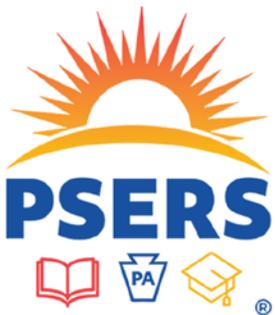


Allegheny National Forest
Marienville, PA

Budget Report Appropriations Committee

Fiscal Year 2021 - 2022



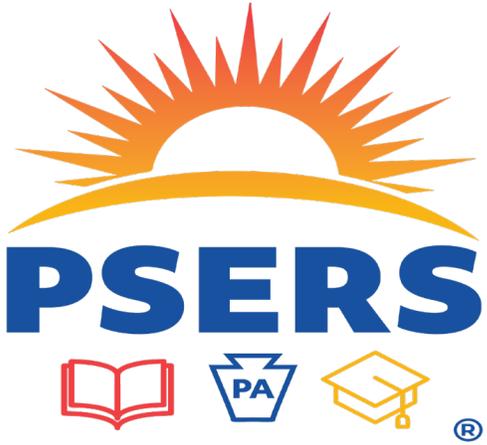
PENNSYLVANIA PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM

A Component Unit of the Commonwealth of Pennsylvania

PSERS

Budget Report

Highlights

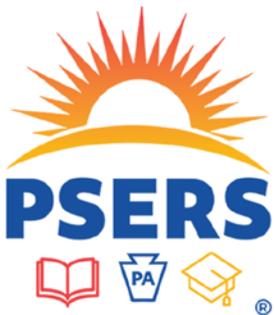


PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

Allegheny National Forest
Marienville, PA

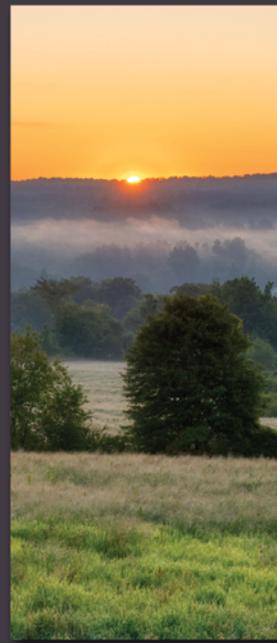
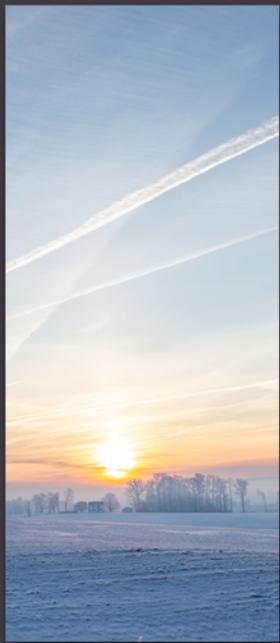
Budget Report Highlights PSERS On Point

Fiscal Year 2021 - 2022



PENNSYLVANIA PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM

A Component Unit of the Commonwealth of Pennsylvania



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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.

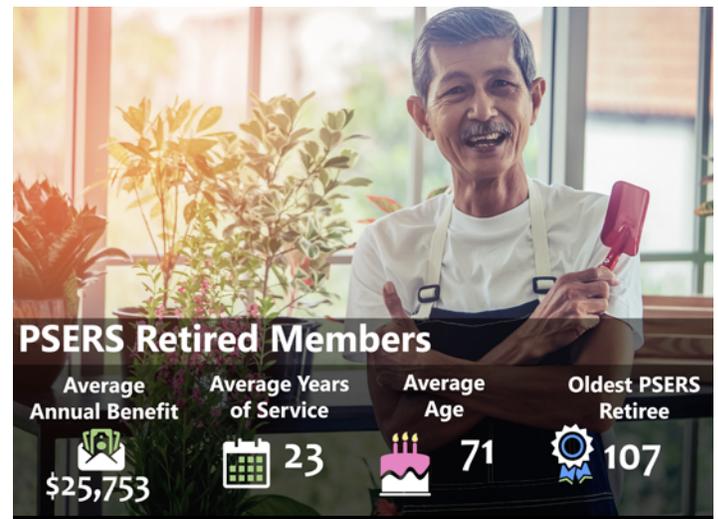
PSERS' role expanded upon the passage of Act 5 of 2017 to include oversight of two new classes consisting of defined benefit (DB) and defined contribution (DC) components and also a stand-alone DC class. PSERS currently serves over 500,000 active, terminated vested, and retired public school employees.

PSERS is administered by a staff of 361 and has 770 reporting units as of June 30, 2020. PSERS is headquartered in Harrisburg, Pennsylvania and also has seven field offices in strategic areas of the Commonwealth to enable direct contact with the members and employers.

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 is 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 against loss in declining investment markets.
Members in the DB Plan contribute between 4.50% and 10.30% of their pay to their PSERS benefit depending on their class of membership. For some membership classes, the contribution rate may change based on PSERS 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

As of June 30, 2020



PSERS Snapshot

240,000
Retired
Members

256,000
Active
Members

26,000
Terminated
Vested Members

770
School
Employers

361
PSERS
Staff

PSERS Adapts to COVID-19 Pandemic

The COVID-19 pandemic has been a challenge for all businesses and organizations, including PSERS. Processes and communication methods had to rapidly change as the pandemic progressed. PSERS was able to continue to provide excellent service to our members without any major interruptions due to prior extensive emergency planning and staff's determination and ability to quickly adapt to migrating conditions.

Since March 16, 2020, most of PSERS employees have been working remotely from their homes with very limited visits to physical office locations to protect their health and reduce exposure to COVID-19. PSERS operations and processes had to be adjusted with staff working remotely, moving from a 100% on-site presence to a 95+% teleworking presence within three weeks of physical office closings.

PSERS Information Technology Office deployed over 250 laptops. PSERS staff adapted to the situation with minimal delays in service. While office locations, including the member call center, were initially closed, PSERS continued to process daily and monthly benefit payrolls, invest assets, process retirements, respond to member inquiries through emails, and issue refunds, all while working remotely.



Continuing Service to PSERS Members and Employers

From the March 16, 2020, office closure to December 31, 2020, PSERS has:

- Remotely processed 10 monthly benefit payrolls totaling over **2.3 million payments** and about **\$5.1 billion**
- Collected and invested over **\$4 billion** in contributions from members and employers.
- Processed over **8,000** retirements
- Issued nearly **4,000** refunds
- Responded to over **66,000** member emails
- Answered over **114,000** phone calls

PSERS Employer Service Center (ESC) has responded to nearly **31,000** emails from employers since working from home began.

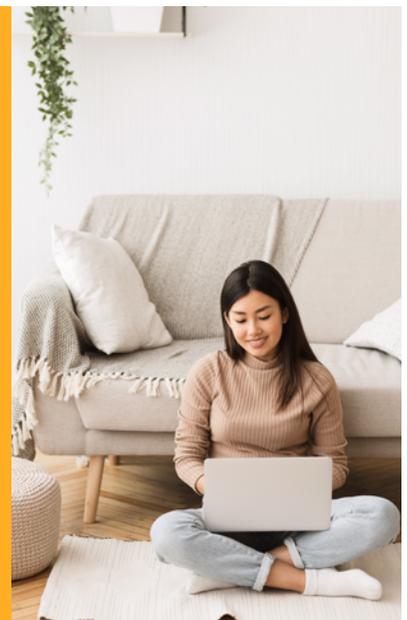
Additionally, nearly **128,000** agency-wide workflows were completed for class elections, retirement estimates, address changes, nomination of beneficiaries, power of attorney, disability, account verification, and many other types of services.

Remote Retirement Exit Counseling Sessions Available

PSERS Retirement Exit Counseling (REC) sessions also needed to be migrated to remote technology. PSERS quickly converted REC sessions for members who are retiring, from small in-person group meetings of 8 to 10 members to small group online counseling sessions using Skype technology at the end of March. As of December 2020, 785 small group and individual online counseling sessions have been conducted with 4,789 members attending these online retirement counseling sessions. Additionally, we now offer educational videos on our website.

Email Volume Increases

When PSERS office locations closed, PSERS encouraged members to email, rather than call the member service center. As a result, PSERS saw email volumes more than triple within weeks of closing. Email continues to be a medium being used by members at a higher than normal average, even though PSERS prioritized reopening the member service call center using remote technology in May. Regional offices were opened with additional safety precautions while maintaining minimal staffing to ensure safety while also being available to assist walk-ins beginning in June.



Commonwealth and School Employer Contributions Make a Positive Difference

PSERS appreciates the budgetary commitment Commonwealth policymakers and school employers make through employer contribution rates (ECR). For the fourth year in row, the ECR increase is in line with inflation and is lower than previously projected.

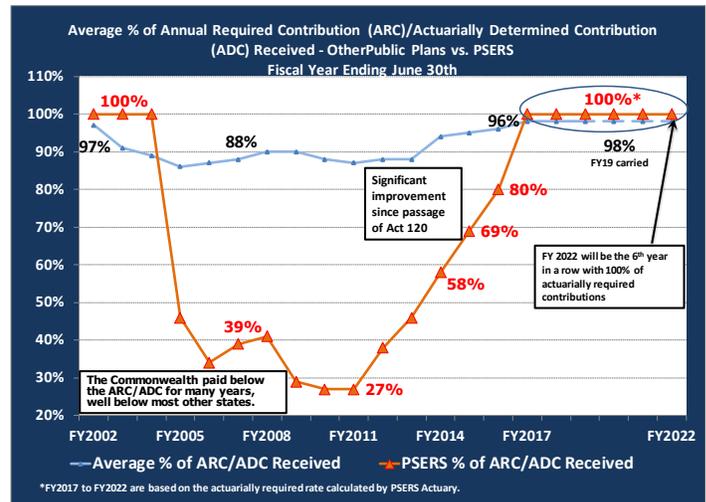
The ECR payments, coupled with Act 120 of 2010 and solid investment performance, helped improve the System's operations.

- PSERS unfunded liability and funded ratio on both actuarial and market value basis continue to improve.
 - ◆ Funded ratio improved from 58.1% to 59.2% this year and over last two years has improved from 56.5% to 59.2%.
 - ◆ PSERS unfunded liability (debt) reduction continues for a second year in a row – The unfunded liability on an actuarial basis was reduced by \$100 million in FY 2020 and by \$800 million over last two fiscal years.
- PSERS external cash flow is more favorable than the public fund average.
- Total employer contributions are lower than originally estimated under Act 120 of 2010.
- Since June 30, 2020, the net asset value (NAV) has continued to grow from \$59.0 billion in assets to \$64.2 billion at December 31, 2020.
- Since June 30, 2020, the unfunded liability on a market value basis declined by an estimated \$4 billion as of December 31, 2020.

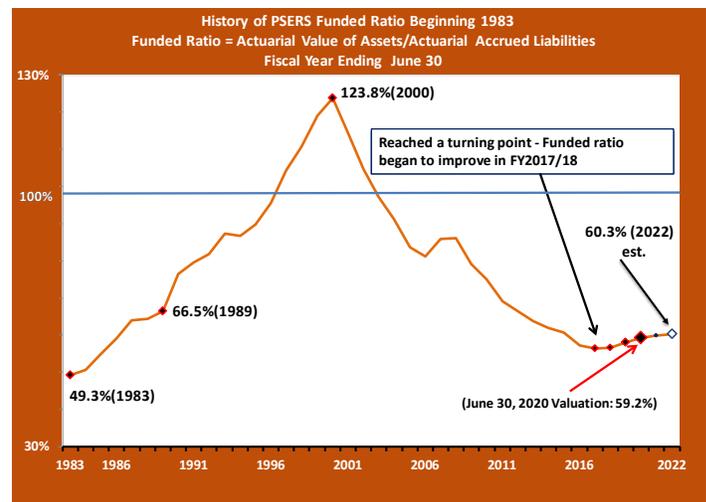
What was the catalyst for this success? The smart changes Act 120 implemented for PSERS and new school employees since July 1, 2011. Act 5 of 2017 also made additional benefit reductions and put in place two new membership classes consisting of defined benefit (DB) and defined contribution (DC) components and a stand-alone DC class.

Act 120 of 2010:

- Reduced the retirement multiplier to the 2.0% level that existed prior to Act 9 of 2001.
- Established a time table of incremental ECR increases needed to repay employer contributions that had been deferred over a long period.
- Set minimum employer payments to cover normal retirement costs not tied to the existing debt.
- Permitted PSERS to smooth in investment gains and losses over 10 years, as opposed to five, to better control budgetary swings for PSERS employers.



Source for Average %: NASRA



Paying Actuarially Required Rate is Vital to the System

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

PSERS Defined Contribution Plan: One-Year Milestone

The Defined Contribution (DC) Plan was successfully implemented with the assistance of Voya Institutional Plan Services (VIPS), as the Third Party Administrator for the DC plan, and Charles W. Cammack Associates, as the pension consultant.

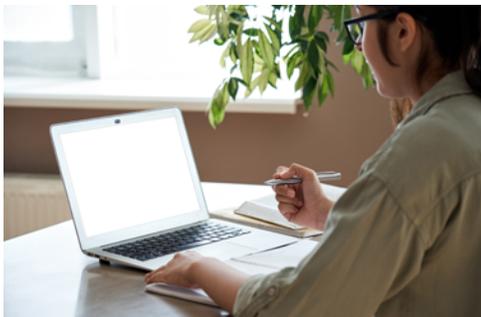
School employees who become new members of PSERS on or after July 1, 2019, can choose from three classes of membership: two consisting of defined benefit and defined contribution components and also one that is a stand-alone defined contribution plan.



PSERS DC Plan Membership

As of December 2020, over 23,500 participants were enrolled in the DC plan. The youngest member is 16 and the oldest is 86.

Current members who were active on July 1, 2019 had a one-time option to elect prospectively into one of the new membership classes; only 10 current members made such an election.



PSERS DC Account Website Statistics

Website Logins

2,743 through Single Sign-On
313 through Voya Financial

Avg Website Time

2:01 Minutes



PSERS DC Investment Options & Plan Balance

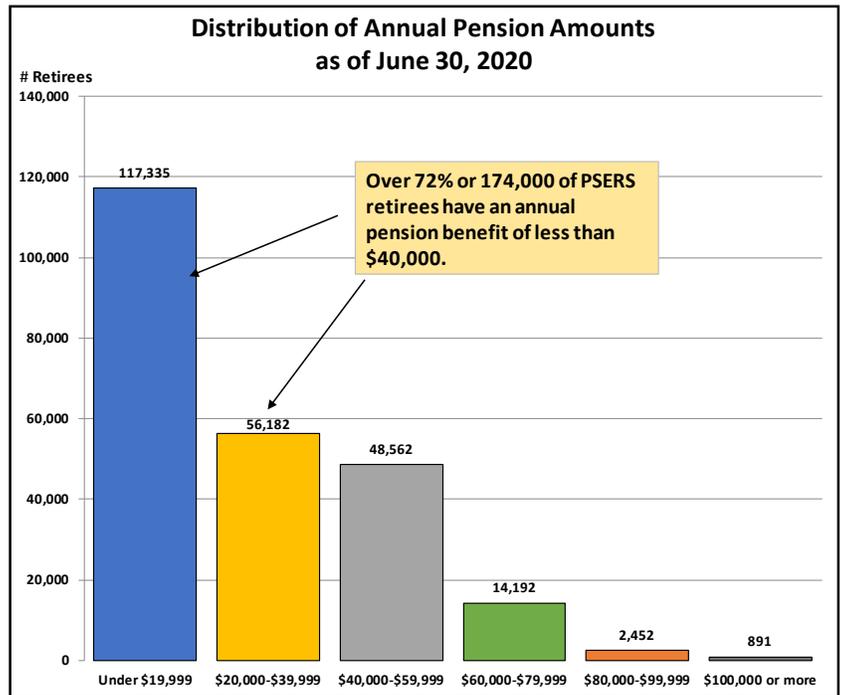
The Retirement Code requires the DC Plan to provide no less than 10 investment options offered by three or more investment providers. Currently, the DC Plan has nine providers offering eleven investment options.

As of December 2020, the total DC Plan balance was approximately \$38 million.

PSEERS Members Help Fund Their Own Retirement Benefit

The average PSEERS retiree receives a modest pension of \$25,753 on an annual basis, a benefit earned through a lengthy career of 23 years in public education. During their career, members make mandatory contributions between 7.50% and 10.30% of their pay depending on their class of membership to help fund their own retirement benefit. In accordance with Act 120, new members as of July 1, 2011 and thereafter 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. At June 30, 2020, less than 1% of retired members received an annual benefit over \$100,000. These 891 pension retirees spent an average of 38 years working in their public education careers and contributing to their benefit.



PSEERS' member contribution rate is one of the highest among U.S. public pension plans that participate in Social Security.**

Most members contribute between 7.50% and 10.30% of their pay depending on their class of membership to help fund their own retirement benefit. Some members also share the investment risk and gain. Member contribution rates for members hired on or after July 1, 2011, are subject to change every three years, based on the investment performance of the retirement fund.



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

** According to the most recent National Association of State Retirement Administrators (NASRA) data, PSEERS member contribution rate is the 15th highest member contribution rate among 77 large U.S. public pension plans that participate in Social Security as of FY 2019.

Payment for Past Service Debt is Nearly 77% of the Total Employer Cost

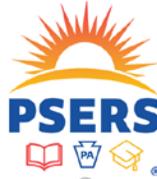
The majority of the employer contribution rate (ECR) in FY 2021-22 is for payment of the debt from past service (unfunded liability). It is not due to the payment of the current cost of benefits (employer normal cost) being earned by active members.



School employers are reimbursed by the Commonwealth for at least 50% of the ECR.



Once the Commonwealth reimbursement is received, school employers contribute the full ECR amount to PSERS.



ECR for FY 2021-22: 34.94%



76.7% of every dollar for **Past Service Payment** (Unfunded Liability)



21.0% of every dollar for **Current Service Payment**

2.3% of every dollar for **Healthcare Premium Assistance***



*per § 8509 in the Retirement Code

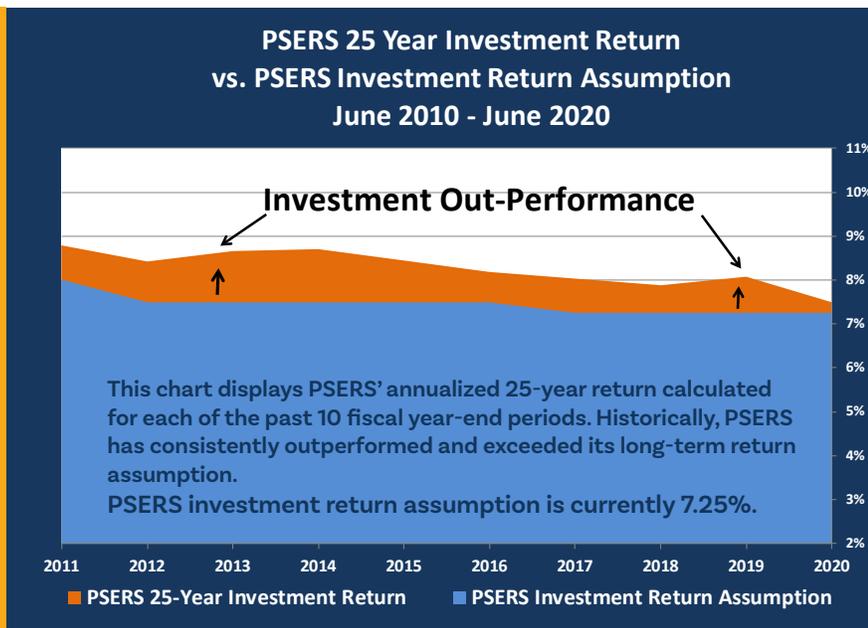
PSERS is Built for the Long Haul

Long-Term Investment Performance Consistently Outperforms

PSERS has built a diversified asset allocation that positions the Fund to earn its return assumption of 7.25% 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 very diversified portfolio which includes all asset classes available to it, such as equities, fixed income, real assets, and absolute return.

The past fiscal year will be remembered as a tale of two halves with a net of fee return of 1.11%. The first half was highlighted by a strong period for equity returns while the second half was dominated by a global pandemic with many economies in the world completely shutting down and plunging the global economy into a recession. However, pension plans like PSERS are built to generate long-term returns, so one good (or bad) year is not going to make (or break) the Fund. The System focuses on long-term returns. For the past 10 years, the Fund's annualized net of fee return was 7.70% and 7.48% over the last 25 years. The System has built a diversified allocation to allow it to collect risk premiums over the long-term.

Longer-term returns continue to remain above PSERS' return assumption. PSERS posted a positive return of 7.48% for the 25-year period ended June 30, 2020.



PSERS Hosted Sustainable Investing Education Sessions



Susan Oh, PSERS Director of ESG Research and Currency Hedging

PSERS Board hosted two educational sessions in December 2020 and January 2021 on sustainable investing as part of the Board's efforts to proactively study financial and corporate trends that could impact investment returns of the \$63 billion pension fund.

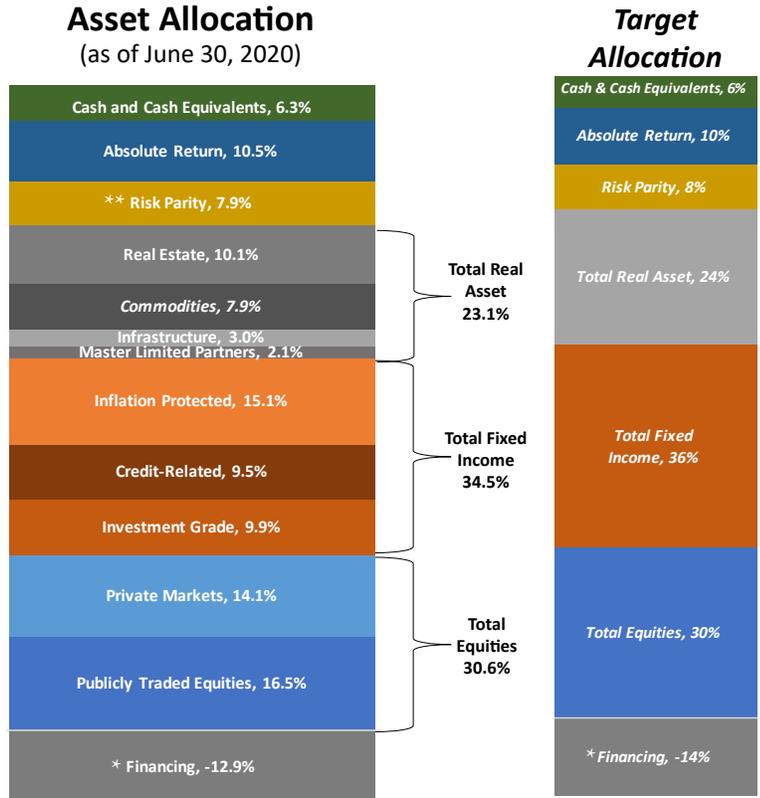
Sustainable investing is also known as ESG, an acronym for an investment practice that examines how well a company incorporates certain Environmental, Social and Governance standards into its operational practices to maximize returns while bettering their employees, customers or clients, and society in the process. The concept started in the 1950s among niche investors, and it has become more mainstream as institutional and individual investors focused on trying to restore public trust in capital markets following the 2008 financial crisis, according to Harvard Law School Forum on Corporate Governance.

Diversified Assets Limit Risk in Volatile Markets

The asset allocation establishes a framework for PSERS that has a reasonable likelihood, in the judgment of the Board, of realizing PSERS' long-term investment objectives. In establishing the asset allocation for the System, the Board considers capital market expectations for expected return, volatility, and asset class correlations as discussed in the Investment Policy Statement (IPS). The Board also establishes Asset Allocation Targets and Ranges and reviews them annually. The Board undertakes a comprehensive strategic asset/liability review designed to assess the continuing appropriateness of the IPS at least every three years or when material changes to the liabilities take place (e.g., plan design changes, material changes in underlying assumptions, etc.). Such review will consider an asset-liability study of future benefit payments, liabilities, required funding, the appropriateness of the actuarial interest rate assumption and the prospective funded status of liabilities. It may also include a study of portfolio design for optimal diversification and comparisons with peer practices.

In August 2020, the Board adopted an updated Strategic Asset Allocation which eliminated the Risk Parity allocation. Risk Parity is a risk balanced portfolio strategy providing exposure to a broad array of asset classes such as public equities, public fixed income, and commodities. The Board "unpacked" the basic parts of the Risk Parity portfolio and correspondingly increased the internally managed passive asset class exposures that were part of Risk Parity. The elimination of the Risk Parity portfolio did not change the prospective risk or return prospects for the Fund but decreased future management fees and increased the transparency related to the asset holdings and leverage.

In December 2020, the Board adopted a new investment protection program, called tail risk mitigation. The tail risk mitigation program serves as a hedge that aims to provide some protection for the Fund from investment losses should markets steeply plunge as occurred at the onset of the COVID-19 pandemic earlier this year. The program will be managed both internally by PSERS' investment professionals and externally by to be determined investment managers.



*PSERS uses financing to increase economic exposure to diversifying asset classes that manages overall portfolio risk while maintaining an allocation designed to achieve the long-term goals of the System.

** The Board of Trustees voted to end the risk-parity program in August 2020, and it was fully liquidated in December 2020.

PSERS is a Global Investor

PSERS invests in 92 countries from Angola to Vietnam on 6 different continents.

Role of Private Equity in PSERS Asset Allocation

Why does PSERS invest in Private Equity?

As a large, mature pension plan, PSERS diversifies the Fund's assets into many different asset classes (or "buckets"), which includes private equity funds.

The three primary benefits of investing in the private equity asset class are:

- 1) Diversification - Private Equity offers exposure to companies not accessible through traditional public markets.
- 2) Returns - Studies show that a private equity allocation can offer investors good absolute returns.
- 3) Long-term investment horizon versus public equity (stocks) - Private equity investments typically mature over a 3-to 5-year time horizon versus public companies which must report earnings over a shorter quarterly basis.

What is Private Equity vs Public Equity?

- Public companies are companies that have their stocks traded on open stock market exchanges.
- Private equity are investments in private companies that do not have access to public capital or have chosen not to list their securities in the public markets.
- Most institutional investors, like corporate and public pension funds, college and university endowments and other long-term investors, provide the capital for private equity funds to function.
- This capital can be used to fund new technology, make acquisitions, expand working capital for a company, improve an underperforming or undermanaged company, or bolster and solidify a company's balance sheet.

Private Equity is essential to the growth and health of the economy. It is estimated there are over 600,000 private companies in North America and Western Europe. In the U.S., the number of public companies has fallen by 50% to around 3,600*.

*Tim Jenkinson, Professor of Finance and Director, Private Equity Institute, University of Oxford, Pennsylvania Public Pension Management & Asset Investment Review Commission, September 2018



PSERS Private Equity Performance

Since the program's inception in 1985, PSERS Private Equity Portfolio earned, AFTER the payment of all fees, expenses, and profit sharing, an internal rate of return (IRR) of 11.19%.

Over the same time frame, the no fee, indexed public market equivalents (PMEs) earned:

- Direct alpha 3.48% annualized (PSERS PE Portfolio earned 300 more basis points than PSERS custom index consisting of 65% MSCI US Small Cap Index / 35% MSCI xUS Small Cap Index.)
- Kaplan Shore (KS) PME 1.12% annualized (PSERS PE Portfolio produced 10% more dollars than an equivalent investment in PSERS custom index)

Private and Public Equity Net of Fees Time-Weighted Returns (June 30, 2020)

Asset Class	1-Year	3-Year	5-Year	10-Year	15-Year	20-Year
Private Equity	1.0%	8.6%	9.1%	10.2%	10.8%	8.7%
U.S. Public Equity*	20.9%	14.4%	15.4%	13.8%	10.0%	7.8%
Foreign Public Equity**	10.7%	4.9%	8.9%	4.9%	4.9%	5.2%

*Russell 3000 Index; **MSCI ACWI xU.S.

PSERS Remains Committed to Transparency

On December 6, 2019, PSERS Board of Trustees approved an investment transparency policy that codified many of the agency's long-standing methods of disseminating investment records to the public, press and policymakers in accordance with existing state laws, Commonwealth directives and best practices in government finance. The policy stresses that PSERS will abide by its legal and fiduciary obligations when using the agency's website and other means to release investment returns and fee data under the Pennsylvania Right to Know Law, Sunshine Act, Public School Retirement Code, various other state codes, and Institutional Limited Partners Association (ILPA) standards. The policy also states PSERS has the discretion to publicize voluntarily "additional financial and investment information" that may go beyond the above-mentioned laws, rules and standards.

The policy also asserts that PSERS has the legal and fiduciary right to protect itself from demands for "additional fee disclosure" that could contain trade secrets and other non-public contractual agreements, which if exposed could hurt investment returns, lead to violations of state and federal statutes, or costly litigation. The policy also urges policymakers and stakeholders to defend the System against "false comparisons" with other pension funds that may not disclose similar data.

For more than two decades, PSERS investment professionals have provided the Trustees with an end-of-the-year private markets report. As part of PSERS' historic commitment to transparency, the report has evolved to provide more detailed information on asset performance, profits and costs. For the third year in a row, the report tabulated cumulative carried interest paid and accrued across asset classes. This report, for the first time, provided a breakdown of base fees and profit sharing/carried interest by individual managers across PSERS' private equity, private credit and private real estate holdings.

Investment Manager Fee Report (FY 2020)

The Investment Manager Fee Report covered costs related to the fund's use of internal investment professionals and external managers to invest the fund's assets of \$59 billion in FY2020. During that time, overall investment expenses increased from 0.82% to 0.90% of the total fund.

The report showed that internal management expenses increased by \$4 million to \$28 million as the System hired more investment professionals to reduce contracting costs with external managers. Additionally, PSERS saves over \$46 million per year in management fees by managing \$26.8 billion internally rather than externally.

What is Carried Interest?

Carried interest is a share of investment profits that is paid out when fund performance is strong. Contractually, the general partner only receives profit shares if it repays all of PSERS' start-up, investment and fixed management fees, and hits an annual preferred rate of return.



For a Closer Look at PSERS Investments, visit the "Investment Program" page at psers.pa.gov.

Reports & Resources on PSERS website include:

"Investment Program" page:

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

"Board of Trustees" page:

- Board Resolutions
- Transparency Policy
- Adjudications

"Financial Publications" page:

- Comprehensive Annual Financial Report (CAFR) & 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

Expanding Internal Investment Professionals Saves Additional Investment Fees

PSERS In-House Management Saves Over \$46 Million Annually

After receiving approval to increase its complement, PSERS Investment Office is currently in the process of filling those positions with very capable investment professionals to continue our efforts to bring additional assets in-house as well as provide additional depth to the investment team. The complement increase will allow the Investment Office to support the large amount of assets managed in-house at a significantly lower cost than if those assets were managed externally. Over the past three years, the Investment Office increased the amount of assets managed internally from 34% to 47%, or by \$11 billion. The estimated fee savings from managing those assets in-house is over \$46 million per year.

Investment Fee Reduction Plan Saves \$2.4 Billion

PSERS investment professionals and investment consultants developed and presented an investment fee savings plan at the August 2018 PSERS Board Meeting as directed by the Board. The fee savings plan has a two-pronged approach to generate fee savings. The first established a plan to renegotiate management fee arrangements to create a better alignment of interest between PSERS and each investment manager. The second expanded internal management and brought additional assets in-house at a lower cost than external management.

Together, the cumulative fee savings are \$2.4 billion compounded over 30 years, which represent a 9.6% annual reduction in base management fees. The detailed fee reduction plan is posted on PSERS website. We are pleased to report that as of November 2020, we were able to exceed the total cost savings documented in the plan, achieving approximately 110% of the base management fee reductions targeted. PSERS investment professionals reported those results at the December 2020 Investment Committee meeting and the presentation is posted on the *Investment Program* page on the PSERS website.



From FY 2013 to FY 2020, total investment expenses have decreased by 8% from \$558 million to \$515 million.

PSERS' Investment Professionals Certifications and Education

Investment management is a dynamic profession that continuously adapts to new technologies and evolving professional standards. PSERS investment professionals demonstrate their commitment to continuing education through completion of recognized investment industry designation programs and degrees program.

- 23 Chartered Financial Analysts (CFA)
- 8 Certified Public Accountants (CPA)
- 13 Chartered Alternative Investment Analysts (CAIA)
- 5 Financial/Professional Risk Managers (FRM/PRM)
- 5 Certified Treasury Professionals (CTP)
- 1 Certified Property Manager (CPM)

- 37 Bachelor's Degrees
- 19 Master's Degrees (MBA)
- 2 Juris Doctors

Numbers as of December 2020

PSERS FY 2021-2022 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 2021-22 budget submission contains an Administrative budget request of \$52,906,000 and a Defined Contribution budget request of \$955,000. PSERS also manages non-appropriated funds that cover expenses for Investment-Related Expenses, Health Insurance Account, Health Options Program, and Directed Commissions. PSERS' FY 2021-22 budgets, including non-appropriated funds, total \$94,019,000.

Appropriation	PSERS' Budget Submission (000s)
Administrative	\$ 52,906
Investment-Related	34,800
Defined Contribution	955
Health Insurance Account	2,004
HIA Health Options Program	1,354
Directed Commissions	2,000
Total	\$ 94,019

Enhancing Processes to Increase Efficiency and Improve Customer Service



PSERS Saves Over \$250,000 Annually in Printing & Mailing Costs with Paperless Delivery

PSERS Continues to Reduce Mailing Costs and Environmental Impact

Since April 2018, nearly 180,000 members have created a Member Self-Service (MSS) account and have conducted more than 237,000 transactions for themselves. The most common action taken was to create a retirement estimate. This new system also enables members to select their preference for how they would like PSERS to communicate with them. To date, nearly 95% of all MSS accounts have opted to go paperless and receive information from PSERS electronically.

PSERS Saves \$6.4 Million Annually

PSERS had a 13% 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 \$6.4 million in administrative expenses compared to its peers.

CALENDAR YEAR 2020 CUSTOMER SERVICE HIGHLIGHTS



Answered
160,000
Member Calls



Issued
267,000
1099-R's



Responded to
72,500
Member Emails



Issued **2.8 Million**
Monthly Benefit
Payments to Members



Served
6,000
Members in
Counseling
Sessions



Processed
9,400
Retirement
Applications

Health Options Program & Premium Assistance

PSERS administers two post-employment healthcare programs. The Health Options Program (HOP) is a group health insurance program funded solely by eligible participants. HOP expanded coverage options to include vision coverage for 2021. Members who enroll in the MetLife Dental Plan will also be enrolled in EyeMed vision coverage. PSERS also provides up to \$100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. As of December 31, 2020, Premium Assistance is provided to more than 94,000 members.

The PSERS HOP Prescription Drug Employer Group Waiver Plan earned a 4.5 star rating (out of 5 stars) from the Centers for Medicare and Medicaid Services (CMS) for the 2020 calendar year. PSERS is committed to keeping the HOP prescription drug program affordable, offering meaningful member choice, and holding vendors accountable to provide our members with best-in-class service. Only five plans in the U.S. had a higher rating.



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 - The Certificate of Achievement awarded by the GFOA is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government financial reports. PSERS has received a Certificate of Achievement for 37 consecutive years from FY 1983 to FY 2019.

GFOA Popular Annual Financial Reporting Award - 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, 2019, which PSERS refers to as its Summary Annual Financial Report. The Award for Outstanding Achievement in Popular Annual Financial Reporting is a prestigious national award recognizing conformance with the highest standards for preparation of state and local government popular reports. PSERS has received a Certificate of Achievement for four consecutive years from FY 2016 to FY 2019.

Public Pension Coordinating Council Public Pension Standards Award - The Public Pension Coordinating Council has awarded its Public Pension Standards Award to PSERS for 2019. This award is in recognition of meeting professional standards for plan design and administration.

February 2021 PSERS Board of Trustees

Christopher SantaMaria, Chairman

Honorable Francis X. Ryan, Vice Chairman
House of Representatives

Deborah J. Beck

Honorable Matt D. Bradford
House of Representatives

Honorable Patrick M. Browne
Senate of Pennsylvania

Jason M. Davis

Eric O. DiTullio

Honorable Stacy Garrity
Treasurer of Pennsylvania

Susan C. Lemmo

Nathan G. Mains

Honorable Katie J. Muth
Senate of Pennsylvania

Noe Ortega
Acting Secretary of Education

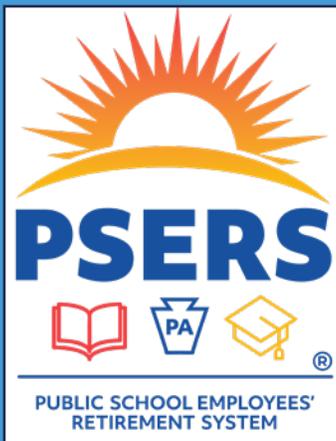
Richard W. Vague
Secretary of Banking and Securities

Melva S. Vogler

Governor's Appointee - Vacant

PSERS Board Education and Training Program

Act 128 of 2020 required PSERS Board of Trustees to receive 10 hours of investment-related education and one hour of ethics training each year. We are pleased to report that in 2020, our 15 Board members and their designees completed over 590 hours of investment-related education and ethics training. On average, each board member and designee received over 31 hours of education, far exceeding the education requirement.



