

**2016**

# **Comprehensive Annual Financial Report**

With Independent Auditors' Report for Fiscal Years Ended  
December 31, 2016 and 2015

Commonwealth of Pennsylvania  
State Employees' Retirement System

A Component Unit of the Commonwealth of Pennsylvania



2016

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With Independent Auditors' Report for Fiscal Years Ended  
December 31, 2016 and 2015

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

**David E. Durbin**

Executive Director

**Anthony J. Faiola**

Chief Financial Officer

**State Employees' Retirement System**

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in Financial  
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Presented to

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

For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**December 31, 2015**

A handwritten signature in black ink, reading "Jeffrey R. Egan". The signature is written in a cursive, flowing style.

Executive Director/CEO



Public Pension Coordinating Council

***Public Pension Standards Award  
For Funding and Administration  
2016***

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". The signature is written in a cursive style with a large, prominent 'A'.

Alan H. Winkle  
Program Administrator

July 28, 2017

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 2016 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 2016, KPMG 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 2016.

As of December 31, 2016, SERS had approximately \$26.4 billion after paying out \$3.2 billion in retirement benefits to more than 127,000 retirees and beneficiaries; \$2.9 billion – more than 90% – was paid to people living in Pennsylvania, stimulating local economies.

In 2016, SERS served 103 agencies/employers and approximately 240,000 total members. Last year, SERS welcomed nearly 6,700 new retirees whose average annual benefit was about \$28,700. It is important to note that as is the case with mature pension plans, newly welcomed retirees tend to have higher benefits than those leaving the rolls. In 2016, approximately 4,000 retirees with average annual benefits of about \$15,000 were removed from the rolls.

Last year, SERS earned nearly \$1.6 billion through investment earnings net of all fees and expenses, falling slightly short of meeting the 7.5% assumed long-term rate of return that was in place during the year. In April 2017, SERS Board lowered the assumed long-term rate of return to 7.25% for the 2016 actuarial valuation. With the positive trend to higher returns, 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, 2016, the resulting net pension liability was \$19.3 billion. SERS plan fiduciary net position as a percentage of the total pension liability was 57.8%. Based on the actuarial methods used for funding purposes as of December 31, 2016, the unfunded actuarial accrued liability was \$19.9 billion. SERS funded ratio was 58.1%. 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.

Fiscal year 2017-18 will mark the first time since legislatively-mandated contribution rates were enacted that Pennsylvania will be paying uncollared contributions to the 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 \$68 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 SERS nearly 200 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 and 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,



