

# Budget Report

Appropriations  
Committee

Fiscal Year 2018-2019



# Pennsylvania

**PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM**

A Component Unit of the Commonwealth of Pennsylvania

COMMONWEALTH OF PENNSYLVANIA  
PUBLIC SCHOOL EMPLOYEES' RETIREMENT BOARD



MELVA S. VOGLER  
Chairman

NATHAN G. MAINS  
Vice Chairman

March 8, 2018

Members of the Appropriations Committee

Dear Members:

On behalf of the Public School Employees' Retirement System (PSERS), I am pleased to present the enclosed document on the financial, actuarial, and investment operations of PSERS and the budgetary recommendations for the 2018/19 fiscal year. Copies of this document and PSERS' Comprehensive Annual Financial Report for the fiscal year ended June 30, 2017 (FY2017) are available for download from PSERS' website at [psers.pa.gov](http://psers.pa.gov). Hard copies and CDs are also available upon request.

"PSERS on Point – Budget Report Highlights," a brief report that summarizes key points from PSERS detailed budget report, appears at the beginning of the document. Copies of the "PSERS on Point" are also available on PSERS' website.

In closing, PSERS looks forward to working with you during the current legislative session. Please contact PSERS Executive Office, if you have any questions or would like additional information.

Respectfully,

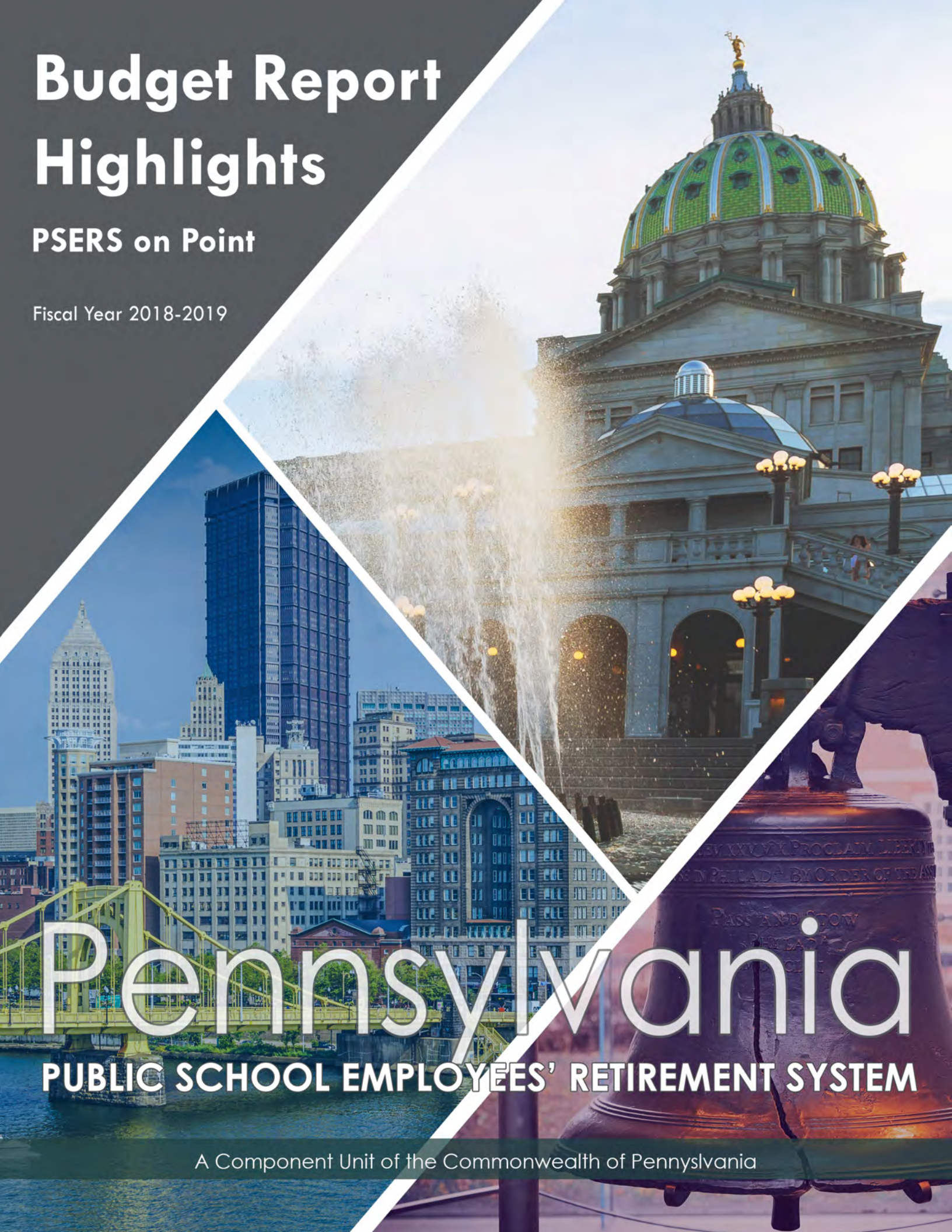
A handwritten signature in blue ink that reads 'Melva S. Vogler'. The signature is written in a cursive style.

Melva S. Vogler  
Chairman of the Board

# Budget Report Highlights

**PSERS on Point**

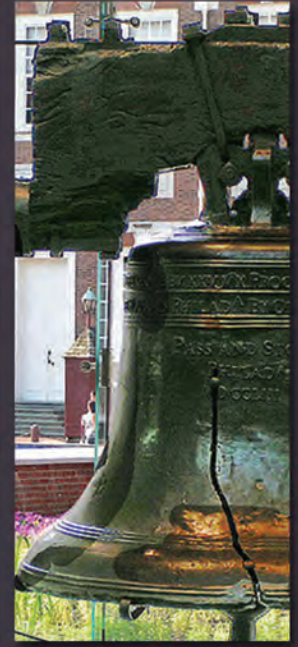
Fiscal Year 2018-2019



# Pennsylvania

**PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM**

A Component Unit of the Commonwealth of Pennsylvania



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## Providing a Secure Retirement Since 1917

PSERS was established on July 18, 1917, to provide retirement benefits to public school employees of the Commonwealth of Pennsylvania. PSERS' total plan net assets as of December 31, 2017, were approximately \$56 billion.

Today, PSERS provides a secure retirement to over half a million current and retired public school employees.

The plan is funded through three sources:

- Employer contributions
- Member contributions
- Investment earnings

*Big Changes Coming to PSERS in 2019*

On June 12, 2017, Act 5 of 2017, was signed into law. Act 5 requires new members hired on or after July 1, 2019, to choose one of three new retirement plan options for their retirement benefit. Two of the new retirement plan options are hybrid plans consisting of both defined benefit and defined contribution components. The third option is a stand-alone defined contribution plan. Under Act 5 the current defined benefit plan will no longer be available to new members hired on or after July 1, 2019.



PSERS administers two postemployment healthcare programs. The Health Options Program is a group health insurance program funded solely by eligible participants. As of December 31, 2017, there were 113,000 participants. 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, 2017, Premium Assistance is offered to 93,000 members.



### PSERS Snapshot

PSERS is the 15th Largest State-Sponsored Defined Benefit Public Pension Plan with:

**230,000**  
Retired  
Members

**256,000**  
Active  
Members

**25,000**  
Terminated  
Vested Members

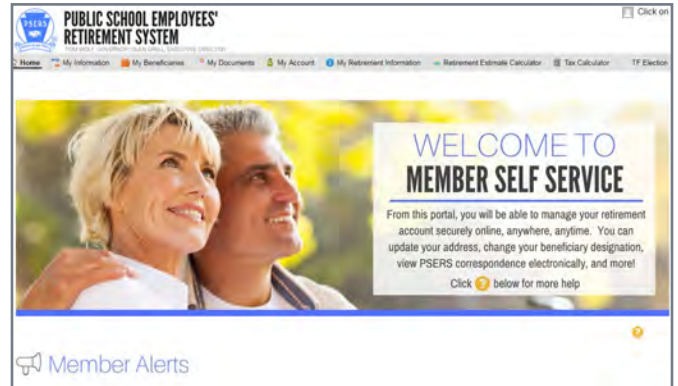
**775**  
School  
Employers

**323**  
PSERS  
Staff

## Enhancing Processes to Increase Efficiency and Improve Customer Service

### Ongoing Pension Administration System Upgrade -

Throughout 2017, PSERS continued to upgrade its pension administration system. This multi-year effort will culminate with implementation of the upgraded system in FY 2018. This upgraded system will provide opportunities for members and employers to conduct transactions for themselves that would have previously required staff intervention. These changes will not only increase customer service opportunities, but will also generate financial savings while potentially enabling PSERS to redeploy staff to other critical needs as workloads shift.



### Customer Service Improvements -

PSERS increased its efforts to provide retirement benefits in an efficient manner through a one-step process. Approximately 93% of the retirement benefits processed in FY 2017 were paid in one-step versus 89% in FY 2016. This was done while decreasing the number of days to pay a benefit from 27 days in FY 2016 to 24 days in FY 2017. Additionally, members whose benefit was processed in two steps, received their finalized benefit in 3 months as opposed to 5 months in the previous fiscal year.



### Regional Office Changes -

During FY 2017, the regional office in Pittsburgh relocated from its downtown location to an updated facility with better accessibility in northern Pittsburgh. Additionally, due to the close proximity of other regional offices that provide the same service, PSERS closed its regional office in Fleetwood. This allowed positions to be relocated to neighboring regional offices for improved customer service in those locations.



### Technology Upgrade -

In March 2017, PSERS updated its websites to a Commonwealth-hosted content management solution. In addition to providing for operational efficiencies, this new medium allowed for the incorporation of a complete redesign using many industry best practices.

## Calendar Year 2017 Customer Service Highlights



Answered  
**168,000**  
Member Calls



Responded to  
**15,000**  
Member Emails



Served  
**7,000**  
Members in  
Counseling  
Sessions



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



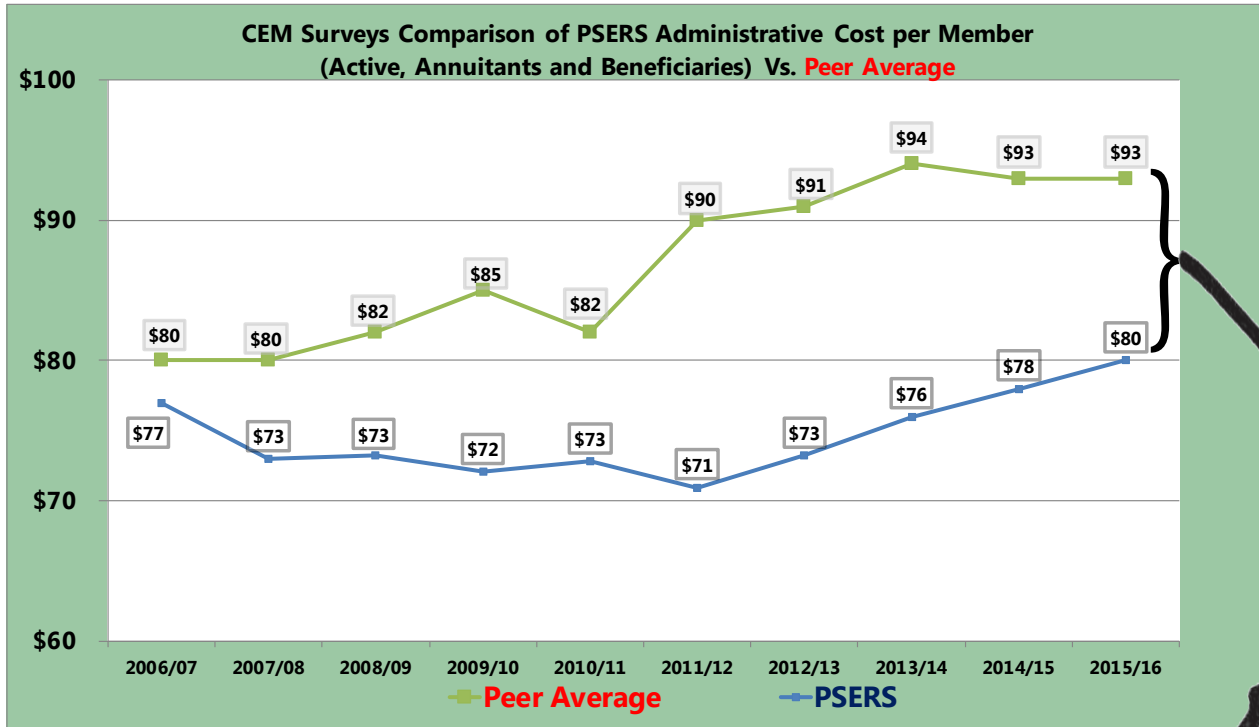
Processed  
**10,500**  
Retirement  
Applications



Prepared & Issued  
**257,000**  
1099-R's

## PSERS Administrative Costs are Significantly Below Peers; Saves \$6.3 Million Annually

PSERS remains prudent in its use of funds and managing its annual budget. PSERS participates in an independent, international benchmarking survey evaluating its costs and service performance in comparison to other similar public pension funds. PSERS has 29% fewer full-time equivalent staff per member than the peer group average. By running a lean and efficient operation, PSERS saves the Commonwealth and school employers approximately \$6.3 million annually in administrative expenses compared to its peers.



**PSERS Saves \$6.3 Million Annually**  
 PSERS had a 14% lower pension administration cost per member than the average cost of its peer group.

### PSERS FY 2018-2019 Budget Summary

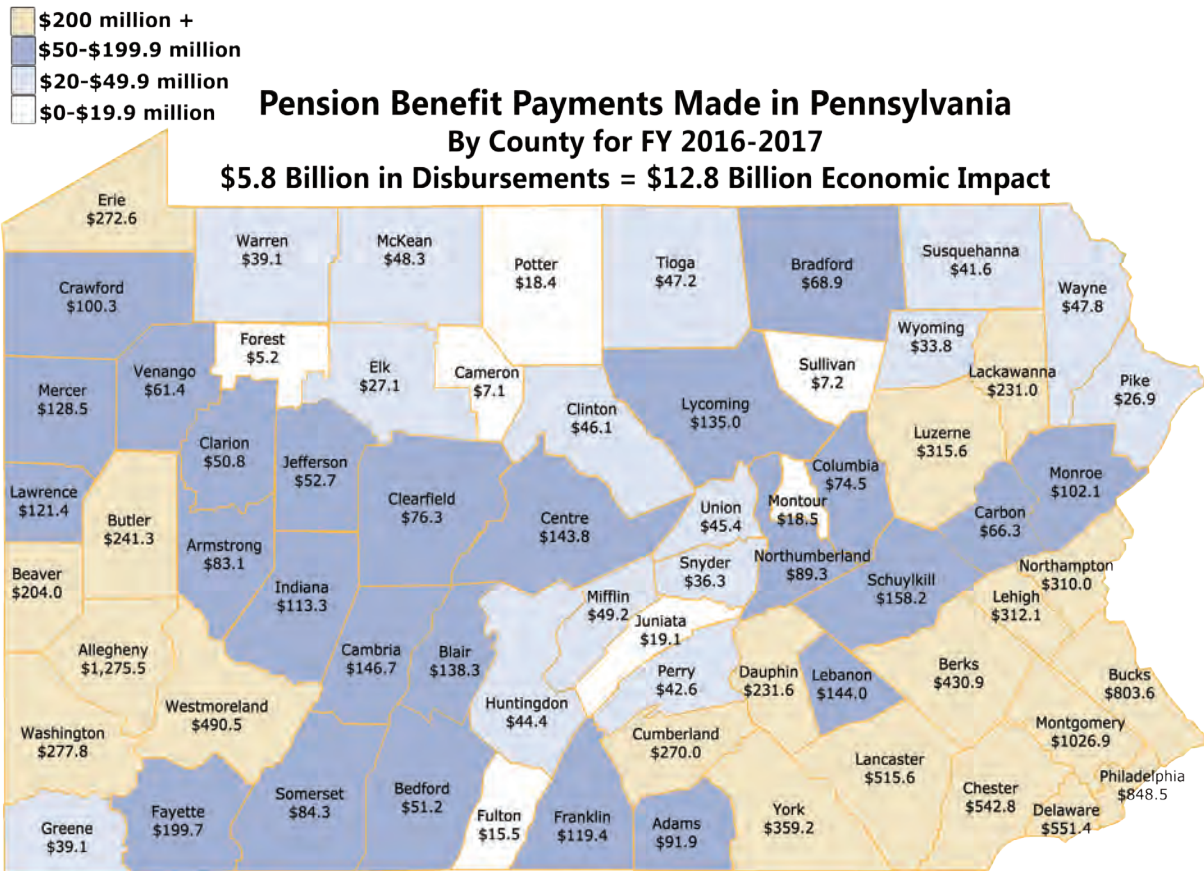
PSERS' administrative budget is not funded from the Commonwealth's General Fund, rather from the investment earnings of the Fund and member and employer contributions. PSERS' FY 2018-19 budget submission contains an Administrative budget request of \$51,637,000 and a Defined Contribution budget request of \$4,950,000. PSERS also manages non-appropriated funds that cover expenses for Directed Commissions, Health Insurance Account, Health Options Program, and Investment Related Expenses. PSERS' FY2018-19 budgets, including non-appropriated funds, total \$84,456,000.

Appropriation	PSERS' Budget Submission (000s)
Administrative	\$ 51,637
Defined Contribution	4,950
Directed Commissions	2,000
Health Insurance Account (HIA)	1,910
HIA Health Options Program	1,247
Investment-Related	22,712
<b>Subtotal</b>	<b>\$ 84,456</b>

# Economic Impact to Pennsylvania: \$12.8 Billion

In FY 2016-17, PSERS pension disbursements to retirees totaled approximately \$6.5 billion. Of this amount, approximately 90%, or \$5.8 billion, went directly into Pennsylvania and local economies.

According to a study by the National Institute on Retirement Security (NIRS) this spending expands through the economy as the retiree's spending becomes another's income, multiplying the effect of the \$5.8 billion into an economic impact of \$12.8 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes \$1.5 billion in federal, state and local tax revenues.

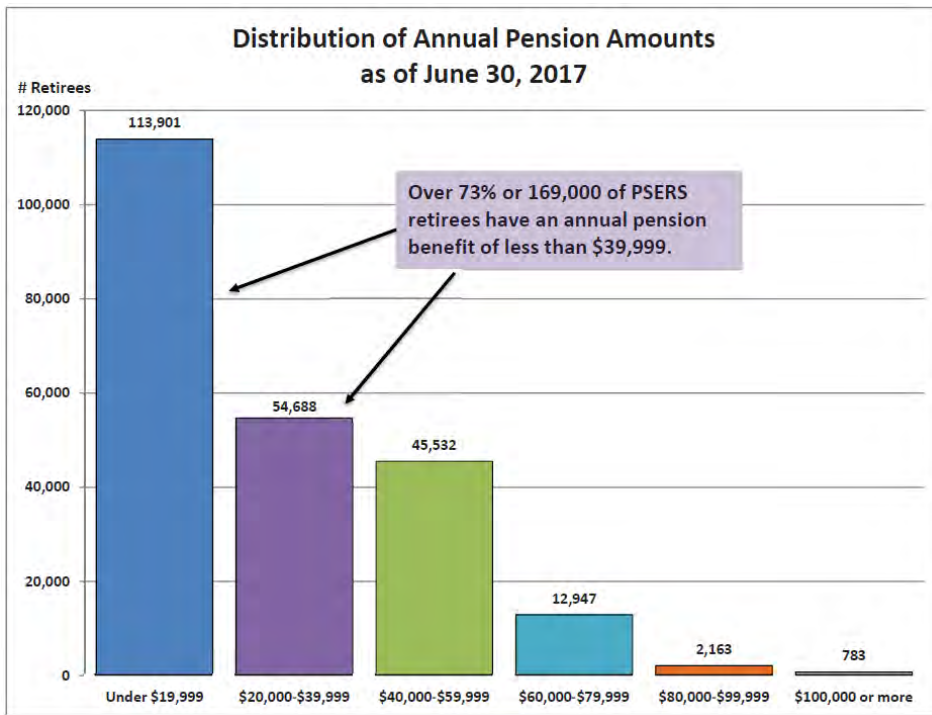




## PSERS Members Help Fund Their Own Retirement Benefit

The average PSERS retiree receives a modest pension of \$25,287 on an annual basis, a benefit earned through a lengthy career of 23 years in public education. During their career, members make mandatory contributions to PSERS 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 over 90% of private pension plans, members do not contribute and the employers bear 100% of the cost of the benefit. \*

Six figure pensions are rare. In FY 2017, there were approximately 783 retired members receiving an annual benefit over \$100,000 out of 230,000 PSERS retirees. These six-figure pension retirees spent an average of 38 years working in their public education careers and contributing to their benefit. In fact, over 73% of retirees have an annual benefit of less than \$39,999.



**PSERS' 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.**



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

\*\* According to recent National Association of State Retirement Administrators (NASRA) data, PSERS member contribution rate is the 12th highest member contribution rate among 84 large U.S. public pension plans that participate in Social Security.

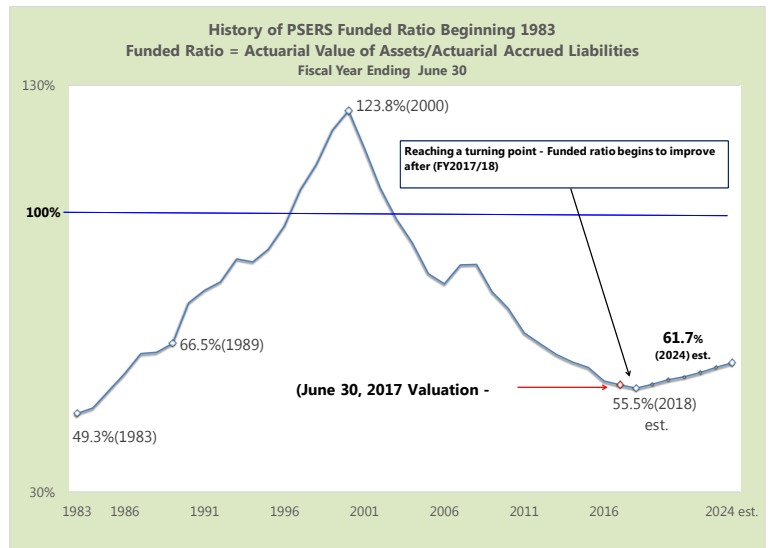
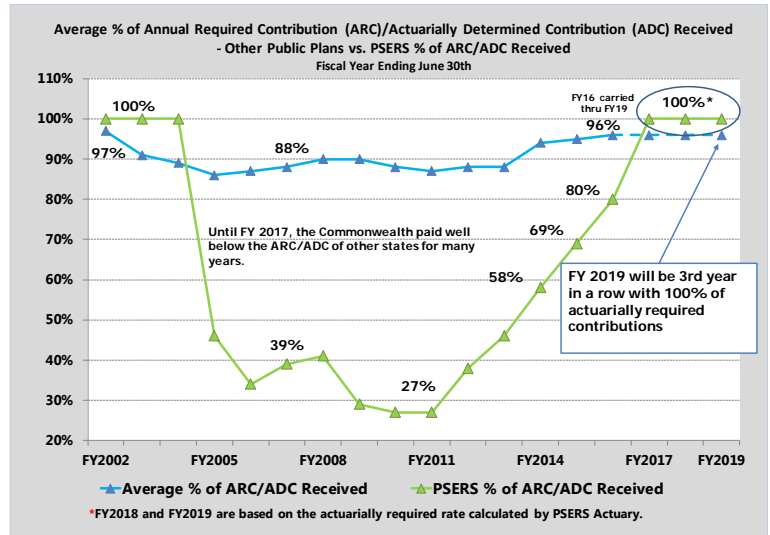
## Reaching a Turning Point in 2018

An independent review of PSERS' assets and liabilities is performed annually. As part of this review, the progress toward funding PSERS' pension obligations is measured. This measurement is referred to as the funded ratio or funded status. The most recent review reports that PSERS is 56.3% funded with an unfunded liability of \$44.5 billion as of June 30, 2017.

The decreasing trend in PSERS funded status since 2000 is primarily the result of legislated underfunding by employers and the Commonwealth; unfunded benefit increases enacted in Act 9 of 2001, Act 38 of 2002, and Act 40 of 2003; funding collars in Act 120 of 2010 and the downturn in the investment markets after 9/11 and the Great Recession of 2008/2009.

PSERS funded ratio on an actuarial basis is reaching a turning point in 2018. After years of declining, the funded ratio is projected to improve as the impact of the Great Recession of 2008/2009 is fully recognized in the System's 10 year smoothing of investment gains and losses.

Additionally, the employer contribution rate certified for FY 2018-2019 marks the third consecutive year the employer rate provides 100 percent of the actuarially required rate necessary to begin to pay down the existing pension debt. In the past, various pieces of pension legislation suppressed the employer contributions paid to PSERS by the school employers and Commonwealth. FY 2017 marked the first time in fifteen years that the actuarially required rate was paid by school employers and the Commonwealth.



### Paying Actuarially Required Rate is Vital to the System

While budgetary issues continue as the employer contribution rate remains high, paying the actuarially required rate is a vital step that will begin to address the already accumulated pension debt. Currently over 75 percent of the total pension contribution rate is for past service, a debt already earned that must be paid.

### Funded Ratio on Market Value Basis Improves

All necessary sources of funding (full actuarial funding from employers, member contributions and investment income) are now in place and will eventually bring PSERS back to fully-funded status over time. Positive results have already occurred in some areas. On a market value basis, PSERS' unfunded liability declined in FY 2017 and continued to decline through December 31, 2017, as PSERS' total net position grew faster than its total pension liability. As a result, the funded ratio on a market value basis improved.

## **Act 5 of 2017: Changes Coming to PSERS**

**The implementation of Act 5 of 2017 requires a tremendous effort by all of PSERS staff.** PSERS has begun to develop an implementation plan to meet the July 1, 2019 deadline. PSERS hired Charles W. Cammack Associates as the Pension Consultant to assist with the implementation of Act 5 and develop a 'best-in-class' caliber plan roll-out.

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 will choose one of three new retirement plan options for their retirement benefits. The new plan design options include two hybrid plans consisting of defined benefit and defined contribution components and a stand-alone defined contribution plan. The current stand-alone defined benefit plan will no longer be available to new members.

Act 5 also 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 makes modifications to the "shared risk" program that will allow members to benefit "shared gain" when the Fund outperforms its investment rate of return assumption.

Key provisions in Act 5 include:

- Established the Public Pension and Asset Investment Review Commission to study and report recommendations to the General Assembly and the Governor regarding PSERS investment performance and investment strategies.
- Provided for PSERS legal counsel to serve independently from the Governor's Office of General Counsel.
- Established Board training requirements of eight hours per year.
- Added Secretary of Banking and Securities as Board member, ex officio, and reduced gubernatorial appointments from two to one.



### **New Members**

School employees who become new members of PSERS on July 1, 2019 and thereafter will choose one of three new retirement plan options for their retirement benefits. The current stand-alone defined benefit plan will no longer be available to new members.

### **Active Members**

All members active on July 1, 2019, will have the option to switch from their current defined benefit plan to one of the three new retirement plan options if they so choose.



### **Retired Members**

Act 5 does not affect already retired members or those whose retirement date was prior to June 12, 2017.



**Payment for Past Service Debt is Nearly 75% of the Employer Contribution Rate (ECR)**

The majority of the employer contribution rate in FY 2018-2019, approximately 75%, is for payment of the debt from past service (unfunded liability), and 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 no less than 50% of the ECR.



School employers contribute full ECR amount to PSERS.



ECR Rate for FY 2018-19:  
33.43%



**Every ECR Dollar is Broken into Three Parts**



**74.8%** of every dollar for **Past Services Payment** (Unfunded Liability)



**22.7%** of every dollar for **Current Services Payment**

**2.5%** of every dollar for **Healthcare Premium Assistance\***



\*per § 8509 in the Retirement Code

## Increasing Fee Transparency and Internally-Managed Assets

Historically, PSERS is one of the most transparent among large public pension funds in the nation for the disclosure of investment management fees. For example, certain pension funds report no or very little management fees for alternative investments because they are considered part of the cost of the investment and are netted against performance rather than shown separately. PSERS, however, obtains management fee information from its limited partnerships, and collective trust fund investments as well, even if it is not specifically disclosed in the fund's standard reports. This information is then used to report all relevant management fees in the System's financial statements. In addition, PSERS reports all other investment expenses, including staff compensation and overhead, consultant, legal, and bank expenses incurred.

Additionally, PSERS has made using the ILPA (Institutional Limited Partners Association) reporting template a mandatory side letter term for all private manager contracts approved by the Board since May 2016.

PSERS aggressively negotiates fees and works to structure fee arrangements that align the interests of the investment manager with those of PSERS. PSERS recently embarked on an expanded effort to reduce base fees on a going forward basis in exchange for profit-sharing fees, thus creating greater incentives for exceptional performance.



*Susan Oh, Senior Portfolio Manager, Risk Parity and Currency Hedging*

**FY 2016-17 fees are lower than FY 2012-13 fees despite the fact that PSERS now manages \$4 billion more in net assets.**

## PSERS Manages a Large Portion of its Assets In-House

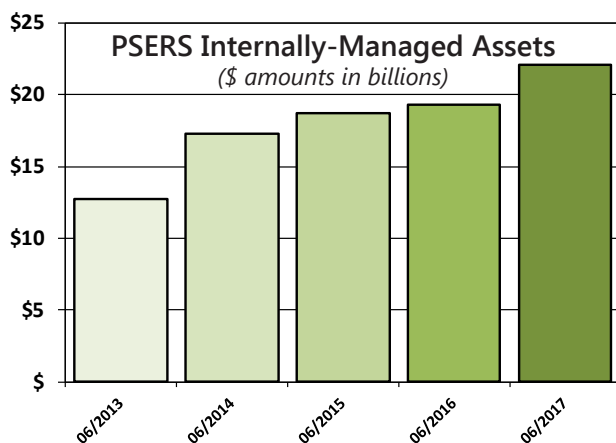


*From left: Thomas A. Bauer, Deputy Chief Investment Officer, Traditional Investments; James H. Grossman Jr., PSERS Chief Investment Officer; Charles J. Spiller, Deputy Chief Investment Officer, Non-Traditional Investments*

During FY 2017, PSERS increased the amount of asset exposure managed internally from \$19.3 billion, or 35% of PSERS' exposures, to \$22.1 billion, or 36% of the System's exposures. Asset classes such as U.S. equities and gold are entirely managed in-house by PSERS investment professionals. Other asset classes such as non U.S. equities, fixed income, private markets, commodities, real estate, risk parity and master limited partnerships are partly managed in-house by PSERS investment professionals.

PSERS uses both internal investment professionals and external investment managers to invest its assets. As of June 30, 2017, PSERS employed 37 internal investment professionals with a variety of professional credentials including: Chartered Financial Analysts, Certified Public Accountants, Masters of Business Administration, Chartered Alternative Investment Analyst, and a Professional Risk Manager.

By bringing more assets in-house, PSERS generates investment management fee savings. When assets are assigned to PSERS' investment professionals, the total costs (e.g., staff salary and benefits, computers and office supplies) are much lower than the largest "very low fee" index mutual fund companies, giving PSERS a significant advantage. Using conservative estimates, the management fees savings on managing \$22 billion in-house is approximately \$39 million per year.



## Maintaining a Prudently Diversified Asset Allocation

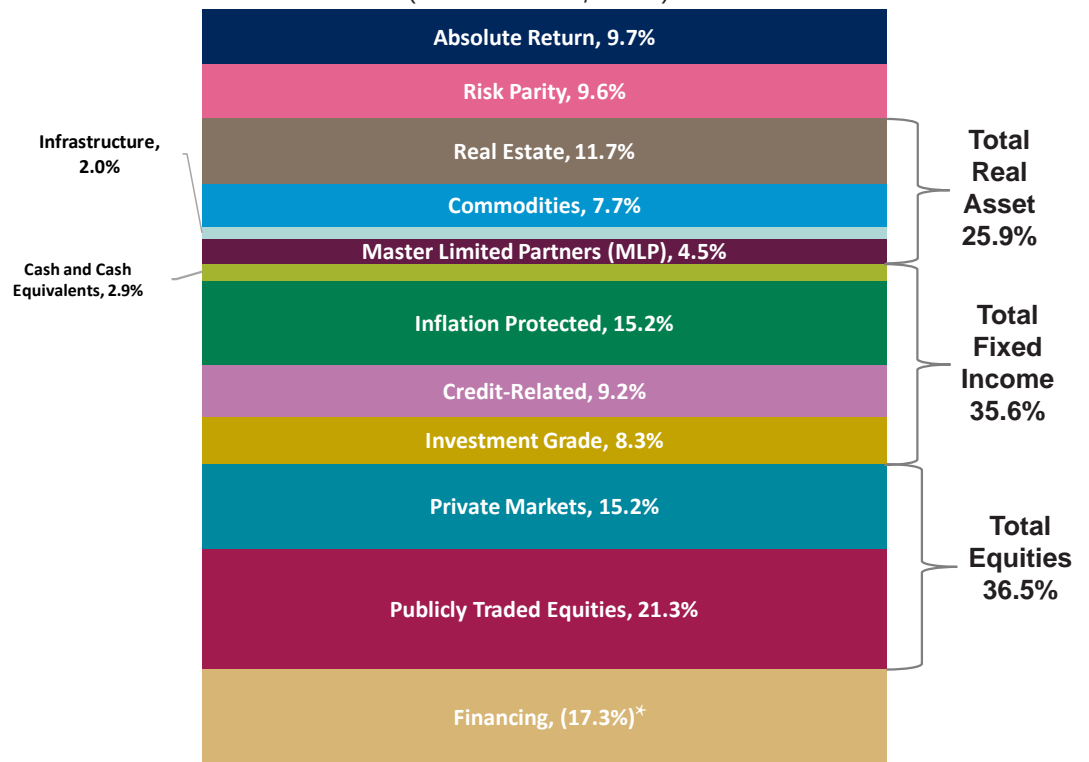
PSERS Board reviews and approves the long-term asset allocation annually taking the following factors into consideration:

- Investment Time Horizon
- Demographics
- Actuarial Assumptions
- Employers' Financial Strength
- Cash Flow
- Funded Status
- Board's Willingness to Take Risk

PSERS Board reviews and approves the long-term asset allocation annually. The Board consults with its actuary, investment consultants, and PSERS internal investment professionals to formulate the asset allocation plan. With interest rates on cash investments around 1%, PSERS needs to take prudent risk to achieve its long-term goal of a 7.25% return. The level of risk taken by PSERS is largely determined by the Board's strategic asset allocation plan.