Toll-Free: 1.888.773.7748

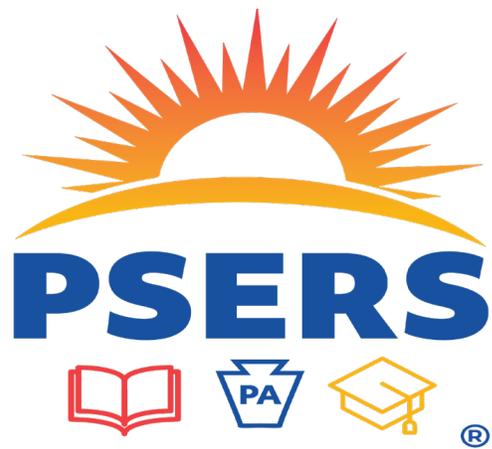
Local Phone: 717.787.8540

Email Address: ContactPSERS@pa.gov

Website: psers.pa.gov

5 North 5th Street | Harrisburg, PA 17101-1905

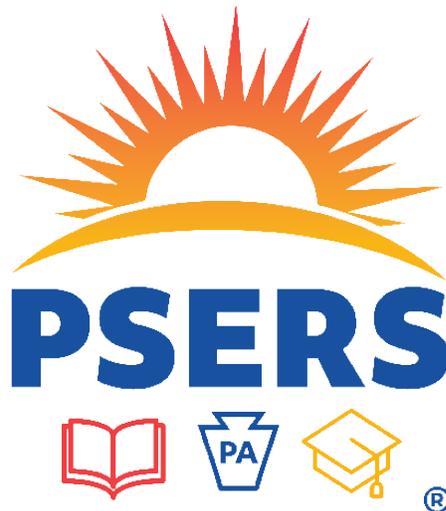
PSERS
Fiscal Year 2021-22
Budget Report
Appropriations Committee



PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

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

5 North 5th Street
Harrisburg, PA 17101-1905



FISCAL YEAR 2021-22 BUDGET REPORT
APPROPRIATIONS COMMITTEE
FEBRUARY 26, 2021

Christopher SantaMaria
Chairman
Board of Trustees

Honorable Francis X. Ryan
Vice Chairman
Board of Trustees

Glen R. Grell
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

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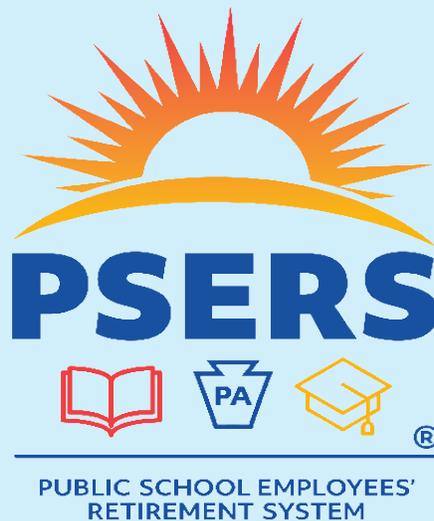
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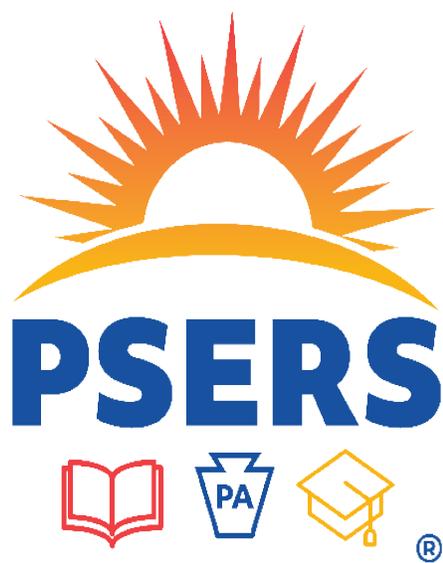
PSERS BUDGET REPORT - FY 2021-2022



SECTION 1 - PSERS OVERVIEW

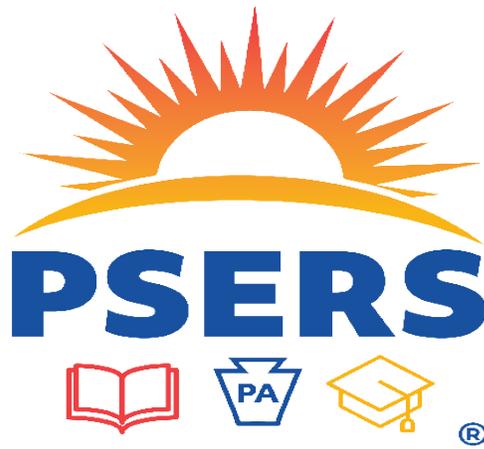
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PSERS Overview and Board of Trustees



PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

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, 2020, the System had approximately 256,000 active members. The annuitant membership was comprised of approximately 240,000 retirees and beneficiaries who collectively received average monthly pension benefit payments of over \$520 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was \$25,753. PSERS had 770 participating employers on June 30, 2020.

As reported in the latest Pension and Investments survey, published February 8, 2021, based on asset size, PSERS is the 37th 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

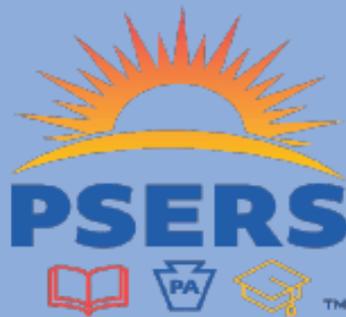
plan assets. PSERS' total plan net assets as of December 31, 2020 were approximately \$64.2 billion. PSERS' investment rate of return for the one-year period ended September 30, 2020 was 3.14%, net of fees.

During fiscal year 2020, PSERS' pension disbursements to retirees totaled \$6.9 billion. Of this amount, nearly 94%, or \$6.5 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, 2020, 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 120,000 retirees and their dependents as of December 31, 2020.



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 February 8, 2021

Christopher SantaMaria, Chairman

Honorable Francis X. Ryan, Vice Chairman

House of Representatives

Deborah J. Beck

Honorable Matt D. Bradford

House of Representatives

Honorable Patrick M. Browne

Senate of Pennsylvania

Jason M. Davis

Eric O. DiTullio

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Susan C. Lemmo

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Noe Ortega

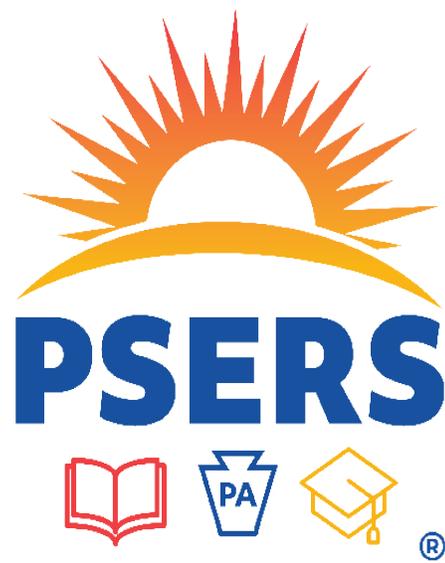
Acting Secretary of Education

Richard W. Vague

Secretary of Banking and Securities

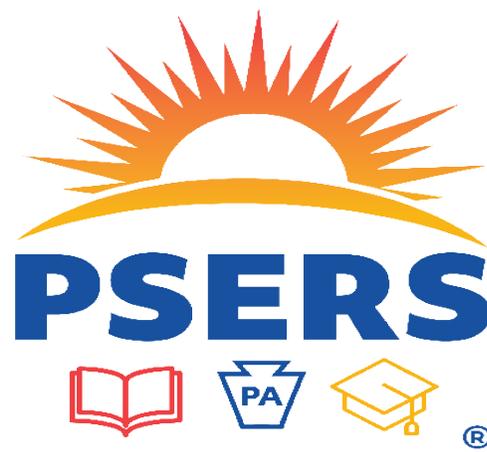
Melva S. Vogler

Governor's Appointee - Vacant



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PSERS Organizational Structure and Member Services



PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

Section 1 - PSERS Overview

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

The 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 Auditor's Office

The office provides independent, objective assurance, and consulting activity designed to add value and improve Public School Employees' Retirement System's (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.

Organizational Structure (continued)

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 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.

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; board of trustees administration; third-party contract administration; 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.

Organizational Structure (continued)

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.

Information Technology Office

This office oversees the Bureau of Information Technology and the Business Architecture Center. It is responsible for strategic 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 needs and requirements as well as those Commonwealth needs and requirements that are consistent with agency needs, and for communicating such to the agency's IT staff. Large information technology contracts and projects are managed by this office. This bureau is responsible for understanding, analyzing, documenting, and improving 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; understand each component, its relationship to each of the other components and to PSERS' mission, vision, values and goals; fully, yet quickly analyze and understand the impact of potential change to one or more of these components on the others; more effectively identify inefficient, duplicate, or suspect processes, technologies; and account for its processes, information systems and technologies.

Bureau of Information Technology

This bureau is responsible for planning, coordinating, administering, and implementing information technology resources in accordance with the agency's strategic plans, goals, objectives, and priorities as communicated by PSERS' Chief Information Officer, and for providing operational support for those technologies and initiatives.

Bureau of Administration

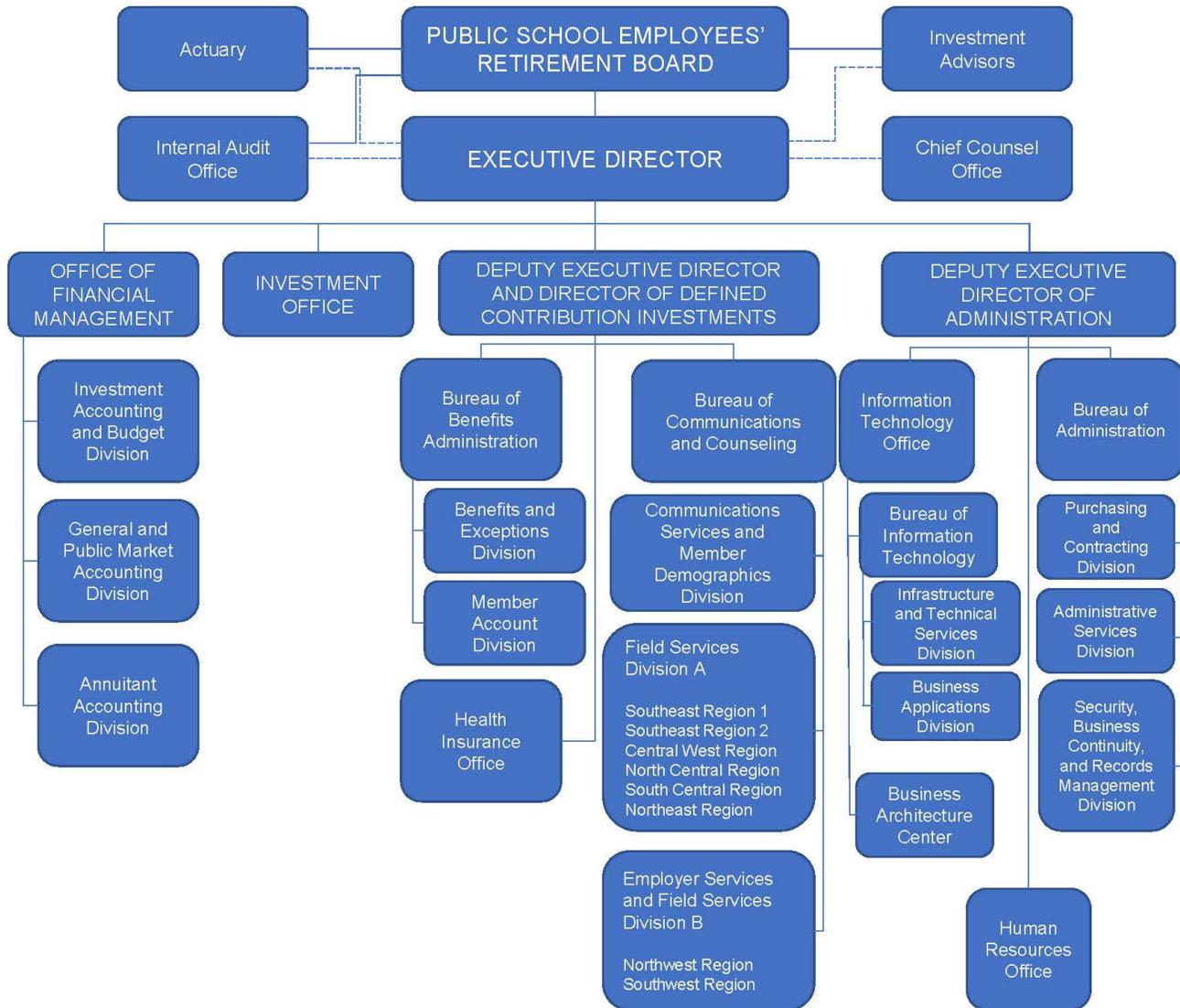
This bureau provides facilities, purchasing and contracting, policies and procedures, business continuity, records management, automotive, mail, imaging, and other administrative services necessary to support agency functions.

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



Section 1 - PSERS Overview

PSERS REGIONAL OFFICES

Chart 2.2

Northwest

Pennwood Center
464 Allegheny Boulevard, Suite C
Franklin, PA 16323-6210
 Local: 1.814.437.9845
 FAX: 1.814.437.5826
Toll-Free: 1.888.773.7748
 Donald Gregory, Administrator

Northcentral

300 Bellefonte Avenue, Suite 201
Lock Haven, PA 17745-1903
 Local: 1.570.893.4410
 FAX: 1.570.893.4414
Toll-Free: 1.888.773.7748
 Jeremy Wible, Administrator

Northeast

417 Lackawanna Avenue, Suite 201
Scranton, PA 18503-2013
 Local: 1.570.614.0269
 FAX: 1.570.614.0278
Toll-Free: 1.888.773.7748
 Sherry Sibio, Administrator



Southwest

300 Cedar Ridge Drive, Suite 301
Pittsburgh, PA 15205-1159
 Local: 1.412.920.2014
 FAX: 1.412.920.2015
Toll-Free: 1.888.773.7748
 Russell Miller, Administrator

Centralwest

219 W. High Street
Ebensburg, PA 15931-1540
 Local: 1.814.419.1180
 FAX: 1.814.419.1189
Toll-Free: 1.888.773.7748
 Brian Farester, Administrator

Southcentral

5 N 5th Street
Harrisburg, PA 17101-1905
 Local: 1.717.720.6335
 FAX: 1.717.783.9606
Toll-Free: 1.888.773.7748
 John Tucker, Administrator

Southeast

605 Louis Drive, Suite 500
Warminster, PA 18974-2830
 Local: 1.215.443.3495
 FAX: 1.215.443.3487
Toll-Free: 1.888.773.7748
 Joshua Cataifu, Administrator
 Linda Visco, Administrator



Section 1 - PSERS Overview

Summary of Various Member Service Statistics

PSERS operates very efficiently. There are only 361 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>2018-19</u>	<u>2019-20</u>
Initial Retirements (1-Step)		7,852	7,403
Initial Retirements (2-Step)		906	1,276
Final Retirements (2 nd Step of 2-Step)		743	1,178
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld		3,353	3,029
Refunds		4,440	4,343
Death Benefits Processed		5,653	3,378
Account Verification - non retirements		12,162	12,390
TOTAL		35,109	32,997
Percent of Retirement Paid as 1 Step		90%	85%

Table 2.2 Other Member Services (Major)

	Fiscal Year	<u>2018-19</u>	<u>2019-20</u>
Retirement Estimates		14,893	15,213
Phone Calls Answered		160,267	159,758
E-mails Received		33,113	69,718
E-mails Sent		29,174	61,251
General Information Sessions		201	154
General Information Attendees		11,449	9,057
Exit Counseling Sessions		1,174	1,214
Exit Counseling Attendees		6,581	5,970

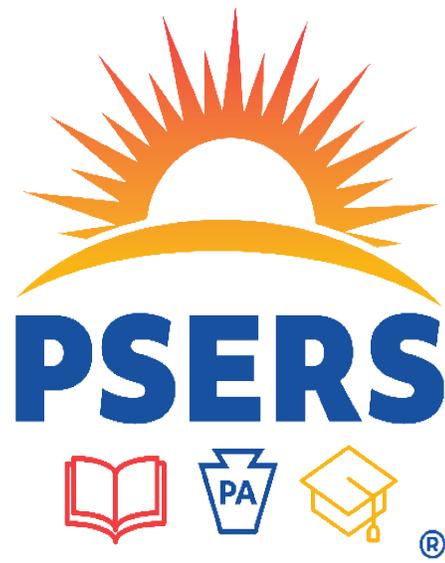
Section 1 - PSERS Overview

Summary of Various Member Service Statistics (continued)

Table 2.3 Member Self Service Transactions Done by Members			
	Calendar Year	<u>2020</u>	<u>2019</u>
Retirement Estimate		26,706	37,151
Nomination of Beneficiary		19,318	23,008
Address Change		10,862	8,152
Income Verification		14,749	14,313
W-4P		1,413	1,317
Apply for Multiple Service		44	61
Elect Class T-F		11	682
Elect Class T-H		79	65
Elect Class DC		160	115
Waive Membership		129	65
TOTAL		73,471	84,929

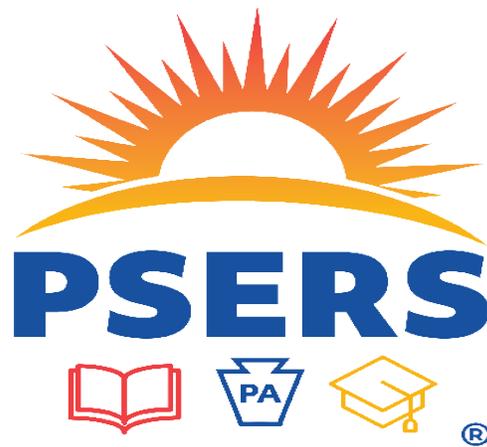
Table 2.4 Member Payment Services for Retirees and Beneficiaries			
	Calendar Year	<u>2020</u>	<u>2019</u>
Monthly Payments to Members		2,823,743	2,787,962
Non-recurring Payments to Members		46,924	47,819
W4-P Tax Withholding Forms Processed		3,168	4,764
EFT Forms Processed - Direct Deposit		7,618	9,861
ACH Rejects Researched and Reviewed (Direct Deposit Failures)		4,797	5,303
Member Payment Changes Processed		2,170	2,476
1099R-Paperless Delivery		58,151	48,191
1099R-Printed for Mailing		208,437	215,525
Total Forms 1099-R Produced		266,588	263,716

PSERS had over 160,000 members sign up for the MSS account. Of those, nearly 96% opted for paperless delivery. This has resulted in annual savings of approximately \$250,000 in postage, printing and paper since MSS went live in April 2018.



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Economic Impact on Pennsylvania, Member Demographics, and Financial Information



PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

Section 1 - PSERS Overview

Economic Impact on Pennsylvania, Member Demographics, and Financial Information

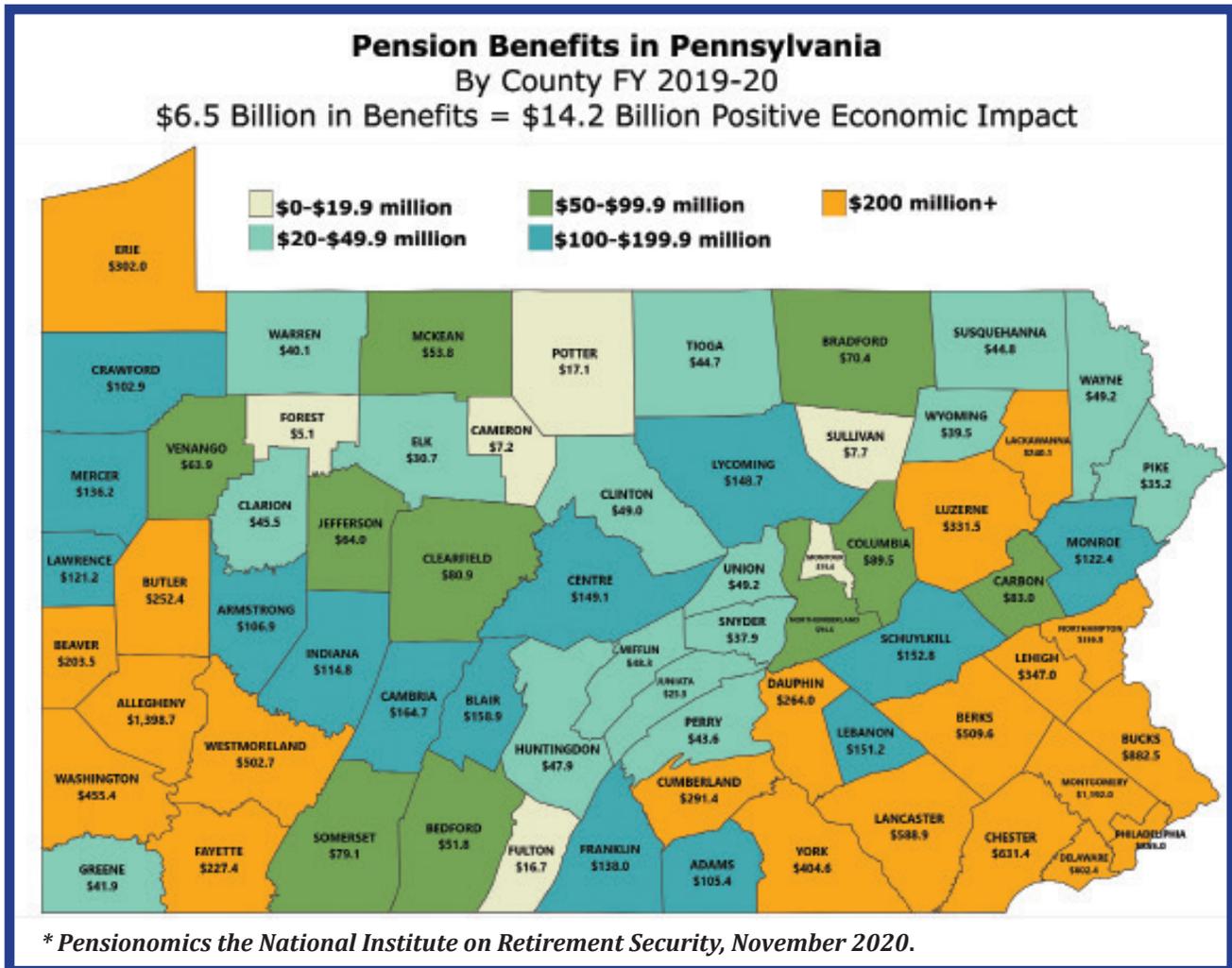
Economic Impact of Pension Benefits on Pennsylvania

In Fiscal Year 2019-20, PSERS' pension disbursements to retirees totaled approximately \$6.9 billion. Of this amount, nearly 94%, or \$6.5 billion, went directly into state and local economies. According to a study by the Pensionomics for 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 \$6.5 billion into an economic impact of \$14.2 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes:*

- Support for over 66,000 jobs that paid \$3.9 billion in wages and salaries.
- \$1.6 billion in federal and local tax revenues

Table 3.1
Top 10 Counties Based on Economic Impact from Benefit Disbursements
(Dollars in Millions)

ALLEGHENY	\$1,398.7
MONTGOMERY	1,192.0
BUCKS	882.5
PHILADELPHIA	855.0
CHESTER	631.4
DELAWARE	602.4
LANCASTER	588.9
BERKS	509.6
WESTMORELAND	502.7
WASHINGTON	455.4



Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.2 Member by Type

Fiscal Year Ended June 30	Active Members	Annuitants, Beneficiaries, and Survivor Annuitants	Total Active/Retired Members	Ratio of Active/ Retired	Vestees	Total Membership
2020	256,246	239,614	495,860	1.07 to 1	25,903	521,763
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
2017	255,945	230,014	485,959	1.13	24,515	510,474
2016	257,080	224,828	481,908	1.14	23,437	505,345
Average ratio of active members to annuitants (Public Funds)				1.34*		

*Based on the November 2020 Public Fund Survey prepared by the National Association of State Retirement Administrators (NASRA).

Table 3.3

Profile of PSERS' Annuitants, Beneficiaries, and Survivor Annuitants

Type of Member	Number of Members		Average Annual Benefit	
	<u>6/30/2020</u>	<u>6/30/2019</u>	<u>6/30/2020</u>	<u>6/30/2019</u>
Normal/Early Retirees	218,478	216,326	\$26,541	\$26,300
Survivor Annuitants	12,072	11,860	15,098	14,847
Disability Retirees	9,064	9,153	20,954	20,348
Total/Average Yearly Benefit	239,614	237,339	\$25,753	\$25,498
Age and Service Profile of All Active Members				
	<u>6/30/2020</u>	<u>6/30/2019</u>		
Average Age	45.5	45.4		
Average Years of PSERS Service	11.8	11.7		
Average Annual Compensation	\$54,535	\$53,458		
Class T-C Members				
	<u>6/30/2020</u>	<u>6/30/2019</u>	Class T-D Members	
	<u>6/30/2020</u>	<u>6/30/2019</u>	<u>6/30/2020</u>	<u>6/30/2019</u>
Number of Members	2,845	3,010	158,971	167,118
Average Age	54.1	53.4	48.9	48.5
Average Years of PSERS Service	22.1	21.3	16.7	16.1
Average Annual Compensation	\$58,049	\$56,239	\$65,821	\$63,502
Class T-E Members				
	<u>6/30/2020</u>	<u>6/30/2019</u>	Class T-F Members	
	<u>6/30/2020</u>	<u>6/30/2019</u>	<u>6/30/2020</u>	<u>6/30/2019</u>
Number of Members	64,658	70,521	14,559	15,100
Average Age	40.4	39.4	39.2	38.3
Average Years of PSERS Service	3.6	2.7	4.1	3.2
Average Annual Compensation	\$35,219	\$31,787	\$46,836	\$42,954
Class T-G Members				
	<u>6/30/2020</u>	<u>6/30/2019</u>	Class T-H Members	
	<u>6/30/2020</u>	<u>6/30/2019</u>	<u>6/30/2020</u>	<u>6/30/2019</u>
Number of Members	15,122	N/A	91	N/A
Average Age	36.6	N/A	35.3	N/A
Average Years of PSERS Service	0.4	N/A	0.5	N/A
Average Annual Compensation	\$25,376	N/A	\$29,308	N/A

Section 1 - PSERS Overview

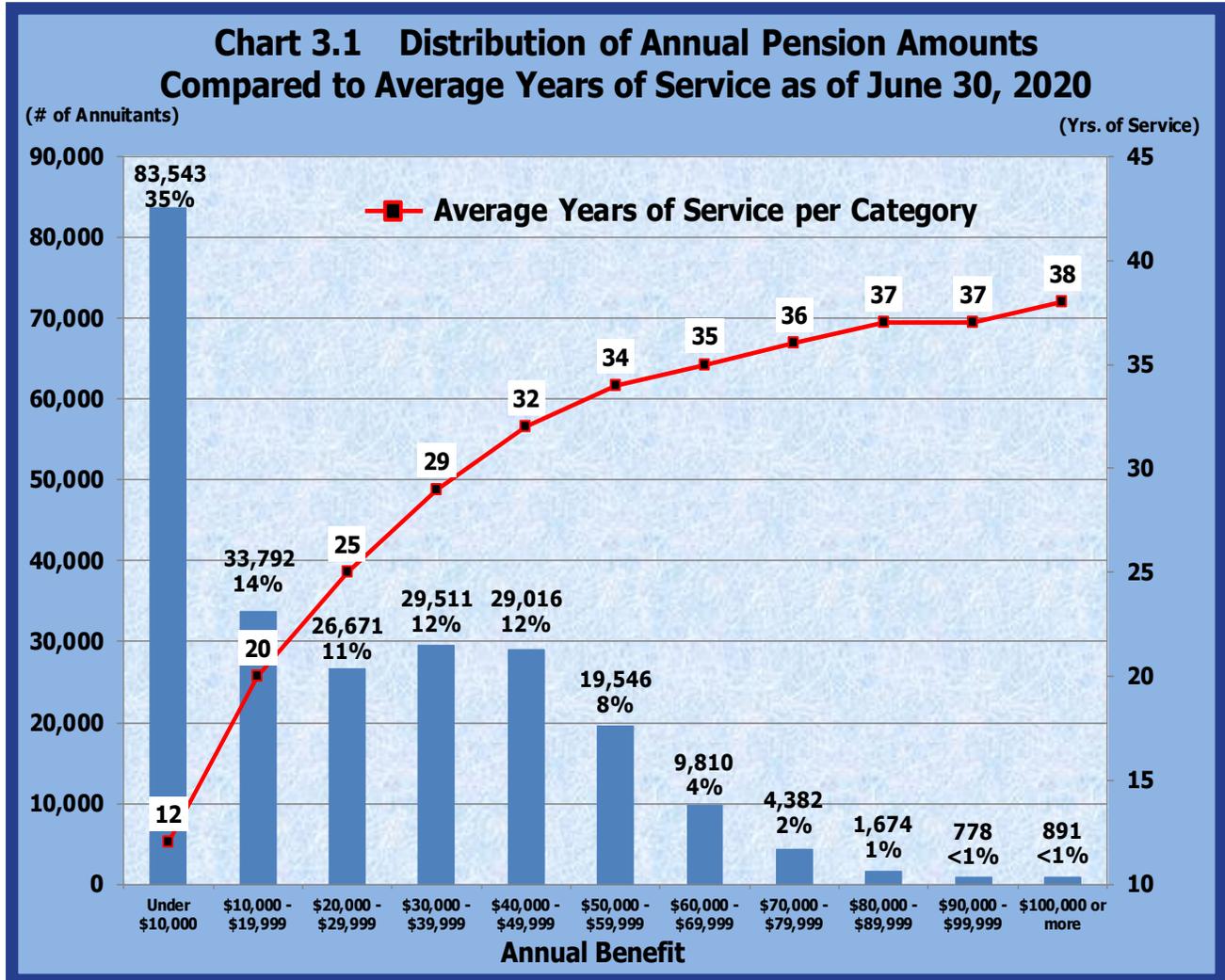
Member Demographics and Financial Information (continued)

Benefit Summary

The average PSERS retiree receives \$25,753 annually, a benefit earned through a lengthy career in education.

- Over 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.



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, 2010 - June 30, 2020
Balance of Net Position (07/01/2010)	\$45,598
Member Contributions	\$10,100
Employer Contributions	28,134
Net Investment Income	37,705
Deductions - Benefits & Expenses	(62,980)
Net Increase	\$12,959
Balance of Net Position (06/30/2020)	\$58,557

**Table 3.5 External Cash Flow - Pension
Fiscal Years Ended June 30
(Dollar Amount in Thousands)**

	----- Projected -----					
	2020	2021	2022	2023	2024	2025
Member Contributions	\$1,068,000	\$1,087,000	\$1,093,000	\$1,102,000	\$1,110,000	\$1,117,000
Employer Contributions	4,677,000	4,784,000	4,952,000	5,180,000	5,375,000	5,566,000
Total Contributions	\$5,745,000	\$5,871,000	\$6,045,000	\$6,282,000	\$6,485,000	\$6,683,000
Less:						
Benefits	\$6,877,000	\$6,984,000	\$7,085,000	\$7,182,000	\$7,278,000	\$7,373,000
Administrative expenses	47,000	50,000	51,000	52,000	53,000	54,000
Total Outflows	\$6,924,000	\$7,034,000	\$7,136,000	\$7,234,000	\$7,331,000	\$7,427,000
Negative External Cash Flow	-\$1,179,000	-\$1,163,000	-\$1,091,000	-\$952,000	-\$846,000	-\$744,000
End of Year Total Assets	\$58,557,000	\$61,404,000	\$64,692,000	\$68,358,000	\$72,399,000	\$76,837,000
Negative External Cash Flow (NECF) as a % of Total Assets	-2.0%	-1.9%	-1.7%	-1.4%	-1.2%	-1.0%
Average NECF as a % of Total Assets (Public Funds)	-2.7% *					

*Based on the November 2020 Public Fund Survey prepared by NASRA.

Negative External Cash Flow (NECF)

Using data from Table 3.4 at the top of the page, the last 10 years of contributions and benefit payments resulted in a Negative External Cash Flow (NECF) of -\$24.7 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

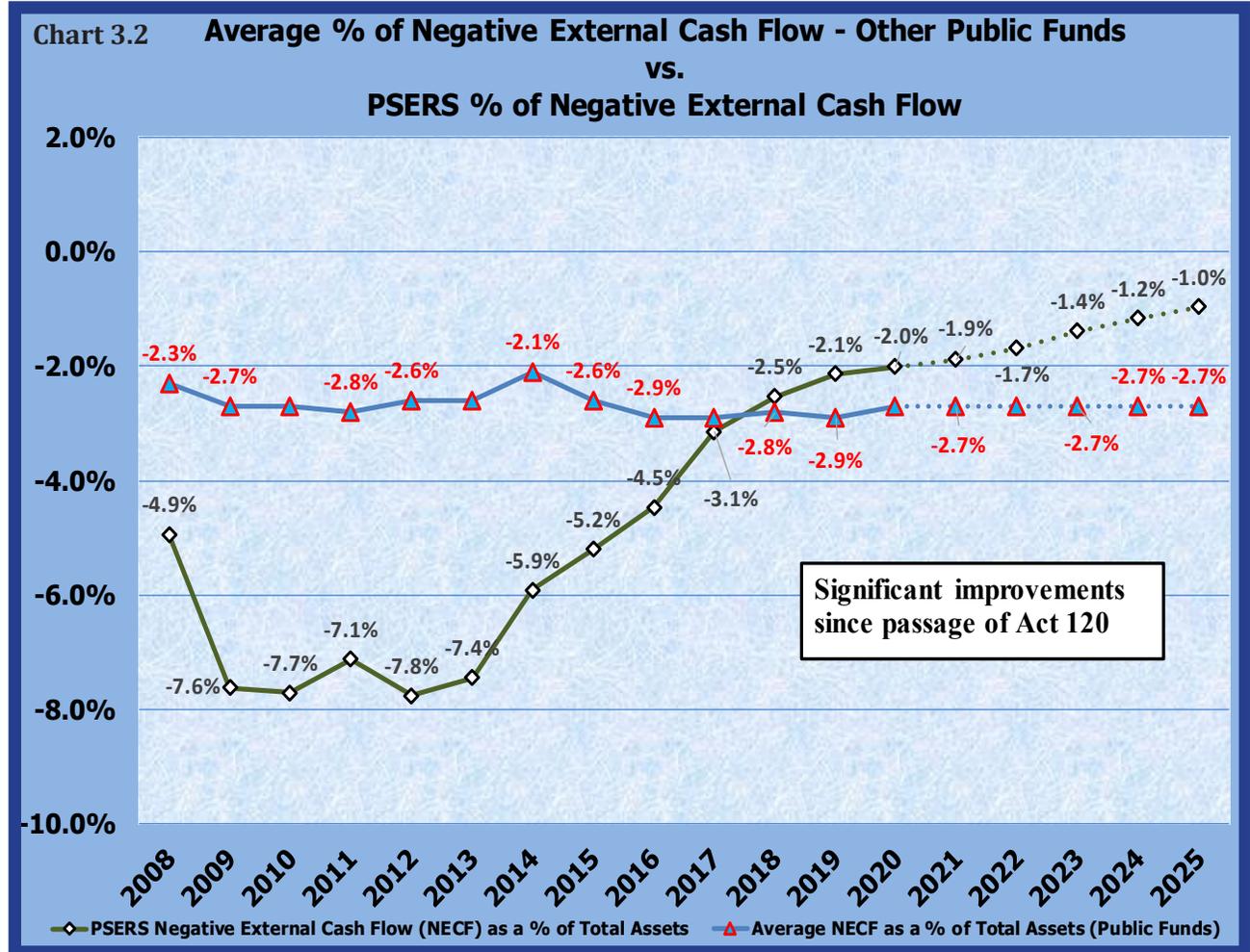
-2.0% of total assets for FY 2019-20, which was more favorable than the public fund average for the third year in a row. The large negative annual external cash flow has improved significantly since fiscal year 2012 due to the implementation of Act 120 in 2010. Act 120 provided for increased employer contributions to the actuarially required

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

contribution levels. Due to receiving 100% of actuarially required contributions for the fourth consecutive year, the System's cash flow shortfall is

now more favorable than the public fund average and will continue to improve over the next several years.



PSERS Negative External Cash Flow Projection (NECF)

In Chart 3.2, beginning in FY2018 PSERS' projected NECF percentage of -2.5% is more favorable than the public fund percentage. If PSERS meets or exceeds its investment return assumptions the

total assets are projected to grow in excess of total liabilities and continue to pay down the unfunded liability.

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

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

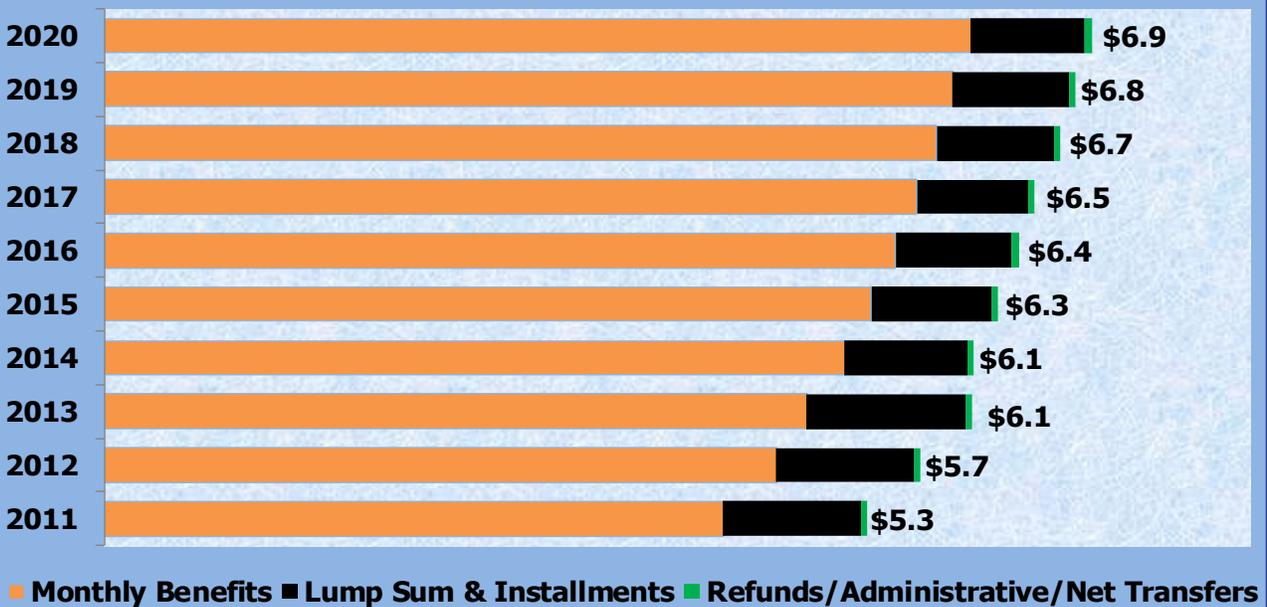


PSERS' Pension Fiduciary Net Position

As depicted in Chart 3.3, PSERS' fiduciary net position decreased by \$0.2 billion from \$58.7 billion at June 30, 2019 to \$58.5 billion at June 30, 2020. The decrease was due in large

part to net investment income being reduced by the uncertainty of the pandemic even though the member and employer contributions exceeded deductions for benefit and administrative expenses.