David E. Durbin  
Executive Director



Anthony J. Faiola, CPA  
Chief Financial Officer

# INTRODUCTORY SECTION

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## SERS Board

December 31, 2016

**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

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## SERS Board

December 31, 2016

**Honorable Vincent J. Hughes**  
State Senator



**Honorable Charles T. McIlhinney, Jr.**  
State Senator



**Mr. Michael V. Puppio, Jr.**  
Attorney



**Honorable Timothy A. Reese**  
State Treasurer



**Mr. T. Terrance Reese**  
President, Overly Manufacturing



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



# INTRODUCTORY SECTION

## SERS Mission, Vision, and Organizational Chart

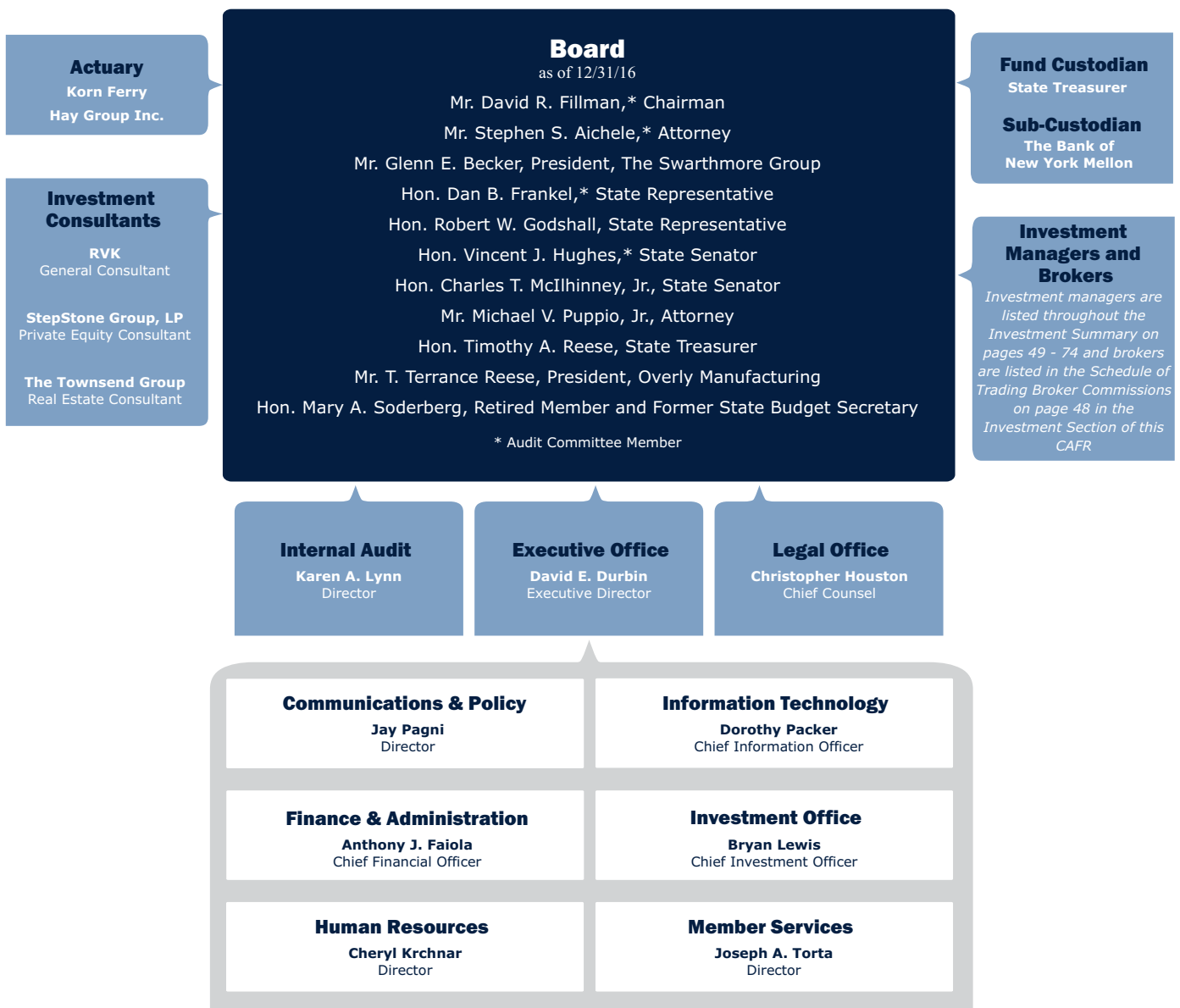
### Mission

To provide retirement benefits and services to our members through sound administration and prudent investments.

### Vision

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



**2016**

**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, 2016 and 2015, 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, 2016 and 2015, 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.



### **Emphasis of Matter**

As discussed in Note 2 to the financial statements, SERS adopted the provisions of Governmental Accounting Standards Board (GASB) Statement No. 72, *Fair Value Measurement and Application*. Our opinion is not modified with respect to this matter.

### **Other Matters**

#### *Required Supplementary Information*

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3-11 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, 2016. 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  
July 28, 2017

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

This section presents Management's Discussion and Analysis of the Pennsylvania State Employees' Retirement System's (SERS) financial statements as well as the significant events and conditions that affected the operations and performance of SERS during the years ended December 31, 2016, 2015, and 2014.

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, 2016 and 2015 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 financial statements. The notes provide information about SERS organization, benefits, and contributions; determination of asset values; the 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.

### Adoption of Accounting Standard

The Governmental Accounting Standards Board (GASB) issued GASB Statement No. 72, *Fair Value Measurement and Application* (GASB 72), the provisions of which are reflected in these financial statements. Since the requirements of GASB 72 were effective for financial statements for fiscal years beginning after June 15, 2015, the first year that GASB 72 was applicable to SERS was 2016. The adoption of GASB 72 did not impact the fiduciary net position of SERS; however, certain changes to note disclosures for both years presented have been incorporated to comply with this new statement. Key changes in the notes to basic financial statements include additional information about the methods used to value investments. GASB 72 requires the use of valuation techniques, which are appropriate under the circumstances, and are either a market, cost, or income approach. For investments measured at fair value, GASB 72 establishes a hierarchy of inputs used to measure fair value consisting of three levels.

# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

### 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 \$0.3 billion for the year ended December 31, 2016 compared to a decrease of approximately \$1.3 billion for the year ended December 31, 2015, as reflected in the table on page 11.

### Member Contributions

Member contributions were approximately \$375 million for the year ended December 31, 2016, \$372 million for the year ended December 31, 2015, and \$366 million for the year ended December 31, 2014. There was a slight decrease in gross salaries, which were approximately \$5.9 billion for 2016 and \$6.0 billion for 2015, and a decrease of 393 in active membership as of year-end 2016. However, there were approximately 900 more employees electing class A-4 that contribute 9.3% of gross salary, compared to the decrease of approximately 500 employees that were contributing 5.0% of gross salary. In addition, there were approximately 600 fewer employees contributing 6.25% 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 \$1.6 billion, \$1.4 billion, and \$1.1 billion for the years ended December 31, 2016, 2015, and 2014, respectively. The 2016 contributions represented an increase of \$262 million – or 19.2% – compared to 2015. The growth was due to an increase in the composite employer rate to 29.5% from 25.0% on July 1, 2016, (excluding the Benefits Completion Plan (BCP) as described in note 3 to the financial statements). The \$276 million – or 25.5% – growth

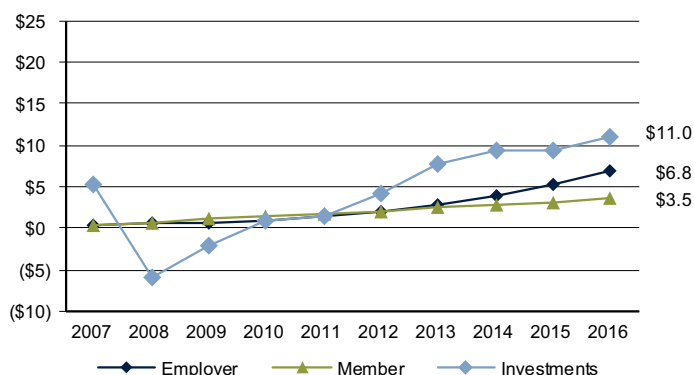
in 2015 from 2014 was due to an increase in the employer rate to 25.0% from 20.5% on July 1, 2015.

Since 2005, Pennsylvania law has 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, FY 17/18 will be the first year since legislatively mandated contribution rates were enacted through Act 2010-120 that collars are no longer needed and employers will be paying the uncollared actuarially required rate. The FY 17/18 composite employer contribution rate including the BCP is going to be 33.24% of payroll. Consequently as a result of the high employer contribution rates, SERS has been tasked with providing data and technical assistance to Pennsylvania policy makers as they explore possible changes to the State Employees' Retirement Code (SERC).

From 2007 through 2016, employer contributions totaled \$6.8 billion – or 32% – of total additions to fiduciary net position, compared to \$3.5 billion – or 17% – of total additions attributed to member contributions, and \$11.0 billion – or 51% – of total additions attributed to investment earnings as illustrated in the following charts.

