

2017

Comprehensive Annual Financial Report

With Independent Auditors' Report for Fiscal Years Ended
December 31, 2017 and 2016

Commonwealth of Pennsylvania
State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania



2017

Comprehensive Annual Financial Report

With Independent Auditors' Report for Fiscal Years Ended
December 31, 2017 and 2016

Commonwealth of Pennsylvania
State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania

Prepared by the staff of the
Pennsylvania State Employees' Retirement System

Terrill J. Sanchez

Executive Director

Anthony J. Faiola

Chief Financial Officer

State Employees' Retirement System

30 N 3rd St, Suite 150
Harrisburg, PA 17101-1716
1.800.633.5461
www.SERS.pa.gov



Introductory Section

GFOA Award Certificate	i
PPCC Award Certificate	ii
Transmittal Letter	iii
SERS Board	v
SERS Mission, Vision, and Organizational Chart	vii

Financial Section

Independent Auditors' Report	1
Management's Discussion and Analysis (unaudited)	3
Basic Financial Statements:	
Statements of Fiduciary Net Position	11
Statements of Changes in Fiduciary Net Position	12
Notes to Basic Financial Statements	13
Required Supplementary Information (unaudited):	
Schedule 1 - Schedule of Changes in Net Pension	
Liability and Related Ratios	36
Schedule 2 - Schedule of Employer Contributions	37
Schedule 3 - Schedule of Investment Returns	37
Supplementary Information:	
Schedule 4 - Schedule of Administrative Expenses	38
Schedule 5 - Summary of Investment and Consultant Expenses	39

Investment Section

Report on Investment Activity	40
Investment Policy and Objectives	42
Investment Returns	44
Fund Values and Annual Returns	45
Largest Assets Held	46
Schedule of Trading Broker Commissions	48
Investment Summary	49
Private Equity	50
Global Public Equity	64
Real Estate	66
Multi-Strategy	70
Legacy Hedge Funds	72
Fixed Income	74
Cash	76

Actuarial Section

Actuary's Certification	77
Summary of Actuarial Assumptions and Methods	81
Schedules of Active Member Valuation Data	83
Schedule of Retirees and Beneficiaries Added to and Removed from Rolls	87
Solvency Test	88
Analysis of Financial Experience	89
Schedule of Funding Progress	90
Schedule of Contributions Under Previous Reporting Standards	91
History and Projection of Contribution Rates and Funded Ratios	92
Summary of Plan Provisions	93

Statistical Section

Statistical Section Narrative	95
Schedule of Trend Data	97
Schedule of Additions to Fiduciary Net Position	98
Schedule of Deductions from Fiduciary Net Position	99
Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type	100
Schedule of Total Changes in Fiduciary Net Position	101
Schedule of Investment Income	102
Schedule of Active Member Statistics	103
Schedule of Retired Members by Type of Benefit	104
Schedule of Retired Members by Option	105
Schedule of Average Monthly Benefit Payments	106
Schedule of Average Annual Benefit Payments	107
Schedule of Employer/Agency Participation	108



Government Finance Officers Association

**Certificate of
Achievement
for Excellence
in Financial
Reporting**

Presented to

**Commonwealth of Pennsylvania
State Employees' Retirement System**

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

December 31, 2016

Christopher P. Morill

Executive Director/CEO



Public Pension Coordinating Council

***Public Pension Standards Award
For Funding and Administration
2017***

Presented to

Pennsylvania State Employees' Retirement System

In recognition of meeting professional standards for
plan funding and administration as
set forth in the Public Pension Standards.

Presented by the Public Pension Coordinating Council, a confederation of

National Association of State Retirement Administrators (NASRA)
National Conference on Public Employee Retirement Systems (NCPERS)
National Council on Teacher Retirement (NCTR)

A handwritten signature in black ink that reads "Alan H. Winkle".

Alan H. Winkle
Program Administrator

June 1, 2018

Mr. David R. Fillman
Chairman, State Employees' Retirement Board
Commonwealth of Pennsylvania
30 North Third Street, Suite 150
Harrisburg, PA 17101

Dear Chairman Fillman,

The Pennsylvania State Employees' Retirement System (SERS) is pleased to present you with the 2017 calendar year Comprehensive Annual Financial Report (CAFR). The purpose of this report is to provide the governor, legislature, system members and annuitants, as well as the public with a clear accounting of SERS operations and financial position. We hope you will find this financial, investment, actuarial, and statistical material produced by SERS management to be both interesting and useful.

SERS remains committed to delivering accurate, meaningful information to policymakers and SERS members, as well as to provide context for our independently audited financial statements.

For 2017, KPMG LLP has conducted an independent audit of SERS financial statements, which are prepared in accordance with U.S. generally accepted accounting principles. Because the cost of a control should not exceed the benefits to be derived, the objective is to provide reasonable, rather than absolute, assurance that SERS financial statements are free of any material misstatements and fairly presented. As is our standard practice, independent auditors have full and unrestricted access to you and the board to discuss their findings regarding the adequacy of SERS internal controls and the integrity of SERS financial reporting.

SERS has again received an unmodified opinion in 2017.

As of December 31, 2017, SERS had approximately \$29.4 billion after paying out \$3.3 billion in retirement benefits to more than 129,000 retirees and beneficiaries; \$3.0 billion – more than 90% – was paid to people living in Pennsylvania, stimulating local economies.

In 2017, SERS served 102 agencies/employers and approximately 239,000 total members. Last year, nearly 6,300 members retired with an average annual benefit of about \$28,100. It is important to note that as is the case with mature pension plans, newly retired members entering the pension rolls tend to have higher benefits than those who die and are removed from rolls. In 2017, approximately 4,200 retirees with average annual benefits of about \$15,100 were removed from the rolls.

Last year, SERS' investment return was 15.1% net of all fees and expenses, which was more than double the 7.25% assumed long-term rate of return. In April 2017, SERS Board lowered the assumed rate from 7.5% to 7.25% for the 2016 actuarial valuation. Taxpayers and policy makers can remain confident that rigorous control and oversight are exercised in the administration of these public funds. Our earnings have been positive for 17 of the last 20 years, and actual earnings have exceeded the assumed long-term rate of return for 12 of them.

Based on the actuarial methods used for financial reporting purposes, as of December 31, 2017, the resulting net pension liability was \$17.3 billion. SERS plan fiduciary net position as a percentage of the total pension liability was 63.0%. Based on the actuarial methods used for funding purposes, as of December 31, 2017, the unfunded actuarial accrued liability was \$19.7 billion. SERS funded ratio was 59.4%. Additional details, as well as a discussion of the continuing impact of Governmental Accounting Standards Board (GASB) Statement No. 67,

Financial Reporting for Pension Plans – an amendment of GASB Statement No. 25 (GASB 67), which was implemented in 2014, are discussed in greater detail in Management's Discussion and Analysis.

The employer contribution rate will drop to 32.9% of payroll in fiscal year 2018-19, the first decrease after eight years of steady increases as employers worked to restore funding to the underfunded system. In absolute contribution dollars, this represents approximately \$2.1 billion of which approximately 45% originates from the general fund from employers under the Governor's jurisdiction.

SERS continues major initiatives to improve services to our stakeholders, as well as improving efficiencies in the delivery of benefits and reducing cost in the administration of the system to our employers. Reducing investment fees has been an ongoing goal for SERS. Since 2010, we have reduced fees and expenses for our investment program by more than \$100 million. Investment strategies seek the highest-conviction vehicles within an acceptable level of risk. To be more responsive to our members and reduce transaction costs, we continue to increase the volume of electronic funds transfers for benefit payments. This initiative also has reduced waiting periods for benefit payments and increased the security of delivery of our members' money. Improving customer service to our members remains a top priority for the plan. We have enhanced our member materials, making the information contained within more understandable and accessible to a range of employees. We have increasingly leveraged technology to deliver many of these materials electronically, allowing the plan to reduce administrative costs and employ data-driven results to help guide future communications initiatives. SERS also continues its multi-year benefits processing system upgrade that is expected to further improve how we interact with our members, their account-related transactions, and payment processing.

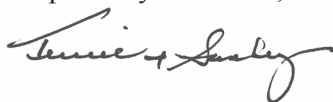
Members can be assured that their retirement system is administered well, and that staff carefully manages the funds entrusted to the Board.

It should be noted that on June 12, 2017, Governor Wolf signed Act 2017-5 into law. This law fundamentally changes retirement options for most new hires beginning January 1, 2019. For most new members, this legislation establishes two hybrid defined benefit/defined contribution tiers and a straight defined contribution plan. In addition to new hires, current members will have the opportunity to opt-in between January 1, 2019, and March 31, 2019. This legislation had no impact on these basic financial statements. Additional information on Act 2017-5 will be provided in future years as it becomes required.

We are solely responsible for the contents of this report, however we do wish to acknowledge the significant contributions of many SERS professionals whose work to compile, quality assure, and produce it is essential.

The commitment of the agency's nearly 190 employees ensures that we maintain effective internal controls to assure that assets are safeguarded, transactions are properly executed, and financial statements conform to U.S. generally accepted accounting principles – all while providing effective, high-quality member services. SERS remains dedicated to providing the highest level of service to commonwealth employers, policymakers, employees, retirees, the SERS Board, and you. Staff at all levels strive to provide exceptional service to those who have dedicated their careers to the citizens of Pennsylvania and maintain careful stewardship of public dollars.

Respectfully submitted,



Terrill J. Sanchez
Executive Director



Anthony J. Faiola, CPA
Chief Financial Officer

INTRODUCTORY SECTION

SERS Board

December 31, 2017

Mr. David R. Fillman
Chairman
Executive Director, AFSCME Council 13



Mr. Stephen S. Aichele
Attorney



Mr. Glenn E. Becker
President, The Swarthmore Group



Honorable Dan B. Frankel
State Representative



Honorable Robert W. Godshall
State Representative



INTRODUCTORY SECTION

SERS Board

December 31, 2017

Honorable Vincent J. Hughes
State Senator



Honorable Charles T. McIlhinney, Jr.
State Senator



Mr. T. Terrance Reese
President, Overly Manufacturing



Honorable Mary A. Soderberg
Retired Member and Former State Budget Secretary



Honorable Joseph M. Torsella
State Treasurer



Honorable Robin L. Wiessmann
Secretary of Banking and Securities



INTRODUCTORY SECTION

SERS Mission, Vision, and Organizational Chart

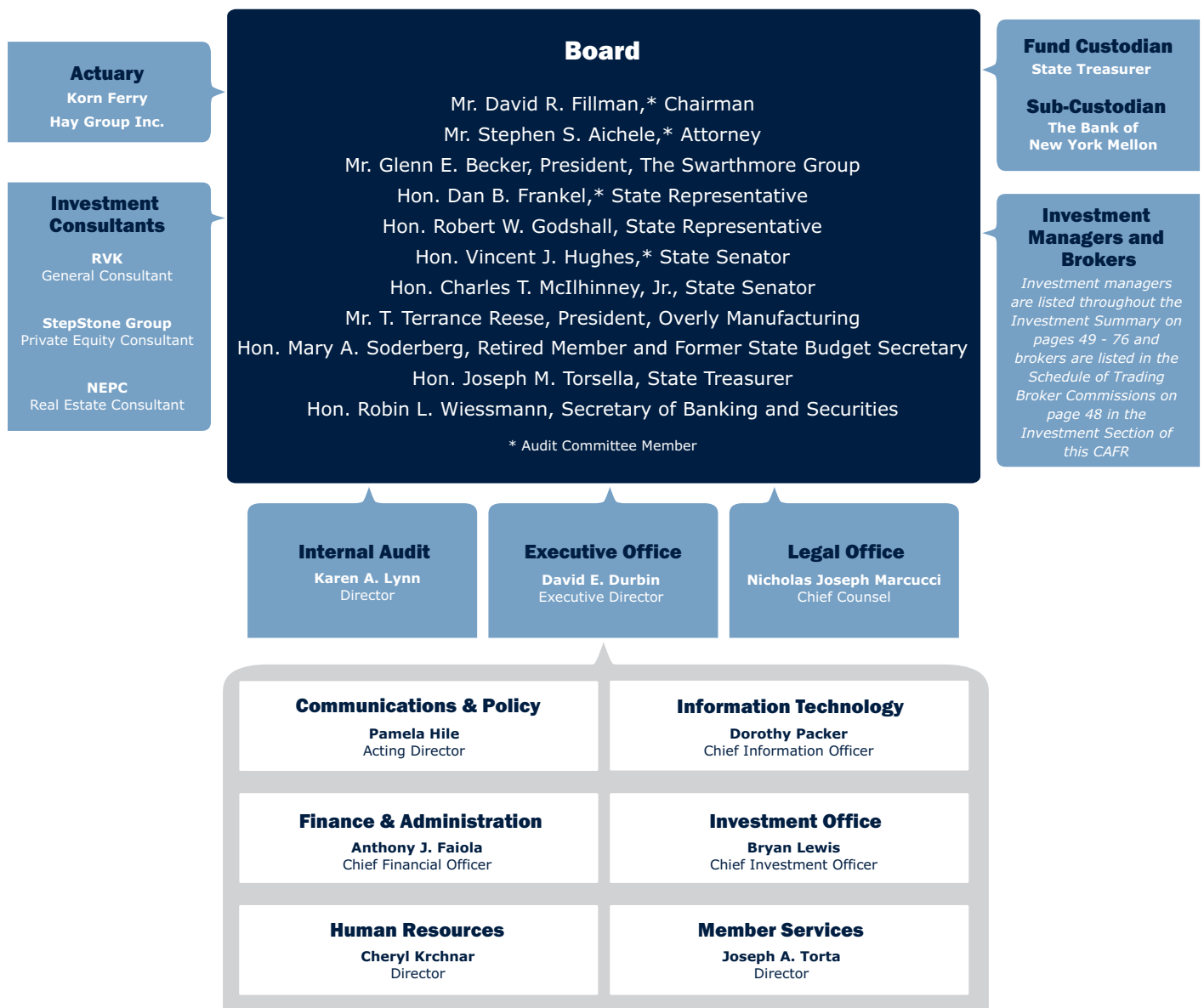
Mission

The mission of SERS is to provide retirement benefits and services to our members through sound administration and prudent investments.

Vision

SERS' vision is to navigate organizational, fiscal, and legislative challenges so that SERS continues to progress toward fully-funded status while enhancing and sustaining effective and responsive member services.

Organizational Chart



As of 12/31/17

2017

Financial Section



KPMG LLP
Suite 1000
30 North Third Street
PO Box 1190
Harrisburg, PA 17108-1190

Independent Auditors' Report

The Members of the Board
Commonwealth of Pennsylvania
State Employees' Retirement System:

We have audited the accompanying financial statements of the Commonwealth of Pennsylvania State Employees' Retirement System (SERS), a component unit of the Commonwealth of Pennsylvania, as of and for the years ended December 31, 2017 and 2016, and the related notes to the financial statements, which collectively comprise the SERS' basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the Commonwealth of Pennsylvania State Employees' Retirement System as of December 31, 2017 and 2016, and the changes in its fiduciary net position for the years then ended in accordance with U.S. generally accepted accounting principles.

KPMG LLP is a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity.



Other Matters

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3–10 and the required supplementary information in schedules 1 through 3 on pages 36–37 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary and Other Information

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise SERS' basic financial statements. The supplementary information in schedules 4 and 5 on pages 38–39, and the other information in the introductory section, investment section, actuarial section, and statistical section as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The supplementary information in schedules 4 and 5 is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements for the year ended December 31, 2017. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the supplementary information in schedules 4 and 5 is fairly stated in all material respects in relation to the basic financial statements as a whole.

The introductory, investment, actuarial and statistical sections have not been subject to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

KPMG LLP

Harrisburg, Pennsylvania
May 25, 2018

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

This section presents Management's Discussion and Analysis of the Pennsylvania State Employees' Retirement System's (SERS) basic financial statements, as well as the significant events and conditions that affected the operations and performance of SERS during the years ended December 31, 2017, 2016, and 2015.

This discussion and analysis includes forward-looking statements that involve certain risks and uncertainties. Actual results and performance may differ materially from those expressed or implied in the forward-looking statements due to a wide range of factors including but not limited to: changes in securities markets, general economic conditions, interest rates, energy policies, legislation, and global conflicts.

Overview of the Basic Financial Statements and Accompanying Information

- (1) **Basic Financial Statements.** SERS presents Statements of Fiduciary Net Position as of December 31, 2017 and 2016 as well as Statements of Changes in Fiduciary Net Position for the years then ended. These statements reflect resources available for the payment of benefits as of year end, and the sources and uses of those funds during the year.
- (2) **Notes to Basic Financial Statements.** The notes to basic financial statements are an integral part of the statements. SERS encourages readers to review them because the additional detail will provide a more complete understanding of the basic financial statements. The notes provide information about SERS organization, benefits, and contributions; determination of asset values; limited use of derivatives; contingencies and commitments; actuarial methods; assumptions; and funding.

- (3) **Required Supplementary Information.** The Required Supplementary Information (RSI) consists of:
 - This Management's Discussion and Analysis (MD&A)
 - A schedule of changes in net pension liability and related ratios
 - A schedule of employer contributions
 - A schedule of investment returns
- (4) **Other Supplementary Information Schedules.** Other schedules provide details of SERS administrative, investment, and consultant expenses.

Financial Analysis

SERS provides retirement benefits to the employees of the Commonwealth of Pennsylvania (commonwealth) and certain other public agencies. SERS benefits are funded through member and employer contributions as well as investment income.

SERS net position increased approximately \$3.0 billion for the year ended December 31, 2017, compared to an increase of approximately \$0.3 billion for the year ended December 31, 2016, as reflected in the table on page 10.

Member Contributions

Member contributions were approximately \$383 million for the year ended December 31, 2017, \$375 million for the year ended December 31, 2016, and \$372 million for the year ended December 31, 2015. There was a slight increase in gross salaries, which were approximately \$6.0 billion for 2017 and \$5.9 billion for 2016. Although there was a decrease of approximately 1,700 in active membership as of year-end 2017, there were also across the board salary increases and approximately 800 more employees electing Class A-4 that contribute at a higher 9.3% of

FINANCIAL SECTION

Management’s Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

gross salary, compared to a decrease of approximately 300 employees that were contributing at a lower 5.0% of gross salary. The member contribution rate of 6.25% of gross salary for most members is set by statute and has remained unchanged for the years presented.

Employer Contributions

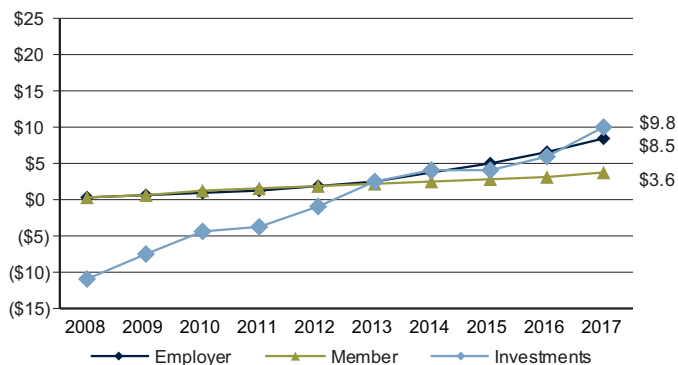
Employer contributions were approximately \$1.9 billion, \$1.6 billion, and \$1.4 billion for the years ended December 31, 2017, 2016, and 2015, respectively. The 2017 contributions represented an increase of \$275 million – or 17% – compared to 2016. The growth was due to an increase in the composite employer rate to 33.22% from 29.5% on July 1, 2017, (excluding the Benefits Completion Plan (BCP) as described in note 3 to the basic financial statements). The \$262 million – or 19.2% – growth in 2016 from 2015 was due to an increase in the employer rate to 29.5% from 25% on July 1, 2016.

Since 2005, Pennsylvania law statutorily suppressed employer contribution rates, primarily through Acts 2003-40 and 2010-120. Act 2010-120 limited the rate at which employer contributions increase in any given year after FY 11/12, up to a maximum of 4.5% each year, until no longer needed. According to this schedule, commonwealth FY 17/18 was the first year since legislatively-mandated contribution rates were enacted through Act 2010-120 that collars were no longer needed and employers paid the uncollared actuarially required rate. The FY 18/19 composite employer contribution rate including the BCP is going to be 32.93% of payroll.

From 2008 through 2017, employer contributions totaled \$8.5 billion – or 39% – of total additions to fiduciary net position, compared to \$3.6 billion – or 16% – of total additions attributed to member contributions, and \$9.8 billion – or 45% – of total additions attributed to investment earnings, as illustrated in the following charts.

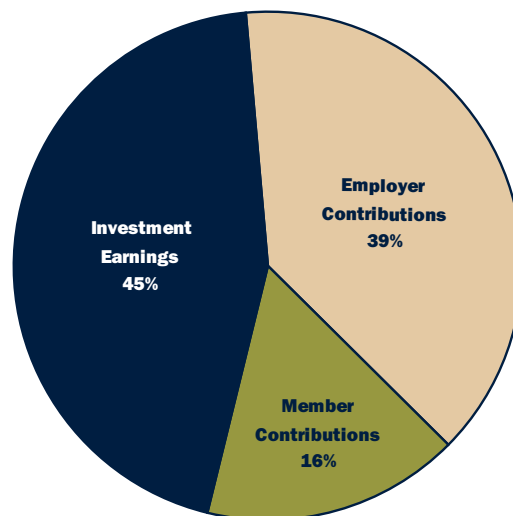
10-Year Cumulative Additions to Fiduciary Net Position

(\$ billions)



Additions by Component as a Percent of Total Additions

(10-Year Cumulative History)



Suppressed employer contributions have provided budgetary relief to commonwealth agencies and the taxpayers of Pennsylvania. The short-term benefits, however, result in employers contributing more over a 30-year period due to implied financing costs. Such financing costs are incurred because the monies are not presently available to invest and cannot compound.

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

Net Investment Income

SERS utilizes two methodologies when analyzing investment returns. The two approaches may vary from each other in any given period based on the underlying methodology used. For GASB 67 accounting valuation purposes, a money-weighted return is used. A money-weighted rate of return calculates the investment performance accounting for all cash flows (contributions and withdrawals) occurring during the performance measurement period. Conversely, for investment performance reporting purposes, SERS and its investment consultants rely on a time-weighted approach. A time-weighted rate of return minimizes the impact of cash flows occurring throughout the measurement period. SERS investment returns, net of manager fees, on a money-weighted basis, were 15.1%, 6.4%, and 0.4% for the years 2017, 2016, and 2015, respectively. SERS investment returns, net of manager fees, on a time-weighted basis, were 15.1%, 6.5%, and 0.4% for the years 2017, 2016, and 2015, respectively.

Positive investment performance contributed approximately \$4.1 billion, \$1.6 billion, and \$88 million to net investment income for the years 2017, 2016, and 2015, respectively. Strong performance in the Global Public Equity asset class helped the overall SERS Fund performance for 2017.

Biennially, SERS reviews and modifies its strategic investment plan, as necessary. The ultimate objective of SERS *2016-2017 Strategic Investment Plan* was to formulate an asset allocation policy that provides a high expected probability of achieving SERS long-term actuarially assumed rate of return. The plan emphasized liquidity, reduction of cash flow volatility, and pursuit of capital protection strategies to ensure that SERS assets are best positioned to meet the SERS Fund's continuing obligations to its beneficiaries.

SERS assets are managed by external investment managers hired by the State Employees' Retirement Board (SERB). SERS strives to engage the highest quality investment managers for the most cost-effective price. Many of these managers are paid a fee based on the amount of assets under management. For private market investments, the industry practice is for the limited partners to pay fees to the general partner based on commitments to the partnership during the investment period.

SERS pays the majority of its fees to managers within its Private Equity and Real Estate asset classes due to the complex and time-consuming nature of managing the investments.

Investment expenses, which include fees paid to managers, were \$135 million and \$168 million for the years ended December 31, 2017 and 2016, respectively.

Benefits, Refunds, and Expenses

Benefit payments to annuitants are the most significant recurring deductions from fiduciary net position. During 2017 and 2016, SERS paid out approximately \$3.3 billion and \$3.2 billion in benefits and refunds, respectively.

There were approximately 6,300 new retirees added to the annuity payroll in 2017, with an average annual benefit of \$28,100. There were approximately 6,700 new retirees added to the annuity payroll in 2016, with an average annual benefit of \$28,700. There were more than 4,200 and 4,000 retirees removed from the rolls with an average annual benefit of \$15,100 and \$15,000 in 2017 and 2016, respectively. As is typical in mature pension plans, new retirees in 2017 received a much higher annual benefit than those removed from the annuity payroll.

The benefits expense on the basic financial statements consists of two primary components: monthly annuity

FINANCIAL SECTION

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

payments and supplemental payments. Most of the supplemental payments were paid to retiring members who joined SERS before January 1, 2011, and chose to withdraw their contributions and interest at retirement. Such withdrawals reduce the retirees' payments over their remaining life. Supplemental payments were \$438 million and \$472 million for 2017 and 2016, respectively.

Act 2010-120 prohibits lump-sum withdrawals for new classes of employees (A-3 and A-4). This act also lowered the benefits earned by most employees who joined SERS on or after January 1, 2011, by reducing the retirement benefit accrual rate, increasing normal retirement age, extending the vesting period from five years to 10 years, and other provisions. Two other important benefit-related aspects of Act 2010-120 are that retirement provisions for legislators elected after December 1, 2010, were reduced and made consistent with those of most rank-and-file employees. Despite the reduction in benefits, most employees continue to contribute 6.25% of their salary and fund a greater proportion of their own retirement benefit.

It will take considerable time to realize savings from Act 2010-120 as detailed above. SERS expects benefit expenses to rise steadily because the number of retirees added to the rolls is projected to outpace the number of retirees removed from the rolls. Additionally, despite the benefit cost reductions for new employees, the monthly annuities for retirees in the near-term are projected to be approximately 90% higher than the annuities of those being removed from the payrolls.

SERS was established in 1923, but did not pay more than \$1 billion in annual benefits until 1997. SERS annual benefit payments reached \$2 billion in 2007 and \$3 billion in 2015. Based on recent actuarial projections, SERS annual benefit payments will reach \$4 billion by 2022.

Growth in Annuity Payroll

	December		
	2017	2016	2015
Monthly annuity payroll (\$ millions)	\$242	\$233	\$222
Retirees	129,473	127,338	124,689

SERS administrative expenses represented 0.1% of fiduciary net position in 2017 and 2016. All expenses were within budget.

SERS Assets

Investments are the most significant component of SERS assets. The fair value of investments increased to \$29.7 billion in 2017 from \$26.5 billion in 2016. The increase is related to the fact that net investment income and contributions exceeded benefit payments for the year. SERS reports assets at fair value as discussed in accounting policies note 2(c) to the basic financial statements. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

The total investment portfolio fair value was \$29.7 billion for 2017, as compared to \$26.5 billion for 2016. Equity values increased to \$16.4 billion for 2017, from \$12.1 billion in 2016. The increase in equity values is attributable to strong broad market returns. Fixed income values increased to \$4.6 billion for 2017, from \$4.1 billion in 2016. The increase in fixed income values is primarily due to returns. Private equity values decreased to \$4.0 billion for 2017, from \$4.1 billion in 2016. Most of the decrease in private equity was due to distributions exceeding contributions. Real estate values decreased to \$2.2 billion for 2017, from \$2.5 billion in 2016. The decrease in real estate values was mostly attributable to distributions exceeding contributions. Hedge funds values decreased to \$1.1 billion for 2017, from \$2.1 billion in 2016. The decrease in hedge funds values is primarily due to continued wind down of the

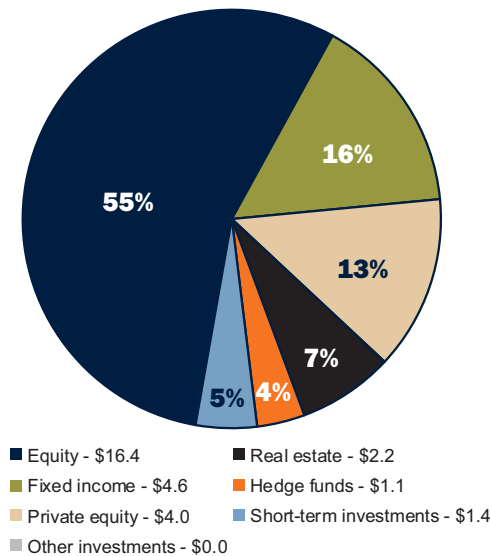
Management’s Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

hedge fund program. Short-term investments values decreased to \$1.4 billion for 2017, from \$1.6 billion in 2016. The total investment portfolio fair value of \$29.7 billion for 2017 was composed as shown by the chart below:

Investments at Fair Value (2017)

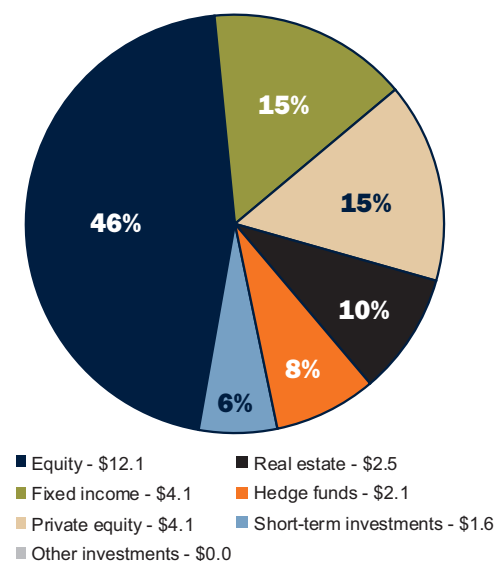
(\$ billions)



The total investment portfolio fair value of \$26.5 billion for 2016 was composed as shown by the chart below:

Investments at Fair Value (2016)

(\$ billions)



SERS earns additional investment income by lending investment securities to brokers. The brokers provide collateral to SERS for borrowed securities generally equal to 102%–105% of the borrowed securities, and SERS invests the collateral to earn interest. Income, net of expenses, from securities lending is dependent on the volume of lending generated at the custodian bank and the spreads (profits) on loaned securities.

SERS earned nearly \$35 million through securities lending over the last 10 years. SERS has scaled back its securities lending program since 2008 (in both the number of securities on loan and the market value of those securities for which cash collateral was provided) due to the increased risk associated with market uncertainty. The program’s guidelines provide for investment of cash collateral in highly liquid, highly-rated securities.

As of December 31, 2017 and 2016, the fair value of loaned securities was \$620 million and \$429 million, respectively. The fair value of the associated collateral was \$639 million and \$458 million, respectively, of which \$391 million and \$274 million was cash, respectively.

Derivatives

SERS permits investment managers to use derivatives to provide market exposure to various asset classes within narrowly prescribed policy guidelines. Used properly, such derivatives cost-efficiently deliver returns similar to indexed returns in the respective asset classes without disrupting SERS liquidity needs. SERS investment managers manage counterparty credit risk by entering into contracts with parties with credit ratings of at least investment grade and by establishing collateral requirements. SERS monitors derivative levels and types to ensure that portfolio derivatives are consistent with their intended purpose and at the appropriate level.

FINANCIAL SECTION

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

Liquidity

SERS 2016-2017 Strategic Investment Plan used Cash as an asset class, while SERS 2014-2015 Strategic Investment Plan used Liquidity Reserve as an asset class that serves as the primary source of short-term liquidity for the SERS Fund. In periods of market distress, liquid reserves reduce capital impairment risk (i.e., selling assets below intrinsic value) and enhance fund returns by enabling the purchase of mispriced securities from distressed sellers. At December 31, 2017 and 2016, the SERS Fund held approximately \$1.0 billion and \$1.3 in Cash, respectively, which is included in short-term investments on the Statements of Fiduciary Net Position.

Actuarial Valuations

Annually, SERS obtains two actuarial valuations, one for financial reporting purposes under GASB 67 and one that is statutorily required for funding purposes. The funding valuation is used to set the employer contribution rate for the plan.

