June 30, 2021

	Management	Fees [1]
First Eagle	109,959	333
GQG	91,201	608
LSV	78,509	390
State St Dev ex-US	26,607	73
Total International Equities	**696,558**	**2,752**
Private Equity		
Neuberger	274,568	1,607
Total Private Equity Funds	**274,568**	**1,607**
Real Estate Funds		
Ascentris	14,228	177
Focus	18,998	241
Hammes Partners III	8,610	350
HSI Real Estate V	2,966	143
JDM Opportunity Fund	22,756	242
JP Morgan Strategic Property	77,194	722
Morgan Stanley Prime Property	82,320	673
Northwood GP LLC IV	20,782	143
Northwood Series V	31,013	194
RealTerm LIF	28,993	54
RECAP III	3,665	30
RECAP IV	16,345	212
RECAP V	14,720	375
SC Core	31,915	233
Wheelock Street Partners I	1,740	(74)
Wheelock Street Partners II	7,268	217
Wheelock Street Partners V	15,334	272
Wheelock Street Partners VI	3,252	300
Total Real Estate	**402,099**	**4,504**
Master Custodian Fees		
BNY Mellon	-	225
Total Master Custodian Fees	**-**	**225**
Total Securities Lending [1]	85,842	
Total Investments	**$ 3,319,034**	**$ 16,735**
Cash And Cash Equivalents	143,738	
Total Cash & Cash Equivalents And Investments	**$ 3,462,772**	

[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, 2021

Type of Investment	Fair Value (in thousands)	Percent of Total Fair Value
Cash and Cash Equivalents:		
Cash & Cash Equivalents	$ 143,738	4.26
Total Cash and Cash Equivalents	**143,738**	**4.26**
Domestic Equities:		
Basic Materials	12,699	0.38
Commingled	533,173	15.79
Consumer Discretionary	12,086	0.36
Consumer Goods	15,381	0.46
Consumer Services	37,038	1.10
Energy Related	12,704	0.38
Financials	55,853	1.65
Health Care	49,180	1.46
Industrials	52,625	1.56
Information Technology	6,570	0.19
Oil and Gas	4,444	0.13
Real Estate Fund	6,212	0.18
Technology	48,080	1.42
Utilities	584	0.02
Total Domestic Equities	**846,629**	**25.07**
Fixed Income:		
Asset Backed	17,497	0.52
Corporate Bonds	326,982	9.68
Derivative	933	0.03
Foreign Bonds	9,217	0.27
Foreign Debt	85,315	2.53
Government Agency	991	0.03
Mortgage Backed	56,900	1.68
Municipal Bond	2,888	0.09
US Government Guaranteed	45,341	1.34
Total Fixed Income	**546,064**	**16.17**
Global Commingled:		
Global Commingled	106,086	3.14
Other	228,193	6.76
Total Global Commingled	**334,279**	**9.90**
Hedge Funds:		
Other	132,995	3.94
Total Hedge Funds	**132,995**	**3.94**
International Equities:		
Commingled	390,198	11.55
International	306,360	9.07
Total International Equities	**696,558**	**20.63**

