

BUDGET REPORT

Appropriations Committee

Fiscal Year
2019-2020

A photograph of a female teacher with long blonde hair, wearing a green vest over a white long-sleeved shirt and light-colored pants, sitting on a wooden chair in a library. She is holding an open book with a colorful illustration and looking at it. In front of her, several young children are sitting on the floor, looking towards her. The background shows bookshelves filled with books and a window with a view of greenery.

PENNSYLVANIA PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM

A Component Unit of the Commonwealth of Pennsylvania

**Pennsylvania
Public School Employees' Retirement System**

A Component Unit of the Commonwealth of Pennsylvania

5 North 5th Street
Harrisburg, Pennsylvania 17101-1905

**Fiscal Year 2019-20 Budget Report
Appropriations Committee
February 12, 2019**

Melva S. Vogler
Chairman
Board of Trustees

Nathan G. Mains
Vice Chairman
Board of Trustees

Glen R. Grell
Executive Director

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

**FY 2019-20 Budget Hearing Materials
Table of Contents**

Section 1 – PSERS Overview

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

Section 2 – PSERS Fiscal Year 2019-20 Budget

PSERS Consultants’ Fees and Legislation.....	Tab 6
PSERS FY 2019-20 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets	Tab 7

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

Section 4 – PSERS Postemployment Healthcare Programs

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

PSERS Budget Report

Fiscal Year 2019-2020



Pennsylvania Public School Employees' Retirement System

SECTION 1 - PSERS OVERVIEW

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



This page intentionally left blank

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, 2018, the System had approximately 256,000 active members. The annuitant membership was comprised of approximately 233,000 retirees and beneficiaries who received average monthly pension benefit payments of over \$497 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was \$25,405. PSERS had 775 participating employers on June 30, 2018.

As reported in the latest *Pension and Investments* survey, published February 5, 2018, based on asset size, PSERS is the 31st 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 June 30, 2018 were approximately \$56.7 billion. PSERS' investment rate of return for the fiscal year ended June 30, 2018 was 9.27%, net of fees.

During fiscal year 2018, PSERS' pension disbursements to retirees totaled \$6.6 billion. Of this amount, nearly 91%, or \$6.0 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, 2018, there are over 93,000 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 117,000 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 18, 2019

Melva S. Vogler, Chairman

Nathan G. Mains, Vice Chairman

Deborah J. Beck

Honorable John P. Blake

Senate of Pennsylvania

Honorable Matthew D. Bradford

(appointed January 18, 2019)

House of Representatives

Honorable Patrick M. Browne

Senate of Pennsylvania

Jason M. Davis

Eric O. DiTullio

Honorable Frederick B. Keller

(appointed January 18, 2019)

House of Representatives

Susan C. Lemmo

Pedro A. Rivera

Secretary of Education

Ambassador Martin J. Silverstein

(resignation effective January 2, 2019)

Christopher SantaMaria

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

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

Investment Office

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

Chief Counsel's Office

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

Internal Auditor's Office

The office provides independent, objective assurance, and consulting activity designed to add value and improve Public School Employees' Retirement System's (PSERS') operations. Objectives are accomplished by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. The office provides a wide range of quality independent internal auditing services for the Audit/Compliance Committee of the PSERS' Board

and executive management. It performs independent assessments of the systems of risk management, internal controls and operating efficiency, guided by professional standards and using innovative approaches. The office also routinely monitors compliance with established laws, rules, regulations, policies and procedures.

Office of Financial Management

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

Deputy Executive Director and Director of Defined Contribution Investments

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

Deputy Executive Director of Administration

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

Organizational Structure (continued)

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. The bureau also conducts retirement exit counseling to individual members in advance of the decision to retire.

Health Insurance Office

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

Information Technology Office

This office is headed by the Chief Information Officer and oversees the Bureau of Information Technology and the Business Architecture Center. It is responsible for strategic information technology planning and policy development, ensuring that information technology plans, projects and policies are aligned with, in support of, and prioritized according to agency needs and requirements as well as those Commonwealth needs and requirements that are consistent with agency needs, and for communicating such to the agency's IT professionals. Large information technology contracts and projects are managed by this office. This bureau is responsible for understanding, analyzing, documenting, and improving PSERS processes, information systems, and the relationships among these components so that PSERS is able to: conduct its business consistently and according to established rules; understand each component, its relationship to each of the other components and to PSERS' mission, vision, values and goals; fully, yet quickly analyze and understand the impact of potential change to one or more of these components on the others; more effectively identify inefficient, duplicate, or suspect processes, technologies; account for its processes, information systems and technologies.

Bureau of Administration

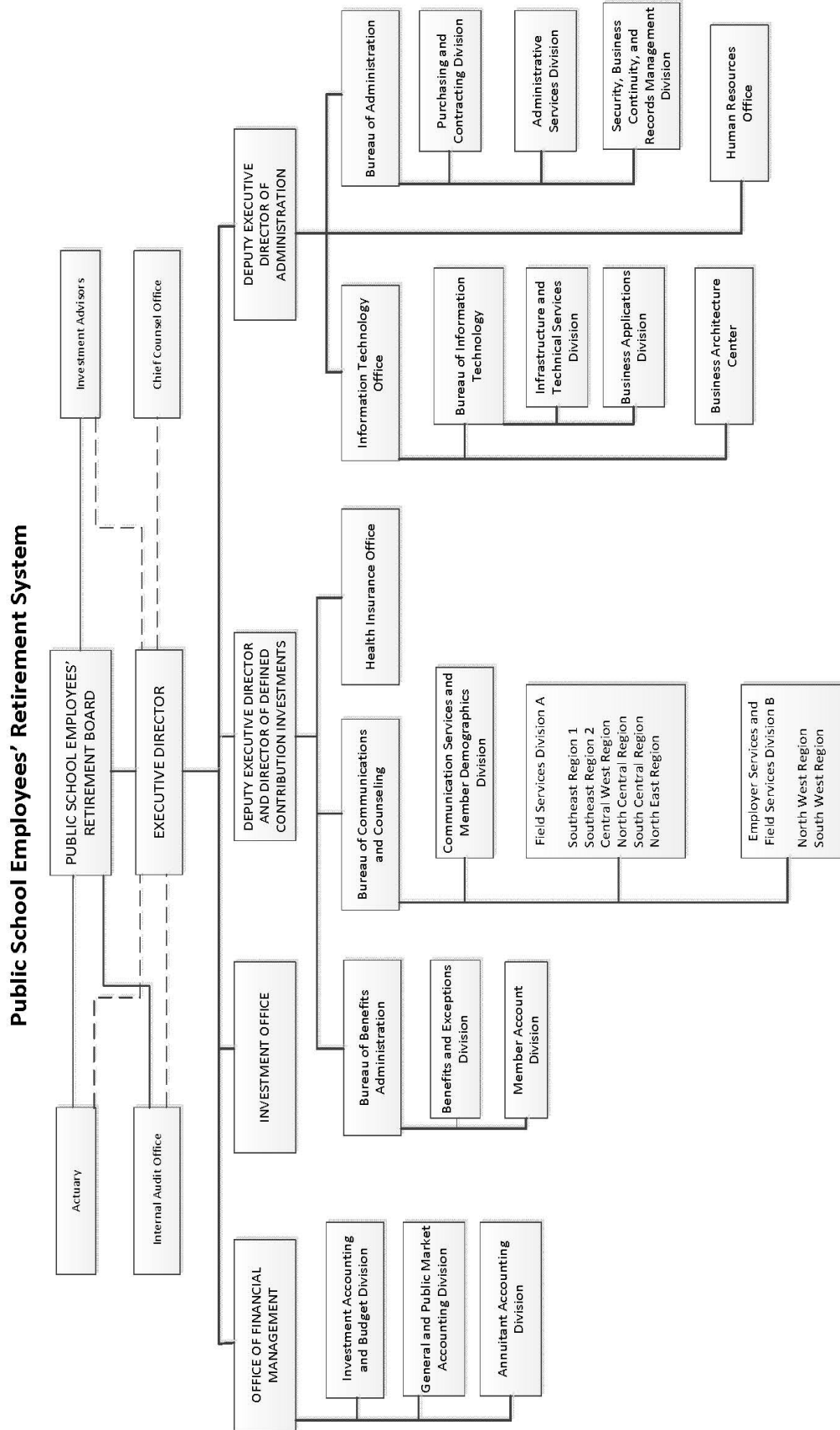
This bureau provides facilities, purchasing and contracting, policies and procedures, business continuity, records management, automotive, mail, imaging, and other administrative services necessary to support agency functions.

Human Resources Office

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

Organizational Chart of the
Public School Employees' Retirement System

Chart 2.1



PSERS REGIONAL OFFICES

Chart 2.2

Northwest

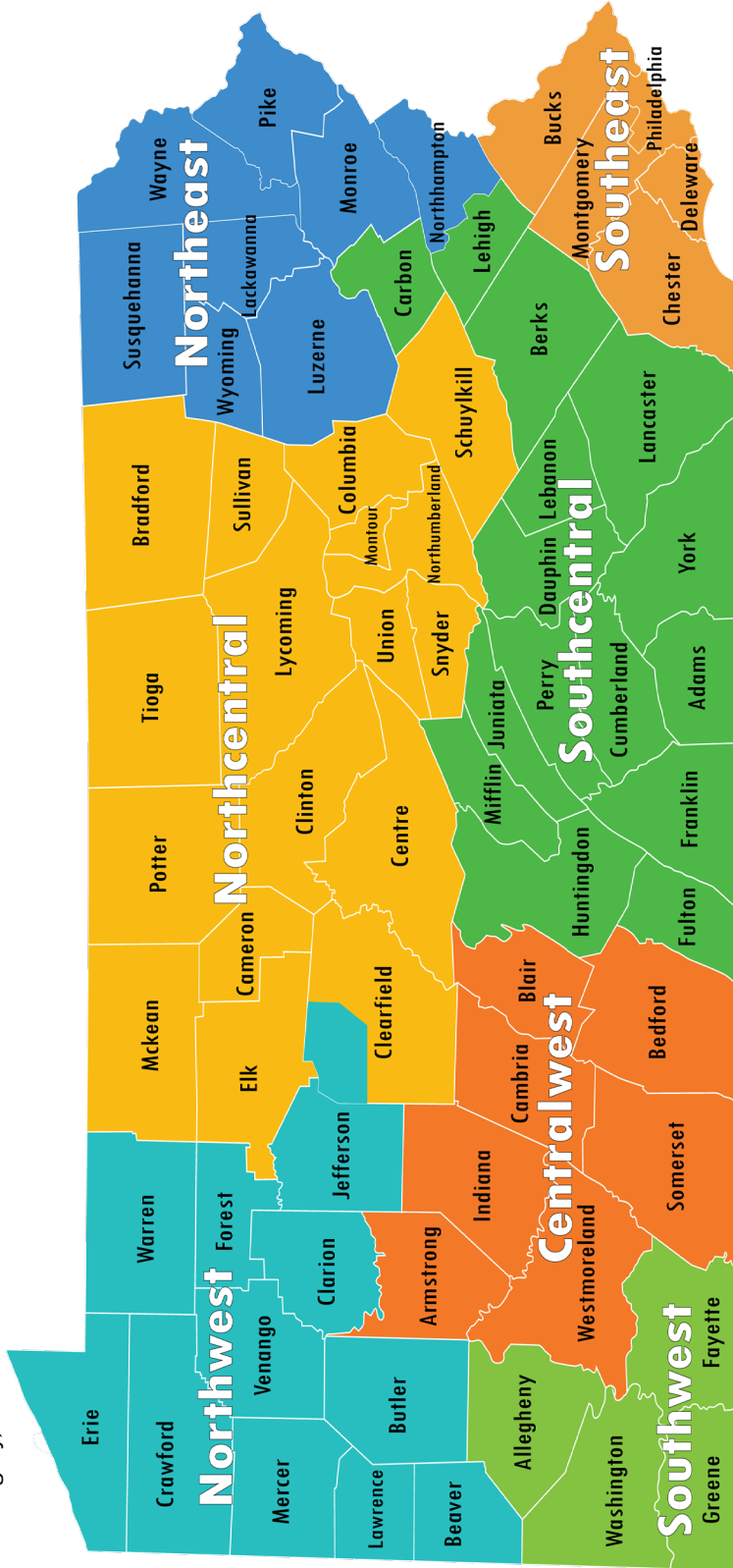
Pennwood Center
464 Allegheny Boulevard, Suite C
Franklin, PA 16323-6210
 Local: 1.814.437.9845
 FAX: 1.814.437.5826
Toll-Free: 1.888.773.7748 ext. 5175
 Donald Gregory, Administrator

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

Summary of Various Member Service Statistics

PSERS operates very efficiently. There are only 332 staff serving the needs of over 500,000 members of the System and 775 employers. PSERS professionals are dedicated to fulfilling PSERS' mission to serve our members. Below are highlights of some of the more common services that PSERS provides to its members.

Table 2.1 Benefits Processed (Major)			
	Fiscal Year	<u>2017</u>	<u>2018</u>
Initial Retirements (1-Step)		8,756	8,407
Initial Retirements (2-Step)		858	677
Final Retirements (2nd Step of 2-Step)		934	598
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld		13,814	8,219
Refunds		4,124	4,295
Deaths - Processed and Paid		4,175	5,579
Account Verification - non retirements		12,346	11,464
TOTAL		45,007	39,239
Percent of Retirement Paid as 1 Step		93%	93%

Table 2.2 Other Member Services (Major)			
	Fiscal Year	<u>2017</u>	<u>2018</u>
Retirement Estimates		19,770	17,953
Phone Calls Answered		168,170	156,184
E-mails Received		15,704	20,644
E-mails Sent		14,953	17,856
General Information Sessions		207	214
General Information Attendees		10,598	11,065
Exit Counseling Sessions		1,343	1,202
Exit Counseling Attendees		7,154	6,771

**Summary of Various Member Service Statistics
(continued)**

Table 2.3 Member Payment Services for Retirees and Beneficiaries		
Calendar Year	2017	2018
Monthly Payments to Members	2,703,487	2,744,206
Non-recurring Payments to Members	48,278	46,847
Forms 1099-R Produced	257,279	259,241
W4-P Tax Withholding Forms Processed	4,170	7,515
EFT Forms Processed - Direct Deposit	9,553	9,344
ACH Rejects Researched and Reviewed (Direct Deposit Failures)	5,026	4,876
Member Payment Changes Processed	3,825	2,981

Table 2.4 Member Self Service Transactions Done by Members	
Calendar Year	2018
Retirement Estimate	27,007
Nomination of Beneficiary	33,800
Address Change	11,162
Income Verification	4,718
W-4P	511
Elect Class T-F	1,241
Apply for Multiple Service	71
TOTAL	78,510

PSERS had 111,275 members sign up for the MSS account. Of those, approximately 98% opted for paperless delivery. Between members and employers, this resulted in over \$180,000 in postage and printing savings.

Economic Impact on Pennsylvania, Member Demographics, and Financial Information

Economic Impact of Pension Benefits on Pennsylvania

In Fiscal Year 2017-18, PSERS' pension disbursements to retirees totaled approximately \$6.6 billion. Of this amount, nearly 91%, or \$6.0 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 \$6.0 billion into an economic impact of \$12.7 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes*:

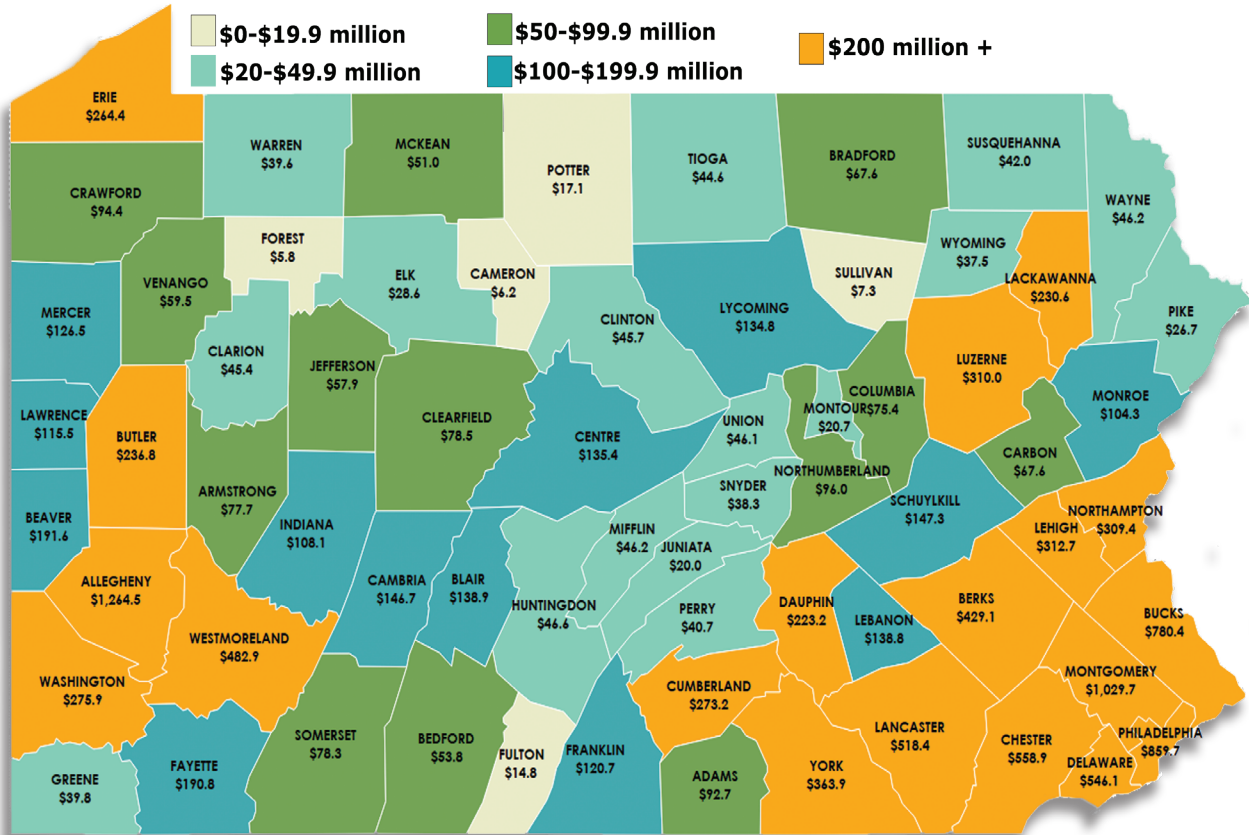
- Economic impact exceeding \$12.7 billion
- Support for over 65,000 jobs that paid \$3.4 billion in wages and salaries
- \$1.7 billion in federal and local tax revenues

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

Allegheny	\$1,264.5
Montgomery	\$1,029.7
Philadelphia	\$859.7
Bucks	\$780.4
Chester	\$558.9
Delaware	\$546.1
Lancaster	\$518.4
Westmoreland	\$482.9
Berks	\$429.1
York	\$363.9

Pension Benefit Payments Made in Pennsylvania By County for FY 2017-18

\$6.0 Billion in Disbursements = \$12.7 Billion Economic Impact



Section 1 - PSERS Overview

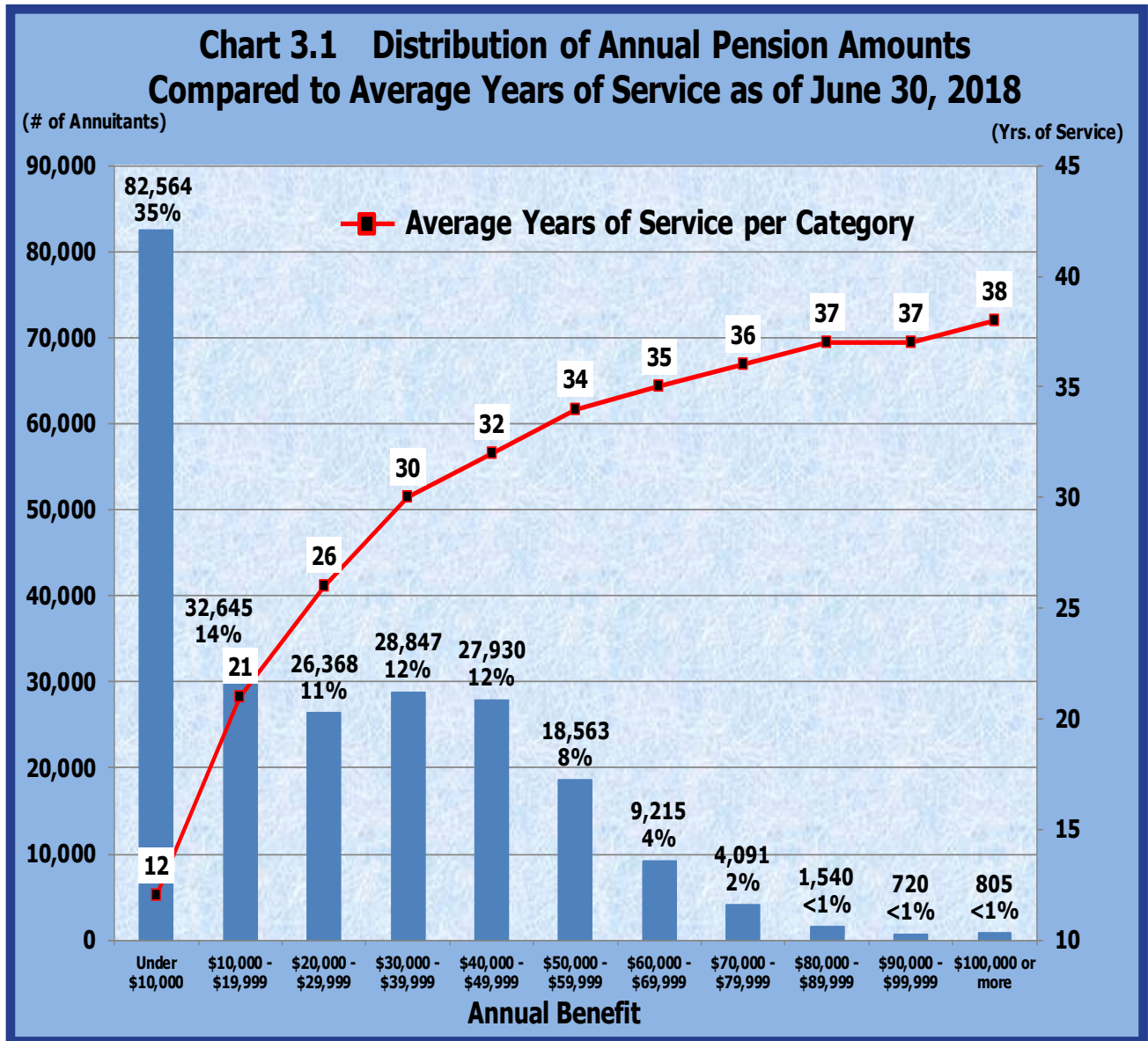
Member Demographics and Financial Information (continued)

Fiscal Year ended <u>June 30</u>	Active Members	Annuitants, Beneficiaries, and Survivor <u>Annuitants</u>	Total Active/Retired Members	Ratio of Active/ Retired	<u>Vestees</u>	Total <u>Membership</u>
2018	256,362	233,288	489,650	1.10 to 1	25,117	514,767
2017	255,945	230,014	485,959	1.13	24,515	510,474
2016	257,080	224,828	481,908	1.14	23,437	505,345
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
Average ratio of active members to annuitants (Public Funds)				1.38*		

*Based on the November 2018 Public Fund Survey prepared by the National Association of State Retirement Administrators (NASRA).