Given the significant net cash outflows, the Board has prudently reduced the risk profile of the System since the financial crisis in 2008. It has done so by decreasing its return dependence on the equity markets and increasing its risk exposures to asset classes that are less correlated to equity markets such as inflation-linked bonds, commodities, and absolute return. The goal of such an allocation is to generate the desired return profile with less volatility. While such an allocation will not provide for a large upside in returns during times of soaring equity markets, it is expected to minimize downside risks to the System's assets in the event of a large equity market drawdown as experienced during the financial crisis in 2008.

### Asset Allocation (as of June 30, 2017)



**PSERS' Asset Allocation is well-diversified into numerous asset classes.**

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

## Long-Term Investment Performance Consistently Outperforms

PSERS is a long-term investor and manages the Fund with long-term objectives (i.e., 25 to 30 years) in mind. The System has built a diversified allocation that positions the Fund to earn its return assumption of 7.25% over the long-term 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, risk parity and absolute return.

In the short-term, PSERS expects to go through periods of time when the Fund may not earn its return assumption. This past fiscal year the Fund beats its earnings assumption.

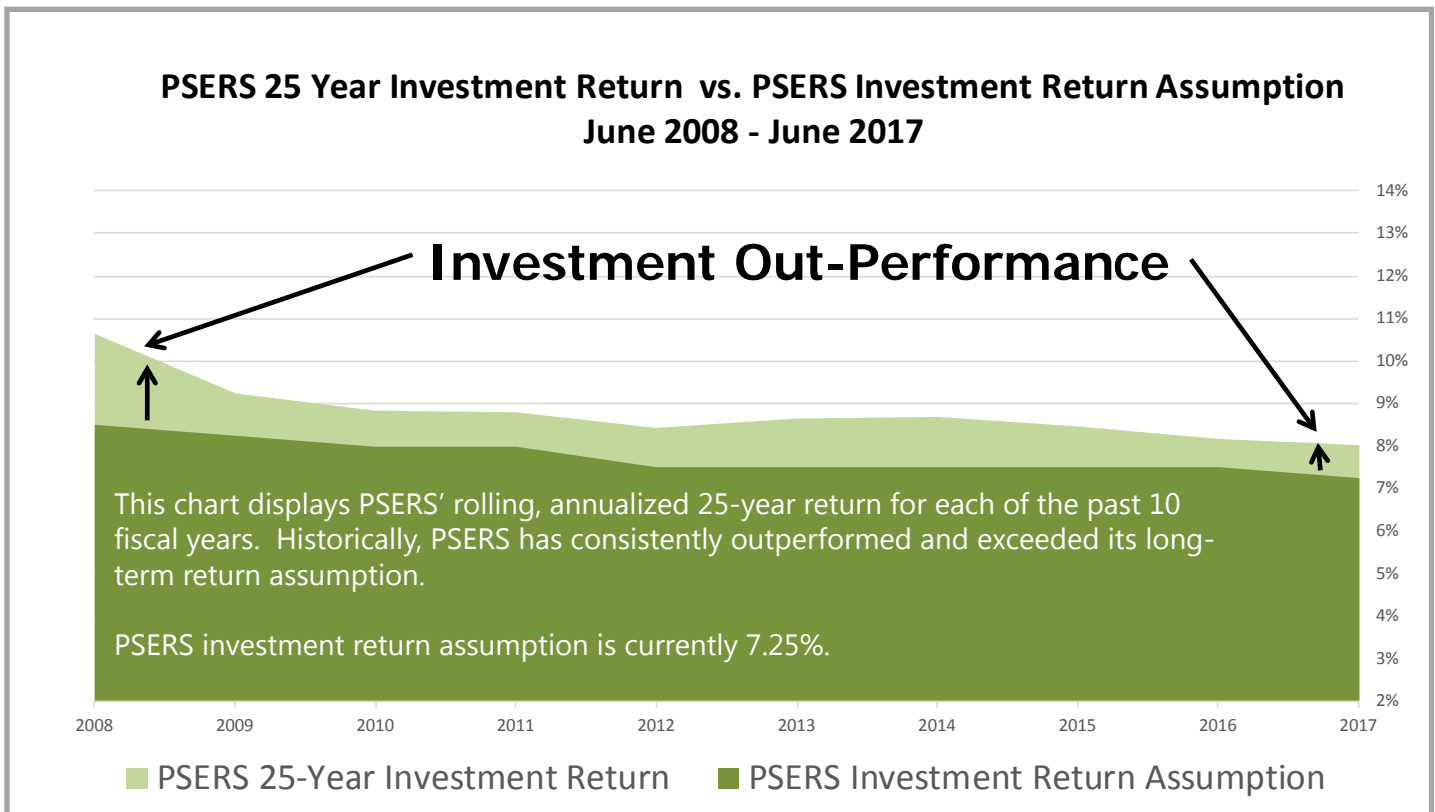
For the period ended June 30, 2017, PSERS posted returns of:

- One-year: 10.14%, added \$5.0 million in net investment income
- Five-year: 7.35%, added \$18.0 billion in net investment income
- 10-year: 3.80%, added \$16.5 billion in net investment income
- Since Great Recession: 9.28%, added \$34.5 billion in net investment income

**For the one-year period ended December 31, 2017, PSERS earned a net of fee return of 12.3% and added \$6.2 billion in net investment income.**

In any given year, PSERS expects some assets to perform well, such as public and private equities did this past fiscal year, and some to not do as well, such as commodities. Over the long run, however, the System expects each of its asset classes to generate a positive return commensurate with the risks taken.

Long-term returns continue to remain above PSERS' return assumption. PSERS posted a positive return of 8.03% for the 25-year period ended June 30, 2017. PSERS' focus remains on maintaining a well-diversified asset allocation that can withstand the volatility in the markets, provide enough liquidity to meet cash flow obligations (primarily monthly benefit payments), and meet PSERS' earnings assumption over the long-term which the Fund has consistently done.



## **Maintaining a High Level of Information Security and Financial Governance**

### **Special Performance Audit Completed in 2017**

During FY 2017, the Pennsylvania Department of the Auditor General completed a complex Special Performance Audit of PSERS. During the 9-month audit, PSERS responded to 72 detailed data requests and participated in multiple interviews and briefings with the Audit Team.

Overall, the Performance Audit Report opined that PSERS' reporting and transparency of investment expenses surpasses its peer public pension funds; PSERS' management of investment expenses appears standard; PSERS' attention to asset allocation, diversification and risk management appears adequate and reasonable; and PSERS has complied with the Public Employee Pension Forfeiture Act. There were no findings that suggest any fraud, waste or abuse of funds or any instances where poor decisions, policies or practices of the PSERS Board or Staff have resulted in losses to the fund or violations of applicable laws or regulations.

### **Financial Governance and Disclosure**

PSERS is considered a component unit of the Commonwealth of Pennsylvania as defined by the Governmental Accounting Standards Board. An annual audit of the System by an independent certified public accounting firm is required by the Retirement Code. PSERS has received an unmodified opinion as evidenced in the Report of Independent Public Accountants in the Financial Section of the Comprehensive Annual Financial Report, which is available on PSERS' website [psers.pa.gov](http://psers.pa.gov). An unmodified opinion means that PSERS' financial statements fairly present, in all material respects, its financial condition. In addition, no significant findings were noted during the audit and therefore, a management letter was not issued. This is the eighth consecutive year that a management letter was not issued and is reflective of the hard work and dedication of PSERS' staff to continue to improve the internal controls, operations, and efficiency of the System.



### **Information and Security Remains Top Priority**



*Steven Hocker, PSERS Chief Information Security Officer*

Understanding the importance of keeping member data protected, PSERS appointed a Chief Information Security Officer (CISO) whose sole purpose is information security. The CISO has started to revamp the information security program at PSERS by completing a Commonwealth IT policy and compliance review and a General Information Security Assessment. PSERS is dedicated to ensuring the protection of member and employer data while still providing ease of access for members and staff. This is especially important as we move to the new Member Self Service Portal in 2018. As today's world changes with new and ever-growing cyber security threats, PSERS maintains a focus on security and will continue to look for new ways to ensure member and employer data is protected.



## Awards Received During the Past Fiscal Year



**Government Finance Officers Association of the United States and Canada (GFOA) Certificate of Achievement for Excellence in Financial Reporting**

– This prestigious national award recognizes conformance with the highest standards for preparation of state and local government financial reports. PSERS has received this award for 34 consecutive years from FY 1983 to FY 2016.

**GFOA Popular Annual Financial Reporting Award** – This prestigious national award recognizes conformance with the highest standards for preparation of state and local government popular reports. This was PSERS' first Popular Annual Financial Report publication.

**Public Pension Coordinating Council Public Pension Standards Award** - The Public Pension Coordinating Council has awarded its Public Pension Standards Award to PSERS for 2016 in recognition of meeting professional standards for plan design and administration.

**CIO Industry Innovation Award** - Chief Investment Officer Magazine awarded PSERS with the 2016 Industry Innovation Award for Public Defined Benefit Plans, \$15 billion to \$100 billion. This investment industry award recognizes innovation in institutional investing.

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### January 2018 PSERS Board of Trustees

Melva S. Vogler, Chairman  
Nathan G. Mains, Vice Chairman  
Deborah J. Beck  
Honorable John P. Blake  
*Senate of Pennsylvania*  
Honorable Stephen Bloom  
*House of Representatives*

Honorable Patrick M. Browne  
*Senate of Pennsylvania*  
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## Contact PSERS

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**Website: [www.psers.pa.gov](http://www.psers.pa.gov)**

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**Pennsylvania**  
**Public School Employees' Retirement System**

(A Component Unit of the Commonwealth of Pennsylvania)

5 North 5th Street  
Harrisburg, Pennsylvania 17101-1905

**Fiscal Year 2018-19 Budget Report**  
**Appropriations Committee**  
**March 8, 2018**

**Melva S. Vogler**  
*Chairman*  
*Board of Trustees*

**Glen R. Grell**  
*Executive Director*

*Report prepared by the Public School Employees' Retirement System  
Office of Financial Management and Investment Office staff*

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# SECTION 1 - PSERS OVERVIEW

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### 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 post employment healthcare benefits to PSERS retirees and dependents.

As of June 30, 2017, the System had approximately 256,000 active members. The annuitant membership was comprised of approximately 230,000 retirees and beneficiaries who received average monthly pension benefit payments of over \$489 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was \$25,287. PSERS had 775 participating employers on June 30, 2017.

As reported in the latest *Pension and Investments* survey, published February 5, 2018, PSERS is the 34th largest plan among United States corporate and public pension plans, and the 15th largest state-sponsored defined benefit public pension fund in the nation. PSERS' total plan net assets as of December 31, 2017 were approximately \$56.0 billion. PSERS' investment rate of return for the calendar year ended December 31, 2017 is 12.30%, net of fees.

During fiscal year 2017, PSERS' pension disbursements to retirees totaled \$6.5 billion. Of this amount, nearly 90%, or \$5.8 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, 2017, there are approximately 95,000 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 95,000 retirees and their dependents.



### Mission Statement

**The Board of Trustees and the employees of the Public School Employees' Retirement 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.

# PSERS Board of Trustees

as of January 2, 2018

**Melva S. Vogler, Chairman**

**Deborah J. Beck**

**Honorable John P. Blake**

*Senate of Pennsylvania*

**Honorable Stephen Bloom**

*House of Representatives*

**Honorable Patrick M. Browne**

*Senate of Pennsylvania*

**Jason M. Davis**

**Eric O. DiTullio**

**Susan C. Lemmo**

**Nathan G. Mains**

**Honorable Joseph F. Markosek**

*House of Representatives*

**Pedro A. Rivera**

*Secretary of Education*

**Christopher SantaMaria**

**Ambassador Martin J. Silverstein**

**Honorable Joseph M. Torsella**

*Treasurer of Pennsylvania*

**Robin L. Weissmann**

*Secretary of Banking and Securities*

## **Organizational Structure of the Public School Employees' Retirement System**

### **Executive Office**

This office is responsible for the overall management of the Public School Employees' Retirement System (PSERS) to achieve the primary objectives of the Fund as established by the Board of Trustees (Board). Reporting directly to the Executive Director are the Deputy Executive Director, Assistant Executive Director, Chief Investment Officer, Chief Financial Officer, Internal Auditor, Press Secretary, Board Liaison, Legislative Liaison, and Executive Secretary. The Executive Director serves as chief executive officer responsible for the establishment, installation, and maintenance of modern management techniques to provide an efficient control of funds for and services to the active members and annuitants of the System.

The Executive Office monitors the operation of the investment portfolio and evaluates portfolio performance for consideration by the Board, certifies expenditures of the Fund and measures performance of professional individuals or firms with whom the Board contracts for specialized services. The Executive Office also apprises the Board of any development that will affect the System and its operation.

### **Investment Office**

This office is responsible for all investment activities of the System. In compliance with the investment policies established by the Board, PSERS' investment assets are allocated to numerous outside professional investment advisors and internal investment professionals. PSERS' investment rate of return for the calendar year ended December 31, 2017 is 12.30%.

### **Chief Counsel's Office**

This office provides legal services through a team of professional personnel in collaboration with PSERS' Executive Director and PSERS' 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**

This office provides independent, objective assurance, and consulting activity designed to add value and improve the Pennsylvania Public School Employees' Retirement System's (PSERS) operations. It helps PSERS accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of

risk management, control, and governance processes. Specifically, the IAO provides a wide range of quality independent internal auditing services for the Audit/Compliance Committee of the PSERS Board and executive management and 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 supports PSERS' efforts to achieve its objectives through independent assurance and consulting services; and routinely monitors compliance with established laws, rules, regulations, policies and procedures.

### **Office of Financial Management**

This office is directed by the Chief Financial Officer and has responsibility for planning, organizing and directing a complete accounting and financial reporting system in conformance with generally accepted accounting principles. 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.

### **Deputy Executive Director**

The Deputy Executive Director directly oversees the benefit programs for all active and retired members of the System, the development and implementation of the member and employer communications programs and the retirement counseling programs, and the maintenance of agency policies, procedures, and benefit related data. Additionally, this position oversees business and information technology strategic planning, policy development, and implementation.

### **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)

#### 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 information technology staff. Large information technology contracts and projects are managed by this office. This office is also 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; account for its processes, information systems and technologies.

#### Business Architecture Center

This center serves as the repository for PSERS' business knowledge and makes that knowledge available and understandable to agency processing and technology staff. The center receives and responds to data queries from agency staff and investigates system, data, or process problems. This center includes staff who collect, analyze, and document PSERS' processes, information systems and data, and perform detailed impact analysis as and when change is proposed. Additionally, staff in this unit coordinate, lead, and track projects and confirm that changes have been applied correctly. They look for opportunities for improvement, lead the development of business requirements, and serve as liaisons between PSERS' end-users and information technology staff. The Systems Support section provides key analytical services to the center and to other bureaus within the organization including specific services such as research, analysis, recommendations for action, and implementation support related to PSERS' information systems, data, or business or management processes.

#### 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.

#### Assistant Executive Director

This position reports to the Executive Director and may provide assistance to the Executive Director on agency-wide projects. The position administers the Health Options and Premium Assistance Programs in addition to the facilities, human resources, and procurement activities necessary to support, secure and optimize agency operations. Organizational units overseen by the Assistant Executive Director include the Bureau of Administration, the Human Resources Office, and the Health Insurance Office.

#### 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 staff to facilitate the accomplishment of the agency's mission. It administers all human resources programs and ensures compliance with labor laws 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.

#### Health Insurance Office

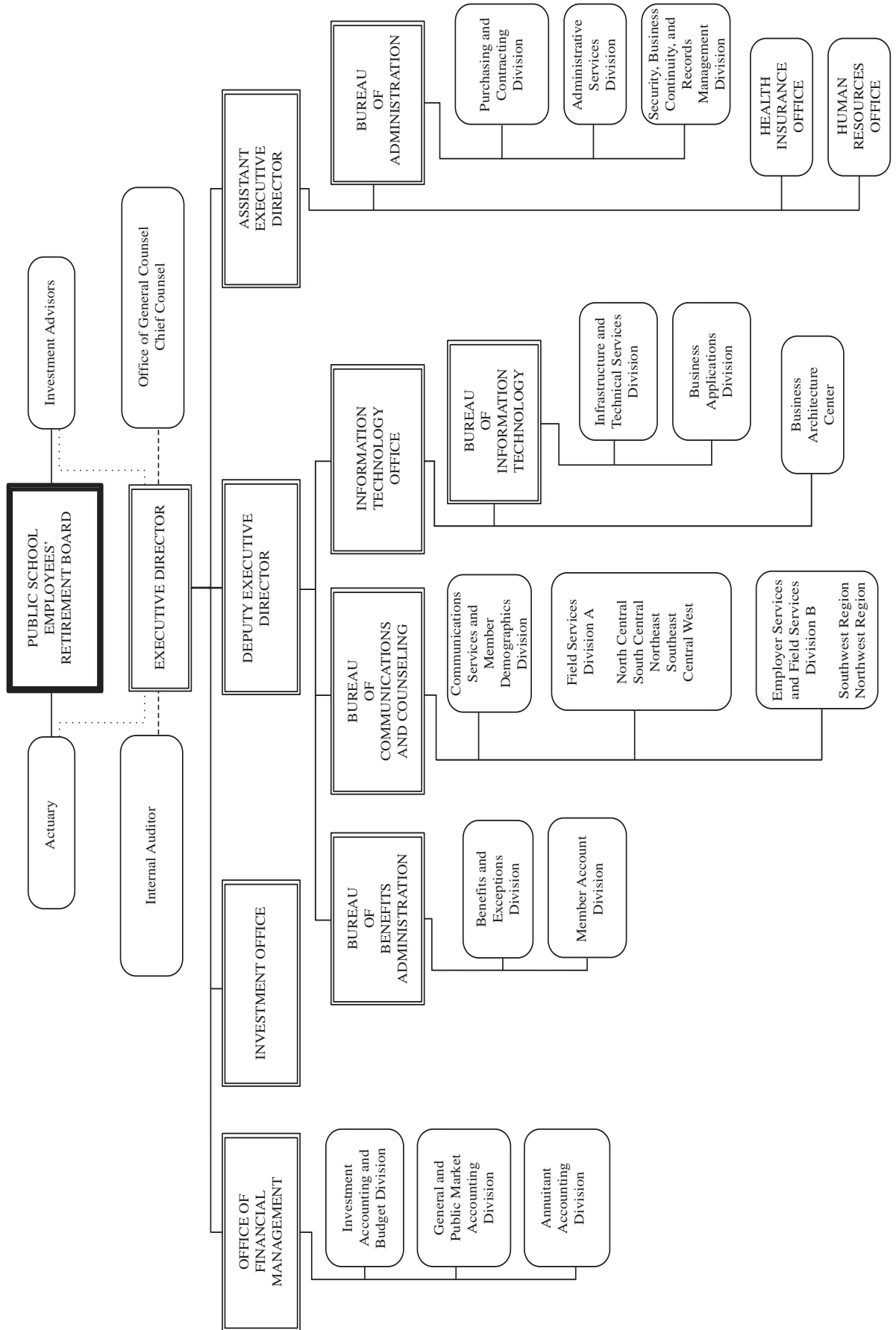
This office is responsible for all aspects of the PSERS' Health Options Program (HOP) and administering the PSERS annuitant health insurance premium assistance benefits. HOP is a voluntary statewide plan that provides group health insurance coverage for school retirees, their spouses, and eligible dependents.

#### PSERS Regional Offices

There are seven PSERS Regional Offices strategically located throughout the Commonwealth. The offices provide services to both active and retired PSERS members and 775 employers. Among these services are regularly scheduled retirement counseling meetings and other informational presentations on various topics relating to retirement benefits and programs.

Organizational Chart of the Public School Employees' Retirement System

Chart 2.1



PSERS REGIONAL OFFICES

Chart 2.2

**Northwest**

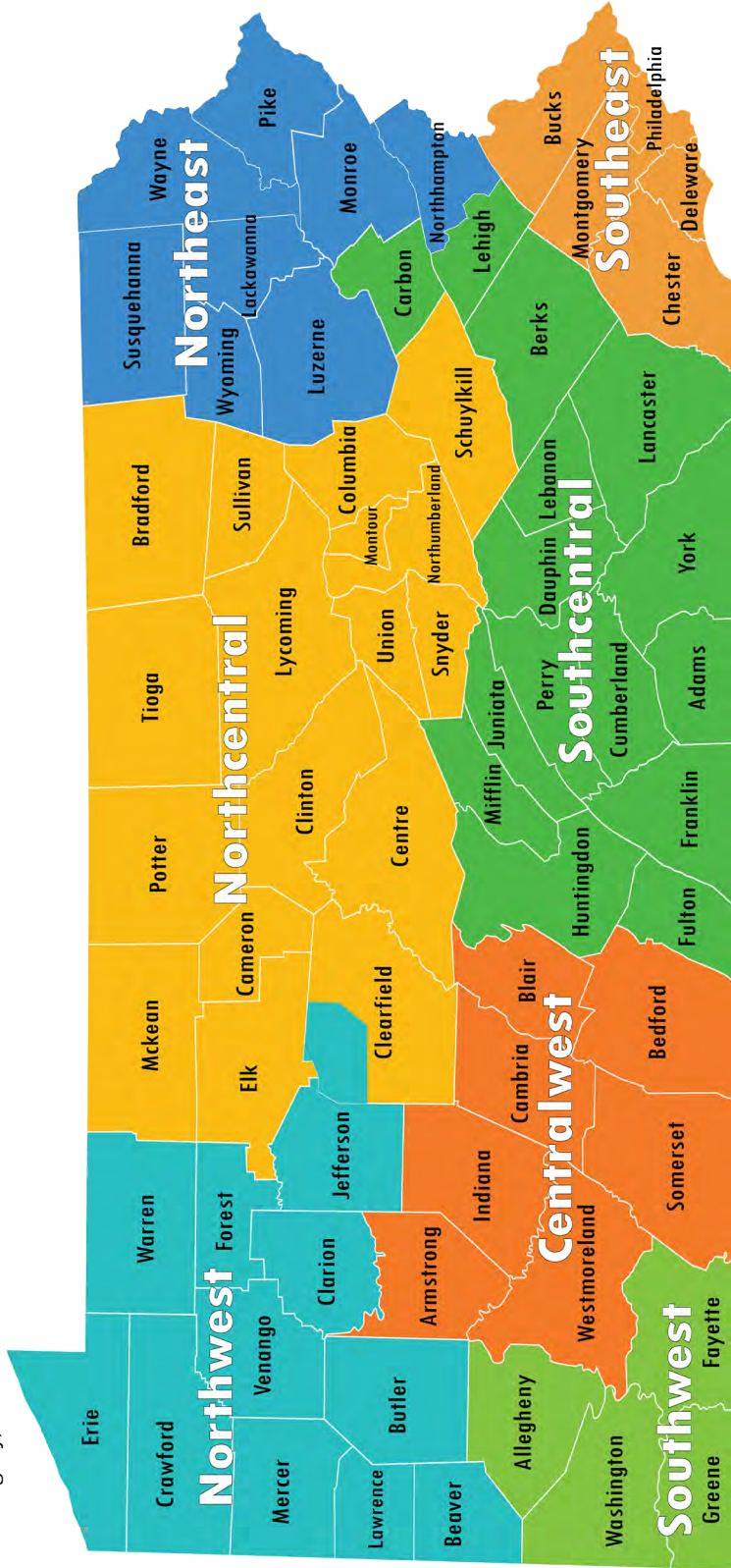
**Pennwood Center**  
**464 Allegheny Boulevard, Suite C**  
**Franklin, PA 16323-6210**  
 Local: 1.814.437.9845  
 FAX: 1.814.437.5826  
**Toll-Free: 1.888.773.7748 ext. 5175**  
 Donald Gregory, Administrator

**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 ext. 5275**  
 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 ext. 5375**  
 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 ext. 5775**  
 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 ext. 5875**  
 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 ext. 6335**  
 John Tucker, Administrator

**Southeast**

**605 Louis Drive, Suite 500**  
**Warminster, PA 18974-2825**  
 Local: 1.215.443.3495  
 FAX: 1.215.443.3487  
**Toll-Free: 1.888.773.7748 ext. 557**  
 Joshua Catalfu, Administrator  
 Linda Visco, Administrator

## Section 1 - PSERS Overview

### Summary of Various Member Service Statistics

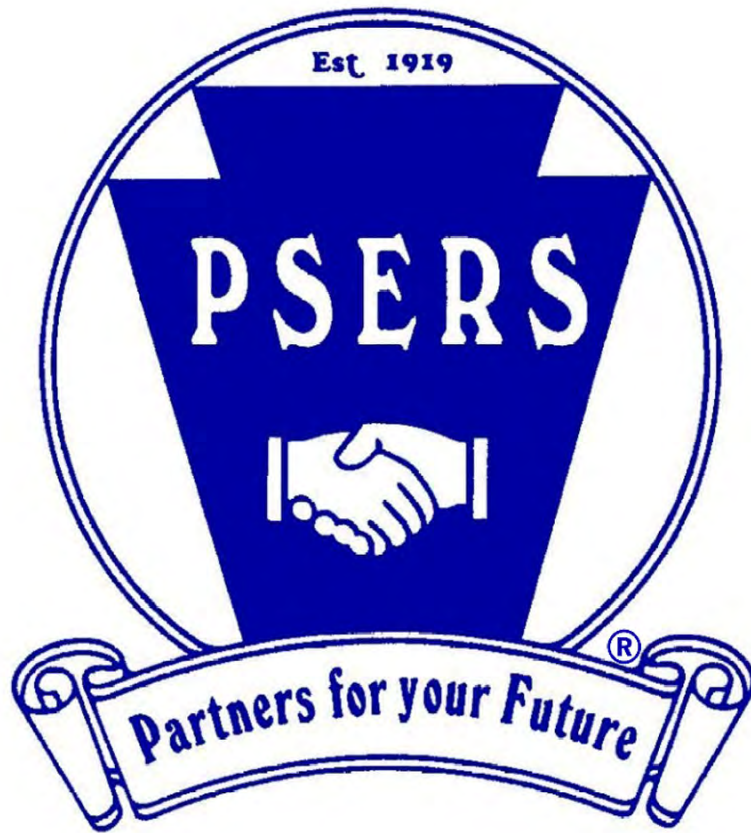
PSERS mission to serve our members. Below are highlights of some of the more common services that PSERS provides to its members.

PSERS operates very efficiently. There are only 323 staff serving the needs of over 500,000 members of the System and 775 employers. PSERS staff is dedicated to fulfilling

Table 2.1 Benefits Processed (Major)		
Fiscal Year	<u>2016</u>	<u>2017</u>
Initial Retirements (1-Step)	9,536	8,756
Initial Retirements (2-Step)	1,216	858
Final Retirements (2nd Step of 2-Step)	1,090	934
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld	15,913	13,814
Refunds	4,348	4,124
Deaths - Processed and Paid	3,186	4,175
Account Verification - non retirements	15,320	12,346
<b>TOTAL</b>	<b>50,517</b>	<b>45,007</b>
Percent of Retirement Paid as 1 Step	89%	93%

Table 2.2 Other Member Services (Major)		
Fiscal Year	<u>2016</u>	<u>2017</u>
Retirement Estimates	21,536	19,770
Phone Calls Answered	177,666	168,170
E-mails Received	13,583	15,704
E-mails Sent	13,201	14,953
General Information Sessions	183	207
General Information Attendees	9,219	10,598
Exit Counseling Sessions	1,465	1,343
Exit Counseling Attendees	7,704	7,154

Table 2.3 Member Payment Services for Retirees and Beneficiaries		
Calendar Year	<u>2016</u>	<u>2017</u>
Monthly Payments to Members	2,648,042	2,703,487
Non-recurring Payments to Members	48,881	48,278
Forms 1099-R Produced	253,000	257,279
W4-P Tax Withholding Forms Processed	4,614	4,170
EFT Forms Processed - Direct Deposit	10,673	9,553
ACH Rejects Researched and Reviewed (Direct Deposit Failures)	4,439	5,026
Member Payment Changes Processed	4,074	3,825



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## Economic Impact on Pennsylvania, Member Demographics, and Financial Information

### Economic Impact of Pension Benefits on Pennsylvania

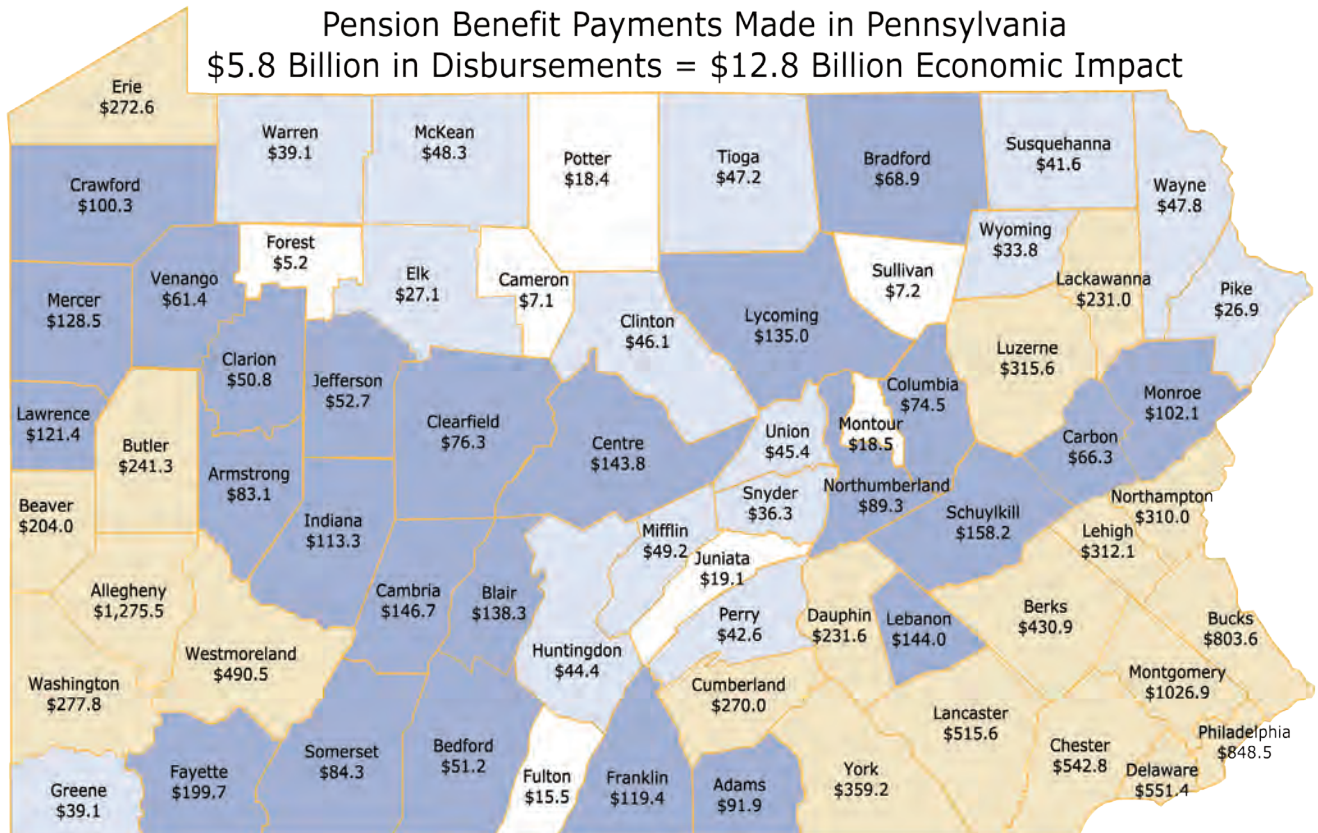
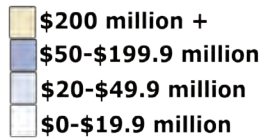
In Fiscal Year 2016-17, PSERS' pension disbursements to retirees totaled approximately \$6.5 billion. Of this amount, nearly 90%, or \$5.8 billion, went directly into state and local economies. According to a study by the National Institute on Retirement Security (NIRS) this spending expands through the economy as the retiree's spending becomes another's income, multiplying the effect of the \$5.8 billion into an economic impact of \$12.8 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes<sup>1</sup>:

- Economic impact exceeding \$12.8 billion
- Support for over 55,000 jobs that paid \$2.8 billion in wages and salaries
- \$1.5 billion in federal and local tax revenues

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

Allegheny	\$1,275.5
Montgomery	\$1,026.9
Philadelphia	\$848.5
Bucks	\$803.6
Delaware	\$551.4
Chester	\$542.8
Lancaster	\$515.6
Westmoreland	\$490.5
Berks	\$430.9
York	\$359.2

### Public School Employees' Retirement System Total Economic Impact from Benefit Disbursements by County for FY 2016-17 (Dollar amounts in millions)



<sup>1</sup>Pensionomics. The National Institute on Retirement Security, September 2016

