

Pennsylvania Public School Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania



Celebrating



Years (est. 1919)

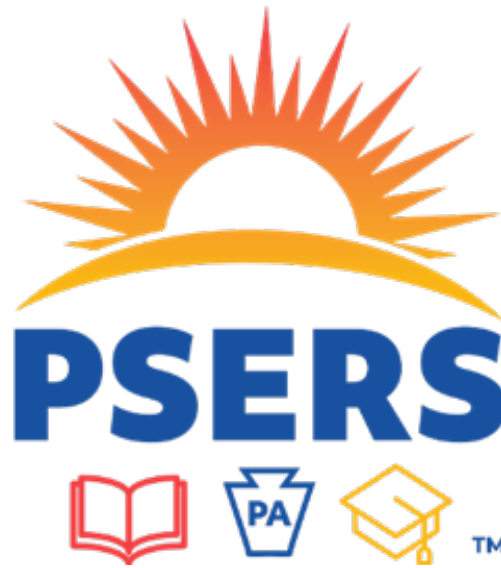


Budget Report

Appropriations Committee
Fiscal Year 2020-2021

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

5 North 5th Street
Harrisburg, PA 17101-1905



FISCAL YEAR 2020-21 BUDGET REPORT
APPROPRIATIONS COMMITTEE
FEBRUARY 28, 2020

Christopher SantaMaria

Chairman

Board of Trustees

Honorable Francis X. Ryan

Vice Chairman

Board of Trustees

Glen R. Grell

Executive Director

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

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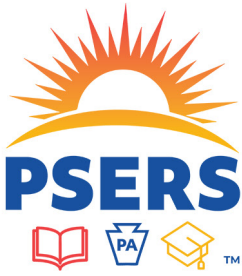
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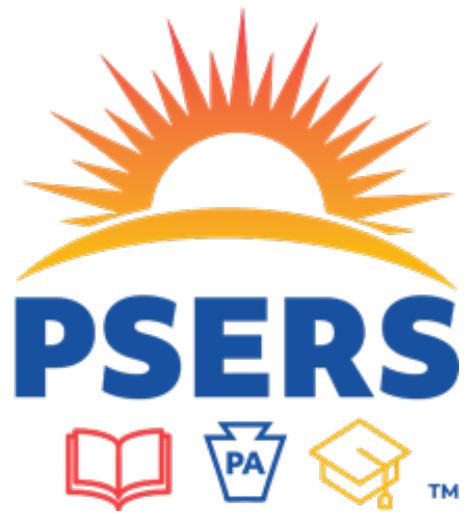
PSERS Budget Report

Fiscal Year 2020 - 2021



SECTION 1 - PSERS OVERVIEW

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Overview

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

As of June 30, 2019, the System had approximately 256,000 active members. The annuitant membership was comprised of approximately 237,000 retirees and beneficiaries who received average monthly pension benefit payments of over \$509 million including healthcare premium assistance. The average yearly pension benefit paid to annuitants was \$25,498. PSERS had 773 participating employers on June 30, 2019.

As reported in the latest *Pension and Investments* survey, published February 10, 2020, based on asset size, PSERS is the 37th largest plan among United States corporate and public pension plans, and the 16th largest state-sponsored public pension fund in the nation based on total plan assets. PSERS' total plan net assets as of December 31, 2019 were approximately \$60.5 billion. PSERS' estimated investment rate of return for the calendar year ended December 31, 2019 is 12.83%, net of fees.

During fiscal year 2019, PSERS' pension disbursements to retirees totaled \$6.7 billion. Of this amount, nearly 93%, or \$6.3 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, 2019, there are over 94,000 retirees who receive this benefit. PSERS also manages a health insurance program, PSERS Health Options Program, that is entirely funded through participating member premiums and provides Medicare Supplemental, Medicare Advantage, Prescription Drug, and Dental plans to over 120,000 retirees and their dependents as of December 31, 2019.



Mission Statement



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

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

adopted June 20, 2008

PSERS Board of Trustees

as of February 8, 2020

Christopher SantaMaria, Chairman

Honorable Francis X. Ryan, Vice Chairman

House of Representatives

Deborah J. Beck

Honorable John P. Blake

Senate of Pennsylvania

Honorable Matt D. Bradford

House of Representatives

Honorable Patrick M. Browne

Senate of Pennsylvania

Jason M. Davis

Eric O. DiTullio

Susan C. Lemmo

Nathan G. Mains

Pedro A. Rivera

Secretary of Education

Honorable Joseph M. Torsella

Treasurer of Pennsylvania

Richard W. Vague

Acting Secretary of Banking and Securities

Melva S. Vogler

Governor's Appointee - Vacant

Section 1 - PSERS Overview

Organizational Structure of the Public School Employees' Retirement System

Executive Office

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

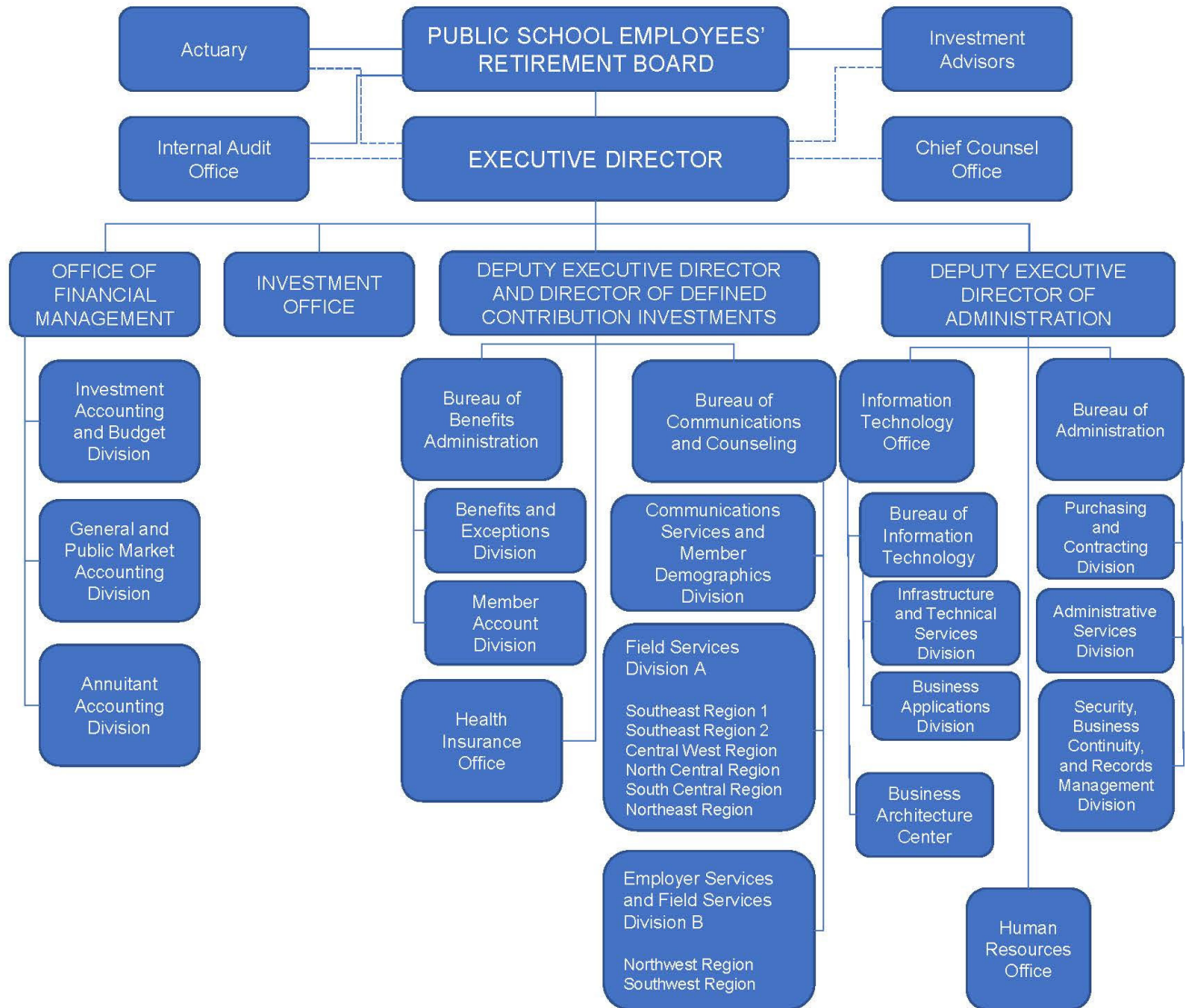
This bureau provides facilities, purchasing and contracting, policies and procedures, business continuity, records management, automotive, mail, imaging, and other administrative services necessary to support agency functions.

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.

Chart 2.1

Organizational Chart of the Public School Employees' Retirement System



PSERS REGIONAL OFFICES

Chart 2.2

Northwest

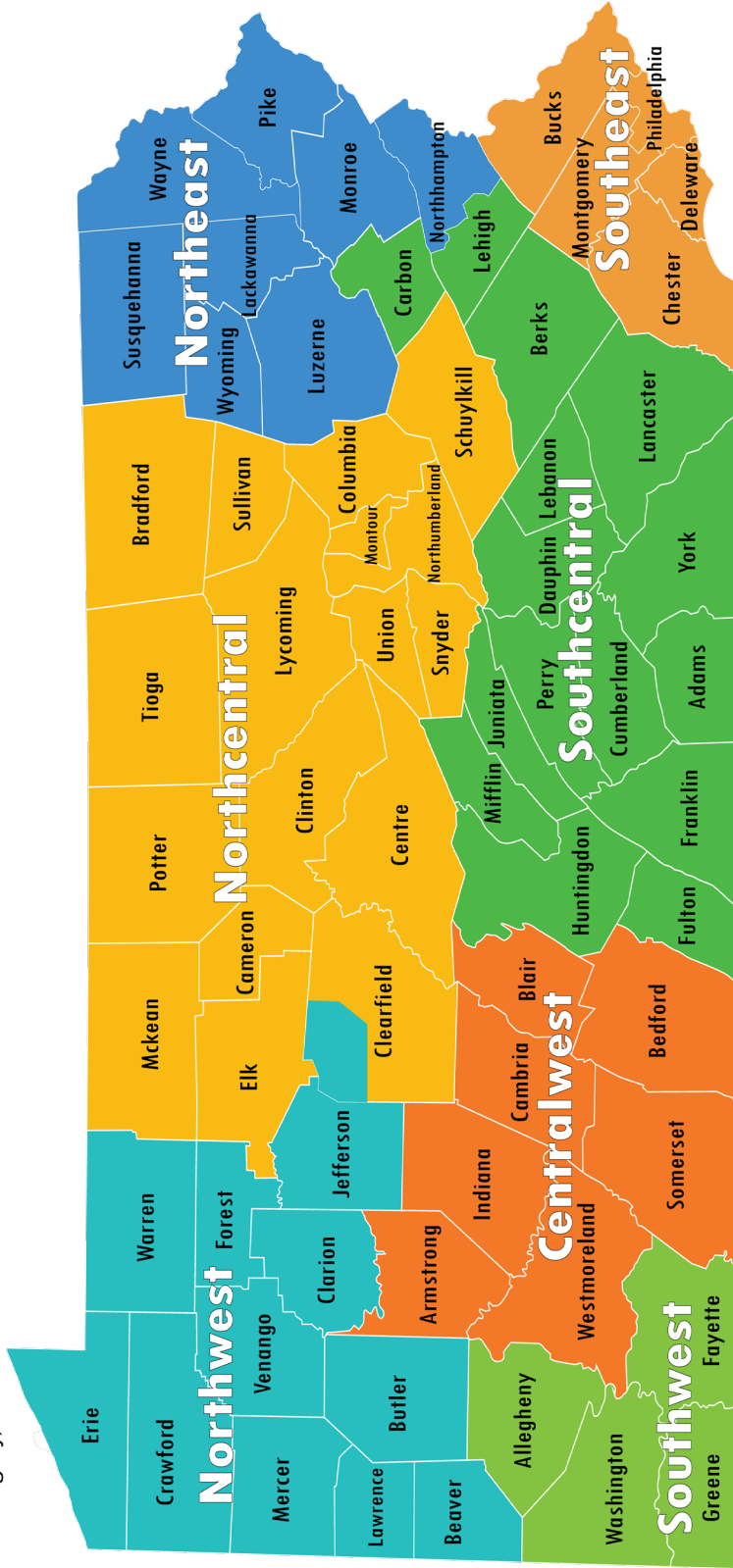
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 Donald Gregory, Administrator

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 Sherry Sibio, Administrator



Southwest

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 Joshua Catalfu, Administrator
 Linda Visco, Administrator

Section 1 - PSERS Overview

Summary of Various Member Service Statistics

PSERS operates very efficiently. There are only 361 staff serving the needs of over 500,000 members of the System and 773 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>2017-18</u>	<u>2018-19</u>
Initial Retirements (1-Step)		8,407	7,852
Initial Retirements (2-Step)		677	906
Final Retirements (2 nd Step of 2-Step)		598	743
Purchases of Service and Corrections for Previously Unreported Service and/or Contributions not Withheld		8,219	3,353
Refunds		4,295	4,440
Death Benefits Processed		5,579	5,653
Account Verification - non retirements		11,464	12,162
TOTAL		39,239	35,109
Percent of Retirement Paid as 1 Step		93%	87%

Table 2.2 Other Member Services (Major)			
	Fiscal Year	<u>2017-18</u>	<u>2018-19</u>
Retirement Estimates		17,953	14,893
Phone Calls Answered		156,184	160,267
E-mails Received		20,644	33,113
E-mails Sent		17,856	29,174
General Information Sessions		214	201
General Information Attendees		11,065	11,449
Exit Counseling Sessions		1,202	1,174
Exit Counseling Attendees		6,771	6,581

Section 1 - PSERS Overview

Summary of Various Member Service Statistics (continued)

Table 2.3 Member Self Service Transactions Done by Members			
	Calendar Year	<u>2018</u>	<u>2019</u>
Retirement Estimate		27,007	37,151
Nomination of Beneficiary		33,800	23,008
Address Change		11,162	8,152
Income Verification		4,718	14,313
W-4P		511	1,317
Apply for Multiple Service		71	61
Elect Class T-F		1,241	682
Elect Class T-H		N/A	65
Elect Class DC		N/A	115
Waive Membership		N/A	65
TOTAL		78,510	84,929

Table 2.4 Member Payment Services for Retirees and Beneficiaries			
	Calendar Year	<u>2018</u>	<u>2019</u>
Monthly Payments to Members		2,744,206	2,787,962
Non-recurring Payments to Members		46,847	47,819
W4-P Tax Withholding Forms Processed		7,515	4,764
EFT Forms Processed - Direct Deposit		9,344	9,861
ACH Rejects Researched and Reviewed (Direct Deposit Failures)		4,876	5,303
Member Payment Changes Processed		2,981	2,476
1099R-Paperless Delivery		35,947	48,191
1099R-Printed for Mailing		223,294	215,525
Total Forms 1099-R Produced		259,241	263,716

PSERS had over 150,000 members sign up for the MSS account. Of those, approximately 95% opted for paperless delivery. This has resulted in over \$450,000 in postage and printing savings since MSS went live in April 2018.

Section 1 - PSERS Overview

Economic Impact on Pennsylvania, Member Demographics, and Financial Information

Economic Impact of Pension Benefits on Pennsylvania

In Fiscal Year 2018-19, PSERS' pension disbursements to retirees totaled approximately \$6.7 billion. Of this amount, nearly 93%, or \$6.3 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 \$6.3 billion into an economic impact of \$13.4 billion throughout the Commonwealth. Estimates show that the impact of money from PSERS in Pennsylvania includes*:

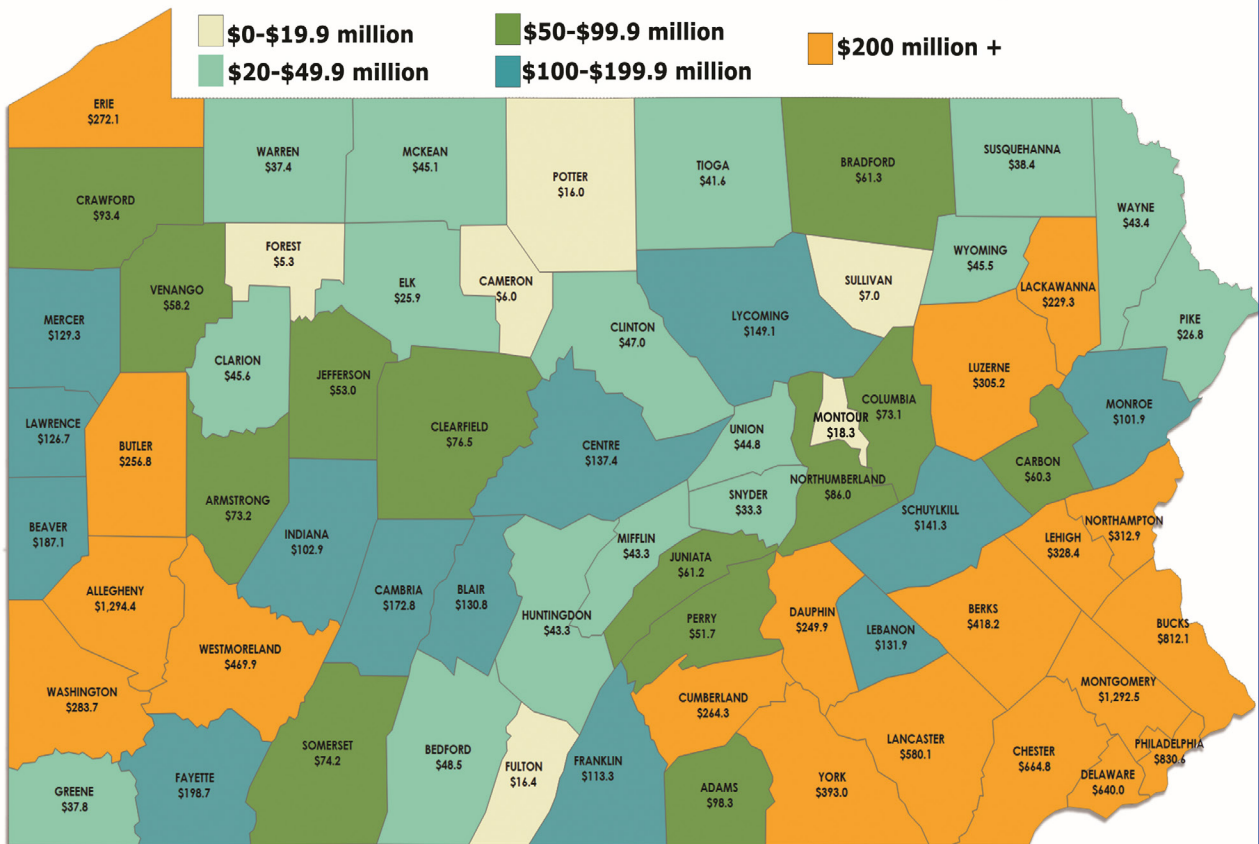
- Economic impact exceeding \$13.4 billion
- Support for over 65,000 jobs that paid \$3.4 billion in wages and salaries
- \$1.7 billion in federal and local tax revenues

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

Allegheny	\$1,294.4
Montgomery	\$1,292.5
Philadelphia	\$830.6
Bucks	\$812.1
Chester	\$664.8
Delaware	\$640.0
Lancaster	\$580.1
Westmoreland	\$469.9
Berks	\$418.2
York	\$393.0

Pension Benefits in Pennsylvania By County for FY 2018-19

\$6.3 Billion in Benefits = \$13.4 Billion Positive Economic Impact



*Pensionomics The National Institute on Retirement Security, December 2018

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Table 3.2 Member by Type

Fiscal Year Ended June 30	Active Members	Annuitants, Beneficiaries, and Survivor Annuitants	Total Active/Retired Members	Ratio of Active/ Retired	Vestees	Total Membership
2019	255,749	237,339	493,088	1.07 to 1	25,514	518,602
2018	256,362	233,288	489,650	1.10	25,117	514,767
2017	255,945	230,014	485,959	1.13	24,515	510,474
2016	257,080	224,828	481,908	1.14	23,437	505,345
2015	259,868	219,775	479,643	1.18	21,909	501,552
Average ratio of active members to annuitants (Public Funds)				1.35*		

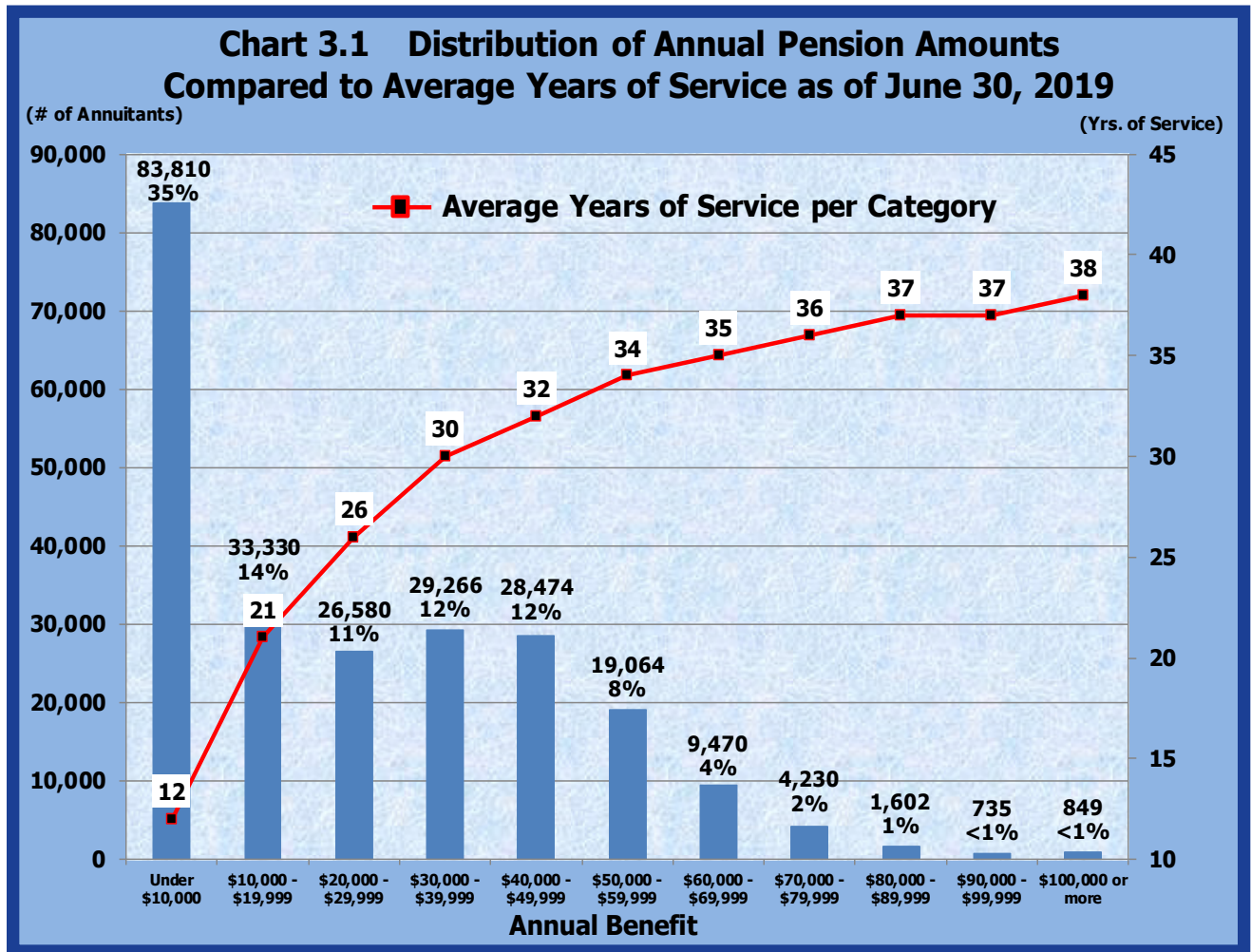
*Based on the December 2019 Public Fund Survey prepared by the National Association of State Retirement Administrators (NASRA).

Table 3.3 Profile of PSERS' Annuitants, Beneficiaries, and Survivor Annuitants

Type of Member	Number of Members		Average Annual Benefit	
	<u>6/30/2018</u>	<u>6/30/2019</u>	<u>6/30/2018</u>	<u>6/30/2019</u>
Normal/Early Retirees	212,712	216,326	\$26,225	\$26,300
Survivor Annuitants	11,409	11,860	14,406	14,847
Disability Retirees	9,167	9,153	20,607	20,348
Total/Average Yearly Benefit	233,288	237,339	\$25,405	\$25,498
Age and Service Profile of All Active Members				
	<u>6/30/2018</u>	<u>6/30/2019</u>		
Average Age	45.3	45.4		
Average Years of PSERS Service	11.5	11.7		
Average Annual Compensation	\$52,188	\$53,458		
	Class T-C Members		Class T-D Members	
	<u>6/30/2018</u>	<u>6/30/2019</u>	<u>6/30/2018</u>	<u>6/30/2019</u>
Number of Members	3,216	3,010	175,975	167,118
Average Age	52.8	53.4	48.0	48.5
Average Years of PSERS Service	20.4	21.3	15.4	16.1
Average Annual Compensation	\$54,084	\$56,239	\$61,105	\$63,502
	Class T-E Members		Class T-F Members	
	<u>6/30/2018</u>	<u>6/30/2019</u>	<u>6/30/2018</u>	<u>6/30/2019</u>
Number of Members	63,880	70,521	13,291	15,100
Average Age	39.0	39.4	38.0	38.3
Average Years of PSERS Service	2.4	2.7	2.8	3.2
Average Annual Compensation	\$29,925	\$31,787	\$40,672	\$42,954

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)



Benefit Summary

The average PSERS retiree receives \$25,498 annually, a benefit earned through a lengthy career in education.

