



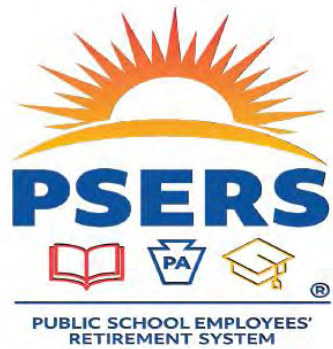
Public School Employees' Retirement System

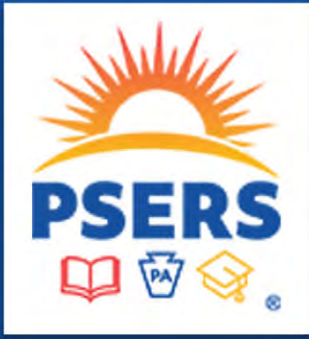
A Component Unit of the Commonwealth of Pennsylvania

Budget Report Appropriations Committee

Fiscal Year 2023-2024

PSERS BUDGET REPORT HIGHLIGHTS





Public School Employees' Retirement System

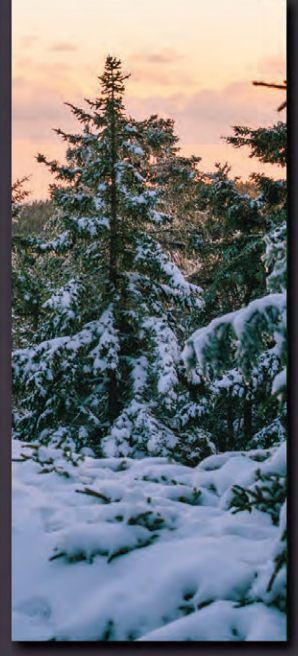
A Component Unit of the Commonwealth of Pennsylvania

Budget Report Highlights PSERS on Point

Fiscal Year 2023-2024

What's Inside

Budget Report Highlights



- 1 PSERS at a Glance
- 2 Introducing New Executive Staff
- 3 New Governance Reforms and Initiatives
- 4 First Decline In ECR In More Than A Decade
- 5 Why did the ECR decrease?
- 6 Commonwealth and School Employer Contributions Make a Positive Difference
- 7 PSERS is Built for the Long Haul
- 8 Diversified Assets Limit Risk in Volatile Markets
- 9 Internal Investment Office Saves Money on External Management Fees
- 10 PSERS Remains Committed to Transparency
- 11 PSERS DC Plan Continues to Grow
- 12 Positive Economic Impact to Pennsylvania: \$14.0 Billion
- 13 PSERS FY 2023-2024 Budget Summary
- 14 Enhancing Processes to Increase Efficiency and Improve Customer Service
- 15 Awards and Board of Trustees

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PSERS At a Glance

PSERS was established on July 18, 1917, and officially began operations on July 1, 1919, to provide retirement benefits to public school employees of the Commonwealth of Pennsylvania.

PSERS' role expanded upon the passage of Act 5 of 2017 to include oversight of two new membership classes consisting of a defined benefit (DB) and a defined contribution (DC) component and one membership class with only a DC component. PSERS currently serves over 500,000 active, terminated vested, and retired public school employees.

PSERS is administered by a staff of 382 and has 770 reporting units as of June 30, 2022. PSERS is headquartered in Harrisburg, Pennsylvania, and also has seven field offices in strategic areas of the Commonwealth to enable direct contact with members and employers.

PSERS sponsors the Health Options Program (HOP) which continued to see steady growth in enrollment and had more than 123,000 PSERS retirees, spouses, and dependents enrolled as of June 30, 2022. Within the plan, there is a Dental Program offering and a Vision Program offering, each of which had 33,614 enrollees as of January 1, 2023. HOP also offers a Silver Sneakers Fitness program.

PSERS Defined Benefit (DB) Plan	PSERS Defined Contribution (DC) Plan
A member's pension benefit is determined by a formula that includes a pension multiplier, years of service, and final average salary and with a goal to be fully funded during their working lifetime.	A member's retirement is based on member and employer contributions, the investment performance on those contributions, and the fees and expenses deducted from the member's DC account.
A DB pension is guaranteed, regardless of market fluctuations.	Member and employer contributions have the potential to grow based on investment earnings, but are not guaranteed.
Members in the DB Plan contribute a base rate between 4.50% and 10.30% of their pay to PSERS DB Plan depending on their class of membership. With the Shared Risk/Shared Gain provision, the contribution rate may change for some membership classes based on investment performance.	Members with a DC account contribute between 2.75% and 7.50% of their pay to PSERS DC Plan depending on the class of membership.

PSERS Active & Retired Membership



PSERS Snapshot

247,000
Retired
Members

248,000
Active
Members

27,000
Terminated
Vested Members

770
School
Employers

382
PSERS
Staff

Introducing New Executive Staff

FY 2022 was a year of great organizational change and development at PSERS. The year included multiple executive staff retirements, the hiring of a new Executive Director in June, the completion of an internal investigation, the end of a federal investigation, and the beginning of implementation of governance reforms.

Three top executives retired during fiscal year 2022 - Executive Director, Chief Investment Officer, and Chief Counsel. PSERS Board conducted executive searches for these positions and has filled all three of the vacancies.

**Executive Director –
Terrill (Terri) J. Sanchez**



Ms. Sanchez is the first woman to hold the position of Executive Director since the System was created in 1917. She reports directly to the Board, and she oversees a staff of more than 380 employees. Ms. Sanchez most recently served in an emergency return to service capacity as Interim Executive Director at PSERS during the search for a new Executive Director. Prior to returning to PSERS, Ms. Sanchez served as the Executive Director of Pennsylvania State Employees' Retirement System (SERS) where she was actively involved in implementing sweeping pension legislation as well as shepherding board governance, independent legal counsel, and investment-related initiatives.

**Chief Investment Officer -
Benjamin (Ben) Cotton**



Mr. Cotton, a U.S Marine veteran, brings over 25 years of corporate leadership, investment, and internal control experience that is well suited for PSERS' commitment to excellent service and continuous improvement. He most recently earned a doctoral degree in Leadership and Learning in Organizations through Vanderbilt University's Peabody College this December 2022. Before initiating his doctoral studies, Mr. Cotton served as a Senior Managing Director for the United Auto Workers Retiree Medical Benefits Trust, established to invest assets and administer healthcare benefits for over 800,000 automotive industry workers and their eligible dependents.

**Chief Counsel –
Joseph J. Indelicato Jr.**



Mr. Indelicato most recently served as General Counsel of the New York State Teachers' Retirement System (NYSTRS). He served in that capacity since January 2013. Mr. Indelicato first joined NYSTRS in 2001 as an Assistant General Counsel. At NYSTRS, Mr. Indelicato oversaw the legal department, which is responsible for protecting the System's legal rights, advising the System on litigation, regulatory and compliance matters, and interpreting the statutes that govern the System. In this role, Mr. Indelicato also advised staff on corporate governance matters, including stock proxy voting for the System's domestic and international equity portfolios.

New Governance Reforms and Initiatives

FY 2022 also marked the conclusion of the internal investigation of the shared-risk calculation error and the purchase and valuation of certain directly-owned properties and the closure of the U.S. Department of Justice investigation. There were no findings of criminal conduct and no civil or criminal charges from either investigation. The SEC investigation noted in last year's Annual Comprehensive Financial Report (ACFR) remains ongoing. PSERS continues to fully cooperate with the SEC.

Opportunities for improvement exist in every organization. Over the past fiscal year, several reviews were conducted to evaluate various governance controls, policies, and procedures, and provide insight and recommendations for improvement. The reviews include the following:

Funston Governance Report

- In December 2021, the PSERS Board accepted a governance review report it commissioned with Funston Advisory Services. The report included 31 recommendations organized into 6 governance reform initiatives which had multiple detailed implementation steps.
- Since then, PSERS has:
 - Reduced the number of Board Committees from 10 to 7.
 - Provided for an election process for Committee Chair and Vice Chair.
 - Developed Committee Charters to create clarity for each Committee's purpose, authority, and responsibilities.
 - Reduced the composition of most committees to five members.
 - Created a Chair/Vice Chair succession plan.
- Position descriptions for Board members and Board and Committee Chairs and Vice Chairs were developed and adopted.

SOC 1/Type 2 Review and Audit

- PSERS has also started the multi-year process to conduct a SOC 1/Type 2 Review and Audit, a rigorous review/audit of operations and controls.
- SOC 1 Type 2 standards are established by the American Institute of Certified Public Accountants (AICPA). A System and Organization Controls (SOC) audit is performed by a certified public accounting firm and offers assurance that the controls that a service organization has put in place to protect its clients' assets (data in most cases) are operating effectively. A Type 1 report describes procedures and controls as of a specific date while a Type 2 report covers how the controls have been operating during a period of time. PSERS audit will cover a six-month period.

Public Participation Policy and a Strategic Planning Policy

- The Board also adopted a Public Participation and Attendance in Open Meetings Policy and a Strategic Planning Policy – a first for the Agency. In support of the new Strategic Planning Policy, in October 2022, the Board hired Dering Consulting Group to assist PSERS with developing a Strategic Plan. PSERS Staff and the Board will work collaboratively to develop a strategic direction and prioritize initiatives.

Investment Office Operational Processes and Procedures Review Report

- The Board engaged Verus Advisory Inc. to provide an assessment of the operational policies, processes, and procedures followed by the Investment Office and Office of Financial Management. In March 2022, Verus presented their findings and determined that PSERS had generally implemented solid processes and controls that aligned with industry best practices, but they did note areas for improvement that could further strengthen those operational policies, processes, and procedures.

Ernst & Young (E&Y) Assessment

- E&Y is working with PSERS staff to review the Fund's systems of internal controls, and provide recommendations to improve those controls, increase efficiencies, and reduce risk.

PSERS Board Certifies The First Decline In The Employer Contribution Rate In More Than A Decade

At its December 2022 Board meeting, PSERS Board of Trustees certified the FY 2023-24 employer contribution rate at 34.00%, which represents the first year-to-year decline for school employers in more than a decade.

The employer contribution rate (ECR) for the fiscal year beginning July 1, 2023, will be 3.6% lower than the current FY 2022-23 rate of 35.26%. The ECR sets the shared costs local school employers and the Commonwealth pay toward retired and current employees' benefits. Total employer contributions is projected to be \$126 million lower (\$5.19 billion) in 2023-24 compared to 2022-23 (\$5.31 billion).

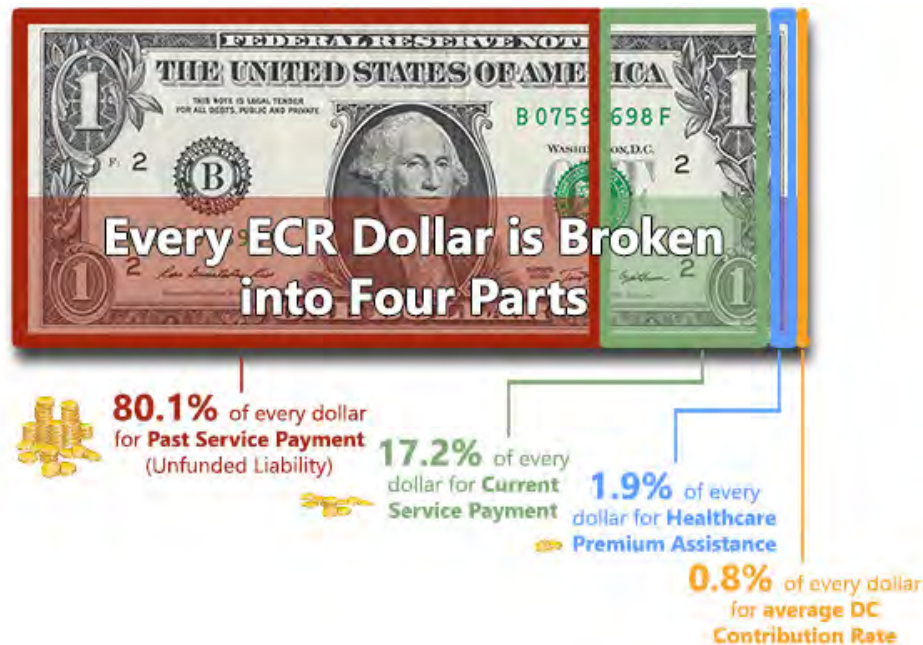
The rate decrease, the first since 2008-09, was caused in large part by PSERS' employers strong payroll growth and favorable demographic changes involving mortality and

retirement experience, according to the Board's actuarial firm, Buck. Those same factors and sustained actuarial ECR funding contributed to a \$1.5 billion decrease in the System's long-term unfunded actuarial liability, the largest decline since 2006-07. Those changes, in turn, raised PSERS actuarial funded status by 3.4% to 61.6% in the recently ended 2021-22 fiscal year, according to Buck.

The ECR is expected to rise slightly in 2024-25 and beyond but those rate projections are lower than previous projections. The System's funded ratio then is expected to reach 80.5% in FY2031 as more newer workers join the System under the reduced retirement benefit structure enacted by Act 120 of 2010 and Act 5 of 2017 and full annual funding of actuarially determined contributions continues.

Payment for Past Service Debt is Over 80% of the Total Employer Cost

The majority of the employer contribution rate in FY 2023-24 covers debt payments for past service (unfunded liability). The remaining 20% pays for the current "normal cost" benefit cost earned by active members, and Healthcare Premium Assistance and the DC Plan.



Why did the Employer Contribution Rate decrease?

Why did the FY 2023-24 Employer Contribution Rate decrease when the Fund did not meet its 7.00% investment rate of return in FY 2021-22?

- The ECR decrease, the first since 2008-09, was caused in large part by PSERS' employers strong payroll growth and favorable demographic changes involving mortality and retirement experience, according to the Board's actuarial firm, Buck. Those same factors and sustained actuarial ECR funding contributed to a \$1.5 billion decrease in the System's long-term unfunded actuarial liability, the largest decline since 2006-07.

What does this mean for the future?

- The decline in the FY 2023-24 ECR is a one-year decline and ECR rates are expected to rise again slowly. Future increases, however, will start from the lower FY 2023-24 base ECR of 34.00% and are expected to remain below the rate of inflation. This means projected ECR increases are expected to remain lower than previous projections over the next few years.
- The System's funded ratio is expected to reach 80.5% in FY 2031 as more workers who join the System do so under the reduced retirement benefit structures enacted by Act 120 of 2010 and Act 5 of 2017 and full annual funding continues to reduce the unfunded liability.
- Full annual funding since July 1, 2016, favorable long-term investment returns, and a declining cost of current benefits continue to make a positive difference on the financial health of PSERS.

For More Information:

- Full fact sheet is available at:
<https://www.pfers.pa.gov/About/PFR/Documents/Decrease%20in%20ECR%20Fact%20Sheet%20FINAL.pdf>

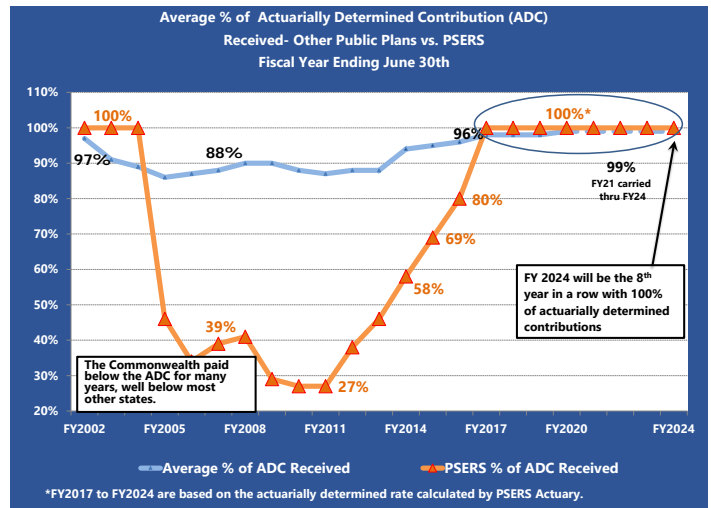
Commonwealth and School Employer Contributions Make a Positive Difference

PSERS appreciates the Commonwealth policymakers' and school employers' commitment to pay the employer contribution rate (ECR). FY 2023-24 will be the eighth year in a row PSERS receives 100% of the actuarially determined contributions.

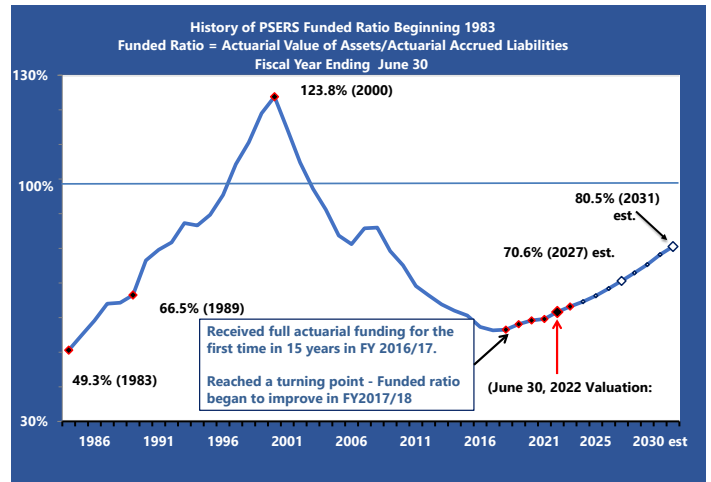
These ECR payments, coupled with lower normal cost, strong employer payroll growth, and solid investment performance, helped improve the System's funded status.

PSERS unfunded liability and funded ratio on an actuarial basis continue to improve.

- Funded ratio improved from 59.6% to 61.6% this year and over last four years has improved from 56.5% to 61.6%.
- PSERS unfunded accrued liability (debt) decreased to approximately \$44.0 billion in FY 2022 due to a net actuarial experience gain, strong employer payroll growth, and favorable demographic changes. This represents the largest decline in the unfunded accrued liability since Fiscal Year 2006-07.



Source for Average %: NASRA



Paying Actuarially Determined Rate is Vital to the System

While the employer contribution rate remains high, paying the actuarially determined rate is a vital step that has begun to pay down the previously accumulated pension debt.

PSERS is Built for the Long Haul

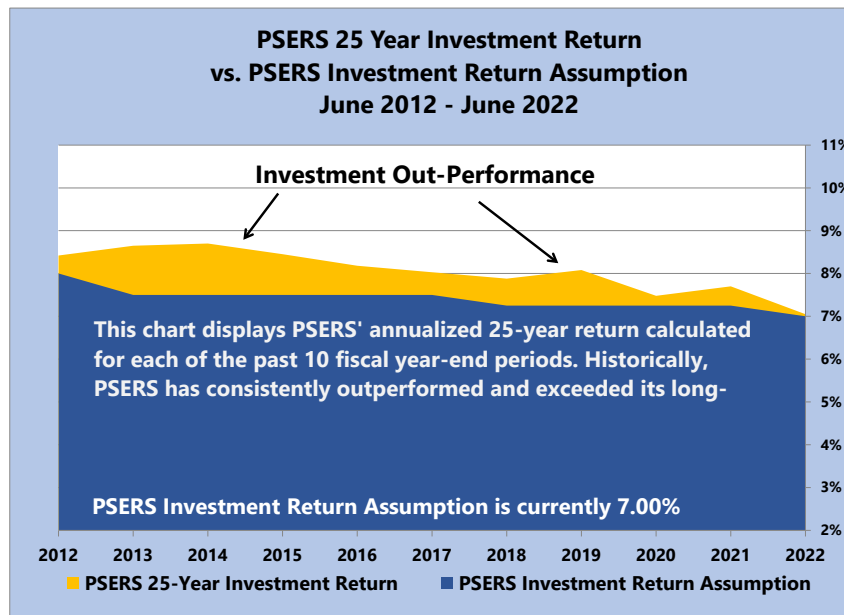
Long-Term Investment Performance Consistently Outperforms

PSERS has built a diversified asset allocation that positions the Fund to earn its return assumption of 7.00% over the long-term (i.e., 25 to 30 years) although annual fluctuations will occur. PSERS believes the best way to achieve its long-term objectives is to maintain a diversified portfolio.

Income from the investment portfolio represents the major source of revenue to the System, accounting for 57% of total revenues over the 25-year period from, FY 1998 to FY 2022. The investment portfolio, which is one part of the System's net position, totaled \$70.9 billion, at fair value, as of June 30, 2022. For FY 2022, the time-weighted net rate of return on the System's investments was 2.23%. While the FY 2022 return was positive, the net investment income (loss) was \$(282.4) million. This is due to the differences in timing between investment return reporting and financial statement reporting. *(Please see the Investment Return Reporting vs. Financial Statement Reporting section on page 39 of the ACFR for more information.)*

During FY 2022, investment markets were volatile and challenging. PSERS' FY 2022 investment rate of return of a positive 2.23%, although below our assumed rate of return, was in the top percentile of investment performance for PSERS public pension peer group and was well above PSERS' investment consultant's public pension peer group median investment rate of return of (7.21%).

As shown in the chart below, PSERS 25-year return, has historically outperformed the actuarial investment rate of return. Throughout much of the 1990's and 2000's, PSERS investment performance exceeded its investment rate of return assumption. However, the most recent 25-year period return through December 31, 2022 was 6.79% (preliminary), which is 21 basis points below this assumption. Overall, long-term investment performance has resulted in declining employer contribution rates and/or contribution rates lower than the annual normal cost of benefits.



Diversified Assets Limit Risk in Volatile Markets

The Board periodically reviews the System's long-term asset allocation targets. The Board consults with its actuary, consultants, Investment Office professionals, and other sources of information it deems appropriate in formulating the asset allocation. The level of risk assumed by the System is largely a result of the asset allocation. The Board, in determining its long-term asset allocation, considers the following factors:

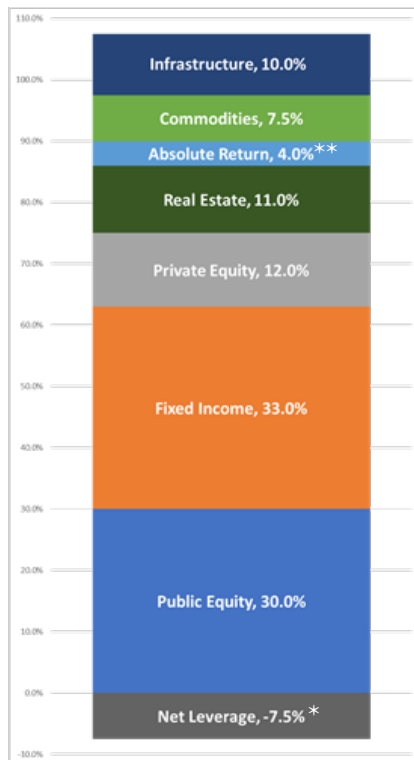
- The System's investment time horizon;
- The demographics of the plan participants and beneficiaries;
- The cash flow requirements of the System;
- The actuarial assumptions approved by the Board;
- The funded status of the System;
- The Board's willingness and ability to take risk; and
- The employers' (Commonwealth and school districts) financial strength.

In approving the asset allocation for the System, the Board considers capital market expectations for expected return, volatility, and asset class correlations for each asset class, as prepared by its general investment consultant.

In August 2022, the Board adopted an updated Strategic Asset Allocation. The Board's strategic asset allocation approval establishes the guidelines for how PSERS' investment professionals and external managers invest the fund's assets to meet its long-term retirement obligations to the System's members. The Board's allocation changes, including an increase in public equities and the elimination of its absolute return holdings, are expected to be implemented prudently over time.

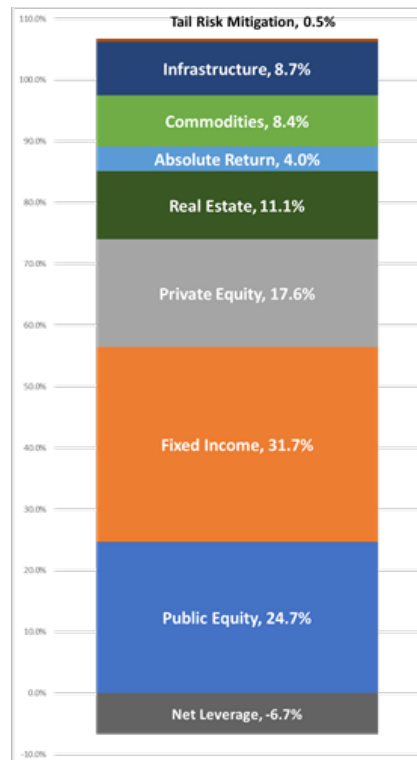
Target Allocation

(as of December 31, 2022)



Actual Asset Allocation

(as of December 31, 2022)



*Leverage is utilized at the asset allocation level to provide additional exposure to diversifying asset classes. Total Leverage is allocated at -10.5%; Total Leverage is netted against the System's Cash allocation of 3% for a Net Leverage allocation of -7.5%.

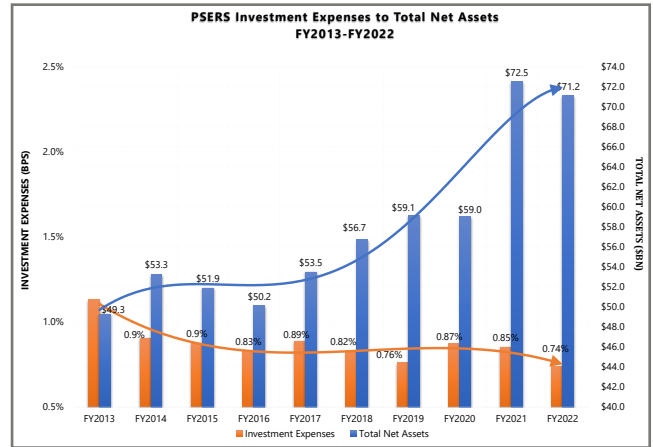
** The Board's allocation changes includes the elimination of its absolute return holdings which is expected to be implemented prudently over time.

Internal Investment Professionals Have Saved Investment Fees

PSERS In-House Management Saves Millions

PSERS' Investment Office presently manages a large amount of assets internally at a lower estimated cost than if those assets were managed externally. At the end of 2022, the Investment Office manages 56%, or \$41.6 billion, of the gross assets (inclusive of leverage) internally. The estimated savings from managing those assets internally is approximately \$33 million per year.

PSERS has increasing the number and size of portfolios managed internally resulting in reduced Total Investment Expenses in recent years. As the chart to the right illustrates, Total Investment Expenses have declined from FY 2012-13 to FY 2021-22, while Total Net Assets have increased significantly from \$49.3 billion to \$71.2 billion. PSERS continues to assess ways to utilize our internal investment management resources most efficiently in relations to the cost associated with managing assets externally.



Divestiture of Russian and Belarusian Investments

As of December 31, 2022, PSERS has divested all possible related assets and continually looks to decrease exposure whenever possible.

At the start of the Russian invasion of Ukraine in late February 2022, PSERS estimated the Fund held under \$300 million (less than ½ of 1% of PSERS total assets of \$72.5 billion) in Russian and Belarusian investments.

On March 3, 2022, PSERS Board of Trustees passed a Resolution to divest PSERS from investments in Russia and Belarus as expeditiously as possible, consistent with the Board's fiduciary duty of prudence. In addition, future investments involving Russia or Belarus were prohibited until directed otherwise by the Board. Since that time, the amount of PSERS investment holdings in Russia and Belarus has steadily declined.

PSERS estimates as of March 13, 2023, direct Russian holdings had a market value of approximately \$1.5 million according to its custodian bank, BNY Mellon. Liquidation has not yet been achieved due to the Russian market's illiquidity. PSERS had indirect Russian holdings and alternative investments of approximately \$70,000 as of year-end 2022. PSERS does not have any indirect or direct holdings in Belarus.

In addition, on November 3, 2022, Act 132 (House Bill 2447) directed PSERS, as well as the State Treasury, State Employees' Retirement System, and the Pennsylvania Municipal Retirement System to divest from Russian and Belarusian assets.



PSERS Remains Committed to Transparency

Board Live Streaming

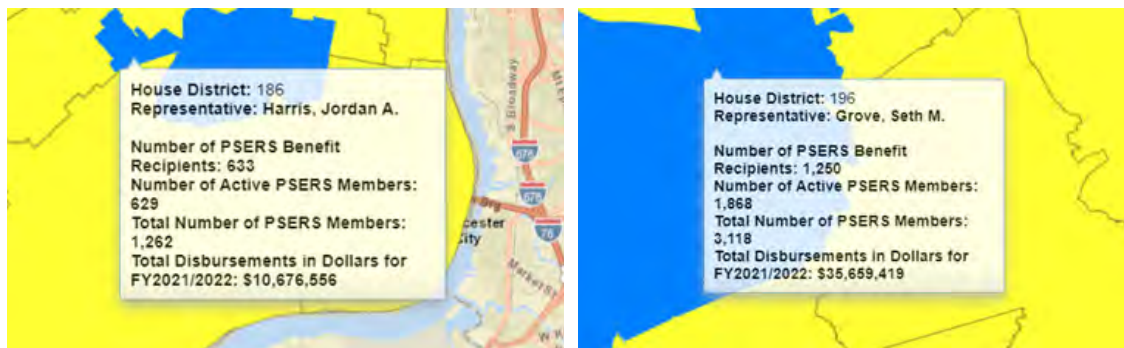
All PSERS public board and committee meetings continue to be streamed online.

Public Participation and Attendance in Open Meetings Policy

The Public Participation and Attendance in Open Meetings Policy was approved at the October 21, 2022 Board meeting. The purpose of this policy is to provide a reasonable opportunity for public participation and attendance at open meetings of the Board and Board committees in accordance with the Pennsylvania Sunshine Act. While recognizing the importance of public attendance and participation in open meetings, the Board also recognizes its responsibility for proper governance and the need to conduct its business in an orderly and efficient manner. This policy governs public participation and attendance in open meetings necessary for the Board to conduct its meetings and to maintain order.

PSERS by the Numbers: Statistics by Legislative Districts

PSERS benefit payments and membership data are shown by U.S. Congressional districts, PA State Senate districts, and PA State House districts. Data is updated on a fiscal year (July 1-June 30) basis. PSERS partnered with the Governor's Office of Administration, Office of Information Technology, Geospatial Services to create interactive, web-based maps that visualize PSERS benefit payments and membership by location. The interactive maps utilize the latest geospatial technology to present several statewide views of PSERS positive economic impact to the Commonwealth.



Maps available at [PSERS.pa.gov](https://psers.pa.gov) About > Legislative Maps



For a closer look at PSERS Investments, visit the "Investment Program" page at [PSERS.pa.gov](https://psers.pa.gov).

Reports & Resources on PSERS website include:

"Investment Program" page:

- Carried Interest Report
- Quarterly Investment Performance
- Detailed Manager Fee Information
- Quarterly Travel Report

"Financial Publications" page:

- Annual Comprehensive Financial Report (ACFR) & Summary Annual Financial Report (SAFR)
- Quarterly Financial Statements
- Budget Hearing Reports & Budget Report Highlights
- Actuarial Valuation
- Financial Asset Listing
- Employer Contribution Rates
- PA Pension Benefit Payments Map

"Board of Trustees" page:

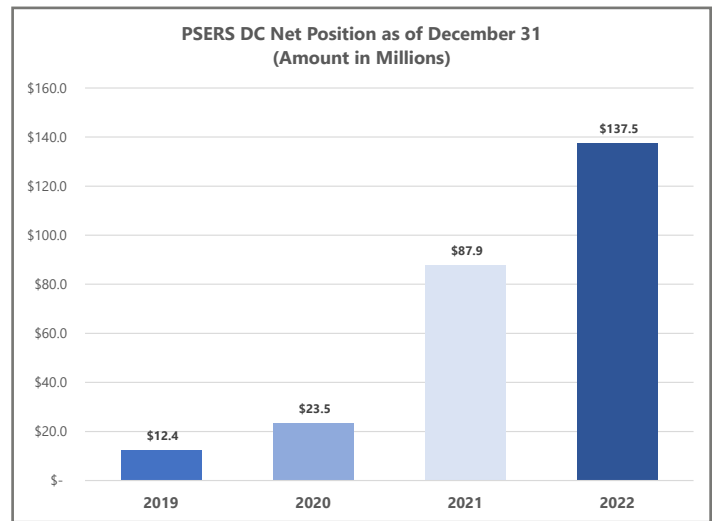
- Board Resolutions
- Transparency Policy
- Board & Committee Minutes
- Adjudication
- Model Governance Framework

PSERS Defined Contribution Plan Continues to Grow

School employees who became new members of PSERS on or after July 1, 2019, can choose from three classes of membership: two consisting of defined benefit (DB) and defined contribution (DC) components and one that is a stand-alone defined contribution plan.

As of December 31, 2022, cumulative highlights included:

- 56,916 Participant Accounts with a Balance (up from 39,508 as of December 31, 2021).
- \$137.5 Million DC Net Position* (up from \$87.9 as of December 31, 2021).
- \$83.2 Million Total Member Contributions.
- \$64.6 Million Total Employer Contributions.



Membership in PSERS DC plan continues to grow, now making up more than 16% of PSERS total membership.

Although new members cannot choose a stand-alone DB Plan, membership in PSERS DB Plan also continues to grow from new members selecting a membership class with a DB component.



PSERS Members Help Fund Their Own Retirement Benefit

During their career, members make mandatory contributions between 7.50% and 10.80% of their pay depending on their class of membership to help fund their own retirement benefit. As of July 1, 2011 and thereafter, members are funding the majority of the cost of their benefit. This is in contrast to many non-public (private) pension plans. In the majority of such plans, members do not contribute and the employers bear 100% of the cost of the benefit**.

Six-figure pensions are rare, with fewer than 0.5% of PSERS retirees receiving an annual pension benefit over \$100,000. These 1,014 six-figure pensioners with PSERS spent an average of 38 years working in their public education careers and contributing to their benefit.

* DC net position includes assets held at Voya and BNY Mellon

** Based on a query of private plan IRS Form 5500 filings

PSERS FY 2023-2024 Budget Summary

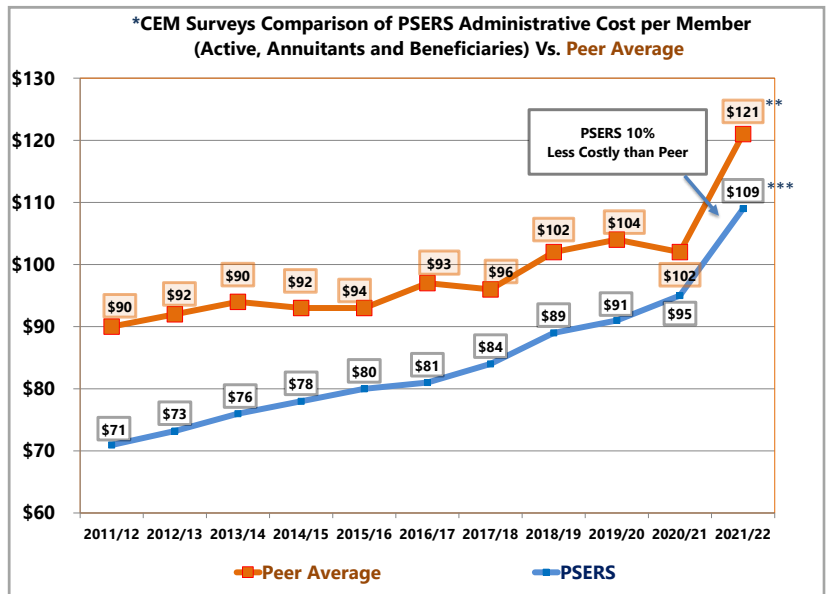
PSERS' administrative budget is not funded from the Commonwealth's General Fund. It is funded from the investment earnings of the Fund and member and employer contributions. PSERS' FY 2023-24 budget submission contains an Administrative budget request of \$57,102,000 and a Defined Contribution budget request of \$1,176,000. PSERS also manages non-appropriated funds that cover costs for Investment-Related Expenses, Health Insurance Account, Health Options Program, and Directed Commissions. PSERS' FY 2023-24 budgets, including non-appropriated funds, total \$104,069,000.

Appropriation	Governor's Recommended Budget (000s)
Administrative	\$ 57,102
Investment-Related	40,883
Defined Contribution	1,176
Health Insurance Account	1,264
HIA Health Options Program	1,644
Directed Commissions	2,000
Total	\$ 104,069

PSERS Saves \$5.9 Million Annually

PSERS participates in an annual independent, international benchmarking survey evaluating its costs and service performance in comparison to other public pension funds. Based on preliminary data from the most recent survey, PSERS had a 10% lower pension administration cost per member than the average cost of its peer group. By running a lean and efficient operation, PSERS saves the Commonwealth and school employers approximately \$5.9 million in administrative expenses compared to its peers.

During FY 2022, the agency lowered its postage costs, reduced contracted maintenance and repair services, decreased rental of equipment and software, and achieved significant savings in subscriptions, all of which helps to maintain more investment earnings for the benefit of the Fund. In addition to these savings, PSERS reduced costs by eliminating unnecessary parking leases at its headquarters location due to the adoption of an Agency-wide telework policy.



*Based on preliminary survey for June 30, 2022

**Large increase in peer average due to higher major project and IT costs and change in peer group membership

***Large increase in PSERS' cost due to investigation expenses



Enhancing Processes to Increase Efficiency and Improve Customer Service



PSERS Continues to Reduce Mailing Costs and Environmental Impact

Since being implemented in April 2018, nearly 240,000 members have created their online account and conducted nearly 400,000 transactions for themselves. The most common actions taken are to create their own retirement estimates, update their beneficiaries, update their address and generate their own income verification. MSS also allows members to “Go Green” and as a result, over 92% of all MSS accounts are paperless and receive information from PSERS electronically.



MSS Enhancements

A redesigned MSS platform has been deployed, making it easier for members to navigate from PCs and mobile devices. New customer service features were added, giving members the ability to track the status of their requests for an estimate, a refund, and a retirement benefit.

Another major undertaking has been incorporating the IRS' revisions to the *W-4P* form for federal tax withholding

Work is currently underway to enable members to submit a refund application online which will expedite the process and reduce the need for manual intervention. Future enhancements will also allow members to update their banking information with PSERS online.

Calendar Year 2022 Customer Service Highlights



**Answered
139,473
Member Calls**



**Responded to
70,504
Member Emails
& Secure
Messages**



**Counseled
6,854
Members for
Retirement**



**Issued
2.9 Million
Monthly Benefit
Payments to
Members**



**Processed
9,999
Retirement
Applications**



**Prepared & Issued
272,184
1099-R's**

Awards Received During the Past Fiscal Year

Government Finance Officers Association (GFOA) of the United States and Canada Certificate of Achievement for Excellence in Financial Reporting - For 39 consecutive years, PSERS has earned the Certificate of Achievement awarded by the GFOA, a prestigious national award recognizing conformance with the highest standards for preparation of state and local government financial reports.

GFOA Popular Annual Financial Reporting Award - For the sixth consecutive year, GFOA has given an Award for Outstanding Achievement in Popular Annual Financial Reporting to PSERS for its Popular Annual Financial Report for the fiscal year ended June 30, 2021, which PSERS refers to as its Summary Annual Financial Report. This is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government popular reports.

Public Pension Coordinating Council Public Pension Standards Award - The Public Pension Coordinating Council has awarded its Public Pension Standards Award to PSERS for 2021. This award is in recognition of meeting professional standards for plan design and administration.

CEM Benchmarking Certificate of Recognition - CEM Benchmarking recognized PSERS for submitting the cleanest CEM pension administration benchmarking surveys in a timely manner.

PSERS HOP CMS Medicare 2022 Star Rating - PSERS HOP Employer Group waiver Plan received a 4.5 Star Rating for the upcoming 2023 plan year. CMS' Medicare Star rating program evaluates Medicare Advantage (MA) and Prescription Drug Programs (PDP) based on a number of metrics around quality and performance. PSERS PDP is among only six other plans in the United States to receive a 4.5 Star Rating.

PSERS Prescription Drug Plan Earned National Award - PSERS HOP Prescription Drug Plan earned the Pharmacy Quality Alliance's (PQA) Laura Cranston Excellence in Quality Award. The alliance seeks to set national prescription medication safety and use standards in partnership with the federal CMS. The alliance bestowed this honor on 25 (2.9%) of the 850 Medicare Part D plan contracts in the CMS system in 2022.