Type of Member	Number of Members		Average Annual Benefit	
	<u>6/30/2017</u>	<u>6/30/2018</u>	<u>6/30/2017</u>	<u>6/30/2018</u>
Normal/Early Retirees	209,715	212,712	\$26,128	\$26,225
Survivor Annuitants	11,128	11,409	14,019	14,406
Disability Retirees	<u>9,171</u>	<u>9,167</u>	19,740	20,607
Total/Average Yearly Benefit	230,014	233,288	\$25,287	\$25,405
Age and Service Profile of All Active Members				
	<u>6/30/2017</u>	<u>6/30/2018</u>		
Average Age	45.2	45.3		
Average Years of PSERS Service	11.4	11.5		
Average Annual Compensation	\$50,924	\$52,188		
	Class T-C Members		Class T-D Members	
	<u>6/30/2017</u>	<u>6/30/2018</u>	<u>6/30/2017</u>	<u>6/30/2018</u>
Number of Members	3,447	3,216	184,831	175,975
Average Age	52.3	52.8	47.6	48.0
Average Years of PSERS Service	19.4	20.4	14.7	15.4
Average Annual Compensation	\$51,683	\$54,084	\$58,559	\$61,105
	Class T-E Members		Class T-F Members	
	<u>6/30/2017</u>	<u>6/30/2018</u>	<u>6/30/2017</u>	<u>6/30/2018</u>
Number of Members	56,453	63,880	11,214	13,291
Average Age	38.4	39.0	37.7	38.0
Average Years of PSERS Service	2.0	2.4	2.4	2.8
Average Annual Compensation	\$28,304	\$29,925	\$38,747	\$40,672

Member Demographics and Financial Information (continued)



Benefit Summary

The average PSERS retiree receives \$25,405 annually, a benefit earned through a career in education.

- Over 73% of PSERS retirees receive less than \$40,000 per year in benefits
- Six-figure pensions are rare, with fewer than one-half of 1% of PSERS retirees receiving an annual benefit over \$100,000. Retirees earning over six figures have spent an average of 38 years working in their careers and contributing to their retirement accounts.

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.4		PSERS Pension Plan Changes in Fiduciary Net Position	
		10 Year Cumulative Summary-FISCAL YEAR	
		(Dollar Amounts in Millions)	
		Cumulative 10 Year Total	
		July 1, 2008- June 30, 2018	
Balance of Net Position (07/01/08)			\$ 62,473
Member Contributions	\$ 9,831		
Employer Contributions	20,022		
Net Investment Income	22,986		
Total Deductions - Benefits & Expenses	(58,948)		
Net Decrease			\$ (6,109)
Balance of Net Position (6/30/18)			\$ 56,364

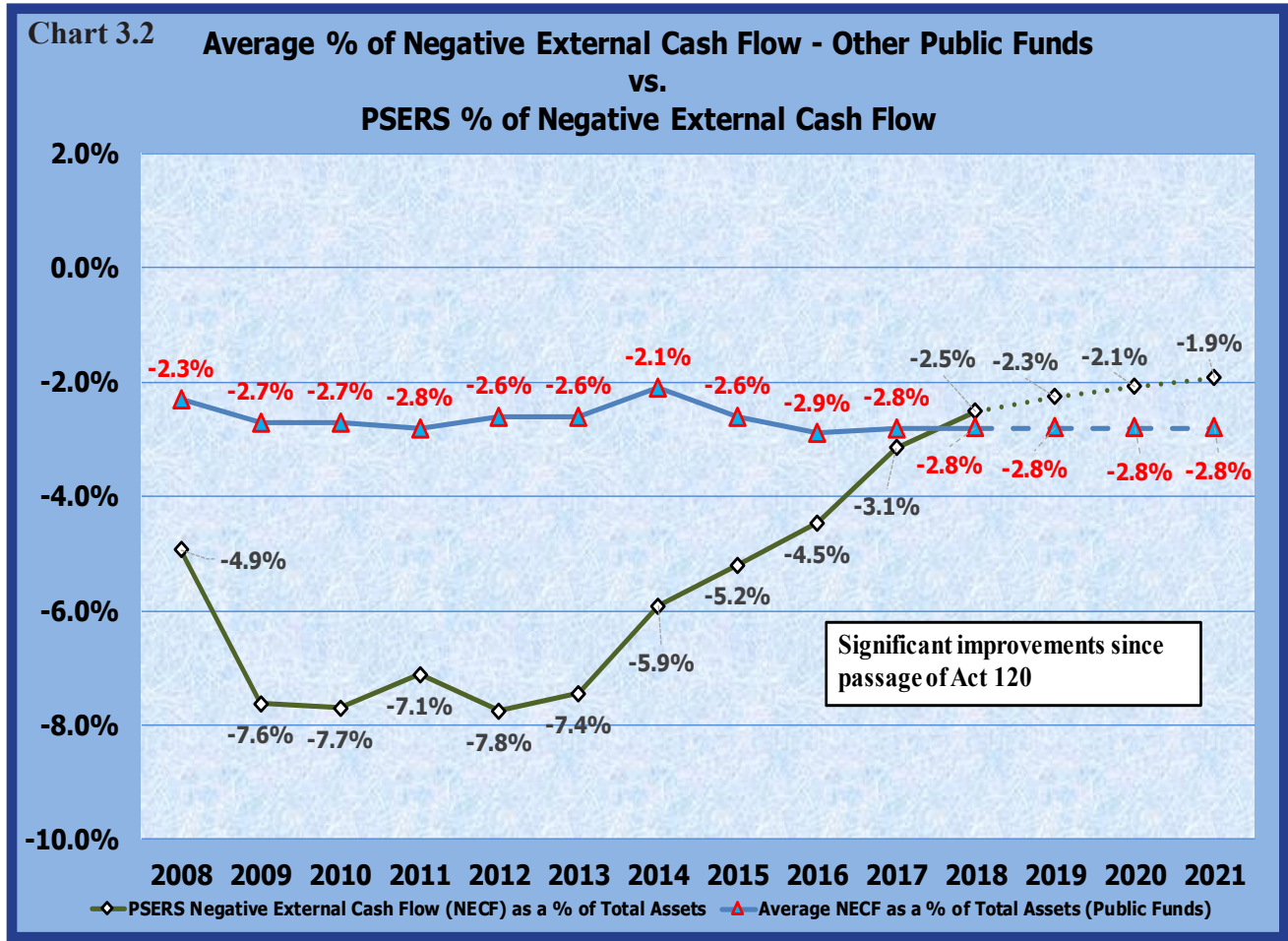
Table 3.5		External Cash Flow			
		Fiscal Years Ended in June 30			
		(Dollar Amounts in Millions)			
		----- Projected -----			
	2018	2019	2020	2021	
Member Contributions	\$ 1,026	\$ 1,041	\$ 1,054	\$ 1,065	
Employer Contributions	4,250	4,489	4,681	4,854	
Total Contributions	\$ 5,276	\$ 5,530	\$ 5,735	\$ 5,919	
Less:					
Pension Benefits & Expenses	6,702	6,865	7,018	7,170	
Negative External Cash Flow	\$ -1,426	\$ -1,335	\$ -1,283	\$ -1,251	
End of Year Total Assets	\$ 56,364	\$ 59,085	\$ 61,790	\$ 64,981	
Negative External Cash Flow (NECF) as a % of Total Assets	-2.5%	-2.3%	-2.1%	-1.9%	
Average NECF as a % of Total Assets (Public Funds)	-2.8%*				

*Based on the November 2018 Public Fund Survey prepared by NASRA.

Negative External Cash Flow (NECF)

Using data from Table 3.4 at the top of the page, the last 10 years of contributions and benefit payments resulted in a Negative External Cash Flow (NECF) of -\$29.1 billion (comprised of total deductions less member and employer contributions) during that time period. In Table 3.5, PSERS' Negative External Cash Flow percentage is -2.5% of total assets for FY 2017-18, which was more favorable than the public fund average for the first time in many years. PSERS' projected NECF percentage of -2.3% for FY 2018-19 is also more favorable than the public fund average due to the System receiving 100% of actuarially required contributions for the third consecutive year. If PSERS meets or exceeds its investment return assumption, PSERS' total assets are projected to grow in excess of total liabilities and begin to pay down the unfunded liability.

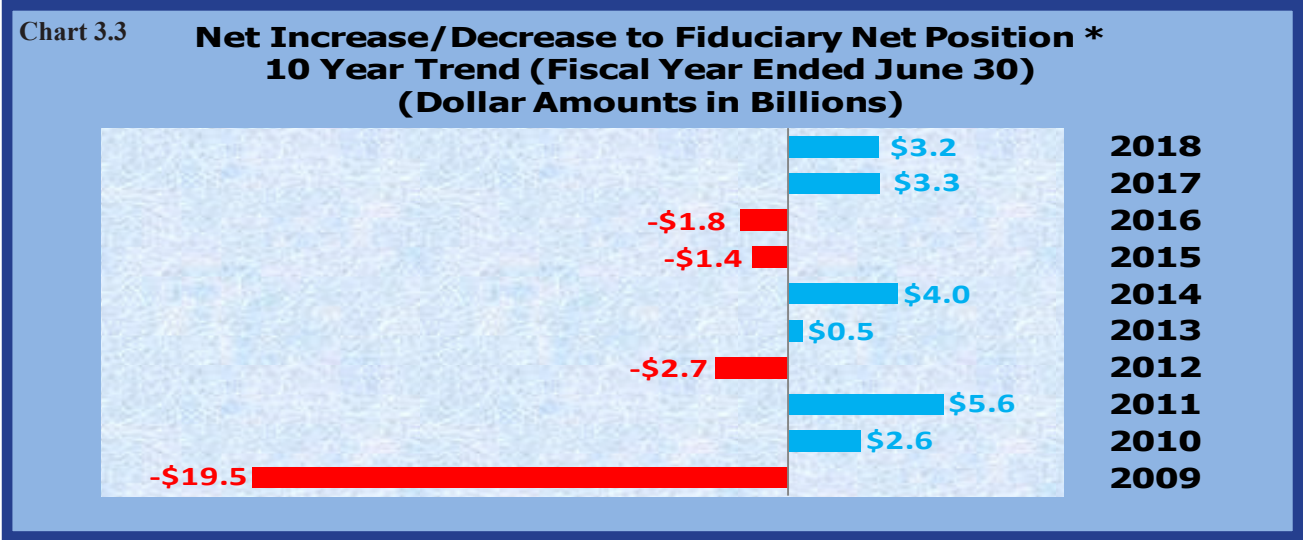
Member Demographics and Financial Information (continued)



PSERS Negative External Cash Flow Projection (NECF)

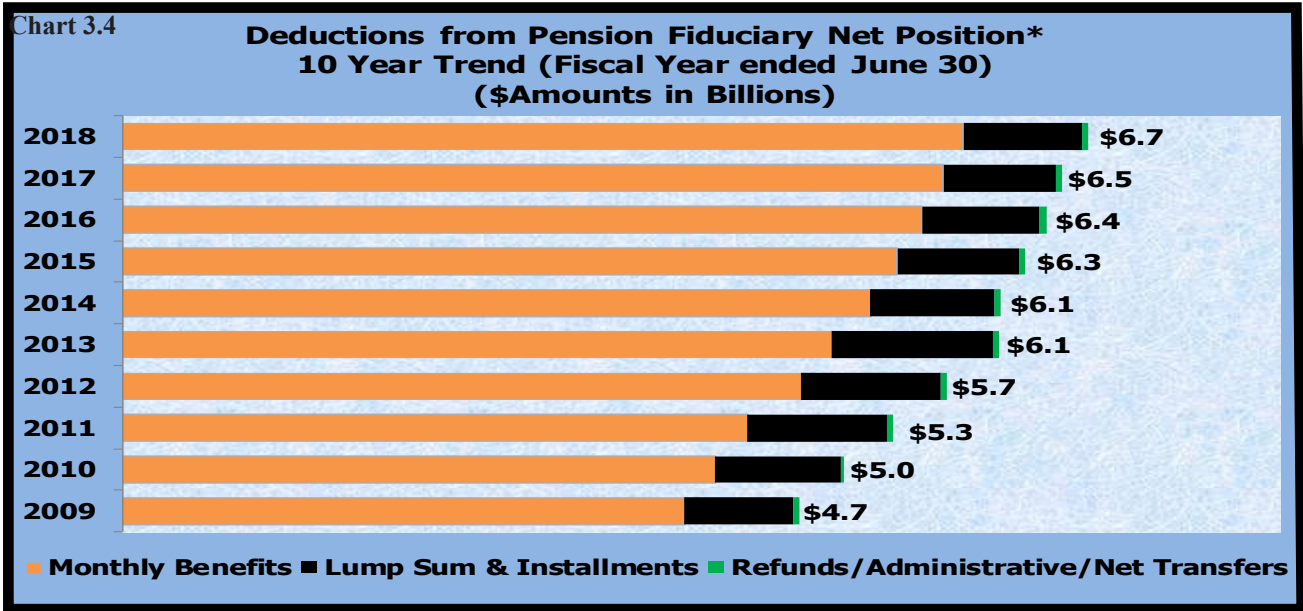
In Chart 3.2, beginning in FY2018 PSERS' projected NECF percentage of -2.5% is more favorable than the public fund percentage. If PSERS meets or exceeds its investment return assumptions the total assets are projected to grow in excess of total liabilities and begin to pay down the unfunded liability.

Member Demographics and Financial Information (continued)



PSERS' Pension Fiduciary Net Position

As depicted in Chart 3.3, PSERS' fiduciary net position increased by \$3.2 billion from \$53.2 billion at June 30, 2017 to \$56.4 billion at June 30, 2018. The increase was due in large part to net investment income from strong investment returns plus member and employer contributions exceeding deductions for benefit and administrative expenses.



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

PSERS Deductions from Pension Fiduciary Net Position

As depicted in Chart 3.4, the increase for FY2017 to FY2018 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 June 30, 2018 (Dollar Amounts in Thousands)

	2018				
	Pension	Defined Contribution (DC)	Postemployment Healthcare		Totals
			Premium Assistance	Health Options Program	
Assets:					
Receivables:					
Members	\$ 347,684	\$ -	\$ 2,703	\$ 40	\$ 350,427
Employers	1,207,900	-	31,789	-	1,239,689
Investment income	192,262	53	124	156	192,595
Investment proceeds	362,317	-	-	-	362,317
CMS Part D and prescriptions	-	-	-	58,381	58,381
Interfund receivable	-	-	592	-	592
Total Receivables	2,110,163	53	35,208	58,577	2,204,001
Investments, at fair value:					
Short-term	5,837,717	6,735	91,705	237,498	6,173,655
Fixed income	5,235,603	-	-	-	5,235,603
Common and preferred stock	12,832,667	-	-	-	12,832,667
Collective trust funds	14,011,193	-	-	-	14,011,193
Real estate	5,039,237	-	-	-	5,039,237
Alternative investments	12,609,975	-	-	-	12,609,975
Total Investments	55,566,392	6,735	91,705	237,498	55,902,330
Securities lending collateral pool	2,980,119	-	-	-	2,980,119
Capital assets (net of accumulated depreciation \$31,840)	23,430	-	-	-	23,430
Miscellaneous	14,565	-	247	2,717	17,529
Total Assets	60,694,669	6,788	127,160	298,792	61,127,409
Liabilities:					
Accounts payable and accrued expenses	82,219	29	313	2,541	85,102
Benefits payable	582,430	-	72	26,721	609,223
HOP Participant premium advances	-	-	-	34,010	34,010
Investment purchases and other payables	537,857	-	4,041	-	541,898
Obligations under securities lending	2,980,119	-	-	-	2,980,119
Interfund payable	592	-	-	-	592
Other liabilities	147,738	-	-	-	147,738
Total Liabilities	4,330,955	29	4,426	63,272	4,398,682
Net position restricted for pension, DC and postemployment healthcare benefits					
	\$ 56,363,714	\$ 6,759	\$ 122,734	\$ 235,520	\$ 56,728,727

Section 1 - PSERS Overview

Statement of Changes in Fiduciary Net Position Years Ended June 30, 2018 (Dollar Amounts in Thousands)

2018

	2018				Totals
	Pension	Defined Contribution (DC)	Postemployment Healthcare		
			Premium Assistance	Health Options Program	
Additions:					
Contributions:					
Members	\$ 1,026,375	\$ -	\$ -	\$ -	\$ 1,026,375
Employers	4,249,611	-	111,986	-	4,361,597
Total contributions	5,275,986	-	111,986	-	5,387,972
HOP Participant premiums	-	-	-	359,896	359,896
Centers for Medicare & Medicaid Services premiums	-	-	-	63,998	63,998
Commonwealth of Pennsylvania	-	6,801	-	-	6,801
Investment income:					
From investing activities:					
Net appreciation in fair value of investments	3,710,566	-	1	-	3,710,567
Short-term	85,074	53	1,485	1,988	88,600
Fixed income	193,759	-	-	-	193,759
Common and preferred stock	321,547	-	-	-	321,547
Collective trust funds	5,166	-	-	-	5,166
Real estate	367,526	-	-	-	367,526
Alternative investments	485,718	-	-	-	485,718
Total investment activity income	5,169,356	53	1,486	1,988	5,172,883
Investment expenses	(467,653)	-	(31)	(28)	(467,712)
Net income from investing activities	4,701,703	53	1,455	1,960	4,705,171
From securities lending activities:					
Securities lending income	38,506	-	-	-	38,506
Securities lending expense	(26,051)	-	-	-	(26,051)
Net income from securities lending activities	12,455	-	-	-	12,455
Total net investment income	4,714,158	53	1,455	1,960	4,717,626
Total Additions	9,990,144	6,854	113,441	425,854	10,536,293
Deductions:					
Benefits	6,635,265	-	111,847	376,348	7,123,460
Refunds of contributions	19,881	-	-	-	19,881
Administrative expenses	46,544	95	2,603	41,853	91,095
Total Deductions	6,701,690	95	114,450	418,201	7,234,436
Net increase (decrease)	3,288,454	6,759	(1,009)	7,653	3,301,857
Net position restricted for pension, DC and postemployment healthcare benefits:					
Balance, beginning of year	53,155,336	-	123,743	227,867	53,506,946
Effect of change in accounting principle	(80,076)	-	-	-	(80,076)
Balance, beginning, as restated	53,075,260	-	123,743	227,867	53,426,870
Balance, end of year	\$ 56,363,714	\$ 6,759	\$ 122,734	\$ 235,520	\$ 56,728,727

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 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.

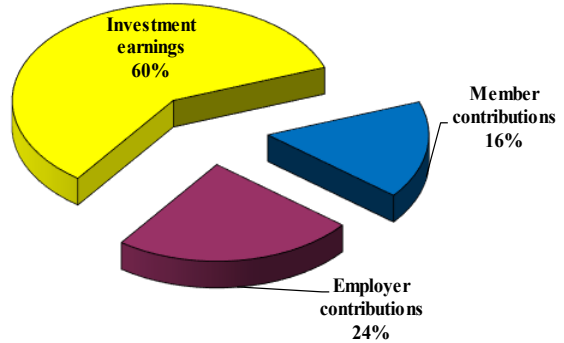
Actuarial Process

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' professionals review economic and demographic experience annually and, in more depth, over five-year periods. The actuary's periodic valuations test the validity of the underlying actuarial assumptions versus the actual experience of the plan. That experience is also used as a basis for formulating actuarial assumptions about what will occur in the future with respect to salary growth, investment returns, and demographic factors such as rates of retirement and death.

Effective with the June 2016 actuarial valuation, PSERS adopted several new demographic and economic assumptions as a result of the five-year Experience Study completed by PSERS' actuary. PSERS' investment rate of return assumption was changed from 7.50% to 7.25%, the salary growth assumption was changed from 5.50% to 5.00%, the inflation assumption was reduced from 3.00% to 2.75%, the rates of withdrawal, disability and retirement from employment among active members were updated

Chart 4.2

PSERS' Sources of Funding
Twenty Year History (1999-2018)



and mortality rates were revised. Chart 4.1 places PSERS' 7.25% return assumption among the more conservative group of funds in the public pension universe.

Funding

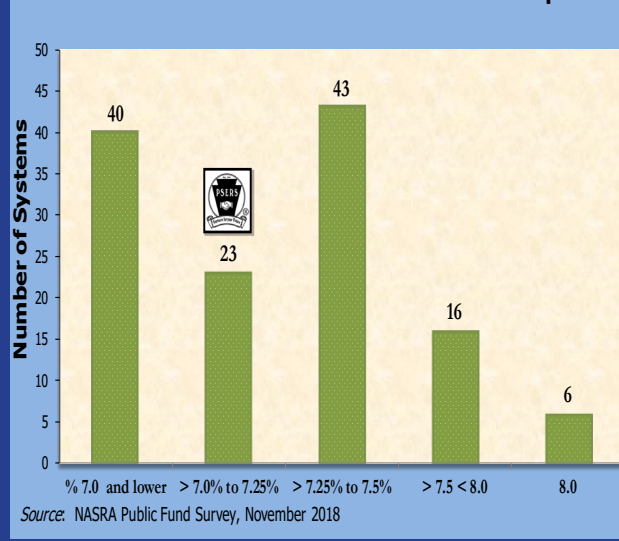
The plan is funded through three sources: (1) employer contributions; (2) member contributions; and, (3) investment earnings. As depicted in Chart 4.2, for the twenty-year period ended June 30, 2018 investment earnings provided 60% of PSERS' funding followed by 24% from employers while members contributed 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 and PSERS' staff establishes the employer contribution rate annually, as part of the annual actuarial valuation. The employer contribution rate, which is expressed as a percentage of payroll, is composed of 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, 2018 was 32.57%, including 0.83% for healthcare premium assistance. The total employer contribution rate for the fiscal year ending June 30, 2019 is 33.43%. This rate consists of a 32.60% pension rate plus the healthcare premium assistance contribution of 0.83%. The FY 2019-20 employer contribution rate is 34.29%. This rate consists of a 33.36% pension rate, the healthcare premium assistance contribution of 0.84% and an Act 5 Defined Contribution (DC) rate of 0.09%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of Act 5 of 2018, at their December 2018 meeting. While any contribution increase is a challenge for PSERS' employers, the increase in the FY 2019-20 contribution rate is the smallest since FY 2009-10. The very large increases that employers experienced prior to FY 2017-18 are now in the past. The projected rate increases in the future are less than current levels of inflation.

Chart 4.1 Distribution of Investment Return Assumptions



The Actuarial Process and Pension Plan Funding
(continued)

For the fiscal year ended June 30, 2018, PSERS’ employer contributions totaled \$4.362 billion, which includes \$112 million for healthcare premium assistance. For the fiscal year ending June 30, 2019 the estimate for total employer contributions is \$4.605 billion, reflective of the 33.43% contribution rate. The contribution rate for the fiscal year ending June 30, 2020 is 34.29% resulting in an employer contribution estimate of \$4.759 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 (FY2018-19) is 7.57%. 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 \$1.026 billion of pension contributions for FY2018. Total member contributions are estimated to be \$1.041 billion for the fiscal year ending June 30, 2019 and \$1.054 billion for the fiscal year ending June 30, 2020.

Investment Returns

PSERS’ investment rate of return for the fiscal year ended June 30, 2018 was 9.27%, 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 September 30, 2018 were 8.78%, 7.31%, and 6.41% respectively. Over the past 25 years ended September 30, 2018, the Fund earned an annualized rate of return of 7.78% 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.