- Nearly 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 Amount in Millions)**

	Cumulative 10 Year Total July 1, 2009 - June 30, 2019
Balance of Net Position (07/01/2009)	\$42,976
Member Contributions	\$9,984
Employer Contributions	23,993
Net Investment Income	42,715
Deductions - Benefits & Expenses	<u>(60,934)</u>
Net Increase	<u>\$15,758</u>
Balance of Net Position (06/30/2019)	<u>\$58,734</u>

Table 3.5

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

	----- Projected -----				
	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
Member Contributions	\$1,064	\$1,066	\$1,083	\$1,087	\$1,090
Employer Contributions	<u>4,487</u>	<u>4,678</u>	<u>\$4,833</u>	<u>4,977</u>	<u>5,158</u>
Total Contributions	\$5,551	\$5,744	\$5,916	\$6,064	\$6,248
Less:					
Pension Benefits & Expenses	<u>6,810</u>	<u>6,962</u>	<u>7,113</u>	<u>7,264</u>	<u>7,416</u>
Negative External Cash Flow	-\$1,259	-\$1,218	-\$1,197	-\$1,200	-\$1,168
End of Year Total Assets	\$58,734	\$61,784	\$65,077	\$68,606	\$72,423
Negative External Cash Flow (NECF) as a % of					
Total Assets	-2.1%	-2.0%	-1.8%	-1.7%	-1.6%
Average NECF as a % of Total Assets (Public Funds)	-2.9% *				

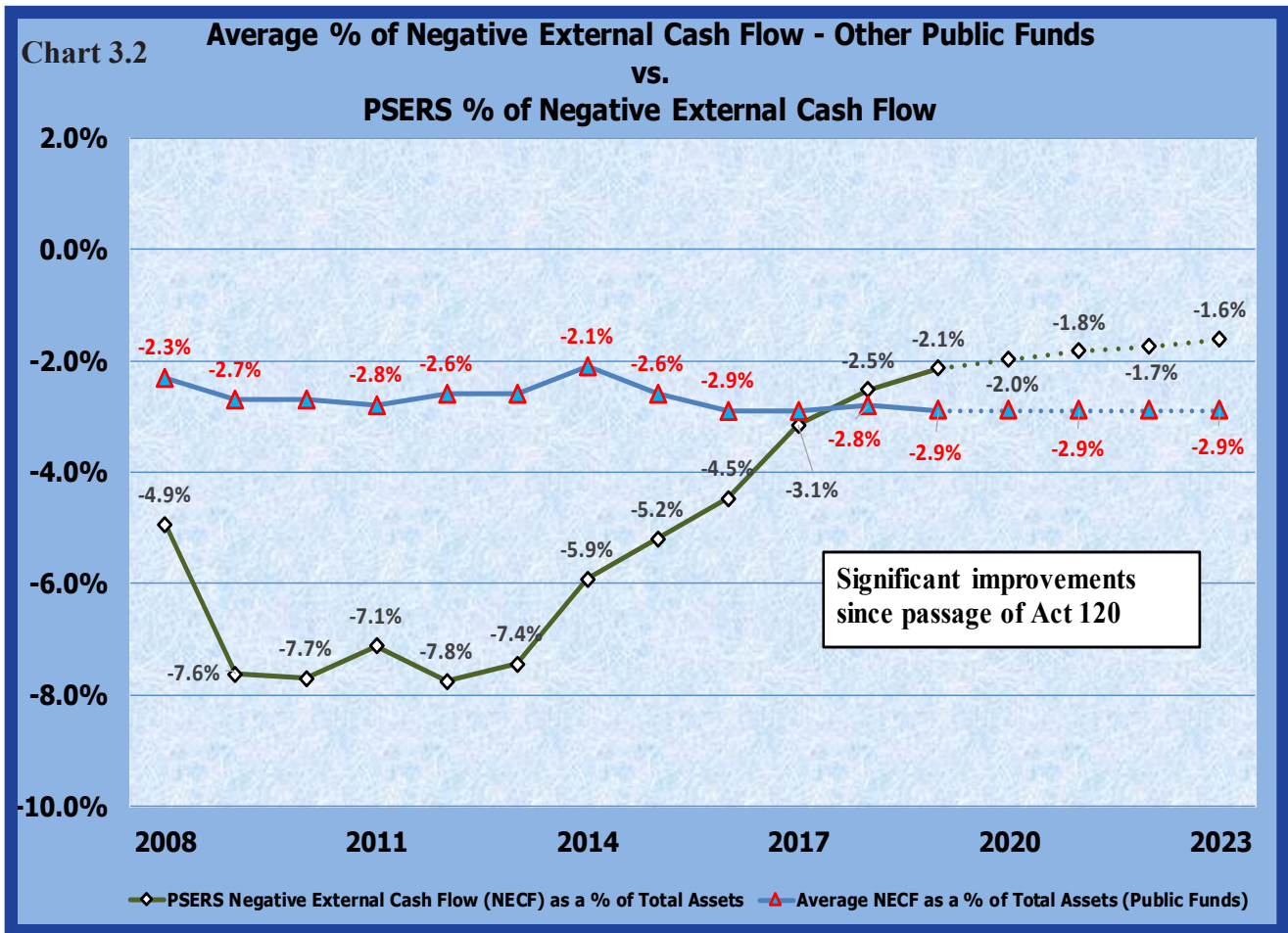
*Based on the December 2019 Public Fund Survey prepared by NASRA.

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 -\$27.0 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 -2.1% of total assets for FY 2018-19, which was more favorable than the public fund average for the second year in a row. The large negative annual external cash flow has improved significantly since fiscal year 2012 due to the implementation of Act 120 in 2010. Act 120 provided for increased employer contributions to the actuarially required contribution levels. Due to receiving 100% of actuarially required contributions for the third consecutive year, the System's cash flow shortfall is now more favorable than the public fund average and will continue to improve over the next several years.

Section 1 - PSERS Overview

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 continue to pay down the unfunded liability.

Section 1 - PSERS Overview

Member Demographics and Financial Information (continued)

Chart 3.3

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

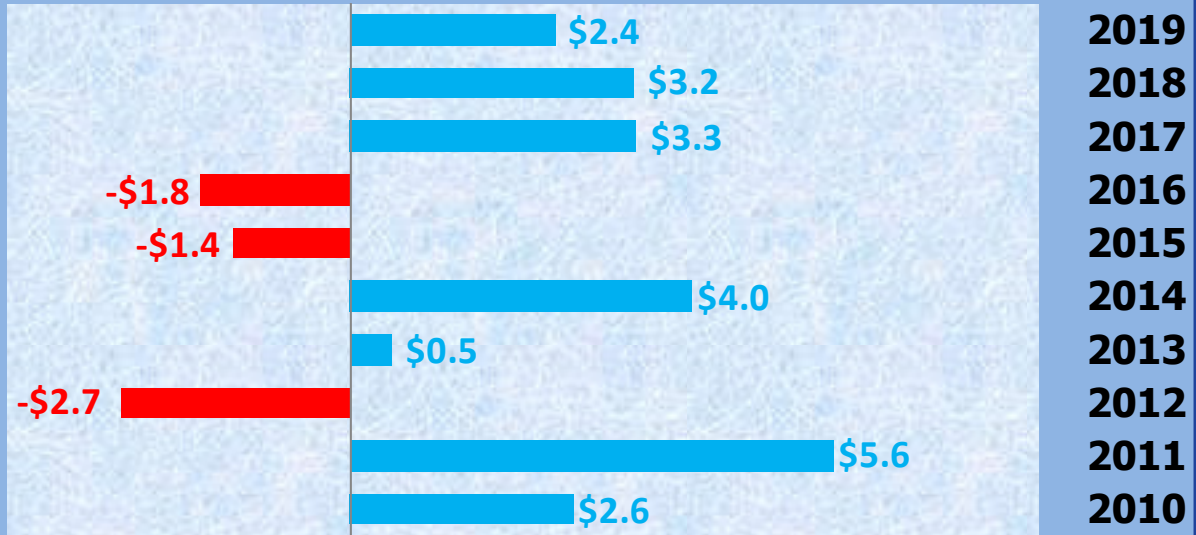
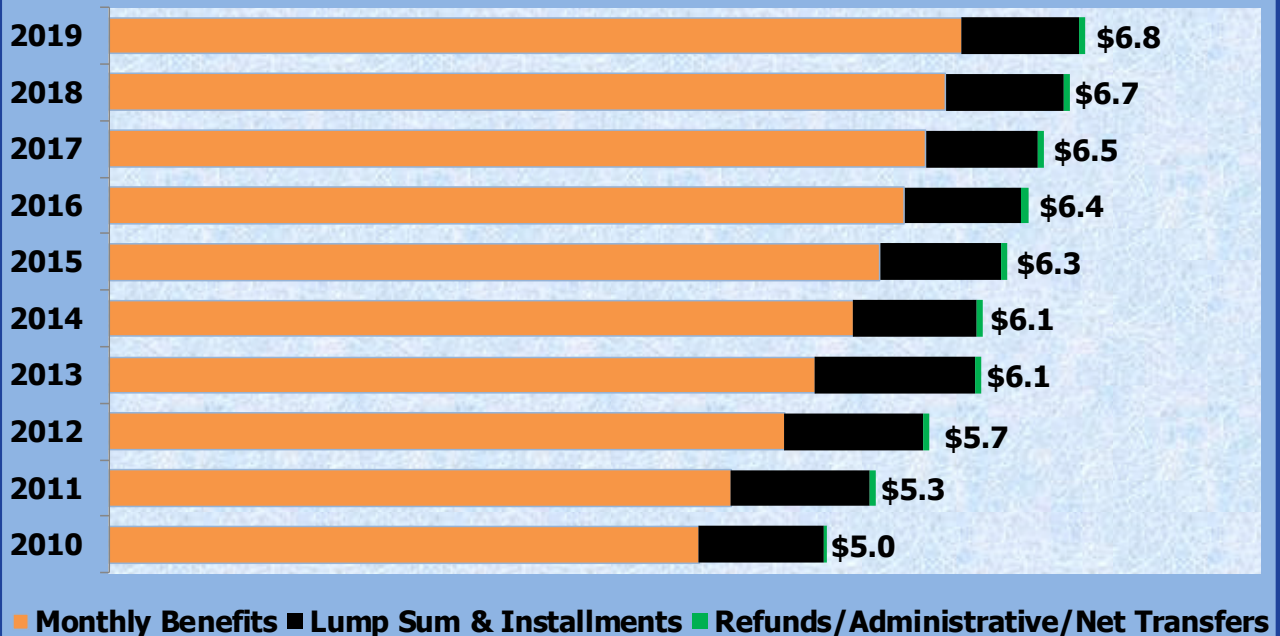


Chart 3.4

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



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

PSERS Deductions from Pension Fiduciary Net Position

As depicted in Chart 3.4, the small increase for FY2018 to FY2019 is mainly attributed to an ongoing slight rise in the average monthly benefit and an increase in the number of members receiving benefits.

Section 1 - PSERS Overview

Statement of Fiduciary Net Position

June 30, 2019

(Dollar Amounts in Thousands)

	Postemployment Healthcare				Totals
	Pension	Defined Contribution	Premium Assistance	Health Options Program	
Assets:					
Receivables:					
Members	\$ 349,892	\$ -	\$ 2,475	\$ 82	\$ 352,449
Employers	1,284,751	-	33,241	-	1,317,992
Investment income	514,815	19	98	173	515,105
Investment proceeds	330,059	-	-	-	330,059
CMS Part D and prescriptions	-	-	-	54,257	54,257
Interfund receivable	1,876	-	-	-	1,876
Total Receivables	2,481,393	19	35,814	54,512	2,571,738
Investments, at fair value:					
Short-term	5,637,562	10,476	93,625	286,077	6,027,740
Fixed income	8,652,870	-	-	-	8,652,870
Common and preferred stock	9,813,146	-	-	-	9,813,146
Collective trust funds	14,305,045	-	-	-	14,305,045
Real estate	5,484,621	-	-	-	5,484,621
Alternative investments	13,445,135	-	-	-	13,445,135
Total Investments	57,338,379	10,476	93,625	286,077	57,728,557
Securities lending collateral pool	4,518,372	-	-	-	4,518,372
Capital assets (net of accumulated depreciation \$34,515)	21,345	-	-	-	21,345
Miscellaneous	25,023	-	307	48	25,378
Total Assets	64,384,512	10,495	129,746	340,637	64,865,390
Liabilities:					
Accounts payable and accrued expenses	97,129	1,386	295	3,377	102,187
Benefits payable	584,960	-	81	38,098	623,139
HOP participant premium advances	-	-	-	31,970	31,970
Investment purchases and other payables	289,484	-	2,462	-	291,946
Obligations under securities lending	4,518,372	-	-	-	4,518,372
Interfund payable	-	153	1,723	-	1,876
Other liabilities	160,683	-	-	-	160,683
Total Liabilities	5,650,628	1,539	4,561	73,445	5,730,173
Net position restricted for pension, DC and postemployment healthcare benefits					
	\$ 58,733,884	\$ 8,956	\$ 125,185	\$ 267,192	\$ 59,135,217

Section 1 - PSERS Overview

Statement of Changes in Fiduciary Net Position Years Ended June 30, 2019 (Dollar Amounts in Thousands)

	Pension	Defined Contribution	Postemployment Healthcare		Totals
			Premium Assistance	Health Options Program	
Additions:					
Contributions:					
Members	\$ 1,064,043	\$ -	\$ -	\$ -	\$ 1,064,043
Employers	4,487,520	-	114,829	-	4,602,349
Total contributions	5,551,563	-	114,829	-	5,666,392
HOP participant premiums	-	-	-	376,449	376,449
Centers for Medicare & Medicaid Services	-	-	-	60,379	60,379
Commonwealth of Pennsylvania	-	5,200	-	-	5,200
Investment income:					
From investing activities:					
Net appreciation in fair value of investments	2,829,899	-	434	-	2,830,333
Short-term	124,184	273	1,907	3,682	130,046
Fixed income	256,597	-	-	-	256,597
Common and preferred stock	322,865	-	-	-	322,865
Collective trust funds	6,373	-	-	-	6,373
Real estate	226,303	-	-	-	226,303
Alternative investments	298,004	-	-	-	298,004
Total investment activity income	4,064,225	273	2,341	3,682	4,070,521
Investment expenses	(449,768)	-	(28)	(28)	(449,824)
Net income from investing activities	3,614,457	273	2,313	3,654	3,620,697
From securities lending activities:					
Securities lending income	116,564	-	-	-	116,564
Securities lending expense	(102,311)	-	-	-	(102,311)
Net income from securities lending activities	14,253	-	-	-	14,253
Total net investment income	3,628,710	273	2,313	3,654	3,634,950
Total Additions	9,180,273	5,473	117,142	440,482	9,743,370
Deductions:					
Benefits	6,734,145	-	112,777	363,295	7,210,217
Refunds of contributions	27,027	-	-	-	27,027
Administrative expenses	48,931	3,276	1,914	45,515	99,636
Total Deductions	6,810,103	3,276	114,691	408,810	7,336,880
Net increase (decrease)	2,370,170	2,197	2,451	31,672	2,406,490
Net position restricted for pension, DC and postemployment healthcare benefits:					
Balance, beginning of year	56,363,714	6,759	122,734	235,520	56,728,727
Balance, end of period	\$ 58,733,884	\$ 8,956	\$ 125,185	\$ 267,192	\$ 59,135,217

Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding

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

Actuarial Process

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

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

Chart 4.1 Distribution of Investment Return Assumptions

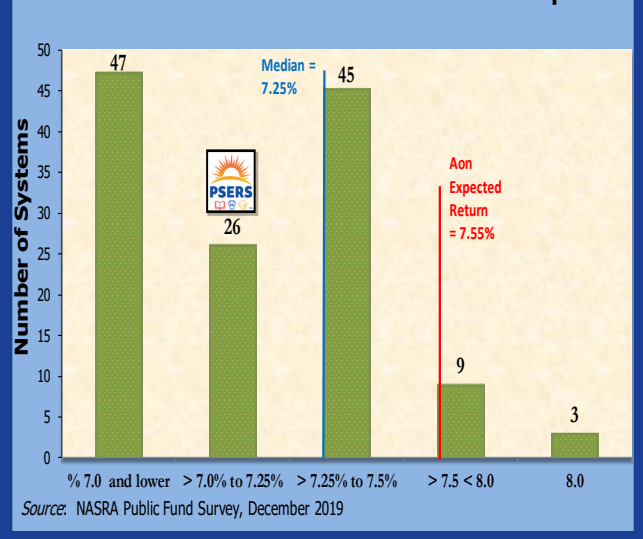
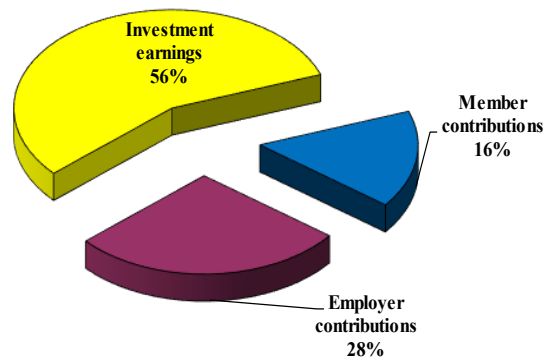


Chart 4.2

**PSERS' Sources of Funding
Twenty Year History (2000-2019)**



mortality rates were revised. Chart 4.1 places PSERS' 7.25% return assumption among the conservative half 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, 2019 investment earnings provided 56% of PSERS' funding followed by 28% 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 three items: (1) the pension, (2) the defined contribution and (3) the healthcare premium assistance contributions.

The total employer contribution rate for the fiscal year ended June 30, 2019 was 33.43%, including 0.83% for healthcare premium assistance. The total employer contribution rate for the fiscal year ending June 30, 2020 is 34.29%. This rate consists of a 33.36% pension rate, 0.09% Act 5 DC (estimated average rate) plus the healthcare premium assistance contribution of 0.83%. The FY 2020-21 employer contribution rate is 34.51%. This rate consists of a 33.51% pension rate, the healthcare premium assistance contribution of 0.82% and an Act 5 DC estimated average rate of 0.18%. The Board of Trustees certified this rate, which was calculated in accordance with the provisions of Act 5 of 2017, at their December 2019 meeting. While any contribution increase is a challenge for PSERS' employers, the increase in the FY 2020-21 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.

Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

For the fiscal year ended June 30, 2019, PSERS' employer contributions totaled \$4.602 billion, which includes \$115 million for healthcare premium assistance. For the fiscal year ending June 30, 2020 the estimate for total employer contributions is \$4.759 billion, reflective of the 34.29% contribution rate. The contribution rate for the fiscal year ending June 30, 2021 is 34.51% resulting in an employer contribution estimate of \$4.858 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 (FY2019-20) is 7.59%. This is in contrast to over 90% of non-public (private) pension plans to which members do not contribute (Source: based on a query of private plan IRS Form 5500 filings). For these plans, the employers bear 100% of the costs of the benefit.

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

Pursuant to Act 120, Class T-E and Class T-F members are subject to a "shared risk" employee contribution rate. 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. These members share a portion of the investment risk of the Fund similar to a defined

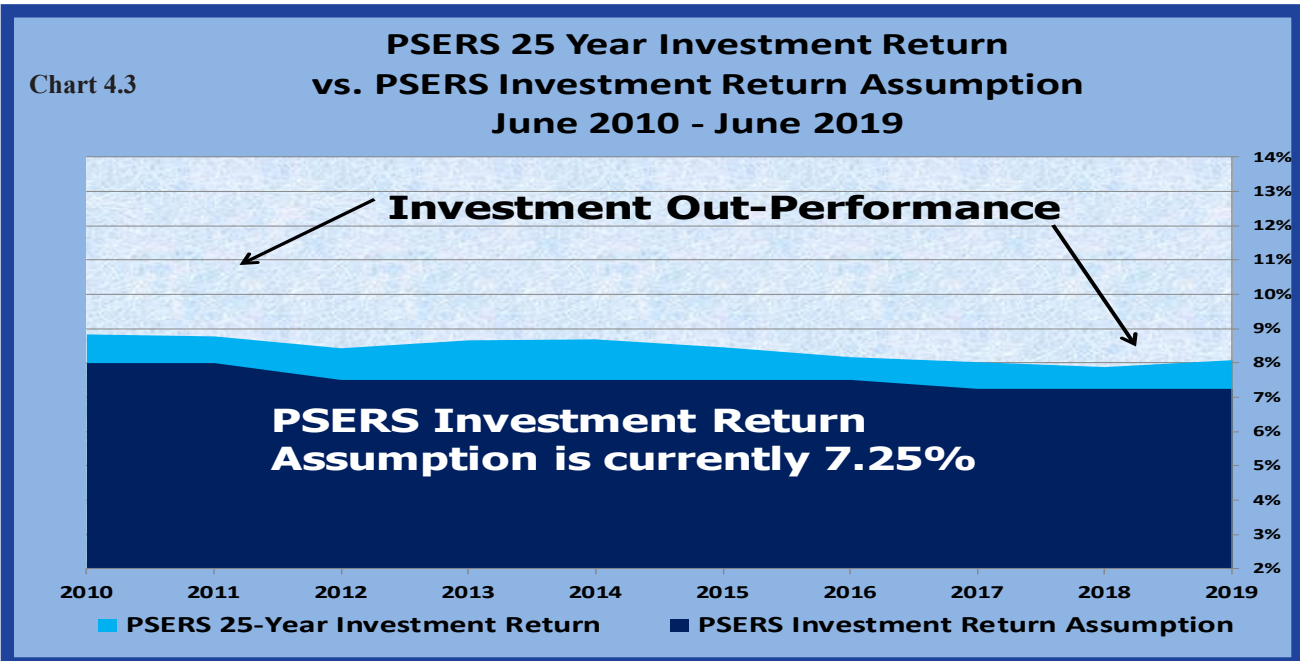
contribution plan. As a result of the Fund's six-year return through June 30, 2017 exceeding the investment performance hurdle mandated by Act 120, the member contribution rate did not change. The next investment performance measurement period for Class T-E and T-F members will be the nine-year period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

PSERS' members contributed \$1.064 billion of pension contributions for FY2019. Total member contributions are estimated to be \$1.067 billion for the fiscal year ending June 30, 2020 and \$1.068 billion for the fiscal year ending June 30, 2021.

Investment Returns

PSERS' investment rate of return for the fiscal year ended June 30, 2019 was 6.68%, net of fees. The investment rates of return (net of fees) for the fiscal years ended June 30, 2018 and June 30, 2017 were 9.27% and 10.14%, respectively. The annualized rates of investment return for the three, five and ten-year periods ended September 30, 2019 were 8.10%, 6.42%, and 8.32% respectively. Over the past 25 years ended September 30, 2019, the Fund earned an annualized rate of return of 8.04% 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



Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

annual normal cost of benefits. Even after the Great Recession of 2008-2009, PSERS' long-term returns continued to exceed the return assumption.

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.

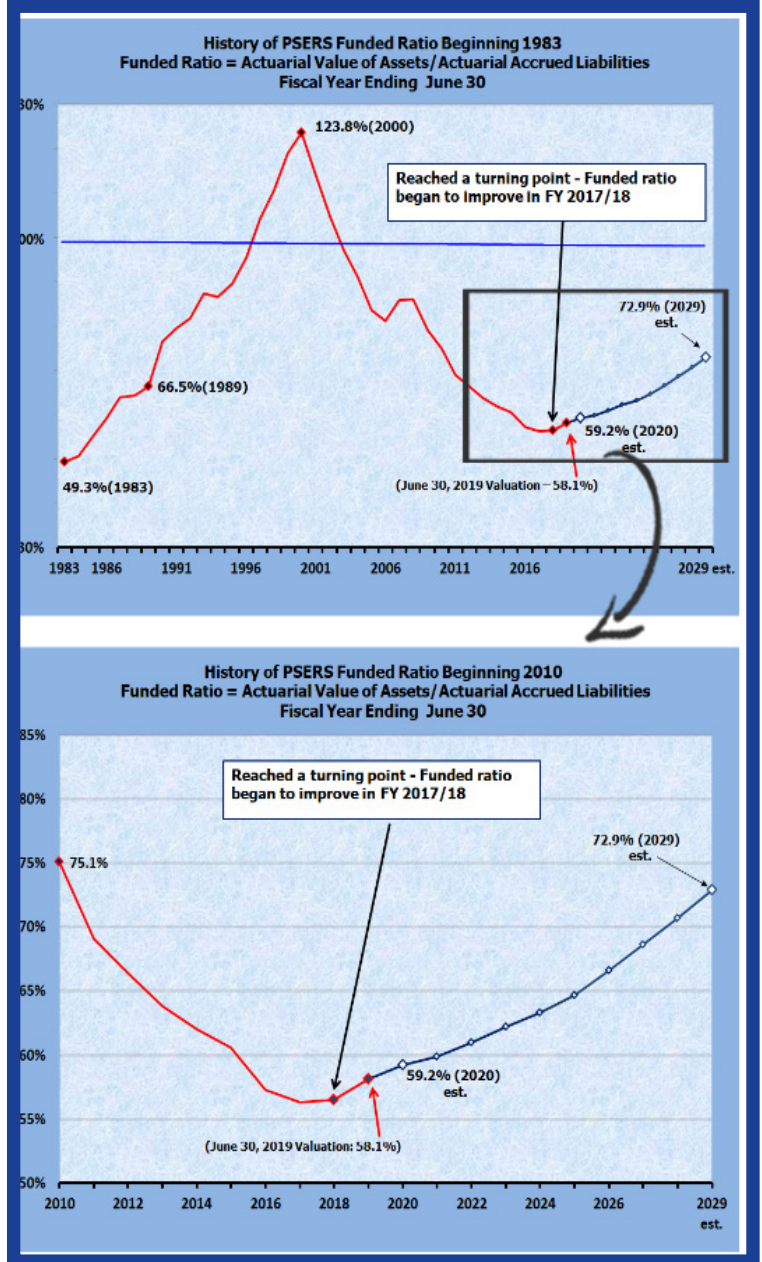
contribution increases under Act 120, PSERS reached a turning point effective with the June 30, 2018 actuarial valuation as PSERS' funded ratio began to slowly improve after declining for many years. Future projections now reflect a steadily increasing funded ratio.

Key Facts

- As a result of legislated contribution increases under Act 120, PSERS reached a turning point effective with the June 30, 2018 actuarial valuation as PSERS' funded ratio began to slowly improve after declining for many years.
- Funded Status: 58.1% as of June 30, 2019
- Funded Status: 56.5% as of June 30, 2018
- The increase in FY2019 is the largest growth in the funded ratio in over a decade.
- The decrease in the funded status from 2000 to 2017 was the result of several factors including: the unfavorable investment markets from FY2001 to FY2003 and FY2008 to FY2009; funding changes enacted in Act 38 of 2002 and Act 40 of 2003 which resulted in employers underfunding PSERS; benefit enhancements from Act 9 and Act 38; the adoption of new demographic and economic assumptions in FY2016; funding collars in Act 120 which continued the employer underfunding of the system; and, actuarial liability losses.

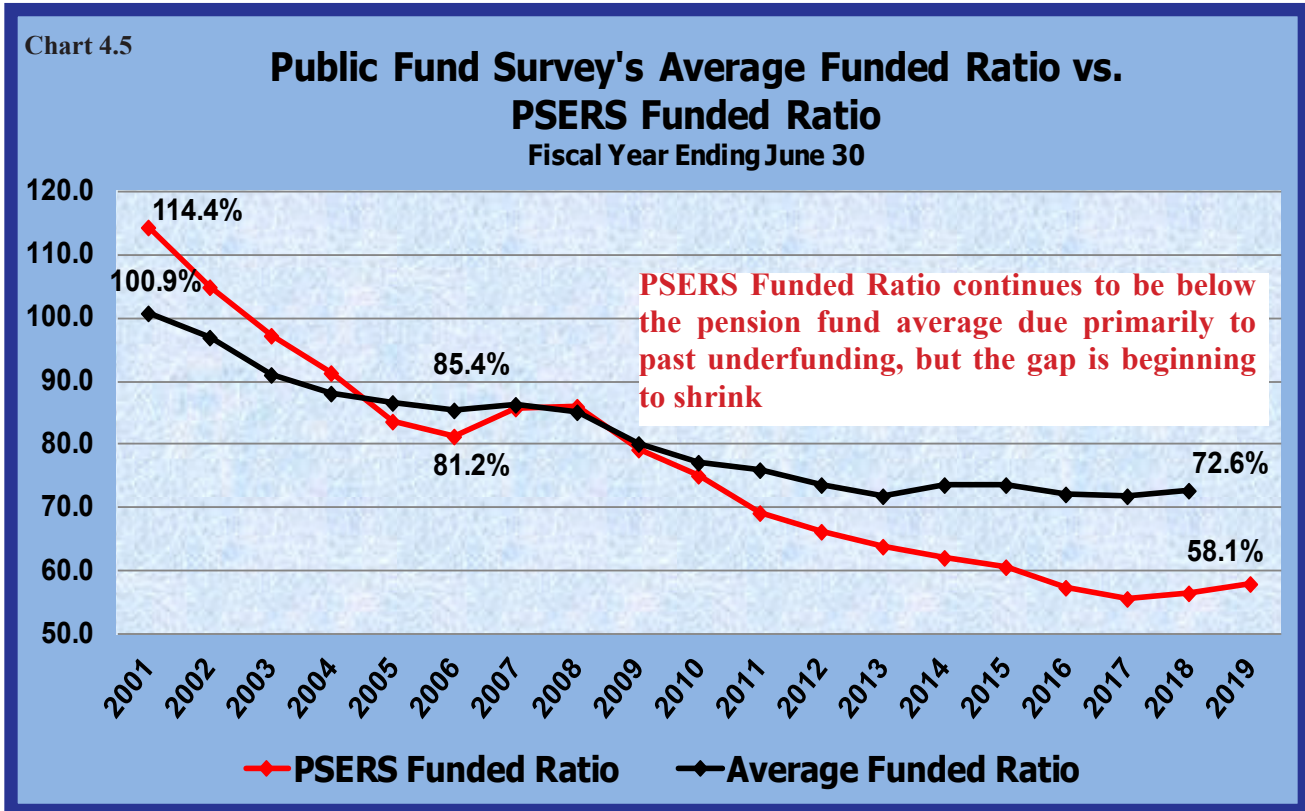
A history of PSERS' funded ratio beginning in 1983 and eight-year projection of PSERS' funded status is shown in Chart 4.4. As a result of legislated

Chart 4.4



Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)



A comparison of PSERS' funded ratio to the public fund projected weighted average funding ratio provided by the National Association of State Retirement Administrators (NASRA) is shown in Chart 4.5 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*, 2019).

Beginning July 1, 2016 PSERS' employer contribution rate provides 100% of the actuarially required rate. This was the first major step needed for PSERS' funded ratio to begin to improve. As noted previously, as a result of receiving 100% of the actuarially required contributions for the second consecutive year, PSERS' funded ratio began to improve in FY 2017-18 and improved again in FY 2018-19. The gap between PSERS' funded ratio and the public fund average is starting to shrink.