March 2023 PSERS Board of Trustees

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Susan C. Lemmo, Interim Vice Chair

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House of Representatives

Honorable Matt D. Bradford
House of Representatives

Jason M. Davis

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Dr. Khalid N. Mumin
Acting Secretary of Education

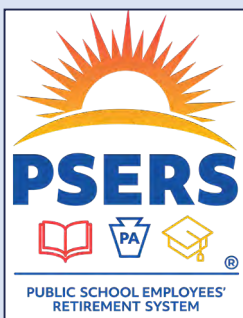
Joseph M. Torsella

Sarah Hammer
Acting Secretary of Banking and Securities

Brian A. Reiser

Vacant
Senate of Pennsylvania

Terrill (Terri) J. Sanchez
PSERS Executive Director and Board Secretary



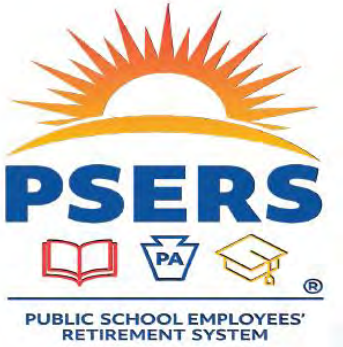
Toll-Free: 1.888.773.7748

Local Phone: 717.787.8540

Email Address: ContactPSERS@pa.gov

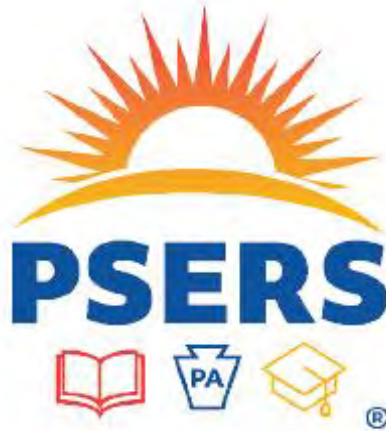
Website: PSERS.pa.gov

PSERS BUDGET FY2023-24



Pennsylvania
Public School Employees Retirement System
A Component Unit of the Commonwealth of Pennsylvania

5 North 5th Street
Harrisburg, PA 17101-1905



FISCAL YEAR 2023-24 BUDGET REPORT
APPROPRIATIONS COMMITTEE
APRIL 13, 2023

Christopher Santa Maria
Chair
Board of Trustees

Susan C. Lemmo
Interim Vice Chair
Board of Trustees

Terrill J. Sanchez
Executive Director

Report prepared primarily by the Public School Employees Retirement System
Office of Financial Management with support from Investment Office and other PSERS professionals

Table of Contents

Section 1 – PSERS Overview

PSERS Overview and Board of Trustees	Tab 1
PSERS Organizational Structure and Member Services	Tab 2
Economic Impact on Pennsylvania, Member Demographics, and Financial Information	Tab 3
Actuarial Process and Pension Plan Funding	Tab 4
Employer Contribution Rate	Tab 5

Section 2 – PSERS Fiscal Year 2023-24 Budget

Consultants Fees and Legislation	Tab 6
PSERS FY2023-24 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets	Tab 7

Section 3 – Investment Information

Investment Guidelines, Philosophy, and Risk Management	Tab 8
Capital Market Assumptions	Tab 9
Asset Exposure and Investment Program Summary	Tab 10
Performance	Tab 11
Managing Investment Fees, Expenses, and Carried Interest	Tab 12
Commitment to Pennsylvania-Based Investments	Tab 13

Section 4 – PSERS Postemployment Healthcare Programs

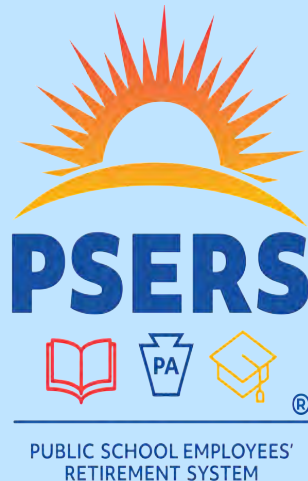
Health Options Program	Tab 14
Premium Assistance Program	Tab 15

PSERS BUDGET REPORT - FY2023-24

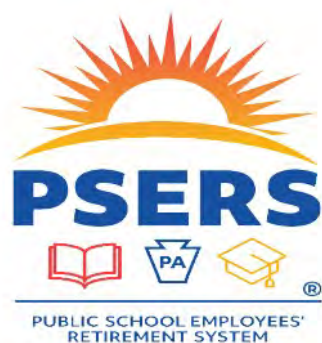


SECTION 1 - PSERS OVERVIEW

PSERS Overview and Board of Trustees	Tab 1
PSERS Organizational Structure and Member Services	Tab 2
Economic Impact on Pennsylvania, Member Demographics, and Financial Information	Tab 3
Actuarial Process and Pension Plan Funding	Tab 4
Employer Contribution Rate	Tab 5



PSERS Overview and Board of Trustees



Overview

Established on July 18, 1917, with operations commencing in 1919, the Pennsylvania Public School Employees Retirement System (PSERS, System, or Fund) provides retirement benefits to public school employees of the Commonwealth of Pennsylvania and administers post-employment healthcare benefits to PSERS retirees and dependents.

As of June 30, 2022, the System had approximately 248,000 active members. The annuitant membership was comprised of approximately 247,000 retirees and beneficiaries who collectively received average monthly pension benefit payments of over \$542 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was \$26,078. PSERS had 770 participating employers on June 30, 2022.

As reported in the latest Pension and Investments survey, published February 13, 2023, based on asset size, PSERS is the 34th largest plan among United States corporate and public pension plans, and the 16th largest state-sponsored public pension fund in the nation based on total plan assets. PSERS total plan net assets as of December

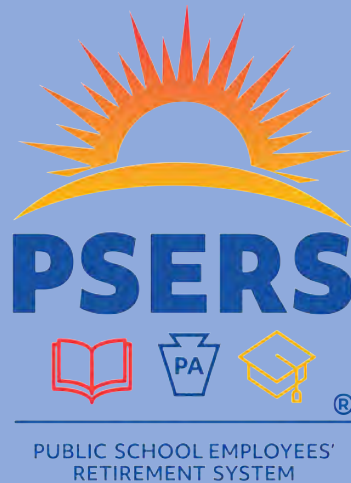
31, 2022 were approximately \$69.7 billion. PSERS preliminary annualized investment rates of return for the one, three, five, and ten-year periods ended December 31, 2022 are -6.14 %, 6.82%, 6.72%, and 7.16%, respectively.

During fiscal year 2022, PSERS pension disbursements to retirees totaled \$7.25 billion. Of this amount, nearly 91%, or \$6.6 billion, was distributed to Pennsylvania residents representing PSERS significant impact on the Commonwealth's economy.

In addition to retirement benefits, PSERS administers the Premium Assistance Program that provides a health insurance premium subsidy of up to \$100 per month for those retirees who qualify. At June 30, 2022, there are over 94,000 retirees who receive this benefit. PSERS also manages a health insurance program, PSERS Health Options Program, that is entirely funded through participating member premiums and provides Medicare Supplemental, Medicare Advantage, Prescription Drug, and Dental plans to over 124,000 annuitants and their dependents as of December 31, 2022.



Mission Statement



The Board of Trustees and the employees of the Public School Employees' Retirement System (System) serve the members and stakeholders of the System by:

- *Providing timely and accurate payment of benefits*
- *Maintaining a financially sound System*
- *Prudently investing the assets of the System*
- *Clearly communicating members' and employers' rights and responsibilities, and*
- *Effectively managing the resources of the System*

adopted June 20, 2008

PSERS Board of Trustees

as of March 11, 2023

Christopher Santa Maria, Chair

Susan C. Lemmo, Interim Vice Chair

Honorable Matt D. Bradford

House of Representatives

Jason M. Davis

Eric O. DiTullio

Honorable Torren Ecker

House of Representatives

Honorable Stacy Garrity

Treasurer of Pennsylvania

Sarah Hammer

Acting Secretary of Banking and Securities

Nathan G. Mains

Ann Monaghan

Dr. Khalid N. Mumin

Acting Secretary of Education

Honorable Katie J. Muth

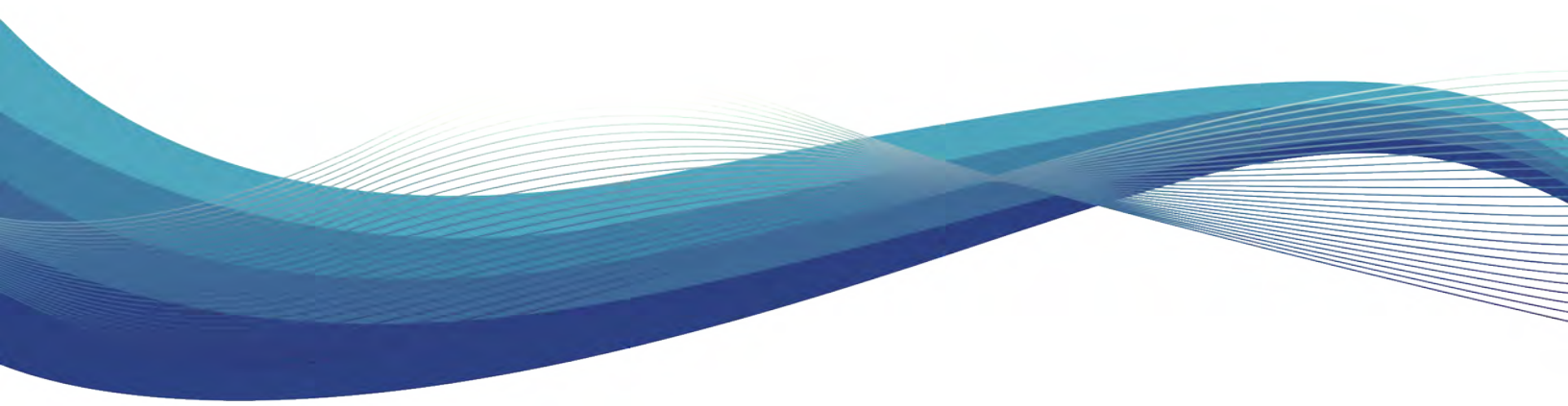
Senate of Pennsylvania

Brian A. Reiser

Joseph M. Torsella

Vacant

Senate of Pennsylvania



PSEERS Organizational Structure and Member Services

Organizational Structure of the Public School Employees' Retirement System

Executive Office

The Executive Director acts as the Chief Executive Officer with overall responsibility for the management of the Public School Employees Retirement System (PSERS) to achieve the objectives of the agency as established by the Board of Trustees (Board). The position's primary duty is to lead PSERS employees in meeting the agency mission by serving the members and stakeholders of the System to: provide timely and accurate payment of benefits; maintain a financially sound System; invest the assets of the System prudently; clearly communicate members' and employers' rights and responsibilities, and manage the resources of the System effectively. In this capacity, the position has responsibility for the establishment, installation, and maintenance of modern management techniques to provide an efficient control of funds and services to the members of the System. It certifies expenditures of the Fund and oversees the performance of professional staff and external contractors for specialized services. The Executive Director also appraises and seeks approval from the Board for significant issues that will affect the System and its operation.

Investment Office

This office is responsible for the investment activities of the System. In compliance with the investment policy established by the Board, PSERS investment assets are allocated to numerous internal investment professionals and outside professional investment advisors.

Chief Counsel's Office

This office provides legal services through a team of professionals in collaboration with PSERS Executive Director and the Board of Trustees. The legal staff is responsible for representing the System in all administrative hearings and other litigation matters and providing counsel in a wide variety of matters including the interpretation of the Retirement Code, form and legality of all System contracts, corporate governance issues and the structure and implementation of the System's varied financial investments.

Internal Audit Office

This office provides independent, objective assurance, and consulting activity designed to add value and improve PSERS operations. Objectives are accomplished by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. The office provides a wide range of quality independent internal auditing services for the Audit/Compliance Committee of the PSERS Board and executive management. It performs independent assessments of the systems of risk management, internal controls and operating efficiency, guided by professional standards and using innovative approaches. The office also routinely monitors compliance with established laws, rules, regulations, policies and procedures.

Office of Financial Management

This office is directed by the Chief Financial Officer (CFO) and has responsibility for planning, organizing and directing a complete accounting and financial reporting system in conformance with accounting principles generally accepted in the United States of America for PSERS Pension, Premium Assistance, HOP, and Defined Contribution Plans. The CFO also functions as the Chief Pension Actuary with oversight for the external actuary, the annual actuarial valuation and setting the employer contribution rate. The Office is also responsible for PSERS annuitant payroll and for managing actuarial functions. Oversight is provided for new systems development and maintenance of existing systems, and ensuring appropriate accounting controls. The office is the liaison for other state and federal agencies, reporting units, financial consultants, actuaries, and investment advisors for all accounting, financial reporting, treasury operations, taxation, actuarial and budgetary matters. The office is comprised of the CFO's Office, General and Public Market Accounting Division, Investment Accounting and Budget Division, Annuitant Accounting and Employer Accounting Division.

Organizational Structure (continued)

Deputy Executive Director and Director of Defined Contribution Investments

The position provides comprehensive leadership to assist the Executive Director to accomplish the agency mission by maintaining oversight of PSERS membership related benefit functions for both the agency's Defined Benefit (DB) and the Defined Contribution (DC) plans in addition to DC related investment contract management. This includes managerial responsibility for the following areas: member and employer communications; member retirement counseling; member and employer data administration; benefits determinations and processing; member appeals; knowledge management of benefit policies and procedures; health insurance retirement programs including premium assistance; third-party contractor administration, and defined contribution contract investment management.

Deputy Executive Director of Administration

The position provides comprehensive leadership to assist the Executive Director to accomplish the agency mission by maintaining oversight of PSERS administrative and information technology related services for the agency. This includes managerial responsibility for the following areas: information technology; human resources; physical security; facilities; contracting and procurement; business continuity; safety; records management; and mail, imaging, and printing services.

Bureau of Benefits Administration

The Bureau of Benefits Administration maintains account data, determines membership and benefits eligibility, and calculates benefits for Pennsylvania public school employees. This bureau provides these functions for all benefits provided by PSERS, except the PSERS Health Options and Premium Assistance Programs.

Bureau of Communications and Counseling

The bureau provides services to educate and inform annuitants, members, employers, staff and the public about the benefit related programs and services provided by PSERS, as well as the rights and duties of employers and members in relation to those benefits. Information communicated spans from very detailed and fact-specific explanations and instructions to more general explanations and educational materials.

Health Insurance Office

This office is responsible for all aspects of the PSERS Health Options Program (HOP) and administering the PSERS annuitant health insurance premium assistance benefits. HOP is a voluntary statewide plan that provides group health insurance coverage for school retirees, their spouses, and eligible dependents.

Organizational Structure (continued)

Information Technology Office

This office oversees the Bureau of Information Technology, the Project Management Office, and the Business Architecture Center. It is responsible for information technology planning and policy development, ensuring that information technology plans, projects and policies are aligned with, in support of, and prioritized according to agency strategic needs and requirements. Large information technology contracts and projects are managed by this office. This bureau is responsible for understanding, analyzing, documenting, and enabling PSERS processes, information systems, and the relationships among these components so that PSERS is able to: conduct its business consistently and according to established rules.

Information Security Office

This office is responsible strategic direction of the agency's information and data security protocols. Work includes monitoring of the agency's deployed information technology hardware; administering the agency cybersecurity insurance policy; consulting with all other agency units on information technology controls and risk management; and providing policy and procedural direction for ensuring an informed information and data security incident response program.

Bureau of Administration

This bureau provides facilities, purchasing and contracting, policies and procedures, business continuity, records management, automotive, mail, imaging, and other administrative services necessary to support agency functions.

Human Resources Office

This office is responsible for supporting management and employees to facilitate the accomplishment of the agency's mission. It administers all human resources programs and ensures compliance with labor law and Commonwealth regulations. Programs include position classification, labor relations, recruitment and placement, employee benefits, employee compensation and pay, training and staff development, time and attendance, performance management, organizational development and support, employee transactions, Equal Employment Opportunities and other miscellaneous programs.

Chart 2.1

Organizational Chart of the Public School Employees Retirement System



PSERS REGIONAL OFFICES

Chart 2.2

Northwest

Franklin Penn Wood Center
 464 Allegheny Boulevard, Suite C
 Franklin, PA 16323-6210
 FAX: 1.814.437.5826
 Toll-Free: 1.888.773.7748
 Kevin Moczan, Administrator

Northcentral

300 Bellefonte Avenue, Suite 201
 Lock Haven, PA 17745-1903
 FAX: 1.570.893.4414
 Toll-Free: 1.888.773.7748
 Jeremy Wible, Administrator

Northeast

417 Lackawanna Avenue, Suite 201
 Scranton, PA 18503-2013
 FAX: 1.570.614.0278
 Toll-Free: 1.888.773.7748
 John Kanavy, Administrator



Southwest

300 Cedar Ridge Drive, Suite 301
 Pittsburgh, PA 15205-1159
 FAX: 1.412.920.2015
 Toll-Free: 1.888.773.7748
 Jason Kosier, Administrator

Centralwest

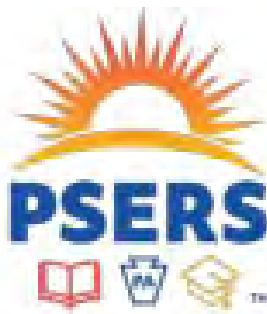
219 W. High Street
 Ebensburg, PA 15931-1540
 FAX: 1.814.419.1189
 Toll-Free: 1.888.773.7748
 Brian Farester, Administrator

Southcentral

5 N 5th Street
 Harrisburg, PA 17101-1905
 FAX: 1.717.783.9606
 Toll-Free: 1.888.773.7748
 John Tucker, Administrator

Southeast

605 Louis Drive, Suite 500
 Warminster, PA 18974-2830
 FAX: 1.215.443.3487
 Toll-Free: 1.888.773.7748
 Joshua Catalfu, Administrator
 Linda Visco, Administrator



Section 1 - PSERS Overview

Summary of Various Member Service Statistics

There are only 382 staff serving the needs of over 500,000 members of the System and 770 employers. PSERS professionals are dedicated to fulfilling PSERS mission to serve

our members. Below are highlights of some of the more common services that PSERS provides to its members.

Table 2.1

Benefits Processed (Major)	Fiscal Year	
	<u>2021-22</u>	<u>2020-21</u>
Initial Retirements (1-Step)	7,363	8,034
Initial Retirements (2-Step)	2,290	1,975
Final Retirements (2nd Step of 2-Step)	1,238	1,865
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld	6,416	4,335
Refunds	4,608	3,832
Death Benefits Processed	3,016	4,307
Account Verification - non retirements	16,156	11,990
TOTAL	41,087	36,338
Percent of Retirement Paid as 1 Step	76%	80%

Table 2.2

Other Member Services (Major)	Fiscal Year	
	<u>2021-22</u>	<u>2020-21</u>
Retirement Estimates	17,944	17,640
Phone Calls Answered	148,440	185,115
E-mails Received	111,176	64,944
E-mails Sent	104,750	55,605
General Information Sessions	40	—
General Information Attendees	3,259	—
Counseling Sessions	1,389	1,061
Counseling Attendees	6,971	6,485

Section 1 - PSERS Overview

Summary of Various Member Service Statistics (continued)

Table 2.3

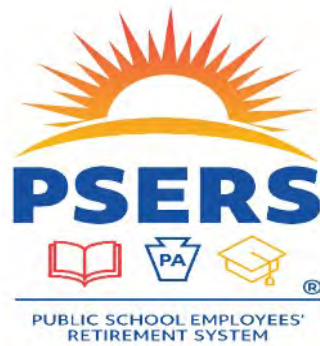
Member Self Service Transactions Done by Members	Calendar Year	
	2022	2021
Retirement Estimate	56,716	23,959
Nomination of Beneficiary	20,859	17,953
Address Change	21,895	13,403
Income Verification	16,739	16,242
W-4P	1,858	1,679
Apply for Multiple Service	84	57
Elect Class T-F	4	2
Elect Class T-H	114	91
Elect Class DC	271	244
Waive Membership	229	176
TOTAL	118,769	73,806

Table 2.4

Member Payment Services for Retirees and Beneficiaries	Calendar Year	
	2022	2021
Monthly Benefit Payments by EFT	2,822,394	2,761,363
Monthly Benefit Payments by Check	83,310	103,539
Total Monthly Payments to Members	2,905,704	2,864,902
Non-recurring Payments to Members	45,531	46,839
W4-P Tax Withholding Forms Processed	3,092	2,410
EFT Forms Processed - Direct Deposit	9,387	11,452
ACH Rejects Researched and Reviewed (Direct Deposit Failures)	5,886	7,092
Member Payment Changes Processed	1,825	2,535
1099R-Paperless Delivery	78,428	68,139
1099R-Printed and Mailed	193,756	199,989
Total Forms 1099-R Produced	272,184	268,128

PSERS had nearly 240,000 members sign up for the MSS account. Of those, over 92% are receiving paperless delivery. This has resulted in annual savings of over \$275,000 in postage, printing and paper since MSS went live in April 2018.

Economic Impact on Pennsylvania, Member Demographics, and Financial Information



Section 1 - PSERS Overview

Economic Impact on Pennsylvania, Member Demographics, and Financial Information

Economic Impact of Pension Benefits on Pennsylvania

In Fiscal Year 2021-22, PSERS pension disbursements to retirees totaled approximately \$7.25 billion. Of this amount, nearly 91%, or \$6.6 billion, went directly into state and local economies. According to a study by Pensionomics for the National Institute on Retirement Security, this spending expands through the economy as the retiree’s spending becomes another’s income, multiplying the effect of the \$6.6 billion into an economic impact of \$14.0 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes:*

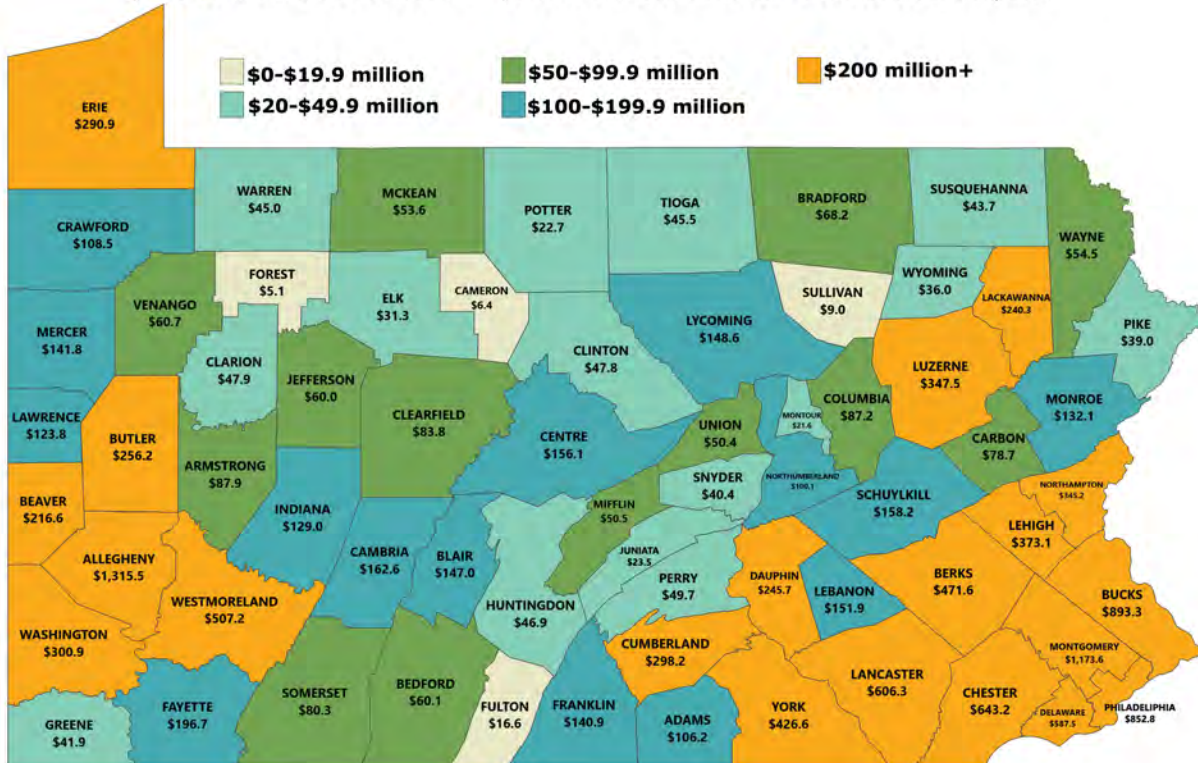
- Support for over 55,000 jobs that paid \$3.4 billion in wages and salaries.
- \$1.2 billion in federal and local tax revenues.

Table 3.1 Top 10 Counties Based on Economic Impact from Benefit Disbursements (Dollars in Millions)	
ALLEGHENY	\$1,315.5
MONTGOMERY	1,173.6
BUCKS	893.3
PHILADELPHIA	852.8
CHESTER	643.2
LANCASTER	606.3
DELAWARE	587.5
WESTMORELAND	507.2
BERKS	471.6
YORK	426.6

Pension Benefits in Pennsylvania

By County FY 2021-22

\$6.6 Billion in Benefits = \$14.0 Billion Positive Economic Impact



*Pensionomics The National Institute on Retirement Security, January 2023

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.2

Member by Type

<u>Fiscal Year Ended June 30</u>	<u>Active Members</u>	<u>Annuitants, Beneficiaries, and Survivor Annuitants</u>	<u>Total Active/Retired Members</u>	<u>Ratio of Active/ Retired</u>	<u>Vestees</u>	<u>Total Membership</u>
2022	248,393	246,901	495,294	1.01 to 1	26,836	522,130
2021	248,410	242,839	491,249	1.02	26,892	518,141
2020	256,306	239,614	495,920	1.07	25,903	521,823
2019	255,749	237,339	493,088	1.07	25,514	518,602
2018	256,362	233,288	489,650	1.10	25,117	514,767
Average ratio of active members to annuitants (Public Funds)				1.26*		

*Based on the October 2022 Public Fund Survey prepared by the National Association of State Retirement Administrators (NASRA).

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.3

Profile of PSERS Annuitants, Beneficiaries, and Survivor Annuitants

Type of Member	Number of Members		Average Annual Benefit	
	<u>6/30/2022</u>	<u>6/30/2021</u>	<u>6/30/2022</u>	<u>6/30/2021</u>
Normal/Early Retirees	225,081	221,277	\$26,842	\$26,783
Survivor Annuitants	13,100	12,704	\$15,982	\$15,529
Disability Retirees	8,720	8,858	\$21,526	\$21,218
Total/Average Yearly Benefit	246,901	242,839	\$26,078	\$25,992

Age and Service Profile of All Active Members				
	<u>6/30/2022</u>	<u>6/30/2021</u>		
Average Age	45.4	45.5		
Average Years of PSERS Service	12.1	12.1		
Average Annual Compensation	\$58,082	\$56,663		

	Class T-C Members		Class T-D Members	
	<u>6/30/2022</u>	<u>6/30/2021</u>	<u>6/30/2022</u>	<u>6/30/2021</u>
Number of Members	2,391	2,635	139,161	148,546
Average Age	54.8	54.4	49.5	49.2
Average Years of PSERS Service	23.2	22.7	18.1	17.4
Average Annual Compensation	\$63,170	\$59,759	\$71,767	\$68,659

	Class T-E Members		Class T-F Members	
	<u>6/30/2022</u>	<u>6/30/2021</u>	<u>6/30/2022</u>	<u>6/30/2021</u>
Number of Members	53,374	57,944	13,082	13,766
Average Age	42.0	41.2	40.6	39.9
Average Years of PSERS Service	5.5	4.6	6.1	5.1
Average Annual Compensation	\$42,727	\$38,989	\$54,275	\$50,590

	Class T-G Members		Class T-H Members	
	<u>6/30/2022</u>	<u>6/30/2021</u>	<u>6/30/2022</u>	<u>6/30/2021</u>
Number of Members	39,655	25,061	210	139
Average Age	37.1	36.4	36.8	35.8
Average Years of PSERS Service	1.1	0.9	2.1	1.6
Average Annual Compensation	\$31,778	\$29,558	\$38,452	\$33,252

	Class DC	
	<u>6/30/2022</u>	<u>6/30/2021</u>
Number of Members	520	319
Average Age	42.2	44
Average Years of PSERS Service	1.9	0.7
Average Annual Compensation	\$36,140	\$34,019

NOTE: See percentages of membership classes as referenced in Tab 5.

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

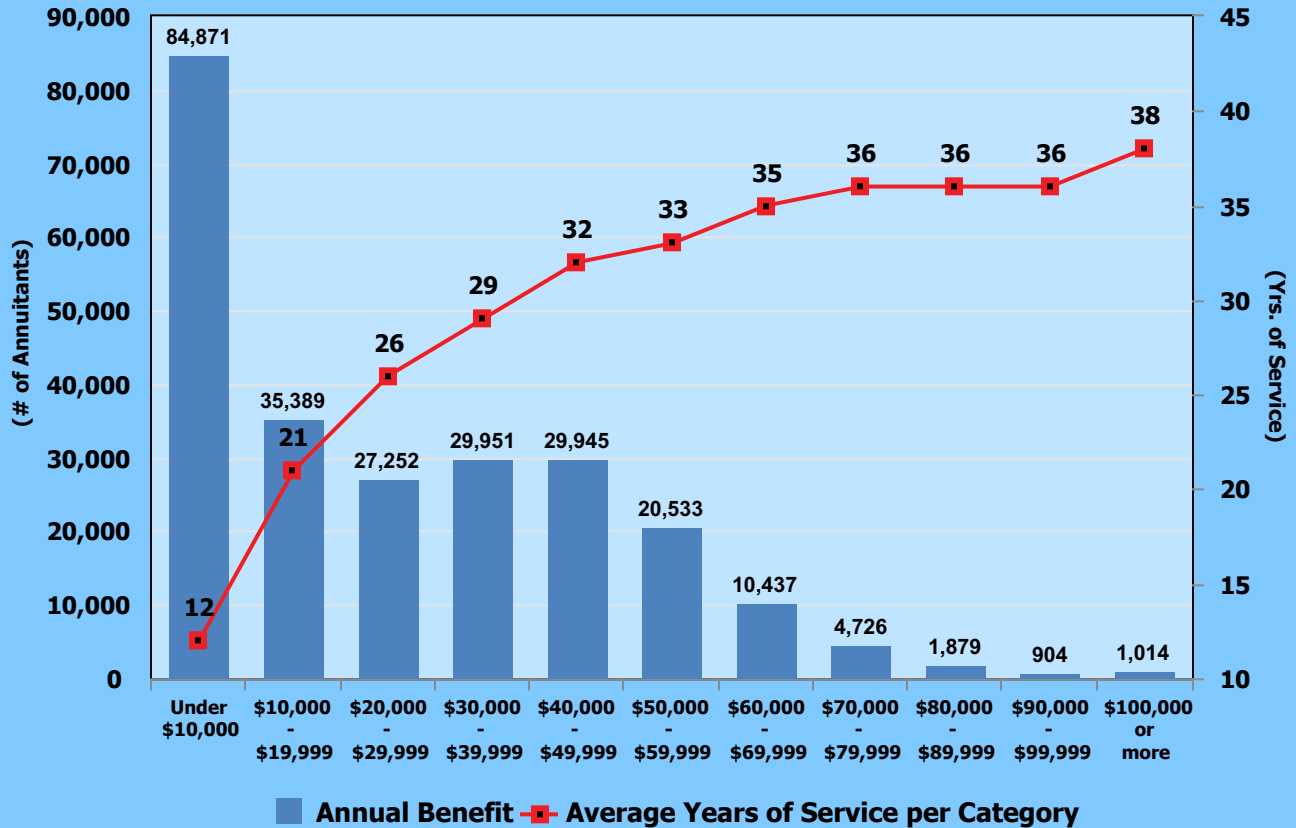
Benefit Summary

The average PSERS retiree receives \$26,078 annually, a benefit earned through a lengthy career averaging 23 years in public education.

- Nearly 72% of PSERS retirees receive less than \$40,000 per year in benefits.
- Six-figure pensions are rare, with fewer than one-half of 1% of PSERS retirees

receiving an annual benefit over \$100,000. Retirees earning over six figures have spent an average of 38 years working in their careers and contributing to their retirement accounts.

Chart 3.1 Distribution of Annual Pension Amounts Compared to Average Years of Service as of June 30, 2022



Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.4

PSERS Pension Plan Changes in Fiduciary Net Position 10 Year Cumulative Summary - FISCAL YEAR (Dollar Amount in Millions)

	Cumulative 10 Year Total July 1, 2012 - June 30, 2022
Balance of Net Position (07/01/2012)	\$48,534
Member Contributions	\$10,319
Employer Contributions	36,228
Net Investment Income	41,854
Deductions - Benefits & Expenses	(66,407)
Net Increase	\$21,994
Balance of Net Position (06/30/2022)	\$70,528

Table 3.5

External Cash Flow - Pension Fiscal Years Ended June 30 (Dollar Amount in Thousands)

	-----Projected-----					
	2022	2023	2024	2025	2026	2027
Member Contributions	\$1,134,000	\$1,144,000	\$1,146,000	\$1,143,000	\$1,141,000	\$1,139,000
Employer Contributions	\$4,998,000	\$5,171,000	\$5,050,000	\$5,169,000	\$5,315,000	\$5,450,000
Total Contributions	\$6,132,000	\$6,315,000	\$6,196,000	\$6,312,000	\$6,456,000	\$6,589,000
Less:						
Benefits	\$7,254,000	\$7,401,000	\$7,549,000	\$7,697,000	\$7,847,000	\$7,998,000
Administrative expenses	\$50,000	\$51,000	\$52,000	\$53,000	\$54,000	\$55,000
Total Outflows	\$7,304,000	\$7,452,000	\$7,601,000	\$7,750,000	\$7,901,000	\$8,053,000
Negative External Cash Flow	-\$1,172,000	-\$1,137,000	-\$1,405,000	-\$1,438,000	-\$1,445,000	-\$1,464,000
End of Year Total Assets	\$70,528,000	\$74,289,000	\$78,038,000	\$82,018,000	\$86,271,000	\$90,805,000
Negative External Cash Flow (NECF) as a % of Total Assets	-1.7 %	-1.5 %	-1.8 %	-1.8 %	-1.7 %	-1.6 %
Average NECF as a % of Total Assets (Public Funds) *	-2.2%					

*Based on the October 2022 Public Fund Survey prepared by NASRA.

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Negative External Cash Flow (NECF)

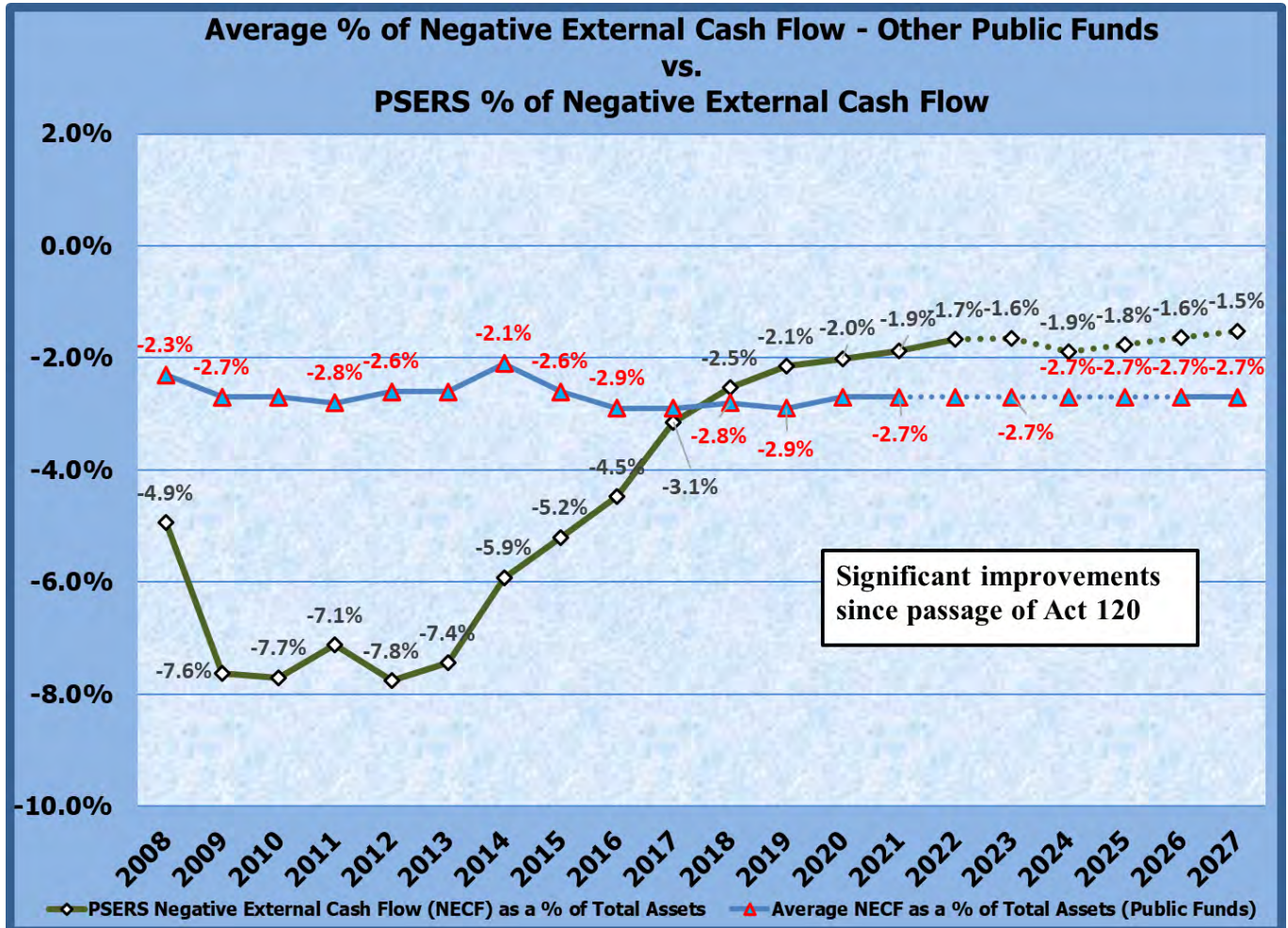
Using data from Table 3.4 on the previous page, the last 10 years of contributions and benefit payments resulted in a Negative External Cash Flow (NECF) of -\$19.9 billion (comprised of total deductions less member and employer contributions) during that time period. In Table 3.5, PSERS Negative External Cash Flow percentage is -1.7% of total assets for FY2021-22, which was more favorable than the public fund average for the fifth year in a row. The negative annual external cash flow has improved significantly since fiscal year 2012 due to the implementation of Act 120 in 2010. Act 120 provided for increased employer contributions to the actuarially determined contribution levels. Due to

receiving 100% of actuarially determined contributions for the sixth consecutive year in FY 2021-22, the system's cash flow shortfall has now stabilized and is more favorable than the public fund average going forward.

PSERS Negative External Cash Flow Projection (NECF)

In Chart 3.2, beginning in FY2017-18 PSERS NECF percentage of -2.5% is more favorable than the public fund percentage. If PSERS meets or exceeds its investment return assumptions, the Chart 3.2 total assets are projected to grow in excess of total liabilities and continue to pay down the unfunded liability.

Chart 3.2



Member Demographics and Financial Information (continued)

Section 1 - PSERS Overview

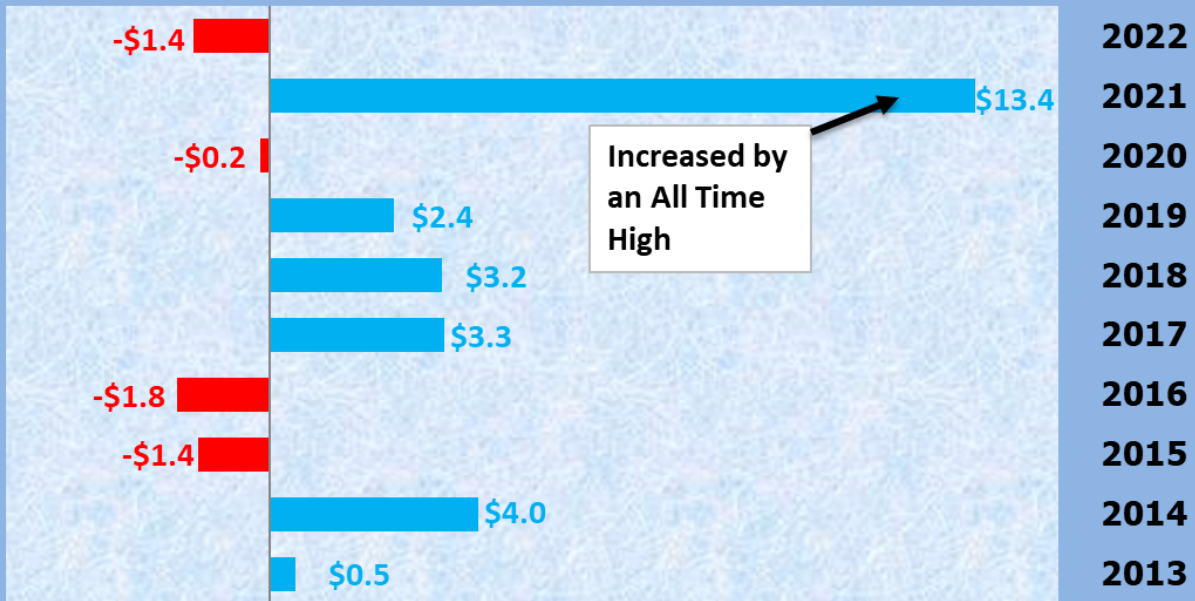
Member Demographics and Financial Information (continued)

PSERS Pension Fiduciary Net Position

As depicted in Chart 3.3, PSERS fiduciary net position decreased by \$1.4 billion from \$71.9 billion at June 30, 2021 to \$70.5 billion at June 30, 2022.

The decrease was due in large part to deductions for benefits, administrative expenses, and net investment loss exceeding member and employer contributions.