## Section 1 - PSERS Overview

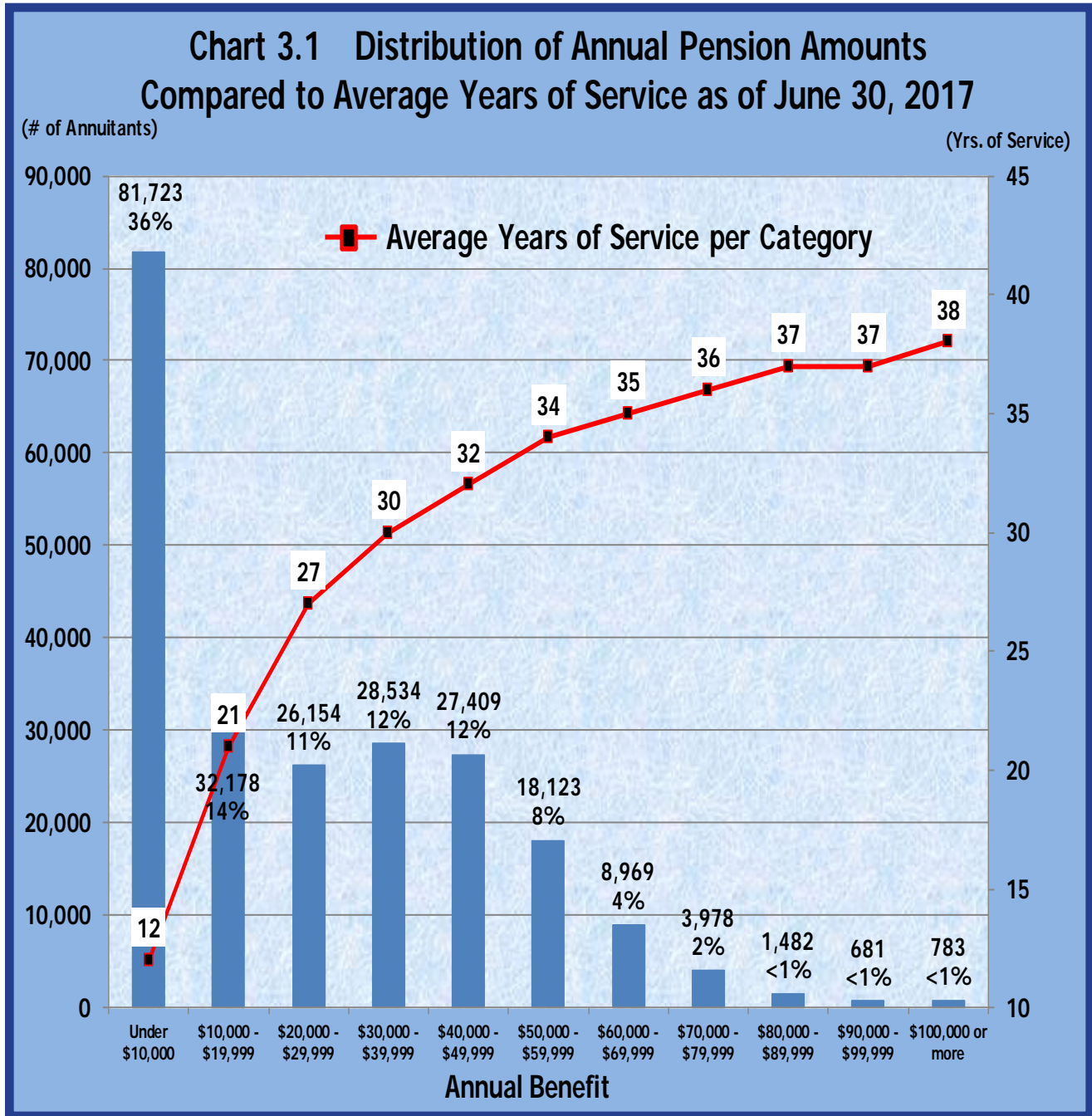
### Member Demographics and Financial Information (continued)

Table 3.2 Members by Type						
Fiscal Year ended <u>June 30</u>	Active Members	Annuitants, Beneficiaries, and Survivor <u>Annuitants</u>	Total Active/Retired Members	Ratio of Active/Retired	Vestees	Total Membership
2017	255,945	230,014	485,959	1.13 to 1	24,515	510,474
2016	257,080	224,828	481,908	1.14	23,437	505,345
2015	259,868	219,775	479,643	1.18	21,909	501,552
2014	263,312	213,900	477,212	1.23	20,467	497,679
2013	267,428	209,204	476,632	1.28	18,911	495,543
<b>Average ratio of active members to annuitants (Public Funds)</b>				1.42*		

\*Based on the November 2017 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>6/30/2016</u>	<u>6/30/2017</u>	<u>6/30/2016</u>	<u>6/30/2017</u>
Normal/Early Retirees	204,843	209,715	\$26,081	\$26,128
Survivor Annuitants	10,809	11,128	13,543	14,019
Disability Retirees	<u>9,176</u>	<u>9,171</u>	<u>19,350</u>	<u>19,740</u>
Total	224,828	230,014	\$25,203	\$25,287
Age and Service Profile of All Active Members				
	<u>6/30/2016</u>	<u>6/30/2017</u>		
Average Age	45.1	45.2		
Average Years of PSERS Service	11.3	11.4		
Average Annual Compensation	\$49,989	\$50,924		
		Class T-C Members		Class T-D Members
	<u>6/30/2016</u>	<u>6/30/2017</u>	<u>6/30/2016</u>	<u>6/30/2017</u>
Number of Members	3,682	3,447	195,477	184,831
Average Age	51.7	52.3	47.1	47.6
Average Years of PSERS Service	18.5	19.4	13.9	14.7
Average Annual Compensation	\$49,329	\$51,683	\$56,372	\$58,559
		Class T-E Members		Class T-F Members
	<u>6/30/2016</u>	<u>6/30/2017</u>	<u>6/30/2016</u>	<u>6/30/2017</u>
Number of Members	48,628	56,453	9,293	11,214
Average Age	37.9	38.4	37.0	37.7
Average Years of PSERS Service	1.7	2.0	1.9	2.4
Average Annual Compensation	\$26,898	\$28,304	\$36,822	\$38,747

Member Demographics and Financial Information (continued)



**Benefit Summary**

The average System retiree receives \$25,287 annually, a benefit earned through a career in education.

- Approximately 73% of System 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.



**Member Demographics and Financial Information (continued)**

<b>Table 3.4 PSERS <u>Pension</u> Plan Changes in Fiduciary Net Position</b>	
<b>10 Year Cumulative Summary-<u>CALENDAR YEAR-PRELIMINARY</u></b>	
<b>(Dollar Amounts in Millions)</b>	
	<b>Cumulative 10 Year Total</b>
	<b>January 1, 2008 - December 31, 2017</b>
<b>Balance of <u>Pension</u> Net Position (01/01/08)</b>	<b>\$ 67,770</b>
Member Contributions	\$ 9,766
Employer Contributions	18,182
Net Investment Income	17,701
Total Deductions - Benefits & Expenses	(57,829)
<b>Net Decrease</b>	<b>\$ (12,180)</b>
<b>Balance of <u>Pension</u> Net Position (12/31/17)</b>	<b>\$ 55,590</b>

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**Member Demographics and Financial Information (continued)**

<b>Table 3.5 PSERS Pension Plan Changes in Fiduciary Net Position</b>	
<b>10 Year Cumulative Summary-FISCAL YEAR</b>	
<b>(Dollar Amounts in Millions)</b>	
	<b>Cumulative 10 Year Total</b>
	<b>July 1, 2007- June 30, 2017</b>
<b>Balance of Net Position (07/01/07)</b>	<b>\$ 67,341</b>
Member Contributions	\$ 9,684
Employer Contributions	16,525
Net Investment Income	16,490
Total Deductions - Benefits & Expenses	(56,885)
<b>Net Decrease</b>	<b>\$ (14,186)</b>
<b>Balance of Net Position (6/30/17)</b>	<b>\$ 53,155</b>

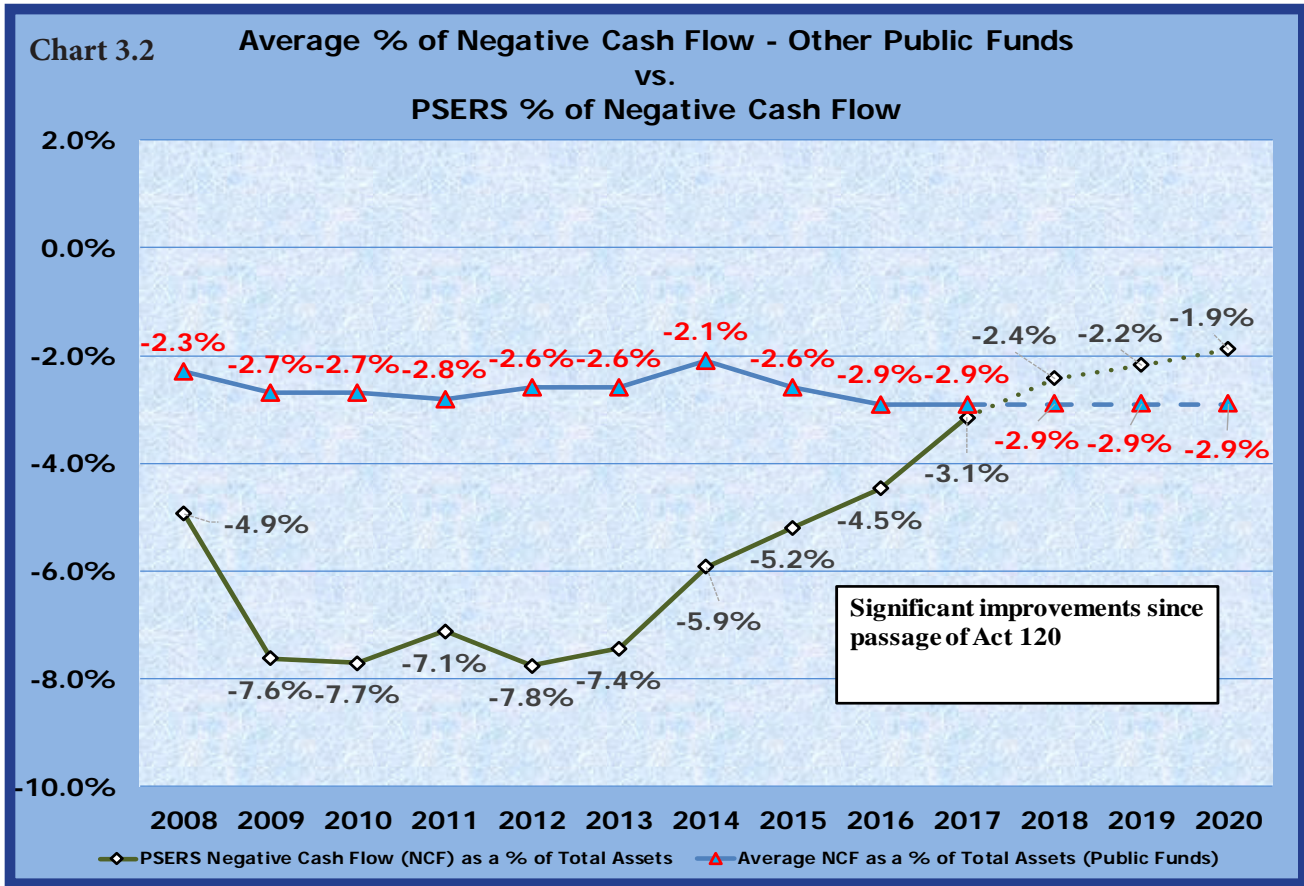
<b>Table 3.6 Cash Flow</b>				
<b>Fiscal Years Ended in June 30</b>				
<b>(Dollar Amounts in Millions)</b>				
	<b>2017</b>	<b>2018</b>	<b>----- Projected -----</b>	
			<b>2019</b>	<b>2020</b>
Member Contributions	\$ 1,014	\$ 1,015	\$ 1,043	\$ 1,059
Employer Contributions	<u>3,833</u>	<u>4,268</u>	<u>4,491</u>	<u>4,749</u>
<b>Total Contributions</b>	<b>\$ 4,847</b>	<b>\$ 5,283</b>	<b>\$ 5,534</b>	<b>\$ 5,808</b>
<b>Less:</b>				
Pension Benefits & Expenses	<u>6,519</u>	<u>6,632</u>	<u>6,805</u>	<u>6,973</u>
<b>Negative Cash Flow</b>	<b>\$ -1,672</b>	<b>\$ -1,349</b>	<b>\$ -1,271</b>	<b>\$ -1,165</b>
<b>End of Year Total Assets</b>	<b>\$ 53,155</b>	<b>\$ 55,669</b>	<b>\$ 58,444</b>	<b>\$ 61,527</b>
<b>Negative Cash Flow (NCF) as a % of Total Assets</b>	<b>-3.1%</b>	<b>-2.4%</b>	<b>-2.2%</b>	<b>-1.9%</b>
<b>Average NCF as a % of Total Assets (Public Funds)</b>	<b>-2.9%*</b>			

\*Based on the November 2017 Public Fund Survey prepared by NASRA.

**Negative Cash Flow (NCF)**

Using data from Table 3.5 at the top of the page, the last 10 years of contributions and benefit payments resulted in a Negative Cash Flow (NCF) of -\$30.7 billion (comprised of total deductions less member and employer contributions) during that time period. In Table 3.6, PSERS' Negative Cash Flow percentage is -3.1% of total assets for FY 2016-17. PSERS' projected NCF percentage of -2.4% for FY 2017-18 is less than the public fund average due to the System receiving actuarially required contributions for the first time in 15 years. If PSERS meets or exceeds its investment return assumption, PSERS' total assets are projected to grow.

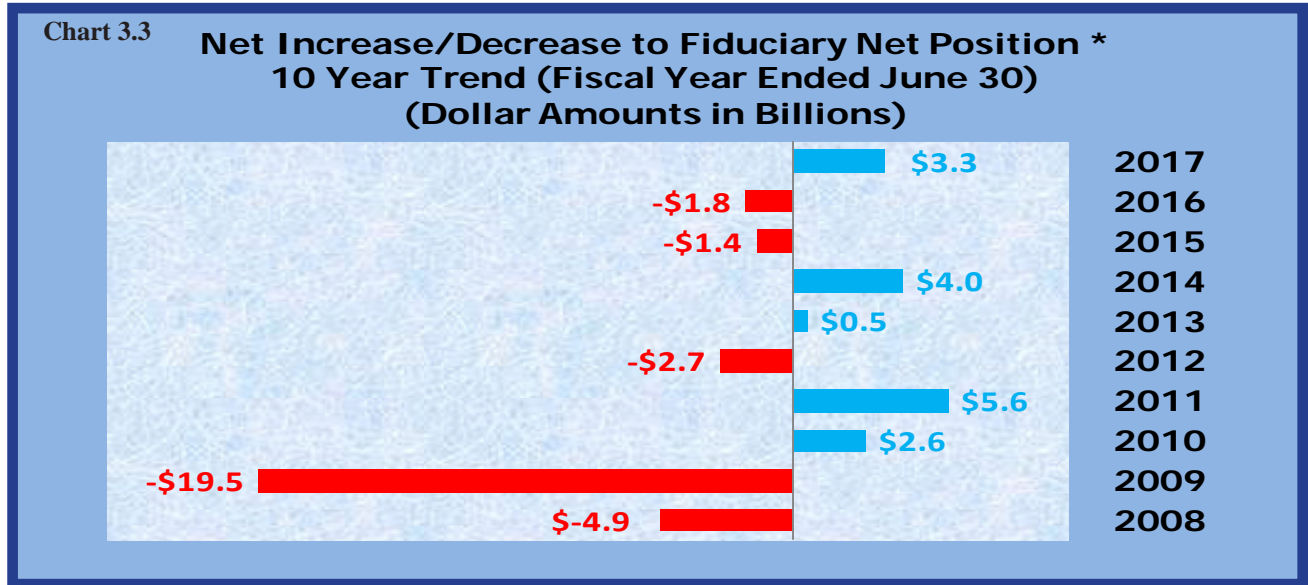
Member Demographics and Financial Information (continued)



**PSERS Negative Cash Flow Projection (NCF)**

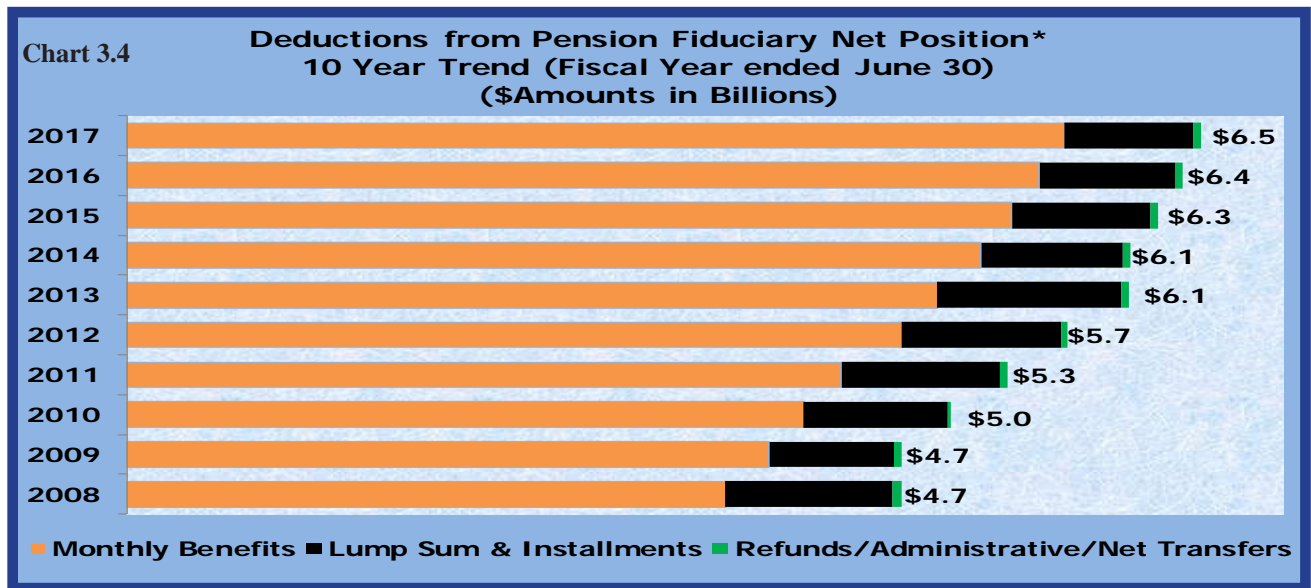
In Chart 3.2, beginning in FY2018 PSERS’ projected NCF percentage of -2.4% is above the Public Fund percentage. If PSERS meets or exceeds its investment return assumptions the total assets are projected to grow.

Member Demographics and Financial Information (continued)



**PSERS' Pension Fiduciary Net Position**

As depicted in Chart 3.3, PSERS' total net position increased by \$3.3 billion from \$50.2 billion at June 30, 2016 to \$53.5 billion at June 30, 2017. The increase was due in large part to net investment income plus member and employer contributions exceeding deductions for benefit and administrative expenses.



\*Does not include PSERS Postemployment Healthcare Plan Net Position.

**PSERS Deductions from Pension Fiduciary Net Position**

As depicted in Chart 3.4, the increase for FY2016 to FY2017 is mainly attributed to an ongoing 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, 2017

(Dollar Amounts in Thousands)

	Postemployment Healthcare			Totals
	Pension	Premium Assistance	Health Options Program	
<b>Assets:</b>				
Receivables:				
Members	\$ 328,680	\$ 2,742	\$ 68	\$ 331,490
Employers	1,115,247	29,726	-	1,144,973
Investment income	308,961	182	107	309,250
Investment proceeds	340,945	-	-	340,945
CMS Part D and prescriptions	-	-	42,229	42,229
Interfund	4,774	-	-	4,774
<b>Total Receivables</b>	<b>2,098,607</b>	<b>32,650</b>	<b>42,404</b>	<b>2,173,661</b>
Investments, at fair value:				
Short-term	7,104,397	92,285	256,773	7,453,455
Fixed income	4,241,409	-	-	4,241,409
Common and preferred stock	12,454,419	-	-	12,454,419
Collective trust funds	13,780,430	-	-	13,780,430
Real estate	4,986,456	-	-	4,986,456
Alternative investments	11,622,824	-	-	11,622,824
<b>Total Investments</b>	<b>54,189,935</b>	<b>92,285</b>	<b>256,773</b>	<b>54,538,993</b>
Securities lending collateral pool	1,527,414	-	-	1,527,414
Capital assets (net of accumulated depreciation \$28,096)	24,868	-	-	24,868
Miscellaneous	16,867	224	-	17,091
<b>Total Assets</b>	<b>57,857,691</b>	<b>125,159</b>	<b>299,177</b>	<b>58,282,027</b>
<b>Liabilities:</b>				
Accounts payable and accrued expenses	103,179	318	1,211	104,708
Benefits payable	208,475	-	25,806	234,281
Participant premium advances	-	-	30,023	30,023
Investment purchases and other liabilities	362,220	-	-	362,220
Obligations under securities lending	1,527,414	-	-	1,527,414
Interfund payable	-	4,774	-	4,774
Other Liabilities	66,558	-	-	66,558
<b>Total Liabilities</b>	<b>2,267,846</b>	<b>5,092</b>	<b>57,040</b>	<b>2,329,978</b>
<b>Net position restricted for pension and postemployment healthcare benefits</b>				
	\$ 55,589,845	\$ 120,067	\$ 242,137	\$ 55,952,049

## Section 1 - PSERS Overview

### Statements of Changes in Fiduciary Net Position Six Months Ended December 31, 2017 (Dollar Amounts in Thousands)

	Postemployment Healthcare			Totals
	Pension	Premium Assistance	Health Options Program	
<b>Additions:</b>				
Contributions:				
Members	\$ 481,210	\$ -	\$ -	\$ 481,210
Employers	1,992,997	52,968	-	2,045,965
<b>Total contributions</b>	<b>2,474,207</b>	<b>52,968</b>	<b>-</b>	<b>2,527,175</b>
Participant premiums			178,238	178,238
Centers for Medicare & Medicaid Services premiums			37,510	37,510
Investment income:				
From investing activities:				
Net appreciation (depreciation) in fair value of investments	2,714,620	(108)	-	2,714,512
Short-term	45,522	711	739	46,972
Fixed income	92,860	-	-	92,860
Common and preferred stock	132,064	-	-	132,064
Collective trust funds	2,174	-	-	2,174
Real estate	162,699	-	-	162,699
Alternative investments	257,023	-	-	257,023
<b>Total investment activity income</b>	<b>3,406,962</b>	<b>603</b>	<b>739</b>	<b>3,408,304</b>
Investment expenses	(242,304)	-	-	(242,304)
<b>Net income from investing activities</b>	<b>3,164,658</b>	<b>603</b>	<b>739</b>	<b>3,166,000</b>
From securities lending activities:				
Securities lending income	15,547	-	-	15,547
Securities lending expense	(10,056)	-	-	(10,056)
<b>Net income from securities lending activities</b>	<b>5,491</b>	<b>-</b>	<b>-</b>	<b>5,491</b>
<b>Total net investment income</b>	<b>3,170,149</b>	<b>603</b>	<b>739</b>	<b>3,171,491</b>
<b>Total Additions</b>	<b>5,644,356</b>	<b>53,571</b>	<b>216,487</b>	<b>5,914,414</b>
<b>Deductions:</b>				
Benefits	3,179,334	55,974	182,472	3,417,780
Refunds of contributions	8,871	-	-	8,871
Administrative expenses	21,642	1,273	19,745	42,660
<b>Total Deductions</b>	<b>3,209,847</b>	<b>57,247</b>	<b>202,217</b>	<b>3,469,311</b>
<b>Net increase (decrease)</b>	<b>2,434,509</b>	<b>(3,676)</b>	<b>14,270</b>	<b>2,445,103</b>
<b>Net position restricted for pension and postemployment healthcare benefits:</b>				
<b>Balance, beginning of year</b>	<b>53,155,336</b>	<b>123,743</b>	<b>227,867</b>	<b>53,506,946</b>
<b>Balance, end of year</b>	<b>\$ 55,589,845</b>	<b>\$ 120,067</b>	<b>\$ 242,137</b>	<b>\$ 55,952,049</b>



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## The Actuarial Process and Pension Plan Funding

PSERS is a defined benefit plan, meaning benefits are based on members' service and salary history. Act 5 of 2017, further described in Tab 6, created two new hybrid defined benefit/defined contribution plans and a defined contribution only plan but they do not go into effect until July 1, 2019. The following information highlights the actuarial process and funding for PSERS current 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' staff 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.

Effective with the February 2018 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 places PSERS'

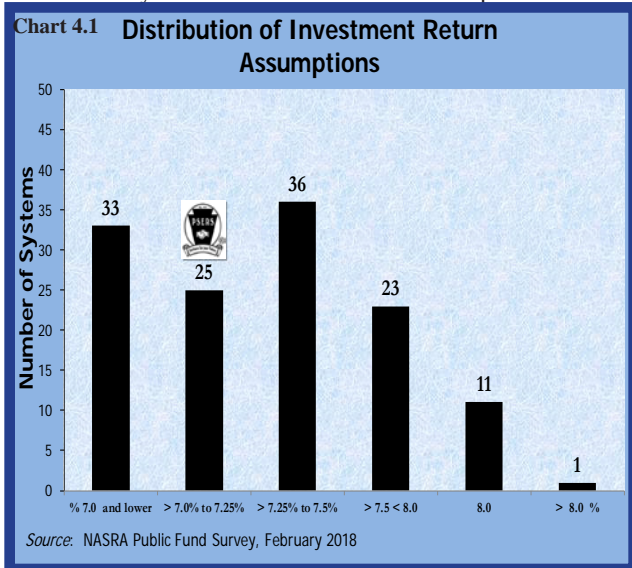
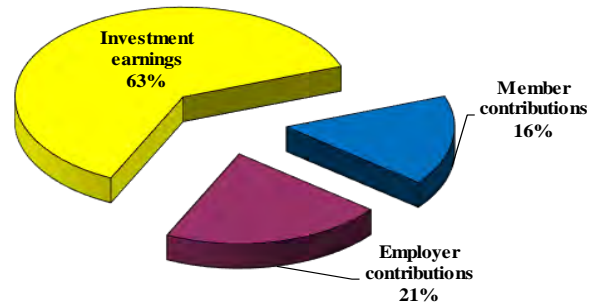


Chart 4.2

**Figure 3 - PSERS' Sources of Funding Twenty Year History (1998-2017)**



7.25% return assumption among the more conservative funds in the public pension universe.

### 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-year period ended June 30, 2017 investment earnings provided 63% of PSERS' funding followed by 21% from employers while members contributed 16%.

### 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, establishes the employer contribution rate annually, as part of the annual actuarial valuation. The employer contribution rate, which is expressed as a percentage of payroll, is composed of two items: (1) the pension contribution; and, (2) the contribution for healthcare premium assistance.

The total employer contribution rate for the fiscal year ended June 30, 2017 was 30.03%, including 0.83% for healthcare premium assistance. The total employer contribution rate for the fiscal year ending June 30, 2018 is 32.57%. This rate consists of a 31.74% pension rate plus the healthcare premium assistance contribution of 0.83%. The FY 2018-19 employer contribution rate is 33.43%. This rate consists of a 32.60% pension rate plus the healthcare premium assistance contribution of 0.83%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of Act 120 of 2010, at their December 2017 meeting. While any contribution increase is a challenge for PSERS' employers, the increase in the FY 2018-19 contribution rate is the smallest since FY 2009-10. The very large increases that employers experienced over the last several years are now in the past. The projected rate increases in the future are consistent with inflation.

For the fiscal year ended June 30, 2017, PSERS' employer contributions totaled \$3.944 billion, which includes \$111



**The Actuarial Process and Pension Plan Funding**  
(continued)

million for healthcare premium assistance. For the fiscal year ending June 30, 2018 the estimate for total employer contributions is \$4.381 billion, reflective of the 32.57% contribution rate. The contribution rate for the fiscal year ending June 30, 2019 is 33.43% resulting in an employer contribution estimate of \$4.669 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 (FY2017-18) is 7.54%. This is in contrast to many non-public (private) pension plans to which members of over 90% of such plans 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. The member contribution rate will stay within the specified range allotted for Class T-E or Class T-F, but could increase or decrease every three years starting July 1, 2011 depending on investment performance. Members now share a portion of the investment risk of the Fund giving PSERS a defined contribution element. As a result of the

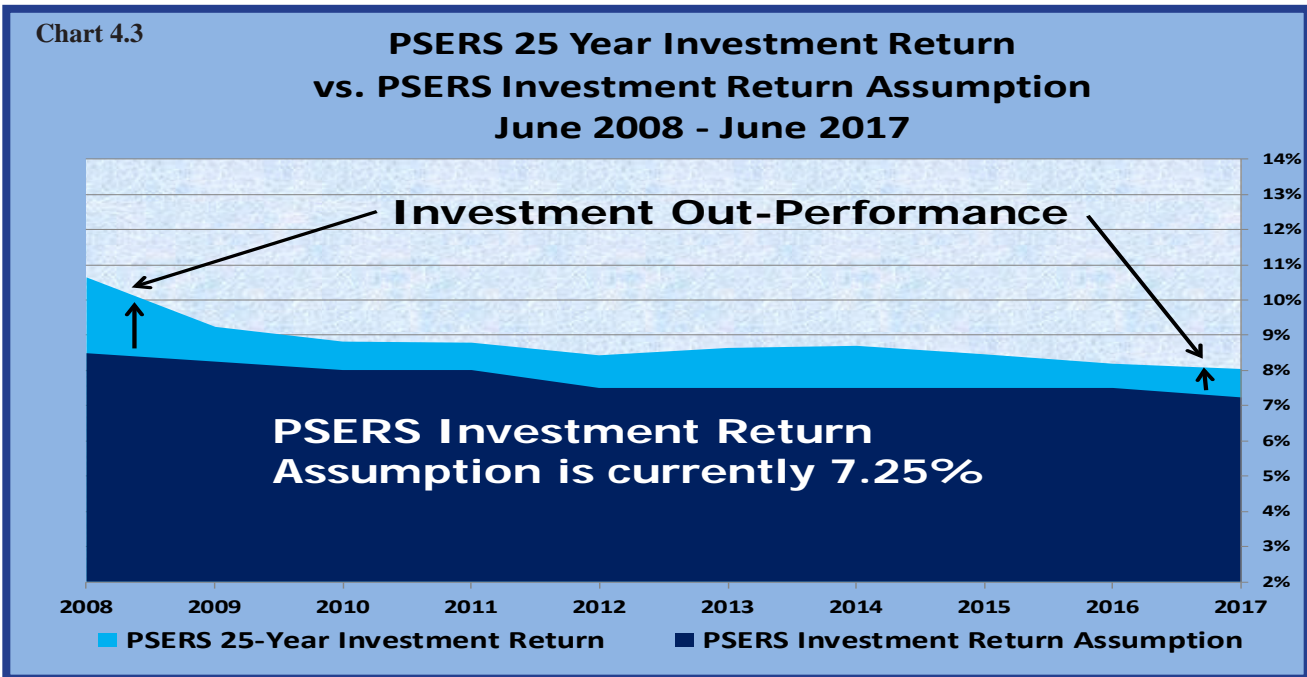
Fund's six- year return through June 30, 2017 exceeding the investment performance hurdle mandated by Act 120, the member contribution rate did not change. The next investment performance measurement period for Class T-E and T-F members will be the nine-year period ending June 30, 2020.

PSERS' members contributed \$1.014 billion of pension contributions for FY2017. Total member contributions are estimated to be \$1.015 billion for the fiscal year ending June 30, 2018 and \$1.043 billion for the fiscal year ending June 30, 2019.

**Investment Returns**

PSERS' investment rate of return for the calendar year ended December 31, 2017 is 12.30%, net of fees. The investment rates of return (net of fees) for the fiscal years ended June 30, 2017 and June 30, 2016 were 10.14% and 1.29%, respectively. The annualized rates of investment return for the three, five and ten-year periods ended December 31, 2017 were 6.91%, 7.62%, and 4.20% respectively. Over the past 25 years ended December 31, 2017, the Fund earned an annualized rate of return of 8.06% 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. Even after the Great Recession of 2008-2009, PSERS' long-term returns continued to exceed the return assumption.