Section 1 - PSERS Overview

The Actuarial Process and Pension Plan Funding (continued)

Sources of Unfunded Liability

The System's total funded ratio (for Pensions and Health Insurance combined) is 58.1% as of June 30, 2019. This funded ratio is based on an actuarial value of assets of \$61.19 billion and a total accrued liability of \$105.33 billion which equates to a \$44.14 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 (43%), investment performance (41%), and benefit enhancements (16%), which include Act 9, cost of living increases and early retirement incentives.

For many years PSERS' outstanding investment performance compensated for unfunded benefit enhancements and employer funding deferrals. The Great Recession had a negative impact upon the System's long-term investment performance and eliminated most of the significant investment outperformance. Without the significant investment 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, 2019 unfunded liability is due to employer funding deferrals and benefit enhancements, both of which are not a result of the defined benefit plan design.

GASB 68 and 75 Pension and Healthcare Reporting for Employers

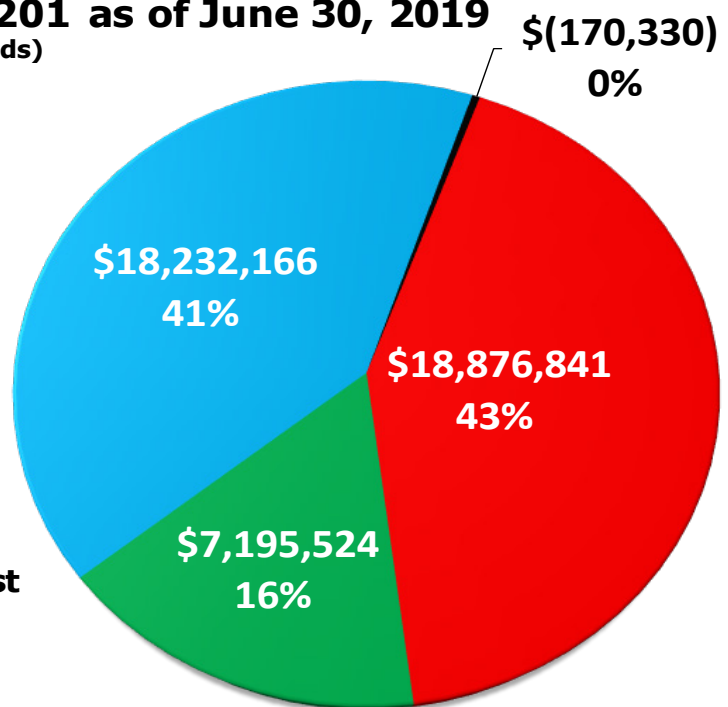
In June 2019, PSERS sent information to its employers to assist them in complying with GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* and Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (OPEB)*. The information sent to employers included a memo explaining PSERS' role, descriptions of the material provided, and the employers' responsibilities. In addition to the memo, PSERS provided a variety of schedules audited by PSERS' independent public accountants as well as unaudited schedules. PSERS strives to incorporate all the information necessary for employers to comply with GASB 68 and 75 reporting requirements in these audited and unaudited schedules. Additionally, PSERS continues to make itself available to assist employers and their auditors should they have any additional requests in order to comply with GASB 68 and 75.

Chart 4.6

PSERS Sources of Unfunded Liability

Total \$44,134,201 as of June 30, 2019
(\$ Amounts in thousands)

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



Section 1 - PSERS Overview

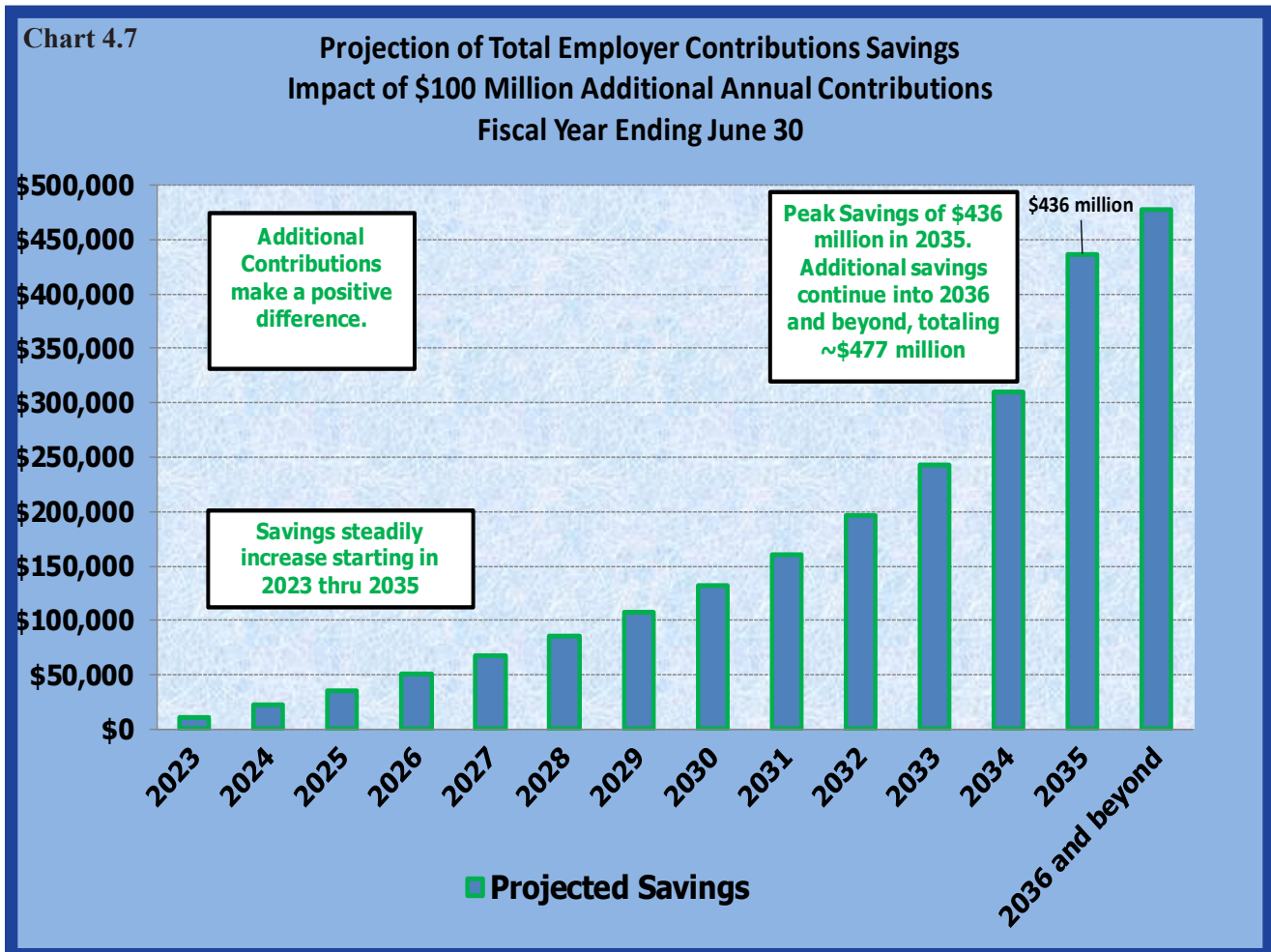
How to Reduce Employer Contribution Rates

Discussion still occurs as to what can be done to lower PSERS employer contribution rates sooner than projected. One alternative is to provide additional funding to pay down PSERS 7.25% pension debt. No matter the size, every additional dollar invested in PSERS has a positive impact on funding. Moving the System to a healthier funding level sooner benefits everyone in Pennsylvania.

Making additional contributions to PSERS results in the following advantages:

- Pre-funds the contributions to the System
- Establishes a visible and fixed repayment plan to tackle the unfunded liability of the System
- Reduces the unfunded liability of the System (7.25% interest rate)
- Reduces unfunded liability amounts required to be reflected on the balance sheet of employers' financial statements under GASB 68
- Lowers projected future employer contribution rates which provides long-term relief to Commonwealth and school budgets
- Reduces the severity of a possible contribution rate increase in the event of a recession

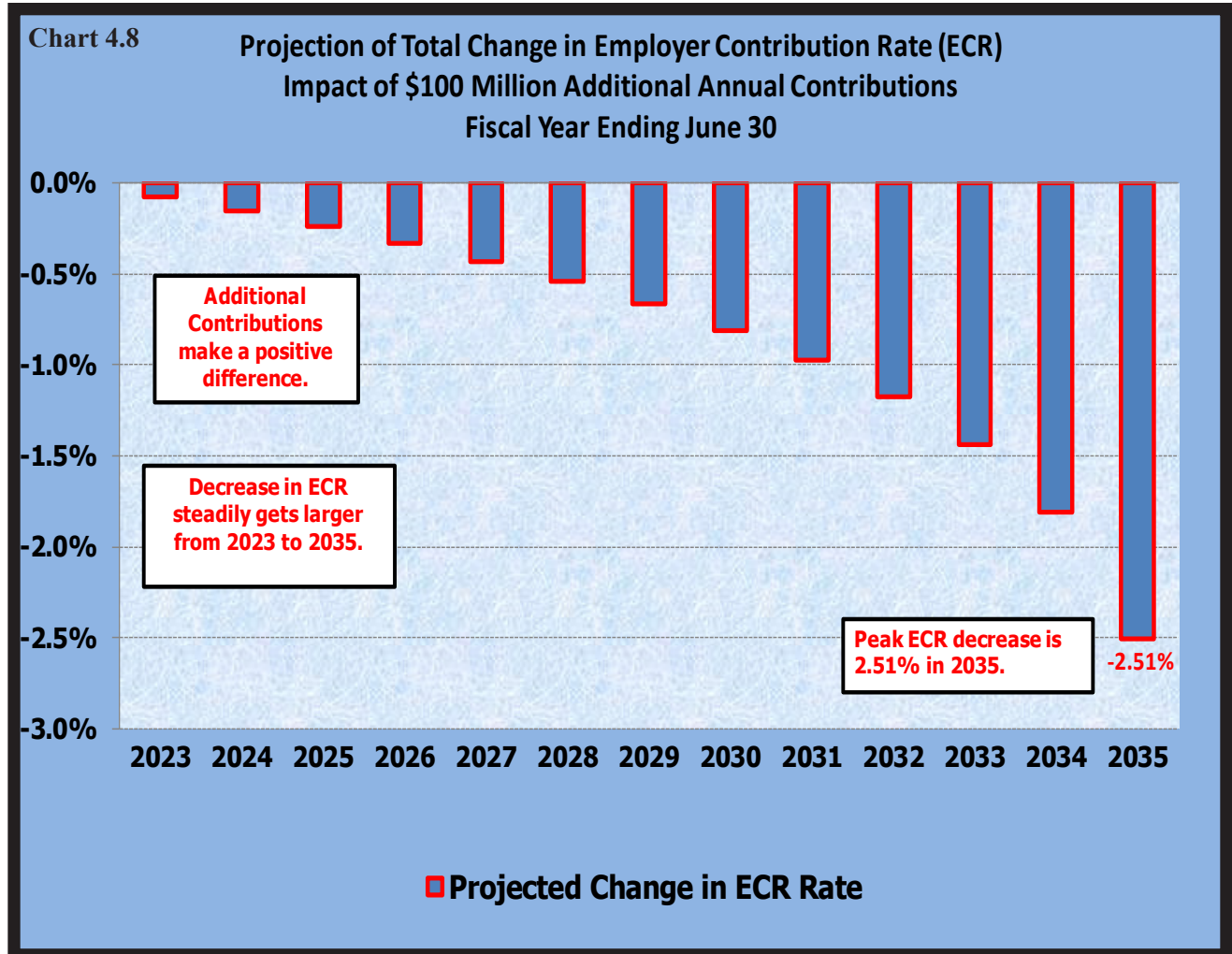
By making additional contributions to PSERS of just 2% over current levels or \$100 million per year for the next sixteen years, the Commonwealth and employers could save \$2.3 billion in future contributions to the System or a return on investment of over 46%. As illustrated in Chart 4.7 below, the savings reach an annual peak of \$436 million in 2035.

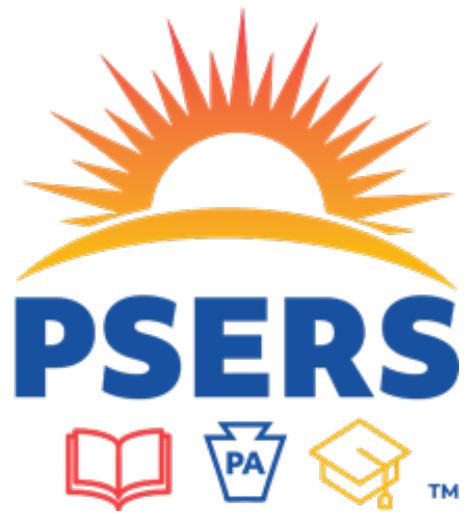


Section 1 - PSERS Overview

How to Reduce Employer Contribution Rates (continued)

Due to the additional funding, the employer contribution rate begins to decrease in 2023 and reaches a maximum of 2.51% below the currently projected rate in 2035 as illustrated in Chart 4.8 below.





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Section 1 - PSERS Overview

Employer Contribution Rate

PSERS undergoes an annual independent actuarial valuation to calculate the actuarial assets and liabilities of the pension fund. Based on the actuarial valuation process, the actuary in consultation with PSERS' professionals, develops the recommended Employer Contribution Rate (ECR) that determines the employer contributions to the pension plan 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 2019-20)	34.29%
• Lowest historical ECR (FY 2001-02)	1.09%
• Ten yr. avg. ECR (2010-11 to 2019-20)	22.11%
• Twenty yr. avg. ECR (2000-01 to 2019-20)	13.06%
• Thirty yr. avg. ECR (1990-91 to 2019-20)	12.51%
• Adopted ECR (FY 2020-21)	34.51%

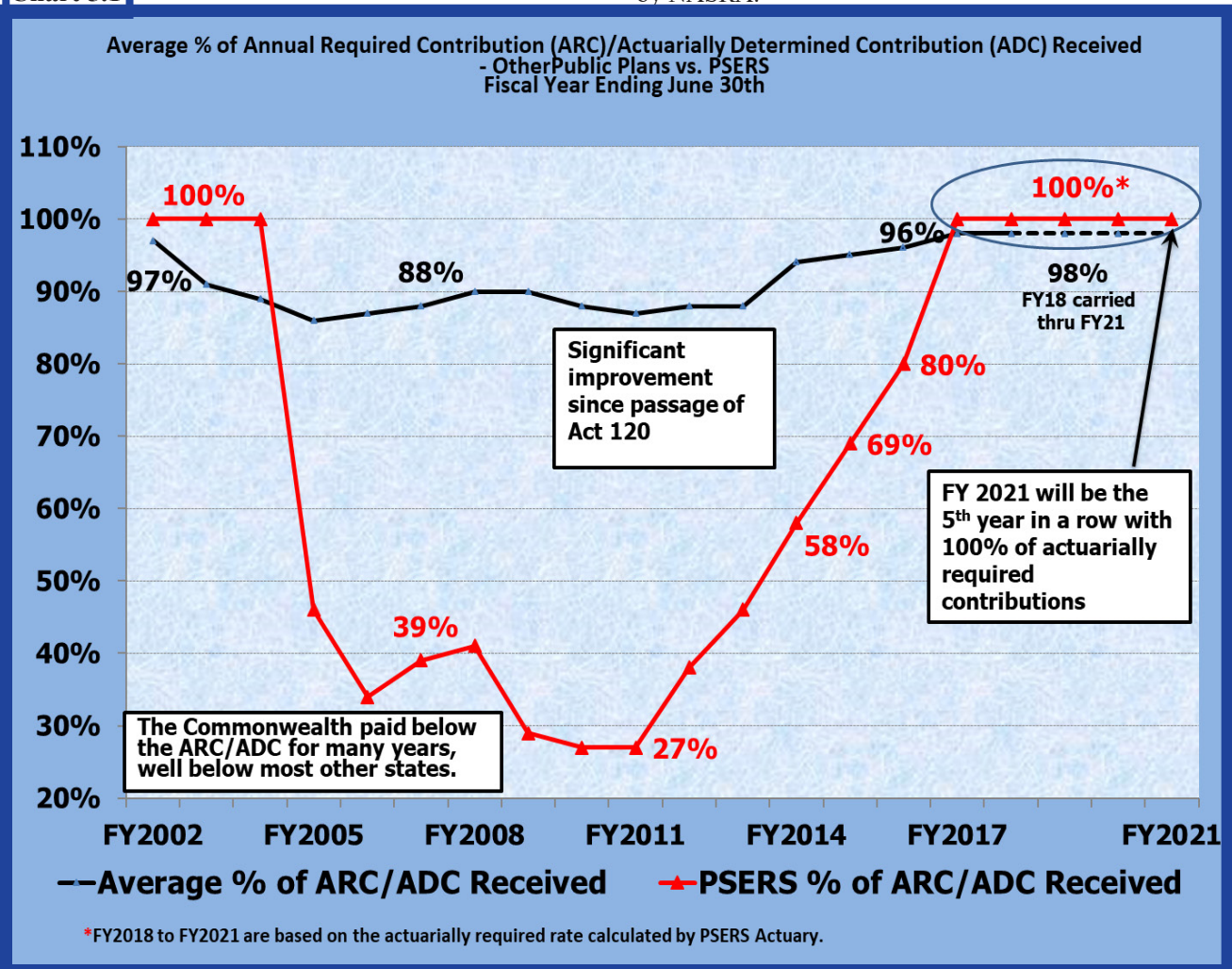
Act 120 of 2010

Progress on Funding Issue

PSERS is now in the 9th year under Act 120 of 2010. Act 120 provided historic pension reform and made dramatic progress toward addressing funding issues at PSERS. The legislation included actuarial and funding changes to PSERS and benefit reductions for individuals who became new members of PSERS on or after July 1, 2011.

As depicted in Chart 5.1, 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 34.51% for FY 2020-21 in compliance with Act 120 and Act 5 of 2017. This will be the fifth 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 December 2019 Public Fund Survey prepared by NASRA.

Chart 5.1



Section 1 - PSERS Overview

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 classes: Class T-E and T-F. As of June 30, 2019, members hired since the passage of Act 120 now total over 85,000 and account for 33% 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

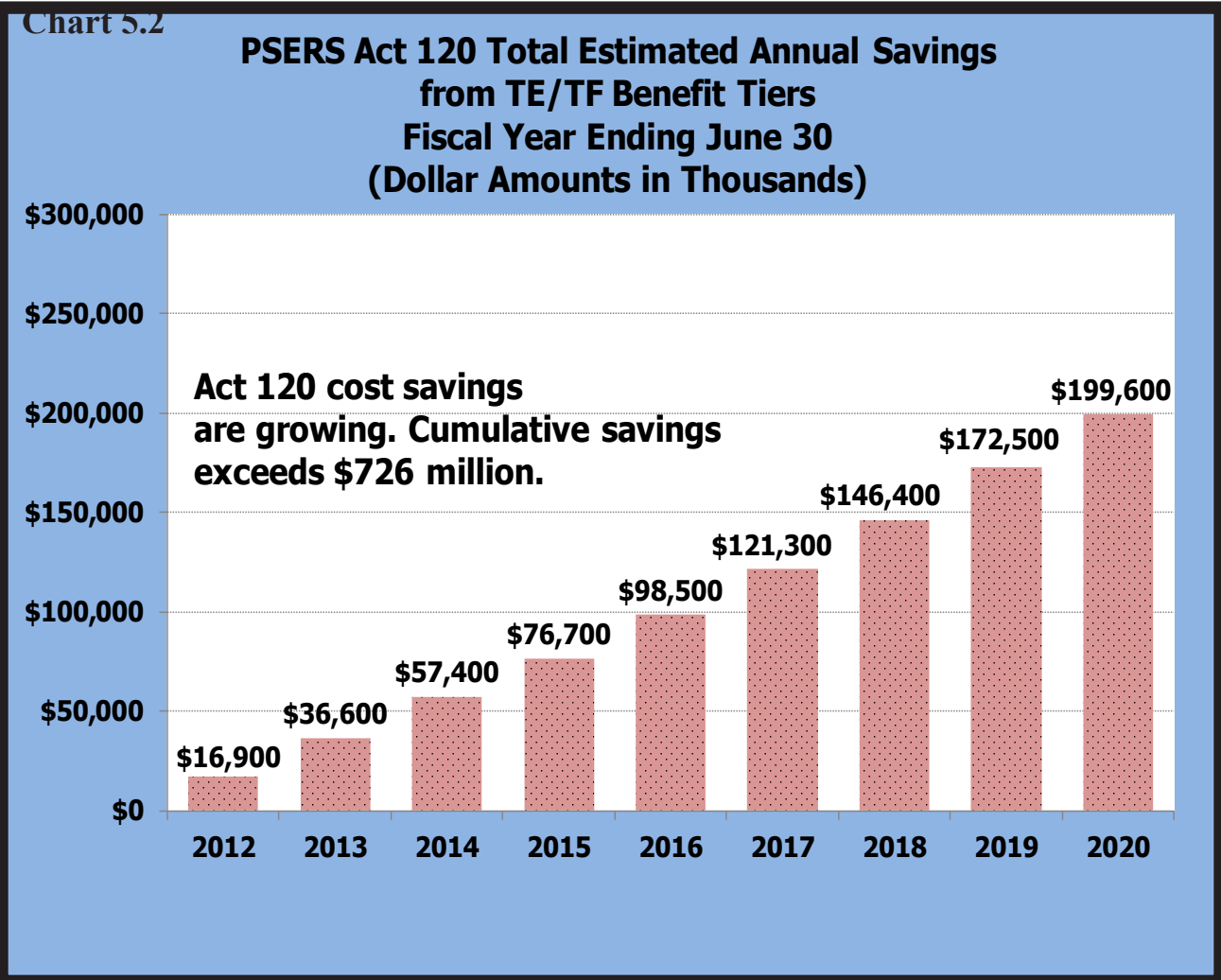
- Pension multiplier is 2.5%
- Effective July 1, 2011 employee contribution base rate is 10.3% (base rate) with “shared risk” contribution levels between 10.3% and 12.3%

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 grew through FY 2018-19, the annual savings from the low T-E/T-F cost structure also increased and allowed a greater portion of employer contributions to go towards paying the unfunded liability. Class T-E and T-F closed to new members after June 30, 2019. Cumulative estimated savings through June 30, 2019 were \$726.3 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, 2019, 70,521 or 82% of new members remained in Class T-E and 15,100 or 18% of new members elected Class T-F. As indicated, Class T-F members maintain the higher 2.5% pension multiplier but fully pay for the higher benefit by contributing a higher member contribution rate than Class T-E members.



Section 1 - PSERS Overview

Employer Contribution Rate

(continued)

Funding Changes - Employer Contributions

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

PSERS' Board has approved a total employer contribution rate of 34.51% for FY 2020-21 which is a less than inflation increase of 0.64% over the FY 2019-20 rate of 34.29%. This is the smallest percentage increase since FY 2009-10.

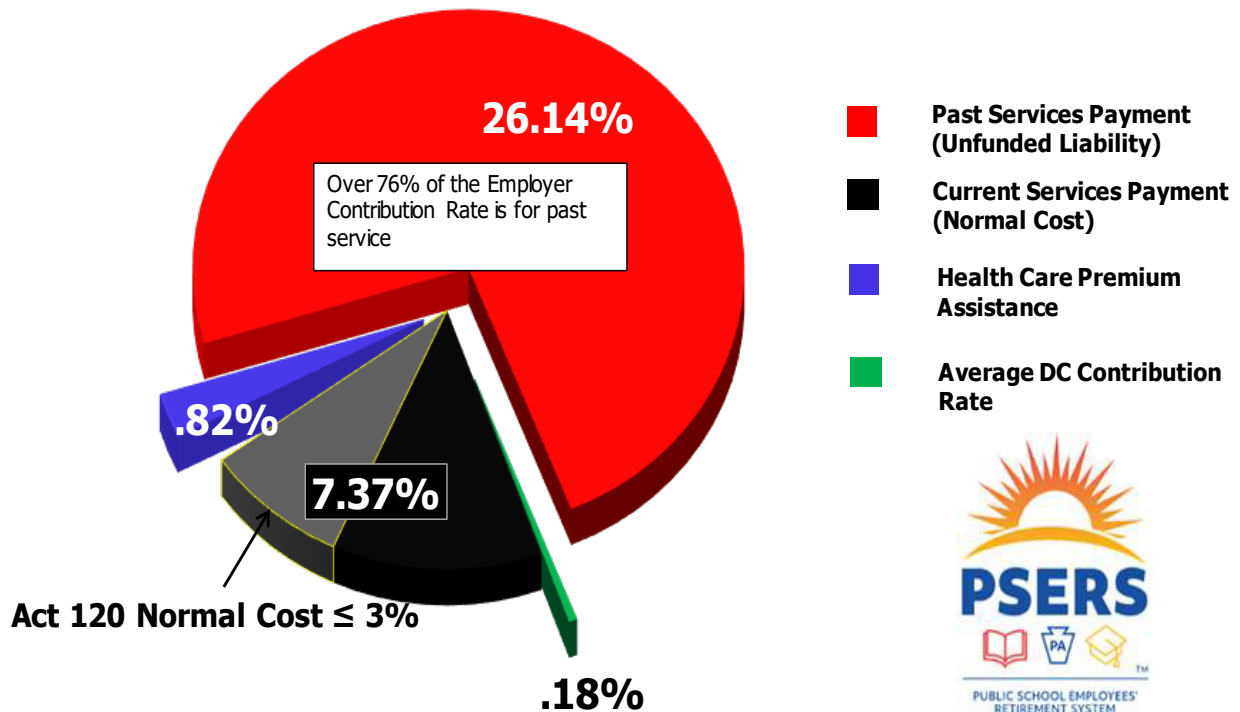
Employer Contribution Rate

Chart 5.3 displays the components of PSERS' projected employer contribution rate of 34.51% in FY 2020-21. The majority of the rate, over 76%, is dedicated toward paying the cost of past service. The employers' cost for current service is a much smaller portion of the contribution rate and is projected to decrease each year as more post Act 120 members (includes Act 5) join the System and pre-Act 120 members retire. The cost structure of PSERS' members since Act 120 is low and the shared risk provisions shift a portion of the investment risk to active members similar to a defined contribution plan. Essentially, Act 120 provides the members with a defined benefit plan, which is both adequate and secure, and provides the employers with a low cost employee pension benefit funded in large part by the members who have also assumed some of the investment risk. New members after June 30, 2019 fall under Act 5. Act 5 continues the low cost of current benefits created by Act 120 and shifts additional investment risks to members in the future.