### 10-Year Cumulative Additions to Fiduciary Net Position

(\$ billions)

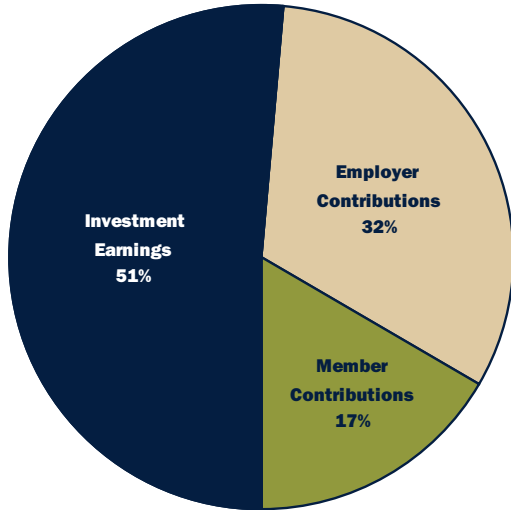


**Management’s Discussion and Analysis**

December 31, 2016 and 2015 (unaudited)

**Additions by Component as a Percent of Total Additions**

(10-Year History)



Suppressed employer contributions have provided budgetary relief to commonwealth agencies and the taxpayers of Pennsylvania. However, the short-term benefits 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.

**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 6.4%, 0.4%, and 6.4% for the years 2016, 2015, and 2014, respectively. SERS investment returns, net of manager fees, on a time-weighted basis, were 6.5%, 0.4%, and 6.4% for the years 2016, 2015, and 2014, respectively.

Positive investment performance contributed approximately \$1.6 billion, \$88 million, and \$1.5 billion to net investment income for the years 2016, 2015, and 2014, respectively. Strong performance in the Global Public Equity asset class helped the overall SERS Fund performance for 2016.

Biennially, SERS reviews and modifies its strategic investment plan, as necessary. The ultimate objective of SERS *2016-2017 Strategic Investment Plan* and *2014-2015 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 plans 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 board. 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 the investments.



# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

Investment expenses, which include fees paid to managers, were \$168 million and \$167 million for the years ended December 31, 2016 and 2015, respectively.

### Benefits, Refunds, and Expenses

Benefit payments to annuitants are the most significant recurring deductions from fiduciary net position. During 2016 and 2015, SERS paid out approximately \$3.2 billion and \$3.1 billion in benefits and refunds, respectively.

There were approximately 6,700 new retirees added to the annuity payroll in 2016, with an average annual benefit of \$28,700. There were approximately 6,700 new retirees added to the annuity payroll in 2015, with an average annual benefit of \$26,100. As is typical in mature retirement plans, new retirees in 2016 received a much higher annual benefit than those removed from the annuity payroll.

There were more than 4,000 and 4,300 retirees removed from the rolls with an average annual benefit of \$15,000 and \$14,600 in 2016 and 2015, respectively. The benefits expense on the financial statements consists of two primary components: monthly annuity payments and supplemental payments. Most of the supplemental payments are paid to retiring members who joined SERS before January 1, 2011, and choose to withdraw their contributions and interest at retirement. Such withdrawals reduce the retirees' payments over their remaining life. Supplemental payments were \$472 million and \$462 million for 2016 and 2015, 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 benefits from the lower costs that are part of Act 2010-120 as detailed above, and SERS expects benefit expenses to rise steadily because the number of retirees added to the rolls is projected to be about 70% higher than the number of retirees removed from the rolls. Additionally, despite the benefit reductions, new retirees' monthly annuities are projected to be approximately 90% higher than the annuities of those being removed.

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		
	2016	2015	2014
Monthly annuity payroll (\$ millions)	\$233	\$222	\$213
Retirees	127,338	124,689	122,249

SERS administrative expenses represented 0.1% of fiduciary net position in 2016 and 2015. All expenses were within budget.

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

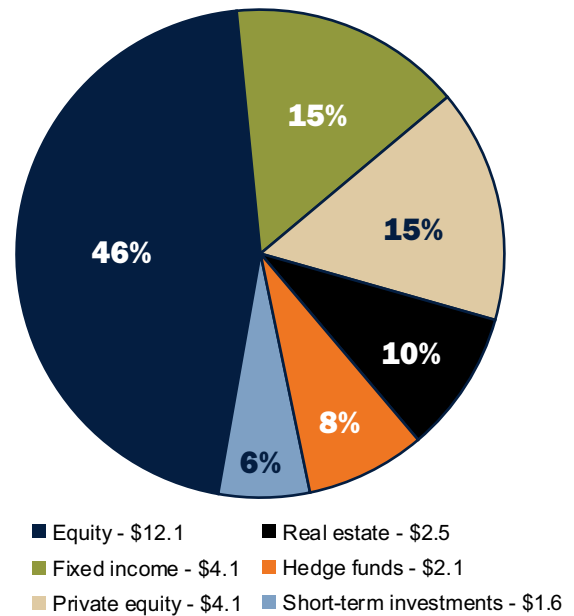
### SERS Assets

Investments are the most significant component of SERS assets. The fair value of investments increased to \$26.5 billion in 2016 from \$26.1 billion in 2015. 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 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 \$26.5 billion for 2016, as compared to \$26.1 billion for 2015. Equity values increased to \$12.1 billion in 2016, from \$10.0 billion in 2015. The increase in equity values is attributable to strong broad market returns and additional funding into new and existing index fund managers. Fixed income values decreased to \$4.1 billion in 2016, from \$4.6 billion in 2015. The decrease in fixed income values is primarily due to rebalancing according to the *2016-2017 Strategic Investment Plan*. Private equity values decreased to \$4.1 billion in 2016, from \$4.7 billion in 2015. Most of the decrease in private equity was due to distributions exceeding contributions. Real estate values decreased to \$2.5 billion in 2016, from \$3.4 billion in 2015. The decrease in real estate values was mostly attributable to the reclassification and movement of the commodities subclass to hedge funds, the elimination of the international portion of the REIT program, and distributions exceeding contributions. Hedge funds values increased to \$2.1 billion in 2016, from \$1.7 billion in 2015. The increase in hedge funds values is primarily due to the reclassification and movement of the commodities subclass from real estate. Short-term investments values decreased to \$1.6 billion in 2016, from \$1.7 billion in 2015. The total investment portfolio fair value of \$26.5 billion for 2016 was composed as shown by the following chart:

### Investments at Fair Value (2016)

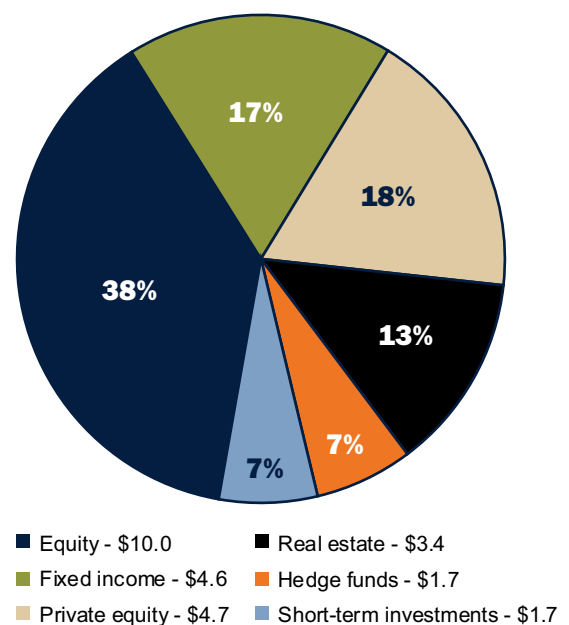
(\$ billions)



The total investment portfolio fair value of \$26.1 billion for 2015 was composed as shown by the chart below:

### Investments at Fair Value (2015)

(\$ billions)



# FINANCIAL SECTION

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

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 more than \$43 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, 2016 and 2015, the fair value of loaned securities was \$429 million and \$628 million, respectively. The fair value of the associated collateral was \$458 million and \$652 million, of which \$274 million and \$371 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 strong credit ratings 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.

### Liquidity

In the past, SERS liquidity needs were met through member and employer contributions, investment earnings, and portfolio diversification. However, increasing liquidity requirements necessitated a change in the role and strategy of SERS investment program.

SERS 2016-2017 Strategic Investment Plan uses 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, 2016, the SERS Fund held approximately \$1.3 billion in Cash.

### 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	Five-year smoothed market value

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

Key valuation results for the accounting valuation compared to the funding valuation for the years ended December 31, 2016 and 2015 are as shown in the following tables:

### 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
<b>Net Pension Liability (NPL)</b>	<b>\$19,260</b>	<b>Unfunded AAL</b>	<b>\$19,923</b>
Ratio - Fiduciary Net Position/TPL	57.8%	Funded Ratio	58.1%

### As of December 31, 2015

(\$ millions)

GASB 67 - Accounting Valuation		Funding Valuation	
Total Pension Liability (TPL)	\$44,239	Actuarial Accrued Liability (AAL)	\$46,329
Fiduciary Net Position	26,055	Actuarial Value of Assets	26,877
<b>Net Pension Liability (NPL)</b>	<b>\$18,184</b>	<b>Unfunded AAL</b>	<b>\$19,452</b>
Ratio - Fiduciary Net Position/TPL	58.9%	Funded Ratio	58.0%

Under the accounting valuation, the net pension liability increased to \$19.3 billion in 2016 from \$18.2 billion in 2015. There was a \$1.4 billion increase in the total pension liability mostly due to benefits earned, differences between expected and actual experience, and the adoption of assumption changes by SERS Board at its April 2017 meeting differing from those of the *18th Investigation of Actuarial Experience* study (as discussed below). To offset this increase, the total pension liability increase was reduced by a \$0.3 billion increase in the fiduciary net position. The increase in fiduciary net position was mainly the result of investment income and contributions exceeding benefit payments. There was still an increase in fiduciary net position although employer contributions were collared under Act 2010-120 and investment income fell slightly short of the actuarial assumed rate of return. Under the funding valuation, the unfunded actuarial accrued liability increased to \$19.9 billion in 2016 from \$19.5 billion in 2015 due mostly to the same factors as discussed above.

The unfunded actuarial accrued liability under the funding valuation was \$0.6 billion and \$1.3 billion higher than the net pension liability under the accounting valuation in 2016 and 2015, 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 2016 and 2015, 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

# FINANCIAL SECTION

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## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

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 SERS Board, 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, which are enumerated as follows. 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, years of service) in both the general and special membership classes. Furthermore, it recommended decreasing most annuitant and survivor mortality rates.

For the 2015 valuation, economic assumption recommendations resulting from the experience study included: keeping the targeted investment return rate assumption at 7.5%; keeping the inflation rate at 2.75%; keeping the general salary growth rate at 3.05%; and decreasing career salary growth rates, by varying amounts depending upon the employee's length of service at all service levels.

The board 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](http://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 as part of its annual valuation. Based on this work, SERS actuary recommended, and SERS Board adopted, a reduction in the targeted investment return rate assumption to 7.25% for the 2016 actuarial valuation from 7.5% used for the 2015 actuarial valuation based on the experience study. In addition, SERS actuary recommended, and SERS Board adopted, a reduction in the inflation rate to 2.6% for the 2016 valuation from 2.75% used for the 2015 actuarial valuation based on the experience study. The change in inflation rate also impacted the general salary growth rate, which was lowered to 2.9% for the 2016 valuation from 3.05% used for the 2015 valuation based on the experience study.

### **Pennsylvania Act 2010-120**

On November 23, 2010, the Governor signed HB 2497 into law as Act 2010-120. This legislation preserved the benefits in place for the current members at that time but mandated a number of benefit reductions for new members by reducing the retirement benefit accrual rate, increasing the normal retirement age, eliminating the lump-sum withdrawal option, extending the vesting period from five years to 10 years, and other provisions for employees hired on or after January 1, 2011. One aspect of Act 2010-120 is that retirement provisions for legislators elected after December 1, 2010, were reduced and made consistent with those of most rank-and-file employees. Additionally, Act 2010-120 limited the rate at which employer contributions can increase in any given year to 3% in commonwealth FY 11/12, 3.5% in commonwealth FY 12/13, and 4.5% each year thereafter until no longer needed. Act 2010-120 also prohibits the use of pension obligation bonds, which are issued by a state or local government in order to meet their obligations to their pension fund. It will take considerable time to realize benefits from the lower costs of Act 2010-120.