**The Actuarial Process and Pension Plan Funding**  
(continued)

**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.

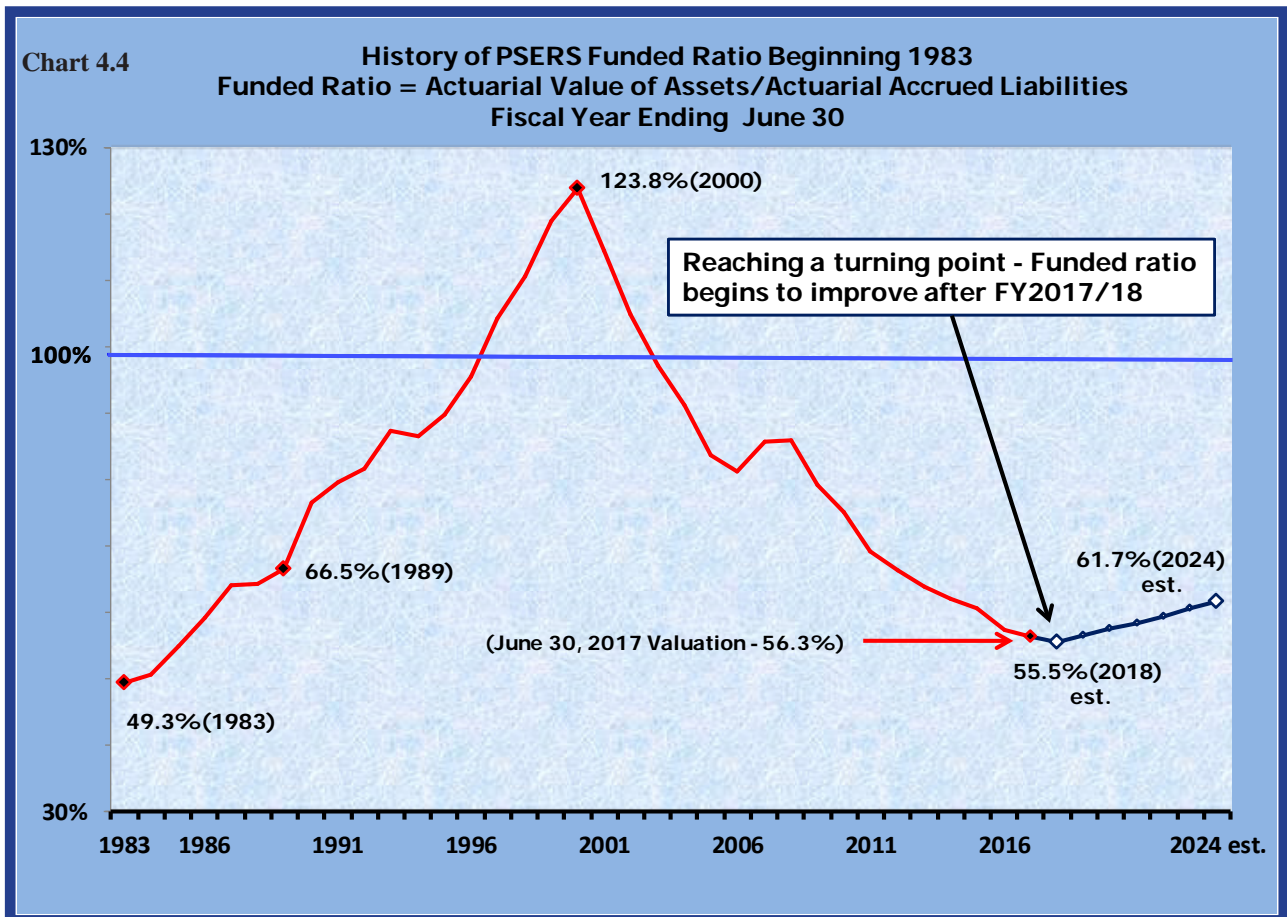
**Key Facts**

- As a result of legislated contribution increases under Act 120, PSERS is reaching a turning point. After FY 2017-18, PSERS' funded ratio is projected to slowly improve after declining for many years.
- Funded Status: 56.3% as of June 30, 2017
- Funded Status: 57.3% as of June 30, 2016
- The decrease in FY2017 is primarily due to the actuarial value of assets loss that occurred during the year as a result of the 10 year asset smoothing used for actuarial valuation purposes (as the 10 year investment return is below the assumed rate of

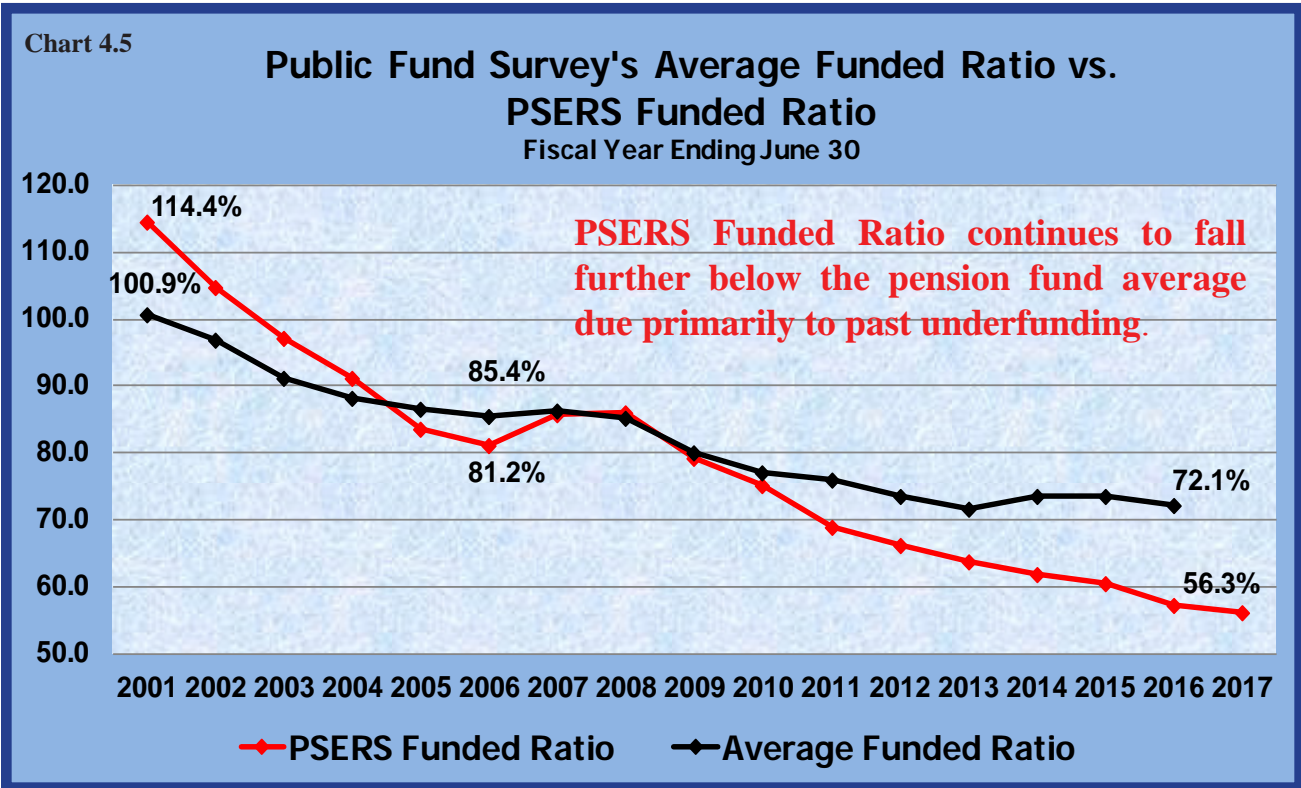
return) and the continued underfunding of PSERS by its employers.

- The decrease in the funded status since 2000 is 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 economics assumptions in FY2016; funding collars in Act 120 which continued the employer underfunding of the system; and, actuarial liability losses.

A history of PSERS' funded ratio beginning in 1983 and seven-year projection of PSERS' funded status is shown in Chart 4.4. As a result of legislated contribution increases under Act 120, PSERS is reaching a turning point. After FY 2017-18 PSERS' funded ratio is projected to slowly improve after declining for many years.



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 above. 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.

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, 2016*).

Beginning July 1, 2016 PSERS’ employer contribution rate provides 100% of the actuarially required rate. This is 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 rate, PSERS’ funded ratio is projected to improve after FY 2017-18 and the gap between PSERS’ funded ratio and the public fund average will start to shrink.

**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 56.3% as of June 30, 2017. This funded ratio is based on an actuarial value of assets of \$57.46 billion and a total accrued liability of \$101.97 billion which equates to a \$44.51 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 (41%), investment performance (37%), and benefit enhancements (18%), which include Act 9, cost of living increases and early retirement incentives. The new demographic and economic assumptions adopted by the Board in June 2016 have added approximately \$2.5 billion to the unfunded liability. The additional unfunded liability will be amortized over 24 years so the impact of the new assumptions to the FY 2017-18 employer contribution rate was small.

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. Without the higher investment out-performance to compensate,

the employer funding deferrals and benefit enhancements have significantly increased PSERS’ unfunded liability. Approximately fifty-nine percent of PSERS’ June 30, 2017 unfunded liability is due to employer funding deferrals and benefit enhancements, both of which are not a result of the defined benefit plan design.

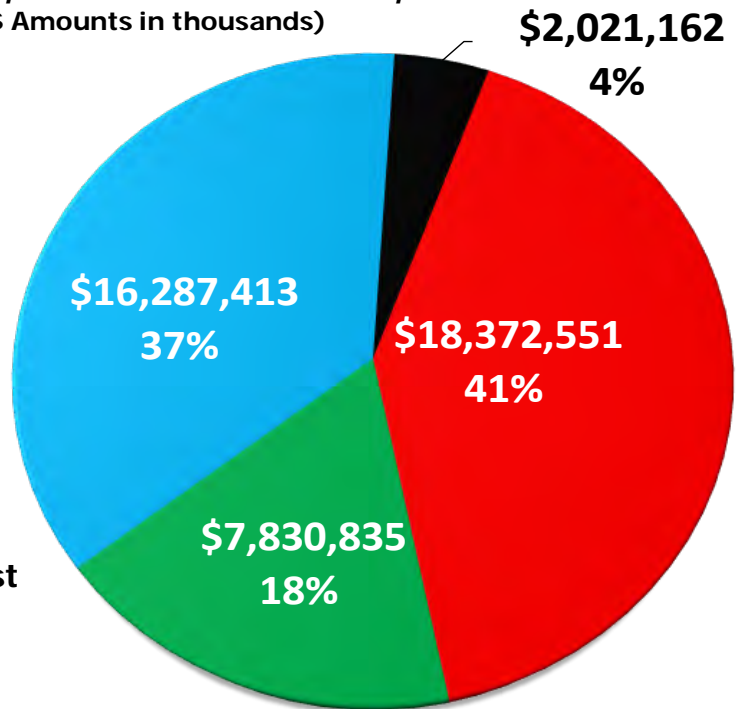
**GASB 68 Pension Reporting for Employers**

In June 2017, PSERS sent information to its employers to assist them in complying with the Governmental Accounting Standards Board (GASB) Statement No. 68, *Accounting and Financial Reporting for Pensions*. 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 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.

Chart 4.6

**PSERS Sources of Unfunded Liability**  
**Total \$44,511,961 as of June 30, 2017**  
 (\$ Amounts in thousands)

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





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## 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 develops the recommended Employer Contribution Rate (ECR) that determines the employer contributions to the pension plan and healthcare premium assistance. The valuation process also measures the progress of the pension system towards funding pensions for its active and retired members.

### Employer Contribution Rate Statistics

- Highest historical ECR (FY 2017-18) 32.57%
- Lowest historical ECR (FY 2001-02) 1.09%
- Ten yr. avg. ECR (2008-09 to 2017-18) 16.30%
- Twenty yr. avg. ECR (1998-99 to 2017-18) 10.20%
- Thirty yr. avg. ECR (1988-89 to 2017-18) 11.56%
- Adopted ECR (FY 2018-19) 33.43%

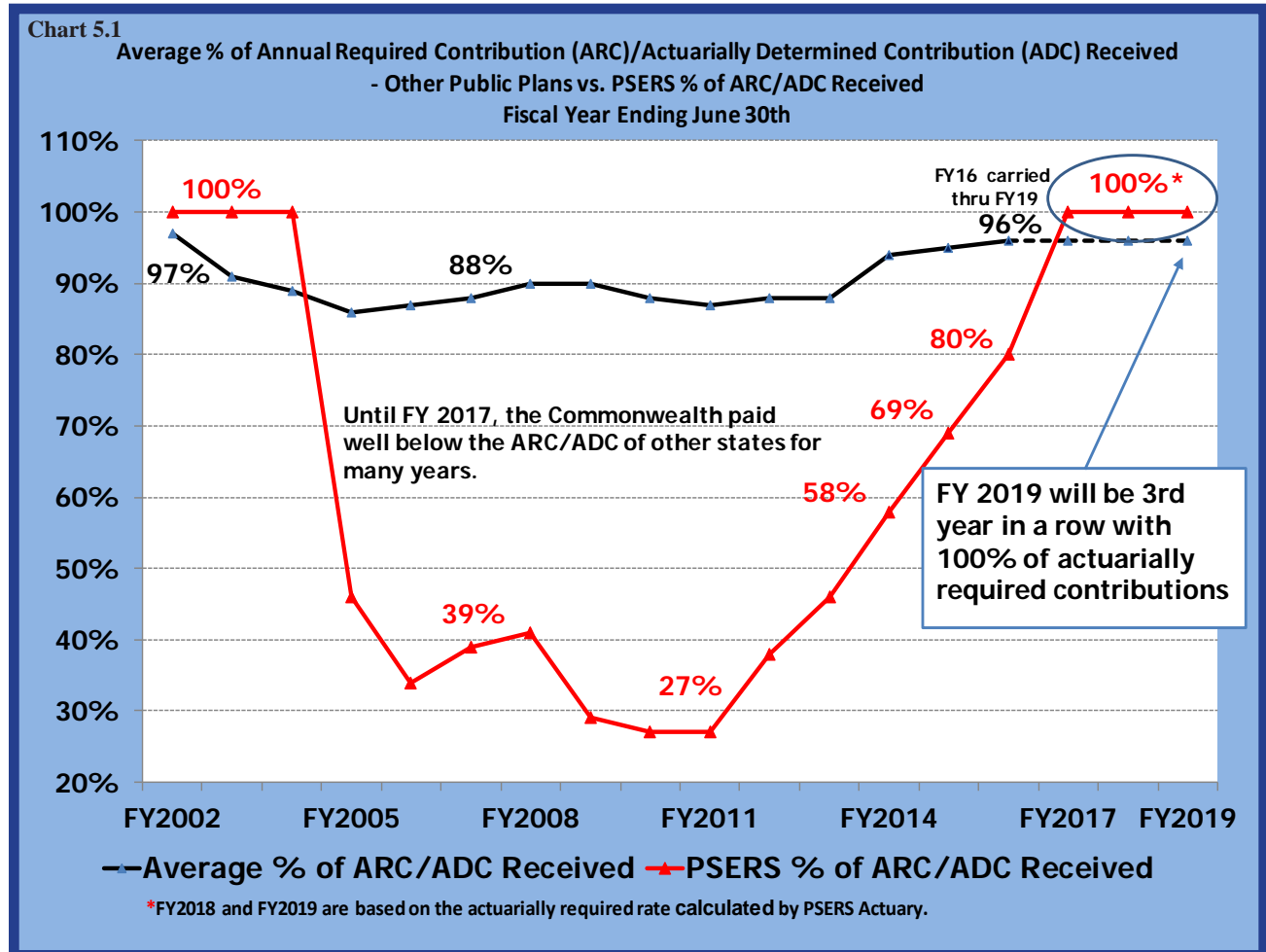
The legislation included actuarial and funding changes to PSERS and benefit reductions for individuals who became new members of PSERS on or after July 1, 2011.

As depicted in the Chart 5.1, the gradual rate increases under Act 120 have raised PSERS' employer contributions to the 100% annual required contribution (ARC) goal, now referred to as the actuarially determined contribution (ADC), for the first time in 15 years. 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 33.43% for FY 2018-19 in compliance with Act 120. This is the third consecutive year PSERS' contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles and now exceeds the average ARC/ADC percentage of 96% for public funds based on the November 2017 Public Fund Survey prepared by NASRA.

## Act 120 of 2010

### Progress on Funding Issue

PSERS is now in the 7th year under Act 120 of 2010. Act 120 provided historic pension reform and made dramatic progress toward addressing funding issues at PSERS.



**Employer Contribution Rate  
(continued)**

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

For school employees who became new members of PSERS on or after July 1, 2011, there are two new classes; Class T-E and T-F. As of June 30, 2017, members hired since the passage of Act 120 now total approximately 68,000 and account for 26% of the total active membership.

**Class T-E**

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

**Class T-F**

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

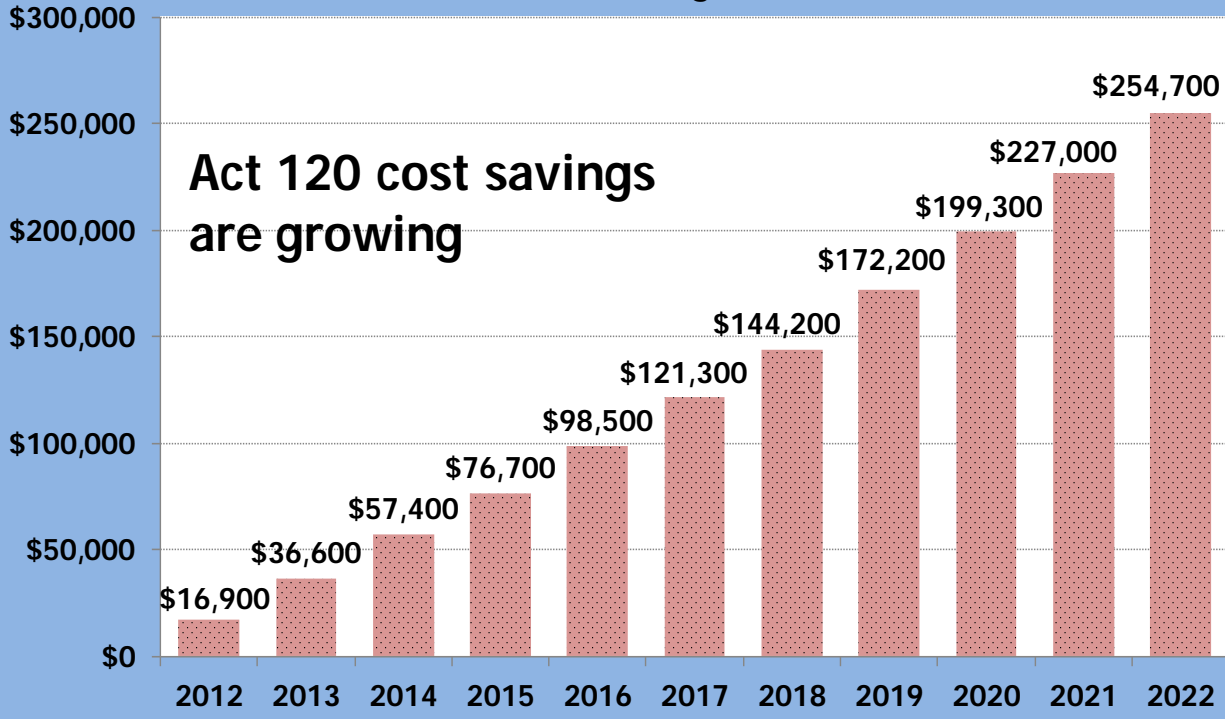
Class T-E and T-F members share some of the risk when

investments underperform. As a result of the Fund’s six-year return through June 30, 2017 exceeding the investment performance hurdle mandated by Act 120, the member rate has not changed. The next investment performance measurement period for T-E/T-F members that could increase the member rate by .5% is for the nine-year period ending June 30, 2020.

The total estimated savings of the T-E/T-F Benefit Tiers is illustrated in Chart 5.2. As the membership grows, the annual savings from the low T-E/T-F cost structure also increases and allows a greater portion of employer contributions to go towards paying the unfunded liability. Cumulative estimated savings through June 30, 2017 were \$407.4 million. The average member benefit for Act 120 members is approximately 32% lower than the benefit for pre-Act 120 members.

As of June 30, 2017, 11,214 or 17% of new members elected Class T-F and 56,453 or 83% of new members remained in Class T-E. 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.

**Chart 5.2**  
**PSERS**  
**Act 120 Total Estimated Annual Savings from TE/TF Benefit Tiers (ooo's omitted)**  
**Fiscal Year Ending June 30**



**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 33.43% for FY 2018-19 which represents an increase of 2.64% over the FY 2017-18 rate of 32.57%.

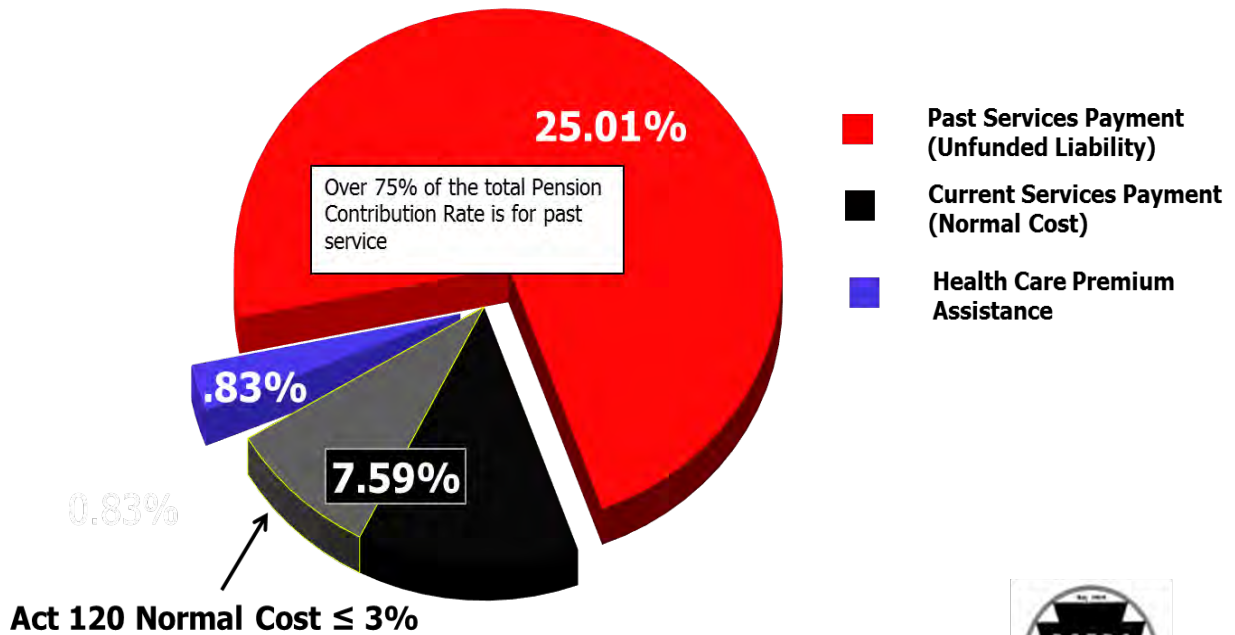
**Employer Contribution Rate**

Chart 5.3 displays the components of PSERS' projected employer contribution rate of 33.43% in FY 2018-19. The majority of the rate, over 75%, 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 Act 120 members, and eventually Act 5, join the System. The cost structure of PSERS' new members under Act 120 is low and the shared risk provisions shift a portion of the investment risk to active members giving PSERS a defined contribution element. 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.

Chart 5.3

**Components of PSERS  
Total Employer Contribution Rate FY2019**

**Total Employer Contribution Rate 33.43%**

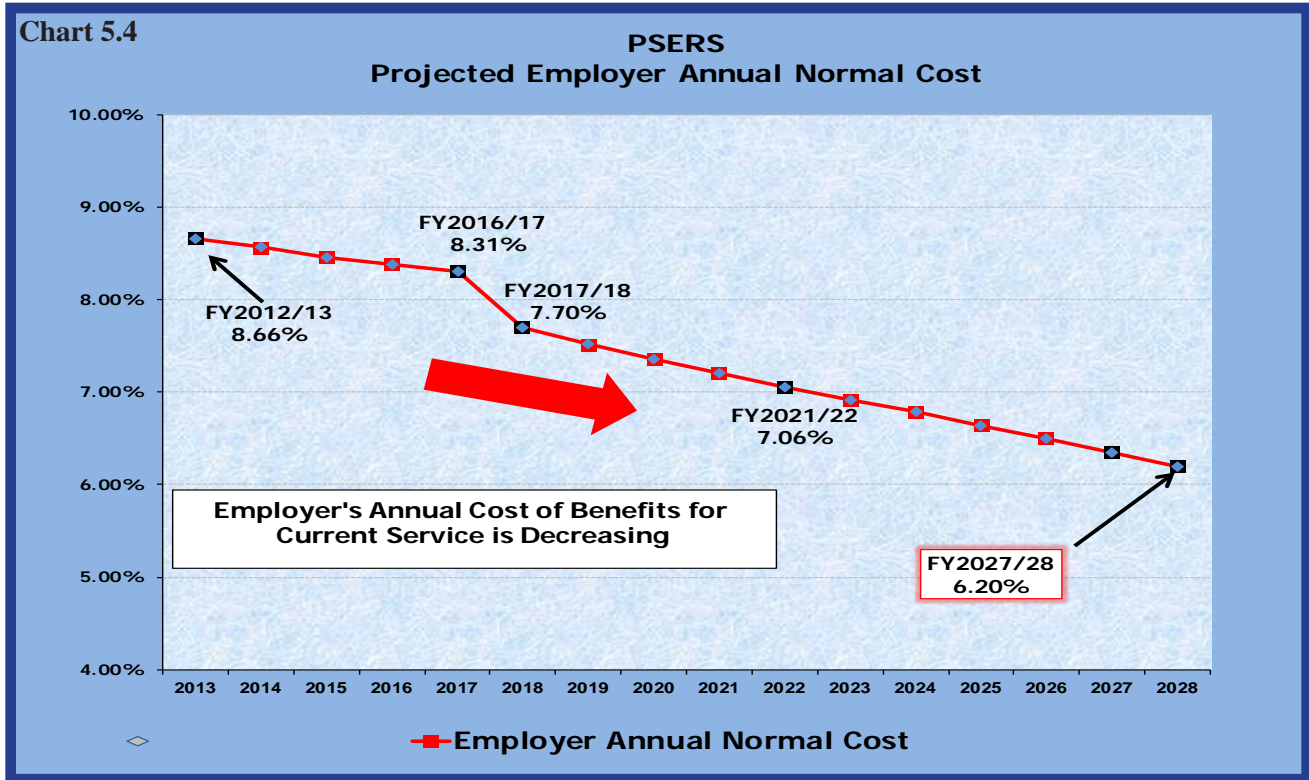




**Employer Contribution Rate**  
(continued)

**Act 120 Employer Costs**

As Chart 5.4 depicts, the employer normal cost decreases over time as Act 120 and eventually 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 6.20% in FY 2027-28 when over 50% of active employees will be Act 120 members.



**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 56% of total employer contributions and employers pay for 44%. Table 5.1 illustrates the projected amounts of the Commonwealth’s Appropriation for FY 2018-19 through FY 2022-23. As depicted, the Commonwealth’s share of contributions are starting to level out as the year-over-year increases are smaller each year.

<b>Table 5.1 Commonwealth’s Department of Education School Employees’ Retirement Appropriation</b>					
(\$ amounts in Billions)					
	----- Projected -----				
	<u>2018-19</u>	<u>2019-20</u>	<u>2020-21</u>	<u>2021-22</u>	<u>2022-23</u>
School Employees’ Retirement	\$ 2.527	\$ 2.689	\$ 2.821	\$ 2.935	\$ 3.066

## Employer Contribution Rate (continued)

### 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 will choose one of three new retirement plan options for their retirement benefits. The new plan design options include two hybrid plans consisting of defined benefit and defined contribution components and a stand-alone defined contribution plan. The current stand-alone defined benefit plan will no longer be 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 will have the option to switch from the current defined benefit plan to one of the three new retirement plans if they so choose.

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 makes modifications to the "shared risk" program that will allow members to benefit when the Fund outperforms its investment rate of return assumption.

### Legislative Pension Proposal Assistance

Throughout 2017, PSERS staff was 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 incurred over \$386,000 in outside actuarial services from PSERS' actuary solely for numerous pension policy proposals during 2017.

PSERS staff also spent hundreds of hours on multiple variations of pension policy proposals. The cost work performed internally by PSERS staff saved over \$70,000 in outside actuarial fees in 2017. PSERS legal staff also drafted hundreds of pages of draft legislation for numerous pension policy proposals.

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

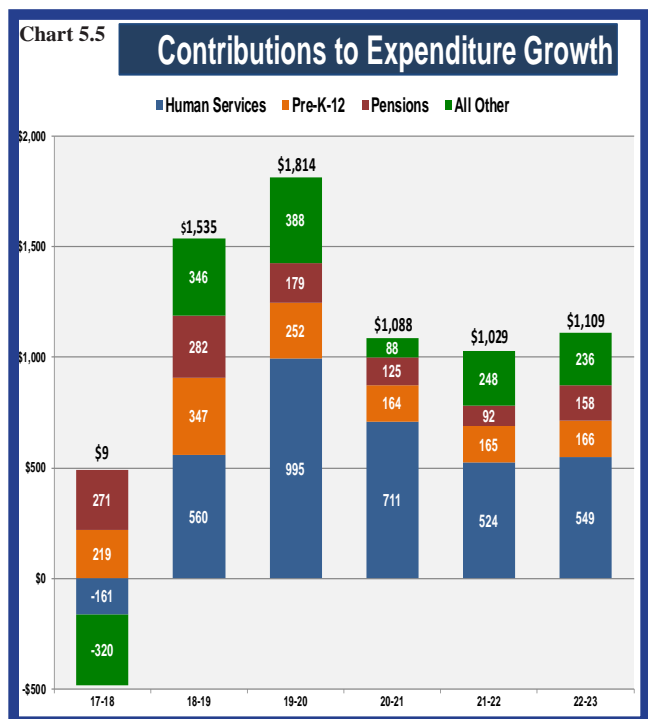
legislative proposals.

### 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 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 2017 meeting, PSERS Board of Trustees certified an annual contribution rate of 33.43% for FY 2018-19 which continues to put PSERS on the path towards full funding. For the third consecutive year, the Commonwealth's employer contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles. After July 1, 2016, no additional pension debt will be added due to underfunding. Future contribution rates begin to level off after FY 2017-18 which will reduce budgetary pressure on the Commonwealth and school districts in FY 2018-19 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, after FY 2017-18 pensions are no longer a major cost driver of Commonwealth expenditure growth.



### **PSERS is reaching a Turning Point under Act 120**

After FY 2017-18, PSERS' actuarial funded ratio is projected to slowly improve after declining steadily since FY2001. On a market value basis, PSERS unfunded liability declined in FY 2016-17 and continued to decline through December 31, 2017. 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. Despite lowering its ratings of the Commonwealth's debt instruments in September 2017, S&P noted in its outlook that "We also expect that the Commonwealth will continue to fully fund pension ADCs (Actuarially Determined Contributions), which we view as a strength relative to lower rated states."

A major funding milestone was also reached during FY 2017 as employers funded 100% of the actuarially required contributions to PSERS for the first time in fifteen years. Full actuarial funding from employers, along with member contributions and investment income are all necessary sources of funds that will 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.



## SECTION 2 - PSERS FY2018-19 BUDGET

PSERS Consultants' Fees and Legislation.....	Tab 6
PSERS FY2018-19 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets.....	Tab 7



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## Section 2 - FY2018-19 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, 2017.

<b>Table 6.1 Investment and Pension Fund Administration Consultants</b>		
<b><u>Firm</u></b>	<b><u>Services Provided</u></b>	<b><u>Consultant Fee</u></b>
ViTech Systems Group, Inc.	Pension administration system services	\$ 5,500,000 *
Portfolio Advisors, LLC	Private market consulting	\$ 1,900,000
Aksia LLC	Hedge fund investment consulting	\$ 700,000
AonHewitt	General investment consulting	\$ 699,892
STP Investment Services, LLC	Investment accounting application service provider	\$ 653,000
Conduent HR Services	Pension benefit actuarial services	\$ 629,815 *
OST, Inc.	Webmaster consulting	\$ 520,367 *
Courtland Partners, Ltd.	Real estate investment consulting	\$ 298,163
Glass, Lewis & Co., LLC	Proxy voting	\$ 178,681

<b>Table 6.2 Health Options and Premium Assistance Program Consultants</b>		
<b><u>Firm</u></b>	<b><u>Services Provided</u></b>	<b><u>Consultant Fee</u></b>
CoreSource, Inc.	Postemployment healthcare benefits administration and claims adjudication	\$ 26,093,049 *
Optum Rx, Inc.	Administration of postemployment healthcare benefits and prescription drug plan	\$ 6,741,479 *
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	\$ 3,649,567 *
Independent Pharmaceutical Consultants, Inc.	Pharmacy benefit consulting services	\$ 565,944 *
Healthways, Inc.	Administration of Silver Sneakers Fitness Program	\$ 763,843 *

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

**Legislation**

**PSERS Related Legislation Activities during Calendar Year 2017**

**Act 3A of 2017**

On July 21, 2017, Governor Wolf signed into law Senate Bill Number 681, Printer's Number 1029. This legislation makes an appropriation in the amount of \$52,453,000 from the Public School Employees' Retirement Fund to provide for the administrative expenses of PSERS for the fiscal year July 1, 2017 to June 30, 2018.

**Act 5 of 2017**

On June 12, 2017, Governor Wolf signed into law Senate Bill Number 1, Printer's Number 902. This legislation establishes a new hybrid defined benefit/defined contribution retirement benefit plan applicable to all new members of PSERS beginning July 1, 2019.

- **Hybrid Plan Design:** Beginning July 1, 2019, the new plan design will offer new members of PSERS (or current members who elect to "opt-in" to the new system) a choice among one of three retirement plans. Members will have 90 days to make an election following notification by the Board. New members hired on or after July 1, 2019 who fail to make a timely election will be placed in the default (Class T-G) hybrid plan.
- **Membership Class T-G (Default Hybrid):** Hybrid Defined Benefit and Defined Contribution plan. Members contribute 8.25% of compensation, with 5.5% allocated to the DB plan that has a 1.25% benefit multiplier, and 2.75% to the DC plan. The employer contribution rate to the DB plan is actuarially determined. The employer contribution rate to the DC plan is statutorily set at 2.25% of compensation.
- **Membership Class T-H (Alternative Hybrid):** Hybrid Defined Benefit and Defined Contribution plan. Members contribute 7.5% of compensation, with 4.5% allocated to the DB plan that has a 1.0% benefit multiplier, and 3.0% to the DC plan. The employer contribution rate to the DB plan is actuarially determined. The employer contribution rate to the DC plan is statutorily set at 2.0% of compensation.
- **Class Defined Contribution (DC) Plan:** A 401(a) defined contribution plan only (no defined benefit component). Participants contribute 7.5% of compensation with an employer contribution match of 2.0%.
- **Opt-in Provision:** Current, active members of PSERS as of July 1, 2019, will be permitted a one-time, irrevocable election to opt-in to one of the three new plan designs. The member contribution rate for a member opting in will not be more or less than what the member is currently contributing.
- **Superannuation Retirement:** For Class T-G Members, age 67 with 3 years of service or the "Rule of 97;" provided the member has at least 35 years of service and attains an age that in combination is equal to or greater than 97. For Class T-H Members, age 67 with 3 years of service.