**Chart 3.4 Deductions from Pension Fiduciary Net Position*
10 Year Trend (Fiscal Year ended June 30)
(\$Amounts in Billions)**



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

PSERS Deductions from Pension Fiduciary Net Position

As depicted in Chart 3.4, the small increase for FY2019 to FY2020 is mainly attributed to an ongoing slight rise in the average monthly

benefit and an increase in the number of members receiving benefits.

Section 1 - PSERS Overview

Statement of Fiduciary Net Position December 31, 2020 Unaudited (Dollar Amounts in Thousands)

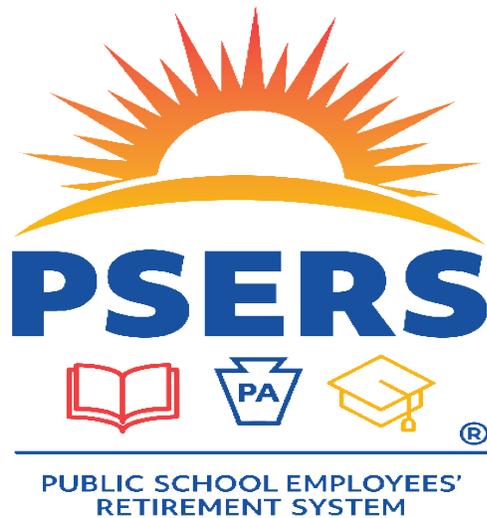
	Pension	Defined Contribution	Postemployment Healthcare		Totals
			Premium Assistance	Health Options Program	
Assets:					
Receivables:					
Members	\$ 346,948	\$ 469	\$ 1,987	\$ 188	\$ 349,592
Employers	1,275,825	363	31,604	-	1,307,792
Investment income	822,859	1	81	18	822,959
Investment proceeds	217,732	-	-	-	217,732
CMS Part D and prescriptions	-	-	-	64,073	64,073
Interfund receivable	298	-	46	-	344
Total Receivables	2,663,662	833	33,718	64,279	2,762,492
Investments, at fair value:					
Short-term	7,878,381	6,628	95,084	349,928	8,330,021
Fixed income	9,663,144	-	-	-	9,663,144
Common and preferred stock	13,017,913	-	-	-	13,017,913
Collective trust funds	12,508,229	31,354	-	-	12,539,583
Real estate	5,174,652	-	-	-	5,174,652
Alternative investments	14,162,460	-	-	-	14,162,460
Total Investments	62,404,779	37,982	95,084	349,928	62,887,773
Securities lending collateral pool	7,705,230	-	-	-	7,705,230
Capital assets (net of accumulated depreciation \$38,657)	17,789	-	-	-	17,789
Miscellaneous	22,178	-	338	-	22,516
Total Assets	72,813,638	38,815	129,140	414,207	73,395,800
Liabilities:					
Accounts payable and accrued expenses	113,479	58	349	2,225	116,111
Benefits payable	241,312	-	135	30,463	271,910
HOP participant premium advances	-	-	-	33,327	33,327
Investment purchases and other payables	866,164	207	-	-	866,371
Obligations under securities lending	7,705,230	-	-	-	7,705,230
Interfund payable	-	344	-	-	344
Other liabilities	155,246	-	-	-	155,246
Total Liabilities	9,081,431	609	484	66,015	9,148,539
Net position restricted for pension, DC and postemployment healthcare benefits	\$ 63,732,207	\$ 38,206	\$ 128,656	\$ 348,192	\$ 64,247,261

Section 1 - PSERS Overview

Statement of Changes in Fiduciary Net Position Six Months Ended December 31, 2020 Unaudited (Dollar Amounts in Thousands)

	Pension	Defined Contribution	Postemployment Healthcare		Totals
			Premium Assistance	Health Options Program	
Additions:					
Contributions:					
Members	\$ 510,126	\$ 7,638	\$ -	\$ -	\$ 517,764
Employers	2,275,213	5,999	55,874	-	2,337,086
Total contributions	2,785,339	13,637	55,874	-	2,854,850
HOP participant premiums	-	-	-	199,392	199,392
Centers for Medicare & Medicaid Services	-	-	-	30,423	30,423
Investment income:					
From investing activities:					
Net appreciation (depreciation) in fair value of investments	5,450,821	4,597	(127)	-	5,455,291
Short-term	5,217	9	287	132	5,645
Fixed income	133,962	-	-	-	133,962
Common and preferred stock	113,513	-	-	-	113,513
Collective trust funds	615	-	-	-	615
Real estate	154,446	-	-	-	154,446
Alternative investments	286,547	-	-	-	286,547
Total investment activity income	6,145,121	4,606	160	132	6,150,019
Investment expenses	(312,880)	(32)	-	-	(312,912)
Net income from investing activities	5,832,241	4,574	160	132	5,837,107
From securities lending activities:					
Securities lending income	12,446	-	-	-	12,446
Securities lending expense	(3,698)	-	-	-	(3,698)
Net income from securities lending activities	8,748	-	-	-	8,748
Total net investment income	5,840,989	4,574	160	132	5,845,855
Total Additions	8,626,328	18,211	56,034	229,947	8,930,520
Deductions:					
Benefits	3,413,272	-	57,017	183,151	3,653,440
Refunds of contributions	13,274	425	-	-	13,699
Administrative expenses	24,361	941	778	19,826	45,906
Total Deductions	3,450,907	1,366	57,795	202,977	3,713,045
Net increase (decrease)	5,175,421	16,845	(1,761)	26,970	5,217,475
Net position restricted for pension, DC and postemployment healthcare benefits:					
Balance, beginning of year	58,556,786	21,361	130,417	321,222	59,029,786
Balance, end of period	\$ 63,732,207	\$ 38,206	\$ 128,656	\$ 348,192	\$ 64,247,261

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' 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.

Chart 4.1 Distribution of Investment Return Assumptions

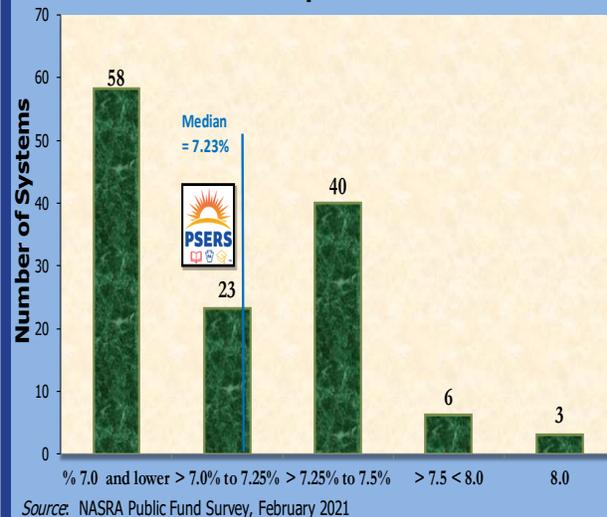
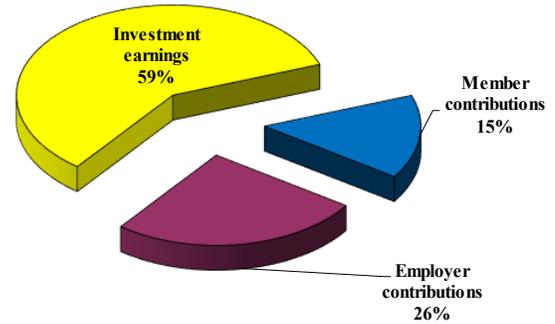


Chart 4.2

PSERS' Sources of Funding
Twenty-five Year History (1996-2020)



Effective with the June 2016 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 7.50% to 7.25%, the salary growth assumption was changed from 5.50% to 5.00%, the inflation assumption was reduced from 3.00% to 2.75%, the rates of withdrawal, disability and retirement from employment among active members were updated and mortality rates were revised. Chart 4.1 displays PSERS' 7.25% return assumption in comparison to other funds in the public pension universe. PSERS and its actuary are currently working on the actuarial Experience Study for the five years ended June 30, 2020 and expect to update many of its actuarial assumptions for implementation in the June 30, 2021 actuarial valuation.

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, 2020 investment earnings provided 59% of PSERS' funding followed by 26% from employers while members contributed 15%.

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

Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

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 employer contribution rate for the fiscal year ended June 30, 2020 was 34.29%, including 0.09% for Act 5 DC (estimated average rate) plus 0.83% for healthcare premium assistance.

The total employer contribution rate for the fiscal year ending June 30, 2021 is 34.51%. This rate consists of a 33.51% pension rate, 0.18% Act 5 DC plus the healthcare premium assistance contribution of 0.82%.

The FY 2021-22 employer contribution rate is 34.94%. This rate consists of a 33.99% pension rate, the healthcare premium assistance contribution of 0.80% and an Act 5 DC estimated average rate of 0.15%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of Act 5 of 2017, at their December 2020 meeting. While any contribution increase is a challenge for PSERS' employers, the increase in the FY 2021-22 contribution rate is only 1.25%. The very large increases that employers experienced prior to FY 2017-18 are now in the past. The projected rate increases in the future are less than current levels of inflation.

For the fiscal year ended June 30, 2020, PSERS' employer contributions totaled \$4.801 billion, which includes \$118 million for healthcare premium assistance and \$7 million for DC. For the fiscal year ending June 30, 2021 the estimate for total employer contributions is \$4.858 billion, reflective of the 34.51% contribution rate. The contribution rate for the fiscal year ending June 30, 2022 is 34.94%, resulting in an employer contribution estimate of \$4.993 billion.

Member Contributions

Most members of the Public School Employees' Retirement System contribute between 7.5% and 10.3% 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 (FY2020-21) is 7.61%. This is in contrast to the majority of non-public (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.

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 similar to a defined contribution plan. As a result of the Fund's nine-year return through June 30, 2020 exceeding the investment performance hurdle mandated by Act 120 and Act 5, the member contribution rate did not change. The next investment performance measurement period for Class T-E, T-F, T-G and T-H members will be the ten-year period ending June 30, 2023.

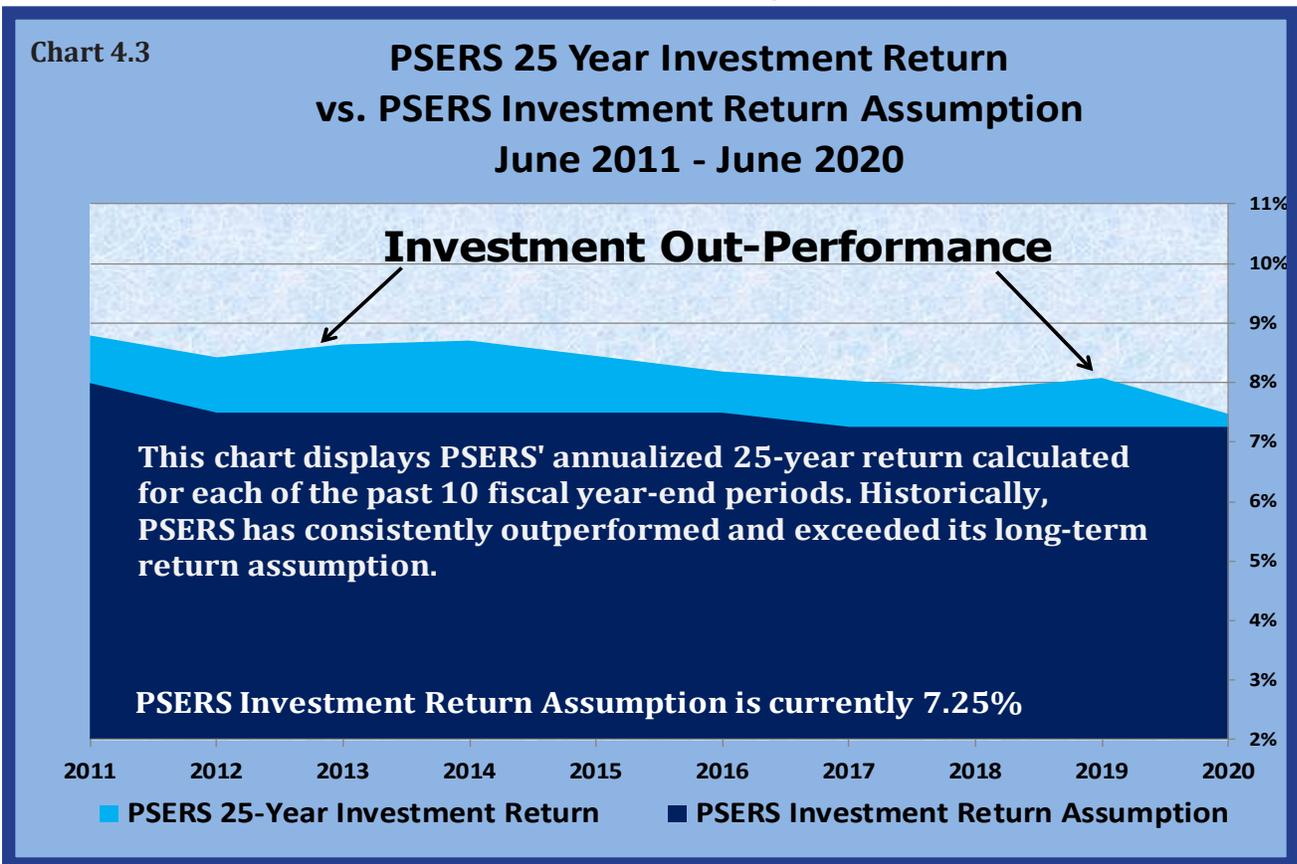
PSERS' members contributed \$1.076 billion of pension contributions for FY2020. Total member contributions are estimated to be \$1.079 billion for the fiscal year ending June 30, 2021 and \$1.088 billion for the fiscal year ending June 30, 2022.

Investment Returns

PSERS' investment rate of return for the fiscal year ended June 30, 2020 was 1.11%, net of fees. The investment rates of return (net of fees) for the fiscal years ended June 30, 2019 and June

Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)



30, 2018 were 6.68% and 9.27%, respectively. The annualized rates of investment return for the three, five and ten-year periods ended September 30, 2020 were 5.92%, 7.36%, and 7.40% respectively. Over the past 25 years ended September 30, 2020, the Fund earned an annualized rate of return of 7.40% which exceeded the Fund's long term investment rate of return assumption.

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. This outstanding long-term investment performance resulted in declining employer contribution rates and/or contribution rates lower than the annual normal cost of benefits.

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: 59.2% 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 FY2020 is the second consecutive major improvement in the funded ratio, on an actuarial basis.
- 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 FY2001 to FY2003 and FY2008 to FY2009; 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 FY2016; funding

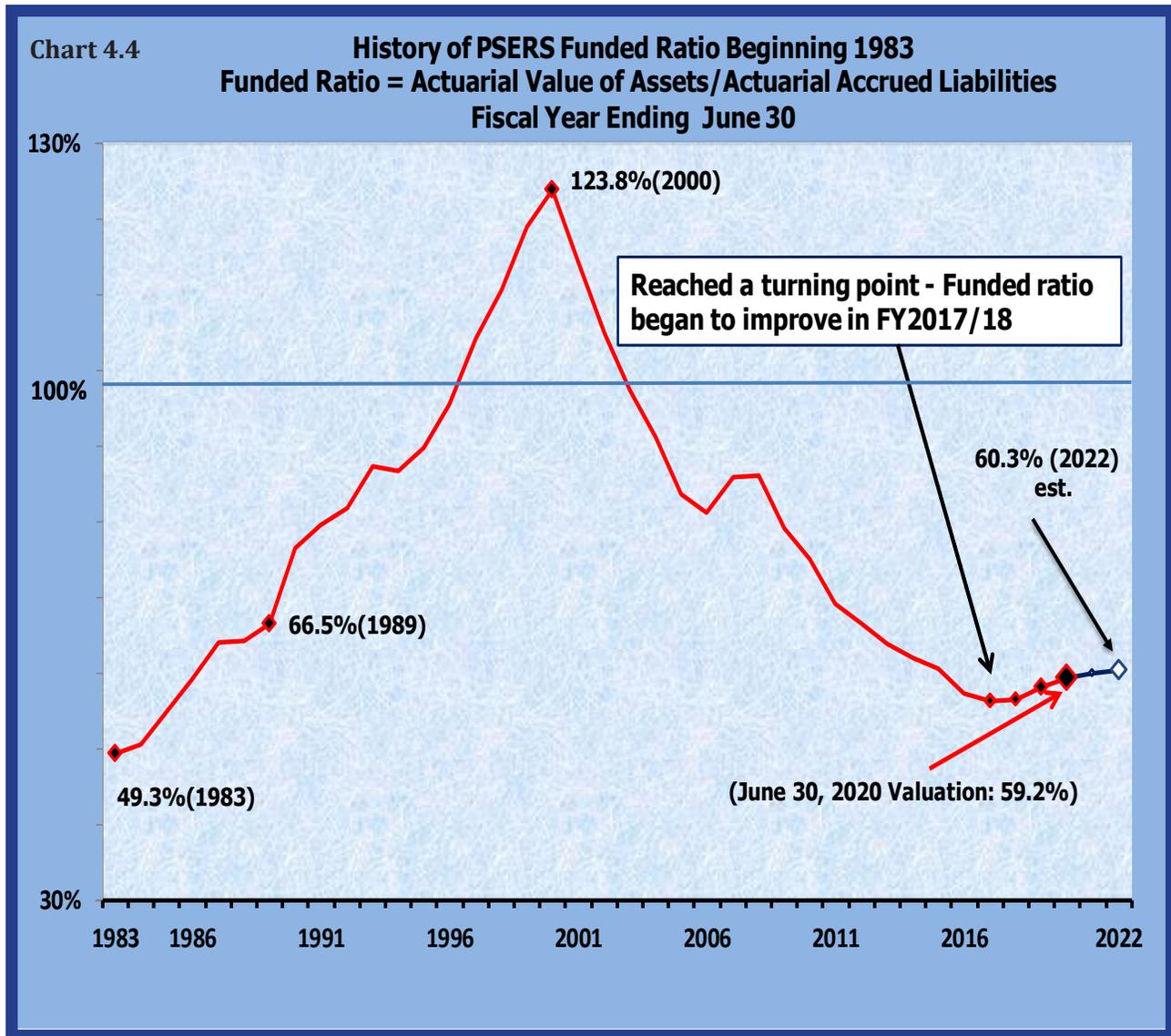
Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

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 two-year projection of PSERS' funded status is shown in Chart 4.4. 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. Future projections now reflect a steadily increasing funded ratio.



Section 1 - PSERS Overview

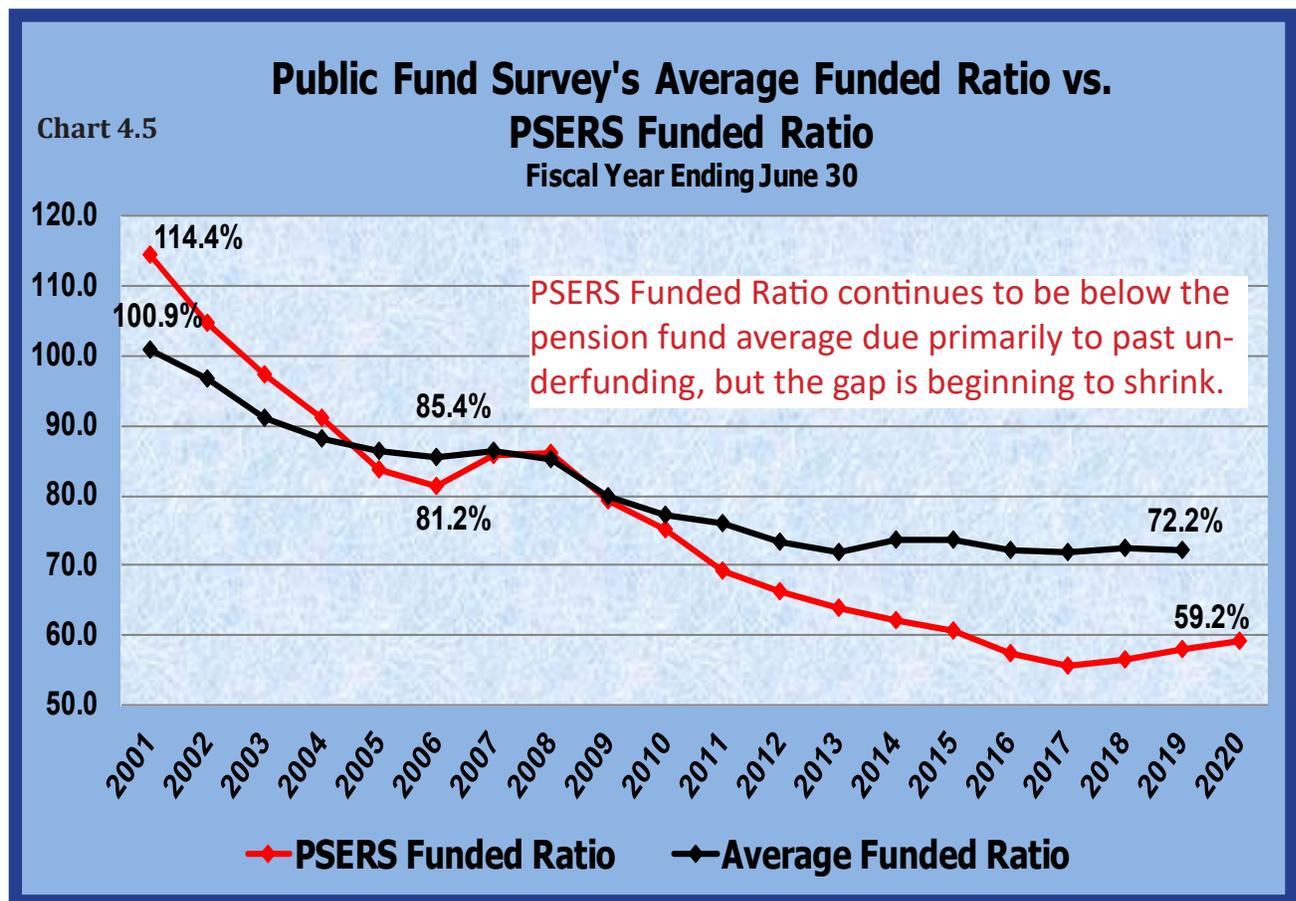
The Actuarial Process and Pension Plan Funding (continued)

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 very slow growth of assets. High employer contributions are required in order for assets to grow.

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, 2020).

Since July 1, 2016 PSERS' employer contribution rate has provided 100% of the actuarially required rate. 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 improve in FY 2017-18 and FY 2018-19 and improved again in FY 2019-20. The gap between PSERS' funded ratio and the public fund average is starting to shrink.



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 59.2% as of June 30, 2020. This funded ratio is based on an actuarial value of assets of \$63.93 billion and a total accrued liability of \$107.96 billion which equates to a \$44.03 billion unfunded liability. Chart 4.6 depicts the sources of the unfunded liability. The largest sources of unfunded liability in order of magnitude are employer funding deferrals (44%), investment performance (42%), and benefit enhancements (15%), which include Act 9, cost of living increases and early retirement incentives.

For many years PSERS' outstanding investment performance compensated for unfunded benefit enhancements and employer funding deferrals. The Great Recession had a negative impact upon the System's long-term investment performance and eliminated most of the significant investment outperformance. Without the significant investment outperformance to compensate, the employer funding deferrals and benefit enhancements have significantly increased PSERS' unfunded liability. Approximately fifty-nine percent of PSERS' June 30, 2020 unfunded liability is due to employer funding deferrals and benefit enhancements, both of which are not a result of the defined benefit plan design.

GASB 68 and 75 Pension and Healthcare Reporting for Employers

In June 2020, 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.

Chart 4.6

PSERS Sources of Unfunded Liability

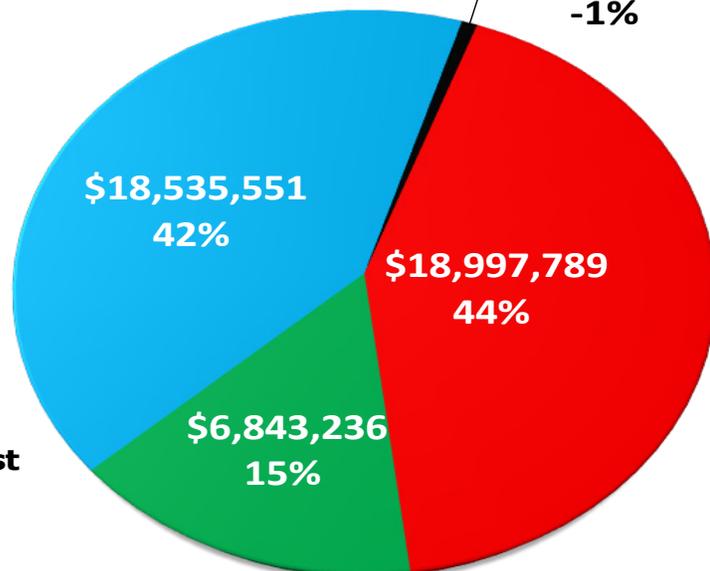
Total \$44,034,461 as of June 30, 2020

(\$ Amounts in thousands)

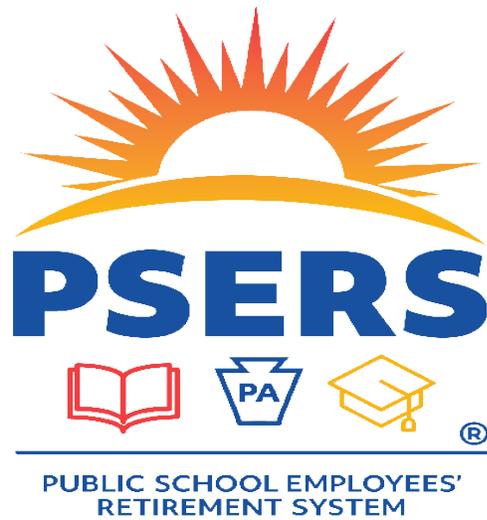
\$(342,115)

-1%

- Employer Underfunding
- Benefit Enhancements
- Investment Performance
- Changes to Assumption, Cost Method, Net Demographics, & Salary Experience



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' 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

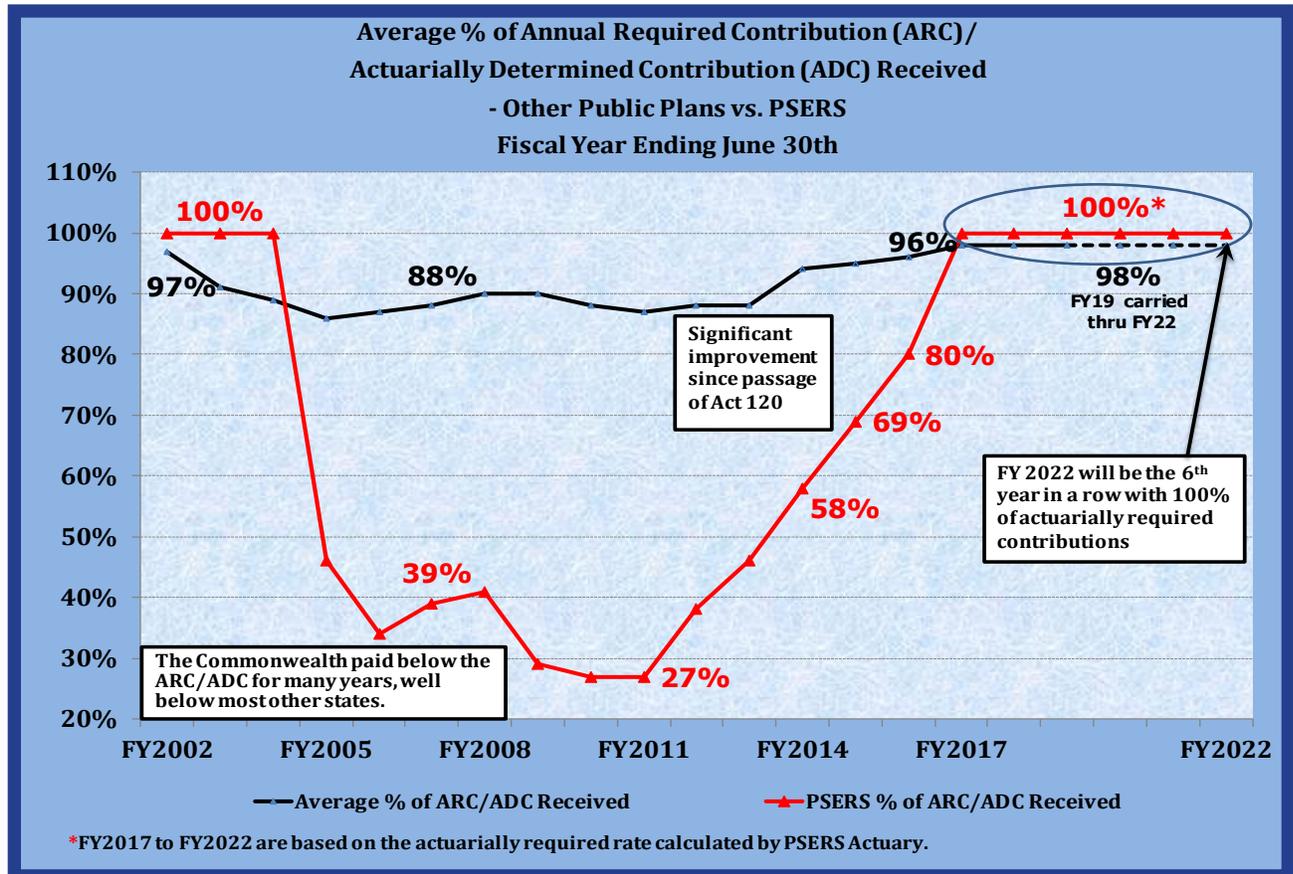
- Highest historical ECR (FY 2020-21) 34.51%
- Lowest historical ECR (FY 2001-02) 1.09%
- Ten yr. avg. ECR (2011-12 to 2020-21) 25.00%
- Twenty yr. avg. ECR (2001-02 to 2020-21) 14.69%
- Thirty yr. avg. ECR (1991-92 to 2020-21) 13.03%
- Adopted ECR (FY 2021-22) 34.94%

Act 120 of 2010

Progress on Funding Issue

PSERS is now in the 10th 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 contribution (ADC) starting in FY 2016-17. An ARC/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 34.94% for FY2021-22 in compliance with Act 120 and Act 5 of 2017. This will be the sixth consecutive year PSERS' contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles and now exceeds the



Section 1 - PSERS Overview

Employer Contribution Rate (continued)

average ARC/ADC percentage of 98% for public funds based on the November 2020 Public Fund Survey prepared by NASRA.

base rate is 10.3% (base rate) with “shared risk” contribution levels between 10.3% and 12.3%

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 to June 30, 2019, there are two membership classes with “shared risk” elements: Class T-E and T-F. As of June 30, 2020, T-E and T-F members now total over 79,000 and account for 31% of the total active membership.

Class T-E

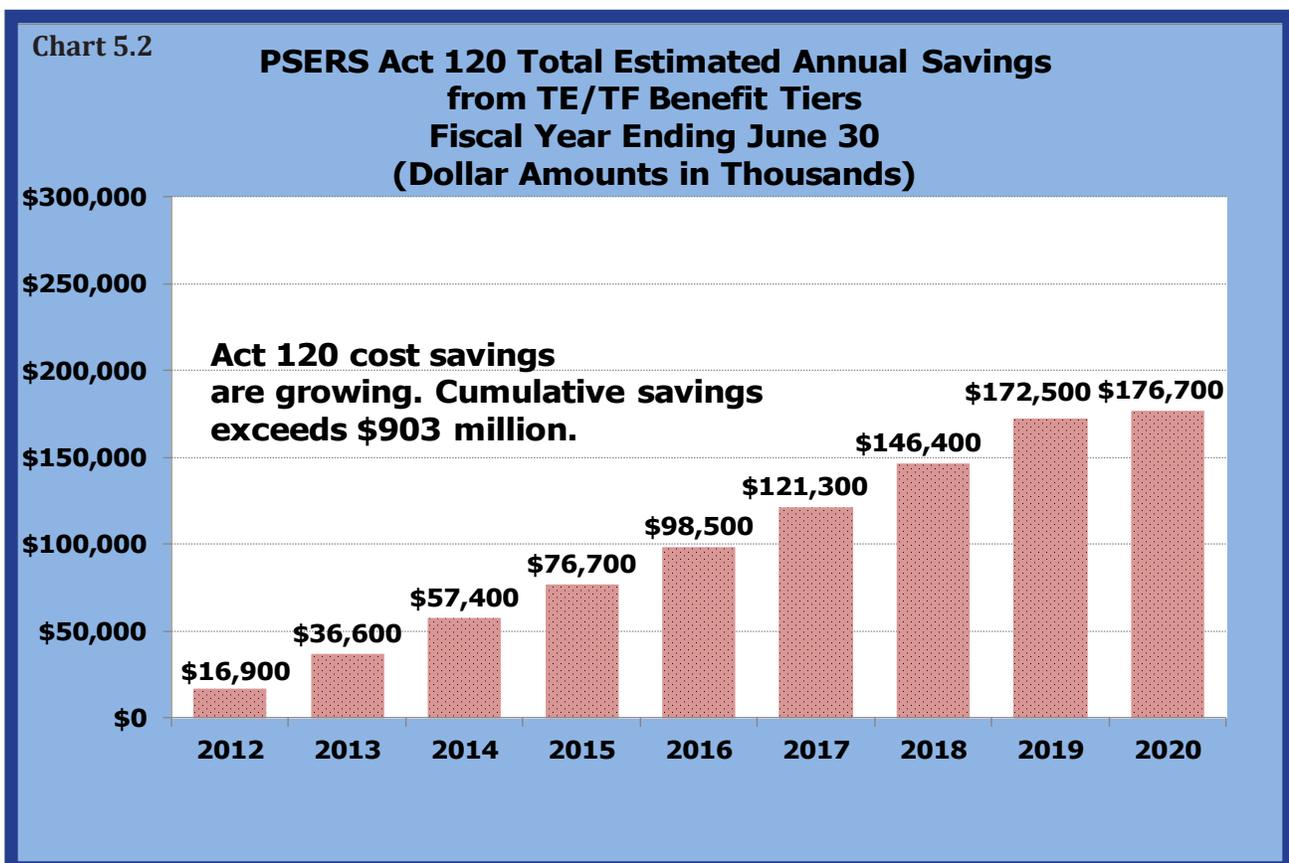
- Pension multiplier is 2%
- Effective July 1, 2011 employee contribution base rate is 7.5% (base rate) with “shared risk” contribution levels between 7.5% and 9.5%

Class T-F

- Pension multiplier is 2.5%
- Effective July 1, 2011 employee contribution

The total estimated savings of the T-E/T-F Benefit Tiers is illustrated in Chart 5.2. As the membership grew through FY 2018-19, the annual savings from the low T-E/T-F 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, 2021 were \$903.0 million. The average member benefit for Act 120 and Act 5 members is approximately 32% lower than the benefit for pre-Act 120 members.

As of June 30, 2020, 64,658 or 82% of new members remained in Class T-E and 14,559 or 18% 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.



Section 1 - PSERS Overview

Employer Contribution Rate (continued)

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 FY 2016-17 the rate caps were no longer in place.

PSERS' Board has approved a total employer contribution rate of 34.94% for FY 2021-22 which is a less than inflation increase of 1.25% over the FY 2020-21 rate of 34.51%. This is the second smallest percentage increase since FY 2009-10.