It is important to note differences in actuarial methods for financial reporting under GASB 67 (accounting valuation) compared to those used for funding purposes (funding valuation). Key differences are shown in the following table:

	GASB 67 - Accounting Valuation	Funding Valuation
Actuarial cost method	Entry age	Variation of entry age
Asset valuation method	Fair (market) value	5-year smoothed market value

Key valuation results for the accounting valuation compared to the funding valuation for the years ended December 31, 2017 and 2016 are as shown in the following tables:

As of December 31, 2017

(\$ millions)

GASB 67 - Accounting Valuation		Funding Valuation	
Total Pension Liability (TPL)	\$46,697	Actuarial Accrued Liability (AAL)	\$48,439
Fiduciary Net Position	29,405	Actuarial Value of Assets	28,777
Net Pension Liability (NPL)	\$17,292	Unfunded AAL	\$19,662
Ratio - Fiduciary Net Position/TPL	63.0%	Funded Ratio	59.4%

As of December 31, 2016

(\$ millions)

GASB 67 - Accounting Valuation		Funding Valuation	
Total Pension Liability (TPL)	\$45,648	Actuarial Accrued Liability (AAL)	\$47,519
Fiduciary Net Position	26,388	Actuarial Value of Assets	27,596
Net Pension Liability (NPL)	\$19,260	Unfunded AAL	\$19,923
Ratio - Fiduciary Net Position/TPL	57.8%	Funded Ratio	58.1%

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

Under the accounting valuation, the net pension liability decreased to \$17.3 billion in 2017 from \$19.3 billion in 2016. This decrease was due to a \$3.0 billion increase in the fiduciary net position mostly due to investment income and contributions exceeding benefit payments. Offsetting this decrease, there was a \$1.0 billion increase in the total pension liability mostly due to benefits earned and differences between expected and actual experience. Under the funding valuation, the unfunded actuarial accrued liability decreased to \$19.7 billion in 2017 from \$19.9 billion in 2016 due mostly to the same factors as discussed above, except the effect of current year investment returns, which are not as impactful because of asset smoothing.

The unfunded actuarial accrued liability under the funding valuation was \$2.4 billion and \$0.6 billion higher than the net pension liability under the accounting valuation in 2017 and 2016, respectively. The more favorable result under the accounting valuation can be specifically attributed to the actuarial cost method required under GASB 67. The entry-age actuarial cost method apportioned more of the pension costs of certain members to the normal cost and therefore lowered the amount apportioned to the unfunded liability. In 2017, the benefit from using the actuarial cost method was compounded by the fact that current year returns, which were above the assumed rate, were recognized immediately in the fiduciary net position balance as opposed to being deferred and smoothed into assets over five years under the funding valuation. In 2016, the benefit from using the actuarial cost method was offset by the fact that current year returns, which fell below the assumed rate, were recognized immediately in the fiduciary net position balance as opposed to being deferred and smoothed into assets over five years under the funding valuation.

Every five years, SERS is required to conduct an actuarial experience study to determine whether the

assumptions used in its annual actuarial valuations remain accurate based on current and anticipated demographic trends and economic conditions. The *18th Investigation of Actuarial Experience* study for the period 2011–2015 was released in March 2016. The actuary, under oversight of the SERB, reviewed economic assumptions (such as the assumed future investment returns and salary increases) as well as demographic assumptions (such as employee turnover, retirement, disability, and death rates). Some assumption adjustments increased projected cost and some decreased projected cost, but the overall result was a slight increase to the net pension liability.

Most demographic assumptions remained the same as, or similar to, experience over the last five years. However, the experience study did recommend changing some assumptions. The study recommended decreasing disability retirement rates for all active members. Additionally, it recommended adjusting superannuation separation rates, early retirement separation rates, and withdrawal rates for certain active member groupings (gender, age, and years of service) in both the general and special membership classes. Furthermore, it recommended decreasing most annuitant and survivor mortality rates.

The SERB adopted the actuarial assumptions set forth in the *18th Investigation of Actuarial Experience* at its March 2016 meeting. The study can be viewed at www.SERS.pa.gov.

In addition to the five-year experience study, SERS reviews its investment return assumption in light of economic conditions every year. The next SERS review will occur in July 2018, and will be used for its 2018 annual valuation.

Pennsylvania Act 2017-5

On June 12, 2017, Governor Wolf signed Act 2017-5 into law. The law established two new side-by-side hybrid defined benefit (DB)/defined contribution (DC)

FINANCIAL SECTION

Management's Discussion and Analysis

December 31, 2017 and 2016 (unaudited)

benefit options and a new DC-only option for all state employees, excluding most hazardous duty employees, who first enter SERS membership on or after January 1, 2019. While most hazardous employees are exempt, those starting on or after January 1, 2019, will have a 10% cap on voluntary overtime that is includable for retirement covered earnings. Additionally, all current SERS members will have a one-time, irrevocable option to select one of the three new retirement benefit options between

January 1, 2019, and March 31, 2019. The newly elected option will be effective July 1, 2019, and generally will apply to all future service.

This legislation had no impact on the basic financial statements as of and for the years ended December 31, 2017 or 2016. SERS does not expect Act 2017-5 to have an impact on its basic financial statements prior to the effective date of the new retirement options and opt-in period in 2019.

Condensed Financial Information

(\$ millions)

Fiduciary Net Position

Assets	2017	Increase (Decrease)	2016	Increase (Decrease)	2015
Total receivables	\$513	\$123	\$390	\$119	\$271
Total investments	29,701	3,246	26,455	326	26,129
Securities lending collateral pool	391	117	274	(97)	371
Total assets	30,605	3,486	27,119	348	26,771
Liabilities					
Accounts payable and accrued expenses	48	(20)	68	16	52
Investment purchases and other liabilities	761	372	389	96	293
Obligations under securities lending	391	117	274	(97)	371
Total liabilities	1,200	469	731	15	716
Net position restricted for pensions	\$29,405	\$3,017	\$26,388	\$333	\$26,055

Changes in Fiduciary Net Position

Additions	2017	Increase	2016	Increase	2015
Member contributions	\$383	\$8	\$375	\$3	\$372
Employer contributions	1,898	276	1,622	262	1,360
Net investment income	4,066	2,479	1,587	1,499	88
Total additions	6,347	2,763	3,584	1,764	1,820
Deductions					
Benefits and refunds	3,304	76	3,228	147	3,081
Administrative expenses	26	3	23	1	22
Total deductions	3,330	79	3,251	148	3,103
Increase/(decrease) in net position restricted for pensions	\$3,017	\$2,684	\$333	\$1,616	\$(1,283)

Statements of Fiduciary Net Position

Statements of Fiduciary Net Position

December 31, 2017 and 2016

(\$ thousands)

	2017	2016
Assets		
Receivables		
Plan members	\$608	\$1,034
Employers	154,806	117,072
Investment income	60,381	60,600
Investment proceeds and other receivables	292,823	207,428
Miscellaneous	4,067	4,276
Total receivables	512,685	390,410
Investments		
Short-term investments	1,403,112	1,591,176
Fixed income	4,593,143	4,056,504
Common and preferred stocks	16,411,156	12,132,688
Hedge funds	1,066,699	2,057,398
Real estate	2,204,129	2,491,424
Private equity	4,023,563	4,125,545
Other investments	(597)	200
Total investments	29,701,205	26,454,935
Securities lending collateral pool	391,449	273,603
Total assets	30,605,339	27,118,948
Liabilities		
Accounts payable and accrued expenses	47,669	68,236
Investment purchases and other liabilities	761,179	389,220
Obligations under securities lending	391,449	273,603
Total liabilities	1,200,297	731,059
Net position restricted for pensions	\$29,405,042	\$26,387,889

See accompanying notes to basic financial statements.

FINANCIAL SECTION

Statements of Changes in Fiduciary Net Position

Statements of Changes in Fiduciary Net Position

Years Ended December 31, 2017 and 2016

(\$ thousands)

	2017	2016
Additions		
Contributions		
Plan members	\$383,359	\$374,570
Employers	1,897,404	1,622,123
Total contributions	2,280,763	1,996,693
Investment income		
From investing activities		
Net appreciation in fair value of investments	3,710,739	1,233,501
Interest	126,728	126,219
Dividends	260,013	273,733
Real estate income	95,533	89,327
Miscellaneous income	3,713	27,381
Total investing activities income	4,196,726	1,750,161
Investment expenses	(135,079)	(167,712)
Net income from investing activities	4,061,647	1,582,449
From securities lending activities		
Securities lending income	4,883	4,893
Securities lending expenses	(475)	(489)
Net income from securities lending activities	4,408	4,404
Net investment income	4,066,055	1,586,853
Total additions	6,346,818	3,583,546
Deductions		
Benefits	3,287,923	3,214,440
Refund of contributions	15,620	13,108
Administrative expenses	26,122	22,999
Total deductions	3,329,665	3,250,547
Net increase	3,017,153	332,999
Net position restricted for pensions		
Balance, beginning of year	26,387,889	26,054,890
Balance, end of year	\$29,405,042	\$26,387,889

See accompanying notes to basic financial statements.

Notes to Basic Financial Statements

December 31, 2017 and 2016

(1) Organization and Description of Pennsylvania State Employees’ Retirement System (SERS)

(a) Organization

SERS was established as of June 27, 1923, under the provisions of Public Law 858, No. 331. SERS was developed as an independent administrative agency of the board, which exercises control and management of SERS, including the investment of its assets. The State Employees’ Retirement Board (SERB) has 11 members including the State Treasurer (ex officio), the Secretary of Banking and Securities (ex officio), two Senators, two members of the House of Representatives, and five members appointed by the Governor, one of whom is an annuitant of SERS. At least five board members must be active members of SERS and at least two must have 10 or more years of credited service.

SERS is the administrator of a cost-sharing multiple-employer defined benefit pension plan established by the Commonwealth of Pennsylvania (commonwealth) to provide pension benefits for employees of state government and certain independent agencies. SERS is a component unit of the commonwealth and is included in the commonwealth’s financial report as a pension trust fund. Administration costs are financed through contributions and investment earnings.

Membership in SERS is mandatory for most state employees. Members and employees of the General Assembly, certain elected or appointed officials in the executive branch, department heads, and certain employees in the field of education are not required, but are given the option to participate. The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth comprises 65 agencies and when everything is evaluated separately, SERS has a total of 102 participating employers/agencies.

At December 31, 2017 and 2016, SERS membership consisted of the following:

SERS Membership

	2017	2016
Inactive plan members or beneficiaries currently receiving benefits	129,473	127,338
Inactive plan members entitled to but not yet receiving benefits	6,815	7,134
Active plan members	102,978	104,632
Total members	239,266	239,104

(b) Pension Benefits

SERS provides retirement, death, and disability benefits. Cost of Living Adjustments (COLA) are provided ad hoc at the discretion of the General Assembly. Article II of the Commonwealth of Pennsylvania’s Constitution assigns the authority to establish and amend the benefit provision of the plan to the General Assembly. Member retirement benefits are determined by taking years of credited service multiplied by the final average salary multiplied by 2% multiplied by the class of service multiplier.

Most employees who entered SERS membership prior to January 1, 2011, and who retire at age 60 with three years of service, or at any age with 35 years of service, are entitled to a full retirement benefit. Members of the General Assembly and certain employees classified in hazardous duty positions can retire with full benefits at age 50, with at least three years of service. Act 2010-120 preserved all benefits in place for members, but mandated a number of benefit reductions for new members effective January 1, 2011. The Act created a new class of service in which members earn a benefit that accrues at 2% of the member’s final average salary instead of 2.5% each year and vests in 10 years instead of five. The Act also eliminated the option for members to withdraw their contributions and interest in a lump sum at retirement in exchange for lower

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

pension payments. The new full retirement age is 65 for most employees who entered SERS membership after January 1, 2011, and age 55 for members of the General Assembly and certain employees classified in hazardous duty positions.

Most members of SERS, and all state employees hired after June 30, 2001, and prior to January 1, 2011 (except state police officers and certain members of the judiciary and legislators), are Class AA members. Each class of benefits is based on a multiple of the base accrual rate of 2%, which is called the multiplier. The multiplier for Class AA is 1.25, which translates into an annual benefit of 2.5% of the member's highest three-year average salary multiplied by years of service and became effective for members July 1, 2001. The general annual benefit for Class A members is 2% of the member's highest three-year average salary multiplied by years of service.

State police are entitled to a benefit equal to a percentage of their highest annual salary, excluding their year of retirement. The benefit is 75% of salary for 25 or more years of service and 50% of salary for 20–24.99 years of service. Judges are entitled to a benefit of 4% of final average salary for each of the first 10 years of service and 3% for subsequent years. Magisterial District Judges are entitled to a benefit of 3% of final average salary for each year of service. Legislators taking office before December 1, 2010, are Class D-4. The multiplier for Class D-4 is 1.5, which translates into an annual benefit of 3% of the final average salary for each year of service.

Act 2010-120 created a new A-3 class of service and an optional A-4 class for most employees who enter SERS membership for the first time on or after January 1, 2011, and December 1, 2010, for legislators newly elected in November 2010. Employees who enter SERS membership after the effective date of Act 2010-120 enter as members

of the A-3 class with a 45-day window to elect membership in the optional A-4 class. The general annual benefit for Class A-3 members is 2% of the member's highest three-year average salary multiplied by years of service, while the Class A-4 benefit accrual rate is 2.5%.

According to the State Employees' Retirement Code (retirement code), all obligations of SERS will be assumed by the commonwealth should SERS terminate.

(c) Contributions

Section 5507 of the retirement code (71 Pa. C.S.) requires that all SERS-participating employers make contributions to the fund on behalf of all active members and annuitants necessary to fund the liabilities and provide the annuity reserves required to pay benefits. SERS funding policy, as set by the board, provides for periodic active member contributions at statutory rates. The SERS funding policy also provides for periodic employer contributions at actuarially determined rates based on SERS funding valuation, expressed as a percentage of annual retirement covered payroll, such that they, along with employee contributions and an actuarially determined rate of investment return, are adequate to accumulate assets to pay benefits when due. However, Act 2010-120 imposes rate increase collars (limits on annual rate increases) on employer contributions that keep the employer contribution rate below the rates established in accordance with actuarial parameters. The collar for commonwealth FY 11/12 was 3%, FY 12/13 was 3.5%, and FY 13/14 was 4.5% and remained at that rate until no longer needed. FY 17/18, the first year, since legislatively-mandated contribution rates were enacted through Act 2010-120 that rate collars were no longer needed. In FY 17/18, the commonwealth paid the full actuarially required rate. At December 31, 2017, the actuarially determined rate including the Benefits Completion Plan (BCP) was 33.24%. At December 31, 2016, the statutorily required composite

Notes to Basic Financial Statements

December 31, 2017 and 2016

contribution rate as collared by Act 2010-120 including the BCP was 29.51% while the actuarially determined rate would have been 32.15%.

Employer rates are computed based on SERS fiscal year end of December 31 and applied to the commonwealth based on its fiscal year end of June 30; therefore, the employer contribution rates, in effect for SERS full year ended December 31, reflect a blended average of calculated rates. As of December 31, 2017 and 2016, the blended contribution rates, which include the BCP, were 31.38% and 27.26%, respectively.

The general membership contribution rate for all Class A and Class AA members is 5% and 6.25% of salary, respectively. The general membership contribution rate under Act 2010-120 for A-3 and A-4 members is 6.25% and 9.3% of salary, respectively. The contribution rate for Class D-4 Members of the General Assembly is 7.5%. Judges and Magisterial District Judges have the option of electing special membership classes requiring a contribution of 10% and 7.5%, respectively. All employee contributions are recorded in individually identified accounts that are credited with interest, calculated at 4% per annum, as mandated by statute. Accumulated employee contributions and credited interest vest immediately and are returned to the employee upon termination of service if the employee is not eligible for other benefits.

(2) Summary of Significant Accounting Policies**(a) Basis of Accounting**

SERS basic financial statements are prepared using the accrual basis of accounting and economic resources measurement focus. Plan member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has a legal requirement to provide the contributions. Benefits

and refunds are recognized when due and payable in accordance with the terms of the plan. Investment purchases and sales are recorded on a trade-date basis.

(b) Use of Estimates

Management of SERS has made certain estimates and assumptions relating to the reporting of assets and liabilities, and the disclosure of contingent assets and liabilities to prepare these basic financial statements in conformity with U.S. generally accepted accounting principles. Actual results could differ from those estimates.

(c) Valuation of Investments

SERS investments are reported at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. U.S. government securities and corporate and foreign bonds and notes are valued based on matrix pricing. Commingled equity funds and common and preferred stocks are generally valued based on published market prices and quotations at the close of business from national security exchanges and securities pricing services. Private equity, real estate, hedge funds, and commingled fixed income funds are reported at fair value as estimated and reported by general partners, based upon the underlying net asset value (NAV) of the fund or partnership as a practical expedient of fair value. Adjustments from NAV are required when SERS expects to sell the investment at a value other than NAV.

The investments in short-term investment funds, including those managed by the treasurer of the commonwealth, are reported at cost plus allocated interest, which approximates fair value. The securities lending collateral pool, which is a fund operated by the securities lending agent, also is accounted for at cost plus accrued interest, which approximates fair value.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

Unsettled investment sales are reported as investment proceeds receivable and unsettled investment purchases are reported as investment purchases payable. Investment expenses consist of investment managers' fees and those expenses directly related to SERS investment operations.

(d) Commitments

As of December 31, 2017 and 2016, SERS had contractual commitments totaling approximately \$2.8 billion and \$1.9 billion, respectively, to fund future private equity and real estate investments over the next several years.

(e) Federal Income Taxes

The Internal Revenue Service (IRS) issued a favorable tax determination letter on September 30, 2013, qualifying SERS as a Governmental Plan under the Internal Revenue Code (IRC). Therefore, SERS is exempt from federal income taxes. This tax determination was conditioned on the General Assembly enacting certain corrective amendments to the retirement code to satisfy the qualification requirements. That legislation was enacted December 28, 2015. SERS submitted a request to the IRS for an updated favorable tax determination letter on January 29, 2016. The updated favorable determination was issued May 19, 2017.

(f) Risk Management

SERS is exposed to various liabilities and risks of loss related to theft or destruction of assets, injuries to employees, and court challenges to fiduciary decisions. SERS is accorded sovereign immunity as an administrative agency of the commonwealth. SERS participates in certain commonwealth pooled insurance programs and requires asset managers to carry certain insurance coverage. SERS is self-insured for fiduciary and director and officer liability. During the past two fiscal years, SERS insurance settlements did not exceed insurance coverage.

(g) Reclassification

Certain 2016 balances have been reclassified to conform to the 2017 presentation. The reclassifications did not impact the net position.

(3) Legally Required Reserves

The retirement code requires SERS to maintain the following accounts representing the net position held for future and current benefit payments:

The **Member Savings Account** accumulates contributions and interest earnings of active employees. Member balances are transferred to the Annuity Reserve Accounts as members retire.

The **State Accumulation Account** accumulates contributions of the employer and the net earnings of the SERS Fund. Funds are transferred to the Annuity Reserve Accounts as members retire. The amount transferred is actuarially determined. Negative balances represent the amounts transferred to other reserve account balances in excess of accumulated employer contributions and net earnings.

The **Directed Commissions Reserve Account** accumulates the income from the commission recapture program less any administrative expenses. SERS has commission recapture contracts with several brokers. These contracts generally stipulate that the brokers rebate a percentage of commissions earned on investments directly to SERS. During the years ended December 31, 2017 and 2016, SERS earned approximately \$132 thousand and \$122 thousand of income resulting from a commission recapture program, respectively. As of December 31, 2017 and 2016, SERS used the program to pay approximately \$155 thousand and \$463 thousand of administrative expenses, respectively. At December 31, 2017 and 2016, SERS had accumulated commission reserves of \$3.3 million for both years. These commission reserves can be used to pay for future expenditures.

Notes to Basic Financial Statements

December 31, 2017 and 2016

The **Annuity Reserve Accounts** are the accounts from which all death and retirement benefits and supplemental annuities are paid. The balances in these accounts are actuarially determined.

The **Interest Reserve Account** accumulates all income earned by the SERS Fund. In addition, all administrative and investment expenses incurred by the SERS Fund and the board necessary for the operation of SERS are paid from this account. Any balance in this reserve is transferred to the State Accumulation Account at year end.

The **Benefits Completion Plan (BCP) Reserve Account** accumulates all BCP employer contributions and net earnings of the SERS Fund less any benefits paid out of the SERS Fund. Act 2002-234 amended the retirement code that directs the board to establish and serve as trustee of a retirement benefit plan that is in conformity with IRC Section 415(m), the BCP. The BCP is a separate trust fund established to provide benefits to all annuitants of SERS defined benefit plan and their survivor annuitants and beneficiaries whose retirement benefit exceeds the IRC Section 415(b) limits. A monthly annuity or death benefit is paid under the BCP only if a corresponding monthly annuity or death benefit is paid from the defined benefit plan to the extent permitted by IRC Section 415(b) and the retirement code. There were 33 and 30 individuals receiving benefits from the BCP at December 31, 2017 and 2016, respectively.

Account balances at December 31, 2017 and 2016 are as follows:

Account Balances

(\$ thousands)

	2017	2016
Member savings account	\$4,965,765	\$4,869,229
State accumulation account	(3,364,341)	(5,312,560)
Directed commissions reserve account	3,297	3,320
Annuity reserve accounts		
Annuitants and beneficiaries	24,884,576	24,096,866
State police	2,867,311	2,682,415
Enforcement officers	46,158	45,025
Benefits completion plan reserve account	2,276	3,594
Total	\$29,405,042	\$26,387,889

(4) Investments

As provided by statute, the board has exclusive control and management responsibility of SERS funds and full power to invest the funds. In exercising its fiduciary responsibility to SERS membership, the board is governed by the prudent investor rule in establishing investment policy. The prudent investor rule requires the exercise of that degree of judgment, skill, and care under the circumstances then prevailing which investors of prudence, discretion, and intelligence, who are familiar with such matters, exercise in the management of their own affairs, not in regard to speculation, but in regard to permanent

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

disposition of the funds, considering the probable income to be derived there from, as well as the probable safety of their capital. The board has adopted its *Statement of Investment Policy* to formally document investment objectives and responsibilities. This policy, as well as applicable state law, establishes guidelines for permissible investments of SERS.

Fair Value Hierarchy

The fair value hierarchy is broken down into three levels based on inputs that market participants would use in valuing assets and liabilities derived from market data as follows:

- **Level 1 inputs:** are quoted prices in active markets for identical assets or liabilities.
- **Level 2 inputs:** are quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, or other than quoted prices that are observable.
- **Level 3 inputs:** are unobservable inputs used to measure fair value if relevant observable inputs are not available for the asset or liability at the reporting date.

Common and preferred stocks, commingled equity funds, master limited partnerships (MLPs), real estate securities, and foreign exchange contracts are valued using prices quoted in active markets for those securities and are categorized as Level 1. They are marked to market daily with changes in fair value recognized as part of investments and investment income. Fixed income securities are valued using a matrix pricing technique and are categorized as Level 2. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices and recently printed security-specific trading levels. Value add/opportunistic separately managed accounts (SMA) in real estate and other securities classified in Level 3 reflect prices, which may use several unobservable inputs using assumptions based on market methodologies to determine the fair value of investments.

Derivative instruments, which include foreign exchange contracts, interest rate swaps, and credit default swaps, are included in other investments in the fair value tables.

Notes to Basic Financial Statements

December 31, 2017 and 2016

At December 31, 2017 and 2016, SERS investments measured at fair value are shown in the following tables:

Investments Measured at Fair Value (2017)

(\$ thousands)

	Fair Value	Level 1	Level 2	Level 3
Fixed income				
Government	\$1,854,617	\$ -	\$1,854,617	\$ -
Corporates	896,679	-	872,672	24,007
Asset- and mortgage-backed securities	758,489	-	757,267	1,222
Private placements	448,747	-	424,304	24,443
Sovereign debt	258,701	-	258,701	-
Agencies	66,718	-	66,718	-
Total fixed income	4,283,951	-	4,234,279	49,672
Equity				
Domestic common and preferred stocks	8,947,544	8,942,091	5,154	299
Commingled equity funds	5,396,139	5,396,139	-	-
Foreign common and preferred stocks	2,066,814	2,061,998	279	4,537
Total equity	16,410,497	16,400,228	5,433	4,836
Real estate				
Value add/opportunistic SMA	1,055,583	-	-	1,055,583
Real estate securities	235,370	235,370	-	-
Total real estate	1,290,953	235,370	-	1,055,583
Other investments				
Other investments	(599)	(657)	(8)	66
Total	\$21,984,802	\$16,634,941	\$4,239,704	\$1,110,157

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

Investments Measured at Fair Value (2016)

(\$ thousands)

	Fair Value	Level 1	Level 2	Level 3
Fixed income				
Government	\$1,632,961	\$ -	\$1,632,961	\$ -
Corporates	747,509	-	725,878	21,631
Asset- and mortgage-backed securities	554,952	-	548,438	6,514
Private placements	511,179	-	452,197	58,982
Sovereign debt	249,606	-	249,606	-
Agencies	80,429	-	80,429	-
Total fixed income	3,776,636	-	3,689,509	87,127
Equity				
Domestic common and preferred stocks	6,562,205	6,552,295	9,910	-
Foreign common and preferred stocks	5,414,830	5,406,965	-	7,865
Commingled equity funds	155,951	155,951	-	-
Total equity	12,132,986	12,115,211	9,910	7,865
Real estate				
Value add/opportunistic SMA	1,032,233	-	-	1,032,233
Real estate securities	221,501	221,501	-	-
Master limited partnership (MLPs)	245,009	245,009	-	-
Total real estate	1,498,743	466,510	-	1,032,233
Other investments				
Other investments	198	397	(199)	-
Total	\$17,408,563	\$12,582,118	\$3,699,220	\$1,127,225

Private equity limited partnerships are valued at the NAV of SERS ownership interest in partners' capital, which approximates fair value. NAV is determined by the general partners using assumptions and estimates that have been reviewed and approved by valuation committees. Since private equity investments in such partnerships are generally illiquid with holding periods lasting seven to 10 years, the value realized by SERS upon disposition may differ from estimated values reflected in the basic financial statements. SERS private equity investments are categorized into the following strategies:

- **Buyouts** is characterized chiefly by investments in established private or

publicly listed firms that are undergoing a fundamental change in operations or strategy.

- **Venture Capital** is characterized chiefly by high-risk investments in new or young companies following a growth path (early, late, and balanced stage funds) in technology and other value-added sectors.
- **Special Situations** is characterized chiefly by investments in funds that acquire distressed companies or companies in need of restructuring, funds from the secondary market, and funds providing mezzanine financing.

Notes to Basic Financial Statements

December 31, 2017 and 2016

- **Private Credit** is characterized chiefly by closed-end (drawdown) limited partnership structures with liquidity events in five years or more, which may include investment strategies such as direct lending, specialty lending, mezzanine, and distressed investing.

Real estate limited partnerships are valued at the NAV of SERS ownership percentage in partners' capital. The investment managers use third-party appraisals based on discounted cash flows, recent comparable sales, and current market conditions to arrive at NAV. For SERS Value Add/Oppportunistic Funds and Core/Core Plus, NAV is updated by independent appraisals typically at least every three years by appraisers who meet specific professional qualifications. The appraisal process involves significant judgment and estimating; thus, the value upon sale of an asset may differ from its appraised value.

The real estate partnerships' investments are valued at NAV. Any assumptions and estimates used in developing the NAV have been reviewed and approved by valuation committees. Because the investments in such partnerships are generally illiquid with holding periods lasting seven to 10 years, the value realized by SERS upon disposition may differ materially from estimated values reflected in the basic financial statements. The following portions of SERS real estate investments are valued at NAV:

- **Value Add/Oppportunistic Funds** utilize greater leverage and development strategies relative to core strategies, thereby taking higher risks but demand higher returns. Returns are primarily generated from capital appreciation from opportunistic investments. Strategies for this category of investing can include niche opportunities that are typically not available in core-style investing. These are closed-end funds.

- **Core/Core Plus** are a long-term investment in high-quality real estate that generates returns primarily from stable income-producing properties. These are open-end funds.
- **Natural Resources/Infrastructure** differ from real estate in that they focus on other real assets other than real estate, but maintain the characteristics of collateralization by hard assets and income-producing potential.

Hedge funds are valued on a monthly basis by general partners based on information provided by underlying hedge fund investments (if a fund-of-hedge fund structure), third-party administrators, and brokers. Hedge fund investments in limited partnerships are valued using NAV of units held at the end of the period based on the fair value of underlying investments. Hedge funds include investments designed to provide total returns comparable to the total fund return but with lower volatility and correlation to other asset classes. Hedge fund investments are designed to provide attractive long-term, risk-adjusted returns, diversification from equity markets, low beta to equity markets, and downside protection during prolonged periods of equity market decline. Most investments within this strategy are generally liquid. In general and under normal market conditions, 80% of most strategies should be able to be liquidated within one year of the withdrawal date. Hedge fund investments are categorized into the following specific strategies:

- **Credit-Focused Strategies** are investments that include directional and relative value investments through various structures, excluding closed-end funds, that may include debt securities, credit derivatives and related instruments, and/or multi-sector fixed income funds.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

- **Funds-of-Hedge Funds** were investments in funds with investment managers who invest in hedge funds. Funds-of-Hedge Funds provided an additional layer of fiduciary oversight (investment, legal, compliance, and monitoring) with similar all-in fees as direct investments in hedge funds. SERS was the only limited partner and was able to make larger allocations, which lowered fees and improved liquidity terms. The assets are to be sold in an orderly fashion as market conditions dictate.
- **Direct Investments** were investments where SERS and other institutional investors pool their funds with a manager tasked with incorporating hedge strategies. The assets are to be sold in orderly fashion as market conditions dictate.
- **Absolute Return Strategies** were investments intended to produce uncorrelated diversified return streams in the portfolio to help preserve and enhance the real value of the SERS Fund over long periods of time. The assets are to be sold in orderly fashion as market conditions dictate.
- **Commodities** were investments in funds with investment managers who invest in commodity hedge funds. SERS is one of several investors in the fund. Commodities were liquidated during 2017.

Commingled fixed income funds are pooled investments in multiple debt-type securities, which are valued at NAV. Commingled fixed income funds are calculated using the closing price of the underlying investments and apportioned to SERS based on units of ownership.

Notes to Basic Financial Statements

December 31, 2017 and 2016

At December 31, 2017 and 2016, SERS investments measured at NAV are shown in the following tables:

Investments Measured at NAV (2017)

(\$ thousands)

	NAV	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Private equity				
Buyouts	\$2,494,681	\$1,527,163	NA	NA
Venture capital	900,545	176,064	NA	NA
Special situations	615,364	319,544	NA	NA
Private credit funds	12,973	237,027	NA	NA
Total private equity	4,023,563	2,259,798		
Real estate				
Value add/opportunistic funds	471,505	236,000	See note (1)	See note (1)
Core/core plus	346,638	300,000	Quarterly	60 - 90 days
Natural resources/infrastructure	95,032	-	Daily	None
Total real estate	913,175	536,000		
Hedge funds				
Credit-focused strategies	875,665	-	Quarterly	95 days
Funds-of-hedge funds	114,130	-	See note (2)	See note (2)
Direct investments	18,374	-	See note (2)	See note (2)
Absolute return strategies	9,473	-	See note (2)	See note (2)
Total hedge funds	1,017,642	-		
Commingled fixed income funds				
Commingled fixed income funds	307,545	-	Quarterly	30 days
Total	\$6,261,925	\$2,795,798		

¹All funds have no redemption terms except for one requiring 30-days notice, which will be followed by quarterly redemptions.