## Section 2 - FY2018-19 Budget

- **Early Retirement:** Class T-G members who terminate on or after attaining age 57 with at least 25 years of service would be able to commence benefits immediately, but benefits are reduced by 3% for each year the commencement occurs prior to superannuation. Class T-G and Class T-H members who are under age 62 and with less than 25 years of service will receive a benefit with a special two-step reduction factor: (1) one factor for a benefit received between age 62-67; and (2) another factor for a benefit received below age 62.
- **Vesting:**
  - **Defined Benefit:** 10 years.
  - **Defined Contribution:** Immediately for employee contributions; 3 years for employer contributions.
- **Final Average Salary:** Calculated using the five highest years of compensation for the defined benefit plan component.
- **Cost Neutral Option 4:** Class T-E, Class T-F, Class T-G, and Class T-H may elect a cost neutral withdrawal of their contributions and interest at the time of retirement. For Class T-E and Class T-F members, this provision applies to all contributions and interest withdrawn at the time of retirement. For Class T-C or Class T-D members who opt into Class T-G or Class T-H membership, this option will only apply to contributions and interest credited on or after July 1, 2019.
- **Shared-Risk / Shared-Gain:** Provides for “shared-risk” and “shared-gain” provisions to be calculated every 3 years comparing PSERS’ actual and assumed rate of return for the past 10 years. For every percentage point in earnings realized in excess of or below the assumed rate of return, the employee contribution requirement will be increased or reduced by 0.75%, not to exceed a maximum of 3% above or below the basic contribution rate. Class T-E and Class T-F members will continue to be subject to the current shared risk requirement, and will also immediately be subject to the shared gain provision, but, such rate will only be increased or reduced by 0.5%, not to exceed a maximum of 2% above or below the basic contribution rate.

### Act 44 of 2017 (Fiscal Code)

On October 30, 2017, Governor Wolf signed into law House Bill Number 674, Printer’s Number 2624. Act 44 amended the act of April 9, 1929, (P.L. 343, No. 176), known as the Fiscal Code, implementing the 2017-2018 Commonwealth budget. Section 1799.6-E (Public School Employees’ Retirement System Restricted Account) of Act 44 transfers \$6,801,000 in prior year unexpended appropriations for school employees’ retirement to the PSERS board for costs associated with the implementation of the Public School Employees Defined Contribution Plan pursuant to Act 5 of 2017.





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## Section 2 - FY2018-19 Budget

### Public School Employees' Retirement System Fiscal Year 2018-19 Administrative Budget

Table 7.1	<u>Budget FY2016-2017</u>	<u>Budget FY2017-2018</u>	<u>PSERS' Budget Request FY2018-2019</u>
<b>Total Personnel Services</b>	\$ 25,644,000	\$ 27,068,000	\$ 28,014,000
<b>Operating Expenses and Fixed Assets</b>			
Travel	\$ 147,900	\$ 153,450	\$ 167,130
Training & Conference Registration	133,300	154,930	199,400
Telecomm - Recurring	349,700	388,900	420,900
Telecomm - Non-Recurring	12,500	13,000	15,000
Telecomm - Voice Hardware less than \$5,000	-	5,000	5,000
Electricity	35,000	30,000	22,300
Consultant Services - Non EDP	1,729,250	3,231,900	2,657,500
Consulting - Managed Services	1,631,000	76,900	20,000
Outsourced IT Consulting for apps & development	17,200	51,000	109,000
Consulting - Maint & Support - (post implementation)	79,800	-	125,000
Consulting - General IT Support	317,500	1,127,600	790,600
Consulting - Outsourced Infrastructure Svcs (DPH)	10,000	1,200,000	921,000
Legal Services/Fees	64,000	664,000	289,000
Specialized Services	427,300	448,750	484,750
Other Specialized Services	181,300	159,720	174,000
Advertising	10,000	10,000	10,000
Medical, Mental, & Dental Services	5,000	4,000	3,500
Software Licensing - Maintenance	1,608,700	1,703,800	1,753,100
Hardware Server - Maintenance	1,500	2,000	2,000
Hardware Network - Maintenance	22,000	61,800	75,000
Hardware Storage - Maintenance	33,400	-	-
Hardware Periph - Maintenance	8,000	8,000	13,000
Hardware Desktop - Maintenance	1,000	1,000	1,000
Contracted Maintenance Non EDP	153,500	166,100	168,000
Telecomm Data Services	87,700	87,700	88,900
Contracted Repairs - Non EDP	105,000	15,200	15,500
Real Estate Rental	2,006,000	2,036,500	2,059,500
Vehicle Rental	1,600	2,600	2,600
Office Equipment Rental	193,800	201,000	236,300
Other Rentals	3,900	8,300	8,400
Office Supplies	214,500	211,500	228,100
Educational Supplies (Books)	10,000	9,000	8,800
Medical Supplies	400	2,600	300
Software License non-recurring less than \$5,000	53,700	23,500	31,300
Hardware - Network	-	-	140,000

## Section 2 - FY2018-19 Budget

### Public School Employees' Retirement System Fiscal Year 2018-19 Administrative Budget (continued)

Table 7.1	Budget <u>FY2016-2017</u>	Budget <u>FY2017-2018</u>	PSERS Budget Request <u>FY2018-2019</u>
Hardware Desktop less than \$5,000	76,000	23,050	407,200
Furniture and Fixtures	58,450	58,100	68,100
Other Equipment	2,000	7,000	13,000
Motorized Equipment Supplies	21,000	21,000	21,000
Postage	1,113,600	1,191,790	1,148,500
Freight	5,000	5,000	3,000
Printing	213,000	212,500	221,000
Subscriptions	306,000	384,300	431,340
Membership Dues	34,500	35,510	38,280
Conference Expense	49,000	49,000	64,000
Insurance, Surety, & Fidelity Bonds	23,000	23,000	10,000
Other Operational Expenses	1,963,000	2,282,000	2,135,700
Hardware-Server	-	85,000	-
HW Network greater than \$25,000	-	-	75,000
Automobiles	40,000	40,000	20,000
Network Hardware	-	-	14,000
Purchase EDP - Computers	7,500	-	-
Software License non-recurring greater than \$5,000	-	-	50,000
Software License recurring greater than \$5,000	5,500,000	8,680,000	7,628,000
Office Equipment	<u>27,500</u>	<u>28,000</u>	<u>29,000</u>
<b>Total Operating Expenses and Fixed Assets</b>	<b>\$ 19,095,000</b>	<b>\$ 25,385,000</b>	<b>\$ 23,623,000</b>
<b>Total Administrative Budget</b>	<b><u>\$ 44,739,000</u></b>	<b><u>\$ 52,453,000</u></b>	<b><u>\$ 51,637,000</u></b>

### Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY2018-19. The \$51,637,000 administrative budget is not funded from the Commonwealth's General Fund, but rather from the earnings of the Fund itself. Historically, PSERS has underspent its approved budget, keeping more funds available to invest for PSERS' members.

Total Administrative Budget for FY 2017-18 includes additional expenses for the implementation of Act 5. These totals include additional staff required, database system changes, legal expenses and other costs related to the defined contribution aspects of Act 5. Some of the

additional expenses pertaining to Act 5 will decrease slightly in FY 2018-19 as certain phases of the implementation are completed.

PSERS continues to be prudent in its use of funds and managing its annual budget. In FY 2017, PSERS expanded upon the process to stop payments sooner when a member dies, saving PSERS both time and money collecting the funds from the members' estate and reducing the amount of potentially uncollectible accounts. Working with its actuary, PSERS continues to save actuarial fees by completing various analyses in-house. Other savings include near historical low levels of overtime, a decrease in copier and printer rentals, and a reduction in overall printing expenses, all part of PSERS' ongoing efforts to control costs and improve operational efficiency.

**Section 2 - FY2018-19 Budget**

**Public School Employees' Retirement System  
Fiscal Year 2018-19 Defined Contribution (DC) Administrative Budget**

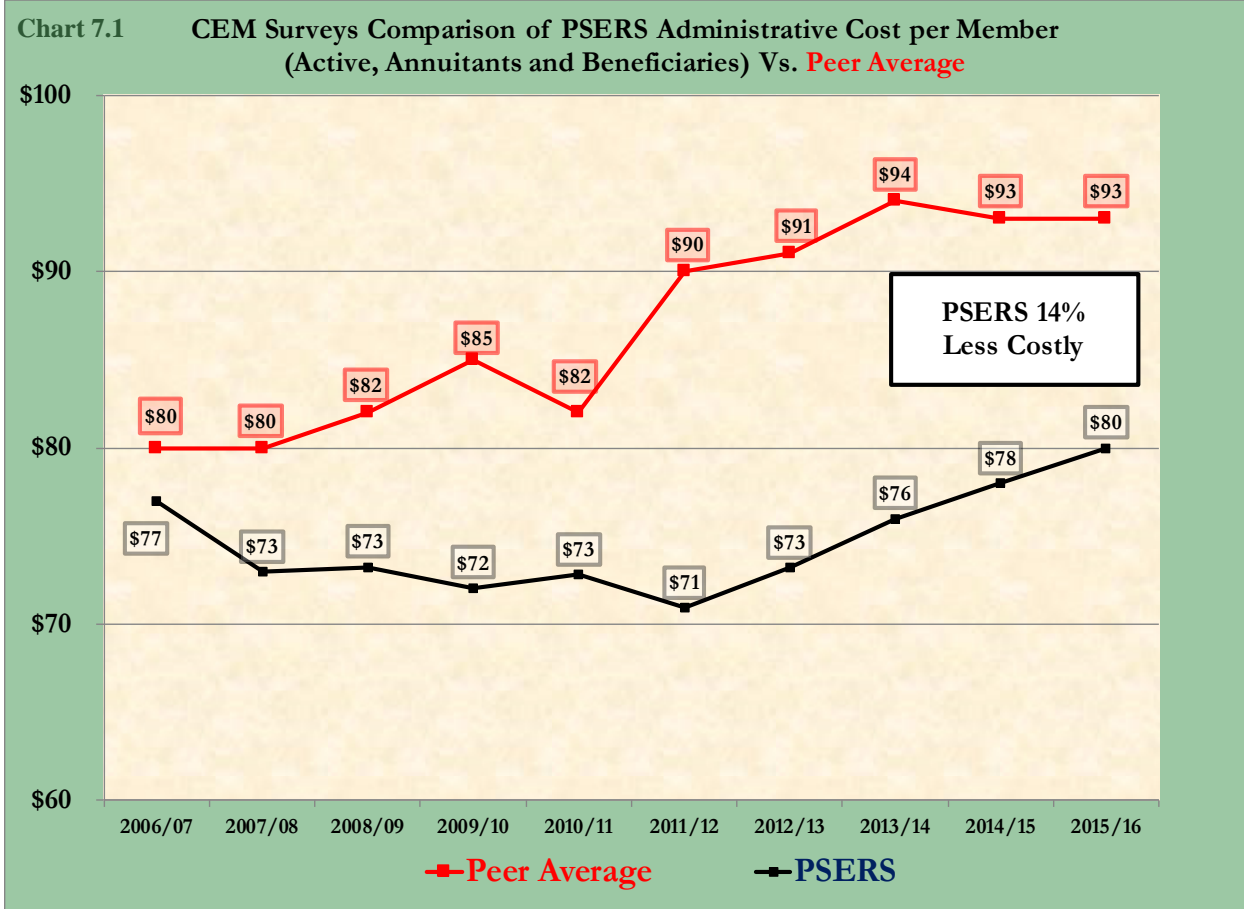
<b>Table 7.2</b>	<b>Budget FY2017-2018</b>	<b>PSERS Budget Request FY2018-2019</b>
<b>Total Personnel Services</b>	610,000	<b>771,000</b>
<b>Operating Expenses and Fixed Assets</b>		
Consultant Services - Non EDP	3,800,000	<b>2,590,000</b>
Legal Services/Fees	275,000	<b>75,000</b>
Other Operational Expenses	191,000	<b>131,500</b>
SW License recurring greater than \$5,000	1,925,000	<b>1,382,500</b>
<b>Total Operating Expenses and Fixed Assets</b>	\$ 6,191,000	<b>\$ 4,179,000</b>
<b>Total Administrative Budget</b>	<u>\$ 6,801,000</u>	<u>\$ 4,950,000</u>

**Defined Contribution (DC) Administrative  
Budget**

Table 7.2 displays PSERS Defined Contribution (DC) Administrative Budget Request for FY 2018-19.

**Section 2 - FY2018-19 Budget**

**Public School Employees' Retirement System  
Fiscal Year 2018-19 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 29% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 above illustrates that PSERS had a 14% 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 \$6.3 million annually in administrative expenses compared to its peers.

**PSERS Directed Commissions  
Recapture Program  
(unaudited)**

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 the 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**

	<u>Budget FY2016-2017</u>	<u>Available FY2017-2018</u>	<u>PSERS' Budget FY2018-2019</u>
Budgetary Reserve	\$2,000,000	<u>\$2,000,000</u>	<u>\$2,000,000</u>
Total	<u>\$2,000,000</u>	<u>\$2,000,000</u>	<u>\$2,000,000</u>



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## SECTION 3 - INVESTMENT INFORMATION

Investment Policy, Objectives, Risk Management and Capital Market Assumptions.....	Tab 8
Asset Exposure and Investment Program Summary.....	Tab 9
Performance .....	Tab 10
Managing Investment Expenses and Investment Fees by Manager .....	Tab 11
Commitment to Pennsylvania-Based Investments.....	Tab 12





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### Investment Policy

The Public School Employees' Retirement Board of Trustees (the Board) are responsible for, among other things, the formulation of an Investment Policy for the Public School Employees' Retirement System (the System). As articulated in the Public School Employees' Retirement Code 24 Pa. C.S. §8521(a), the Board and PSERS' staff delegated with investment authority must act in a manner consistent with the Prudent Investor Standard, which requires "the exercise of that degree of judgment, skill and care under the circumstances then prevailing which persons of prudence, discretion and intelligence who are familiar with such matters exercise in the management of their own affairs not in regard to speculation, but in regard to the permanent disposition of the fund, considering the probable income to be derived therefrom as well as the probable safety of their capital." The Prudent Investor Standard recognizes modern portfolio theory and guides investment and management decisions respecting individual assets so that the trade-offs between risk and return for each asset are considered in the context of an overall investment strategy.

The System's Investment Policy Statement, Objectives, and Guidelines (the Policy), which is available at [www.pfers.pa.gov](http://www.pfers.pa.gov), reflects the many implications of the Prudent Investor Standard. The Board reviews the Policy regularly, and makes changes as necessary. The Policy establishes clear criteria for the management of the assets by or on behalf of the Board. For example:

- The Board, PSERS' staff, investment consultants, and investment managers are assigned appropriate responsibilities and made to understand clearly the objectives and policies of the Board and the System;
- Asset-Liability studies are prepared to guide the investment of the System's assets;
- Guidelines are established for each investment category so that asset quality, diversification, and return can be monitored;
- Investment managers are given guidance and limitations on the investment of the System's assets; and,
- The Board has created a meaningful basis for evaluating the investment performance of individual investment managers, as well as for evaluating overall success in meeting its objectives.

### General Return and Risk Objectives

The System seeks to provide benefits to its members through a carefully planned and well-executed investment program, and the Policy identifies the following general return and risk objectives and constraints for its investments:

#### Return Objectives

- The assets of the System shall be invested to maximize the returns for the level of risk taken; and
- The System shall strive to achieve a return that exceeds the Policy Index.

#### Risk Objectives

- The assets of the System shall be diversified to minimize the risk of losses within any one asset class, investment type, industry or sector distribution, maturity date, or geographic location; and
- The System's assets shall be invested so that the probability of investment losses (as measured by the Policy Index) in excess of 15% in any one year is no greater than 2.5% (or two standard deviations below the expected return).

#### Constraints

- The System shall maintain adequate liquidity to meet required benefit payments to the System's beneficiaries;
- The System's assets shall be invested in a manner that is consistent with the System's long-term investment horizon; and,
- As a tax-exempt investor, the System's assets may be invested without distinction between returns generated from income and returns generated from capital gains.

## Investment Risk Management

PSERS recognizes that risk management is an essential component of a prudent investment program. The implementation of a well-defined risk management framework improves the likelihood that the System is compensated adequately for the risks taken, and helps to avoid unexpected and unintended risks. Therefore, PSERS pursues a disciplined and advanced risk management approach. Through investment policies and guidelines, PSERS defines the amount of investment risk to be taken by the System, and how it is to be measured and monitored.

PSERS has created a practical framework that enables the System to implement risk-focused investment strategies, and transparently monitor active portfolio risks and returns relative to budgets and/or specific objectives. PSERS has identified over 100 specific investment risks for modeling and analysis, and categorizes those risks into the following broad classes:

- Market
- Fund and Portfolio
- Operational
- Liquidity, Leverage and Finance
- Legal
- Organizational

PSERS’ team manages these broad classes of risk consistent with its long-term investment objectives.

Investment risk reflects the possibility that the future value of investments will deviate from targeted return objectives. This deviation often occurs as a result of changes in perception of market conditions, whether those changes

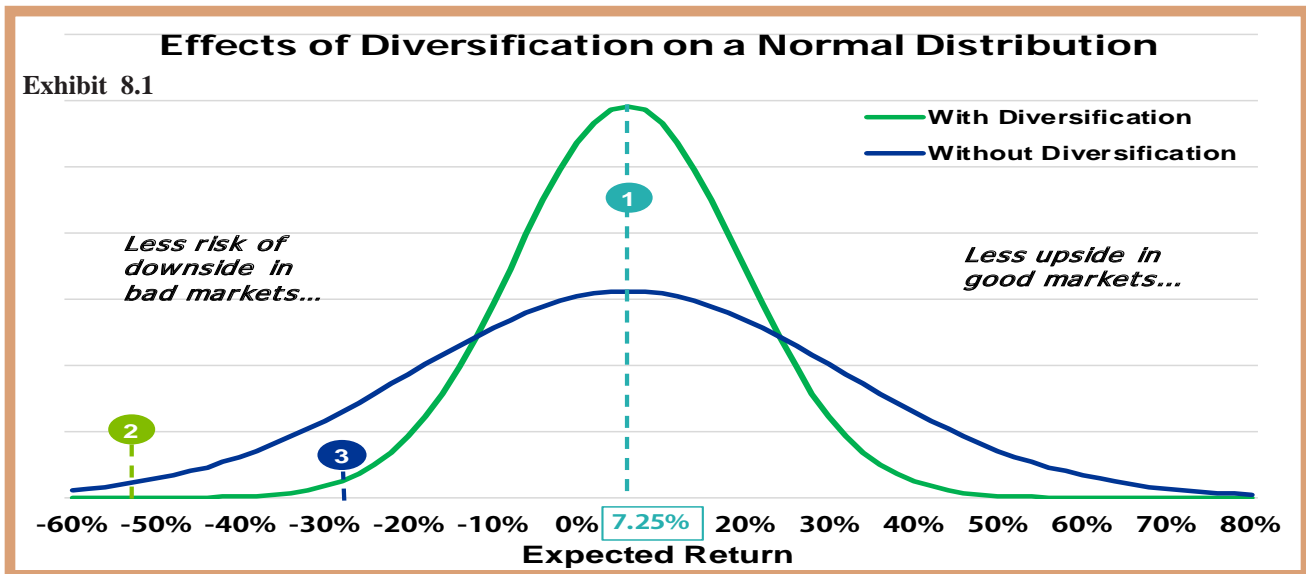
are caused by factors specific to individual investments, classes of investments or factors affecting all investments simultaneously.

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 investment returns required to maintain stable and cost-effective contribution rates. In positioning for future developments, PSERS cannot know with complete certainty how markets or particular investment strategies will perform, but 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.

Given its long-term investment horizon, PSERS accepts prudent investment risk in exchange for acceptable levels of additional incremental return. PSERS diversifies across investment categories, each having different characteristics across all market environments.

The benefit of a diversified portfolio is that it reduces the probability of outsized outcomes relative to return objectives. Diversification is the only “free lunch” in finance; excess volatility is damaging to PSERS’ portfolio, while diversification is beneficial.

Exhibit 8.1 illustrates two distributions with the same expected return. The distribution shown in blue assumes a portfolio risk of 22.5%, which reflects 100% correlations between risk factors, while the green distribution reflects the risk of PSERS’ portfolio which benefits from diversification. In the event of a negative two standard deviation move, the undiversified portfolio would experience losses more than double what the diversified portfolio would experience. In a normal distribution, the chance of a two standard deviation decline is approximately 2.3%.

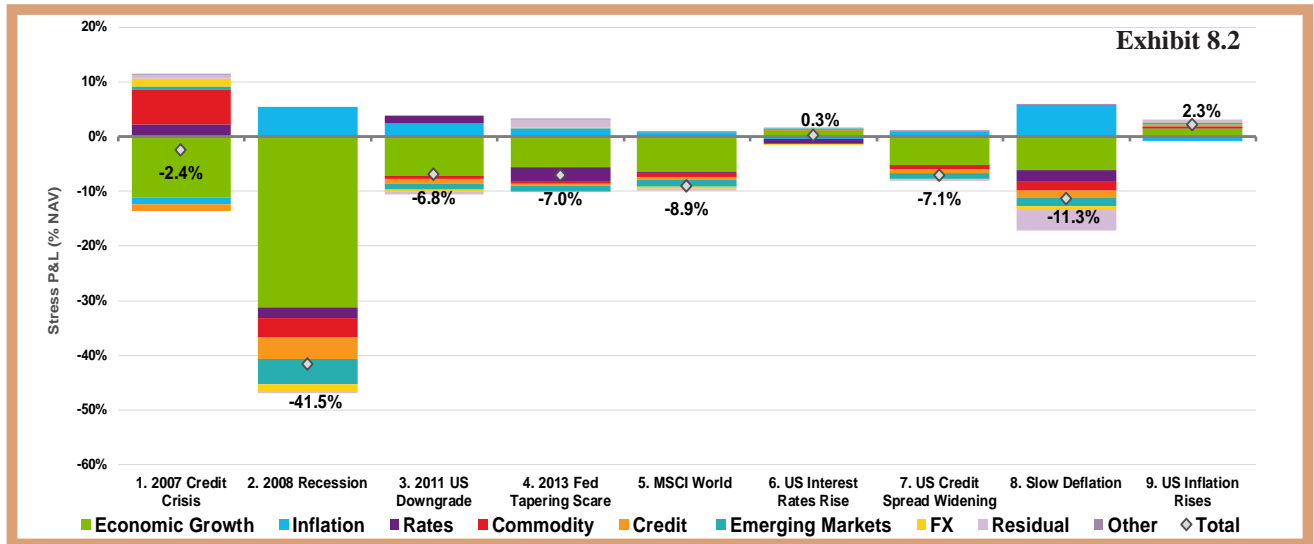


## Investment Risk Management

(continued)

One way that PSERS assesses the amount of diversification in the portfolio is through stress testing. This testing process quantifies anticipated portfolio losses under various calamitous market events. There are two types of stress tests: historical (meaningful actual past market events) and hypothetical (scenarios designed to reflect potentially calamitous market events).

Exhibit 8.2 below depicts several historical and hypothetical stress scenarios of PSERS' allocation as of June 30, 2017, and the impact of each as related to a series of common economic factors. Strategically, the exposures to each risk factor are driven by PSERS' asset allocation decisions, which could be tactically adjusted to the extent that a market event is likely, using stress scenarios to assist in these tactical decisions.



## Section 3 - Investment Information

### 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 2016, 2017 survey results under the 20-year forecast indicate a slight 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.

### Equities

Equity return assumptions are driven by market valuations, earnings growth expectations and assumed dividend payouts:

- Global equity assumptions have slightly decreased across most markets as valuations have increased in recent years

Equity market returns over the past three years have been driven by rising valuations rather than profits. A growing number of market participants worry that equities look expensive and there is an expectation for these market valuations to decline towards historical levels.

### 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. The majority of the decrease in corporate bond return assumptions can be explained by falling yields and flattening of yield curves.

### Real Estate

Like equities, real estate assumptions have increased to their 2013 levels due to strong supply/demand fundamentals in the asset class.

**Table 8.1 summarizes the average expected capital market 20 year geometric return assumptions of 20 to 30 surveyed independent investment advisors in 2013, 2014, 2015, 2016 and 2017:**

Asset Class	2013 Survey	2014 Survey	2015 Survey	2016 Survey	2017 Survey
U.S. Equity - Large Cap	7.6%	7.4%	7.1%	7.9%	7.8%
U.S. Equity - Small Cap	8.1%	7.7%	7.3%	8.2%	8.4%
Non-U.S. Equity - Developed	8.0%	7.8%	7.5%	8.0%	7.6%
Non-U.S. Equity - Emerging	9.1%	8.9%	8.7%	9.1%	8.7%
U.S. Fixed Income - Core	3.4%	4.0%	3.7%	4.6%	4.4%
U.S. Fixed Income - Long Duration Corp.	4.2%	4.9%	4.0%	4.9%	4.8%
U.S. Fixed Income - High Yield	5.9%	6.0%	6.0%	6.8%	6.2%
Non-U.S. Fixed Income - Developed	3.0%	3.5%	2.7%	3.7%	3.5%
Non-U.S. Fixed Income - Emerging	5.4%	5.9%	6.0%	6.4%	6.2%
Treasuries (Cash Equivalents)	2.2%	2.7%	2.4%	3.2%	3.2%
TIPS (Inflation-Protected)	2.6%	3.5%	3.1%	3.9%	4.0%
Real Estate	6.8%	6.5%	6.3%	6.8%	6.7%
Hedge Funds	6.4%	6.3%	5.8%	6.2%	6.0%
Commodities	5.1%	4.9%	4.4%	4.8%	5.0%
Infrastructure	7.1%	7.8%	7.1%	7.1%	7.1%
Private Equity	10.1%	9.8%	9.5%	10.3%	10.1%
Inflation	2.5%	2.4%	2.2%	2.3%	2.4%

## Section 3 - Investment Information

### Capital Market Assumptions (continued)

#### Hedge Funds

Recent structural changes within the hedge fund industry include a) improved information availability, b) lower leverage utilized, c) changing objectives, and d) dramatic increases in market players. This, along with historically low interest rates, has resulted in lower expected alpha opportunities for hedge funds generally.

An alternative approach to asset allocation that 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 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.**

<b>Table 8.2 PSERS Capital Market Assumptions (CMAs)</b>					
<b>Average Expected Risk (2013 - 2017)</b>					
<b>Asset Class</b>	<b>2013 Survey</b>	<b>2014 Survey</b>	<b>2015 Survey</b>	<b>2016 Survey</b>	<b>2017 Survey</b>
U.S. Equity - Large Cap	18.1%	17.5%	17.1%	16.9%	16.6%
U.S. Equity - Small Cap	22.5%	21.1%	21.0%	21.0%	20.2%
Non-U.S. Equity - Developed	20.5%	19.8%	19.6%	19.5%	18.9%
Non-U.S. Equity - Emerging	27.5%	26.4%	26.6%	26.4%	25.4%
U.S. Fixed Income - Core	5.3%	5.4%	5.6%	6.0%	5.5%
U.S. Fixed Income - Long Duration Corp.	11.8%	11.3%	10.8%	10.5%	10.4%
U.S. Fixed Income - High Yield	12.3%	11.5%	11.2%	11.0%	10.6%
Non-U.S. Fixed Income - Developed	8.2%	7.6%	7.4%	7.6%	7.4%
Non-U.S. Fixed Income - Emerging	12.4%	10.9%	11.7%	11.6%	11.8%
Treasuries (Cash Equivalents)	1.8%	2.3%	2.8%	2.8%	3.0%
TIPS (Inflation-Protected)	5.9%	6.3%	6.3%	6.5%	6.3%
Real Estate	12.4%	13.1%	13.6%	14.7%	14.5%
Hedge Funds	9.4%	9.0%	8.3%	8.4%	8.0%
Commodities	18.5%	18.0%	18.0%	18.5%	17.9%
Infrastructure	15.2%	13.5%	13.1%	13.8%	14.6%
Private Equity	26.2%	24.8%	23.6%	23.1%	22.0%
Inflation	2.0%	2.1%	1.8%	1.8%	1.7%



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## Section 3 - Investment Information

### Asset Exposure

(as of June 30, 2017)

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' staff 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.

Table 9.1 represents PSERS' asset exposure and target allocation plan that became effective October 1, 2016, and was in effect on June 30, 2017:

<b>Table 9.1 PSERS' Asset Exposure and Target Asset Allocation Plan</b>						
<b>(as of June 30, 2017)</b>						
<b>Asset Class</b>	<b>Market Value (in millions)</b>	<b>Percentage of Gross Asset Exposure</b>	<b>Percentage of Net Asset Exposure</b>	<b>Target Allocation %</b>	<b>Target Allocation Range</b>	
Global Public Market Equity:						
U.S. Equity	\$ 3,729.6	6.1 %	7.2 %	7.4 %		
Non-U.S. Equity	<u>6,786.2</u>	<u>11.1</u>	<u>13.1</u>	<u>11.6</u>		
Total Global Public Market Equity	\$ 10,515.8	17.2 %	20.3 %	19.0 %		
Private Markets	<u>7,656.4</u>	<u>12.6</u>	<u>14.8</u>	<u>16.0</u>		
<b>Total Equity</b>	<b>\$ 18,172.2</b>	<b>29.8 %</b>	<b>35.1 %</b>	<b>35.0 %</b>		± 10%
Fixed Income*	\$ 19,199.3	31.5 %	37.0 %	36.0 %		± 10%
Commodities*	\$ 4,059.6	6.7 %	7.8 %	8.0 %		± 4%
Infrastructure*	3,417.5	5.6	6.6	6.0		
Real Estate*	<u>5,956.1</u>	<u>9.8</u>	<u>11.5</u>	<u>12.0</u>		
<b>Total Real Asset Exposure</b>	<b>\$ 13,433.2</b>	<b>22.1 %</b>	<b>25.9 %</b>	<b>26.0 %</b>		± 10%
Risk Parity*	\$ 5,051.1	8.3 %	9.7 %	10.0 %		± 5%
Absolute Return	\$ <u>5,049.3</u>	<u>8.3</u> %	<u>9.7</u> %	<u>10.0</u> %		± 5%
<b>Gross Asset Exposure</b>	<b>\$ 60,905.1</b>	<b><u>100.0</u> %</b>	<b>117.4 %</b>	<b>117.0 %</b>		
<b>Financing*</b>	<b>\$ <u>(9,070.9)</u></b>		<b><u>(17.4)</u> %</b>	<b><u>(17.0)</u> %</b>		
<b>Net Asset Exposure</b>	<b>\$ <u>51,834.2</u></b>		<b><u>100.0</u> %</b>	<b><u>100.0</u> %</b>		

\*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, 2017, PSERS had total increased economic exposure of \$9.1 billion related to the following asset classes: Fixed Income (\$5.6 billion); Risk Parity (\$0.5 billion); Infrastructure (\$0.5 billion); Real Estate (\$0.3 billion) and Commodities (\$2.2 billion).

Note: PSERS' asset allocation was updated October 1, 2017, and is available for review at <http://www.psers.pa.gov>.