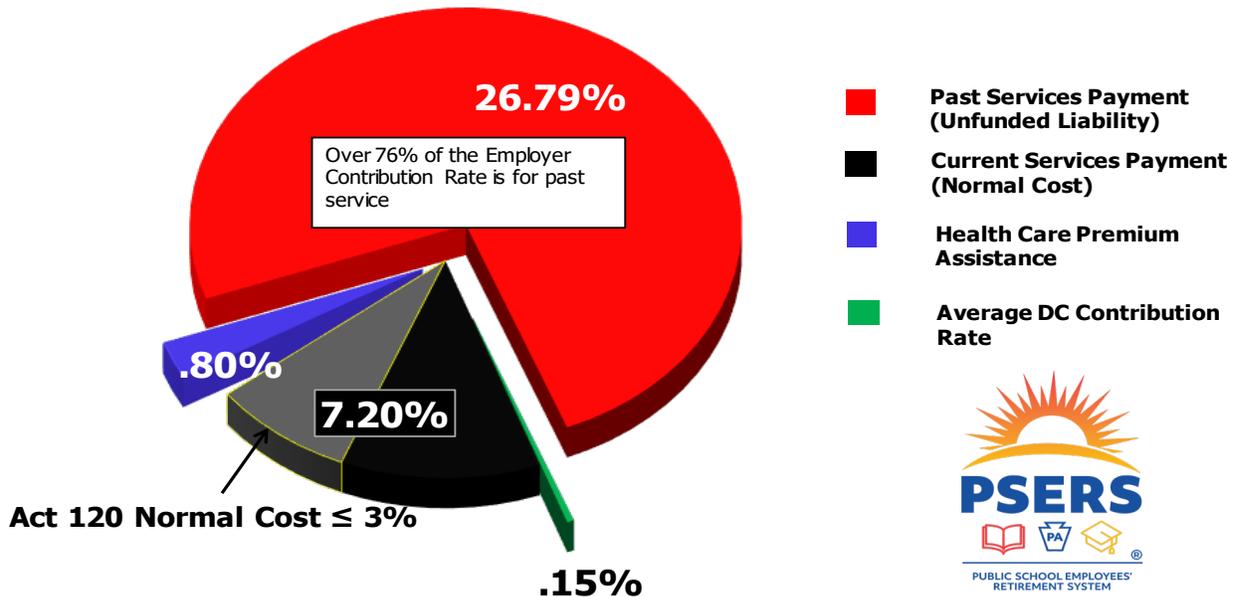
Employer Contribution Rate

Chart 5.3 displays the components of PSERS' certified employer contribution rate of 34.94% in FY 2021-22. The majority of the rate, over 76%, 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 members (includes Act 5) join the System and pre-Act 120 members retire. The cost structure of PSERS' members since Act 120 is low and the shared risk provisions shift a portion of the investment risk to active members similar to a defined contribution plan. Essentially, Act 120 provides the members with a defined benefit plan, which is both adequate and secure, and provides the employers with a low cost employee pension benefit funded in large part by the members who have also assumed some of the investment risk. 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

Components of PSERS Total Employer Contribution Rate FY2022

Total Employer Contribution Rate 34.94%



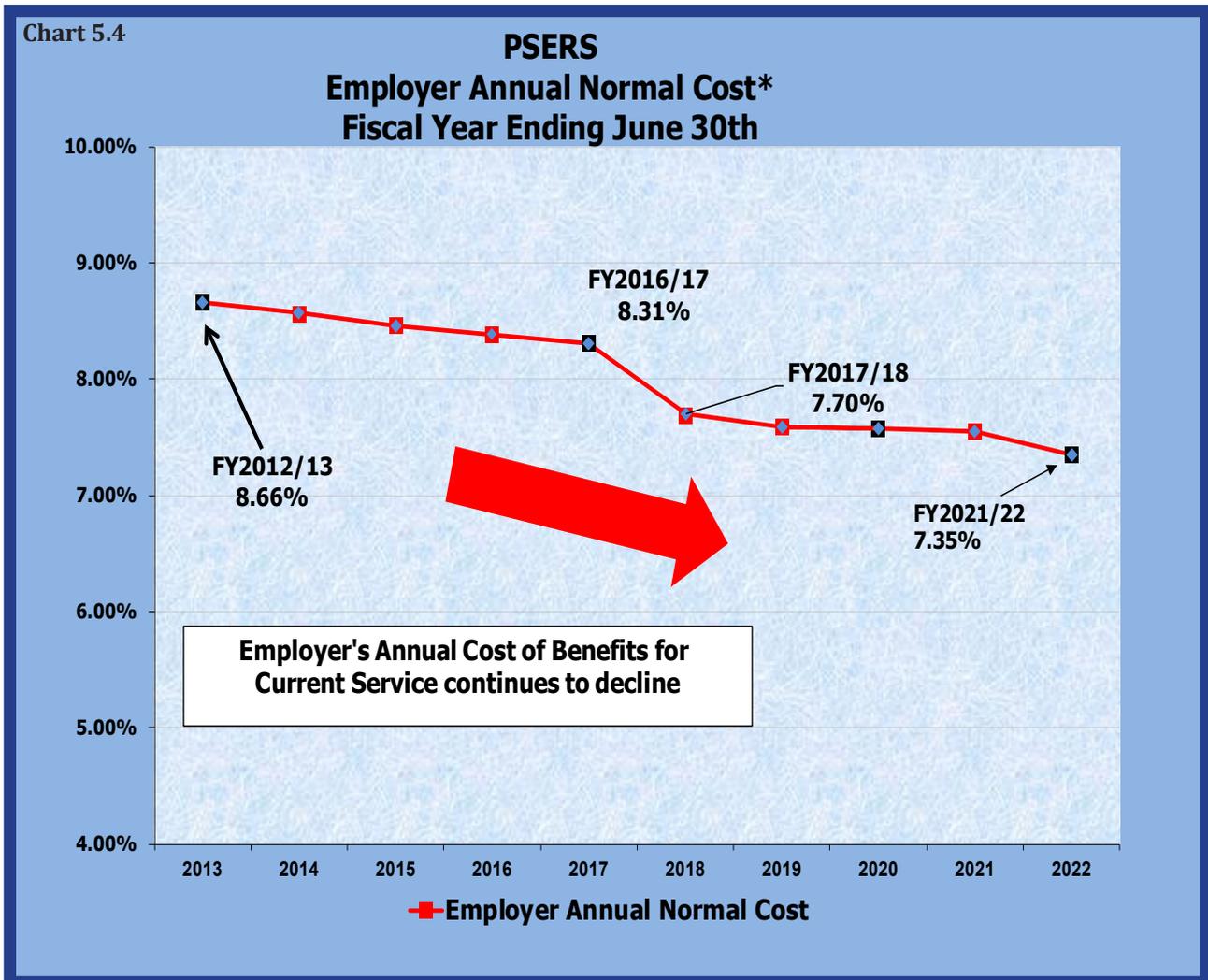
Section 1 - PSERS Overview

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 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 7.35% in FY 2021-22 which is a 15% reduction from the 8.66% normal cost in FY2012-13.



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 57% of total employer contributions and employers pay for 43%.

Table 5.1 illustrates the projected amounts of the Commonwealth's Appropriation for FY 2021-22 through FY 2025-26. As depicted, the Commonwealth's share of 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

Commonwealth's Department of Education School Employees' Retirement Appropriation

(Dollar Amounts in Billions)

	----- Projected -----				
	<u>2021-22</u>	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>	<u>2025-26</u>
School Employees' Retirement	\$2.734	\$2.894	\$3.021	\$3.144	\$3.277

Act 5 of 2017

On June 12, 2017 Governor Wolf signed Act 5 of 2017 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 plan designs include two hybrid benefit options consisting of defined benefit and defined contribution components and a stand-alone defined contribution plan. 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 current 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 to the "shared risk" program.

Legislative Pension Proposal Assistance

Throughout 2020, 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 and operational aspects of various proposals, while remaining policy neutral on plan design elements of legislative proposals.

Recap

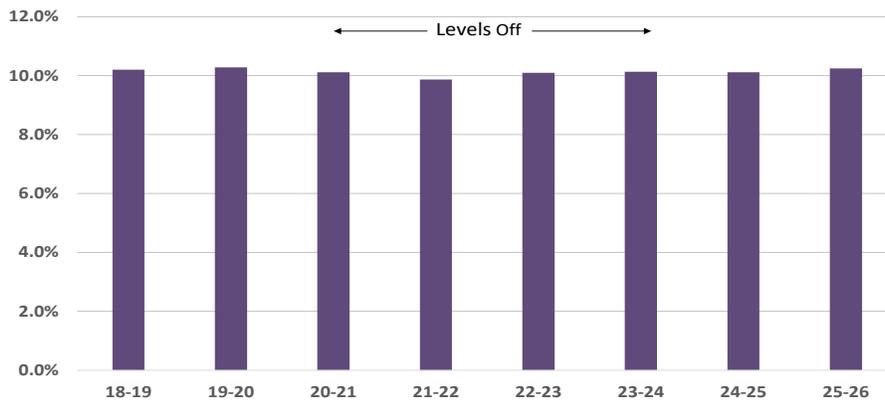
Act 120 reduced the employer's annual cost of benefits for members hired after June 30, 2011 by over 32% via member benefit reductions. However, a significant unfunded liability for service already rendered by pre-Act 120 members still remains to be paid. To address the underfunding which had taken place since FY 2000-01, Act 120 also included rate collars designed to systematically increase the employer contribution rate over

Section 1 - PSERS Overview

Employer Contribution Rate (continued)

Chart 5.5

Pensions Share of General Fund Expenditures

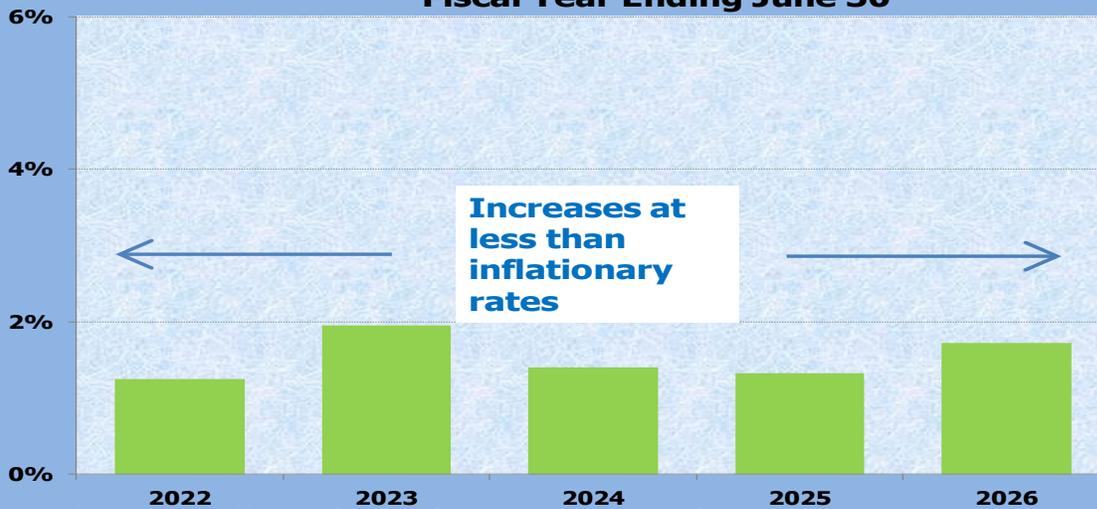


Data from IFO'S Economic and Budget Outlook Fiscal Years 2020-21 to 2025-26

1

Chart 5.6

**PSERS
Anticipated ECR Increases
Fiscal Year Ending June 30**



Source: Anticipated growth in pension contributions

several years to raise the funding to actuarially required levels. Now that this objective has been achieved, the rate collars no longer apply.

At its December 2020 meeting, PSERS Board of Trustees certified an annual contribution rate of 34.94% for FY 2021-22 which continues to put PSERS on the path towards full funding. For the sixth consecutive year, the Commonwealth's employer contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles. Contribution rates began to level off after FY 2017-18 which has reduced

budgetary pressure on the Commonwealth and school districts in FY 2019-20 and beyond.

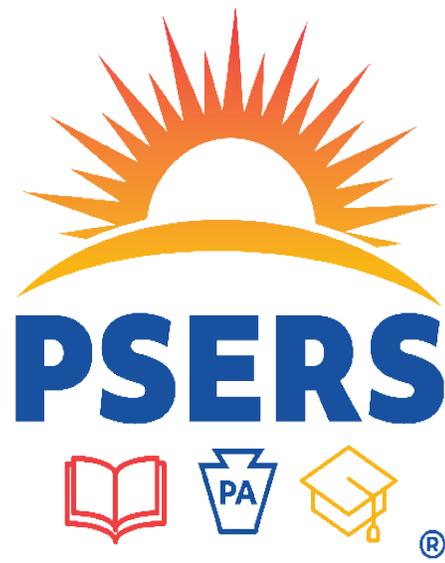
The Pennsylvania Independent Fiscal Office (IFO) has recognized the Commonwealth's progress on its pension funding issues. As shown in Chart 5.5, pensions share of the Commonwealth's General Fund expenditures has leveled off and is no longer a major driver of General Fund expenditure growth. As displayed in Chart 5.6, the anticipated growth in PSERS' Employer Contribution Rate is expected to be at less than inflationary levels for the next several years.

Employer Contribution Rate (continued)

PSERS has reached a Turning Point under Act 120

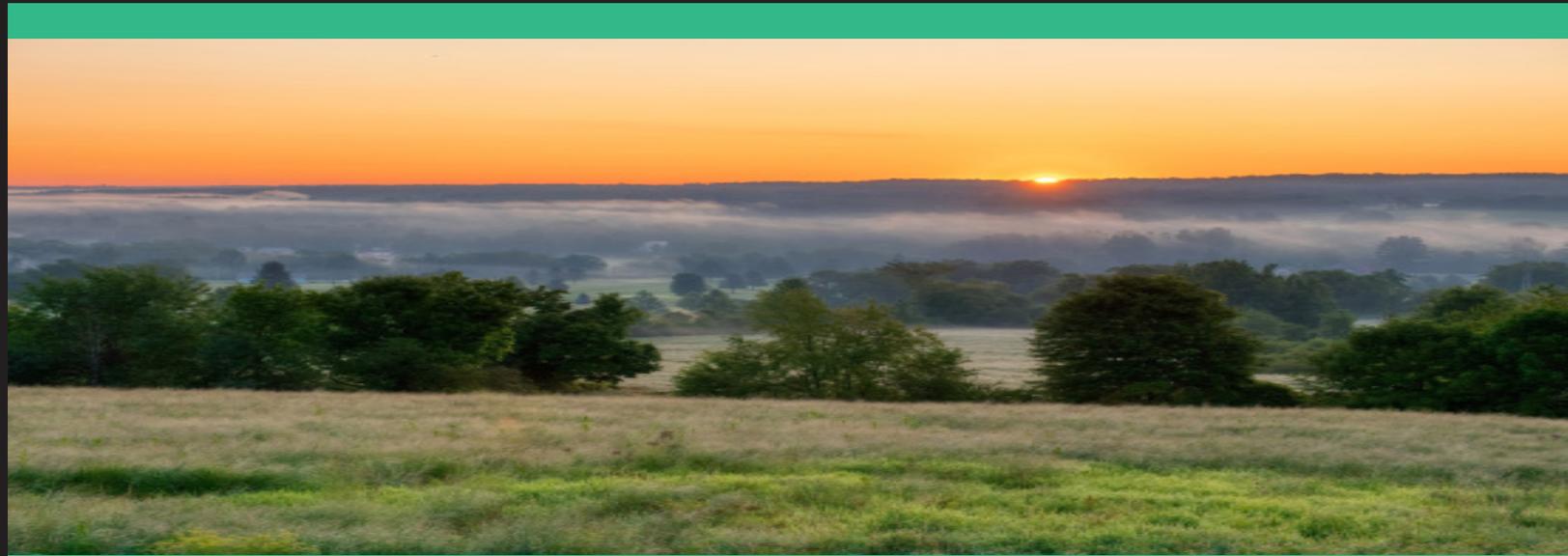
Effective in FY 2017-18, PSERS' actuarial funded ratio has begun to slowly improve after declining steadily since FY 2000-01. On a market value basis, PSERS funded ratio increased from 50.14% at June 30, 2016 to 54.32% at June 30, 2020 due primarily to PSERS receiving the full actuarially required contributions in each of the past four 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 raising its outlook on the Commonwealth's general obligation bonds from 'negative' to 'stable' in September 2020, Fitch Ratings, Inc. noted that "The Commonwealth's long term liability burden is low. A recently completed ramp-up to making full actuarially determined contributions could slow future growth in net pension liabilities and lead to liability declines if maintained over time and if actuarial assumptions are met."

A major funding milestone was also reached during FY 2016-17 as employers funded 100% of the actuarially required contributions to PSERS for the first time in fifteen years. FY 2021-22 will be the sixth year in a row that PSERS will receive the full actuarially required contributions. These contributions are making a positive difference as PSERS funded ratio in FY 2019-20 increased by a significant amount for the second consecutive year following a period of general decline since FY 1999-00. 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.



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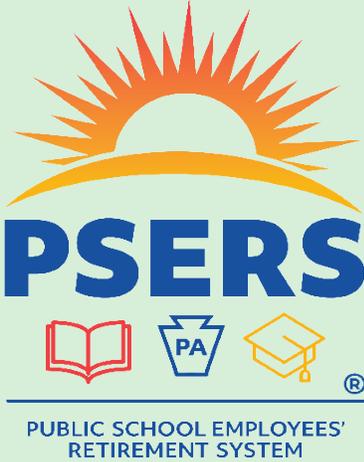
PSERS BUDGET REPORT - FY 2021-2022

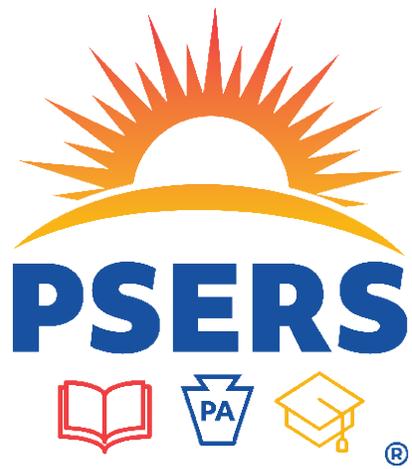


SECTION 2 - PSERS FY2021-22 BUDGET

Consultants’ Fees and Legislation Tab 6

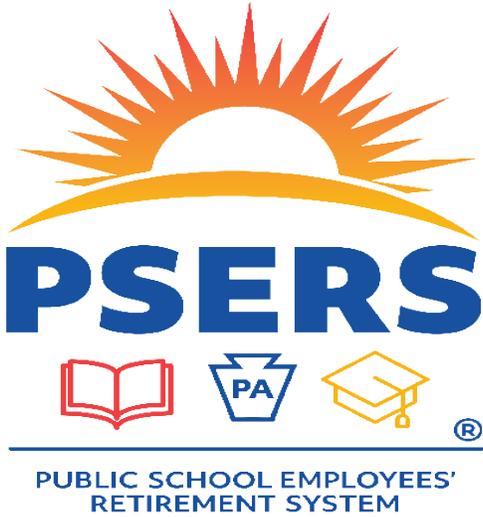
PSERS FY2021-22 Administrative, Defined Contribution Administrative,
and Directed Commissions Recapture Program Budgets Tab 7





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Consultants' Fees and Legislation



Section 2 - FY2021-22 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, 2020.

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	\$ 5,646,500 *
Hamilton Lane Advisors LLC	Private market consulting	\$ 2,000,000
Voya Holdings, Inc.	Defined Contribution Plan administration	\$ 1,854,000 *
Unisys Corporation	Server maintenance	\$ 1,820,021
OST, Inc.	Information technology services	\$ 713,619 *
Aksia LLC	Hedge fund investment consulting	\$ 700,000
Aon Investment Consulting	General investment consulting	\$ 687,337
Buck Global LLC	Pension Benefit Actuarial Services	\$ 389,505 *
Stepstone Group LP	General investment consulting	\$ 209,379
Clifton Larson Allen LLP	Financial audit - pension, defined contr., healthcare	\$ 181,570

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	\$ 33,167,940 *
Optum Rx, Inc.	Post employment healthcare benefits administration and prescription drug plan	\$ 5,753,946 *
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	\$ 3,608,231 *
Blue Peak Advisors LLC	Pharmacy benefit consulting services	\$ 1,286,997 *
Tivity Health	Silver Sneakers Fitness Program administration	\$ 829,356 *

* Amounts as reported in PSERS' Comprehensive Annual Financial Report.

Legislation

PSERS-Related Legislation 2020

Act 12A (House Bill 2471) makes an appropriation of \$52,294,000 from the Public School Employees' Retirement Fund to provide for the expenses incurred by the Public School Employees' Retirement Board for the administration of the system for the fiscal year July 1, 2020, to June 30, 2021, and for the payment of bills incurred and remaining unpaid at the close of the fiscal year ending June 30, 2020. Additionally, the Act appropriates \$1,083,000 from the PSERS Defined Contribution Fund restricted revenue account to provide for the expenses incurred by the Public School Employees' Retirement Board for the implementation and administration of the defined contribution plan authorized by Act 5 of 2017 for the fiscal year beginning July 1, 2020, and for the payment of bills incurred and remaining unpaid at the close of the fiscal year ending June 30, 2020.

Act 13 of 2020 (Senate Bill 751) added a new section to the Public School Code concerning the pandemic of 2020, applicable only to the 2019-2020 school year. The main impact for PSERS members is that school entity employees will experience no loss of retirement benefits due to the pandemic of 2020 or due to action taken by the Secretary of Education under this section. The Act allows the Secretary of Education to order the closure of all school entities until the threat to health and safety caused by the pandemic of 2020 has ended and waive the requirement that school entities be open for at least 180 days of instruction. This waiver of the 180 instructional day requirement would also apply to home education programs and nonpublic schools if their governing bodies decide to close them. The Secretary may also increase the allowable number of flexible instructional days and waive the timeline to apply for flexible instructional days. The Secretary is also given the power to waive career and technical education program hours, the use of performance data in professional employee evaluation systems, prekindergarten instruction hours, and the 12-week student teacher preparation program requirement. An employee of a school entity employed as of March 13, 2020 may not receive more or less compensation than the employee would otherwise have been entitled to receive from the school entity had the pandemic of 2020 not occurred or had the Secretary

not taken action under this section. If employees were already furloughed, the school entity would need to bring those employees back and keep paying them. If the employee already applied for unemployment, it would be considered a no-fault overpayment and unemployment benefits would cease.

Act 20 of 2020 (House Bill 1076) created the Senior Tax Reduction Incentive Volunteer Exchange Program (STRIVE) by adding a new chapter to the Taxpayer Relief Act to create the Senior Tax Reduction Incentive Volunteer Exchange program. The legislation authorizes all public school districts in the Commonwealth to establish an optional program to allow older residents to volunteer in the school district and receive a real property tax credit in exchange for volunteer service. The legislation defines a "participant" in the program as an individual at least 60 years of age who has been a resident of this Commonwealth for at least 90 days, owns real property located in a participating school district and participates in the school district's program. Payment under the STRIVE Program is valued at no less than the required minimum hourly wage for each hour of service rendered and constitutes income subject to federal taxation, regardless of whether such income is diverted for use as a tax credit. Accordingly, payment earned under the STRIVE Program is retirement-covered compensation under the Retirement Code and the service rendered is school service that must be reported to PSERS.

Act 37 of 2020 (House Bill 2418) amended the Administrative Code to require the State Employees' Retirement System and the Public School Employees' Retirement System to provide the Independent Fiscal Office (IFO) with all information necessary to complete an actuarial note within 14 days of the request for information by the IFO. The act also requires that no later than October 1, 2020, July 31, 2021, and July 31 of each year thereafter, the State Employees' Retirement System and the Public School Employees' Retirement System shall each submit to the IFO data showing the 30-year baseline actuarial projections for the retirement systems based on the State law in effect at the time of the submission. The office may specify the data fields and the file format for the data to be transmitted under this subsection. Data submitted under this subsection shall include projections which simulate a 1.0 percentage point

Section 2 - FY2021-22 Budget

increase and a 1.0 percentage point decrease to the official assumed rate of return used by each retirement system.

The Act also requires a COVID-19 related debt reduction review to be conducted. The Treasury Department, in conjunction with the Secretary of the Budget, the Auditor General and any chairperson of an authority, commission, agency or board that has the power to issue debt, shall identify and review all outstanding debt obligations of the Commonwealth and its authorities, commissions, agencies or boards and submit a report of the findings to the General Assembly no later than October 30, 2020. In addition to the identification and review of all outstanding debt obligations, the report shall identify options for the refinancing of the outstanding debt obligations to reduce the costs to the Commonwealth and its authorities.

Act 77 of 2020 (House Bill 2463) amends the Administrative Code to add a new Article relating to Access to Public Records During Disaster Declaration. The main impact on PSERS involves how PSERS responds to Right-to-Know requests during an emergency, such as the COVID-19 pandemic. Under the new law, the Governor may not direct a Commonwealth agency to ignore requests for records or suspend the Commonwealth agency's process to answer a request for records during a disaster declaration. A Commonwealth agency may suspend the process by which a Commonwealth agency responds to a request for records during a disaster declaration only as provided under section 902(a) of the Right-to-Know Law (RTKL). If an extension of time is necessary, the agency shall comply with section 902(b) of the law. No later than 5 days after the effective date, the Office of Open Records shall publish guidelines for a Commonwealth agency specifying how the Commonwealth agency is required to respond to a request for records made during a disaster declaration when the Governor has ordered the Commonwealth agency to close the Commonwealth agency's physical location.

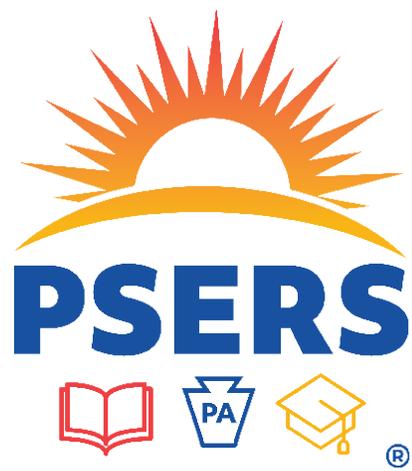
Act 128 of 2020 (House Bill 1962) amends both the PSERS and SERS Codes to provide for annual stress testing and provides additional Board governance processes through establishment of additional committees related to audit functions. The bill increases the required hours of annual mandatory training for members of the PSERS and

SERS Boards from 8 to 10 hours and expands the scope of training to include asset allocation and risk assessment. The legislation provides that in order to be appointed to the audit/compliance committee as a voting member, a member of the PSERS board or SERS board must complete at least 16 hours of training in risk assessment, internal control and auditing standards inclusive of the hours indicated for board training within 90 days of appointment. The Committee on Sponsoring Organizations Enterprise risk management guidelines may be considered as a guide to the training, and current members of the audit/compliance committee are exempt from the new 16-hour training requirement.

The bill provides that the PSERS board and SERS board may establish an executive committee consisting of the board chair, vice chair, the chair of the audit/compliance committee, the chair of the bylaws/policy committee, the chair of the investment committee and the chair of the budget/finance committee or other members of the board as determined by the board. The legislation provides for the PSERS board and SERS board to establish an asset liability contingency operating committee as a function within the investment committee, which shall be charged with evaluating the risk associated with the systems' assets and liabilities. The bill directs the PSERS and SERS boards to provide for an internal control audit of their respective systems and plans at least every five years. If an annual financial report or an internal control audit identifies a material weakness or significant deficiency, the board shall provide for an additional internal control audit of the system and the plan for the year subsequent to the report or audit in which the weakness or deficiency was identified.

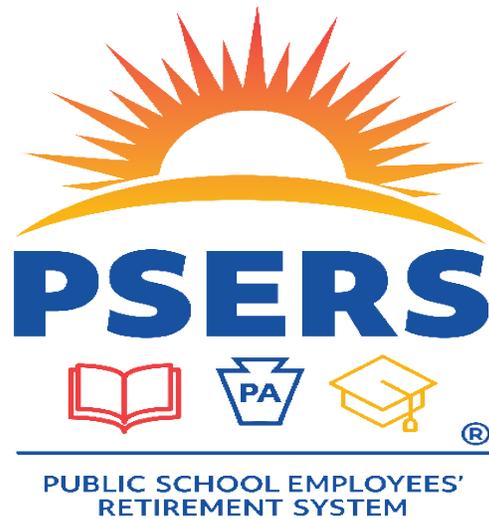
The bill requires the PSERS and SERS boards to conduct an annual stress test of their respective systems and submit the results to the Governor, the General Assembly and the Independent Fiscal Office no later than January 1 of each year. The stress test shall include a scenario analysis, simulation analysis and sensitivity analysis in accordance with accepted industry standards.

Finally, the bill directs that no later than March 1 of each year, the Independent Fiscal Office (IFO) shall produce a report summarizing the results of the stress tests, including a calculation of the ratio of projected employer pension contributions to projected State revenues under a scenario analysis.



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PSERS
FY2021-22 Administrative,
Defined Contribution Administrative,
and Directed Commissions
Recapture Program Budgets



Section 2 - FY2021-22 Budget

Public School Employees' Retirement System Fiscal Year 2021-2022 Administrative Budget

Table 7.1

	<u>Budget</u> <u>FY2019-20</u>	<u>Budget</u> <u>FY2020-21</u>	<u>Budget</u> <u>Request</u> <u>FY2021-22</u>
Total Personnel Services	\$ 28,293,000	\$ 28,749,000	\$ 28,577,000
Operating Expenses and Fixed Assets			
Travel	\$ 167,900	\$ 197,400	\$ 166,700
Training & Conference Registration	181,400	185,600	170,300
Telecomm	460,900	419,200	415,200
Electricity	22,300	20,700	20,700
Consultant Services - Non EDP	2,190,100	2,165,500	2,190,000
Outsourced IT Consulting For Appl & Development	40,000	110,000	70,000
Consulting - Maint & Support - (Post Implementation)	53,000	83,000	45,000
Consulting - Security (Outsourced Inf Sec Services)	75,000	75,000	45,000
Consulting - General IT Support	985,000	1,278,000	1,127,600
Consulting - Outsourced Infrastructure Svcs (PACS)	1,075,000	1,250,000	2,095,000
Legal Services/Fees	227,000	227,000	352,000
Specialized Services	646,500	821,800	715,000
Other Specialized Services	221,200	220,300	241,900
Advertising	10,000	10,000	10,000
Medical, Mental & Dental Services	4,700	6,500	6,500
IT Shared Services	255,800	204,640	225,000
Software Licensing - Maintenance	1,338,400	1,064,860	989,100
Hardware - Maintenance	96,000	90,300	58,000
Contracted Maintenance Non EDP	167,800	162,800	157,800
Telecomm Data Services	92,500	83,200	80,000
Contracted Repairs - Non EDP	15,500	15,500	15,500
Real Estate Rental	2,080,100	1,936,900	1,998,300
Vehicle Rental	2,600	5,500	6,300
Office Equipment Rental	290,700	314,900	308,400
Other Rentals	8,400	8,900	28,500
Office Supplies	253,000	229,600	216,500
Educational & Medical Supplies	8,600	8,300	6,300
Software License Non-Recurring < \$5,000	27,800	11,900	73,000
Software Licensing - Proc. - Recurring	295,000	297,500	399,100
Hardware Desktop < \$5,000	286,500	281,500	279,200
Furniture and Fixtures	69,500	75,200	66,700
Other Equipment	13,000	13,000	10,000

Section 2 - FY2021-22 Budget

Public School Employees' Retirement System Fiscal Year 2021-22 Administrative Budget (continued)

Table 7.1

	<u>Budget</u> FY2019-20	<u>Budget</u> FY2020-21	<u>Budget</u> <u>Request</u> FY2021-22
Motorized Equipment Supplies	\$ 21,000	\$ 21,000	\$ 10,000
Postage and Freight	1,086,500	953,000	850,000
Printing	210,200	210,400	203,300
Subscriptions	47,400	48,500	48,000
Member Dues	41,500	44,300	44,600
Conference Expense	61,000	69,200	74,700
Insurance, Surety & Fidelity Bonds	10,000	10,000	170,000
Other Operational Expenses	2,851,200	2,680,000	2,655,700
HW Network and Server	-	340,000	330,000
Automobiles	19,800	19,800	19,800
Software License	7,507,000	7,246,000	7,306,000
Office Equipment	28,200	28,300	28,300
Total Operating Expenses and Fixed Assets	\$ 23,545,000	\$ 23,545,000	\$ 24,329,000
Total Administrative Budget	<u>\$ 51,838,000</u>	<u>\$ 52,294,000</u>	<u>\$ 52,906,000</u>

Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY2021-22. The \$52,906,000 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.

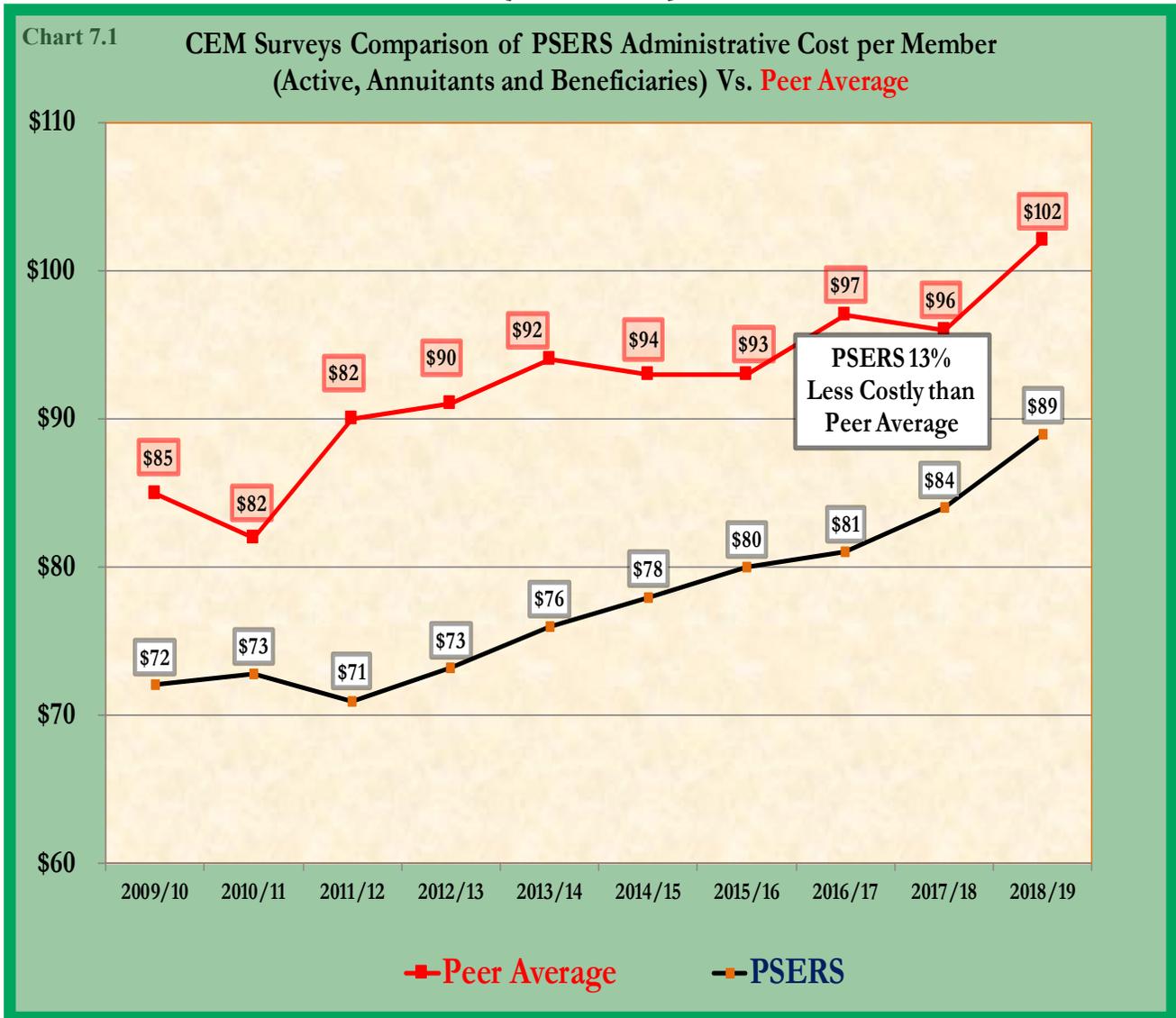
PSERS' Administrative Budget Request for FY 2021-22 represents an increase of \$612,000 or 1.17% above the FY 2021-22 available budget. Operating costs remain the same while personnel costs reflect increases in salaries and related benefits.

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 two 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 approximately \$250,000 per year in postage, printing and paper costs. During FY2021 specifically, the agency achieved a substantial savings in postage, reduced overtime, decreased rental of equipment and software, and lowered consultant and legal fees, all of which helps to maintain more investment earnings for the benefit of the Fund. In addition to these savings, PSERS purchased programming hours from its pension administration system vendor at a reduced prepaid rate in order to allow for vital changes to be made in the near future to the pension administration system.

Section 2 - FY2021-22 Budget

Public School Employees' Retirement System Fiscal Year 2021-22 Administrative Budget (continued)



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 30% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 above illustrates

that PSERS had a 13% 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 \$6.4 million annually in administrative expenses compared to its peers.

Section 2 - FY2021-22 Budget

Public School Employees' Retirement System Fiscal Year 2021-22 Defined Contribution (DC) Administrative Budget

Table 7.2

	<u>Budget</u> FY2019-20	<u>Budget</u> FY2020-21	<u>Budget Request</u> FY2021-22
Total Personnel Services	\$895,000	\$497,000	\$586,000
Operating Expenses and Fixed Assets			
Consultant Services - Non EDP	640,000	270,000	207,000
Legal Services/Fees	145,000	50,000	25,000
Other Operational Expenses	70,000	66,000	112,000
SW License recurring > \$,5000	<u>700,000</u>	<u>200,000</u>	<u>25,000</u>
Total Operating Expenses and Fixed Assets	\$1,555,000	\$586,000	\$369,000
Total Administrative Budget	<u>\$2,450,000</u>	<u>\$1,083,000</u>	<u>\$955,000</u>

Defined Contribution (DC) Administrative Budget

Table 7.2 displays PSERS' Defined Contribution (DC) Administrative Budget Request for FY2021-22. The \$955,000 amount requested represents a decrease of almost 12% from the FY 2020-21 available budget. As the implementation stage of Act 5 is completed, the need for consulting services and software programming changes decreases significantly.