Chart 5.3

Components of PSERS Total Employer Contribution Rate FY2021

Total Employer Contribution Rate 34.51%

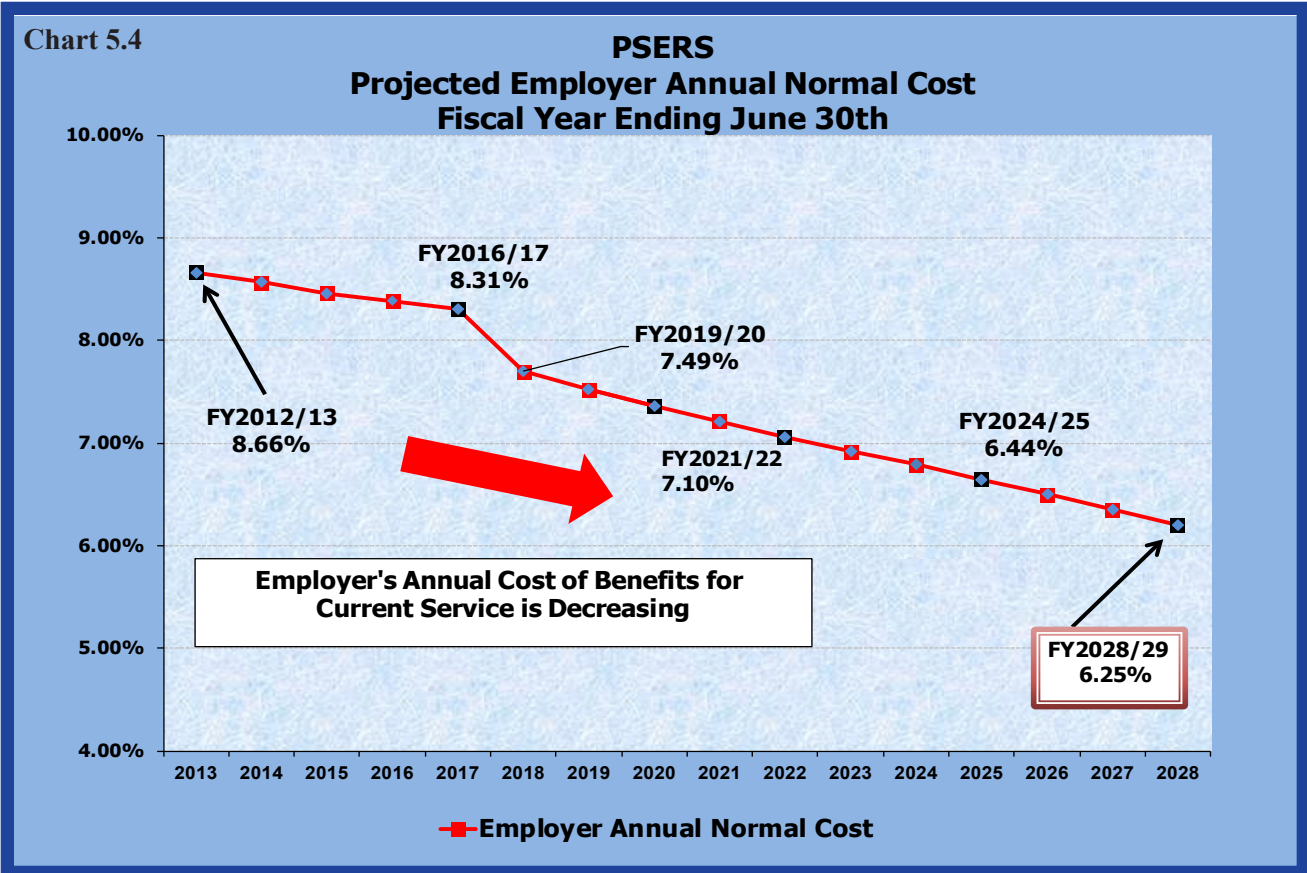


Section 1 - PSERS Overview

Employer Contribution Rate (continued)

Act 120 Employer Costs

As Chart 5.4 depicts, the employer normal cost decreases over time as Act 120 and Act 5 members replace retiring pre-Act 120 members. The employer normal cost of current benefits earned by Act 120 members is less than 3% of payroll which is less than 65% of the normal cost for pre-Act 120 members. This represents a significant cost reduction for the employers. Chart 5.4 projects the employer normal cost to be 6.25% in FY 2028-29 when over 60% 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 2020-21 through FY 2024-25. 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)

	2020-21	2021-22	2022-23	2023-24	2024-25
School Employees' Retirement	\$2.747	\$2.845	\$2.974	\$3.097	\$3.207

Section 1 - PSERS Overview

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 is no longer available to new members.

Act 5 does not affect already retired members or those whose retirement date was prior to June 12, 2017. Class T-C, Class T-D, Class T-E, and Class T-F members active on July 1, 2019 had the option to switch from the current defined benefit plan to one of the three new retirement plans if they so chose.

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

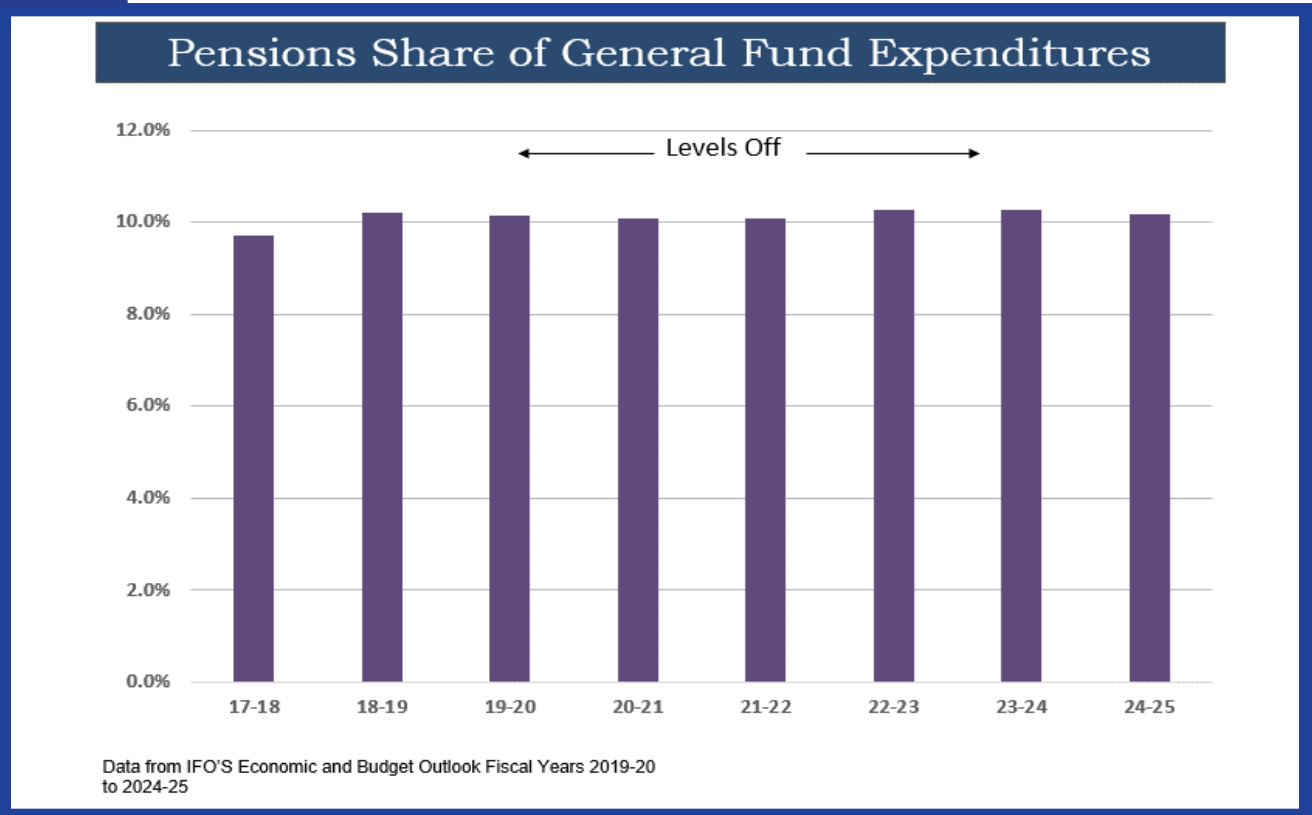
Throughout 2019, PSERS professionals were actively engaged in providing actuarial data, legislative analyses and related technical information to members of the General Assembly and Executive Branch Officials on a range of pension policy proposals while remaining policy neutral.

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



Section 1 - PSERS Overview

Employer Contribution Rate (continued)

At its December 2019 meeting, PSERS Board of Trustees certified an annual contribution rate of 34.51% for FY 2020-21 which continues to put PSERS on the path towards full funding. For the fifth 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.

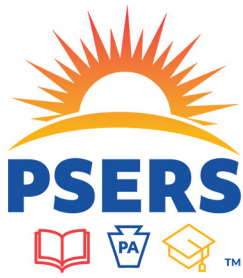
The Pennsylvania Independent Fiscal Office (IFO) has recognized the Commonwealth's progress on its pension funding issues. As shown in Chart 5.5, after FY 2017-18 pensions share of the Commonwealth's General Fund expenditures levels off and is no longer a major driver of General Fund expenditure growth.

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, 2019. 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. FY 2020-21 will be the fifth year in a row that PSERS will receive the full actuarially required contributions. These contributions are making a positive difference as PSERS funded ratio in FY 2018-19 increased by the largest amount in over a decade. Full actuarial funding from employers, along with member contributions and investment income are all necessary sources of funds that continue to pay down the unfunded liability of the System. While a challenging pension funding environment remains for school employers and the Commonwealth due to legacy debt issues, all of the sources of funding are now in place to bring PSERS back to fully funded status in an actuarially sound manner.



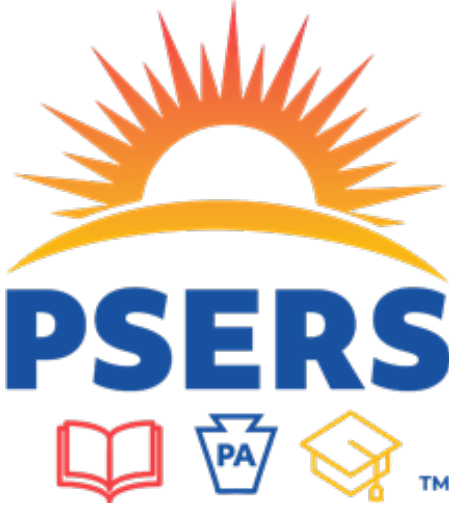
PSERS Budget Report

Fiscal Year 2020 - 2021



SECTION 2 - PSERS FY2020-21 BUDGET

PSERS Consultants' Fees and Legislation.....	Tab 6
PSERS FY2020-21 Administrative, Defined Contribution Administrative, and Directed Commissions Recapture Program Budgets	Tab 7



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Section 2 - FY2020-21 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, 2019.

Table 6.1

Investment, Pension and Defined Contribution Plan Administration Consultants

<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
ViTech Systems Group, Inc.	Pension administration system services	\$ 6,290,000 *
Hamilton Lane Advisors LLC	Private market consulting	\$ 1,718,205
Unisys Corporation	Server maintenance	\$ 1,594,053
Voya Holdings, Inc.	Defined Contribution Plan administration	\$ 1,380,000 *
Aksia LLC	Hedge fund investment consulting	\$ 875,000
Aon Investment Consulting	General investment consulting	\$ 762,500
Bloomberg Finance LP	Investment consulting	\$ 709,121
OST, Inc.	Information technology services	\$ 489,423 *
Buck Global LLC	Pension Benefit Actuarial Services	\$ 225,758 *
Glass, Lewis & Co., LCC	Proxy voting	\$ 178,681
Ernst and Young US LLP	Investment consulting	\$ 165,033
Gartner, Inc.	Information Technology consulting services	\$ 161,400 *
Charles W. Cammack Associates	Defined Contribution Plan consulting services	\$ 133,332 *
Clifton Larson Allen LLP	Financial audit - pension, defined contr., healthcare	\$ 112,450 *

Table 6.2

Health Options and Premium Assistance Program Consultants

<u>Firm</u>	<u>Services Provided</u>	<u>Consultant Fee</u>
Coresource, Inc	Post employment healthcare benefits administration and claims adjudication	\$ 31,307,090 *
Optum Rx, Inc	Post employment healthcare benefits administration and prescription drug plan	\$ 5,681,861 *
The Segal Company, Inc.	Consulting services for the Health Options Program and prescription drug plan	\$ 3,571,134 *
Blue Peak Advisors LLC	Pharmacy benefit consulting services	\$ 1,263,817 *
Tivity Health	Silver Sneakers Fitness Program administration	\$ 838,823 *

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

Legislation

PSERS-Related Legislation 2019

House Bill 1960, Printer's Number 2794 (Consolidation)

House Bill 1960, Printer's Number 2794 would amend Title 24 (Education), Title 64 (Public Authorities and Quasi-public Corporations) and Title 71 (State Government) of the Pennsylvania Consolidated Statutes, to establish a new state government agency known as the Commonwealth Pension Investment Office (CPIO). The stated purpose of the CPIO is to manage and invest the combined assets of the State Employees' Retirement System (SERS) and Public School Employees' Retirement System (PSERS). The day-to-day management of the consolidated pension fund assets of PSERS and SERS would be transferred from the respective retirement Boards to the newly created CPIO.

In general, HB 1960 seeks to combine the investment offices of SERS and PSERS based upon the assumption that consolidation would generate cost savings and enhance net investment returns, as discussed in the Public Pension Management and Asset Investment Review Commission (PPMAIRC) Final Report (released December 13, 2018) upon which many of the bill's provisions are based.

However, the alleged savings and return assumptions are not guaranteed to materialize, possibly leading to increased government operating costs for employers and taxpayers, according to detailed analysis that was conducted on behalf of the Independent Fiscal Office.

PSERS authorized its consultants to conduct the analyses upon request from the Independent Fiscal Office. By statute, IFO provides cost estimates of pension-related legislation for the General Assembly. The IFO did not dispute the findings of PSERS' consultants.

Major provisions of the bill are as follows:

- The CPIO would consist of nine paid members: three appointed by the SERS board, three appointed by the PSERS board and three appointed by the six appointees of the two boards. It is unknown who would set the salaries for the CPIO Board, as PSERS and SERS Boards are currently unpaid.
- Trustees would serve four-year terms and no trustee could serve more than two full or partial terms. All trustees would be appointed from a pool of candidates identified and maintained by an independent third-party consultant.
- Trustees must have demonstrated competencies in various disciplines such as economics, finance, financial management and accounting.
- Administrative expenses of the CPIO would be shared between PSERS (60 percent) and SERS (40 percent) and paid from investment earnings. The administrative budget of the CPIO would be prepared and approved by the trustees after transmission to the boards of SERS and PSERS for review and comment. By November 1 of each year, a copy of the approved budget will be provided to the boards of SERS and PSERS.
- Investment expenses for internally managed funds and externally managed funds would be divided in a just and reasonable way based on the share of each investment held by SERS and PSERS.
- The CPIO would have authority to invest the retirement funds of SERS and PSERS. The office would have authority to (1) diversify investments to minimize risk, (2) hold, purchase, sell, lend, assign, transfer or dispose of securities and investments in which money in the client funds has been invested, (3) invest, reinvest, assign, reassign, sell and transfer client funds and portfolios of the client boards and (4) other necessary actions to generally invest and manage the assets of SERS and PSERS.
- The CPIO would not be subject to a number of provisions under the Administrative Code of 1929 and the Procurement Code,

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- ostensibly to allow the office greater flexibility regarding the structure and salary level of investment staff and contractors.
- The bill also establishes two restricted funds that would receive employer contributions through a certified transfer from the Department of Revenue in order to establish a dedicated funding mechanism to ensure that the full actuarially required contributions are made each year. The transfer would come from personal income tax revenues.

While well intentioned, the overall impact of HB 1960, as written, could impose additional costs on employers (and by extension, taxpayers) in return for no increase in investment performance as indicated in the Buck and Aon reports. Those reports are available on IFO's and PSERS' websites. In its November 15, 2019 actuarial analysis, PSERS consulting actuary, Buck, indicated enactment of House Bill 1960 would result in additional employer costs of \$775,347,000 through fiscal year 2052.

Finally, PSERS' investment consultant, Aon, indicated in its Nov. 13, 2019 letter, that the bill largely would preserve the status quo with respect to investment returns, and there would be no meaningful change in the investment returns for the private market investments. Furthermore, Aon said the estimated increase in administrative costs associated with establishing an entirely new state agency exceeds the expected decrease in PSERS fees that could result from combining SERS' assets with PSERS' current internal management.

House Bill 1964, Printer's Number 2897 (Transparency and Reporting)

House Bill 1964, Printer's Number 2897 would amend Title 24 (Education) and Title 71 (State Government) of the Pennsylvania Consolidated Statutes, by mandating additional fee and other reporting requirements applicable to both PSERS and SERS. Certain mandates, however, contained in House Bill 1964 could result in investment

losses of \$1 billion annually to the PSERS Fund and could impose costly administrative burdens on the System, according to an analysis conducted by PSERS' general investment consultant, Aon, and PSERS' private markets advisor, Hamilton Lane. Those unintended consequences would have to be paid by the state and public school employers and, eventually impact taxpayers.

PSERS consultants conducted the analysis upon request from the Independent Fiscal Office. By statute, IFO provides cost estimates of pension-related legislation for the General Assembly. The IFO did not dispute the findings of PSERS' consultants.

The bill contains the following provisions:

- The State Employees' Retirement System (SERS) and Public School Employees' Retirement System (PSERS) must livestream board meetings for public access and post unedited video and records of those meetings online. The videos and records must be retained on the website for seven years.
- Both systems must publish additional reports submitted to the Governor and General Assembly and publish those reports online. The reports would detail (1) investment performance over various periods, (2) performance by asset class and manager, (3) fees and expenses paid to or retained by all investment managers, (4) travel and other expenses incurred by system staff and paid by an external investment manager, fund or consultant and (5) internal control representations relative to deficiencies in systems of internal control.
- Classifies all investment records, including alternative investments, as public records subject to the Right to Know Law, unless a majority of the board finds that access would cause substantial competitive harm to the entity providing the information or have a substantial detrimental impact on the value of an investment to be acquired, held or disposed of by the system or would

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cause a breach of the system's fiduciary duty.

- Amends the SERS code to make access to its alternative investment records consistent with the rules for PSERS.
- Prohibits the systems from entering into any investment management contract or agreement that contains terms or provisions contrary to the legislation.

As indicated earlier, the bill's mandates could have unintended consequences related to investment losses and increased costs by crippling PSERS' alternative investment program which currently comprises over 40% of the total Fund.

In its analysis, Aon projects a decline in expected investment returns of 4 basis points in fiscal year 2021 and falling by 85 basis points per year beginning in fiscal year 2031 and beyond. Buck's preliminary cost estimate for HB 1964 is \$29.2 billion in additional employer contributions between 2021 and 2052. School employers and taxpayers would have to pay for the additional contributions through higher employer rates.

Following are additional concerns and observations related to specific provisions contained in the bill:

- Livestreaming all board meetings and maintaining the recordings for a period of seven years is a significant cost to the system, requiring the purchase of additional equipment, bandwidth, and server space. (bill page 1, line 16 - page 2, line 6)
- This bill makes every record of the system and board a public record unless the board determines by majority vote that the disclosure of the information will either cause substantial competitive harm or have a substantial detrimental impact on the value of an investment. This appears to include information on specific members, banking information, material non-public information (the disclosure of which may constitute insider trading), privileged documents (including attorney/client), and medical information. (bill page 2, lines 7-29)
 - o PSERS would now be required to

compile and disclose information that does not currently exist in a record thus adding additional administrative costs.

- o This broad level of disclosure could violate privileges and other laws, including:
 - Federal/SEC prohibitions including insider trading disclosures
 - Attorney-Client privilege
 - Sensitive personal and banking information - including individual members' Defined Contribution Account information and PSERS banking information
 - Sensitive or financial alternative investment information that was only obtained by agreeing not to redisclose the information is no longer protected and must be disclosed. There is no exception for information obtained under existing contracts, meaning PSERS could be required to violate contracts currently in effect. (bill page 2, line 16-21).
 - This provision also puts PSERS at a competitive disadvantage as it would no longer be able to guaranty confidentiality, and therefore, will not receive confidential information necessary to perform due diligence or negotiate fee reductions.
 - The new section requiring disclosure of "unredacted marketing materials, including, without limitation, proposed fee terms, prospectuses, staff and consultant investment memorandum, subscription agreements, investment management agreements, contracts, side letters, and annual investor reports of the alternative investment vehicle" for all alternative investments is a drastic increase in disclosure that appears to require the unredacted disclosure of alternative investment contracts, side letters, proposed fee terms, and staff and consultant investment memorandum. This requires the disclosure of confidential information (including PSERS banking information) and represents a significant administrative cost. Because the information must be disclosed "unredacted," this provision would most likely result in PSERS being shut out of investing in alternative investments as most

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- managers would not work with PSERS if their sensitive investment information is disclosed. (bill page 5, lines 21-26)
- The broad disclosure requirement without any “reasonableness” or time limit would further increase the administrative burden and expense of complying with this legislation as currently written. (the addition of subsection (s) beginning page 5, line 28).
 - Disclosure of internal control representations/management letters from auditors and independent accounting firms could result in the disclosure of confidential and privileged information. These letters often contain system vulnerabilities, the disclosure of which would make PSERS more susceptible to cyber/criminal attack. (bill page 7, lines 3-15).
 - o At a time when the Commonwealth and school district employers are struggling to make the required actuarially-determined contribution to the Fund, it would be counterproductive to impose these costly new mandates on PSERS and risk a substantial decline in investment opportunities, favorable terms and investment returns. If this bill passes in its current form, the Board may be obligated to reduce the actuarial expected rate of return from 7.25% to 6.50% due to our model of lost earnings, thereby increasing the unfunded liability by billions of dollars and increasing the employer contribution rate.

House Bill Number 1962 Printer’s Number 2896. (Stress Testing)

House Bill Number 1962 Printer’s Number 2896. (Stress Testing) The bill would amend Title 24 (Education) and Title 71 (State Government) of the Pennsylvania Consolidated Statutes, by requiring that the State Employees’ Retirement System (SERS) and the Public School Employees’ Retirement System (PSERS) conduct annual stress test evaluations. The required stress test would include a scenario analysis, simulation analysis and sensitivity analysis as detailed by the legislation. The bill

would require each board to submit the results of the stress test to the Governor, the General Assembly, and the Independent Fiscal Office (IFO) by January 1 (PSERS) or July 1 (SERS) of each year. The IFO would be responsible for producing report that summarizes the results of the stress test, including a calculation of the ratio of employer contributions to projected state revenues, by March 1 (PSERS) or September 1 (SERS) each year. The requirements would apply beginning with fiscal year 2020-21 for PSERS and the valuation year 2020 for SERS.

Stress-testing, which involves analysis of various economic scenarios to ascertain their impacts upon system funding, is a well-established practice at PSERS. PSERS consultants regularly perform 5,000 extensive, robust stress-testing analyses involving thousands of potential scenarios. By contrast, the legislation does not reflect industry best-practices and is overly prescriptive by mandating scenarios that will generate an unbalanced and unrealistic picture of the true liabilities of PSERS. In particular, the use of the 30-year Treasury yield as one mandated scenario adds no decision-making value for policymakers because it is merely one of many thousands of possible scenarios that the PSERS Board looks at when developing the asset allocation policy. Moreover, the mandates contained in the bill would impose an unnecessary unfunded mandate on the system, the costs of which must be borne by the system, its members and ultimately the taxpayers of the Commonwealth.

House Bill Number 1963, Printer’s Number 2705. (Contribution Collars)

House Bill Number 1963, Printer’s Number 2705. (Contribution Collars) The bill would amend Title 24 (Education) and Title 71 (State Government) of the Pennsylvania Consolidated Statutes, by prohibiting the use of collared employer contribution rates moving forward for the State Employees’ Retirement System (SERS) and the Public School Employees’ Retirement

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System (PSERS) after June 30, 2019. The bill would establish that the contribution collars which artificially suppressed the PSERS and SERS contribution rates for a number of years are no longer in effect. While PSERS already interprets the existing language to mean that the collars no longer apply, this additional language will add clarification of PSERS existing interpretation.

Amendment Number A04426, Proposed COLA for PSERS Retirees

An actuarial cost note for a cost-of-living adjustment (COLA) for PSERS retirees has been posted by the IFO. The actuarial note addresses only the COLA proposal contained in Amendment A04426 and not the underlying bill in the form of Senate Bill 951, P.N. 1369. Senate Bill 951 mandates the consolidation of investment offices of SERS and PSERS and is nearly identical to House Bill 1960, Printer's Number 2794. The proposed COLA amendment (A04426) has not yet been included in any bill. If enacted, the proposed COLA would increase monthly pension benefits between 4.5% to 15% for school employees who retired prior to July 1, 2001.

Cost Impact of COLA

Provides no additional state funding for the enhanced benefits. PSERS unfunded liability would rise by \$339.5 million.

The COLA would cost an additional \$524.3 million in employer contributions between 2020 and 2052.

PSERS actuary, Buck, cautioned: "increasing benefits at a time when the funded status of the plan is only at 56.5% based on the actuarial value of assets at June 30, 2018 and employer contribution levels are at a rate of 34.29% of payroll may be inadvisable. However, Buck does not take a position in favor of or in opposition to the proposed legislation."

The IFO did not take a position, but noted the legislation would increase PSERS' and SERS' unfunded liability and require higher taxpayer costs.

Act 1 of 2019

On March 28, 2019, Governor Wolf signed into law Senate Bill Number 113, Printer's Number 398, which amends the act of July 8, 1978 (P.L. 752, No. 140), known as the Public Employee Pension Forfeiture Act. The legislation expands the definition of "crimes related to public office or public employment" to provide that public pension benefit forfeiture shall occur when a public official or employee is found guilty of any state or federal criminal offense classified as a felony or that is punishable by a term of imprisonment exceeding five years. Language is added to the Act to specify the forfeiture shall not be stayed or affected by the pendency of an appeal. Section 7 of the Public Employee Pension Forfeiture Act is also repealed by the bill. Section 7 made the provisions of the act retroactive to December 1, 1972. Court rulings have deemed the retroactive application of the Act unconstitutional.

Act 11A of 2019

On June 28, 2019, Governor Wolf signed into law Senate Bill Number 239, Printer's Number 990. This legislation makes an appropriation in the amount of \$51,838,000 from the Public School Employees' Retirement Fund to provide for the administrative expenses of PSERS for the fiscal year beginning July 1, 2019.

The legislation also appropriates the sum of \$2,454,000 from the PSERS Defined Contribution Fund authorized under section 1799.8-E of the act of April 9, 1929 (P.L.343, No.176), known as The Fiscal Code, to the Public School Employees' Retirement Board for the payment of all salaries, wages and other compensation and travel expenses of the employees and members of the Public School Employees' Retirement Board, for

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contractual services and other expenses necessary for the proper conduct of the duties, functions and activities of the board related to the administration of the School Employees' Defined Contribution Plan established under 24 Pa.C.S. Ch. 84 (relating to School Employees' Defined Contribution Plan) for the fiscal year beginning July 1, 2019.

Finally, the legislation appropriates the sum of \$4,000,000 from the Public School Employees' Retirement Fund to the Public School Employees' Retirement Board for any contractual services and all expenses necessary for the proper conduct of the duties, functions and activities of the board related to investment office consolidation for the fiscal year beginning July 1, 2019.

Act 72 of 2019

On July 2, 2019, Governor Wolf signed into law Senate Bill Number 724, Printer's Number 1046. This legislation amends Titles 24 (Education) and 71 (State Government) of the Pennsylvania Consolidated Statutes, to make technical changes necessary to clarify provisions added to the retirement codes by Act 5 of 2017; add provisions to provide for nonparticipatory employer withdraw liabilities of the Public School Employees' Retirement System (PSERS); and for the statutory establishment of the PSERS Public Markets Emerging Investment Manager Program.



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Public School Employees' Retirement System Fiscal Year 2020-2021 Administrative Budget

Table 7.1

	<u>Budget</u> <u>FY2018-19</u>	<u>Budget</u> <u>FY2019-20</u>	<u>Budget Request</u> <u>FY2020-21</u>
Total Personnel Services	\$28,014,000	\$28,293,000	\$28,749,000
Operating Expenses and Fixed Assets			
Travel	167,130	167,900	159,100
Training & Conference Registration	199,400	181,400	185,600
Telecomm	440,900	460,900	419,200
Electricity	22,300	22,300	20,700
Consultant Services - Non EDP	2,657,500	2,190,100	2,173,500
Outsourced IT Consulting For Appl & Development	-	40,000	110,000
Consulting - Maint & Support - (Post Implementation)	109,000	53,000	83,000
Consulting - Security (Outsourced Inf Sec Services)	125,000	75,000	75,000
Consulting - General IT Support	810,600	985,000	1,278,000
Consulting - Outsourced Infrastructure Svcs (PACS)	921,000	1,075,000	1,250,000
Legal Services/Fees	289,000	227,000	227,000
Specialized Services	484,750	646,500	706,800
Other Specialized Services	174,000	221,200	220,300
Advertising	10,000	10,000	10,000
Medical, Mental & Dental Services	3,500	4,700	4,200
IT Shared Services	-	255,800	204,640
Software Licensing - Maintenance	1,753,100	1,338,400	1,079,560
Hardware - Maintenance	91,000	96,000	90,300
Contracted Maintenance Non EDP	168,000	167,800	162,800
Telecomm Data Services	88,900	92,500	83,200
Contracted Repairs - Non EDP	15,500	15,500	15,500
Real Estate Rental	2,059,500	2,080,100	1,917,200
Vehicle Rental	2,600	2,600	2,600
Office Equipment Rental	236,300	290,700	314,900
Other Rentals	8,400	8,400	8,400
Office Supplies	228,100	253,000	240,500
Educational & Medical Supplies	9,100	8,600	8,100
Software License Non-Recurring < \$5,000	31,300	27,800	11,900
Hardware - Network	140,000	-	-
Hardware Desktop < \$5,000	407,200	286,500	281,500
Furniture and Fixtures	68,100	69,500	67,200
Other Equipment	13,000	13,000	13,000
Motorized Equipment Supplies	21,000	21,000	21,000

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Public School Employees' Retirement System Fiscal Year 2020-21 Administrative Budget (continued)

Table 7.1	<u>Budget</u>	<u>Budget</u>	<u>Budget Request</u>
	<u>FY2018-19</u>	<u>FY2019-20</u>	<u>FY2020-21</u>
Postage and Freight	1,151,500	1,086,500	953,000
Printing	221,000	210,200	210,400
Subscriptions	431,340	342,400	346,000
Member Dues	38,280	41,500	44,300
Conference Expense	64,000	61,000	64,200
Insurance, Surety & Fidelity Bonds	10,000	10,000	10,000
Other Operational Expenses	2,135,700	2,851,200	2,838,300
HW Network and Server	89,000	-	340,000
Automobiles	20,000	19,800	19,800
Software License	7,678,000	7,507,000	7,246,000
Office Equipment	<u>29,000</u>	<u>28,200</u>	<u>28,300</u>
Total Operating Expenses and Fixed Assets	\$23,623,000	\$23,545,000	\$23,545,000
Total Administrative Budget	<u>\$51,637,000</u>	<u>\$51,838,000</u>	<u>\$52,294,000</u>

Administrative Budget

Table 7.1 displays PSERS Administrative Budget Request for FY2020-21. The \$52,294,000 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.