Investment Summary by Sector (continued)
For the Fiscal Year Ended June 30, 2021

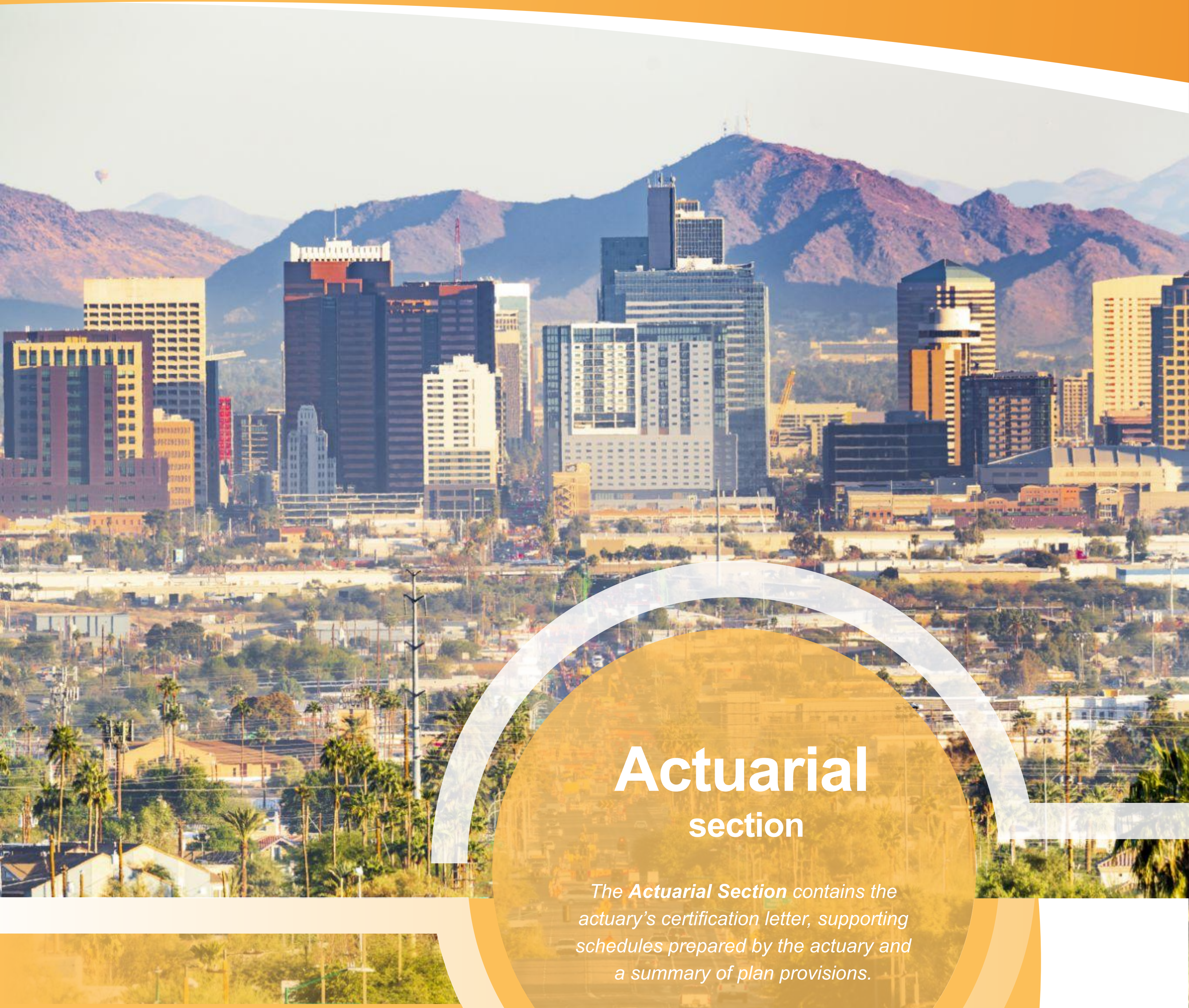
Type of Investment	Fair Value (in thousands)	Percent of Total Fair Value
Private Equity:		
Private Equity	274,568	8.13
Total Private Equity	**274,568**	**8.13**
Real Estate:		
Real Estate Fund	402,099	11.91
Total Real Estate	**402,099**	**11.91**
Securities Lending	**85,842**	**2.48**
Total Investments	**$ 3,462,772**	**100%**

Schedule of Commissions
For the Fiscal Year Ended June 30, 2021

Brokerage Firm	Number of Shares Traded	Total Commissions	Commissions Per Share
LIQUIDNET INC, NEW YORK	482,693	$ 14,481	$ 0.030
GOLDMAN SACHS & CO, NY	642,388	13,489	0.024
J.P. MORGAN SECURITIES LLC, NEW YORK	625,809	11,465	0.019
MORGAN STANLEY & CO INC, NY	485,570	10,309	0.026
All Other Brokers [1]	4,088,952	108,988	
Total	**6,325,412**	**$ 158,732**	

[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

Supplementary Information (Continued)

GRS

P: 720.274.7270 | www.grsconsulting.com

October 31, 2021

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

Re: City of Phoenix Employees' Retirement System Actuarial Certification

Dear Mr. Steventon:

At the request of the City of Phoenix Employees' Retirement System ("COPERS"), Gabriel Roeder Smith & Company (GRS) has performed the actuarial valuation of the benefits associated with the COPERS defined benefit pension plan. The information in the Actuarial Section is based on our annual actuarial valuation report, with the most recent valuation conducted as of June 30, 2021. The Actuarial Section is intended to be used in conjunction with the full report.