**Chart 3.3 Net Increase/Decrease to Fiduciary Net Position *
10 Year Trend (Fiscal Year Ended June 30)
(Dollar Amounts in Billions)**

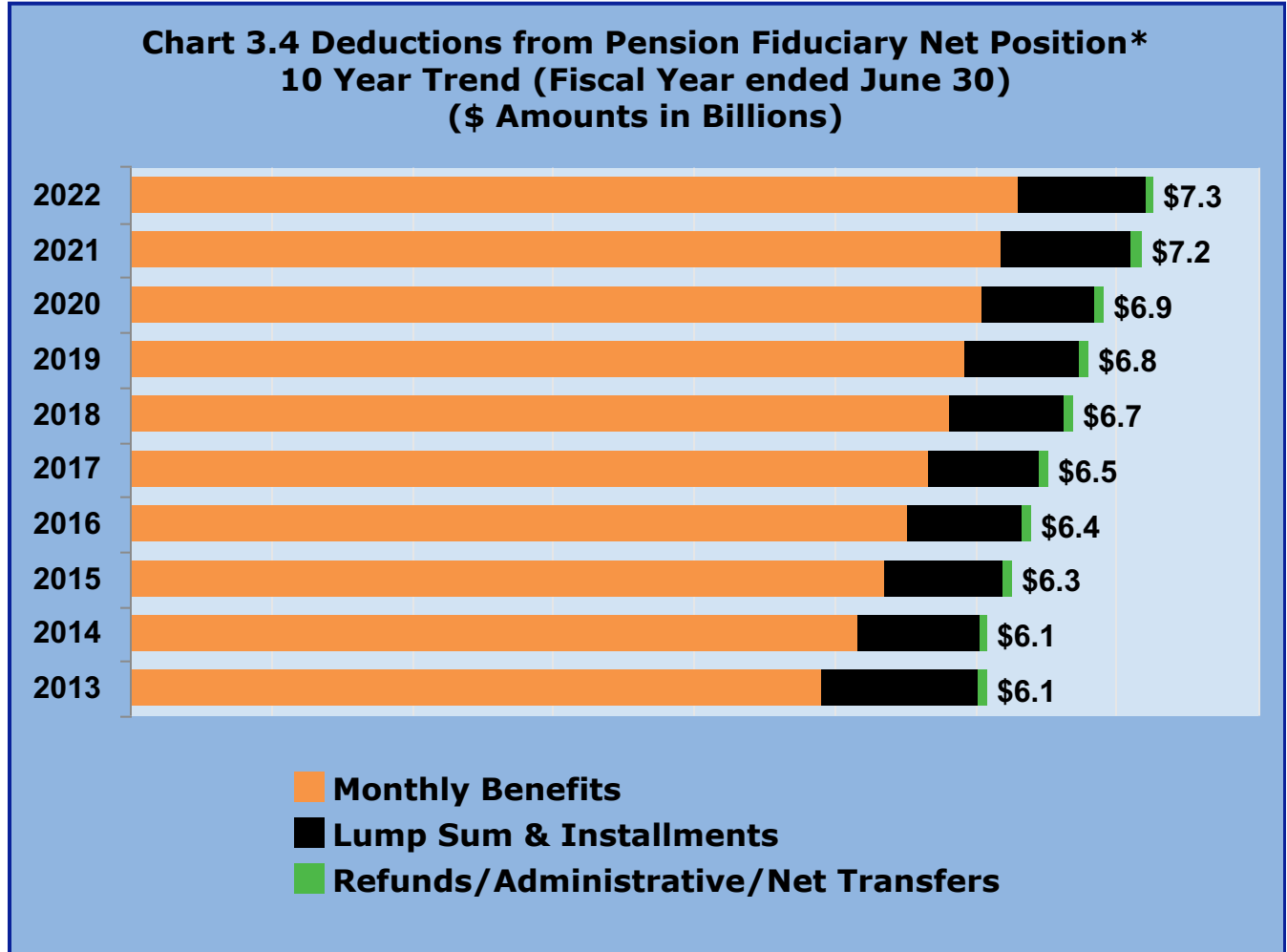


Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

PSERS Deductions from Pension Fiduciary Net Position

As depicted in Chart 3.4, the increase for FY2021-22 to FY2022-23 is mainly attributed to an ongoing rise in the average monthly benefit and an increase in the number of members receiving benefits.



*Does not include PSERS Postemployment Healthcare and DC Plans' Net Position.

Section 1 - PSERS Overview

Statement of Fiduciary Net Position As of December 31, 2022 Unaudited (Dollar Amounts in Thousands)

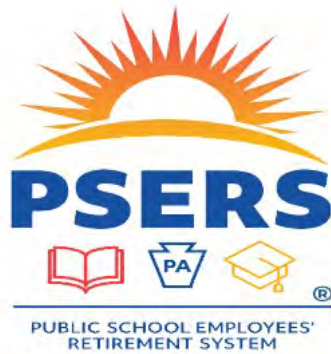
	Postemployment Healthcare				
	Pension	Defined Contribution	Premium Assistance	Health Options Program	Totals
Assets:					
Receivables:					
Members	\$ 381,859	\$ 615	\$ 1,480	\$ 122	\$ 384,076
Employers	1,332,181	473	29,726	—	1,362,380
Investment income	529,781	23	434	386	530,624
Investment proceeds	424,529	—	—	—	424,529
CMS Part D and prescriptions	—	—	—	68,551	68,551
Interfund receivable	2,883	—	—	—	2,883
Total Receivables	2,671,233	1,111	31,640	69,059	2,773,043
Investments, at fair value:					
Short-term	5,833,251	10,036	106,785	409,411	6,359,483
Fixed income	14,766,297	—	—	—	14,766,297
Common and preferred stock	19,575,982	—	—	—	19,575,982
Collective trust funds	2,751,819	127,980	—	—	2,879,799
Real estate	7,087,402	—	—	—	7,087,402
Alternative investments	17,526,236	—	—	—	17,526,236
Total Investments	67,540,987	138,016	106,785	409,411	68,195,199
Securities lending collateral pool	10,595,022	—	—	—	10,595,022
Capital assets (net of accumulated depreciation \$44,394)	13,380	—	—	—	13,380
Miscellaneous	31,441	5	—	—	31,446
Total Assets	80,852,063	139,132	138,425	478,470	81,608,090
Liabilities:					
Accounts payable and accrued expenses	97,524	110	179	6,266	104,079
Benefits payable	264,330	—	117	35,780	300,227
HOP participant premium advances	—	—	—	34,406	34,406
Investment purchases and other payables	687,090	857	—	—	687,947
Obligations under securities lending	10,595,022	—	—	—	10,595,022
Interfund payable	—	619	2,264	—	2,883
Other liabilities	152,236	—	—	—	152,236
Total Liabilities	11,796,202	1,586	2,560	76,452	11,876,800
Net position restricted for pension, DC and postemployment healthcare benefits	\$ 69,055,861	\$ 137,546	\$ 135,865	\$ 402,018	\$ 69,731,290

Section 1 - PSERS Overview

Statement of Changes in Fiduciary Net Position Six Months Ended December 31, 2022 Unaudited (Dollar Amounts in Thousands)

	Pension	Defined Contribution	Premium Assistance	Postemployment Healthcare Health Options Program	Totals
Additions:					
Contributions:					
Members	\$ 561,366	\$ 22,741	\$ —	\$ —	\$ 584,107
Employers	2,520,001	17,601	55,961	—	2,593,563
Total contributions	3,081,367	40,342	55,961	—	3,177,670
HOP participant premiums	—	—	—	205,235	205,235
Centers for Medicare & Medicaid Services	—	—	—	31,516	31,516
Investment income:					
From investing activities:					
Net appreciation (depreciation) in fair value of investments	(1,556,631)	2,434	—	—	(1,554,197)
Short-term	103,676	84	1,686	2,288	107,734
Fixed income	377,794	—	—	—	377,794
Common and preferred stock	197,666	—	—	—	197,666
Collective trust funds	823	46	—	—	869
Real estate	105,007	—	—	—	105,007
Alternative investments	146,037	—	—	—	146,037
Total investment activity income	(625,628)	2,564	1,686	2,288	(619,090)
Investment expenses	(207,964)	(111)	—	—	(208,075)
Net income from investing activities	(833,592)	2,453	1,686	2,288	(827,165)
From securities lending activities:					
Securities lending income	168,202	—	—	—	168,202
Securities lending expense	(155,930)	—	—	—	(155,930)
Net income from securities lending activities	12,272	—	—	—	12,272
Total net investment income	(821,320)	2,453	1,686	2,288	(814,893)
Total Additions	2,260,047	42,795	57,647	239,039	2,599,528
Deductions:					
Benefits	3,684,477	—	56,721	206,473	3,947,671
Refunds of contributions	20,430	—	—	—	20,430
Distributions	—	2,995	—	—	2,995
Administrative expenses	27,521	1,225	537	20,337	49,620
Total Deductions	3,732,428	4,220	57,258	226,810	4,020,716
Net increase (decrease)	(1,472,381)	38,575	389	12,229	(1,421,188)
Net position restricted for pension, DC and postemployment healthcare benefits:					
Balance, beginning of year	70,528,242	98,971	135,476	389,789	71,152,478
Balance, end of period	\$ 69,055,861	\$ 137,546	\$ 135,865	\$ 402,018	\$ 69,731,290

Actuarial Process and Pension Plan Funding



Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding

Nearly all PSERS members are part of a defined benefit (DB) plan, meaning benefits are based on members' service and salary history. Act 5 of 2017 created two new hybrid defined benefit/defined contribution benefit options and a defined contribution only plan but did not go into effect until July 1, 2019. The following information highlights the actuarial process and funding for PSERS DB plan.

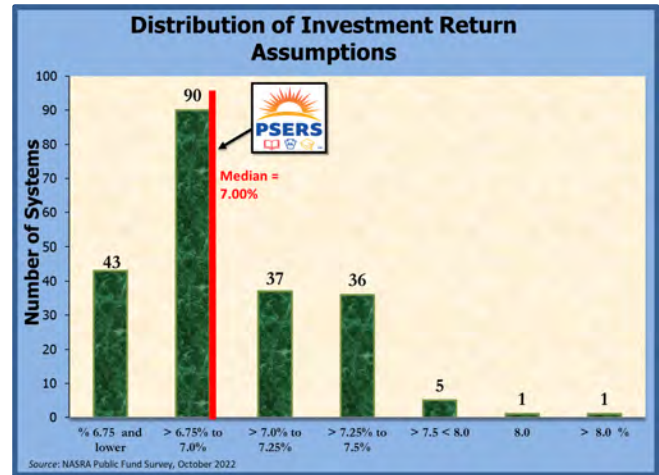
Actuarial Process

The actuarial process presumes that there will be a systematic flow of contributions at a specified level to pay for plan benefits and that the flow of contributions, together with investment earnings, will be sufficient to meet all benefit and expense requirements of the plan. Actuarial cost methods for funding PSERS pension plan are defined in the Public School Employees Retirement Code. The actuary for the pension plan and PSERS board and staff professionals review economic and demographic experience annually and, in more depth, over five-year periods. The actuary's periodic valuations test the validity of the underlying actuarial assumptions versus the actual experience of the plan. That experience is also used as a basis for formulating actuarial assumptions about what will occur in the future with respect to salary growth, investment returns, and demographic factors such as rates of retirement and death.

Actuarial Experience Study - June 30, 2020

Effective with the June 30, 2021 actuarial valuation, PSERS adopted several new demographic and economic assumptions as a result of the five-year Experience Study completed by PSERS actuary. PSERS investment rate of return assumption was changed from 7.25% to 7.00%, the salary growth assumption was changed from 5.00% to 4.50%, the inflation assumption was reduced from 2.75% to 2.50%, the payroll growth assumption was reduced from 3.50% to 3.25% and the rates of withdrawal, disability and retirement from employment among active members were updated and mortality rates were revised. Chart 4.1 displays PSERS 7.00% return assumption in comparison to other funds in the public pension universe.

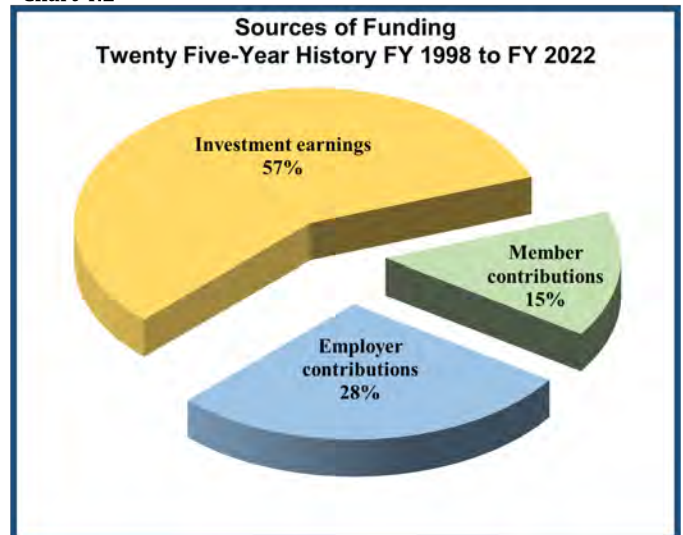
Chart 4.1



Funding

The plan is funded through three sources (1) employer contributions; (2) member contributions; and, (3) investment earnings. As depicted in Chart 4.2, for the twenty-five-year period ended June 30, 2022, investment earnings provided 57% of PSERS funding followed by 28% from employers while members contributed 15%.

Chart 4.2



The Actuarial Process and Pension Plan Funding (continued)

Employer Contributions

The Retirement Code vests PSERS Board with the authority to establish the employer contribution rate (ECR) based on the parameters in the Retirement Code. The Board in consultation with the actuary and PSERS staff establishes the employer contribution rate annually, as part of the annual actuarial valuation. The employer contribution rate, which is expressed as a percentage of payroll, is composed of three items: (1) the pension, (2) the defined contribution and (3) the healthcare premium assistance contributions.

The total contribution rate for the fiscal year ended June 30, 2022 was 34.94%. This rate consists of a 33.99% pension rate, 0.15% defined contribution estimated average rate plus the healthcare premium assistance contribution of 0.80%.

The total employer contribution rate for the fiscal year ending June 30 2023 is 35.26%. This rate consists of a 34.31% pension rate, 0.20% defined contribution estimated average rate plus the healthcare premium assistance contribution of 0.75%.

The FY2023-2024 employer contribution rate is 34.00%. This rate consists of a 33.09% pension rate, 0.27% defined contribution estimated average rate plus the healthcare premium assistance contribution of 0.64%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of PSERS Retirement Code, at their December 2022 meeting. This represents the first decrease in the ECR since the fiscal year ended June 30, 2009, when rates were being restricted due to Act 40. The very large increases that employers experienced prior to FY2017-2018 are now in the past. The FY2023-2024 rate is declining by 126 basis points or 3.57% of the FY2022-23 ECR. The ECR decrease was caused primarily by PSERS employers strong payroll growth and favorable demographic changes involving mortality and retirement experience.

The decline in the FY2023-2024 ECR is a one-year decline and ECR rates are expected to rise again slowly. Future increases, however, will start from the lower FY2023-24 base ECR of 34.00%. This means projected ECR increases are expected to remain lower than previous projections over the next few years.

For the fiscal year ended June 30, 2022, PSERS employer contributions totaled \$5.141 billion, which includes \$117 million for healthcare premium assistance and \$25 million for defined contribution. For the fiscal year ending June 30, 2023, the estimate for total employer contributions is \$5.103 billion, reflective of the 35.26% contribution rate. The contribution rate for the fiscal year ending June 30, 2024 is 34.00%, resulting in an employer contribution estimate of \$4.994 billion.

Member Contributions

Most members of the Public School Employees Retirement System contribute between 7.5% and 10.8% of their pay depending on their class of membership to help fund their own retirement benefit. The average contribution rate payable by the members for the current year (FY2022-23) is 7.52%. This is in contrast to the majority of nonpublic (private) pension plans to which members do not contribute (Source: based on a query of private plan IRS Form 5500 filings). For these plans, the employers bear 100% of the costs of the benefit.

According to recent National Association of State Retirement Administrators (NASRA) data, PSERS member contribution rate is one of the highest among U.S. public pension plans that participate in Social Security.

The Actuarial Process and Pension Plan Funding (continued)

Member Contributions (continued)

Pursuant to Act 120, Class T-E and Class T-F members are subject to a shared risk employee contribution rate. Act 5 enhanced the shared risk program for T-E and T-F members and also added Class T-G and T-H members to the program. Under the shared risk program, eligible members benefit when investments of the Fund are doing well and share some of the risk when investments underperform. The member contribution rate will stay within the specified range allotted for Class T-E, T-F, T-G and T-H but can fluctuate by the shared risk increment every three years depending on the investment performance of PSERS. These members share a portion of the investment risk of the Fund. The member risk share measurement for the nine-year period ended June 30, 2020 determined that PSERS investment performance did not meet the shared risk target return, resulting in the statutorily prescribed increase in the shared risk contribution rate.

Membership Class T-E, Class T-F, Class T-G, and Class T-H member defined benefit contribution rates increased on July 1, 2021. The next member risk share measurement is for the ten-year period ended June 30, 2023 and may affect the Class T-E, Class T-F, Class T-G, and Class T-H member contributions starting on July 1, 2024. PSERS members contributed \$1.134 billion of pension contributions for FY2022-23. Total member contributions are estimated to be \$1.129 billion for the fiscal year ending June 30, 2023 and \$1.133 billion for the fiscal year ending June 30, 2024.

Investment Returns

PSERS investment rate of return for the fiscal year ended June 30, 2022 was 2.23%, net of fees. The investment rates of return (net of fees) for the fiscal years ended June 30, 2021 and 2020 were 24.58% and 1.12%, respectively. The preliminary annualized rates of investment return for the one, three, five, and ten-year periods ended December 31, 2022 are -6.14%, 6.82%, 6.72%, and 7.16%, respectively.

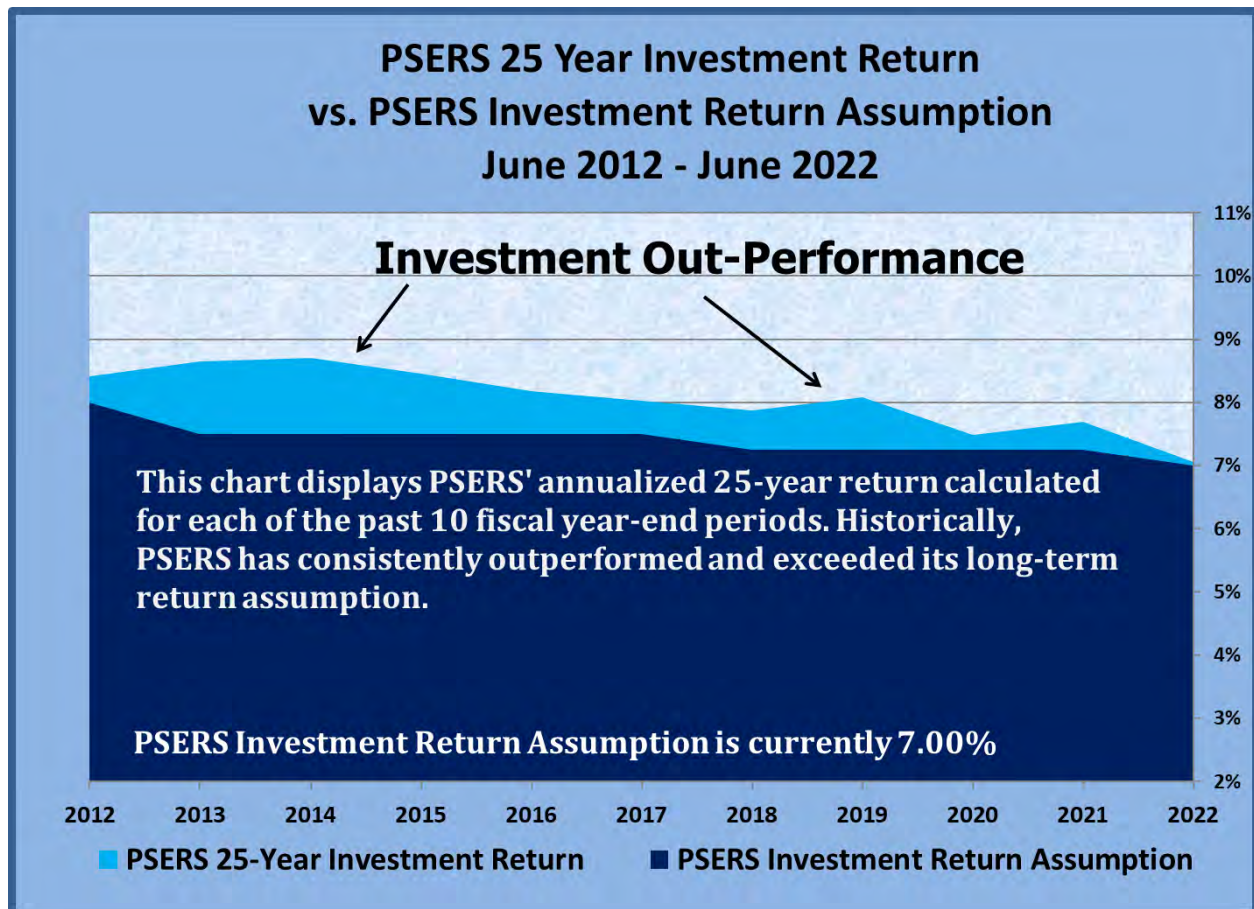
Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

PSERS 25-year return, as shown in Chart 4.3, has consistently outperformed the actuarial investment rate of return. Throughout much of the 1990's and 2000's, PSERS investment performance exceeded its investment rate of return assumption. However, the most recent 25-year period return through

December 31, 2022 is 6.79% (preliminary), which is 21 bps below this assumption. Overall, long-term investment performance resulted in declining employer contribution rates and/or contribution rates lower than the annual normal cost of benefits.

Chart 4.3



Funded Status

PSERS funded status is measured by comparing the actuarial value of assets with the accrued liability. The accrued liability is the present value of benefits accumulated to date for both active and retired members.

Key Facts

As a result of legislated contribution increases under Act 120, PSERS reached a turning point effective with the June 30, 2018 actuarial valuation as PSERS funded ratio began to slowly improve after declining for many years.

- Funded Status: 59.6% as of June 30, 2021
- Funded Status: 59.2% as of June 30, 2020
- Funded Status: 58.1% as of June 30, 2019
- Funded Status: 56.5% as of June 30, 2018

The increase in FY2021-22 is the fourth consecutive improvement in the funded ratio, on an actuarial basis.

- Funded Status: 61.6% as of June 30, 2022

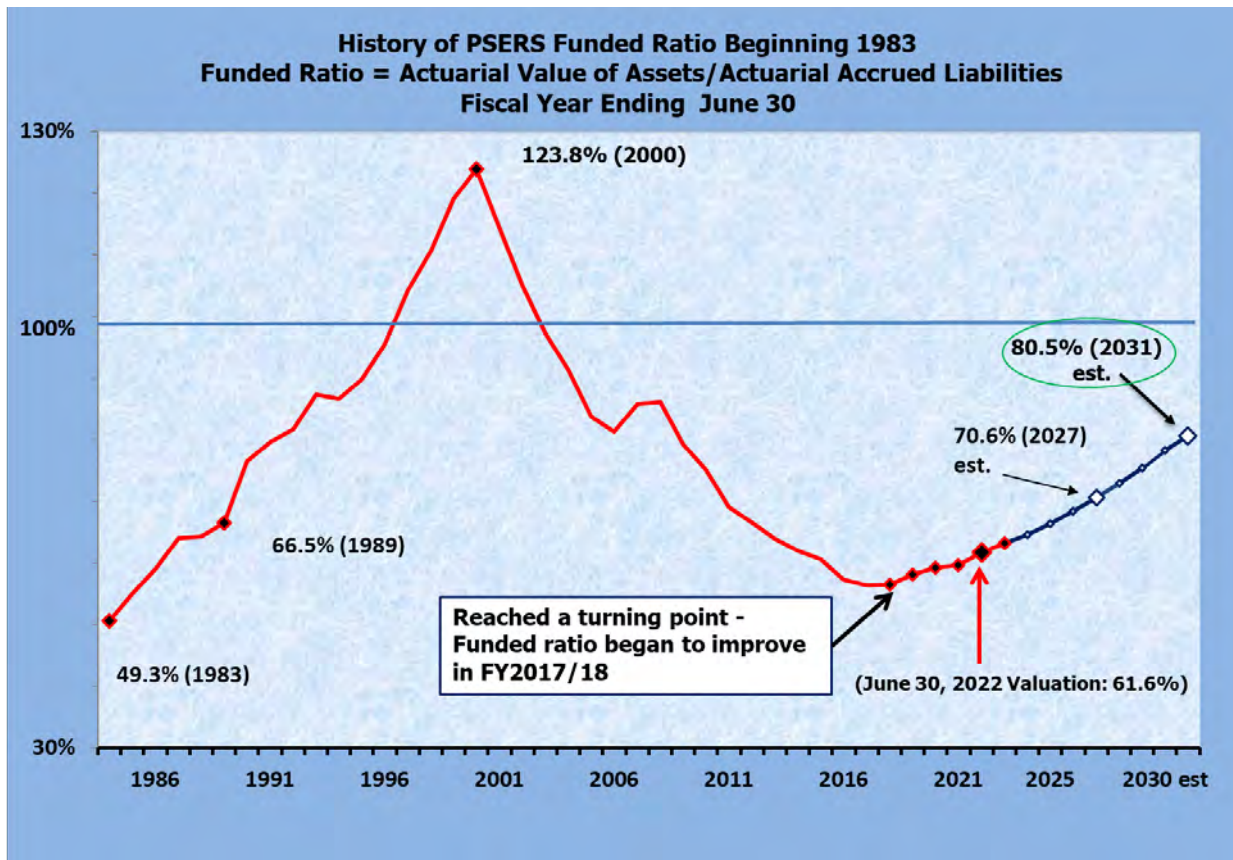
Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

The decrease in the funded status from 2000 to 2017 as depicted in Chart 4.4 was the result of several factors including: the unfavorable investment markets from 2001 to FY2002-03 and FY2007-08 to FY2008-09; funding changes enacted in Act 38 of 2002 and Act 40 of 2003 which resulted in employers underfunding PSERS; benefit enhancements from Act 9 and Act 38; the adoption of new demographic and economic assumptions in FY2015-16; funding collars in Act 120 which continued the employer underfunding of the system; and actuarial liability losses.

A history of PSERS funded ratio beginning in 1983 and nine-year projection of PSERS funded status is shown in Chart 4.4. PSERS funded ratio began in FY2017-18 to slowly improve after declining for many years. Future projections now reflect a steadily increasing funded ratio reaching 80.5% in less than a decade.

Chart 4.4



Section 1 - PSERS Overview

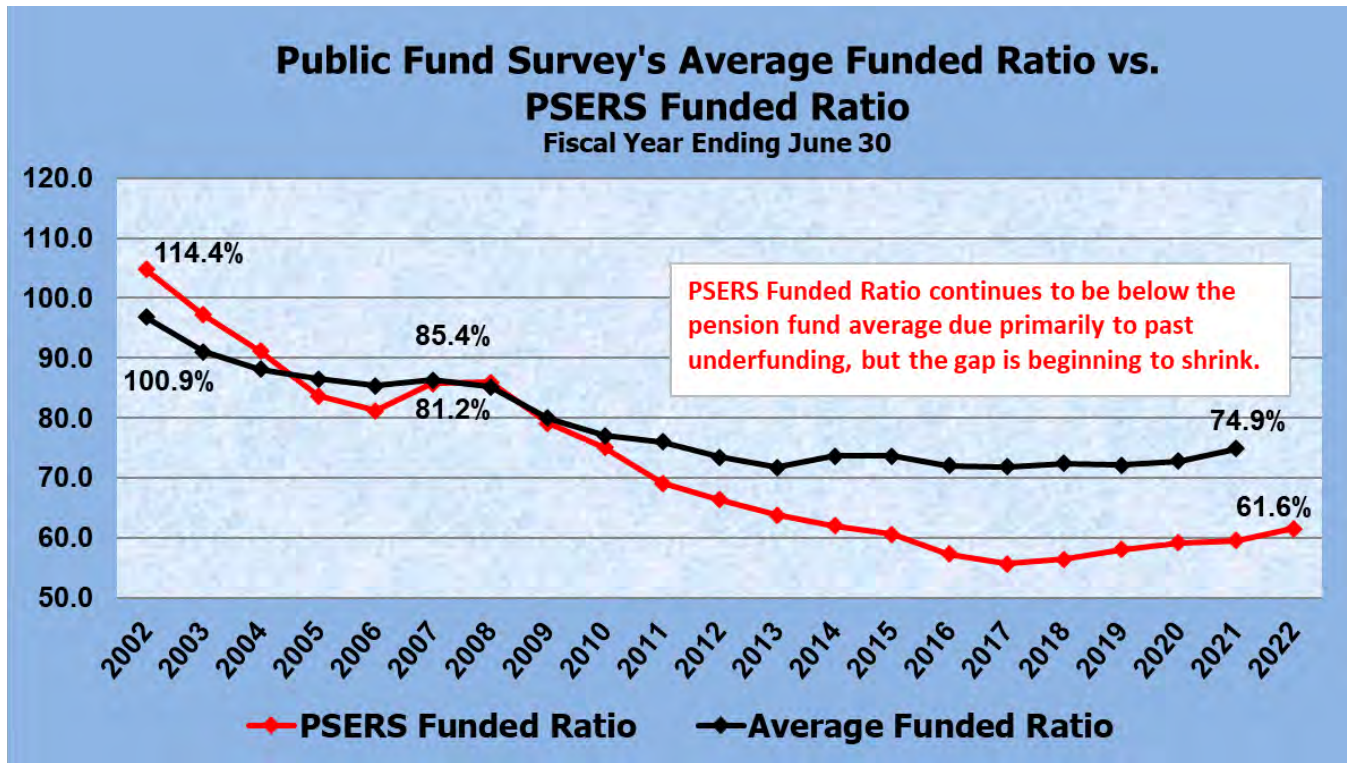
The Actuarial Process and Pension Plan Funding (continued)

A comparison of PSERS funded ratio to the public fund projected weighted average funding ratio provided by the National Association of State Retirement Administrators (NASRA) is shown in Chart 4.5 below. A lower than average funded ratio is an important factor because it signifies a smaller than average asset base. A smaller asset base means a greater percentage of the investment returns are being used to pay benefits, and results in a slower growth of assets. High employer contributions are required in order for assets to grow.

Since July 1, 2016 PSERS employer contribution rate has provided 100% of the actuarially required contributions. This was the first major step needed for PSERS funded ratio to begin to improve. As noted previously, as a result of receiving 100% of the actuarially required contributions for the second consecutive year, PSERS funded ratio began to increase in FY2017-18 and has steadily improved through FY2021-22. The gap between PSERS funded ratio and the public fund average is shrinking.

Besides market performance, other factors that affect a plan's funding level include contributions made relative to those that are required; changes in benefit levels; changes in actuarial assumptions, and rates of employee salary growth (Public Fund Survey, 2022).

Chart 4.5



Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

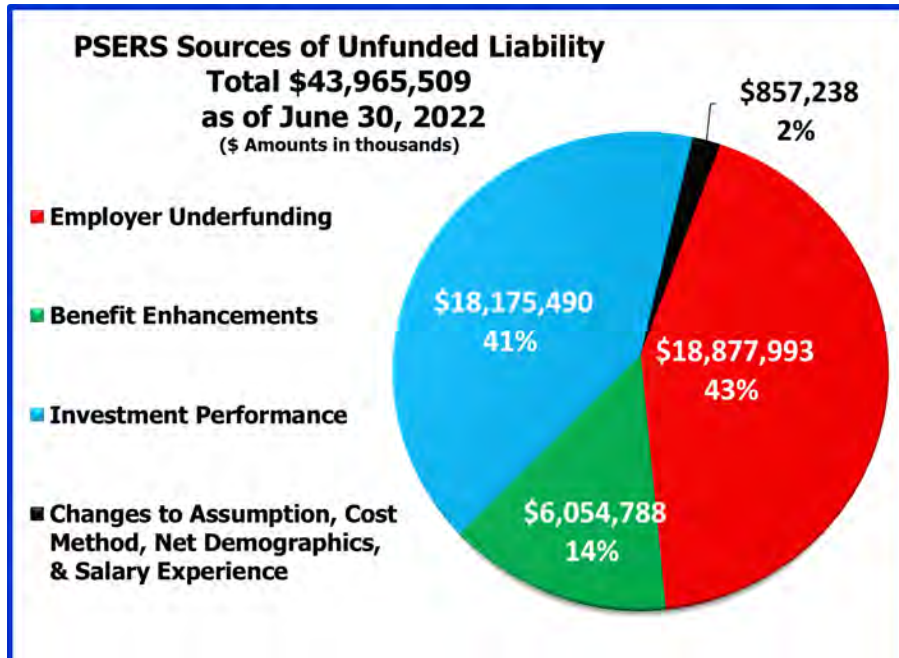
Sources of Unfunded Liability

The System's total funded ratio (for Pensions and Health Insurance combined) is 61.6% as of June 30, 2022. This funded ratio is based on an actuarial value of assets of \$70.65 billion and a total accrued liability of \$114.61 billion which equates to a \$43.96 billion unfunded liability. Strong payroll growth among PSERS employers and favorable demographic changes including mortality and retirement experience, coupled with sustained actuarial ECR funding, have contributed to a \$1.5 billion decrease in the System's long-term unfunded actuarial liability in FY2021-22, the largest decline since FY2006-07. Chart 4.6 depicts the sources of the unfunded liability. The largest sources of unfunded liability in order of magnitude are employer funding deferrals (43%), investment performance (41%), and benefit enhancements (14%), which include Act 9, cost of living increases and early retirement incentives that were not prefunded.

Throughout the 1990's and early 2000's, PSERS outstanding investment performance compensated for unfunded benefit enhancements and employer funding deferrals. The Great Recession of 2008-2009 had a negative impact upon the System's long-term investment performance and eliminated most of the significant investment out-performance. Without the significant investment out-performance to compensate, the employer funding deferrals and benefit enhancements have significantly increased PSERS unfunded liability.

Approximately 57% of PSERS June 30, 2022 unfunded liability is due to employer funding deferrals and benefit enhancements.

Chart 4.6



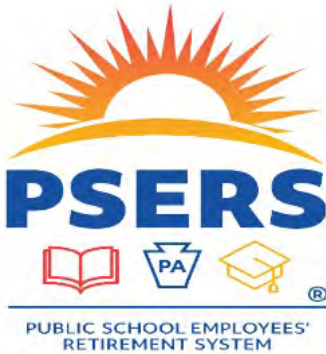
The Actuarial Process and Pension Plan Funding (continued)

GASB 68 and 75 Pension and Healthcare Reporting for Employers

In June 2022, PSERS sent information to its employers to assist them in complying with GASB Statement No. 68, Accounting and Financial Reporting for Pensions and Statement No. 75, Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB). The information sent to employers included a memo explaining PSERS role, descriptions of the material provided, and the

employers responsibilities. In addition to the memo, PSERS provided a variety of schedules audited by PSERS independent public accountants as well as unaudited schedules. PSERS strives to incorporate all the information necessary for employers to comply with GASB 68 and 75 reporting requirements in these audited and unaudited schedules. Additionally, PSERS continues to make itself available to assist employers and their auditors should they have any additional requests in order to comply with GASB 68 and 75.

Employer Contribution Rate



Section 1 - PSERS Overview

Employer Contribution Rate

PSERS undergoes an annual independent actuarial valuation to calculate the actuarial assets and liabilities of the pension fund. Based on the actuarial valuation process, the actuary in consultation with PSERS board and staff professionals, develops the recommended Employer Contribution Rate (ECR) that determines the employer contributions to the pension plan, defined contribution plan, and healthcare premium assistance. The valuation process also measures the progress of the pension system toward funding pensions for its active and retired members.

Employer Contribution Rate Statistics

- Highest historical ECR (FY2022-23) 35.26 %
- Lowest historical ECR (FY2001-02) 1.09 %
- Ten yr. avg. ECR (2013-14 to 2022-23) 29.92 %
- Twenty yr. avg. ECR (2003-04 to 2022-23) 18.08 %
- Thirty yr. avg. ECR (1993-94 to 2022-23) 14.39 %
- Adopted ECR {FY2023-24} 34.00 %

Act 120 of 2010

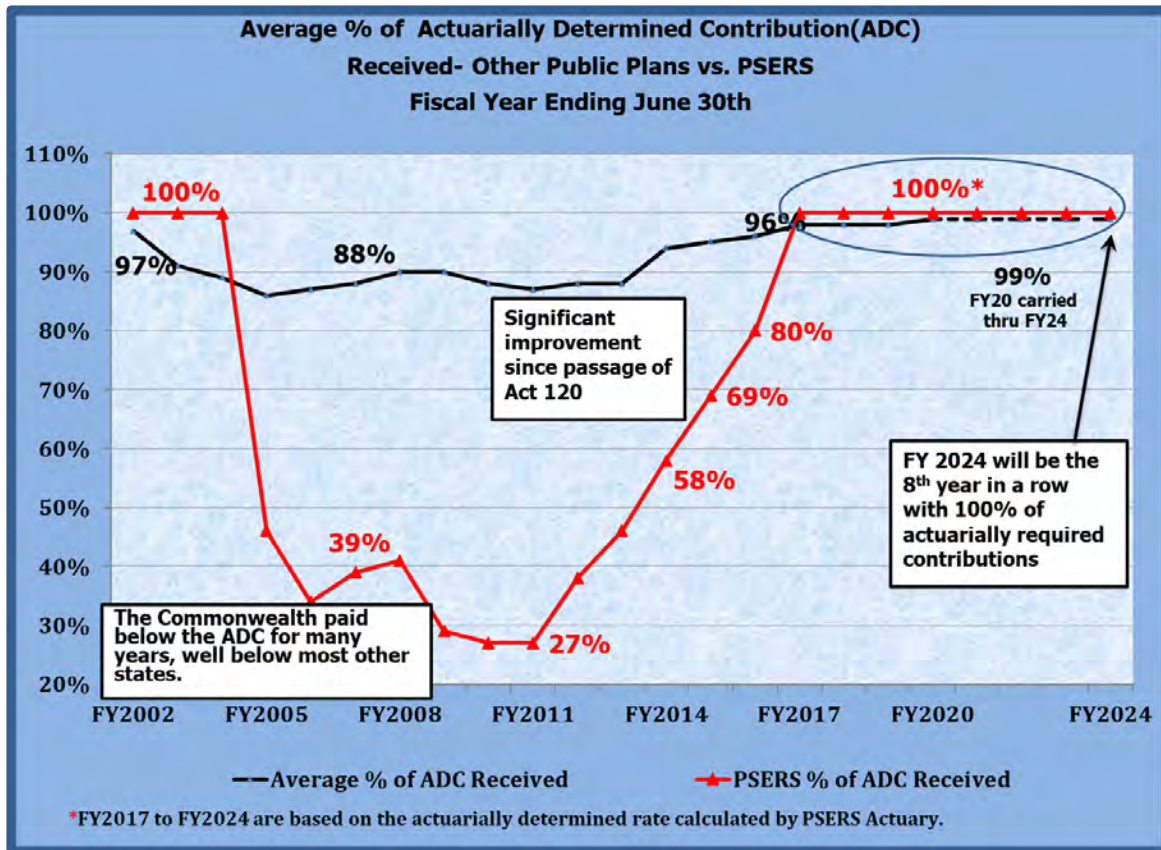
Progress on Funding Issue

PSERS is now in the 12th year under Act 120 of 2010. Act 120 provided historic pension reform and made dramatic progress toward addressing funding issues at PSERS. The legislation included actuarial and funding changes to PSERS and benefit reductions for individuals who became new members of PSERS on or after July 1, 2011.

As depicted in Chart 5.1, the gradual rate increases under Act 120 raised PSERS employer contributions to the 100% annual required contribution (ARC) goal, now referred to as the actuarially determined contributions (ADC) starting in FY2016-17.

An ADC includes both the employer's normal cost and the amount required to amortize the unfunded actuarial accrued liability (UAAL) in an actuarially sound manner. PSERS Board certified an employer contribution rate of 34.00% for FY2023-24 in compliance with Act 120 and Act 5 of 2017.

Chart 5.1



Employer Contribution Rate (continued)

This will be the eighth consecutive year PSERS contribution rate provides 100% of the actuarially determined contributions based on sound actuarial practices and principles and now exceeds the average ADC percentage of 99% for public funds based on the October 2022 Public Fund Survey prepared by NASRA. FY2023-24 is also the first decline in Employer Contribution Rate in over a decade.

Impact of Benefit Reduction for New Members on or after July 1, 2011

For school employees who became new members of PSERS on or after July 1, 2011 through June 30, 2019, there are two membership classes with “shared risk” elements: Class T-E and T-F. As of June 30, 2022, T-E and T-F members now total over 66,000 and account for 27% of the total active membership.

Class T-E

- Pension multiplier is 2%
- Effective July 1, 2011 employee contribution base rate is 7.5% (base rate) with “shared risk” contribution levels between 7.5% and 9.5%

Class T-F

- Pension multiplier is 2.5%
- Effective July 1, 2011 employee contribution base rate is 10.3% (base rate) with “shared risk” contribution levels between 10.3% and 12.3%

As of June 30, 2022, 53,374 or 80% of new members remained in Class T-E and 13,082 or 20% of new members elected Class T-F. As indicated, Class T-F members maintain the higher 2.5% pension multiplier but fully pay for the higher benefit by contributing a higher member contribution rate than Class T-E members.