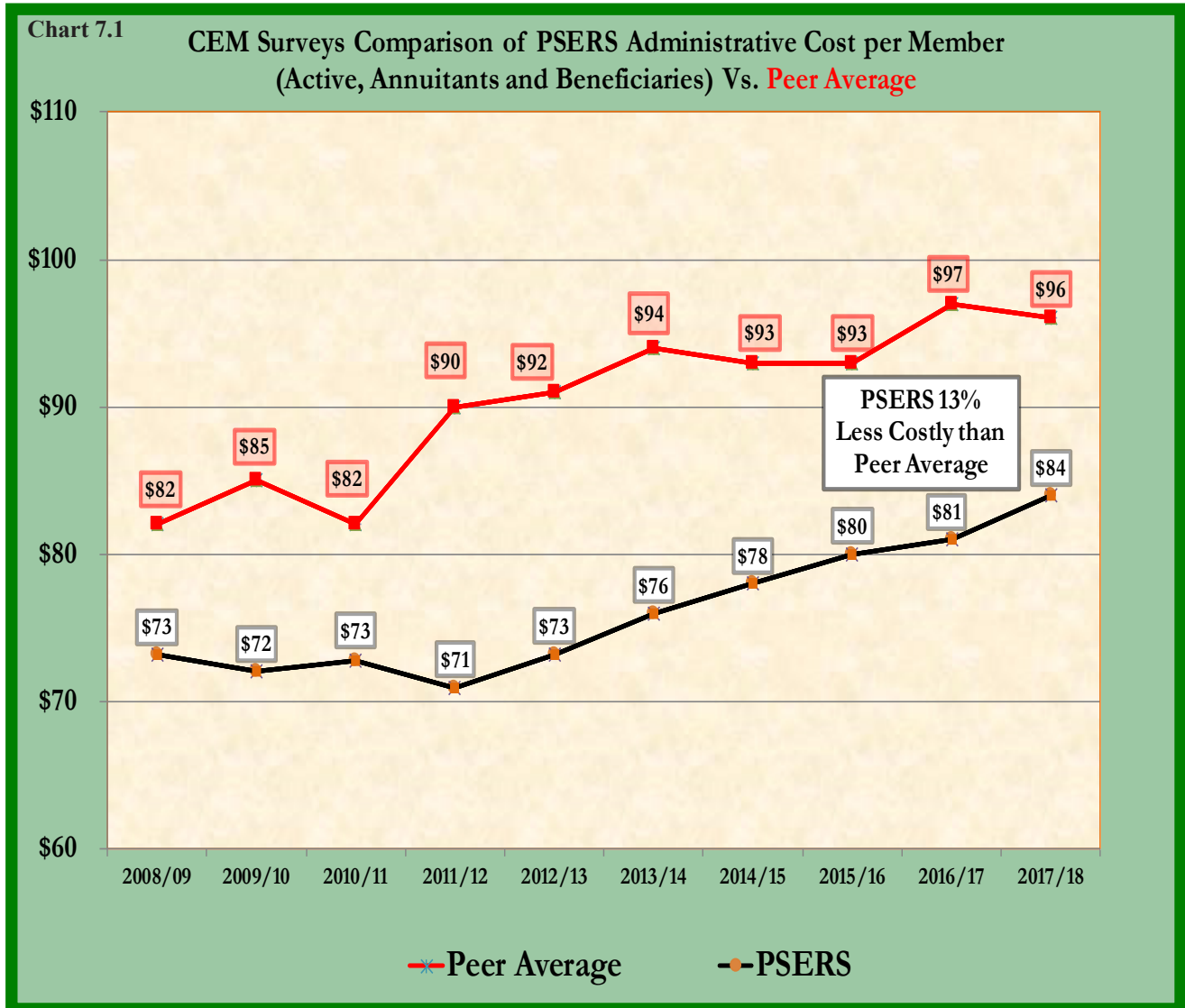
PSERS' Administrative Budget Request for FY 2020-21 represents an increase of \$456,000 or 0.9% above the FY 2019-20 available budget. Operating costs remain the same while personnel costs reflect increases in salaries and related benefits.

PSERS continues to be a leader among large U.S. public pension funds in its effective control of expenses while providing necessary services to its membership. Within the past eighteen months, the System has added significantly to

the number of active and retired members electing to receive newsletters, statement of accounts, 1099-Rs and other publications electronically, which saves the agency over \$200,000 per year in postage, printing and paper costs. During FY2019 specifically, the agency achieved a substantial decline in overtime, reduced consultant and legal fees, decreased election and data storage services, and lowered subscriptions, all of which helps to maintain more investment earnings for the benefit of the Fund. In addition to these savings, PSERS purchased programming hours from its pension administration system vendor at a reduced prepaid rate in order to allow for vital changes to be made in the near future to comply with Act 5 of 2017.

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Public School Employees' Retirement System Fiscal Year 2020-21 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 31% fewer full-time equivalent staff per member than the peer group average. Chart 7.1 above illustrates that PSERS had a 13% lower pension administration cost per member than the average cost for its peer group. By running a lean and efficient operation, PSERS saves the Commonwealth and school employers approximately \$6.2 million annually in administrative expenses compared to its peers.

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Public School Employees' Retirement System Fiscal Year 2020-21 Defined Contribution (DC) Administrative Budget

Table 7.2

	<u>Budget</u> <u>FY2018-19</u>	<u>Budget</u> <u>FY2019-20</u>	<u>Budget Request</u> <u>FY2020-21</u>
Total Personnel Services	\$771,000	\$895,000	\$497,000
Operating Expenses and Fixed Assets			
Consultant Services - Non EDP	2,415,000	640,000	270,000
Legal Services/Fees	250,000	145,000	50,000
Other Operational Expenses	131,500	70,000	66,000
SW License recurring > \$,5000	<u>1,382,500</u>	<u>700,000</u>	<u>200,000</u>
Total Operating Expenses and Fixed Assets	\$4,179,000	\$1,555,000	\$586,000
Total Administrative Budget	<u>\$4,950,000</u>	<u>\$2,450,000</u>	<u>\$1,083,000</u>

Defined Contribution (DC) Administrative Budget

Table 7.2 displays PSERS' Defined Contribution (DC) Administrative Budget Request for FY 2020-21. The \$1,083,000 amount requested represents a decrease of more than 50% from the FY 2019-20 available budget. As the implementation stage of Act 5 is completed, the need for consulting services and software programming changes decreases significantly.

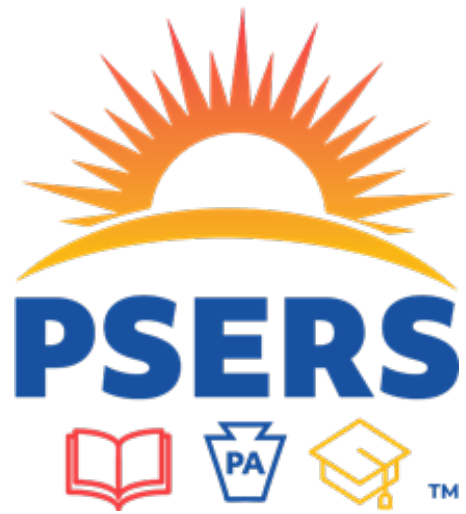
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PSERS Directed Commissions Recapture Program

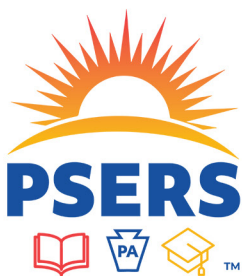
Directed Commissions Recapture is a program whereby a portion of commissions incurred by PSERS through investment trading activity is returned to PSERS. These funds can be used for the administration of the Fund or can be reinvested back into the asset allocation through a transfer to PSERS Retirement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

Directed Commissions Recapture Program - Directed Commissions Appropriation #6012700000

Table 7.3	<u>Budget</u>	<u>Budget</u>	<u>Budget Request</u>
	<u>FY2018-19</u>	<u>FY2019-20</u>	<u>FY2020-21</u>
Budgetary Reserve	\$2,000,000	\$2,000,000	\$2,000,000
Total	\$2,000,000	\$2,000,000	\$2,000,000



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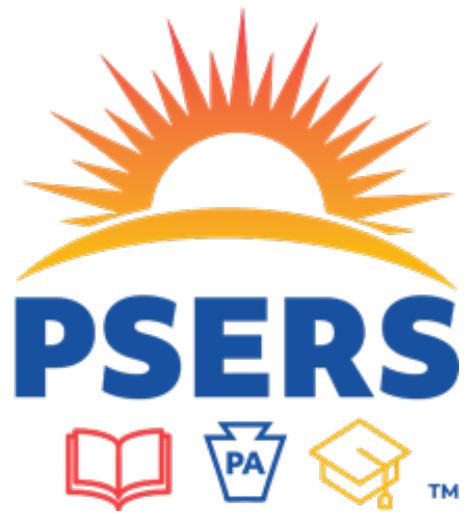
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Section 3 - Investment Information

Investment Risk Management

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

The future is difficult to forecast with any accuracy or certainty, particularly changes in the economic and market environment but PSERS can understand the future as a range of probabilities, some desirable and some not, and can position its current investments to guard against undesirable outcomes and to make desirable outcomes more likely. In positioning

for future developments, PSERS cannot know with complete certainty how markets or particular investment strategies will perform. The strategic asset allocation mix, more than implementation or any other factor or decision, largely determines the portfolio's overall risk and return.

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

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

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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 2018, 2019 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. The 2019 survey newly introduced assumptions for Private Debt. Select asset classes are detailed in Table 8.1.

Table 8.1 summarizes the average expected capital market geometric return assumptions of 20 - 30 surveyed independent investment advisors in 2015, 2016, 2017, 2018 and 2019:

PSERS Capital Market Assumptions (CMA's)					
Average Expected Geometric Returns (2015 - 2019)					
Asset Class	2015 Survey	2016 Survey	2017 Survey	2018 Survey	2019 Survey
U.S. Equity - Large Cap	7.1%	7.9%	7.8%	7.4%	7.1%
U.S. Equity - Small Cap	7.3%	8.2%	8.4%	8.2%	7.5%
Non-U.S. Equity - Developed	7.5%	8.0%	7.6%	7.7%	7.7%
Non-U.S. Equity - Emerging	8.7%	9.1%	8.7%	8.8%	8.7%
U.S. Fixed Income - Core	3.7%	4.6%	4.4%	4.5%	4.3%
U.S. Fixed Income - Long Duration Corp.	4.0%	4.9%	4.8%	4.4%	4.4%
U.S. Fixed Income - High Yield	6.0%	6.8%	6.2%	5.8%	5.8%
Non-U.S. Fixed Income - Emerging	2.7%	3.7%	3.5%	3.2%	3.4%
Non-U.S. Fixed Income - Developed	6.0%	6.4%	6.2%	6.1%	6.1%
Treasuries (Cash Equivalents)	2.4%	3.2%	3.2%	3.1%	3.0%
TIPS (Inflation-Protected)	3.1%	3.9%	4.0%	4.0%	3.5%
Real Estate	6.3%	6.8%	6.7%	6.7%	6.8%
Hedge Funds	5.8%	6.2%	6.0%	6.2%	6.2%
Commodities	4.4%	4.8%	5.0%	4.9%	4.7%
Infrastructure	7.1%	7.1%	7.1%	7.1%	7.2%
Private Equity	9.5%	10.3%	10.1%	9.5%	10.1%
Private Debt	N/A	N/A	N/A	N/A	7.8%
Inflation	2.2%	2.3%	2.4%	2.5%	2.3%

Fixed Income

Nominal government bond returns are a function of long-term expectations for inflation and government yields. Corporate bond returns are a function of expected inflation, government yields and expectations for credit spreads, defaults and downgrades. The majority of the decrease in corporate bond return assumptions from 2016 – 2018 can be explained by falling yields and the flattening of yield curves. This trend continued into 2019 as the yield curve inverted and flattened.

Equities

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

- Global Equity returns expectations have declined relative to 2018, driven by slowing growth, political uncertainty and trade wars.

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. In the past year, volatility has increased and participants concern over slowing growth has driven future expected returns lower.

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Capital Market Assumptions

(continued)

Real Estate

Expected returns across the global real estate markets remained in line with 2017 assumptions, slightly higher than 2014 assumptions.

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

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 from 2017 - 2018 reflected rising expectations for cash. Expectations as of 2019 remain unchanged.

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.

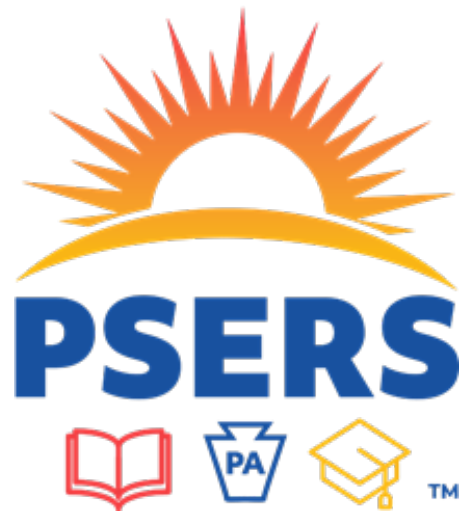
The CMA surveys also included forecasts for 20 year average expected risk (Table 8.2). The numbers below reflect the expected standard deviation in % around the expected return.

Table 8.2

PSERS Capital Market Assumptions (CMA's)

Average Expected Risk (2015 - 2019)

<u>Asset Class</u>	<u>2015 Survey</u>	<u>2016 Survey</u>	<u>2017 Survey</u>	<u>2018 Survey</u>	<u>2019 Survey</u>
U.S. Equity - Large Cap	17.1%	16.9%	16.6%	16.4%	16.2%
U.S. Equity - Small Cap	21.0%	21.0%	20.2%	20.2%	20.2%
Non-U.S. Equity - Developed	19.6%	19.5%	18.9%	18.7%	18.2%
Non-U.S. Equity - Emerging	26.6%	26.4%	25.4%	24.9%	24.7%
U.S. Fixed Income - Core	5.6%	6.0%	5.5%	5.7%	5.5%
U.S. Fixed Income - Long Duration Corp.	10.8%	10.5%	10.4%	10.8%	10.5%
U.S. Fixed Income - High Yield	11.2%	11.0%	10.6%	10.2%	10.1%
Non-U.S. Fixed Income - Emerging	7.4%	7.6%	7.4%	6.9%	7.6%
Non-U.S. Fixed Income - Developed	11.7%	11.6%	11.8%	11.4%	11.3%
Treasuries (Cash Equivalents)	2.8%	2.8%	3.0%	2.7%	2.3%
TIPS (Inflation-Protected)	6.3%	6.5%	6.3%	6.3%	6.1%
Real Estate	13.6%	14.7%	14.5%	13.9%	15.0%
Hedge Funds	8.3%	8.4%	8.0%	7.9%	8.4%
Commodities	18.0%	18.5%	17.9%	17.6%	17.7%
Infrastructure	13.1%	13.8%	14.6%	14.7%	14.0%
Private Equity	23.6%	23.1%	22.0%	22.2%	22.0%
Private Debt	N/A	N/A	N/A	N/A	11.6%
Inflation	1.8%	1.8%	1.7%	1.8%	1.7%



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Asset Exposure

(as of June 30, 2019)

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, 2018, and was in effect on June 30, 2019:

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	\$ 2,646.8	4.1%	4.6%	4.8	
Non-U.S. Equity	6,532.9	10.1%	11.4%	10.2	
Total Global Public Market Equity	\$ 9,179.7	14.1%	16.0%	15.0	
Private Markets	8,310.9	12.9%	14.5%	15.0	
Total Equity	\$ 17,490.6	27.2%	30.6%	30.0	± 10
Fixed Income*	\$ 22,535.7	35.0%	39.4%	36.0	± 10
Commodities*	4,357.6	6.8%	7.6%	8.0	± 4
Infrastructure*	3,838.6	6.0%	6.7%	6.0	
Real Estate*	5,516.7	8.6%	9.6%	10.0	
Total Real Asset Exposure	\$ 13,712.9	21.4%	23.9%	24.0	± 10
Risk Parity*	\$ 4,717.6	7.3%	8.2%	8.0	± 5
Absolute Return	\$ 5,964.8	9.3%	10.4%	10.0	± 5
Gross Asset Exposure	\$ 64,421.5	100.0%	112.5%	108.0	
Financing*	(7,215.9)		-12.5%	-8.0	+24/-14
Net Asset Exposure	\$ 57,205.6		100.0%	100.0	

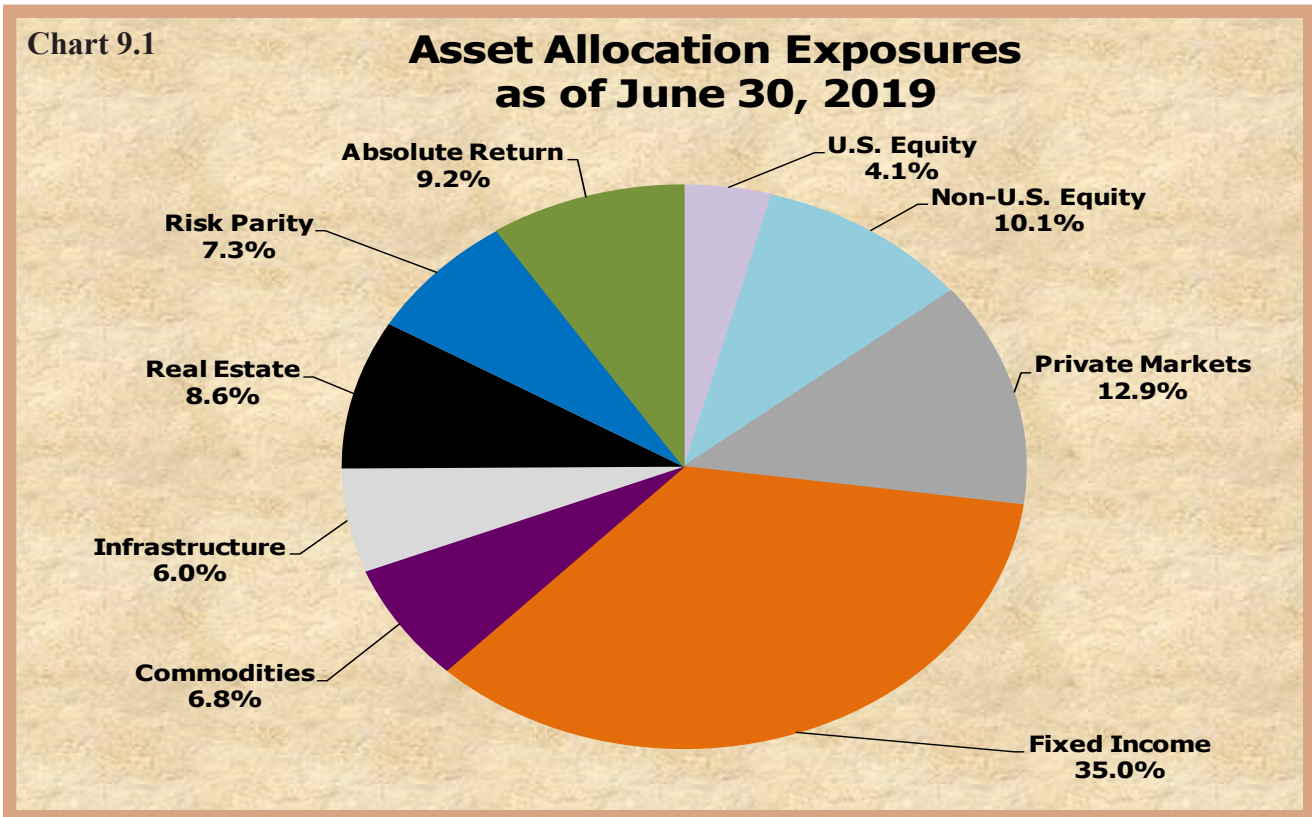
*PSERS uses financing to achieve increased economic exposure to diversifying asset classes to manage the overall portfolio risk while maintaining an allocation designed to achieve the long-term return goals of the System. Increased economic exposure is generally achieved through the use of either derivative positions or higher volatility funds. As of June 30, 2019, PSERS had total increased economic exposure of \$7.2 billion related to the following asset classes: Fixed Income (\$3.6 billion); Risk Parity (\$0.5 billion); Infrastructure (\$0.6 billion); Real Estate (\$0.2 billion) and Commodities (\$2.3 billion). An allocation of 6% to Cash is included in the Target Allocation.

Note: PSERS' asset allocation was updated October 1, 2019 and is available for review at <http://www.psers.pa.gov>.

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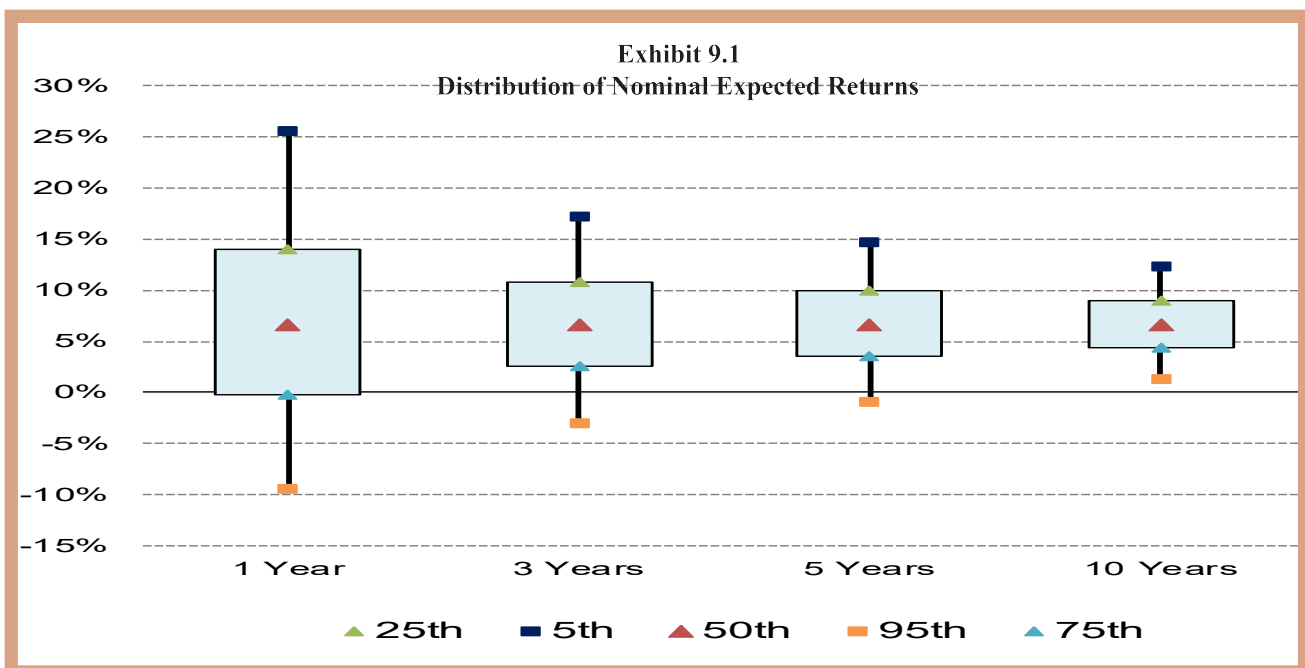
Asset Exposure (continued)

Chart 9.1 illustrates PSERS' asset allocation exposure as of June 30, 2019:



Note: Financing represents a negative 12.5% 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:



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Range of Returns				
Percentiles	1 Year	3 Years	5 Years	10 Years
5%	27.2%	18.4%	15.8%	13.3%
25%	15.1%	11.8%	10.7%	9.7%
50%	7.4%	7.4%	7.4%	7.4%
75%	0.1%	3.1%	4.1%	5.0%
95%	-9.4%	-2.7%	-0.5%	1.7%

Source: Aon Hewitt's 30-year capital market assumptions as of June 30, 2019.

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 worldwide 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 15.0% 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.

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Private Market Investments (continued)

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.

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.

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 42.0% of assets to Fixed Income, 10.0% 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, and a 6.0% allocation to Cash is included in the (8)% allocation to Financing.

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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

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Real Estate Investments (continued)

target allocation is 10.0% of total assets, of which 9.0% 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 8.0% of assets to Risk Parity investments. The Risk Parity investments are targeted to be 100% actively managed.

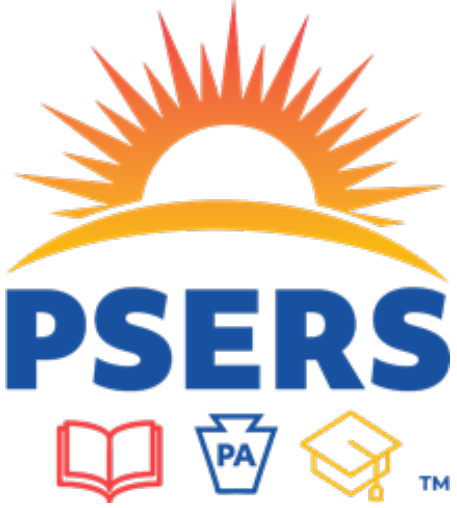
Absolute Return Investments

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.



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Section 3 - Investment Information

Performance

PSERS' general investment consultant calculates the total investment return of the System as well as the performance of each external investment management firm and each internal investment manager retained by the Board to invest the System's assets. Performance is calculated using a time-weighted return methodology. For the one-year period ended June 30, 2019, the System

generated a total net of fee return of 6.68%. This return was below the Total Fund Policy Index return of 7.68% by 100 basis points. Annualized total net of fee returns for the three-, five-, and ten-year periods ended June 30, 2019 were 8.71%, 6.04%, and 9.02%, respectively. The three-year and ten-year returns ended June 30, 2019, exceeded the Total Fund Policy Index returns by 62 and 59 basis points, while the five-year return trailed by 2 basis points.