## Management's Discussion and Analysis

December 31, 2016 and 2015 (unaudited)

### Condensed Financial Information

(\$ millions)

#### Fiduciary Net Position

<b>Assets</b>	2016	Increase (Decrease)	2015	Increase (Decrease)	2014
Total receivables	\$390	\$119	\$271	\$52	\$219
Total investments	26,455	326	26,129	(1,315)	27,444
Securities lending collateral pool	274	(97)	371	9	362
<b>Total assets</b>	<b>27,119</b>	<b>348</b>	<b>26,771</b>	<b>(1,254)</b>	<b>28,025</b>
<b>Liabilities</b>					
Accounts payable and accrued expenses	68	16	52	(4)	56
Investment purchases and other liabilities	389	96	293	24	269
Obligations under securities lending	274	(97)	371	9	362
<b>Total liabilities</b>	<b>731</b>	<b>15</b>	<b>716</b>	<b>29</b>	<b>687</b>
<b>Net position restricted for pensions</b>	<b>\$26,388</b>	<b>\$333</b>	<b>\$26,055</b>	<b>\$(1,283)</b>	<b>\$27,338</b>

#### Changes in Fiduciary Net Position

<b>Additions</b>	2016	Increase (Decrease)	2015	Increase (Decrease)	2014
Member contributions	\$375	\$3	\$372	\$6	\$366
Employer contributions	1,622	262	1,360	276	1,084
Net investment income	1,587	1,499	88	(1,374)	1,462
<b>Total additions</b>	<b>3,584</b>	<b>1,764</b>	<b>1,820</b>	<b>(1,092)</b>	<b>2,912</b>
<b>Deductions</b>					
Benefits and refunds	3,228	147	3,081	135	2,946
Administrative expenses	23	1	22	-	22
<b>Total deductions</b>	<b>3,251</b>	<b>148</b>	<b>3,103</b>	<b>135</b>	<b>2,968</b>
<b>Increase/(decrease) in net position restricted for pensions</b>	<b>\$333</b>	<b>\$1,616</b>	<b>\$(1,283)</b>	<b>\$(1,227)</b>	<b>\$(56)</b>

# FINANCIAL SECTION

## Statements of Fiduciary Net Position

### Statements of Fiduciary Net Position

December 31, 2016 and 2015

(\$ thousands)

	2016	2015
<b>Assets</b>		
Receivables		
Plan members	\$1,034	\$3,136
Employers	117,072	103,415
Investment income	60,600	61,664
Investment proceeds and other receivables	207,428	98,239
Miscellaneous	4,276	4,717
Total receivables	390,410	271,171
Investments		
Short-term investments	1,591,176	1,711,654
U.S. government securities	2,091,890	2,531,112
Corporate and foreign bonds and notes	1,963,883	2,058,179
Common and preferred stocks	12,133,806	9,984,352
Hedge funds	2,057,398	1,673,295
Real estate	2,491,314	3,419,045
Private equity	4,125,468	4,751,827
Total investments	26,454,935	26,129,464
Securities lending collateral pool	273,603	370,517
Total assets	27,118,948	26,771,152
<b>Liabilities</b>		
Account payable and accrued expenses	68,236	51,995
Investment purchases and other liabilities	389,220	293,750
Obligations under securities lending	273,603	370,517
Total liabilities	731,059	716,262
<b>Net position restricted for pensions</b>	<b>\$26,387,889</b>	<b>\$26,054,890</b>

See accompanying notes to basic financial statements.

**Statements of Changes in Fiduciary Net Position**

**Statements of Changes in Fiduciary Net Position**

Years Ended December 31, 2016 and 2015

(\$ thousands)

	2016	2015
<b>Additions</b>		
Contributions		
Plan members	\$374,570	\$371,624
Employers	1,622,123	1,360,431
Total contributions	1,996,693	1,732,055
Investment income		
From investing activities		
Net appreciation/(depreciation) in fair value of investments	1,233,501	(216,817)
Interest	126,219	130,616
Dividends	273,733	223,927
Real estate income	89,327	108,844
Miscellaneous income	27,381	3,426
Total investing activities income	1,750,161	249,996
Investment expenses	(167,712)	(166,610)
Net income from investing activities	1,582,449	83,386
From securities lending activities		
Securities lending income	4,893	5,105
Securities lending expenses	(489)	(501)
Net income from securities lending activities	4,404	4,604
Net investment income	1,586,853	87,990
Total additions	3,583,546	1,820,045
<b>Deductions</b>		
Benefits	3,214,440	3,069,328
Refund of contributions	13,108	11,533
Administrative expenses	22,999	22,072
Total deductions	3,250,547	3,102,933
Net increase/(decrease)	332,999	(1,282,888)
Net position restricted for pensions		
Balance, beginning of year	26,054,890	27,337,778
<b>Balance, end of year</b>	<b>\$26,387,889</b>	<b>\$26,054,890</b>

See accompanying notes to basic financial statements.



# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2016 and 2015

### (1) Organization and Description of 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 has 11 members including the State Treasurer (ex officio), two members from the Senate, two members of the House of Representatives, and six 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 66 agencies and when everything is evaluated separately, SERS has a total of 103 participating employers/agencies.

At December 31, 2016 and 2015, SERS membership consisted of the following:

#### SERS Membership

	2016	2015
Inactive plan members or beneficiaries currently receiving benefits	127,338	124,689
Inactive plan members entitled to but not yet receiving benefits	7,134	6,918
Active plan members	104,632	105,025
<b>Total members</b>	<b>239,104</b>	<b>236,632</b>

#### (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 final average salary multiplied by 2% multiplied by class of service multiplier.