The information in the Financial Section is based on the GASB 67 and 68 valuation report, with the most recent report conducted as of June 30, 2021. The Financial Section is intended to be used in conjunction with the full report.

This letter and the schedules listed below represent GRS' certification of the funded status as required for the financial report for the fiscal year ended June 30, 2021. GRS prepared the following schedules (information prior to 2017 was provided by COPERS):

- Actuarial Section
    - Summary of Actuarial Assumptions and Methods
    - Schedule of Retirees Members Added To and Removed From Rolls
    - Solvency Test
    - Analysis of Financial Experience
    - Summary of Benefit Provisions
- Financial Section
    - Sensitivity of Net Pension Liability to Changes in Discount Rate
    - Schedule of Changes in Net Pension Liability and Related Ratios
    - Schedule of Employer Contributions

Data

The valuation was based upon information as of June 30, 2021, furnished by COPERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal 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 COPERS staff.

7900 East Union Avenue | Suite 650 | Denver, Colorado 80237-2746

Supplementary Information (Continued)

Mr. Scott Steventon
October 31, 2021
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Actuarial Assumptions and Methods

The Board accepted GRS's recommendations on both the economic and demographic assumptions based on the most recent experience study that analyzed data from July 1, 2014 through June 30, 2019. The new assumptions were adopted in July 2020. The assumptions regarding sick leave, vacation time, and compensation time were adopted in August 2020.

We believe the assumptions are internally consistent and are reasonable, based on the actual experience of COPERS.

The actuarial assumptions and methods used to develop the Net Pension Liability, Discount Rate Sensitivity, Schedule of Changes in the Net Pension Liability, and Schedule of Net Pension Liability, noted above, meet the parameters set forth in the disclosures presented in the Financial Section by Government Accounting Standards Board Statement No. 67 including the use of the Entry Age Normal actuarial cost method to calculate the total pension liability.

Furthermore, the assumptions and methods used for funding purposes meet the parameters set by Actuarial Standards of Practice.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. A review of the impact of a different set of assumptions on the funded status of COPERS is outside the scope of this actuarial valuation.

The current actuarial assumptions are outlined in the section titled "Summary of Actuarial Assumptions and Methods."

Benefits

There were no changes to the plan provisions during the past year. The current benefit provisions are outlined in the section titled "Summary of Benefit Provisions."

Funding Policy and Objectives

The Actuarially Determined Contribution 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 change liability as 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

Supplementary Information (Continued)

Mr. Scott Steventon
October 31, 2021
Page 3

percentage of payroll; amortizes the assumption change liability as of July 1, 2015 over a closed 20-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. Since the 2020 actuarial valuation, the actuarially determined contribution has decreased from 37.60% of pay to 34.14% of pay. The decrease is primarily due to asset and contribution gains.

Assuming all actuarial assumptions are met, this method of payment of the unfunded liability will result in full funding of the unfunded accrued liability in 20 years. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code, and ERISA.

The signing actuaries are independent of COPERS sponsor. All signing actuaries are Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.
Respectfully submitted,

Gabriel, Roeder, Smith & Company

Paul Wood, ASA, FCA, MAAA
Consultant and Team Leader

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

	2021	2020	2019	2018	2017
Active Members					
Counts	7,969	8,027	7,941	7,977	8,030
Annual Compensation	$ 580,866,220	$ 568,646,484	$ 562,988,925	$ 527,160,824	$ 521,709,266
Average Annual Compensation	$ 72,891	$ 70,842	$ 70,896	$ 66,085	$ 64,970
Change in Average Annual Compensation	2.9%	-0.1%	7.3%	1.7%	1.9%
Average Age	46.8	46.8	46.6	46.6	46.5
Average Service	12.2	12.1	12.2	12.4	12.3
Deferred Vested Members					
Counts	1,053	1,033	1,008	943	925
Annual Deferred Benefits	$ 14,506,046	$ 14,115,513	$ 13,619,208	$ 12,167,691	$ 11,638,455
Average Benefit	$ 13,776	$ 13,665	$ 13,511	$ 12,903	$ 12,582
Retired Members					
Counts	6,183	6,109	6,013	5,813	5,661
Annual Deferred Benefits	$ 221,252,111	$ 214,952,799	$ 210,707,173	$ 202,550,837	$ 195,912,247
Average Benefit	$ 35,784	$ 35,186	$ 35,042	$ 34,844	$ 34,607
Disability					
Counts	233	233	245	249	247
Annual Deferred Benefits	$ 3,898,236	$ 3,830,503	$ 3,963,226	$ 4,069,714	$ 4,000,756
Average Benefit	$ 16,731	$ 16,440	$ 16,176	$ 16,344	$ 16,197
Beneficiaries and QDROs					
Counts	1,171	1,160	1,110	1,076	1,072
Annual Benefits	$ 24,608,323	$ 23,551,335	$ 22,007,859	$ 21,231,243	$ 20,639,481
Average Benefit	$ 21,015	$ 20,303	$ 19,827	$ 19,732	$ 19,253
Total Members Included in Valuation	**16,609**	**16,562**	**16,317**	**16,058**	**15,935**