Impact of Benefit Reduction for New Members on or after July 1, 2019

For school employees who became new members of PSERS on or after July 1, 2019 through present, there are two membership classes with shared risk elements: Class T-G and T-H or DC. As of June 30, 2022, T-G and T-H members now total over 40,000 and account for 16% of the total active membership. Class DC members now total 520.

Class T-G

- Pension multiplier is 1.25%
- Effective July 1, 2019 employee contribution base rate is 8.25% (base DB rate of 5.5% plus DC rate of 2.75%) with “shared risk” contribution levels between 8.25% and 11.25%

Class T-H

- Pension multiplier is 1.00%
- Effective July 1, 2019 employee contribution base rate is 7.5% (base DB rate of 4.5% plus DC rate of 3.0%) with “shared risk” contribution levels between 7.5% and 10.5%

Class DC

- Effective July 1, 2019 employee contribution rate is 7.5%

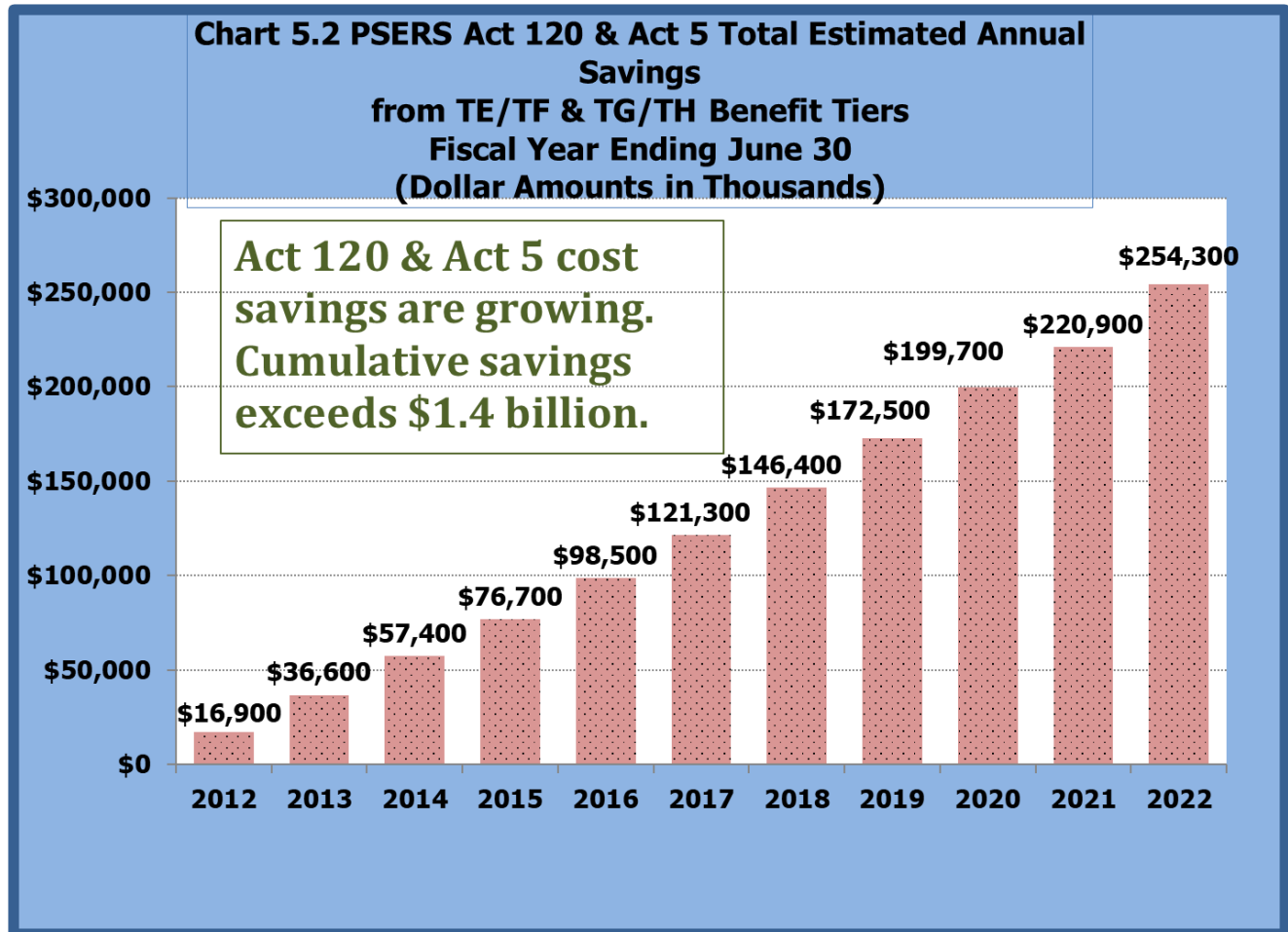
As of June 30, 2022, 39,655 or 99% of new members remained in Class T-G and 210 or 1% of new members elected Class T-H. As indicated, Class T-G members maintain the higher 1.25% pension multiplier but fully pay for the higher benefit by contributing a higher member contribution rate than Class T-H members.

Section 1 - PSERS Overview

Employer Contribution Rate (continued)

The total estimated savings of the T-E/T-F and T-G/T-H Benefit Tiers is illustrated in Chart 5.2. As the membership of these classes grew through FY2021-22, the annual savings from the low T-E/T-F and T-G/T-H cost structure also increased and allowed a greater portion of employer contributions to go towards paying the unfunded

liability. Class T-E and T-F closed to new members after June 30, 2019. Cumulative estimated savings through June 30, 2022 are \$1.401 billion. The average member benefit for Act 120 members is approximately 32% lower than the benefit for pre - Act 120 members.



Funding Changes - Employer Contributions

Act 120 of 2010 also suppressed the employer contribution rate by using rate caps to keep the rate from rising too high, too fast for budgetary purposes. The rate caps limited the amount the pension component of the employer contribution rate could increase over the prior year's rates. Effective with FY2016-17 the rate caps were no

longer in place. PSERS Board has approved a total employer contribution rate of 34.00% for FY2023-24 which represents a decrease of 3.57% from the FY2022-23 rate of 35.26%. This is the first decrease in the ECR since FY2008-09 when rates were being restricted due to Act 40.

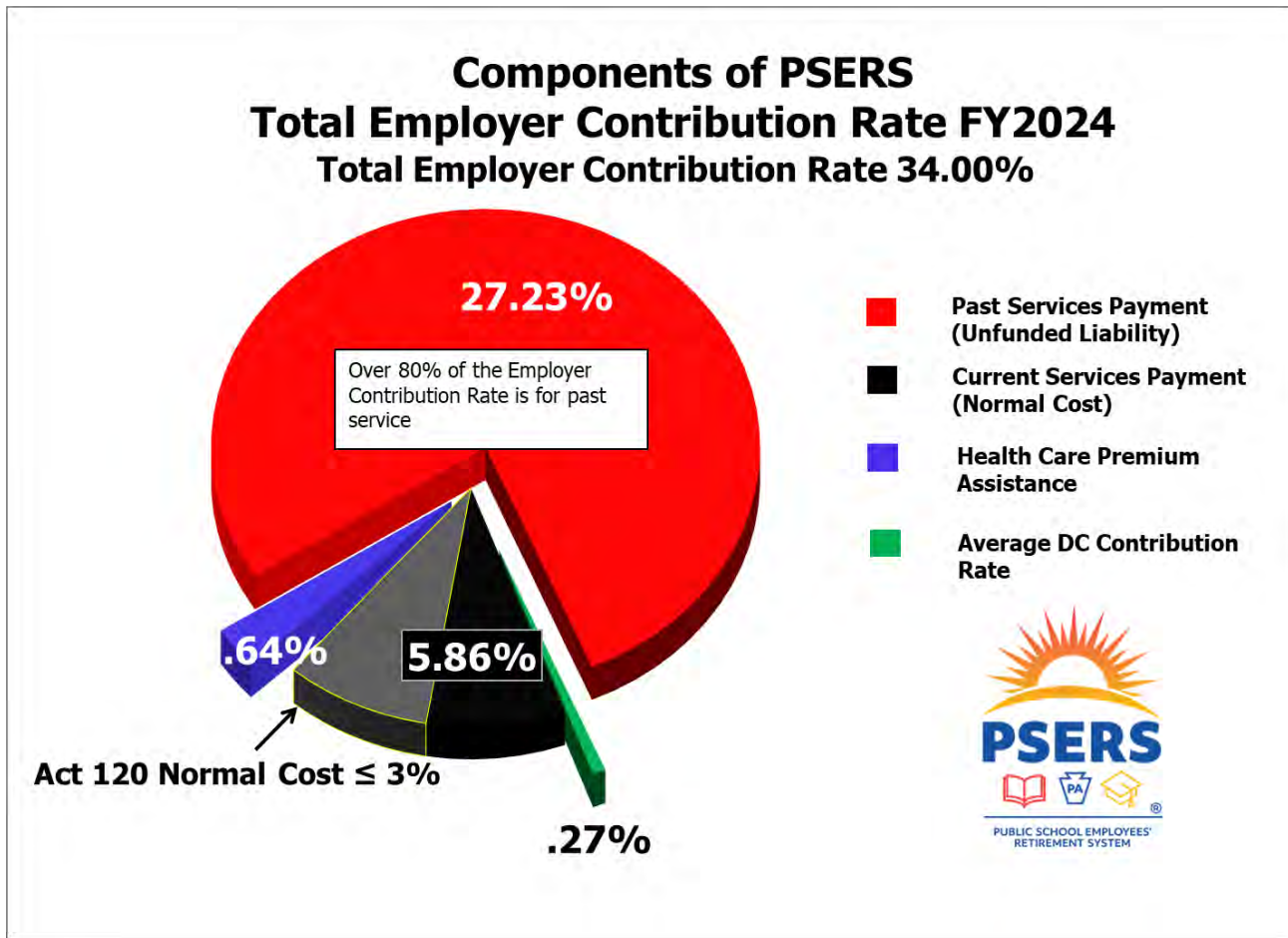
Employer Contribution Rate (continued)

Employer Contribution Rate

Chart 5.3 displays the components of PSERS certified employer contribution rate of 34.00% in FY2023-24. The majority of the rate, over 80%, is dedicated toward paying the cost of past service. The employers' cost for current service is a much smaller portion of the contribution rate and is projected to decrease each year as more post Act 120/Act 5 members join the System and pre-Act 120 members retire. The cost structure of PSERS

members since Act 120 is lower than pre-Act 120 and the shared risk provisions shift a portion of the investment risk to active members. New members after June 30, 2019 fall under Act 5. Act 5 continues the low cost of current benefits created by Act 120 and shifts additional investment risks to members in the future as the defined contribution plan of Act 5 grows.

Chart 5.3



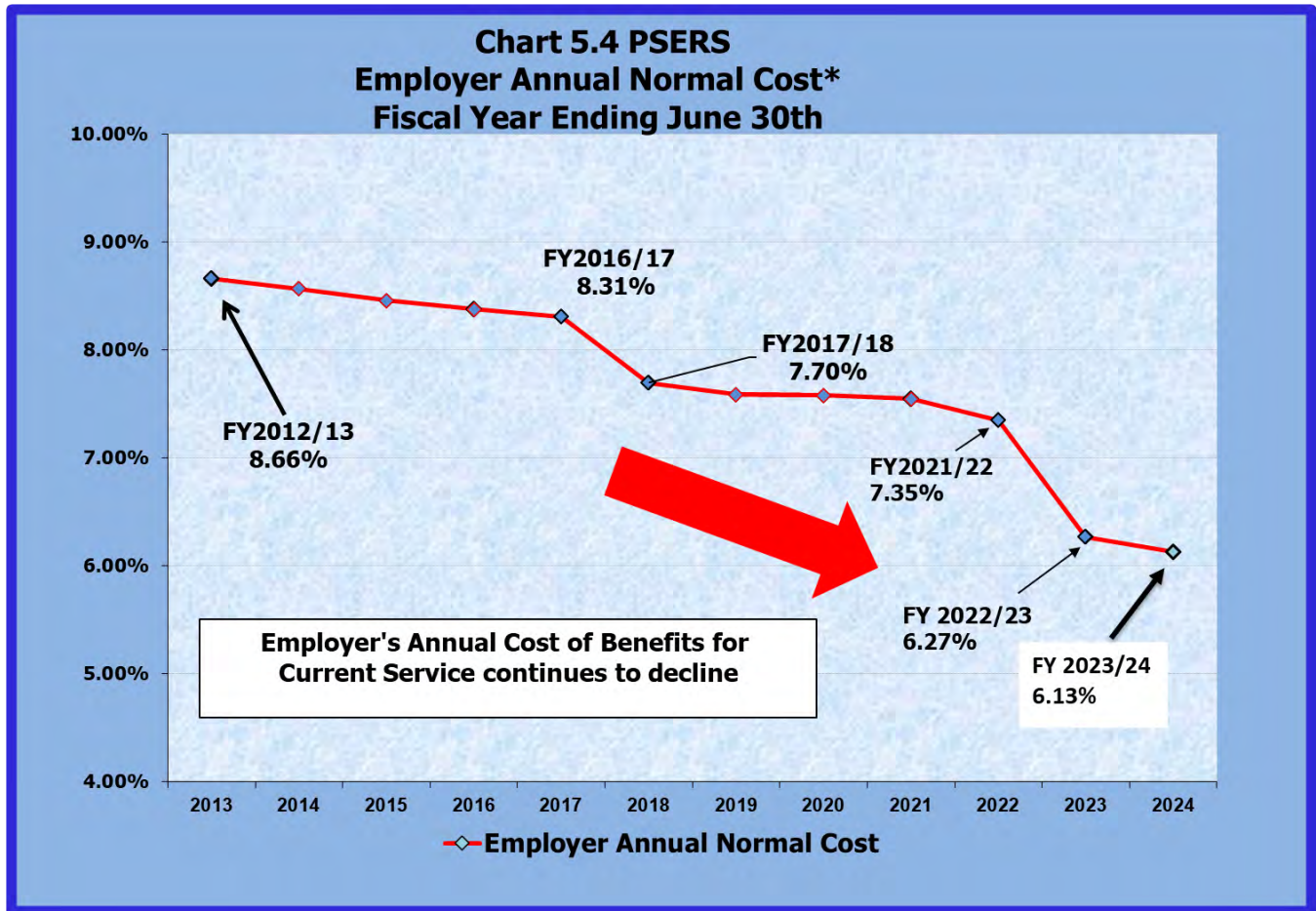
Section 1 - PSERS Overview

Employer Contribution Rate (continued)

Act 120 Employer Costs

As Chart 5.4 depicts, the employer normal cost decreases over time as Act 120 and Act 5 members replace retiring pre-Act 120 members. The employer normal cost of current benefits earned by Act 120 and Act 5 members is less than 3% of payroll which is less than 65% of the normal cost for pre-Act 120 members. This represents a

significant cost reduction for the employers. Chart 5.4 projects the employer normal cost to be 6.13% in FY2023-24 which is a 29% reduction from the 8.66% normal cost in FY2012-13. The substantial decrease from 7.35% in FY2021-22 to 6.27% in FY2022-23 is mainly due to the continued migration to lower cost members and from the new actuarial assumptions adopted by the Board.



*Includes average employer DC contribution rate for FY2019/20 and thereafter.

Section 1 - PSERS Overview

Employer Contribution Rate (continued)

The Commonwealth’s Department of Education School Employees Retirement Appropriation

The Commonwealth provides for its share of contributions to PSERS within the Department of Education budget. On average, the Commonwealth pays 55% of total employer contributions and employers pay for 45%.

As depicted, the Commonwealth’s share of contributions is expected to decrease next fiscal year due to the decline in the ECR from 35.26% in FY2022-23 to 34.00% in FY2023-24. The contributions are starting to level out as the projected employer contribution rate increases in the future are less than current levels of inflation.

Table 5.1 illustrates the actual amount of the Commonwealth’s Appropriation for FY2022-23 and the projected amounts for FY2023-24 through FY2026-27.

Table 5.1					
Commonwealth's Department of Education School Employees Retirement Appropriation					
(Dollar Amounts in Billions)					
			-----Projected-----		
	2022-23	2023-24	2024-25	2025-26	2026-27
School Employees Retirement	\$2.987	\$2.971	\$3.042	\$3.165	\$3.283

Act 5 of 2017

On June 12, 2017, Act 5 of 2017 was signed into law. This pension legislation represents a substantial change to PSERS operations and made significant changes to PSERS benefit structure for future members. School employees who become new members of PSERS on July 1, 2019 and thereafter must choose one of three new retirement plan options for their retirement benefits. The new membership classes include two with a defined benefit and a defined contribution component and one membership class with only a defined contribution component. The current stand-alone defined benefit plan is no longer available to new members.

Act 5 does not affect already retired members or those whose retirement date was prior to June 12, 2017. Class T-C, Class T-D, Class T-E, and Class T-F members active on July 1, 2019 had a one time option to elect prospectively into one of the new membership classes; only 10 members made such election.

Act 5 allows an actuarially neutral Option 4 “lump sum” withdrawal of member contributions and

interest for Class T-E and Class T-F members whose retirement date is on or after June 12, 2017, and expanded the “shared risk” program.

Legislative Pension Proposal Assistance

Throughout 2022, PSERS professionals were actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension policy proposals while remaining policy neutral.

PSERS will continue to cooperate with the General Assembly in its role as a technical expert in providing fact-based information to support efforts in determining effective pension policy. As in the past, PSERS will assist in drafting technically correct provisions and providing input on funding, operational, and legal aspects of various proposals, while remaining policy neutral on plan design elements of legislative proposals.

Employer Contribution Rate (continued)

Recap

At its December 2022 meeting, PSERS Board of Trustees certified an annual contribution rate of 34.00% for FY2023-24 which continues to put PSERS on the path towards full funding. The FY2023-24 ECR represents the first decline in the ECR since FY 2008-09. For the eighth consecutive year, the Commonwealth's and school districts' employer contribution rate provides 100% of the actuarially determined contributions based on sound actuarial practices and principles. Contribution rates began to level off after FY2017-18 which has reduced budgetary pressure on the Commonwealth and school districts in FY2021-22 and beyond. The Pennsylvania Independent Fiscal Office (IFO) has recognized the Commonwealth's progress on its pension funding issues in its Economic and Budget Outlook published in November 2022. As shown in Chart 5.5, pensions share of the Commonwealth's General Fund expenditures has leveled off and is no longer a major driver of General Fund expenditure growth. As displayed in Chart 5.6, the anticipated growth in

PSERS Employer Contribution Rate is expected to be at less than half of inflationary levels for the next several years.

PSERS reached a Turning Point under Act 120

Effective in FY2017-18, PSERS actuarial funded ratio began to slowly improve after declining steadily since FY2000-01. On a market value basis, PSERS funded ratio increased from 50.14% at June 30, 2016 to 61.70% at June 30, 2022 due primarily to PSERS receiving the full actuarially determined contributions in each of the past six years and positive investment returns. As a result of these funding improvements, bond rating agencies have stated that the pension contribution increases borne by school employers and the Commonwealth have made a positive impact upon their ratings. This is very significant as the bond rating agencies' outlooks impact the Commonwealth's borrowing costs. In affirming its positive outlook on the

Commonwealth's general obligation bonds in August 2022, Fitch Ratings, Inc. noted that "The Commonwealth's long-term liability burden is low, with pension obligations on a sustainable trajectory given Pennsylvania's ongoing statutory commitment to full actuarially determined contributions." In a February 21, 2023 article, the Pew Charitable Trusts noted that the implementations of Act 120 of 2010 and Act 5 of 2017 have positively impacted the Commonwealth's pension plans. The article states that "Overall, the changes made in Pennsylvania have put in place many prerequisites for long-term success, including a funding plan designed to pay down pension debt and the fiscal discipline to stick with it. The state also introduced a benefit plan design that will help ensure that employer costs stay predictable for new workers while maintaining a path to retirement security for the entire workforce. In addition, the changes incorporate efforts to manage the pension funds in a more cost-effective, responsible, and transparent fashion, with a needed emphasis on reducing fees and measuring risk through regular stress testing."

A major funding milestone was also reached during FY2016-17 as employers funded 100% of the actuarially determined contributions to PSERS for the first time in fifteen years. FY2023-24 will be the eighth year in a row that PSERS will receive the full actuarially determined contributions. These contributions are making a positive difference as PSERS funded ratio in FY2021-22 increased by a considerable amount for the fourth consecutive year following a period of general decline since FY1999-00.

Full actuarial funding from employers, along with member contributions and investment income are all necessary sources of funds that continue to pay down the unfunded liability of the System. While a challenging pension funding environment remains for school employers and the Commonwealth due to legacy debt issues, all of the sources of funding are now in place to bring PSERS back to fully funded status in an actuarially sound manner.

Section 1 - PSERS Overview

Chart 5.5

Pensions Share of General Fund Expenditures

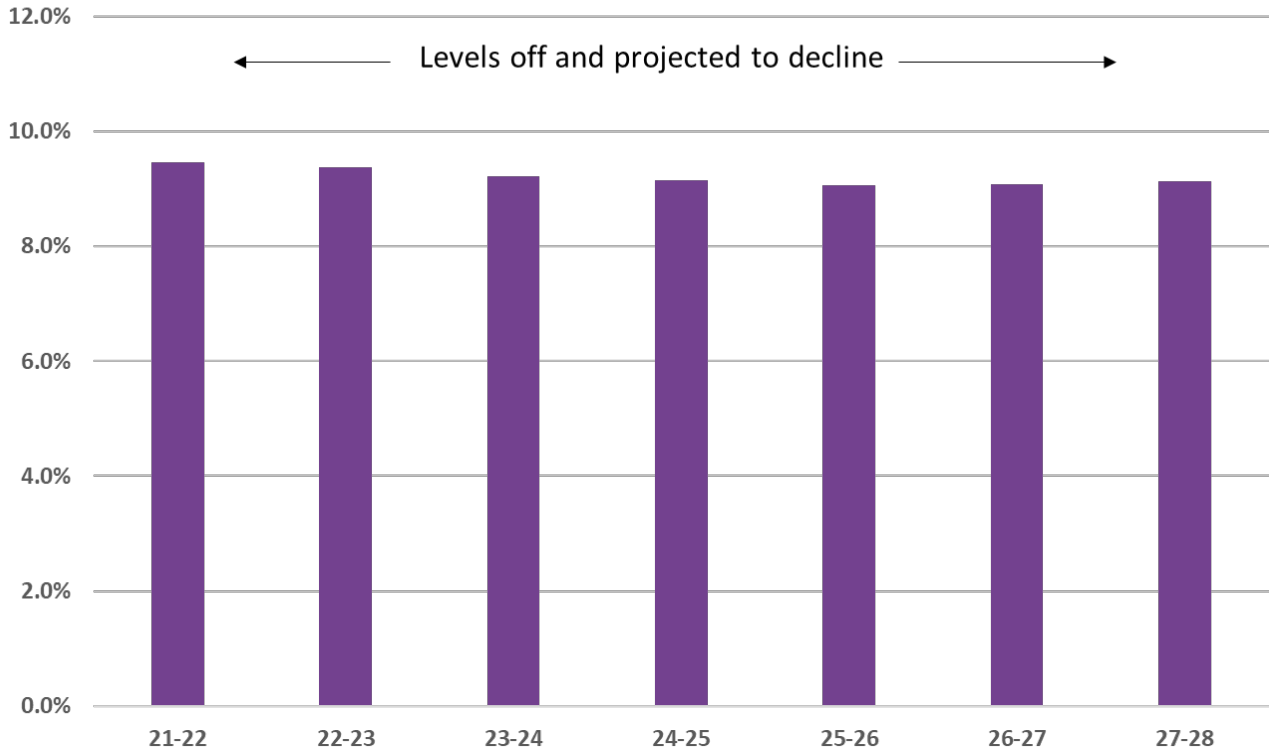
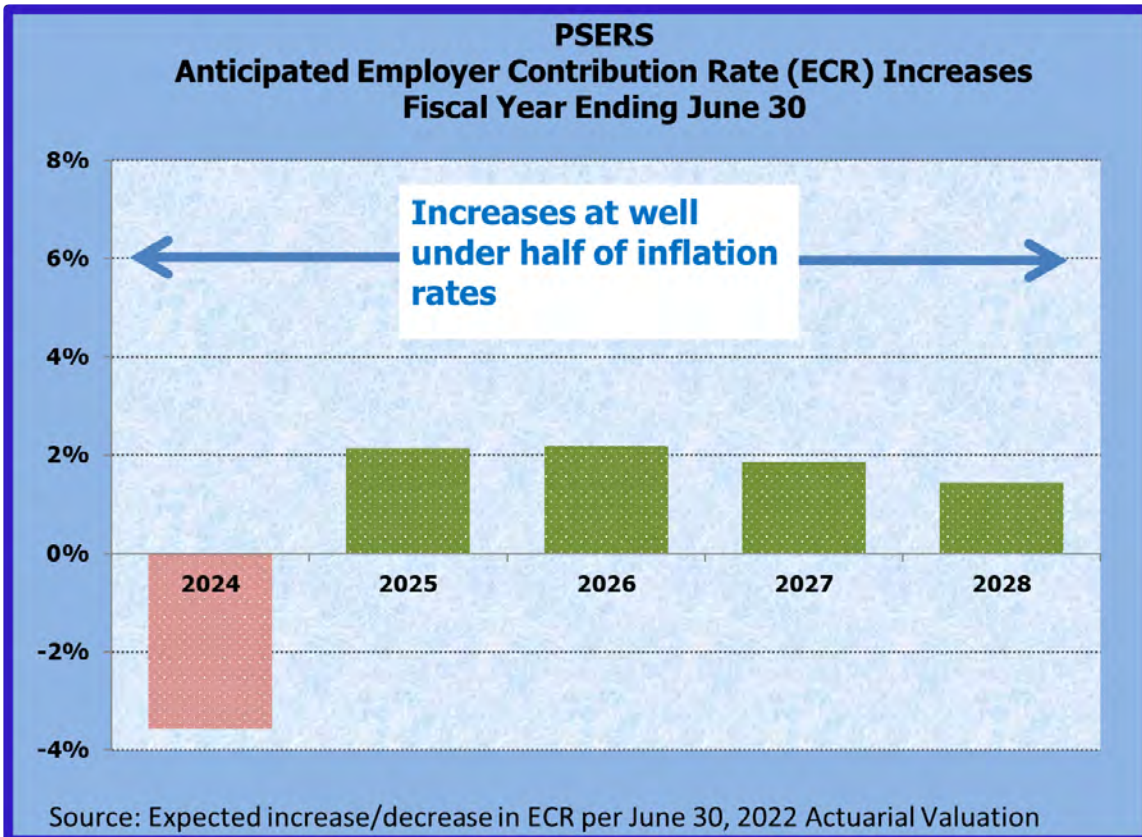


Chart 5.6



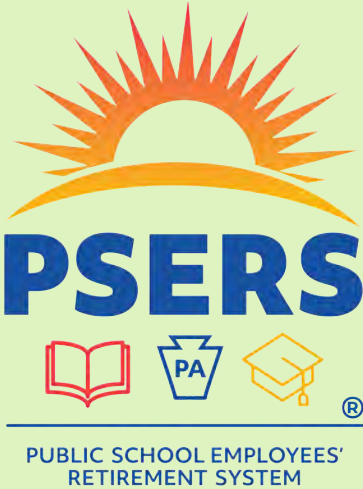
PSERS BUDGET REPORT - FY2023-24



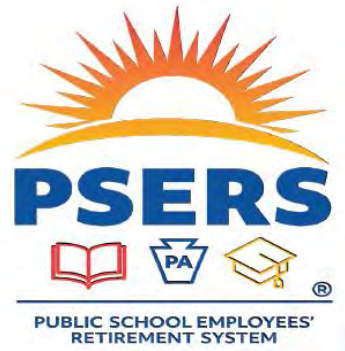
SECTION 2 - PSERS FY2023-24 BUDGET

Consultants Fees and Legislation Tab 6

PSERS FY2023-24 Administrative, Defined Contribution Administrative, and
Directed Commissions Recapture Program Budgets Tab 7



Consultants Fees and Legislation



Section 2 - FY2023-24 Budget

Consultants Fees (\$100,000 and Over)

Tables 6.1 and 6.2 list professional service firms under contract to provide services to PSERS during the fiscal year ended June 30, 2022.

Table 6.1

Investment, Pension and Defined Contribution Plan Administration Consultants

<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
ViTech Systems Group, Inc.	Pension administration system services	\$ 5,500,188 *
Hamilton Lane Advisors LLC	Private market consulting	\$ 2,000,000
Verus Advisory Inc.	General investment consulting	\$ 1,405,000
OST Inc.	Information technology services	\$ 862,702 *
Aksia LLC	Hedge fund investment consulting	\$ 842,616
Aon Investment Consulting	General investment consulting	\$ 674,475
Buck Global, LLC	Pension benefit actuarial services	\$ 529,864 *
Constellation Advisors LLC	Compliance consulting	\$ 518,679
Hudepohl & Associates Inc.	Executive search consulting	\$ 199,818
Glass, Lewis & Co., LLC	Proxy voting consulting	\$ 149,106
Clifton Larson Allen LLP	Financial audit - pension, defined contribution, healthcare	\$ 140,730 *

Table 6.2

Health Options and Premium Assistance Program Consultants

<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
Trustmark Health Benefits	Post employment healthcare benefits administration and claims adjudication	\$ 31,979,496 *
Optum Rx, Inc.	Post employment healthcare benefits administration and prescription drug plan	\$ 6,921,876 *
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	\$ 3,536,054 *
Gallagher Benefits Services, Inc.	Pharmacy benefit consulting services	\$ 1,401,119 *
Tivity Health	Silver Sneakers Fitness Program administration	\$ 847,858 *

Legislation PSERS-Related 2022

Act 8A of 2022 (House Bill 2657)

Act 8A of 2022 (House Bill 2657) appropriates \$55,467,000 from the Public School Employees Retirement Fund for expenses incurred by the Public School Employees Retirement Board to administer the system for the fiscal year beginning July 1, 2022, and for the payment of bills incurred and remaining unpaid at the close of the fiscal year ending June 30, 2022. The FY2022-23 appropriation is a 6% increase over the prior fiscal year.

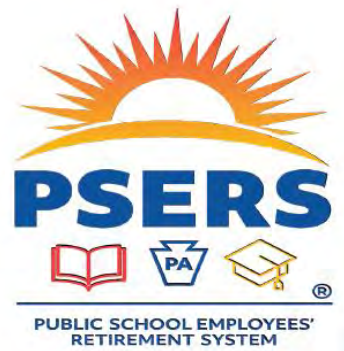
Additionally, the bill budgets \$949,000 from the PSERS Defined Contribution Fund restricted revenue account for expenses incurred by the PSERS Board for the administration of the defined contribution plan authorized by Act 5 of 2017 for the fiscal year beginning July 1, 2022, and for the payment of bills incurred and remaining unpaid at the close of the fiscal year ending June 30, 2022. The FY2022-23 appropriation is a 0.63% decrease from the prior fiscal year.

Act 132 of 2022 (House Bill 2447)

Act 132 of 2022 (House Bill 2447) creates the Russia and Belarus Divestiture Act. The Act directs the State Treasurer, the State Employees Retirement System (SERS), the Public School Employees Retirement System (PSERS), and the Pennsylvania Municipal Retirement System (PMRS) to divest their respective assets relating to Russia and Belarus. Divestiture of direct, indirect and alternative investment is to occur in accordance with federal law. The act also prohibits future investments related to the two countries.

The Commonwealth is required to reimburse each public fund for net losses, costs, and expenses incurred as a result of compliance with the act. For reimbursement, the affected public funds must submit an itemization of the amount by the General Assembly to the Budget Secretary for its net losses, costs, and expenses. Upon appropriation by the General Assembly, the reimbursement will be paid by the State Treasurer through the Department of Revenue to the applicable fund within 90 days.

PSERS FY2023-24 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets



Section 2 - FY2023-24 Budget

Public School Employees Retirement System Fiscal Year 2023-2024 Administrative Budget

Table 7.1	<u>Appropriated Budget FY2021-22</u>	<u>Appropriated Budget FY2022-23</u>	<u>Budget Request FY2023-24</u>
Total Personnel Services	\$ 29,466,000	\$ 29,381,000	\$ 32,174,000
Operating Expenses and Fixed Assets			
Travel	\$ 163,800	\$ 158,800	\$ 153,300
Training & Conference Registration	170,400	164,900	196,200
Telecomm	415,200	427,000	409,300
Electricity	20,700	20,700	25,900
Consultant Services - Non EDP	1,602,000	1,576,100	1,714,500
Outsourced IT Consulting For Appl & Developmt	70,000	—	—
Consulting - Maint & Support - (Post Implementation)	45,000	45,000	116,400
Consulting - Security (Outsourced Inf Sec Services)	45,000	50,000	50,000
Consulting - General IT Support	1,108,600	1,050,600	1,026,600
Consulting - Outsourced Infrastructure Svcs (PACS)	2,095,000	2,655,000	2,285,600
Legal Services/Fees	352,000	1,329,700	1,379,700
Specialized Services	736,000	856,400	781,200
Other Specialized Services	244,400	244,700	219,800
Advertising	10,000	10,000	10,000
Medical, Mental & Dental Services	6,500	6,500	6,500
IT Shared Services	240,000	240,000	686,000
Software Licensing - Maintenance	1,114,100	1,096,800	1,756,700
Hardware - Maintenance	58,000	73,000	74,000
Contracted Maintenance Non EDP	162,800	166,000	164,700
Telecomm Data Services	64,000	56,000	28,000
Contracted Repairs - Non EDP	15,500	15,500	15,500
Real Estate Rental	2,039,100	2,022,900	1,982,500
Vehicle Rental	7,000	7,600	6,900
Office Equipment Rental	158,400	158,400	149,400
Other Rentals	10,000	15,600	3,500
Office Supplies	166,500	135,400	127,300
Educational & Medical Supplies	6,600	4,800	4,500
Software License Non-Recurring	261,000	246,100	234,400
Software Licensing - Proc. - Recurring	399,100	464,400	423,100
Hardware Desktop	134,500	49,500	55,500
Furniture and Fixtures	65,200	60,200	56,000
Other Equipment	10,000	10,000	10,000

Section 2 - FY2023-24 Budget

Table 7.1

	<u>Appropriated Budget FY2021-22</u>	<u>Appropriated Budget FY2022-23</u>	<u>Budget Request FY2023-24</u>
Motorized Equipment Supplies	\$ 19,500	\$ 20,000	\$ 17,500
Postage and Freight	794,000	727,000	665,000
Printing	203,300	183,400	165,500
Subscriptions	48,300	37,200	37,400
Member Dues	44,800	49,500	56,400
Conference Expense	74,700	69,700	63,000
Insurance, Surety & Fidelity Bonds	170,000	191,800	314,000
Other Operational Expenses	2,630,900	4,641,500	2,714,000
HW Network and Server	—	—	—
Automobiles	19,800	20,000	—
Software License	6,798,000	6,700,000	6,710,500
Office Equipment	28,300	28,300	31,700
Total Operating Expenses and Fixed Assets	\$ 22,828,000	\$ 26,086,000	\$ 24,928,000
Total Administrative Budget	\$ 52,294,000	\$ 55,467,000	\$ 57,102,000

Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY2023-24. The \$57,102,000 administrative budget is not funded from the Commonwealth's General Fund, but rather from the earnings of the Fund itself. Historically, PSERS has under spent its approved budget, keeping more funds available to invest for PSERS members.

PSERS Administrative Budget Request for FY2023-24 resulted in an increase of \$1,635,000 or 2.95% above the FY2022-23 available budget. The majority of the increase is in personnel costs due to rising healthcare expenses, in particular the contributions to the Retired Employee Health Program.

PSERS continues to be a leader among large U.S. public pension funds in its effective control of expenses while providing necessary services to its

membership. In the past four years, the System has added significantly to the number of active and retired members electing to receive newsletters, statement of accounts, 1099-Rs and other publications electronically, which saves the agency over \$275,000 per year in postage, printing and paper costs. During FY2021-22 specifically, the agency lowered its postage costs, reduced contracted maintenance and repair services, decreased rental of equipment and software, and achieved significant savings in subscriptions, all of which helps to maintain more investment earnings for the benefit of the Fund. In addition to these savings, PSERS reduced costs by eliminating unnecessary parking leases at its headquarters location due to the adoption of an Agency-wide telework policy.

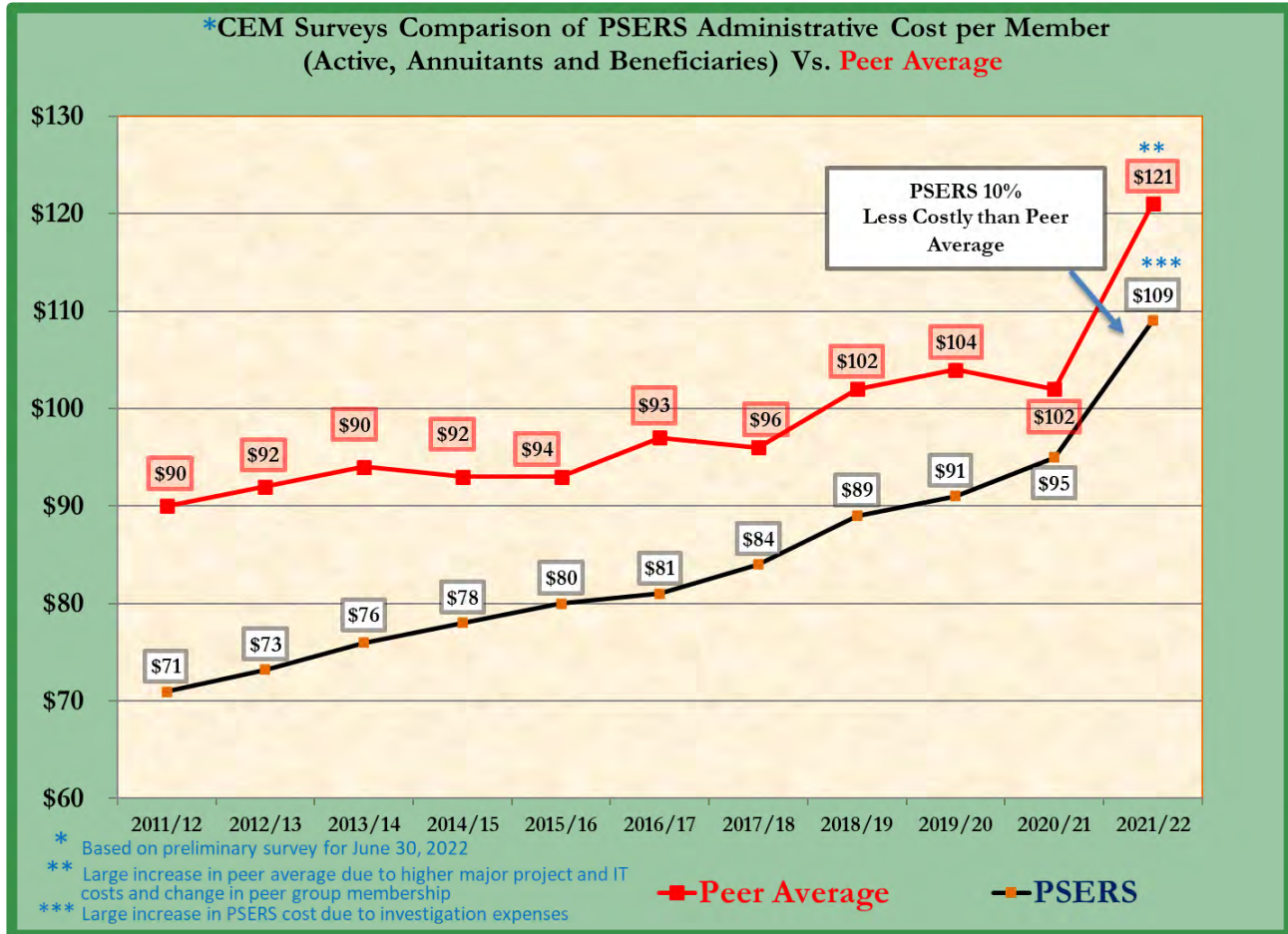
Section 2 - FY2023-24 Budget

PSERS Administrative Costs are Significantly Below Peers

PSERS participates in an independent, international benchmarking survey evaluating its costs and service performance in comparison to other similar public pension funds. Based on the results of the most recent survey, PSERS has 22% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 below illustrates that PSERS had

a 10% lower pension administration cost per member than the average cost for its peer group. By running a lean and efficient operation, PSERS saves the Commonwealth and school employers approximately \$5.9 million annually in administrative expenses compared to its peers.

Chart 7.1



Section 2 - FY2023-24 Budget

Fiscal Year 2023-24 Defined Contribution (DC) Administrative Budget

	<u>Budget</u> <u>FY2021-22</u>	<u>Budget</u> <u>FY2022-23</u>	<u>Budget</u> <u>Request</u> <u>FY2023-24</u>
Total Personnel Services	\$586,000	\$808,000	\$881,000
Operating Expenses and Fixed Assets			
Consultant Services - Non EDP	207,000	96,000	175,000
Legal Services/Fees	25,000	20,000	50,000
Insurance, Surety & Fidelity Bonds	25,000	25,000	30,000
Other Operational Expenses	112,000	—	40,000
Total Operating Expenses and Fixed Assets	\$369,000	\$141,000	\$295,000
Total Administrative Budget	\$955,000	\$949,000	\$1,176,000

Defined Contribution Administrative Budget

Table 7.2 displays PSERS Defined Contribution Administrative Budget Request for FY2023-24. The \$1,176,000 amount requested represents an increase of 23.9% above the FY2022-23 available budget. The significant increase is due to several factors: a reallocation of staff time between the Administrative and Defined Contribution appropriations; higher anticipated usage of consultant and legal services; renewed consultant and legal contracts at higher amounts; and the allocation of rent, telecom, and audit costs.