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, 2019					
	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
PSERS Total Portfolio	6.68	8.71	6.04	9.02	6.87	6.11
Total Fund Policy Index	7.68	8.09	6.06	8.43	6.43	5.41
Median Public Defined Benefit Plan (DBP) Fund Universe (Aon Hewitt Database)	5.98	8.53	5.61	8.77	6.37	5.68
60% Global Equity / 40% Barclays U.S. Aggregate Bond Index	7.01	8.00	5.02	7.89	6.29	5.30
PSERS U.S. Equity Portfolios	7.84	13.63	10.16	14.95	8.71	N/A
U.S. Equity Policy Index (1)	8.96	14.04	10.24	14.60	8.91	N/A
PSERS Non-U.S. Equity Portfolios	2.84	11.72	6.94	9.58	8.43	N/A
Non-U.S. Equity Policy Index (2)	2.15	10.67	5.47	8.34	7.28	N/A
PSERS Fixed Income Portfolios (10)	7.89	6.55	5.59	8.12	6.83	6.94
Fixed Income Policy Index (3)	8.38	4.52	3.70	5.75	5.56	5.90
PSERS Commodity Portfolios (10)	0.19	0.63	-3.85	0.08	N/A	N/A
Commodity Policy Index (4)	0.17	-0.63	-5.22	-1.84	N/A	N/A
PSERS Absolute Return Portfolios	2.42	5.38	3.35	6.08	N/A	N/A
Absolute Return Policy Index (5)	6.16	5.34	4.76	6.22	N/A	N/A
PSERS Risk Parity Portfolios (11)	8.16	7.37	4.18	N/A	N/A	N/A
Risk Parity Policy Index (6)	9.41	7.10	5.08	N/A	N/A	N/A
PSERS Master Limited Partnership (MLP) Portfolios	1.55	1.99	-4.98	12.42	N/A	N/A
Standard & Poor's MLP Index	3.23	1.54	-6.65	8.88	N/A	N/A
PSERS Infrastructure Portfolios	5.55	5.86	N/A	N/A	N/A	N/A
Infrastructure Policy Index*	7.56	6.34	N/A	N/A	N/A	N/A
PSERS Real Estate (7) (10)	7.59	9.83	10.44	9.16	7.50	8.35
Blended Real Estate Index (8)	5.99	8.49	10.14	8.73	8.96	9.04
PSERS Alternative Investments (7)	11.21	13.93	9.44	12.14	12.26	10.50
Burgiss Median Return, Vintage Year Weighted (9)	9.67	13.26	10.88	13.37	9.27	6.64

*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 92 of PSERS Comprehensive Annual Financial Report.

Section 3 - Investment Information

Performance (continued)

The past fiscal year was a positive year for the System with a net of fee return of 6.68%, however the return trailed the Policy Index by 1.00% for the fiscal year. The following asset classes were additive to returns this past fiscal year:

- Public Infrastructure, as represented by FTSE Developed Core Infrastructure 50/50 Index (Net) (Hedged), was up 16.1%.
- U.S. Long Treasuries, as represented by the Bloomberg Barclays U.S. Long Treasury Index, were up 12.3%. Returns in long-term treasuries were driven by falling interest rates.
- Gold, as represented by the Bloomberg Gold Subindex Total Return, was up 12.1%. Many investors flocked to Gold as a safe haven from turbulent global stock markets.
- Private Equity, as represented by Burgiss All Private Markets ex Real Estate (1Q Lag), was up 9.67%.
- Emerging Markets Debt, as represented by Bloomberg Barclays Emerging Market 10% Country Capped Index, gained 8.7%. US dollar-denominated EMD returns were aided by a strong rally within US treasuries, coupled with relatively stable credit spreads.

Significant detractors from performance this past fiscal year included:

- Commodities, as represented by the Bloomberg Commodity Index Total Return, were down -6.8%. Negative absolute returns were largely driven by slowing global growth concerns, which was a drag on crude oil prices.
- Emerging Markets equities, as represented by the MSCI Emerging Markets IMI Index (net), returned +0.5%. While this return was positive on an absolute basis, the asset class detracted relative to other markets, including U.S. and developed Non-U.S. equities.

As noted, one of the best performing asset classes this past fiscal year was Public Infrastructure, which was up over 16%, while one of the worst performers was Commodities returning -6.8% for FY 2019, a big change from its strong performance in FY 2018, returning +7.3%. This illustrates the importance of diversification. Many investment professionals discuss diversification using terms such as standard deviation, correlation, and co-variance. However, at its most basic level, diversification is insurance against

bad outcomes. The System diversifies simply because it doesn't know how actual events in the future will transpire relative to what is priced into the market. Diversification is a very humble approach to investing. If an investor knew with certainty which asset class would perform best the next month, quarter, or year, the investor would simply invest in that one asset class. However, without such perfect foresight, the downside risk of such a strategy could be devastating. PSERS employs diversification across a wide variety of public and private markets. Exposure to private equity and private real estate provided return enhancement and diversification benefits in FY 2019. Diversification into asset classes such as absolute return, TIPS, and high yield 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 1.17 for the 5-year period ending June 30, 2019, a top 4th percentile score among public pension plans with assets above \$1B.

The fiscal year continued a recent trend of strong performance but with increased volatility in the markets, with the VIX reaching a peak in December 2018. Global Equities closed the fiscal year higher after recovering from sharp losses in Q4 driven by concerns of slowing global growth and trade wars. Prospects of looser monetary policy by central banks, and a more positive outlook on US-China trade negotiations drove performance higher toward the end of the fiscal year.

Volatility in US equities over the year was driven by concerns around the slowing US economy and uncertainties around political risks and the future economic outlook. December in particular brought about huge losses across all sectors due to worse than expected earnings growth. Equities ended the fiscal year strong with returns largely driven by the prospect of monetary easing by the Fed and, at the time, a more positive outlook on the US – China trade wars.

Prospects of looser monetary policy were touted by major central banks at the end of June 2019. Over the year the US nominal yield curve inverted and shifted downwards as yields fell across all maturities. In the UK, Brexit uncertainties continued as UK Prime Minister Theresa May resigned in Q2 2019. However, increased expectations of further monetary stimulus from the European Central Bank combined with a strengthening of the euro against the U.S. dollar resulted in the European equities ending Q2 higher.

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Performance (continued)

Emerging market equities, especially those with greater linkages to China, came under pressure over the fiscal year due to uncertainties around ongoing trade dispute.

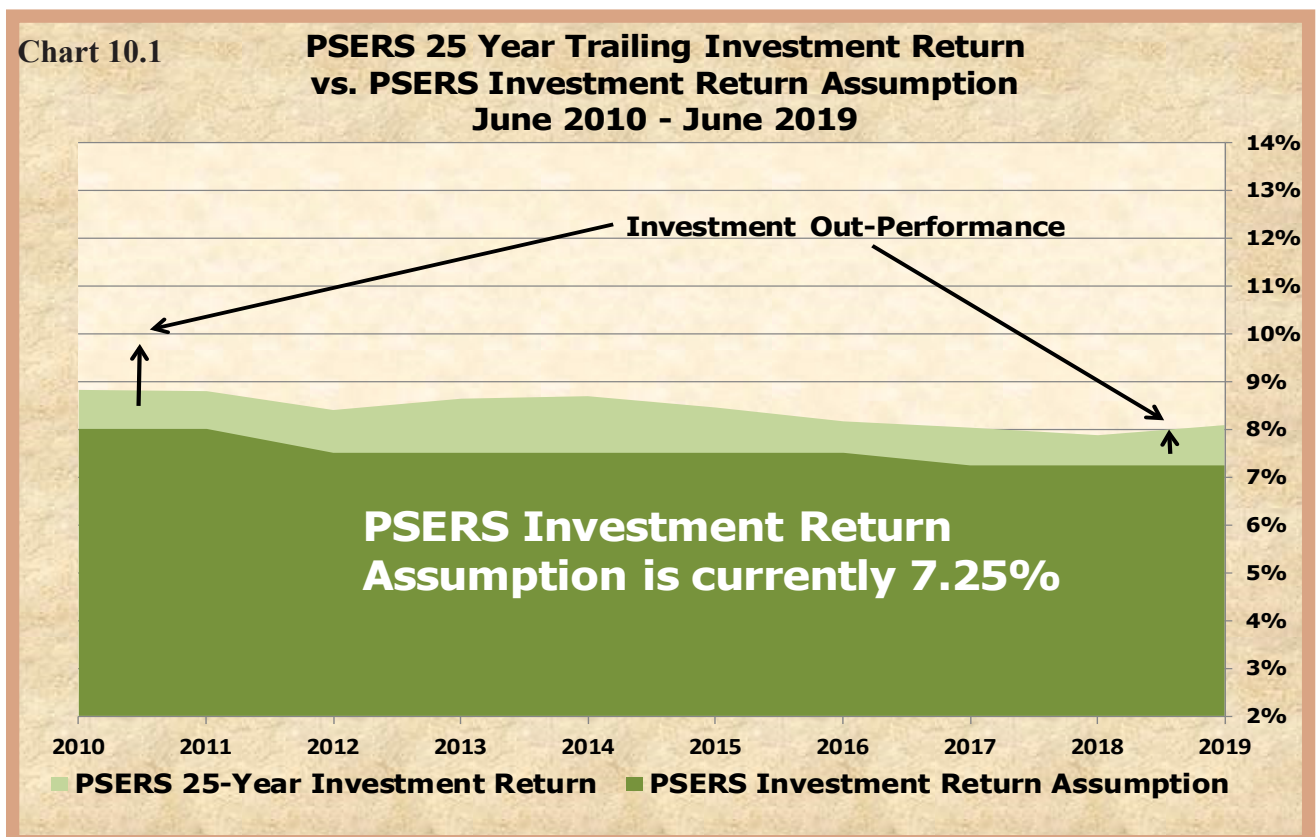
Commodity prices were negative over the 12 months ended June 30, 2019, driven by concerns of slowing growth. Oil prices got some support from rising tensions in Middle East as the U.S. re-imposed sanctions on Iran. However, a sharp rise in U.S. crude inventories and, more significantly, signs of slowing global growth put pressure on energy prices. The price of WTI crude oil decreased by ~22% over the past 12 months to US\$58/bbl. While it has been a challenging return environment as evidenced by the System's one-, and five-year annualized returns, since the first quarter after the Great Recession (10-years), PSERS' annualized net of fee return has been 9.06%, comfortably above the actuarial assumed rate of return of 7.25%. With cash rates around 2.25%, 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 Infrastructure and U.S. Long Treasuries did this past fiscal year, and expects some to not do as well, such as Commodities 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.

Long Term Investment Performance Consistently Outperforms

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

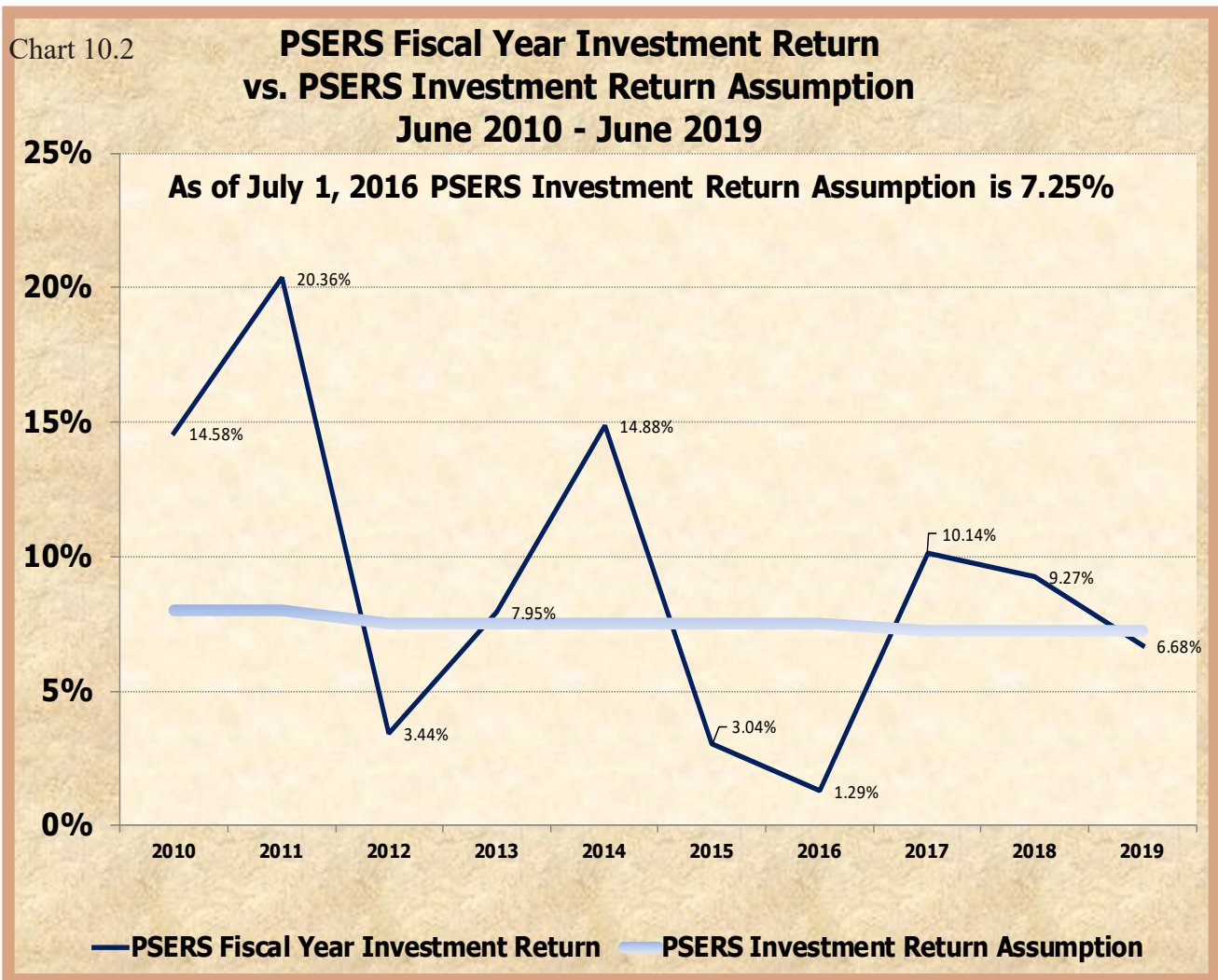
As shown in Chart 10.1, the 25 year trailing investment return has exceeded the investment return assumption over the last ten years including the Great Recession.



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Performance (continued)

As depicted in chart 10.2, PSERS' one-year investment return was below the investment return assumption for fiscal year 2019. Six of the past ten fiscal years, it performed above the assumption.



Section 3 - Investment Information

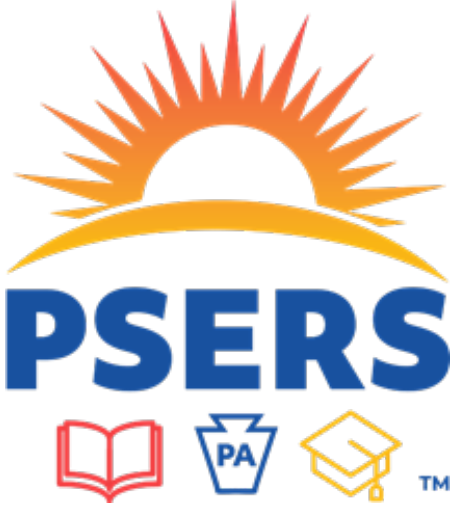
Performance (continued)

Table 10.2 demonstrates that over the past 20 fiscal years, on average, every dollar PSERS has spent in investment fees and expenses has resulted in investment earnings of \$2.06 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><u>Fiscal Year</u></i>	<i><u>Total Investment Expenses *</u></i>	<i><u>PSERS' Net Return over Policy Benchmark (AFTER Payment of all Expenses)</u></i>	<i><u>PSERS' Investment Earnings over Policy Benchmark Net of Total Investment Expenses *</u></i>	<i><u>\$'s of Gross Alpha for every \$1 of Investment Expenses</u></i>
2019	\$450	-1.00%	(\$631)	(0.40)
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>\$7,218</u>		<u>\$8,503</u>	<u>\$2.06</u>

*Dollar amounts in millions.



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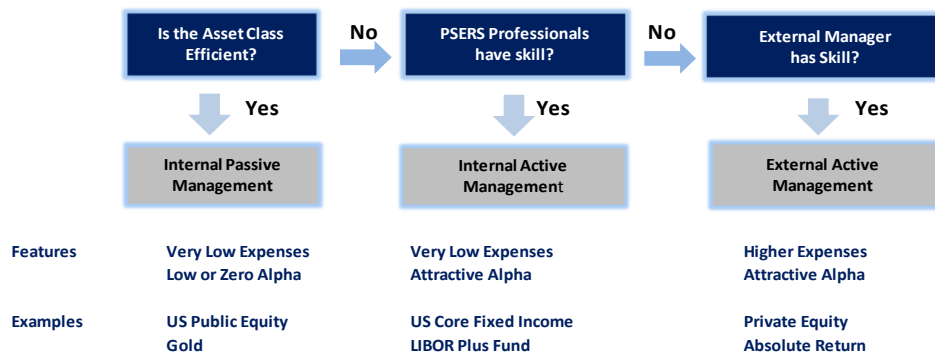
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Managing Investment Fees and Expenses

PSERS' investment 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.

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.

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Managing Investment Fees and Expenses (continued)

Chart 11.2 below demonstrates that over the past 20 fiscal years, PSERS has earned \$7.6 billion in additional investment returns above the Board-approved Policy Index, net of fees.

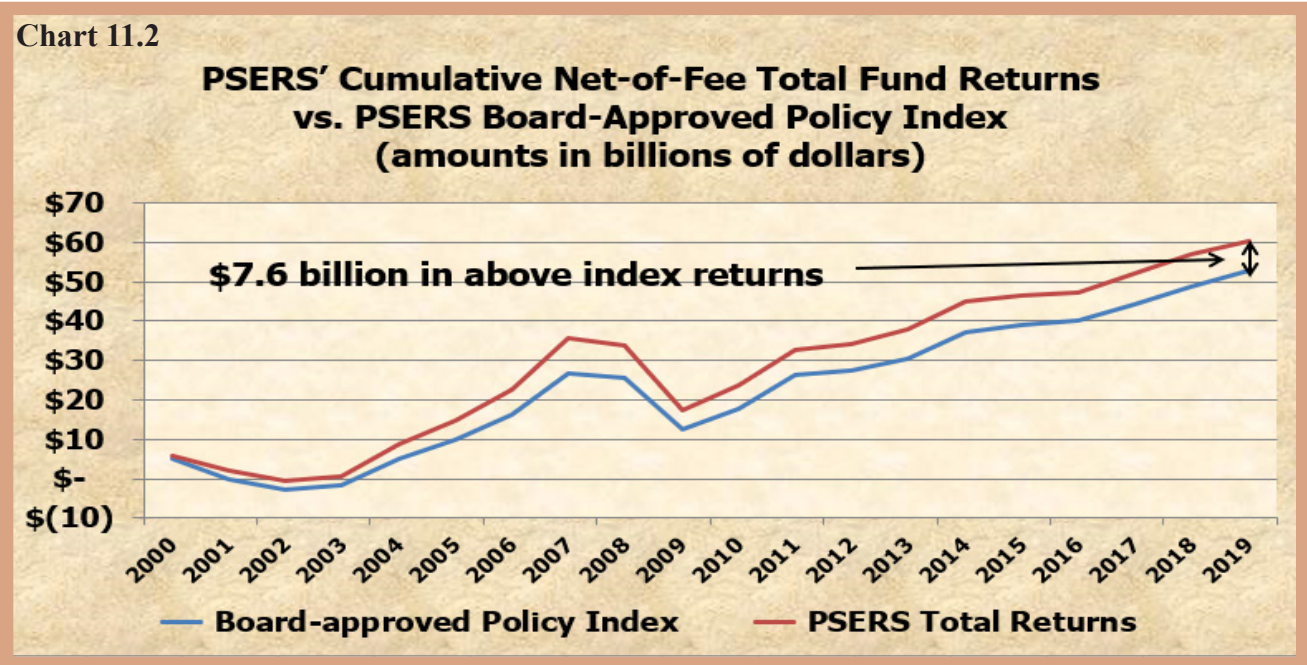
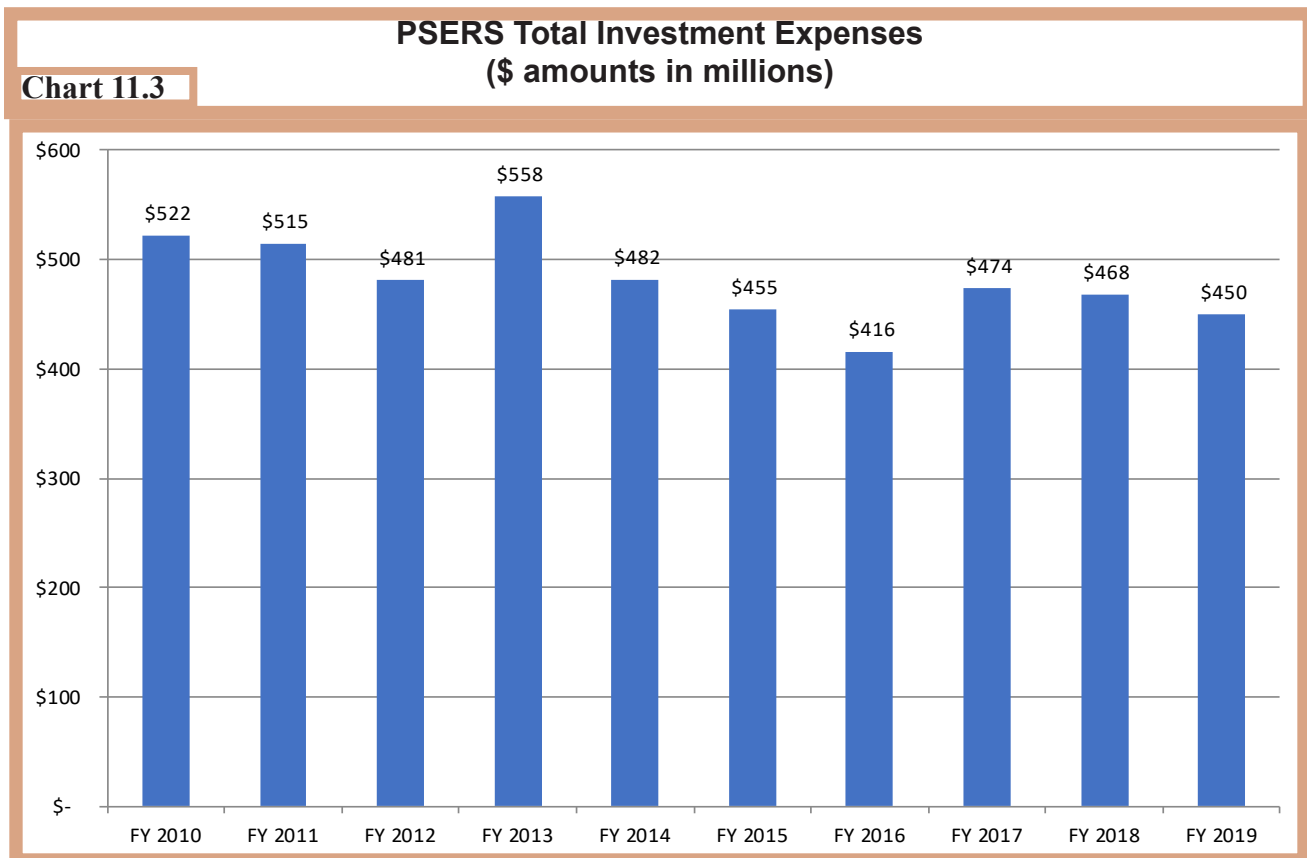


Chart 11.3 shows PSERS Total Investment Expenses over the past ten fiscal years.



Section 3 - Investment Information

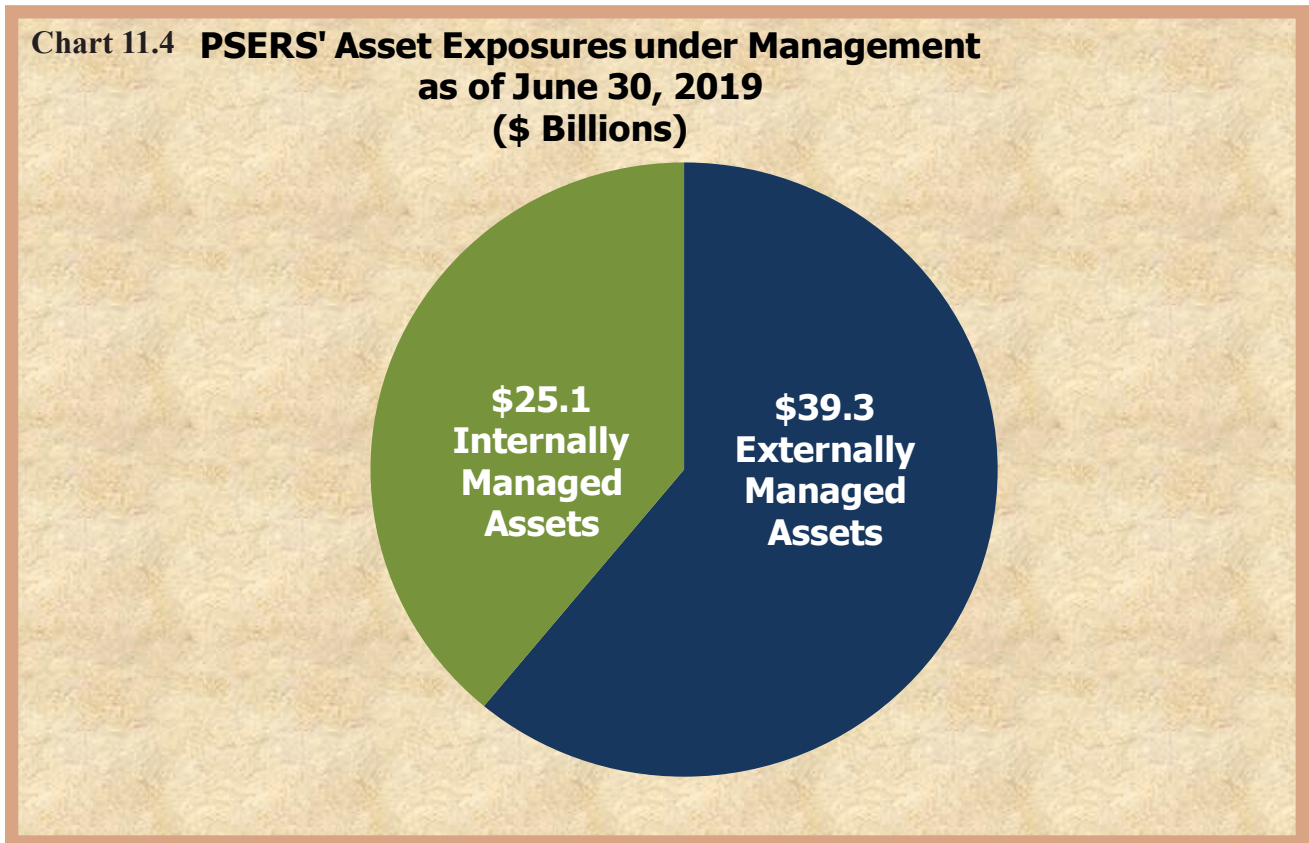
Key Decision: Internal vs. External Investment Management

PSERS generally prefers to assign investment management responsibilities to internal professionals rather than to external investment management companies when certain conditions are present (see Chart 11.1). For example, it must be clear that internal professionals can achieve risk-adjusted returns that are at least equal to what might be earned by external investment managers in equivalent strategies, and PSERS' investment professionals must simultaneously have the operational capacity to take on the additional work. When assets are assigned to PSERS' professionals, the total costs (e.g., salary and benefits, computers and office supplies) are much lower than using even the largest "very low

fee" index mutual fund companies charge, giving PSERS a significant advantage.

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

Chart 11.4 displays the distribution of PSERS managed assets as of June 30, 2019.



Note: Financing represents a negative \$7.2 billion allocation exposure and is not reflected in Chart 11.4.