	2016	2015	2014	2013	2012
Active Members					
Counts	7,783	7,463	7,731	8,090	8,325
Annual Compensation	$ 496,332,801	$ 484,853,108	$ 509,267,263	$ 508,031,593	$ 506,016,928
Average Annual Compensation	$ 63,771	$ 64,968	$ 65,873	$ 62,797	$ 60,783
Change in Average Annual Compensation	-1.8%	-1.4%	4.9%	3.3%	1.5%
Average Age	46.5	46.7	46.8	46.6	46.5
Average Service	12.2	12.6	12.8	12.8	12.5
Deferred Vested Members					
Counts	885	901	816	788	697
Annual Deferred Benefits	$ 11,080,138	$ 11,207,455	$ 9,956,781	$ 9,526,523	$ 8,158,009
Average Benefit	$ 12,520	$ 12,439	$ 12,202	$ 12,089	$ 11,704
Retired Members					
Counts	5,576	5,419	5,080	4,653	4,455
Annual Deferred Benefits	$ 191,137,835	$ 185,103,085	$ 168,443,463	$ 150,600,135	$ 142,722,085
Average Benefit	$ 34,279	$ 34,158	$ 33,158	$ 32,366	$ 32,036
Disability					
Counts	249	251	249	246	248
Annual Deferred Benefits	$ 3,895,823	$ 3,873,354	$ 3,639,564	$ 3,557,536	$ 3,570,997
Average Benefit	$ 15,646	$ 15,432	$ 14,617	$ 14,462	$ 14,399
Beneficiaries and QDROs					
Counts	1,060	1,018	961	925	886
Annual Benefits	$ 20,103,429	$ 18,896,049	$ 17,301,146	$ 16,199,651	$ 15,295,172
Average Benefit	$ 18,965	$ 18,562	$ 18,003	$ 17,513	$ 17,263
Total Members Included in Valuation	**15,553**	**15,052**	**14,837**	**14,702**	**14,611**

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, 2020. 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

Actuarial Value of Assets

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

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 Assumptions and Methods (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 2021 (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	0.033%	0.012%	0.036%	0.012%	0.369%	0.209%
25	0.025	0.008	0.027	0.008	0.249	0.147
30	0.032	0.013	0.035	0.014	0.317	0.230
35	0.042	0.021	0.046	0.021	0.410	0.359
40	0.059	0.032	0.064	0.034	0.577	0.563
45	0.088	0.050	0.107	0.061	0.902	0.882
50	0.133	0.074	0.291	0.207	1.437	1.328
55	0.196	0.110	0.421	0.266	1.893	1.560
60	0.286	0.167	0.600	0.358	2.241	1.751
65	0.419	0.265	0.891	0.571	2.725	2.020
70	0.629	0.438	1.489	0.990	3.493	2.562
75	0.981	0.723	2.607	1.753	4.649	3.584
80	1.549	1.191	4.659	3.129	6.579	5.378
85	6.467	4.775	8.384	5.778	9.683	8.354
90	13.239	10.365	14.430	10.780	14.666	12.330

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 Assumptions and Methods (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 Assumptions and Methods (Continued)