Directed Commissions Recapture Program

Directed Commissions Recapture is a program whereby a portion of commissions incurred by PSERS through investment trading activity is returned to PSERS. These funds can be used for the administration of the Fund or can be reinvested back into the asset allocation through a transfer to PSERS Retirement Account. Expenditures paid from the Directed Commissions Recapture Program Budget have the same PSERS internal approval process as any other expenditure made by the Fund.

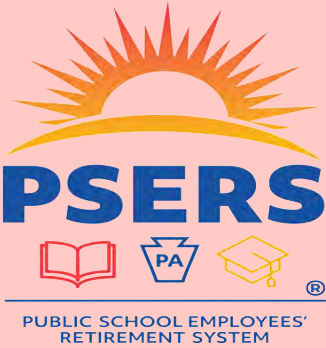
	<u>Budget</u> <u>FY2021-22</u>	<u>Budget</u> <u>FY2022-23</u>	<u>Budget</u> <u>Request</u> <u>FY2023-24</u>
Budget	\$2,000,000	\$2,000,000	\$2,000,000
Total	\$2,000,000	\$2,000,000	\$2,000,000

PSERS BUDGET REPORT - FY2023-24

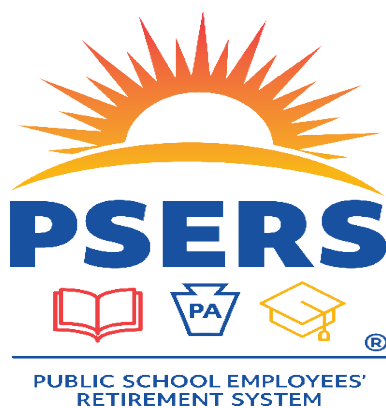


SECTION 3 - INVESTMENT INFORMATION

Investment Guidelines, Philosophy, and Risk Management	Tab 8
Capital Market Assumptions	Tab 9
Asset Exposure and Investment Program Summary	Tab 10
Performance	Tab 11
Managing Investment Fees, Expenses, and Carried Interest	Tab 12
Commitment to Pennsylvania-Based Investments	Tab 13



Investment Guidelines, Philosophy and Risk Management



Investment Guidelines, Philosophy, and Risk Management

Investment Guidelines

The Board has established investment objectives for the Fund as follows:

To generate returns to support the System's actuarial soundness so it may provide its members with benefits as required by law.

To earn a long-term total return, net of fees and investment expenses, that equals or exceeds the Actuarial Assumed Rate approved by the Board.

To earn a long-term total return, net of fees and investment expenses, that equals or exceeds the Policy Index approved by the Board.

To prudently manage investment risks that are related to the achievement of investment goals.

Investment Philosophy

The PSERS Board of Trustees believes PSERS assets should be managed in accordance with PSERS unique liability stream, funding sources, cash flows, and portfolio size, focusing on the prudent accumulation of wealth over the long term to meet the retirement benefit obligations established by the plan sponsor to its members.

PSERS assets should be managed based on the following beliefs:

1. Uncertainty

The future is difficult to forecast with any accuracy or certainty, particularly changes in the economic and market environment.

2. Asset Allocation

The strategic asset allocation mix, more than implementation or any other factor or decision, largely determines the portfolio's overall risk and return.

3. Diversification

Diversification is the best approach to addressing future uncertainty and therefore meeting PSERS long-term investment objectives.

Diversification should be across multiple dimensions:

- By and within asset classes.
- By geography.
- By strategy (e.g., in Public Equity: growth and value, concentrated and diversified, quantitative and fundamental).
- By vintage year for Private Investments (investment pacing in and out of investments helps mitigate the impact of market volatility).

Over any given period, any number of asset classes, geographies, strategies, and vintages will underperform others; that is to be expected and accepted.

4. Risk

For an underfunded plan or for a plan with negative cash flow (benefits paid exceed contributions received), the path of compounding of investment returns – from month to month, quarter to quarter, and year to year -- matters more than for a plan that is fully funded or has positive cash flow; for the former type of plan, peak-to-trough declines transform unrealized losses into permanent ones.

Drawdown risk should be mitigated, especially as the environment in which drawdowns occur is likely. Also the environment where the Plan Sponsor's willingness and ability to make contributions to the plan may be less than in normal times.

Liquidity should be managed to reasonably ensure that the fund can meet its obligations during periods of market dislocations.

5. Leverage

Leverage at the total fund level can be an effective tool to enhance diversification, since asset classes, over the long-term, have similar risk-adjusted returns, different correlations to each other, and different responses to changes in the economic and market environment.

Leverage can be a vital tool to increase or decrease total fund risk in a diversified manner.

Investment Philosophy (continued)

6. Rebalancing

Disciplined rebalancing enhances long term returns as it is an inherently contrarian process.

Rebalancing restores strategic asset allocation as the primary driver of return and risk.

7. Portfolio Size

Managing a large pool of assets provides investors unique access to investment opportunities not available to smaller institutional investors or individual investors.

PSERS should use its size to its advantage to enhance its net-of-fees return and diversification opportunities.

8. Private Investments

Allocations to Private Equity, Private Credit, Private Real Estate, Private Infrastructure, and other illiquid asset classes may be justified by the illiquidity risk premium available to investors.

Allocations to these asset classes may also be justified by the diversification benefit they provide, through exposure to sectors, businesses, and mode of corporate governance not obtainable through public markets.

9. Active Management

Passive investing, rather than active management, is the default choice to be used for any asset class that is highly efficient or where skilled active managers are less likely to be identified.

Certain asset classes continue to exhibit information inefficiency, where skilled active management and well-resourced investors such as PSERS can potentially persistently outperform peers and the benchmark for that asset class.

There will be short-term periods when a skilled active manager may under perform peers and the benchmark; that is to be expected and accepted; therefore a long-term perspective will be employed.

10. Internal Management

PSERS has developed skilled internal investment managers; as such internal investment management is preferred over external investment management in cases where internal management most likely can match or exceed the long term, net of fees, risk-adjusted returns provided by external managers, provided the internal investment and operational resources are available to do so.

11. Investment Fees

Investment management fees for external management are one of the few aspects of investment management that are certain and over which the investor has control.

Investment management and performance fees should be managed to (i) maximize long term, net of fees, risk-adjusted returns, (ii) split the value added fairly between the investment manager and PSERS, and (iii) align the interests of the investment manager with PSERS.

Risk Management

Risk management is essential to the entire investment process. The goal of investment risk management is to find the appropriate balance between expected returns and the risks taken to generate those returns. An entirely risk-free investment portfolio that has a high probability of meeting all investment goals does not exist. Therefore, PSERS does not attempt to eliminate all risk but instead seeks to limit the possibility of permanent loss. Risk itself is neither good nor bad, but it is necessary that the System expose itself to some appropriate level of risk if it is to generate the long-term investment returns required to maintain stable and cost-effective contribution rates.

Risk Management (continued)

The future is difficult to forecast with any accuracy or certainty, particularly changes in the economic and market environment but PSERS can understand the future as a range of probabilities, some desirable and some not, and can position its current investments to guard against undesirable outcomes and to make desirable outcomes more likely. In positioning for future developments, PSERS cannot know with complete certainty how markets or particular investment strategies will perform. The strategic asset allocation mix, more than implementation or any other factor or decision, largely determines the portfolio's overall risk and return.

Given its long-term investment horizon, PSERS accepts prudent investment risk in exchange for acceptable levels of additional incremental return. PSERS Board sets long-term asset allocation and risk parameters. The Investment Office implements investment policies within these approved guidelines. The Investment Office works closely with PSERS Board to establish, monitor, and report its various risk metrics and has the required authority to efficiently and effectively implement associated actions.

The Policies of the Board can be found on the Investment page on PSERS website.

Divestiture of Russian and Belarusian Investments

As of December 31, 2022, PSERS has divested all possible related assets and continually looks to decrease exposure whenever possible.

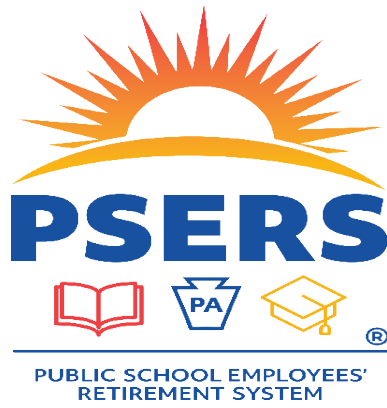
At the start of the Russian invasion of Ukraine in late February 2022, PSERS estimated the Fund held under \$300 million (less than ½ of 1% of PSERS total assets of \$72.5 billion) in Russian and Belarusian investments.

On March 3, 2022, PSERS Board of Trustees passed a Resolution to divest PSERS from investments in Russia and Belarus as expeditiously as possible, consistent with the Board's fiduciary duty of prudence. In addition, future investments involving Russia or Belarus were prohibited until directed otherwise by the Board. Since that time, the amount of PSERS investment holdings in Russia and Belarus has steadily declined.

PSERS estimates as of March 13, 2023, direct Russian holdings had a market value of approximately \$1.5 million according to its custodian bank, BNY Mellon. Liquidation has not yet been achieved due to the Russian market's illiquidity. PSERS had indirect Russian holdings and alternative investments of approximately \$70,000 as of year-end 2022. PSERS does not have any indirect or direct holdings in Belarus.

In addition, on November 3, 2022, Act 132 (House Bill 2447) directed PSERS, as well as the State Treasury, State Employees' Retirement System, and the Pennsylvania Municipal Retirement System to divest from Russian and Belarusian assets.

Capital Market Assumptions



Capital Market Assumptions

Capital Market Assumptions (CMAs) are estimates of expected returns and risks for a given set of asset classes, and expectations of the relationship (correlations) between these asset classes over long periods of time. They are issued periodically by investment consultants, asset managers, and investment banks. Inflation, real short-term interest rates, and economic data frequently provide the foundation used by CMAs for expected returns across global asset classes. These are the primary building blocks for developing equity and fixed income return expectations, which in turn are used in setting expectations for alternative asset class returns. PSERS collects and evaluates this information when considering its long-term actuarial rates of return assumptions and in setting its Asset Allocation Policy.

Compared to 2021, 2022 survey results under the 20-year forecast indicate a slight increase in return assumptions across most asset classes. We elaborate on select asset classes below.

Fixed Income

Nominal government bond returns are a function of long-term expectations for inflation and government yields. Corporate bond returns are a function of expected inflation, government yields, and expectations for credit spreads, defaults, and downgrades. Most of the decrease in bond return assumptions from 2016 – 2021 can be explained by falling yields and tightening credit spreads. In response to the COVID-19 pandemic, the Federal Reserve lowered the target range for the federal funds rate to 0% to 0.25% in 2020 and maintained the target range in 2021. Due to rising inflation in 2022, the Federal Reserve raised the target range for the federal funds rate to 3.75% to 4% as of November 30, 2022. Fixed income return expectations have increased relative to 2021, driven by rising bond yields.

Equities

Equity return assumptions are driven by market valuations, earnings growth expectations and assumed dividend payouts. Equity return expectations have largely remained unchanged relative to 2021. From 2016 – 2021, most of the decrease in equity market return assumptions can be explained by rising valuations.

Real Estate

Global real estate return assumption in 2022 decreased relative to expected returns from 2021. Slowing growth impacted the real return assumption in 2022.

Hedge Funds

Hedge Fund assumptions reflect changes in the underlying equity, fixed income, and cash capital market assumptions. The increase in the hedge fund assumption from 2021 to 2022 reflects the expectations for fixed income and cash.

Diversification Benefit

PSERS can select from a broad array of asset allocation alternatives, analyzing allocation strategies using asset classes with varying expected returns and expected risk to formulate an optimal asset allocation policy more likely to achieve the investment return and investment risk goals established by the Board. In recent years, lower risk projections have afforded PSERS flexibility in identifying different combinations of asset allocations that can achieve our long-term goal of 7.0% at acceptable levels of risk even as return assumptions have fallen. PSERS also applies leverage in implementing its asset allocation policy, providing an additional mechanism to increase expected volatility to target higher expected returns when warranted.

Section 3 Investment Information

Capital Market Assumptions (continued)

The table below summarizes the average expected capital market geometric return assumptions of 20-30 surveyed independent investment advisors in 2018 - 2022.

Table 9.1

Capital Market Assumptions (CMA's) Average Expected Geometric Returns (2018 - 2022)

<u>Asset Class</u>	<u>2018 Survey</u>	<u>2019 Survey</u>	<u>2020 Survey</u>	<u>2021 Survey</u>	<u>2022 Survey</u>
U.S. Equity - Large Cap	7.4%	7.1%	7.1%	6.7%	6.5%
U.S. Equity - Small/Mid Cap	8.2%	7.5%	7.6%	7.0%	7.0%
Non-U.S. Equity - Developed	7.7%	7.7%	7.5%	7.1%	7.1%
Non-U.S. Equity - Emerging	8.8%	8.7%	8.4%	7.8%	7.9%
U.S. Corporate Bonds - Core	4.5%	4.3%	3.6%	3.2%	3.5%
U.S. Corp Bonds - Long Duration	4.4%	4.4%	3.6%	3.4%	3.5%
U.S. Corporate Bonds - High Yield	5.8%	5.8%	5.6%	5.0%	5.0%
Non-U.S. Debt - Developed	3.2%	3.4%	2.3%	2.3%	2.5%
Non-U.S. Debt - Emerging	6.1%	6.1%	5.9%	5.3%	5.3%
U.S. Treasuries (Cash Equivalent)	3.1%	3.0%	2.3%	1.9%	2.0%
TIPS (Inflation-Protected)	4.0%	3.5%	2.7%	2.4%	2.6%
Real Estate	6.7%	6.8%	6.6%	6.2%	6.0%
Hedge Funds	6.2%	6.2%	5.7%	5.3%	5.5%
Commodities	4.9%	4.7%	4.0%	4.0%	4.2%
Infrastructure	7.1%	7.2%	7.3%	6.8%	6.9%
Private Equity	9.5%	10.1%	9.9%	9.7%	9.8%
Private Debt	—	7.8%	7.9%	6.9%	7.1%
Inflation	2.5%	2.3%	2.2%	2.2%	2.4%

Section 3 Investment Information

Capital Market Assumptions (continued)

The CMA surveys also included forecasts for 20 year average expected risk (Table 9.2). The numbers below reflect the expected standard deviation in % around the expected return.

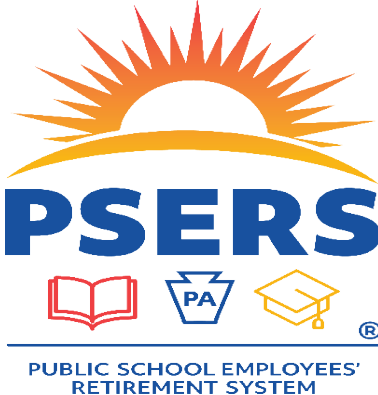
Table 9.2

Capital Market Assumptions (CMA's)

Average Expected Risk (2018 - 2022)

<u>Asset Class</u>	<u>2018 Survey</u>	<u>2019 Survey</u>	<u>2020 Survey</u>	<u>2021 Survey</u>	<u>2022 Survey</u>
US Equity – Large Cap	16.4%	16.2%	16.2%	16.4%	16.3%
US Equity – Small/Mid Cap	20.2%	20.2%	20.2%	20.2%	20.3%
Non-US Equity – Developed	18.7%	18.2%	18.1%	18.3%	18.1%
Non-US Equity – Emerging	24.9%	24.7%	24.2%	24.3%	23.9%
US Corporate Bonds – Core	5.7%	5.5%	5.5%	5.5%	5.4%
US Corporate Bonds – Long Duration	10.8%	10.5%	10.2%	10.4%	10.5%
US Corporate Bonds – High Yield	10.2%	10.1%	9.8%	9.9%	9.9%
Non-US Debt – Developed	6.9%	7.6%	7.0%	7.2%	7.5%
Non-US Debt – Emerging	11.4%	11.3%	11.0%	11.3%	10.9%
US Treasuries (Cash Equivalent)	2.7%	2.3%	1.8%	1.3%	1.1%
TIPS (Inflation-Protected)	6.3%	6.1%	6.1%	5.6%	5.8%
Real Estate	13.9%	15.0%	16.8%	17.6%	17.0%
Hedge Funds	7.9%	8.4%	8.0%	8.1%	8.0%
Commodities	17.6%	17.7%	17.6%	17.3%	17.8%
Infrastructure	14.7%	14.4%	14.6%	17.0%	16.6%
Private Equity	22.2%	22.0%	22.0%	22.3%	22.1%
Private Debt	—	11.6%	12.1%	11.4%	11.5%
Inflation	1.8%	1.7%	1.7%	2.1%	2.1%

Asset Exposure and Investment Program Summary



Asset Exposure (as of June 30, 2022)

The Board maintains a disciplined and thorough process to establish a new asset allocation policy presently every three years while monitoring the implementation of any related adjustments ongoing. This process begins following the Board's review and acceptance of the actuary's annual report, as described in Tab 5. PSERS investment professionals and general investment consultant collaborate to analyze potential asset allocations (using actuarial as well as capital market return assumptions) in order to identify those potential asset allocations that meet the long-term return and risk objectives of the Fund. The Board is then presented with various asset allocations choices

with detailed analysis of probable long-term return and risk characteristics from which it will select a new Asset Allocation Policy for further implementation by staff.

The Board reassesses the long-term asset allocation targets of the System not less than every three years. In establishing the asset allocation plan, the Board will consult with its actuary, consultants, investment staff, and other sources of information it deems appropriate in formulating this allocation. The purpose of the asset allocation is to align strategic investment objectives with the long-term financial needs of the System.

Section 3 - Investment Information

Asset Exposure (continued)

Table 10.1 represents PSERS asset exposure and target allocation plan that became effective April 1, 2022, and was in effect on June 30, 2022.

Table 10.1

PSERS Asset Exposure and Target Asset Allocation Plan (as of June 30, 2022)

<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>Percentage of Gross Asset Exposure</u>	<u>Percentage of Net Asset Exposure</u>	<u>Target Allocation %</u>	<u>Target Allocation Range</u>
Public Equity	\$ 15,763.9	21.1 %	22.7 %	28.0 %	
Private Equity	12,293.0	16.5 %	17.6 %	12.0 %	
Total Equity	\$ 28,056.9	37.6 %	40.3 %	40.0 %	± 5%
Public Fixed Income*	\$ 16,004.0	21.4 %	23.0 %	27.0 %	
Private Credit	5,323.9	7.1 %	7.6 %	6.0 %	
Total Fixed Income	\$ 21,327.9	28.5 %	30.6 %	33.0 %	± 5%
Public Real Asset*	13,118.1	17.6 %	18.8 %	18.0 %	
Private Real Asset	7,412.8	9.9 %	10.6 %	11.0 %	
Total Real Asset	\$ 20,530.9	27.5 %	29.4 %	29.0 %	± 3%
Tail Risk Mitigation	\$ 370.0	0.5 %	0.5 %	— %	
Absolute Return	\$ 4,438.3	5.9 %	6.4 %	6.0 %	0 to 7%
Gross Asset Exposure	\$ 74,724.0	100.0 %	107.2 %	108.0 %	
Cash	\$ 3,552.1	4.8 %	5.1 %	3.0 %	
Explicit Leverage	(8,561.2)	(11.5)%	(12.3)%	(11.0)%	
Net Leverage	(5,009.1)	(6.7)%	(7.2)%	(8.0)%	10 to -20%
Net Asset Exposure	\$ 69,714.9	100.0%	100.0%	100.0%	

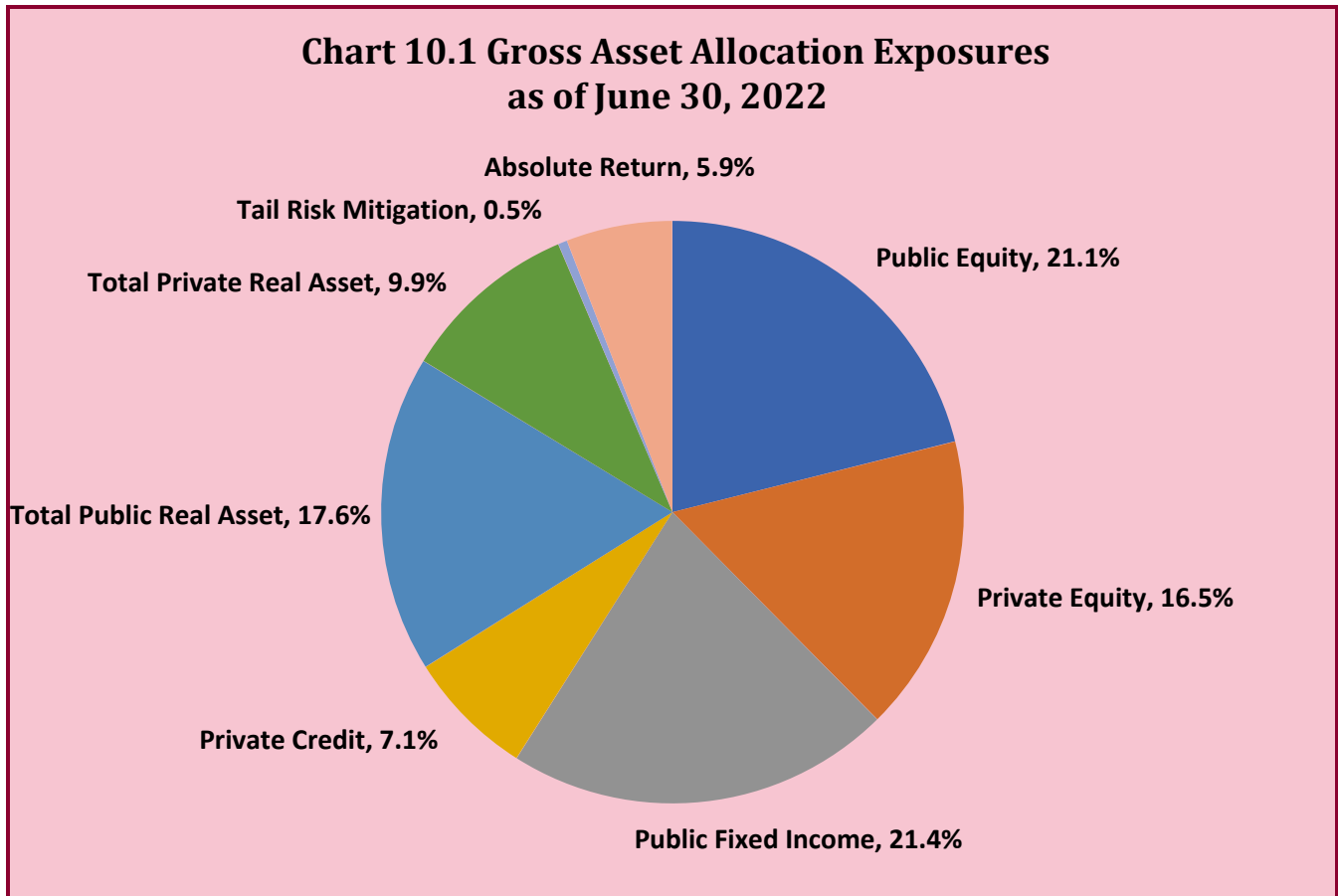
*PSERS uses leverage to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2022, PSERS had total increased economic exposure of \$8.6 billion related to the following asset classes: Fixed Income (\$2.5 billion); Infrastructure (\$1.0 billion); Real Estate (\$0.7 billion) and Commodities (\$4.4 billion). An allocation of 3% to Cash is included in the Target Allocation.

Note: PSERS asset allocation was updated August 5, 2022 and is available for review at <https://www.psers.pa.gov>

Section 3 - Investment Information

Asset Exposure (continued)

Chart 10.1 illustrates PSERS asset allocation exposure as of June 30, 2022:



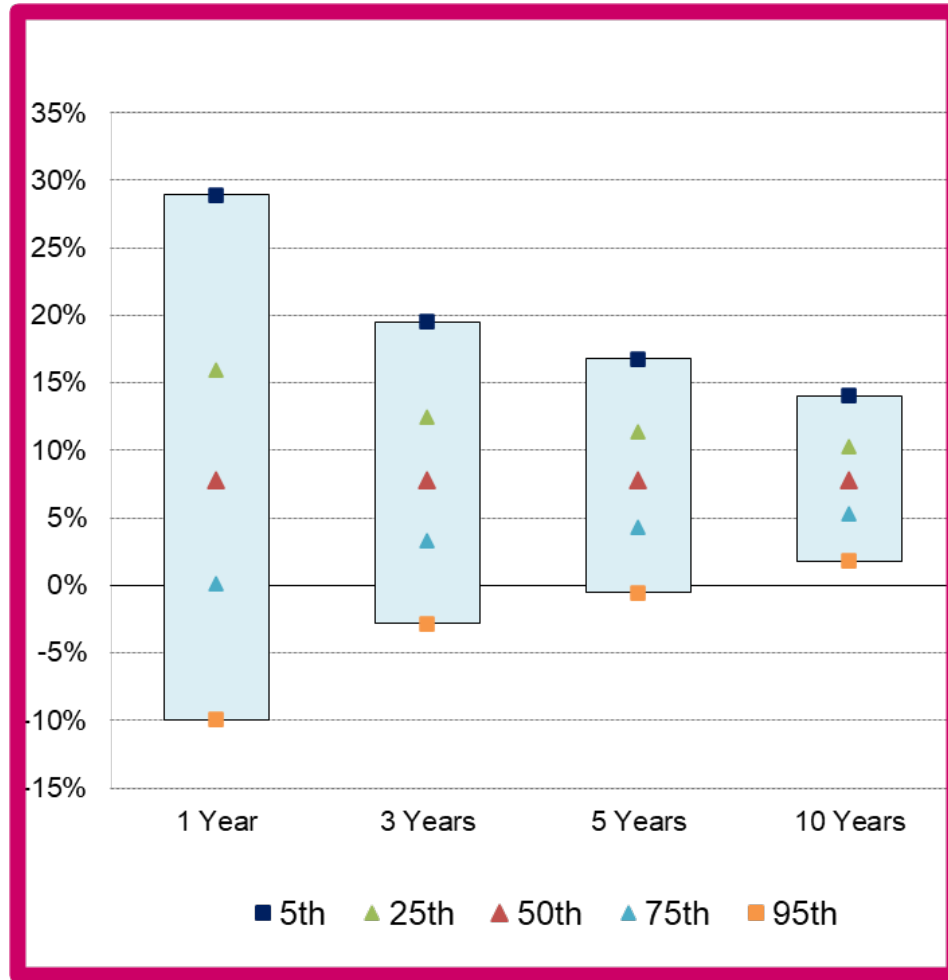
Note: Financing represents a negative 6.7% allocation and is not reflected in Chart 10.1.

Section 3 - Investment Information

Asset Exposure (continued)

The purpose of the asset allocation is to meet the long-term investment objectives of the System. PSERS considers the expected range of returns for 1, 3, 5, and 10 year periods of various asset allocations choices to select the optimal asset allocation. While the range of returns can be high for any single year, volatility will decrease and converge around a median return over time. This is demonstrated in Exhibit 10.1 below, which depicts expected future returns for PSERS current asset allocation:

Exhibit 10.1



Range of Returns

Percentiles	1 Year	3 Years	5 Years	10 Years
5%	29.0%	19.5%	16.8%	14.1%
25%	16.0%	12.4%	11.4%	10.3%
50%	7.8%	7.8%	7.8%	7.8%
75%	0.1%	3.3%	4.3%	5.3%
95%	(9.9)%	(2.8)%	(0.5)%	1.8%

Source: Aon Hewitt's 30-year capital market assumptions as of June 30, 2022.

Asset Classifications

Public Equity Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded equity markets. Public Equity plays a strategic role within the Fund, by providing a return premium over inflation, thereby preserving and enhancing the real value of the Fund, and by performing well when economic growth is stronger than expected or inflation is lower than expected. To maintain diversification within the asset class, the Fund pursues a global investment strategy across regions, sectors, market capitalization segments, and investment styles.

Public Equity assets may be invested in instruments that provide equity returns. Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Private Equity Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Equity also provides access to investment opportunities not available in Public Equity markets. The Private Equity asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Equity portfolio will achieve diversification by investing in funds and co-investments that are complementary in nature regarding fund size, sector, strategic, geographic and industry focus, and vintage year.

Private Equity assets may include but are not limited to, funds, co-investments, secondaries, separate accounts, joint ventures, partnerships, limited liability companies, and operating companies (collectively "Private Equity Investments") investing in Private Equity strategies. Private Equity Investments may result in exposure to any type of private security throughout the capital structure. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount invested.

Public Fixed Income Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded fixed income markets. Public Fixed Income plays a strategic role within the Fund in a variety of ways. Nominal bonds serve as a hedge against lower inflation and weak economic growth, produce current income in the form of periodic interest payments, and provide liquidity to meet the Fund's obligations. Inflation protected bonds serve as a hedge against higher inflation and weaker economic growth and provide liquidity. Higher quality bond returns have also served as a diversifier relative to equity returns. Credit-related securities such as emerging market debt and public high yield bonds generate higher current income relative to investment grade debt and tend to do well when economic growth is stronger than expected. To maintain diversification within the asset class, the Fund pursues a global investment strategy across regions, sectors, maturity segments, credit quality, and investment styles.

Public Fixed Income assets may be invested in instruments that provide fixed income returns. Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Private Credit Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Credit typically provides enhanced yields over publicly-traded fixed income markets and serves as a diversifier to the overall portfolio by providing exposure to a variety of underlying collateral types not easily accessed through traditional asset classes. The Private Credit asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Credit asset class will achieve diversification by investing in both closed-end and evergreen funds, as well as co-investments that are complementary with respect to fund size, sector, strategic focus, geographic and industry focus and vintage year.

Asset Classifications (continued)

Private Credit assets may include, but are not limited to, funds, co-investments, secondaries and separate accounts (collectively “Private Credit Investments”) investing in Private Credit strategies. Private Credit Investments may result in exposure to diverse securities throughout the capital structure. Private Credit also allows for investment structures which may not conform precisely to the previous list but whose intent is to capture Private Credit exposure and returns. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Public Commodities Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded commodities markets. Commodity investments consist of energy, precious metals, industrial metals, and agricultural. The prices of commodities are determined primarily by near-term events in global supply and demand conditions and are positively related with both the level of inflation and changes in the rate of inflation. Public Commodities play a strategic role within the Fund, by providing a hedge against unanticipated inflation and diversification benefits. To maintain diversification within the asset class, the Fund pursues an investment strategy across all key commodities and across investment styles.

Public Commodities assets may be invested in instruments that provide publicly traded commodities returns. Instruments used may be exchange-traded or non exchange-traded and may be physical securities or derivatives, and leverage may be employed.

Public Infrastructure Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly traded infrastructure markets. Public Infrastructure investments target stable, defensive investments with steady cash flows primarily within the energy, power, water, and transportation sectors. Public Infrastructure plays a strategic role within the Fund, by providing steady returns and cash yields, defensive growth, inflation protection, capital preservation, liquidity and diversification benefits. To maintain diversification within the asset class, the Fund pursues a global investment strategy across geographic regions, sectors, market capitalization segments, and investment styles.

Public Infrastructure assets may be invested in instruments that provide publicly-traded infrastructure returns. Instruments used may be exchange-traded or non exchange-traded and may be physical securities or derivatives, and leverage may be employed.

Public Real Estate Investments

PSERS seeks to diversify assets by obtaining broad exposure to publicly-traded real estate markets. Public Real Estate provides a strategic role within the Fund, by providing steady returns and cash yields, inflation protection, defensive growth, capital preservation, liquidity and diversification benefits. To maintain diversification within the asset class, the Fund pursues a global investment strategy across geographic regions, property sectors, market capitalization segments, and investment styles.

Public Real Estate assets may be invested in instruments that provide publicly-traded real estate returns. These include, but are not limited to, US and Non-US publicly-traded real estate investment trusts (REITs). Instruments used may be exchange-traded or non-exchange-traded and may be physical securities or derivatives.

Asset Classifications (continued)

Private Infrastructure Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. While providing a current income return and a potential hedge against inflation, Private Infrastructure also provides access to investment opportunities not available in Public Infrastructure markets. The Private Infrastructure asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Infrastructure asset class will achieve diversification by investing in funds, both closed-end and evergreen and co-investments that are complementary in nature regarding fund size, sector, strategic focus, regional footprint and vintage year.

Private Infrastructure assets can include but are not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, limited liability companies, and operating companies (collectively "Private Infrastructure Investments") investing in private infrastructure strategies. Private Infrastructure Investments may result in exposure to any type of security throughout the capital structure. Notwithstanding investments in Separate Accounts, PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Private Real Estate Investments

PSERS seeks to diversify its assets by providing exposure to private investments as part of the overall investable universe. Additionally, when compared to other investable opportunities, private investments are intended to provide exposure to higher potential returns and better alignment of interests. Private Real Estate typically provides current income, appreciation, and a potential hedge against inflation, and serves as a diversifier to the overall portfolio. Private Real Estate also provides access to investment opportunities not available in the publicly traded real estate markets. The Private Real Estate asset class targets returns in excess of the benchmark, net of fees, over a full market cycle. The Private Real Estate asset class will achieve diversification by investing in funds, both closed-end and evergreen, and co-investments that are complementary in nature regarding fund size, property type, strategic focus, regional footprint and vintage year.

Private Real Estate investments can be committed to, but not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, limited liability companies, private REITS and real estate operating companies (collectively "Private Real Estate Investments") investing in private real estate strategies. Private Real Estate Investments may be considered throughout the entire capital structure. Notwithstanding investments in Separate Accounts, PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

Asset Classifications (continued)

Absolute Return Investments

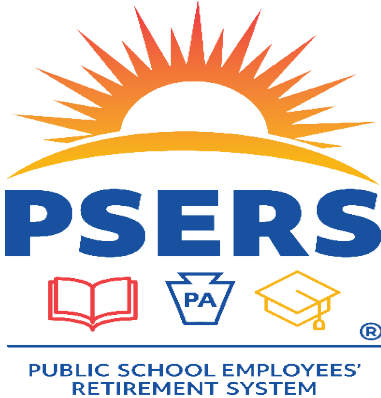
Through investment in Absolute Return strategies, PSERS seeks to reduce the risk and/or enhance the returns of PSERS overall investment program through investment in a diversified basket of portfolios. The Absolute Return asset class targets managers which provide idiosyncratic returns and portfolios that exhibit low correlation to equities, fixed income, commodities, and other sources of low-cost beta over a full market cycle. The Absolute Return asset class targets risk-adjusted returns in excess of the benchmark, net of fees, over a full market cycle. The Absolute Return asset class will achieve diversification by investing in funds, both closed-end and evergreen, and co-investments that are complementary in nature regarding fund size, sector, and strategic focus.

All strategies are eligible for inclusion in the Absolute Return asset class including event driven, relative value, tactical trading, and long/short equity. Investments are diversified by strategy in order to reduce the impact from any one strategy. Absolute Return assets can be committed to, but not limited to, funds, co-investments, separate accounts, joint ventures, partnerships, and limited liability companies (collectively “Absolute Return Investments”) investing in Absolute Return strategies. Absolute Return Investments may result in exposure to diverse securities throughout the capital structure. This Policy also allows for structures which may not conform precisely to the previous list but whose intent is to capture absolute return exposure and returns. PSERS will only consider investment structures that provide limited liability to PSERS which limits PSERS losses to the amount committed.

The Board of Trustees voted to end the Absolute Return program in December 2021, and it is anticipated the program will be fully liquidated over the next few years.

PSERS Asset Class Policies can be found on our website at <https://www.psers.pa.gov/About/Investment/Pages/Guide.aspx>

Performance



Section 3 - Investment Information

Performance

PSERS general investment consultant calculates the total investment return of the System as well as the performance of each external investment management firm and each internal investment manager retained by the Board to invest the System's assets. Performance is calculated using a time-weighted return methodology. For the one-year period ended June 30, 2022, the System generated a total net of fee return of 2.23%. This

return was above the Total Fund Policy Index return of -0.18% by 241 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2022 were 8.80%, 8.46%, and 7.91%, respectively. The three-, five-, and ten-year returns ended June 30, 2022 exceeded the Total Fund Policy Index returns by 137, 80, and 55 basis points, respectively.

Table 11.1 provides the System's total time-weighted investment returns for each major asset class and the total portfolio, including, where applicable and available, respective benchmark indexes used by asset class and median performance by asset class:

Table 11.1	Annualized Total Returns (%) Net of Fees Ended June 30, 2022					
	1 Year	3 Year	5 Year	10 Year	15 Year	20 Year
PSERS Total Fund	2.23	8.80	8.46	7.91	5.33	7.55
Total Fund Policy Index	(0.18)	7.43	7.66	7.36	5.26	6.89
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	(7.21)	6.26	6.47	7.54	5.55	6.89
60% Global Equity / 40% Barclays U.S. Aggregate Bond Index	(13.41)	3.93	4.99	6.11	4.65	6.20
PSERS U.S. Equity Portfolios	(11.61)	10.21	10.48	12.74	8.25	9.08
U.S. Equity Policy Index	(11.87)	9.83	10.65	12.60	8.34	9.24
PSERS Non-U.S. Equity Portfolios	(21.33)	3.98	5.01	7.94	4.30	8.10
Non-U.S. Equity Policy Index	(18.87)	2.34	3.50	6.79	3.14	7.05
PSERS Fixed Income Portfolios	(5.58)	2.39	4.28	4.82	6.39	6.38
Fixed Income Policy Index	(9.10)	0.74	2.51	2.67	4.89	4.89
PSERS Commodity Portfolios	8.66	8.20	5.98	0.54	(0.38)	N/A
Commodity Policy Index	8.27	6.50	4.84	(0.99)	(1.88)	N/A
PSERS Absolute Return Portfolios	8.79	6.86	5.55	4.82	5.18	N/A
Absolute Return Policy Index	1.10	6.11	5.97	5.71	6.43	6.82
PSERS Infrastructure Portfolios	10.92	0.60	1.73	N/A	N/A	N/A
Infrastructure Policy Index	10.63	1.69	2.60	7.63	N/A	N/A
PSERS Real Estate (hedged)	26.92	14.31	12.79	11.98	4.55	9.12
Blended Real Estate Index	16.69	8.93	9.09	9.87	7.37	8.92
PSERS Alternative Investments	22.64	22.68	19.01	13.85	11.38	13.41
Burgiss Median, Vintage Year Weighted Index	23.07	21.96	18.71	14.97	11.33	10.14

Footnotes to the Total Portfolio are available on page 105 of PSERS Annual Comprehensive Financial Report.

Performance (continued)

The past fiscal year was positive for the System with a net of fee return of 2.23%, exceeding the Total Fund Policy Index by 2.41%. The following asset classes were significant contributors to asset class returns this past fiscal year:

- Private Real Estate, as represented by the National Council of Real Estate Investment Fiduciaries (NCREIF) Open End Diversified Core Equity (ODCE) Net of Fees (1 Quarter Lag), was up 27.3%.
- Public Commodities, as represented by the Bloomberg Commodity Index Total Return, were up 24.3%. Positive absolute returns were largely driven by the energy sector and rising crude oil prices.
- Private Equity, as represented by Burgiss Private Equity (1 Quarter Lag), was up 23.1%.

Significant detractors from performance this past fiscal year included:

- Emerging Market Equities, as represented by the MSCI Emerging Market Investable Market Index, were down 24.8%.
- U.S. Long Treasuries, as represented by the Bloomberg U.S. Long Treasury Index, were down 18.5%. Returns in long-term treasuries were driven by rising interest rates.

As noted, two of the best performing asset classes this past fiscal year were Private Real Estate and Commodities, which were both up over 24%, while two of the worst performers were Emerging Market Equities and U.S. Long Treasuries, returning -24.8% and -18.5%, respectively, for FY 2022. This illustrates the importance of diversification. Many investment professionals discuss diversification using terms such as standard deviation, correlation, and co-variance. However, at its most basic level, diversification is insurance against bad outcomes.

The System diversifies simply because it does not know how actual events in the future will transpire relative to what is priced into the market. Diversification is a prudent approach to investing. If an investor knew with certainty which asset class would perform best the next month, quarter, or year, the investor would simply invest in that one asset class. However, without such perfect foresight, the downside risk of such a strategy could be devastating. PSERS employs diversification across a wide variety of public and private markets. Exposure to private real estate, commodities, and private equity aided the System's overall performance during the past fiscal year. Diversification into asset classes such as emerging market equities and U.S. long treasuries resulted in a drag on overall performance.

In analyzing performance, PSERS Board, general investment consultant and staff pay attention to the Sharpe ratio, which tells an investor what portion of a portfolio's performance is associated with risk taking. The Sharpe ratio measures a portfolio's added value relative to its total risk; the higher a portfolio's Sharpe ratio, the better its risk-adjusted return. PSERS Sharpe ratio, as calculated by the general investment consultant, was 0.91 for the 5-year period ending June 30, 2022, a top 2nd percentile score among public pension plans with assets above \$1 billion.