Waiver of Prior Year Remaining Budgets

PSERS received approval to waive \$3,675,800 and \$1,714,082 from the FY2018-19 Administrative and DC Appropriations, respectively, by extending the lapse date until June 30, 2020. PSERS also received approval to waive \$949,600 from the FY2019-20 DC Appropriation by extending the lapse date until June 30, 2021.

Section 2 - FY2021-22 Budget

PSERS Directed Commissions Recapture Program

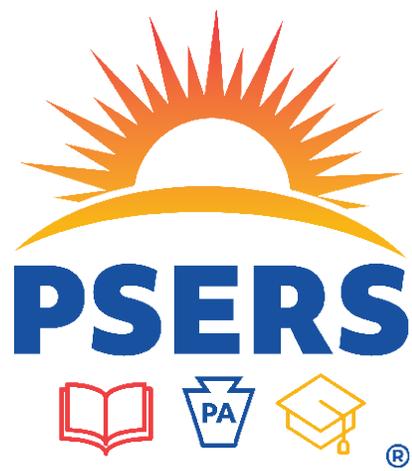
Directed Commissions Recapture is a program whereby a portion of commissions incurred by PSERS through investment trading activity is returned to PSERS. These funds can be used for the administration of the Fund or can be reinvested back into the asset allocation through a transfer

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.

Directed Commissions Recapture Program - Directed Commissions Appropriation #6012700000

Table 7.3

	<u>Budget</u> <u>FY2019-20</u>	<u>Budget</u> <u>FY2020-21</u>	<u>Budget Request</u> <u>FY2021-22</u>
Budgetary Reserve	\$2,000,000	\$2,000,000	\$2,000,000
Total	\$2,000,000	\$2,000,000	\$2,000,000



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PSERS BUDGET REPORT - FY 2021-2022



SECTION 3 - INVESTMENT INFORMATION

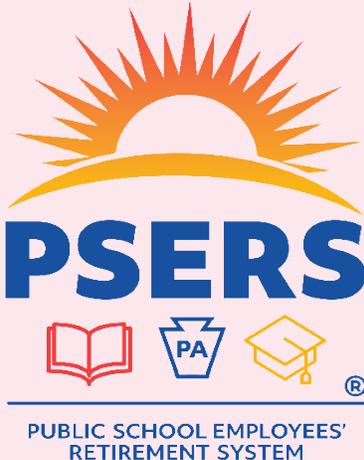
Investment Guidelines, Philosophy, Risk Management, and Capital Market Assumptions Tab 8

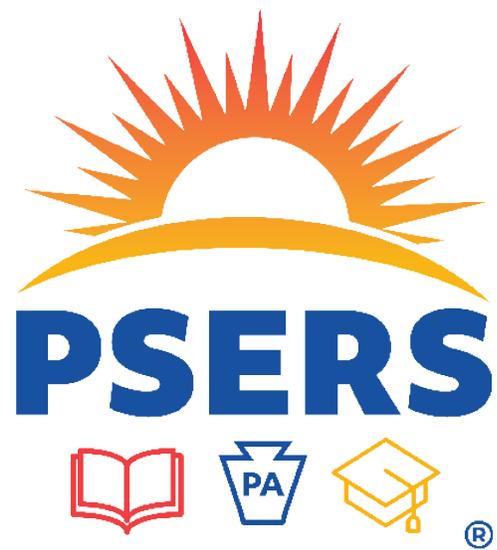
Asset Exposure and Investment Program Summary Tab 9

Performance Tab 10

Managing Investment Fees, Expenses, and Carried Interest..... Tab 11

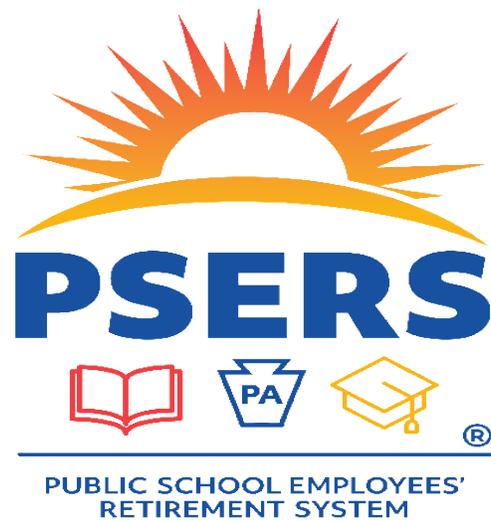
Commitment to Pennsylvania-Based Investments Tab 12





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Investment Guidelines, Philosophy, Risk Management, and Capital Market Assumptions



Section 3 - Investment Information

Investment Objectives, Philosophy, Risk Management, and Capital Market

Assumptions

Investment Objectives

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 underperform 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 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.

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,

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Investment Risk Management (continued)

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.

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 returns 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 2019, 2020 survey results under the 20-year forecast indicate a decrease in return assumptions across most asset classes. CMAs are forecasting slower growth and lower asset returns over the coming decade than has been experienced in past decades. Select asset classes are detailed in Table 8.1 on the next page.

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 – 2020 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 projected to keep rates near 0% until at least 2023.

Equities

Equity return assumptions are driven by market valuations, earnings growth expectations and assumed dividend payouts: Non-US Equity return expectations have declined relative to 2019, driven by slowing growth, political uncertainty and trade wars.

Equity market returns over the past few years have been driven by rising valuations. Due to the COVID-19 pandemic, participants' concern over slowing growth has driven future expected returns lower.

Real Estate

Global real estate return assumption in 2020 decreased relative to expected returns from 2019. Lower initial yields and slowing growth impacted the real return assumption in 2020.

Hedge Funds

Hedge Fund assumptions reflect changes in the underlying equity, fixed income and cash capital market assumptions. Decrease in the hedge fund assumption from 2019 to 2020 reflect the declining expectations for fixed income and cash.

An alternative approach to asset allocation that

Section 3 - Investment Information

Capital Market Assumptions

is sometimes suggested to pension plans is to establish a stereotypical 60% equity/40% fixed income policy that remains static over time. Tables 8.1 and 8.2 illustrate one reason why such an approach would not be prudent. Because PSERS can select from a broad array of asset allocation alternatives, we can analyze alternative allocation strategies using asset classes with varying expected returns and expected risk in order to formulate an optimal asset allocation policy most likely to achieve the investment return and investment risk goals established by the Board. In recent years, lower risk projections have

afforded PSERS valuable flexibility in identifying different combinations of asset allocations that can achieve our current long-term goal of 7.25% at acceptable levels of risk even as return assumptions have fallen. Furthermore, PSERS applies leverage opportunistically in implementing its asset allocation policy, providing an additional mechanism to increase expected volatility in order to target higher expected return when warranted. A stereotypical 60%/40% strategy would have precluded such flexibility and exposed the system to artificial and harmful limits on our ability to manage the Fund.

The table below summarizes the average expected capital market geometric return assumptions of 20-30 surveyed independent investment advisors in 2016 - 2020.

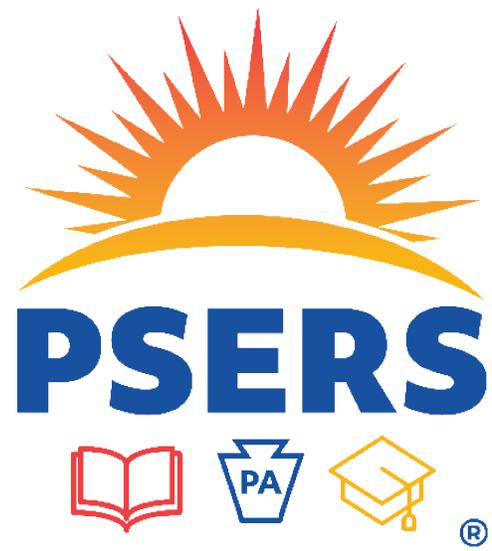
PSERS Capital Market Assumptions (CMA's)					
Average Expected Geometric Returns (2016 - 2020)					
Asset Class	2016 Survey	2017 Survey	2018 Survey	2019 Survey	2020 Survey
U.S. Equity - Large Cap	7.9%	7.8%	7.4%	7.1%	7.1%
U.S. Equity - Small/Mid Cap	8.2%	8.4%	8.2%	7.5%	7.6%
Non-U.S. Equity - Developed	8.0%	7.6%	7.7%	7.7%	7.5%
Non-U.S. Equity - Emerging	9.1%	8.7%	8.8%	8.7%	8.4%
U.S. Corporate Bonds - Core	4.6%	4.4%	4.5%	4.3%	3.6%
U.S. Corporate Bonds - Long Duration	4.9%	4.8%	4.4%	4.4%	3.6%
U.S. Corporate Bonds - High Yield	6.8%	6.2%	5.8%	5.8%	5.6%
Non-U.S. Debt - Developed	3.7%	3.5%	3.2%	3.4%	2.3%
Non-U.S. Debt - Emerging	6.4%	6.2%	6.1%	6.1%	5.9%
U.S. Treasuries (Cash Equivalent)	3.2%	3.2%	3.1%	3.0%	2.3%
TIPS (Inflation-Protected)	3.9%	4.0%	4.0%	3.5%	2.7%
Real Estate	6.8%	6.7%	6.7%	6.8%	6.6%
Hedge Funds	6.2%	6.0%	6.2%	6.2%	5.7%
Commodities	4.8%	5.0%	4.9%	4.7%	4.0%
Infrastructure	7.1%	7.1%	7.1%	7.2%	7.3%
Private Equity	10.3%	10.1%	9.5%	10.1%	9.9%
Private Debt	-	-	-	7.8%	7.9%
Inflation	2.3%	2.4%	2.5%	2.3%	2.2%

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Capital Market Assumptions (continued)

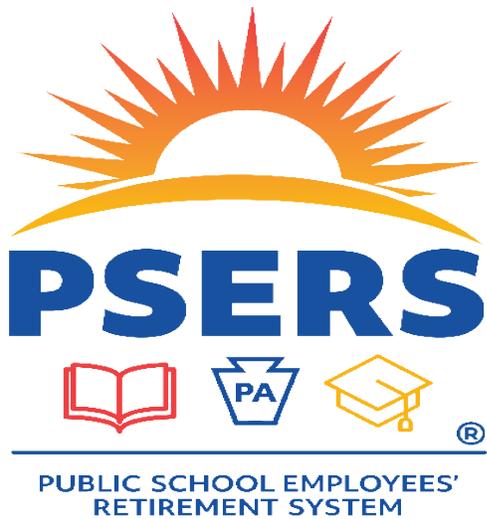
The CMA surveys also included forecasts for 20 year average expected risk (Table 8.2). The numbers below reflect the expected standard deviation in % around the expected return.

Table 8.2					
PSERS Capital Market Assumptions (CMA's)					
Average Expected Risk (2016 - 2020)					
<u>Asset Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
	<u>Survey</u>	<u>Survey</u>	<u>Survey</u>	<u>Survey</u>	<u>Survey</u>
US Equity – Large Cap	16.9%	16.6%	16.4%	16.2%	16.2%
US Equity – Small/Mid Cap	21.0%	20.2%	20.2%	20.2%	20.2%
Non-US Equity – Developed	19.5%	18.9%	18.7%	18.2%	18.1%
Non-US Equity – Emerging	26.4%	25.4%	24.9%	24.7%	24.2%
US Corporate Bonds – Core	6.0%	5.5%	5.7%	5.5%	5.5%
US Corporate Bonds – Long Duration	10.5%	10.4%	10.8%	10.5%	10.2%
US Corporate Bonds – High Yield	11.0%	10.6%	10.2%	10.1%	9.8%
Non-US Debt – Developed	7.6%	7.4%	6.9%	7.6%	7.0%
Non-US Debt – Emerging	11.6%	11.8%	11.4%	11.3%	11.0%
US Treasuries (Cash Equivalent)	2.8%	3.0%	2.7%	2.3%	1.8%
TIPS (Inflation-Protected)	6.5%	6.3%	6.3%	6.1%	6.1%
Real Estate	14.7%	14.5%	13.9%	15.0%	16.8%
Hedge Funds	8.4%	8.0%	7.9%	8.4%	8.0%
Commodities	18.5%	17.9%	17.6%	17.7%	17.6%
Infrastructure	13.8%	14.6%	14.7%	14.4%	14.6%
Private Equity	23.1%	22.0%	22.2%	22.0%	22.0%
Private Debt	-	-	-	11.6%	12.1%
Inflation	1.8%	1.7%	1.8%	1.7%	1.7%



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Asset Exposure and Investment Program Summary



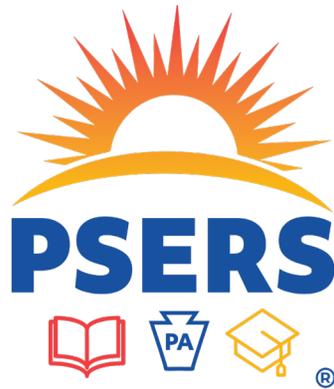
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Asset Exposure (as of June 30, 2020)

While the Board can choose to modify its asset allocation at any time it determines that changes are warranted (for example, due to changing liquidity circumstances or opportunities in the marketplace), the Board maintains a disciplined and thorough process to establish a new asset allocation policy annually. 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 alternative

asset allocations 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 reviews the long-term asset allocation targets of the System at least annually. 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 meet the long-term financial needs and investment objectives of the System.



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Asset Exposure (continued)

Table 9.1 represents PSERS asset exposure and target allocation plan that became effective October 1, 2019, and was in effect on June 30, 2020.

PSERS' Asset Exposure and Target Asset Allocation Plan					
(as of June 30, 2020)					
Asset Class	Market Value (in millions)	Percentage of Gross Asset Exposure	Percentage of Net Asset Exposure	Target Allocation %	Target Allocation Range
Public Equity	\$ 9,104.0	14.2%	16.0%	14.0%	
Private Equity	7,969.9	12.4%	14.0%	16.0%	
Total Equity	\$ 17,073.9	26.6%	30.0%	30.0%	± 5
Public Fixed Income*	18,178.1	28.3%	32.0%	26.0%	
Private Credit	5,109.3	8.0%	9.0%	10.0%	
Total Fixed Income	\$ 23,287.4	36.3%	41.0%	42.0%	± 5
Public Commodities*	4,552.8	7.1%	8.0%	8.0%	
Public Infrastructure*	2,523.5	3.9%	4.5%	5.0%	
Public Real Estate*	787.6	1.2%	1.4%	0.5%	
Total Public Real Asset	\$ 7,863.9	12.3%	13.9%	13.5%	± 3
Private Commodities	140.0	0.2%	0.3%	0.0%	
Private Infrastructure	356.1	0.5%	0.6%	1.0%	
Private Real Estate	4,946.3	7.7%	8.7%	9.5%	
Total Private Real Asset	\$ 5,442.4	8.4%	9.6%	10.5%	± 3
Risk Parity*	4,469.3	7.0%	7.9%	8.0%	± 2
Absolute Return	6,033.6	9.4%	10.5%	10.0%	± 3
Gross Asset Exposure	64,170.5	100.0%	112.9%	114.0%	
Financing*	(7,318.1)		-12.9%	-14.0%	+24/-6
Net Asset Exposure	\$ 56,852.4		100.0%	100.0%	

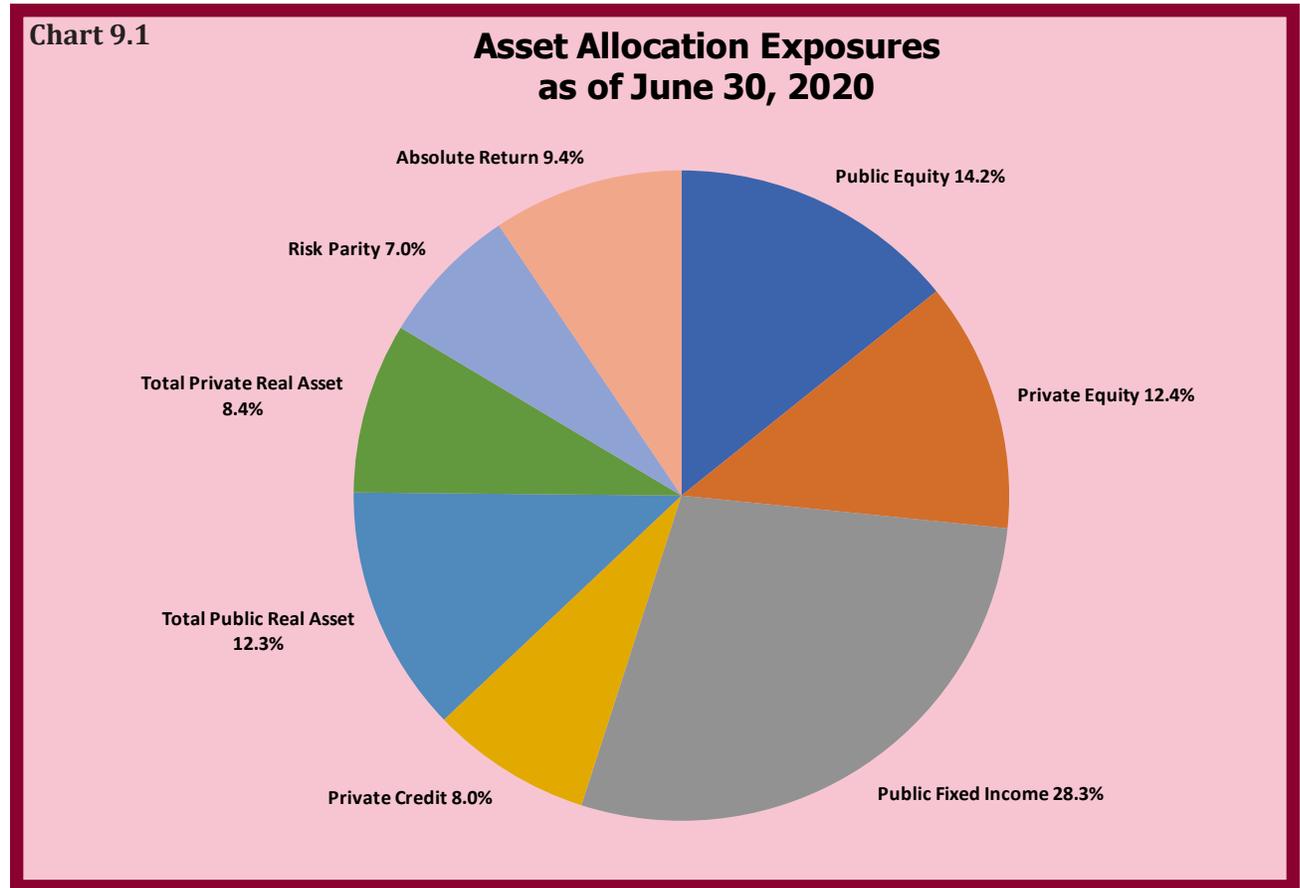
*PSERS uses financing to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2020, PSERS had total increased economic exposure of \$7.3 billion related to the following asset classes: Fixed Income (\$3.7 billion); Risk Parity (\$0.5 billion); Infrastructure (\$0.6 billion); Real Estate (\$0.3 billion) and Commodities (\$2.9 billion). An allocation of 6% to Cash is included in the Target Allocation.

Note: PSERS' asset allocation was updated December 3, 2020 and is available for review at <http://www.psers.pa.gov>

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Asset Exposure (continued)

Chart 9.1 illustrates PSERS' asset allocation exposure as of June 30, 2020:

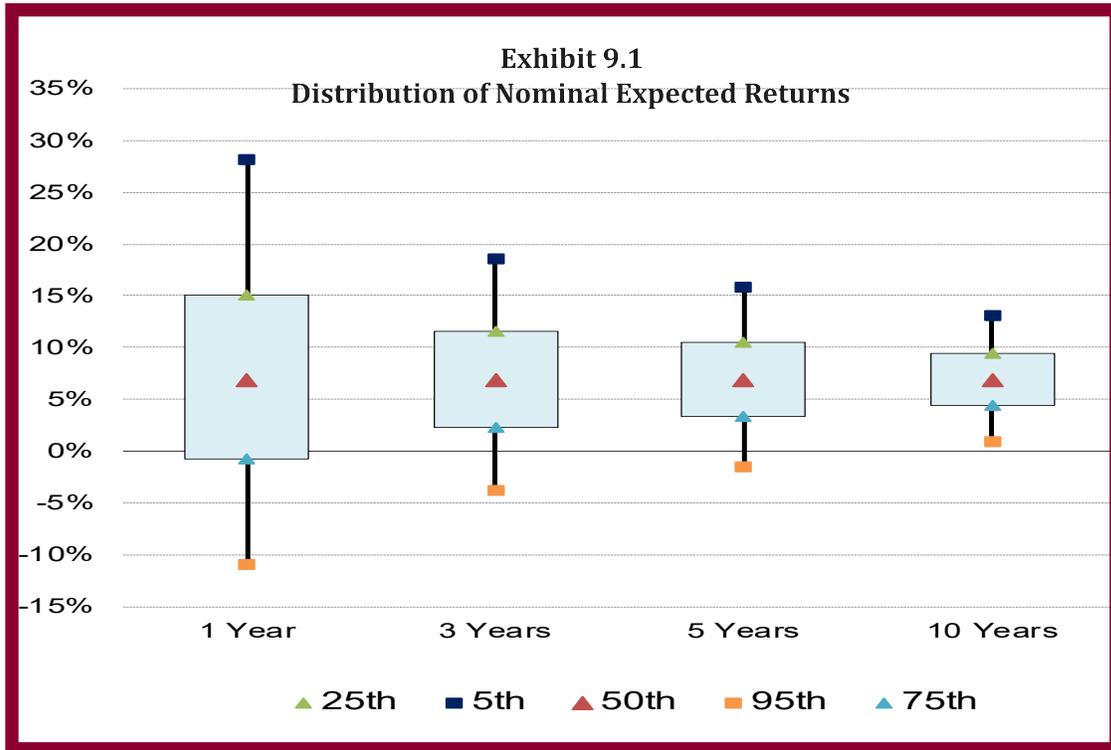


Note: Financing represents a negative 12.9% allocation and is not reflected in Chart 9.1.

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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 alternative asset allocations (as seen in Exhibit 9.1) to select the optimal asset allocation annually. 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 9.1 below, which depicts expected future returns for PSERS' current asset allocation:



Range of Returns				
Percentiles	1 Year	3 Years	5 Years	10 Years
5%	28.1%	18.6%	15.9%	13.1%
25%	15.1%	11.5%	10.4%	9.4%
50%	6.8%	6.8%	6.8%	6.8%
75%	-0.8%	2.3%	3.3%	4.3%
95%	-10.9%	-3.8%	-1.5%	0.9%

Source: Aon Hewitt's 30-year capital market assumptions as of June 30, 2020.

Public Market Investments

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 and to take advantage of the ability to accept less liquidity in exchange for higher potential returns, stronger investor rights and protections, 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 risk-adjusted 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 be committed to, but 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 (sometimes public) 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. 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 and to take advantage of the ability to accept less liquidity in exchange for higher potential returns, stronger investor rights and protections, 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 due to the variety of underlying collateral types not easily accessed in traditional asset classes. The Private Credit asset class targets risk-adjusted 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 funds, both

Section 3 - Investment Information

Private Credit Investments (continued)

closed-end and evergreen, and co-investments that are complementary in nature regarding fund size, sector, strategic focus, geographic and industry focus and vintage year.

Private Credit assets may be committed to, but 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 assets also allow for 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 nonexchange-traded and may be physical securities or derivatives, and leverage may be employed. In the case of Gold, the instruments may include physical gold (bullion).

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 nonexchange-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.

Private Commodities Investments

Through investment in Private Commodities, PSERS seeks to increase the diversification of PSERS’ commodities assets. Exposure to Private Commodities as part of the overall investable universe can offer the option to access investment

Private Commodities Investments (continued)

opportunities not available in Public Commodities and accept less liquidity in exchange for historically higher private equity-like returns within the overall Commodities allocation. Private Commodity manager selection can be enhanced by PSERS experience with private equity managers who have shown success in commodities-related investment sleeves. The Private Commodities asset class will achieve risk moderation by investing in vehicles and co-investments that are complementary in nature regarding fund size, sector, strategic focus, and vintage year.

Private Commodity assets may be committed to, but not limited to, funds, co-investments, secondaries, separate accounts, joint ventures, partnerships, limited liability companies, and operating companies (collectively “Private Commodity Investments”) investing in Private Commodity strategies. Private Commodity Investments may result in exposure to any type of private (sometimes public) 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.

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, stronger investor rights and protections, 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 risk-adjusted 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 be committed to, but 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 and to take advantage of the ability to accept less liquidity in exchange for higher potential returns, stronger investor rights and protections, 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 risk-adjusted 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

Section 3 - Investment Information

Private Real Estate Investments (continued)

to PSERS which limits PSERS' losses to the amount committed.

Risk Parity Investments

PSERS seeks to diversify assets by obtaining exposure to Risk Parity. Risk Parity plays a strategic role within the Fund by providing exposure to a broad array of asset classes in a risk-balanced manner. Given the different volatilities of the underlying asset classes, portfolio leverage is employed in order to obtain both the desired level of risk balance and the desired target level of risk (standard deviation). Inclusion of this asset class is expected to reduce the Fund's overall risk exposure over long term horizons, because it is designed to be more resistant to market downturns than traditional investment strategies, and it enhances the Fund's diversification due to its risk-balanced portfolio construction. Risk Parity portfolios are designed to perform consistently well, whether the period is characterized by rising economic growth, falling economic growth, rising inflation, or falling inflation. It does less well in periods of broadly rising interest rates and/or broadly rising risk premiums.

Risk Parity assets may be invested in a variety of asset classes, including but not limited to, global equity, global fixed income, global inflation protected fixed income, credit, and commodities. Instruments used may be exchange-traded or over-the-counter and may be physical securities or derivatives.

The Board of Trustees voted to end the Risk Parity program in August 2020, and it was fully liquidated in December 2020.

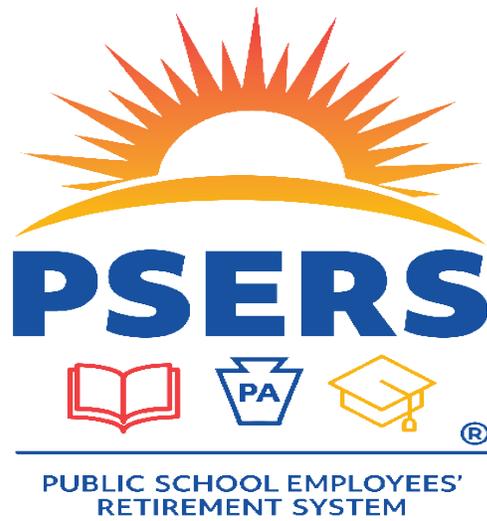
Absolute Return Investments

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.

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, 2020, the System generated a total net of fee return of 1.11%. This

return was below the Total Fund Policy Index return of 2.74% by 163 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2020 were 5.62%, 5.64%, and 7.70%, respectively. The ten-year return ended June 30, 2020 exceeded the Total Fund Policy Index returns by 20 basis points, while the three- and five-year returns trailed by 64 and 44 basis points, respectively.

Table 10.1 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 10.1	Annualized Total Returns (%)					
	Net of Fees					
	Ended June 30, 2020					
	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
PSERS Total Fund	1.11	5.62	5.64	7.70	6.11	5.58
Total Fund Policy Index	2.74	6.26	6.08	7.50	5.94	5.06
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	1.91	5.40	5.78	8.10	6.27	5.80
60% Global Equity / 40% Barclays U.S. Aggregate Bond Index	6.02	6.41	6.01	7.36	6.06	5.14
PSERS U.S. Equity Portfolios	3.23	8.27	9.47	13.37	8.35	6.58
U.S. Equity Policy Index (1)	3.25	8.94	9.38	13.35	8.57	6.02
PSERS Non-U.S. Equity Portfolios	1.77	4.94	5.45	8.92	7.88	6.22
Non-U.S. Equity Policy Index (2)	-2.53	2.60	3.67	6.89	5.99	4.66
PSERS Fixed Income Portfolios (10)	7.10	7.16	6.65	6.93	6.78	7.19
Fixed Income Policy Index (3)	8.70	6.38	5.70	5.15	5.64	6.12
PSERS Commodity Portfolios (10)	2.13	6.17	2.65	0.76	N/A	N/A
Commodity Policy Index (4)	-2.68	0.67	-1.84	-2.37	N/A	N/A
PSERS Absolute Return Portfolios	-0.49	2.23	2.38	3.92	N/A	N/A
Absolute Return Policy Index (5)	1.74	4.39	4.34	5.59	N/A	N/A
PSERS Risk Parity Portfolios (11)	0.14	4.96	4.39	N/A	N/A	N/A
Risk Parity Policy Index (6)	10.51	8.66	7.37	N/A	N/A	N/A
PSERS Master Limited Partnership (MLP) Portfolios	-35.43	-13.04	-11.06	3.54	N/A	N/A
Standard & Poor's MLP Index	-30.96	-11.20	-10.14	0.91	N/A	N/A
PSERS Real Estate (7) (10)	2.43	7.78	8.12	10.68	6.02	8.16
Blended Real Estate Index (8)	-0.73	6.17	7.10	9.93	7.98	8.52
PSERS Private Equity (7)	-4.18	7.40	7.97	9.44	10.30	8.21
Burgiss Median Return, Vintage Year Weighted (9)	1.79	9.79	9.76	11.46	8.94	6.47

Other Footnotes to the Total Portfolio are available on page 94 of PSERS Comprehensive Annual Financial Report.

Performance (continued)

The past fiscal year was a positive year for the System with a net of fee return of 1.11%; however, the return trailed the Policy Index by 1.63% for the fiscal year. The following asset classes were additive to absolute returns this past fiscal year:

- Gold, as represented by the Bloomberg Gold Subindex Total Return, was up 25.7%. Many investors flocked to gold, as a safe-haven asset, from the riskier assets.
- U.S. Long Treasuries, as represented by the Bloomberg Barclays U.S. Long Treasury Index, were up 25.4%. Returns in long-term treasuries were driven by falling interest rates.
- U.S. Large Cap Equities, as represented by the S&P 500 Index, were up 7.5%. U.S. large cap technology stocks drove returns as these stocks benefitted from increased demand for technology amidst social distancing measures in response to the COVID-19 pandemic.

Significant detractors from absolute performance this past fiscal year included:

- Commodities, as represented by the Bloomberg Commodity Index Total Return, were down -17.4%. Negative absolute returns were largely driven by the energy sector and falling crude oil prices.
- Public Infrastructure, as represented by FTSE Developed Core Infrastructure 50/50 Index (Net), was down -9.0%.
- Non-U.S. Equities, as represented by the MSCI All Country World ex USA Index (net), returned -4.8%. Non-U.S. stocks underperformed their U.S. counterparts due to slowing global growth and geopolitical uncertainty.

As noted, two of the best performing asset classes this past fiscal year were Gold and U.S. Long Treasuries, which were both up over 25%, while one of the worst performers was Commodities, returning -17.4% for FY 2020. 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 very humble 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 U.S. long treasuries, gold, TIPS, and private real estate aided the System's overall performance during the past fiscal year. Diversification into asset classes such as commodities and public infrastructure 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 0.70 for the 5-year period ending June 30, 2020, a top 8th percentile score among public pension plans with assets above \$1 billion.

During the past fiscal year, the equity markets experienced volatility due to the spread of COVID-19 and slowing global growth, with the VIX reaching a peak in March 2020. Despite the headwinds, U.S. stocks proved to be resilient as the top performing region within the global equity market. U.S. stocks were supported by fiscal and monetary policies, as well as more favorable economic data coming out of the U.S. relative to the international markets. In the U.S., Congress passed a \$2.3 trillion economic relief package for workers, families, and small businesses, which pumped liquidity in the capital markets. Non-U.S. stocks lagged their U.S. counterparts due to COVID-19 cases increasing more rapidly and geopolitical uncertainty. In Europe, Brexit uncertainties continued as negotiations between the United Kingdom and European Union stalled.

Section 3 - Investment Information

Performance (continued)

In response to the COVID-19 pandemic and slowing global growth, major central banks implemented looser monetary policies. In the U.S., the Federal Reserve lowered the target range for the federal funds rate to 0% to 0.25% in 2020 and projected to keep rates near 0% until at least 2023. Over the fiscal year, the U.S. nominal yield curve shifted downwards as yields fell across all maturities. The 10-year U.S. Treasury yield ended the fiscal year at 0.66%, 134 basis points lower than the beginning of the fiscal year. The sharp decline in interest rates resulted in a strong positive return for long government bonds. Gold also benefitted from falling interest rates and market volatility as investors flocked to the safe-haven asset. Gold tends to perform well as a defensive hedge in weak

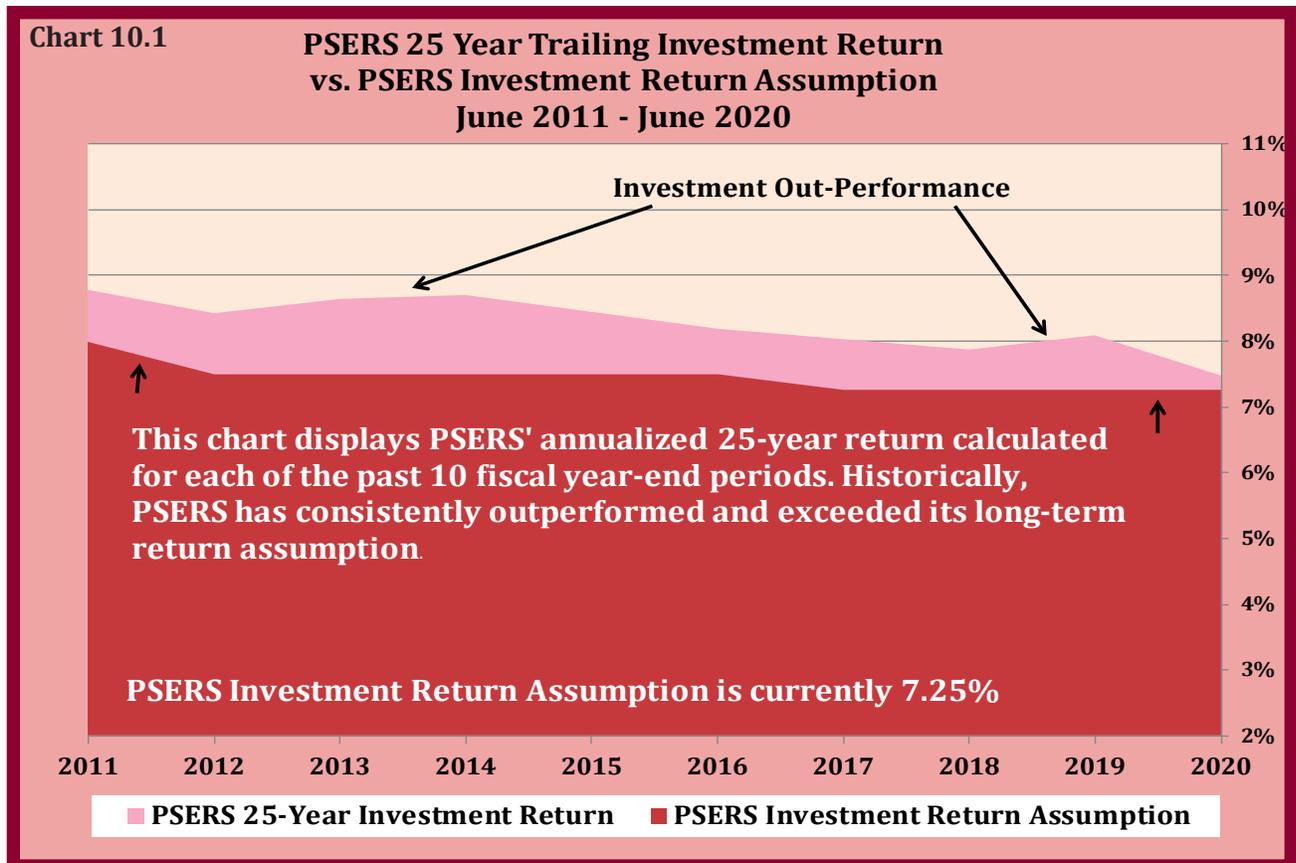
market conditions, which are currently marred by low real interest rates, record highs in government debt, unprecedented levels of central bank intervention in capital markets, and geopolitical risk.

Commodities produced negative returns over the 12 months ended June 30, 2020, largely driven by the energy sector and falling crude oil prices. Oil prices declined sharply after OPEC negotiations collapsed as Saudi Arabia engaged in a pricing war with Russia. Oil prices fell into negative territory for the first time in April 2020 as investors faced storage facility shortages and a decreasing demand, leaving them with no choice but to pay in order to not receive physical barrels. An increase in global

Long Term Investment Performance Consistently Outperforms

The assets of the System are invested to maximize the returns for the level of risk taken. Chart 10.1 shows PSERS' 25-Year Trailing Investment Return for each of the past 10 fiscal years and Chart 10.2 depicts PSERS' Fiscal Year Investment Return versus PSERS' Investment Return Assumption for the past 10 fiscal years.

As shown in Chart 10.1, the 25-year trailing investment return has exceeded the investment return assumption over the last ten years including the Great Recession.