Schedule of Retired Members Added to and Removed from Rolls

	Added to Rolls		Removed		Total			
Year Ended	Count	Annual Pensions*	Count	Annual Pensions*	Count	Annual Pensions*	Average Annual Pension	% Increase in Pensions
6/30/2012	448	$ 14,488	161	$ 4,174	5,478	$ 160,264	$ 29,256	6.9
6/30/2013	426	12,574	201	3,996	5,703	168,843	29,606	5.4
6/30/2014	597	21,948	145	3,232	6,155	187,559	30,473	11.1
6/30/2015	578	22,483	192	4,225	6,541	205,816	31,466	9.7
6/30/2016	375	11,573	182	4,329	6,734	213,061	31,640	3.5
6/30/2017	321	9,317	233	4,395	6,822	218,364	32,009	2.5
6/30/2018	370	11,314	218	4,825	6,974	225,644	32,355	3.3
6/30/2019	417	13,109	196	4,398	7,195	234,341	32,570	3.9
6/30/2020	378	12,025	251	6,530	7,322	239,836	32,756	2.3
6/30/2021	396	14,487	312	7,105	7,406	247,218	33,381	3.1

* 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)
6/30/2012	443,964	1,525,152	970,258	1,827,528	100.00%	90.7%	0.0
6/30/2013	396,583	1,881,123	1,201,741	1,962,533	100.00%	83.2%	0.0
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

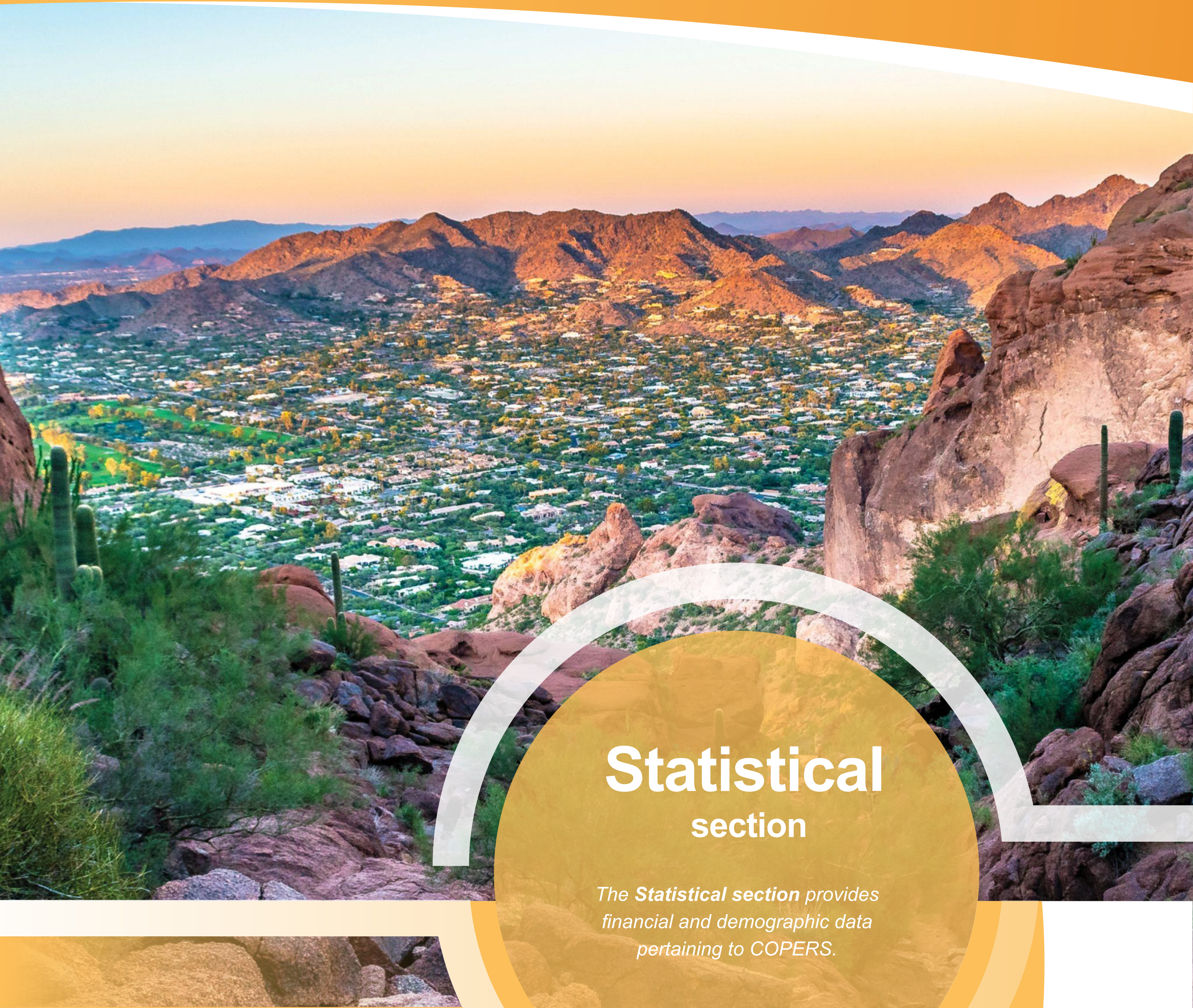
Summary of Actuarial Assumptions and Methods (Continued)