Over the past fiscal year, the equity markets performed poorly due to inflation levels not seen in decades, sharply rising interest rates, and uncertainty stemming from lingering supply-chain issues and the Russia-Ukraine war. Within the global equity market, growth stocks significantly underperformed value stocks as technology and consumer discretionary stocks struggled amidst elevated inflation and rising interest rates. From a regional perspective, non-U.S. stocks lagged their U.S. counterparts during the fiscal year.

Section 3 - Investment Information

Performance (continued)

Within the non-U.S. markets, continental Europe performed poorly due to its proximity and exposure to the fallout of the Russia-Ukraine war. Emerging markets was the worst performing region for the fiscal year largely driven by China. China's GDP growth slowed over the fiscal year, and China re-imposed lockdown measures in major cities as the country faced a significant surge in COVID-19 cases.

In response to elevated inflation, major central banks increased benchmark interest rates. In the U.S., the Federal Reserve raised the federal funds rate by 150 basis points, to a target range of 1.50% to 1.75%, in the first six months of the 2022 calendar year. Headline inflation, as measured by the Consumer Price Index, rose by 9.1% over the fiscal year. The U.S. nominal yield curve shifted upward as yields rose across all maturities during the fiscal year. The 10-year U.S.

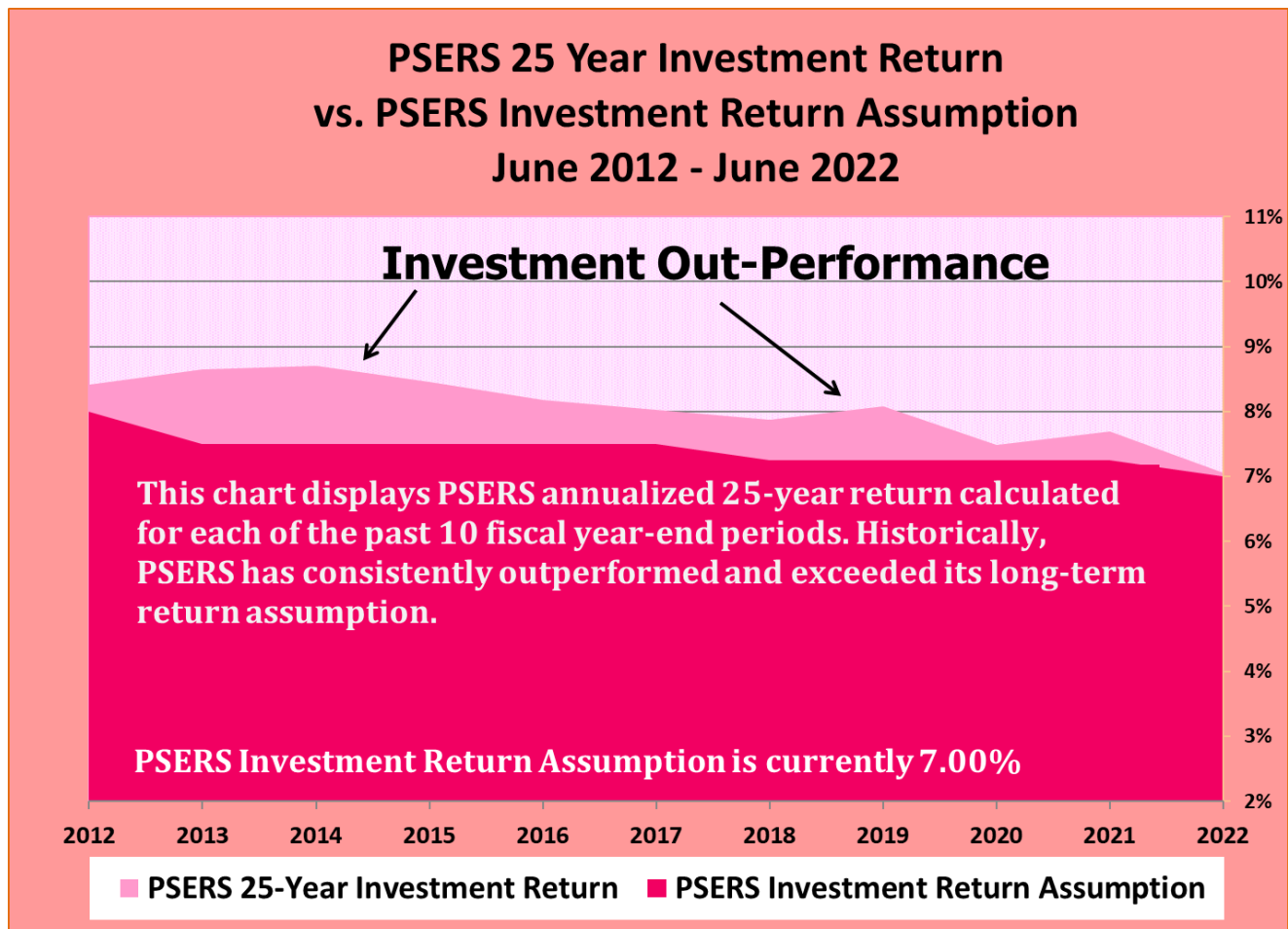
Treasury yield ended the fiscal year at 2.98%, 153 basis points higher than the beginning of the fiscal year. The sharp increase in interest rates resulted in a negative return for long government bonds.

Commodities produced strong positive returns over the 12 months ended June 30, 2022, largely driven by the energy sector and rising crude oil prices. Oil prices advanced sharply due to supply shortages resulting from the Russia-Ukraine war. The price of WTI crude oil increased by ~45% over the past 12 months to US \$106/bbl.

The assets of the System are invested to maximize the returns for the level of risk taken. Chart 11.1 shows PSERS 25-Year Trailing Investment Return for each of the past 10 fiscal years and Chart 11.2 depicts PSERS Fiscal Year Investment Return versus PSERS Investment Return Assumption for the past 10 fiscal years.

As shown in Chart 11.1, the 25-year trailing investment return has exceeded the investment return assumption over the last ten years including the Great Recession.

Chart 11.1



Section 3 - Investment Information

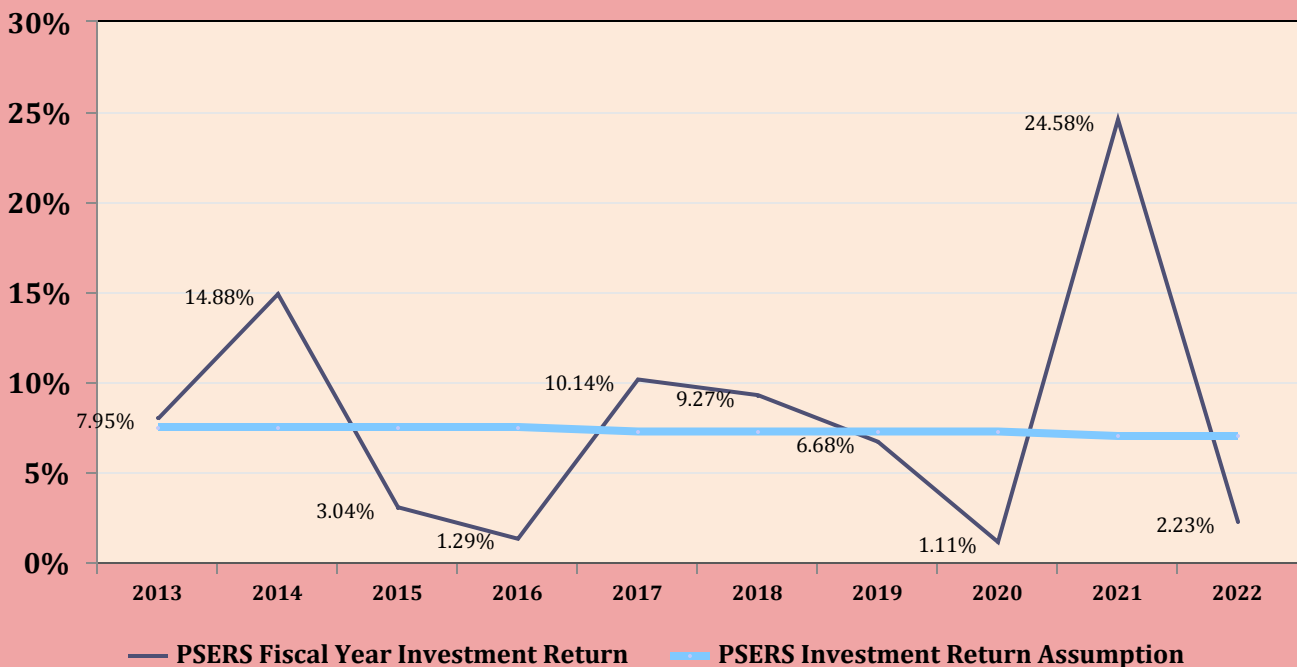
Performance (continued)

PSERS annualized net of fee return for the ten-year period ended June 30, 2022 was 7.91%, exceeding the actuarial assumed rate of return of 7.0%. The System needs to take prudent risks to achieve its long-term goal of a 7.0% return. An important concept to remember from the last sentence is “long-term”. The System has built a diversified allocation to allow it to collect risk premia over the long term. In the short term, no one knows what will happen, and the System can experience periods of time in which annual returns are above and below 7.0%. The System continues to believe the best way to achieve its long-term objectives is to

maintain a very diversified portfolio which includes all asset classes available to it, such as equities, fixed income, and real assets. In any given year, the System expects some assets to perform well, such as Private Real Estate and Commodities did this past fiscal year, and some assets to not perform as well, such as Emerging Market Equities and U.S. Long Treasuries did this past fiscal year. However, over the long term, the System expects each of its asset classes to generate a positive return commensurate with the risks taken. The future is uncertain, but PSERS believes it is well positioned to accomplish its objectives.

As depicted in chart 11.2, PSERS one-year investment return was below the investment return assumption for the fiscal year 2022. Five of the ten fiscal years, it performed above the assumption.

**Chart 11.2 PSERS Fiscal Year Investment Return vs. PSERS Investment Return Assumption
June 2013 - June 2022**



Section 3 - Investment Information

Performance (continued)

Table 11.2 demonstrates that over the past 23 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$2.15 above the Policy Benchmark's dollar returns.

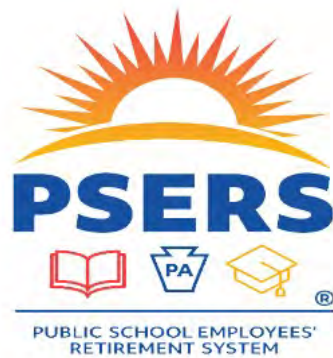
Table 11.2

PSERS Investment Earnings over Policy Benchmark Fiscal Years Ended June 30

Fiscal Year	Total Investment Expenses *	PSERS Net Return over Policy Benchmark (AFTER Payment of all Expenses)	PSERS Investment Earnings over Policy Benchmark Net of Total Investment Expenses *	\$'s of Gross Alpha for every \$1 of Investment Expenses
2022	\$525	2.41%	\$1,721	\$4.28
2021	618	3.50%	1,902	4.08
2020	515	(1.46)%	(807)	(0.57)
2019	450	(1.20)%	(640)	(0.42)
2018	468	1.11%	554	2.18
2017	474	1.80%	821	2.73
2016	416	(1.95)%	(1,006)	(1.42)
2015	455	0.04%	10	1.02
2014	482	0.50%	222	1.46
2013	558	1.25%	579	2.04
2012	481	1.10%	518	2.08
2011	515	1.01%	413	1.80
2010	522	2.19%	890	2.70
2009	478	(5.22)%	(3,131)	(5.55)
2008	399	(0.98)%	(618)	(0.55)
2007	314	4.36%	2,360	8.52
2006	211	3.26%	1,635	8.75
2005	193	2.36%	1,090	6.65
2004	191	3.51%	1,388	8.27
2003	179	(0.42)%	(140)	(0.22)
2002	163	0.56%	316	2.94
2001	144	2.13%	1,200	9.33
2000	125	1.85%	934	8.47
Total	\$8,876		\$10,211	\$2.15

*Dollar amounts in millions.

Managing Investment Fees, Expenses, and Carried Interest



Managing Investment Fees, Expenses, and Carried Interest

PSERS investment professionals formulate an Asset Allocation Policy every three years (as more fully described in Tab 9) with input from the general investment consultant, and work on an ongoing basis to implement the Policy through identification of attractive investment strategies and well-qualified investment managers. The Board reviews and reconfirms the long-term asset allocation targets of the System annually unless there has been a materially change in the underlying assumptions supporting those targets . A fundamental part of this implementation process is making key decisions with regard to use of active or passive strategies implemented by internal professionals or external investment managers.

Management of investment fees and expenses is integrated into the process of making these key decisions, so analysis of these costs must also occur within this context. If one assumes that, under PSERS Asset Allocation Policy, all of PSERS investments could be made in a passive manner resulting in negligible fees and expenses while earning investment returns equal to the Policy Benchmark, then one can also assume that all of PSERS actual investment fees and expenses are incurred with the goal of earning investment

returns that exceed the Policy Benchmark (of course, as the prudent investor realizes, not all investments can be made in passive strategies, not all passive strategies have low fees, and not all passive strategies deliver the market returns targeted).

These assumptions allow PSERS to analyze how much excess investment return above the Policy Benchmark the System has been able to generate over time for the level of fees and expenses actually paid.

PSERS ability to select a prudent combination of both internal and external managers, and both active and passive strategies, can help generate excess risk- adjusted, net of fee returns relative to the Policy Benchmarks.

Section 3 - Investment Information

Managing Investment Fees, Expenses, and Carried Interest (continued)

Chart 12.2 below demonstrates that over the past 23 fiscal years, PSERS has earned \$10.3 billion in additional investment returns above the Board-approved Policy Index, net of fees.

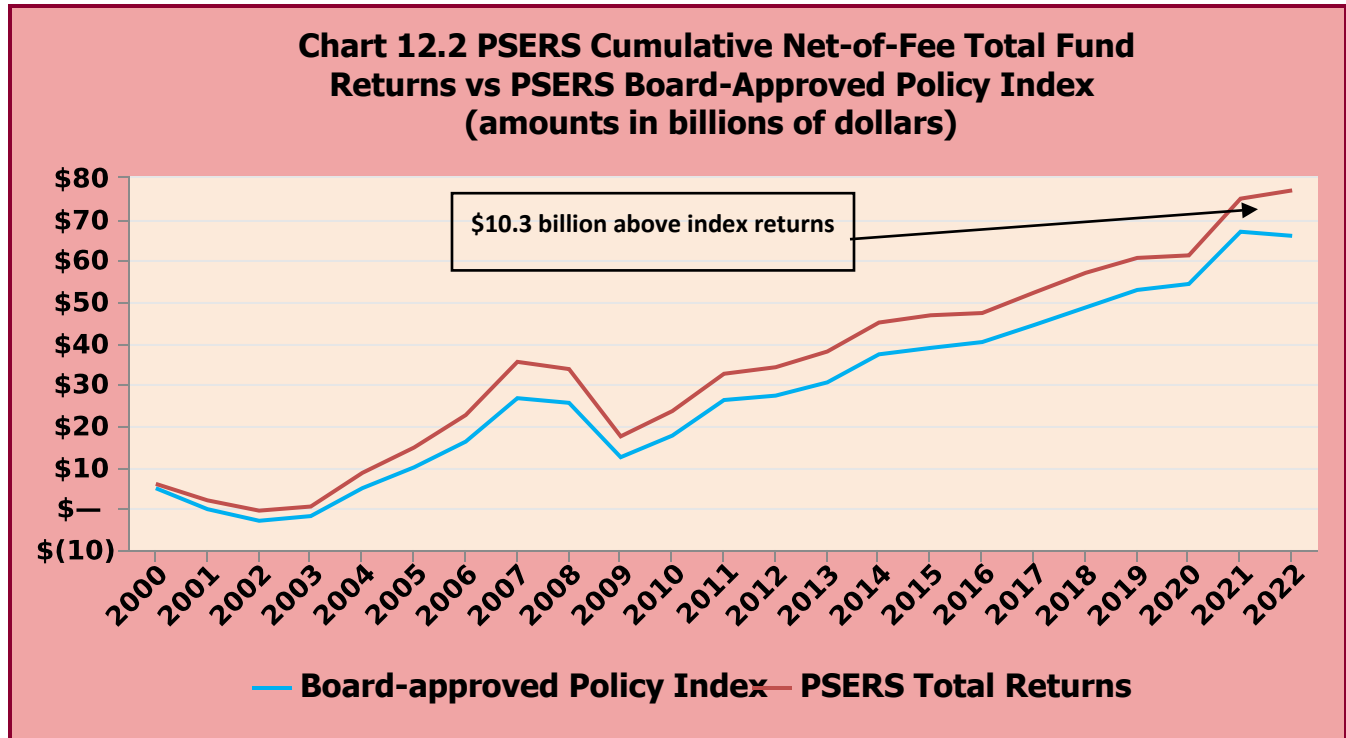
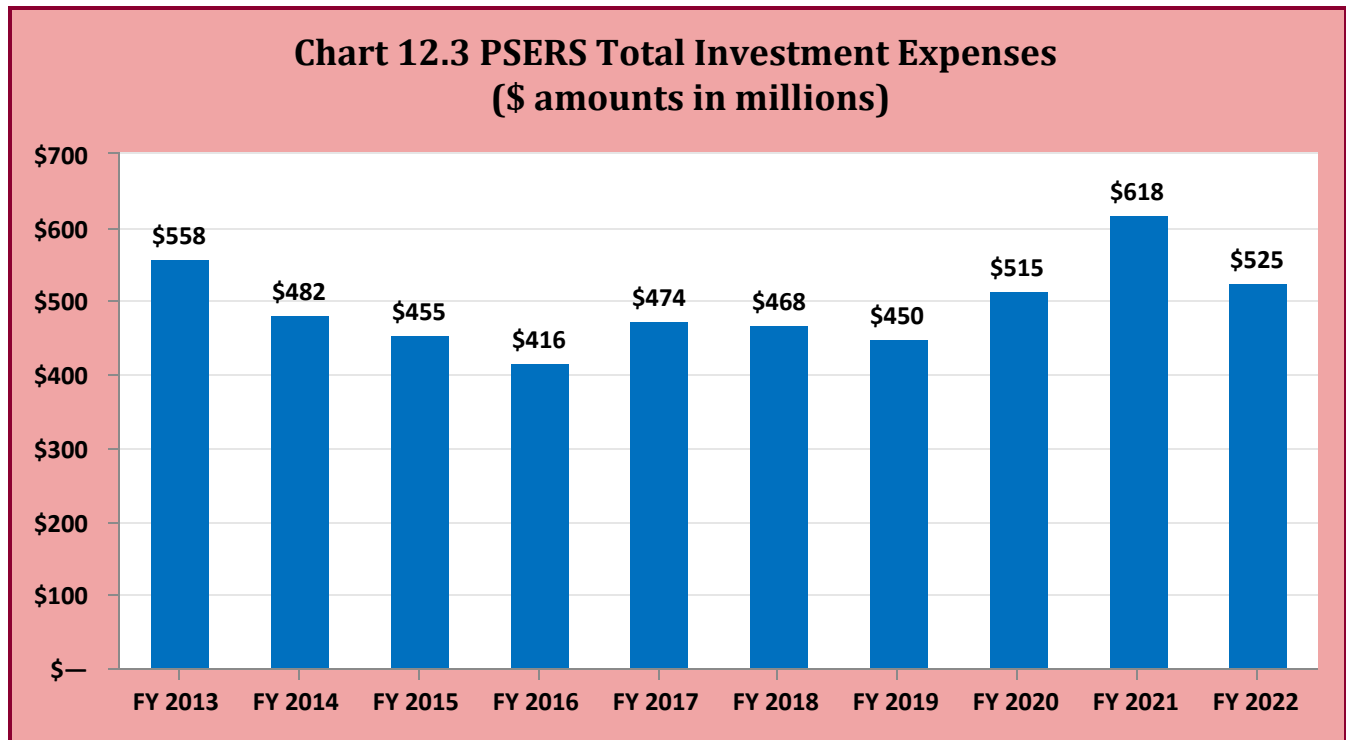


Chart 12.3 shows PSERS Total Investment Expenses over the past ten fiscal years.



Section 3 - Investment Information

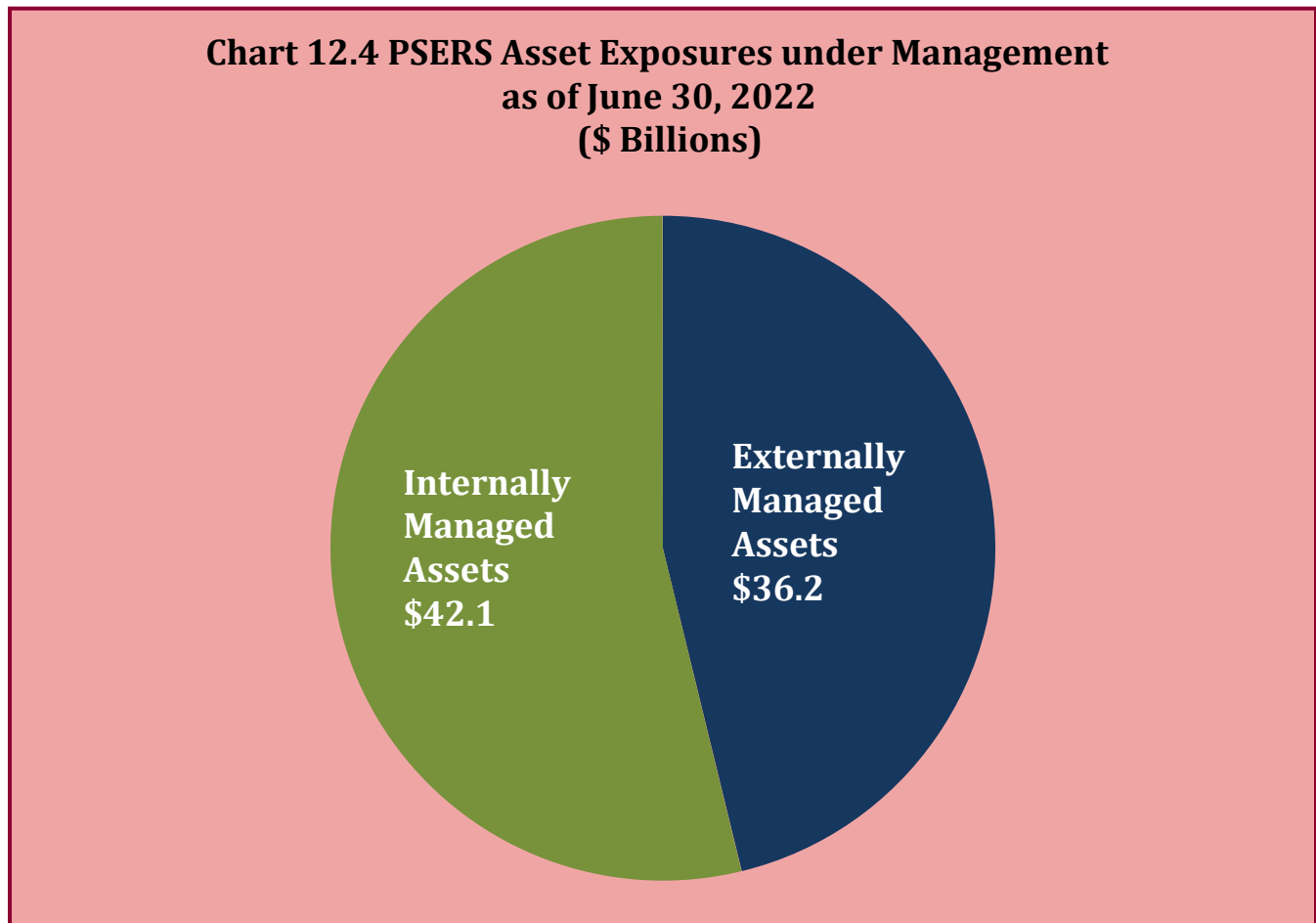
Key Decision: Internal vs. External Investment Management

PSERS generally prefers to assign investment management responsibilities to internal professionals rather than to external investment management companies when certain conditions are present (see Chart 12.1). For example, it must be clear that internal professionals can achieve risk-adjusted returns that are at least equal to what might be earned by external investment managers in equivalent strategies net of all cost and fees, and PSERS investment professionals must simultaneously have the operational capacity to take on the additional work. When assets are assigned to PSERS professionals, the total costs (e.g., salary and benefits, computers and office supplies, incremental operational support) must be

lower than those of even the largest “very low fee” investment fund managers delivering a similar strategy.

When PSERS does select external investment managers, the decision is based in part on the fees the System has negotiated and in part on the likelihood the manager will meet or exceed the performance expected. Fee negotiations begin with the expectation that the contract with the investment manager will have a “Most Favored Nations” clause guaranteeing that PSERS fees will be at least as low as other clients with a similar investment amount, and the System then negotiates fees lower from that point wherever possible.

Chart 12.4 displays the distribution of PSERS managed assets as of June 30, 2022.



Note: Financing represents a negative \$8.6 billion allocation exposure and is not reflected in Chart 12.4.

PSERS investment staff managed 27 portfolios internally, with a total estimated net asset value of over \$42 billion on June 30, 2022. We estimate that this has resulted in net savings for the entire

fiscal year of approximately \$33 million. PSERS investment staff also oversee external managers, manage the asset allocation, oversee risk, and perform other tasks in managing the overall investment program.

Section 3 - Investment Information

Key Decision: Internal vs. External Investment Management (continued)

As shown in Table 12.1 below, managing these assets externally would have cost PSERS over \$55 million in fees (\$ amounts in thousands).

Table 12.1

Internally Managed Accounts as of June 30, 2022

Account	Asset Class	Market Value as of 6/30/22*	Estimated Annual Fee %**	Estimated Cost to Manage Externally
S&P 600 Index	Public Equities	\$ 818,993	0.04%	\$ 328
S&P 500 Index	Public Equities	4,890,100	0.05%	2,445
S&P 400 Index	Public Equities	814,368	0.03%	244
Emerging Market Equity Index	Public Equities	485,280	0.03%	146
EMG Mkts IMI	Public Equities	761,405	0.09%	685
MSCI ACWI ex. U.S.	Public Equities	3,357,000	0.17%	5,707
Public Equity Total		\$ 11,127,146		\$ 9,555
Private Equity Co-Investments	Private Equities	1,386,613	1.00%	13,866
Private Equity Total		\$ 1,386,613		\$ 13,866
Active High Yield	Public Fixed Income	184,226	0.44%	811
Emerging Market Bond	Public Fixed Income	21,260	0.39%	83
Funded Passive U.S. TIPS	Public Fixed Income	3,728,923	0.03%	1,119
U.S. Core Fixed Income	Public Fixed Income	589,061	0.21%	1,237
U.S. Long Treasuries	Public Fixed Income	5,149,950	0.03%	1,545
U.S. TIPS	Public Fixed Income	1,062,253	0.13%	1,381
U.S. TIPS Swap	Public Fixed Income	2,539,360	0.03%	762
Public Fixed Income Total		\$ 13,275,033		\$ 6,938
Private Credit Co-Investments	Private Fixed Income	196,255	1.00%	1,963
Private Fixed Income Total		\$ 196,255		\$ 1,963
Bloomberg Commodity Index	Public Real Assets	1,248,880	0.03%	375
Gold Index	Public Real Assets	4,466,130	0.03%	1,340
Infrastructure Index	Public Real Assets	2,067,060	0.03%	620
Public Infrastructure	Public Real Assets	2,666,118	0.35%	9,331
REIT Index	Public Real Assets	1,321,160	0.03%	396
Public Real Assets Total		\$ 11,769,348		\$ 12,062
Direct Real Estate	Private Real Assets	535,200	0.50%	2,676
Real Estate Co-Investments	Private Real Assets	87,252	0.49%	428
Pvt Infrastructure Co-Investments	Private Real Assets	229,017	1.00%	2,290
Pvt Commodities Co-Investments	Private Real Assets	83,900	1.00%	839
Private Real Assets Total		\$ 935,369		\$ 6,233
Absolute Return Co-Investments	Absolute Return	26,300	1.00%	263
Absolute Return Total		\$ 26,300		\$ 263
Tail Risk Mitigation	Tail Risk Mitigation	94,260	1.50%	1,414
Tail Risk Mitigation Total		\$ 94,260		\$ 1,414
Cash Management	Cash Management	3,310,600	0.10%	3,311
Cash Management Total		\$ 3,310,600		\$ 3,311
Total		\$ 42,120,925		\$ 55,603
Internal Management Costs				\$ (22,935)
Net Savings				\$ 32,668

*Market values include cash and derivatives exposure

**Represents consultants peer cost comparisons

Key Decision: Active vs. Passive Investment Management

Passive investment strategies form the basis that the Fund uses to attain market exposure in many public market asset classes. The advantage of passive strategies, such as indexing, is that they are generally very inexpensive to implement. If solely using passive strategies, however, performance will be limited to general market performance with little or no potential for excess earnings.

PSERS evaluates and selects active managers on a case by case basis with strong emphasis on understanding the manager's sustainable investment edge. If PSERS investment professionals and consultants have conviction that the manager's process will generate attractive and potentially uncorrelated risk-adjusted net of fee returns in excess of the most competitive passive benchmarks, the active manager will be considered. Active strategies are also used by PSERS in asset classes where passive strategies are not available, such as Private Equity.

In selecting active managers, PSERS strives to hire managers that meet the following criteria:

- have a unique insight or process;
- have the ability to add long-term excess returns above passive alternatives, net of fees;
- have adequate capacity to execute the strategy;
- add diversification to PSERS existing investment structure;
- do not exhibit style drift; and
- exhibit a high level of ethical behavior.

The advantage of active strategies is that they endeavor to generate net of fee returns in excess of the passive alternatives, if available, and/or provide diversification benefits which help manage total portfolio risk. The disadvantages of active strategies include being more expensive to implement than passive strategies and the risk that they may underperform passive strategies.

PSERS regularly measures the performance of active strategies relative to alternative passive strategies. In cases where PSERS is not receiving investment earnings from its active strategies in excess of alternative passive strategies, when all investment fees are taken into account, capital is redeployed either to other active strategies or to passive strategies. If PSERS determines that the active managers are not meeting expectations as a group, the Fund would endeavor to exit active strategies altogether and move to a purely passive implementation.

Section 3 - Investment Information

Investment Advisory Fees

As depicted in Table 12.2 “Total External Management” includes all fees paid to external investment managers as either a base fee or a share of profits earned (performance fee). “Total Internal Management” includes all staff salaries related to PSERS Investment Office as well as

costs needed to support their work (e.g., vendor services, hardware and software, office supplies). “Total Other Expenses” include fees paid to the custodian bank, consultants, and legal services providers.

Table 12.2 summarizes total investment expenses for the fiscal year ended June 30, 2022.

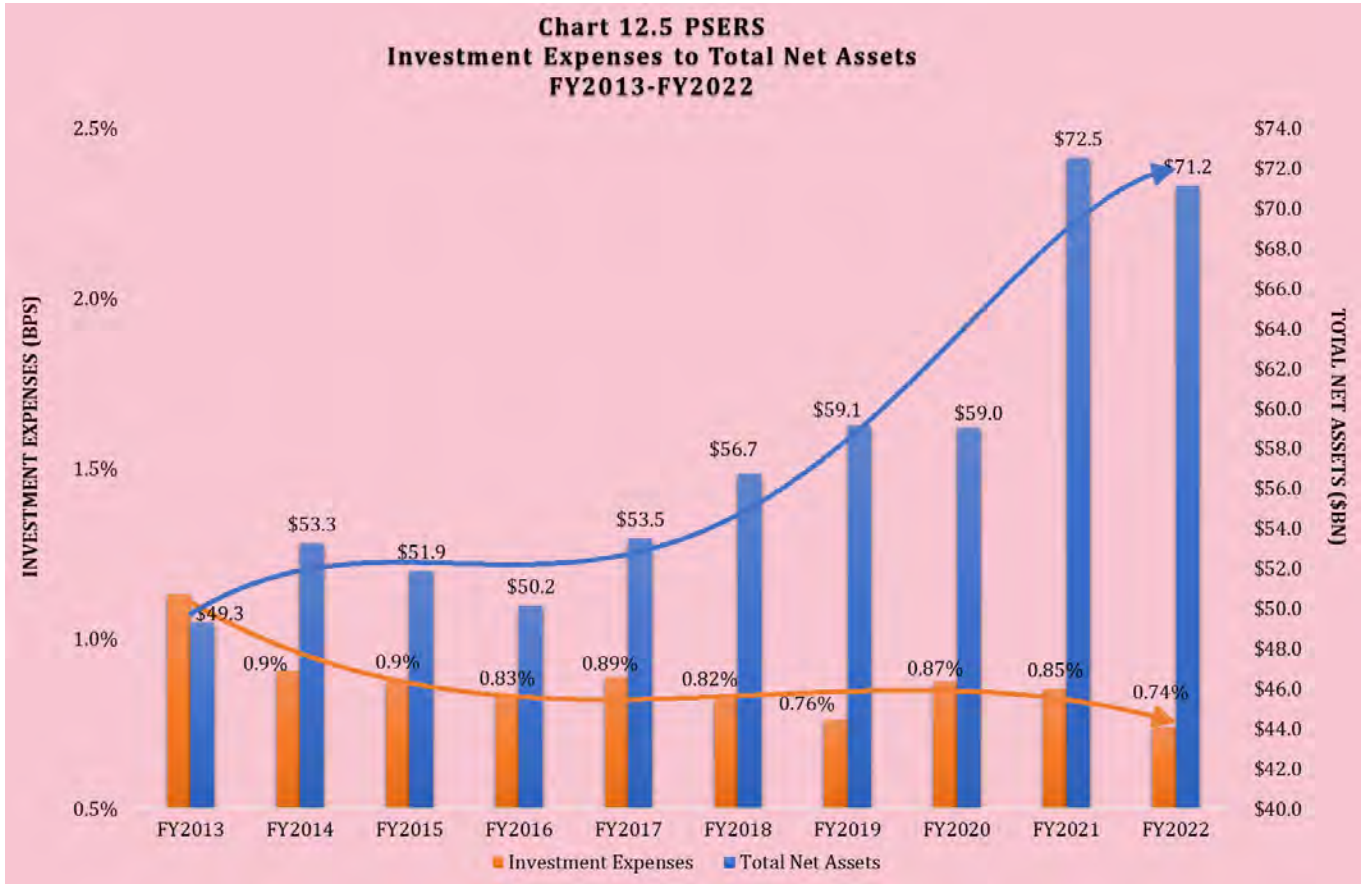
Table 12.2					
Summary of Investment Advisory Fees					
Fiscal Year Ended June 30, 2022					
(Dollar Amounts in Thousands)					
	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total Fees</u>	<u>Basis Points</u>	
External Management					
International Equity	\$ 25,547	\$ 73,509	\$ 99,056	203	
Fixed Income	32,164	7,922	40,086	124	
Real Estate	45,579	—	45,579	81	
Alternative Investments	106,573	—	106,573	100	
Absolute Return	81,504	45,115	126,619	247	
Commodities	7,710	—	7,710	60	
Master Limited Partnerships	365	1,248	1,613	68	
Infrastructure	9,035	—	9,035	99	
Private Credit	58,079	655	58,734	113	
Tail Risk	642	—	642	44	
Defined Contribution	155	—	155	17	
Total External Management	\$ 367,353	\$ 128,449	\$ 495,802	113	
Total Internal Management			\$ 22,935	6	
Total Investment Management			\$ 518,737	64	
Custodian Fees			\$ 2,522		
Consultant & Legal Fees			4,131		
Total Other Expenses			\$ 6,653		
Total Investment Expenses			\$ 525,390	65	

Section 3 - Investment Information

Investment Advisory Fees (continued)

Increasing the number and size of portfolios managed internally has resulted in reducing PSERS Total Investment Expenses in recent years. As Chart 12.5 illustrates, Total Investment

Expenses have declined from Fiscal Year 2013 to Fiscal Year 2022, while Total Net Assets have increased significantly from \$49.3 billion to \$71.2 billion.



Section 3 - Investment Information

External management fees are treated as a reduction of the investment revenue of the Fund rather than as a budgeted administrative expense.