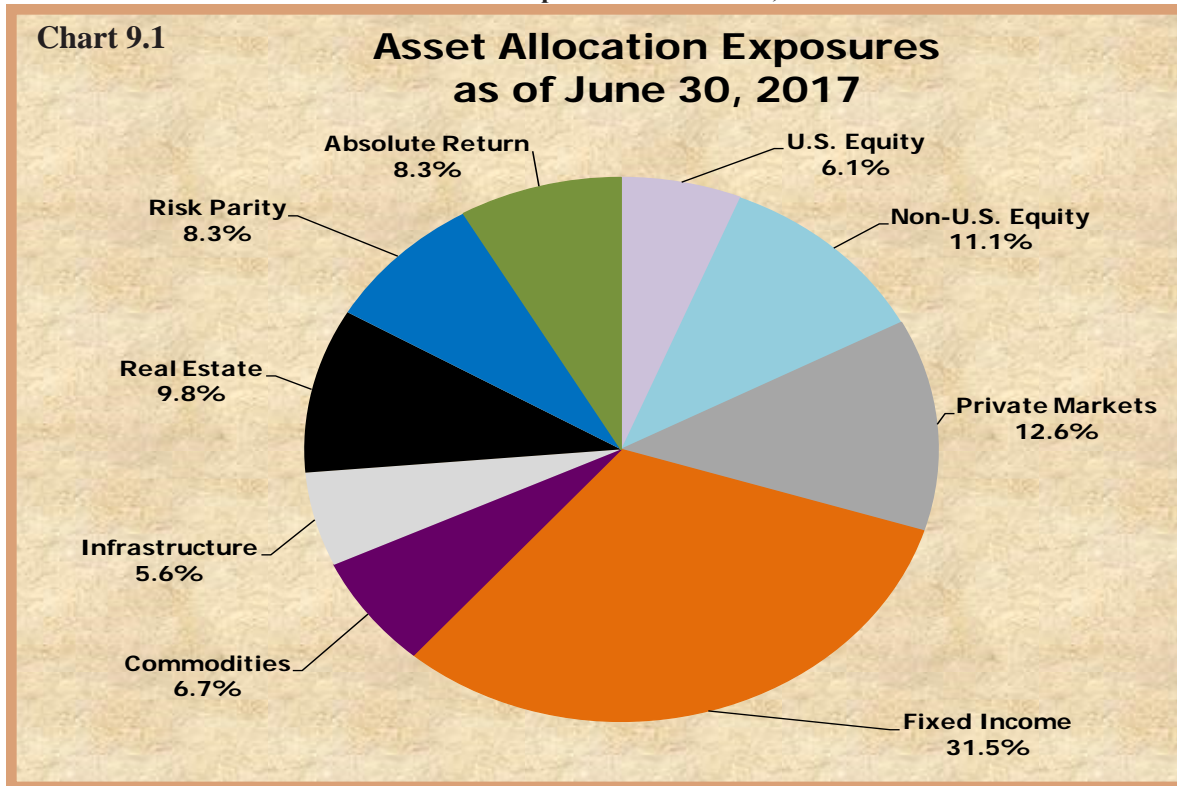


**Section 3 - Investment Information**

**Asset Exposure**

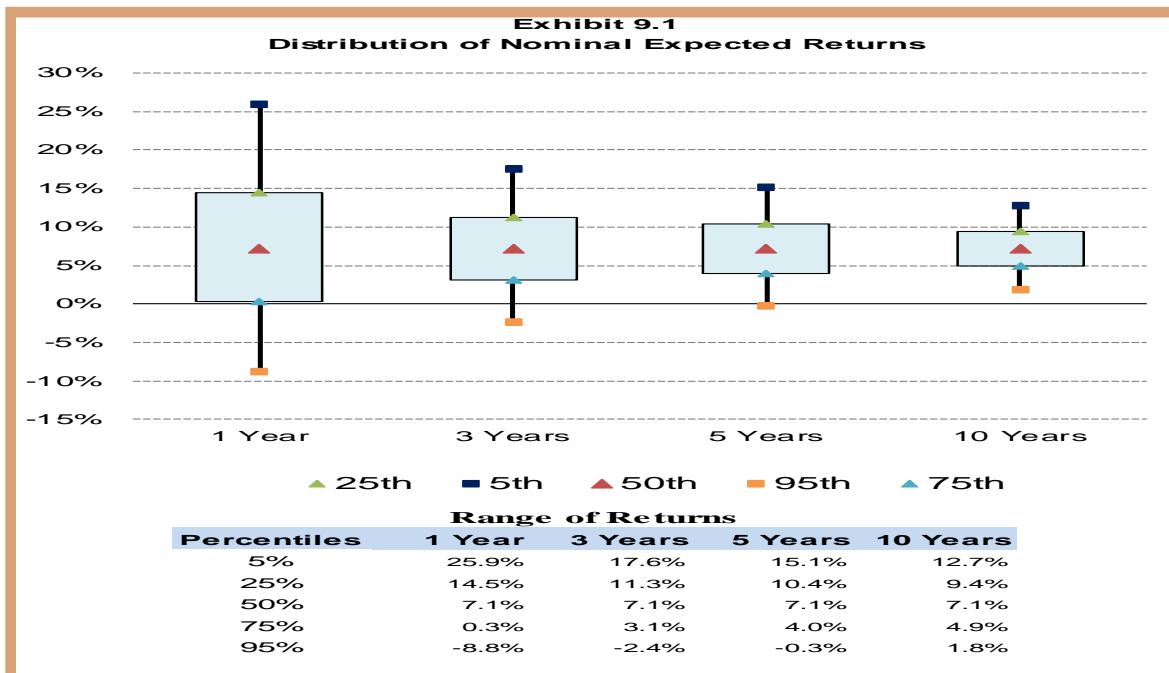
(continued)

Chart 9.1 illustrates PSERS' asset allocation exposure as of June 30, 2017:



Note: Financing represents a negative 17.4% allocation and is not reflected in Chart 9.1.

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:



Source: Aon Hewitt's 30-year capital market assumptions.

## Section 3 - Investment Information

### Public Market Global Equity Investments

Public Market Global Equity includes both U.S. Equity and Non-U.S. Equity investments. PSERS' investment plan diversifies equity investments and balances equity management styles. Equities are utilized by the Fund primarily because their expected large return premiums versus inflation will, if realized, help preserve and enhance the real value of the Fund over long periods of time. Equities tend to perform well when economic growth is stronger than expected or inflation is lower than expected. The Public Market Global Equity Exposure asset class is managed on a total return basis.

Equity investments consist almost entirely of publicly-traded securities listed on major world-wide stock exchanges or derivatives such as swaps or listed futures that replicate the performance of equity indexes such as the S&P 500 Index. Swaps and futures are employed by PSERS' to equitize cash.

PSERS' Asset Allocation targets an eventual allocation of 19.0% of assets to Global Public Market Equity. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Public Market Equity portfolios.

### Private Market Investments

Private Market investments provide the opportunity to negotiate and set a price between the owner of a business and the buyer/investor in a private fashion. There exists a very large private economy of companies with various needs (for example, operating expertise, capital to grow their businesses, and an exit out of family businesses). In public equity markets, thousands of buyers and sellers set prices of securities issued by companies every day, however no such mechanism exists in the private markets. Thus, private markets provide fertile grounds for investing.

For the Private Markets investment program, PSERS' long-term investment objective is to achieve a risk-adjusted total return, net of fees, that exceeds market returns for similar investments. The primary vehicle used to invest funds in this asset class is the limited partnership. Individual management groups selected by PSERS form these partnerships for the purpose of investing in and managing private equity and unlisted-subordinated debt positions on behalf of PSERS and other limited partners. PSERS' Asset Allocation currently targets an allocation of 16.0% to Private Market investments.

As an example of PSERS' private markets success, PSERS has modeled, in Chart 9.2, what its returns would have been if, instead of investing in Private Equity, the cash flows into/out of Private Equity investments were made into/out of a very low cost mutual fund that seeks to replicate the U.S. equity market. PSERS chose the Vanguard Total Stock Market Index Fund (VITSMX) due to its low cost (currently 0.03%) and its success at closely matching the returns of the overall U.S. stock market. Private Market Investment sub-asset classes include:

**Private Equity** involves investments in private companies which normally do not have technology risk associated with traditional venture capital investments. It has evolved to include the financing of more mature, profitable companies that do not have access to, or qualify for, public equity and debt funding.

**Table 9.2 reflects the more recent total returns for the past 10 years (through March 31, 2017) for PSERS' Private Equity Program, the MSCI World Net Total Return USD Index, a global equity index, and the Vanguard Global Equity Fund (VHGEX).**

Table 9.2 10 Year Return Comparison	
	10 Year, Net of Fee Return (March 2007 - March 2017)
PSERS' Private Equity Program	7.74%
MSCI World Net Total Return USD Index	4.21%
Vanguard Global Equity Fund (VHGEX)	3.85%

**Venture Capital** is considered the financing of young, relatively small, rapidly growing companies. In traditional venture capital investments, companies have a 5-10 year investment horizon and develop technology for a particular market, such as pharmaceuticals, software, medical products, etc.

**Private Debt** involves investments in the secured and/or unsecured debt obligations of private and/or public companies. This debt is typically acquired through directly negotiated or competitively bid transactions. Owners of these debt instruments typically take either an active or passive role in the management of the firm.

### Private Market Investments (continued)

**PSERS Private Market Internal Co-Investment Program** consists of co-investments made alongside of General Partners with whom PSERS has a strong relationship. These relationships aid in the generation of deal flow for investments and also serve as additional due diligence for the evaluation of General Partners. The investments have the potential for higher returns as they have low or no fees and no profit sharing. This program also provides PSERS with the ability to buy secondary interests in funds from other Limited Partners usually at a discount to net asset value.

### Fixed Income Investments

**Fixed Income investments** include a wide variety of bonds and similar securities which allow PSERS to diversify Fixed Income investments and balance Fixed Income management styles. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Fixed Income portfolios.

Fixed Income securities are used for a variety of purposes as follows:

*Nominal bonds* are used for their ability to serve as a hedge against disinflation and/or deflation, their general ability to produce current income in the form of periodic interest payments, and their ability to provide sufficient liquidity to meet the Fund's obligations to pay member benefits and support other investment commitments. Nominal bonds tend to do well when growth is weaker than expected or when inflation is lower than expected;

*Inflation-linked bonds* are used for their ability to serve as a hedge against inflation, their general ability to produce current income in the form of periodic interest payments, and their ability to provide sufficient liquidity to meet the Fund's obligations to pay member benefits and support other investment commitments. Inflation-linked bonds tend to do well when growth is weaker than expected or when inflation is higher than expected; and

*High yield securities and emerging market bonds* are used for their ability to generate high current income in the form of periodic interest payments as well as offering greater total return opportunities than high grade debt. High yield securities and emerging market bonds tend to do well when growth is stronger than expected.

PSERS' Asset Allocation targets an eventual allocation of 36.0% of assets to Fixed Income, 9.0% of which is designated to Investment Grade, 9.0% of which is designated to Credit-Related, 15.0% of which is designated to TIPS strategies, and 3.0% designated to Cash.

### Master Limited Partnerships

**Master Limited Partnership (MLP) securities**, which are publicly traded on a securities exchange, avoid federal and state income taxes by meeting specific qualifications of the IRS related to the production, processing or transportation of oil, natural gas, and coal. MLP securities are utilized by the System due to their low correlation to stock and bond returns, attractive growth characteristics, and their ability to produce current income in the form of periodic distributions. MLP securities tend to do well when economic growth is stronger than expected and when inflation is higher than expected. PSERS contracts with external investment managers and also uses internal portfolio managers to manage MLP portfolios.

PSERS' Asset Allocation currently targets an allocation of 4.0% of assets to MLP investments and consists of both actively managed and passively managed portfolios.

### Commodity Investments

**Commodity investments** such as gold, oil and wheat, are utilized by the Fund for diversification within the portfolio and to act as a hedge against unanticipated inflation. 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 the changes in the rate of inflation. However, stock and bond valuations are based on longer-term expectations and react negatively to inflation. Therefore, commodity returns have had a historically negative correlation to stock and bond returns since commodities tend to do very well in periods of rising inflation. As such, commodities, when combined with stocks and bonds, lower the risk of a portfolio. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Commodity portfolios.

PSERS' Asset Allocation currently targets an allocation of 8.0% of assets to Commodity investments which includes a 5.0% target allocation to a Diversified Commodity Basket and a 3.0% asset allocation to Gold. Gold is particularly useful as a contra-currency to provide protection against the debasement of fiat currencies in periods of monetary inflation.

### Infrastructure Investments

Infrastructure investments target stable, defensive investments primarily within the energy, power, water, and transportation sectors. The program plays a strategic role within the System by providing steady returns and cash yields, defensive growth, inflation protection, capital preservation and diversification benefits. Historically, Infrastructure investments have performed better in environments of falling growth and falling inflation. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Infrastructure portfolios.

PSERS' Asset Allocation currently targets an allocation of 2.0% of assets in Infrastructure investments.

### Real Estate Investments

Real Estate investments provide PSERS exposure to real property directly or indirectly through global publicly-traded real estate securities (PTRES), direct investments, commingled fund investments, limited partnerships, and direct private placements. This is done in a prudent manner to create a diversified real estate portfolio of high quality investments which will enhance PSERS' overall long-term investment performance, diversify the asset base, and reduce the volatility of the total investment portfolio returns. Real Estate investments tend to perform well in periods of stronger than expected growth and lower than expected inflation.

The real estate program is designed to create the highest possible risk-adjusted returns in a controlled, coordinated, and comprehensive manner. Recognizing that real estate market conditions and PSERS' objectives for real estate may change over time, the program is reviewed periodically and updated as needed. The existing target allocation is 12.0% of total assets, of which 10.0% is designated for Private Real Estate and 2.0% for PTRES.

PSERS seeks to diversify its real estate portfolio by investing in a mix of Opportunistic (30%), Value Added (50%) and Core (20%) real estate investments.

*Opportunistic* real estate investing is the financing, acquisition or investment in real estate assets, real estate companies, portfolios of real estate assets, and private and public Real Estate Investment Trusts (REIT's) that do not have access to traditional public equity or debt financing. Opportunistic real estate consists of investment strategies that seek to exploit market inefficiencies with an emphasis on total return. Opportunistic investments require specialized expertise and the flexibility to respond quickly to market imbalances or changing market conditions. Investments may include non-traditional property types and/or assets that involve development, re-development, or leasing risks.

*Value Added* real estate investing typically focuses on both income growth and appreciation potential, where opportunities created by dislocations and inefficiencies between and within segments of the real estate capital markets are capitalized upon to enhance returns. Investments can include high-yield equity and debt investments and undervalued or impaired properties in need of repositioning, re-development, or leasing.

*Core* real estate investing is the financing, acquisition or investment in real estate assets, real estate companies, portfolios of real estate assets, and private REITs that are broadly diversified by property type and location, focused primarily on completed, well-leased properties with modest levels of leasing risk, using relatively low leverage, and investing mainly in institutional property types and qualities allowing for relative ease of resale.

**PSERS Real Estate Internal Co-Investment Program** consists of co-investments made alongside of General Partners with whom PSERS has a strong relationship. These relationships aid in the generation of deal flow for investments and also serve as additional due diligence for the evaluation of General Partners. The investments have the potential for higher returns as they have low or no fees and profit sharing. This program also provides PSERS with the ability to buy secondary interests in funds from other Limited Partners usually at a discount to net asset value.

## **Risk Parity Investments**

**R**isk Parity investments are designed to generate investment returns through a more diversified allocation by endeavoring to balance market risk factor exposures as opposed to capital exposures. PSERS' Risk Parity investment managers each have proprietary methods to define and measure the risk factors upon which they manage their portfolios. Inclusion of this asset class is expected to reduce the portfolio's overall risk exposure over long-term horizons because it is designed to be more resistant to market downturns than traditional investment strategies, and further enhances the System's diversification due to the risk-balancing portfolio construction. Risk Parity portfolios are designed to perform consistently well in periods of rising or falling growth or inflation. PSERS contracts with external investment managers and also uses internal portfolio managers to manage Risk Parity portfolios.

PSERS' Asset Allocation currently targets an allocation of 10.0% of assets to Risk Parity investments. The Risk Parity investments are targeted to be 100% actively managed.

## **Absolute Return Investments**

**A**bsolute Return investments, sometimes referred to as hedge funds, are used by the Fund primarily to generate returns that are uncorrelated to the equities, fixed income, and commodities asset classes and to diversify the overall Fund. As such, returns are driven more by manager skill than changes in economic growth and inflation which affects other financial assets. PSERS contracts with external investment managers to manage Absolute Return portfolios.

Absolute Return investments are made in a variety of unique, non-directional investment strategies, including global macro, relative value, event driven, capital structure arbitrage, reinsurance, volatility and other opportunistic strategies. The Fund diversifies this program by manager and style.

PSERS' Asset Allocation currently targets an allocation of 10.0% of assets in Absolute Return investments.



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## 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, 2017, the System generated a total net of fee return of 10.14%. This return

was above the Total Fund Policy Index return of 6.39% by 375 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2017 were 4.76%, 7.35%, and 3.80%, respectively. The three-, five- and ten-year returns ended June 30, 2017, exceeded the Total Fund Policy Index returns by 127, 188, and 100 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:**

<b>Table 10.1</b>	Annualized Total Returns (%)			
	Net of Fees			
	Ended June 30, 2017			
	1 Year	3 Years	5 Years	10 Years
<b>PSERS Total Portfolio</b>	<b>10.14</b>	<b>4.76</b>	<b>7.35</b>	<b>3.80</b>
Total Fund Policy Index	6.39	3.49	5.47	2.80
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	11.73	5.04	8.58	5.20
<b>PSERS U.S. Equity Portfolios</b>	<b>19.32</b>	<b>9.68</b>	<b>15.04</b>	<b>7.15</b>
U.S. Equity Policy Index (1)	18.43	9.14	14.59	7.21
<b>PSERS Non-U.S. Equity Portfolios</b>	<b>22.57</b>	<b>7.12</b>	<b>10.97</b>	<b>3.96</b>
Non-U.S. Equity Policy Index (2)	22.32	5.60	10.19	2.96
<b>PSERS Fixed Income Portfolios (10)</b>	<b>5.22</b>	<b>4.51</b>	<b>5.17</b>	<b>7.36</b>
Fixed Income Policy Index (3)	3.09	2.69	2.83	6.10
<b>PSERS Commodity Portfolios (10)</b>	<b>-3.48</b>	<b>-8.02</b>	<b>-4.62</b>	<b>-3.42</b>
Commodity Policy Index (4)	-6.41	-10.45	-6.49	-5.08
<b>PSERS Absolute Return Portfolios</b>	<b>9.00</b>	<b>3.16</b>	<b>4.09</b>	<b>4.99</b>
Absolute Return Policy Index (5)	4.53	4.10	5.45	6.67
<b>PSERS Risk Parity Portfolios (11)</b>	<b>7.17</b>	<b>2.05</b>	N/A	N/A
Risk Parity Policy Index (6)	5.81	3.33	N/A	N/A
<b>PSERS Master Limited Partnership (MLP) Portfolios</b>	<b>4.19</b>	<b>-8.71</b>	<b>7.23</b>	N/A
Standard & Poor's MLP Index	3.23	-11.25	2.48	5.99
<b>PSERS Infrastructure Portfolios</b>	<b>10.86</b>	N/A	N/A	N/A
Infrastructure Policy Index*	10.15	N/A	N/A	N/A
<b>PSERS Real Estate (7) (10)</b>	<b>8.38</b>	<b>10.36</b>	<b>11.18</b>	<b>0.66</b>
<b>Blended Real Estate Index (8)</b>	<b>2.92</b>	<b>7.38</b>	<b>8.59</b>	<b>5.20</b>
<b>PSERS Alternative Investments (7)</b>	<b>14.36</b>	<b>6.68</b>	<b>8.89</b>	<b>7.74</b>
Burgiss Median Return, Vintage Year Weighted (9)	3.00	3.50	4.33	3.02

\*FTSE Developed Core Infrastructure 50/50 (Hedged to USD) Index (Net) effective October 1, 2015.

This represents a blend of three broad sectors: 50% Utilities, 30% Transportation (with rails capped at 7.5%) and 20% mix of other sectors including pipelines, satellites, and communication towers.

**Other Footnotes to the Total Portfolio are available on page 85 of PSERS Comprehensive Annual Financial Report.**

### Performance (continued)

The past fiscal year was a strong year for the System with a net of fee return of 10.14%. The following asset classes generated solid returns this past fiscal year:

- Public Equities, as represented by the MSCI ACWI IMI with USA Gross Index (net), were up 20.85%. Returns in global equities were driven by the prospects of US reflationary policies, subsided political risk within continental Europe, and strong corporate and economic fundamentals.
- High Yield, as represented by the Bloomberg Barclays U.S. Corporate High Yield Index, was up 12.70%. Returns were supported by investors reaching for higher yields as the interest rate environment remains low.
- Infrastructure, as represented by the FTSE Developed Core Infrastructure 50/50 100% Hedged Index-Net, was up 10.15%. Returns in infrastructure were supported by improving economic momentum, favorable global interest rate backdrop as well as the anticipation of favorable Trump administration infrastructure spending.

Significant detractors from performance this past fiscal year included:

- U.S. Long Treasuries, as represented by the Bloomberg Barclays U.S. Treasury Long Index, were down 7.22%. Returns in long-term treasuries were driven by rising interest rates.
- Commodities, as represented by the Bloomberg Commodity Index, were down 6.50% led by a fall in oil prices. Crude oil futures fell from \$49.44 a barrel on June 30, 2016, to \$46.36 a barrel on June 30, 2017. Prices continued to fall due to a large supply glut driven by increasing shale production in the U.S. and slow global growth.

As noted, the best performing asset class this past fiscal year was public equities, which were up over 20%. Public equities are also one of the most volatile asset classes as illustrated by its return last year of -4.97%. 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 doesn't 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 private equity, private real estate, and absolute return strategies all provided return enhancement and diversification benefits in 2017. Diversification into asset classes such as U.S. Long Treasuries and commodities resulted in a drag on overall performance during this past fiscal year.

In analyzing performance, PSERS' Board, general investment consultant and staff pay particular 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 1.68 for the 5 year period ending June 30, 2017, a top 38th percentile score.

The fiscal year continued a recent trend of strong performance while volatility remained near historic lows, with the VIX dipping into single digits in early May. Global equities advanced steadily higher throughout the 12-month period to June 2017 with the MSCI AC World index returning 19.2% in local currency terms. The strong equity performance came despite uncertainties created by increasing political risks. The UK economy proved to be resilient after the surprise Brexit vote in the EU referendum and economic conditions improved across many regions. A surprise Donald Trump win in the US presidential election further boosted optimism in the US economy towards the end of the year. Equity markets were driven higher with prospects of greater reflationary policies pursued by the new US administration and solid economic releases, particularly in the Eurozone, and strong corporate earnings growth on a global basis.

Major central bank policy diverged over the period with the US Federal Reserve (Fed) raising the target federal funds rate in three successive quarters starting at the end of 2016 and reaching 1.00-1.25% in June 2017. In contrast, monetary policy eased in other major countries as the Bank of England (BoE), the European Central Bank (ECB) and the Bank of Japan (BoJ) pursued greater monetary easing, utilizing a combination of lower policy rates and extended quantitative easing (QE). Commodity prices were fairly directionless over the 12 months. The Organization of the Petroleum Exporting Countries' (OPEC) production cuts, announced in late 2016, were later extended to March 2018. However, US crude oil inventories remained stubbornly high which has capped the price of Brent crude oil.

While it has been a challenging return environment as evidenced by the System's three-, five-, and ten-year returns, since the first quarter after the Great Recession, PSERS' annualized net of fee return has been 9.28%, comfortably above the actuarial assumed rate of return of 7.25%. With

**Performance  
(continued)**

cash rates below 1%, 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 premiums over the long- term. In the short-term, no one knows what will happen and the System can go through 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, risk parity and absolute return. In any given year, the System expects some assets to perform well, such as public equities, high yield, and infrastructure did this past fiscal year, and some to not do as well, such as U.S. Long Treasuries and commodities did this past fiscal year. However, over the long run, 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.



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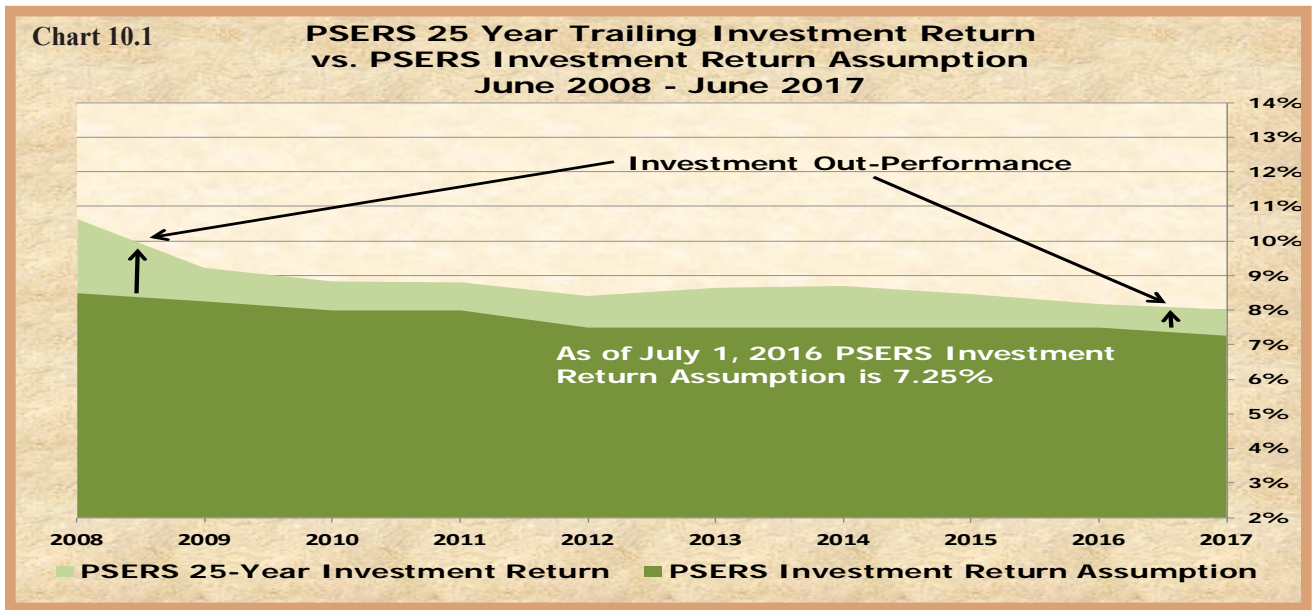


**Performance  
(continued)**

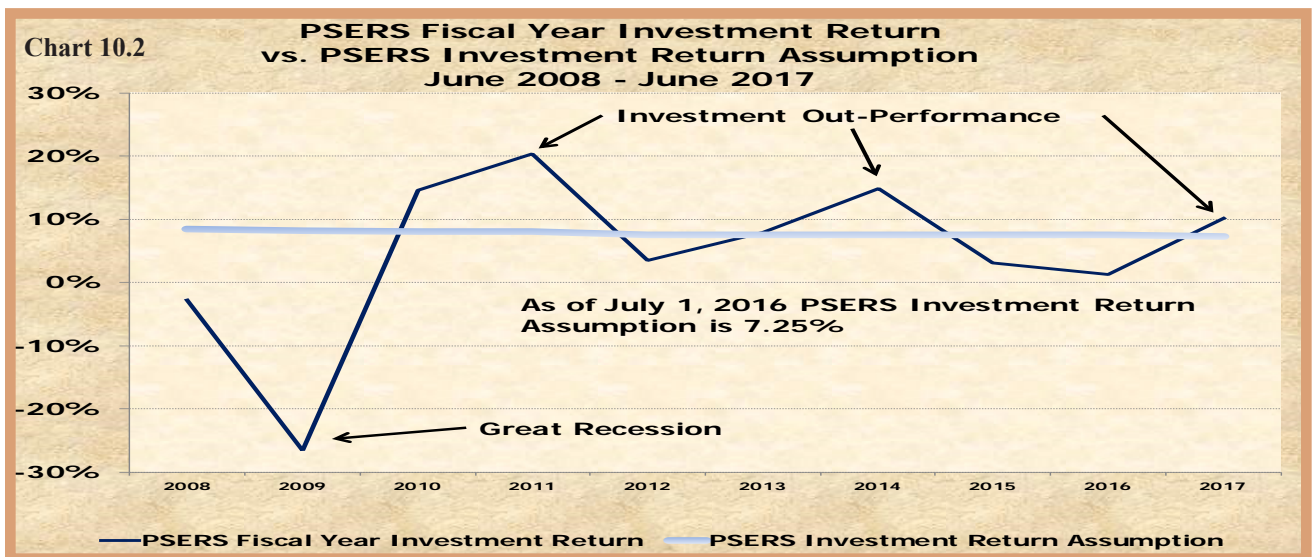
**Long Term Investment Performance  
Consistently Outperforms**

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.



As depicted in chart 10.2, PSERS' one-year investment return has remained above the investment return assumption for five of the past ten fiscal years. The notable exception is the Great Recession period from December 2007 through June 2009 which resulted in the largest decrease in stock market performance since the Great Depression.



## Section 3 - Investment Information

### Performance (continued)

Table 10.2 demonstrates that over the past 18 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$2.37 above the Policy Benchmark's dollar returns.

**Table 10.2 PSERS' Investment Earnings over Policy Benchmark**  
**Fiscal Years Ended June 30**  
**(Dollar Amounts in Millions)**

<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>\$1 of Investment Expenses Translates into \$\$\$ in Excess Earnings</i>
2017	\$ 474	1.78 %	\$ 814	\$ 2.72
2016	416	(1.81)%	(868)	(1.09)
2015	455	0.00 %	(14)	0.97
2014	482	0.58 %	254	1.53
2013	558	1.14 %	525	1.94
2012	481	1.78 %	849	2.77
2011	515	3.74 %	1,585	4.08
2010	522	4.28 %	1,754	4.36
2009	478	(5.22)%	(3,131)	(5.55)
2008	399	(0.98)%	(618)	(0.55)
2007	314	4.36 %	2,360	8.52
2006	211	3.26 %	1,635	8.75
2005	193	2.36 %	1,090	6.65
2004	191	3.51 %	1,388	8.27
2003	179	(0.43)%	(141)	(0.21)
2002	163	0.57 %	319	2.96
2001	144	2.13 %	1,200	9.33
2000	<u>125</u>	1.85 %	<u>934</u>	8.47
<b>Total</b>	<b><u>\$ 6,300</u></b>		<b><u>\$ 9,938</u></b>	<b>\$ 2.37</b>

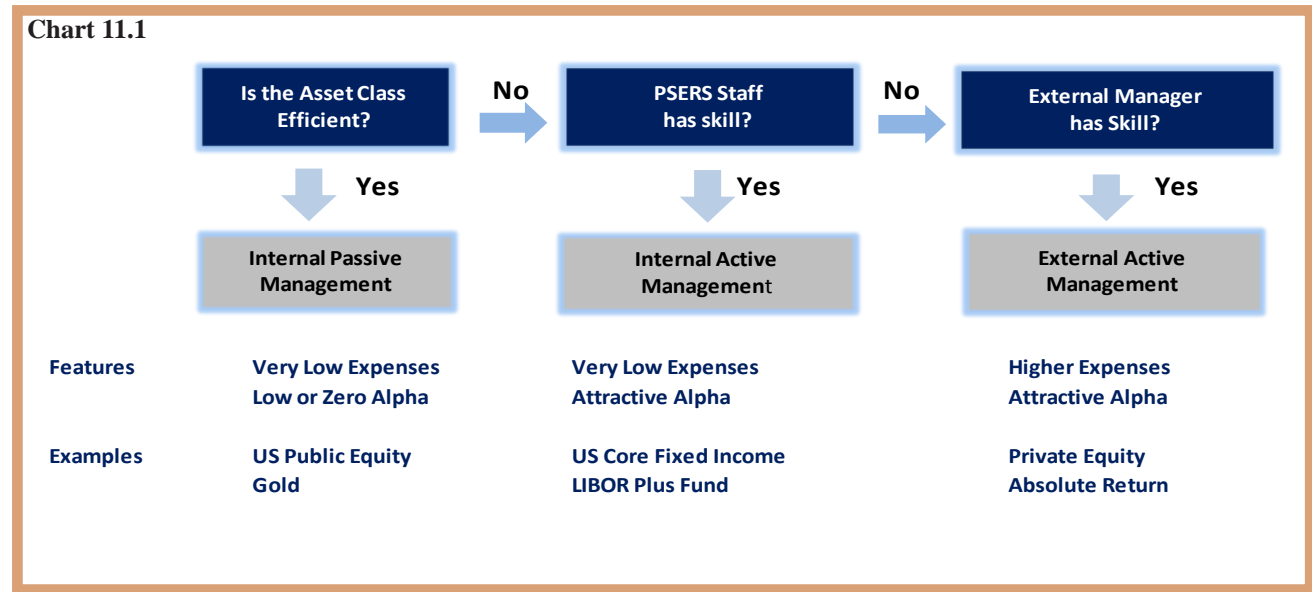
\*Dollar amounts in millions.



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## Managing Investment Fees and Expenses

PSERS' Board annually establishes an Asset Allocation Policy (as more fully described in Tab 9) with input from staff and the general investment consultant, and works on an ongoing basis to implement the Policy through identification of attractive investment strategies and well-qualified investment managers. A fundamental part of this implementation process is making key decisions with regard to use of active or passive strategies implemented by internal staff 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.

# Managing Investment Fees and Expenses

(continued)

Chart 11.2 below demonstrates that over the past 18 fiscal years, PSERS has earned \$10.0 billion in additional investment returns above the Board-approved Policy Index, net of fees.