Analysis of Financial Experience (in thousands)

	2021	2020	2019	2018	2017
(1) UAAL at Start of Year	1,602,951	1,724,473	1,663,199	1,726,745	1,700,921
(2) Normal Cost for Year*	80,573	83,628	74,048	73,449	73,256
(3) Expected Contributions	(222,103)	(213,142)	(198,860)	(187,324)	(183,023)
(4) Assumed Investment Income Accrual on (1), (2) and (3)	107,337	120,412	116,137	121,133	123,527
(5) Expected UAAL Before Changes	1,568,758	1,715,371	1,654,524	1,734,003	1,714,681
(6) Effect of Assumption/Method Changes	-	(62,386)	-	-	2,420
(7) Effect of Benefit Changes	-	-	-	-	-
(8) Expected UAAL After Changes	1,568,758	1,652,985	1,654,524	1,734,003	1,717,101
(9) Actual UAAL	1,330,656	1,602,951	1,724,473	1,663,199	1,726,745
(10) Gain/Loss [8. - 9.]	238,102	50,034	(69,949)	70,804	(9,644)
(11) As % of AAL at Start of Year	5.39%	1.14%	-1.66%	1.71%	-0.24%

	2016	2015	2014	2013	2012
(1) UAAL at Start of Year	1,772,985	1,494,084	1,516,915	1,111,845	918,289
(2) Normal Cost for Year	80,757	75,310	78,331	71,828	77,366
(3) Expected Contributions	(178,288)	(157,314)	(153,885)	(143,502)	(133,822)
(4) Assumed Investment Income Accrual on (1), (2) and (3)	129,383	109,037	110,987	86,136	71,248
(5) Expected UAAL Before Changes	1,804,837	1,521,117	1,552,348	1,126,307	933,081
(6) Effect of Assumption/Method Changes	(69,420)	254,870	-	423,247	-
(7) Effect of Benefit Changes	(3,229)	-	-	-	-
(8) Expected UAAL After Changes	1,732,188	1,775,987	1,552,348	1,549,554	933,081
(9) Actual UAAL	1,700,921	1,772,985	1,494,084	1,516,915	1,111,845
(10) Gain/Loss [8. - 9.]	31,267	3,002	58,264	32,639	(178,764)
(11) As % of AAL at Start of Year	0.80%	0.10%	1.70%	1.10%	-6.50%

*Includes administrative expenses beginning in 2017



Statistical

section

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

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

	2021	2020	2019	2018	2017
Additions					
Employer Contributions	$ 357,382	$ 175,947	$ 165,796	$ 229,006	$ 152,153
Member Contributions	40,561	39,356	35,042	33,340	30,870
Inter-System Transfers	-	-	375	484	43
Retirement Office Administration	2,047	2,134	1,986	1,863	-
Net Investment Income (Loss)	610,554	50,389	142,964	166,514	243,210
Total Additions	**1,010,544**	**267,826**	**346,163**	**431,207**	**426,276**
Deductions					
Benefit Payments	$ 246,214	$ 239,407	$ 234,301	$ 224,454	$ 220,276
Refunds of Contributions	3,047	2,526	3,012	3,472	3,227
Inter-System Transfers (Note 11)	452	211	451	134	207
Retirement Office Administration	2,047	2,134	1,986	1,863	-
Administrative Expenses	1,930	2,509	793	377	380
Total Deductions	**253,690**	**246,787**	**240,543**	**230,300**	**224,090**
Change In Net Position Restricted For Pensions	**$ 756,854**	**$ 21,039**	**$ 105,620**	**$ 200,907**	**$ 202,186**