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

PSERS' investment staff managed 21 portfolios internally, with a total estimated net asset value of over \$25 billion on June 30, 2019, resulting in significant fee savings. For the entire fiscal year, PSERS incurred costs of approximately \$18 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 \$48 million in additional fees:

Table 11.1

<u>Account</u>	<u>Asset Class</u>	<u>Market Value as of 6/30/19*</u> <u>(,000)</u>	<u>Estimated Annual Fee</u> <u>%</u>	<u>Estimated Cost to Manage Externally</u> <u>(,000)</u>
PSERS - S&P 500 Index	U.S. Equities	\$2,036,956	0.01%	\$204
PSERS - S&P 400 Index	U.S. Equities	317,259	0.03%	95
PSERS - S&P 600 Index	U.S. Equities	291,498	0.04%	117
Misc. PSERS Equity Accounts	U.S. Equities	1,084	0.00%	-
	U.S. Equities Total	2,646,797		\$416
PSERS ACWI ex. U.S. Index	Non U.S. Equities	2,497,669	0.08%	1,998
	Non U.S. Equities Total	2,497,669		1,998
Private Markets Co-Investments	Private Markets	687,284	1.38%	6,873
PA Inv. Fund - Private Equity	Private Markets	2,715	1.38%	27
	Private Markets Total	689,999		6,900
Special Situations Internal	Fixed Income	111,717	1.00%	1117
PSERS Active Aggregate	Fixed Income	1,344,716	0.21%	2,824
PSERS TIPS Portfolio	Fixed Income	3,463,763	0.13%	4,503
PSERS Long Treasuries	Fixed Income	3,492,479	0.18%	6,286
	Fixed Income Total	8,412,675		14,730
PSERS Infrastructure Index	Infrastructure	1,172,970	0.50%	5,865
Infrastructure Internal	Infrastructure	38,437	0.50%	192
	Infrastructure Total	1,211,407		6,057
PSERS Commodity Beta	Commodities	1,608,042	0.15%	2,412
PSERS Gold Fund	Commodities	1,867,652	0.15%	2,801
Private Commodities Internal	Commodities	8,132	0.15%	12
	Commodities Total	3,483,826		5,225
PSERS S&P MLP Index	MLP	370,149	0.50%	1,851
	MLP Total	370,149		1,851
PSERS REIT Index	Real Estate	494,050	0.08%	395
Real Estate Co-Investments	Real Estate	107,841	0.49%	523
	Real Estate Total	601,891		918
PSERS Risk Parity	Risk Parity	2,508,599	0.30%	7,526
	Risk Parity Total	2,508,599		7,526
PSERS Cash Management	Cash Management	2,694,996	0.10%	2,695
	Cash Mgt Total	2,694,996		2,695
	Grand Total	<u>\$25,118,008</u>		<u>\$48,316</u>

*Market values include cash and derivatives exposure

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Key Decision: Active vs. Passive Investment Management

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

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

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

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

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

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

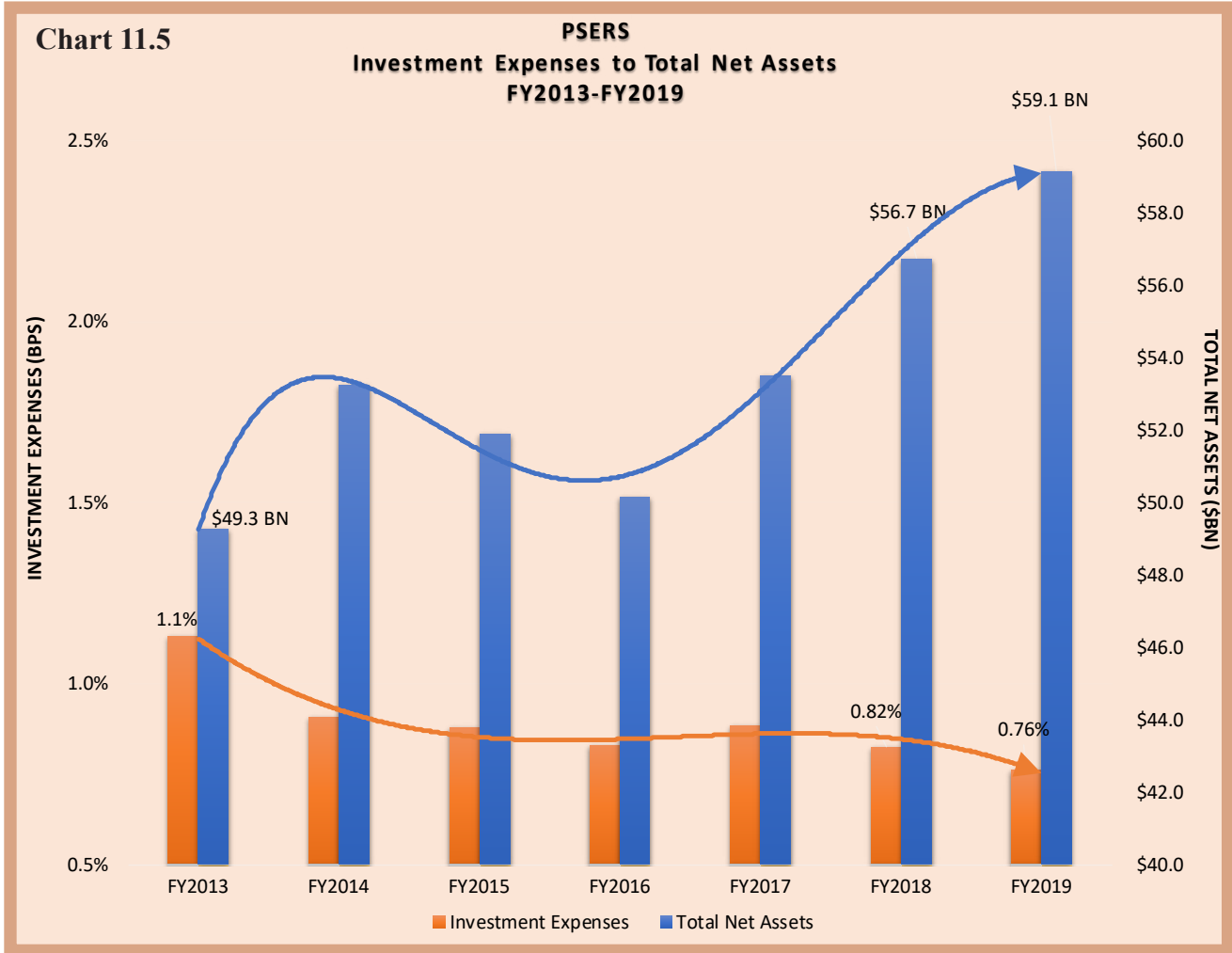
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Table 11.2 summarizes total investment expenses for the fiscal year ended June 30, 2019. “Total External Management” includes all fees paid to external investment managers as either a base fee or a share of profits earned (performance fee). “Total 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, 2019				
(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	\$1,527	\$1,561	\$3,088	86
Non - U.S. Equity	20,220	20,014	40,234	113
Fixed Income	100,007	1,414	101,421	84
Real Estate	47,702	-	47,702	100
Alternative Investments	96,060	-	96,060	130
Absolute Return	87,410	16,623	104,033	178
Commodities	4,998	-	4,998	59
Master Limited Partnerships	8,145	-	8,145	41
Infrastructure	2,478	-	2,478	105
Risk Parity	16,414	780	17,194	78
Total External Management	\$384,961	\$40,392	\$425,353	107
Total Internal Management			17,602	8
Total Investment Management			\$442,955	71
Custodian Fees			\$2,518	
Consultant and Legal Fees			4,351	
Total Other Expenses			\$6,869	
Total Investment Expenses			\$449,824	72

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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 \$450 million in Fiscal Year 2019, while Total Net Assets have increased from \$49.3 billion to \$59.1 billion. It is worth noting that these decreases have occurred while Total Internal Management and Total Other Expenses have remained flat.



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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, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>U.S. Equity</u>	
Radcliffe Capital Management LP	\$3,088
Total - U.S. Equity	3,088
<u>Non - U.S. Equity</u>	
Acadian Asset Management, LLC	1,074
Baillie Gifford Overseas Ltd.	3,156
BlackRock Financial Management, Inc.	(280)
BlackRock Institutional Trust Company, N.A.	1,359
Cederberg Greater China EQ FD	1,414
ECM Feeder Fund 2 LP	4,067
Insight Investment International Limited	644
Marathon Asset Management Limited	3,175
Oberweis Asset Management, Inc.	1,718
QS Batterymarch Financial Management, Inc.	672
Steadview Capital Partners LP	2,147
The Children's Investment Fund LP	14,479
Wasatch Advisors, Inc.	6,609
Total - Non - U.S. Equity	40,234
<u>Fixed Income</u>	
AllianceBernstein L.P.	110
Apollo European Principal Finance Fund II (Dollar A), L.P.	697
Apollo European Principal Finance Fund III (Dollar A), L.P.	2,164
Avenue Energy Opportunities Fund, L.P.	1,900
Avenue Energy Opportunities Fund II, L.P.	652
Avenue Europe Special Situations Fund III (U.S.), L.P.	1,801
Bain Capital Credit Managed Account (PSERS), L.P.	1,870
Bain Capital Distressed and Special Situations 2013 (A), L.P.	2,151
Bain Capital Distressed and Special Situations 2016 (A), L.P.	2,503
Bain Capital Middle Market Credit 2010, L.P.	213
Bain Capital Middle Market Credit 2014, LP	1,183
BlackRock Financial Management, Inc.	4,263
Bridgewater Associates, LP	24,963
Brigade Capital Management, LLC	4,038

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

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
Fixed Income (continued)	
Capula Investment Management, LP	730
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	3,104
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,315
Cerberus Levered Loan Opportunities Fund II, L.P.	1,084
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	7,475
Galton Onshore Mortgage Recovery Fund III, L.P.	203
Galton Onshore Mortgage Recovery Fund IV, L.P.	683
Garda Capital Partners, LP	3,791
Hayfin SOF II USD Co-Invest, L.P.	72
Hayfin SOF II USD, L.P.	1,737
Hayfin Special Opportunities Credit Fund (Parallel), L.P.	841
ICG Europe Fund V, L.P.	953
ICG Europe Fund VI, L.P.	1,486
ICG Europe Fund VII Feeder SCSp	1,727
Insight Investment International Limited	84
International Infrastructure Finance Company, L.P.	904
Latitude Management Real Estate Capital IV, Inc.	738
LBC Credit Partners II, L.P.	199
LBC Credit Partners III, L.P.	1,788
LBC-P Credit Fund, L.P.	4,375
Mariner Investment Group, LLC	1,682
Pacific Investment Management Company (PIMCO)	1,368
Park Square - PSERS Credit Opportunities Fund, L.P.	2,123
Penn Mutual Asset Management, LLC	196
PIMCO BRAVO Fund III Onshore Feeder, LP	1,280
Pugh Capital Management, Inc.	203
PSERS TAO Partners Parallel Fund, L.P.	3,085
Radcliffe Capital Management, L.P.	1,431
Sankaty Credit Opportunities IV, L.P.	962
SEI Investments Company	763
Templeton Investment Counsel, LLC	1,839
TOP NPL (A), L.P.	33
TPG Opportunities Partners II (A), L.P.	155
TPG Opportunities Partners III (A), L.P.	1,604
TSSP Opportunities Partners IV (A), L.P.	1,110
Varde Scratch and Dent Feeder I-A, L.P., The	863
Varde Scratch and Dent Fund, L.P., The	927
Total - Fixed Income	101,421

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Direct Ownership</u>	
Bell Partners Inc.	2,062
Charter Oak Advisors, Inc.	1,159
GF Management, Inc.	131
L & B Realty Advisors, L.L.P.	108
Subtotal - Real Estate-Direct Ownership	3,460
<u>Real Estate-Partnerships/Funds (continued)</u>	
AG Core Plus Realty Fund III, L.P.	223
AG Core Plus Realty Fund IV, L.P.	1,025
AG Europe Realty Fund II, L.P.	998
AG Realty Value Fund X, L.P.	205
Almanac Realty Securities V, L.P.	97
Almanac Realty Securities VI, L.P.	271
Almanac Realty Securities VII, L.P.	884
Almanac Realty Securities VIII, L.P.	1,455
Apollo Real Estate Finance Corp	86
Ares European Real Estate Fund IV, L.P.	1,014
Ares U.S. Real Estate Fund VII, L.P.	25
Ares U.S. Real Estate Fund VIII, L.P.	796
Ares U.S. Real Estate Fund IX, L.P.	649
Avenue Real Estate Fund (Parallel) L.P.	826
Bell Institutional Fund IV, LLC	44
Bell Institutional Fund V, L.P.	862
Bell Institutional Fund VI, L.P.	616
BlackRock Asia Property Fund III, L.P.	0.2
Blackstone Real Estate Debt Strategies II, L.P.	110
Blackstone Real Estate Debt Strategies III, L.P.	1,188
Blackstone Real Estate Partners Europe III, L.P.	681
Blackstone Real Estate Partners Europe IV, L.P.	606
Blackstone Real Estate Partners VI, L.P.	174
Blackstone Real Estate Partners VII, L.P.	1,845
Blackstone Real Estate Partners VIII, L.P.	1,943
Brookfield Strategic Real Estate Partners, L.P.	1,139
Brookfield Strategic Real Estate Partners II, L.P.	2,345
Brookfield Strategic Real Estate Partners III-A, L.P.	603
Cabot Industrial Core Fund, L.P.	1,357
Cabot Industrial Value Fund IV, L.P.	184

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Partnerships/Funds (continued)</u>	
Cabot Industrial Value Fund V, L.P.	1,500
Carlyle Realty Partners IV, L.P.	15
Carlyle Realty Partners V, L.P.	369
Carlyle Realty Partners VI, L.P.	209
Carlyle Realty Partners VII, L.P.	653
Carlyle Realty Partners VIII, L.P.	1,606
DRA Growth and Income Fund IX, LLC	1,359
DRA Growth and Income Fund VI, L.P.	58
DRA Growth and Income Fund VII, L.P.	993
DRA Growth and Income Fund VIII, LLC	1,588
Exeter Core Industrial Club Fund II, L.P.	494
Exeter Industrial Value Fund II, L.P.	7
Exeter Industrial Value Fund III, L.P.	252
Exeter Industrial Value Fund IV, L.P.	1,150
Fortress Investment Fund V (Fund A) L.P.	213
Insight Investment International Limited	43
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.	194
LEM Real Estate Mezzanine Fund II, L.P.	24
Paramount Group Real Estate Fund VII, L.P.	36
Pramerica Real Estate Capital VI, L.P.	548
RCG Longview Debt Fund V, L.P.	287
RCG Longview Debt Fund VI, L.P.	1,155
RCG Longview Equity Fund, L.P.	58
Security Capital Preferred Growth (Public)	1,371
Senior Housing Partnership Fund IV, L.P.	530
Senior Housing Partnership Fund V, L.P.	551
Stockbridge Real Estate Fund II, LP	189
Stockbridge Real Estate Fund III, LP	298
Stockbridge Real Estate Fund, L.P.	2,974
Strategic Partners Fund IV RE, L.P.	84
UBS (US) Trumbull Property Fund, L.P.	<u>570</u>
Subtotal - Real Estate-Partnerships/Funds	43,353

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Farmland</u>	
Prudential Agricultural Group	889
Subtotal - Real Estate-Farmland	889
Total Real Estate	47,702
<u>Private Equity</u>	
Actis Emerging Markets 3, L.P.	449
Actis Global 4 L.P.	1,259
Apax Digital, L.P.	1,705
Bain Capital Asia Fund II, L.P.	742
Bain Capital Asia Fund III, L.P.	2,600
Bain Capital XI, L.P.	898
Bain Capital XII, L.P.	1,875
Baring Asia Private Equity Fund III, L.P.	49
Baring Asia Private Equity Fund IV, L.P.	637
Baring Asia Private Equity Fund V, L.P.	3,021
Baring Asia Private Equity Fund VI, L.P.	833
Blue Point Capital Partners II (B), L.P.	19
Blue Point Capital Partners III (B), L.P.	437
Blue Point Capital Partners IV, L.P.	744
Bridgepoint Development Capital III, L.P.	1,265
Bridgepoint Europe IV, L.P.	1,470
Bridgepoint Europe V, L.P.	1,206
Bridgepoint Europe VI, L.P.	250
Capital International Private Equity Fund V, L.P.	377
Capital International Private Equity Fund VI, L.P.	512
Catterton Growth Partners II, L.P.	1,201
Catterton Growth Partners III, L.P.	1,334
Catterton Growth Partners, L.P.	593
Catterton Partners VI, L.P.	734
Catterton Partners VII, L.P.	1,561
Catterton VIII, L.P., L	1,862
Cinven Fund (Fifth), L.P.	707
Cinven Fund (Sixth), L.P.	1,128
Coller International Partners VI, L.P.	865
Coller International Partners VII, L.P.	1,469
Crestview Partners II, L.P.	1,054

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Equity (continued)</u>	
Crestview Partners III, L.P.	605
Crestview Partners, L.P.	265
CVC Capital Partners Asia Pacific III, L.P.	156
CVC European Equity Partners V (A), L.P.	39
DCPF VI Oil and Gas Co-Investment Fund, L.P.	131
Denham Commodity Partners Fund VI, L.P.	687
Energy & Mineral Group Fund III, L.P.	1,262
Equistone Partners Europe Fund V E, L.P.	949
Equistone Partners Europe Fund VI E, SCSp	1,498
Evergreen Pacific Partners II, L.P.	121
First Reserve Fund XII, L.P.	308
GoldPoint Partners Co-Investment V, L.P.	387
HgCapital 7 A, L.P.	888
HgCapital 8 D, L.P.	1,659
HGGC Fund II, L.P.	1,186
HGGC Fund III, L.P.	314
Incline Equity Partners IV, L.P.	1,280
Irving Place Capital Partners III SPV, L.P.	733
K4 Private Investors, L.P.	1,213
Landmark Equity Partners XIII, L.P.	237
Landmark Equity Partners XIV, L.P.	405
Milestone Partners III, L.P.	292
Milestone Partners IV, L.P.	257
New Mountain Partners IV, L.P.	260
New Mountain Partners V, L.P.	2,191
New York Life Capital Partners IV-A. L.P.	84
NGP Natural Resources X, L.P.	786
NGP Natural Resources XI, L.P.	1,368
North Haven PE Asia Fund IV, L.P. (Morgan Stanley)	1,219
Odyssey Investment Partners Fund V, L.P.	1,998
Orchid Asia V, L.P.	163
Orchid Asia VI, L.P.	1,176
Orchid Asia VII, L.P.	1,250
PAI Europe V, L.P.	205
PAI Europe VI, L.P.	380
Palladium Equity Partners IV, L.P.	578
Partners Group Secondary 2008, L.P.	617

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Equity (continued)</u>	
Partners Group Secondary 2011, L.P.	1,069
Partners Group Secondary 2015 (USD) A, L.P.	1,235
Portfolio Advisors Secondary Fund III, L.P.	884
StepStone International Investors III L.P.	509
Strategic Partners Fund IV, L.P.	113
Strategic Partners Fund V, L.P.	337
Strategic Partners Fund VI, L.P.	708
Strategic Partners Fund VII, L.P.	1,250
Trilantic Capital Partners IV L.P.	68
Trilantic Capital Partners V (North America), L.P.	614
Trilantic Capital Partners VI (North America), L.P.	1,728
Webster Capital IV, L.P.	502
Subtotal - Private Equity	69,021
<u>Special Situations</u>	
Apollo Investment Fund IX, L.P.	887
Apollo Investment Fund VIII, L.P.	865
Cerberus Institutional Partners V, L.P.	777
Cerberus Institutional Partners VI, L.P.	2,600
Clearlake Capital Partners IV, L.P.	591
Clearlake Capital Partners V, L.P.	647
Gold Hill Venture Lending 03-A, L.P.	35
NYLIM Mezzanine Partners Parallel Fund II, L.P.	1
OCM Opportunities Fund VII-B L.P.	146
Searchlight Capital II, L.P.	1,450
Venor Special Situations Fund II, L.P.	804
Versa Capital Fund II, L.P.	1,976
Versa Capital Fund III, L.P.	570
Subtotal - Special Situations	11,350
<u>Venture Capital</u>	
Aisling Capital III, L.P.	69
Aisling Capital IV, L.P.	934
Co-Investment Fund II, L.P.	306
Insight Investment International Limited	36
Insight Venture Partners X, L.P.	1,575
LLR Equity Partners III, L.P.	858

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Venture Capital (continued)</u>	
LLR Equity Partners IV, L.P.	2,297
LLR Equity Partners V, L.P.	3,491
Psilos Group Partners III-C, L.P.	57
Quaker BioVentures II, L.P.	541
SCP Private Equity Partners II, L.P.	377
Starvest Partners II (Parallel), L.P.	316
Strategic Partners Fund IV VC, L.P.	137
Summit Partners Growth Equity Fund VIII, L.P.	1,401
Tenaya Capital VI, L.P.	788
Tenaya Capital VII, L.P.	2,000
Tenaya Capital V-P, L.P.	508
Subtotal - Venture Capital	15,689
Total Alternative Investments	96,060
<u>Absolute Return</u>	
Aeolus Capital Management Ltd.	7,958
AKAZ Offshore Fund LTD	1,357
BlackRock Financial Management, Inc.	2,278
Bridgewater Associates, Inc.	24,695
Brigade Capital Management	2,168
Capula Investment Management, LLP	19,417
Caspian Capital, LP	4,000
Garda Capital Partners, LP	10,009
HS Group Sponsor Fund II Ltd.	651
Independence Reinsurance Partners GP, LLC	2,324
Nephila Capital Ltd.	2,703
Nimbus Weather Fund	1,790
Oceanwood Opportunities Fund	3,415
OWS Credit Opportunity Offshore Fund III, Ltd.	7,264
Pacific Investment Management Company (PIMCO)	7,269
Perry Partners, L.P.	201
Sciens Aviation Special Opportunities Investment Fund II, L.P.	53
Sciens Aviation Special Opportunities Investment Fund III, L.P.	1,895
Sciens Aviation Special Opportunities Investment Fund IV, L.P.	1,670
Two Sigma Risk Premia Enhanced Fund	2,755
Venor Capital Offshore	162
Total - Absolute Return	104,033

Section 3 - Investment Information

Investment Fees by Manager Fiscal Year ended June 30, 2019 (Dollar amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>Commodities</u>	
Denham Mining Fund, L.P.	1,016
Gresham Investment Management, LLC	985
NGP Natural Resources XII, L.P.	1,926
Wellington Management Company, LLP	1,071
Total - Commodities	4,998
<u>Master Limited Partnerships</u>	
Harvest Fund Advisors, LLC	3,754
Salient Capital Advisors, LLC	2,961
Stein Roe Investment Counsel D/B/A Atlantic Trust	1,430
Subtotal - Master Limited Partnerships	8,145
<u>Diversified Infrastructure</u>	
Insight Investment International Limited	96
International Infrastructure Finance Company II, LP	547
GCM Grosvenor Customized Infrastructure Strategies II, LP	1,185
Strategic Partners Real Assets II, L.P.	650
Subtotal - Diversified Infrastructure	2,478
Total Infrastructure	10,623
<u>Risk Parity</u>	
BlackRock Institutional Trust Company, N.A.	2,053
Bridgewater Associates, LP	9,536
D.E. Shaw Investment Management, L.L.C.	5,605
Total - Risk Parity	17,194
Total External Management	425,353
Total Internal Management	17,602 *
Total Investment Management	\$442,955

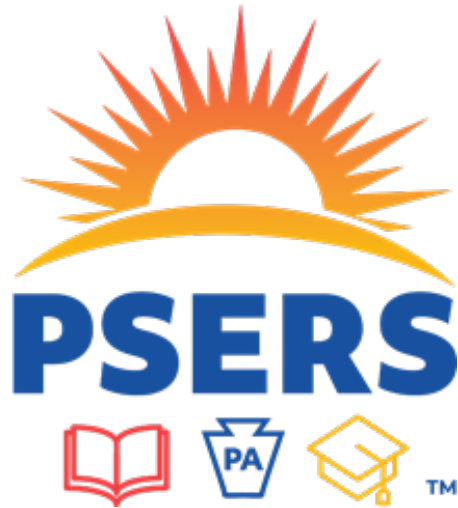
*Internal Management expenses include salaries and fringe benefits of \$12,441 and operating expenses of \$5,161.

Section 3 - Investment Information

Investment Fees and Expenses Initiatives

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

- For external managers making traditional investments, reduce base fees and create better alignment of interests by moving to a lower base fee coupled with a profit share.
- For external managers making traditional and absolute return investments, enter into arrangements for netting of profit shares for managers with multiple PSERS mandates.
- For external managers making non-traditional investments, continue to grow co-investments (which have lower fees and profit shares).
- For external managers making non-traditional investments, move away from paying on committed capital and towards paying on invested capital whenever possible.
- For external managers, re-underwriting all fee arrangements to ensure that the fee arrangements are fair and equitable.
- Research firms specializing in investment management fee negotiations, considering their credentials, references, past performance in reducing investment management fees for clients, and probable cost effectiveness for PSERS, for possible retention.



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Section 3 - Investment Information

Commitment to Pennsylvania Financial Services Firms

(as of June 30, 2019)

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 2019, investment management fees paid to external firms managing PSERS' assets from offices located in Pennsylvania amounted to \$ 32.4 million, or 7.6% of the total external investment manager fees.

Table 12.1 lists the asset exposures managed internally by PSERS, as of June 30, 2019.

<u>Asset Class</u>	<u>Market Value (in millions)</u>	<u>% of Total</u>
U.S. Equity	\$2,646.8	10.5%
Non-U.S. Equity	2,497.7	9.9%
Private Markets	690.0	2.7%
Fixed Income	8,412.7	33.5%
Master Limited Partnerships	370.1	1.5%
Commodities	3,483.8	13.9%
Infrastructure	1,211.4	4.8%
Real Estate	601.9	2.4%
Risk Parity	2,508.6	10.0%
Cash Management	2,695.0	10.7%
Totals	<u>\$25,118.0</u>	<u>100%</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, 2019.

Table 12.2 is a list of assets managed by external managers with headquarters or offices located in Pennsylvania, as of June 30, 2019.

Chart 12.1 PA-Based Asset Exposures Managed Internally as of June 30, 2019

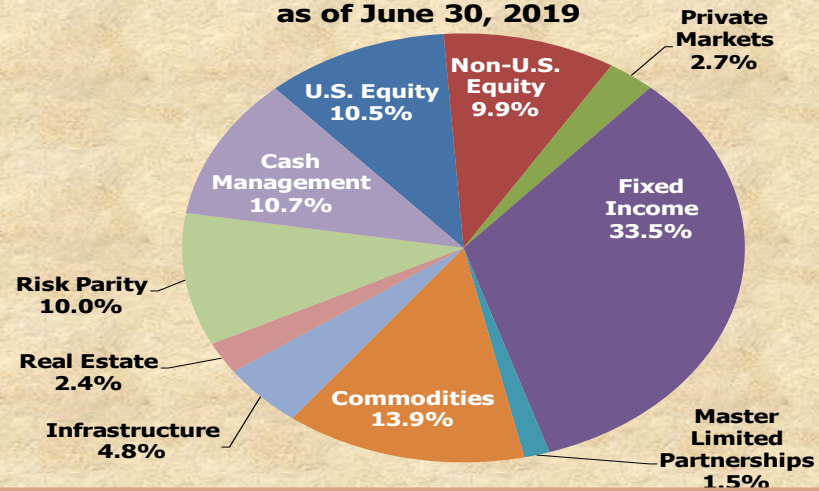


Table 12.2

Pennsylvania-Based External Managers

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

Section 3 - Investment Information

Investments in Pennsylvania-Based

Companies

(as of June 30, 2019)

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 \$17.5 billion to 134 partnerships. From the program inception to June 30, 2019, PSERS has committed capital to 18 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, 2019, 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, 2019, 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, 2019, PSERS has committed capital to 3 partnerships headquartered in Pennsylvania.

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

In April 2015, PSERS' Board approved a \$250 million commitment for PSERS to co-investment in portfolio companies based in Pennsylvania. The portfolio companies are sourced from funds where PSERS or its consultant is an investor. As of June 30, 2019, PSERS has invested \$56.4 million. The market value of the investments total \$78.0 million. The number of employees, payroll, and market value are included within their respective asset class in Table 12.3.