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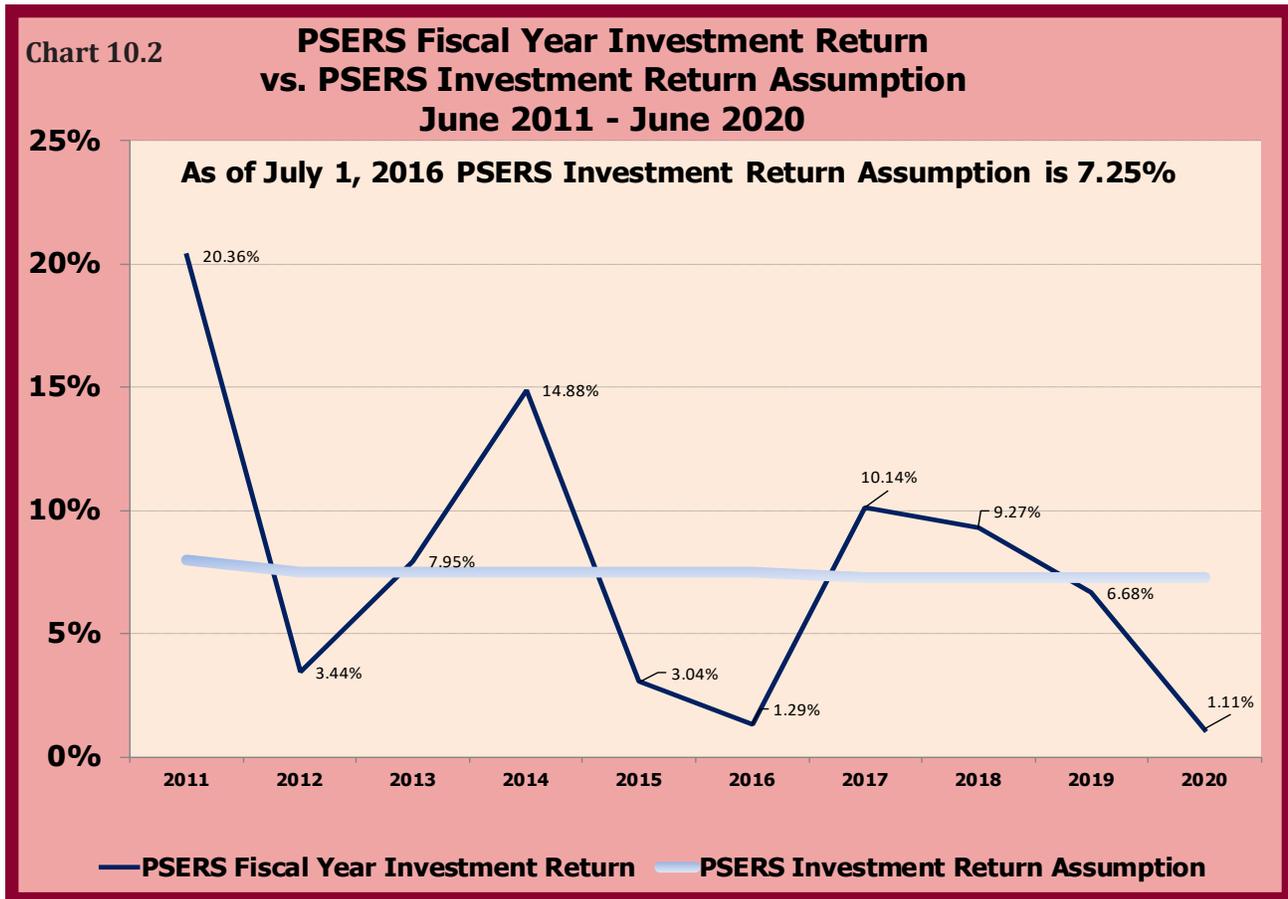
Performance (continued)

travel and supply cuts created major tailwinds for oil later in the fiscal year, which propelled oil prices into positive territory. The price of WTI crude oil decreased by ~32% over the past 12 months to US\$39/bbl.

While it has been a challenging return environment as evidenced by the System's one-year annualized return, PSERS' ten-year annualized net of fee return was 7.70%, exceeding the actuarial assumed rate of return of 7.25%. With interest rates at historically low levels, the System needs to take prudent risks to achieve its long-term goal of a 7.25% 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 of sub-7.25% annual returns. 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, real assets, and absolute return. In any given year, the System expects some assets to perform well, such as Gold and U.S. Long Treasuries did this past fiscal year, and some assets to not perform as well, such as Commodities 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 10.2, PSERS' one-year investment return was below the investment return assumption for fiscal year 2020. Five of the past ten fiscal years, it performed above the assumption.



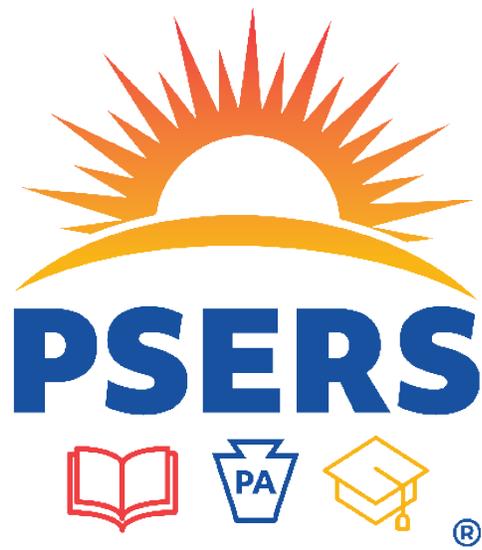
Section 3 - Investment Information

Performance (continued)

Table 10.2 demonstrates that over the past 20 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$1.78 above the Policy Benchmark's dollar returns.

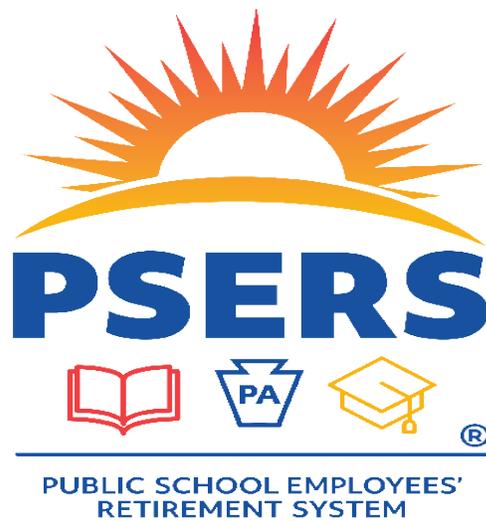
Table 10.2 PSERS' Investment Earnings over Policy Benchmark Fiscal Years Ended June 30				
<i>Fiscal Year</i>	<i>Total Investment Expenses *</i>	<i>PSERS' Net Return over Policy Benchmark (AFTER Payment of all Expenses)</i>	<i>PSERS' Investment Earnings over Policy Benchmark Net of Total Investment Expenses *</i>	<i>\$'s of Gross Alpha for every \$1 of Investment Expenses</i>
2020	\$515	-1.63%	(\$838)	(\$0.63)
2019	450	-1.00%	(631)	(0.40)
2018	468	1.06%	528	2.13
2017	474	1.78%	814	2.72
2016	416	-1.84%	(883)	(1.12)
2015	455	0.39%	190	1.42
2014	482	0.50%	221	1.46
2013	558	1.27%	586	2.05
2012	481	1.09%	515	2.07
2011	515	1.02%	414	1.80
2010	522	2.20%	890	2.71
2009	478	-5.22%	(3,133)	(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	-0.43%	(142)	(0.21)
2002	163	0.57%	319	2.96
2001	<u>144</u>	2.13%	<u>1,200</u>	9.33
Total	<u>\$7,608</u>		<u>\$5,907</u>	<u>\$1.78</u>

*Dollar amounts in millions.



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Managing Investment Fees, Expenses, and Carried Interest

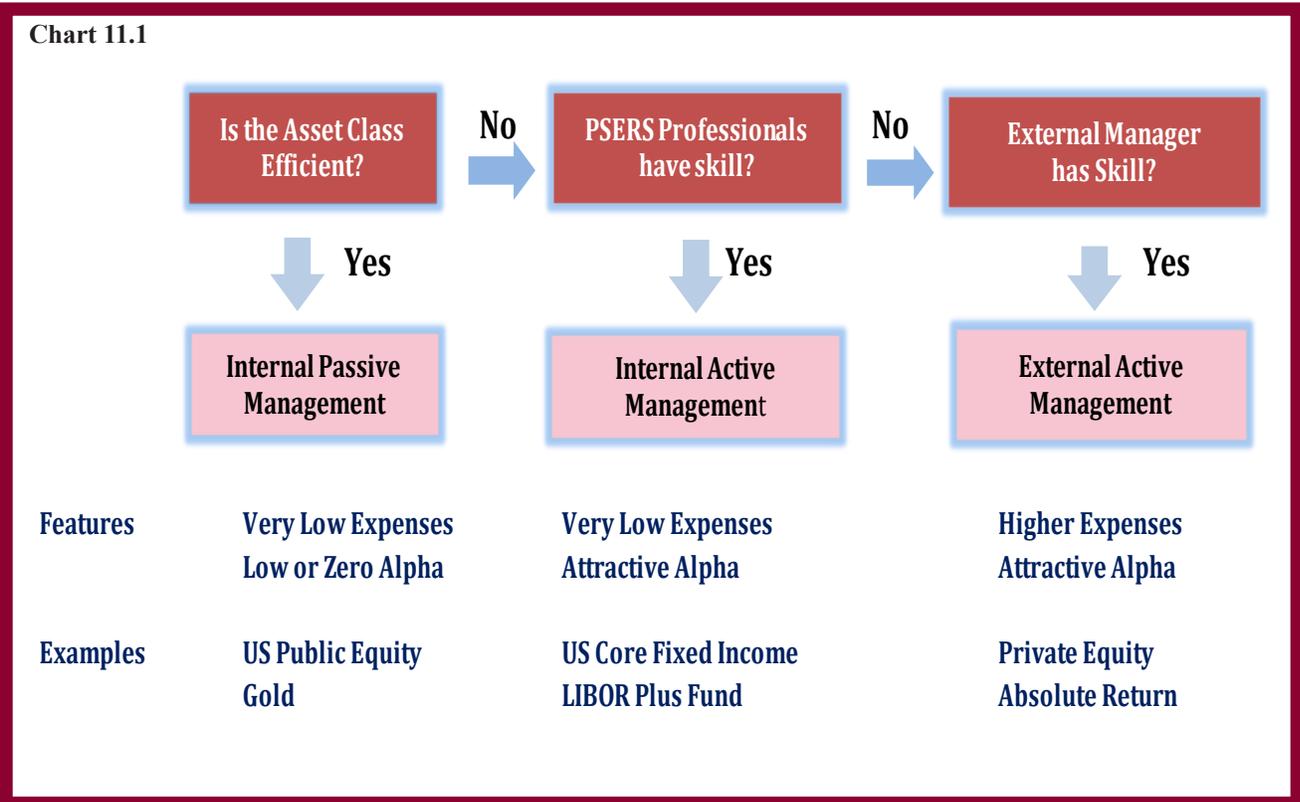


Section 3 - Investment Information

Managing Investment Fees, Expenses, and Carried Interest

PSERS' investment professionals annually formulate an Asset Allocation Policy (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 approves the long-term asset

allocation targets of the System annually. 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, as depicted in Chart 11.1.



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, has generated and continues to generate significant 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 11.2 below demonstrates that over the past 20 fiscal years, PSERS has earned \$6.0 billion in additional investment returns above the Board-approved Policy Index, net of fees.

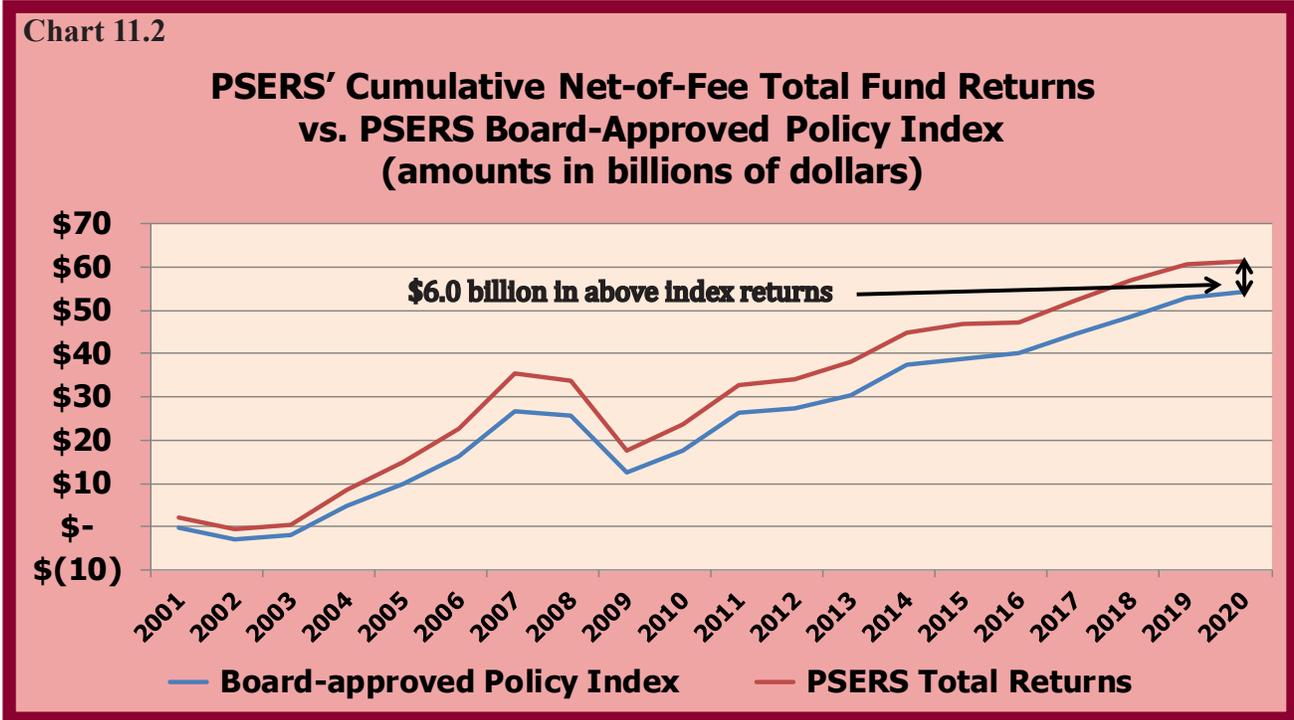
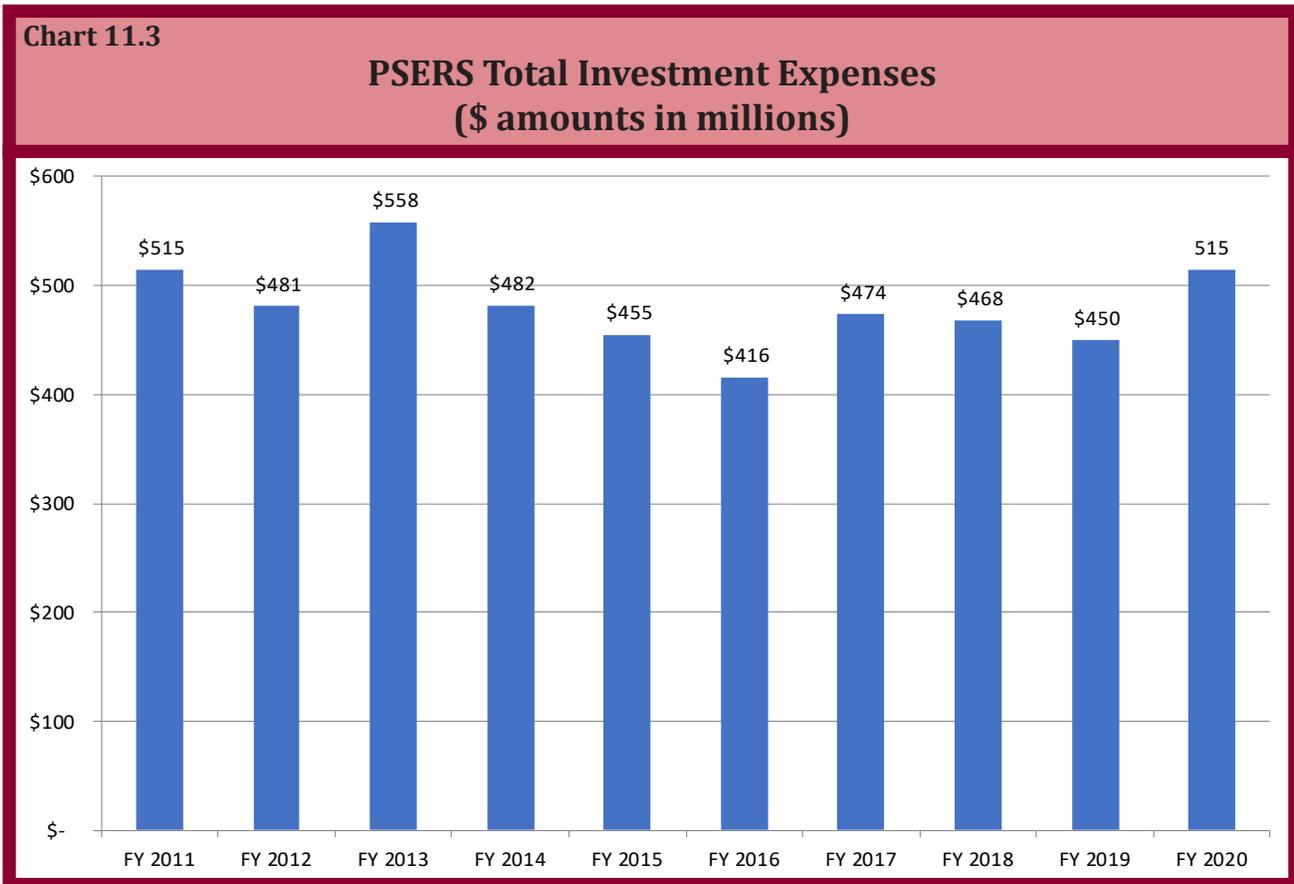


Chart 11.3 shows PSERS Total Investment Expenses over the past ten fiscal years.



Section 3 - Investment Information

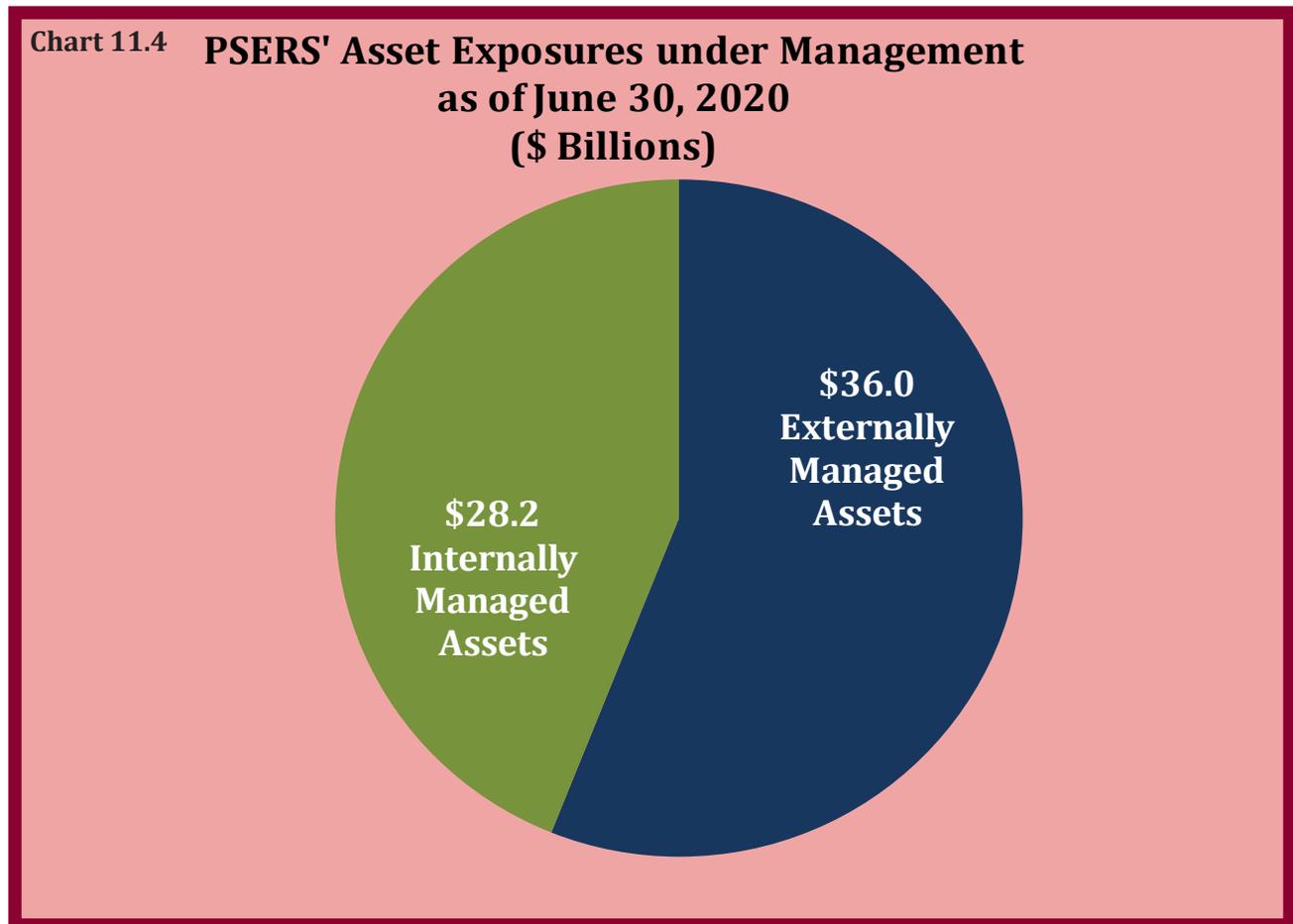
Key Decision: Internal vs. External Investment Management

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 11.1). 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, 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) are much lower than using even the largest "very low fee" index mutual fund

companies charge, giving PSERS a significant advantage.

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 11.4 displays the distribution of PSERS managed assets as of June 30, 2020.



Note: Financing represents a negative \$7.3 billion allocation exposure and is not reflected in Chart 11.4.

Section 3 - Investment Information

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

PSERS' investment staff managed 21 portfolios internally, with a total estimated net asset value of over \$28 billion on June 30, 2020, resulting in significant fee savings. For the entire fiscal year, PSERS incurred costs of approximately \$23 million to manage these portfolios internally, as well as oversee all of the external managers, manage the asset allocation, oversee risk, and perform other tasks in managing the overall investment program.

As shown in Table 11.1 below, managing these assets externally would have cost PSERS over \$50 million in additional fees: (\$ amounts in thousands).

Table 11.1

<u>Account</u>	<u>Asset Class</u>	<u>Market Value as of 6/30/20*</u>	<u>Estimated Annual Fee %</u>	<u>Estimated Cost to Manage Externally</u>
PSERS - S&P 500 Index	U.S. Equities	\$ 2,087,712	0.01%	\$ 209
PSERS - S&P 400 Index	U.S. Equities	345,712	0.03%	104
PSERS - S&P 600 Index	U.S. Equities	346,657	0.04%	139
Misc. PSERS Equity Accounts	U.S. Equities	565	0.00%	0
	U.S. Equities Total	2,780,646		451
PSERS ACWI ex. U.S. Index	Non U.S. Equities	2,909,881	0.08%	2,328
	Non-U.S. Equities Total	2,909,881		2,328
Private Equity Co-Investments	Private Equity	682,497	1.00%	6,825
PA Investment Fund - Private Equity	Private Equity	55,223	1.00%	552
	Private Equity Total	737,720		7,377
Private Credit Internal	Fixed Income	128,399	1.00%	1,284
PSERS Active Aggregate	Fixed Income	1,459,558	0.21%	3,065
PSERS TIPS Portfolio	Fixed Income	4,204,660	0.13%	5,466
PSERS Long Treasuries	Fixed Income	3,267,203	0.18%	5,881
	Fixed Income Total	9,059,820		15,696
PSERS Infrastructure Index	Infrastructure	1,277,366	0.35%	4,471
Infrastructure Internal	Infrastructure	37,678	1.00%	377
	Infrastructure Total	1,315,044		4,848
PSERS Commodity Beta	Commodities	1,007,678	0.15%	1,512
PSERS Gold Fund	Commodities	2,884,942	0.15%	4,327
Private Commodities Internal	Commodities	17,513	1.00%	175
	Commodities Total	3,910,133		6,014
PSERS Midstream Energy Index	MLP	548,591	0.35%	1,920
	MLP Total	548,591		1,920
PSERS REIT Index	Real Estate	611,303	0.08%	489
Real Estate Co-Investments	Real Estate	85,932	0.49%	417
	Real Estate Total	697,235		906
PSERS Risk Parity	Risk Parity	2,449,286	0.30%	7,348
	Risk Parity Total	2,449,286		7,348
PSERS Cash Management	Cash Management	3,789,063	0.10%	3,789
	Cash Management Total	3,789,063		3,789
	Grand Total	\$ 28,197,419		\$ 50,677

*Market values include cash and derivatives exposure

Section 3 - Investment Information

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.

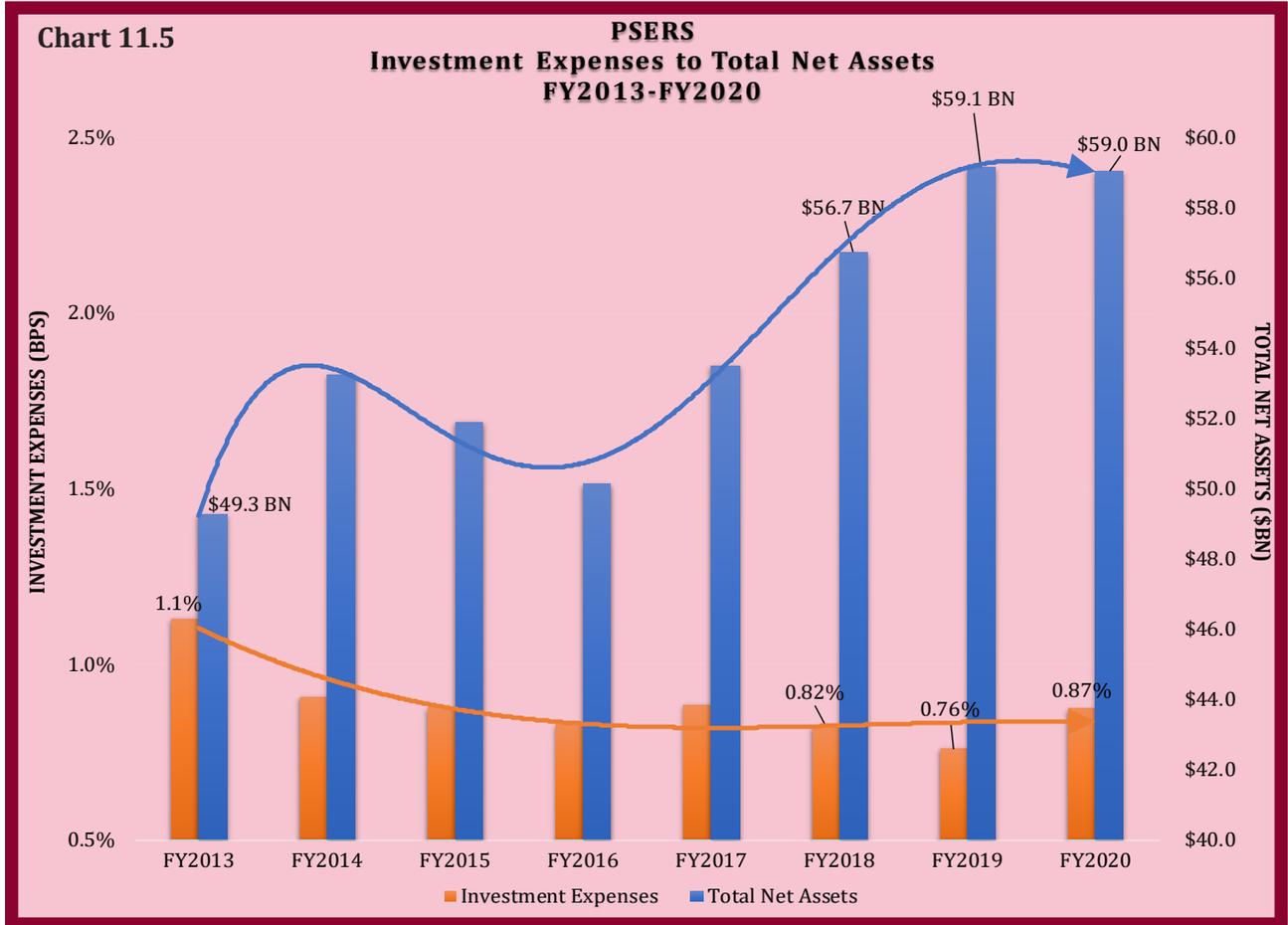
Section 3 - Investment Information

Table 11.2 summarizes total investment expenses for the fiscal year ended June 30, 2020. “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 11.2 Summary of Investment Advisory Fees				
Fiscal Year Ended June 30, 2020				
(Dollar Amounts in Thousands)				
	Base Fees	Performance Fees	Total Fees	Basis Points
External Management				
U.S. Equity	\$ 1,600	\$ 277	\$ 1,877	51
Non U.S. Equity	19,777	51,127	70,904	183
Fixed Income	92,585	1,471	94,056	88
Real Estate	49,808	-	49,808	100
Alternative Investments	99,640	-	99,640	133
Absolute Return	87,784	52,219	140,003	230
Commodities	7,019	-	7,019	128
Master Limited Partnerships	4,016	-	4,016	37
Infrastructure	3,921	-	3,921	120
Risk Parity	15,277	690	15,967	71
Defined Contribution	30	-	30	38
Total External Management	\$ 381,457	\$ 105,784	\$ 487,241	129
Total Internal Management			22,891	9
Total Investment Management			\$ 510,132	79
Custodian Fees			\$ 2,481	
Consultant & Legal Fees			2,649	
Total Other Expenses			\$ 5,130	
Total Investment Expenses			\$ 515,262	80

Section 3 - Investment Information

Increasing the number and size of portfolios managed internally has been a core initiative in reducing PSERS' Total Investment Expenses in recent years. As Chart 11.5 illustrates, Total External Management fees have decreased from \$558 million in Fiscal Year 2013 to \$515 million in Fiscal Year 2020, while Total Net Assets have increased from \$49.3 billion to \$59.0 billion. It is worth noting that these decreases have occurred while Total Internal Management and Total Other Expenses have remained flat.



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 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>U.S. Equity</u>			
Radcliffe Capital Management LP	\$ 1,600	\$ 277	\$ 1,877
Total - U.S. Equity	\$ 1,600	\$ 277	\$ 1,877
<u>Non - U.S. Equity</u>			
Acadian Asset Management, LLC	\$ 1,062	\$ -	\$ 1,062
Baillie Gifford Overseas Ltd.	2,182	9,247	11,428
BlackRock Financial Management, Inc.	521	-	521
BlackRock Institutional Trust Company, N.A.	1,324	(1,274)	50
Cederberg Greater China EQ FD	-	12,536	12,536
ECM Feeder Fund 2 LP	(494)	-	(494)
Insight Investment International Limited	561	-	561
Marathon Asset Management Limited	2,669	-	2,669
Oberweis Asset Management, Inc.	1,721	-	1,721
QS Batterymarch Financial Management, Inc.	652	-	652
Steadview Capital Partners LP	2,331	(503)	1,828
The Children's Investment Fund LP	3,212	7,395	10,607
Wasatch Advisors, Inc.	4,037	23,727	27,763
Total - Non - U.S. Equity	\$ 19,777	\$ 51,127	\$ 70,904
<u>Fixed Income</u>			
Apollo European Principal Finance Fund II (Dollar A), L.P.	\$ 321	\$ -	\$ 321
Apollo European Principal Finance Fund III (Dollar A), LP	2,764	-	2,764
Avenue Energy Opportunities Fund, L.P.	1,715	-	1,715
Avenue Energy Opportunities Fund II, L.P.	850	-	850
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,800	-	1,800
Bain Capital Credit Managed Account (PSERS), L.P.	1,756	-	1,756
Bain Capital Distressed and Special Situations 2013 (A), L.P.	1,440	-	1,440
Bain Capital Distressed and Special Situations 2016 (A), L.P.	2,716	-	2,716
Bain Capital Distressed and Special Situations 2019 (A), L.P.	174	-	174
Bain Capital Middle Market Credit 2010, L.P.	152	-	152
Bain Capital Middle Market Credit 2014, LP	893	-	893
BlackRock Financial Management, Inc.	2,025	-	2,025
Bridgewater Associates, LP	23,852	-	23,852
Brigade Capital Management, LLC	4,424	-	4,424
Capula Investment Management, LP	525	717	1,242

() Represents reversal of amount accrued in prior fiscal year.