²The assets are to be sold in an orderly fashion as market conditions dictate.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

Investments Measured at NAV (2016)

(\$ thousands)

	NAV	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Private equity				
Buyouts	\$2,438,702	\$1,285,052	NA	NA
Venture capital	1,000,861	107,708	NA	NA
Special situations	685,982	379,882	NA	NA
Total private equity	4,125,545	1,772,642		
Real estate				
Value add/opportunistic funds	514,811	156,699	See note (1)	See note (1)
Core/core plus	328,697	-	Quarterly	60 - 90 days
Natural resources/infrastructure	149,186	-	Daily	None
Total real estate	992,694	156,699		
Hedge funds				
Funds-of-hedge funds	1,506,618	-	Quarterly	60 -95 days
Commodities	368,199	-	Daily, monthly	30 days
Direct investments	105,138	-	Monthly, quarterly, semi-annually	11 - 90 days
Absolute return strategies	11,088	-	See note (2)	See note (2)
Total hedge fund	1,991,043	-		
Commingled fixed income funds				
Commingled fixed income funds	275,206	-	Quarterly	30 days
Total	\$7,384,488	\$1,929,341		

^{1/}All funds have no redemption terms except for one requiring 30-days notice, which will be followed by quarterly redemptions.

^{2/}The assets are to be sold in an orderly fashion as market conditions dictate.

SERS also has investments that are not measured at fair value or NAV. SERS owns a portion of the Pennsylvania Treasury Department's (Treasury Department) short-term investment fund (STIF). SERS portion of STIF is valued at cost plus accrued interest, which approximates fair value. Additionally, SERS also has investments that are carried at either cost or liquidation basis values.

At December 31, 2017 and 2016, SERS investments not measured at fair value or NAV are shown in the following tables:

Investments Not Measured at Fair Value or NAV

(\$ thousands)

	2017	2016
Short-term investments	\$1,403,112	\$1,591,176
Hedge funds	49,057	66,355
Fixed income	1,647	4,662
Equity	659	(298)
Real estate	1	(13)
Other investments	2	2
Total	\$1,454,478	\$1,661,884

Notes to Basic Financial Statements

December 31, 2017 and 2016

For the years ended December 31, 2017 and 2016, the money-weighted rate of return for SERS, net of manager fees, was 15.1% and 6.4% respectively. A money-weighted rate of return expresses investment performance, net of manager fees, adjusted for the changing amounts actually invested.

SERS investment office, in consultation with the board and its investment consultants, update the SERS strategic investment plan every two years. In December 2016, the board approved the SERS *2016-2017 Strategic Investment Plan*. SERS assets are managed according to this plan with a long-term objective of achieving and maintaining a fully-funded status for the benefits provided by SERS.

The target asset allocations on the following tables are based on a 7.5% assumed investment rate of return. At its April 2017 meeting, SERS Board approved a reduction in the assumed investment rate of return to 7.25%. As a result of a portfolio examination, several changes were made to the asset allocation during the fourth quarter of 2017. The portfolio was restructured to add Multi-Strategy as a new asset class. Targets will be updated to reflect the new assumed investment rate of return and asset classes in the *2018-2019 Investment Plan*.

Under the current plan, Fixed Income and Cash are structured to generate income to pay benefits; provide liquidity to minimize capital impairment risk; reduce volatility in the total fund; protect the fund against deflation (and inflation via inflation protection securities); and contribute to total fund return when market conditions permit.

The following table shows the target asset allocation as of December 31, 2017:

Target Asset Allocation (2017)

Asset Class	Long-Term 10-Year Strategic Target
Private Equity	16%
Global Public Equity	43
Real Estate	12
Multi-Strategy	12
Legacy Hedge Funds	0
Fixed Income	14
Cash	3
Total	100%

The following table shows the target asset allocation as of December 31, 2016:

Target Asset Allocation (2016)

Asset Class	Long-Term 10-Year Strategic Target
Private Equity	16%
Global Public Equity	43
Real Estate	12
Hedge Funds	12
Fixed Income	14
Cash	3
Total	100%

SERS investments are subject to various risks. Among these risks are concentration of credit risk, custodial credit risk, credit risk, interest rate risk, and foreign currency risk.

Concentration of credit risk is the risk of loss attributed to the magnitude of investment in a single issuer. As of December 31, 2017 and 2016, SERS had no single issuer that exceeded 5% of total investments. Investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments were excluded.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

Custodial credit risk for investments is the risk that, in the event of the failure of the counterparty to a transaction, SERS would be unable to recover the value of investment or collateral securities that are in the possession of an outside party. Pursuant to the retirement code (71 Pa. C.S. §5931(c)), the State Treasurer serves as custodian of SERS Fund. In accordance with a contractual relationship between the commonwealth's Treasury Department and its custodial agent, substantially all investments, where securities are used as evidence of the investment, are held by the custodian in book-entry form in SERS name. Those investments are defined as insured or registered investments for which the securities are held by SERS or its agent and, therefore, have a very minimal level of custodial credit risk losses. All remaining investments do not have securities that are used as evidence of the investments. These

investments are primarily in commingled funds, hedge funds, and limited partnerships, which include real estate and private equity.

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The credit risk of a debt instrument is measured by nationally recognized statistical rating agencies such as Moody's Investors Services (Moody's), Standard and Poor's (S&P), and Fitch Ratings (Fitch).

For securities exposed to credit risk in the Fixed Income portfolio, the following tables disclose aggregate fair value, by the least favorable credit rating issued using Moody's, S&P, and Fitch credit ratings at December 31, 2017 and 2016 by debt sector:

Debt Securities Exposed to Credit Risk (2017)

(\$ thousands)

	AAA	AA	A	BAA	BA and below	NA ^{1/}	Short-Term Investments ^{2/}	Total Exposed to Credit Risk ^{3/}
Short-term investments ^{2/}	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,402,365	\$1,402,365
Asset- and mortgage-backed securities	319,613	322,005	12,506	708	327,620	3,198	-	985,650
Corporates	29,790	52,395	251,462	411,012	145,465	6,555	-	896,679
Private placements ^{4/}	9,070	15,227	36,102	156,390	206,730	27,756	-	451,275
Sovereign debt	16,854	64,857	31,741	67,586	75,722	1,941	-	258,701
Agencies	8,298	58,420	-	-	-	-	-	66,718
Government	170	14,751	10,690	1,106	754	-	-	27,471
Total	\$383,795	\$527,655	\$342,501	\$636,802	\$756,291	\$39,450	\$1,402,365	\$4,088,859

^{1/}Represents other securities that were either not rated or had a withdrawn rating.

^{2/}Represents short-term investments mostly in the Pennsylvania Treasury Department's STIF, which is not rated. This category comprises short-term, investment grade securities, which are mainly U.S. treasuries, agencies, or repurchase agreements.

^{3/}Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments and fixed income from the Statements of Fiduciary Net Position.

^{4/}Private placements raise capital via offerings directly to qualified investors rather than through public offerings. Private placements do not have to register with the Securities and Exchange Commission if the securities are purchased for investment as opposed to resale. These private placements have exposure to various fixed income securities.

Notes to Basic Financial Statements

December 31, 2017 and 2016

Debt Securities Exposed to Credit Risk (2016)

(\$ thousands)

	AAA	AA	A	BAA	BA and below	NA ^{1/}	Short-Term Investments ^{2/}	Total Exposed to Credit Risk ^{3/}
Short-term investments ^{2/}	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,577,941	\$1,577,941
Asset- and mortgage-backed securities	204,548	214,269	25,213	4,258	338,578	4,467	-	791,333
Corporates	8,506	42,676	196,958	357,961	138,326	4,245	-	748,672
Private placements ^{4/}	14,197	32,202	48,237	166,897	226,311	27,175	-	515,019
Sovereign debt	19,143	61,634	14,028	94,880	59,921	-	-	249,606
Agencies	13,829	66,600	-	-	-	-	-	80,429
Government	168	14,497	11,121	1,844	134	-	-	27,764
Other investments	-	-	-	-	-	6,436	-	6,436
Total	\$260,391	\$431,878	\$295,557	\$625,840	\$763,270	\$42,323	\$1,577,941	\$3,997,200

^{1/}Represents other securities that were either not rated or had a withdrawn rating.

^{2/}Represents short-term investments mostly in the Pennsylvania Treasury Department's STIF, which is not rated. This category comprises short-term, investment grade securities, which are mainly U.S. treasuries, agencies, or repurchase agreements.

^{3/}Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments and fixed income from the Statements of Fiduciary Net Position.

^{4/}Private placements raise capital via offerings directly to qualified investors rather than through public offerings. Private placements do not have to register with the Securities and Exchange Commission if the securities are purchased for investment as opposed to resale. These private placements have exposure to various fixed income securities.

SERS held U.S. government guaranteed securities with a fair value of \$1.9 billion and \$1.7 billion as of December 31, 2017 and 2016, respectively, which were not included in the previous tables because they are not subject to credit risk.

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. As a means for limiting SERS exposure to fair value losses arising from rising interest rates,

SERS long-term asset allocation policy diversifies its fixed income core segment between intermediate duration and longer duration strategies based on the Bloomberg Barclays U.S. Aggregate Bond Index. Duration is a measure of an investment's sensitivity to changes in interest rates. The higher the duration, the greater the changes in fair value when interest rates change. SERS measures interest rate risk using option-adjusted duration, which considers the effect of a security's embedded options on cash flows.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

At December 31, 2017 and 2016, SERS Fixed Income portfolio had the following option-adjusted durations by debt sector:

Debt Option-Adjusted Durations

(\$ thousands)

	2017		2016	
	Fair Value	Option-Adjusted Duration	Fair Value	Option-Adjusted Duration
Sovereign debt	\$258,701	7.5	\$249,606	7.6
Government	1,855,214	6.6	1,645,855	6.3
Corporates	896,679	5.9	748,672	5.4
Agencies	66,718	4.7	80,429	4.5
Private placements ^{1/}	451,270	4.5	515,019	2.7
Asset- and mortgage-backed securities	757,763	3.9	554,952	2.7
Commingled investment funds	307,545	3.8	275,206	3.7
Short-term investments - (STIF)	1,177,299	0.1	1,539,304	0.1
Short-term investments	225,066	0.0	38,637	0.1
Total^{2/}	\$5,996,255		\$5,647,680	

^{1/}Private placements raise capital via offerings directly to qualified investors rather than through public offerings. Private placements do not have to register with the Securities and Exchange Commission if the securities are purchased for investment as opposed to resale. These private placements have exposure to various fixed income securities.

^{2/}Total fair values exposed to interest rate risk comprised short-term investments, and fixed income from the Statements of Fiduciary Net Position.

Notes to Basic Financial Statements

December 31, 2017 and 2016

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. As part of SERS program to manage risk and enhance returns, SERS invests in global markets. At December 31, 2017 and 2016, SERS had the following currency exposures:

Foreign Currency Exposures (2017)

(\$ thousands)

Currency	Short-Term Investments ^{1/}	Fixed Income	Equity	Other Investments	Real Estate	Private Equity	Total
European Euro	\$6,797	\$34,674	\$252,259	\$(11,306)	\$ -	\$273,071	\$555,495
British Pound Sterling	1,703	47,699	177,538	10,163	-	10,406	247,509
Hong Kong Dollar	-	-	206,105	-	-	-	206,105
South Korean Won	1,502	-	161,969	-	-	-	163,471
Japanese Yen	99	460	125,265	17,776	-	-	143,600
Swiss Franc	7,814	-	93,974	(8,600)	-	-	93,188
Australian Dollar	132	12,542	63,652	262	-	-	76,588
Swedish Krona	-	-	6,158	17,747	-	50,248	74,153
New Taiwan Dollar	20	-	57,277	-	-	-	57,297
Mexican Peso	203	26,084	26,619	1,404	539	-	54,849
South African Rand	401	12,145	37,643	(6,621)	-	-	43,568
Indonesian Rupiah	184	8,869	29,348	-	-	-	38,401
Canadian Dollar	286	3,541	33,833	(810)	-	-	36,850
Brazilian Real	458	7,939	21,599	5,925	-	-	35,921
Turkish Lira	120	2,321	25,415	5,600	-	-	33,456
Danish Krone	1,041	-	29,016	292	-	-	30,349
Norwegian Krone	146	-	15,731	12,782	-	-	28,659
New Zealand Dollar	53	-	13,501	10,412	-	-	23,966
Malaysian Ringgit	112	12,763	9,282	-	-	-	22,157
Polish Zloty	287	13,102	1,080	2,967	-	-	17,436
Hungarian Forint	-	-	10,833	-	-	-	10,833
Thai Baht	18	-	10,027	-	-	-	10,045
Other currencies (7)	881	16,049	4,030	626	-	-	21,586
Total	\$22,257	\$198,188	\$1,412,154	\$58,619	\$539	\$333,725	\$2,025,482

^{1/}Includes receivables and payables as of December 31 for securities sold and purchased.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

Foreign Currency Exposures (2016)

(\$ thousands)

Currency	Short-Term Investments ^{1/}	Fixed Income	Equity	Other Investments	Real Estate	Private Equity	Total
European Euro	\$4,411	\$34,294	\$1,305,531	\$(23,958)	\$ -	\$322,051	\$1,642,329
Japanese Yen	12,525	464	850,315	(9,454)	-	-	853,850
British Pound Sterling	5,535	41,563	783,200	13,432	-	8,300	852,030
Swiss Franc	4,050	-	397,495	(14,148)	-	-	387,397
Hong Kong Dollar	108	-	318,255	(24)	-	-	318,339
Canadian Dollar	3,678	11,646	290,127	(3,058)	-	-	302,393
Australian Dollar	1,223	13,743	231,058	(738)	-	-	245,286
South Korean Won	1,552	-	142,467	-	-	-	144,019
Swedish Krona	314	-	87,399	17,727	-	38,109	143,549
New Taiwan Dollar	20	-	76,608	-	-	-	76,628
Danish Krone	575	251	56,012	-	-	-	56,838
Norwegian Krone	639	-	41,657	9,200	-	-	51,496
Mexican Peso	106	22,095	26,106	-	552	-	48,859
Singapore Dollar	223	-	45,715	-	-	-	45,938
South African Rand	272	9,313	33,102	-	-	-	42,687
Brazilian Real	920	8,262	31,164	1,248	-	-	41,594
Indonesian Rupiah	(900)	8,858	18,229	855	-	-	27,042
New Zealand Dollar	98	3,964	18,040	(3,506)	-	-	18,596
Thai Baht	13	-	16,279	-	-	-	16,292
Malaysian Ringgit	64	7,272	5,637	-	-	-	12,973
Chilean Peso	5	-	3,137	9,153	-	-	12,295
Hungarian Forint	108	7,308	4,790	-	-	-	12,206
Other currencies (9)	1,018	7,160	25,787	7,688	-	-	41,653
Total	\$36,557	\$176,193	\$4,808,110	\$4,417	\$552	\$368,460	\$5,394,289

^{1/}Includes receivables and payables as of December 31 for securities sold and purchased.

(5) Securities Lending

In accordance with a contract between the commonwealth's treasurer and its custodian, SERS participates in a securities lending program.

The custodian, acting as lending agent, lends SERS equity, debt, and money market securities for cash, securities, or letter of credit collateral. Collateral is required at 102% of the fair value of the securities loaned except for the equity securities of non-U.S. corporations, for which collateral of 105% is required. Collateral is marked to market daily. If the

collateral falls below guidelines for the fair value of the securities loaned, additional collateral is obtained. Cash collateral is invested by the lending agent in accordance with investment guidelines approved by the board. The lending agent cannot pledge or sell securities collateral unless the borrower defaults.

As of December 31, 2017 and 2016, SERS credit exposure to individual borrowers was limited because the amounts SERS owed the borrowers exceeded the amounts the borrowers owed SERS. The treasurer's contract with the lending agent requires the agent to

Notes to Basic Financial Statements

December 31, 2017 and 2016

indemnify SERS if the borrowers fail to return the underlying securities and the collateral is inadequate to replace the loaned securities or if the borrowers fail to pay income distributions on the loaned securities.

All loaned securities at December 31, 2017 and 2016 could be terminated on demand by either the lending agent or the borrower. Cash collateral is invested in a short-term collective investment pool. The duration of the investments in the pool at December 31, 2017 and 2016 was two days and three days, respectively. Interest rate risk may be posed by mismatched maturities and could be affected by other program features, such as the lending agent's ability to reallocate loaned securities among all of its lending customers.

As of December 31, 2017 and 2016, the fair value of loaned securities was \$620 million and \$429 million, respectively; the fair value of the associated collateral was \$639 million and \$458 million, of which \$391 million and \$274 million was cash, respectively. As of December 31, 2017 and 2016, noncash collateral of \$248 million and \$184 million, respectively, was invested in U.S. government guaranteed securities, which are not subject to credit risk.

(6) Derivative and Structured Financial Instruments and Restricted Assets

Within narrowly prescribed guidelines, SERS permits investment managers to enter into certain derivative and structured financial instruments primarily to hedge risk and reduce the volatility of its portfolio. Typically, investment managers enter into foreign exchange contracts to make payment for international investments and to hedge currency risk, futures contracts to manage interest rate risk, and swaps to more efficiently gain investment exposure in the equity and credit markets.

SERS is exposed to counterparty credit risk on all open derivative positions. Counterparty credit risk is the risk that a derivative counterparty may fail to meet its payment obligation under the derivative contract. As of December 31, 2017 and 2016, SERS counterparty credit risk was not significant. SERS mitigates its legal risk on investment holdings including derivatives by ensuring that all of our legal requirements (indemnification, sovereign immunity, jurisdiction, etc.) are acknowledged and agreed to in all of the derivatives agreements to which they are subject.

SERS managers also indirectly hold foreign exchange contracts, futures contracts, and certain swap contracts through its investments in commingled funds and hedge funds. These funds invest in instruments directly and indirectly to gain foreign exchange exposure, to synthetically create equity-like returns, and to manage interest rate risk by altering the average life of the portfolio.

Foreign exchange contracts are agreements to exchange the currency of one country for the currency of another country at an agreed-upon price and settlement date. The investment manager uses these contracts primarily for its international investments to settle pending trades that occur more than two business days after trade date. The contracts are used by the investment manager for the purpose of eliminating foreign exchange risk. As a matter of policy, the investment managers enter into these contracts at their full discretion to protect currency fluctuations. To reduce the risk of counterparty nonperformance, the investment managers generally enter into these contracts with institutions regarded as meeting high standards of creditworthiness. The unrealized gain/loss on contracts is included in SERS net position and represents the fair value of the contracts on December 31.

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

At December 31, 2017 and 2016, SERS contracts to purchase and sell by foreign currencies are shown in the following tables:

Foreign Exchange Contracts (2017)

(\$ thousands)

Currency	Purchases	Unrealized Gain/(Loss)	Sales	Unrealized Gain/(Loss)
Japanese Yen	\$17,776	\$(87)	\$ -	\$ -
Swedish Krona	17,747	161	-	-
Norwegian Krone	15,358	(215)	2,576	134
British Pound Sterling	13,071	135	2,908	(20)
New Zealand Dollar	10,412	270	-	-
European Euro	7,493	54	18,799	(307)
Canadian Dollar	6,156	167	6,967	(177)
Brazilian Real	5,925	(97)	-	-
Turkish Lira	5,600	(204)	-	-
Danish Krone	3,520	28	3,227	(26)
Polish Zloty	2,967	98	-	-
Mexican Peso	1,404	(59)	-	-
Russian Ruble	1,252	30	627	(13)
Australian Dollar	262	2	-	-
Swiss Franc	-	-	8,600	176
South African Rand	-	-	6,621	(708)
Total	\$108,943	\$283	\$50,325	\$(941)

Foreign Exchange Contracts (2016)

(\$ thousands)

Currency	Purchases	Unrealized Gain/(Loss)	Sales	Unrealized Gain/(Loss)
Swedish Krona	\$17,995	\$(130)	\$268	\$ -
British Pound Sterling	17,071	(454)	3,638	(35)
European Euro	10,508	(2)	34,467	237
Norwegian Krone	9,200	(445)	-	-
Chilean Peso	9,153	94	-	-
Indian Rupee	8,359	10	-	-
Australian Dollar	3,663	(111)	4,401	54
Japanese Yen	1,402	(73)	10,857	(78)
Brazilian Real	1,261	68	13	-
Indonesian Rupiah	855	(3)	-	-
Canadian Dollar	623	(14)	3,681	(6)
New Zealand Dollar	425	5	3,931	130
Swiss Franc	-	-	14,148	688
Colombian Peso	-	-	671	(33)
Hong Kong Dollar	-	-	24	-
Total	\$80,515	\$(1,055)	\$76,099	\$957

Notes to Basic Financial Statements

December 31, 2017 and 2016

Swap agreements provide for periodic payments between parties based on the change in value of underlying assets, indexes, rates, and creditworthiness. SERS uses contracts with multiple counterparties as well as collateral posting requirements to manage its counterparty credit risk. Credit default swaps are agreements with counterparties to either purchase or sell credit protection. SERS managers use credit default swaps to either increase or decrease credit exposure to certain credit markets. Interest rate swaps are over-the-counter contracts that allow counterparties to exchange a fixed rate liability for a floating rate liability or vice versa. SERS managers use interest rate swaps as a cost-effective way of gaining exposure to certain sectors of the fixed income market. SERS exposure to swap agreements was not significant at December 31, 2017 and 2016.

(7) Other Post-Employment Benefits (OPEB) for Employees of SERS

SERS participates in the Commonwealth of Pennsylvania Office of Administration’s (OA) Retired Employees Health Program (REHP). The REHP is a single-employer plan and provides certain healthcare benefits to qualifying individuals meeting specified age and/or service requirements. The OA, in its sole discretion, determines available REHP benefits on an ongoing basis.

The REHP is administered through the Pennsylvania Employees’ Benefit Trust Fund (PEBTF) as a third-party administrator for the commonwealth. Employer costs for retiree healthcare benefits are charged as a component of payroll expenditures on a “pay as you go” basis. During 2017, SERS funded REHP benefits by paying \$362 (actual dollars) per pay period from January 1 to June 30, 2017, and \$300 (actual dollars) per pay period from July 1 to December 31, 2017, for each active SERS employee.

For REHP, the following table details the commonwealth’s annual OPEB cost or Annual

Required Contribution (ARC), SERS allocated portion of the ARC, and SERS allocated portion of the OPEB liability based on aggregate REHP qualifying contributions:

OPEB Liability

(\$ thousands)

Commonwealth fiscal year ended June 30	Commonwealth ARC	SERS ARC	SERS Net OPEB
2017	\$1,107,290	\$2,653	\$1,087
2016	1,169,885	3,108	941
2015	1,136,817	3,020	906
Three-year cumulative OPEB			\$2,934

(8) Litigation and Contingencies

SERS is involved in various individual lawsuits, generally related to benefit payments, which, in the event of an adverse result, could increase estimated actuarial liabilities by approximately \$1 billion. Some of the cases involve legal issues that, if extended to the entire membership, may result in significant costs to SERS. If such an event were to occur, the additional costs would be recovered by SERS through adjustments to the employer contribution rate. SERS makes every effort to defend its position in these proceedings.

(9) Net Pension Liability

The components of the net pension liability of participating employers at December 31, 2017 and 2016, were as follows:

Net Pension Liability

(\$ thousands)

	2017	2016
Total pension liability	\$46,696,751	\$45,648,214
Plan fiduciary net position	29,405,042	26,387,889
Net pension liability	\$17,291,709	\$19,260,325
Plan fiduciary net position as a percentage of the total pension liability	63.0%	57.8%

FINANCIAL SECTION

Notes to Basic Financial Statements

December 31, 2017 and 2016

The total pension liability was determined by an actuarial valuation for financial reporting purposes as of December 31, 2017 and 2016, using some of the following actuarial methods and assumptions:

- Actuarial cost method: entry age
- Investment rate of return: 7.25% net of manager fees including inflation
- Projected salary increases: average of 5.60% with range of 3.70%–8.90% including inflation
- Asset valuation method: fair (market) value
- Inflation: 2.60%
- Mortality rate: projected RP-2000 Mortality Tables adjusted for actual plan experience and future improvement

Assumptions, unless otherwise approved by the board, mentioned above are based on the *18th Investigation of Actuarial Experience* study covering the periods 2011–2015, which was released in March 2016. The next experience study is expected to be released in 2021.

The long-term expected real rate of return on pension plan investments are determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of manager fees and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation in note 4 as of December 31, 2017 and 2016 (see the discussion of the pension plan's investment policy) are summarized in the following tables:

Long-Term Expected Real Rate of Return (2017)

Asset Class	Long-Term Expected Real Rate of Return
Private Equity	8.00%
Global Public Equity	5.30
Real Estate	5.44
Multi-Strategy	5.10
Fixed Income	1.63
Legacy Hedge Funds	0.00
Cash	-0.25

Long-Term Expected Real Rate of Return (2016)

Asset Class	Long-Term Expected Real Rate of Return
Private Equity	8.00%
Global Public Equity	5.30
Real Estate	5.44
Hedge Funds	4.75
Fixed Income	1.63
Cash	-0.25

The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current contribution rate and that contributions from participating employers will be made at actuarially determined rates as set by statute. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Notes to Basic Financial Statements

December 31, 2017 and 2016

The following presents the net pension liability calculated using the discount rate of 7.25%, as well as what the net pension liability would be if it were calculated using a discount rate that is one percentage point lower or one percentage point higher than the current rate:

Sensitivity of the Net Pension Liability to Change in the Discount Rate (2017)

(\$ thousands)

	1% Decrease to 6.25%	Current Discount Rate of 7.25%	1% Increase to 8.25%
Net pension liability	\$21,948,571	\$17,291,709	\$13,302,567

Sensitivity of the Net Pension Liability to Change in the Discount Rate (2016)

(\$ thousands)

	1% Decrease to 6.25%	Current Discount Rate of 7.25%	1% Increase to 8.25%
Net pension liability	\$23,835,549	\$19,260,325	\$15,342,306

FINANCIAL SECTION

Required Supplementary Information

December 31, 2017 (unaudited)

Schedule 1 Schedule of Changes in Net Pension Liability and Related Ratios (\$ millions)

	2017	2016	2015	2014	2013
Total pension liability					
Service cost	\$961	\$953	\$955	\$944	\$943
Interest	3,262	3,271	3,123	3,042	2,975
Changes of benefit terms	-	-	-	-	-
Differences between expected and actual experience	130	(534)	378	98	(143)
Changes of assumptions	-	947	669	-	-
Benefit payments, including refunds of member contributions	(3,304)	(3,228)	(3,081)	(2,946)	(2,844)
Net change in total pension liability	1,049	1,409	2,044	1,138	931
Total pension liability - beginning	45,648	44,239	42,195	41,057	40,126
Total pension liability - ending (a)	46,697	45,648	44,239	42,195	41,057
Plan fiduciary net position					
Contributions - employer	1,898	1,622	1,360	1,084	795
Contributions - member	383	375	372	366	352
Net investment income	4,066	1,587	88	1,462	3,724
Benefit payments, including refunds of member contributions	(3,304)	(3,228)	(3,081)	(2,946)	(2,844)
Administrative expense	(26)	(23)	(22)	(22)	(22)
Net change in plan fiduciary net position	3,017	333	(1,283)	(56)	2,005
Plan fiduciary net position - beginning	26,388	26,055	27,338	27,394	25,389
Plan fiduciary net position - ending (b)	29,405	26,388	26,055	27,338	27,394
Net pension liability (asset) - ending (a) - (b)	\$17,292	\$19,260	\$18,184	\$14,857	\$13,663
Plan fiduciary net position as a percentage of the total pension liability	63.0%	57.8%	58.9%	64.8%	66.7%
Covered-employee payroll	\$5,984	\$5,912	\$5,972	\$5,720	\$5,598
Net pension liability (asset) as percentage of covered-employee payroll	288.9%	325.8%	304.5%	259.7%	244.1%

Schedule 1 is intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditors' report.

Required Supplementary Information

December 31, 2017 (unaudited)

**Schedule 2
Schedule of Employer Contributions**

(\$ millions)

Year ^{1/}	Actuarially Determined Contribution (ADC) ^{2/}	Contributions in Relation to the ADC	Contribution Deficiency (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered-Employee Payroll
2017 ^{3/}	\$1,884	\$1,884	\$ -	\$5,984	31.47%
2016 ^{3/}	1,614	1,614	-	5,912	27.30
2015	1,360	1,360	-	5,972	22.78
2014	1,084	1,084	-	5,720	18.95
2013	795	795	-	5,598	14.20
2012	566	566	-	5,539	10.22
2011	392	392	-	5,582	7.02
2010	273	273	-	5,597	4.88
2009	253	253	-	5,595	4.52
2008	235	235	-	5,428	4.33

^{1/}The rates used in developing the ADC in the above schedule of contributions are calculated as of December 31, two years prior to the first half, January 1 – June 30, of the year in which contributions are reported and one year prior to the second half, July 1 – December 31, of the year in which contributions are reported. The following funding valuation actuarial methods and assumptions were used to determine contribution rates reported in this schedule as of the December 31 annual funding valuations:

- Actuarial cost method: variation of entry-age cost method (all years)
- Asset valuation method: five-year smoothing (all years)
- Inflation: 3.0% from valuation years 2008 - 2009, 2.75% from valuation years 2010 - 2015, and 2.6% from valuation years 2016 - 2017
- Projected average salary increases: 7.1% from valuation years 2008 - 2009, 6.2% from valuation years 2010 - 2012, 6.1% from valuation years 2013 - 2014, 5.7% for valuation year 2015, and 5.6% from valuation years 2016 - 2017
- Investment rate of return (net of manager fees including inflation): 8.0% from valuation years 2008 - 2010, 7.50% from valuation years 2011 - 2015, and 7.25% from valuation years 2016 - 2017

^{2/}The ADC disclosed above is based on minimum floor rates or suppressed rates resulting from collars that are required based on statutory law. These rates are determined by SERS actuary during the annual funding valuation and include an adjustment to the “preliminary employer contribution rate” calculated before the minimum floor or collars are applied. These “final employer contribution rates” fall within the realm of an appropriate ADC calculation under actuarial standards of practice and temporarily defer a portion of the payments that work towards fully funding the plan.

^{3/}ADC excludes multiple service transfers made to SERS. These transfers are included as contributions on the Statements of Changes in Fiduciary Net Position.

**Schedule 3
Schedule of Investment Returns**

	2017	2016	2015	2014	2013
Annual money-weighted rate of return, net of investment expense	15.1%	6.4%	0.4%	6.4%	13.6%

Schedule 3 is intended to show information for 10 years. Additional years will be displayed as they become available.

See accompanying independent auditors’ report.

FINANCIAL SECTION

Supplementary Information

December 31, 2017

Schedule 4 Schedule of Administrative Expenses

(\$ thousands)

Personnel services	
Salaries	\$9,056
Benefits	6,588
Temporary personnel wages, overtime, and out-service training	24
Total personnel services	15,668
Professional services	
Information technology services	3,257
Treasury department services	1,405
Other commonwealth services	613
Consultant fees	474
Legal fees	38
Total professional services	5,787
Rentals	
Real estate rent	1,866
Other equipment rental	108
Total rentals	1,974
Communication	
Postage	368
Telephone	326
Printing and advertising	98
Total communication	792
Other expenses	
Maintenance	1,146
Office equipment	486
Supplies	161
Subscriptions and memberships	68
Travel and conferences	40
Total other expenses	1,901
Total administrative expenses	\$26,122

See accompanying independent auditors' report.