Chart 4.3

PSERS 25 Year Investment Return vs. PSERS Investment Return Assumption June 2009 - June 2018



The Actuarial Process and Pension Plan Funding

(continued)

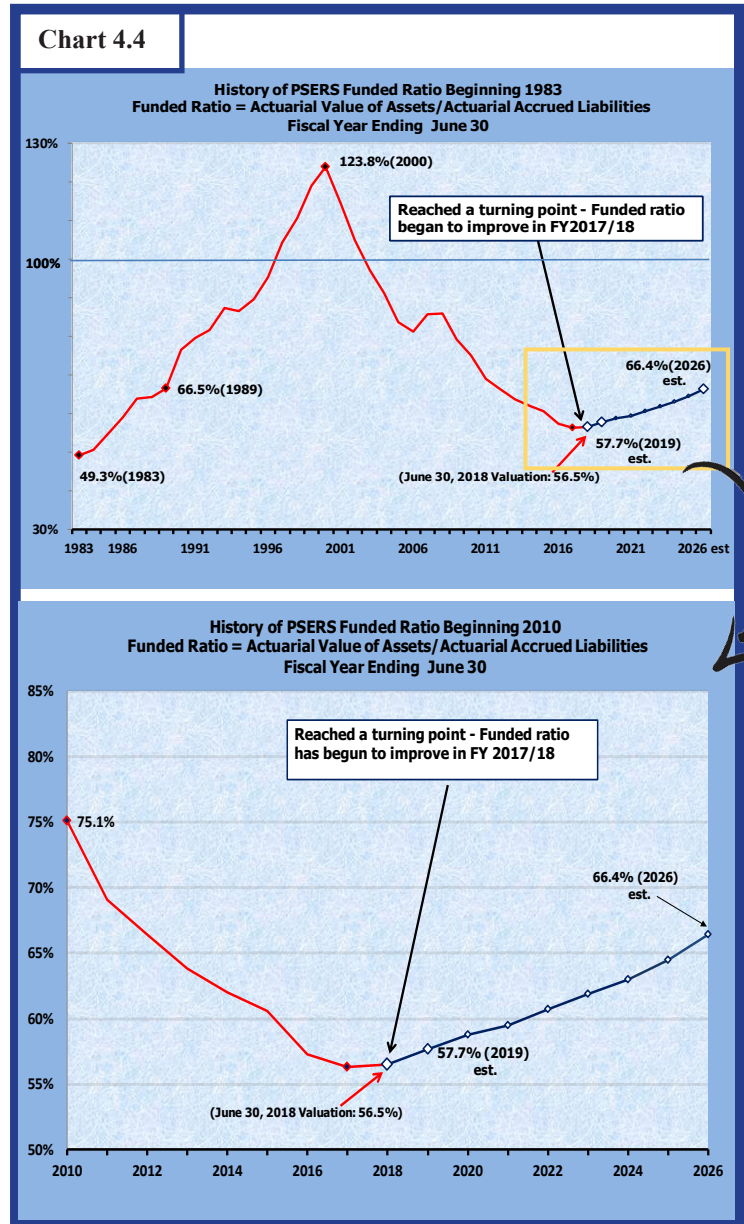
Funded Status

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.

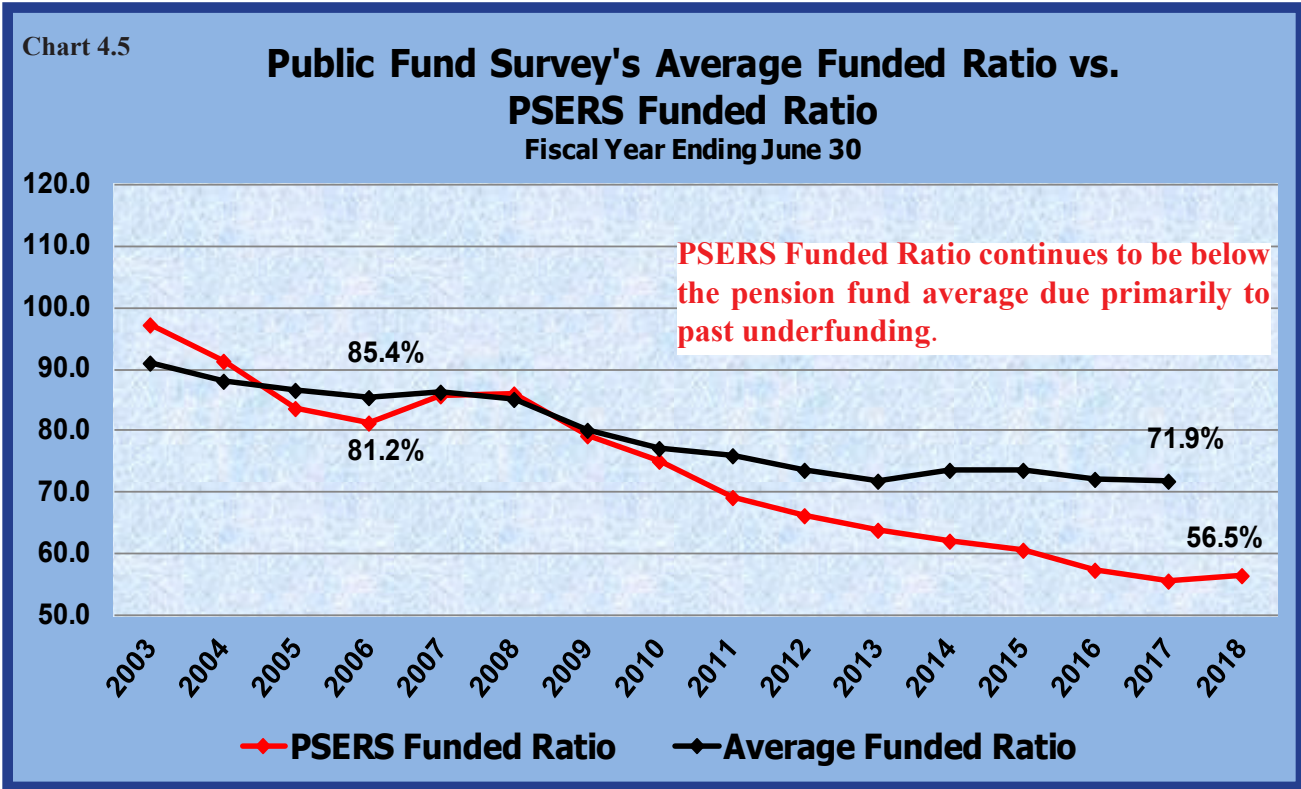
Key Facts

- As a result of legislated contribution increases under Act 120, PSERS has reached a turning point. Effective with the June 30, 2018 actuarial valuation, PSERS' funded ratio has begun to slowly improve after declining for many years.
- Funded Status: 56.5% as of June 30, 2018
- Funded Status: 56.3% as of June 30, 2017
- The increase in FY2018 is one year earlier than projected due to favorable demographic experience and investment returns.
- 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 economic 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 eight-year projection of PSERS' funded status is shown in Chart 4.4. As a result of legislated contribution increases under Act 120, PSERS has reached a turning point. Effective with the June 30, 2018 actuarial valuation, PSERS' funded ratio has begun to slowly improve after declining for many years. Future projections now reflect a steadily increasing funded ratio.



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. High employer contributions are required in order for assets to grow.

Besides market performance, other factors that affect a plan’s funding level include contributions made relative to those that are required; changes in benefit levels; changes in actuarial assumptions, and rates of employee salary growth (*Public Fund Survey*, 2018).

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 began to improve in FY 2017-18 and the gap between PSERS’ funded ratio and the public fund average will slowly begin to shrink.

The Actuarial Process and Pension Plan Funding (continued)

Sources of Unfunded Liability

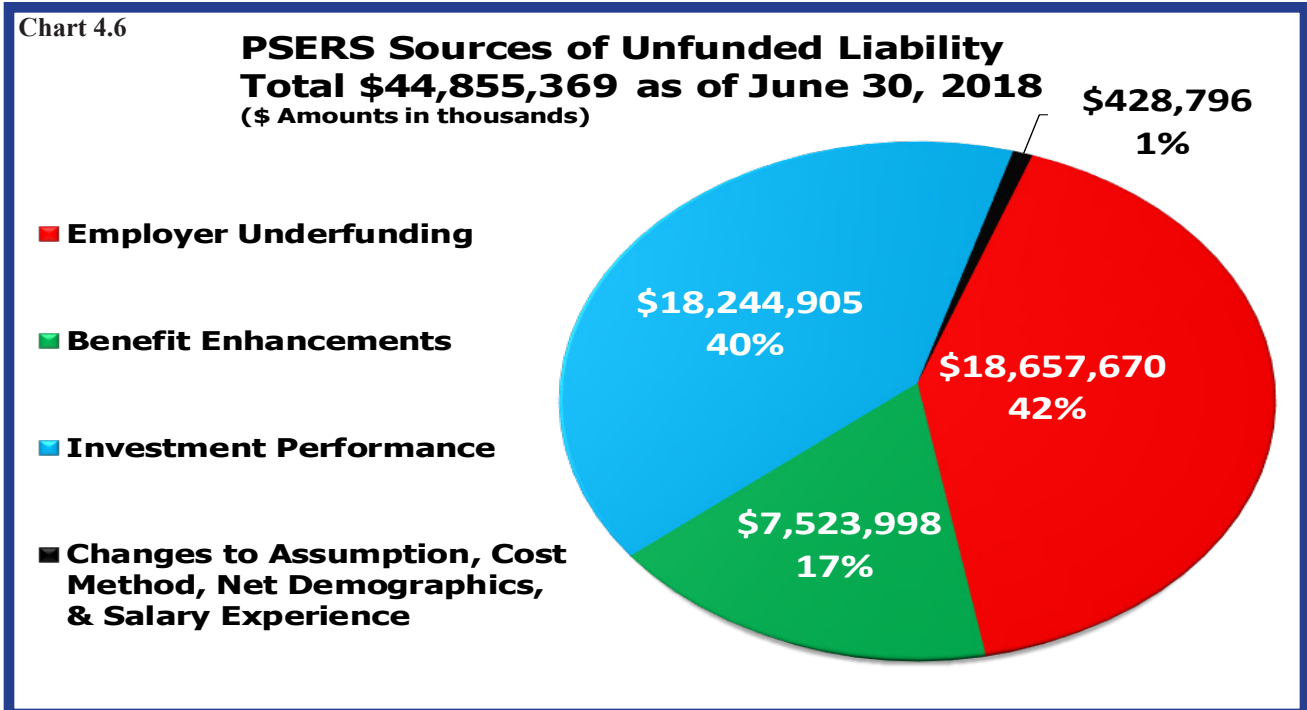
The System’s total funded ratio (for Pensions and Health Insurance combined) is 56.5% as of June 30, 2018. This funded ratio is based on an actuarial value of assets of \$58.26 billion and a total accrued liability of \$103.11 billion which equates to a \$44.85 billion unfunded liability. Chart 4.6 depicts the sources of the unfunded liability. The largest sources of unfunded liability in order of magnitude are employer funding deferrals (42%), investment performance (40%), and benefit enhancements (17%), 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 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 2018-19 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, 2018 unfunded liability is due to employer funding deferrals and benefit enhancements, both of which are not a result of the defined benefit plan design.

GASB 68 and 75 Pension and Healthcare Reporting for Employers

During the fiscal year ended June 30, 2018 the System adopted Governmental Accounting Standards Board (GASB) Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)*. GASB 75 addresses financial accounting and reporting for governments that provide or finance OPEB. GASB 75 replaces GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*, as amended, and GASB No. 57, *OPEB Measurements by Agent Employers and Agent Multiple-Employer Plans*, for OPEB.

In June 2018, PSERS sent information to its employers to assist them in complying with GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* and Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)*. The information sent to employers included a memo explaining PSERS’ role, descriptions of the material provided, and the employers’ responsibilities. In addition to the memo, PSERS provided a variety of schedules audited by PSERS’ independent public accountants as well as unaudited schedules. PSERS strives to incorporate all the information necessary for employers to comply with GASB 68 and 75 reporting requirements in these audited and unaudited schedules. Additionally, PSERS continues to make itself available to assist employers and their auditors should they have any additional requests in order to comply with GASB 68 and 75.





This page intentionally left blank

Employer Contribution Rate

PSERS undergoes an annual independent actuarial valuation to calculate the actuarial assets and liabilities of the pension fund. Based on the actuarial valuation process, the actuary in consultation with PSERS' professionals, develops the recommended Employer Contribution Rate (ECR) that determines the employer contributions to the pension plan 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 2018-19) 33.43%
- Lowest historical ECR (FY 2001-02) 1.09%
- Ten yr. avg. ECR (2009-10 to 2018-19) 19.16%
- Twenty yr. avg. ECR (1999-2000 to 2018-19) 11.57%
- Thirty yr. avg. ECR (1989-90 to 2018-19) 12.02%
- Adopted ECR (FY 2019-20) 34.29%

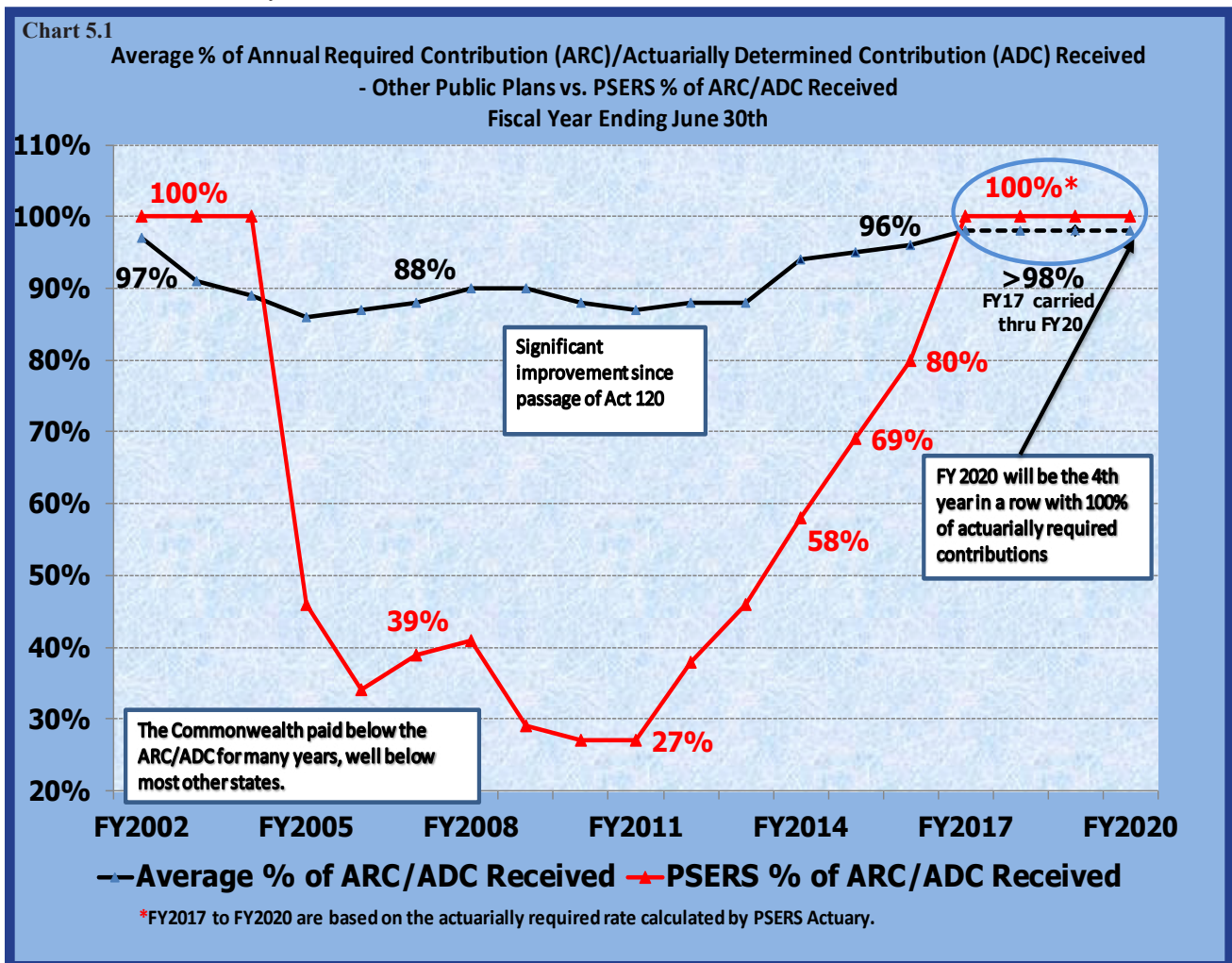
Act 120 provided historic pension reform and made dramatic progress toward addressing funding issues at PSERS. The legislation included actuarial and funding changes to PSERS and benefit reductions for individuals who became new members of PSERS on or after July 1, 2011.

As depicted in the Chart 5.1, effective in FY2016-17, the gradual rate increases under Act 120 raised PSERS' employer contributions to the 100% annual required contribution (ARC) goal, now referred to as the actuarially determined contribution (ADC), 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 34.29% for FY 2019-20 in compliance with Act 120 and Act 5 of 2017. This is the fourth 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 98% for public funds based on the November 2018 Public Fund Survey prepared by NASRA.

Act 120 of 2010

Progress on Funding Issue

PSERS is now in the 8th year under Act 120 of 2010. Act



**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, 2018, members hired since the passage of Act 120 now total approximately 77,000 and account for 30% 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-

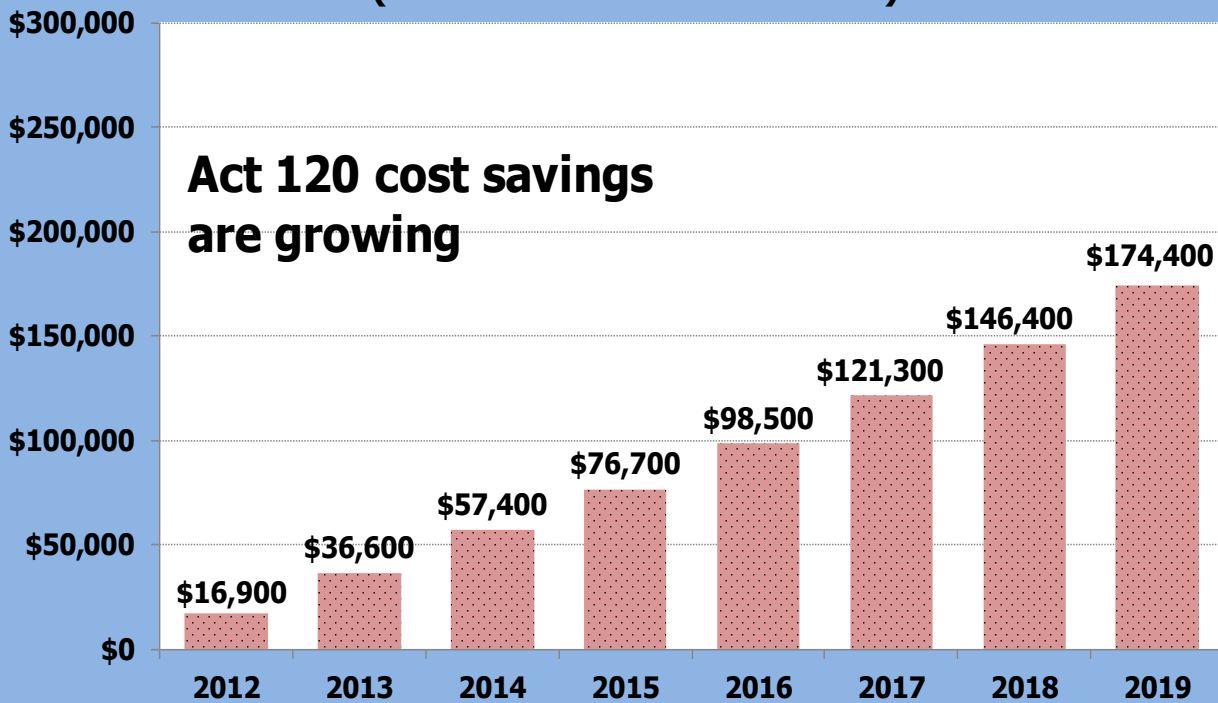
year return through June 30, 2017 exceeding the investment performance hurdle mandated by Act 120, the member rate has not changed. The next investment performance measurement period for T-E/T-F members that could increase the member rate by .5% is for the nine-year period ending June 30, 2020.

The total estimated savings of the T-E/T-F Benefit Tiers is illustrated in Chart 5.2. As the membership grows through FY 2018-19, 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. Class T-E and T-F will close to new members after June 30, 2019. Cumulative estimated savings through June 30, 2018 were \$553.0 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, 2018, 13,291 or 17% of new members elected Class T-F and 63,880 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
Fiscal Year Ending June 30
(Dollar Amounts in Thousands)**



Employer Contribution Rate (continued)

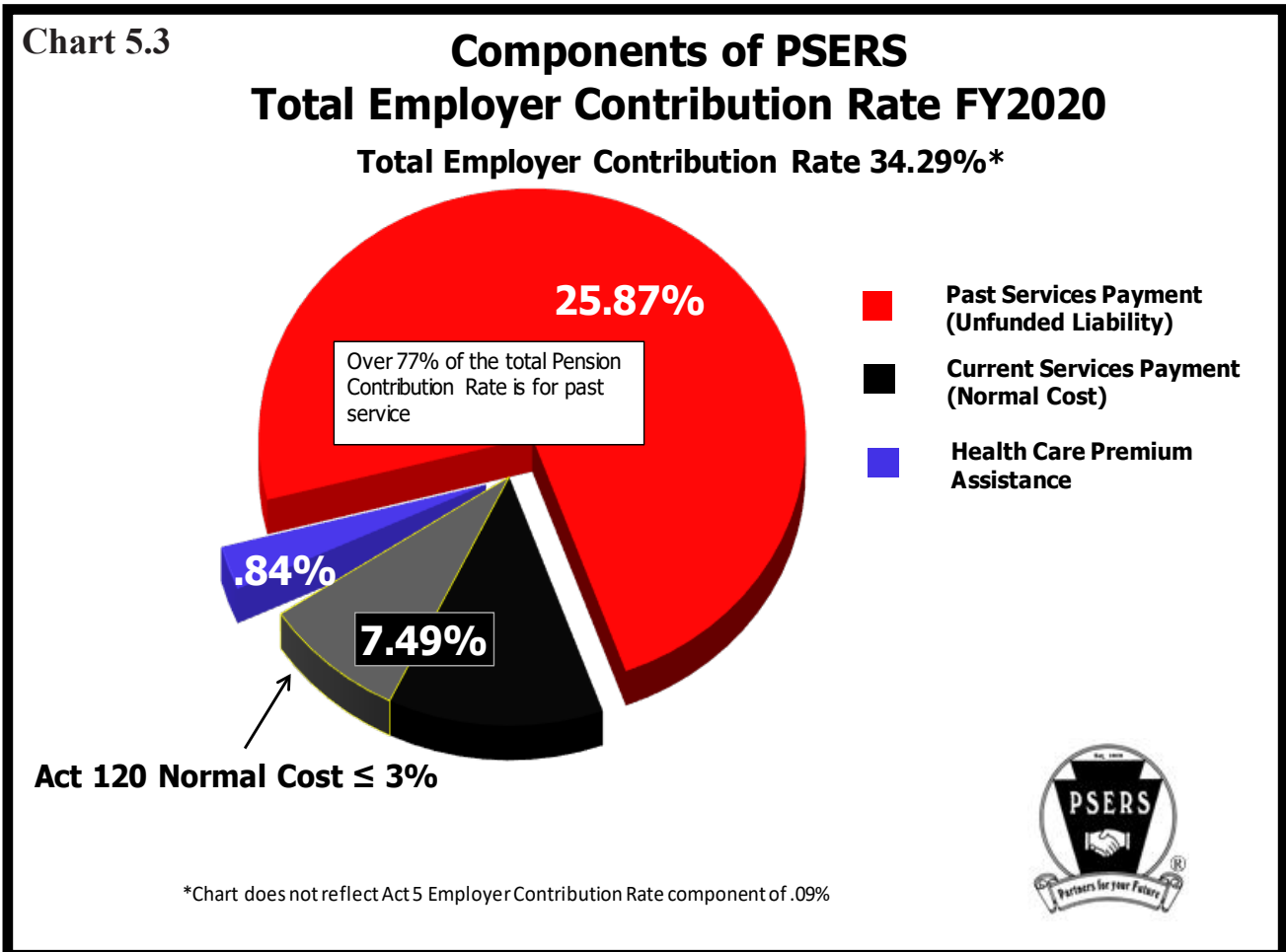
Funding Changes - Employer Contributions

Act 120 of 2010 also suppressed the employer contribution rate by using rate caps to keep the rate from rising too high, too fast for budgetary purposes. The rate caps limited the amount the pension component of the employer contribution rate could increase over the prior year's rates. Effective with FY 2016-17 the rate caps were no longer in place.