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
Fixed Income (continued)			
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	\$ 1,426	\$ -	\$ 1,426
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	888	-	888
Cerberus Levered Loan Opportunities Fund II, L.P.	557	-	557
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	8,019	-	8,019
Clearlake Opportunities Partners (P) II, L.P.	837	-	837
Galton Onshore Mortgage Recovery Fund III, L.P.	23	-	23
Galton Onshore Mortgage Recovery Fund IV, L.P.	963	-	963
Hayfin SOF II USD Co-Invest, L.P.	93	-	93
Hayfin SOF II USD, L.P.	2,195	-	2,195
HayFin Special Opportunities Credit Fund (Parallel), L.P.	470	-	470
ICG Europe Fund V, L.P.	621	-	621
ICG Europe Fund VI, L.P.	1,035	-	1,035
ICG Europe Fund VII Feeder SCSp	2,270	-	2,270
Insight Investment International Limited	83	-	83
International Infrastructure Finance Company Fund, L.P.	898	-	898
Latitude Management Real Estate Capital IV, Inc.	819	-	819
LBC Credit Partners III, L.P.	975	-	975
LBC-P Credit Fund, L.P.	6,075	-	6,075
Mariner Investment Group, LLC	1,273	42	1,314
Pacific Investment Management Company (PIMCO)	530	-	530
Park Square - PSERS Credit Opportunities Fund, L.P.	2,223	-	2,223
Penn Mutual Asset Management, LLC	157	45	202
PIMCO BRAVO Fund III Onshore Feeder, LP	1,726	-	1,726
Pugh Capital Management, Inc.	47	-	47
PSERS TAO Partners Parallel Fund, L.P.	3,710	-	3,710
Radcliffe Capital Management, L.P.	693	667	1,359
Sankaty Credit Opportunities IV, L.P.	382	-	382
SEI Investments Company	752	-	752
SSG Capital Partners V Sidecar, L.P.	29	-	29
SSG Capital Partners V, L.P.	1,097	-	1,097
Templeton Investment Counsel, LLC	1,899	-	1,899
TOP NPL (A), L.P.	16	-	16
TPG Opportunities Partners II (A), L.P.	70	-	70
TPG Opportunities Partners III (A), L.P.	804	-	804
TSSP Opportunities Partners IV (A), L.P.	2,252	-	2,252
Varde Scratch and Dent Feeder I-A, L.P., The	729	-	729
Varde Scratch and Dent Feeder, L.P., The	544	-	544
Total - Fixed Income	\$ 92,585	\$ 1,471	\$ 94,056

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Profit Share</u>	<u>Total</u>
<u>Real Estate-Direct Ownership</u>			
Bell Partners Inc.	\$ 969	\$ -	\$ 969
Charter Oak Advisors, Inc.	680	-	680
GF Management, Inc.	131	-	131
L & B Realty Advisors, L.L.P.	149	-	149
Subtotal - Real Estate-Direct Ownership	\$ 1,930	\$ -	\$ 1,930
<u>Real Estate-Partnerships/Funds</u>			
AG Core Plus Realty Fund III, L.P.	\$ 193	\$ -	\$ 193
AG Core Plus Realty Fund IV, L.P.	1,258	-	1,258
AG Europe Realty Fund II, L.P.	1,044	-	1,044
AG Realty Value Fund X, L.P.	1,006	-	1,006
Almanac Realty Securities V, L.P.	16	-	16
Almanac Realty Securities VI, L.P.	164	-	164
Almanac Realty Securities VII, L.P.	563	-	563
Almanac Realty Securities VIII, L.P.	1,878	-	1,878
Ares European Real Estate Fund IV, L.P.	868	-	868
Ares U.S. Real Estate Fund VIII, L.P.	643	-	643
Ares U.S. Real Estate Fund IX, L.P.	887	-	887
ARS VII (Sidecar V), L.P.	78	-	78
ARS VIII (SC V), L.P.	33	-	33
Avenue Real Estate Fund (Parallel) L.P.	661	-	661
Bell Institutional Fund V, L.P.	857	-	857
Bell Institutional Fund VI, L.P.	848	-	848
Bell Institutional Fund VII, L.P.	846	-	846
Blackstone Real Estate Debt Strategies II, L.P.	40	-	40
Blackstone Real Estate Debt Strategies III, L.P.	1,066	-	1,066
Blackstone Real Estate Partners Europe III, L.P.	597	-	597
Blackstone Real Estate Partners Europe IV, L.P.	482	-	482
Blackstone Real Estate Partners VII, L.P.	1,371	-	1,371
Blackstone Real Estate Partners VIII, L.P.	2,891	-	2,891
Brookfield Strategic Real Estate Partners, L.P.	846	-	846
Brookfield Strategic Real Estate Partners II, L.P.	2,306	-	2,306
Brookfield Strategic Real Estate Partners III-A, L.P.	2,599	-	2,599
Cabot Industrial Core Fund, L.P.	1,365	-	1,365
Cabot Industrial Core Fund II, L.P.	307	-	307
Cabot Industrial Value Fund V, L.P.	1,500	-	1,500
Carlyle Realty Partners IV, L.P.	15	-	15
Carlyle Realty Partners V, L.P.	144	-	144
Carlyle Realty Partners VI, L.P.	110	-	110

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Profit Share</u>	<u>Total</u>
<u>Real Estate-Partnerships/Funds (continued)</u>			
Carlyle Realty Partners VII, L.P.	\$ 459	\$ -	\$ 459
Carlyle Realty Partners VIII, L.P.	1,703	-	1,703
DRA Growth and Income Fund IX, LLC	2,024	-	2,024
DRA Growth and Income Fund VII, L.P.	507	-	507
DRA Growth and Income Fund VIII, LLC	1,396	-	1,396
DRA Fund IX Industrial Co-Investment LLC	104	-	104
DRA Growth and Income Fund VIII Co-Investment I, LLC	145	-	145
DRA Growth and Income Master Fund X, LLC	205	-	205
Exeter Core Industrial Club Fund II, L.P.	743	-	743
Exeter Industrial Core Fund III, L.P.	37	-	37
Exeter Industrial Value Fund II, L.P.	0	-	0
Exeter Industrial Value Fund III, L.P.	206	-	206
Exeter Industrial Value Fund IV, L.P.	1,060	-	1,060
Insight Investment International Limited	46	-	46
Latitude Management Real Estate Capital III, Inc.	876	-	876
LEM Multifamily Fund V, L.P.	1,000	-	1,000
LEM Multifamily Senior Equity Fund IV, L.P.	838	-	838
LEM RE High Yield Debt & Preferred Equity Fund III, L.P.	33	-	33
Pramerica Real Estate Capital VI, L.P.	688	-	688
RCG Longview Debt Fund V, L.P.	75	-	75
RCG Longview Debt Fund VI, L.P.	1,127	-	1,127
RCG Longview Equity Fund, L.P.	47	-	47
Security Capital Preferred Growth (Public)	1,252	-	1,252
Senior Housing Partnership Fund IV, L.P.	274	-	274
Senior Housing Partnership Fund V, L.P.	715	-	715
Stockbridge Real Estate Fund II, LP	130	-	130
Stockbridge Real Estate Fund III, LP	299	-	299
Stockbridge Real Estate Fund, L.P.	3,257	-	3,257
Strategic Partners Fund IV RE, L.P.	27	-	27
UBS (US) Trumbull Property Fund, L.P.	303	-	303
Subtotal - Real Estate-Partnerships/Funds	\$ 47,058	\$ -	\$ 47,058
Real Estate-Farmland			
Prudential Agricultural Group	820	-	820
Subtotal - Real Estate-Farmland	\$ 820	\$ -	\$ 820
Total Real Estate	\$ 49,808	\$ -	\$ 49,808

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Profit Share</u>	<u>Total</u>
Private Equity			
Actis Global 4, L.P.	\$ 1,330	\$ -	\$ 1,330
Apax Digital, L.P.	1,758	-	1,758
Bain Capital Asia Fund II, L.P.	640	-	640
Bain Capital Asia Fund III-A, L.P.	2,600	-	2,600
Bain Capital Asia Fund IV-B, L.P.	1,375	-	1,375
Bain Capital Fund XI-A, L.P.	449	-	449
Bain Capital Fund XII-A, L.P.	1,875	-	1,875
Baring Asia Private Equity Fund IV, L.P.	619	-	619
Baring Asia Private Equity Fund V, L.P.	3,050	-	3,050
Baring Asia Private Equity Fund VI, L.P.	1,212	-	1,212
Blue Point Capital Partners II (B), L.P.	76	-	76
Blue Point Capital Partners III (B), L.P.	519	-	519
Blue Point Capital Partners IV, L.P.	885	-	885
Bridgepoint Development Capital III, L.P.	1,477	-	1,477
Bridgepoint Europe IV, L.P.	580	-	580
Bridgepoint Europe V, L.P.	1,369	-	1,369
Bridgepoint Europe VI, L.P.	1,520	-	1,520
Capital International Private Equity Fund VI, L.P.	550	-	550
Catterton Growth Partners II, L.P.	1,075	-	1,075
Catterton Growth Partners III, L.P.	1,187	-	1,187
Catterton Growth Partners, L.P.	462	-	462
Catterton Partners VI, L.P.	477	-	477
Catterton Partners VII, L.P.	1,409	-	1,409
Catterton VIII, L.P.	1,227	-	1,227
Cinven Fund (Fifth), L.P.	586	-	586
Cinven Fund (Sixth), L.P.	1,156	-	1,156
Coller International Partners VI, L.P.	791	-	791
Coller International Partners VII, L.P.	1,250	-	1,250
Crestview Partners II, L.P.	872	-	872
Crestview Partners III, L.P.	1,290	-	1,290
Crestview Partners, L.P.	250	-	250
DCPF VI Oil and Gas Co-Investment Fund, L.P.	75	-	75
Denham Commodity Partners Fund VI, L.P.	723	-	723
Energy & Minerals Group Fund III, L.P.	1,058	-	1,058
Equistone Partners Europe Fund V E, L.P.	932	-	932
Equistone Partners Europe Fund VI E, SCSp	1,473	-	1,473
First Reserve Fund XII, L.P.	32	-	32
GoldPoint Partners Co-Investment V, L.P.	343	-	343
Hahn & Company III L.P.	169	-	169
Hahn & Company III-S L.P.	86	-	86

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

Manager	Base Fees	Profit Share	Total
Private Equity (continued)			
HgCapital 7 A, L.P.	\$ 985	\$ -	\$ 985
HgCapital 8 D, L.P.	2,057	-	2,057
HGGC Fund II, L.P.	1,141	-	1,141
HGGC Fund III, L.P.	1,032	-	1,032
Incline Elevate Fund, L.P.	745	-	745
Incline Equity Partners IV, L.P.	1,109	-	1,109
K4 Private Investors, L.P.	1,952	-	1,952
Landmark Equity Partners XIII, L.P.	91	-	91
Landmark Equity Partners XIV, L.P.	298	-	298
Milestone Partners III, L.P.	182	-	182
Milestone Partners IV, L.P.	315	-	315
New Mountain Partners IV, L.P.	442	-	442
New Mountain Partners V, L.P.	2,043	-	2,043
New York Life Capital Partners IV-A. L.P.	38	-	38
NGP Natural Resources X, L.P.	593	-	593
NGP Natural Resources XI, L.P.	1,207	-	1,207
North Haven PE Asia Fund IV, L.P. (Morgan Stanley)	1,135	-	1,135
Odyssey Investment Partners Fund V, L.P.	1,999	-	1,999
Orchid Asia V, L.P.	158	-	158
Orchid Asia VI, L.P.	1,001	-	1,001
Orchid Asia VII, L.P.	1,507	-	1,507
PAI Europe V, L.P.	100	-	100
PAI Europe VI, L.P.	1,160	-	1,160
PAI Europe VII, L.P.	1,099	-	1,099
Palladium Equity Partners IV, L.P.	503	-	503
Partners Group Secondary 2008, L.P.	372	-	372
Partners Group Secondary 2011 (USD), L.P. Inc.	962	-	962
Partners Group Secondary 2015 (USD) A, L.P.	1,250	-	1,250
Platinum Equity Capital Partners V, L.P.	247	-	247
Platinum Equity Small Cap Fund, L.P.	765	-	765
Portfolio Advisors Secondary Fund III, L.P.	1,349	-	1,349
Strategic Partners Fund IV, L.P.	65	-	65
Strategic Partners Fund V, L.P.	253	-	253
Strategic Partners Fund VI, L.P.	530	-	530
Strategic Partners Fund VII, L.P.	1,250	-	1,250
Trilantic Capital Partners IV L.P.	19	-	19
Trilantic Capital Partners V (North America), L.P.	564	-	564
Trilantic Capital Partners VI (North America), L.P.	2,261	-	2,261
Webster Capital IV, L.P.	348	-	348
Subtotal - Private Equity	\$ 71,932	\$ -	\$ 71,932

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Profit Share</u>	<u>Total</u>
<u>Private Debt</u>			
Apollo Investment Fund IX, L.P.	\$ 2,265	\$ -	\$ 2,265
Apollo Investment Fund VIII, L.P.	761	-	761
Cerberus Institutional Partners V, L.P.	624	-	624
Cerberus Institutional Partners VI, L.P.	2,086	-	2,086
Clearlake Capital Partners IV, L.P.	687	-	687
Clearlake Capital Partners V, L.P.	380	-	380
Gold Hill Venture Lending 03-A, L.P.	35	-	35
Searchlight Capital II, L.P.	921	-	921
Searchlight Capital III, L.P.	1,000	-	1,000
Venor Special Situations Fund II, L.P.	691	-	691
Versa Capital Fund II, L.P.	1,446	-	1,446
Versa Capital Fund III, L.P.	884	-	884
Subtotal - Private Debt	\$ 11,779	\$ -	\$ 11,779
<u>Venture Capital</u>			
Aisling Capital IV, L.P.	\$ 302	\$ -	\$ 302
Insight Investment International Limited	51	-	51
Insight Partners XI, L.P.	693	-	693
Insight Venture Partners X, L.P.	1,371	-	1,371
LLR Equity Partners III, L.P.	605	-	605
LLR Equity Partners IV, L.P.	2,091	-	2,091
LLR Equity Partners V, L.P.	3,475	-	3,475
Psilos Group Partners III-C, L.P.	15	-	15
Sante Health Ventures III	1,191	-	1,191
SCP Private Equity Partners II, L.P.	141	-	141
Starvest Partners II (Parallel), L.P.	230	-	230
Strategic Partners Fund IV VC, L.P.	125	-	125
Summit Partners Growth Equity Fund VIII-A, L.P.	1,111	-	1,111
Summit Partners Growth Equity Fund X-A, L.P.	429	-	429
Summit Partners Venture Capital Fund III-A, L.P.	200	-	200
Summit Partners Venture Capital Fund IV-A, L.P.	800	-	800
Tenaya Capital VI, L.P.	713	-	713
Tenaya Capital VII, L.P.	2,000	-	2,000
Tenaya Capital V-P, L.P.	387	-	387
Subtotal - Venture Capital	\$ 15,929	\$ -	\$ 15,929
Total Alternative Investments	\$ 99,640	\$ -	\$ 99,640

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2020 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Absolute Return</u>			
Aeolus Capital Management Ltd.	\$ 7,624	\$ 4,705	\$ 12,328
AKAZ Offshore Fund LTD	2,609	20,951	23,560
Bridgewater Associates, Inc.	23,963	-	23,963
Brigade Capital Management	3,139	(129)	3,011
Capula Investment Management, LLP	12,052	11,518	23,570
Caspian Capital, LP	2,566	762	3,328
Falko Regional Aircraft Opportunities Fund II L.P.	1,032	-	1,032
Garda Capital Partners, LP	7,138	18,862	26,000
HS Group Sponsor Fund II Ltd.	889	-	889
Independence Reinsurance Partners GP, LLC	2,818	1,061	3,879
Nephila Capital Ltd.	2,509	-	2,509
Nimbus Weather Fund	1,986	-	1,986
Oceanwood Opportunities Fund	1,262	1,158	2,420
OWS Credit Opportunity Offshore Fund III, Ltd.	4,573	(7,011)	(2,438)
Pacific Investment Management Company (PIMCO)	7,492	-	7,492
Perry Partners, L.P.	123	-	123
Sciens Aviation Special Opportunities Investment Fund II, L.P.	35	-	35
Sciens Aviation Special Opportunities Investment Fund III, L.P.	1,578	-	1,578
Sciens Aviation Special Opportunities Investment Fund IV, L.P.	1,425	-	1,425
Sciens Aviation Special Opportunities Investment Fund V, L.P.	249	1	249
Two Sigma Risk Premia Enhanced Fund	1,058	343	1,401
Venor Capital Offshore	1,664	-	1,664
Total - Absolute Return	\$ 87,784	\$ 52,219	\$ 140,003
<u>Commodities</u>			
Denham Mining Fund, L.P.	\$ 888	\$ -	\$ 888
Gresham Investment Management, LLC	2,998	-	2,998
NGP Natural Resources XII, L.P.	1,040	-	1,040
Wellington Management Company, LLP	2,094	-	2,094
Total - Commodities	\$ 7,019	\$ -	\$ 7,019
<u>Master Limited Partnerships</u>			
Harvest Fund Advisors, LLC	\$ 1,882	\$ -	\$ 1,882
Salient Capital Advisors, LLC	1,548	-	1,548
Stein Roe Investment Counsel D/B/A Atlantic Trust	586	-	586
Total - Master Limited Partnerships	\$ 4,016	\$ -	\$ 4,016

() Represents reversal of amount accrued in prior fiscal year.

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year ended June 30, 2021 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total</u>
<u>Diversified Infrastructure</u>			
Blackstone Infrastructure Partners L.P.	\$ 1,700	\$ -	\$ 1,700
Insight Investment International Limited	109	-	109
International Infrastructure Finance Company II, LP	703	-	703
GCM Grosvenor Customized Infrastructure Strategies II, LP	1,062	-	1,062
Strategic Partners Real Assets II, L.P.	348	-	348
Total - Infrastructure	\$ 3,921	\$ -	\$ 3,921
<u>Risk Parity</u>			
BlackRock Institutional Trust Company, N.A.	\$ 2,004	\$ -	\$ 2,004
Bridgewater Associates, LP	8,354	690	9,044
D.E. Shaw Investment Management, L.L.C.	4,919	-	4,919
Total - Risk Parity	\$ 15,277	\$ 690	\$ 15,967
<u>Defined Contribution</u>			
T. Rowe Price Target Date Funds	30	-	30
Total - Defined Contribution	\$ 30	\$ -	\$ 30
Total External Management	\$ 383,799	\$ 103,442	\$ 487,241
Total Internal Management			\$ 22,891 *
Total Investment Management			\$ 510,132

*Internal Management expenses include salaries and fringe benefits of \$13,220 and operating expenses of \$9,671.

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 investments, reduce base fees and create better alignment of interests by moving to a lower base fee coupled with a profit share.
- 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 non-traditional investments, continue to grow co-investments (which have lower fees and profit shares).
- For external managers making non-traditional 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.

- Research firms specializing in investment management fee negotiations, considering their credentials, references, past performance in reducing investment management fees for clients, and probable cost effectiveness for PSERS, for possible retention.

Carried Interest Reported by Manager

PSERS, as part of its historic commitment to transparency, has evolved its reporting on private markets fees and costs. This past year, PSERS disclosed for the first time profit share (carried interest), net management fees, and other fund expenses by fund in one report for the calendar year ended 2019. 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 2020 and the full report is available on our website at www.psers.pa.gov

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
<u>Private Equity</u>				
Actis Emerging Markets 3, L.P.	\$ -	\$ -	\$ 255	\$ 255
Actis Global 4, L.P.	1,281	-	259	1,540
Adams Capital Management, L.P.	-	-	6	6
Aisling Capital II, L.P.	-	-	29	29
Aisling Capital III, L.P.	(32)	10,289	42	10,300
Aisling Capital IV, L.P.	776	7,182	268	8,226
Allegheny New Mountain Partners, L.P.	-	(131)	-	(131)
Apax Digital L.P.	1,632	669	587	2,888
Apax Europe VII-A, L.P.	-	5,585	16	5,601
Apollo Investment Fund IX, L.P.	2,472	-	1,102	3,574
Apollo Investment Fund VIII, L.P.	776	10,677	513	11,966
Avenue Special Situations Fund VI, L.P.	-	-	20	20
Bain Capital Asia Fund II, L.P.	657	2,212	363	3,232
Bain Capital Asia Fund III, L.P.	2,600	776	1,836	5,212
Bain Capital Asia Fund IV, L.P.	625	-	206	831
Bain Capital Fund XI, L.P.	458	9,341	67	9,867
Bain Capital Fund XII, L.P.	1,875	-	1,201	3,076
Baring Asia Private Equity Fund III, L.P.	-	2,019	494	2,513
Baring Asia Private Equity Fund IV, L.P.	341	(169)	364	537
Baring Asia Private Equity Fund V, L.P.	3,170	(5,773)	2,871	268
Baring Asia Private Equity Fund VI, L.P.	952	4,080	936	5,968
BDC III, L.P.	926	1,293	260	2,478
Blue Point Capital Partners I, L.P.	-	-	9	9
Blue Point Capital Partners II, L.P.	49	2,153	21	2,223
Blue Point Capital Partners III, L.P.	385	377	155	917
Blue Point Capital Partners IV, L.P.	976	-	239	1,215
Bridgepoint Capital II (Secondary)	-	-	-	-
Bridgepoint Europe I	-	-	-	-
Bridgepoint Europe II, L.P.	-	625	11	635
Bridgepoint Europe III, L.P.	-	-	114	114
Bridgepoint Europe IV, L.P.	(5,719)	2,636	(555)	(3,638)
Bridgepoint Europe V, L.P.	1,052	5,543	827	7,422
Bridgepoint Europe VI, L.P.	1,264	825	506	2,595
Capital International Private Equity Fund V, L.P.	108	-	140	248
Capital International Private Equity Fund VI, L.P.	509	-	512	1,021

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
Catterton Growth Partners II, L.P.	\$ 1,077	\$ -	\$ 126	\$ 1,203
Catterton Growth Partners, L.P.	508	(2,350)	103	(1,739)
Catterton Partners V, L.P.	-	-	8	8
Catterton Partners VI, L.P.	706	(1,443)	67	(669)
Catterton Partners VII, L.P.	1,528	3,989	127	5,644
Cerberus Institutional Partners V, L.P.	656	4,857	484	5,997
Cerberus Institutional Partners VI, L.P.	2,375	-	1,564	3,939
Cerberus Institutional Partners, L.P. - Series 3	(32)	74	8	50
Cerberus Institutional Partners, L.P. (Series 4)	(342)	2,429	424	2,510
Cinven Fifth Fund, L.P.	566	7,492	2,404	10,463
Cinven Fourth Fund	-	-	-	-
Cinven Sixth Fund	1,005	2,886	466	4,356
Clearlake Capital Partners IV, L.P.	584	4,454	103	5,140
Clearlake Capital Partners V, L.P.	525	7,212	428	8,164
Clearlake Capital Partners VI, L.P.	-	-	-	-
Co-Investment 2000 Fund, L.P.	-	-	207	207
Co-Investment Fund II, L.P.	-	-	233	233
Coller International Partners VI, L.P.	820	2,032	47	2,899
Coller International Partners VII, L.P.	1,342	364	137	1,843
Crestview Capital Partners	250	4,550	243	5,042
Crestview Partners II, L.P.	902	3,805	465	5,172
Crestview Partners III, L.P.	906	5,677	378	6,961
Cross Atlantic Technology Fund II, L.P.	-	-	4	4
Cross Atlantic Technology Fund, L.P.	-	-	19	19
CVC Capital Partners Asia Pacific III, L.P.	-	731	603	1,334
CVC European Equity Partners V, L.P.	19	25,336	25	25,380
DCPF VI Oil and Gas Coinvestment Fund LP	114	1,871	17	2,002
Denham Commodity Partners Fund VI, L.P.	736	(29)	120	827
Denham Mining Fund, L.P.	1,818	(0)	305	2,122
Equistone Partners Europe Fund V, L.P.	820	-	91	912
Equistone Partners Europe Fund VI, L.P.	1,313	-	380	1,693
Evergreen Pacific Partners II, L.P.	-	18	43	62
Evergreen Pacific Partners, L.P.	-	-	100	100
First Reserve Fund XII, L.P.	206	-	91	298
Gleacher Mezzanine Fund II, L.P.	-	21	23	44
Gold Hill Venture Lending 03, L.P.	35	11	15	61

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
GoldPoint Partners Co-Investment V, L.P.	\$ 369	\$ 1,221	\$ 24	\$ 1,614
GSC Recovery II, L.P.	-	-	-	-
GSC Recovery III (Parallel Fund), L.P.	-	-	-	-
Hahn & Company III, L.P.	3,265	-	935	4,200
Hahn & Company III-S, L.P.	172	-	315	488
HgCapital 7, L.P.	811	-	93	905
HgCapital 8, L.P.	1,643	-	430	2,073
HGGC Fund II, L.P.	1,154	4,273	103	5,530
HGGC Fund III, L.P.	314	7,481	637	8,431
Incline Elevate Fund, L.P.	919	-	585	1,504
Incline Equity Partners III, L.P.	-	14,672	30	14,702
Incline Equity Partners IV, L.P.	1,126	2,152	72	3,350
Incline Equity Partners V, L.P.	-	-	-	-
Insight Partners XI, L.P.	190	-	339	529
Insight Venture Partners X, L.P.	391	896	103	1,390
Irving Place Capital III SPV, L.P.	-	-	90	90
Irving Place Capital MB-PSERS II, L.P.	-	(3,649)	37	(3,612)
K4 Private Investors, L.P.	1,928	-	168	2,095
KBL Partnership, L.P.	-	-	8	8
L Catterton Growth Partners III, L.P.	1,130	5,995	485	7,610
L Catterton VIII, L.P.	1,596	3,053	705	5,353
Landmark Equity Partners XIII, L.P.	206	-	19	226
Landmark Equity Partners XIV, L.P.	341	170	54	565
Lindsay Goldberg V, L.P.	-	-	-	-
LLR Equity Partners II, L.P.	-	87	43	130
LLR Equity Partners III, L.P.	379	9,691	140	10,210
LLR Equity Partners IV, L.P.	2,159	17,766	192	20,118
LLR Equity Partners V, L.P.	3,500	4,201	1,379	9,080
Milestone Partners FS 2, L.P.	8	-	350	358
Milestone Partners III, L.P.	239	-	41	281
Milestone Partners IV, L.P.	334	(507)	266	92
NEPA Venture Fund II	-	-	3	3
New Mountain Partners III, L.P.	-	9,116	-	9,116
New Mountain Partners IV, L.P.	423	16,165	40	16,628
New Mountain Partners V, L.P.	2,372	4,789	1,754	8,915
New York Life Capital Partners I, L.P.	-	-	29	29

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
New York Life Capital Partners II, L.P.	\$ -	\$ 14	\$ 34	\$ 48
New York Life Capital Partners III-A, L.P.	-	(1,084)	55	(1,029)
New York Life Capital Partners IV-A, L.P.	77	456	96	629
NGP Natural Resources X, L.P.	750	-	64	814
NGP Natural Resources XI, L.P.	1,340	(6,019)	54	(4,624)
NGP Natural Resources XII, L.P.	3,002	-	112	3,114
North Haven Private Equity Asia IV, L.P.	1,143	4,316	584	6,043
NYLIM Mezzanine Partners II (Parallel Fund) LP	-	-	-	-
OCM Opportunities Fund VII, L.P.	-	-	21	21
OCM Opportunities Fund VII-B, L.P.	5	2	25	32
Odyssey Investment Partners Fund V, L.P.	969	-	422	1,391
Orchid Asia Fund VI, L.P.	1,189	1,064	42	2,294
Orchid Asia V, L.P.	150	128	4	282
Orchid Asia VII, L.P.	1,498	452	574	2,523
PAI Europe IV	-	35	(15)	20
PAI Europe V	180	(861)	238	(442)
PAI Europe VI	979	4,037	826	5,842
PAI Europe VII	1,431	-	1,808	3,239
Palladium Equity Partners IV, L.P.	628	(41)	427	1,014
Partners Group Secondary 2008 S.C.A., SICAR	997	144	56	1,197
Partners Group Secondary 2011 (USD), L.P. Inc.	1,012	(120)	468	1,360
Partners Group Secondary 2015 (USD) A, L.P.	1,250	511	284	2,045
Permira IV, L.P.	-	1,008	21	1,029
Perseus-Soros BioPharmaceutical Fund, L.P.	-	-	-	-
Platinum Equity Capital Partners II, L.P.	-	2,905	194	3,099
Platinum Equity Capital Partners III, L.P.	-	(2,205)	216	(1,989)
Platinum Equity Capital Partners IV, L.P.	-	5,512	1,135	6,648
Platinum Equity Capital Partners V, L.P.	1,023	-	292	1,315
Platinum Equity Capital Partners, L.P.	-	-	88	88
Platinum Equity Small Cap Fund, L.P.	3,778	-	924	4,702
PNC Equity Partners II, L.P.	-	80	38	118
Portfolio Advisors Secondary Fund III, L.P.	1,147	2,699	266	4,112
Psilos Group Partners III, L.P.	-	-	-	-
Quaker BioVentures II, L.P.	279	-	29	308
Quaker Bio-Ventures, L.P.	-	-	16	16
Sante Health Ventures III, L.P.	-	-	210	210

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Equity (continued)				
SCP Private Equity Partners I, L.P.	\$ -	\$ -	\$ -	\$ -
SCP Private Equity Partners II, L.P.	-	-	-	-
Searchlight Capital Partners II, L.P.	1,318	1,469	468	3,254
Searchlight Capital Partners III, L.P.	-	-	-	-
StarVest	0	-	20	20
StarVest Partners II (Parallel), L.P.	268	-	62	330
StepStone International Investors III L.P.	248	-	131	379
Sterling Capital Partners, L.P.	-	-	32	32
Sterling Venture Partners I, L.P.	-	-	9	9
Strategic Partners Fund II, L.P.	-	-	-	-
Strategic Partners Fund III VC, L.P.	-	-	91	91
Strategic Partners Fund III-B, L.P.	-	-	202	202
Strategic Partners Fund IV VC, L.P.	123	969	28	1,120
Strategic Partners Fund IV, L.P.	95	560	21	676
Strategic Partners Fund V, L.P.	283	1,846	128	2,257
Strategic Partners Fund VI, L.P.	593	271	178	1,042
Strategic Partners Fund VII, L.P.	1,250	3,999	588	5,838
Summit Partners Growth Equity Fund IX, L.P.	-	5,315	138	5,453
Summit Partners Growth Equity Fund VIII, L.P.	1,211	11,204	79	12,493
Summit Partners Growth Equity Fund X, L.P.	-	-	268	268
Summit Partners Venture Capital Fund III, L.P.	247	2,100	17	2,363
Summit Partners Venture Capital Fund IV, L.P.	784	3,138	107	4,029
TDH III, L.P.	-	-	-	-
Tenaya Capital IV-P, L.P.	-	(3,730)	69	(3,660)
Tenaya Capital VI, L.P.	764	(1,436)	55	(617)
Tenaya Capital VII, L.P.	2,000	5,251	106	7,357
Tenaya Capital V-P, L.P.	431	461	71	963
The Energy & Minerals Group Fund III, L.P.	1,190	-	25	1,214
Trilantic Capital Partners IV L.P.	52	(408)	46	(311)
Trilantic Capital Partners V (North America), L.P.	594	3,482	134	4,210
Trilantic Capital Partners VI (North America), L.P.	2,249	-	266	2,514
Tulco LLC	-	-	-	-
U.S. Equity Partners II, L.P.	-	-	(32)	(32)
Venor Special Situations Fund II, L.P.	718	-	315	1,033
Versa Capital Fund I, L.P.	-	-	172	172
Versa Capital Fund II, L.P.	1,544	-	548	2,092

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
<u>Private Equity (continued)</u>				
Versa Capital Fund III, L.P.	\$ 287	\$ -	\$ 1,150	\$ 1,436
Webster Capital IV, L.P.	348	(251)	125	223
Windjammer Senior Equity Fund III, L.P.	-	-	-	-
Windjammer Senior Equity Fund IV, L.P.	-	-	-	-
Total - Private Equity	\$ 99,962	\$ 279,037	\$ 48,228	\$ 427,228
<u>Private Credit</u>				
Apollo European Principal Finance Fund II (Dollar A), L.P.	516	81	(7)	590
Apollo European Principal Finance Fund III (Dollar A), LP	2,142	5,273	1,392	8,807
Avenue Energy Opportunities Fund II, L.P.	840	-	406	1,246
Avenue Energy Opportunities Fund, L.P.	1,800	-	441	2,241
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,864	-	770	2,634
Bain Capital Credit Managed Account (PSERS), L.P.	1,807	-	430	2,237
Bain Capital Credit Managed Account (PSERS), L.P. (SCF)	-	-	-	-
Bain Capital Credit Managed Account (PSERS), L.P. (SSA)	431	731	430	1,592
Bain Capital Distressed and Special Situations 2013 (A) AIV, L.P.	1,248	-	254	1,501
Bain Capital Distressed and Special Situations 2013 (A), L.P.	526	-	101	628
Bain Capital Distressed and Special Situations 2016 (A), L.P.	2,687	15	2,431	5,133
Bain Capital Distressed and Special Situations 2019, L.P.	76	-	1,833	1,909
Bain Capital Middle Market Credit 2010, L.P.	198	758	78	1,034
Bain Capital Middle Market Credit 2014, LP	1,031	7,496	171	8,697
Brigade Distressed Value Offshore Fund	1,688	-	678	2,366
Brigade Structured Credit Offshore Fund	2,860	176	246	3,282
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	2,306	-	667	2,973
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,244	-	559	1,803
Cerberus Levered Loan Opportunities Fund I, L.P.	-	-	-	-
Cerberus Levered Loan Opportunities Fund II, L.P.	-	-	-	-
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	7,706	5,342	1,470	14,517
Clearlake Opportunities Partners II, L.P.	201	84	517	802
Galton Onshore Mortgage Recovery Fund III, L.P.	74	-	246	320
Galton Onshore Mortgage Recovery Fund IV, L.P.	973	-	710	1,683
Galton Residential Mortgage-Backed Securities	1,240	1,222	-	2,462
Hayfin SOF II USD Co-Invest, L.P.	88	-	74	162
Hayfin SOF II USD, L.P.	2,065	-	665	2,730
HayFin Special Opportunities Credit Fund (Parallel), L.P.	582	101	94	777
ICG Europe Fund V, L.P.	649	582	391	1,623

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
<u>Private Credit (continued)</u>				
ICG Europe Fund VI, L.P.	\$ 1,184	\$ 3,142	\$ 219	\$ 4,546
ICG Europe Fund VII Feeder SCSp	1,786	2,920	133	4,839
International Infrastructure Finance Company Fund II, L.P.	585	1,806	368	2,760
International Infrastructure Finance Company Fund, L.P.	998	1,251	326	2,574
Latitude Management Real Estate Capital IV, Inc.	803	-	116	919
LBC Credit Partners II, LP	-	-	-	-
LBC Credit Partners III, L.P.	1,277	-	244	1,521
LBC-P Credit Fund, L.P.	5,360	3,182	642	9,183
Oaktree Loan Fund 2X, LP	-	-	92	92
Pacific Investment Management Company, LLC	(0)	194	44	238
Park Square - PSERS Credit Opportunities Fund, L.P. (COPS)	2,349	-	714	3,063
Park Square - PSERS Credit Opportunities Fund, L.P. (ELP)	255	915	1,415	2,585
PIMCO BRAVO Fund III Onshore Feeder, LP	1,550	4,632	871	7,052
PSERS TAO Partners Parallel Fund, L.P. - (TAO 2.0)	1,669	3,459	974	6,102
PSERS TAO Partners Parallel Fund, L.P. - (TAO 3.0)	1,578	3,277	992	5,847
PSERS TAO Partners Parallel Fund, L.P. - (TAO Contingent)	-	-	-	-
Sankaty Credit Opportunities IV, L.P.	570	1,215	135	1,920
SSG Capital Partners V Sidecar, L.P.	1,403	-	267	1,671
SSG Capital Partners V, L.P.	-	-	66	66
Summit Partners Credit Fund II, L.P.	-	851	584	1,435
TCI Real Estate Partners Fund III, L.P.	-	1,420	99	1,518
TOP NPL (A), L.P.	26	519	189	734
TPG Opportunities Partners II (A), L.P.	105	261	162	527
TPG Opportunities Partners III (A), L.P.	885	2,842	351	4,078
TSSP Opportunities Partners IV, L.P.	2,244	15	480	2,738
Varde Scratch and Dent Feeder I-A, L.P., The	774	226	331	1,331
Varde Scratch and Dent Feeder, L.P., The	630	10	209	849
Total - Private Credit	\$ 62,871	\$ 53,996	\$ 25,071	\$ 141,939
<u>Private Real Estate</u>				
812 Market Street	\$ 30	\$ -	\$ -	\$ 30
AG Core Plus Realty Fund III, L.P.	202	375	63	640
AG Europe Realty Fund II, L.P.	1,011	2,660	868	4,539
AG Europe Realty Fund III, L.P.	-	-	-	-
AG Realty Fund X, L.P.	886	-	762	1,648
Almanac Realty Securities V, L.P.	28	386	6	420

Section 3 - Investment Information

Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
<u>Private Real Estate (continued)</u>				
Almanac Realty Securities VI, L.P.	\$ 101	\$ (604)	\$ 11	\$ (492)
Almanac Realty Securities VII, L.P.	407	938	33	1,378
Almanac Realty Securities VIII, L.P.	930	-	65	995
Angelo Gordon Core Plus Realty Fund IV, L.P.	1,184	582	413	2,179
Apollo Real Estate Finance Corporation	-	-	37	37
Ares European Real Estate Fund III, L.P.	-	-	67	67
Ares European Real Estate Fund IV, L.P.	401	737	265	1,403
Ares U.S. Real Estate Fund IX, L.P.	353	-	140	493
Ares U.S. Real Estate Fund VII, L.P.	-	-	294	294
Ares U.S. Real Estate Fund VIII, L.P.	366	693	38	1,097
Atlanta Marriott	131	-	-	131
Avenue Real Estate Fund (Parallel) L.P.	744	-	256	999
Bell Institutional Fund IV, LLC	-	4	76	80
Bell Institutional Fund V, L.P.	888	1,792	733	3,414
Bell Institutional Fund VI, L.P.	764	-	1,013	1,777
Bell Institutional Fund VII, L.P.	322	-	39	361
Big Valley Ranch	248	-	-	248
BlackRock Asia Property Fund III L.P.	-	-	(16)	(16)
BlackRock Europe Property Fund III L.P.	-	-	889	889
Blackstone Real Estate Debt Strategies II, L.P.	30	1	3	33
Blackstone Real Estate Debt Strategies III, L.P.	606	414	7	1,027
Blackstone Real Estate Partners Europe III, L.P.	282	31	61	374
Blackstone Real Estate Partners Europe IV, L.P. (USD)	287	517	25	829
Blackstone Real Estate Partners V, L.P.	-	612	3	615
Blackstone Real Estate Partners VI, L.P.	-	1,201	(13)	1,187
Blackstone Real Estate Partners VII, L.P.	875	4,025	80	4,981
Blackstone Real Estate Partners VIII, L.P.	1,006	3,024	428	4,458
BPG/PSEERS Co-Investment Fund	-	6	3	9
Brookfield Strategic Real Estate Partners II, L.P.	2,359	5,836	158	8,354
Brookfield Strategic Real Estate Partners III, L.P.	5,235	-	710	5,945
Brookfield Strategic Real Estate Partners, L.P.	950	28,260	339	29,549
Cabot Industrial Core Fund, L.P.	678	10	99	787
Cabot Industrial Value Fund IV, L.P.	-	0	7	7
Cabot Industrial Value Fund V, L.P.	750	348	105	1,204
Cabot Industrial Value Fund VI, L.P.	-	-	-	-
Cabot U.K. Core-Plus Industrial Fund SCSp	-	-	-	-

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Table 11.4

**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

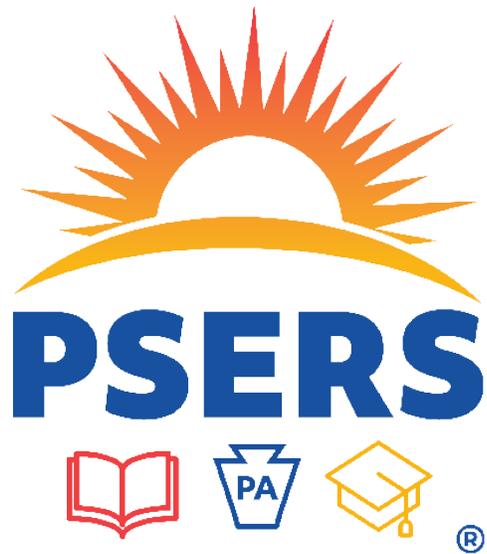
<u>Manager</u>	<u>Net Management</u>	<u>Net Carried Interest</u>	<u>Partnership Expenses</u>	<u>Total</u>
Private Real Estate (continued)				
Carlyle Realty Partners III, L.P.	\$ -	\$ 4,258	\$ 109	\$ 4,367
Carlyle Realty Partners IV, L.P.	15	-	127	141
Carlyle Realty Partners V, L.P.	138	17,205	77	17,419
Carlyle Realty Partners VI, L.P.	155	72	228	456
Carlyle Realty Partners VII, L.P.	547	1,889	132	2,568
Carlyle Realty Partners VIII, L.P.	829	-	128	956
Centerline High Yield CMBS III - Loan/Stock	27	-	-	27
DRA Growth and Income Fund IX, LLC	1,898	-	161	2,059
DRA Growth and Income Fund VI, L.P.	-	1,191	37	1,228
DRA Growth and Income Fund VII, LLC	620	9,780	233	10,634
DRA Growth and Income Fund VIII, LLC	1,500	225	137	1,862
DRA Growth and Income Fund X, L.P.	20	-	106	126
Exeter Core Industrial Club Fund II, L.P.	638	545	124	1,307
Exeter Core Industrial Fund III, L.P.	-	-	-	-
Exeter Industrial Value Fund II, L.P.	1	6	44	51
Exeter Industrial Value Fund III, L.P.	230	3,199	84	3,512
Exeter Industrial Value Fund IV, L.P.	1,150	2,090	150	3,391
Exeter Industrial Value Fund V, L.P.	-	-	-	-
Five North 5th Street	52	-	-	52
Fortress Investment Fund IV, L.P.	-	-	72	72
Fortress Investment Fund V, L.P.	-	-	251	251
Fortress Investment Fund, L.P.	-	-	15	15
Golden Hills Ranch	151	-	-	151
Keystone Portfolio	719	-	1,192	1,912
LAI Strategic Realty Investors, L.P.	-	-	15	15
Latitude Management Real Estate Capital III, L.P.	876	(25)	95	946
Legg Mason Real Estate Capital II	-	-	-	-
LEM Multifamily Senior Equity Fund IV, L.P.	563	3,753	145	4,460
LEM Multifamily Senior Equity Fund V, L.P.	1,000	-	1,862	2,862
LEM RE HY Debt & Pfd Equity Fund III, L.P.	65	415	51	530
LEM Real Estate Mezzanine Fund II, L.P.	-	-	92	92
Lorida Groves	352	-	-	352
Maricopa Citrus	42	-	-	42
Paramount Group Real Estate Fund VII, L.P.	6	-	47	53
Peabody Global Real Estate Partners	-	-	-	-
Pramerica Real Estate Capital VI, L.P.	477	383	-	860

Section 3 - Investment Information

Table 11.4

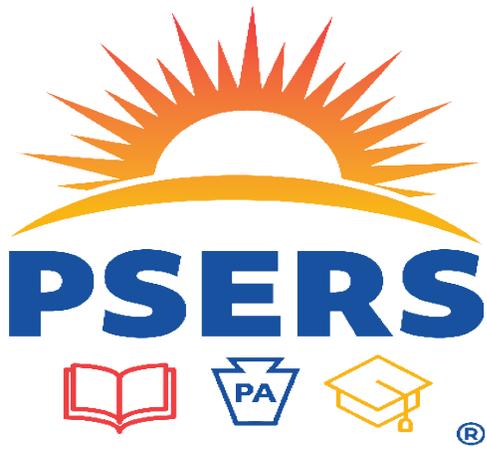
**Carried Interest Reported by Manager
Calendar Year ended December 31, 2019
(Dollar amounts in Thousands)**

<u>Manager</u>	<u>Net</u> <u>Management</u>	<u>Net Carried</u> <u>Interest</u>	<u>Partnership</u> <u>Expenses</u>	<u>Total</u>
<u>Private Real Estate (continued)</u>				
Prudential Senior Housing Partners IV, L.P.	\$ 517	\$ 17	\$ 61	\$ 595
Prudential Senior Housing V, L.P.	656	490	217	1,362
PSERS YES Holdings, L.P.	-	-	90	90
RCG Longview Debt Fund V, L.P.	55	-	180	235
RCG Longview Debt Fund VI, L.P.	277	154	324	755
RCG Longview Equity Fund, L.P.	14	-	33	47
Rivercenter Mall	57	-	-	57
Security Capital Preferred Growth (Public)	1,205	-	211	1,415
Silverpeak Legacy/PSERS, L.P.	-	2,456	164	2,621
Stockbridge Real Estate Fund II, L.P.	189	-	66	256
Stockbridge Real Estate Fund III, L.P.	298	-	72	370
Stockbridge Real Estate Fund, L.P.	3,028	14,866	426	18,321
Strategic Partners Fund IV RE, L.P.	-	-	-	-
Strategic Partners III RE, L.P.	-	-	-	-
The Galleria at Ft Lauderdale	571	-	-	571
Townsend Grove	198	-	-	198
UBS Trumbull Property Income Fund	330	-	21	351
Total - Private Real Estate	\$ 41,518	\$ 114,816	\$ 15,647	\$ 171,980
Grand Total	\$ 204,351	\$ 447,849	\$ 88,947	\$ 741,147



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Commitment to Pennsylvania-Based Investments



PUBLIC SCHOOL EMPLOYEES'
RETIREMENT SYSTEM

Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms (as of June 30, 2020)

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 FY 2020, investment management fees paid to external firms managing PSERS' assets from offices located in Pennsylvania amounted to \$27.9 million, or 5.7% of the total external investment manager fees.