Schedule 5
Summary of Investment and Consultant Expenses

(\$ thousands)

Investment Expenses

Expense Category	Expenses
Manager investment expenses	
Private Equity	\$63,144
Global Public Equity	21,552
Real Estate	20,392
Multi-Strategy	9,433
Fixed Income	9,176
Hedge Funds	2,844
Total manager investment expenses	126,541
Investment consultants	3,597
Investment professional personnel	2,864
Custodian	1,302
Legal	369
Subscriptions and memberships	296
Operational	110
Total investment expenses	\$135,079

Consultant Expenses

Firm	Service Type	Expenses
Investment consultant expenses		
StepStone Group	Private equity investments	\$1,975
RVK	General investments	707
NEPC LLC	Real estate investments	291
The Townsend Group	Real estate investments	268
GCM Customized Investment Group	Investment portfolio management	210
Institutional Shareholder Services	Proxy services	93
Abel/Noser	Transaction cost analysis	53
Total investment consultant expenses		3,597
Administrative consultant expenses		
Korn Ferry Hay Group	Actuary	443
Other	Miscellaneous	31
Total administrative consultant expenses		474
Total consultant expenses		\$4,071

See accompanying independent auditors' report

2017

Investment Section

May 18, 2018

State Employees' Retirement Board and Executive Director
State Employees' Retirement System
30 North Third Street, Suite 150
Harrisburg, Pennsylvania 17101

On behalf of SERS' investment office, I am pleased to present the investment section of the Pennsylvania State Employees' Retirement System (SERS) Comprehensive Annual Financial Report for calendar year 2017. The SERS Board administers and advises a large public defined benefit investment program with approximately \$29 billion in assets and a voluntary 457 Deferred Compensation Plan offered to members that has increased in size to approximately \$3.5 billion in assets.

SERS' investment performance for calendar year ended December 31, 2017, was 15.1%, net of investment management fees. In dollar terms, this performance added \$4.1 billion in investment income to the fund. This compares to a 2016 calendar year return of 6.5%. While year-to-year returns are important, as long-term investors, a longer time horizon is a more appropriate view of SERS' returns. 2017 marks the ninth consecutive year of positive returns for SERS and returning 9.8% since the economic crisis of 2008. Over a 20-, 25-, and 30-year period SERS has returned 7.1%, 8.4% and 9.0% (net of fees), respectively.

SERS' funded status as a percentage of total pension liability increased from 57.8% to 63.0% while its net pension liability decreased from \$19.3 billion to \$17.3 billion as of December 31, 2017. Based on this data SERS prioritizes an asset allocation and efficient deployment of investments to meet the long-term actuarial assumed rate of return and the shorter-term liquidity needs of its members.

A number of key accomplishments were achieved in 2017, several of which are documented below. The investment section of this report provides further information regarding the investment program.

- Restructured the Global Public Equity portfolio to include low cost index strategies that comprised 78% of invested Global Public Equity assets as of December 31, 2017.
- Reduced annual investment manager expenses paid to external firms to only 46 basis points or 0.46% of total plan assets.
- Executed a \$1 billion reallocation from cash to public market investments.
- Executed a thematic asset class change from Hedge Funds to Multi-Strategy investments to improve the risk-adjusted return profile of the total fund.
- Committed to invest a total of \$1.9 billion in 19 best-in-class Private Equity, Private Credit, and Real Estate managers.
- Established and expanded the emerging manager program to identify and gain early access to talented investment managers.

The SERS investment office continues to operate efficiently and effectively during the current challenging and changing global economic conditions. The organization has been fortunate to capture strong, long-term positive investment returns but recognizes that investment returns are only part of the continued success of SERS. I remain confident that with a focus on the SERS mission, thoughtful leadership from the board, and a disciplined investment process aligned with the strategic investment plan objectives, SERS and its members will continue on the path of financial security.

Sincerely,



Bryan Lewis
Chief Investment Officer

The data contained in the Investment Section that follows was compiled by SERS' investment, accounting, and auditing professionals; SERS' consultants, RVK, Inc., StepStone Group LP, and NEPC, LLC; and SERS' sub-custodian, BNY Mellon. Performance was calculated using the Modified Dietz day-weighted return methodology.

Investment Policy and Objectives

December 31, 2017 (unaudited)

Investment Policy

The SERS Board originally adopted a formal *Statement of Investment Policy* (policy) in 1979. It has been revised periodically to reflect and incorporate legislative changes governing investments and amendments to policies and procedures guiding the investment of the defined benefit portfolio. The policy was last amended in March 2017.

The purpose of the policy is to formalize the board's investment objectives and policies, and to define the duties and responsibilities of the various individuals and entities involved in the investment process.

The major elements of the policy are:

- The assets of the SERS Fund will be managed with the primary objectives of the payment of benefit obligations to participants in the plans as well as to maximize return with acceptable risk considerations and sufficient liquidity so that employer contributions can be minimized.
- The SERS Fund's overall investment objective is to provide a total rate of return, over full economic cycles, which achieves SERS long-term, actuarially assumed rate of return consistent with the board's tolerance for risk.
- The board's investment authority is governed by the prudent investor standard as set forth in Title 71, Pennsylvania Consolidated Statutes, Section 5931(a).
- The members of the board, employees of the board, and agents thereof shall stand in a fiduciary relationship to the members of the system regarding the investments and disbursements of any of the monies of the fund and shall not profit either directly or indirectly with respect thereto.
- The board employs an investment staff which is responsible to the board to review and analyze the current investment climate, and to recommend adjustments with respect to the policy that are appropriate to take optimum advantage of new conditions and strategies as they arise in the market place. The staff also reviews and analyzes the philosophies, policies, and strategies employed by the investment managers, evaluating the appropriateness of their decision-making processes and their investment styles in relation to present and projected investment horizons.
- The board continually seeks to employ investment managers that possess superior capabilities in the management of assets of public retirement systems. Each manager has full discretion to carry out its investment mandate subject to the investment strategy statement contained in the investment management agreement and will be expected to conduct business on behalf of SERS in accordance with the mandate for which they were retained.

INVESTMENT SECTION

Investment Policy and Objectives

December 31, 2017 (unaudited)

- SERS will employ investment consultants, who act as fiduciaries to the fund, and who will provide investment consulting services in their respective areas of expertise.
- Where investment characteristics are equivalent, the policy will favor investments that will have a positive impact on the economy of the Commonwealth of Pennsylvania.
- SERS instituted an Emerging Investment Manager Program designed to identify and gain early access to talented investment managers in their early stages to generate above benchmark returns (net of fees).

Investment Objectives

As indicated in SERS *Statement of Investment Policy*, the objectives of the SERS Fund are to provide benefit payments to participants and beneficiaries at the lowest cost to the commonwealth and to fund the program through a carefully planned and executed investment program.

Consistent with achieving these objectives, the board has established the following goals relative to investment performance:

- Achieve a net total return equivalent to the actuarial assumed rate of return, or preferably, in excess of this rate in order to improve the funded ratio of the SERS Fund through investment earnings and favorably impact future employer and employee contribution rates.
- Achieve a net, total long-term return that meets or exceeds an appropriate, composite plan benchmark index on a five- to 10-year rolling time horizon. The composite benchmark index will be based on the asset allocation set forth in the investment plan approved by the board.

Investment Returns

December 31, 2017 (unaudited)

Calendar Year, Net-of-Fees Returns^{1/}

As a result of a portfolio examination, SERS made certain changes to the asset allocation during the fourth quarter of 2017. Data in this table reflects the current asset classes.

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity ^{2/5/}	12.8%	8.6%	10.3%	7.5%
<i>Burgiss All Private Equity Custom Index^{3/5/}</i>	14.9	11.1	13.1	8.5
<i>Russell 3000 Index+3%^{4/5/}</i>	22.3	14.1	17.7	10.8
Global Public Equity	24.1	9.7	11.5	4.3
<i>MSCI ACWIM Index (Net)</i>	23.9	9.5	11.0	5.0
Real Estate ^{5/}	2.0	5.0	7.8	0.9
<i>Real Estate Custom Benchmark^{5/6/}</i>	5.6	9.4	10.4	4.1
<i>Consumer Price Index+3%^{5/}</i>	5.3	4.3	4.3	4.8
Multi-Strategy	NA	NA	NA	NA
<i>S&P/LSTA Leveraged Loan Index</i>	4.1	4.4	4.0	4.9
Legacy Hedge Funds	4.9	0.9	2.2	1.9
<i>HF Custom Index^{7/}</i>	11.3	3.4	7.1	5.6
Fixed Income	4.7	2.5	2.4	4.8
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	3.5	2.2	2.1	4.0
Cash	1.5	0.9	0.7	0.8
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.9	0.4	0.3	0.4
Total Fund	15.1%	7.2%	8.3%	4.1%
<i>Total Fund Custom Benchmark</i>	<i>14.5%</i>	<i>7.6%</i>	<i>8.5%</i>	<i>5.5%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>15.9%</i>	<i>8.1%</i>	<i>9.5%</i>	<i>6.1%</i>

^{1/}Returns for periods greater than one year are annualized. Performance was calculated using the Modified Dietz day-weighted return methodology.

^{2/}Historical Private Equity performance includes Buyouts, Special Situations, and Venture Capital.

^{3/}Intended to compare the program's performance to its peers.

^{4/}Long-term benchmark by which SERS measures its private market performance. Shorter term variances (1-year and 3-year) can be pronounced due to the nature of private assets and are not as relevant for benchmark purposes.

^{5/}Private Equity, Real Estate, and their corresponding benchmarks are reported on a quarter lagged basis.

^{6/}Calculated monthly using beginning of the month asset class weights applied to each corresponding primary benchmark return. The custom benchmark consists of the NCREIF - ODCE Index (AWA) (Net) (Qtr Lag), the FTSE NAREIT U.S. Real Estate Index (Qtr Lag), and the Consumer Price Index+3% (Qtr Lag).

^{7/}Beginning April 2014, the HF Custom Index is comprised of the HFRI Fund-of-Funds Strategic Index consistent with board approval of the 2014-2015 Strategic Investment Plan, which establishes this index as the appropriate benchmark for Hedge Funds with regard to its composition and objectives.

INVESTMENT SECTION

Fund Values and Annual Returns

December 31, 2017 (unaudited)

Fund Values and Annual Returns

(\$ millions)

Year Ended	SERS Fund Fair Value	Annual Total Fund Rate of Return ^{1/}
1988	\$8,312	12.8%
1989	9,785	17.8
1990	9,886	1.0
1991	11,940	22.6
1992	12,453	7.4
1993	13,701	13.2
1994	13,330	-1.1
1995	16,343	25.2
1996	18,492	15.4
1997	21,312	18.5
1998	24,123	16.3
1999	28,093	19.9
2000	27,880	2.2
2001	24,706	-7.9
2002	20,880	-10.9
2003	24,536	24.3
2004	26,641	15.1
2005	28,752	14.5
2006	32,053	16.4
2007	35,516	17.2
2008	22,796	-28.7
2009	24,662	9.1
2010	25,886	11.9
2011	24,377	2.7
2012	25,389	12.0
2013	27,394	13.6
2014	27,338	6.4
2015	26,055	0.4
2016	26,388	6.5
2017	29,405	15.1

^{1/}Returns were calculated using the Modified Dietz day-weighted return methodology.

INVESTMENT SECTION

Largest Assets Held

December 31, 2017 (unaudited)

U.S. Equity

Holding	Fair Value
Apple Inc	\$228,122,548
Microsoft Corp	187,255,443
Facebook Inc	129,193,071
Amazon.com Inc	121,864,621
Johnson and Johnson	116,775,601
Berkshire Hathaway Inc	100,009,522
Alphabet Inc Class C	99,955,267
JPMorgan Chase and Co	96,936,298
Exxon Mobil Corp	93,006,258
Alphabet Inc Class A	84,371,020

Non-U.S. Equity

Holding	Fair Value
Samsung Electronics Co Ltd	\$49,903,227
Taiwan Semiconductor Manufacturing Corp	45,910,735
Tencent Holdings Ltd	42,961,534
Alibaba Group Holding Ltd	34,399,785
AIA Group Ltd	31,755,797
Medtronic PLC	28,951,459
IWG PLC	28,024,467
Broadcom Ltd	27,175,396
Allergan PLC	25,740,294
Accenture PLC	24,869,011

Non-U.S. Fixed Income

Holding	Fair Value
United Kingdom Gilt, 1.250% July 22, 2018	\$11,958,113
Internation Finance Corp, 6.450% October 30, 2018	8,659,586
United Mexican States, 7.750% November 13, 2042	8,529,943
Petroleos Mexicanos SA de CV, 6.750% September 21, 2047	8,074,180
United Mexican States, 8.500% November 18, 2038	6,848,790
Portugal Obrigacoes do Tesouro OT, 2.875% October 15, 2025	6,476,405
Turkey Government International Bond, 6.000% March 25, 2027	6,228,612
Republic of South Africa Government, 8.750% February 28, 2048	5,871,944
United Mexican States, 8.500% May 31, 2029	5,684,623
Australian Government Bond, 2.750% October 21, 2019	4,954,207

Note: A detailed list of SERS investment holdings at December 31, 2017, may be viewed at www.SERS.pa.gov.

INVESTMENT SECTION

Largest Assets Held

December 31, 2017 (unaudited)

U.S. Government and Government Related Fixed Income

Holding	Fair Value
U.S. Treasury Note, 2.250% February 15, 2027	\$243,603,433
U.S. Treasury Note, 1.500% August 15, 2026	160,552,750
U.S. Treasury Note, 2.250% August 15, 2027	55,464,055
U.S. Treasury Inflation Index Note, 0.125% April 15, 2019	54,595,555
U.S. Treasury Inflation Index Note, 0.125% July 15, 2022	54,421,481
U.S. Treasury Inflation Index Note, 0.125% April 15, 2021	46,319,937
U.S. Treasury Inflation Index Note, 1.375% February 15, 2044	43,998,019
U.S. Treasury Inflation Index Note, 2.375% January 15, 2027	43,404,020
U.S. Treasury Inflation Index Note, 0.375% July 15, 2023	40,975,111
U.S. Treasury Inflation Index Note, 0.125% April 15, 2020	40,312,013

U.S. Corporate Fixed Income

Holding	Fair Value
Goldman Sachs Group Inc, 5.750% January 24, 2022	\$6,597,539
Goldman Sachs Group Inc, Variable Rate November 15, 2018	5,996,892
Bank of America Corp, Variable Rate December 20, 2017	4,886,075
Morgan Stanley, 5.750% January 25, 2021	4,794,856
JP Morgan Chase & Co, Variable Rate February 01, 2028	4,663,125
ABN AMRO Commercial Mortgage Trust, Variable Rate May 10, 2043	4,100,210
Dell International LLC, 5.450% June 15, 2023	3,857,885
Suntrust Inc, 2.350% November 01, 2018	3,810,260
Motel 6 Trust, Variable Rate August 15, 2034	3,649,570
General Motors Financial Corp, Variable Rate April 13, 2020	3,646,100

Note: A detailed list of SERS investment holdings at December 31, 2017, may be viewed at www.SERS.pa.gov.

Schedule of Trading Broker Commissions

December 31, 2017 (unaudited)

Broker commissions on equity and fixed income investment transactions for the year ended December 31, 2017, were \$4.6 million. Below is a list of brokers receiving commissions in excess of \$20,000 during the year.

Broker	Commissions	Broker	Commissions
Citigroup	\$887,147	Raymond James & Associates	\$43,731
Fidelity	532,250	Societe Generale	43,621
Merrill Lynch	531,292	Deutsche Bank	43,319
Goldman Sachs	316,639	Korea Investment Holdings	38,733
JP Morgan Chase	304,755	RBC Dominion Securities	38,076
Pershing	164,094	Sanford C Bernstein & Company	35,748
Morgan Stanley Smith Barney	151,618	CL King & Associates	34,705
Credit Suisse First Boston	113,197	Northern Trust	34,144
Bloomberg Tradebook	108,494	Baird	33,762
CITIC	111,864	ICBC	29,622
UBS	89,587	Nomura Group	54,014
HSBC Securities	76,016	Wedbush Securities	28,027
Stifel Nicolaus	62,341	Piper Jaffray	25,740
Jefferies and Company	61,027	CICC	22,510
Barclays	56,047	Yuanta Financial Holdings	22,245
Investment Technology Group	51,635	Wells Fargo and Company	21,030
Liquidnet	46,704	Hanwha Investment & Securities	20,183
Macquarie Bank	43,950		

INVESTMENT SECTION

Investment Summary

December 31, 2017 (unaudited)

The assets of SERS are administered by the board. The board adopted an investment policy that incorporates the provisions of the Retirement Code, which governs the investment of SERS assets. SERS investment plan is reviewed and updated biennially for strategic asset allocation purposes, as well as for diversification needs within each asset class.

Investments on the Statements of Fiduciary Net Position for financial reporting purposes are not based on the below asset allocation. The asset allocation is for investment reporting purposes only. As such, there may be differences between the Financial Section and the Investment Section.

Asset Allocation

(\$ millions)

Asset Class	Market Exposure ^{4/}	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$4,077.5	13.9%	16.0%
Global Public Equity	15,505.3	53.0	43.0
Real Estate	2,207.4	7.5	12.0
Multi-Strategy	2,121.4	7.2	12.0
Legacy Hedge Funds	191.0	0.7	0.0
Fixed Income	4,238.2	14.5	14.0
Cash	948.4	3.2	3.0
Total Fund	\$29,289.2	100.0%	100.0%

^{4/}Includes securities, cash, and accruals.

Number of Investment Managers

Asset Class	Investment Managers
Private Equity	148
Global Public Equity	13
Real Estate	28
Multi-Strategy	5
Legacy Hedge Funds	13
Fixed Income	11
Cash	1
Total Managers	219

Number of Investment Portfolios

Asset Class	Investment Portfolios
Private Equity	349
Global Public Equity	17
Real Estate	58
Multi-Strategy	5
Legacy Hedge Funds	14
Fixed Income	14
Cash	1
Total Portfolios	458

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS Private Equity program seeks the highest return and growth opportunities, which capture market inefficiencies through active management in the private markets.

Program Structure

Investments in Private Equity are in the form of closed-end limited partnership interests. As an investor, SERS is a limited partner and does not have control of distributions in Private Equity investments. The investment horizon is typically seven or more years. SERS Private Equity program endeavors to continue to build long-term strategic partnerships by investing in world class top-quartile funds. Private equity investments require commitments greater than seven years and therefore, must offer premium returns to compensate for illiquidity and risks.

Objective

The objective of the Private Equity program is to generate annualized net-of-fee returns that exceed the total return of public equity markets by at least 3% (illiquidity premium) and exceed the mean return for the asset class over a seven- to 10-year period.

Performance is measured relative to the following benchmarks:

- Public Market Benchmark – Russell 3000 + 300 basis points (illiquidity premium)
- Private Market Benchmark – Burgiss All Private Equity Custom Index

Private Equity

(\$ millions)

Sub-Asset Class	Unfunded Commitments	Fair Value	% of Total Fund
Buyouts	\$1,527.2	\$2,495.0	8.5%
Special Situations	319.5	615.2	2.1
Venture Capital	176.1	967.3	3.3
Total Private Equity	\$2,022.8	\$4,077.5	13.9%

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Portfolio Exposure

The Private Equity program is well diversified by sub-sector, geography, and industry focus. As of September 30, 2017, based on fair value, the program's exposure was:

By Fund Sub-Sector		By Geography^{2/}		By Industry^{2/}	
U.S. Private Equity	36.9%	United States	69.8%	Financials	27.7%
Non-U.S. ^{1/}	25.7	China	5.6	Information Technology	23.7
U.S. Venture Capital	21.7	United Kingdom	3.0	Consumer Discretionary	14.2
Distressed/Oppportunistic	10.1	Canada	2.0	Health Care	12.6
Pennsylvania-Related	5.6	Germany	1.4	Industrials	8.7
		Italy	1.0	Energy	6.2
		France	0.5	Materials	3.1
		Rest of World	16.7	Consumer Staples	1.8
				Telecommunication Services	1.1
				Utilities	0.9

^{1/}Some managers with a domestic investment focus may invest globally. Thus, non-U.S. exposure measured on a portfolio company basis will be greater.

^{2/}Geography and industry are determined by the portfolio company.

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

The capital committed column represents total dollars allocated from SERS to each limited partnership. Accumulated capital drawn is the portion of SERS capital commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The accumulated distributions column shows the value of capital and profits returned to SERS.

Buyouts Committed, Drawn, and Distributed

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
1. ABRY Partners IV	Middle	3/30/2001	\$35,000,000	\$25,497,290	\$74,633,973
ABRY Partners V	Middle	7/29/2005	45,000,000	41,718,374	82,909,286
ABRY Partners VI	Middle	3/26/2008	50,000,000	59,841,619	106,026,972
ABRY Partners VII	Middle	8/10/2011	30,000,000	36,654,815	39,158,084
ABRY Partners VIII	Middle	5/5/2015	25,000,000	22,477,919	3,599,240
2. ABS Capital Partners IV	Growth Equity	10/13/2000	35,000,000	30,984,280	68,253,149
ABS Capital Partners V	Growth Equity	11/14/2005	20,000,000	19,704,037	57,297,716
ABS Capital Partners VI	Growth Equity	3/13/2009	40,000,000	38,747,792	17,444,057
3. Advent International GPE VI-A	Large	7/7/2008	35,000,000	35,146,325	55,248,414
Advent International GPE VII-B	Large	12/6/2012	40,000,000	36,000,000	15,159,752
Advent International GPE VIII-B	Large	9/26/2016	50,000,000	22,575,000	0
Advent Latin American Private Equity Fund IV	Middle	8/2/2007	30,000,000	30,797,073	33,875,921
Advent Latin American Private Equity Fund V	Middle	5/17/2010	15,000,000	14,355,000	3,675,000
Advent Latin American Private Equity Fund VI	Middle	5/11/2015	25,000,000	9,037,500	5,000,000
4. Alpha Private Equity Fund 4	Small	5/15/2002	26,508,000	35,605,050	77,986,040
Alpha Private Equity Fund 5	Small	4/1/2006	57,796,800	65,860,056	94,043,299
5. APAX Europe V	Mega	4/27/2001	53,262,000	70,406,088	150,017,403
APAX Europe VI	Mega	5/19/2005	76,349,190	76,478,697	134,550,076
APAX Europe VII	Mega	6/27/2007	132,170,235	138,817,717	145,865,152
APAX Excelsior VI	Small	7/3/2000	35,000,000	34,151,324	56,569,467
6. Apollo Investment Fund IV	Mega	9/30/1998	75,000,000	74,838,620	124,814,033
Apollo Investment Fund IX	Mega	*	85,400,000	0	0
Apollo Investment Fund V	Mega	8/23/2001	50,000,000	44,972,146	122,268,807
Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,911,805	53,622,539
7. Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	50,000,000	25,129,085	36,260,022
Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	50,000,000	28,446,960	22,208,150
Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	50,469,728	20,975,634
Asia Alternatives Capital Partners V	Fund of Funds	*	50,000,000	0	0
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	7/22/2011	7,000,000	8,293,455	6,846,837
Penn Asia Investors	Fund of Funds	9/28/2012	133,000,000	62,390,350	21,590,297
8. Asia Pacific Growth Fund III	Growth Equity	9/28/1999	15,000,000	15,337,963	16,708,736

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
9.	Audax Private Equity Fund	Middle	5/25/2000	\$35,000,000	\$36,839,098	\$55,936,816
	Audax Private Equity Fund II	Middle	6/17/2005	25,000,000	25,517,169	45,110,929
	Audax Private Equity Fund III	Middle	11/7/2007	37,000,000	42,498,691	73,271,872
	Audax Private Equity Fund V	Middle	1/25/2016	50,000,000	13,450,925	291,352
10.	Bain Capital Asia Fund	Middle	10/18/2007	12,000,000	11,701,715	15,300,491
	Bain Capital Europe III	Mega	7/10/2008	72,432,276	66,079,936	114,817,980
	Bain Capital Fund IX	Mega	4/10/2006	75,000,000	76,051,118	108,706,029
	Bain Capital Fund VII	Mega	7/6/2000	25,000,000	25,000,000	48,444,396
	Bain Capital Fund VIII-E	Mega	12/15/2004	12,144,000	13,502,825	19,631,405
	Bain Capital Fund X	Mega	1/15/2008	90,000,000	89,061,909	105,148,286
	Bain Capital IX Coinvestment Fund	Mega	4/20/2006	15,000,000	15,637,673	21,969,013
	Bain Capital X Coinvestment Fund	Mega	7/28/2008	5,000,000	1,225,000	1,061,774
11.	Baring India Private Equity Fund III Limited	Small	10/10/2008	5,000,000	5,058,949	3,923,981
12.	Baring Vostok Private Equity Fund IV	Middle	3/10/2008	30,000,000	30,891,524	14,782,880
13.	BC European Capital IX	Large	9/16/2011	26,472,535	26,363,839	15,970,201
	BC European Capital VII	Large	7/28/2000	32,658,500	37,921,760	96,576,440
	BC European Capital VII Top Up	Large	7/2/2001	10,046,300	12,351,504	32,386,202
	BC European Capital VIII	Large	12/13/2005	98,107,500	97,538,004	112,624,971
14.	Berkshire Fund VI	Middle	7/11/2002	20,000,000	18,828,770	45,077,203
	Berkshire Fund VII	Middle	11/15/2006	32,000,000	32,263,170	44,722,827
	Berkshire Fund VIII	Middle	8/25/2011	30,000,000	28,542,641	7,231,941
15.	Blackstone Capital IV	Mega	2/26/2003	75,000,000	69,028,384	184,703,538
	Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	149,852,662	229,130,352
	Blackstone Capital Partners VII	Mega	10/21/2016	50,000,000	7,416,492	68,880
	Blackstone Communications Partners I	Mega	8/29/2000	25,000,000	25,114,042	30,998,189
16.	Brait IV	Small	12/11/2006	25,000,000	22,314,010	2,873,282
17.	Brynwood Partners V	Small	7/31/2005	10,000,000	10,491,974	18,886,569
	Brynwood Partners VI	Small	10/13/2009	10,000,000	11,419,515	20,942,840
18.	Capvis Equity IV	Middle	1/30/2014	49,855,591	29,861,393	11,046,958
19.	Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	57,888,312	19,937,821
	Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	82,720,855	15,109,012
20.	Charterhouse Capital Partners IX	Middle	4/28/2009	66,385,000	60,484,579	66,885,783
	Charterhouse Capital Partners VII	Middle	1/17/2003	55,482,500	54,972,470	109,645,407
	Charterhouse Capital Partners VIII	Middle	4/19/2006	63,826,976	73,764,619	70,399,353
21.	Chequers Capital XV	Middle	7/5/2006	31,133,996	33,048,083	57,540,479
22.	Clayton Dubilier & Rice VI	Middle	12/31/1998	50,000,000	36,437,713	57,754,625
23.	Clessidra Capital Partners II	Middle	11/5/2008	25,631,168	17,760,173	20,490,598
24.	Code Hennessy & Simmons V	Middle	11/10/2005	50,000,000	54,107,136	91,608,248

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Buyouts Committed, Drawn, and Distributed (continued)

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
25. CVC Capital Partners VII	Mega	*	\$91,202,040	\$0	\$0
26. Denham Commodity VI	Large	4/20/2012	50,000,000	45,222,315	18,857,097
27. Elevation Partners	Middle	11/10/2005	35,000,000	31,212,376	50,013,176
28. Energy Spectrum Partners V	Small	7/9/2007	30,000,000	27,592,169	51,487,729
29. Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	12,174,439	10,514,420
Eureka II	Growth Equity	1/30/2006	20,000,000	20,014,694	17,102,126
30. Excelsior Capital Asia Partners III	Small	8/17/2006	25,000,000	25,067,982	12,628,664
31. First Reserve Fund X	Large	10/28/2004	30,000,000	30,000,000	54,728,700
First Reserve Fund XI	Large	12/14/2006	60,000,000	63,939,423	40,018,579
First Reserve Fund XII	Mega	11/19/2008	50,000,000	54,203,739	24,077,391
32. Francisco Partners	Middle	7/27/2000	50,000,000	47,769,948	61,464,903
Francisco Partners II	Middle	7/10/2006	30,000,000	29,383,916	40,498,812
Francisco Partners III	Middle	10/17/2011	20,000,000	19,861,399	24,516,565
Francisco Partners IV	Middle	4/15/2015	25,000,000	17,687,500	0
33. FSN Capital IV	Middle	12/19/2013	46,049,703	37,724,308	16,898,189
FSN Capital V	Middle	1/4/2017	77,189,328	10,212,917	(32,659)
34. Great Hill Equity Partners III	Middle	3/7/2006	35,000,000	35,000,000	40,355,000
Great Hill Equity Partners IV	Middle	9/8/2008	25,000,000	24,869,412	40,092,185
35. Gryphon Partners II	Small	11/3/1999	35,000,000	34,700,788	41,953,023
Gryphon Partners III	Small	9/8/2004	30,000,000	37,599,444	51,691,321
36. GTCR IX	Middle	12/1/2006	50,000,000	47,916,718	79,736,269
GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	114,671,436
GTCR XI	Middle	9/2/2014	25,000,000	19,635,430	4,643,047
GTCR XII	Large	*	32,500,000	0	0
37. H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	5,071,432	9,139
H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	6,975,472	0
H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	8,458,683	2,654,945
38. Hahn & Company II	Middle	5/29/2015	50,000,000	29,991,619	129
39. HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	61,020,829
HarbourVest IPEP IV	Fund of Funds	4/9/2001	40,000,000	39,000,000	67,144,292
HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	238,663,997
HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	91,346,062
HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	32,034,370
HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	98,000,000	98,290,049
Horizon Impact Fund - HarbourVest	Small	10/24/2014	50,000,000	25,504,802	2,444,290
Horizon Impact Fund B - HarbourVest	Small	5/31/2017	100,000,000	6,250,000	0
40. Hellman & Friedman Capital Partners V	Large	12/20/2004	80,000,000	71,563,406	191,936,442
Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,905,614	196,074,817
Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	13,828,595	997,958

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^v	Accumulated Capital Drawn	Accumulated Distributions ^w
41.	Incline Equity Partners III	Small	1/14/2013	\$15,000,000	\$12,174,014	\$12,841,882
42.	InterMedia Partners VII	Small	1/5/2007	15,000,000	17,789,220	16,403,677
43.	Invemed Catalyst Fund	Small	10/19/1999	25,000,000	15,068,118	11,020,768
44.	J.H. Whitney IV	Small	2/1/2000	20,000,000	17,964,926	7,543,844
	J.H. Whitney VI	Small	1/5/2006	50,000,000	49,577,191	41,526,736
45.	J.W. Childs Equity Partners III	Middle	8/20/2002	40,000,000	41,966,505	76,553,620
46.	JMI Equity Fund V	Growth Equity	6/7/2005	24,000,000	24,009,205	122,661,437
	JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	66,053,810
	JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	6,364,735
	JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	11,950,000	2,758,153
47.	Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,700,625
	Kelso VIII	Middle	11/29/2007	150,000,000	145,503,127	111,747,910
48.	Leeds Equity Partners IV	Small	11/12/2004	20,000,000	20,396,199	22,913,831
49.	Lime Rock Partners III	Middle	3/7/2005	15,000,000	15,365,837	7,379,936
	Lime Rock Partners IV	Middle	11/16/2006	25,000,000	27,690,239	19,382,889
	Lime Rock Partners V	Middle	10/2/2008	42,500,000	46,542,069	23,057,932
50.	LLR Equity Partners	Middle	2/4/2000	25,000,000	24,576,062	52,596,658
	LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	42,098,368
	LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	33,660,883
	LLR Equity Partners IV	Middle	3/14/2014	50,000,000	40,485,764	12,263,158
51.	Madison Dearborn Capital Partners IV	Middle	4/2/2001	90,000,000	90,365,390	167,519,294
	Madison Dearborn Capital Partners V	Middle	10/20/2006	75,000,000	71,533,320	98,078,137
	Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	49,977,516	73,749,304
52.	Meridian Venture Partners II	Small	2/11/2005	10,000,000	10,000,000	21,939,244
53.	Motion II B	Middle	11/2/2005	48,204,998	47,742,247	38,726,742
54.	New York Life Capital Partners III	Fund of Funds	6/30/2006	50,000,000	54,896,855	45,234,214
	New York Life Capital Partners IV	Fund of Funds	4/4/2008	50,000,000	54,421,699	83,129,161
55.	NewSpring Growth Capital II	Growth Equity	12/5/2006	10,000,000	9,850,000	13,815,193
	NewSpring Growth Capital III	Growth Equity	7/27/2012	25,000,000	21,682,069	2,218,985
56.	Nordic Capital V	Middle	5/7/2004	34,996,500	46,006,701	131,706,706
	Nordic Capital VI	Middle	7/25/2006	54,369,000	64,480,850	95,047,724
	Nordic Capital VII	Middle	5/2/2008	92,519,165	101,148,241	74,215,867
57.	Oakhill Capital Partners	Middle	5/17/1999	50,000,000	53,718,802	93,999,577
58.	Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	16,537,030	13,173,469
	OCM/GFI Power Opportunities Fund II	Small	5/9/2005	25,000,000	13,470,852	41,644,215
59.	Parthenon Investors II	Small	8/9/2001	20,000,000	22,177,965	35,780,448
60.	Patriot Financial Partners	Small	6/12/2008	25,000,000	25,017,767	45,592,334