PSERS' Board has approved a total employer contribution rate of 34.29% for FY 2019-20 which represents an inflationary-like increase of 2.57% over the FY 2018-19 rate of 33.43%. This is the smallest percentage increase since FY 2009-10.

Employer Contribution Rate

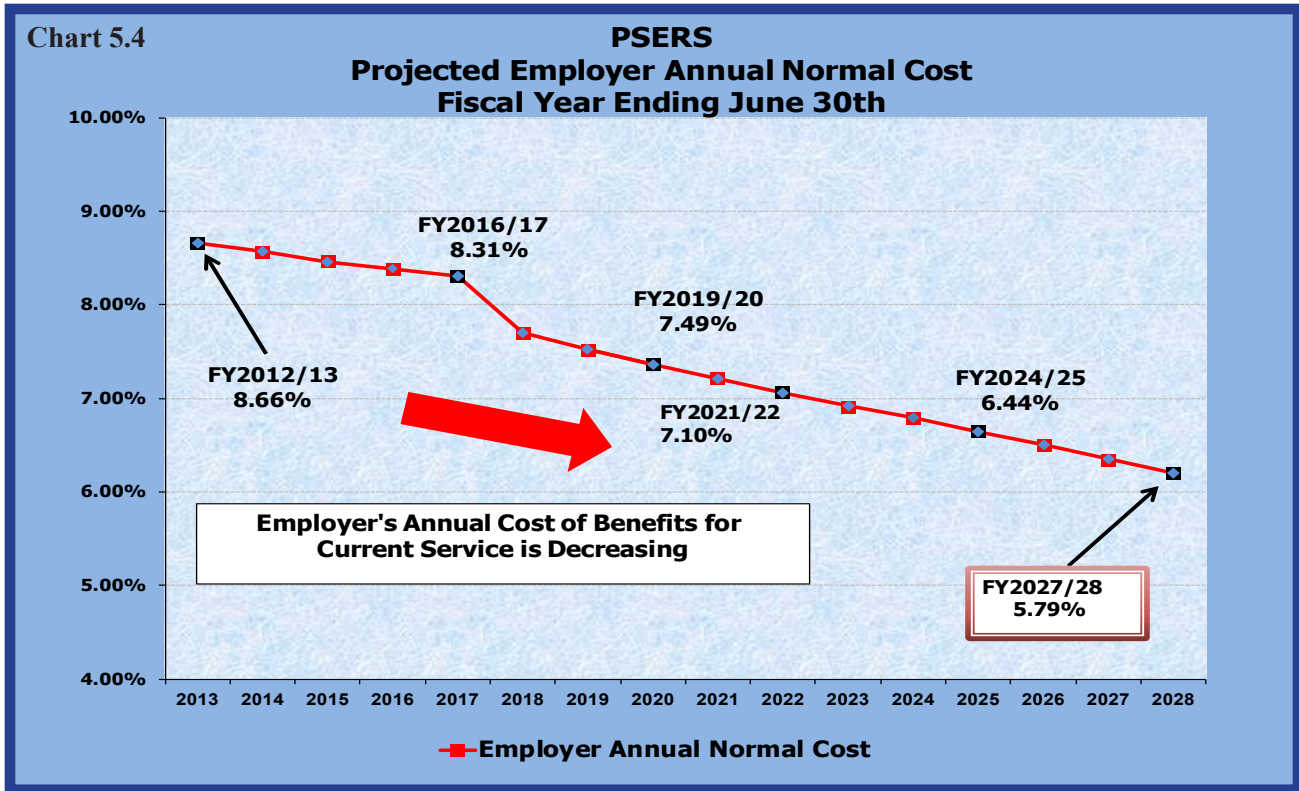
Chart 5.3 displays the components of PSERS' projected employer contribution rate of 34.29% in FY 2019-20. The majority of the rate, over 77%, is dedicated toward paying the cost of past service. The employers' cost for current service is a much smaller portion of the contribution rate and is projected 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.



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 5.79% in FY 2027-28 when over 50% of active employees will be Act 120 and Act 5 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 2019-20 through FY 2023-24. As depicted, the Commonwealth's share of contributions are starting to level out as the year-over-year increases are smaller each year.

Table 5.1 Commonwealth's Department of Education School Employees' Retirement Appropriation					
(Dollar Amounts in Billions)					
----- Projected -----					
	<u>2019-20</u>	<u>2020-21</u>	<u>2021-22</u>	<u>2022-23</u>	<u>2023-24</u>
School Employees' Retirement	\$ 2.648	\$ 2.750	\$ 2.850	\$ 2.962	\$ 3.071

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

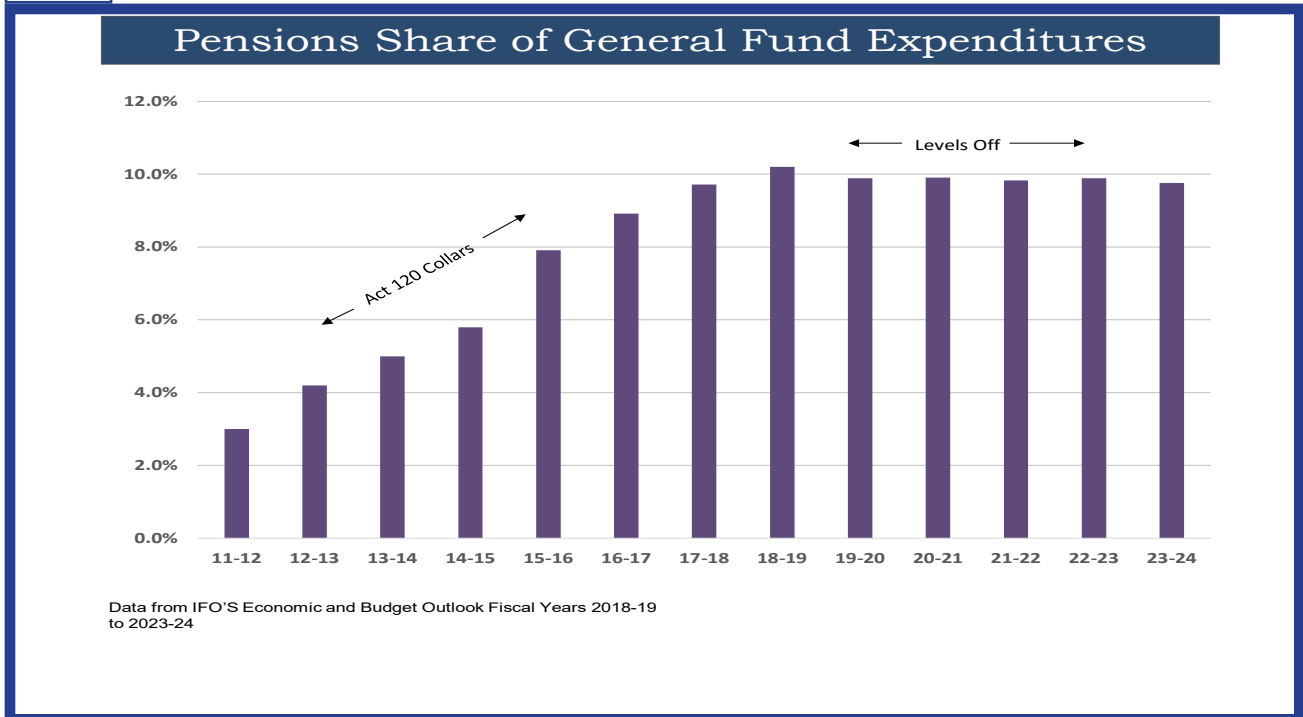
Throughout 2018, PSERS professionals were actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension policy proposals while remaining policy neutral.

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

Recap

Act 120 reduced the employer’s annual cost of benefits for members hired after June 30, 2011 by over 32% via member benefit reductions. However, a significant unfunded liability for service already rendered by pre-Act 120 members still remains to be paid. To address the underfunding which had taken place since FY 2000-01, Act 120 also included rate collars designed to systematically increase the employer contribution rate over several years to raise the funding to actuarially required levels. Now that this objective has been achieved, the rate collars no longer apply.

Chart 5.5



Employer Contribution Rate (continued)

At its December 2018 meeting, PSERS Board of Trustees certified an annual contribution rate of 34.29% for FY 2019-20 which continues to put PSERS on the path towards full funding. For the fourth consecutive year, the Commonwealth's employer contribution rate provides 100% of the actuarially required rate based on sound actuarial practices and principles. Contribution rates began to level off after FY 2017-18 which has reduced budgetary pressure on the Commonwealth and school districts in FY 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 2018-19 pensions share of the Commonwealth's General Fund expenditures levels off and is no longer a major driver of General Fund expenditure growth.

PSERS has reached a Turning Point under Act 120

Effective in FY 2017-18, PSERS' actuarial funded ratio has begun to slowly improve after declining steadily since FY2000-01. On a market value basis, PSERS unfunded liability began to decline in FY 2016-17 and continued to decline through June 30, 2018. 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 2016-17 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.

PSERS Budget Report

Fiscal Year 2019-2020



Pennsylvania Public School Employees' Retirement System

SECTION 2 - PSERS FY2019-20 BUDGET

PSERS Consultants' Fees and Legislation.....	Tab 6
PSERS FY2019-20 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets	Tab 7



This page intentionally left blank

Section 2 - FY2019-20 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, 2018.

Table 6.1 Investment and Pension Fund Administration Consultants		
<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
ViTech Systems Group, Inc.	Pension administration system services	\$ 5,168,750 *
Portfolio Advisors, LLC	Private market consulting	\$ 1,530,978
Unisys Corporation	Server maintenance	\$ 1,436,523 *
Hamilton Lane Advisors LLC	Private market consulting	\$ 770,000
AonHewitt	General investment consulting	\$ 741,525
Aksia LLC	Hedge fund investment consulting	\$ 700,000
OST, Inc	Information technology training, testing, and consulting services	\$ 502,341 *
Courtland Partners, Ltd.	Real estate investment consulting	\$ 294,302
Conduent HR Services	Pension benefit actuarial services	\$ 284,320 *
Glass, Lewis & Co., LLC	Proxy voting	\$ 178,681

Table 6.2 Health Options and Premium Assistance Program Consultants		
<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
CoreSource, Inc.	Postemployment healthcare benefits administration and claims adjudication	\$ 28,933,725 *
Optum Rx, Inc.	Administration of postemployment healthcare benefits and prescription drug plan	\$ 8,142,534 *
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	\$ 3,095,874 *
Healthways, Inc.	Administration of Silver Sneakers Fitness Program	\$ 807,462 *
Blue Peak Advisors LLC	Pharmacy benefit consulting services	\$ 451,850 *
Independent Pharmaceutical Consultants, Inc.	Pharmacy benefit consulting services	\$ 243,028 *

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

Legislation

PSERS Related Legislation Activities since January 1, 2018

Act 6A of 2018

On June 22, 2018, Governor Wolf signed into law House Bill Number 2082, Printer's Number 3325. This legislation makes an appropriation in the amount of \$51,637,000 from the Public School Employees' Retirement Fund to provide for the administrative expenses of PSERS for the fiscal year July 1, 2018 to June 30, 2019.

Act 42 of 2018 (Fiscal Code)

On June 22, 2018, Governor Wolf signed into law House Bill Number 1929, Printer's Number 3810. Act 42 amended the act of April 9, 1929, (P.L. 343, No. 176), known as the Fiscal Code, implementing the 2018-2019 Commonwealth budget. Section 1726-I (Fund Transfers) of Act 42 transferred the sum of \$5,200,000 from funds received under the Tax Reform Code of 1971 to the account established under Section 1799-E of the Fiscal Code (known as the Public School Employees' Retirement System Restricted Account), for use by the PSERS Board for costs associated with implementation of the Public School Employees Defined Contribution Plan pursuant to Act 5 of 2017.

Senate Bill 113, Printer's Number 58

This bill would amend the act of July 8, 2018, (P.L. 752, No. 140), known as the Public Employee Pension Forfeiture Act to expand the list of applicable offenses by requiring the forfeiture of pension benefits by public employees that are convicted or plead guilty or no contest to any employment-related felony offense.

Section 2 - FY2019-20 Budget

**Public School Employees' Retirement System
Fiscal Year 2019-2020 Administrative Budget**

Table 7.1	Budget FY2017-2018	Budget FY2018-2019	PSERS' Budget Request FY2019-2020
Total Personnel Services	\$ 27,068,000	\$ 28,014,000	\$ 28,735,000
Operating Expenses and Fixed Assets			
Travel	\$ 153,450	\$ 167,130	\$ 167,900
Training & Conference Registration	154,930	199,400	181,400
Telecomm	406,900	440,900	460,900
Electricity	30,000	22,300	22,300
Consultant Services - Non EDP	3,231,900	2,657,500	2,190,100
Outsourced IT Consulting for appl & development	76,900	-	40,000
Consulting - Maint & Support - (post implementation)	51,000	109,000	53,000
Consulting - Security (Outsourced Inf Sec Services)	-	125,000	75,000
Consulting - General IT Support	1,127,600	810,600	985,000
Consulting - Outsourced Infrastructure Svcs (PACS)	1,200,000	921,000	1,075,000
Legal Services/Fees	664,000	289,000	227,000
Specialized Services	448,750	484,750	521,500
Other Specialized Services	159,720	174,000	221,200
Advertising	10,000	10,000	10,000
Medical, Mental, & Dental Services	4,000	3,500	4,700
Software Licensing - Maintenance	1,703,800	1,753,100	1,594,200
Hardware - Maintenance	72,800	91,000	96,000
Contracted Maintenance Non EDP	166,100	168,000	167,800
Telecomm Data Services	87,700	88,900	92,500
Contracted Repairs - Non EDP	15,200	15,500	15,500
Real Estate Rental	2,036,500	2,059,500	2,080,100
Vehicle Rental	2,600	2,600	2,600
Office Equipment Rental	201,000	236,300	290,700
Other Rentals	8,300	8,400	8,400
Office Supplies	211,500	228,100	253,000
Educational & Medical Supplies	11,600	9,100	8,600
Software License non-recurring less than \$5,000	23,500	31,300	27,800
Hardware - Network	-	140,000	-
Hardware Desktop less than \$5,000	23,050	407,200	286,500
Furniture and Fixtures	58,100	68,100	69,500
Other Equipment	7,000	13,000	13,000
Motorized Equipment Supplies	21,000	21,000	21,000

Section 2 - FY2019-20 Budget

Public School Employees' Retirement System Fiscal Year 2019-20 Administrative Budget (continued)

Table 7.1	Budget <u>FY2017-2018</u>	Budget <u>FY2018-2019</u>	PSERS Budget Request <u>FY2019-2020</u>
Postage and Freight	1,196,790	1,151,500	1,086,500
Printing	212,500	221,000	210,200
Subscriptions	384,300	431,340	467,400
Membership Dues	35,510	38,280	41,500
Conference Expense	49,000	64,000	61,000
Insurance, Surety, & Fidelity Bonds	23,000	10,000	10,000
Other Operational Expenses	2,282,000	2,135,700	2,215,200
HW Network and Server	85,000	89,000	-
Automobiles	40,000	20,000	19,800
Software License	8,680,000	7,678,000	7,507,000
Office Equipment	<u>28,000</u>	<u>29,000</u>	<u>28,200</u>
Total Operating Expenses and Fixed Assets	\$ 25,385,000	\$ 23,623,000	\$ 22,909,000
Total Administrative Budget	<u>\$ 52,453,000</u>	<u>\$ 51,637,000</u>	<u>\$ 51,644,000</u>

Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY2019-20. The \$51,644,000 administrative budget is not funded from the Commonwealth's General Fund, but rather from the earnings of the Fund itself. Historically, PSERS has under spent its approved budget, keeping more funds available to invest for PSERS' members.

PSERS' Administrative Budget Request for FY 2019-20 represents an increase of only \$7,000 or 0.1% above the FY 2018-19 available budget. Although personnel expenses will increase as new positions put in place due to Act 5 will be fully deployed, many operating expenses pertaining to Act 5 will decline 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 2017-18, PSERS completed the upgrade of its pension administration system from

the "classic" to the "browser-based" version. Due to this change, a significant number of PSERS active and retired members have elected to receive newsletters, statement of accounts, 1099Rs and other documents electronically, thereby saving the agency thousands of dollars in postage, printing and paper costs annually for years to come. Other savings include a decline in contracted maintenance and repair services, a decrease in consultant and legal fees, and a reduction in equipment purchases, all part of PSERS' ongoing efforts to control costs and improve operational efficiency.

Section 2 - FY2019-20 Budget

**Public School Employees' Retirement System
Fiscal Year 2019-20 Defined Contribution (DC) Administrative Budget**

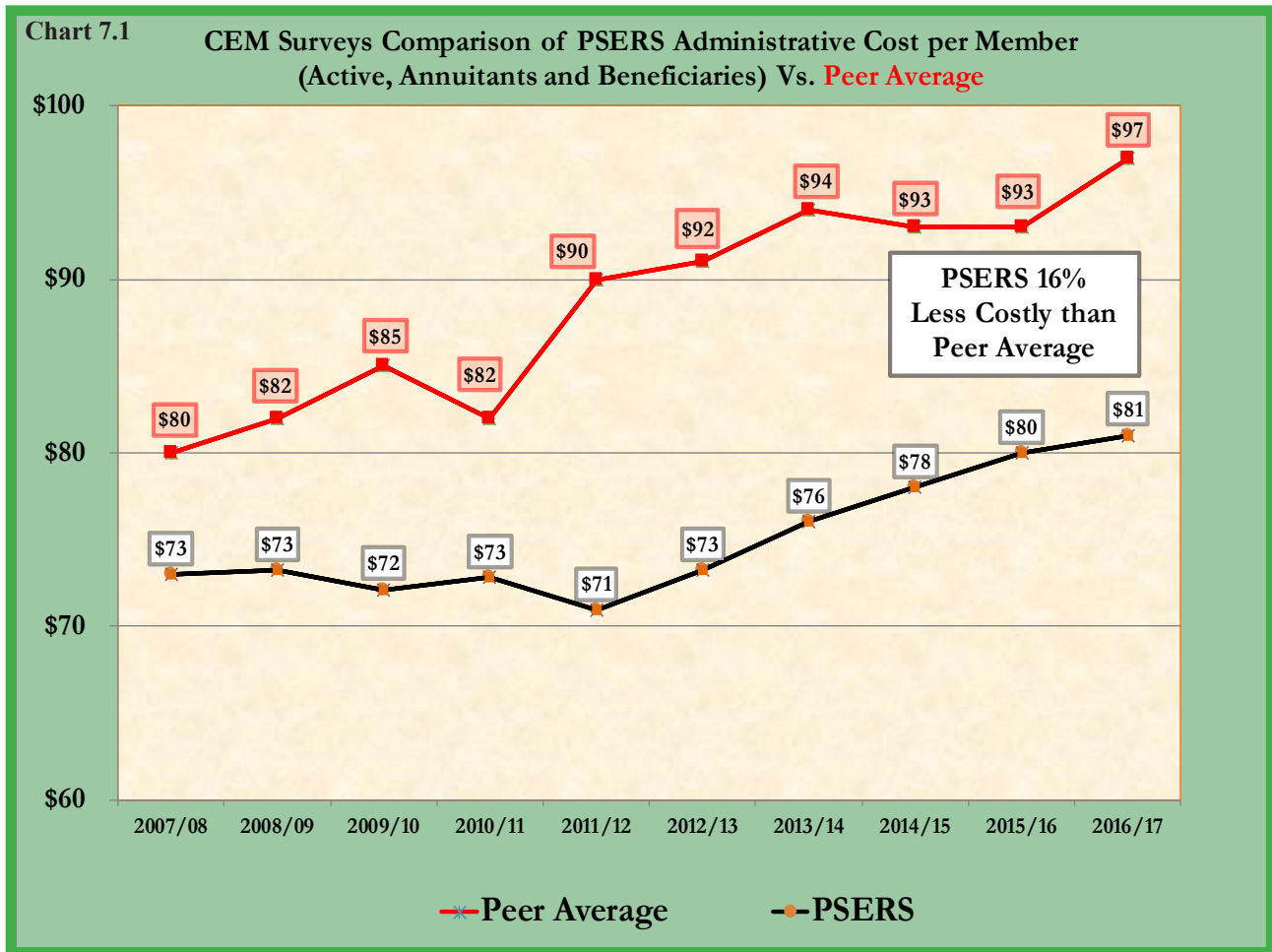
Table 7.2	Budget FY 2017-2018	Budget FY2018-2019	PSERS' Budget Request FY2019-2020
Total Personnel Services	\$ 610,000	\$ 771,000	\$ 895,000
Operating Expenses and Fixed Assets			
Consultant Services - Non EDP	\$ 3,800,000	\$ 2,415,000	\$ 640,000
Legal Services/Fees	275,000	250,000	145,000
Other Operational Expenses	191,000	131,500	70,000
SW License recurring greater than \$5,000	<u>1,925,000</u>	<u>1,382,500</u>	<u>700,000</u>
Total Operating Expenses and Fixed Assets	\$ 6,191,000	\$ 4,179,000	\$ 1,555,000
Total Administrative Budget	<u>\$ 6,801,000</u>	<u>\$ 4,950,000</u>	<u>\$ 2,450,000</u>

Defined Contribution (DC) Administrative Budget

Table 7.2 displays PSERS' Defined Contribution (DC) Administrative Budget Request for FY 2019-20. The \$2,450,000 amount requested represents a decrease of approximately 50% from the FY 2018-19 available budget as PSERS will be entering the third year of funding for Act 5 and the need for consulting services and software programming changes will be decreasing significantly.

Section 2 - FY2019-20 Budget

Public School Employees' Retirement System Fiscal Year 2019-20 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 33% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 above illustrates that PSERS had a 16% 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 \$8.2 million annually in administrative expenses compared to its peers.