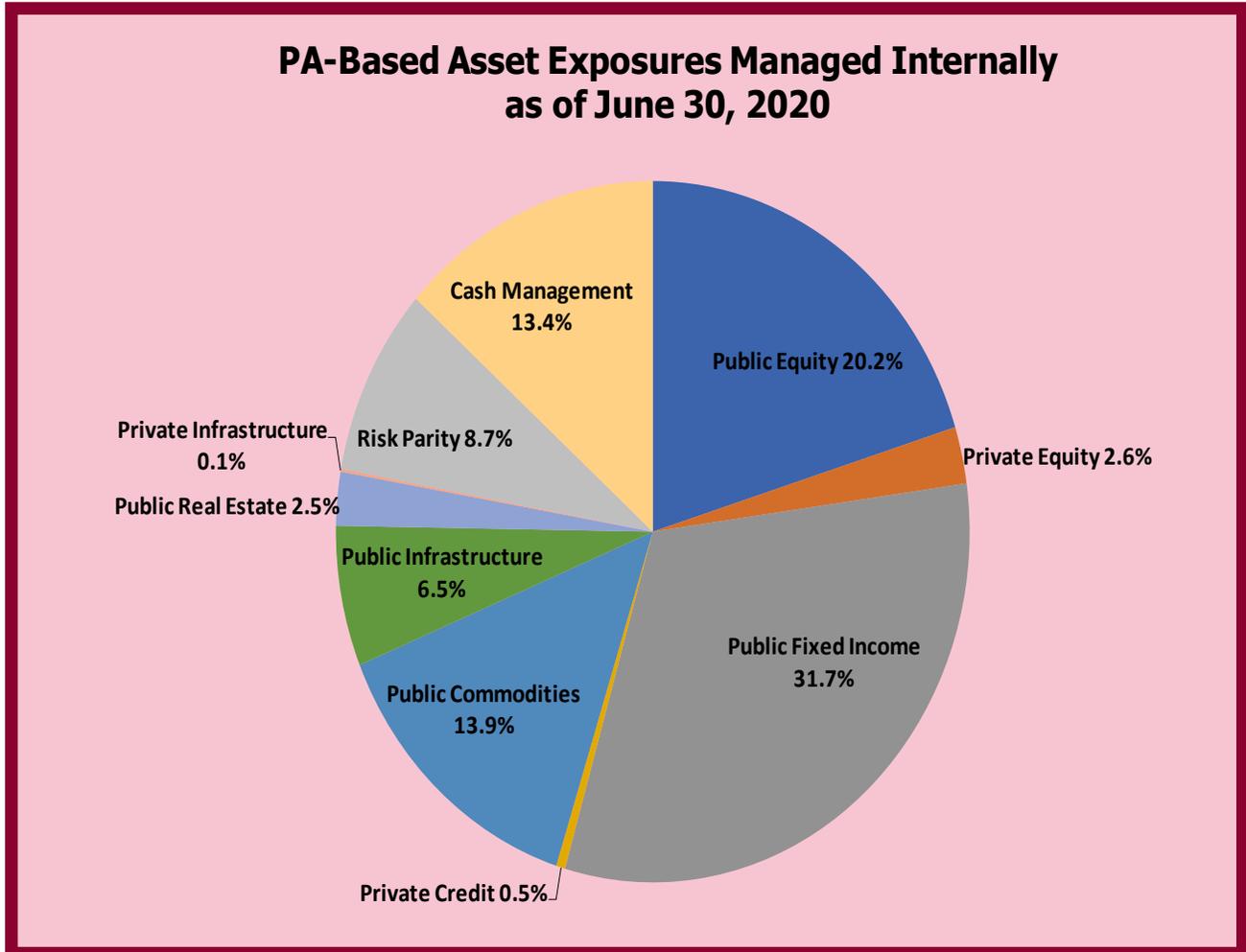
Table 12.1 lists the asset exposures managed internally by PSERS, as of June 30, 2020.

Table 12.1			
Pennsylvania-Based Asset Exposures Managed Internally			
(as of June 30, 2020)			
<u>Asset Class</u>	<u>Market Value</u>		<u>% of Total</u>
	<u>(in millions)</u>		
Public Equity	\$	5,690.5	20.1%
Private Equity		737.7	2.6%
Public Fixed Income		8,931.4	31.7%
Private Credit		128.4	0.5%
Public Commodities		3,910.1	13.9%
Public Infrastructure		1,826.0	6.5%
Public Real Estate		697.2	2.5%
Private Infrastructure		37.7	0.1%
Risk Parity		2,449.3	8.7%
Cash Management		3,789.1	13.4%
Totals	\$	28,197.4	100%

Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms (continued)

Chart 12.1 displays the distribution of exposures managed internally as of June 30, 2020.



Section 3 - Investment Information

Table 12.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2020.

Table 12.2	
Pennsylvania-Based External Managers	
Public Equity:	Private Equity:
Radcliffe Capital Management, L.P.	Adams Capital Management, L.P.
	Co-Investment 2000 Fund, L.P.
	Co-Investment Fund II, L.P.
Public Fixed Income:	
Penn Mutual Management, LLC	Cross Atlantic Technology Fund II
Radcliffe Capital Management, L.P.	Cross Atlantic Technology Fund, L.P.
SEI Investments Company	Incline Equity Partners III, L.P.
	Incline Equity Partners IV, L.P.
	Incline Equity Partners V, L.P.
Private Credit:	
International Infrastructure Finance Company Fund, L.P.	LLR Equity Partners II, L.P.
LBC Credit Partners III, LP	LLR Equity Partners III, L.P.
LBC Credit Partners-P Credit Fund, LP	LLR Equity Partners IV, L.P.
	LLR Equity Partners V, L.P.
Private Real Estate:	
BPG/PSERS Co-Investment Fund	Milestone Partners FS 2, L.P.
Charter Oak Advisors, Inc.	Milestone Partners III, L.P.
Exeter Core Industrial Club Fund II, L.P.	Milestone Partners IV, L.P.
Exeter Industrial Core Fund III, L.P.	NEPA Venture Fund II
Exeter Industrial Value Fund II, L.P.	PNC Equity Partners II, L.P.
Exeter Industrial Value Fund III, L.P.	SCP Private Equity Partners II, L.P.
Exeter Industrial Value Fund IV, L.P.	Versa Capital Fund I, L.P.
Exeter Industrial Value Fund V, L.P.	Versa Capital Fund II, L.P.
GF Management	Versa Capital Fund III, L.P.
LEM Multifamily Fund V, L.P.	
LEM Multifamily Senior Equity Fund IV, L.P.	
LEM RE HY Debt & Preferred Equity Fund III, L.P.	
Property Management, Inc.	
Private Infrastructure:	
International Infrastructure Finance Company Fund II, L.P.	

Investments in Pennsylvania-Based Companies (as of June 30, 2020)

Where investment characteristics including yield, risk, and liquidity are equivalent, the Board's policy favors investments that have a positive impact on the economy of Pennsylvania. 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 \$900 million to 4 partnerships. From the program inception to June 30, 2020, 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 \$16.7 billion to 140 partnerships. From the program inception to June 30, 2020, PSERS has committed capital to 23 partnerships headquartered in Pennsylvania.

Private Equity

PSERS' Private Equity program has committed \$32.0 billion to 282 partnerships. From the program inception to June 30, 2020, PSERS has committed capital to 30 partnerships headquartered in Pennsylvania.

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

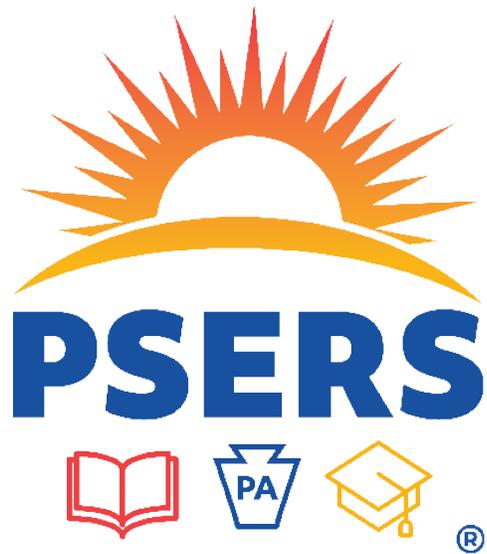
In April 2015, PSERS' Board approved a \$250 million commitment for PSERS to co-investment in portfolio companies based in Pennsylvania. The portfolio companies are sourced from funds where PSERS or its consultant is an investor. As of June 30, 2020, PSERS has invested \$60.4 million. The market value of the investments total \$56.5 million. The number of employees, payroll, and market value are included within their respective asset class in Table 12.3.

Section 3 - Investment Information

Table 12.3 displays Pennsylvania-based investments and other statistics at June 30, 2020 (\$'s in millions):

Table 12.3					
Statistics of Pennsylvania-Based Investments					
<u>Asset Class</u>	<i>Total PA Market Value (PSERS' Portion)</i>	<i>Total PA Market Value (Total Invested)</i>	<i># of People Employed</i>	<i>Payroll</i>	
US Equities	\$ 83.5	\$ 83.5	\$ *	\$ *	\$ *
Fixed Income	136.8	136.8	*	*	*
Private Real Estate	100.0	1,362.2	96.0	3.8	3.8
Private Markets:					
Venture Capital	347.1	2,710.1	1,806.0	53.0	53.0
Private Equity	1,095.1	18,173.6	34,962.0	413.5	413.5
Private Debt	457.3	17,420.4	16,173.0	90.9	90.9
Total	\$ 2,219.7	\$ 39,886.6	\$ 53,037.0	\$ 561.2	\$ 561.2

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



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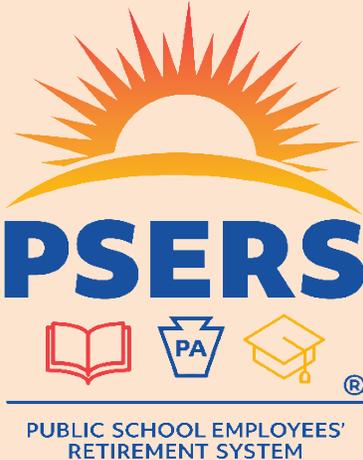
PSERS BUDGET REPORT - FY 2021-2022

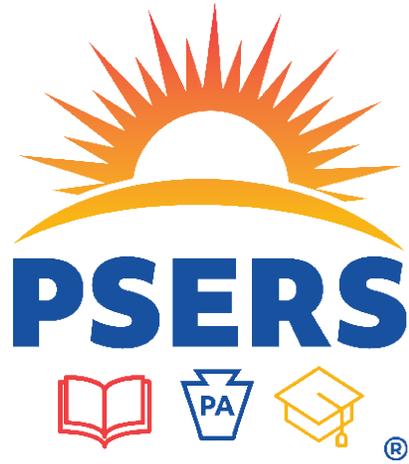


SECTION 4 - POSTEMPLOYMENT HEALTHCARE PROGRAMS

Health Options Program Tab 13

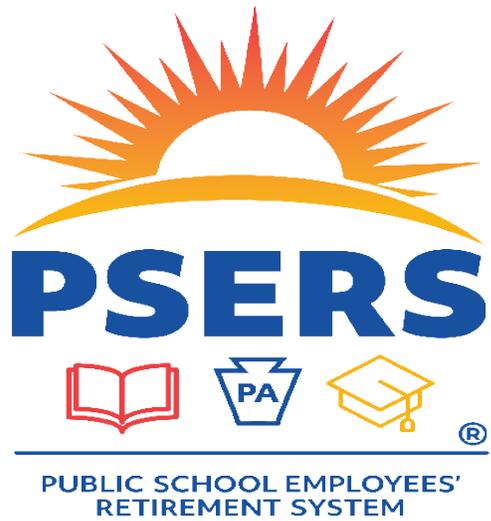
Premium Assistance Program Tab 14





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Health Options Program



Health Options Program

Pursuant to Sec. 8502.2, 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, 2021 there are 122,341 participants (103,399 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, 2020 to January 1, 2021.

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 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, 2021. 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 Request for Proposal (RFP) for a Third Party Administrator (TPA) for the HOP and Premium Assistance Programs PSERS RFP 2020-2. Based on the total scores for all bid proposal categories, Trustmark Health Benefits, Inc. was determined to be the successful bidder. The Retirement Board accepted the results of the RFP process and awarded Trustmark the contract with an initial term of three (3) years beginning January 1, 2021, with options

to renew the contract, upon mutual consent of the parties, annually for two (2) additional years.

The Retirement Board issued an RFP for retiree Dental Benefits PSERS RFP 2020-3. Based on the total scores for all bid proposal categories, Metropolitan Life Insurance Company (MetLife), was determined to be the successful bidder. The Retirement Board accepted the results of the RFP process and awarded MetLife the contract with an initial term of two (2) years beginning January 1, 2021, with options to renew the contract, upon mutual consent of the parties, annually for three (3) additional years.

The Retirement Board issued an RFP for retiree Vision Benefits PSERS RFP 2020-4. Based on the total scores for all bid proposal categories, EyeMed Vision Care (EyeMed) was determined to be the successful bidder. The Retirement Board accepted the results of the RFP process and awarded EyeMed the contract with an initial term of two (2) years beginning January 1, 2021, with options to renew the contract, upon mutual consent of the parties, annually for three (3) additional years.

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 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 page shows a summary of the plans and premium rates paid by participants:

Section 4 - Other PSERS Programs

Health Options Program (continued)

Standard Benefit	2020	2021
Deductible	\$435	\$445
Initial Coverage Limit	\$4,020	\$4,130
Out-of-Pocket Threshold	\$6,350	\$6,550
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit		
Generic	\$3.60	\$3.70
Other	\$8.95	\$9.20

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.

Medicare prescription drug plans are required to provide 75% coverage for generic drugs in the Coverage Gap for 2020 and beyond. 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:	2020 Medicare Rx Option	2021 Medicare Rx Option
Generic Drugs	25%	25%
Brand Drugs	25% (after 70% manufacturer discount and 5% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)
Non-preferred Brand Rx	25% (after 70% manufacturer discount and 5% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)

Note: The brand-name drug discount began in 2011 at 50% and increased to 75% in 2020 (and beyond).

Section 4 - Other PSERS Programs

Health Options Program (continued)

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 2021 option selection period conducted in the fall of 2020. The following is a list of HOP plans as of January 1, 2021:

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 V02 PPO	Aetna Premier Open Choice PPO
Capital Blue Cross BlueJourney PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue (80-70 Plan)
Highmark Security Blue HMO POS	Highmark PPO Blue (High Option)
Independence Blue Cross Keystone 65 HMO (\$5/\$40)	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 2021

compared to the 2020 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	2020	2021	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$117	\$117	0%
Value Medical Plan w/ Value Medicare Rx Option	\$140	\$140	0%
Value Medical Plan w/ Basic Medicare Rx Option	\$186	\$186	0%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$245	\$245	0%
HOP Medical Plan	\$203	\$207	2%
HOP Medical Plan w/ Value Medicare Rx Option	\$226	\$230	2%
HOP Medical Plan w/ Basic Medicare Rx Option	\$272	\$276	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$331	\$335	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$241	\$242	0%
CBC BlueJourney PPO	\$246	\$250	2%
Highmark FreedomBlue PPO	\$336	\$342	2%
IBC Keystone 65 Select HMO (\$5/\$40)	\$128	\$132	3%
UPMC PSERS HOP Custom HMO	\$257	\$243	(5)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$568	\$547	(4)%
Aetna Medicare P01 PPO	\$453	\$441	(3)%
IBC Keystone 65 Select HMO (\$15/\$20)	\$381	\$393	3%
IBC Personal Choice 65 PPO	\$771	\$794	3%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2020	2021	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$115	\$115	0%
Value Medical Plan w/ Value Medicare Rx Option	\$138	\$138	0%
Value Medical Plan w/ Basic Medicare Rx Option	\$184	\$184	0%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$243	\$243	0%
HOP Medical Plan	\$194	\$198	2%
HOP Medical Plan w/ Value Medicare Rx Option	\$217	\$221	2%
HOP Medical Plan w/ Basic Medicare Rx Option	\$263	\$267	2%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$322	\$326	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$218	\$216	(1)%
CBC BlueJourney PPO	\$246	\$250	2%
Highmark SecurityBlue HMO POS	\$248	\$253	2%
UPMC PSERS HOP Custom HMO	\$257	\$243	(5)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P01 PPO	\$409	\$395	(3)%
Highmark FreedomBlue PPO	\$317	\$323	2%

North & Central Region: (All other counties in Pennsylvania)	2020	2021	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$102	\$102	0%
Value Medical Plan w/ Value Medicare Rx Option	\$125	\$125	0%
Value Medical Plan w/ Basic Medicare Rx Option	\$171	\$171	0%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$230	\$230	0%
HOP Medical Plan	\$175	\$179	2%
HOP Medical Plan w/ Value Medicare Rx Option	\$198	\$202	2%
HOP Medical Plan w/ Basic Medicare Rx Option	\$244	\$248	2%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$303	\$307	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$177	\$169	(5)%
CBC BlueJourney PPO	\$246	\$250	2%
Highmark FreedomBlue PPO	\$243	\$248	2%
UPMC PSERS HOP Custom HMO*	\$257	\$243	(5)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$366	\$342	(7)%
Aetna Medicare P01 PPO	\$299	\$280	(6)%
Highmark SecurityBlue HMO POS	\$297	\$303	2%
CBC BlueJourney HMO	\$198	\$198	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	2020	2021	Increase
Enhanced Medicare Rx Only	\$128	\$128	0%
Basic Medicare Rx Only	\$69	\$69	0%
Value Medicare Rx Only	\$23	\$23	0%

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 2021 compared to the 2020 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees.

All Regions	2020	2021	Increase
HOP Pre-65 Medical Plan			
HOP Pre-65 Medical Plan (Single Coverage)	\$889	\$941	6%
Pre-65 Medical Plan w/ Prescription Drugs	\$1,001	\$1,060	6%

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2020	2021	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,628	\$2,113	30%
CBC PPO	\$1,264	\$1,371	8%
Highmark PPOBlue (80-70 Plan)	\$1,754	\$1,287	(27)%
IBC POS (\$20-\$40/\$250)	\$2,085	\$2,273	9%
UPMC Business Advantage	\$1,383	\$1,448	5%
Legacy Managed Care Plans (no new enrollments)			
Aetna HMO Plan	\$1,528	\$1,973	29%
Aetna Value Open Choice PPO	\$1,408	\$1,828	30%
IBC Personal Choice PPO	\$2,227	\$2,424	9%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2020	2021	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,628	\$2,113	30%
CBC PPO	\$1,264	\$1,371	8%
Highmark PPOBlue (80-70 Plan)	\$1,754	\$1,287	(27)%
UPMC Business Advantage	\$1,383	\$1,448	5%
Legacy Managed Care Plans (no new enrollments)			
Aetna HMO Plan	\$1,528	\$1,973	29%
Aetna Value Open Choice PPO	\$1,408	\$1,828	30%
Highmark PPOBlue (High Option)	\$2,314	\$1,760	(24)%
North & Central Region: (All other counties in Pennsylvania)			
	2020	2021	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,628	\$2,113	30%
CBC PPO	\$1,264	\$1,371	8%
Highmark PPOBlue (80-70 Plan)	\$1,754	\$1,287	(27)%
UPMC Business Advantage*	\$1,383	\$1,448	5%
Legacy Managed Care Plans (no new participants)			
Aetna HMO Plan	\$1,528	\$1,973	29%
Aetna Value Open Choice PPO	\$1,408	\$1,828	30%
Highmark PPOBlue (High Option)	\$2,314	\$1,760	(24)%
CBC HMO	\$1,827	\$1,935	6%

*Not available in all North & Central Region counties.

Section 4 - Other PSERS Programs

Health Options Program (continued)

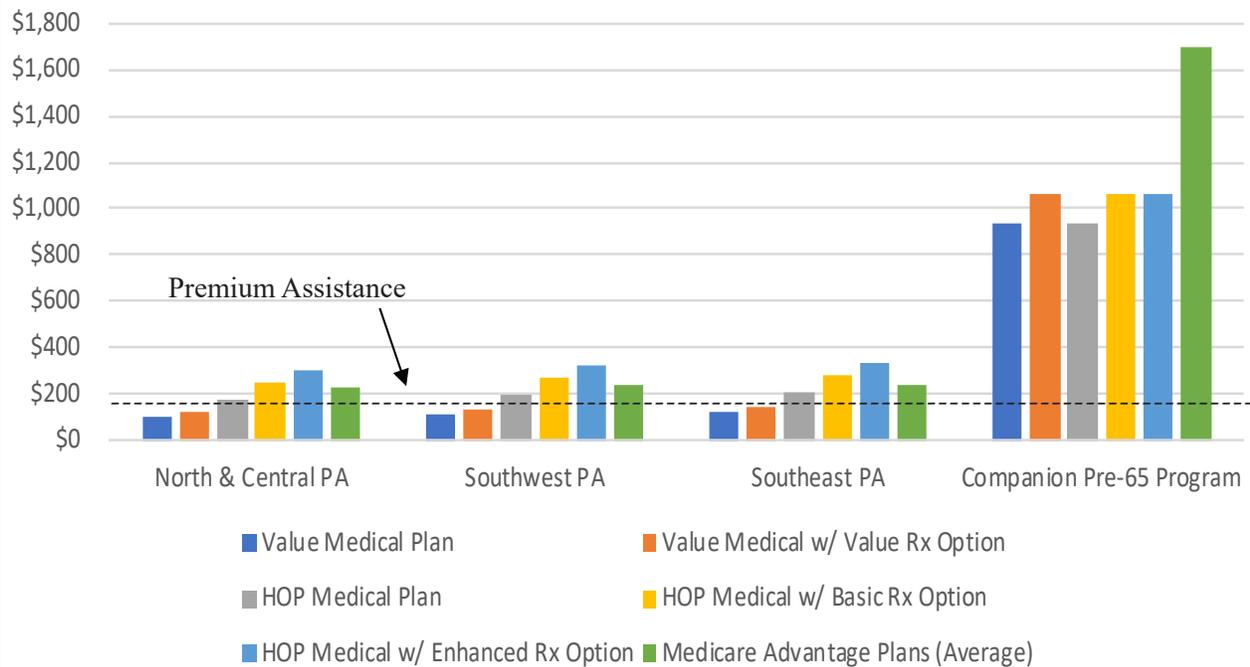
HOP Premiums Compared to the PSERS Premium Assistance Benefit

Chart 13.1 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 payments equal to the lesser of \$100 per month or their

out-of-pocket monthly health insurance premium. 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.

Chart 13.1

2021 Comparison of HOP Premium Rates and Premium Assistance Benefits



2021	North & Central PA	Southwest PA	Southeast PA	Companion Pre-65 Program
Value Medical Plan	\$102	\$115	\$117	\$941
Value Medical w/ Value Rx Option	\$125	\$138	\$140	\$1,060
HOP Medical Plan	\$179	\$198	\$207	\$941
HOP Medical w/ Basic Rx Option	\$248	\$267	\$276	\$1,060
HOP Medical w/ Enhanced Rx Option	\$307	\$326	\$335	\$1,060
Medicare Advantage Plans (Average)	\$228	\$241	\$242	\$1,698
Premium Assistance	\$100	\$100	\$100	\$100

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

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Enrollment

As of January 1, 2021 there are 122,341 dependents) in the HOP. The total numbers of participants (103,399 retirees plus their retirees by Option are:

Individuals Eligible for Medicare	Retirees	Participants
HOP Medical w/ Basic Medicare Rx Option	48,316	57,581
HOP Medical w/ Enhanced Medicare Rx Option	29,902	35,012
HOP Medical w/ Value Medicare Rx Option	2,336	2,588
HOP Medical Plan (no Rx)	9,455	10,486
HOP Enhanced Rx Only	92	112
HOP Basic Rx Only	198	251
HOP Value Rx Only	25	28
HOP Value Medical Only	59	68
HOP Value Medical w/ Enhanced Medicare Rx Option	10	16
HOP Value Medical w/ Basic Medicare Rx Option	40	57
HOP Value Medical w/ Value Medicare Rx Option	266	332
Highmark PPO/Legacy HMO	9,648	12,071
Keystone East HMO/IBC Legacy PPO	702	815
CBC PPO/Keystone Central Legacy HMO	685	866
UPMC HMO	1,053	1,375
Aetna PPO/Legacy HMO	386	446
Total Medicare Eligible	103,173	122,104
Individuals Not Eligible for Medicare		
HOP Pre-65 Medical Plan w/ Rx Coverage	136	141
HOP Pre-65 Medical Plan	59	60
Highmark PPO	4	4
CBC PPO/Keystone Central Legacy HMO	18	21
Keystone East HMO/IBC Legacy PPO	1	1
Aetna PPO/Legacy HMO	6	8
UPMC Business Advantage	2	2
Total Not Eligible for Medicare	226	237
Total in HOP	103,399	122,341

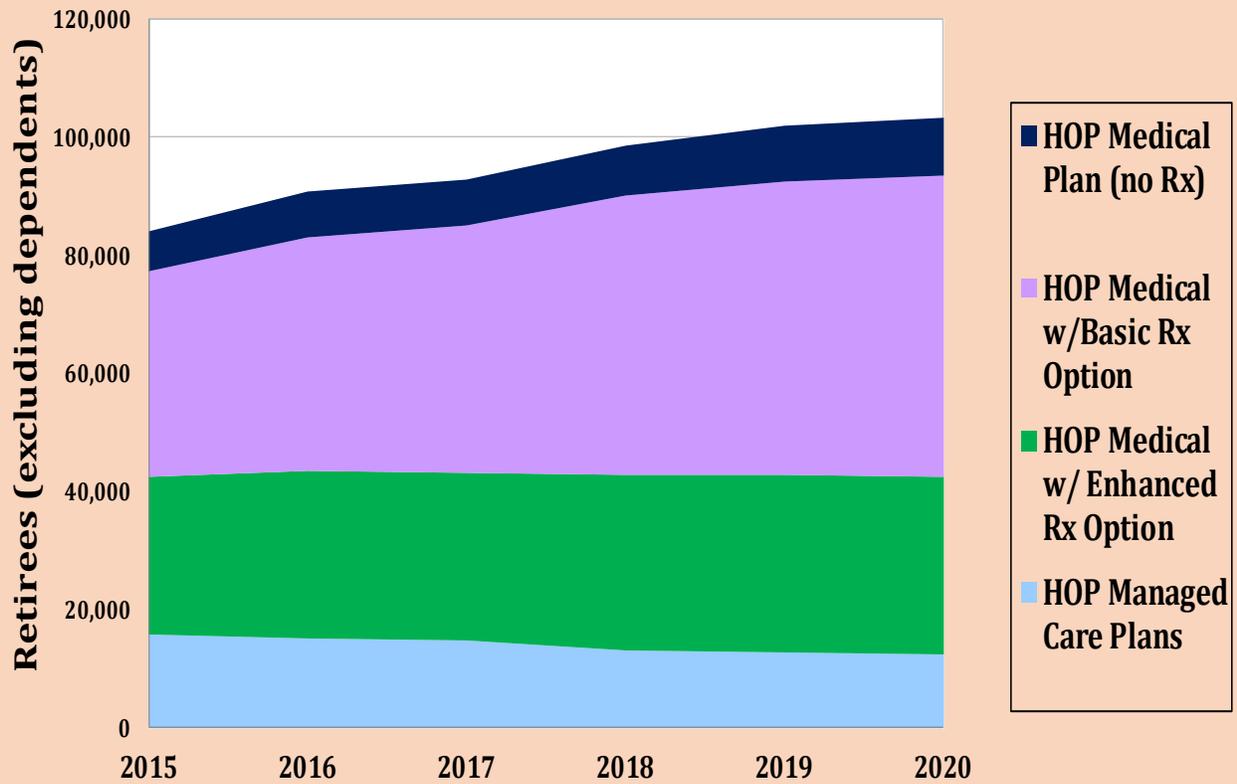
Section 4 - Other PSERS Programs

Health Options Program (continued)

Enrollment in the PSERS' HOP continues to increase. As illustrated by Chart 13.2, the number of retirees participating in the HOP has increased 37% over the past 5 years.

Chart 13.2

HOP Enrollment of Retirees Eligible for Medicare



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). Effective 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 standalone basis and participants must be enrolled in either the HOP Medical Plan or the Value Medical Plan.

Enrollment is typically limited to the initial offering or upon a qualifying event. For 2021, all HOP participants were given the opportunity to elect combined dental and vision benefits during a special open enrollment period, with benefits effective January 1, 2021.

As of January 1, 2021 there are 22,829 participants (17,456 retirees plus their dependents) in the HOP voluntary dental and vision program. The total numbers of retirees by year since program inception:

Dental Enrollment Per Year (As of January 1)	Retirees	Participants
2021*	17,456	22,829
2020	16,729	18,864
2019	14,482	16,436
2018	11,535	13,099
2017	8,497	9,701

*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 5,000 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 \$499.7 million during the 2021 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 13.1 displays the breakdown of these sources of income (Dollar amounts in millions):

Table 13.1 Income	Calendar Year 2021
Participant Contributions	\$417.0
CMS - Medicare Prescription Drug Payments	\$82.4
Interest Income	\$0.3
Total	\$499.7

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 85,015 of the 103,399 HOP retirees receive Premium Assistance. This accounts for nearly \$93 million of the \$113 million annual benefit expense of the Premium Assistance Program. The following Premium

Assistance Program section provides additional information.

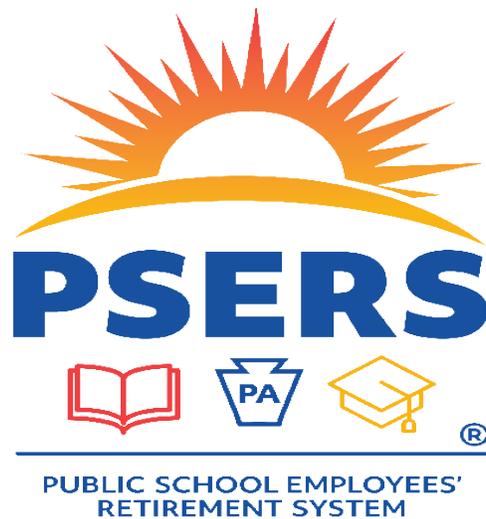
Contributions and interest income pay for the benefits provided to HOP participants plus administrative expenses. Table 13.2 displays the breakdown of the benefit expenses (Dollar amounts in millions).

Table 13.2 Benefit Expense	Calendar Year 2021
Self-funded Hospital, Medical & Major Medical Benefits	\$236.3
Self-funded Prescription Drug Benefits	\$189.8
Insured Managed Care and Dental Premiums	\$63.1
Total	\$489.2

In addition to the benefit expenses identified above, the HOP will pay \$11.4 million in enrollment and administrative expenses including reimbursing PSERS for its expenses.

As of September 30, 2020, HOP had net assets of \$331 million held in trust to pay the expenses of HOP for the exclusive benefit of participants.

Premium Assistance Program



Section 4 - Other PSERS Programs

Premium Assistance Program

In accordance with Sec. 8509 of the Public School Employees' Retirement Code 24 Pa. C.S. § 8509, 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, 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.

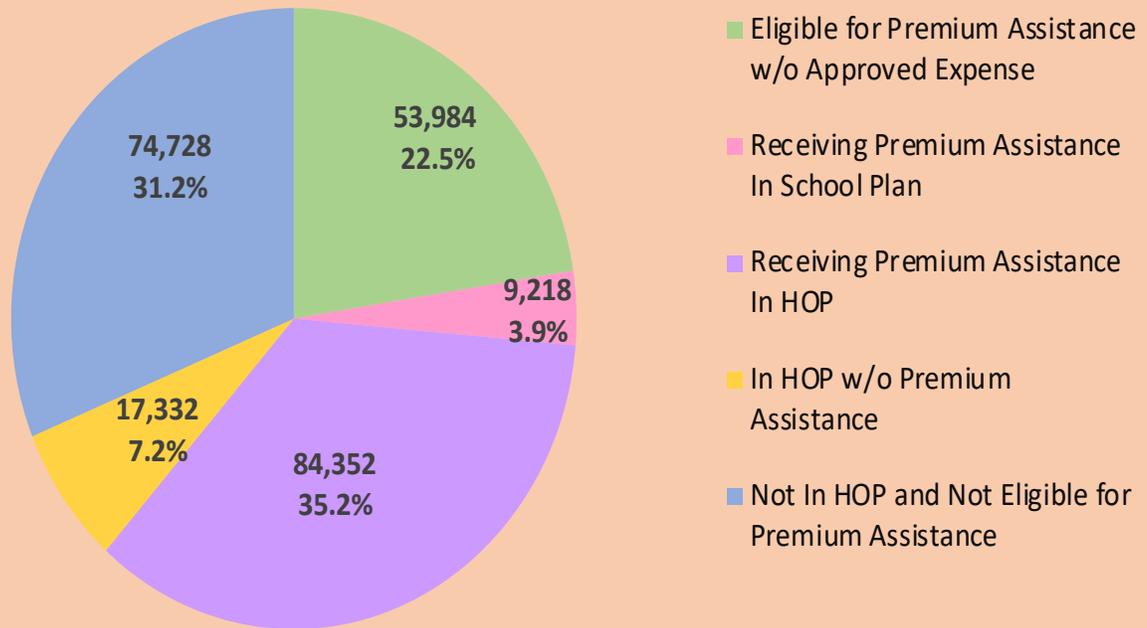
Enrollment

As of June 30, 2020, PSERS had 239,614 retirees receiving a monthly benefit. Of these retirees 147,554 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, 53,984 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 93,570 retirees receiving premium assistance benefits, 84,352 are enrolled in HOP and 9,218 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 14.1:

Chart 14.1

Retiree Population by Premium Assistance Status



Section 4 - Other PSERS Programs

Premium Assistance Program (continued)

June 30, 2020	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense ¹	53,984	22.5%
Receiving Premium Assistance In School Plan ¹	9,218	3.9%
Receiving Premium Assistance In HOP ¹	84,352	35.2%
In HOP w/o Premium Assistance	17,332	7.2%
Not In HOP or Eligible for Premium Assistance	74,728	31.2%
Total Retiree Population	239,614	100.0%

¹ Meeting the service, service and age at termination of school employment or retirement type requirements.

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 Code¹. The contribution needed during FY2021/22 is 0.80% of payroll.

For the year ended June 30, 2020, employer contributions equaled \$117.9 million and net investment income totaled \$1.8 million. During this period, PSERS paid Premium Assistance benefits equaling \$113.3 million and incurred administrative expenses of \$1.1 million.

As of September 30, 2020, the Premium Assistance Program had net assets of \$127.0 million.

¹§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.