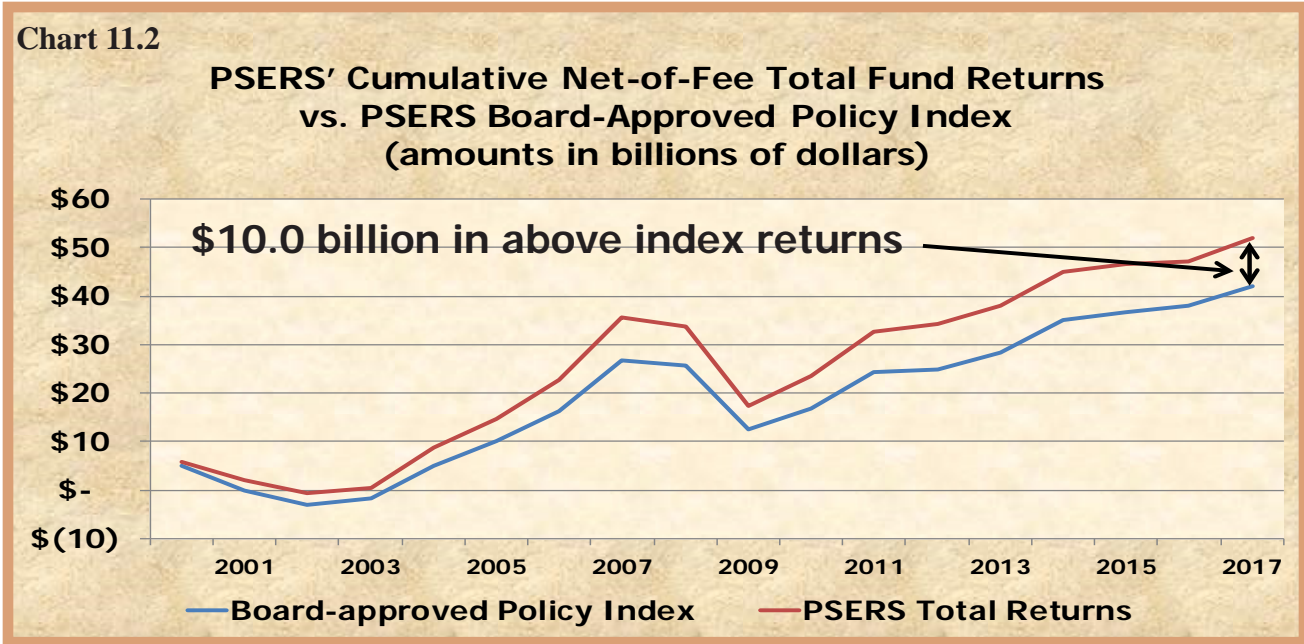
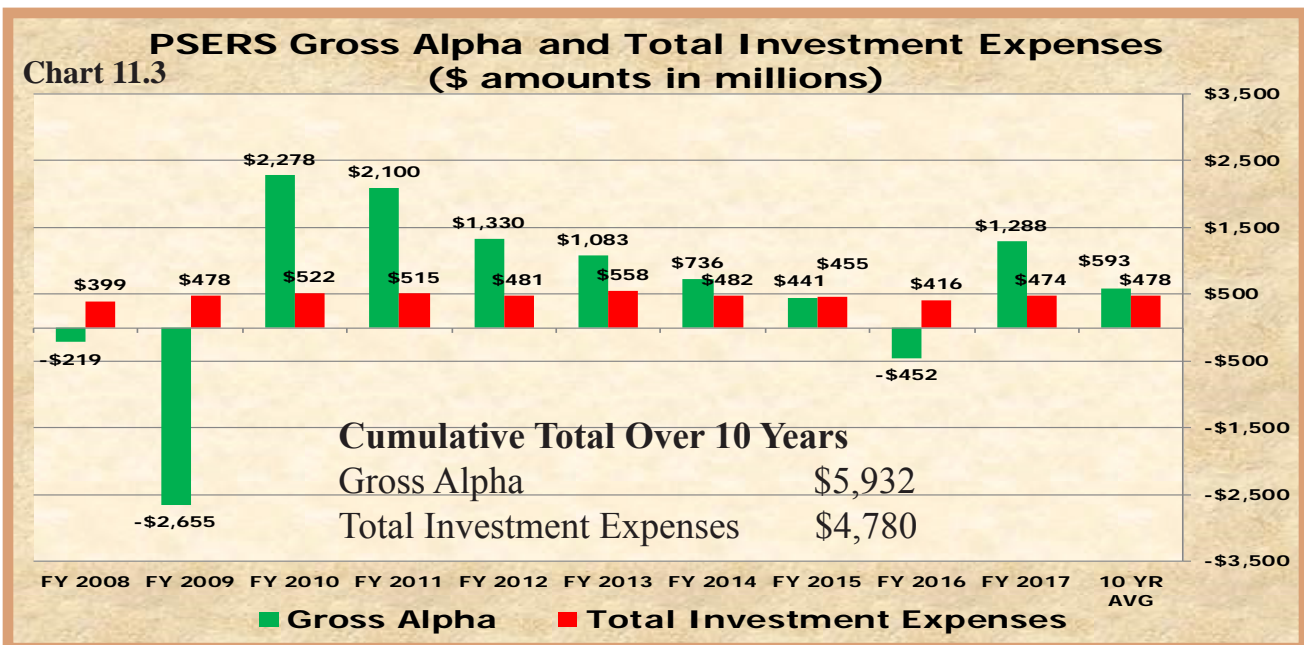


Chart 11.3 shows that PSERS has earned \$1,288 in gross alpha during fiscal year 2017, or \$2.72 of gross alpha for every \$1 of total investment expenses. Over the last ten years PSERS has earned \$5,932 million in gross alpha, or \$1.24 in gross alpha for every \$1 spent on total investment expenses.



Gross Alpha is excess earnings (without regard for investment expenses) above the earnings of the relevant benchmark index.

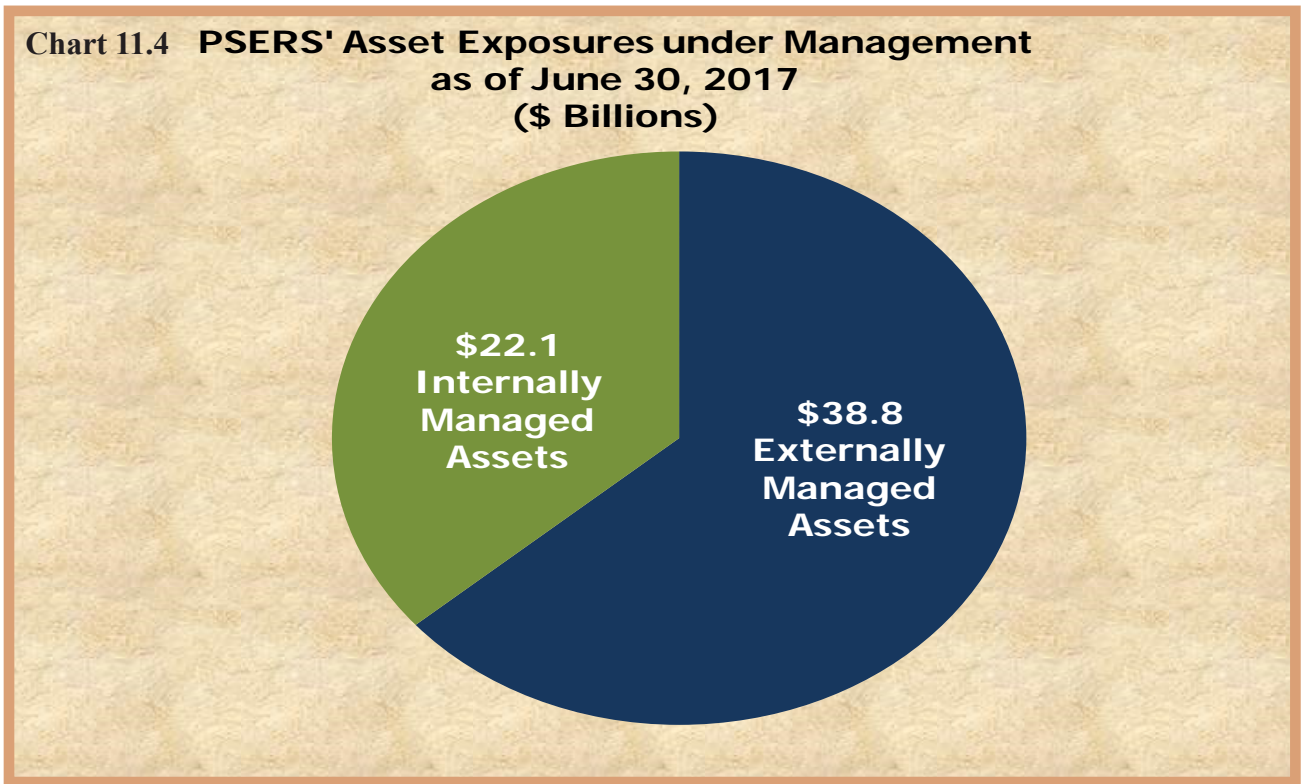
### Section 3 - Investment Information

#### 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' 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, 2017.



**Note:** Financing represents a negative \$9.1 billion allocation exposure and is not reflected in Chart 11.3.

## Section 3 - Investment Information

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

PSERS' Investment staff managed 19 portfolios internally, with a total estimated net asset value of over \$22 billion on June 30, 2017, resulting in significant fee savings. For the entire fiscal year, PSERS incurred costs of just under \$13 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 \$39 million in additional fees:

Table 11.1		<i>Market Value as of 6/30/17*</i>	<i>Estimated Annual Fee %</i>	<i>Estimated Cost to Manage Externally (000s)</i>
<i>Account</i>	<i>Asset Class</i>	<i>(000s)</i>		<i>(000s)</i>
PSERS - S&P 500 Index	U.S. Equities	\$2,767,860	0.01%	\$277
PSERS - S&P 400 Index	U.S. Equities	479,769	0.03%	144
PSERS - S&P 600 Index	U.S. Equities	468,466	0.04%	187
Misc. PSERS Equity Accounts	U.S. Equities	13,446	0.00%	-
	<b>U.S. Equities Total</b>	<b>3,729,541</b>		<b>6,108</b>
PSERS ACWI ex. U.S. Index	Non U.S. Equities	3,041,602	0.08%	2,433
	<b>Non U.S. Equities Total</b>	<b>3,041,602</b>		<b>2,433</b>
Private Markets Co-Investments	Private Markets	482,313	1.00%	4,823
PA Investment Fund - Private Equity.	Private Markets	4,602	1.00%	46
	<b>Private Markets Total</b>	<b>486,915</b>		<b>4,869</b>
Special Situations Internal	Fixed Income	13,823	1.00%	138
PSERS Active Aggregate	Fixed Income	1,235,757	0.21%	2,595
PSERS TIPS Portfolio	Fixed Income	1,900,433	0.13%	2,471
PSERS Long Treasuries	Fixed Income	1,520,361	0.18%	2,737
	<b>Fixed Income Total</b>	<b>4,670,374</b>		<b>7,941</b>
PSERS Infrastructure Index	Infrastructure	992,668	0.47%	4,666
	<b>Infrastructure Total</b>	<b>992,668</b>		<b>4,666</b>
PSERS Commodity Beta	Commodities	1,631,156	0.15%	2,447
PSERS Gold Fund	Commodities	1,700,000	0.15%	2,550
	<b>Commodities Total</b>	<b>3,331,156</b>		<b>4,997</b>
PSERS S&P MLP Index	MLP	476,238	0.50%	2,381
	<b>MLP Total</b>	<b>476,238</b>		<b>2,381</b>
PSERS REIT Index	Real Estate	688,139	0.08%	551
Real Estate Co-Investments	Real Estate	121,858	1.00%	1,219
	<b>Real Estate Total</b>	<b>809,997</b>		<b>1,769</b>
PSERS Risk Parity	Risk Parity	2,575,580	0.30%	7,727
	<b>Risk Parity Total</b>	<b>2,575,580</b>		<b>7,727</b>
PSERS Cash Management	Cash Management	2,025,802	0.01%	2,026
	<b>Cash Management Total</b>	<b>2,025,802</b>		<b>2,026</b>
	<b>Grand Total</b>	<b>\$22,139,873</b>		<b>\$39,416</b>

*\*Market values include cash and derivatives exposure*

### 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 the investment staff 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.



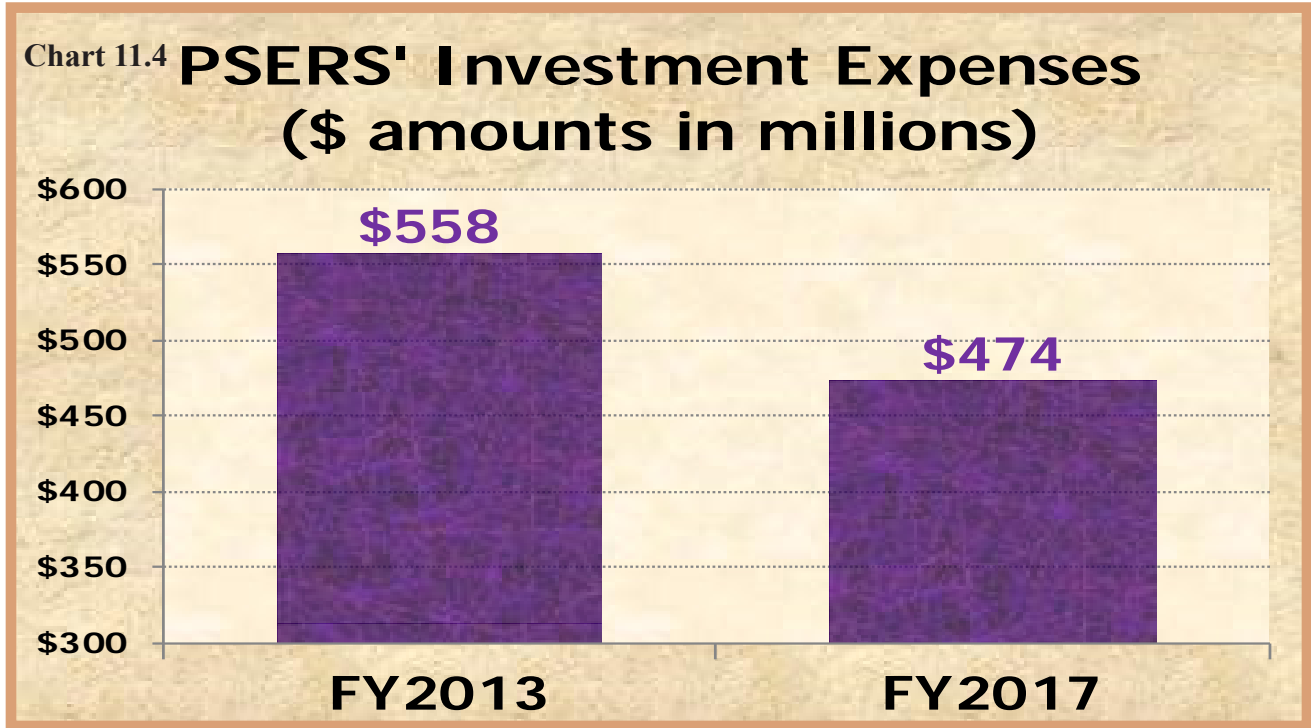
### Section 3 - Investment Information

**Table 11.2 summarizes total investment expenses for the fiscal year ended June 30, 2017.** “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.

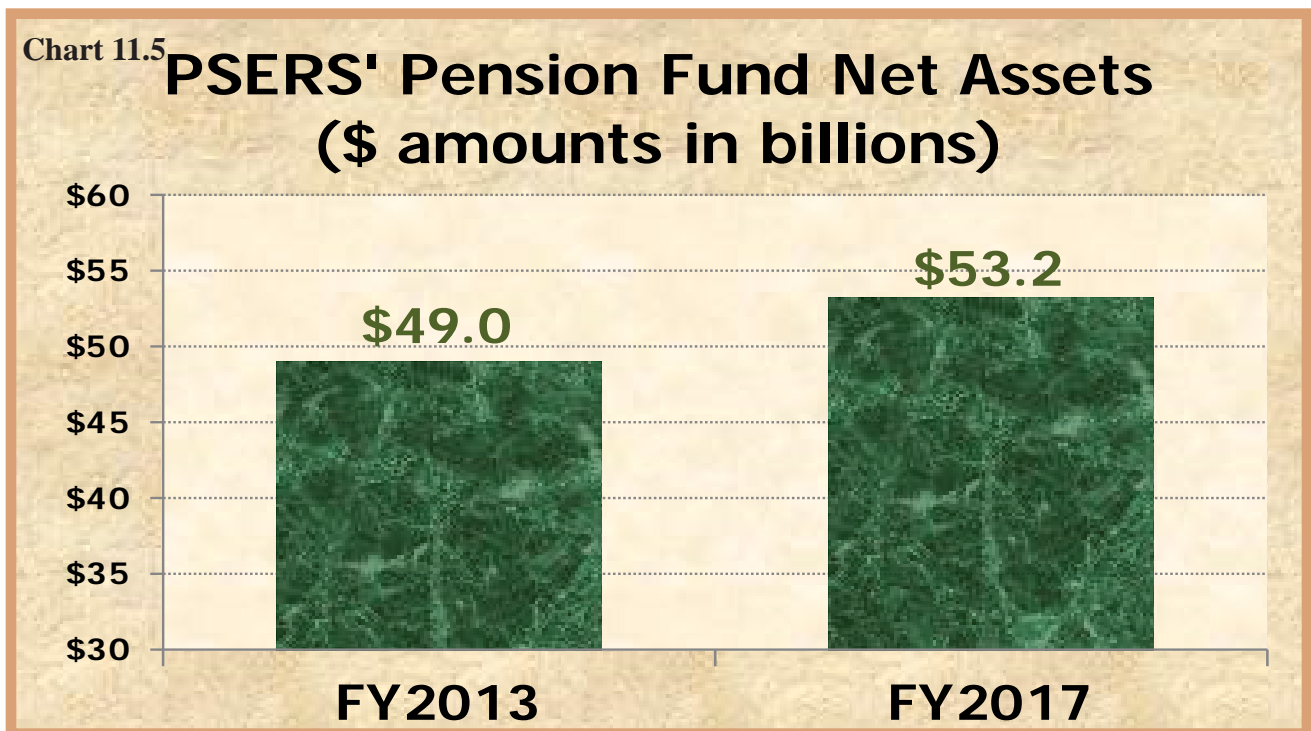
<b>Table 11.2 Summary of Investment Advisory Fees</b>				
<b>Fiscal Year Ended June 30, 2017</b>				
<b>(Dollar Amounts in Thousands)</b>				
	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total Fees</u>	<u>Basis Points</u>
<b>External Management</b>				
U.S. Equity	\$ 1,494	\$ 1,490	\$ 2,984	90
Non - U.S. Equity	19,771	5,392	25,163	28
Fixed Income	87,464	21,061	108,525	91
Real Estate	50,609	-	50,609	99
Alternative Investments	102,714	-	102,714	100
Absolute Return	78,202	50,784	128,986	264
Commodities	4,132	-	4,132	57
Master Limited Partnerships	8,295	238	8,533	44
Risk Parity	<u>19,632</u>	<u>3,466</u>	<u>23,098</u>	87
<b>Total External Management</b>	<b>\$ 372,313</b>	<b>\$ 82,431</b>	<b>\$ 454,744</b>	97
<b>Total Internal Management</b>			<u><b>12,787</b></u>	6
<b>Total Investment Management</b>			<b>467,531</b>	69
Custodian Fees			2,476	
Consultant and Legal Fees			<u>4,484</u>	
<b>Total Other Expenses</b>			<u><b>6,960</b></u>	
<b>Total Investment Expenses</b>			<b>\$ <u>474,491</u></b>	70

### 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 11.4 illustrates, Total External Management fees have decreased from \$558 million in Fiscal Year 2013 to \$474 million in Fiscal Year 2017. It is worth noting that these decreases have occurred while Total Internal Management and Total Other Expenses have remained flat. As discussed elsewhere, PSERS is hopeful that it will be permitted to increase its investment professional complement in order to maintain and even expand these savings.



FY2017 fees are lower than FY2013 fees despite the fact that, as illustrated in Chart 11.5, PSERS now manages \$4 billion more in net assets.



### 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.

<b>Table 11.3 Investment Fees by Manager</b>	
<b>Fiscal Year Ended June 30, 2017</b>	
<b>(Dollar Amounts in Thousands)</b>	
<b><u>Manager</u></b>	<b><u>Total Fees</u></b>
<b><u>U.S. Equity</u></b>	
Radcliffe Capital Management, L.P.	\$ 2,984
<b>Total - U.S. Equity</b>	<b>2,984</b>
<b><u>Non - U.S. Equity</u></b>	
Acadian Asset Management, LLC	960
Baillie Gifford Overseas Ltd.	6,525
BlackRock Financial Management, Inc.	3,433
BlackRock Institutional Trust Company, N.A.	2,281
Fidelity Institutional Asset Management LLC	1,138
Marathon Asset Management Limited	3,153
Oberweis Asset Management, Inc.	1,487
Pareto Investment Management, Ltd.	1,057
QS Investors, LLC	610
Wasatch Advisors, Inc.	4,519
<b>Total - Non - U.S. Equity</b>	<b>25,163</b>
<b><u>Fixed Income</u></b>	
AllianceBernstein L.P.	420
Apollo European Principal Finance Fund II(Dollar A), L.P.	1,907
Avenue Energy Opportunities Fund, L.P.	1,931
Avenue Europe Special Situations Fund III (U.S.), L.P.	979
Bain Capital Credit Managed Account (PSERS), L.P.	1,687
Bain Capital Distressed and Special Situations 2013 (A), L.P.	1,013
Bain Capital Distressed and Special Situations 2016 (A), L.P.	814
Bain Capital Middle Market Credit 2010, L.P.	281
Bain Capital Middle Market Credit 2014, LP	1,505
BlackRock Financial Management, Inc.	11,342
Bridgewater Associates, LP	21,719
Brigade Capital Management, LLC	16,777
Capula Investment Management, LLP	975
Cargill Financial Services Corporation	2,891
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	3,121
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,305
Cerberus Levered Loan Opportunities Fund I, L.P.	274
Cerberus Levered Loan Opportunities Fund II, L.P.	2,760
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	4,533

## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**  
(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Fixed Income (continued)</u></b>	
Galton Onshore Mortgage Recovery Fund III, L.P.	\$ 1,377
Hayfin SOF II USD Co-Invest, L.P.	12
Hayfin SOF II USD, L.P.	339
Hayfin Special Opportunities Credit Fund (Parallel), L.P.	2,341
ICG Europe Fund V, L.P.	1,583
ICG Europe Fund VI, L.P.	1,059
International Infrastructure Finance Company, L.P.	1,343
Latitude Management Real Estate Capital IV, Inc.	124
LBC Credit Partners II, L.P.	674
LBC Credit Partners III, L.P.	3,638
LBC-PSERS Credit Fund, L.P.	842
Mariner Investment Group, LLC	1,672
Oaktree Loan Fund 2X, LP	27
Pacific Investment Management Company (PIMCO)	1,633
Park Square - PSERS Credit Opportunities Fund, L.P.	1,601
Penn Mutual Asset Management, LLC	13
Pugh Capital Management, Inc.	197
PSERS TAO Partners Parallel Fund, L.P.	2,974
Radcliffe Capital Management, L.P.	1,851
Sankaty Credit Opportunities IV, L.P.	1,459
SEI Investments Company	686
Templeton Investment Counsel, LLC	1,669
TOP NPL (A), L.P.	21
TPG Opportunities Partners II (A), L.P.	305
TPG Opportunities Partners III (A), L.P.	2,261
Varde Scratch and Dent Feeder I-A, L.P. (The)	349
Varde Scratch and Dent Fund, L.P. (The)	<u>2,241</u>
<b>Total - Fixed Income</b>	<b>108,525</b>
<b><u>Real Estate-Direct Ownership</u></b>	
Charter Oak Advisors, Inc.	1,207
GF Management, Inc.	131
Grosvenor Investment Management U.S., Inc.	50
L & B Realty Advisors, L.L.P.	<u>104</u>
<b>Subtotal - Real Estate-Direct Ownership</b>	<b>1,492</b>
<b><u>Real Estate-Partnerships/Funds</u></b>	
AG Core Plus Realty Fund III, L.P.	457
AG Core Plus Realty Fund IV, L.P.	531

## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**  
(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Real Estate-Partnerships/Funds (continued)</u></b>	
Almanac Realty Securities V, L.P.	\$ 314
Almanac Realty Securities VI, L.P.	312
Almanac Realty Securities VII, L.P.	1,360
Apollo Real Estate Finance Corporation	189
Ares European Real Estate Fund III, L.P.	310
Ares European Real Estate Fund IV, L.P.	1,493
Ares U.S. Real Estate Fund VII L.P.	583
Ares U.S. Real Estate Fund VIII, L.P.	1,075
Avenue Real Estate Fund Parallel, L.P.	872
Bell Institutional Fund IV, LLC	694
Bell Institutional Fund V, LLC	956
Bell Institutional Fund VI, L.P.	415
BlackRock Asia Property Fund III, L.P.	107
BlackRock Europe Property Fund III, L.P.	86
Blackstone Real Estate Debt Strategies II, L.P.	922
Blackstone Real Estate Debt Strategies III, L.P.	219
Blackstone Real Estate Partners Europe III, L.P.	1,357
Blackstone Real Estate Partners Europe IV, L.P.	1,374
Blackstone Real Estate Partners VI.TE.1, L.P.	1,312
Blackstone Real Estate Partners VII.TE.2, L.P.	2,585
Blackstone Real Estate Partners VIII, L.P.	3,750
BPG Co-Investment Partnership L.P.	11
Brookfield Strategic Real Estate Partners II, L.P.	2,293
Brookfield Strategic Real Estate Partners, L.P.	1,524
Cabot Industrial Value Fund IV, L.P.	1,125
Carlyle Real Estate Fund IV L.P.	242
Carlyle Real Estate Fund V L.P.	333
Carlyle Real Estate Fund VI L.P.	364
Carlyle Real Estate Fund VII L.P.	997
DRA Growth and Income Fund IX, LLC	297
DRA Growth and Income Fund VI, L.P.	524
DRA Growth and Income Fund VII, L.P.	1,541
DRA Growth and Income Fund VIII, L.P.	2,384
Exeter Core Industrial Club Fund II, L.P.	173
Exeter Industrial Value Fund II, L.P.	94
Exeter Industrial Value Fund III, L.P.	770
Fortress Investment Fund IV, L.P.	452

## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
(Dollar Amounts in Thousands)  
(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Real Estate-Partnerships/Funds (continued)</u></b>	
Fortress Investment Fund V (Fund A), L.P.	\$ 1,646
GCM Grosvenor Customized Infrastructure Strategies II, L.P.	58
International Infrastructure Finance Company II, L.P.	140
JPMCB Strategic Property Fund	135
Latitude Management Real Estate Capital III, Inc.	897
Legg Mason Real Estate Capital II, Inc.	220
LEM Multifamily Senior Equity Fund IV, L.P.	633
LEM RE High Yield Debt & Preferred Equity Fund III, L.P.	773
LEM Real Estate Mezzanine Fund II, L.P.	99
Pramerica Real Estate Capital VI, L.P.	325
PRISA	964
RCG Longview Debt Fund IV, L.P.	140
RCG Longview Debt Fund V, L.P.	1,017
RCG Longview Debt Fund VI, L.P.	460
RCG Longview Equity Fund, L.P.	367
Senior Housing Partnership Equity Fund IV, L.P.	649
Senior Housing Partnership Fund V, L.P.	1,097
Silverpeak Legacy/PSERS, L.P.	82
Stockbridge Real Estate Fund II, L.P.	395
Stockbridge Real Estate Fund III, L.P.	801
Stockbridge Real Estate Fund, L.P.	2,247
Strategic Partners Fund IV RE, L.P.	78
UBS Trumbull Property Fund	<u>963</u>
<b>Subtotal - Real Estate-Partnerships/Funds</b>	<b>48,583</b>
<b><u>Real Estate-Farmland</u></b>	
Prudential Agricultural Group	<u>534</u>
<b>Subtotal - Real Estate-Farmland</b>	<b>534</b>
<b>Total Real Estate</b>	<b>50,609</b>
<b><u>Private Equity</u></b>	
Actis Emerging Markets 3, L.P.	1,883
Actis Global 4 L.P.	1,794
Apax Europe VII, L.P.	1
Bain Capital Asia Fund II, L.P.	1,474
Bain Capital Asia Fund III, L.P.	2,592
Bain Capital XI, L.P.	1,370

### Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**  
(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Private Equity (continued)</u></b>	
Baring Asia Private Equity Fund III, L.P.	\$ 561
Baring Asia Private Equity Fund IV, L.P.	2,903
Baring Asia Private Equity Fund V, L.P.	3,413
Barings Asia Private Equity Fund VI, L.P.	1,495
Blue Point Capital Partners II (B), L.P.	153
Blue Point Capital Partners III (B), L.P.	363
Bridgepoint Europe IV, L.P.	1,748
Bridgepoint Europe V, L.P.	2,128
Capital International Private Equity Fund V, L.P.	678
Capital International Private Equity Fund VI, L.P.	508
Catterton Growth Partners II, L.P.	1,040
Catterton Growth Partners III, L.P.	2,000
Catterton Growth Partners, L.P.	675
Catterton Partners V, L.P.	306
Catterton Partners VI, L.P.	1,239
Catterton Partners VII, L.P.	1,425
Catterton VIII, L.P.	94
Cinven Fund (Fourth), L.P. (The)	193
Cinven Fund (Fifth), L.P. (The)	1,003
Cinven Fund (Sixth), L.P. (The)	106
Coller International Partners VI, L.P.	1,031
Coller International Partners VII, L.P.	1,497
Crestview Partners II (PF), L.P.	1,600
Crestview Partners III, L.P.	1,465
Crestview Partners, L.P.	250
CVC Capital Partners Asia III Pacific, L.P.	574
CVC European Equity Partners V (A), L.P.	730
DCPF VI Oil and Gas Co-Investment Fund, L.P.	154
Denham Commodity Partners Fund VI, L.P.	1,098
Energy & Mineral Group Fund III, L.P.	1,223
Equistone Partners Europe Fund V E, L.P.	1,243
Evergreen Pacific Partners II, L.P.	481
First Reserve Fund XI, L.P.	114
First Reserve Fund XII, L.P.	1,274
GoldPoint Partners Co-Investment V, L.P.	500
HgCapital 7, L.P.	1,669
HGGC Fund II, L.P.	761
Incline Equity Partners III, L.P.	277

## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**

(continued)

<u>Manager</u>	<u>Total Fees</u>
<b>Private Equity (continued)</b>	
Irving Place Capital Partners III, L.P.	\$ 464
Landmark Equity Partners XIII, L.P.	319
Landmark Equity Partners XIV, L.P.	1,500
Milestone Partners II, L.P.	39
Milestone Partners III, L.P.	331
Milestone Partners IV, L.P.	705
New Mountain Partners III, L.P.	666
New Mountain Partners IV, L.P.	1,134
New York Life Capital Partners III, L.P.	431
New York Life Capital Partners IV, L.P.	360
NGP Natural Resources X, L.P.	958
NGP Natural Resources XI, L.P.	1,320
North Haven PE Asia Fund IV, L.P. (Morgan Stanley)	1,478
Odyssey Investment Partners Fund V, L.P.	1,971
Orchid Asia V, L.P.	276
Orchid Asia VI, L.P.	1,464
PAI Europe IV, L.P.	752
PAI Europe V, L.P.	1,059
PAI Europe VI, L.P.	1,563
Palladium Equity Partners IV, L.P.	1,137
Partners Group Secondary 2008, L.P.	1,108
Partners Group Secondary 2011, L.P.	1,371
Partners Group Secondary 2015 (USD) A, L.P.	1,371
Permira IV, L.P.	93
StepStone International Investors III, L.P.	636
Strategic Partners III-B, L.P.	500
Strategic Partners IV, L.P.	253
Strategic Partners V, L.P.	612
Strategic Partners VI, L.P.	981
Strategic Partners Fund VII, L.P.	1,250
Trilantic Capital Partners IV, L.P.	151
Trilantic Capital Partners V, L.P.	1,420
<b>Subtotal - Private Equity</b>	<b>74,760</b>



## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**  
(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Special Situations</u></b>	
Apollo Investment Fund VIII, L.P.	\$ 1,173
Avenue Special Situations Fund VI, L.P.	134
Cerberus Institutional Partners, L.P. (Series Three)	19
Cerberus Institutional Partners, L.P. (Series Four)	733
Cerberus Institutional Partners V, L.P.	1,697
Cerberus Institutional Partners VI, L.P.	2,599
Clearlake Capital Partners IV, L.P.	858
GSC Recovery III, L.P.	270
NYLIM Mezzanine Partners Parallel Fund II, L.P.	30
OCM Opportunities Fund VII, L.P.	225
OCM Opportunities Fund VII-B, L.P.	384
Searchlight Capital II, L.P.	1,378
Venor Special Situations Fund II, L.P.	681
Versa Capital Fund I, L.P.	399
Versa Capital Fund II, L.P.	1,811
Windjammer Senior Equity Fund IV, L.P.	<u>1,008</u>
<b>Subtotal - Special Situations</b>	<b>13,399</b>
<b><u>Venture Capital</u></b>	
Aisling Capital III, L.P.	577
Aisling Capital IV, L.P.	784
Co-Investment Fund II, L.P. (The)	1,313
LLR Equity Partners II, L.P.	20
LLR Equity Partners III, L.P.	1,593
LLR Equity Partners IV, L.P.	3,178
Psilos Group Partners III, L.P.	252
Quaker BioVentures II, L.P.	890
SCP Private Equity Partners II, L.P.	422
Starvest Partners II, L.P.	372
Strategic Partners III-VC, L.P.	145
Strategic Partners IV VC, L.P.	188
Summit Partners Growth Equity Fund VIII, L.P.	1,043
Tenaya Capital V-P, LP	779
Tenaya Capital VI, L.P.	1,000
Tenaya Capital VII, L.P.	<u>2,000</u>
<b>Subtotal - Venture Capital</b>	<b>14,555</b>
<b>Total Alternative Investments</b>	<b>\$ 102,714</b>

### Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager  
Fiscal Year Ended June 30, 2017  
(Dollar Amounts in Thousands)**

(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Absolute Return</u></b>	
Aeolus Capital Management Ltd.	\$ 6,437
BlackRock Financial Management, Inc.	1,411
Brevan Howard Asset Management, LLP	590
Bridgewater Associates, Inc.	21,317
Brigade Capital Management, LLC	11,356
Capula Global Relative Value Fund	14,272
Capula Tail Risk Fund	7,033
Caspian Select Credit International, Ltd.	2,748
Caspian Keystone Focused Fund, Ltd.	187
Garda Asset Management, LLC	13,274
Independence Reinsurance Partners GP, LLC	1,388
Nephila Capital Ltd.	3,674
Oceanwood Capital Management, LLP	4,295
One William Street Capital Management, L.P.	9,796
Pacific Investment Management Company (PIMCO)	24,147
Perry Partners, L.P.	1,058
Sciens Aviation Special Opportunities Investment Fund II, L.P.	1,723
Sciens Aviation Special Opportunities Investment Fund III, L.P.	2,525
Two Sigma Investments, L.P.	124
Venor Capital Offshore, Ltd.	<u>1,631</u>
<b>Total - Absolute Return</b>	<b>128,986</b>
<b><u>Commodities</u></b>	
Gresham Investment Management, LLC	944
Wellington Management Company, L.L.P.	<u>3,188</u>
<b>Total - Commodities</b>	<b>4,132</b>
<b><u>Master Limited Partnerships</u></b>	
Harvest Fund Advisors, LLC	3,807
Salient Capital Advisors, LLC	3,034
Stein Roe Investment Counsel D/B/A Atlantic Trust	<u>1,692</u>
<b>Total - Master Limited Partnerships</b>	<b>8,533</b>

## Section 3 - Investment Information

**Table 11.3 Investment Fees by Manager**  
**Fiscal Year Ended June 30, 2017**  
**(Dollar Amounts in Thousands)**

(continued)

<u>Manager</u>	<u>Total Fees</u>
<b><u>Risk Parity</u></b>	
AQR Capital Management, LLC	\$ 673
BlackRock Institutional Trust Company, N.A.	1,978
Bridgewater All Weather Fund @15%, Ltd.	2,694
Bridgewater Optimal Portfolios, Ltd.	9,651
D.E. Shaw Investment Management, L.L.C.	<u>8,102</u>
<b>Total - Risk Parity</b>	<b>23,098</b>
<b>Total External Management</b>	<b>454,744</b>
<b>Total Internal Management</b>	<b><u>12,787</u> *</b>
<b>Total Investment Management</b>	<b><u>\$ 467,531</u></b>

\*Internal Management expenses include salaries and fringe benefits of \$8,455 and operating expenses of \$4,332.