**PSERS Directed Commissions
Recapture Program**

Directed Commissions Recapture is a program whereby a portion of commissions incurred by PSERS through investment trading activity is returned to PSERS. These funds can be used for the administration of the Fund or can be reinvested back into the asset allocation through a transfer to 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 FY2017-2018</u>	<u>Available FY2018-2019</u>	<u>PSERS' Budget FY2019-2020</u>
Budgetary Reserve	<u>\$2,000,000</u>	<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>



This page intentionally left blank

PSERS Budget Report

Fiscal Year 2019-2020



Pennsylvania Public School Employees' Retirement System

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



This page intentionally left blank

Investment Policy

The Public School Employees' Retirement Board of Trustees (the Board) is 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' professionals 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.psers.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' investment professionals, 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

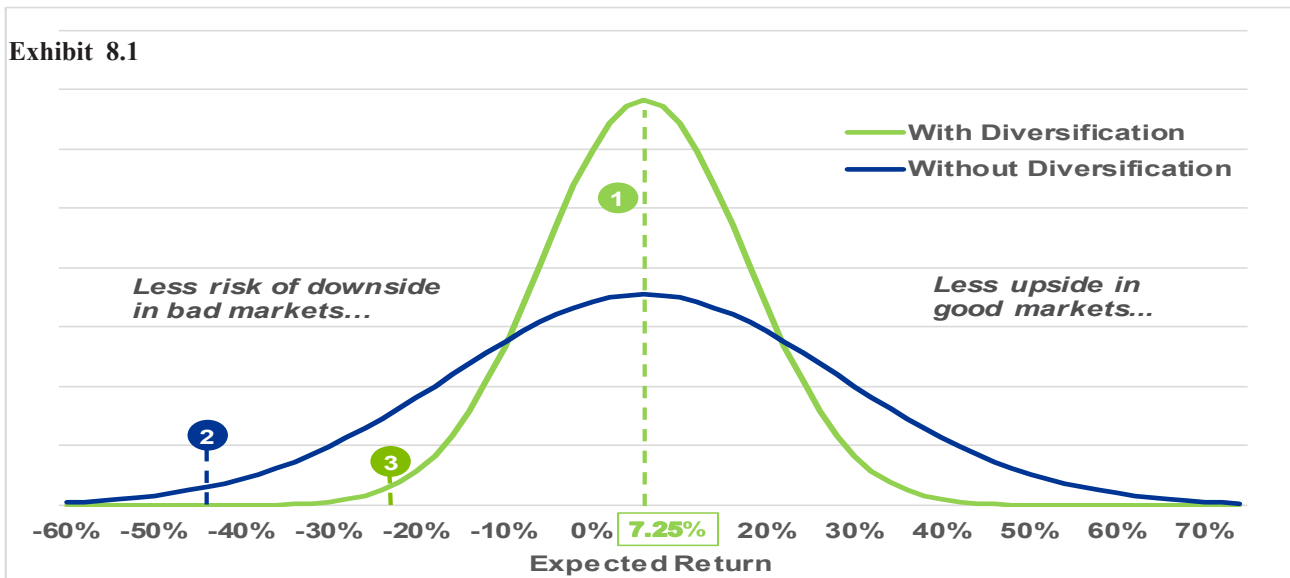
are caused by factors specific to individual investments, classes of investments or factors affecting all investments simultaneously.

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%.



Section 3 - Investment Information

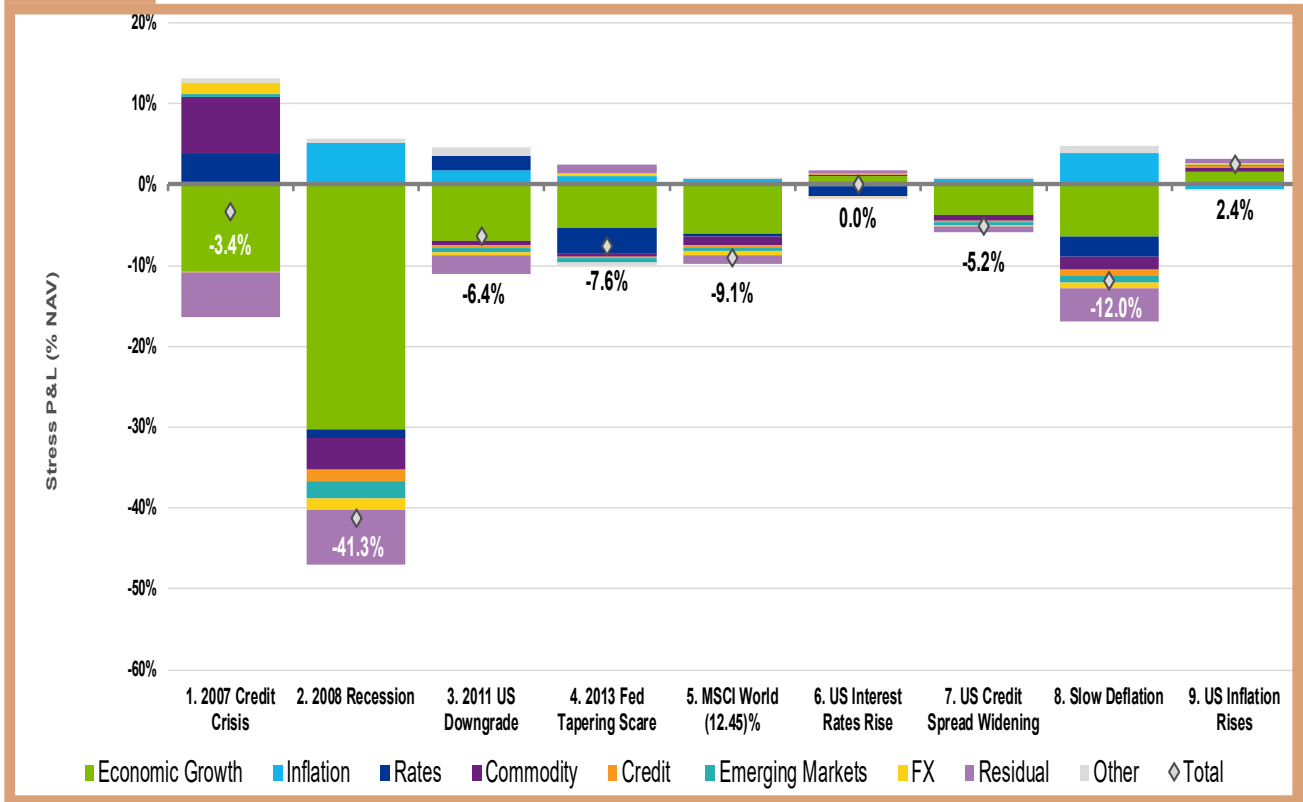
Investment Risk Management

(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, 2018, 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.

Exhibit 8.2



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 2017, 2018 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.

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.

Equities

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

- U.S. equity assumptions have slightly decreased as valuations have increased in recent years while Non-U.S. equities have slightly increased as valuations have decreased.

Equity market returns over the past three years have been driven by rising valuations and to a lesser extent, an increase in profits from tax cuts. 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.

Real Estate

Expected returns across the global real estate markets remained in line with 2017 assumptions.

- Slightly higher initial yields are offset by expected price declines.

Table 8.1 summarizes the average expected capital market geometric return assumptions of 20 - 30 surveyed independent investment advisors in 2014, 2015, 2016, 2017 and 2018:

Table 8.1 PSERS Capital Market Assumptions (CMAs)					
Average Expected Geometric Returns (2014 - 2018)					
Asset Class	2014 Survey	2015 Survey	2016 Survey	2017 Survey	2018 Survey
U.S. Equity - Large Cap	7.4%	7.1%	7.9%	7.8%	7.4%
U.S. Equity - Small Cap	7.7%	7.3%	8.2%	8.4%	8.2%
Non-U.S. Equity - Developed	7.8%	7.5%	8.0%	7.6%	7.7%
Non-U.S. Equity - Emerging	8.9%	8.7%	9.1%	8.7%	8.8%
U.S. Fixed Income - Core	4.0%	3.7%	4.6%	4.4%	4.5%
U.S. Fixed Income - Long Duration Corp.	4.9%	4.0%	4.9%	4.8%	4.4%
U.S. Fixed Income - High Yield	6.0%	6.0%	6.8%	6.2%	5.8%
Non-U.S. Fixed Income - Developed	3.5%	2.7%	3.7%	3.5%	3.2%
Non-U.S. Fixed Income - Emerging	5.9%	6.0%	6.4%	6.2%	6.1%
Treasuries (Cash Equivalents)	2.7%	2.4%	3.2%	3.2%	3.1%
TIPS (Inflation-Protected)	3.5%	3.1%	3.9%	4.0%	4.0%
Real Estate	6.5%	6.3%	6.8%	6.7%	6.7%
Hedge Funds	6.3%	5.8%	6.2%	6.0%	6.2%
Commodities	4.9%	4.4%	4.8%	5.0%	4.9%
Infrastructure	7.8%	7.1%	7.1%	7.1%	7.1%
Private Equity	9.8%	9.5%	10.3%	10.1%	9.5%
Inflation	2.4%	2.2%	2.3%	2.4%	2.5%

Section 3 - Investment Information

Capital Market Assumptions (continued)

Hedge Funds

Hedge Fund assumptions reflect changes in the underlying equity, fixed income and cash capital market assumptions. Slight increases in the hedge fund assumptions reflect rising expectations for cash.

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.

Average Expected Risk (2014 - 2018)					
Asset Class	2014 Survey	2015 Survey	2016 Survey	2017 Survey	2018 Survey
U.S. Equity - Large Cap	17.5%	17.1%	16.9%	16.6%	16.4%
U.S. Equity - Small Cap	21.1%	21.0%	21.0%	20.2%	20.2%
Non-U.S. Equity - Developed	19.8%	19.6%	19.5%	18.9%	18.7%
Non-U.S. Equity - Emerging	26.4%	26.6%	26.4%	25.4%	24.9%
U.S. Fixed Income - Core	5.4%	5.6%	6.0%	5.5%	5.7%
U.S. Fixed Income - Long Duration Corp.	11.3%	10.8%	10.5%	10.4%	10.8%
U.S. Fixed Income - High Yield	11.5%	11.2%	11.0%	10.6%	10.2%
Non-U.S. Fixed Income - Developed	7.6%	7.4%	7.6%	7.4%	6.9%
Non-U.S. Fixed Income - Emerging	10.9%	11.7%	11.6%	11.8%	11.4%
Treasuries (Cash Equivalents)	2.3%	2.8%	2.8%	3.0%	2.7%
TIPS (Inflation-Protected)	6.3%	6.3%	6.5%	6.3%	6.3%
Real Estate	13.1%	13.6%	14.7%	14.5%	13.9%
Hedge Funds	9.0%	8.3%	8.4%	8.0%	7.9%
Commodities	18.0%	18.0%	18.5%	17.9%	17.6%
Infrastructure	13.5%	13.1%	13.8%	14.6%	14.7%
Private Equity	24.8%	23.6%	23.1%	22.0%	22.2%
Inflation	2.1%	1.8%	1.8%	1.7%	1.8%



This page intentionally left blank

Section 3 - Investment Information

Asset Exposure

(as of June 30, 2018)

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

annual report, as described in Tab 5. PSERS' investment professionals and general investment consultant collaborate to analyze potential asset allocations (using actuarial as well as capital market return assumptions) in order to identify those potential asset allocations that meet the long-term return and risk objectives of the Fund. The Board is then presented with alternative asset allocations with detailed analysis of probable long-term return and risk characteristics from which it will select a new Asset Allocation Policy for further implementation by staff.

Table 9.1 represents PSERS' asset exposure and target allocation plan that became effective October 1, 2017, and was in effect on June 30, 2018:

Table 9.1 PSERS' Asset Exposure and Target Asset Allocation Plan						
(as of June 30, 2018)						
Asset Class	Market Value (in millions)	Percentage of Gross Asset Exposure	Percentage of Net Asset Exposure	Target Allocation %	Target Allocation Range	
Global Public Market Equity:						
U.S. Equity	\$ 4,282.7	6.7 %	7.8 %	7.4 %		
Non-U.S. Equity	<u>7,091.2</u>	<u>11.1</u>	<u>12.9</u>	<u>11.6</u>		
Total Global Public Market Equity	\$ 11,373.9	17.8 %	20.7 %	19.0 %		
Private Markets	<u>7,727.1</u>	<u>12.0</u>	<u>14.1</u>	<u>15.0</u>		
Total Equity	\$ 19,101.0	29.8 %	34.8 %	34.0 %		± 10%
Fixed Income*	\$ 20,532.1	32.0 %	37.4 %	35.0 %		± 10%
Commodities*	\$ 4,274.0	6.7 %	7.8 %	8.0 %		± 4%
Infrastructure*	3,799.5	5.9	6.9	6.0		
Real Estate*	<u>5,340.5</u>	<u>8.3</u>	<u>9.7</u>	<u>11.0</u>		
Total Real Asset Exposure	\$ 13,414.0	20.9 %	24.4 %	25.0 %		± 10%
Risk Parity*	\$ 5,447.6	8.5 %	9.9 %	10.0 %		± 5%
Absolute Return	<u>\$ 5,643.8</u>	<u>8.8 %</u>	<u>10.3 %</u>	<u>10.0 %</u>		± 5%
Gross Asset Exposure	\$ 64,138.5	<u>100.0 %</u>	116.8 %	114.0 %		
Financing*	<u>\$ (9,249.5)</u>		<u>(16.8) %</u>	<u>(14.0) %</u>		+24/-14
Net Asset Exposure	<u>\$ 54,889.0</u>		<u>100.0 %</u>	<u>100.0 %</u>		

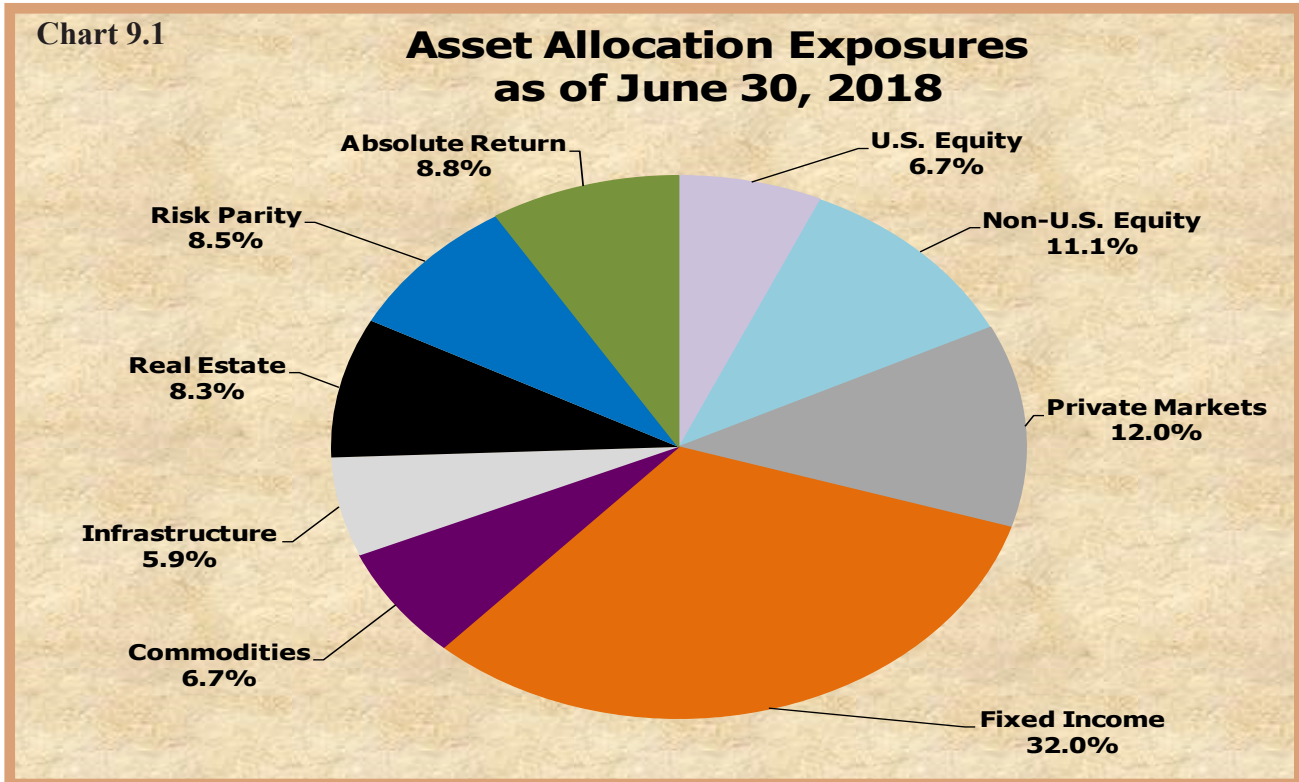
*PSERS uses financing to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2018, PSERS had total increased economic exposure of \$9.2 billion related to the following asset classes: Fixed Income (\$5.5 billion); Risk Parity (\$0.6 billion); Infrastructure (\$0.5 billion); Real Estate (\$0.2 billion) and Commodities (\$2.4 billion).

Note: PSERS' asset allocation was updated October 1, 2018, and is available for review at <http://www.psers.pa.gov>.

Section 3 - Investment Information

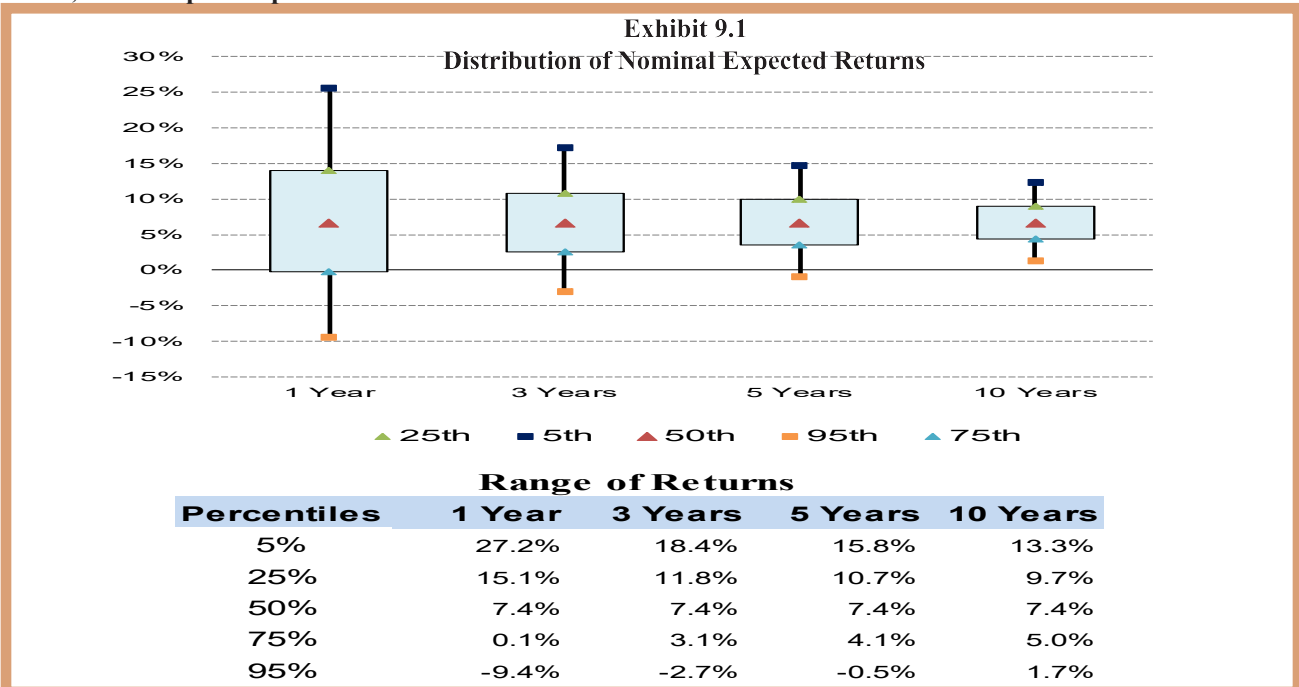
Asset Exposure
(continued)

Chart 9.1 illustrates PSERS' asset allocation exposure as of June 30, 2018:



Note: Financing represents a negative 16.8% 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 as of June 30, 2018.

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 a current 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, an exit out of family businesses, etc.). 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 15.0% to Private Market investments.

As an example of PSERS' private markets success, PSERS has modeled, in Table 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 global equity market. PSERS chose the Vanguard Global Equity Fund (VHGEX) due to its low cost (currently 0.03%) and its success at closely matching the returns of the global 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, 2018) 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 2008 - March 2018)
PSERS' Private Equity Program	7.40%
MSCI World Net Total Return USD Index	5.91%
Vanguard Global Equity Fund (VHGEX)	6.23%

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 a current allocation of 35.0% of assets to Fixed Income, 9.0% of which is designated to Investment Grade, 11.0% of which is designated to Credit-Related, 15.0% of which is designated to TIPS strategies. A 3.0% allocation to Cash is included in the (14)% allocation to Financing.

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.

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 6.0% of assets in Infrastructure investments, inclusive of the 4.0% target for MLP 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 11.0% of total assets, of which 10.0% is designated for Private Real Estate and 1.0% 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

Risk 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

Absolute 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.

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, 2018, the System

generated a total net of fee return of 9.27%. This return was above the Total Fund Policy Index return of 7.95% by 132 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2018 were 6.84%, 7.62%, and 5.03%, respectively. The three-, five- and ten-year returns ended June 30, 2018, exceeded the Total Fund Policy Index returns by 39, 32, and trailed by 3 basis points, respectively.

Table 10.1 provides the System's total time-weighted investment returns for each major asset class and the total portfolio, including, where applicable and available, respective benchmark indexes used by asset class and median performance by asset class:

Table 10.1	Annualized Total Returns (%)					
	Net of Fees					
	Ended June 30, 2018					
	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
PSERS Total Portfolio	9.27	6.84	7.62	5.03	7.69	6.39
Total Fund Policy Index	7.95	6.45	7.30	5.06	6.95	5.66
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	8.17	6.55	7.79	6.50	6.93	5.98
60% Global Equity / 40% Barclays U.S. Aggregate Bond Index	6.19	5.67	6.60	5.42	6.77	5.55
PSERS U.S. Equity Portfolios	14.02	12.19	13.51	10.21	9.62	N/A
U.S. Equity Policy Index (1)	14.93	11.65	13.34	10.17	9.69	N/A
PSERS Non-U.S. Equity Portfolios	10.44	7.55	9.91	6.10	10.25	N/A
Non-U.S. Equity Policy Index (2)	8.48	6.34	9.12	4.76	9.16	N/A
PSERS Fixed Income Portfolios (10)	6.42	6.07	5.97	7.21	6.54	6.70
Fixed Income Policy Index (3)	2.18	3.85	3.34	5.35	5.08	5.64
PSERS Commodity Portfolios (10)	5.36	0.11	-2.10	-5.76	N/A	N/A
Commodity Policy Index (4)	4.67	-2.22	-4.04	-7.90	N/A	N/A
PSERS Absolute Return Portfolios	4.85	3.34	4.20	5.01	N/A	N/A
Absolute Return Policy Index (5)	5.34	4.62	5.02	6.40	N/A	N/A
PSERS Risk Parity Portfolios (11)	6.76	4.60	6.02	N/A	N/A	N/A
Risk Parity Policy Index (6)	6.11	5.68	6.40	N/A	N/A	N/A
PSERS Master Limited Partnership (MLP) Portfolios	0.27	-5.31	0.73	N/A	N/A	N/A
Standard & Poor's MLP Index	-1.76	-6.32	-3.03	N/A	N/A	N/A
PSERS Infrastructure Portfolios	1.39	N/A	N/A	N/A	N/A	N/A
Infrastructure Policy Index*	0.53	N/A	N/A	N/A	N/A	N/A
PSERS Real Estate (7) (10)	13.63	10.26	12.02	2.50	8.48	8.52
Blended Real Estate Index (8)	12.80	9.69	11.20	6.40	9.22	9.47
PSERS Alternative Investments (7)	16.26	11.21	10.03	7.48	12.87	10.31
Burgiss Median Return, Vintage Year Weighted (9)	15.87	11.47	12.41	8.71	8.82	6.15

*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 87 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 9.3%. The following asset classes generated solid returns this past fiscal year:

- Private Real Estate, as represented by Burgiss (Lagged) – Opportunistic and Burgiss (Lagged) – Value Added, were both up 15.8%.
- Public Equity, as represented by the MSCI ACWI IMI with USA Gross Index (net), was up 11.5%. Returns in global equities were driven by the prospects of US tax cuts and strong corporate and economic fundamentals.
- Commodities, as represented by the Bloomberg Commodity Index Total Return, were up 7.3%. Returns were supported by increased oil prices on the back of strong global growth and a supportive supply-demand balance.

Significant detractors from performance this past fiscal year included:

- U.S. Core Fixed Income, as represented by the Bloomberg Barclays U.S. Aggregate Index, were down -0.4%. Returns were driven by rising interest rates in the U.S.
- U.S. Long Treasuries, as represented by the Bloomberg Barclays U.S. Treasury Long Index, were down -0.1%. Returns in long-term treasuries were driven by rising interest rates.