Prior to Act 2010-120, employees who retire at age 60 with three years of service, or with 35 years of service if under age 60, are entitled to a normal annual 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 benefit reduction included a new class of membership that accrues benefits at 2% of their final average salary instead of the previous 2.5%. The new vesting period

changed from five to 10 years of credited service, and the option to withdraw lump-sum accumulated deductions was eliminated. The new normal retirement age is 65 for most employees 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 that entered 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 (SERC), all obligations of SERS will be assumed by the commonwealth should SERS terminate.

**(c) Contributions**

Section 5507 of the SERC (71 Pa. C.S. §5507) requires the commonwealth and other employers whose employees are SERS members to 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%. The commonwealth FY 12/13 collar was 3.5%. The collar for commonwealth FY 13/14 was 4.5% and will remain at that rate until no longer needed. At December 31, 2016, the statutorily required composite contribution rate as collared by Act 2010-120 including the Benefits Completion Plan (BCP) was 29.51% while the actuarially determined rate would have been 32.15%. At December 31, 2015,

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2016 and 2015

the statutorily required composite contribution rate as collared by Act 2010-120 including the BCP was 25.01% while the actuarially determined rate would have been 31.52%.

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, 2016 and 2015, the blended contribution rates, which include the BCP, were 27.26% and 22.77%, 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

The financial statements of SERS 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 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. 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.

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, 2016 and 2015, SERS had contractual commitments totaling approximately \$1.9 billion and \$1.8 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 SERC 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. That request is pending.

**(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) Adopted Accounting Pronouncement**

SERS has adopted Governmental Accounting Standards Board (GASB) Statement No. 72, *Fair Value Measurement and Application* (GASB 72), which addresses accounting and financial reporting issues related to fair value measurements. GASB 72 requires funds to use valuation techniques, which are appropriate under the circumstances, and are either a market; cost; or income approach. GASB 72 establishes a hierarchy of inputs used to measure fair value consisting of three levels. Level 1 inputs are investments reflecting prices quoted in active markets. Level 2 inputs are investments reflecting prices that are based on a similar observable asset either directly or indirectly, which may include inputs in markets that are not considered to be active. Level 3 inputs are investments with unobservable inputs, and typically reflect management's estimates of assumptions that market participants would use in pricing the assets or liability. Adoption of GASB 72 did not impact the fiduciary net position of SERS; however, there were changes to disclosures in note 4 regarding the hierarchy of valuation inputs and valuation techniques that were used for fair value measurements. The requirements of GASB 72 were effective for financial statements for fiscal years beginning after June 15, 2015 and have been applied to all periods presented.

**(3) Legally Required Reserves**

The SERC 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

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2016 and 2015

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, 2016 and 2015, SERS earned approximately \$122 thousand and \$136 thousand of income resulting from a commission recapture program, respectively. As of December 31, 2016 and 2015, SERS used the program to pay approximately \$463 thousand and \$308 thousand of administrative expenses, respectively. At December 31, 2016 and 2015, SERS had accumulated commission reserves of \$3.3 million and \$3.6 million, respectively. These commission reserves can be used to pay for future expenditures.

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 SERC by adding Section 5941 to the SERC. Section 5941 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 SERC. There were 30 and 26 individuals receiving benefits from the BCP at December 31, 2016 and 2015, respectively.

Account balances at December 31, 2016 and 2015 are as follows:

### Account Balances

(\$ thousands)

	2016	2015
Member savings account	\$4,869,229	\$4,816,121
State accumulation account	(5,312,560)	(3,925,580)
Directed commissions reserve account	3,320	3,661
Annuity reserve accounts		
Annuitants and beneficiaries	24,096,866	22,800,203
State police	2,682,415	2,310,957
Enforcement officers	45,025	44,965
Benefits completion plan reserve account	3,594	4,563
<b>Total</b>	<b>\$26,387,889</b>	<b>\$26,054,890</b>

### (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

## Notes to Basic Financial Statements

December 31, 2016 and 2015

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 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 investment trusts (REITs), 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. Real estate separate accounts 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.

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## Notes to Basic Financial Statements

December 31, 2016 and 2015

At December 31, 2016 and 2015, SERS investments measured at fair value are shown in the following tables:

### Investments Measured at Fair Value (2016)

(\$ thousands)

	Fair Value	Level 1	Level 2	Level 3
<b>Fixed income</b>				
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	511,178	-	452,196	58,982
Sovereign debt	249,606	-	249,606	-
Agencies	80,429	-	80,429	-
<b>Equity</b>				
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	-	-
<b>Real estate</b>				
Real estate separate accounts	1,032,233	-	-	1,032,233
REITs	221,501	221,501	-	-
MLPs	245,009	245,009	-	-
<b>Other</b>				
Other investments <sup>1/</sup>	197	396	(199)	-
<b>Total</b>	<b>\$17,408,561</b>	<b>\$12,582,117</b>	<b>\$3,699,219</b>	<b>\$1,127,225</b>

<sup>1/</sup>Represents derivative instruments and other securities where portions of which are reported in various captions on the Statements of Fiduciary Net Position including short-term investments, U.S. government securities, corporate and foreign bonds and notes, common and preferred stocks, real estate, and private equity.

## Notes to Basic Financial Statements

December 31, 2016 and 2015

### Investments Measured at Fair Value (2015)

(\$ thousands)

	Fair Value	Level 1	Level 2	Level 3
<b>Fixed income</b>				
Government	\$1,875,233	\$ -	\$1,875,233	\$ -
Corporates	894,929	-	874,160	20,769
Asset- and mortgage-backed securities	721,908	-	713,034	8,874
Private placements	500,770	-	405,603	95,167
Sovereign debt	245,552	-	243,697	1,855
Agencies	111,702	-	111,702	-
<b>Equity</b>				
Domestic common and preferred stocks	5,253,949	5,242,078	11,871	-
Foreign common and preferred stocks	4,587,171	4,578,405	-	8,766
Commingled equity funds	142,623	142,623	-	-
<b>Real estate</b>				
Real estate separate accounts	1,244,449	-	-	1,244,449
REITs	340,060	340,060	-	-
MLPs	211,818	211,818	-	-
<b>Other</b>				
Other investments <sup>1/</sup>	1,259	536	609	114
<b>Total</b>	<b>\$16,131,423</b>	<b>\$10,515,520</b>	<b>\$4,235,909</b>	<b>\$1,379,994</b>

<sup>1/</sup>Represents derivative instruments and other securities where portions of which are reported in various captions on the Statements of Fiduciary Net Position including short-term investments, U.S. government securities, corporate and foreign bonds and notes, common and preferred stocks, real estate, and private equity.