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Buyouts Committed, Drawn, and Distributed (continued)

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
61. Permira European Fund	Large	9/30/1997	\$33,494,536	\$32,159,947	\$84,005,717
Permira European Fund II	Large	6/7/2000	48,000,000	45,672,612	91,464,087
Permira European Fund III	Large	1/12/2004	115,960,000	127,340,454	217,778,356
Permira IV	Large	12/14/2006	127,779,198	136,060,572	186,107,259
Permira VI	Large	1/10/2017	56,202,000	8,790,642	0
62. PNC Equity Partners II	Small	8/30/2007	15,000,000	13,375,562	26,013,377
63. Primavera Capital Fund II	Large	11/17/2015	50,000,000	41,716,988	820,321
64. Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,420,710	56,040,748
Providence Equity Partners V	Large	4/4/2005	45,000,000	42,692,171	51,743,883
Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,676,390	53,527,825
Providence Strategic Growth II	Small	12/7/2016	60,000,000	24,821,498	0
65. Ridgemont Equity Partners II	Small	11/30/2015	50,000,000	28,282,972	5,851,833
66. Segulah IV	Middle	9/25/2008	16,705,647	16,946,994	12,712,411
67. Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	6,016,547	2,759,408
68. SFC Energy Partners I	Small	7/27/2007	25,000,000	24,921,811	22,641,255
SFC Energy Partners II	Small	12/19/2011	25,000,000	21,868,871	2,222,349
69. ShoreView Capital Partners	Small	6/16/2003	38,000,000	32,264,744	56,043,792
ShoreView Capital Partners II	Small	3/27/2008	40,000,000	38,622,228	59,637,977
70. Siguler Guff BRIC Opportunities Fund	Fund of Funds	5/8/2006	10,000,000	9,558,299	8,957,645
Siguler Guff BRIC Opportunities Fund II	Fund of Funds	4/9/2008	25,000,000	24,371,139	14,376,832
71. Silver Lake Partners V	Large	*	78,000,000	0	0
72. Sterling Capital Partners I	Middle	10/31/2002	15,000,000	14,979,168	30,923,365
Sterling Capital Partners II	Middle	8/18/2005	30,000,000	29,893,709	27,662,225
Sterling Capital Partners III	Middle	8/13/2007	32,000,000	32,502,101	30,703,208
73. Sterling Group Partners IV	Middle	6/15/2016	20,000,000	7,014,793	342,813
74. Summit Partners Private Equity Fund VII	Middle	2/9/2006	97,134,500	97,134,505	141,097,097
Summit V	Growth Equity	3/31/1998	37,500,000	36,187,500	49,997,247
Summit Ventures VI	Growth Equity	3/23/2001	62,000,000	63,914,751	134,008,940
75. TA X	Middle	4/25/2006	70,000,000	69,732,009	88,457,009
76. TDR Capital IV	Middle	*	93,047,720	0	0
77. Thomas H. Lee Equity Fund VI	Large	11/14/2006	50,000,000	53,710,483	54,596,921
78. TPG Asia V	Large	2/19/2008	22,500,000	21,964,311	20,736,313
TPG Partners III	Mega	1/13/2000	75,000,000	64,119,169	165,383,087
TPG Partners IV	Mega	12/29/2003	30,000,000	27,981,463	56,716,528
Newbridge Asia IV	Middle	9/27/2005	40,000,000	38,903,378	82,887,170
TPG Partners V	Mega	6/27/2006	95,756,241	92,531,812	106,351,549
TPG Partners VI	Mega	5/22/2008	45,000,000	49,708,200	51,121,614

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
79.	Vestar Capital Partners III	Middle	6/30/1997	\$25,000,000	\$24,362,534	\$27,746,687
	Vestar Capital Partners IV	Middle	1/25/2000	100,000,000	97,632,498	172,192,260
	Vestar Capital Partners V	Middle	1/25/2006	50,000,000	51,558,920	55,759,304
80.	Vista Equity Partners Fund VI	Large	12/29/2016	150,000,000	87,320,735	(1,099,211)
81.	Weston Presidio III	Growth Equity	12/31/1998	35,000,000	31,989,586	36,399,850
	Weston Presidio IV	Growth Equity	6/21/2000	35,000,000	34,451,015	39,417,544
	Weston Presidio V	Growth Equity	12/8/2005	50,000,000	49,821,364	109,759,888
82.	Wind Point Partners VIII	Small	9/14/2017	100,000,000	32,005,485	0
83.	Yucaipa American Alliance Fund II	Middle	1/13/2009	25,000,000	29,699,340	15,650,108
	Total Active Buyouts			\$8,836,817,739	\$7,501,150,375	\$9,695,768,328

Cash flows as of September 30, 2017.

*Not funded as of September 30, 2017.

^{1/}Commitments as of December 31, 2017.

^{2/}Distributions include stock distributions. Distributions may include fees that are recorded as negative distributions to be offset against future distributions of the underlying limited partnership investment.

Investment Summary - Private Equity

December 31, 2017 (unaudited)

The capital committed column represents total dollars allocated from SERS to each limited partnership. Accumulated capital drawn is the portion of SERS capital commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The accumulated distributions column shows the value of capital and profits returned to SERS.

Special Situations Committed, Drawn, and Distributed

Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
1. ABRY Mezzanine Partners	Mezzanine	3/15/2002	\$30,000,000	\$26,731,187	\$49,707,116
ABRY Senior Equity II	Mezzanine	7/27/2006	30,000,000	28,187,191	44,684,849
ABRY Advanced Securities Fund	Distressed/Restructuring	8/1/2008	25,000,000	23,430,048	38,682,209
2. ADV Opportunities Fund I	Distressed/Restructuring	10/5/2015	50,000,000	40,283,747	(138,445)
3. AG Capital Recovery Partners V	Distressed/Restructuring	4/17/2006	20,000,000	20,000,000	22,050,783
4. Avenue Special Situations Fund IV	Distressed/Restructuring	3/27/2006	50,000,000	50,000,000	69,076,799
Avenue Asia Special Situations Fund IV	Distressed/Restructuring	6/30/2006	50,000,000	31,897,973	34,199,724
Avenue Special Situations Fund V	Distressed/Restructuring	6/4/2007	70,000,000	70,004,050	92,690,854
Avenue Special Situations Fund VI	Distressed/Restructuring	11/2/2010	20,000,000	20,068,464	18,821,062
5. AXA Secondary Fund III	Secondaries	11/19/2004	26,000,000	21,737,894	37,244,706
AXA Secondary Fund III-2	Secondaries	11/24/2004	14,000,000	11,677,210	19,062,764
AXA Secondary Fund IV	Secondaries	2/26/2007	80,000,000	70,134,752	87,715,816
AXA Secondary Fund V B	Secondaries	6/19/2012	75,000,000	60,545,527	71,984,731
ASF VII B LP	Secondaries	2/19/2016	100,000,000	15,314,636	303,544
ASF VII PA Co-Invest	Secondaries	5/18/2016	50,000,000	555,899	0
6. Centerbridge Capital Partners I	Distressed/Restructuring	2/27/2007	50,000,000	56,713,719	107,910,945
Centerbridge Capital Partners III	Distressed/Restructuring	5/21/2015	30,000,000	14,093,544	1,371,817
7. Cerberus Institutional Partners Series Two	Distressed/Restructuring	10/9/2001	35,000,000	30,100,793	93,674,154
Cerberus Institutional Partners Series Three	Distressed/Restructuring	11/13/2003	35,000,000	22,321,354	48,003,987
Cerberus Institutional Partners Series Four	Distressed/Restructuring	11/27/2006	75,000,000	69,258,215	101,111,502
8. Clearlake Capital Partners IV	Distressed/Restructuring	9/1/2015	15,000,000	12,259,181	6,956,322
9. CVI Global Value Fund	Distressed/Restructuring	2/23/2007	60,000,000	57,151,667	82,038,032
10. Dover Street VII	Secondaries	7/2/2008	30,000,000	28,745,287	34,471,879

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Special Situations Committed, Drawn, and Distributed (continued)

	Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
11.	H.I.G. Bayside Debt & LBO Fund II	Distressed/ Restructuring	6/17/2008	\$30,000,000	\$30,627,042	\$29,146,270
	H.I.G. Bayside Loan Opp. Fund III	Distressed/ Restructuring	6/12/2013	50,000,000	40,418,122	12,372,504
	H.I.G. Bayside Loan Opp. Fund IV	Distressed/ Restructuring	1/16/2015	25,000,000	8,269,796	3,706,363
12.	JP Morgan U.S. Corp Finance Investors II	Distressed/ Restructuring	1/14/2003	50,000,000	53,426,051	83,158,875
13.	KPS Special Situations Fund IV	Distressed/ Restructuring	5/8/2014	25,000,000	10,812,963	5,396,135
14.	Landmark Equity IV	Secondaries	3/31/1995	14,923,291	12,495,850	18,815,175
	Landmark Equity Partners V	Secondaries	12/31/1995	19,624,113	19,434,947	23,752,434
15.	LBC Credit Partners III	Mezzanine	3/4/2013	50,000,000	46,866,047	35,322,300
16.	Lexington Capital Partners II	Secondaries	6/30/1998	40,000,000	39,538,000	52,511,592
	Lexington Capital Partners III	Secondaries	1/26/1999	35,000,000	34,516,449	43,363,378
	Lexington Capital Partners V	Secondaries	1/17/2002	75,000,000	74,623,418	122,184,001
	Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	63,056,665
17.	Matlin Patterson Global Opportunities Partners II	Distressed/ Restructuring	6/30/2004	30,000,000	30,410,597	10,578,309
18.	OCM Opportunities Fund III	Distressed/ Restructuring	1/20/2000	60,000,000	60,007,890	90,237,385
	OCM Principal Opportunities II	Distressed/ Restructuring	4/24/2001	25,000,000	25,000,000	43,894,166
	OCM Opportunities Fund IV	Distressed/ Restructuring	9/26/2001	70,000,000	70,000,000	115,665,253
	Oaktree Capital Management	Distressed/ Restructuring	5/28/2004	40,000,000	40,581,778	121,445,808
	OCM Opportunities Fund V	Distressed/ Restructuring	8/12/2004	40,000,000	40,003,507	64,930,528
	OCM Opportunities Fund VI	Distressed/ Restructuring	9/28/2005	40,000,000	40,000,000	63,171,009
	OCM Principal Opportunities Fund IV	Distressed/ Restructuring	1/24/2007	20,000,000	20,400,000	32,981,361
	OCM Opportunities Fund VII	Distressed/ Restructuring	5/16/2007	40,000,000	40,000,000	51,627,682
	OCM Opportunities Fund VIIb	Distressed/ Restructuring	6/3/2008	40,000,000	36,000,000	59,059,393
	OCM Opportunities Fund VIII	Distressed/ Restructuring	9/20/2010	12,500,000	12,583,425	14,757,279
	OCM Opportunities Fund VIIIb	Distressed/ Restructuring	8/22/2011	12,500,000	12,500,000	8,133,886
	Oaktree Opportunities Fund IX	Distressed/ Restructuring	3/26/2013	50,000,000	50,000,000	11,467,825
19.	Platinum Equity Capital Partners III	Distressed/ Restructuring	8/5/2013	50,000,000	45,315,233	42,306,939

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Special Situations Committed, Drawn, and Distributed (continued)

Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
20. RRJ Capital Master Fund III	Growth Equity	12/10/2015	\$50,000,000	\$17,233,065	\$861,470
21. Sankaty Credit Opportunities III	Distressed/Restructuring	3/8/2007	50,000,000	50,000,000	52,113,736
Sankaty Credit Opportunities IV	Distressed/Restructuring	7/15/2008	40,000,000	38,000,000	50,708,763
22. Templeton Strategic Emerging Markets Fund III	Distressed/Restructuring	5/29/2009	100,000,000	95,482,762	60,966,332
23. Versa Capital Partners	Distressed/Restructuring	10/16/2005	20,000,000	23,611,753	15,988,714
Versa Capital Partners II	Distressed/Restructuring	7/31/2008	15,000,000	16,654,364	5,867,313
24. W Capital Partners II	Secondaries	8/8/2007	40,000,000	39,034,444	51,953,047
Total Active Special Situations			\$2,329,547,404	\$2,008,126,166	\$2,523,127,040

Cash flows as of September 30, 2017.

^{1/}Commitments as of December 31, 2017.

^{2/}Distributions include stock distributions. Distributions may include fees that are recorded as negative distributions to be offset against future distributions of the underlying limited partnership investment.

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

The capital committed column represents total dollars allocated from SERS to each limited partnership. Accumulated capital drawn is the portion of SERS capital commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The accumulated distributions column shows the value of capital and profits returned to SERS.

Venture Capital Committed, Drawn, and Distributed

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
1. Abingworth Bioventures IV	Balanced	9/1/2003	\$20,000,000	\$19,858,273	\$23,712,133
Abingworth Bioventures V	Balanced	1/23/2007	33,775,000	29,012,009	37,604,294
2. Accel Europe	Early Stage	7/2/2001	15,000,000	11,350,000	16,931,665
3. Adams Capital Management III	Early Stage	11/21/2000	30,000,000	30,000,000	7,536,905
4. Advanced Technology Ventures VI	Balanced	3/9/2000	10,000,000	10,000,000	4,498,689
Advanced Technology Ventures VII	Balanced	7/11/2001	27,000,000	27,000,000	28,185,753
5. Alloy Ventures 2000	Early Stage	5/19/2000	20,000,000	20,000,000	5,964,401
Alloy Ventures 2002	Early Stage	7/22/2002	25,000,000	24,832,999	15,448,474
Alloy Annex I	Early Stage	10/31/2003	5,000,000	5,000,000	1,958,747
Alloy Ventures 2005	Early Stage	8/11/2005	25,000,000	25,000,000	11,779,933
6. APEX Investment Fund V	Early Stage	4/19/2002	20,000,000	20,678,579	7,739,736
7. Artiman Ventures II	Early Stage	10/27/2006	25,000,000	25,000,000	13,141,575
Artiman Ventures III	Early Stage	8/9/2010	20,000,000	18,910,000	0
8. Atlas Venture Fund VI	Early Stage	8/1/2001	24,800,000	24,800,000	16,191,410
9. Austin Ventures VIII	Balanced	7/26/2001	20,932,140	21,100,362	33,669,094
Austin Ventures IX	Balanced	1/9/2006	15,000,000	15,127,754	16,396,495
10. Battery Ventures VIII	Balanced	8/13/2007	25,000,000	25,050,751	44,528,658
Battery Ventures VIII Side Car Fund	Balanced	8/29/2008	9,000,000	6,803,790	17,412,210
11. Birchmere Ventures III	Early Stage	5/5/2005	10,000,000	10,453,117	8,692,184
12. Care Capital Investments III	Balanced	2/8/2006	25,000,000	23,145,437	11,823,694
13. Charles River Partnership XI	Early Stage	2/15/2001	11,032,259	11,032,259	14,422,548
14. CID Greater China Venture Capital Fund II	Balanced	8/10/2007	20,000,000	18,640,000	21,263,329
15. Clearstone Venture Partners III-A	Early Stage	12/22/2004	25,000,000	24,250,000	12,828,843
16. Cross Atlantic Technology Fund	Balanced	2/14/2000	20,000,000	20,149,041	23,742,240
Cross Atlantic Technology Fund II	Balanced	1/28/2002	32,900,000	32,900,000	33,327,455
17. Devon Park Bioventures	Balanced	12/15/2006	10,842,697	9,643,956	25,366,934
18. Draper Fisher Jurvetson Fund VI	Early Stage	8/13/1999	8,000,000	8,000,000	5,347,835
Draper Fisher Jurvetson Fund VII	Early Stage	9/22/2000	20,000,000	20,000,000	9,781,991
19. Draper Triangle Ventures	Early Stage	12/20/1999	20,000,000	20,708,909	11,357,493
Draper Triangle Ventures II	Early Stage	10/13/2004	12,000,000	13,510,542	13,724,504
Draper Triangle Ventures III	Early Stage	1/28/2015	10,000,000	6,085,317	0
20. Fairview II	Fund of Funds	3/31/1998	10,000,000	9,870,000	4,047,645

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Venture Capital Committed, Drawn, and Distributed (continued)

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^y	Accumulated Capital Drawn	Accumulated Distributions ^z
21. Frazier Healthcare III	Balanced	3/31/1999	\$30,000,000	\$30,000,000	\$13,051,047
Frazier Healthcare IV	Balanced	9/27/2001	30,000,000	29,820,000	24,821,191
Frazier Healthcare V	Balanced	5/10/2005	30,000,000	29,625,000	46,754,238
22. Guggenheim Technology Ventures I	Early Stage	11/17/2008	2,000,000	2,000,000	585,422
23. Healthcare Ventures V	Early Stage	12/31/1997	25,000,000	25,000,000	52,714,973
Healthcare Ventures VII	Early Stage	10/29/2002	35,000,000	35,000,000	22,026,107
Healthcare Ventures VIII	Early Stage	8/22/2005	30,000,000	29,775,000	21,080,090
24. Highland Capital Partners VI	Early Stage	10/25/2001	25,000,000	25,000,000	37,031,136
Highland Capital Partners VII	Early Stage	10/13/2006	35,000,000	35,001,991	27,335,325
Highland Consumer Fund I	Early Stage	5/4/2007	25,000,000	25,013,199	9,548,421
25. IP II	Balanced	12/17/2001	8,600,000	8,584,073	2,799,296
IP III	Balanced	11/19/2004	10,500,000	9,555,000	13,116,820
IP IV	Balanced	9/21/2007	14,000,000	13,300,000	11,104,733
26. Insight Venture Partners VI	Balanced	8/21/2007	30,000,000	32,244,176	61,968,071
Insight Venture Partners VII	Balanced	4/27/2011	20,000,000	21,320,428	16,529,693
Insight Venture Partners VIII	Balanced	7/10/2013	50,000,000	50,000,000	14,984,276
Insight Venture Partners IX	Balanced	3/24/2015	50,000,000	35,750,000	1,339,968
Insight Venture Partners X	Balanced	*	100,000,000	0	0
27. InterWest Partners VIII	Early Stage	8/25/2000	25,000,000	25,000,000	12,953,647
InterWest Partners IX	Balanced	10/19/2005	20,000,000	20,000,000	21,478,462
InterWest Partners X	Balanced	10/30/2008	30,000,000	28,500,000	2,300,138
28. JP Morgan Venture Capital Investors	Fund of Funds	7/8/1999	100,000,000	107,875,494	70,128,287
JP Morgan Venture Capital Investors II	Fund of Funds	9/8/2000	100,000,000	112,592,778	117,953,338
JP Morgan Venture Capital Investors III	Fund of Funds	6/20/2006	100,000,000	111,193,136	83,193,237
29. Kline Hawkes Pacific	Balanced	8/30/2000	15,000,000	15,100,498	7,024,260
30. Knightsbridge Venture Capital VI	Fund of Funds	12/7/2004	20,000,000	18,266,667	14,673,947
31. Lightspeed Venture Partners VII	Early Stage	2/27/2006	18,000,000	18,000,000	30,892,231
Lightspeed Venture Partners VIII	Early Stage	6/27/2008	15,000,000	14,550,000	19,296,708
Lightspeed India Partners I	Early Stage	8/14/2015	15,000,000	7,050,000	0
32. Media/Communications Ventures Fund V	Growth Equity	9/27/2000	35,000,000	34,812,205	56,014,639
33. Meritech Capital Partners II	Late Stage	1/2/2001	26,475,166	24,842,529	37,926,932
Meritech Capital Partners III	Late Stage	4/5/2006	35,000,000	35,000,000	181,327,706
Meritech Capital Partners IV	Late Stage	2/10/2011	20,000,000	19,100,000	11,914,133
Meritech Capital Partners V	Late Stage	9/3/2014	23,000,000	16,847,500	0
34. NEPA Venture-II	Balanced	12/31/1992	7,500,000	7,500,000	34,879,769
Mid-Atlantic Venture Fund III	Early Stage	6/30/1997	20,008,308	20,000,000	5,654,702
Mid-Atlantic Venture Fund IV	Early Stage	5/4/2000	30,000,000	30,246,718	9,177,849

INVESTMENT SECTION

Investment Summary - Private Equity

December 31, 2017 (unaudited)

Venture Capital Committed, Drawn, and Distributed (continued)

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions ^{2/}
35. Morgenthaler Partners VII	Balanced	7/26/2001	\$35,000,000	\$35,143,798	\$29,412,743
Morgenthaler Partners VIII	Balanced	10/3/2005	35,000,000	35,957,046	40,695,836
Morgenthaler Partners IX	Balanced	11/25/2008	20,000,000	20,000,000	31,155,428
36. New Enterprise Associates VII	Early Stage	12/31/1996	30,000,000	30,000,000	102,186,705
New Enterprise Associates IX	Early Stage	11/15/1999	20,000,000	19,600,000	6,787,262
New Enterprise Associates X	Early Stage	12/11/2000	35,000,000	35,028,000	32,493,542
New Enterprise Associates 11	Early Stage	3/1/2004	25,000,000	25,000,000	53,967,678
New Enterprise Associates 12	Early Stage	6/26/2006	35,000,000	35,631,130	40,918,418
37. Novitas Capital III	Early Stage	4/17/2003	10,000,000	9,925,000	3,924,047
38. Oak Investment Partners XI	Late Stage	7/21/2004	35,000,000	34,989,363	21,790,624
Oak Investment Partners XII	Late Stage	7/10/2006	40,000,000	39,960,127	28,177,778
39. Pitango Venture Capital Fund IV	Early Stage	7/19/2004	20,000,000	20,381,133	16,748,067
Pitango Venture Capital Fund V	Early Stage	8/22/2007	30,000,000	28,163,295	16,866,840
40. Polaris Venture Partners II	Balanced	9/30/1998	25,000,000	24,750,000	40,761,283
Polaris Venture Partners III	Balanced	1/21/2000	50,000,000	49,500,000	35,229,712
Polaris Venture Partners IV	Balanced	9/30/2002	50,000,000	49,750,000	47,129,701
Polaris Venture Partners V	Balanced	8/8/2006	50,000,000	49,000,000	39,037,060
41. Quaker BioVentures	Balanced	2/20/2003	20,000,000	20,000,000	5,472,501
Quaker BioVentures II	Balanced	4/3/2007	25,000,000	24,000,000	17,040,348
42. SCP Private Equity Partners II	Late Stage	6/15/2000	25,000,000	25,000,000	8,534,307
43. Sofinnova Venture Partners VII	Early Stage	1/18/2007	20,000,000	20,000,000	28,586,833
44. Summit Accelerator Fund	Early Stage	11/15/1999	8,000,000	7,609,500	13,302,985
Summit Partners Venture Capital Fund II	Early Stage	9/22/2006	15,000,000	15,823,703	28,086,917
45. T.Rowe Price Stock Distribution Account ^{3/}	Late Stage	1/3/2005		See Footnote	
46. Three Arch Capital	Balanced	12/20/2000	20,000,000	19,500,000	16,330,214
Three Arch Partners IV	Balanced	6/4/2004	20,000,000	19,050,000	20,110,555
47. TL Ventures IV	Early Stage	5/13/1999	35,000,000	35,000,000	26,810,892
TL Ventures V	Early Stage	10/18/2000	40,000,000	40,048,219	16,218,967
48. US Venture Partners VII	Balanced	2/18/2000	13,750,000	13,750,000	4,800,279
US Venture Partners VIII	Early Stage	6/1/2001	26,250,000	25,830,000	31,214,948
49. Weathergag Venture Capital	Fund of Funds	6/26/2007	25,000,000	22,875,000	21,931,174
Weathergag Venture Capital II	Fund of Funds	6/29/2010	25,000,000	23,000,000	5,365,454
50. Worldview Technology Partners IV	Balanced	1/31/2001	18,130,023	16,951,175	7,863,559
Total Active Venture Capital			\$2,691,495,593	\$2,562,595,976	\$2,430,960,316

Cash flows as of September 30, 2017.

*Not funded as of September 30, 2017.

^{1/}Commitments as of December 31, 2017.

^{2/}Distributions include stock distributions. Distributions may include fees that are recorded as negative distributions to be offset against future distributions of the underlying limited partnership investment.

^{3/}T. Rowe Price acts as a stock liquidation account. All cash and stock distributions are reflected in the corresponding distributions.

Investment Summary - Global Public Equity

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS Global Public Equity program seeks high returns through capital appreciation and income from dividend payments while also improving the total fund's liquidity. SERS Global Public Equity program contributes a high expected long-term return to the fund but also may be the greatest contributor to near-term volatility.

Program Structure

Investments in public equity are achieved through buying and holding publicly-traded securities of companies throughout the developed world and in

emerging markets. These companies exhibit a wide range of market capitalizations in many industries and sectors, and offer vastly different equity return opportunities.

Objective

The objective of the Global Public Equity program is to generate annualized net-of-fee returns that exceed its benchmark, the MSCI All Country World Investable Market Index, over a three- to five-year period.

INVESTMENT SECTION

Investment Summary - Global Public Equity

December 31, 2017 (unaudited)

Global Public Equity

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/17 ^{1/}
Global Mandates		
1. Walter Scott & Partners Limited	Global Growth	\$871.4
Total Global Mandates		871.4
U.S. Equity		
2. Emerald Advisers	U.S. Small-cap growth	635.1
3. Iridian Asset Management	U.S. Mid-cap	485.1
4. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	5,805.2
Mellon Capital Management Russell 2000 Core Index	Russell 2000 Core	311.7
Mellon Capital Management Russell 2000 Value Index	Russell 2000 Value	582.9
Total U.S. Equity		7,820.0
Non-U.S. Developed Markets Equity		
5. Artisan Partners - Global ex U.S. ^{2/}	Global ex-U.S. growth	1.3
6. BlackRock MSCI World ex U.S. Index	Developed ex-U.S. Index	5,048.4
7. Harris Associates	Non-U.S. Small-cap value	626.5
Mellon Capital Management MSCI World ex U.S. Index ^{2/}	MSCI World ex-U.S. Index	6.7
8. Morgan Stanley Investment Management Limited-developed ex U.S. ^{2/}	EAFE value	1.6
9. Templeton Investment Counsel - Global ex U.S. ^{2/}	Global ex-U.S. value	1.4
Total Non-U.S. Developed Markets Equity		5,685.9
Emerging Markets Equity		
BlackRock MSCI Emerging Markets Index	MSCI Emerging Markets Index	331.3
10. GlobeFlex Capital	Small-cap - GARP	102.6
11. Macquarie Emerging Markets	Mid/large cap value	343.2
12. Martin Currie Investment Management	All-cap	343.4
Total Emerging Markets Equity		1,120.5
Transition Assets		
13. Northern Trust	Transition	7.5
Total Transition Assets		7.5
Total Global Public Equity		\$15,505.3

^{1/}Includes securities and cash, which the manager had available for investment.

^{2/}Manager in liquidation.

Investment Summary - Real Estate

December 31, 2017 (unaudited)

Role in the SERS Fund

Real Estate plays several roles within SERS overall investment portfolio, including enhancing returns, diversification and income and providing inflation hedging. In the past, SERS has emphasized tactical value-add and opportunistic Real Estate strategies to provide competitive total returns through capital appreciation. Going forward, SERS will tilt the risk profile to more core-like strategies, which is appropriate given the larger allocation to Real Estate and the desire for more income and liquidity created by SERS maturing pension fund obligations. This moderating risk profile may be achieved by improving diversification within Real Estate, which may result in better long-term, risk-adjusted returns.

Program Structure

SERS will diversify its Real Estate allocation by increasing investments in more stable, core-like

investments, and by adding agriculture to the portfolio. New target allocations within the Real Estate program are designed to increase expected return, liquidity, diversification, and inflation hedging, while decreasing expected risk.

Objective

The objective of the Real Estate program is to generate annualized net-of-fee returns that exceed a custom benchmark (NCREIF – Open-End Diversified Core Equity Index, FTSE NAREIT U.S. Real Estate Index for Real Estate Securities, & CPI plus a 3% premium for Natural Resources/Infrastructure, with the various components weighted according to long-term allocation targets within the asset class), over a three- to five-year period.

Real Estate

(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Core/Core Plus ^{1/}	\$346.6	1.2%
Value Add/Opportunistic SMA	1,055.6	3.6
Value Add/Opportunistic Funds ^{1/}	471.5	1.6
Natural Resources/Infrastructure	95.0	0.3
Real Estate Securities	238.7	0.8
Total Real Estate	\$2,207.4	7.5%

^{1/}As of December 31, 2017, unfunded commitments are \$536.0 million.

INVESTMENT SECTION

Investment Summary - Real Estate

December 31, 2017 (unaudited)

The capital committed column represents total dollars allocated from SERS to each fund/manager. Accumulated capital drawn is the portion of SERS capital commitments drawn by the fund/manager to be invested. This amount may also include recycled capital (capital that was distributed and later recalled by the manager to be reinvested) as well as manager fees paid outside of the fund. The accumulated distributions column shows the value of capital and profits returned to SERS.