As noted, one of the best performing asset classes this past fiscal year was public equity, which was up over 11%. Public equity is also one of the most volatile asset classes as illustrated by its return in fiscal year 2016, -4.97%. This illustrates the importance of diversification. Many investment professionals discuss diversification using terms such as standard deviation, correlation, and covariance. 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 high yield strategies all provided return enhancement and diversification benefits in FY 2018. Diversification into asset classes such as U.S. long treasuries and absolute

return 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 1.75 for the 5 year period ending June 30, 2018, a top 15th percentile score.

The fiscal year continued a recent trend of strong performance but with volatility introduced into the markets, with the VIX peaking in the mid 30's during February. Global equities advanced steadily higher throughout the 12 month period to June 2018 with the MSCI ACWI IMI with USA Gross Index (net) returning 11.5%. The strong equity performance came despite uncertainties created by increasing political risks. Concerns over the health of the Chinese economy resurfaced, new political parties engendered fears of a potential Italian exit from the European Monetary Union, and the US administration set out plans for rebalancing global trade with the imposition of tariffs on members of NAFTA, the European Union and in particular, China. Equity markets were driven by the prospects of US tax cuts and strong corporate and economic fundamentals.

Major central bank policy continued to diverge over the period, the US Federal Reserve (Fed) has been tightening monetary policy at a faster rate than its peers with an additional 25 basis point (bp) rate hike in June and reaching 1.75-2.00%. In the UK, the Monetary Policy Committee (MPC) decided to refrain from tightening policy citing weak domestic economic data. Meanwhile, the European Central Bank (ECB) announced that its quantitative easing program would end in December 2018 while also insisting that any tightening to conventional monetary policy would only take place in the second half of 2019. Within Asia, the People's Bank of China (PBoC) loosened monetary policy as it cut the reserve requirement ratio – the proportion of deposits required to be held as central bank reserves. Commodity prices were positive over the 12 months ended June 2018. Crude oil prices have risen on the back of strong global growth and a supportive supply-demand balance. The reintroduction of US sanctions against Iran and imposition of additional sanctions on Venezuela provided additional support to crude oil prices with the price of WTI crude oil increasing by 61% over the past 12 months to US\$74.13/bbl.

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

**Performance
(continued)**

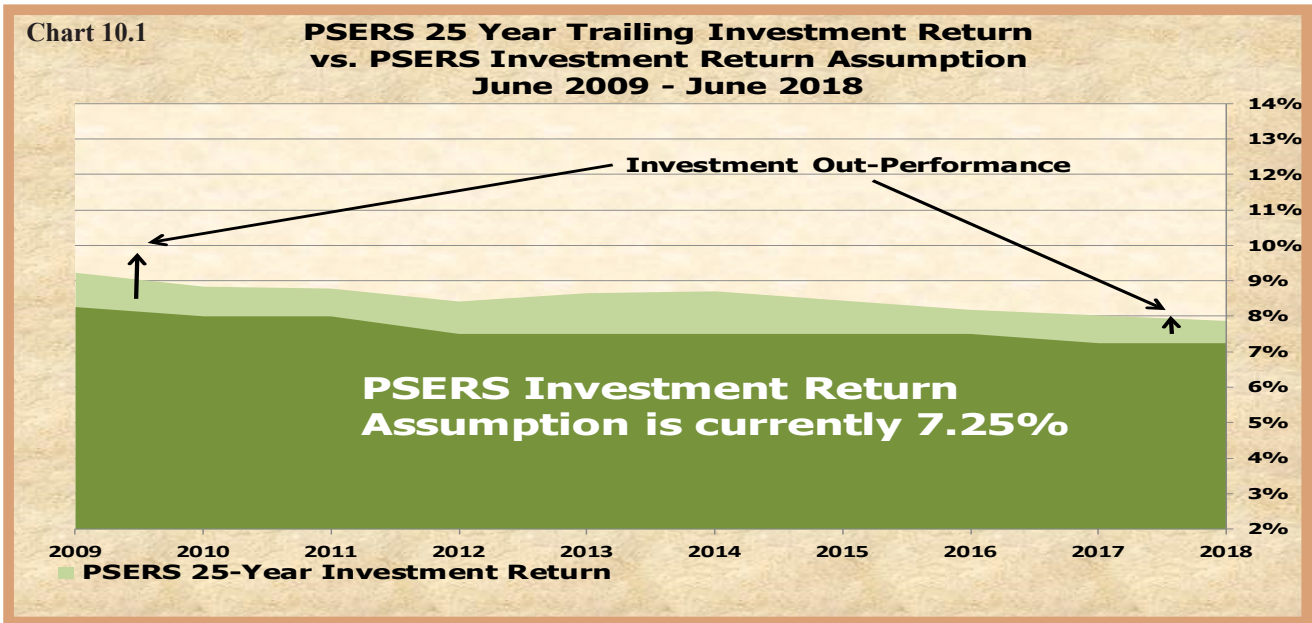
cash rates below 2%, the System needs to take prudent risks to achieve its long-term goal of a 7.25% return. An important concept to remember from the last sentence is “long-term.” The System has built a diversified allocation to allow it to collect risk premiums over the long-term. In the short-term, 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 and high yield did this past fiscal year, and expects some to not do as well, such as U.S. Long Treasuries 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.

Performance
(continued)

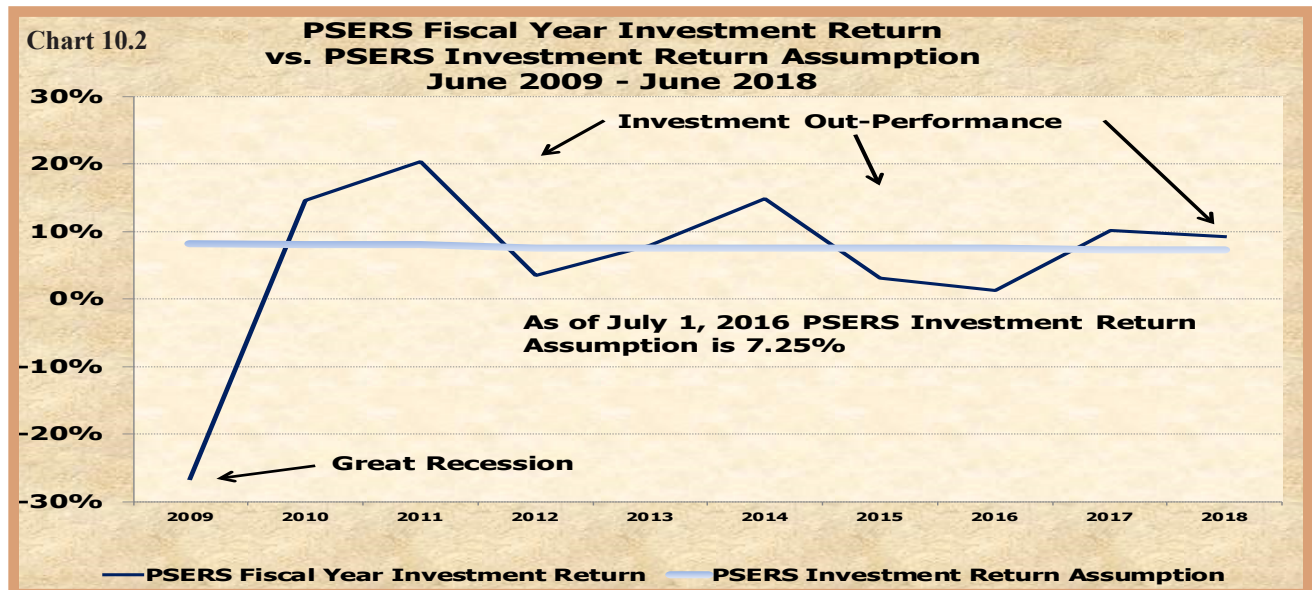
Long Term Investment Performance Consistently Outperforms

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 six 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 19 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$2.35 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>
2018	\$ 468	1.32 %	\$ 661	\$ 2.41
2017	474	1.75 %	800	2.69
2016	416	(1.78)%	(853)	(1.05)
2015	455	(0.04)%	(31)	0.93
2014	482	0.55 %	240	1.50
2013	558	1.28 %	590	2.06
2012	481	1.10 %	521	2.08
2011	515	1.02 %	416	1.81
2010	522	2.20 %	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	2.36 %	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
Total	<u>\$ 6,768</u>		<u>\$ 9,134</u>	<u>\$ 2.35</u>

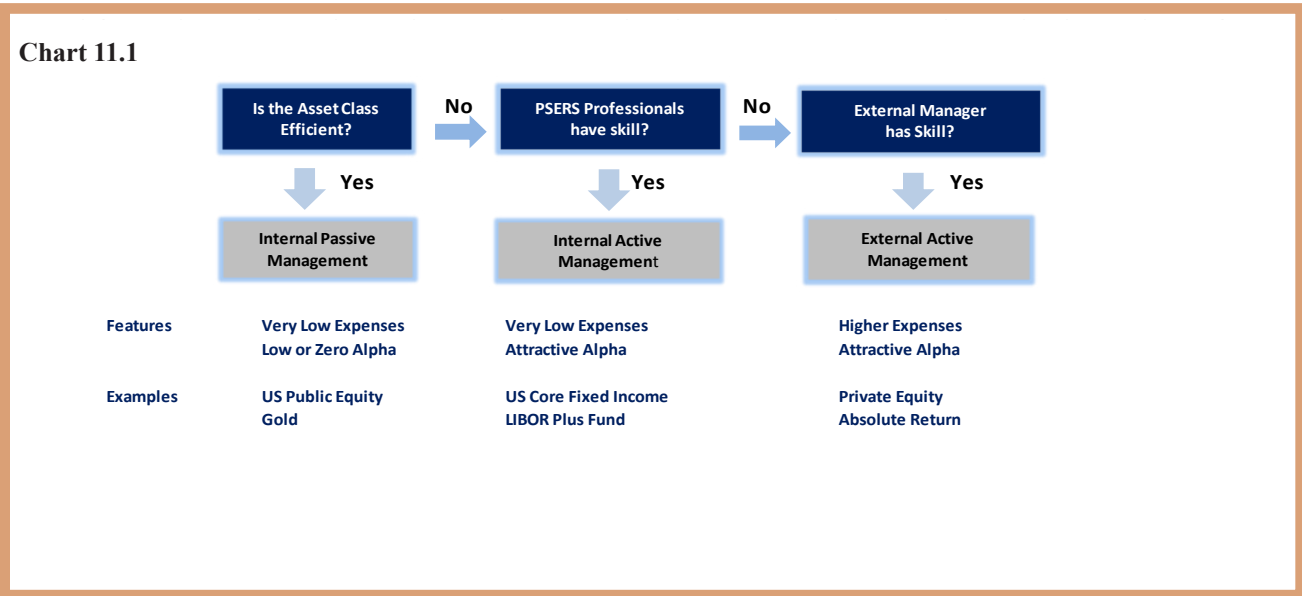
*Dollar amounts in millions.



This page intentionally left blank

Managing Investment Fees and Expenses

PSERS’ professionals annually formulate an Asset Allocation Policy (as more fully described in Tab 9) with input from 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. The Board reviews and approves the long-term asset allocation targets of the System annually. A fundamental part of this implementation process is making key decisions with regard to use of active or passive strategies implemented by internal professionals or external investment managers, as depicted in Chart 11.1.



Management of investment fees and expenses is integrated into the process of making these key decisions, so analysis of these costs must also occur within this context. If one assumes that, under PSERS’ Asset Allocation Policy, all of PSERS’ investments could be made in a passive manner resulting in negligible fees and expenses while earning investment returns equal to the Policy Benchmark, then one can also assume that all of PSERS’ actual investment fees and expenses are incurred with the goal of earning investment returns that exceed the Policy Benchmark (of course, as the prudent investor realizes, not all investments can be made in passive strategies, not all passive strategies have low fees, and not all passive strategies deliver the market returns targeted). These assumptions allow PSERS to analyze how much excess investment return above the Policy Benchmark the System has been able to generate over time for the level of fees and expenses actually paid.

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

Managing Investment Fees and Expenses

(continued)

Chart 11.2 below demonstrates that over the past 19 fiscal years, PSERS has earned \$8.3 billion in additional investment returns above the Board-approved Policy Index, net of fees.

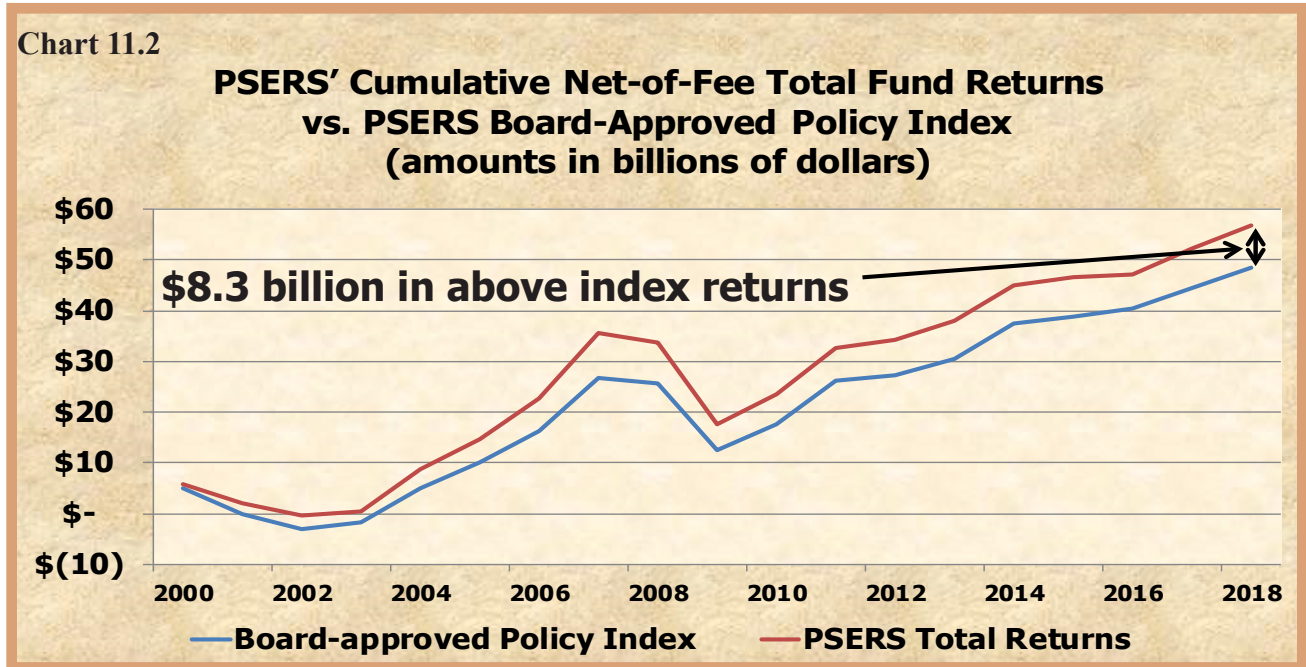
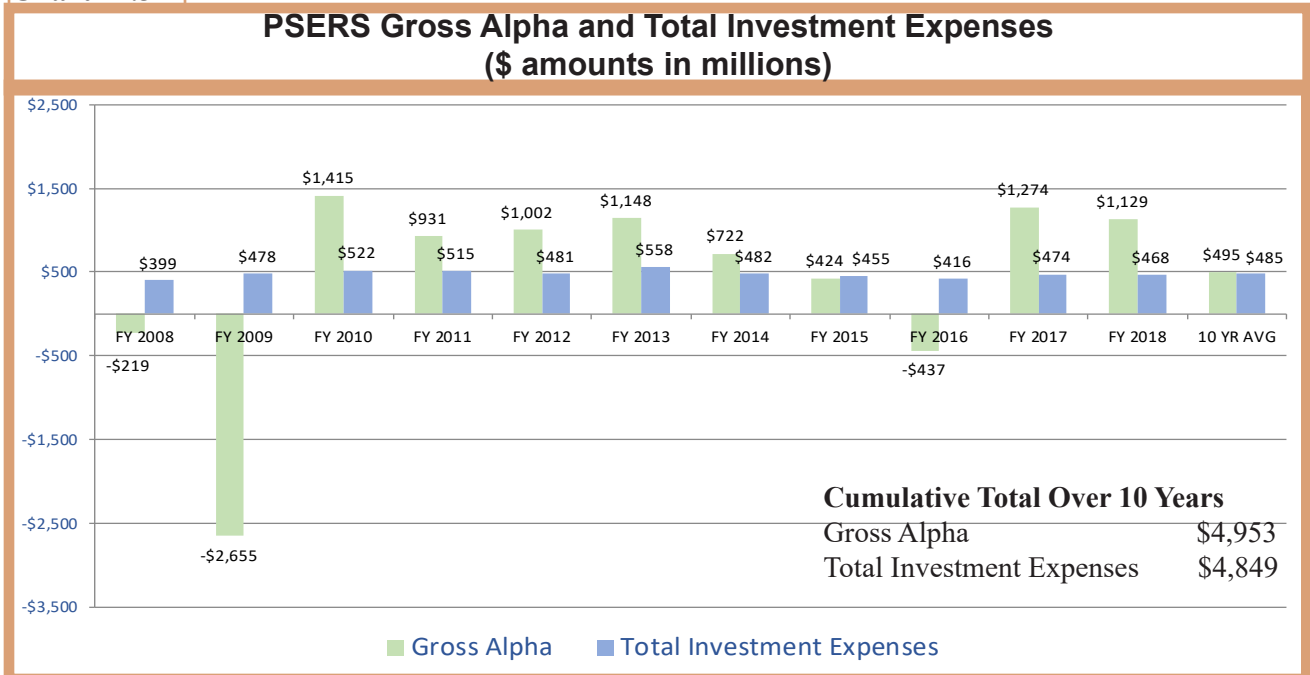


Chart 11.3 shows that PSERS has earned \$1,129 in gross alpha during fiscal year 2018, or \$2.41 of gross alpha for every \$1 of total investment expenses. Over the last ten years PSERS has earned \$4,953 million in gross alpha, or \$1.02 in gross alpha for every \$1 spent on total investment expenses.

Chart 11.3



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

Section 3 - Investment Information

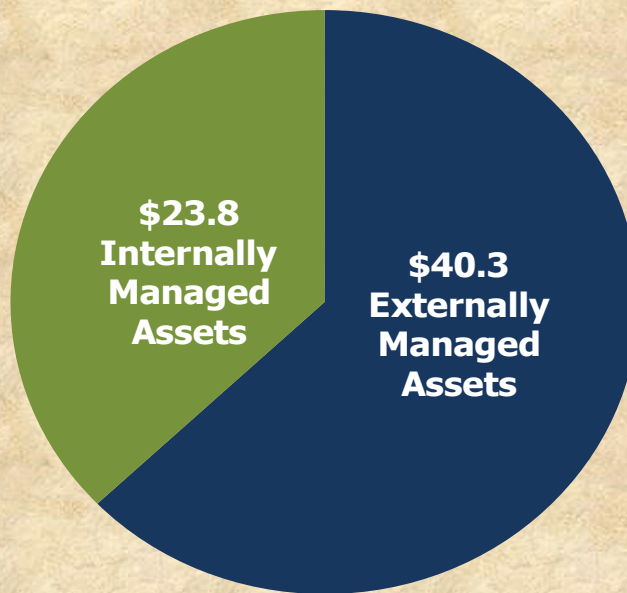
Key Decision: Internal vs. External Investment Management

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, 2018.

Chart 11.4 **PSERS' Asset Exposures under Management as of June 30, 2018 (\$ Billions)**



Note: Financing represents a negative \$9.2 billion allocation exposure and is not reflected in Chart 11.4.

Section 3 - Investment Information

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

PSERS' Investment staff managed 19 portfolios internally, with a total estimated net asset value of over \$23 billion on June 30, 2018, resulting in significant fee savings. For the entire fiscal year, PSERS incurred costs of approximately \$14 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 \$43 million in additional fees:

<i>Account</i>	<i>Asset Class</i>	<i>Market Value as of 6/30/18* (000s)</i>	<i>Estimated Annual Fee %</i>	<i>Estimated Cost to Manage Externally (000s)</i>
PSERS - S&P 500 Index	U.S. Equities	\$3,124,356	0.01%	\$312
PSERS - S&P 400 Index	U.S. Equities	545,220	0.03%	164
PSERS - S&P 600 Index	U.S. Equities	567,573	0.04%	227
Misc. PSERS Equity Accounts	U.S. Equities	45,554	0.00%	-
	U.S. Equities Total	4,282,703		703
PSERS ACWI ex. U.S. Index	Non U.S. Equities	3,152,720	0.08%	2,522
	Non U.S. Equities Total	3,152,720		2,522
Private Markets Co-Investments	Private Markets	493,983	1.38%	6,817
PA Investment Fund - Private Equity.	Private Markets	3,778	1.38%	52
	Private Markets Total	497,761		6,869
Special Situations Internal	Fixed Income	41,646	1.00%	416
PSERS Active Aggregate	Fixed Income	1,243,914	0.21%	2,612
PSERS TIPS Portfolio	Fixed Income	1,943,835	0.13%	2,527
PSERS Long Treasuries	Fixed Income	1,778,897	0.18%	3,202
	Fixed Income Total	5,008,292		8,758
PSERS Infrastructure Index	Infrastructure	1,034,990	0.50%	5,175
	Infrastructure Total	1,034,990		5,175
PSERS Commodity Beta	Commodities	1,748,381	0.15%	2,623
PSERS Gold Fund	Commodities	1,700,000	0.15%	2,550
	Commodities Total	3,448,381		5,173
PSERS S&P MLP Index	MLP	476,238	0.50%	2,381
	MLP Total	476,238		2,381
PSERS REIT Index	Real Estate	454,734	0.08%	364
Real Estate Co-Investments	Real Estate	116,518	0.49%	565
	Real Estate Total	571,252		929
PSERS Risk Parity	Risk Parity	2,811,232	0.30%	8,434
	Risk Parity Total	2,811,232		8,434
PSERS Cash Management	Cash Management	2,489,293	0.10%	2,489
	Cash Management Total	2,489,293		2,489
	Grand Total	<u>\$23,772,862</u>		<u>\$43,433</u>

**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 PSERS' investment professional 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.