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 financial statements. SERS Private Equity program is 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.

- **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.
- **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.



# FINANCIAL SECTION

## Notes to Basic Financial Statements

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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 Non-Core Real Estate (closed-end funds) and open-end Core Real Estate funds, 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, which approximates fair value. 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 financial statements. The following portions of SERS Real Estate program are valued at NAV:

- **Non-Core Real Estate** utilizes 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.
- **Core Real Estate** is a long-term investment in high-quality real estate that generates returns primarily from stable income producing properties.

- **Timberland** is renewable and derives its return from the biological growth of trees and sale of timber.

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. SERS Hedge Funds program includes investments designed to provide total returns comparable to the total fund return but with lower volatility and correlation to other asset classes. The Hedge Funds program is 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. SERS Hedge Funds program is categorized into the following specific strategies:

- **Funds-of-Hedge Funds** are investments in funds with investment managers who invest in hedge funds. Funds-of-Hedge Funds provide an additional layer of fiduciary oversight (investment, legal, compliance, and monitoring) with similar all-in fees as direct investments in hedge funds. SERS is the only limited partner and is able to make larger allocations, which lowers fees and improves liquidity terms.
- **Commodities** include investments in funds with investment managers who invest in commodity hedge funds. SERS is one of several investors in the fund.

## Notes to Basic Financial Statements

December 31, 2016 and 2015

- **Direct Investments** are investments where SERS and other institutional investors pool their funds with a manager tasked with incorporating hedge strategies.
- **Absolute Return Strategies** are a legacy Hedge Funds program currently in liquidation. The remaining assets were rebalanced by board-approved mandates to transition the assets into other strategies within the Hedge Funds program or to SERS cash account.

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.

At December 31, 2016 and 2015, SERS investments measured at NAV are shown in the following tables:

### Investments Measured at NAV (2016)

(\$ thousands)

	NAV	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
<b>Private equity</b>				
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
<b>Real estate</b>				
Non-core real estate	514,811	156,699	See note (1)	See note (1)
Core real estate	328,697	-	Quarterly	60 - 90 days
Timberland	149,186	-	Daily	None
<b>Hedge funds</b>				
Funds-of-hedge funds	1,506,618	-	Quarterly	60 -95 days
Commodities	368,199	-	Daily, monthly	30 days
Direct investments	105,138	-	Monthly, quarterly, semiannually	11 - 90 days
Absolute return strategies	39,546	-	See note (2)	See note (2)
<b>Commingled funds</b>				
Commingled fixed income funds	275,206	-	Quarterly	30 days
<b>Total</b>	<b>\$7,412,946</b>	<b>\$1,929,341</b>		

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

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

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## Notes to Basic Financial Statements

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### Investments Measured at NAV (2015)

(\$ thousands)

	NAV	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
<b>Private equity</b>				
Buyouts	\$2,836,541	\$1,145,649	NA	NA
Venture capital	1,164,453	147,864	NA	NA
Special situations	750,832	300,894	NA	NA
<b>Real estate</b>				
Non-core real estate	583,472	212,898	See note (1)	See note (1)
Core real estate	306,842	-	Quarterly	60 - 90 days
Timberland	153,680	-	Daily	None
<b>Hedge funds</b>				
Funds-of-hedge funds	1,464,793	-	Quarterly	60 - 95 days
Commodities	578,758	-	Daily, monthly	30 days
Direct investments	103,158	-	Monthly, quarterly, semiannually	11 - 90 days
Absolute return strategies	46,217	-	See note (2)	See note (2)
<b>Commingled funds</b>				
Commingled fixed income funds	237,423	-	Quarterly	30 days
<b>Total</b>	<b>\$8,226,169</b>	<b>\$1,807,305</b>		

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

<sup>2</sup>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, which were excluded from the previous tables. 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. The value of SERS portion of the STIF was \$1.6 billion and \$1.7 billion as of December 31, 2016 and 2015, respectively. Additionally, SERS had cash, foreign currencies, and other investments that are carried at either cost or liquidation basis values. These other investments totaled \$94 million and \$87 million as of December 31, 2016 and 2015, respectively and portions of which are reported in various captions on the Statements of Fiduciary Net Position including

short-term investments, U.S. government securities, corporate and foreign bonds and notes, common and preferred stocks, hedge funds, and real estate.

For the years ended December 31, 2016 and 2015, the money-weighted rate of return for SERS, net of manager fees, was 6.4% and 0.4%, 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

## Notes to Basic Financial Statements

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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.

Under this plan, the following table shows the target asset allocation as of December 31, 2016:

### Target Asset Allocations (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
<b>Total</b>	<b>100%</b>

In April 2014, the board approved the SERS *2014-2015 Strategic Investment Plan*. Under that plan, the following table shows the target asset allocation as of December 31, 2015:

### Target Asset Allocations (2015)

Asset Class	Long-Term 10-Year Strategic Target
Alternative Investments	15%
Global Public Equity	40
Real Assets	17
Diversifying Assets	10
Fixed Income	15
Liquidity Reserve	3
<b>Total</b>	<b>100%</b>

The target asset allocations in the two prior tables were 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% for the 2016 actuarial valuation. Targets may be updated to reflect the new assumed investment rate of return in the upcoming year.

Under the SERS *2016-2017 Strategic Investment Plan*, Fixed Income is 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. This plan established a long-term 10-year strategic target allocation to the Fixed Income asset class of 14%. This allocation is divided among distinct segments, each of which fulfills a specific role within the scope of the Fixed Income structure. The segments are as follows:

- **Core Plus and Core Fixed Income** provides excess return when performance conditions are favorable, provides capital protection in difficult market conditions, and may offer risk mitigation due to the low correlation with equities.
- **Global Treasury Inflation Protected Securities (TIPS)** protects SERS Fund against inflation.
- **Nominal U.S. Treasuries** protects SERS Fund against deflation and provides liquidity.
- **Short-Term Notes** provides an additional source of liquidity to pay benefits.