Real Estate

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
Core/Core Plus					
1. Blackstone Property Partners	Diversified	*	\$300,000,000	\$0	\$0
2. Heitman America Real Estate Trust	Diversified	2007	100,000,000	100,000,000	0
3. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	67,265,772
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	87,606,992
Total Core/Core Plus			458,890,552	158,890,552	154,872,764
Value Add/Oppportunistic Funds					
4. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
5. Apollo Real Estate Fund III	Diversified	1998	50,000,000	50,000,000	74,810,023
6. Berwind Investment Partnership V	Diversified	1999	25,000,000	24,136,964	43,475,859
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	41,480,101
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,014,471	3,740,329
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	10,394,221
Berwind Investment Partnership IX	Diversified	2012	25,000,000	24,303,409	18,642,614
Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	25,000,000	36,171,714
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	47,912,974	82,725,811
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	71,481,521	136,781,213
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	64,172,705	48,110,302
7. C-III Recovery Fund III	Diversified	*	100,000,000	0	0
8. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,228,956	11,411,294
9. Colony Investors VIII	Diversified	2007	22,500,000	21,655,800	6,507,255
10. Fidelity Real Estate Opportunistic Income Fund ^{2/}	Debt	2007	35,000,000	35,000,000	0
11. Fillmore West Fund	Diversified	2008	30,000,000	29,342,336	24,261,423
12. Hawkeye Scout Fund I	Diversified	2009	75,000,000	75,000,000	116,323,890
Hawkeye Scout Fund II	Diversified	2016	30,000,000	23,031,210	0
13. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	16,960,208	14,682,298
14. Lubert Adler Fund III	Diversified	2000	30,000,000	30,000,000	45,442,098
Lubert Adler Fund IV	Diversified	2004	25,000,000	23,820,755	11,363,529
Lubert Adler Fund V	Diversified	2006	30,000,000	30,000,000	5,783,261
Lubert Adler Fund VI	Diversified	2008	20,927,116	19,200,031	13,895,107
Lubert Adler Fund VI-A	Diversified	2010	4,072,884	2,329,415	4,534,231
Lubert Adler Fund VII	Diversified	2014	25,000,000	23,750,000	0

INVESTMENT SECTION

Investment Summary - Real Estate

December 31, 2017 (unaudited)

Real Estate (continued)

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
Value Add/Oppportunistic Funds (continued)					
15. Oak Street Real Estate Fund IV	Diversified	*	\$100,000,000	\$0	\$0
16. OCM Real Estate Opp Fund III	Diversified	2003	25,000,000	25,000,000	41,978,732
17. Oxford GSA Fund	Diversified	2006	30,000,000	21,369,627	18,384,338
18. Prudential Latin America Retail Fund I	Retail	2006	25,000,000	2,271,117	8,162,626
Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	10,712,768
Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	20,799,516	9,359,577
Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	21,798,638	0
19. Rockpoint Finance Fund I	Residential Land	2007	50,000,000	4,409,628	1,566,309
Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	37,403,546	29,091,713
Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	50,390,292	63,912,781
Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	15,763,370	0
20. Singerman Real Estate Fund III	Diversified	*	50,000,000	0	0
Singerman Real Estate Fund III Select	Diversified	*	50,000,000	0	0
21. Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,363,491
Starwood Fund VI	Diversified	2001	50,000,000	50,000,000	50,176,283
Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	24,181,672
Starwood Fund VIII	Diversified	2009	50,000,000	45,356,281	65,047,009
22. ValStone Opportunity Fund V	Diversified	2014	14,663,402	14,224,170	1,959,834
23. Westbrook Fund V	Diversified	2004	25,000,000	27,118,630	44,485,779
Westbrook Fund VI	Diversified	2006	35,000,000	38,579,242	30,012,504
Westbrook Fund VII	Diversified	2007	50,000,000	55,705,424	48,090,909
Westbrook Fund VIII	Diversified	2009	50,000,000	53,904,201	62,318,055
Total Value Add/Oppportunistic Funds			1,803,156,608	1,321,848,916	1,362,153,453
Value Add/Oppportunistic SMA^{3/}					
Heitman I.M.A.	Diversified	1988	NA	813,635,039	1,064,259,873
24. LaSalle I.M.A.	Diversified	1994	NA	444,873,501	481,653,208
25. Lowe I.M.A.	Diversified	1994	NA	706,229,496	849,781,978
Lowe GTO	Diversified	2012	NA	349,069,212	220,770,000
Total Value Add/Oppportunistic SMA				2,313,807,248	2,616,465,059
Natural Resources/Infrastructure^{3/}					
26. Forest I.M.A.	Timberland	1992	NA	124,231,969	124,263,725
Total Natural Resources/Infrastructure				124,231,969	124,263,725

INVESTMENT SECTION

Investment Summary - Real Estate

December 31, 2017 (unaudited)

Real Estate (continued)

Fund/Manager	Asset Type	SERS Initial Funding Year	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
Real Estate Securities^{3/}					
27. CBRE Clarion Real Estate Securities	Diversified	1996	NA	\$210,848,120	\$669,514,323
28. CenterSquare Real Estate Securities	Diversified	2002	NA	26,282,779	36,168,336
Total Real Estate Securities				237,130,899	705,682,659
Total Real Estate			\$2,262,047,160	\$1,717,870,367	\$2,222,708,876

Cash flows as of September 30, 2017.

*Not funded as of September 30, 2017.

^{1/}Commitments as of December 31, 2017.

^{2/}This is an open-end fund. All distributions are automatically reinvested.

^{3/}Due to the nature of the investments, there are no capital commitments for Value Add/Oppportunistic SMA, Natural Resources Infrastructure, and Real Estate Securities managers.

Investment Summary - Multi-Strategy

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS Multi-Strategy program is structured to provide attractive long-term returns which capture market inefficiencies through active management in multiple markets. Multi-Strategy increases investment flexibility to invest in strategies with high return generating potential which may not fit the characteristics of other asset classes.

Program Structure

SERS Multi-Strategy program invests in a diverse set of strategies including distressed debt, direct lending,

structured credit, niche credit, and opportunistic equity. The program will be less liquid than traditional strategies.

Objective

The objective of the Multi-Strategy program is to generate annualized net-of-fee returns that exceed the public equity market over a long-term period but with lower volatility and beta to traditional markets, measured by recession to recession. The benchmark is the S&P/LSTA Leveraged Loan Index.

Multi-Strategy

(\$ millions)

Sub-Asset Class	Fair Value	% of Total Fund
Private Credit Funds ^{1/}	\$12.9	0.0%
Credit-Focused Strategies	875.7	3.0
Opportunistic Equity and Fixed Income	1,232.8	4.3
Total Multi-Strategy	\$2,121.4	7.3%

^{1/}As of December 31, 2017, unfunded commitments are \$237 million.

INVESTMENT SECTION

Investment Summary - Multi-Strategy

December 31, 2017 (unaudited)

Private Markets

The capital committed column represents total dollars allocated from SERS to each limited partnership. Accumulated capital drawn is the portion of SERS capital commitments drawn by the general partner to be invested with underlying portfolio companies along with any reinvested capital. The accumulated distributions column shows the value of capital and profits returned to SERS.

Private Credit Committed, Drawn, and Distributed

Active Private Credit Funds	Strategy/Stage	SERS Initial Funding	Capital Committed ^{1/}	Accumulated Capital Drawn	Accumulated Distributions
1. Glendon Opportunities Fund II	Distressed and Credit	*	\$150,000,000	\$0	\$0
2. TSSP Adjacent Opportunities Partners (B)	Distressed and Credit	*	100,000,000	0	0
Total Active Private Credit Funds			\$250,000,000	\$0	\$0

Public Markets

Manager	Investment Style	Market Exposure as of 12/31/17 ^{2/} (\$ millions)
Credit-Focused Strategies		
3. Blackstone Keystone	Fund-of-Funds	\$875.7
Total Credit-Focused Strategies		875.7
Opportunistic Equity & Fixed Income		
4. Mellon Capital Management Russell 3000 Index	Russell 3000 Core	925.3
5. SEI Structured Credit Fund	High Yield Bank Loans	307.5
Total Opportunistic Equity & Fixed Income		1,232.8
Total Public Market Multi-Strategy		\$2,108.5

Cash flows as of September 30, 2017.

*Not funded as of September 30, 2017.

^{1/}Commitments as of December 31, 2017.

^{2/}Includes securities and cash, which the manager had available for investment.

Investment Summary - Legacy Hedge Funds

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS Legacy Hedge Fund program included investments designed to provide total returns comparable to the total fund return but with lower volatility and correlation to other asset classes. SERS Legacy Hedge Fund program was designed to provide attractive long-term, risk-adjusted returns, diversification from equity markets, low beta to equity markets, and downside protection during prolonged periods of equity market decline. SERS Legacy Hedge Fund portfolios are currently in liquidation.

Program Structure

Investments in hedge funds are achieved through funds-of-hedge funds and direct investment in hedge

funds. SERS Legacy Hedge Fund program invests in a diverse set of strategies including long/short equity, global macro, relative value, credit, event driven, and other hedge fund strategies – all with attractive long-term, risk-adjusted returns. The program is designed to target a liquidity profile less than that of public equities but significantly more liquid than private equity.

Objective

The objective of the Legacy Hedge Fund program is to generate annualized net-of-fee returns that exceed its benchmark, the HF Custom Index, over a three- to five-year period.

INVESTMENT SECTION

Investment Summary - Legacy Hedge Funds

December 31, 2017 (unaudited)

Legacy Hedge Funds^{1/}

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/17 ^{2/}
Funds-of-Hedge Funds		
1. Arden Keystone	Fund-of-Funds	\$19.8
2. Entrust Keystone	Fund-of-Funds	94.3
Total Funds-of-Hedge Funds		114.1
Absolute Return Strategies		
Arden	Fund-of-Funds	16.4
3. Blackstone - Stable Alpha	Fund-of-Funds	15.4
4. Mesirow Financial	Fund-of-Funds	9.7
5. Morgan Stanley Alternative Investment Partners	Fund-of-Funds	6.9
6. PAAMCO	Fund-of-Funds	7.4
7. Robeco Investment	Fund-of-Funds	0.2
8. Rock Creek	Fund-of-Funds	2.5
Total Absolute Return Strategies		58.5
Direct Investments		
9. Hoplite Partners	Direct Hedge Fund	0.6
10. Luxor Capital Partners	Direct Hedge Fund	11.8
11. Pine River Fund	Direct Hedge Fund	3.5
12. Samlyn Onshore Fund	Direct Hedge Fund	1.7
13. Stelliam Fund	Direct Hedge Fund	0.8
Total Direct Investments		18.4
Total Legacy Hedge Funds		\$191.0

^{1/}Managers in liquidation.

^{2/}Includes securities and cash, which the manager had available for investment.

Investment Summary - Fixed Income

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS Fixed Income program is structured to:

- Generate income to pay benefits
- Provide additional liquidity to minimize capital impairment risk
- Reduce volatility of the total fund
- Protect SERS against deflation (and inflation via TIPS)
- Contribute total return to SERS when market conditions permit

Program Structure

Fixed income includes investments in publicly-traded debt obligations of sovereign, quasi-sovereign, and

corporate entities. The asset class generates current income and the repayment of principal at maturity. Shorter duration fixed income has substantially lower volatility than equity, and most fixed income investments have a low correlation with equity returns. SERS Fixed Income program is categorized into five strategies and a separate cash allocation to improve transparency on SERS unallocated cash amount.

Objective

The objective of the Fixed Income program is to generate annualized net-of-fee returns that exceed its benchmark, the Bloomberg Barclays U.S. Aggregate Bond Index, over a three- to five-year period.

INVESTMENT SECTION

Investment Summary - Fixed Income

December 31, 2017 (unaudited)

Fixed Income

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/17 ^{1/}
Core Plus Fixed Income		
1. Brandywine Global	Global Sovereign Credit	\$197.2
2. PIMCO EMD ^{2/}	Emerging Market Debt	0.1
3. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	304.8
4. Stone Harbor	Emerging Market Debt	160.2
Stone Harbor	Global High Yield	177.2
5. W.R. Huff ^{2/}	High Yield	0.2
6. Waterfall Asset Management ^{2/}	Asset-Backed Securities	0.1
Total Core Plus		839.8
Core Fixed Income		
7. Mellon Capital Management	Bloomberg Barclays U.S. Aggregate	1,232.0
PIMCO Core	Bloomberg Barclays U.S. Aggregate ex. Treasuries	615.9
8. Taplin, Canida & Habacht (TCH)	U.S. Credit	184.9
Total Core		2,032.8
Global Treasury Inflation Protected Securities (TIPS)		
9. Brown Brothers Harriman	Global TIPS	216.6
10. New Century Advisors	Global TIPS	115.9
11. NISA Investment Advisors	U.S. TIPS	487.6
Total Global Treasury Inflation Protected Securities (TIPS)		820.1
Nominal U.S. Treasuries		
PIMCO U.S. Treasuries	Domestic Treasuries	545.5
Total Nominal U.S. Treasuries		545.5
Total Fixed Income		\$4,238.2

^{1/}Includes securities and cash, which the manager had available for investment.

^{2/}Manager in liquidation.

Investment Summary - Cash

December 31, 2017 (unaudited)

Role in the SERS Fund

SERS investment program endeavors to maintain an appropriate level of cash to pay retirement benefits and covenants during prolonged periods of market decline and state budgetary constraints.

have historically been invested in the Pennsylvania Treasury Group Investment Fund, a short-term investment fund.

Program Structure

Cash investments emphasize the use of higher credit quality debt instruments that are liquid and have short maturities and durations, or have floating rates and

Objective

The objective of Cash is to generate annualized net-of-fee returns that exceed its benchmark, the Bank of America 90-Day T-Bill Index, over a three-year period.

Cash		
(\$ millions)		
Manager	Investment Style	Market Exposure as of 12/31/17 ^{4/}
Cash		
1. PA State Treasury (STIF)	Cash	\$948.4
Total Cash		\$948.4

^{4/}Includes securities and cash, which the manager had available for investment.

2017

Actuarial Section



May 14, 2018

Ms. Terrill J. Sanchez
Executive Director
State Employees' Retirement System
30 North Third Street
Suite 150
Harrisburg, PA 17101-1716

Dear Ms. Sanchez:

The purpose of this letter is to certify the actuarial adequacy of the contributions being made by the Commonwealth of Pennsylvania and other participating agencies to the Pennsylvania State Employees' Retirement System (SERS), and to discuss the approach currently being taken toward meeting the financing objectives of the plan. The results provided herein are based upon the December 31, 2017 annual actuarial valuation for funding purposes.

The funding objective of the plan is set forth in the State Employees' Retirement Code (SERC). The annual employer contribution is equal to the sum of the following for the fiscal year beginning July 1, 2018:

- (1) The employer share of the normal cost.
- (2) The fresh start amortization of the December 31, 2009 unfunded liability over a 30-year period beginning July 1, 2010 and ending on June 30, 2040.
- (3) The amortization of the change in liability due to Act 2010-120 (Act 120) over a 30-year period beginning July 1, 2011 and ending on June 30, 2041.
- (4) The amortization of changes in liability due to actual experience differing from assumed experience after December 31, 2009 over 30-year periods beginning with the July following the actuarial funding valuation determining such changes.
- (5) The amortization of legislated benefit changes, including cost-of-living increases, over 10-year periods beginning with the July following the actuarial funding valuation determining such changes. (Note: There are currently no 10-year amortizations being funded.)

The amortization payments are level dollar amounts over the remaining applicable amortization periods. The employer cost is determined as a percent of retirement covered compensation. The total employer cost is the average contribution amount that needs to be received from the



Ms. Terrill J. Sanchez
May 14, 2018

employer groups participating in the system. Some employer groups contribute a higher percent of compensation, and some contribute a lower percent of compensation depending on the benefits payable to their employees.

The actuarial funding valuation is based on financial and participant data, which is prepared by SERS staff. We rely on that data and ensure that it is reviewed for internal and year-to-year consistency as well as general reasonableness prior to being used in the actuarial funding valuation.

The actuarial funding valuation uses assumptions regarding future rates of investment return and rates of retirement, withdrawal, death, and disability among SERS members and their beneficiaries. The current set of assumptions used in the December 31, 2017 actuarial funding valuation, with the exception of the investment return and inflation assumptions, was adopted by the State Employees' Retirement Board (the Board) based upon actual experience of SERS during the years 2011 through 2015. To ensure that the investment return assumption remains up-to-date and appropriate for every actuarial valuation, we review it annually with the SERS Board. As a result of the review undertaken during March/April of 2017, the Board approved (i) a reduction in the annual investment return assumption from 7.50% to 7.25% and (ii) a reduction in the annual inflation assumption from 2.75% to 2.60%, and both changes became effective with the December 31, 2016 actuarial valuation. We believe these assumptions remain appropriate and reasonable, therefore, they have been retained for the December 31, 2017 valuation. We will continue to closely monitor this assumption and will recommend changing it if conditions warrant such change. The actuarial value of assets is developed by recognizing the difference between the expected actuarial value of assets and the market value of assets over a five-year period.

Governmental Accounting Standards Board (GASB) Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of GASB Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, effective for financial statements for fiscal years ending on or after June 30, 2014. GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaced the requirements of GASB Statement No. 27, *Accounting for Pensions by State and Local Governmental Employers*, effective for fiscal years ending on or after June 30, 2015. GASB 67 is designed for financial reporting by pension plans and GASB 68 is designed for financial reporting by entities that participate in pension plans. The objective of both statements is to provide more useful, transparent, and comparable financial information related to pensions. The Financial Section now includes new schedules in response to the reporting requirements of GASB Statement No. 67. Although two schedules that were required disclosures under



Ms. Terrill J. Sanchez
May 14, 2018

Statement No. 25 were discontinued, namely the “Schedule of Funding Progress” and the “Schedule of Employer Contributions,” these schedules remain of interest and, therefore, have been updated to reflect the December 31, 2017 actuarial funding valuation and are included herein.

GASB Statement No. 25, although it has been replaced by GASB Statement No. 67, established the Annual Required Contribution (ARC), which was recognized for many years as the minimum annual contribution required by GASB. How a pension plan’s actual contributions compare to the ARC is likely to remain of interest despite the fact that GASB has discontinued the ARC. For SERS, the scheduled contributions from July 1, 2005 through June 30, 2015 were below the minimum amount required to meet the GASB No. 25 minimum. Originally this was a result of financing changes implemented by Act 2003-40 in December 2003. Later, this became a consequence of the contribution collars required under Act 2010-120. After June 30, 2015, because employer contributions are being made in accordance with current law, they are exceeding the GASB No. 25 minimum.

With the exception of the “Schedule of Retirees and Beneficiaries Added to and Removed from Rolls” and the “Summary of Plan Provisions”, the schedules appearing in the Actuarial Section were prepared from the December 31, 2017 actuarial funding valuation.

Based upon the valuation results, it is our opinion that, provided future employer contributions are made in accordance with current law, the Pennsylvania State Employees’ Retirement System is in sound condition in accordance with generally accepted actuarial principles and procedures.

It should be noted that, during June of 2017, Governor Tom Wolf signed into law Act 2017-5. Act 2017-5 will fundamentally change retirement options for most new hires beginning January 1, 2019. This legislation introduced two new hybrid defined benefit (DB)/defined contribution (DC) options and a straight DC option. The new classes of service will apply to all State employees – with the exemption of most hazardous duty employees – who first become SERS members on or after January 1, 2019. Additionally, all current State employees will have an irrevocable option to join one of the new hybrid options or the straight DC plan between January 1, 2019 and March 31, 2019, with an effective date of July 1, 2019. The newly elected tier or plan would be prospective only and generally apply to all future service. More details relating to the provisions of Act 2017-5 can be found at SERS’ web site.



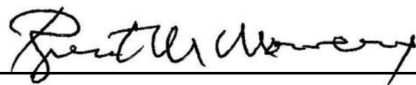
Ms. Terrill J. Sanchez
May 14, 2018

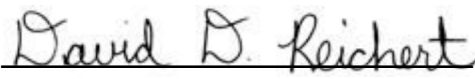
Actuarial Certification

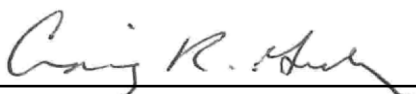
To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in accordance with the applicable actuarial standards of practice and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of SERS and reasonable expectations) and which represent our best estimate of anticipated experience under the plan.

The actuaries certifying to this valuation are members of the Society of Actuaries or other professional actuarial organizations, and meet the Qualification Standards of the American Academy of Actuaries for purposes of issuing Statements of Actuarial Opinion.

Respectfully submitted,
Korn Ferry Hay Group, Inc.

By 
Brent M. Mowery, F.S.A.
Member American Academy of Actuaries
Enrolled Actuary No. 17-3885

By 
David Reichert
Member American Academy of Actuaries
Enrolled Actuary No. 17-6461

By 
Craig R. Graby
Member American Academy of Actuaries
Enrolled Actuary No. 17-7319

Summary of Actuarial Assumptions and Methods

December 31, 2017 (unaudited)

The schedules in this Actuarial Section are reported in accordance with SERS actuarial funding valuation based on statutory requirements. For funding purposes, actuarial methods are specified by statute while actuarial assumptions are recommended by SERS actuary and approved by the SERS Board, as trustees of the State Employees' Retirement Fund. The State Employees' Retirement Code (retirement code), legislated by the General Assembly and signed into law by the Governor, establishes funding policy. The retirement code is administered by the SERS Board. The General Assembly, along with the Governor's signing, has the authority to amend the retirement code. The Financial Section, except where noted, is reported in accordance with a separate actuarial accounting valuation based on Governmental Accounting Standards Board Statement No. 67 (GASB 67).

For funding purposes, a variation of the entry-age normal actuarial cost method, which is used to determine the liabilities and costs related to SERS benefits, is based on the benefits and contributions for new members rather than for all current members from their date of entry under the entry-age actuarial cost method for financial reporting purposes under GASB 67. Ultimately, this variation for funding purposes should produce approximately the same results as the typical entry-age method over the long run. For funding purposes, a five-year smoothed market value is used as the asset valuation method compared to fair (market) value for financial reporting purposes.

SERS uses amortization periods of 10 years and 30 years with level payments over closed periods. The current amortization schedules are as follows:

- (1) Act 2010-120 established a fresh start amortization of the December 31, 2009 unfunded liability over a 30-year period beginning July 1, 2010, and ending June 30, 2040.

- (2) The amortization of the change in liability due to Act 2010-120 over a 30-year period beginning July 1, 2011, and ending on June 30, 2041.
- (3) The amortization of changes in liability due to actual experience differing from assumed experience after December 31, 2009, over 30-year periods beginning with the July 1 following the actuarial valuation determining such changes.

Actuarial methods and assumptions used for both funding purposes as well as financial reporting purposes include:

- The investment rate of return of 7.25% per year is based on an underlying rate of inflation of 2.6% per year.
- For current and future non-disabled retirees, beneficiaries, and survivors, SERS uses the RP-2000 Male and Female Combined Healthy Mortality Tables projected (using Projection Scale AA) to 2016 for males and to 2020 for females, and then further adjusted to ensure sufficient margin for improvement in certain age ranges. For current and future disabled retirees, SERS uses the RP-2000 Male and Female Disabled Retiree Mortality Tables projected (using Projection Scale AA) to 2021 for males and to 2017 for females. For all pre-retirement active members, the mortality is based on actual SERS experience.

ACTUARIAL SECTION

Summary of Actuarial Assumptions and Methods

December 31, 2017 (unaudited)

- The rates for probability of retirement and the probabilities of withdrawal from active service, including death, before age and service retirements, which are presented in the **Schedules of Active Member Valuation Data**.
- The projected average salary increase of 5.6% with a range of 3.7% to 8.9%. This increase includes an underlying assumption of 2.6% for inflation. The annual rate of salary increase for promotions and longevity for members is presented in the **Schedules of Active Member Valuation Data**.
- No cost-of-living adjustments were used in the determination of actuarial valuations.

SERS periodically prepares a study using actual experience in order to develop assumptions for use in its actuarial valuations. The latest study dated March 9, 2016 was completed for the period January 1, 2011 through December 31, 2015.

The most recent valuations were based on members of SERS as of December 31, 2017. All census and asset data was supplied by SERS and was subject to reasonable consistency checks. The actuarial computations were prepared by, or under the supervision of, a Member of the American Academy of Actuaries (M.A.A.A.).

Schedules of Active Member Valuation Data

December 31, 2017 (unaudited)

Table A^{1/}
Withdrawal From Active Employment Before Age and Service Retirement

Annual Rate of Active Members Separating Within the Next Year

Sample Age	Male						Female					
	Withdrawal Years of Service				Death	Disability	Withdrawal Years of Service				Death	Disability
	0	5	9	14+			0	5	9	14+		
20	24.20%	NA	NA	NA	0.04%	NA	28.40%	NA	NA	NA	0.02%	NA
25	18.50	3.00%	2.10%	NA	0.04	0.02%	22.40	3.70%	2.30%	NA	0.02	0.04%
30	16.40	3.00	2.10	1.00%	0.05	0.06	19.20	3.30	2.30	1.70%	0.02	0.09
35	15.60	2.40	1.30	1.00	0.06	0.11	15.00	3.20	2.30	1.20	0.03	0.14
40	15.00	2.40	1.30	1.00	0.09	0.17	13.40	3.20	1.20	1.00	0.04	0.19
45	14.40	2.40	0.70	1.10	0.13	0.30	13.10	2.70	1.20	1.00	0.06	0.30
50	14.40	2.60	0.70	1.10	0.24	0.42	13.10	2.70	1.50	1.00	0.09	0.45
55	14.40	1.90	0.80	0.80	0.29	0.55	13.10	1.80	1.00	1.60	0.14	0.57
60	NA	NA	NA	NA	0.35	NA	NA	NA	NA	NA	0.24	NA

Table B^{1/}
Annual Rate of Retirement

Sample Age	Full Benefits	
	Male	Female
53	20.0%	23.0%
54-55	23.0	23.0
56-57	24.0	23.0
58	27.0	23.0
59	30.0	25.0
60	25.0	25.0
61	20.0	20.0
62	25.0	25.0
63-64	20.0	20.0
65-66	25.0	25.0
67-70	23.0	23.0
71-79	20.0	20.0
80	100.0	100.0

^{1/}The assumptions presented in Table A and Table B were based on a review of SERS experience from 2011 – 2015. The rates are the probabilities that an event will occur in the year after the valuation. For instance, the male retirement rate of 25% at age 62 means that 250 of every 1,000 male employees age 62 and eligible for full benefits are expected to retire before they reach age 63.

ACTUARIAL SECTION

Schedules of Active Member Valuation Data

December 31, 2017 (unaudited)

Table C
Annual Rate of Salary Increase

Completed Years of Service	Increase	Completed Years of Service	Increase
1	6.00%	16	2.10%
2	4.50	17	2.05
3	4.00	18	2.00
4	3.75	19	1.95
5	3.50	20	1.90
6	3.25	21	1.85
7	3.00	22	1.75
8	2.90	23	1.65
9	2.80	24	1.55
10	2.70	25	1.45
11	2.60	26	1.25
12	2.50	27	1.05
13	2.40	28	0.90
14	2.30	29	0.85
15	2.20	30+	0.80

Table D
Reduced Benefits

Sample Age	5 - 14 Years of Service		15 or More Years of Service	
	Male	Female	Male	Female
25	2.00%	3.70%	NA	NA
30	1.60	1.90	NA	NA
35	1.60	1.90	1.00%	1.20%
40	1.60	1.90	1.00	1.20
45	1.35	1.90	1.00	1.60
50	1.35	1.90	2.00	2.00
55	1.35	1.90	6.00	6.00

ACTUARIAL SECTION

Schedules of Active Member Valuation Data

December 31, 2017 (unaudited)

Active Members by Age and Years of Service - Male

Age Group	Years of Service							Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+		
< 20	30	NA	NA	NA	NA	NA	NA	30	\$28,057
20 - 24	1,237	4	NA	NA	NA	NA	NA	1,241	35,984
25 - 29	3,631	557	13	NA	NA	NA	NA	4,201	46,103
30 - 34	3,013	2,298	749	16	NA	NA	NA	6,076	54,114
35 - 39	1,975	1,789	2,258	573	11	NA	NA	6,606	60,048
40 - 44	1,519	1,319	1,727	1,640	509	5	NA	6,719	64,356
45 - 49	1,482	1,251	1,596	1,797	2,118	774	20	9,038	70,421
50 - 54	1,309	1,089	1,313	1,412	1,397	1,418	551	8,489	68,151
55 - 59	1,162	1,012	1,278	1,213	947	1,076	1,271	7,959	65,682
60 - 64	815	887	1,028	936	551	505	556	5,278	64,948
65+	478	483	595	504	220	174	319	2,773	67,437
Total	16,651	10,689	10,557	8,091	5,753	3,952	2,717	58,410	\$62,739

Average Age: 46.23
Average Service: 11.79

Active Members by Age and Years of Service - Female

Age Group	Years of Service							Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+		
< 20	34	NA	NA	NA	NA	NA	NA	34	\$24,526
20 - 24	1,056	7	NA	NA	NA	NA	NA	1,063	31,189
25 - 29	2,662	426	16	NA	NA	NA	NA	3,104	39,542
30 - 34	2,214	1,312	496	16	NA	NA	NA	4,038	45,582
35 - 39	1,886	1,203	1,416	462	23	NA	NA	4,990	50,481
40 - 44	1,517	1,052	1,218	962	297	29	NA	5,075	53,164
45 - 49	1,533	1,060	1,260	1,082	796	501	61	6,293	55,200
50 - 54	1,341	1,074	1,249	978	706	827	566	6,741	55,737
55 - 59	1,142	1,067	1,258	1,118	752	782	916	7,035	56,065
60 - 64	697	763	982	825	430	365	404	4,466	54,332
65+	225	303	368	371	156	117	189	1,729	56,153
Total	14,307	8,267	8,263	5,814	3,160	2,621	2,136	44,568	\$52,049

Average Age: 46.61
Average Service: 10.97

ACTUARIAL SECTION

Schedules of Active Member Valuation Data

December 31, 2017 (unaudited)

Aggregate Active Member Valuation Data

Valuation Year Ended Dec 31	Number of Employers	Number of Active Members	Covered-Employee Payroll	Annual Average Pay	% Increase/(Decrease) in Average Pay
2017	102 ^{1/}	102,978	\$5,984,000,000	\$58,113	2.9%
2016	103 ^{2/}	104,632	5,912,000,000	56,499	-0.6
2015	104 ^{3/}	105,025	5,972,000,000	56,858	3.7
2014	104 ^{3/}	104,431	5,720,000,000	54,769	2.8
2013	104	105,186	5,598,000,000	53,224	1.9
2012	105	106,048	5,539,000,000	52,230	0.1
2011	107	107,021	5,582,000,000	52,159	1.8
2010	106	109,255	5,597,000,000	51,228	0.8
2009	106	110,107	5,595,000,000	50,813	3.8
2008	108	110,866	5,428,000,000	48,957	1.3

^{1/}The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth comprises 65 agencies and when everything is evaluated separately, SERS has a total of 102 participating employers/agencies.

^{2/}The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth comprises 66 agencies and when everything is evaluated separately, SERS has a total of 103 participating employers/agencies.

^{3/}The membership includes 39 employers and the commonwealth is classified as its largest employer. The commonwealth comprises 66 agencies and when everything is evaluated separately, SERS has a total of 104 participating employers/agencies.

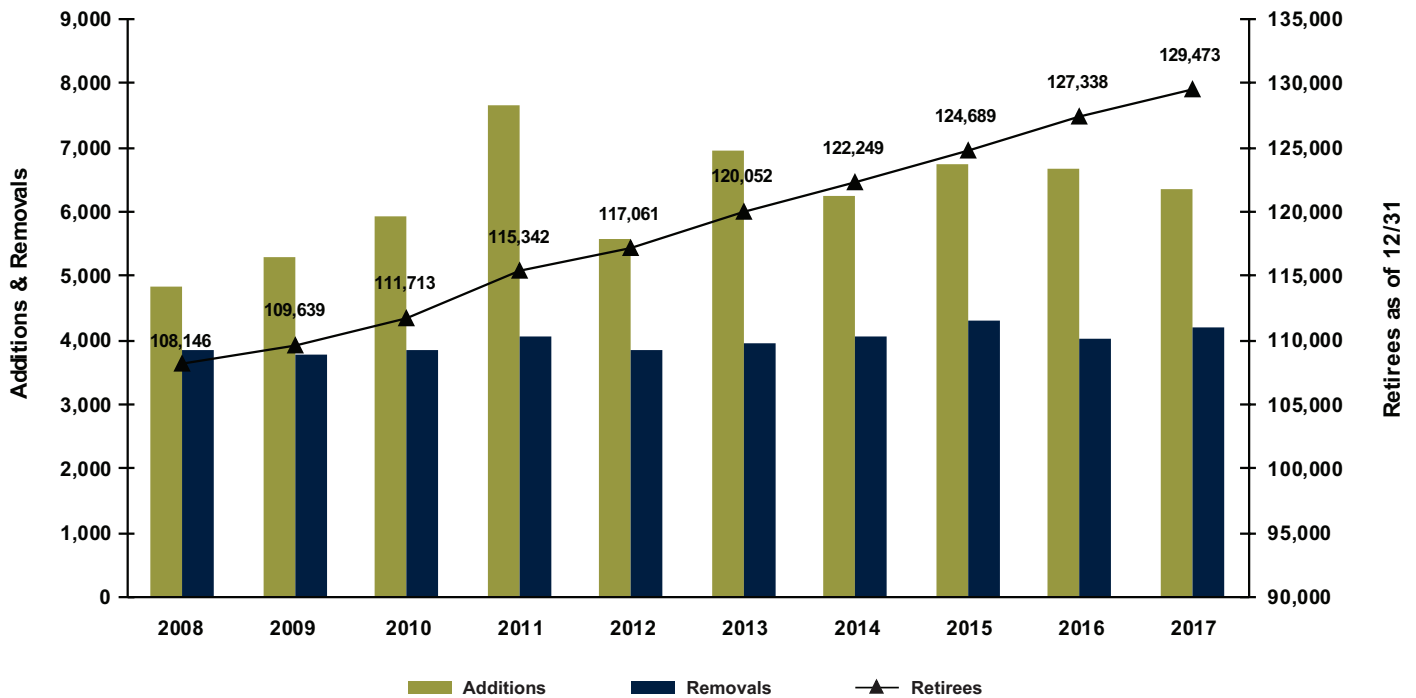
Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

December 31, 2017 (unaudited)

Retirees and Beneficiaries Added to and Removed from Rolls

Year Ended	Added to Rolls		Removed from Rolls		Rolls - End of Year		Percentage Change	
	No.	Allowances	No.	Allowances	No.	Allowances ^{1/}	No.	Allowances
2017	6,338	\$178,317,205	4,203	\$63,576,892	129,473	\$2,909,267,596	1.7%	4.1%
2016	6,658	191,327,122	4,009	60,165,549	127,338	2,794,984,868	2.1	4.9
2015	6,743	175,810,502	4,303	63,027,188	124,689	2,664,418,763	2.0	4.4
2014	6,245	157,593,809	4,048	59,524,055	122,249	2,552,077,530	1.8	4.0
2013	6,944	178,392,487	3,953	53,186,262	120,052	2,454,388,693	2.6	5.4
2012	5,572	138,363,766	3,853	50,453,118	117,061	2,329,489,208	1.5	3.9
2011	7,669	205,521,876	4,040	50,132,667	115,342	2,241,716,566	3.3	7.4
2010	5,906	148,169,231	3,832	48,182,212	111,713	2,086,701,831	1.9	5.0
2009	5,278	125,610,303	3,785	45,195,072	109,639	1,987,109,540	1.4	4.2
2008	4,841	105,374,596	3,825	45,068,366	108,146	1,907,133,859	1.0	3.2

^{1/}Calculated by multiplying monthly benefit for December 31 by 12 to arrive at an annual amount.