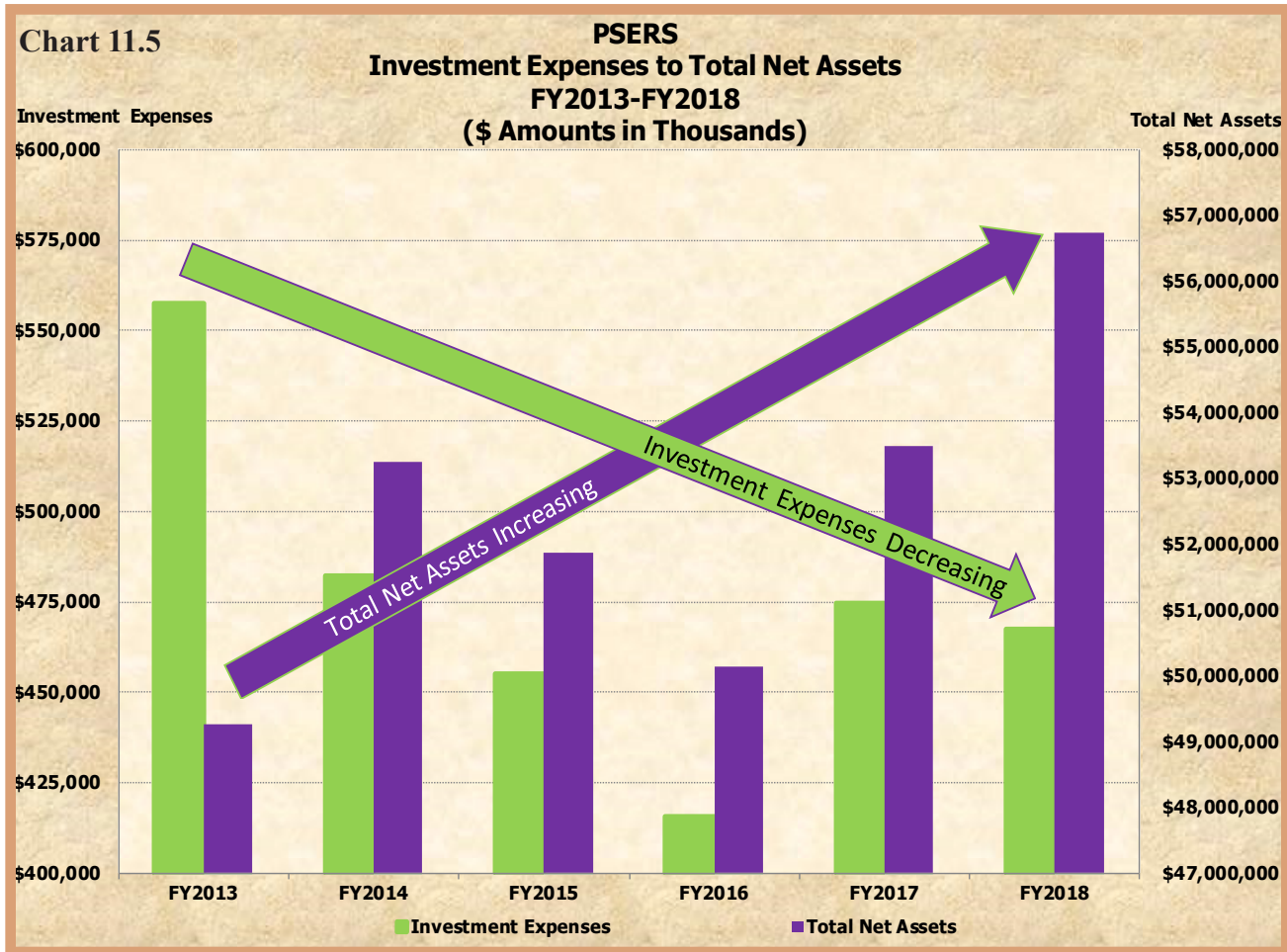
Section 3 - Investment Information

Table 11.2 summarizes total investment expenses for the fiscal year ended June 30, 2018. “Total External Management” includes all fees paid to external investment managers as either a base fee or a share of profits earned (performance fee). “Total Internal Management” includes all staff salaries related to PSERS’ Investment Office as well as costs needed to support their work (e.g., vendor services, hardware and software, office supplies). “Total Other Expenses” include fees paid to the custodian bank, consultants, and legal services providers.

Table 11.2 Summary of Investment Advisory Fees				
Fiscal Year Ended June 30, 2018				
(Dollar Amounts in Thousands)				
	<u>Base Fees</u>	<u>Performance Fees</u>	<u>Total Fees</u>	<u>Basis Points</u>
External Management				
U.S. Equity	\$ 1,479	\$ 572	\$ 2,051	59
Non - U.S. Equity	22,220	6,144	28,364	30
Fixed Income	98,076	12,594	110,670	88
Real Estate	49,640	-	49,640	101
Alternative Investments	98,176	-	98,176	141
Absolute Return	83,243	32,086	115,329	216
Commodities	5,534	4,449	9,983	126
Master Limited Partnerships	7,887	987	8,874	48
Infrastructure	<u>1,707</u>	--	1,707	173
Risk Parity	<u>20,372</u>	<u>1,862</u>	<u>22,234</u>	81
Total External Management	\$ 388,334	\$ 58,694	\$ 447,028	113
Total Internal Management			<u>14,474</u>	6
Total Investment Management			461,502	73
Custodian Fees			2,268	
Consultant and Legal Fees			<u>3,942</u>	
Total Other Expenses			<u>6,210</u>	
Total Investment Expenses			\$ <u>467,712</u>	74

Section 3 - Investment Information

Increasing the number and size of portfolios managed internally has been a core initiative in reducing PSERS' Total Investment Expenses in recent years. As Chart 11.5 illustrates, Total External Management fees have decreased from \$558 million in Fiscal Year 2013 to \$468 million in Fiscal Year 2018, while Total Net Assets have increased from \$49.3 billion to \$56.7 billion. 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.



Section 3 - Investment Information

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

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>U.S. Equity</u>	
Radcliffe Capital Management, L.P.	\$ 2,051
Total - U.S. Equity	2,051
<u>Non - U.S. Equity</u>	
Acadian Asset Management, LLC	1,143
Baillie Gifford Overseas Ltd.	4,481
BlackRock Financial Management, Inc.	4,500
BlackRock Institutional Trust Company, N.A.	5,103
Fidelity Institutional Asset Management LLC	284
Marathon Asset Management Limited	3,680
Oberweis Asset Management, Inc.	1,863
Pareto Investment Management, Ltd.	1,150
QS Batterymarch Financial Management, Inc.	738
Wasatch Advisors, Inc.	5,422
Total - Non - U.S. Equity	28,364
<u>Fixed Income</u>	
AllianceBernstein L.P.	270
Apollo European Principal Finance Fund II (Dollar A), L.P.	1,406
Apollo European Principal Finance Fund III (Dollar A), L.P.	2,374
Avenue Energy Opportunities Fund, L.P.	2,000
Avenue Energy Opportunities Fund II, L.P.	218
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,527
Bain Capital Credit Managed Account (PSERS), L.P.	1,877
Bain Capital Distressed and Special Situations 2013 (A), L.P.	1,144
Bain Capital Distressed and Special Situations 2016 (A), L.P.	1,655
Bain Capital Middle Market Credit 2010, L.P.	249
Bain Capital Middle Market Credit 2014, L.P.	1,789
BlackRock Financial Management, Inc.	11,884
Bridgewater Associates, L.P.	23,488
Brigade Capital Management, LLC	7,443
Capula Investment Management, LLP	872
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	2,964
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,474
Cerberus Levered Loan Opportunities Fund I, L.P.	123
Cerberus Levered Loan Opportunities Fund II, L.P.	1,680

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Fixed Income (continued)</u>	
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	\$ 6,385
Galton Onshore Mortgage Recovery Fund III, L.P.	769
Galton Onshore Mortgage Recovery Fund IV, L.P.	160
Garda Capital Partners, L.P.	5,825
Hayfin SOF II USD Co-Invest, L.P.	30
Hayfin SOF II USD, L.P.	1,201
Hayfin Special Opportunities Credit Fund (Parallel), L.P.	1,589
ICG Europe Fund V, L.P.	1,384
ICG Europe Fund VI, L.P.	1,643
International Infrastructure Finance Company, L.P.	1,060
Latitude Management Real Estate Capital IV, Inc.	743
LBC Credit Partners II, L.P.	622
LBC Credit Partners III, L.P.	2,522
LBC-PSERS Credit Fund, L.P.	2,820
Mariner Investment Group, LLC	1,330
Oaktree Loan Fund 2X, L.P.	12
Pacific Investment Management Company (PIMCO)	1,862
Park Square - PSERS Credit Opportunities Fund, L.P.	2,638
Penn Mutual Asset Management, LLC	216
PIMCO BRAVO Fund III Onshore Feeder, L.P.	446
Pugh Capital Management, Inc.	201
PSERS TAO Partners Parallel Fund, L.P.	2,970
Radcliffe Capital Management, L.P.	878
Sankaty Credit Opportunities IV, L.P.	1,108
SEI Investments Company	739
Templeton Investment Counsel, LLC	1,821
TOP NPL (A), L.P.	163
TPG Opportunities Partners II (A), L.P.	364
TPG Opportunities Partners III (A), L.P.	2,198
Varde Scratch and Dent Feeder I-A, L.P. (The)	892
Varde Scratch and Dent Fund, L.P. (The)	<u>1,642</u>
Total - Fixed Income	110,670
<u>Real Estate-Direct Ownership</u>	
Charter Oak Advisors, Inc.	1,204
GF Management, Inc.	131
Grosvenor Investment Management U.S., Inc.	51
L & B Realty Advisors, LLP.	<u>55</u>
Subtotal - Real Estate-Direct Ownership	1,441

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
Real Estate-Partnerships/Funds	
AG Core Plus Realty Fund III, L.P.	\$ 341
AG Core Plus Realty Fund IV, L.P.	695
Almanac Realty Securities V, L.P.	150
Almanac Realty Securities VI, L.P.	280
Almanac Realty Securities VII, L.P.	1,068
AREFIN Co-Invest / Apollo Real Estate Finance Corp.	189
Ares European Real Estate Fund III, L.P.	252
Ares European Real Estate Fund IV, L.P.	1,124
Ares U.S. Real Estate Fund VII L.P.	312
Ares U.S. Real Estate Fund VIII, L.P.	923
Ares U.S. Real Estate Fund IX, L.P.	501
Avenue Real Estate Fund Parallel, L.P.	849
Bell Institutional Fund IV, LLC	392
Bell Institutional Fund V, LLC	895
Bell Institutional Fund VI, L.P.	965
BlackRock Asia Property Fund III, L.P.	18
BlackRock Europe Property Fund III, L.P.	2
Blackstone Real Estate Debt Strategies II, L.P.	379
Blackstone Real Estate Debt Strategies III, L.P.	944
Blackstone Real Estate Partners Europe III, L.P.	1,170
Blackstone Real Estate Partners Europe IV, L.P.	972
Blackstone Real Estate Partners VI.TE.1, L.P.	525
Blackstone Real Estate Partners VII.TE.2, L.P.	2,226
Blackstone Real Estate Partners VIII, L.P.	3,770
BPG Co-Investment Partnership L.P.	5
Brookfield Strategic Real Estate Partners, L.P.	1,564
Brookfield Strategic Real Estate Partners,II, L.P.	2,377
Cabot Industrial Core Fund	678
Cabot Industrial Value Fund IV, L.P.	518
Cabot Industrial Value Fund V, L.P.	750
Carlyle Real Estate Fund IV L.P.	53
Carlyle Real Estate Fund V L.P.	660
Carlyle Real Estate Fund VI L.P.	237
Carlyle Real Estate Fund VII L.P.	900
Carlyle Real Estate Fund VIII L.P.	1,373

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
Real Estate-Partnerships/Funds (continued)	
DRA Growth and Income Fund IX, LLC	\$ 857
DRA Growth and Income Fund VI, L.P.	158
DRA Growth and Income Fund VII, L.P.	1,158
DRA Growth and Income Fund VIII, L.P.	1,927
Exeter Core Industrial Club Fund II, L.P.	325
Exeter Industrial Value Fund II, L.P.	68
Exeter Industrial Value Fund III, L.P.	735
Exeter Industrial Value Fund IV, L.P.	1,150
Fortress Investment Fund IV, L.P.	255
Fortress Investment Fund V (Fund A), L.P.	1,248
JPMCB Strategic Property Fund	211
Latitude Management Real Estate Capital III, Inc.	876
LEM Multifamily Senior Equity Fund IV, L.P.	844
LEM RE High Yield Debt & Preferred Equity Fund III, L.P.	501
LEM Real Estate Mezzanine Fund II, L.P.	75
Pramerica Real Estate Capital VI, L.P.	650
PRISA	987
RCG Longview Debt Fund IV, L.P.	20
RCG Longview Debt Fund V, L.P.	440
RCG Longview Debt Fund VI, L.P.	1,125
RCG Longview Equity Fund, L.P.	69
Senior Housing Partnership Fund IV, L.P.	637
Senior Housing Partnership Fund V, L.P.	1,017
Silverpeak/PSERS Real Estate, L.P.	84
Stockbridge Real Estate Fund, L.P.	2,653
Stockbridge Real Estate Fund II, L.P.	189
Stockbridge Real Estate Fund III, L.P.	581
Strategic Partners Fund IV RE, L.P.	118
UBS (US) Trumbull Property Fund, L.P.	813
Subtotal - Real Estate-Partnerships/Funds	47,828

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Farmland</u>	
Prudential Agricultural Group	\$ 371
Subtotal - Real Estate-Farmland	371
Total Real Estate	49,640
<u>Private Equity</u>	
Actis Emerging Markets 3, L.P.	1,406
Actis Global 4, L.P.	1,468
Bain Capital Asia Fund II, L.P.	861
Bain Capital Asia Fund III, L.P.	2,600
Bain Capital XI, L.P.	1,243
Bain Capital XII, L.P.	1,563
Baring Asia Private Equity Fund III, L.P.	406
Baring Asia Private Equity Fund IV, L.P.	1,872
Baring Asia Private Equity Fund V, L.P.	2,794
Baring Asia Private Equity Fund VI, L.P.	1,486
Blue Point Capital Partners II (B), L.P.	157
Blue Point Capital Partners III (B), L.P.	486
Bridgepoint Development Capital III, L.P.	1,047
Bridgepoint Europe IV, L.P.	1,724
Bridgepoint Europe V, L.P.	2,625
Capital International Private Equity Fund V, L.P.	524
Capital International Private Equity Fund VI, L.P.	617
Catterton Growth Partners, L.P.	725
Catterton Growth Partners II, L.P.	1,109
Catterton Growth Partners III, L.P.	1,951
Catterton Partners V, L.P.	48
Catterton Partners VI, L.P.	1,101
Catterton Partners VII, L.P.	1,617
Catterton VIII, L.P.	1,940
Cinven Fund (Fifth), L.P. (The)	976
Cinven Fund (Sixth), L.P. (The)	1,258
Coller International Partners VI, L.P.	961
Coller International Partners VII, L.P.	1,500
Crestview Partners, L.P.	265
Crestview Partners II (PF), L.P.	1,302
Crestview Partners III, L.P.	894

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
 (continued)

<u>Manager</u>	<u>Total Fees</u>
Private Equity (continued)	
CVC Capital Partners Asia III Pacific, L.P.	\$ 356
CVC European Equity Partners V (A), L.P.	284
DCPF VI Oil and Gas Co-Investment Fund, L.P.	95
Denham Commodity Partners Fund VI, L.P.	588
Energy & Mineral Group Fund III, L.P.	1,281
Equistone Partners Europe Fund V E, L.P.	1,360
Evergreen Pacific Partners II, L.P.	156
First Reserve Fund XII, L.P.	1,100
GoldPoint Partners Co-Investment V, L.P.	458
HgCapital 7, L.P.	1,342
HgCapital 8 D, L.P.	541
HGGC Fund II, L.P.	887
HGGC Fund III, L.P.	218
Incline Equity Partners III, L.P.	1,087
Irving Place Capital Partners III, L.P.	464
Landmark Equity Partners XIII, L.P.	267
Landmark Equity Partners XIV, L.P.	1,014
Milestone Partners III, L.P.	346
New Mountain Partners IV, L.P.	48
New Mountain Partners V, L.P.	1,825
New York Life Capital Partners III-A, L.P.	182
New York Life Capital Partners IV-A, L.P.	158
NGP Natural Resources X, L.P.	845
NGP Natural Resources XI, L.P.	1,413
North Haven PE Asia Fund IV, L.P. (Morgan Stanley)	1,484
Odyssey Investment Partners Fund V, L.P.	1,478
Orchid Asia V, L.P.	172
Orchid Asia VI, L.P.	1,464
PAI Europe V, L.P.	275
PAI Europe VI, L.P.	882
Palladium Equity Partners IV, L.P.	515
Partners Group Secondary 2008, L.P.	1,512
Partners Group Secondary 2011, L.P.	1,491
Partners Group Secondary 2015 (USD) A, L.P.	1,530
Platinum Equity Capital Partners IV, L.P.	86
StepStone International Investors III, L.P.	558

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Equity (continued)</u>	
Strategic Partners III-B, L.P.	\$ 500
Strategic Partners IV, L.P.	177
Strategic Partners V, L.P.	487
Strategic Partners VI, L.P.	826
Strategic Partners Fund VII, L.P.	1,250
Trilantic Capital Partners IV, L.P.	74
Trilantic Capital Partners V, L.P.	<u>1,230</u>
Subtotal - Private Equity	70,832
<u>Special Situations</u>	
Apollo Investment Fund VIII, L.P.	1,107
Avenue Special Situations Fund VI, L.P.	15
Cerberus Institutional Partners, L.P. (Series Four)	411
Cerberus Institutional Partners V, L.P.	1,083
Cerberus Institutional Partners VI, L.P.	2,616
Clearlake Capital Partners IV, L.P.	759
Clearlake Capital Partners V, L.P.	391
NYLIM Mezzanine Partners Parallel Fund II, L.P.	24
OCM Opportunities Fund VII, L.P.	143
OCM Opportunities Fund VII-B, L.P.	280
Searchlight Capital II, L.P.	1,480
Venor Special Situations Fund II, L.P.	1,068
Versa Capital Fund, L.P.	74
Versa Capital Fund II, L.P.	1,774
Windjammer Senior Equity Fund IV, L.P.	<u>1,060</u>
Subtotal - Special Situations	12,285
<u>Venture Capital</u>	
Aisling Capital III, L.P.	244
Aisling Capital IV, L.P.	858
Co-Investment Fund II, L.P. (The)	955
Insight Venture Partners X, L.P.	953
LLR Equity Partners III, L.P.	1,139
LLR Equity Partners IV, L.P.	2,474
LLR Equity Partners V, L.P.	1,955
Psilos Group Partners III, L.P.	252
Quaker BioVentures II, L.P.	782

Section 3 - Investment Information

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2018
(Dollar Amounts in Thousands)

(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Venture Capital (continued)</u>	
Starvest Partners II, L.P.	\$ 352
Strategic Partners IV VC, L.P.	145
Summit Partners Growth Equity Fund VIII, L.P.	1,401
Tenaya Capital V-P, L.P.	710
Tenaya Capital VI, L.P.	839
Tenaya Capital VII, L.P.	<u>2,000</u>
Subtotal - Venture Capital	15,059
Total Alternative Investments	98,176
<u>Absolute Return</u>	
Aeolus Capital Management Ltd.	5,017
BlackRock Financial Management, Inc.	9,572
Bridgewater Associates, Inc.	23,139
Brigade Capital Management, LLC	4,205
Capula Global Relative Value Fund	11,081
Capula Tail Risk Fund	6,074
Caspian Keystone Focused Fund, Ltd.	187
Caspian Select Credit International Fund	4,352
Garda Capital Partners, L.P.	9,088
Independence Reinsurance Partners GP, LLC	1,370
Nephila Capital Ltd.	2,635
Nimbus Weather Fund	2,598
Oceanwood Opportunities Fund	2,058
One William Street Capital Management, L.P.	9,503
Pacific Investment Management Company (PIMCO)	10,764
Perry Partners, L.P.	302
Sciens Aviation Special Opportunities Investment Fund II, L.P.	1,514
Sciens Aviation Special Opportunities Investment Fund III, L.P.	2,270
Sciens Aviation Special Opportunities Investment Fund IV, L.P.	1,930
Two Sigma Risk Premia Enhanced Fund	3,443
Venor Capital Offshore, Ltd.	<u>4,227</u>
Total - Absolute Return	115,329

Section 3 - Investment Information

Table 11.3

Investment Fees by Manager Fiscal Year Ended June 30, 2018 (Dollar Amounts in Thousands)

(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Commodities</u>	
Gresham Investment Management, LLC	\$ 1,019
PIMCO Commodity	7,284
Wellington Management Company, LLP	<u>1,680</u>
Total - Commodities	9,983
<u>Master Limited Partnerships</u>	
Harvest Fund Advisors, LLC	3,634
Salient Capital Advisors, LLC	2,887
Stein Roe Investment Counsel D/B/A Atlantic Trust	<u>2,353</u>
Total - Master Limited Partnerships	8,874
<u>Infrastructure</u>	
International Infrastructure Finance Company II, L.P.	370
GCM Grosvenor Customized Infrastructure Strategies II, L.P.	622
Strategic Partners Real Assets, II, L.P.	<u>715</u>
Total - Infrastructure	1,707
<u>Risk Parity</u>	
BlackRock Institutional Trust Company, N.A.	2,191
Bridgewater All Weather Fund @15%, Ltd.	2,958
Bridgewater Optimal Portfolios, Ltd.	8,237
D.E. Shaw Investment Management, LLC	<u>8,848</u>
Total - Risk Parity	22,234
Total External Management	447,028
Total Internal Management	<u>14,474</u> *
Total Investment Management	<u>\$ 461,502</u>

*Internal Management expenses include salaries and fringe benefits of \$10,422 and operating expenses of \$4,052.

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 professionals. 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 FY2019-20 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.
- Research firms specializing in investment management fee negotiations, considering their credentials, references, past performance in reducing investment management fees for clients, and probable cost effectiveness for PSERS, for possible retention.

Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms (as of June 30, 2018)

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

The Board evaluates external managers based on a variety of factors, including: (1) a unique insight or process; (2) the ability to add long-term excess returns above passive alternatives, net of fees; (3) adequate capacity to execute the strategy; (4) adding diversification to our existing investment structure; (5) not exhibiting style drift, and; (6) exhibiting a high level of ethical behavior. In selecting external managers, PSERS will show preference to Pennsylvania-based potential managers that demonstrate similar strengths to alternative managers without a Pennsylvania nexus.

PSERS has shown a strong commitment to Pennsylvania's financial services industry by having assets managed by firms based in Pennsylvania or by firms with offices in Pennsylvania. In FY 2018, investment management fees paid to external firms managing PSERS' assets from offices located in Pennsylvania amounted to \$ 30.5 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, 2018.

Table 12.1		
Pennsylvania-Based Asset Exposures		
Managed Internally		
(as of June 30, 2018)		
<u>Asset Class</u>	<u>Market Value</u> <u>(in millions)</u>	<u>Percentage of Total</u>
U.S. Equity	\$ 4,282.7	18.0 %
Non-U.S. Equity	3,152.7	13.3
Private Markets	497.8	2.1
Fixed Income	7,497.6	31.5
Master Limited Partnerships	476.2	2.0
Commodities	3,448.4	14.5
Infrastructure	1,035.0	4.4
Real Estate	571.3	2.4
Risk Parity	<u>2,811.2</u>	<u>11.8</u>
Totals	<u>\$ 23,772.9</u>	<u>100.0</u> %

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, 2018.

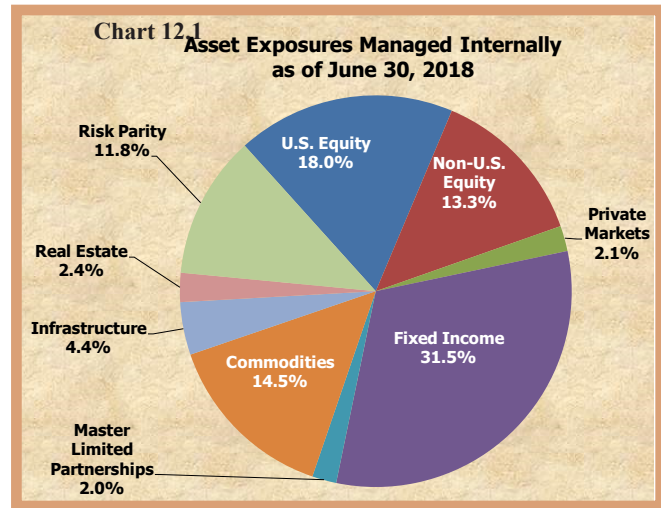


Table 12.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2018.

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

Investments in Pennsylvania-Based Companies (as of June 30, 2018)

Where investment characteristics including yield, risk, and liquidity are equivalent, the Board's policy favors investments that have a positive impact on the economy of Pennsylvania. The Board, in managing the investment portfolio, will also be cognizant of concentration risk to any one region, including Pennsylvania. The Fund will continue to seek investments in Pennsylvania-based companies when the investment characteristics are equivalent to other favorable investments, subject to diversification considerations.