	2016	2015	2014	2013	2012
Additions					
Employer Contributions	$ 119,844	$ 117,092	$ 115,244	$ 27,738	$ 28,140
Member Contributions	29,306	27,861	28,815	110,094	105,682
Funds from Other Systems	217	199	160	105	4,030
Net Investment Income (Loss)	9,171	47,149	298,576	195,305	(5,664)
Total Additions	**158,538**	**192,301**	**442,795**	**333,242**	**132,188**
Deductions					
Benefit Payments	$ 213,047	$ 201,178	$ 177,447	$ 165,521	$ 156,679
Refunds of Contributions	3,047	3,004	2,192	2,464	2,333
Inter-System Transfers (Note 11)	315	-	-	-	-
Funds to Other Systems	-	421	238	606	1,365
Administrative Expenses	234	414	628	389	328
Total Deductions	**216,643**	**205,017**	**180,505**	**168,980**	**160,705**
Change In Net Position Restricted For Pensions	**$ (58,105)**	**$ (12,716)**	**$ 262,290**	**$ 164,262**	**$ (28,517)**

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
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
2012-2013	143,970	2,812	702	2,880	11,581	2,158	31	1,387	165,521
2011-2012	136,223	2,792	700	2,882	10,792	1,997	36	1,257	156,679

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

Fiscal Year	Beneficiaries	Separation	Total Refunds
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
2012-2013	821	1,643	2,464
2011-2012	437	1,896	2,333

Schedule of Retired Members by Type of Benefit
For the Fiscal Year ended June 30, 2021

		Type of Retirement						
Monthly Benefit	Number of Retirees	Deferred	Normal or Voluntary	Duty Disability	Non-Duty Disability	Survivor Payment	Death Benefit	Alternate Payee
Deferred	1,053	1,053						
$1 - $300	87		42	0	0	14	19	12
$301 – $400	130		86	5	1	26	1	11
$401 – $500	133		83	4	2	31	0	13
$501 – $600	146		97	6	5	25	3	10
$601 – $700	153		81	3	7	46	5	11
$701 – $800	181		97	1	10	51	8	14
$801 – $900	180		108	5	20	26	8	13
$901 – $1,000	179		108	1	13	40	4	13
$1,001 – $1,100	203		123	4	10	48	7	11
$1,101 – $1,200	204		134	1	12	35	8	14
$1,201 – $1,300	172		122	1	16	23	2	8
$1,301 – $1,400	175		118	-	14	27	9	7
$1,401 – $1,500	172		128	1	8	25	7	3
$1,501 – $2,000	879		672	13	34	108	35	17
$2,001 – $2,500	903		765	1	13	101	14	9
$2,501 – $3,000	836		744	0	11	61	12	8
$3,001 – $4,000	1,268		1,171	0	8	72	14	3
$4,001 – $5,000	786		745	0	3	30	6	2
$5,001+	800		759	0	0	36	3	2
Totals	**8,640**	**1,053**	**6,183**	**46**	**187**	**825**	**165**	**181**

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+
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
2018						
Average Monthly Benefit	$ 485.88	$ 1,247.90	$ 1,864.62	$ 2,831.05	$ 3,702.93	$ 4,536.18
Mean Monthly Final Average Compensation	3,717.43	5,233.92	5,715.12	6,283.43	6,669.52	6,924.99
Number of New Retirees	25	37	47	75	58	47
2017						
Average Monthly Benefit	$ 705.81	$ 973.60	$ 1,887.47	$ 2,534.96	$ 3,720.04	$ 3,945.87
Mean Monthly Final Average Compensation	4,447.09	4,259.10	5,826.38	5,694.16	6,652.33	6,235.95
Number of New Retirees	17	37	32	48	67	53
From July 1, 2017 to June 30, 2021						
Average Monthly Benefit	$ 672.28	$ 1,268.79	$ 1,883.89	$ 2,740.92	$ 3,736.67	$ 4,406.08
Mean Monthly Final Average Compensation	4,990.96	5,245.83	5,646.25	6,162.55	6,807.94	6,830.14
Average Number of New Retirees	22	33	41	68	69	53

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

Setting a path forward for a sustainable Phoenix