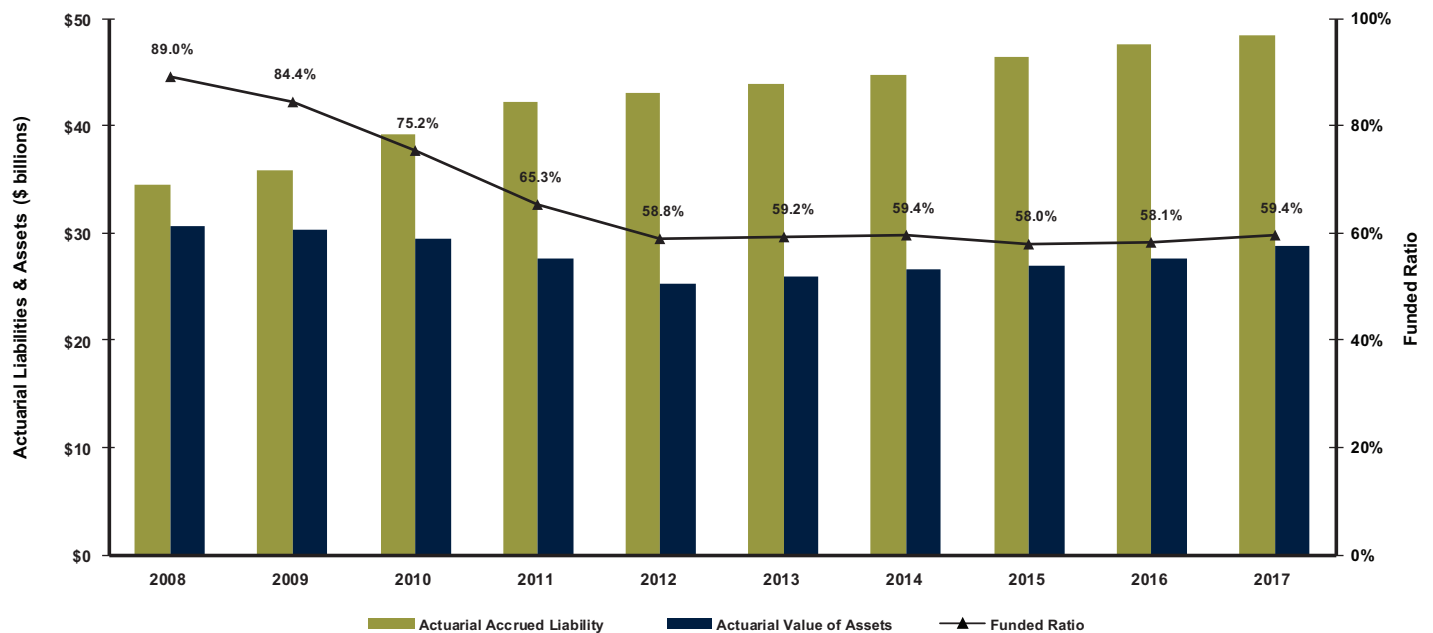
ACTUARIAL SECTION

Solvency Test

December 31, 2017 (unaudited)

Fund Solvency^{1/} (\$ thousands)

Valuation Year Ended Dec 31	Actuarial Accrued Liabilities For			Total Actuarial Accrued Liability (AAL)	Actuarial Value of Assets	Portion of Accrued Liabilities Covered by Reported Assets			Funded Ratio
	(1)	(2)	(3)			(1)	(2)	(3)	
	Active Member Contributions	Retirees and Beneficiaries	Active Members (Employer Financed Portion)						
2017	\$4,965,765	\$27,798,045	\$15,675,593	\$48,439,403	\$28,776,939	100.0%	85.7%	0.0%	59.4%
2016	4,869,229	26,824,306	15,825,429	47,518,964	27,596,048	100.0	84.7	0.0	58.1
2015	4,816,121	25,156,125	16,356,683	46,328,929	26,877,127	100.0	87.7	0.0	58.0
2014	4,733,833	23,872,658	16,144,179	44,750,670	26,584,948	100.0	91.5	0.0	59.4
2013	4,636,219	23,046,717	16,191,644	43,874,580	25,975,185	100.0	92.6	0.0	59.2
2012	4,551,507	22,095,052	16,409,005	43,055,564	25,302,688	100.0	93.9	0.0	58.8
2011	4,406,306	21,222,075	16,653,481	42,281,862	27,618,461	100.0	100.0	11.9	65.3
2010	4,409,444	18,995,355	15,774,795	39,179,594	29,443,945	100.0	100.0	38.3	75.2
2009	4,280,680	17,962,741	13,553,596	35,797,017	30,204,693	100.0	100.0	58.7	84.4
2008	4,068,036	17,305,971	13,063,389	34,437,396	30,635,621	100.0	100.0	70.9	89.0



^{1/}Based on statutory funding requirements.

Analysis of Financial Experience

December 31, 2017 (unaudited)

Gains and Losses in Accrued Liabilities^{1/} Resulting from Differences Between Assumed Experience and Actual Experience (\$ thousands)

Type of Activity	2017	2016	2015	2014
Gain/(loss) from investment earnings ^{2/}	\$265,709	\$2,982	\$(279,734)	\$237,982
Changes in demographics of new entrants	(18,681)	6,113	(6,055)	(31,582)
Pay increases different than assumptions	(9,426)	613,858	(253,176)	86,914
Differences between actual and expected demographic experience	(144,105)	33,565	(81,547)	(35,152)
Gain/(loss) during year from financial experience	93,497	656,518	(620,512)	258,162
Non-recurring items				
Changes in assumptions ^{3/}	-	(1,021,315)	(366,637)	-
Loss due to collar restrictions ^{4/}	(140,438)	(375,572)	(535,701)	(740,401)
Composite loss	\$(46,941)	\$(740,369)	\$(1,522,850)	\$(482,239)

^{1/}Based on statutory funding requirements.

^{2/}Net gains and losses from returns different than the assumed rate of return that are amortized over a five-year period.

^{3/}2016 change primarily due to reduction of investment rate of return to 7.25% from 7.5% and reduction of inflation to 2.6% from 2.75%, which was approved by SERS Board at its April 2017 meeting.

^{4/}Act 2010-120 capped the growth of employer contributions at 4.5% for commonwealth FY 13/14 and each subsequent year until no longer needed.

ACTUARIAL SECTION

Schedule of Funding Progress

December 31, 2017 (unaudited)

Funding Progress^{1/}

(\$ thousands)

Actuarial Valuation Year Ended December 31	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL)	Ratio of Assets to AAL	Unfunded Actuarial Accrued Liability (UAAL)	Covered-Employee Payroll	UAAL as a Percentage of Covered-Employee Payroll
2017	\$28,776,939	\$48,439,403	59.4%	\$19,662,464	\$5,984,361	328.6%
2016	27,596,048	47,518,964	58.1	19,922,916	5,911,603	337.0
2015	26,877,127	46,328,929	58.0	19,451,802	5,971,511	325.7
2014	26,584,948	44,750,670	59.4	18,165,722	5,719,581	317.6
2013	25,975,185	43,874,580	59.2	17,899,395	5,598,420	319.7
2012	25,302,688	43,055,564	58.8	17,752,876	5,538,887	320.5
2011	27,618,461	42,281,862	65.3	14,663,401	5,582,108	262.7
2010	29,443,945	39,179,594	75.2	9,735,649	5,596,915	173.9
2009	30,204,693	35,797,017	84.4	5,592,324	5,594,867	100.0
2008	30,635,621	34,437,396	89.0	3,801,775	5,427,667	70.0

^{1/}Based on statutory funding requirements.

Schedule of Contributions Under Previous Reporting Standards

December 31, 2017 (unaudited)

Contributions Under Previous Reporting Standards^{1/}

Annual Required Contributions Using Governmental Accounting Standards Board Statement No. 25

(\$ thousands)

Actuarial Valuation Year Ended December 31	Annual Required Contribution (ARC)	Actual Contribution	Actual Contribution as a Percentage of ARC
2017 ^{2/}	\$1,883,541	\$1,883,541	100.0%
2016 ^{2/}	1,613,626	1,613,626	100.0
2015	1,469,116	1,359,246	92.5
2014	1,407,361	1,081,826	76.9
2013	1,314,925	790,996	60.2
2012	1,044,632	562,883	53.9
2011	913,778	391,189	42.8
2010	866,822	272,525	31.4
2009	643,861	251,870	39.1
2008	584,248	233,138	39.9

^{1/}The ARC is calculated as part of SERS funding valuation using Governmental Accounting Standard Board No. 25 (GASB 25) requirements. Starting in 2014, GASB 25 was superseded by Governmental Accounting Standards Board Statement No. 67 (GASB 67) for accounting purposes. GASB 67 replaces the ARC with an actuarially determined contribution (ADC). While no longer applicable to 2014 and subsequent years, this disclosure is being provided for informational purposes.

^{2/}ADC excludes multiple service transfers made to SERS. These transfers are included as contributions on the Statements of Changes in Fiduciary Net Position.

For developing the ARC, GASB 25 established a range of actuarial cost and amortization methods for the unfunded actuarial accrued liability. The scheduled contributions for the years shown above have been below the amount required to meet the GASB minimum under previous standards. Underfunding of the ARC in 2008 and 2009 was the result of significant provisions of Act 2003-40, which changed the periods in which unfunded liabilities

were amortized in a manner that artificially suppressed the employer contribution rate below the ARC. Underfunding of the ARC from 2010 through 2015 was the result of significant provisions of Act 2010-120, which capped increases in the employer contribution rate. The capped contribution rates during those years were below the respective years' ARC contribution rates.

ACTUARIAL SECTION

History and Projection of Contribution Rates and Funded Ratios

December 31, 2017 (unaudited)

Contribution Rates and Funded Ratios^{1/}

(\$ thousands)

For FY Beginning July 1 Following Valuation Year^{2/}

Valuation Year Ended Dec 31	Funding Payroll	Member Contribution Rate ^{3/}	Employer Normal Cost Rate	Unfunded Liability Rate ^{4/}	Preliminary Employer Contribution Rate ^{5/}	Final Employer Contribution Rate	Funded Ratio
2008	\$5,660,319	6.25%	9.51%	-5.88%	3.63%	4.00%	89.0%
2009 ^{6/}	5,935,988	6.25	9.53	-3.89	5.64	5.00	84.4
2010 ^{7/}	5,851,704	6.25	4.08	14.85	18.93	8.00	75.2
2011	5,890,704	6.25	5.10	21.29	26.39	11.50	65.3
2012	5,836,402	6.25	5.01	26.21	31.22	16.00	58.8
2013	5,897,627	6.25	5.00	26.41	31.41	20.50	59.2
2014	6,021,688	6.25	4.95	26.56	31.51	25.00	59.4
2015	6,255,189	6.25	4.52	27.62	32.14	29.50	58.0
2016	6,187,427	6.25	4.91	28.31	33.22	33.22	58.1
2017^{8/}	6,265,071	6.25	4.88	28.02	32.90	32.90	59.4
2018 ^{9/}	6,446,758	6.25	1.46	30.92	32.38	32.38	57.8
2019 ^{10/}	6,633,714	6.25	1.46	30.12	31.58	31.58	58.9
2020	6,826,092	6.25	1.46	28.86	30.32	30.32	60.8
2021 ^{11/}	7,024,048	6.25	9.00	21.75	30.75	30.75	68.5
2022	7,227,746	6.25	8.74	21.07	29.81	29.81	69.8
2023	7,437,350	6.25	8.49	20.43	28.92	28.92	71.0
2024	7,653,034	6.25	8.24	19.84	28.08	28.08	72.3
2025	7,874,972	6.25	8.01	19.27	27.28	27.28	73.5
2026	8,103,346	6.25	7.79	18.73	26.52	26.52	74.7
2027	8,338,343	6.25	7.58	18.19	25.77	25.77	75.9
2028	8,580,155	6.25	7.37	17.68	25.05	25.05	77.2

^{1/}Except as noted, the projection of contribution rates is based on the assumption that there are no changes in SERS statutory funding methodology, no changes in demographics or economic assumptions, no changes in benefit provisions, and no actuarial gains or losses on the actuarial value of assets that result from recognizing currently deferred gains or losses on the fair value of assets. All information on this page is based on statutory funding requirements.

^{2/}Rates and values are for the fiscal year beginning July 1 following the valuation year and do not include Benefits Completion Plan contributions.

^{3/}For Class AA and A-3 employees, as they comprise most of SERS membership.

^{4/}Act 2003-40 imposed a split amortization that recognized Cost of Living Adjustments and certain large gains over 10 years, while recognizing other gains and losses over 30 years. The effect was to suppress the unfunded liability rate for 10 years ending in 2011.

^{5/}Actuarial rate before floor and collar.

^{6/}Act 2010-46 amended the retirement code to set the employer contribution rate at 5.00% for fiscal year beginning July 1, 2010.

^{7/}Act 2010-120 amended the retirement code to collar increases to the employer contribution rate at 3.00% and 3.50% for fiscal years beginning July 1, 2011 and 2012, respectively. The employer contribution rate is collared at 4.50% for fiscal years beginning July 1, 2013, and thereafter until collar becomes unnecessary.

^{8/}Act 2010-120 amended the retirement code to place a permanent floor at employer normal cost after collars expire.

^{9/}Numbers are projected from 2018 – 2028 based on 2017 actuarial funding valuation.

^{10/}Act 2017-5 amended the retirement code to add two hybrid Defined Benefit (DB)/Defined Contribution (DC) plans and one straight 401(a) DC only plan effective January 1, 2019.

^{11/}Act 2017-5 amended the retirement code to change the funding method to traditional entry age.

Summary of Plan Provisions

December 31, 2017 (unaudited)

Benefit and Contribution Provisions

SERS makes provisions for retirement, disability, and death benefits for all state employees, except for those specifically excluded under section 5301 of the State Employees' Retirement Code, and certain other eligible groups. The major provisions may be summarized as follows:

Eligible Employees**Class A**

All regular state employees, employees of certain commissions and authorities, employees of state-owned educational institutions, and the Pennsylvania State University (unless such employees have joined the Public School Employees' Retirement System (PSERS), TIAA, or Alternative Retirement Program (ARP)) hired before July 1, 2001, who did not elect into the class AA membership as of December 31, 2001. This excludes judges and Magisterial District Judges who have elected class E-1 or class E-2.

Class AA

All regular state employees who are hired after June 30, 2001, and before January 1, 2011, and former class A state employees hired before July 1, 2001, who elected into class AA as of December 31, 2001. This includes employees of certain commissions and authorities, employees of state-owned educational institutions, and the Pennsylvania State University (unless such employees have joined PSERS, TIAA, or ARP), but excludes state police troopers, judges, Magisterial District Judges, and legislators with class D-4.

Class A-3

All regular state employees who enter SERS membership for the first time on or after January 1, 2011, and all legislators who became members on or after December 1, 2010; Capitol police and park rangers who became members after July 1, 2011;

and state police officers who became members after July 1, 2012, provided the member did not elect membership in the optional A-4 class within 45 days of becoming a member.

Class A-4

All members who would be class A-3 but elected A-4 within 45 days of becoming a member.

Class D-4

Legislators coming into service after June 30, 2001, and before December 1, 2010, who elect to be SERS members and legislators who elected class D-4 before July 1, 2001.

Class E-1

Judges who elect class E-1.

Class E-2

Magisterial District Judges who elect class E-2.

Age and Service Requirements for Superannuation (Normal Retirement)

(Full Formula Benefit)

Class AA/A

Age 60 with three years of service; except for members of the General Assembly, enforcement officers, correction officers, psychiatric security aids, and officers of the Delaware River Port Authority for whom the requirement is age 50 with three years of service. Members of class AA/A with 35 years of credited service are entitled to full formula benefits regardless of age. State police officers can retire on full benefits after age 50 or with 20 years of service. Capitol police and park rangers can retire on full benefits at age 50 with 20 years of Capitol police or park ranger service.

ACTUARIAL SECTION

Summary of Plan Provisions

December 31, 2017 (unaudited)

Class A-3/A-4

Age 65 for most members and age 55 for members of the General Assembly, enforcement officers, correction officers, psychiatric security aides, Delaware River Port Authority police officers, officers of the Pennsylvania State Police, and for Capitol police officers and park rangers with 20 or more years of credited service in the classification. Members of class A-3/A-4 are eligible for full formula benefits with 35 years of credited service with a superannuation score of 92.

Class D-4

Age 50, with three years of service.

Class E-1

Age 60, with three years of service; or 35 or more years of credited service, regardless of age.

Class E-2

Age 60, with three years of service; or 35 or more years of credited service, regardless of age.

Formula for Superannuation (Normal) Annuity

The maximum single-life annuity for most members is 2% of the highest three-year average salary of the member multiplied by years and fractions of credited service multiplied by the multiplier of the class of membership.

The annuity paid to a member shall not exceed the member's highest salary during any period of 12 consecutive months of creditable service.

The multiplier for each of the major classes are as follows:

Multiplier for Major Classes

Class	Multiplier	
A	1.00	For state police with 20 – 24.99 years of service, the benefit is 50% of the highest annual salary; with 25 or more years of service, the benefit is 75% of the highest annual salary.
AA	1.25	
A-3	1.00	
A-4	1.25	
D-4	1.50	
E-1	2.00	For each of the first 10 years of judicial service dropping to 1.5 for each subsequent year of judicial service.
E-2	1.50	For each year of judicial service.

NOTE: There are conditions under which long-service members or members retiring at advanced ages may receive somewhat larger benefits than those described above. Further, benefit limitations exist for most members of SERS.

2017

Statistical Section

The Statistical Section of SERS CAFR presents detailed information related to the financial statements, as well as highlights of actuarial valuations. The schedules in this section are classified into the following four categories: financial trends, revenue capacity, demographic and economic information, and operating information.

Financial Trends

The **Schedule of Trend Data** provides key financial, actuarial, and demographic data for 10 years ended December 31, 2017. This data includes items such as employer and member contribution rates; contributions received and benefits paid by SERS; values of assets and liabilities; and the number of annuitants, beneficiaries, and active members.

The **Schedule of Additions to Fiduciary Net Position** presents the member and employer contributions, as well as the net investment income/loss for the 10 years ended December 31, 2017. SERS investment returns have the most significant impact on fiduciary net position.

The **Schedule of Deductions from Fiduciary Net Position** presents the benefits, refunds of contributions, and administrative expenses for the 10 years ended December 31, 2017. Of these three categories, SERS benefit payments have the most significant impact on the total deductions from fiduciary net position.

The **Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type** presents the amount of benefit payments and refunds by type for the 10 years ended December 31, 2017. Most benefit types are either normal or early, which is determined by the number of years of service and/or age at retirement.

The **Schedule of Total Changes in Fiduciary Net Position** combines the additions to and deductions from fiduciary net position from the Schedule of Additions to Fiduciary Net Position and Schedule of Deductions from Fiduciary Net Position to arrive at net increase/decrease of changes in fiduciary net position for the 10 years ended December 31, 2017.

Revenue Capacity

The **Schedule of Investment Income** presents the details of the total net investment income/loss for the 10 years ended December 31, 2017. SERS has two external sources of revenue and one own-source (internal) of revenue. Employer contributions and member contributions, which information is provided for in the Schedule of Additions to Fiduciary Net Position, are the two external sources of revenue, and investment income is SERS own-source revenue. Since investment income/loss has the greatest impact, to SERS, this schedule provides more detail on the major components of the investment income/loss, which is also disclosed in total on the Schedule of Additions to Fiduciary Net Position.

Demographic and Economic Information

The **Schedule of Active Member Statistics** provides the total number of active members, as well as the average age, average service, and average salary by gender for the 10 years ended December 31, 2017.

STATISTICAL SECTION

Statistical Section Narrative

December 31, 2017 (unaudited)

Operating Information

The **Schedule of Retired Members by Type of Benefit** presents, for given benefit ranges, the total number of retirees, total monthly benefits, and total number of retirees by retirement type as of December 31, 2017.

The **Schedule of Retired Members by Option** presents, for given benefit ranges, the total number of retirees, total monthly benefits, and total number of retirees by retirement option as of December 31, 2017.

The **Schedule of Average Monthly Benefit Payments** presents, in five-year increments of credited service, the average monthly benefit, average final average salary, and number of retired members for the 10 years ended December 31, 2017.

The **Schedule of Average Annual Benefit Payments** presents, in five-year age increments and by gender, the average annual benefit for each major retirement type as of December 31, 2017.

The **Schedule of Employer/Agency Participation** provides the number of covered members and the corresponding percentage of participation for the five largest employers/agencies for the 10 years ended December 31, 2017, as well as a listing of additional employers/agencies participating with SERS as of December 31, 2017.

Sources: Unless otherwise noted, the information for these schedules is derived from the Financial Section and Actuarial Section of the Comprehensive Annual Financial Report for the relevant year.

Schedule of Trend Data

December 31, 2017 (unaudited)

Trend Data^{1/}

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Year-End Contribution Rates										
Employer ^{2/,3/A/}	33.24 %	29.51 % ^{7/}	25.01 % ^{7/}	20.53 % ^{7/}	16.05 % ^{7/}	11.59 % ^{7/}	8.01 % ^{7/}	5.01 % ^{8/}	4.01 % ^{8/}	4.04 % ^{8/}
Member	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %	6.25 %
Contributions										
Employer ^{2/}	\$1,897,404	\$1,622,123	\$1,360,431	\$1,084,104	\$794,911	\$565,621	\$391,749	\$273,083	\$253,250	\$235,288
Member	\$383,359	\$374,570	\$371,624	\$365,923	\$351,968	\$347,937	\$350,852	\$349,049	\$348,805	\$336,833
Average Annual Compensation	\$58,113	\$56,499	\$56,858	\$54,769	\$53,224	\$52,230	\$52,159	\$51,228	\$50,813	\$48,957
Fiduciary Net Position (FNP)	\$29,405,042	\$26,387,889	\$26,054,890	\$27,337,778	\$27,394,156	\$25,389,335	\$24,377,179	\$25,886,102	\$24,661,949	\$22,795,813
Total Pension Liability (TPL) ^{5/}	\$46,696,751	\$45,648,214	\$44,238,721	\$42,195,186	\$41,057,541	NA	NA	NA	NA	NA
FNP as % of TPL ^{5/}	63.0 %	57.8 %	58.9 %	64.8 %	66.7 %	NA	NA	NA	NA	NA
Net Pension Liability ^{5/}	\$17,291,709	\$19,260,325	\$18,183,831	\$14,857,408	\$13,663,385	NA	NA	NA	NA	NA
Actuarial Value of Assets ^{4/}	\$28,776,939	\$27,596,048	\$26,877,127	\$26,584,948	\$25,975,185	\$25,302,688	\$27,618,461	\$29,443,945	\$30,204,693	\$30,635,621
Actuarial Accrued Liability ^{4/}	\$48,439,403	\$47,518,964	\$46,328,929	\$44,750,670	\$43,874,580	\$43,055,564	\$42,281,862	\$39,179,594	\$35,797,017	\$34,437,396
Funded Ratio ^{4/}	59.4 %	58.1 %	58.0 %	59.4 %	59.2 %	58.8 %	65.3 %	75.2 %	84.4 %	89.0 %
Total Benefits and Refunds	\$3,303,543	\$3,227,548	\$3,080,861	\$2,946,465	\$2,844,285	\$2,674,133	\$2,705,263	\$2,449,253	\$2,273,372	\$2,204,579
Average Pension ^{6/}	\$28,352	\$27,722	\$27,042	\$26,426	\$25,839	\$25,083	\$24,448	\$23,491	\$22,695	\$21,965
Annuityants and Beneficiaries	129,473	127,338	124,689	122,249	120,052	117,061	115,342	111,713	109,639	108,146
Active Members	102,978	104,632	105,025	104,431	105,186	106,048	107,021	109,255	110,107	110,866

^{1/}All dollar amounts are in thousands, except Average Annual Compensation and Average Pension.

^{2/}Includes Benefits Completion Plan contribution.

^{3/}Employer rate represents total contributions as a percent of covered-employee payroll at December 31.

^{4/}Based on actuarial valuation for funding purposes as required by statute.

^{5/}Based on actuarial valuation for financial purposes as required by Governmental Accounting Standards Board Statement No. 67 (GASB 67). Information for 10 years will be displayed in the future to coincide with financial reporting requirements under GASB 67.

^{6/}Represents average annual pension only for members who have reached superannuation through age or service credits.

^{7/}Act 2010-120 set collars on the increase of the employer contribution rate at 3% effective July 1, 2011, 3.5% for July 1, 2012, and 4.5% every year thereafter until no longer needed.

^{8/}Act 2010-46 set the employer contribution rate at 5% effective July 1, 2010.

^{9/}Act 2007-8 established a permanent minimum employer contribution rate floor of 4%.

Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

Schedule of Additions to Fiduciary Net Position

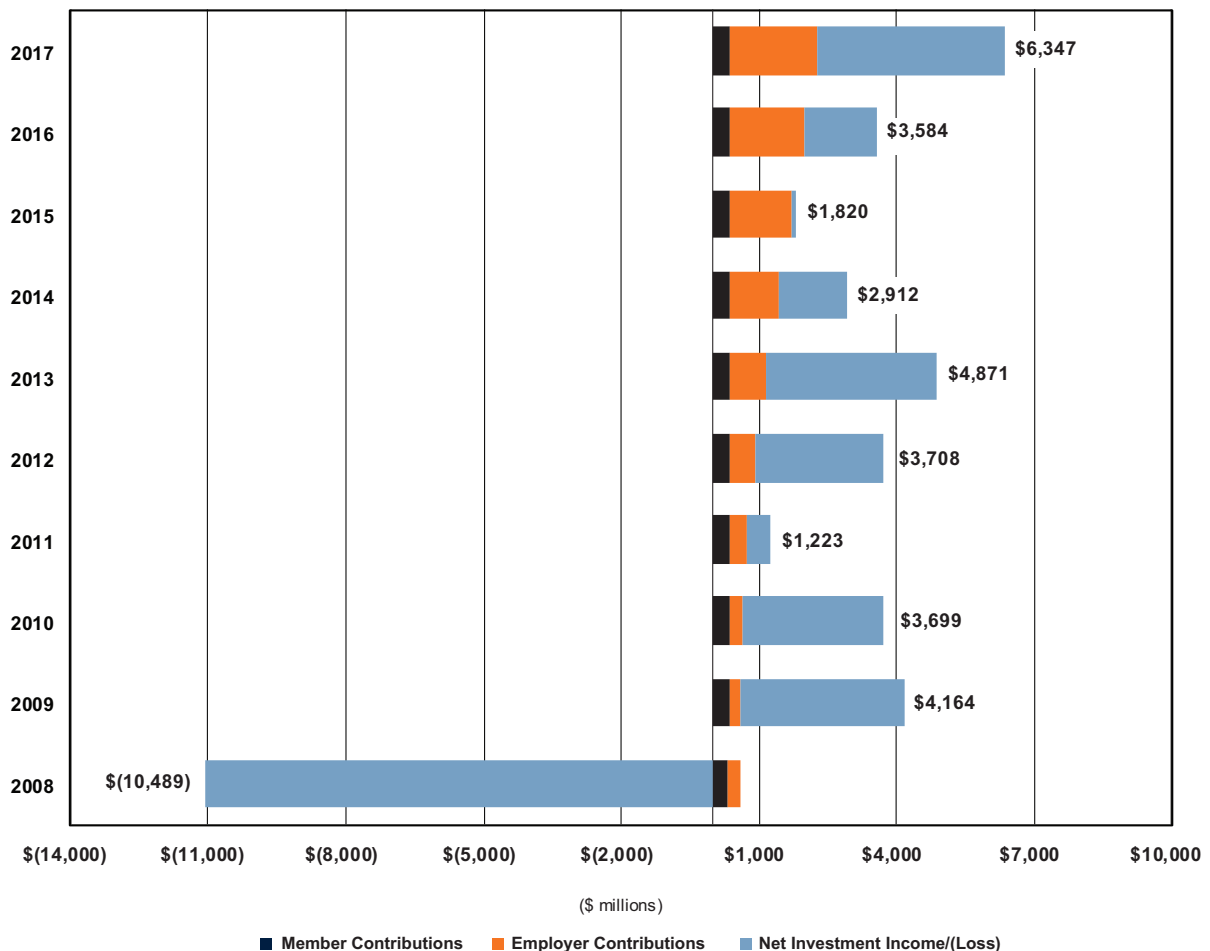
December 31, 2017 (unaudited)

Additions to Fiduciary Net Position

(\$ thousands)

Year Ended	Member Contributions	Employer Contributions		Net Investment Income/(Loss)	Total
		Dollar Amount	% of Covered-Employee Payroll ^{1/}		
2017	\$383,359	\$1,897,404	31.7%	\$4,066,055	\$6,346,818
2016	374,570	1,622,123	27.4	1,586,853	3,583,546
2015	371,624	1,360,431	22.8	87,990	1,820,045
2014	365,923	1,084,104	19.0	1,462,051	2,912,078
2013	351,968	794,911	14.2	3,724,038	4,870,917
2012	347,937	565,621	10.2	2,794,940	3,708,498
2011	350,852	391,749	7.0	480,445	1,223,046
2010	349,049	273,083	4.9	3,076,410	3,698,542
2009	348,805	253,250	4.5	3,561,526	4,163,581
2008	336,833	235,288	4.3	(11,061,207)	(10,489,086)

^{1/}Calculated by dividing employer contributions by total annualized compensation (covered-employee payroll) provided by actuary.