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Non - U.S. Equity			
Acadian Asset Management, LLC	\$ 1,472	\$ —	\$ 1,472
Baillie Gifford Overseas Ltd.	2,236	—	2,236
BlackRock Financial Management, Inc.	2,079	18	2,097
Cederberg Greater China EQ FD	—	(10,519)	(10,519) *
ECM Feeder Fund 2 LP	—	48,444	48,444
Insight Investment International Limited	996	—	996
Marathon Asset Management Limited	2,721	—	2,721
Oberweis Asset Management, Inc.	2,560	—	2,560
QS Batterymarch Financial Management, Inc.	227	—	227
Steadview Capital Partners LP	2,581	9,812	12,393
The Children's Investment Fund LP	7,214	5,690	12,904
Wasatch Advisors, Inc.	3,461	20,064	23,525
Total - Non - U.S. Equity	\$ 25,547	\$ 73,509	\$ 99,056
<i>*Represents reversal of amount accrued in prior year</i>			
Fixed Income			
BlackRock Financial Management, Inc.	\$ 4,375	\$ 7,922	\$ 12,297
Bridgewater Associates, LP	25,269	—	25,269
Radcliffe Capital Management, L.P.	517	—	517
Templeton Investment Counsel, LLC	2,003	—	2,003
Total - Fixed Income	\$ 32,164	\$ 7,922	\$ 40,086
Real Estate-Partnership/Direct Owner			
AG Core Plus Realty Fund III, L.P.	\$ 110	\$ —	\$ 110
AG Core Plus Realty Fund IV, L.P.	1,055	—	1,055
AG Europe Realty Fund II, L.P.	1,200	—	1,200
AG Europe Realty Fund III, L.P.	1,147	—	1,147
AG Realty Value Fund X, L.P.	1,436	—	1,436
Almanac Realty Securities VI, L.P.	149	—	149
Almanac Realty Securities VII, L.P.	635	—	635
Almanac Realty Securities VIII, L.P.	944	—	944
Ares European Real Estate Fund IV, L.P.	477	—	477
Ares U.S. Real Estate Fund IX, L.P.	936	—	936
Ares U.S. Real Estate Fund VIII, L.P.	298	—	298
ARS VII (SIDE CAR V), L.P.	78	—	78
ARS VIII (SC V), L.P.	99	—	99
Avenue Real Estate Fund (Parallel) L.P.	500	—	500
Bell Institutional Fund V, L.P.	139	—	139

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Real Estate-Partnerships/Direct Owner (continued)</u>			
Bell Institutional Fund VI, L.P.	\$ 1,060	\$ —	\$ 1,060
Bell Institutional Fund VII, L.P.	844	—	844
Bell Partners, Inc.	738	—	738
Blackstone Real Estate Debt Strategies II, L.P.	3	—	3
Blackstone Real Estate Debt Strategies III, L.P.	662	—	662
Blackstone Real Estate Partners Europe IV, L.P.	317	—	317
Blackstone Real Estate Partners VII, L.P.	1,233	—	1,233
Blackstone Real Estate Partners VIII, L.P.	2,378	—	2,378
Brookfield Strategic Real Estate Partners II, L.P.	1,719	—	1,719
Brookfield Strategic Real Estate Partners III-B, L.P.	2,543	—	2,543
Brookfield Strategic Real Estate Partners, L.P.	638	—	638
BSREP IV Obsidian Co-Invest B, L.P.	9	—	9
Cabot Industrial Core Fund II, L.P.	888	—	888
Cabot Industrial Value Fund V, L.P.	528	—	528
Cabot Industrial Value Fund VI, L.P.	1,500	—	1,500
Carlyle Realty Partners V, L.P.	76	—	76
Carlyle Realty Partners VI, L.P.	72	—	72
Carlyle Realty Partners VII, L.P.	319	—	319
Carlyle Realty Partners VIII, L.P.	1,564	—	1,564
DRA Fund IX Industrial Co-Investment LLC	99	—	99
DRA Growth and Income Fund IX, LLC	1,470	—	1,470
DRA Growth and Income Fund VII, L.P.	138	—	138
DRA Growth and Income Fund VIII Co-Investment I, LLC	115	—	115
DRA Growth and Income Fund VIII, LLC	902	—	902
DRA Growth and Income Fund X, LLC	1,114	—	1,114
Exeter Core Industrial Club Fund II, L.P.	769	—	769
Exeter Industrial Core Fund III, L.P.	761	—	761
Exeter Industrial Value Fund III, L.P.	56	—	56
Exeter Industrial Value Fund IV, L.P.	555	—	555
Exeter Industrial Value Fund V, L.P.	1,200	—	1,200
GF Management, LLC	131	—	131
L&B Realty Advisors, LLP	87	—	87
Latitude Management Real Estate Capital III, Inc.	118	—	118
LEM Multifamily Fund V, L.P.	1,000	—	1,000
LEM Multifamily Senior Equity Fund IV, L.P.	270	—	270
O'Connor Real Estate Advisors, LLC	900	—	900
Pramerica Real Estate Capital VI, L.P.	549	—	549
Property Management, Inc.	31	—	31
RCG Longview Debt Fund VI, L.P.	564	—	564

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Real Estate-Partnerships/Direct Owner (continued)</u>			
RCG Longview Equity Fund, L.P.	\$ 21	\$ —	\$ 21
Security Capital Preferred Growth	2,133	—	2,133
Senior Housing Partnership Fund V, L.P.	755	—	755
Stockbridge I Secondary	107	—	107
Stockbridge Real Estate Fund II, LP	54	—	54
Stockbridge Real Estate Fund III, LP	298	—	298
Stockbridge Real Estate Fund, L.P.	3,887	—	3,887
UBS (US) Trumbull Property Fund, L.P.	230	—	230
Total - Real Estate-Partnership/Direct Owner	\$ 44,608	\$ —	\$ 44,608
<u>Real Estate-Farmland</u>			
Prudential Agricultural Group	\$ 971	\$ —	\$ 971
Subtotal - Real Estate-Farmland	\$ 971	\$ —	\$ 971
Total Real Estate	\$ 45,579	\$ —	\$ 45,579
<u>Alternative Investments</u>			
Actis Global 4, L.P.	\$ 1,251	\$ —	\$ 1,251
Aisling Capital IV, L.P.	463	—	463
Apax Digital, L.P.	1,053	—	1,053
Apax X USD, L.P.	1,943	—	1,943
Apollo Investment Fund IX, L.P.	2,312	—	2,312
Apollo Investment Fund VIII, L.P.	485	—	485
Bain Capital Asia Fund II, L.P.	534	—	534
Bain Capital Asia Fund III-A, L.P.	1,129	—	1,129
Bain Capital Asia Fund IV-B, L.P.	1,500	—	1,500
Bain Capital Fund XI-A, L.P.	350	—	350
Bain Capital Fund XII-A, L.P.	1,048	—	1,048
Baring Asia Private Equity Fund V, L.P.	754	—	754
Baring Asia Private Equity Fund VI, L.P.	348	—	348
Blue Point Capital Partners III (B), L.P.	114	—	114
Blue Point Capital Partners IV, L.P.	750	—	750
Bridgepoint Development Capital III, L.P.	1,031	—	1,031
Bridgepoint Development Capital IV, L.P.	679	—	679
Bridgepoint Europe IV, L.P.	452	—	452
Bridgepoint Europe V, L.P.	1,351	—	1,351
Bridgepoint Europe VI, L.P.	1,570	—	1,570
Capital International Private Equity Fund VI, L.P.	432	—	432
Catterton Growth Partners II, L.P.	934	—	934
Catterton Growth Partners III, L.P., L	1,200	—	1,200

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Catterton Growth Partners, L.P.	\$ 166	\$ —	\$ 166
Catterton Partners VI, L.P.	33	—	33
Catterton Partners VII, L.P.	943	—	943
Catterton VIII, L.P., L	1,146	—	1,146
Cerberus Institutional Partners V, L.P.	146	—	146
Cerberus Institutional Partners VI, L.P.	2,165	—	2,165
Clearlake Capital Partners IV, L.P.	320	—	320
Clearlake Capital Partners VII, L.P.	240	—	240
Coller International Partners VI, L.P.	631	—	631
Coller International Partners VII, L.P. - Series A	936	—	936
Crestview Partners II, L.P.	872	—	872
Crestview Partners III, L.P.	1,360	—	1,360
Crestview Partners, L.P.	250	—	250
Crown CG Private Equity Fund 2019, L.P.	1,410	—	1,410
DCPF VI Oil and Gas Co-Investment Fund, L.P.	14	—	14
Denham Commodity Partners Fund VI, L.P.	477	—	477
Energy & Minerals Group Fund III, L.P., The	805	—	805
Equistone Partners Europe Fund V E, L.P.	802	—	802
Equistone Partners Europe Fund VI E, SCSp	1,459	—	1,459
GoldPoint Partners Co-Investment V, L.P.	199	—	199
Greenoaks Capital Opportunities Fund III	2,000	—	2,000
Hahn & Company III L.P.	2,250	—	2,250
Hahn & Company III-S L.P.	337	—	337
Hg Genesis 9 L.P.	1,938	—	1,938
Hg Saturn 2 A L.P.	881	—	881
HgCapital 7 A, L.P.	87	—	87
HgCapital 8 D, L.P.	1,599	—	1,599
HGGC Fund II, L.P.	349	—	349
HGGC Fund III, L.P.	1,113	—	1,113
Incline Elevate Fund, L.P.	1,500	—	1,500
Incline Equity Partners IV, L.P.	543	—	543
Insight Opportunities Fund I, L.P.	626	—	626
Insight Partners XI, L.P.	2,189	—	2,189
Insight Partners XII Buyout Annex Fund, L.P.	181	—	181
Insight Partners XII, L.P.	885	—	885
Insight Venture Partners X, L.P.	1,487	—	1,487
Interactions Corporation	50	—	50
K4 Private Investors, L.P.	1,853	—	1,853

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Landmark Equity Partners XIV, L.P.	\$ 240	\$ —	\$ 240
Lindsay Goldberg V, L.P.	2,558	—	2,558
LLR Equity Partners IV, L.P.	1,353	—	1,353
LLR Equity Partners V, L.P.	2,845	—	2,845
LLR Equity Partners VI, L.P.	3,470	—	3,470
Milestone Partners III, L.P.	85	—	85
Milestone Partners IV, L.P.	263	—	263
New Mountain Partners IV, L.P.	282	—	282
New Mountain Partners V, L.P.	1,424	—	1,424
New Mountain Partners VI, L.P.	2,343	—	2,343
NGP Natural Resources X, L.P.	299	—	299
NGP Natural Resources XI, L.P.	960	—	960
North Haven Private Equity Asia IV, L.P.	979	—	979
Oak HC/FT Partners IV, L.P.	835	—	835
Odyssey Investment Partners Fund V, L.P.	985	—	985
Orchid Asia V, L.P.	106	—	106
Orchid Asia VI, L.P.	619	—	619
Orchid Asia VII, L.P.	1,089	—	1,089
PAI Europe VI, L.P.	1,226	—	1,226
PAI Europe VII, L.P.	1,669	—	1,669
Palladium Equity Partners IV, L.P.	353	—	353
Partners Group Secondary 2011 (USD), L.P. Inc.	779	—	779
Partners Group Secondary 2015 (USD) A, L.P.	1,097	—	1,097
Platinum Equity Capital Partners V, L.P.	2,117	—	2,117
Platinum Equity Small Cap Fund, L.P.	1,456	—	1,456
Portfolio Advisors Secondary Fund III, L.P.	1,812	—	1,812
Portfolio Advisors Secondary Fund IV, L.P.	882	—	882
Portfolio Advisors Secondary Fund, L.P., PA	504	—	504
Sante Health Ventures III	2,382	—	2,382
Sante Health Ventures IV	138	—	138
Searchlight Capital II, L.P.	542	—	542
Searchlight Capital III, L.P.	2,749	—	2,749
StarVest Partners II (Parallel), L.P.	238	—	238
Strategic Partners Fund IV, L.P.	17	—	17
Strategic Partners Fund V, L.P.	89	—	89
Strategic Partners Fund VI, L.P.	467	—	467
Strategic Partners Fund VII, L.P.	1,250	—	1,250
Summit Partners Growth Equity Fund IX-A, L.P.	1,292	—	1,292
Summit Partners Growth Equity Fund VIII-A, L.P.	944	—	944
Summit Partners Growth Equity Fund X-A, L.P.	128	—	128
Summit Partners Growth Equity Fund XI-A, L.P.	118	—	118

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Alternative Investments (continued)			
Summit Partners Venture Capital Fund IV-A, L.P.	\$ 683	\$ —	\$ 683
Tenaya Capital VI, L.P.	451	—	451
Tenaya Capital VII, L.P.	1,394	—	1,394
Tenaya Capital V-P, L.P.	61	—	61
Trilantic Capital Partners V (North America), L.P.	494	—	494
Trilantic Capital Partners VI (North America), L.P.	2,241	—	2,241
Venor Special Situations Fund II, L.P.	397	—	397
Versa Capital Fund II, L.P.	845	—	845
Versa Capital Fund III, L.P.	874	—	874
Webster Capital IV, L.P.	224	—	224
Total Alternative Investments	\$ 106,573	\$ —	\$ 106,573
Absolute Return			
Aeolus Capital Management Ltd.	\$ 3,533	\$ 984	\$ 4,517
AKAZ Offshore Fund LTD	2,166	—	2,166
Bridgewater Associates, Inc.	23,535	—	23,535
Brigade Capital Management	771	902	1,673
Capula Investment Management, LLP	10,017	6,417	16,434
Caspian Capital, LP	3,127	1,430	4,557
Falko Regional Aircraft Opportunities Fund II L.P.	571	—	571
Garda Capital Partners, LP	9,654	9,620	19,274
HS Group Sponsor Fund II Ltd.	933	—	933
Independence Reinsurance Partners GP, LLC	2,115	144	2,259
Nephila Capital Ltd.	416	—	416
Nimbus Weather Fund	2,588	—	2,588
Oceanwood Opportunities Fund	—	(224)	(224) *
OWS Credit Opportunity Offshore Fund III, Ltd.	6,540	7,193	13,733
Pacific Investment Management Company (PIMCO)	10,457	22,033	32,490
Perry Partners, L.P.	(16)	—	(16) *
Sciens Aviation Special Opportunities Investment Fund III, L.P.	410	—	410
Sciens Aviation Special Opportunities Investment Fund IV, L.P.	1,404	—	1,404
Sciens Aviation Special Opportunities Investment Fund V, L.P.	2,180	—	2,180
Venor Capital Offshore	1,103	(3,384)	(2,281) *
Total - Absolute Return	\$ 81,504	\$ 45,115	\$ 126,619
<i>*Represents reversal of amount accrued in prior year</i>			
Commodities			
Denham Mining Fund, L.P.	\$ 1,809	\$ —	\$ 1,809
Gresham Investment Management, LLC	1,359	—	1,359
NGP Natural Resources XII, L.P.	3,068	—	3,068
Wellington Management Company, LLP	1,474	—	1,474
Total - Commodities	\$ 7,710	\$ —	\$ 7,710

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Infrastructure</u>			
Blackstone Infrastructure Partners L.P.	\$ 4,911	\$ —	\$ 4,911
CIM Infrastructure Fund III, L.P.	18	—	18
GCM Grosvenor Customized Infrastructure Strategies II, LP	306	—	306
International Infrastructure Finance Company II, LP	678	—	678
ISQ Global Infrastructure Fund III, L.P.	1,930	—	1,930
ISQ KIO Co-Invest Fund, L.P.	6	—	6
Strategic Partners Real Assets II, L.P.	1,186	—	1,186
Total - Infrastructure	\$ 9,035	\$ —	\$ 9,035
<u>Master Limited Partnerships</u>			
Salient Capital Advisors, LLC	193	—	193
Stein Roe Investment Counsel D/B/A Atlantic Trust	172	1,248	1,420
Total - Master Limited Partnerships	\$ 365	\$ 1,248	\$ 1,613
<u>Private Credit</u>			
Apollo European Principal Finance Fund II (Dollar A), L.P.	\$ 128	\$ —	\$ 128
Apollo European Principal Finance Fund III, (Dollar A), L.P.	1,716	—	1,716
Avenue Energy Opportunities Fund II, L.P.	750	—	750
Avenue Energy Opportunities Fund, L.P.	1,094	—	1,094
Avenue Europe Special Situations Fund III (U.S.), L.P.	821	—	821
Bain Capital Credit Managed Account (PSERS), L.P.	1,170	—	1,170
Bain Capital Distressed and Special Situations 2013 (A), L.P.	802	—	802
Bain Capital Distressed and Special Situations 2016 (A), L.P.	2,227	—	2,227
Bain Capital Distressed and Special Situations 2019 (A), L.P.	2,041	—	2,041
Bain Capital Middle Market Credit 2014, LP	493	—	493
Bain Capital Special Situations Asia II, LP	7	—	7
Brigade Capital Management	1,620	655	2,275
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,230	—	1,230
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	14	—	14
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	9,100	—	9,100
Clearlake Opportunities Partners (P) II, L.P.	648	—	648
Galton Onshore Mortgage Recovery Fund IV, L.P.	382	—	382
Hayfin SOF II USD Co-Invest, L.P.	86	—	86
Hayfin SOF II USD, L.P.	2,165	—	2,165
HayFin Special Opportunities Credit Fund (Parallel), L.P.	182	—	182
ICG Europe Fund V, L.P.	343	—	343
ICG Europe Fund VI, L.P.	769	—	769
ICG Europe Fund VII Feeder SCSp	1,489	—	1,489

Section 3 - Investment Information

Table 12.3

Investment Fees by Manager Fiscal Year ended June 30, 2022 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Private Credit (continued)</u>			
International Infrastructure Finance Company Fund, L.P.	\$ 407	\$ —	\$ 407
Keystone Partners, L.P. Series A	196	—	196
Latitude Management Real Estate Capital IV, Inc.	895	—	895
LBC Credit Partners III, L.P.	442	—	442
LBC-P Credit Fund, L.P.	7,022	—	7,022
Park Square - PSERS Credit Opportunities Fund, L.P.	4,148	—	4,148
PIMCO BRAVO Fund III Onshore Feeder, LP	1,765	—	1,765
PSERS TAO Partners Parallel Fund, L.P. - (TAO 2.0)	1,918	—	1,918
PSERS TAO Partners Parallel Fund, L.P. - (TAO 3.0)	1,867	—	1,867
PSERS TAO Partners Parallel Fund, L.P. - (TAO Contingent)	1,022	—	1,022
Sixth Street Fundamental Strategies Partners (A), L.P.	434	—	434
Sixth Street Opportunities Partners V (A), L.P.	150	—	150
Sixth Street Specialty Lending Europe II, L.P.	631	—	631
SSG Capital Partners V Sidecar, L.P.	750	—	750
SSG Capital Partners V, L.P.	2,097	—	2,097
Sixth Street Opportunities Partners III (A), L.P.	468	—	468
Sixth Street Opportunities Partners IV (A), L.P.	2,062	—	2,062
Varde Scratch and Dent Feeder I-A, L.P., The	363	—	363
Varde Scratch and Dent Feeder, L.P., The	65	—	65
Whitehorse Liquidity Partners (Onshore) IV, L.P.	1,400	—	1,400
Whitehorse Liquidity Partners V, L.P.	700	—	700
Total - Private Credit	\$ 58,079	\$ 655	\$ 58,734
<u>Tail Risk Mitigation</u>			
Capstone Commonwealth Fund LP	\$ 642	\$ —	\$ 642
Total - Tail Risk Mitigation	\$ 642	\$ —	\$ 642
<u>Defined Contribution</u>			
T. Rowe Price Target Date Funds	\$ 155	\$ —	\$ 155
Total - Defined Contribution	\$ 155	\$ —	\$ 155
Total External Management	\$ 367,353	\$ 128,449	\$ 495,802
Total Internal Management			\$ 22,935
Total Investment Management			\$ 518,737

*Internal Management expenses include salaries and fringe benefits of \$16,104 and operating expenses of \$6,831.

Section 3 - Investment Information

Investment Fees and Expenses Initiatives

PSERS continues to pursue several avenues intended to maintain a reasonable cost structure. These initiatives include:

- For external managers making traditional and absolute return investments, enter into arrangements for netting of profit shares for managers with multiple PSERS mandates.
- For external managers making nontraditional investments, move away from paying on committed capital and towards paying on invested capital whenever possible.
- For external managers, re-underwriting all fee arrangements to ensure that the fee arrangements are fair and equitable.

Carried Interest Reported by Manager

PSERS, as part of its historic commitment to transparency, has evolved its reporting on private markets fees and costs. PSERS disclosed profit share (carried interest), net management fees, and other fund expenses by fund in one report for the calendar year ended 2021. PSERS uses a best effort approach to gather the necessary data by canvassing our active funds for carried interest, management fee offsets and other fund expenses detailed out by fund. This information was presented to PSERS Board in December 2022 and the full report is available on our website at www.psers.pa.gov.

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity				
Actis Emerging Markets 3, L.P.	\$ —	\$ —	\$ —	\$ —
Actis Global 4, L.P.	1,368	2,251	18	3,637
Adams Capital Management, L.P.	—	—	6	6
Aisling Capital II L.P.	—	—	26	26
Aisling Capital III, L.P.	—	76	20	96
Aisling Capital IV, L.P.	—	(21,797)	264	(21,533) *
Apax Digital, L.P.	1,240	5,969	1,145	8,354
Apax Europe VII, L.P.	—	476	12	488
Apax X USD, L.P.	2,011	2,443	1,795	6,249
Apollo Investment Fund IX, L.P.	2,036	13,799	740	16,575
Apollo Investment Fund VIII, L.P.	564	20,354	361	21,279
Avenue Special Situations Fund VI, L.P.	—	—	19	19
Bain Capital Asia Fund II, L.P.	572	1,354	52	1,978
Bain Capital Asia Fund III-A, L.P.	1,206	935	94	2,235
Bain Capital Asia Fund IV-B, L.P.	1,464	4,553	478	6,495
Bain Capital Fund XI-A, L.P.	335	6,848	44	7,227
Bain Capital Fund XII-A, L.P.	1,192	8,373	269	9,834
Baring Asia Private Equity Fund IV, L.P.	—	(167)	151	(16) *
Baring Asia Private Equity Fund V, L.P.	2,200	(8,110)	870	(5,040) *
Baring Asia Private Equity Fund VI, L.P.	843	(14,914)	200	(13,871)
Blue Point Capital Partners II (B), L.P.	—	—	33	33
Blue Point Capital Partners III (B), L.P.	373	11,814	123	12,310
Blue Point Capital Partners IV, L.P.	732	7,477	194	8,403
Bridgepoint Development Capital III, L.P.	391	7,136	603	8,130
Bridgepoint Development Capital IV, L.P.	2,948	—	521	3,469
Bridgepoint Europe III A, L.P.	—	—	54	54
Bridgepoint Europe IV, L.P.	503	4,556	31	5,090
Bridgepoint Europe V, L.P.	1,335	20,625	135	22,095
Bridgepoint Europe VI, L.P.	1,290	4,861	376	6,527
Capital International Private Equity Fund V L.P.	—	—	29	29
Capital International Private Equity Fund VI, L.P.	433	—	46	479
Catterton Growth Partners II, L.P.	956	(11,712)	148	(10,608) *
Catterton Growth Partners III, L.P., L	1,191	21,411	186	22,788
Catterton Growth Partners, L.P.	243	(6,630)	88	(6,299) *
Catterton Partners VI, L.P.	322	2,540	46	2,908
Catterton Partners VII, L.P.	1,103	3,822	88	5,013

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Catterton VIII, L.P., L	\$ 1,122	\$ 588	\$ 184	\$ 1,894
Cerberus Institutional Partners V, L.P.	183	16,098	533	16,814
Cerberus Institutional Partners VI, L.P.	2,289	12,219	599	15,107
Cerberus Institutional Partners, L.P. (Series 4)	—	3,621	194	3,815
Cinven Fund (Fourth), L.P.	—	—	3	3
Clearlake Capital Partners IV, L.P.	114	32,192	79	32,385
Clearlake Capital Partners V, L.P.	(118)	39,893	331	40,106
Clearlake Capital Partners VI, L.P.	(398)	18,335	652	18,589
Clearlake Flagship Plus Partners, L.P.	—	2,151	330	2,481
Co-Investment 2000 Fund, L.P.	—	—	13	13
Co-Investment Fund II, L.P.	—	—	125	125
Coller International Partners VI, L.P.	664	2,765	20	3,449
Coller International Partners VII, L.P. - Series A	985	3,054	162	4,201
Crestview Partners II, L.P.	884	12,697	243	13,824
Crestview Partners III, L.P.	1,202	6,097	332	7,631
Crestview Partners, L.P.	250	3,892	211	4,353
Cross Atlantic Technology Fund II	—	—	13	13
Cross Atlantic Technology Fund, L.P.	—	—	13	13
Crown CG Private Equity Fund 2019, L.P.	1,474	—	155	1,629
Crown CG Private Equity Fund 2019S, L.P.	—	134	57	191
CVC Capital Partners Asia Pacific III, L.P.	—	1,372	49	1,421
CVC European Equity Partners V (A), L.P.	—	2,780	43	2,823
DCPF VI Oil and Gas Co-Investment Fund, L.P.	20	523	7	550
Denham Commodity Partners Fund VI, L.P.	479	372	90	941
Energy & Minerals Group Fund III, L.P., The	812	—	39	851
Equistone Partners Europe Fund V E, L.P.	909	—	20	929
Equistone Partners Europe Fund VI E, SCSp	1,487	—	279	1,766
Evergreen Pacific Partners II, L.P.	—	138	420	558
Evergreen Pacific Partners, L.P.	—	—	306	306
First Reserve Fund XII, L.P.	—	—	113	113
Gleacher Mezzanine Fund II, L.P.	—	123	12	135
Gold Hill Venture Lending 03-A, L.P.	—	54	18	72
GoldPoint Partners Co-Investment V, L.P.	245	3,206	36	3,487
Greenoaks Capital Opportunities Fund III	3,626	17,862	572	22,060
Hahn & Company III L.P.	2,250	3,172	375	5,797
Hahn & Company III-S L.P.	316	1,911	66	2,293

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Hg Genesis 9 L.P.	\$ 1,975	\$ —	\$ 370	\$ 2,345
Hg Saturn 2 A L.P.	996	—	370	1,366
HgCapital 7 A, L.P.	175	8,528	25	8,728
HgCapital 8 D, L.P.	1,317	—	287	1,604
HGGC Fund II, L.P.	762	11,912	96	12,770
HGGC Fund III, L.P.	1,190	17,582	116	18,888
Incline Elevate Fund, L.P.	315	26,680	87	27,082
Incline Equity Partners III (PSERS), L.P.	—	4,602	20	4,622
Incline Equity Partners IV, L.P.	270	6,975	59	7,304
Incline Equity Partners V, L.P.	1,847	—	173	2,020
Insight Opportunities Fund I, L.P.	684	1,084	155	1,923
Insight Partners XI, L.P.	2,155	(1,367)	296	1,084
Insight Partners XII, L.P.	772	—	64	836
Insight Venture Partners X, L.P.	1,435	70,631	48	72,114
Irving Place Capital Partners III SPV, L.P.	—	24,019	82	24,101
K4 Private Investors, L.P.	1,827	11,003	139	12,969
Landmark Equity Partners XIII, L.P.	—	—	1	1
Landmark Equity Partners XIV, L.P.	266	1,886	2	2,154
Lindsay Goldberg V, L.P.	2,467	3,419	746	6,632
LLR Equity Partners II, L.P.	—	88	39	127
LLR Equity Partners III, L.P.	—	32,438	98	32,536
LLR Equity Partners IV, L.P.	1,010	36,305	145	37,460
LLR Equity Partners V, L.P.	2,670	14,959	202	17,831
LLR Equity Partners VI, L.P.	3,469	—	419	3,888
Milestone Partners FS 2, L.P.	121	13,890	59	14,070
Milestone Partners III, L.P.	(86)	—	32	(54) *
Milestone Partners IV, L.P.	340	585	70	995
NEPA Venture Fund II	—	(15,993)	36	(15,957) *
New Mountain Partners III L.P.	—	17,767	34	17,801
New Mountain Partners IV, L.P.	363	1,358	26	1,747
New Mountain Partners V, L.P.	424	24,097	83	24,604
New Mountain Partners VI, L.P.	3,225	594	541	4,360
New Mountain Partners, L.P., Allegheny	—	(157)	20	(137) *
New York Life Capital Partners IV-A. L.P.	—	39	93	132
NGP Natural Resources X, L.P.	403	—	74	477
NGP Natural Resources XI, L.P.	989	—	45	1,034

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
North Haven Private Equity Asia IV, L.P.	\$ 1,035	\$ (6,452)	\$ 203	\$ (5,214) *
Oak HC/FT Partners IV, L.P.	770	794	293	1,857
OCM Opportunities Fund VII L.P.	—	—	9	9
OCM Opportunities Fund VII-b L.P.	—	46	9	55
Odyssey Investment Partners Fund V, L.P.	1,189	—	53	1,242
Orchid Asia V, L.P.	107	192	9	308
Orchid Asia VI, L.P.	785	(4,225)	123	(3,317) *
Orchid Asia VII, L.P.	1,274	(1,703)	406	(23) *
PAI Europe IV-B2, L.P.	—	1,167	164	1,331
PAI Europe V, L.P.	—	(67)	14	(53) *
PAI Europe VI, L.P.	1,094	7,791	52	8,937
PAI Europe VII, L.P.	1,178	6,251	650	8,079
Palladium Equity Partners IV, L.P.	393	5,798	212	6,403
Partners Group Secondary 2008, L.P.	—	156	84	240
Partners Group Secondary 2011 (USD), L.P. Inc.	820	933	22	1,775
Partners Group Secondary 2015 (USD) A, L.P.	1,156	4,243	108	5,507
Platinum Equity Capital Partners IV, L.P.	—	68,607	194	68,801
Platinum Equity Capital Partners V, L.P.	2,710	25,397	662	28,769
Platinum Equity Capital Partners-A II, L.P.	—	3,219	—	3,219
Platinum Equity Capital Partners-A III, L.P.	—	4,690	—	4,690
Platinum Equity Capital Partners-A, L.P.	—	1,941	1,555	3,496
Platinum Equity Small Cap Fund, L.P.	1,456	6,625	568	8,649
Portfolio Advisors Secondary Fund III, L.P.	1,734	5,378	182	7,294
Portfolio Advisors Secondary Fund IV, L.P.	442	3,111	87	3,640
Portfolio Advisors Secondary Fund, L.P., PA	373	—	141	514
Sante Health Ventures III	2,382	—	102	2,484
Sante Health Ventures IV	—	—	176	176
SCP Private Equity Partners II, L.P.	—	—	108	108
Searchlight Capital II, L.P.	566	13,559	110	14,235
Searchlight Capital III, L.P.	2,594	10,369	651	13,614
StarVest Partners , L.P.	—	—	12	12
StarVest Partners II (Parallel), L.P.	247	—	110	357
StepStone International Investors III L.P.	—	—	48	48
Sterling Capital Partners, L.P.	—	(93)	185	92
Sterling Venture Partners, L.P.	—	—	15	15
Strategic Partners Fund III VC, L.P.	—	—	6	6

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Strategic Partners Fund III-B, L.P.	\$ —	\$ —	\$ 94	\$ 94
Strategic Partners Fund IV VC, L.P.	8	289	26	323
Strategic Partners Fund IV, L.P.	17	671	23	711
Strategic Partners Fund V, L.P.	179	2,059	35	2,273
Strategic Partners Fund VI, L.P.	432	1,203	51	1,686
Strategic Partners Fund VII, L.P.	1,250	6,759	147	8,156
Summit Partners Growth Equity Fund IX-A, L.P.	1,262	35,727	39	37,028
Summit Partners Growth Equity Fund VIII-A, L.P.	990	14,572	32	15,594
Summit Partners Growth Equity Fund X-A, L.P.	—	6,185	585	6,770
Summit Partners Growth Equity Fund XI-A, L.P.	—	—	124	124
Summit Partners Venture Capital Fund III-A, L.P.	172	2	9	183
Summit Partners Venture Capital Fund IV-A, L.P.	713	23,262	37	24,012
Tenaya Capital IV-P, L.P.	—	—	13	13
Tenaya Capital VI, L.P.	508	1,589	34	2,131
Tenaya Capital VII, L.P.	1,420	42,655	72	44,147
Tenaya Capital V-P, L.P.	194	1,380	76	1,650
Trilantic Capital Partners IV L.P.	—	147	76	223
Trilantic Capital Partners V (North America), L.P.	521	4,907	100	5,528
Trilantic Capital Partners VI (North America), L.P.	2,241	8,265	1,348	11,854
Valar Velocity Fund 2 LP	—	—	525	525
Venor Special Situations Fund II, L.P.	443	1,111	248	1,802
Versa Capital Fund I, L.P.	—	—	130	130
Versa Capital Fund II, L.P.	1,072	—	428	1,500
Versa Capital Fund III, L.P.	1,156	—	852	2,008
Webster Capital IV, L.P.	553	12,569	65	13,187
Total - Private Equity	\$ 112,465	\$ 907,595	\$ 33,604	\$1,053,663
Private Credit				
Apollo European Principal Finance Fund II (Dollar A), L.P.	\$ 170	\$ 1,325	\$ 149	\$ 1,644
Apollo European Principal Finance Fund III, (Dollar A), L.P.	2,189	5,133	738	8,060
SSG Capital Partners V Sidecar, L.P.	793	1,640	284	2,717
SSG Capital Partners V, L.P.	2,335	3,161	268	5,764
Avenue Energy Opportunities Fund II, L.P.	850	5,654	569	7,073
Avenue Energy Opportunities Fund, L.P.	1,267	—	454	1,721
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,155	—	798	1,953
Bain Capital Credit Managed Account (PSERS), L.P.	1,498	—	240	1,738
Bain Capital Distressed and Special Situations 2013 (A), L.P.	990	3,456	206	4,652

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Credit (continued)				
Bain Capital Distressed and Special Situations 2016 (A), L.P.	\$ 2,451	\$ (10,743)	\$ 1,041	\$ (7,251) *
Bain Capital Distressed and Special Situations 2019 (A), L.P.	1,542	3,930	1,303	6,775
Bain Capital Middle Market Credit 2010, L.P.	—	440	75	515
Bain Capital Middle Market Credit 2014, LP	600	(320)	113	393
Sankaty Credit Opportunities IV, L.P.	—	585	14	599
Brigade Distressed Value Offshore Fund	1,677	5,863	533	8,073
Brigade Structured Credit Offshore Fund	2,538	(60)	420	2,898
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,223	—	219	1,442
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	127	—	449	576
Cerberus Levered Loan Opportunities Fund II, L.P.	—	(3,806)	159	(3,647) *
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	8,924	9,548	19,059	37,531
Clearlake Opportunities Partners (P) II, L.P.	593	2,905	706	4,204
Galton Onshore Mortgage Recovery Fund III, L.P.	—	—	258	258
Galton Onshore Mortgage Recovery Fund IV, L.P.	381	—	422	803
Hayfin SOF II USD Co-Invest, L.P.	98	—	119	217
Hayfin SOF II USD, L.P.	2,449	—	55	2,504
HayFin Special Opportunities Credit Fund (Parallel), L.P.	235	1,527	60	1,822
ICG Europe Fund V, L.P.	517	1,844	241	2,602
ICG Europe Fund VI, L.P.	980	10,801	1,005	12,786
ICG Europe Fund VII Feeder SCSp	1,586	16,070	631	18,287
Latitude Management Real Estate Capital IV, Inc.	1,038	—	72	1,110
LBC Credit Partners III, L.P.	655	894	181	1,730
LBC-P Credit Fund, L.P.	6,277	5,110	884	12,271
International Infrastructure Finance Company Fund, L.P.	457	(272)	166	351
PIMCO BRAVO Fund III Onshore Feeder, LP	1,623	23,555	307	25,485
PIMCO Commercial Real Estate Debt Fund, L.P.	—	2,812	238	3,050
Park Square - PSERS Credit Opportunities Fund, L.P.	4,293	3,676	5,413	13,382
Opps NPL (A), L.P.	—	20	123	143
PSERS TAO Partners Parallel Fund, L.P. - (TAO 2.0)	1,934	5,249	557	7,740
PSERS TAO Partners Parallel Fund, L.P. - (TAO 3.0)	1,913	5,308	499	7,720
PSERS TAO Partners Parallel Fund, L.P. - (TAO Contingent)	780	2,063	434	3,277
Sixth Street Fundamental Strategies Partners (A), L.P.	278	1,191	258	1,727
Sixth Street Opportunities Partners II (A), L.P.	—	252	54	306
Sixth Street Opportunities Partners III (A), L.P.	554	4,504	202	5,260
Sixth Street Opportunities Partners IV (A), L.P.	2,251	1,789	572	4,612
Sixth Street Specialty Lending Europe II, L.P.	463	474	346	1,283

Section 3 - Investment Information

Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Credit (continued)				
Summit Partners Credit Fund II, L.P.	\$ —	\$ —	\$ 201	\$ 201
TCI Real Estate Partners Fund III, L.P.	—	986	81	1,067
Varde Scratch and Dent Feeder I-A, L.P., The	411	102	284	797
Varde Scratch and Dent Feeder, L.P., The	275	(232)	262	305
Whitehorse Liquidity Partners (Onshore) IV, L.P.	1,400	2,724	122	4,246
Total - Private Credit	\$ 61,770	\$ 119,158	\$ 41,844	\$ 222,772
Private Commodities				
Denham Mining Fund, L.P.	\$ 1,973	\$ 8,466	\$ 181	\$ 10,620
NGP Natural Resources XII, L.P.	3,071	—	175	3,246
Total - Private Commodities	\$ 5,044	\$ 8,466	\$ 356	\$ 13,866
Private Infrastructure				
Blackstone Infrastructure Partners L.P.	\$ 3,760	\$ 9,459	\$ 1,915	\$ 15,134
Brookfield Global Transition Fund, L.P.	205	—	248	453
GCM Grosvenor Customized Infrastructure Strategies II, LP	351	925	125	1,401
ISQ Global Infrastructure Fund III, L.P.	4,820	—	708	5,528
International Infrastructure Finance Company II, L.P.	748	1,393	205	2,346
Strategic Partners Real Assets II, L.P.	910	2,596	—	3,506
Total - Private Infrastructure	\$ 10,794	\$ 14,373	\$ 3,201	\$ 28,368
Private Real Estate				
AG Core Plus Realty Fund III, L.P.	\$ 125	\$ 696	\$ 36	\$ 857
AG Core Plus Realty Fund IV, L.P.	1,255	5,205	255	6,715
AG Europe Realty Fund II, L.P.	1,257	4,939	344	6,540
AG Europe Realty Fund III, L.P.	1,128	835	241	2,204
AG Realty Value Fund X, L.P.	1,432	6,058	471	7,961
Almanac Realty Securities V, L.P.	—	(7)	34	27
Almanac Realty Securities VI, L.P.	149	9	13	171
Almanac Realty Securities VII, L.P.	594	1,394	34	2,022
Almanac Realty Securities VIII, L.P.	1,539	2,709	34	4,282
Ares European Real Estate Fund III, L.P.	—	—	30	30
Ares European Real Estate Fund IV, L.P.	491	1,182	467	2,140
Ares U.S. Real Estate Fund IX, L.P.	1,069	8,175	190	9,434
Ares U.S. Real Estate Fund VII, L.P.	—	1	25	26

Section 3 - Investment Information

Table 12.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2021
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Real Estate (continued)				
Ares U.S. Real Estate Fund VIII, L.P.	\$ 393	\$ 5,065	\$ 71	\$ 5,529
Atlanta Marriott	131	—	—	131
Avenue Real Estate Fund (Parallel) L.P.	612	—	291	903
Bell Institutional Fund IV, LLC	—	—	1	1
Bell Institutional Fund V, L.P.	424	7,965	462	8,851
Bell Institutional Fund VI, L.P.	879	8,349	600	9,828
Bell Institutional Fund VII, L.P.	702	3,480	575	4,757
BlackRock Europe Property Fund III, L.P.	—	—	244	244
Blackstone Real Estate Debt Strategies II, L.P.	(3)	9	78	84
Blackstone Real Estate Debt Strategies III, L.P.	837	1,033	169	2,039
Blackstone Real Estate Partners Europe III, L.P.	—	(580)	265	(315) *
Blackstone Real Estate Partners Europe IV, L.P.	351	(97)	—	254
Blackstone Real Estate Partners V, L.P.	—	1,251	—	1,251
Blackstone Real Estate Partners VI, L.P.	—	213	—	213
Blackstone Real Estate Partners VII, L.P.	1,251	11,208	—	12,459
Blackstone Real Estate Partners VIII, L.P.	2,542	24,477	—	27,019
Brookfield Strategic Real Estate Partners II, L.P.	1,778	16,636	71	18,485
Brookfield Strategic Real Estate Partners III-B, L.P.	2,607	8,838	171	11,616
Brookfield Strategic Real Estate Partners IV, L.P.	1,777	—	—	1,777
Brookfield Strategic Real Estate Partners, L.P.	685	2,375	546	3,606
Cabot Industrial Core Fund II, L.P.	699	3,145	88	3,932
Cabot Industrial Core Fund, L.P.	—	4	35	39
Cabot Industrial Value Fund V, L.P.	1,278	28,761	221	30,260
Cabot Industrial Value Fund VI, L.P.	1,500	3,351	138	4,989
Cabot UK Core Plus Industrial Fund SCSp	—	1,172	740	1,912
Carlyle Realty Partners III, L.P.	—	—	82	82
Carlyle Realty Partners IV, L.P.	—	—	131	131
Carlyle Realty Partners IX, L.P.	451	—	261	712
Carlyle Realty Partners V, L.P.	134	12,797	80	13,011
Carlyle Realty Partners VI, L.P.	84	293	132	509
Carlyle Realty Partners VII, L.P.	357	1,857	79	2,293
Carlyle Realty Partners VIII, L.P.	1,753	14,049	325	16,127
Centerline High Yield CMBS III - Loan/Stock	99	—	—	99
DRA Growth and Income Fund IX, LLC	1,573	5,797	85	7,455
DRA Growth and Income Fund VI, L.P.	—	(50)	10	(40) *
DRA Growth and Income Fund VII, L.P.	162	702	63	927
DRA Growth and Income Fund VIII, LLC	1,043	710	79	1,832
DRA Growth and Income Fund X, LLC	792	—	161	953

Section 3 - Investment Information

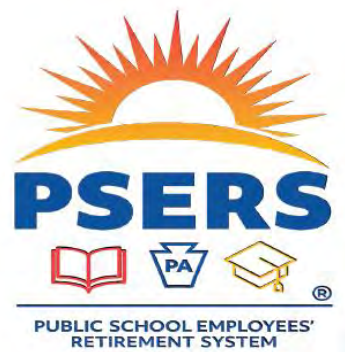
Table 12.4

Carried Interest Reported by Manager Calendar Year ended December 31, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Net Mgmt Fees</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Real Estate (continued)				
Exeter Core Industrial Club Fund II, L.P.	\$ 778	\$ 18,599	\$ 90	\$ 19,467
Exeter Industrial Core Fund III, L.P.	469	4,872	71	5,412
Exeter Industrial Value Fund II, L.P.	—	70	7	77
Exeter Industrial Value Fund III, L.P.	136	3,169	39	3,344
Exeter Industrial Value Fund IV, L.P.	1,057	18,290	117	19,464
Exeter Industrial Value Fund V, L.P.	1,200	10,025	108	11,333
Five North 5th Street	54	—	—	54
Fortress Investment Fund IV LP	—	—	59	59
Fortress Investment Fund LLC	—	—	84	84
Fortress Investment Fund V (Fund A) L.P.	—	—	257	257
Galleria at Ft Lauderdale, The	900	—	—	900
Keystone Milano LLC	173	1,397	279	1,849
Keystone Miramar LLC	97	1,436	131	1,664
Keystone Orlando LLC	189	953	212	1,354
Keystone Parkland LLC	279	4,689	474	5,442
LAI Strategic Realty Investors, L.P.	—	—	67	67
Latitude Management Real Estate Capital III, Inc.	350	(150)	157	357
LEM Multifamily Fund V, L.P.	500	10,328	492	11,320
LEM Multifamily Senior Equity Fund IV, L.P.	276	4,394	142	4,812
Paramount Group Real Estate Fund VII, L.P.	—	—	23	23
PGIM Agricultural Separate Account	998	—	—	998
PGIM Real Estate Capital VII, SCSp	268	99	1,054	1,421
Pramerica Real Estate Capital VI, L.P.	664	627	1,345	2,636
PSERS YES Holdings, L.P.	—	—	111	111
RCG Longview Debt Fund VI, L.P.	560	231	974	1,765
RCG Longview Equity Fund, L.P.	35	—	35	70
Rivercenter Mall	59	—	—	59
Senior Housing Partnership Fund IV, L.P.	—	20	(8)	12
Senior Housing Partnership Fund V, L.P.	754	—	152	906
Stockbridge Real Estate Fund II, LP	72	—	44	116
Stockbridge Real Estate Fund III, LP	298	—	134	432
Stockbridge Real Estate Fund, L.P.	3,114	35,362	330	38,806
Strategic Partners Fund IV RE, L.P.	5	—	36	41
UBS (US) Trumbull Property Fund, L.P.	243	—	13	256
Total - Private Real Estate	\$ 47,458	\$ 308,417	\$ 15,457	\$ 371,332
Grand Total	\$ 237,531	\$ 1,358,009	\$ 94,462	\$1,690,001

**Negative balances represent a reduction of previously earned amounts.*

Commitment to Pennsylvania Based Investments



Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms

(as of June 30, 2022)

The members of the Board and Professional Staff are fiduciaries and must act in the interests of the members of the System and for the exclusive benefit of the System's members. In creating the investment program, the Board hires both external and internal investment managers. The Board has determined that it is in the best interest of the System to manage assets internally when (1) the System's investment professionals have the proven ability and capacity to manage portfolios internally at least as well as the external investment managers, and (2) the cost of investing those assets is no greater than the cost that would have been incurred to have those assets externally managed. The Board will also consider the diversification benefits that may be achieved by allocating assets to external portfolio managers even when conditions (1) and (2) are met.