### Investment Fees and Expenses Initiatives

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

- Identifying opportunities to invest more assets internally. PSERS' current staffing levels are too low to significantly increase internal asset management, but we continue to work with the Administration to look for ways to reduce investment fees by increasing internal investment staff. PSERS continues to believe this is in the best interests of both the Fund and the Commonwealth and, therefore, has included additional positions in the FY2018-19 budget request.
- 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.

## Section 3 - Investment Information

### Commitment to Pennsylvania Financial Services Firms (as of June 30, 2017)

The members of the Board and 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 staff has 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 2017, investment management fees paid to external firms managing PSERS' assets from offices located in Pennsylvania amounted to \$ 30.8 million, or 6.8% of the total external investment manager fees.

Table 12.1 lists the asset exposures managed internally by PSERS, as of June 30, 2017.

Table 12.1		
<b>Pennsylvania-Based Asset Exposures Managed Internally</b>		
(as of June 30, 2017)		
<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>Percentage of Total</u>
U.S. Equity	\$ 3,729.6	16.8 %
Non-U.S. Equity	3,041.6	13.7
Private Markets	486.9	2.2
Fixed Income	6,696.2	30.2
Master Limited Partnerships	476.2	2.2
Commodities	3,331.2	15.1
Infrastructure	992.7	4.5
Real Estate	810.0	3.7
Risk Parity	<u>2,575.6</u>	<u>11.6</u>
<b>Totals</b>	<b><u>\$ 22,140.0</u></b>	<b><u>100.0</u> %</b>

## 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, 2017.

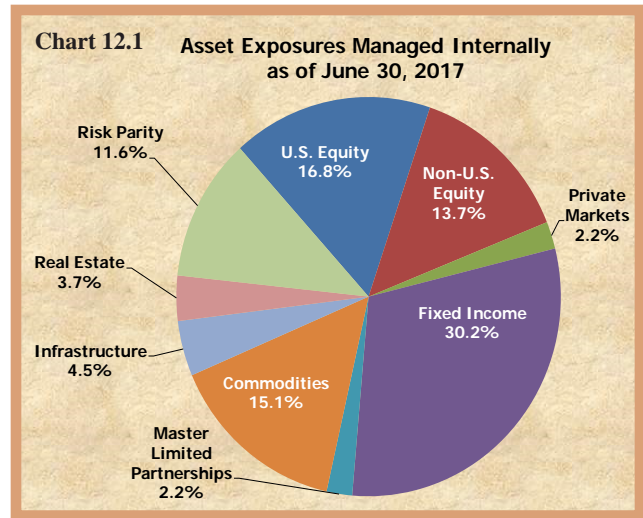


Table 12.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2017.

<b>Table 12.2 Pennsylvania-Based External Managers</b>	
U. S. Equity:	Private Equity and Special Situations (continued):
Radcliffe Capital Management, L.P.	PNC Equity Partners, L.P.
	PNC Equity Partners II, L.P.
Fixed Income:	Versa Capital Fund I, L.P.
International Infrastructure Finance Company Fund, L.P.	Versa Capital Fund II, L.P.
LBC Credit Partners II, LP	Versa Capital Fund III, L.P.
LBC Credit Partners III, LP	
LBC-PSERS Credit Fund L.P.	Venture Capital:
Radcliffe Capital Management, L.P.	Adams Capital Management, L.P.
SEI Investments Company	Co-Investment 2000 Fund, L.P.
	Co-Investment Fund II, L.P. (The)
Master Limited Partnership:	Cross Atlantic Technology Fund, L.P.
Harvest Fund Advisors, LLC	Cross Atlantic Technology Fund II, L.P.
	LLR Equity Partners, L.P.
Real Estate:	LLR Equity Partners II, L.P.
BPG Co-Investment Partnership, L.P.	LLR Equity Partners III, L.P.
Charter Oak Advisors, Inc.	LLR Equity Partners IV, L.P.
Exeter Core Industrial Club Fund II, L.P.	NEPA Venture Fund II
Exeter Industrial Value Fund II, L.P.	Novitas Capital, L.P.
Exeter Industrial Value Fund III, L.P.	Novitas Capital II, L.P.
GF Management, Inc.	Quaker BioVentures, L.P.
International Infrastructure Finance Company Fund II, L.P.	Quaker BioVentures II, L.P.
LEM Multifamily Senior Equity Fund IV, L.P.	SCP Private Equity Partners I, L.P.
LEM Real Estate Mezzanine Fund II, L.P.	SCP Private Equity Partners II, L.P.
LEM RE High Yield Debt & Preferred Equity Fund III, LP	
Private Equity and Special Situations:	
Incline Equity Partners III, L.P.	
Milestone Partners II, L.P.	
Milestone Partners III, L.P.	
Milestone Partners IV, L.P.	

### Investments in Pennsylvania-Based

#### Companies

(as of June 30, 2017)

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 external and 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 Real Estate

PSERS has investments in limited partnerships that have invested in Pennsylvania real estate properties. PSERS Real Estate program has committed \$16.9 billion to 129 partnerships. From the program inception to June 30, 2017, PSERS has committed capital to 16 partnerships headquartered in Pennsylvania.

#### Venture Capital

PSERS' Venture Capital program has committed \$3.1 billion to 59 partnerships. In addition to the current geographically diverse scope of venture capital investments, a historical objective of this program has been to target partnerships that demonstrate an ability to invest in Pennsylvania-based companies. Selected partnerships offer diversification according to geographic region and financing stage within Pennsylvania. From the program inception to June 30, 2017, PSERS has committed capital to 30 partnerships headquartered in Pennsylvania.

#### Private Equity

PSERS' Private Equity program has committed \$20.4 billion to 153 partnerships. From the program inception to June 30, 2017, PSERS has committed capital to 8 partnerships headquartered in Pennsylvania.

#### Special Situations

PSERS' Special Situations program has committed \$5.4 billion to 35 partnerships. From the program inception to June 30, 2017, PSERS has committed capital to 3 partnerships headquartered in Pennsylvania.

#### Private Markets and Real Estate Pennsylvania In-House Co-Investment Program

PSERS seeks to make co-investments in assets located in Pennsylvania from funds where PSERS or Portfolio Advisors, PSERS' former Private Market Consultant, is already a Limited Partner. PSERS has set aside \$250 million to be committed to this program. As of June 30, 2017, PSERS has invested \$42.8 million in the Private Markets and Real Estate Pennsylvania In-House Co-Investment Program. The number of employees, payroll and market value are included within their respective asset class.

### Section 3 - Investment Information

Table 12.3 displays Pennsylvania-based investments and other statistics at June 30, 2017 (\$'s in millions):

Table 12.3 <b>Statistics of Pennsylvania-Based Investments</b>				
<i>Asset Class</i>	<i>Total PA Market Value (PSERS' Portion)</i>	<i>Total PA Market Value (Total Invested)</i>	<i># of People Employed</i>	<i>Payroll</i>
U.S. Equities	\$ 151.0	\$ 151.0	*	\$ *
Fixed Income	64.0	64.0	*	*
Private Real Estate	65.3	1,469.0	370	8.8
Private Markets:				
Venture Capital	123.2	804.0	1,895	74.2
Private Equity	1,431.6	22,993.5	36,221	1,105.4
Special Situations	<u>331.8</u>	<u>11,584.1</u>	<u>13,419</u>	<u>78.1</u>
<b>Total</b>	<b>\$ <u>2,166.9</u></b>	<b>\$ <u>37,065.6</u></b>	<b><u>51,905</u></b>	<b>\$ <u>1,266.5</u></b>

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



*Partners for Your Future*

# SECTION 4 - PSERS POSTEMPLOYMENT HEALTHCARE PROGRAMS

Health Options Program.....	Tab 13
Premium Assistance Program.....	Tab 14





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## **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 December 1, 2017 there are 110,635 participants (93,419 retirees plus their dependents) in the Health Options Program. The HOP is funded solely by and for eligible participants. Employers provide no funding for the HOP. The following is a summary of HOP initiatives during the period January 1, 2017 to January 1, 2018.

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 Health Options Program. The effective date of the insurance is January 1, 2018. As a result of the IFA, PSERS is expecting the following carriers to participate in HOP:

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

The Retirement Board issued a Request for Proposals (RFP) for Health Care Consulting and Project Management Services PSERS RFP 2017-2. Based on the total scores for all bid proposal categories, the Segal Company was determined to be the successful bidder for RFP 2017-2. The Retirement Board accepted the results of the RFP process and awarded the Segal Company the contract with an initial term of three (3) years beginning February 1, 2018, with options to renew the contract, upon mutual consent of the parties, annually for two (2) additional years.

The Retirement Board issued a Request for Proposals (RFP) for CMS Part D Compliance Activities Services and Pharmacy Benefit Consulting PSERS RFP 2017-3. Based on the total scores for all bid proposal categories, Blue Peak, LLC was determined to be the successful bidder. The Retirement Board accepted the results of the RFP process and awarded Blue Peak the contract with an initial term of two (2) years beginning February 1, 2018, with options to renew the contract, upon mutual consent of the parties, annually for three (3) additional years.

The Health Options Program 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

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

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 Health Options Program provide a pre-65 plan for individuals not yet eligible for Medicare. Each year participants of the Health Options Program may change their health benefit coverage to meet changing needs. The following is a summary of the plans and premium rates paid by participants:

Standard Benefit	2017	2018
Deductible	\$ 400	\$ 400
Initial Coverage Limit	3,700	3,750
Out-of-Pocket Threshold	4,950	5,000
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit:		
Generic	\$ 3.30	\$ 3.35
Other	8.25	8.35

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.

The Affordable Care Act (ACA) mandates that Medicare prescription drug plans provide 51% coverage for generic drugs in the Coverage Gap for 2017, and 44% in 2018. While the Act increases this benefit ratably toward an ultimate level of 75%, it provides effectively no additional funding from CMS. Accordingly, the cost of the mandated benefit increase is paid by participants not receiving low-income subsidies. The Affordable Care Act also mandates that Medicare prescription drug plans pay 15% of the cost of brand drugs in the Coverage Gap for 2018, which will increase to 25% over the next several years. The following table shows how much members pay for drugs in the Coverage Gap:

The Member Pays in Coverage Gap:	2017 Medicare Rx Option	2018 Medicare Rx Option
Generic Drugs	51%	44%
Brand Drugs	40% (after 50% manufacturer discount and 10% plan benefit)	35% (after 50% manufacturer discount and 15% plan benefit)
Non-preferred Brand Rx	40% (after 50% manufacturer discount and 10% plan benefit)	35% (after 50% manufacturer discount and 15% plan benefit)

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

#### Plans Available Through the Health Options Program

The Health Options Program 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 Health Option Program participants electing to change coverage during the 2018 option selection period conducted in the fall of 2017.

The following is a list of HOP plans as of January 1, 2018:

<b>For Individuals Eligible for Medicare:</b>	<b>For Individuals Not Eligible for Medicare:</b>
HOP Value Medical Plan (Medicare supplement)	
HOP Medical Plan (Medicare supplement)	HOP Pre-65 Medical Plan
Value Medicare Rx Option (Medicare Part D)	
Basic Medicare Rx Option (Medicare Part D)	
Enhanced Medicare Rx Option (Medicare Part D)	HOP Pre-65 Medical Plan w/ Rx coverage
<b>Medicare Advantage Plans</b>	<b>Companion Pre-65 Managed Care Plans</b>
Aetna Medicare PPO	Aetna PPO Plan
Capital Blue Cross SeniorBlue PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue
Independence Blue Cross-Keystone 65 HMO	Independence Blue Cross-Keystone HMO
UPMC for Life HMO	UPMC Health Plan

## 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 premium rates for 2018 compared to the 2017 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	2017	2018	Increase/ (Decrease)
<b>Medicare Supplement Plans</b>			
Value Medical Plan	\$117	\$117	0%
Value Medical Plan w/ Value Medicare Rx Option	139	139	0%
HOP Medical Plan	199	199	0%
HOP Medical Plan w/ Basic Medicare Rx Option	257	257	0%
HOP Medical Plan w/ Enhanced Medicare Rx Option	310	310	0%
<b>Medicare Advantage Plans</b>			
Aetna Medicare 15 Special PPO	368	428	16%
Highmark FreedomBlue PPO	376	376	0%
Independence Blue Cross/Keystone 65 Select HMO	353	363	3%
UPMC for Life HMO	N/A	242	N/A
<b>Legacy Medicare Advantage Plans (no new enrollment)</b>			
Aetna Medicare 10 Special Plan HMO	449	511	14%
IBC's Personal Choice 65 PPO	714	734	3%

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2017	2018	Increase/ (Decrease)
<b>Medicare Supplement Plans</b>			
Value Medical Plan	\$115	\$115	0%
Value Medical Plan w/ Value Medicare Rx Option	137	137	0%
HOP Medical Plan	190	190	0%
HOP Medical Plan w/ Basic Medicare Rx Option	248	248	0%
HOP Medical Plan w/ Enhanced Medicare Rx Option	301	301	0%
<b>Medicare Advantage Plans</b>			
Aetna Medicare 15 Special PPO	328	382	16%
Highmark SecurityBlue HMO	317	317	0%
UPMC for Life HMO	242	242	0%
<b>Legacy Medicare Advantage Plans (no new enrollment)</b>			
Aetna Medicare 15 Special Plan HMO	437	389	(11)%
Highmark FreedomBlue PPO	351	351	0%

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

North & Central Region: (All other counties in Pennsylvania)	2017	2018	Increase/ (Decrease)
<b>Medicare Supplement Plans</b>			
Value Medical Plan	\$102	\$102	0%
Value Medical Plan w/ Value Medicare Rx Option	124	124	0%
HOP Medical Plan	172	172	0%
HOP Medical Plan w/ Basic Medicare Rx Option	230	230	0%
HOP Medical Plan w/ Enhanced Medicare Rx Option	283	283	0%
<b>Medicare Advantage Plans</b>			
Aetna Medicare 15 Special PPO <sup>1</sup>	229	267	17%
Capital Blue Cross SeniorBlue PPO <sup>1</sup>	221	237	7%
Highmark FreedomBlue PPO	310	310	0%
UPMC for Life HMO <sup>1</sup>	242	242	0%
<b>Legacy Medicare Advantage Plans (no new enrollment)</b>			
Aetna Medicare 10 Special HMO Plan <sup>1</sup>	274	313	14%
Highmark SecurityBlue HMO <sup>1</sup>	317	317	0%
Keystone Central SeniorBlue HMO <sup>1</sup>	199	210	6%

<sup>1</sup>Plans not available in all North & Central Region counties.

Health Options Program participants may select Enhanced, Basic, or Value Medicare Rx Option coverage without enrolling in the HOP Medical Plan or Value Medical Plan. The 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	2017	2018	Increase/ (Decrease)
Enhanced Medicare Rx Only	\$111	\$111	0%
Basic Medicare Rx Only	58	58	0%
Value Medicare Rx Only	22	22	0%

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

#### HOP 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 premium rates for 2018 compared to the 2017 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees.

All Regions	2017	2018	Increase/ (Decrease)
<b>HOP Pre-65 Medical Plan</b>			
HOP Pre-65 Medical Plan (Single Coverage)	\$ 889	\$ 889	0%
Pre-65 Medical Plan w/ Prescription Drugs	1,001	1,001	0%

Southeastern Region: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties	2017	2018	Increase/ (Decrease)
<b>Managed Care Plans</b>			
Aetna PPO	\$ 1,146	\$1,146	0%
Highmark PPOBlue	1,588	1,189	(25)%
Keystone East HMO	1,864	2,169	16%
UPMC Health Plan EPO	N/A	1,383	N/A
<b>Legacy Managed Care Plans (no new enrollments)</b>			
Aetna Citizen HMO Plan	1,244	1,244	0%
IBC's Personal Choice PPO	1,934	2,248	16%

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2017	2018	Increase/ (Decrease)
<b>Managed Care Plans</b>			
Aetna PPO	\$ 1,147	\$ 1,147	0%
Highmark PPOBlue	1,588	1,189	(25)%
UPMC Health Plan EPO	1,384	1,384	0%
<b>Legacy Managed Care Plans (no new enrollments)</b>			
Aetna Citizen HMO Plan	1,244	1,244	0%
Highmark PPOBlue - High Option	2,170	1,618	(25)%

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

North & Central Region: (All other counties in Pennsylvania)	2017	2018	Increase/ (Decrease)
<b>Managed Care Plans</b>			
Aetna PPO*	\$1,146	\$1,146	0%
Capital Blue Cross PPO*	1,343	1,831	36%
Highmark PPO	1,588	1,189	(25)%
UPMC EPO*	1,383	1,383	0%
<b>Legacy Managed Care Plans (no new participants)</b>			
Aetna Citizen Plan HMO	1,244	1,244	0%
Highmark PPOBlue – High Option	2,170	1,618	(25)%
Capital Blue Cross / Keystone Central HMO	1,338	1,824	36%

\*Not available in all North and Central Region counties.



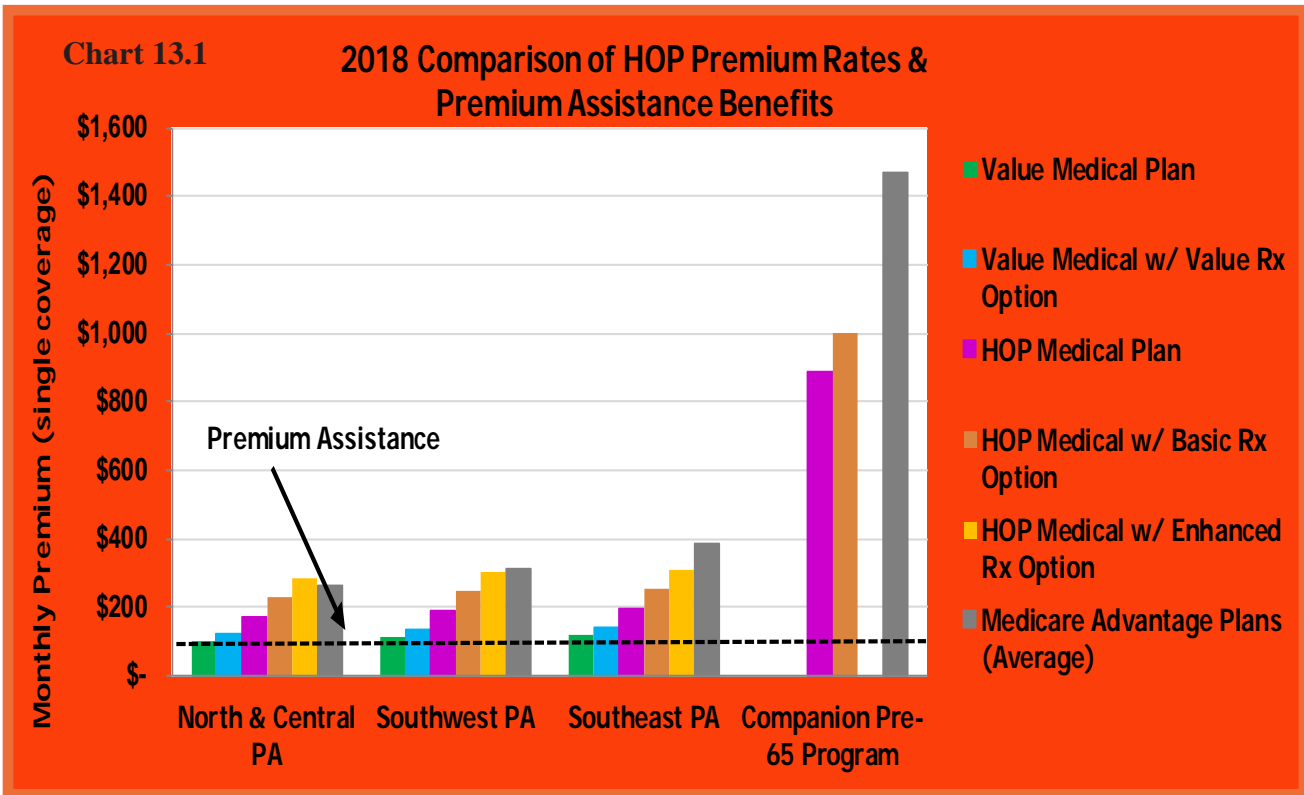
## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

#### HOP Premiums Compared to the PSERS Premium Assistance Benefit

Chart 13.1 displays the HOP 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.



	North & Central PA	Southwest PA	Southeast PA	Companion Pre-65 Program
Value Medical Plan	\$102	\$115	\$117	
Value Medical Plan w/ Value Rx Option	124	137	139	
HOP Medical Plan	172	190	199	\$ 889
HOP Medical Plan w/ Basic Rx Option	230	248	257	1,001
HOP Medical Plan w/ Enhanced Rx Option	283	301	310	
Medicare Advantage Plans (Average)	264	314	389	1,472
Premium Assistance	100	100	100	100

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

#### HOP Enrollment

As of December 1, 2017 there are 110,635 participants (93,419 retirees plus their dependents) in the Health Options Program. The total numbers of retirees by Option are:

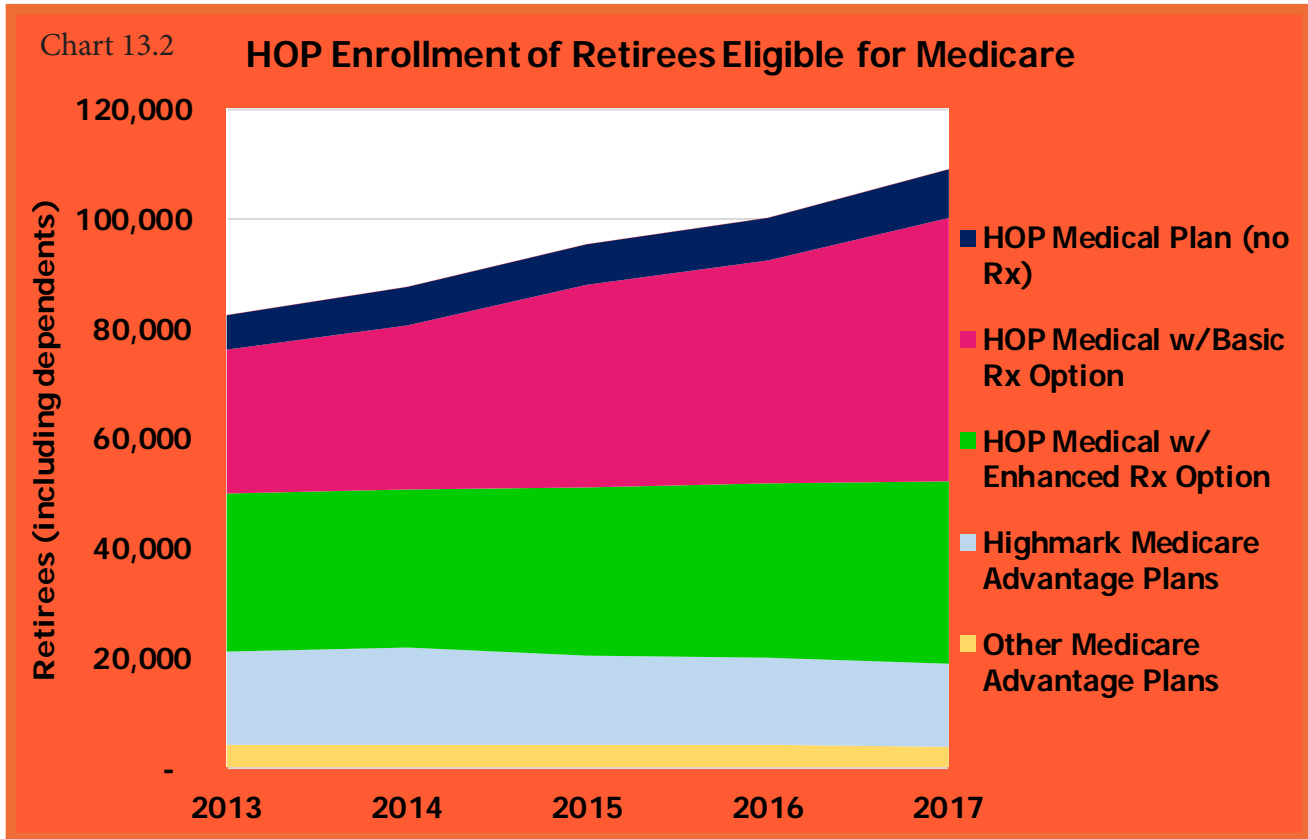
Individuals Eligible for Medicare	Retirees	Participants
HOP Medical w/ Basic Medicare Rx Option	40,865	48,120
HOP Medical w/ Enhanced Medicare Rx Option	28,445	33,272
HOP Medical w/ Value Medicare Rx Option	811	880
HOP Medical Plan (no Rx)	7,879	8,737
HOP Enhanced Rx Only	90	111
HOP Basic Rx Only	224	290
HOP Value Rx Only	11	11
HOP Value Medical Only	43	52
HOP Value Medical w/ Enhanced Medicare Rx Option	7	10
HOP Value Medical w/ Basic Medicare Rx Option	31	43
HOP Value Medical w/ Value Medicare Rx Option	122	158
Highmark PPO/Legacy HMO	11,624	14,873
Keystone East HMO/IBC Legacy PPO	938	1,116
Capital BC PPO/Keystone Central Legacy HMO	814	1,118
UPMC HMO	756	982
91Aetna PPO/Legacy HMO	542	640
<b>Total Medicare Eligible</b>	<b>93,202</b>	<b>110,413</b>
<b>Individuals Not Eligible for Medicare</b>		
HOP Pre-65 Medical Plan w/ Rx Coverage	40	41
HOP Pre-65 Medical Plan	139	141
Highmark PPO	15	15
Capital BC PPO/Keystone Central Legacy HMO	11	12
Keystone East HMO/IBC Legacy PPO	6	6
Aetna PPO/Legacy HMO	6	7
<b>Total Not Eligible for Medicare</b>	<b>217</b>	<b>222</b>
<b>Total in Health Options Program</b>	<b>93,419</b>	<b>110,635</b>

## Section 4 - Other PSERS Programs

### Health Options Program

(continued)

Enrollment in the PSERS' Health Options Program continues to increase. As illustrated by Chart 13.2, the number of retirees participating in the HOP has increased 32% over the past 5 years.



#### 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. In addition, individuals enrolled in a Medicare Rx Option without HOP Medical plan coverage must submit monthly premium payments.

Health Options Program income is projected to be \$412.7 million during the 2018 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 the Center for Medicare and Medicaid Services (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 2018
Participant Contributions	\$ 356.0
CMS - Medicare Prescription Drug Payments	56.0
Interest Income	0.7
<b>Total</b>	<b>\$ 412.7</b>

**Health Options Program**

(continued)

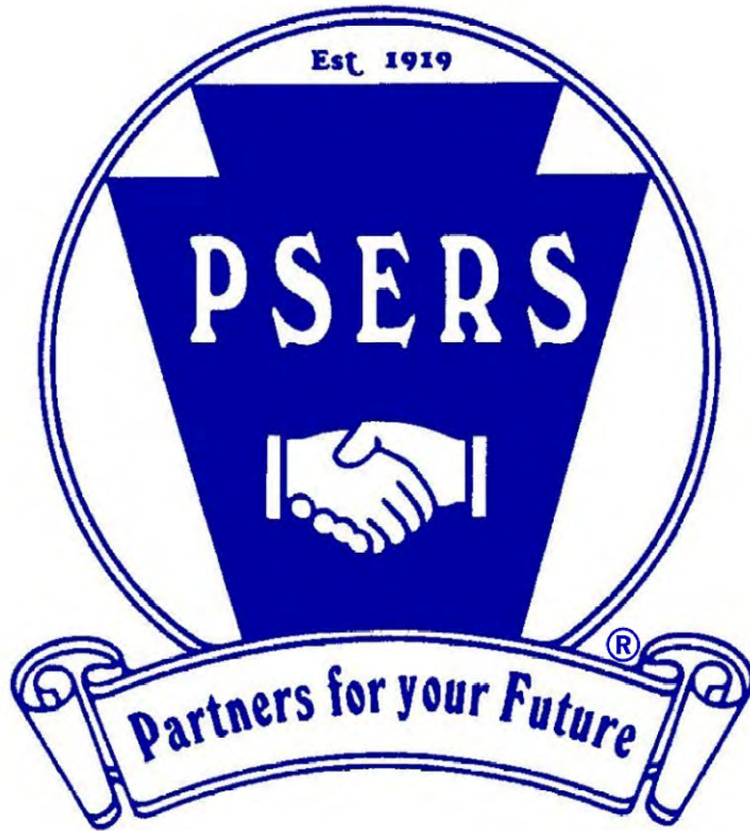
PSERS retirees enrolled in the Health Options Program, who meet the eligibility requirements for Premium Assistance, receive \$100 per month as a partial reimbursement for the out-of-pocket premium expense. Approximately 78,000 of the 96,045 retirees receive Premium Assistance. This accounts for nearly \$93 million of the \$110 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 Health Options Program participants plus administrative expenses. Table 13.2 displays the breakdown of the benefit expenses (Dollar amounts in millions):

<b>Table 13.2 Benefit Expense</b>	<b>Calendar Year 2018</b>
Self-funded Hospital, Medical & Major Medical Benefits	\$ 176.3
Self-funded Prescription Drug Benefits	150.6
Insured Managed Care and Dental Premiums	77.9
<b>Total</b>	<b>\$ 404.8</b>

In addition to the benefit expenses identified above, the Health Options Program will pay \$9 million in enrollment and administrative expenses including reimbursing PSERS for its expenses.

As of December 31, 2017, HOP had net assets of \$242.1 million held in trust to pay the expenses of Health Options Program for the exclusive benefit of participants.



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## 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:

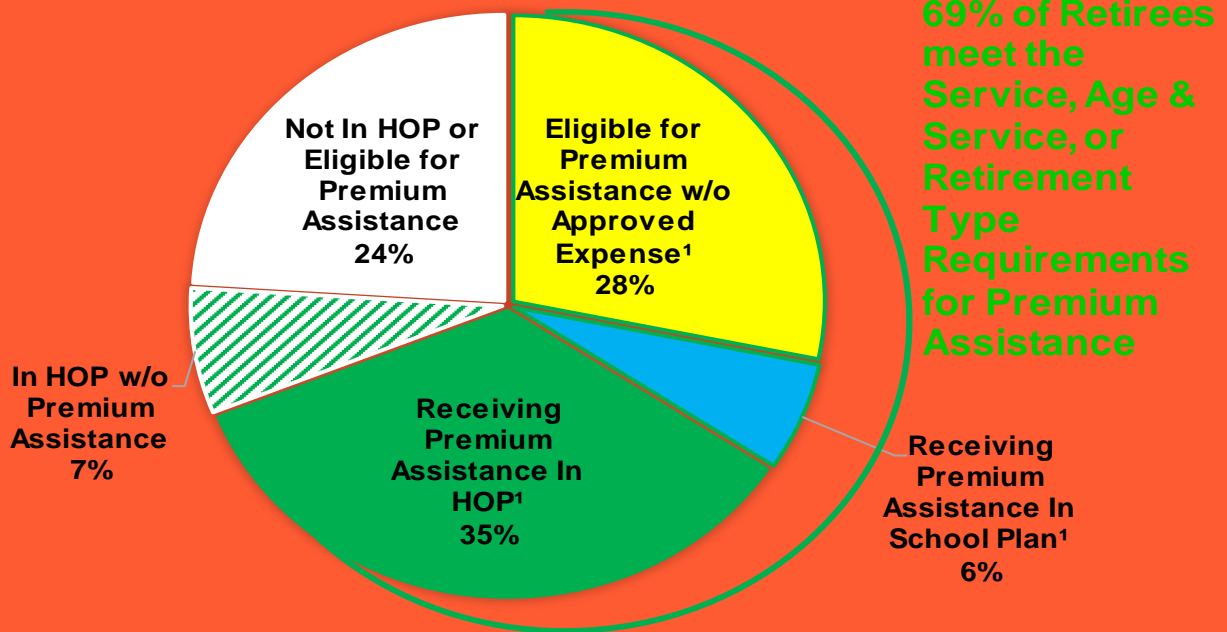
- 24.5 years of credited service, or
- 15 years of credited service if termination of employment and retirement occurred after superannuation age, or
- Receiving a disability annuity from PSERS; and
- Have an out-of-pocket premium expense from their former school employer's health plan or the PSERS sponsored Health Options Program (HOP).

#### Enrollment

As of June 30, 2016, PSERS had 224,828 retirees receiving a monthly benefit. Of these retirees 154,984 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, 63,476 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 91,508 retirees receiving premium assistance benefits, 77,767 are enrolled in HOP and 13,741 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**



June 30, 2016	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense <sup>1</sup>	63,476	28%
Receiving Premium Assistance In School Plan <sup>1</sup>	13,741	6%
Receiving Premium Assistance In HOP <sup>1</sup>	77,767	35%
In HOP w/o Premium Assistance	15,901	7%
Not In HOP or Eligible for Premium Assistance	<u>53,943</u>	<u>24%</u>
Total Retiree Population <sup>2</sup>	224,828	100%

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

(2) As of June 30, 2016 Actuarial Valuation.

## **Premium Assistance Program**

(continued)

### **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 Code<sup>1</sup>. The contribution needed during FY2018/19 is 0.83% of payroll.

For the year ended June 30, 2017, employer contributions equaled \$111.0 million and net investment income totaled \$0.7 million. During this period, PSERS paid Premium Assistance benefits equaling \$110.2 million and incurred administrative expenses of \$2.2 million.

As of December 31, 2017, the Premium Assistance Program had net assets of \$120.1 million.

<sup>1</sup>§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.