Source: Pennsylvania State Employees' Retirement System

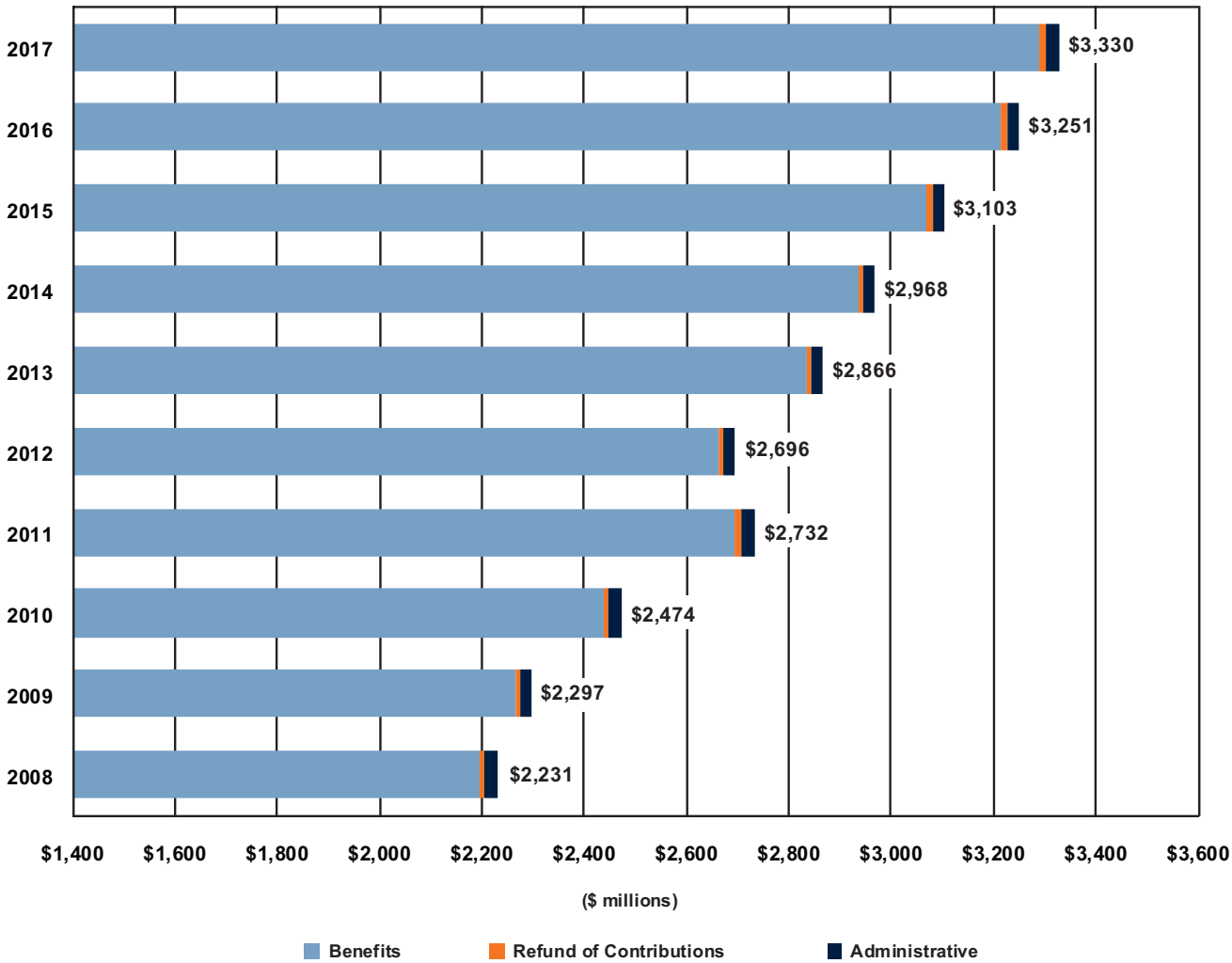
Schedule of Deductions from Fiduciary Net Position

December 31, 2017 (unaudited)

Deductions from Fiduciary Net Position

(\$ thousands)

Year Ended	Benefits	Refund of Contributions	Administrative Expenses	Total
2017	\$3,287,923	\$15,620	\$26,122	\$3,329,665
2016	3,214,440	13,108	22,999	3,250,547
2015	3,069,328	11,533	22,072	3,102,933
2014	2,936,591	9,874	21,991	2,968,456
2013	2,833,676	10,609	21,811	2,866,096
2012	2,664,242	9,891	22,209	2,696,342
2011	2,695,732	9,531	26,706	2,731,969
2010	2,440,246	9,007	25,136	2,474,389
2009	2,265,404	7,968	24,073	2,297,445
2008	2,195,206	9,373	26,720	2,231,299



Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

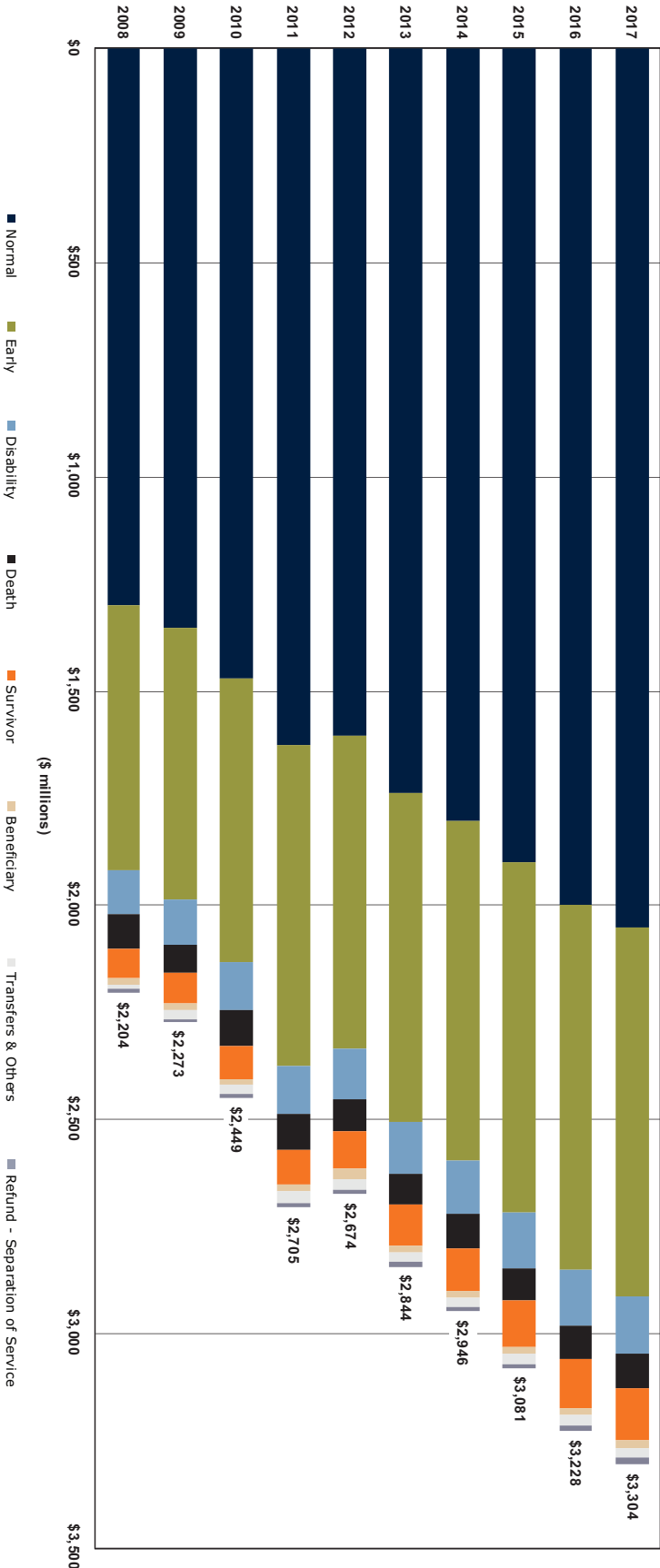
Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type

December 31, 2017 (unaudited)

Benefit and Refund Deductions from Fiduciary Net Position by Type

(\$ thousands)

Year Ended	Retirement										Refunds		
	Normal	Early	Disability	Death	Survivor	Beneficiary	Transfers & Other	Total Benefit Deductions	Separation of Service	Death	Total Refunds		
2017	\$2,051,059	\$859,554	\$135,707	\$80,322	\$121,511	\$16,510	\$23,260	\$3,287,923	\$15,372	\$248	\$15,620		
2016	1,997,704	851,302	132,833	76,455	114,465	15,976	25,705	3,214,440	12,861	247	13,108		
2015	1,900,468	816,595	129,810	75,845	106,748	16,066	23,796	3,069,328	11,302	231	11,533		
2014	1,803,669	789,723	126,457	78,580	100,527	15,510	22,125	2,936,591	9,723	151	9,874		
2013	1,737,107	769,385	121,640	71,216	93,919	17,271	23,138	2,833,676	10,318	291	10,609		
2012	1,604,985	728,719	116,914	75,254	88,055	26,497	23,818	2,664,242	9,673	218	9,891		
2011	1,626,233	749,180	112,575	82,123	82,467	15,093	28,061	2,695,732	9,271	260	9,531		
2010	1,470,101	663,004	109,506	84,878	77,384	14,039	21,334	2,440,246	8,693	314	9,007		
2009	1,351,710	633,880	105,207	65,873	72,466	14,143	22,125	2,265,404	7,824	144	7,968		
2008	1,300,312	618,027	102,250	81,728	67,623	14,209	11,057	2,195,206	9,222	151	9,373		



Source: Pennsylvania State Employees' Retirement System

Schedule of Total Changes in Fiduciary Net Position

December 31, 2017 (unaudited)

Total Changes in Fiduciary Net Position

(\$ thousands)

Year Ended	Additions to Fiduciary Net Position				Deductions from Fiduciary Net Position				Net Increase/ (Decrease)
	Member Contributions	Employer Contributions	Net Investment Income/ (Loss)	Total Additions	Benefits	Refund of Contributions	Administrative Expenses	Total Deductions	
2017	\$383,359	\$1,897,404	\$4,066,055	\$6,346,818	\$3,287,923	\$15,620	\$26,122	\$3,329,665	\$3,017,153
2016	374,570	1,622,123	1,586,853	3,583,546	3,214,440	13,108	22,999	3,250,547	332,999
2015	371,624	1,360,431	87,990	1,820,045	3,069,328	11,533	22,072	3,102,933	(1,282,888)
2014	365,923	1,084,104	1,462,051	2,912,078	2,936,591	9,874	21,991	2,968,456	(56,378)
2013	351,968	794,911	3,724,038	4,870,917	2,833,676	10,609	21,811	2,866,096	2,004,821
2012	347,937	565,621	2,794,940	3,708,498	2,664,242	9,891	22,209	2,696,342	1,012,156
2011	350,852	391,749	480,445	1,223,046	2,695,732	9,531	26,706	2,731,969	(1,508,923)
2010	349,049	273,083	3,076,410	3,698,542	2,440,246	9,007	25,136	2,474,389	1,224,153
2009	348,805	253,250	3,561,526	4,163,581	2,265,404	7,968	24,073	2,297,445	1,866,136
2008	336,833	235,288	(11,061,207)	(10,489,086)	2,195,206	9,373	26,720	2,231,299	(12,720,385)

Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

Schedule of Investment Income

December 31, 2017 (unaudited)

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Investment Income										
(\$ thousands)										
Investment income/(loss)										
From investing activities										
Net appreciation/(depreciation) in fair value of investments ^{1/}	\$3,710,739	\$1,233,501	\$(216,817)	\$1,155,301	\$3,476,349	\$2,268,730	\$614,117	\$2,211,065	\$2,456,209	\$(9,979,685)
Commingled funds appreciation/(depreciation) and income ^{1/}	NA	NA	NA	NA	NA	275,103	(267,177)	810,147	1,063,673	(1,377,568)
Interest	126,728	126,219	130,616	142,434	120,815	144,431	165,082	146,995	149,040	342,163
Dividends	260,013	273,733	223,927	246,528	204,214	190,733	78,823	61,964	69,400	154,779
Real estate income	95,533	89,327	108,844	93,167	99,314	97,641	82,707	73,355	73,561	109,523
Miscellaneous income	3,713	27,381	3,426	1,799	668	4,583	2,316	6,471	3,499	5,969
Total investing activities income/(loss)	4,196,726	1,750,161	249,996	1,639,229	3,901,360	2,981,221	675,868	3,309,997	3,815,382	(10,744,819)
Investment expenses	(135,079)	(167,712)	(166,610)	(186,527)	(181,042)	(189,722)	(197,505)	(235,826)	(260,376)	(310,454)
Net income/(loss) from investing activities	4,061,647	1,582,449	83,386	1,452,702	3,720,318	2,791,499	478,363	3,074,171	3,555,006	(11,055,273)
From securities lending activities										
Securities lending income	4,883	4,893	5,105	9,917	4,326	3,953	2,376	2,511	7,092	41,319
Securities lending expenses	(475)	(489)	(501)	(568)	(606)	(512)	(294)	(272)	(572)	(47,253)
Net income/(loss) from securities lending activities	4,408	4,404	4,604	9,349	3,720	3,441	2,082	2,239	6,520	(5,934)
Net investment income/(loss)	\$4,066,055	\$1,586,853	\$87,990	\$1,462,051	\$3,724,038	\$2,794,940	\$480,445	\$3,076,410	\$3,561,526	\$(11,061,207)

^{1/}In 2014, SERS began to report commingled funds as part of net appreciation/(depreciation) in fair value of investments. Certain 2013 figures were restated to conform to 2014 reporting.

Source: Pennsylvania State Employees' Retirement System

Schedule of Active Member Statistics

December 31, 2017 (unaudited)

Active Member Statistics

Year Ended	Male			Female			Total Number of Active Members
	Average Age	Average Service	Average Salary	Average Age	Average Service	Average Salary	
2017	46.23	11.79	\$62,739	46.61	10.97	\$52,049	102,978
2016	46.15	11.73	60,965	46.51	10.95	50,629	104,632
2015	46.33	11.94	61,639	46.57	11.11	50,525	105,205
2014	46.55	12.12	59,228	46.77	11.44	48,825	104,431
2013	46.63	12.19	57,416	46.92	11.64	47,583	105,186
2012	46.64	12.23	56,118	46.90	11.79	46,981	106,048
2011	46.55	12.17	56,008	46.70	11.70	46,992	107,021
2010	46.58	12.36	54,983	46.71	11.91	46,206	109,255
2009	46.50	12.35	54,414	46.52	12.00	45,987	110,107
2008	46.23	12.21	52,536	46.18	11.79	44,176	110,866

Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

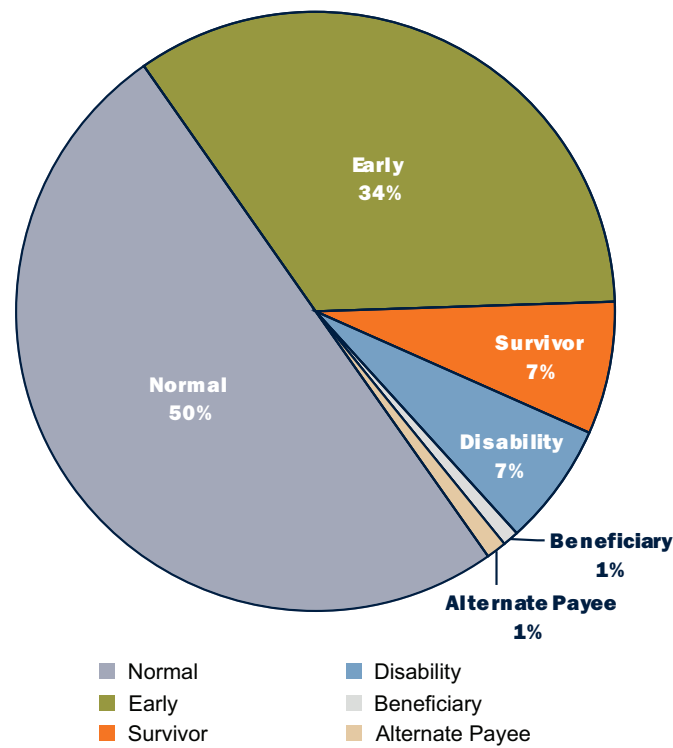
Schedule of Retired Members by Type of Benefit

December 31, 2017 (unaudited)

Retired Members by Type of Benefit

Amount of Monthly Benefits	Total Monthly Benefits ^{4/}	Total Number of Retirees	Type of Benefit					
			Normal	Disability	Early	Beneficiary	Survivor	Alternate Payee
≤ \$500	\$6,643,693	27,516	5,859	508	17,157	446	3,042	504
> 500 to 1,000	16,130,418	21,673	9,953	3,479	5,002	316	2,486	437
> 1,000 to 1,500	21,730,390	17,565	9,262	2,137	4,223	135	1,531	277
> 1,500 to 2,000	24,605,899	14,108	7,582	1,116	4,397	82	813	118
> 2,000 to 2,500	26,698,990	11,913	6,832	613	3,837	48	543	40
> 2,500 to 3,000	25,930,312	9,463	5,878	355	2,884	27	304	15
> 3,000 to 3,500	25,903,711	7,993	5,286	184	2,297	19	194	13
> 3,500 to 4,000	21,090,692	5,650	4,021	96	1,406	14	111	2
> 4,000 to 4,500	17,272,994	4,083	3,064	53	883	12	71	NA
> 4,500 to 5,000	12,952,564	2,736	2,111	25	541	9	48	2
> 5,000 to 5,500	10,734,597	2,049	1,431	13	544	7	53	1
> 5,500 to 6,000	8,608,936	1,500	1,028	6	438	3	25	NA
> 6,000	24,135,770	3,224	2,489	4	679	6	45	1
Totals	\$242,438,966	129,473	64,796	8,589	44,288	1,124	9,266	1,410

^{4/}Does not include supplemental payments and transfers.



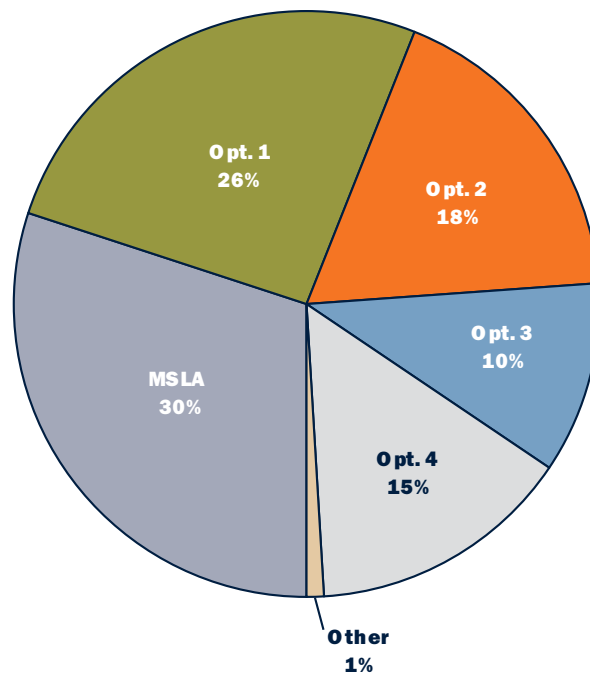
Source: Pennsylvania State Employees' Retirement System

Schedule of Retired Members by Option

December 31, 2017 (unaudited)

Retired Members by Option

Amount of Monthly Benefits	Total Monthly Benefits	Total Number of Retirees	Option Selected					
			MSLA	Opt. 1	Opt. 2	Opt. 3	Opt. 4	Other
≤ \$500	\$6,643,693	27,516	6,309	11,219	5,820	1,653	2,040	475
> 500 to 1,000	16,130,418	21,673	7,414	5,304	4,312	2,103	2,190	350
> 1,000 to 1,500	21,730,390	17,565	5,416	4,147	3,566	1,873	2,411	152
> 1,500 to 2,000	24,605,899	14,108	4,355	3,299	2,463	1,674	2,221	96
> 2,000 to 2,500	26,698,990	11,913	3,521	2,635	1,997	1,487	2,220	53
> 2,500 to 3,000	25,930,312	9,463	2,911	1,982	1,478	1,205	1,854	33
> 3,000 to 3,500	25,903,711	7,993	2,430	1,743	1,153	1,046	1,601	20
> 3,500 to 4,000	21,090,692	5,650	1,945	1,111	700	793	1,085	16
> 4,000 to 4,500	17,272,994	4,083	1,381	742	521	550	876	13
> 4,500 to 5,000	12,952,564	2,736	890	458	340	386	653	9
> 5,000 to 5,500	10,734,597	2,049	656	327	245	242	572	7
> 5,500 to 6,000	8,608,936	1,500	503	232	160	204	398	3
> 6,000	24,135,770	3,224	1,151	448	352	475	792	6
Totals	\$242,438,966	129,473	38,882	33,647	23,107	13,691	18,913	1,233



- MSLA - Maximum Single-Life Annuity
- Opt. 1 - Beneficiary receiving remainder of present value when member dies
- Opt. 2 - Survivor receiving 100% of the member's annuity when member dies
- Opt. 3 - Survivor receiving 50% of the member's annuity when member dies
- Opt. 4 - Member designs a different plan approved by SERS not covered under the above options
- Other - Death benefit or domestic relations order

Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

Schedule of Average Monthly Benefit Payments

December 31, 2017 (unaudited)

Average Monthly Benefit Payments^{1/}

Retirement Effective Dates	Years of Credited Service						
	< 5	5-9	10-14	15-19	20-24	25-29	30+
Period 1/1/2017 to 12/31/2017							
Average monthly benefit	\$226	\$488	\$928	\$1,490	\$2,352	\$3,853	\$4,495
Average final average salary	\$36,612	\$43,755	\$51,691	\$56,721	\$65,980	\$83,170	\$78,194
Number of retired members	46	681	820	526	788	1,033	1,166
Period 1/1/2016 to 12/31/2016							
Average monthly benefit	\$331	\$472	\$987	\$1,574	\$2,259	\$4,116	\$4,349
Average final average salary	\$48,086	\$45,428	\$51,515	\$57,976	\$63,844	\$85,896	\$75,240
Number of retired members	53	777	786	528	845	1,209	1,332
Period 1/1/2015 to 12/31/2015							
Average monthly benefit	\$308	\$433	\$896	\$1,369	\$2,279	\$3,396	\$4,214
Average final average salary	\$43,955	\$44,272	\$48,934	\$53,496	\$64,173	\$75,168	\$72,142
Number of retired members	71	924	744	515	772	1,036	1,454
Period 1/1/2014 to 12/31/2014							
Average monthly benefit	\$300	\$453	\$892	\$1,462	\$2,177	\$3,256	\$4,061
Average final average salary	\$43,879	\$43,513	\$48,310	\$55,258	\$61,462	\$72,587	\$70,590
Number of retired members	91	963	814	473	912	1,018	1,344
Period 1/1/2013 to 12/31/2013							
Average monthly benefit	\$262	\$399	\$845	\$1,466	\$2,178	\$3,408	\$4,036
Average final average salary	\$40,035	\$42,368	\$47,413	\$55,071	\$61,526	\$74,649	\$69,812
Number of retired members	68	947	779	496	814	1,049	1,451
Period 1/1/2012 to 12/31/2012							
Average monthly benefit	\$261	\$406	\$823	\$1,495	\$2,101	\$3,464	\$4,073
Average final average salary	\$38,197	\$42,106	\$46,477	\$54,120	\$58,807	\$74,455	\$70,238
Number of retired members	94	899	724	535	680	908	1,184
Period 1/1/2011 to 12/31/2011							
Average monthly benefit	\$263	\$445	\$843	\$1,430	\$2,095	\$2,994	\$3,829
Average final average salary	\$36,895	\$44,808	\$46,588	\$52,687	\$58,928	\$67,793	\$66,989
Number of retired members	103	851	716	769	856	1,134	2,276
Period 1/1/2010 to 12/31/2010							
Average monthly benefit	\$254	\$398	\$788	\$1,332	\$2,109	\$2,938	\$3,818
Average final average salary	\$39,114	\$41,128	\$44,562	\$50,607	\$57,784	\$66,053	\$65,579
Number of retired members	75	755	505	646	712	846	1,662
Period 1/1/2009 to 12/31/2009							
Average monthly benefit	\$209	\$374	\$740	\$1,337	\$1,936	\$2,919	\$3,767
Average final average salary	\$32,925	\$38,184	\$43,520	\$50,161	\$55,113	\$65,193	\$64,685
Number of retired members	60	543	448	545	539	710	1,287
Period 1/1/2008 to 12/31/2008							
Average monthly benefit	\$198	\$340	\$729	\$1,266	\$1,903	\$2,968	\$3,782
Average final average salary	\$30,280	\$39,066	\$45,753	\$48,823	\$55,471	\$65,893	\$65,569
Number of retired members	64	646	484	788	586	705	938

^{1/}Includes normal retirement, early retirement, and disability benefits for new retirees in the years listed.

Source: Pennsylvania State Employees' Retirement System

Schedule of Average Annual Benefit Payments

December 31, 2017 (unaudited)

Average Annual Benefit Payments

Age	Normal		Early		Disability		Beneficiary and Survivor	
	Male	Female	Male	Female	Male	Female	Male	Female
Under 25	NA	NA	NA	NA	NA	NA	\$7,765	\$8,394
25-29	NA	NA	\$881	\$652	\$15,396	NA	9,175	9,173
30-34	NA	NA	1,285	971	14,644	\$12,522	10,704	7,285
35-39	NA	NA	1,731	1,371	14,978	13,385	7,492	17,116
40-44	NA	NA	2,782	1,919	17,742	13,802	15,821	9,992
45-49	NA	NA	24,392	4,437	18,109	15,263	9,228	10,701
50-54	\$49,017	\$33,916	31,405	8,824	19,590	15,797	6,941	12,742
55-59	42,502	42,261	23,951	15,200	20,110	17,248	9,118	12,830
60-64	36,664	34,068	23,291	17,721	18,183	16,493	11,814	13,978
65-69	31,634	28,737	23,026	16,842	16,386	14,933	11,439	15,605
70-74	31,054	24,556	23,196	15,755	13,269	13,290	13,329	15,492
75-79	30,383	20,903	17,625	11,994	10,798	9,766	10,479	15,161
80-84	25,762	16,598	14,940	9,491	8,729	8,576	10,372	12,816
85-89	22,365	12,480	15,368	9,196	10,220	7,685	9,772	11,210
90 and over	18,817	10,333	13,514	7,651	10,063	7,196	8,181	8,885
Total Average	\$31,216	\$24,412	\$21,679	\$13,579	\$16,583	\$14,548	\$10,815	\$13,228

	Normal	Early	Disability	Beneficiary and Survivor
Average Pension	\$28,352	\$17,751	\$15,521	\$12,947
Average Age	72.3	64.7	63.7	74.6

Source: Pennsylvania State Employees' Retirement System

STATISTICAL SECTION

Schedule of Employer/Agency Participation

December 31, 2017 (unaudited)

Schedule of Employer/Agency Participation - 5 Largest

- Number of active members

% - Percentage of total active members

Year Ended	Department of Human Services		Department of Corrections		Department of Transportation		Pennsylvania State University		Pennsylvania State Police		Active Members for 5 Largest Employers/Agencies	
	#	%	#	%	#	%	#	%	#	%	#	%
2017 ^{1/}	16,624	16.14	15,435	14.99	12,221	11.87	6,308	6.13	6,255	6.07	56,843	55.20
2016	17,205	16.44	15,752	15.05	12,312	11.77	6,367	6.09	6,219	5.94	57,855	55.29
2015	17,085	16.27	15,362	14.63	12,434	11.84	6,111	5.82	6,459	6.15	57,451	54.70
2014	16,870	16.15	14,916	14.28	12,325	11.80	6,123	5.86	6,323	6.05	56,557	54.16
2013	16,668	15.85	15,529	14.76	12,656	12.03	6,210	5.90	6,084	5.78	57,147	54.33
2012	16,764	15.81	15,682	14.79	12,729	12.00	6,368	6.00	6,012	5.67	57,555	54.27
2011	17,087	15.97	15,764	14.73	12,826	11.98	6,532	6.10	6,033	5.64	58,242	54.42
2010	18,007	16.48	16,133	14.77	12,427	11.37	6,653	6.09	6,084	5.57	59,304	54.28
2009	18,201	16.53	16,174	14.69	12,548	11.40	6,608	6.00	6,102	5.54	59,633	54.16
2008	18,618	16.79	16,075	14.50	12,494	11.27	6,468	5.83	6,222	5.61	59,877	54.01

Numbers may not add due to rounding.

^{1/}The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 65 agencies and when everything is evaluated separately, SERS has a total of 102 participating employers/agencies.

Source: Pennsylvania State Employees' Retirement System

Schedule of Employer/Agency Participation

As of December 31, 2017 (unaudited)

Remaining Employers/Agencies^{1/}

Administrative Office of Pennsylvania Courts	Joint Legislative Conservation Committee
Bloomsburg University Community Activities	Joint State Government Commission
Board of Probation and Parole	Kutztown University Student Services, Inc.
Bucks County Community College	Lancaster-Lebanon Intermediate Unit
Bucks County Health Department	Legislative Budget and Finance Committee
California University Student Association, Inc.	Legislative Data Processing Center
Capitol Preservation Committee	Legislative Reference Bureau
Center for Rural Pennsylvania	Lehigh Carbon Community College
Central Susquehanna Intermediate Unit	Liquor Control Board
Chester County Health Department	Local Government Commission
Clarion Students' Association	Luzerne County Community College
Community College of Allegheny County	Mansfield College Community Services, Inc.
Community College of Philadelphia	Milk Marketing Board
Delaware County Community College	Millersville University Student Services, Inc.
Delaware River Joint Toll Bridge Commission	Montgomery County Community College
Delaware River Port Authority	Northampton Community College
Delaware Valley Regional Planning Commission	Office of Attorney General
Department of Aging	Office of Liquidations and Rehabilitations
Department of Agriculture	Office of the Governor
Department of Banking and Securities	Office of the Lieutenant Governor
Department of Community & Economic Development	Pennsylvania College of Technology
Department of Conservation and Natural Resources	Pennsylvania Convention Center
Department of Drug and Alcohol Programs	Pennsylvania Emergency Management Agency
Department of Education	Pennsylvania Gaming Control Board
Department of Environmental Protection	Pennsylvania Health Care Cost Containment Council
Department of General Services	Pennsylvania Higher Education Assistance Agency
Department of Health	Pennsylvania Highlands Community College
Department of Labor and Industry	Pennsylvania Housing Finance Agency
Department of Military and Veterans Affairs	Pennsylvania Infrastructure Investment Authority
Department of Revenue	Pennsylvania Municipal Retirement System
Department of State	Pennsylvania Port Authority
Department of the Auditor General	Pennsylvania State Employees' Retirement System
East Stroudsburg University Student Activity Association, Inc.	Pennsylvania State Senate
Edinboro University Services, Inc.	Pennsylvania Turnpike Commission
Environmental Hearing Board	Port Authority Transit Corporation
Erie County Department of Health	Public School Employees' Retirement System
Executive Offices	Public Utility Commission
Fish and Boat Commission	Reading Area Community College
Game Commission	Shippensburg University Student Services, Inc.
Harrisburg Area Community College	Slippery Rock Student Government Association, Inc.
Historical and Museum Commission	State Civil Service Commission
House Democratic Appropriations Committee	State Ethics Commission
House of Representatives	State Public School Building Authority
House Republican Appropriations Committee	State System of Higher Education
Independent Fiscal Office	Susquehanna River Basin Commission
Independent Regulatory Review Commission	Thaddeus Stevens College of Technology
Indiana University Student Co-op Association	Treasury Department
Insurance Department	West Chester University Student Services, Inc.
	Westmoreland County Community College

^{1/}The membership includes 38 employers and the commonwealth is classified as its largest employer. The commonwealth is comprised of 65 agencies and when everything is evaluated separately, SERS has a total of 102 participating employers/agencies.

State Employees' Retirement System

30 N 3rd St, Suite 150

Harrisburg, PA 17101-1716

1.800.633.5461

www.SERS.pa.gov