The Board evaluates external managers based on a variety of factors, including: (1) a unique insight or

process; (2) the ability to add long-term excess returns above passive alternatives, net of fees; (3) adequate capacity to execute the strategy; (4) adding diversification to our existing investment structure; (5) not exhibiting style drift, and; (6) exhibiting a high level of ethical behavior. In selecting external managers, PSERS will show preference to Pennsylvania-based potential managers that demonstrate similar strengths to alternative managers without a Pennsylvania nexus.

PSERS has shown a strong commitment to Pennsylvania's financial services industry by having assets managed by firms based in Pennsylvania or by firms with offices in Pennsylvania. In FY2021-22, investment management fees paid to external firms managing PSERS assets from offices located in Pennsylvania amounted to \$25.8 million, or 5.2% of the total external investment manager fees.

Table 13.1 lists the asset exposures managed internally by PSERS, as of June 30, 2022.

Table 13.1

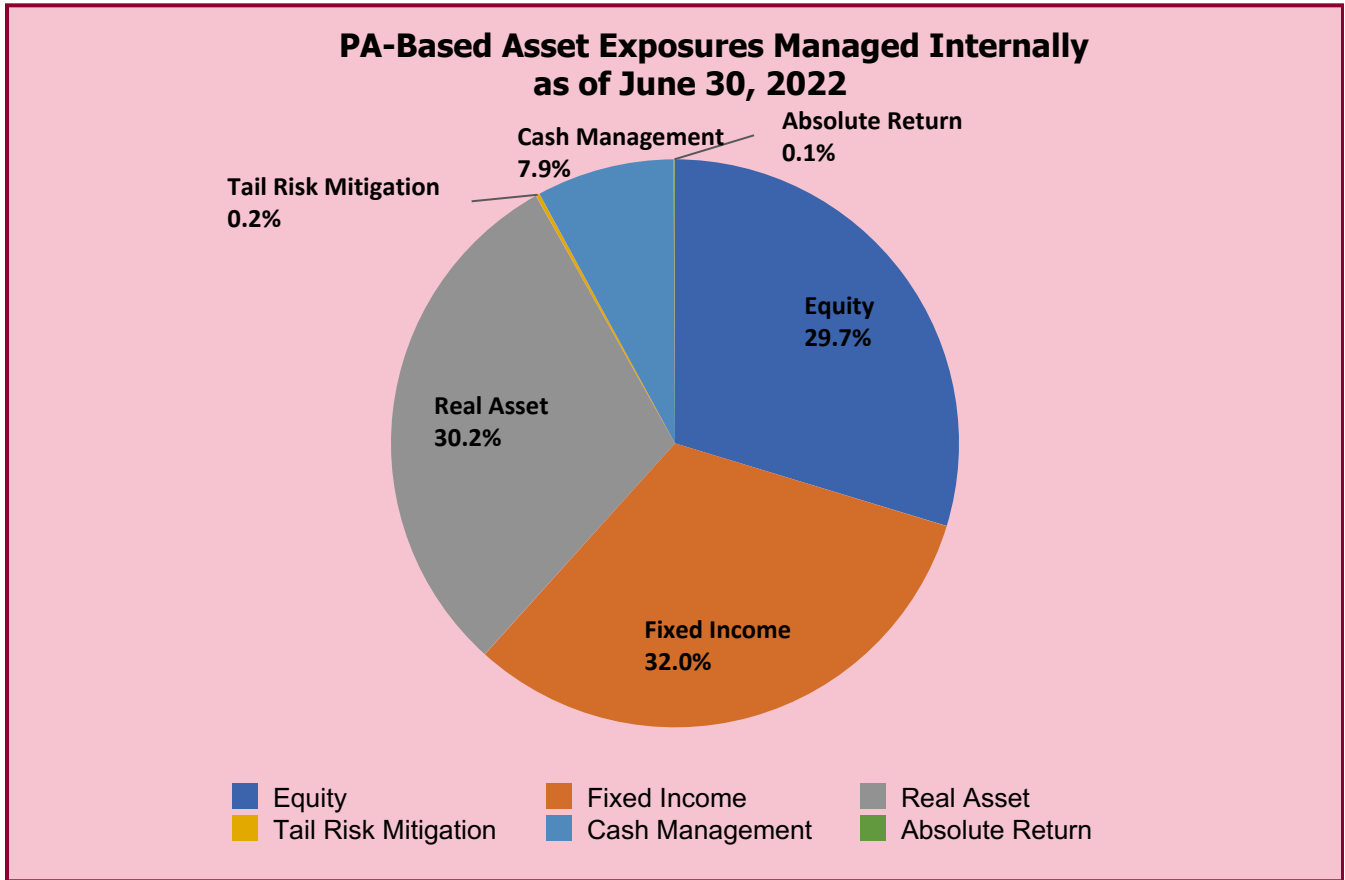
Pennsylvania-Based Asset Exposures Managed Internally

<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>% of Total</u>
Public Equity	11,127.1	26.4%
Private Equity	1,386.6	3.3%
Public Fixed Income	13,275.0	31.5%
Private Credit	196.3	0.5%
Public Real Asset	11,769.3	27.9%
Private Real Asset	935.4	2.2%
Tail Risk Mitigation	94.3	0.2%
Absolute Return	26.3	0.1%
Cash Management	3,310.6	7.9%
Totals	\$ 42,120.9	100.0%

Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms (continued)

Chart 13.1 displays the distribution of exposures managed internally as of June 30, 2022.



Section 3 - Investment Information

Table 13.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2022.

Table 13.2	
Pennsylvania-Based External Managers	
Public Equity:	Private Equity:
Radcliffe Capital Management, L.P.	Adams Capital Management, L.P.
	Co-Investment 2000 Fund, L.P.
Private Credit:	Co-Investment Fund II, L.P.
International Infrastructure Finance Co Fund, L.P.	Cross Atlantic Technology Fund II
Keystone Partners, L.P. Series A	Cross Atlantic Technology Fund, L.P.
Keystone Partners, L.P. Series B	Incline Elevate Fund II, L.P.
LBC Credit Partners III, LP	Incline Elevate Fund, L.P.
LBC Credit Partners-P Credit Fund, LP	Incline Equity Partners III (PSERS), L.P.
	Incline Equity Partners IV, L.P.
Private Real Estate:	Incline Equity Partners V, L.P.
EQT Exeter Industrial Core-Plus Fund IV, L.P.	LLR Equity Partners III, L.P.
Exeter Core Industrial Club Fund II, L.P.	LLR Equity Partners IV, L.P.
Exeter Industrial Core Fund III, L.P.	LLR Equity Partners V, L.P.
Exeter Industrial Value Fund II, L.P.	LLR Equity Partners VI, L.P.
Exeter Industrial Value Fund III, L.P.	Milestone Partners FS 2, L.P.
Exeter Industrial Value Fund IV, L.P.	Milestone Partners III, L.P.
Exeter Industrial Value Fund V, L.P.	Milestone Partners IV, L.P.
GF Management	NEPA Venture Fund II
LEM Multifamily Fund V, L.P.	SCP Private Equity Partners II, L.P.
LEM Multifamily Fund VI, L.P.	Versa Capital Fund I, L.P.
LEM Multifamily Senior Equity Fund IV, L.P.	Versa Capital Fund II, L.P.
Property Management, Inc.	Versa Capital Fund III, L.P.
Private Infrastructure:	
International Infrastructure Finance Co Fund II, L.P.	

Investments in Pennsylvania-Based Companies

Pennsylvania Private Equity and Private Equity Co-Investments are sourced from funds where PSERS or its consultant is an investor. The Board, in managing the investment portfolio, will also be cognizant of concentration risk to any one region, including Pennsylvania. The Fund will continue to seek investments in Pennsylvania-based companies when the investment characteristics are equivalent to other favorable investments, subject to diversification considerations.

U.S. Equities

PSERS invests in the stock of Pennsylvania-based companies through the various U.S. Equity portfolios managed by internal portfolio managers. PSERS has always had investments in large national firms located in Pennsylvania.

Fixed Income Securities

PSERS invests in the debt of Pennsylvania-based companies through the various Fixed Income portfolios managed by external and internal portfolio managers. PSERS has always had investments in large national firms located in Pennsylvania.

Private Infrastructure

PSERS Private Infrastructure Program has committed \$1.9 billion to 8 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 1 partnership headquartered in Pennsylvania.

Private Real Estate

PSERS has investments in limited partnerships that have invested in Pennsylvania real estate properties. PSERS Real Estate program has committed \$17.4 billion to 145 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 21 partnerships headquartered in Pennsylvania.

Private Equity

PSERS Private Equity program has committed \$33.3 billion to 302 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 46 partnerships headquartered in Pennsylvania.

Private Equity and Private Real Estate Pennsylvania In-House Co-Investment Program

In April 2015, PSERS Board approved a \$250 million commitment for PSERS to co-investment in portfolio companies based in Pennsylvania. The portfolio companies are sourced from funds where PSERS or its consultant is an investor. As of June 30, 2022, PSERS has invested \$58.2 million and has a total value of \$122.5 million, resulting from \$101.9 million in distributions and \$20.6 million of net assets. The number of employees, payroll, and market value are included within their respective asset class in Table 13.3.

Private Credit

PSERS Private Credit Program has committed \$13.0 billion to 63 partnerships. From the program inception to June 30, 2022, PSERS has committed capital to 5 partnerships headquartered in Pennsylvania.

Section 3 - Investment Information

Table 13.3 displays Pennsylvania-based investments and other statistics at June 30, 2022 (\$'s in millions):

Table 13.3

Statistics of Pennsylvania-Based Investments

<u>Asset Class</u>	<u>Total PA Market Value (PSERS Portion)</u>	<u>Total PA Market Value (Total Invested)</u>	<u># of People Employed</u>	<u>Payroll</u>
U.S. Equities	\$ 251.4	\$ 251.4	*	\$ *
Fixed Income	57.2	57.2	*	*
Private Real Estate	147.8	1,809.5	45	3.9
Private Equity	3,066.1	63,456.4	88,068	803.5
Total	\$ 3,522.5	\$ 65,574.5	88,113	\$ 807.4

* Statistics for publicly traded companies not included due to the difficulty in obtaining the information.

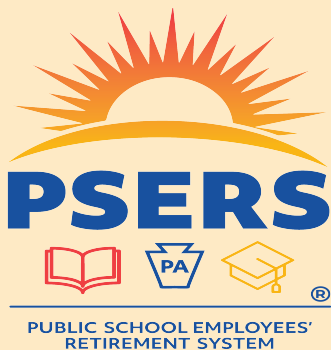
PSERS BUDGET REPORT - FY2023-24



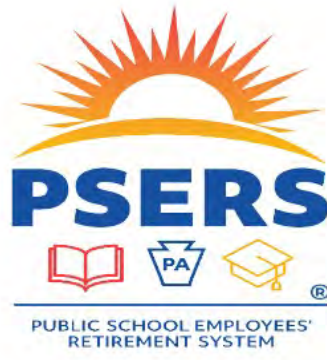
SECTION 4 - POSTEMPLOYMENT HEALTHCARE PROGRAMS

Health Options Program Tab 14

Premium Assistance Program Tab 15



HEALTH OPTIONS PROGRAM



Section 4 - Other PSERS Programs

Health Options Program

PSERS sponsors a group health insurance program called the Health Options Program (HOP) for individuals who are annuitants or survivor annuitants or the spouse or dependents of an annuitant or survivor annuitant. The HOP commenced on January 1, 1994. As of January 1, 2023 there are 124,397 participants (104,291 retirees plus their dependents) in the HOP. The HOP is funded solely by and for eligible participants. The following is a summary of HOP initiatives during the period January 1, 2022 to January 1, 2023. The Retirement Board issued an Invitation for Application (IFA) to allow qualified insurance carriers to apply to PSERS to offer a fully insured Medicare Advantage Prescription Drug (MAPD) group insurance plan and accompanying Pre-65 group insurance plan to PSERS retirees who participate in the HOP. The effective date of the insurance is January 1, 2023. As a result of the IFA, PSERS is expecting the following carriers to participate in HOP:

- Aetna
- Capital Blue Cross (CBC)/Keystone Health Plan Central
- Highmark
- Independence Blue Cross (IBC)/Keystone Health Plan East
- UPMC

The Retirement Board issued an RFP for a Pharmacy Benefit Manager PSERS RFP 2022-4. The Retirement Board awarded OptumRx the contract with an initial term of two (2) years beginning January 1, 2023, with options to renew the contract, upon mutual consent of the parties, annually for three (3) additional years.

There was one plan change for the Enhanced Medicare Rx Option: the coinsurance for Speciality Drugs in the Initial Coverage phase will be reduced to 25% in 2023 (from 33% in 2022). There was also a benefit enhancement to the MetLife Dental option: the annual maximum will increase from \$1,350 to \$1,400 in 2023.

The HOP offers PSERS annuitants a variety of health benefits and insurance plans. Annuitants and their dependents may select among plans supplementing original Medicare, Medicare prescription drug plans, and dental insurance. Annuitants also may select a Medicare Advantage plan that provides prescription drug coverage and may include a dental and vision benefit. All plans offered through the HOP provide a Pre-65 plan for individuals not yet eligible for Medicare. Each year participants of the HOP may change their health benefit coverage to meet changing needs. The following is a summary of the standard Medicare Part D benefits for the prescription drug plans:

Standard Benefit	2023	2022
Deductible	\$505	\$480
Initial Coverage Limit	\$4,660	\$4,430
Out-of Pocket Threshold	\$7,400	\$7,040
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit		
Generic	4.15	3.95
Other	10.35	\$9.85

These plan design limits and thresholds are tied to specific indices, including the average per capita Part D spending and the annual percentage increase in the Consumer Price Index.

Section 4 - Other PSERS Programs

Health Options Program (continued)

Medicare prescription drug plans are required to provide 75% coverage for generic drugs in the Coverage Gap. There is effectively no additional funding from CMS; accordingly, the cost of the mandated benefit increase is paid by participants

not receiving low-income subsidies. Medicare prescription drug plans pay 5% of the cost of brand drugs in the Coverage Gap, with the manufacturer discount covering the remaining 70%. The following table shows how much members pay for drugs in the Coverage Gap.

The Member Pays in Coverage Gap:	Medicare Rx Discount
Generic Drugs	25%
Brand Drugs	25% (after 70% manufacturer discount and 5% plan benefit)
Non-preferred Brand Rx	25% (after 70% manufacturer discount and 5% plan benefit)

Plans Available Through the Health Options Program

The HOP offers participants a choice among supplements to Medicare, various Medicare prescription drug plans, and Medicare Advantage plans. Participants under age 65 and not eligible for Medicare may elect to enroll in a high deductible health insurance plan with or without prescription

drug coverage or a managed care plan. These options were available to new enrollees or HOP participants electing to change coverage during the 2023 option selection period conducted in the fall of 2022. The following is a list of HOP plans as of January 1, 2023.

For Individuals Eligible for Medicare:	For Individuals Not Eligible for Medicare:
HOP Value Medical Plan (Medicare supplement)	HOP Pre-65 Medical Plan
HOP Medical Plan (Medicare supplement)	
Value Medicare Rx Option (Medicare Part D)	HOP Pre-65 Medical Plan w/ Rx coverage
Basic Medicare Rx Option (Medicare Part D)	
Enhanced Medicare Rx Option (Medicare Part D)	
Medicare Advantage Plans	Companion Pre-65 Managed Care Plans
Aetna Medicare P01 PPO	Aetna Premier Open Choice PPO
CBC PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue (80-70 Plan)
Independence Blue Cross Personal Choice 65 PPO	Independence Blue Cross POS (\$20-\$40/\$250)
UPMC PSERS HOP Custom HMO	UPMC Business Advantage

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Program Plan Premiums

Paid By Individuals ELIGIBLE for Medicare

The premiums paid by participants eligible for Medicare generally vary by geographical area. The exceptions are the premiums for the HOP Medicare Rx Options. The following tables show the standard monthly premium rates for 2023 compared to the

2022 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees or discounts available to individuals enrolling at age 65.

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2023	2022	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$117	\$117	0%
Value Medical Plan w/ Value Medicare Rx Option	\$142	\$139	2%
Value Medical Plan w/ Basic Medicare Rx Option	\$184	\$183	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$243	\$239	2%
HOP Medical Plan	\$209	\$207	1%
HOP Medical Plan w/ Value Medicare Rx Option	\$234	\$229	2%
HOP Medical Plan w/ Basic Medicare Rx Option	\$276	\$273	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$335	\$329	2%
Medicare Advantage Plans			
Aetna Medicare P01 PPO	\$466	\$450	4%
CBC PPO	\$258	\$250	3%
Highmark FreedomBlue PPO	\$336	\$336	0%
IBC Personal Choice 65 PPO	\$429	\$433	(1)%
UPMC PSERS HOP Custom HMO	\$243	\$243	0%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$569	\$555	3%
IBC Keystone 65 Select HMO High Option	\$369	\$400	(8)%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2023	2022	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$115	\$115	0%
Value Medical Plan w/ Value Medicare Rx Option	\$140	\$137	2%
Value Medical Plan w/ Basic Medicare Rx Option	\$182	\$181	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$241	\$237	2%
HOP Medical Plan	\$200	\$198	1%
HOP Medical Plan w/ Value Medicare Rx Option	\$225	\$220	2%
HOP Medical Plan w/ Basic Medicare Rx Option	\$267	\$264	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$326	\$320	2%
Medicare Advantage Plans			
Aetna Medicare P01 PPO	\$418	\$403	4%
CBC PPO	\$258	\$250	3%
Highmark Freedom Blue PPO	\$242	\$242	0%
UPMC PSERS HOP Custom HMO	\$243	\$243	0%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$356	\$347	3%
Highmark Legacy Freedom Blue PPO	\$323	\$323	0%
Highmark Security Blue HMO	\$253	\$253	0%

North & Central Region: (All Other Counties in Pennsylvania)	2023	2022	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$102	\$102	0%
Value Medical Plan w/ Value Medicare Rx Option	\$127	\$124	2%
Value Medical Plan w/ Basic Medicare Rx Option	\$169	\$168	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$228	\$224	2%
HOP Medical Plan	\$183	\$179	2%
HOP Medical Plan w/ Value Medicare Rx Option	\$208	\$202	3%
HOP Medical Plan w/ Basic Medicare Rx Option	\$250	\$245	2%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$309	\$301	3%
Medicare Advantage Plans			
Aetna Medicare P01 PPO	\$296	\$286	3%
CBC PPO	\$258	\$250	3%
Highmark FreedomBlue PPO	\$242	\$242	0%
UPMC PSERS HOP Custom HMO*	\$243	\$243	0%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$356	\$347	3%
CBC Custom HMO	\$207	\$207	0%
Highmark SecurityBlue HMO	\$303	\$303	0%

*Not available in all North & Central Region counties.

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP participants may select Enhanced, Basic, or Value Medicare Rx Option coverage without enrolling in the HOP Medical Plan or Value Medical Plan. The monthly premium rates for the Medicare

Rx Options do not vary by region. Stand-alone prescription drug coverage does not qualify for Premium Assistance.

Medicare Prescription Drug Plans All Regions	2023	2022	Increase
Enhanced Medicare Rx Only	\$126	\$122	3%
Basic Medicare Rx Only	\$67	\$66	2%
Value Medicare Rx Only	\$25	\$22	14%

HOP Options Program Premiums Paid By Individuals NOT ELIGIBLE for Medicare

The premiums paid by participants not eligible for Medicare generally do not vary by geographical area. The exceptions are the regional managed care plans. The following tables show the monthly

premium rates for 2023 compared to the 2022 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees.

All Regions	2023	2022	Increase
HOP Pre-65 Medical Plan			
HOP Pre-65 Medical Plan (Single Coverage)	\$990	\$990	0%
Pre-65 Medical Plan w/ Prescription Drugs	\$1,115	\$1,115	0%

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2023	2022	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$2,113	\$2,113	0%
CBC PPO	\$1,698	\$1,371	24%
Highmark PPOBlue (80-70 Plan)	\$1,385	\$1,292	7%
IBC POS (\$20-\$40/\$250)	\$2,852	\$2,472	15%
UPMC Business Advantage	\$1,581	\$1,516	4%
Legacy Managed Care Plans (no new enrollments)			
Aetna Value Open Choice PPO	\$1,828	\$1,828	0%
IBC Personal Choice PPO	\$2,894	\$2,634	10%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2023	2022	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$2,113	\$2,113	0%
CBC PPO	\$1,698	\$1,371	24%
Highmark PPOBlue (80-70 Plan)	\$1,385	\$1,292	7%
UPMC Business Advantage	\$1,581	\$1,516	4%
Legacy Managed Care Plans (no new enrollments)			
Aetna Value Open Choice PPO	\$1,828	\$1,828	0%
Highmark PPOBlue (High Option)	\$1,745	\$1,784	(2)%

North & Central Region: (All other counties in Pennsylvania)	2023	2022	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$2,113	\$2,113	0%
CBC PPO	\$1,698	\$1,371	24%
Highmark PPOBlue (80-70 Plan)	\$1,385	\$1,292	7%
UPMC Business Advantage*	\$1,581	\$1,516	4%
Legacy Managed Care Plans (no new participants)			
Aetna Value Open Choice PPO	\$1,828	\$1,828	0%
CBC HMO	\$2,376	\$1,935	23%
Highmark PPOBlue (High Option)	\$1,745	\$1,784	(2)%

*Not available in all North & Central Region counties.

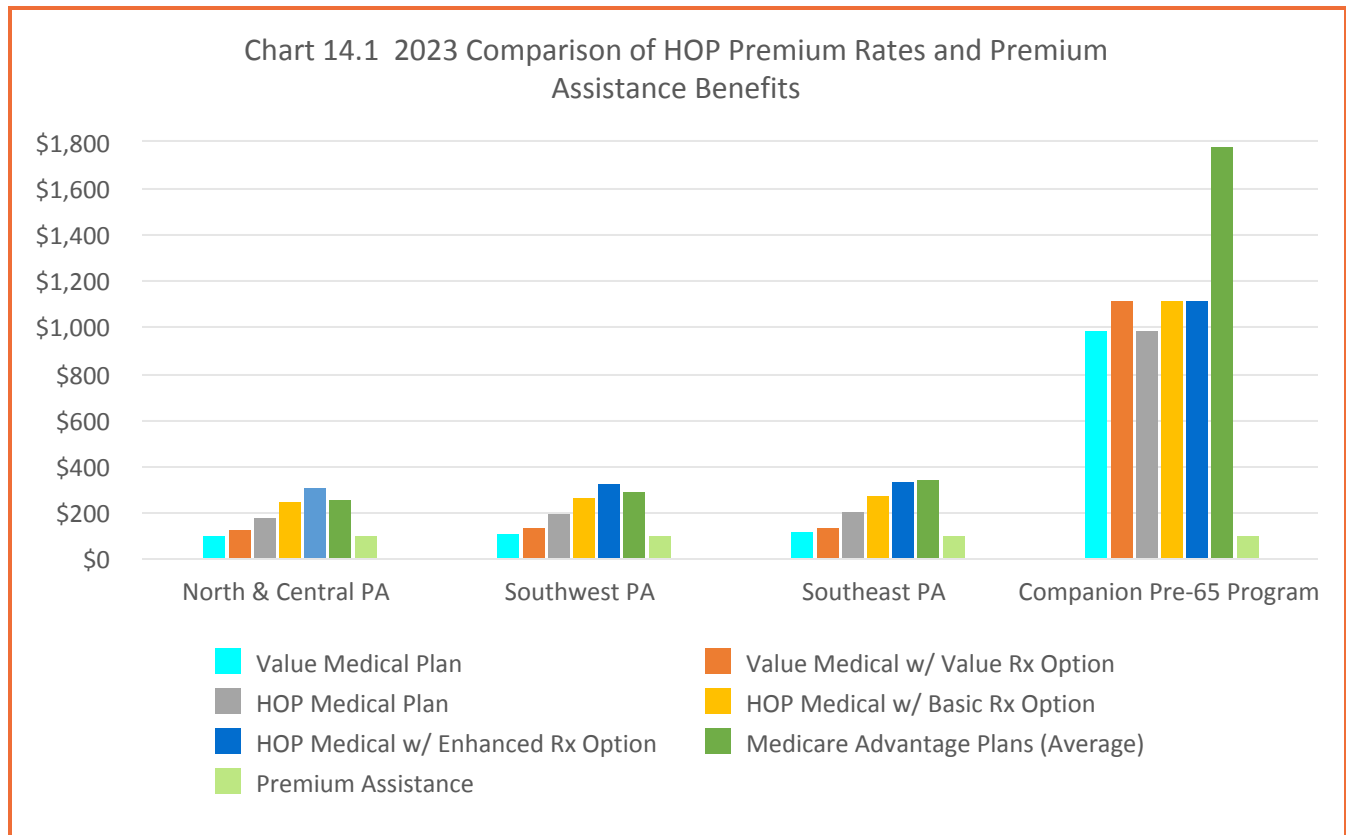
Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Premiums Compared to the PSERS Premium Assistance Benefit

Chart 14.1 displays the HOP monthly premiums paid by PSERS retirees for single coverage compared with the PSERS Premium Assistance benefit. Participating eligible annuitants are entitled to receive Premium Assistance payment of

\$100 per month or their out-of-pocket monthly health insurance premium, whichever is less. The premiums for 2-person and family coverage would be at least twice the cost of single coverage. Premium Assistance is an offset for the PSERS retiree's premium only.



As shown in the table below, the percentage of Premium Assistance benefit coverage varies by region and plan.

2023	North & Central PA	Southwest PA	Southeast PA	Companion Pre-65 Program
Value Medical Plan	\$102	\$115	\$117	\$990
Value Medical w/ Value Rx Option	\$127	\$140	\$142	\$1,115
HOP Medical Plan	\$183	\$200	\$209	\$990
HOP Medical w/ Basic Rx Option	\$250	\$267	\$276	\$1,115
HOP Medical w/ Enhanced Rx Option	\$309	\$326	\$335	\$1,115
Medicare Advantage Plans (Average)	\$260	\$290	\$346	\$1,787
Premium Assistance	\$100	\$100	\$100	\$100

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Enrollment

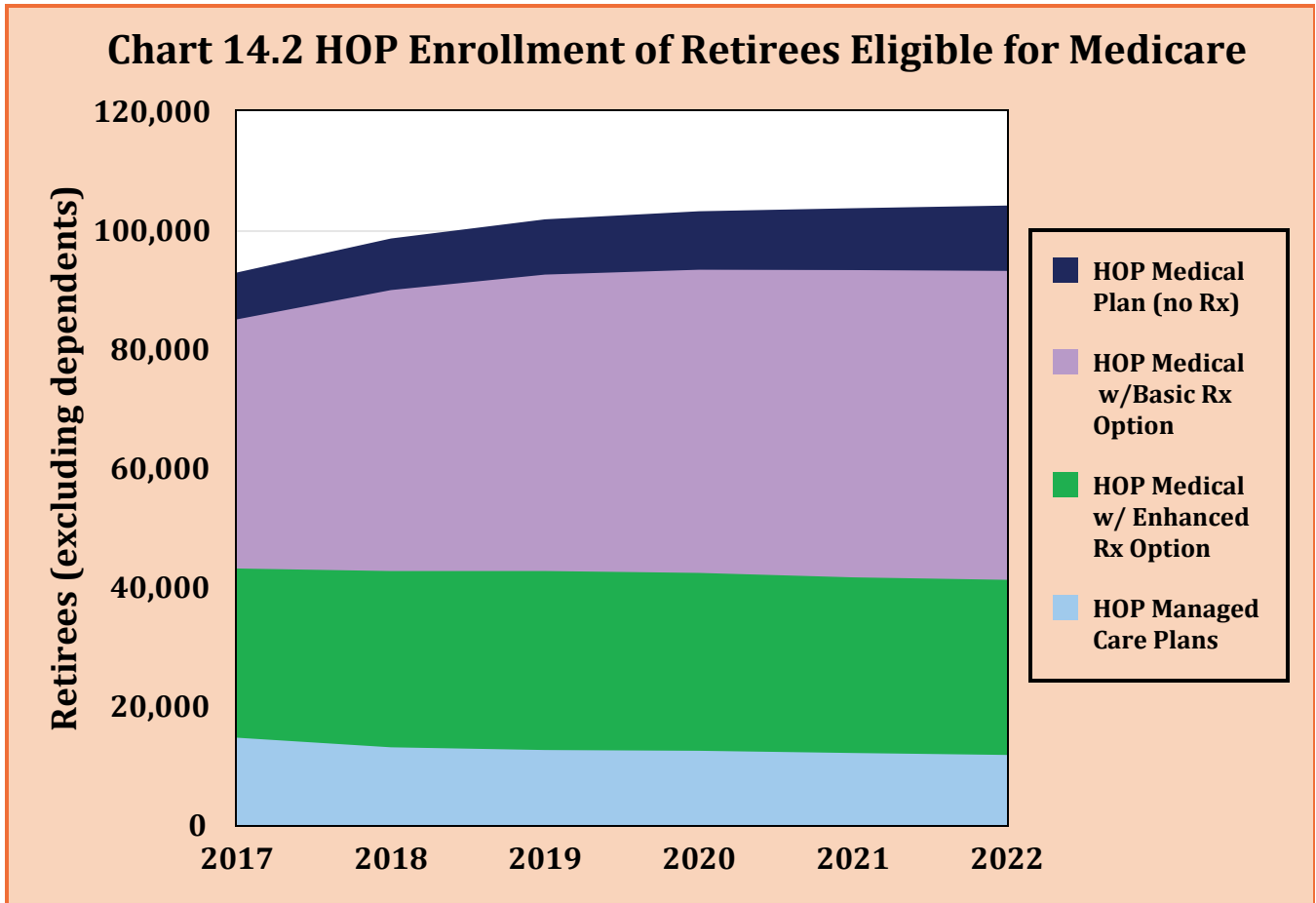
As of January 1, 2023 there are 124,397 participants (104,291 retirees plus their dependents) in the HOP. The total numbers of retirees by Option are:

Individuals Eligible for Medicare	Retirees	Participants
HOP Medical w/ Basic Medicare Rx Option	48,665	58,873
HOP Medical w/ Enhanced Medicare Rx Option	29,440	34,694
HOP Medical w/ Value Medicare Rx Option	2,866	3,260
HOP Medical Plan (no Rx)	10,642	11,817
HOP Enhanced Rx Only	79	98
HOP Basic Rx Only	167	213
HOP Value Rx Only	23	27
HOP Value Medical Only	74	89
HOP Value Medical w/ Enhanced Medicare Rx Option	11	16
HOP Value Medical w/ Basic Medicare Rx Option	56	74
HOP Value Medical w/ Value Medicare Rx Option	337	441
Highmark PPO/Legacy HMO	9,303	11,570
Keystone East HMO/IBC Legacy PPO	540	623
CBC PPO/Keystone Central Legacy HMO	700	886
UPMC HMO	935	1,213
Aetna PPO/Legacy HMO	295	339
Total Medicare Eligible	104,133	124,233
Individuals Not Eligible for Medicare		
HOP Pre-65 Medical Plan w/ Rx Coverage	94	96
HOP Pre-65 Medical Plan	29	32
Highmark PPO	11	11
CBC PPO/Keystone Central Legacy HMO	21	22
Keystone East HMO/IBC Legacy PPO	1	1
Aetna PPO/Legacy HMO	1	1
UPMC Business Advantage	1	1
Total Not Eligible for Medicare	158	164
Total in HOP	104,291	124,397

Section 4 - Other PSERS Programs

Health Options Program (continued)

Enrollment in the PSERS HOP continues to increase. As illustrated by Chart 14.2, the number of retirees participating in the HOP has increased 12% over the past 5 years.



Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Voluntary Dental and Vision Programs

Beginning January 1, 2016, HOP offered a voluntary MetLife Dental Plan to members and dependents enrolled in the HOP Medical Plan or the Value Medical Plan (those enrolled in a Medicare Advantage Plan are not eligible for this program as most of these plans have dental coverage). Beginning January 1, 2021, HOP began offering the MetLife Dental and EyeMed Vision Option. As with the previous dental program, dental and vision

coverage is not available on a stand alone basis and participants must be enrolled in either the HOP Medical Plan or the Value Medical Plan.

As of January 1, 2023 there are (33,614 participants 28,973 retirees plus their dependents) in the HOP voluntary dental and vision program. The total numbers of retirees by year since program inception:

Dental and Vision Enrollment Per Year (As of January 1)	Retirees	Participants	Increase (Participants)
2023**	28,973	33,614	20%
2022**	25,249	28,927	27%
2021*	17,456	22,829	21%
2020*	16,729	18,864	15%
2019*	14,482	16,436	25%
2018*	11,535	13,099	35%
2017*	8,497	9,701	

*Includes Dental Enrollment **Includes Dental & Vision Enrollment

Health Options Program Funding

A majority of the premium income is deducted from the retiree's monthly retirement benefit and transferred to the plan (claims administrator for the self-funded Options). Approximately 4,683 retirees submit monthly premium payments to the HOP Administration Unit, as their monthly retirement benefits, if any, are insufficient to cover the premium cost.

HOP income is projected to be \$495.9 million during the 2023 Plan (calendar) Year. A majority of this income comes from premium payments from participants. Other sources of funding are Medicare prescription drug payments (for participants enrolled in a Medicare prescription drug plan) from CMS and interest income. Table 14.1 displays the breakdown of these sources of income (Dollar amounts in millions):

Table 14.1 Income	Calendar Year 2023
Participant Contributions	\$418.7
CMS - Medicare Prescription Drug Payments	\$76.2
Interest Income	\$1.0
Total	\$495.9

Section 4 - Other PSERS Programs

Health Options Program (continued)

PSERS retirees enrolled in the HOP, who meet the eligibility requirements for Premium Assistance, receive up to \$100 per month as a partial reimbursement for the out-of-pocket premium expense. Approximately 85,656 of the 104,291 HOP retirees receive Premium Assistance while an additional 7,821 retirees are enrolled in coverage through a Commonwealth public school employer or district health plan and also receive Premium Assistance. This accounts for approximately \$112

million of the \$114 million annual benefit expense of the Premium Assistance Program. The following Premium Assistance Program section provides additional information.

Contributions and interest income pay for the benefits provided to HOP participants plus administrative expenses. Table 14.2 displays the breakdown of the benefit expenses (Dollar amounts in millions):

Table 14.2 Benefit Expense

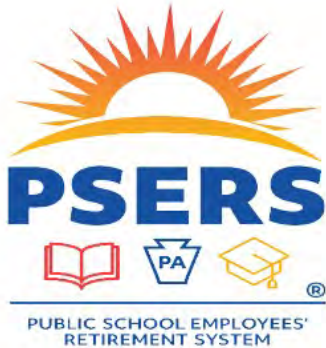
Calendar Year 2023

Self-funded Hospital, Medical & Major Medical Benefits	\$240.9
Self-funded Prescription Drug Benefits	\$188.1
Insured Managed Care and Dental Premiums	\$62.7
Total	\$491.7

In addition to the benefit expenses identified above, the HOP will pay \$11.8 million in enrollment and administrative expenses including reimbursing PSERS for its expenses.

As of September 30, 2022, HOP had net assets of \$396 million held in trust to pay the expenses of HOP for the exclusive benefit of participants.

PREMIUM ASSISTANCE PROGRAM



Premium Assistance Program

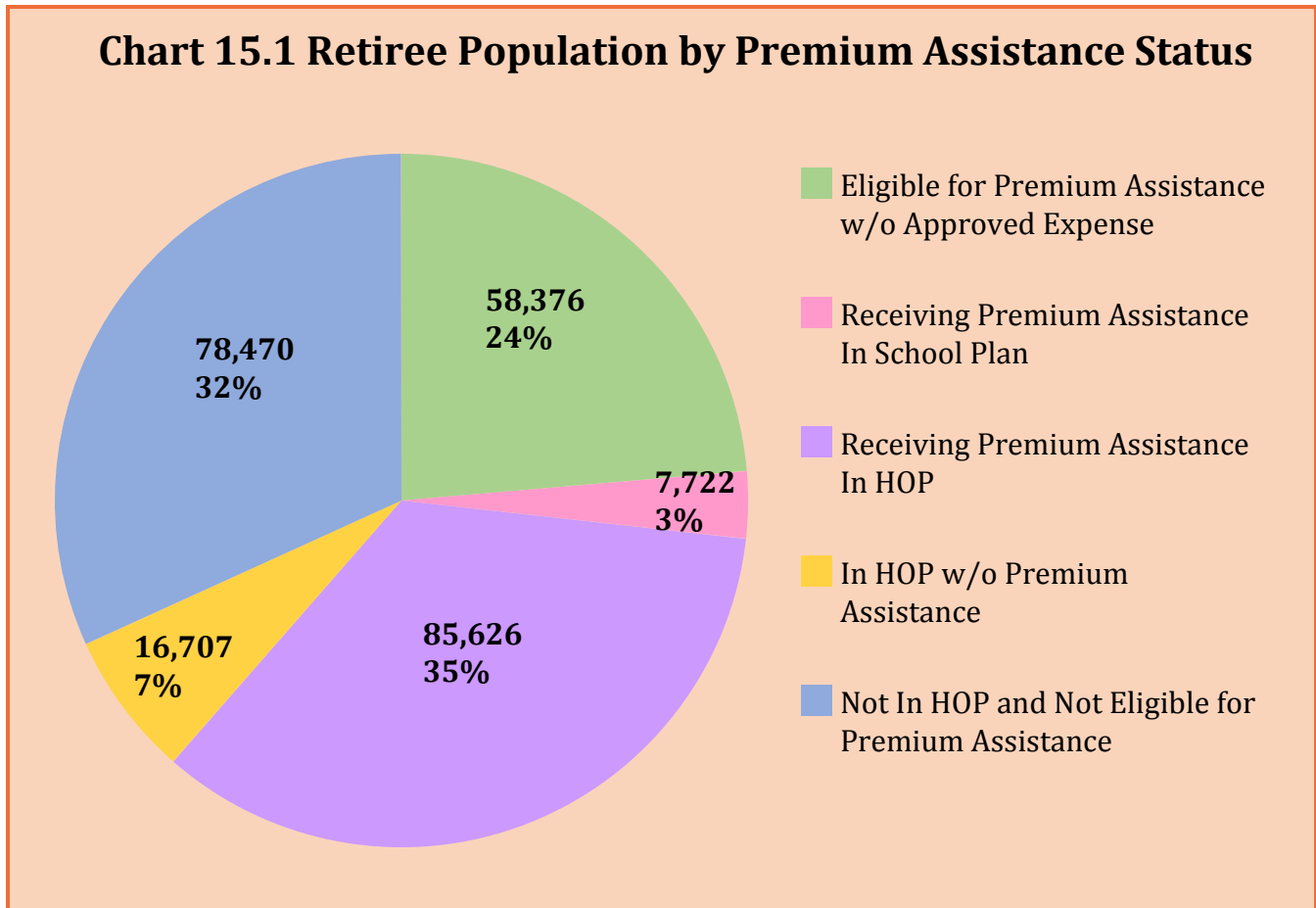
By law, PSERS provides up to \$100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. The Premium Assistance program began on July 1, 1992. The eligibility requirements for premium assistance are as follows:

- 24.5 years of credited service (for Class DC members, Medicare eligibility with at least 24.5 eligibility points), or
- 15 years of credited service if termination of employment and retirement occurred after superannuation age , or
- Receiving a disability annuity from PSERS; and
- Have an out-of-pocket premium expense from their former school employer’s health plan or the PSERS sponsored HOP.

Enrollment

As of June 30, 2022, PSERS had 246,901 retirees receiving a monthly benefit. Of these retirees 151,274 meet the service, service and age at termination of school service, or retirement type (disability) eligibility requirements for the premium assistance program. Of the retirees meeting these requirements, 58,376 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 93,348 retirees receiving premium assistance benefits, 85,626 are enrolled in HOP and 7,722 are participating in their former school employer’s health plan and have an out-of-pocket premium expense.

A breakdown of retirees by their premium assistance status is displayed in Chart 15.1



Premium Assistance Program (continued)

June 30, 2022	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense	58,376	23.6%
Receiving Premium Assistance In School Plan	7,722	3.1%
Receiving Premium Assistance In HOP	85,626	34.7%
In HOP w/o Premium Assistance	16,707	6.8%
Not in HOP and Not Eligible for Premium Assistance	78,470	31.8%
Total Retiree Population	246,901	100.0%

Funding

The Premium Assistance Program is funded by employer contributions. The contribution rate is calculated by PSERS actuary in accordance with the formula set forth in the Retirement Code². The contribution needed during FY2023-24 is 0.80% of payroll.

For the year ended June 30, 2022, employer contributions equaled \$117.2 million and net investment income totaled \$0.3 million. During this period, PSERS paid Premium Assistance benefits equaling \$113.7 million and incurred administrative expenses of \$0.8 million. As of September 30, 2022, the Premium Assistance Program had net assets of \$134.6 million.

²§8509. Health insurance premium assistance program: (a) Contribution rate.-- For each fiscal year beginning after July 1, 1991, the premium assistance contribution rate shall be established to provide reserves sufficient, when combined with unexpended amounts from the reserves set aside the previous fiscal year for health insurance assistance payments, to provide premium assistance payments in the subsequent fiscal year for all participating eligible annuitants. The Board is authorized to expend an amount not to exceed 2% of the health insurance account each year to pay for the direct expense of administering the health insurance premium assistance program, which expenditure may be included in the Board's consideration when it establishes the premium assistance contribution rate each year.