Section 3 - Investment Information

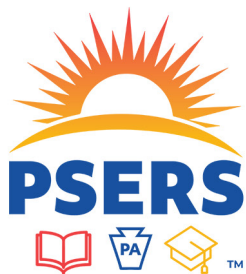
Table 12.3 displays Pennsylvania-based investments and other statistics at June 30, 2019 (\$'s in millions)

Table 12.3

Statistics of Pennsylvania-Based Investments

<u>Asset Class</u>	<i>Total PA Market Value (PSERS' Portion)</i>	<i>Total PA Market Value (Total Invested)</i>	<i># of People Employed</i>	<i>Payroll</i>
US Equities	\$84.0	\$84.0	*	\$ *
Fixed Income	154.2	154.2	*	*
Private Real Estate	76.9	987.5	236	7.0
Private Markets:				
Venture Capital	112.6	735.2	2,117	60.9
Private Equity	1,280.8	22,689.1	37,292	443.4
Private Debt	409.7	12,488.9	10,603	97.6
Total	\$2,118.2	\$37,138.9	50,248	\$608.8

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



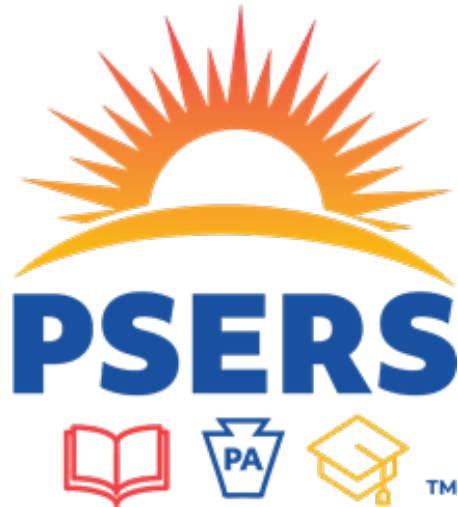
PSERS Budget Report

Fiscal Year 2020 - 2021



SECTION 4 - POSTEMPLOYMENT HEALTHCARE PROGRAMS

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



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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, 2020 there are 120,273 participants (102,062 retirees plus their dependents) in the HOP. The HOP is funded solely by and for eligible participants. The following is a summary of HOP initiatives during the period January 1, 2019 to January 1, 2020.

The Retirement Board issued an Invitation for Application (IFA) to allow qualified insurance carriers to apply to PSERS to offer a fully insured Medicare Advantage group insurance plan and accompanying Pre-65 group insurance plan to PSERS retirees who participate in the HOP. The effective date of the insurance is January 1, 2020. As a result of the IFA, PSERS is expecting the following carriers to participate in HOP:

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

The Retirement Board issued a Request for Proposals (RFP) for Health Care Consulting and Project Management Services PSERS RFP 2017-2. Based on the total scores for all bid proposal categories, the

Segal Company was determined to be the successful bidder for RFP 2017-2. The Retirement Board accepted the results of the RFP process and awarded the Segal Company the contract with an initial term of 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 an RFP for Center for Medicare and Medicaid Services (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 HOP offers PSERS annuitants a variety of health benefits and insurance plans. Annuitants and their dependents may select among plans supplementing original Medicare, Medicare prescription drug plans, and dental insurance. Annuitants also may select a Medicare Advantage plan that provides prescription drug coverage and may include a dental benefit. All plans offered through the HOP provide a Pre-65 plan for individuals not yet eligible for Medicare. Each year participants of the HOP may change their health benefit coverage to meet changing needs. The following is a summary of the plans and premium rates paid by participants:

Standard Benefit	2019	2020
Deductible	\$415	\$435
Initial Coverage Limit	\$3,820	\$4,020
Out-of Pocket Threshold	\$5,100	\$6,350
Minimum Cost sharing in Catastrophic Coverage Portion of the Benefit		
Generic	\$3.40	\$3.60
Other	\$8.50	\$8.95

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 63% coverage for generic drugs in the Coverage Gap for 2019, and 75% in 2020 and beyond. There is effectively no additional funding from CMS; accordingly, the cost of the mandated benefit increase is paid by participants not receiving low-income subsidies. Medicare prescription drug plans pay 5% of the cost of brand drugs in the Coverage Gap, with the manufacturer discount covering the remaining 70%. The following table shows how much members pay for drugs in the Coverage Gap:

The Member Pays in Coverage Gap:	2019 Medicare Rx Option	2020 Medicare Rx Option
Generic Drugs	37%	25%
Brand Drugs	25% (after 70% manufacturer discount and 5% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)
Non-preferred Brand Rx	25% (after 70% manufacturer discount and 5% plan benefit)	25% (after 70% manufacturer discount and 5% plan benefit)

Plans Available Through the Health Options Program

The HOP offers participants a choice among supplements to Medicare, various Medicare prescription drug plans, and Medicare Advantage plans. Participants under age 65 and not eligible for Medicare may elect to enroll in a high deductible health insurance plan with or without prescription drug coverage or a managed care plan. These options were available to new enrollees or HOP participants electing to change coverage during the 2020 option selection period conducted in the fall of 2019. The following is a list of HOP plans as of January 1, 2020:

For Individuals Eligible for Medicare:	For Individuals Not Eligible for Medicare:
HOP Value Medical Plan (Medicare supplement)	HOP Pre-65 Medical Plan
HOP Medical Plan (Medicare supplement)	
Value Medicare Rx Option (Medicare Part D)	HOP Pre-65 Medical Plan w/ Rx coverage
Basic Medicare Rx Option (Medicare Part D)	
Enhanced Medicare Rx Option (Medicare Part D)	
Medicare Advantage Plans:	Companion Pre-65 Managed Care Plans:
Aetna Medicare V02 PPO	Aetna Premier Open Choice PPO
Capital Blue Cross BlueJourney PPO	Capital Blue Cross PPO
Highmark FreedomBlue PPO	Highmark PPO Blue (80-70 Plan)
Highmark Security Blue HMO Point of Service	Highmark PPO Blue (High Option)
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 2020 compared to the 2019 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	2019	2020	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$117	\$117	0%
Value Medical Plan w/ Value Medicare Rx Option	\$139	\$140	1%
Value Medical Plan w/ Basic Medicare Rx Option	\$184	\$186	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$242	\$245	1%
HOP Medical Plan	\$203	\$203	0%
HOP Medical Plan w/ Value Medicare Rx Option	\$225	\$226	0%
HOP Medical Plan w/ Basic Medicare Rx Option	\$270	\$272	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$328	\$331	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$201	\$241	20%
CBC BlueJourney PPO	N/A	\$246	New
Highmark FreedomBlue PPO	\$336	\$336	0%
IBC Keystone 65 Select HMO (\$5/\$40)	\$128	\$128	0%
UPMC for Life HMO	\$237	\$257	8%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$509	\$568	12%
Aetna Medicare P01 PPO	\$401	\$453	13%
IBC Keystone 65 Select HMO (\$15/\$20)	\$374	\$381	2%
IBC Personal Choice 65 PPO	\$756	\$771	2%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties	2019	2020	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$115	\$115	0%
Value Medical Plan w/ Value Medicare Rx Option	\$137	\$138	1%
Value Medical Plan w/ Basic Medicare Rx Option	\$182	\$184	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$240	\$243	1%
HOP Medical Plan	\$194	\$194	0%
HOP Medical Plan w/ Value Medicare Rx Option	\$216	\$217	0%
HOP Medical Plan w/ Basic Medicare Rx Option	\$261	\$263	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$319	\$322	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$181	\$218	20%
CBC BlueJourney PPO	N/A	\$246	New
Highmark SecurityBlue HMO POS	\$248	\$248	0%
UPMC for Life HMO	\$237	\$257	8%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P01 PPO	\$360	\$409	14%
Highmark FreedomBlue PPO	\$317	\$317	0%

North & Central Region: (All other counties in Pennsylvania)	2019	2020	Increase/ (Decrease)
Medicare Supplement Plans			
Value Medical Plan	\$102	\$102	0%
Value Medical Plan w/ Value Medicare Rx Option	\$124	\$125	1%
Value Medical Plan w/ Basic Medicare Rx Option	\$169	\$171	1%
Value Medical Plan w/ Enhanced Medicare Rx Option	\$227	\$230	1%
HOP Medical Plan	\$175	\$175	0%
HOP Medical Plan w/ Value Medicare Rx Option	\$197	\$198	1%
HOP Medical Plan w/ Basic Medicare Rx Option	\$242	\$244	1%
HOP Medical Plan w/ Enhanced Medicare Rx Option	\$300	\$303	1%
Medicare Advantage Plans			
Aetna Medicare V02 PPO	\$144	\$177	23%
CBC BlueJourney PPO	\$263	\$246	-6%
Highmark FreedomBlue PPO	\$243	\$243	0%
UPMC for Life HMO ¹	\$237	\$257	8%
Legacy Medicare Advantage Plans (no new enrollment)			
Aetna Medicare P02 HMO	\$316	\$366	16%
Aetna Medicare P01 PPO	\$255	\$299	17%
Highmark SecurityBlue HMO POS	\$297	\$297	0%
CBC BlueJourney HMO	\$198	\$198	0%

¹Not available in all North & Central Region counties.

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP participants may select Enhanced, Basic, or Value Medicare Rx Option coverage without enrolling in the HOP Medical Plan or Value Medical Plan. The monthly premium rates for the Medicare Rx Options do not vary by region. Stand-alone prescription drug coverage does not qualify for Premium Assistance.

Medicare Prescription Drug Plans All Regions	2019	2020	Increase
Enhanced Medicare Rx Only	\$125	\$128	2%
Basic Medicare Rx Only	\$67	\$69	3%
Value Medicare Rx Only	\$22	\$23	5%

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 2020 compared to the 2019 rates in Pennsylvania for single coverage. These rates do not reflect the \$100 Premium Assistance benefit provided to eligible retirees.

All Regions	2019	2020	Increase
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

	2019	2020	Increase
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,261	\$1,628	29%
CBC PPO	N/A	\$1,264	New
Highmark PPOBlue (80-70 Plan)	\$1,733	\$1,754	1%
IBC POS (\$20-\$40/\$250)	\$1,690	\$2,085	23%
UPMC Health Plan EPO	\$1,383	\$1,383	0%
Legacy Managed Care Plans (no new enrollments)			
Aetna HMO Plan	\$1,244	\$1,528	23%
Aetna Value Open Choice PPO	\$1,146	\$1,408	23%
IBC Personal Choice PPO	\$1,789	\$2,227	24%

Section 4 - Other PSERS Programs

Health Options Program (continued)

Southwestern Region: Allegheny, Fayette, Greene, Indiana, Washington, and Westmoreland Counties			
	2019	2020	Increase
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,261	\$1,628	29%
CBC PPO	N/A	\$1,264	New
Highmark PPOBlue (80-70 Plan)	\$1,733	\$1,754	1%
UPMC Health Plan EPO	\$1,383	\$1,383	0%
Legacy Managed Care Plans (no new enrollments)			
Aetna HMO Plan	\$1,244	\$1,528	23%
Aetna Value Open Choice PPO	\$1,146	\$1,408	23%
Highmark PPOBlue (High Option)	\$2,265	\$2,314	2%

North & Central Region: (All other counties in Pennsylvania)			
	2019	2020	Increase
Managed Care Plans			
Aetna Premier Open Choice PPO	\$1,261	\$1,628	29%
CBC PPO	\$1,264	\$1,264	0%
Highmark PPOBlue (80-70 Plan)	\$1,733	\$1,754	1%
UPMC EPO ₂	\$1,383	\$1,383	0%
Legacy Managed Care Plans (no new participants)			
Aetna Citizen Plan HMO	\$1,244	\$1,528	23%
Aetna PPO	\$1,146	\$1,408	23%
Highmark PPOBlue (High Option)	\$2,265	\$2,314	2%
CBC HMO	\$1,827	\$1,827	0%

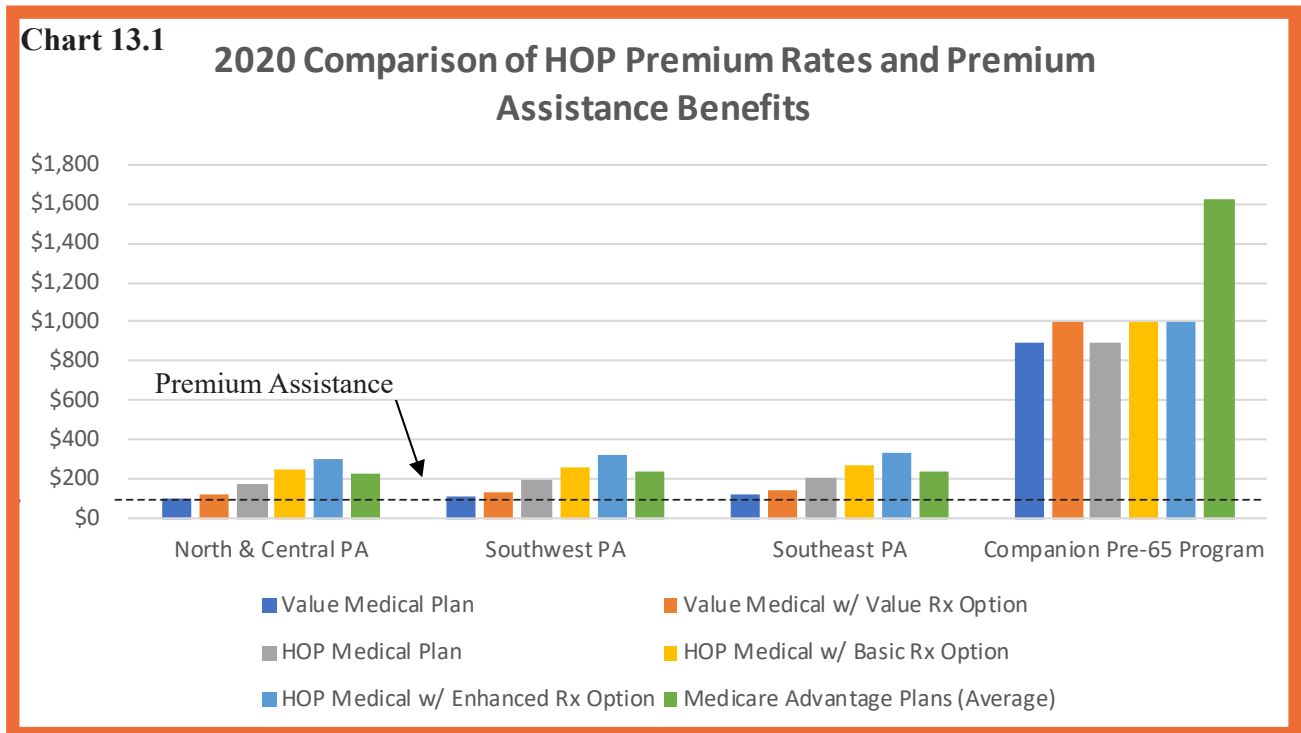
²Not available in all North & Central Region counties

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Premiums Compared to the PSERS Premium Assistance Benefit

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



2020	North & Central PA	Southwest PA	Southeast PA	Companion Pre-65 Program
Value Medical Plan	\$102	\$115	\$117	\$889
Value Medical w/ Value Rx Option	\$125	\$138	\$140	\$1,001
HOP Medical Plan	\$175	\$194	\$203	\$889
HOP Medical w/ Basic Rx Option	\$244	\$263	\$272	\$1,001
HOP Medical w/ Enhanced Rx Option	\$303	\$322	\$331	\$1,001
Medicare Advantage Plans (Average)	\$231	\$242	\$242	\$1,623
Premium Assistance	\$100	\$100	\$100	\$100

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

Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Enrollment

As of January 1, 2020 there are 120,273 participants (102,062 retirees plus their dependents) in the HOP. The total numbers of retirees by Option are:

Individuals Eligible for Medicare	Retirees	Participants
HOP Medical w/ Basic Medicare Rx Option	47,666	56,363
HOP Medical w/ Enhanced Medicare Rx Option	30,092	35,087
HOP Medical w/ Value Medicare Rx Option	1,906	2,094
HOP Medical Plan (no Rx)	8,923	9,868
HOP Enhanced Rx Only	93	113
HOP Basic Rx Only	207	267
HOP Value Rx Only	18	20
HOP Value Medical Only	47	54
HOP Value Medical w/ Enhanced Medicare Rx Option	6	9
HOP Value Medical w/ Basic Medicare Rx Option	33	47
HOP Value Medical w/ Value Medicare Rx Option	222	272
Highmark PPO/Legacy HMO	9,602	12,070
Keystone East HMO/IBC Legacy PPO	760	885
CBC PPO/Keystone Central Legacy HMO	662	840
UPMC HMO	1,126	1,494
Aetna PPO/Legacy HMO	451	535
Total Medicare Eligible	101,814	120,018
Individuals Not Eligible for Medicare		
HOP Pre-65 Medical Plan w/ Rx Coverage	158	161
HOP Pre-65 Medical Plan	53	55
Highmark PPO	7	7
CBC PPO/Keystone Central Legacy HMO	13	13
Keystone East HMO/IBC Legacy PPO	3	3
Aetna PPO/Legacy HMO	13	15
UPMC Health Plan EPO	1	1
Total Not Eligible for Medicare	248	255
Total in HOP	102,062	120,273

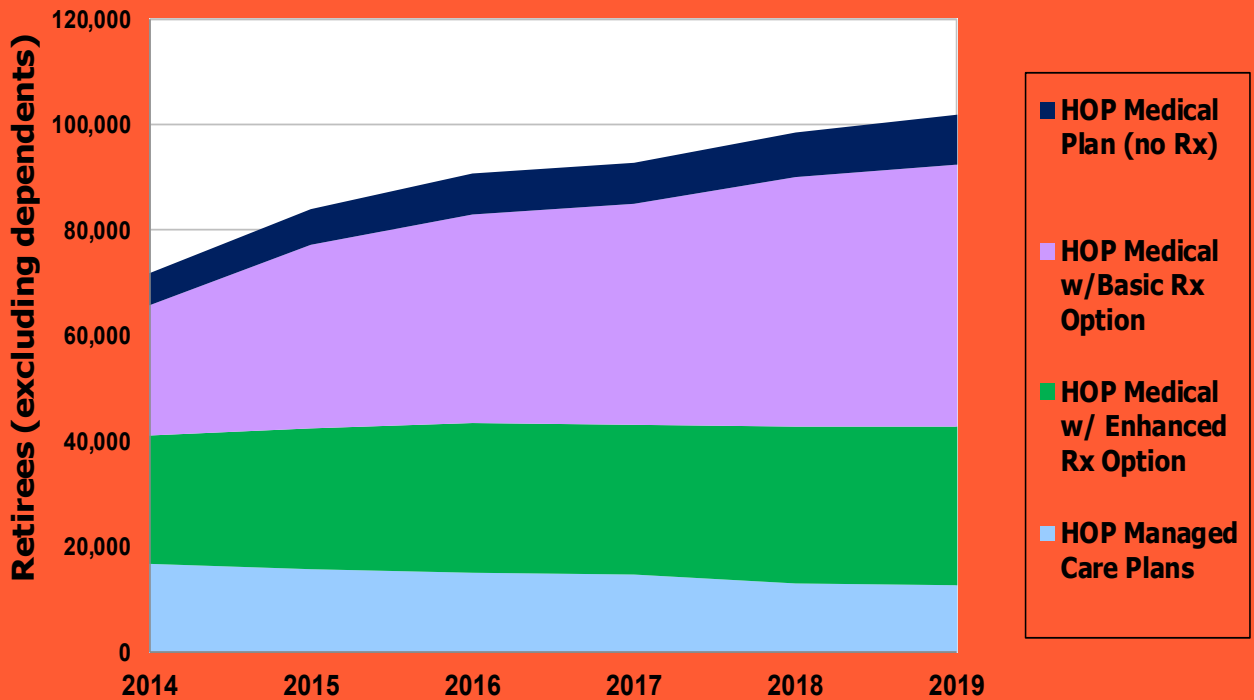
Section 4 - Other PSERS Programs

Health Options Program (continued)

Enrollment in the PSERS' HOP continues to increase. As illustrated by Chart 13.2, the number of retirees participating in the HOP has increased 42% over the past 5 years.

Chart 13.2

HOP Enrollment of Retirees Eligible for Medicare



Section 4 - Other PSERS Programs

Health Options Program (continued)

HOP Voluntary Dental Program

Beginning January 1, 2016, HOP offers a voluntary MetLife Dental Plan to members and dependents enrolled in the HOP Medical Plan or the Value Medical Plan (those enrolled in a Medicare Advantage Plan are not eligible for this program as most of these plans have dental coverage).

Prior to January 1, 2020, enrollment was limited to the initial offering or upon a qualifying event. For 2020, all HOP participants were given the opportunity to elect dental benefits during a special open enrollment period, with benefits effective January 1, 2020.

As of January 1, 2020 there are 18,864 participants (16,729 retirees plus their dependents) in the HOP voluntary dental program. The total numbers of retirees by year since program inception:

Dental Enrollment Per Year (As of January 1)	Retirees	Participants	Increase (Participants)
2020	16,729	18,864	15%
2019	14,482	16,436	25%
2018	11,535	13,099	35%
2017	8,497	9,701	110%
2016	3,930	4,622	N/A

Health Options Program Funding

A majority of the premium income is deducted from the retiree's monthly retirement benefit and transferred to the plan (claims administrator for the self-funded Options). Approximately 5,000 retirees submit monthly premium payments to the HOP Administration Unit, as their monthly retirement benefits, if any, are insufficient to cover the premium cost.

HOP income is projected to be \$466.7 million during the 2020 Plan (calendar) Year. A majority of this income comes from premium payments from participants. Other sources of funding are Medicare prescription drug payments (for participants enrolled in a Medicare prescription drug plan) from CMS and interest income. Table 13.1 displays the breakdown of these sources of income (Dollar amounts in millions):

Table 13.1 Income	Calendar Year 2020
Participant Contributions	\$398.0
CMS - Medicare Prescription Drug Payments	\$65.3
Interest Income	\$3.4
Total	\$466.7

Section 4 - Other PSERS Programs

Health Options Program (continued)

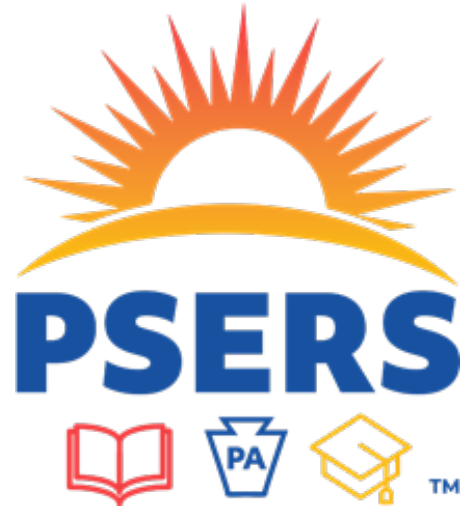
PSERS retirees enrolled in the HOP, who meet the eligibility requirements for Premium Assistance, receive up to \$100 per month as a partial reimbursement for the out-of-pocket premium expense. Approximately 94,000 of the 102,062 HOP retirees receive Premium Assistance. This accounts for nearly \$99 million of the \$113 million annual benefit expense of the Premium Assistance Program. The following Premium Assistance Program section provides additional information:

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

Table 13.2 Benefit Expense	Calendar Year 2020
Self-funded Hospital, Medical & Major Medical Benefits	\$228.9
Self-funded Prescription Drug Benefits	\$172.1
Insured Managed Care and Dental Premiums	\$62.2
Total	\$463.2

In addition to the benefit expenses identified above, the HOP will pay \$11 million in enrollment and administrative expenses including reimbursing PSERS for its expenses.

As of September 30, 2019, HOP had net assets of \$275 million held in trust to pay the expenses of HOP for the exclusive benefit of participants.



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Premium Assistance Program

In accordance with Sec. 8509 of the Public School Employees' Retirement Code 24 Pa. C.S. § 8509, PSERS provides up to \$100 per month in Premium Assistance to eligible retirees to help cover the cost of their health insurance. The Premium Assistance program began on July 1, 1992. The eligibility requirements for premium assistance are as follows:

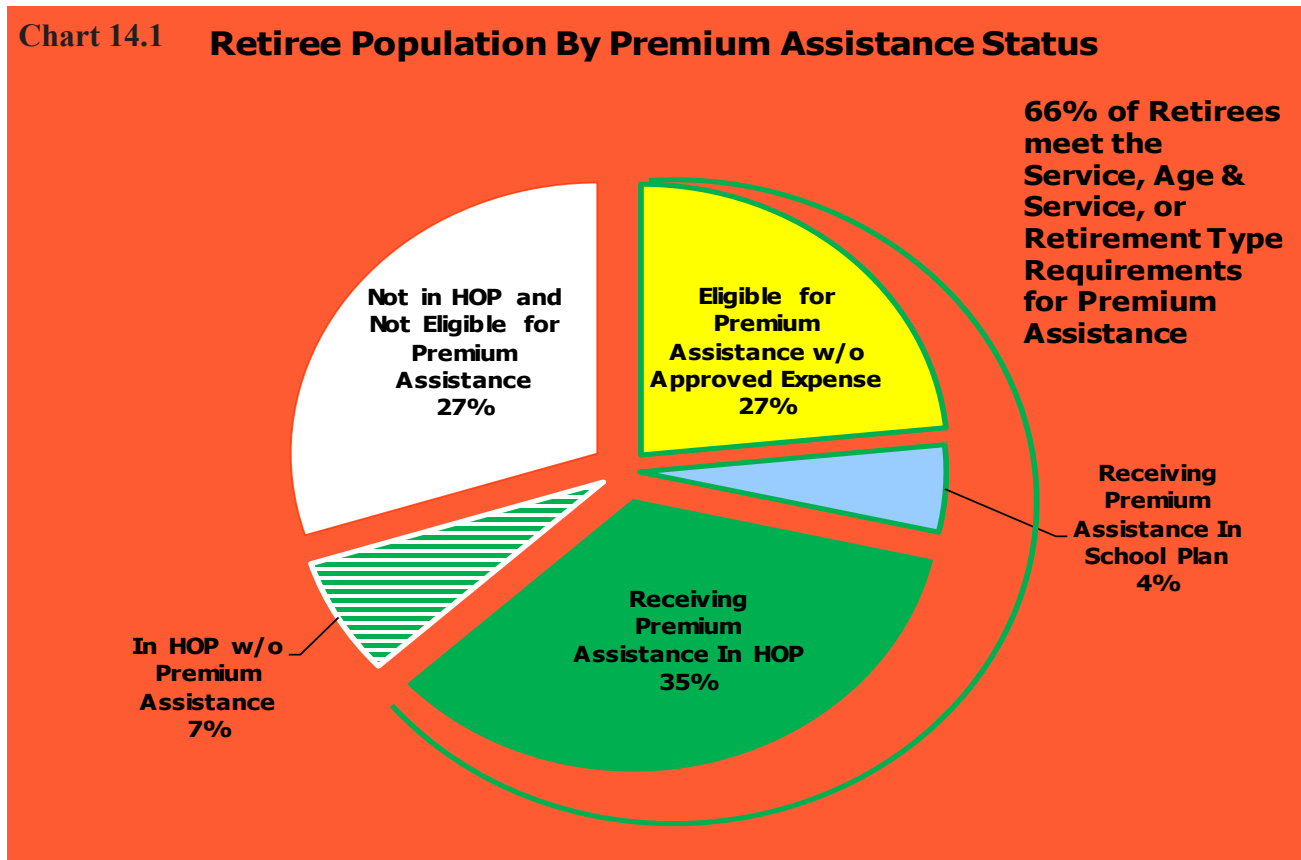
- 24.5 years of credited service, or
- 15 years of credited service if termination of employment and retirement occurred after superannuation age , or
- Receiving a disability annuity from PSERS; and
- Have an out-of-pocket premium expense from their former school employer's health plan or the PSERS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

Enrollment

As of June 30, 2019, PSERS had 237,339 retirees receiving a monthly benefit. Of these retirees 157,653 meet the service, age and service, or retirement type (disability) eligibility requirements for the premium assistance program. Of the retirees meeting these requirements, 63,476 are not receiving premium assistance payments because they do not have an out-of-pocket premium expense from an approved plan. Of the 94,177 retirees receiving premium assistance benefits, 83,977 are enrolled in HOP and 10,200 are participating in their former school employer's health plan and have an out-of-pocket premium expense.

A breakdown of retirees by their premium assistance status is displayed in Chart 14.1:

Chart 14.1 Retiree Population By Premium Assistance Status



Section 4 - Other PSERS Programs

Premium Assistance Program (continued)

June 30, 2019	Number	Percentage
Eligible for Premium Assistance w/o Approved Expense ¹	63,476	27%
Receiving Premium Assistance In School Plan ¹	10,200	4%
Receiving Premium Assistance In HOP ¹	83,977	35%
In HOP w/o Premium Assistance	15,901	7%
Not In HOP and not in Eligible for Premium Assistance	63,785	27%
Total Retiree Population ²	237,339	100%

- (1) Meeting the service, service and age at termination of school employment or retirement type requirements.
(2) As of June 30, 2019 Actuarial Data.

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 FY2020/21 is 0.82% of payroll.

For the year ended June 30, 2019, employer contributions equaled \$115.0 million and net investment income totaled \$2.3 million. During this period, PSERS paid Premium Assistance benefits equaling \$112.8 million and incurred administrative expenses of \$1.9 million.

As of September 30, 2019, the Premium Assistance Program had net assets of \$122 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.