U.S. Equities

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

Fixed Income Securities

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

Private Real Estate

PSERS has investments in limited partnerships that have invested in Pennsylvania real estate properties. PSERS Real Estate program has committed \$17.2 billion to 131 partnerships. From the program inception to June 30, 2018, PSERS has committed capital to 16 partnerships headquartered in Pennsylvania.

Venture Capital

PSERS' Venture Capital program has committed \$3.2 billion to 60 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, 2018, PSERS has committed capital to 30 partnerships headquartered in Pennsylvania.

Private Equity

PSERS' Private Equity program has committed \$21.8 billion to 164 partnerships. From the program inception to June 30, 2018, PSERS has committed capital to 8 partnerships headquartered in Pennsylvania.

Special Situations

PSERS' Special Situations program has committed \$5.5 billion to 36 partnerships. From the program inception to June 30, 2018, 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, 2018, PSERS has invested \$75.9 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, 2018 (\$'s in millions):

Table 12.3 Statistics of Pennsylvania-Based Investments				
<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	\$ 141.0	\$ 141.0	*	\$ *
Fixed Income	74.9	74.9	*	*
Private Real Estate	81.3	1,087.2	227	7.0
Private Markets:				
Venture Capital	151.6	923.2	2,318	78.0
Private Equity	1,418.7	23,316.5	34,078	497.6
Special Situations	<u>313.1</u>	<u>11,601.0</u>	<u>10,015</u>	<u>71.1</u>
Total	\$ <u>2,180.6</u>	\$ <u>37,143.8</u>	<u>46,638</u>	\$ <u>653.7</u>

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

PSERS Budget Report

Fiscal Year 2019-2020



Pennsylvania Public School Employees' Retirement System

SECTION 4 - PSERS POSTEMPLOYMENT HEALTHCARE PROGRAMS

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



This page intentionally left blank

Section 4 - Other PSERS Programs

Health Options Program

Pursuant to Sec. 8502.2 PSERS sponsors a group health insurance program called the Health Options Program (HOP) for individuals who are annuitants or survivor annuitants or the spouse or dependents of an annuitant or survivor annuitant. The HOP commenced on January 1, 1994. As of January 1, 2019 there are 117,728 participations (99,164 retirees plus their dependents) in the Health Options Program. The HOP is funded solely by and for eligible participants. The following is a summary of HOP initiatives during the period January 1, 2018 to January 1, 2019.

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, 2019. 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 Proposal (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 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 Retirement Board issued a Request for Proposal (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 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	2018	2019
Deductible	\$ 405	\$ 415
Initial Coverage Limit	3,750	3,820
Out-of-Pocket Threshold	5,000	5,100
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit:		
Generic	\$ 3.35	\$ 3.40
Other	8.35	8.50

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

Section 4 - Other PSERS Programs

Health Options Program

(continued)

Medicare prescription drug plans are required to provide 44% coverage for generic drugs in the Coverage Gap for 2018, and 37% in 2019. There is effectively no additional funding from CMS; accordingly, the cost of the mandated benefit increase is paid by participants not receiving low-income subsidies. Recent legislation accelerated the Brand drug closure, and Medicare prescription drug plans will pay 25% of the cost of brand drugs in the Coverage Gap beginning in 2019. The following table shows how much members pay for drugs in the Coverage Gap:

The Member Pays in Coverage Gap:	2018 Medicare Rx Option	2019 Medicare Rx Option
Generic Drugs	44%	37%
Brand Drugs	35% (after 50% manufacturer discount and 15% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)
Non-preferred Brand Rx	35% (after 50% manufacturer discount and 15% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)

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 2019 option selection period conducted in the fall of 2018. The following is a list of HOP plans as of January 1, 2019:

For Individuals Eligible for Medicare:	For Individuals Not Eligible for Medicare:
HOP Value Medical Plan (Medicare supplement)	HOP Pre-65 Medical Plan
HOP Medical Plan (Medicare supplement)	
Value Medicare Rx Option (Medicare Part D)	HOP Pre-65 Medical Plan w/ Rx coverage
Basic Medicare Rx Option (Medicare Part D)	
Enhanced Medicare Rx Option (Medicare Part D)	
Medicare Advantage Plans:	Companion Pre-65 Managed Care Plans:
Aetna Medicare V02 PPO	Aetna Premier Open Choice PPO
Capital Blue Cross BlueJourney PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue
Highmark Security Blue HMO Point of Service	
Independence Blue Cross-Keystone 65 HMO (\$5/\$40)	Independence Blue Cross- POS (\$20-\$40/\$250)
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 monthly premium rates for 2019 compared to the 2018 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	2018	2019	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$117	\$117	0 %
Value Medical Plan w/ Value Medicare Rx Option	139	139	0 %
HOP Medical Plan	199	203	2 %
HOP Medical Plan w/ Basic Medicare Rx Option	257	270	5 %
HOP Medical Plan w/ Enhanced Medicare Rx Option	310	328	6 %
Medicare Advantage Plans			
Aetna Medicare V02 PPO (new Active for 2019)	N/A	201	N/A
Highmark FreedomBlue PPO	376	336	(11)%
Independence Blue Cross/Keystone 65 Select HMO (\$5/\$40) (new Active for 2019)	N/A	128	N/A
UPMC for Life HMO	242	237	(2)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO (Previously titled Aetna Medicare 10 Special HMO) ¹	511	509	0 %
Aetna Medicare P01 PPO (Previously titled Aetna Medicare 15 Special PPO) ¹	428	401	(6)%
Independence Blue Cross/Keystone 65 Select HMO ¹	363	374	3 %
IBC's Personal Choice 65 PPO ¹	734	756	3 %

¹Plans not available in all counties.

Section 4 - Other PSERS Programs

Health Options Program

(continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2018	2019	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$ 115	\$ 115	0 %
Value Medical Plan w/ Value Medicare Rx Option	137	137	0 %
HOP Medical Plan	190	194	2 %
HOP Medical Plan w/ Basic Medicare Rx Option	248	261	5 %
HOP Medical Plan w/ Enhanced Medicare Rx Option	301	319	6 %
Medicare Advantage Plans			
Aetna Medicare V02 Plan (new Active for 2019)	N/A	181	N/A
Highmark SecurityBlue HMO - Point of Service	317	248	(22)%
UPMC for Life HMO	242	237	(2)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P01 PPO (new Legacy for 2019) ¹	382	360	(6)%
Aetna Medicare P02 HMO ¹	389	385	(1)%
Highmark FreedomBlue PPO ¹	351	317	(10)%

North & Central Region: (All other counties in Pennsylvania)	2018	2019	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$102	\$ 102	0 %
Value Medical Plan w/ Value Medicare Rx Option	124	124	0 %
HOP Medical Plan	172	175	2 %
HOP Medical Plan w/ Basic Medicare Rx Option	230	242	5 %
HOP Medical Plan w/ Enhanced Medicare Rx Option	283	300	6 %
Medicare Advantage Plans			
Aetna Medicare V02 (new Active for 2019)	N/A	144	N/A
Capital Blue Cross BlueJourney PPO	237	263	11 %
Highmark FreedomBlue PPO	310	243	(22)%
UPMC for Life HMO ¹	242	237	(2)%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare PO2 HMO (Previously titled Aetna Medicare 10 Special HMO) ¹	313	316	1 %
Aetna Medicare P01 PPO (Previously titled Aetna Medicare 15 Special PPO) ¹	267	255	(4)%
Highmark SecurityBlue HMO Point of Service ¹	317	297	(6)%
Capitol Blue Cross BlueJourney HMO ¹	210	198	(6)%

¹Plans not available in all counties.

Section 4 - Other PSERS Programs

Health Options Program

(continued)

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 monthly premium rates for the Medicare Rx Options do not vary by region. Stand-alone prescription drug coverage does not qualify for Premium Assistance.

Medicare Prescription Drug Plans All Regions	2018	2019	Increase/ (Decrease)
Enhanced Medicare Rx Only	\$ 111	\$ 125	13%
Basic Medicare Rx Only	58	67	16%
Value Medicare Rx Only	22	22	0%

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 monthly premium rates for 2019 compared to the 2018 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees.

All Regions	2018	2019	Increase/ (Decrease)
HOP Pre-65 Medical Plan			
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	2018	2019	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO (new Active for 2019)	N/A	\$ 1,261	N/A
Highmark PPOBlue (80-70 plan)	1,189	1,733	46 %
IBC's POS \$20-\$40/\$250 (new Active for 2019)	N/A	1,690	N/A
UPMC Health Plan EPO ¹	1,383	1,383	0 %
Legacy Managed Care Plans (no new enrollments)			
Aetna Value Open Choice PPO (new Legacy for 2019) ¹	1,146	1,146	0 %
Aetna HMO Plan ¹	1,244	1,244	0 %
IBC's Keystone East HMO (new Legacy for 2019) ¹	2,169	1,770	(18)%
IBC's Personal Choice PPO ¹	2,248	1,789	(20)%

¹Plans not available in all counties.

Section 4 - Other PSERS Programs

Health Options Program

(continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2018	2019	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO (new Active for 2019)	N/A	\$ 1,261	N/A
Highmark PPOBlue (80-70 plan)	1,189	1,733	46 %
UPMC Health Plan EPO	1,383	1,383	0 %
Legacy Managed Care Plans (no new enrollments)			
Aetna Value Open Choice PPO (new Legacy for 2019) ¹	1,146	1,146	0 %
Aetna Citizen HMO Plan ¹	1,244	1,244	0 %
Highmark PPOBlue (High Option) ¹	1,618	2,265	40 %

North & Central Region: (All other counties in Pennsylvania)	2018	2019	Increase/ (Decrease)
Managed Care Plans			
Aetna Premier Open Choice PPO (new Active for 2019)	N/A	\$ 1,261	N/A
Capital Blue Cross PPO	1,831	1,264	(31)%
Highmark PPOBlue (80-70)	1,189	1,733	46 %
UPMC Health Plan EPO ¹	1,383	1,383	0 %
Legacy Managed Care Plans (no new participants)			
Aetna Value Open Choice PPO (new Legacy for 2019) ¹	1,146	1,146	0 %
Aetna HMO Plan ¹	1,244	1,244	0 %
Highmark PPOBlue (High Option) ¹	1,618	2,265	40 %
Capital Blue Cross HMO ¹	1,824	1,824	0 %

¹Plans not available in all counties..

Section 4 - Other PSERS Programs

Health Options Program

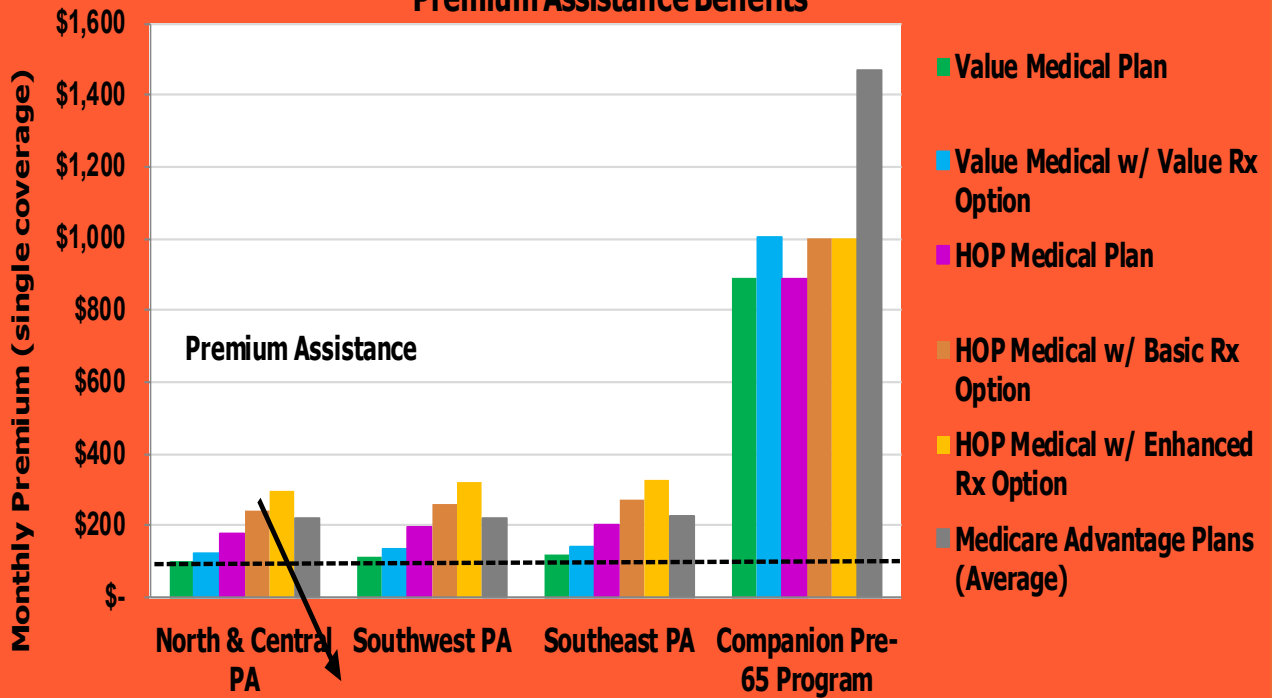
(continued)

HOP Premiums Compared to the PSERS Premium Assistance Benefit

Chart 13.1 displays the HOP monthly premiums paid by PSERS' retirees for single coverage compared with the PSERS Premium Assistance benefit. Participating eligible annuitants are entitled to receive Premium Assistance payments equal to the lesser of \$100 per month or their out-of-pocket monthly health insurance premium. The premiums for 2-person and family coverage would be at least twice the cost of single coverage. Premium Assistance is an offset for the PSERS retiree's premium only.

Chart 13.1

2019 Comparison of HOP Premium Rates & Premium Assistance Benefits



	North & Central PA	Southwest PA	Southeast PA	Companion Pre-65 Program
Value Medical Plan	\$ 102	\$ 115	\$ 117	\$ 889
Value Medical Plan w/ Value Rx Option	124	137	117	1,001
HOP Medical Plan	175	194	203	889
HOP Medical Plan w/ Basic Rx Option	242	261	270	1,001
HOP Medical Plan w/ Enhanced Rx Option	300	319	328	1,001
Medicare Advantage Plans (Average)	222	222	226	1,466
Premium Assistance	100	100	100	100

Section 4 - Other PSERS Programs

Health Options Program

(continued)

HOP Enrollment

As of January 1, 2019 there are 117,728 participants (99,164 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	45,498	54,185
HOP Medical w/ Enhanced Medicare Rx Option	29,630	34,775
HOP Medical w/ Value Medicare Rx Option	1,472	1,626
HOP Medical Plan (no Rx)	8,672	9,647
HOP Enhanced Rx Only	91	114
HOP Basic Rx Only	212	277
HOP Value Rx Only	18	20
HOP Value Medical Only	50	57
HOP Value Medical w/ Enhanced Medicare Rx Option	8	11
HOP Value Medical w/ Basic Medicare Rx Option	28	40
HOP Value Medical w/ Value Medicare Rx Option	175	212
Highmark PPO/Legacy HMO	10,071	12,746
Keystone East HMO/IBC Legacy PPO	825	967
Capital BC PPO/Keystone Central Legacy HMO	706	909
UPMC HMO	983	1,321
91Aetna PPO/Legacy HMO	474	561
Total Medicare Eligible	98,913	117,468
Individuals Not Eligible for Medicare		
HOP Pre-65 Medical Plan w/ Rx Coverage	156	159
HOP Pre-65 Medical Plan	50	52
Highmark PPO	16	16
Capital BC PPO/Keystone Central Legacy HMO	10	11
Keystone East HMO/IBC Legacy PPO	5	5
Aetna PPO/Legacy HMO	14	17
Total Not Eligible for Medicare	251	260
Total in Health Options Program	99,164	117,728

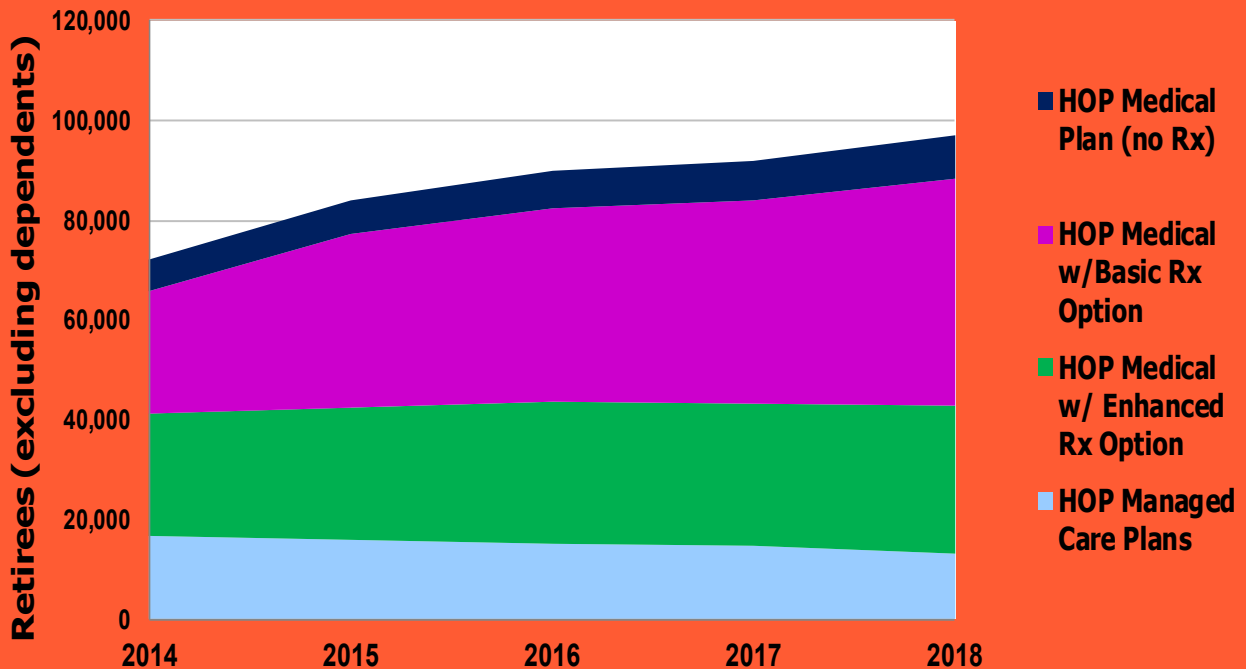
Section 4 - Other PSERS Programs

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 37% over the past 5 years.

Chart 13.2

HOP Enrollment of Retirees Eligible for Medicare



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 \$466.5 million during the 2019 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 2019
Participant Contributions	\$ 395.6
CMS - Medicare Prescription Drug Payments	68.4
Interest Income	2.5
Total	\$ 466.5

Section 4 - Other PSERS Programs

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 82,000 of the 99,164 retirees receive Premium Assistance. This accounts for nearly \$98 million of the \$112 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):

Table 13.2 Benefit Expense	Calendar Year 2019
Self-funded Hospital, Medical & Major Medical Benefits	\$ 206.4
Self-funded Prescription Drug Benefits	173.4
Insured Managed Care and Dental Premiums	74.4
Total	\$ 454.2

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 September 30, 2018, HOP had net assets of \$246.2 million held in trust to pay the expenses of Health Options Program for the exclusive benefit of participants.



This page intentionally left blank

Section 4 - Other PSERS Programs

Premium Assistance Program

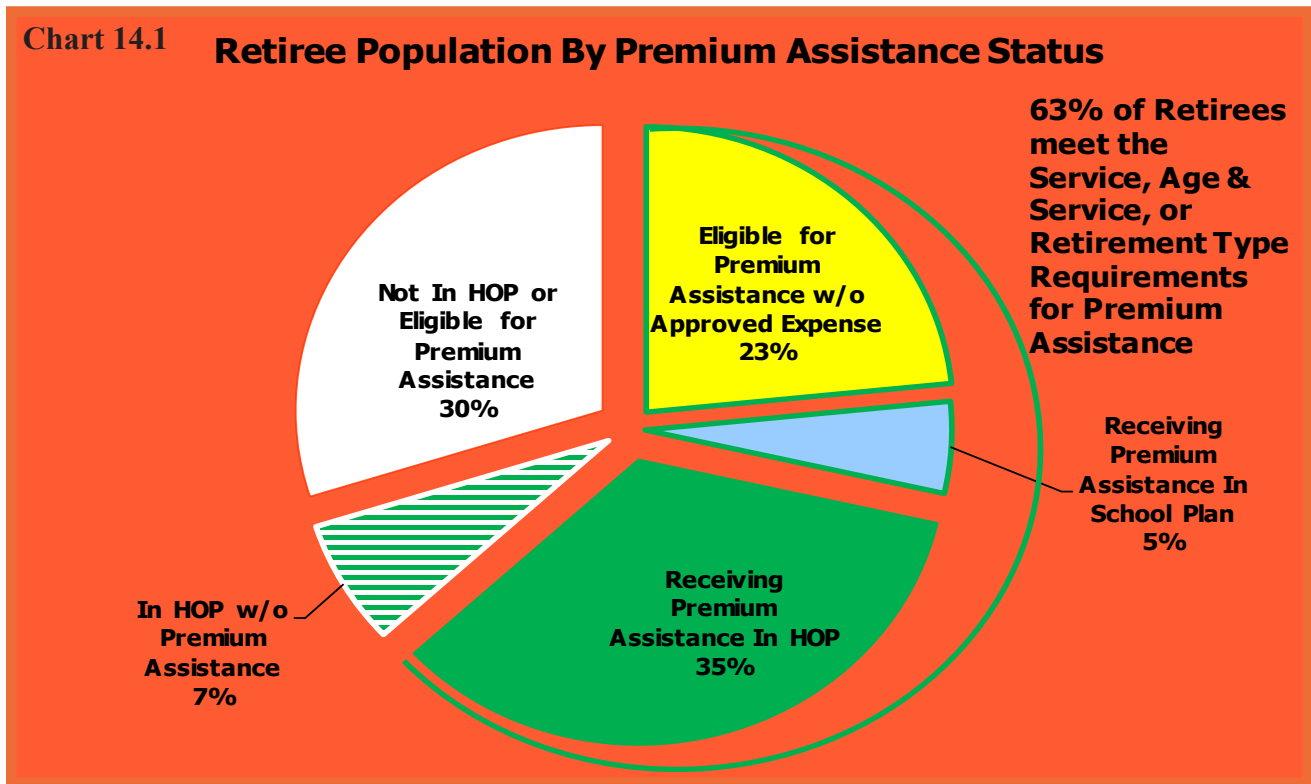
In accordance with Sec. 8509 of the Public School Employees' Retirement Code 24 Pa. C.S. § 8509, PSERS provides up to \$100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. The Premium Assistance program began on July 1, 1992. The eligibility requirements 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, 2018, PSERS had 233,288 retirees receiving a monthly benefit. Of these retirees 147,226 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, 54,571 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 92,655 retirees receiving premium assistance benefits, 80,573 are enrolled in HOP and 12,082 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:



June 30, 2018	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense ¹	54,571	23%
Receiving Premium Assistance In School Plan ¹	12,082	5%
Receiving Premium Assistance In HOP ¹	80,573	35%
In HOP w/o Premium Assistance	16,368	7%
Not In HOP and Not Eligible for Premium Assistance	<u>69,694</u>	<u>30%</u>
Total Retiree Population ²	233,288	100%

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

(2) As of June 30, 2018 Actuarial Data.

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 Code¹. The contribution needed during FY2019/20 is 0.84% of payroll.

For the year ended June 30, 2018, employer contributions equaled \$112.0 million and net investment income totaled \$1.5 million. During this period, PSERS paid Premium Assistance benefits equaling \$111.8 million and incurred administrative expenses of \$2.6 million.

As of September 30, 2018, the Premium Assistance Program had net assets of \$119.8 million.

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