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, 2016 and 2015, 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.

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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 Title 71, Pennsylvania Consolidated Statutes Section 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 alternative investments.

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, 2016 and 2015 by debt sector:

### Debt Securities Exposed to Credit Risk (2016)

(\$ thousands)

	AAA	AA	A	BAA	BA and below	NA <sup>1/</sup>	Short-Term Investments <sup>2/</sup>	Total Exposed to Credit Risk <sup>3/</sup>
Short-term investments <sup>2/</sup>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$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 <sup>4/</sup>	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	-	-	-	-	-	5,706	-	5,706
<b>Total</b>	<b>\$260,391</b>	<b>\$431,878</b>	<b>\$295,557</b>	<b>\$625,840</b>	<b>\$763,270</b>	<b>\$41,593</b>	<b>\$1,577,941</b>	<b>\$3,996,470</b>

<sup>1/</sup>Represents other securities that were either not rated or had a withdrawn rating.

<sup>2/</sup>Represents short-term investments mostly in the PA 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.

<sup>3/</sup>Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments, U.S. government securities, and corporate and foreign bonds and notes from the Statements of Fiduciary Net Position.

<sup>4/</sup>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.

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### Debt Securities Exposed to Credit Risk (2015)

(\$ thousands)

	AAA	AA	A	BAA	BA and below	NA <sup>1/</sup>	Short-term investments <sup>2/</sup>	Total exposed to credit risk <sup>3/</sup>
Short-term investments <sup>2/</sup>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,711,312	\$1,711,312
Corporates	19,831	42,946	243,336	439,428	143,481	6,600	-	895,622
Asset- and mortgage-backed securities	222,543	326,024	29,227	8,160	280,113	4,862	-	870,929
Private placements <sup>4/</sup>	12,020	31,271	42,944	156,107	228,846	31,406	-	502,594
Sovereign debt	19,923	56,440	38,986	83,273	45,244	1,686	-	245,552
Agencies	9,707	101,996	-	-	-	-	-	111,703
Government	336	15,954	18,350	1,663	189	-	-	36,492
Other investments	-	-	-	-	-	10,382	-	10,382
<b>Total</b>	<b>\$284,360</b>	<b>\$574,631</b>	<b>\$372,843</b>	<b>\$688,631</b>	<b>\$697,873</b>	<b>\$54,936</b>	<b>\$1,711,312</b>	<b>\$4,384,586</b>

<sup>1/</sup>Represents other securities that were either not rated or had a withdrawn rating.

<sup>2/</sup>Represents short-term investments mostly in the PA 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.

<sup>3/</sup>Debt securities exposed to credit risk and U.S. government guaranteed securities, as noted in the subsequent paragraph, comprised short-term investments, U.S. government securities, and corporate and foreign bonds and notes from the Statements of Fiduciary Net Position.

<sup>4/</sup>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 \$1.7 billion and \$1.9 billion as of December 31, 2016 and 2015, 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 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.

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## Notes to Basic Financial Statements

December 31, 2016 and 2015

At December 31, 2016 and 2015, SERS Fixed Income portfolio had the following option-adjusted durations by debt sector:

### Debt Option-Adjusted Durations

(\$ thousands)

	2016		2015	
	Fair Value	Option-Adjusted Duration	Fair Value	Option-Adjusted Duration
Sovereign debt	\$249,606	7.6	\$245,552	8.3
Government	1,645,854	6.3	1,875,233	6.5
Corporates	748,672	5.4	895,622	5.4
Agencies	80,429	4.5	111,703	4.2
Commingled investment funds	275,206	3.7	237,423	3.4
Asset- and mortgage-backed securities	554,952	2.7	721,908	2.7
Private placements <sup>1/</sup>	515,019	2.7	502,594	3.1
Short-term investments - (STIF)	1,539,304	0.1	1,684,770	0.1
Short-term investments	38,637	0.1	26,541	0.2
Other investments <sup>2/</sup>	(730)	NA	(401)	NA
<b>Total<sup>3/</sup></b>	<b>\$5,646,949</b>		<b>\$6,300,945</b>	

<sup>1/</sup>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.

<sup>2/</sup>Represents derivative instruments and other securities for which durations are not available.

<sup>3/</sup>Total fair values exposed to interest rate risk comprised short-term investments, U.S. government securities, and corporate and foreign bonds and notes from the Statements of Fiduciary Net Position.

## Notes to Basic Financial Statements

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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, 2016 and 2015, SERS had the following currency exposures:

### Foreign Currency Exposures (2016)

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Equity	Real Estate	Private Equity	Total
European Euro	\$4,411	\$19,025	\$1,305,642	\$(164)	\$313,416	\$1,642,330
Japanese Yen	12,525	1,860	850,071	(10,607)	-	853,849
British Pound Sterling	5,535	57,845	783,413	(3,063)	8,300	852,030
Swiss Franc	4,050	-	383,347	-	-	387,397
Hong Kong Dollar	108	-	318,230	-	-	318,338
Canadian Dollar	3,678	8,577	290,139	-	-	302,394
Australian Dollar	1,223	17,406	226,657	-	-	245,286
South Korean Won	1,552	-	142,467	-	-	144,019
Swedish Krona	314	12,987	87,130	-	43,118	143,549
New Taiwan Dollar	20	-	76,608	-	-	76,628
Danish Krone	575	251	56,012	-	-	56,838
Norwegian Krone	639	9,192	41,664	-	-	51,495
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	9,523	31,150	-	-	41,593
Indonesian Rupiah	(900)	8,858	19,084	-	-	27,042
New Zealand Dollar	98	458	18,040	-	-	18,596
Thai Baht	13	-	16,279	-	-	16,292
Malaysian Ringgit	64	7,272	5,637	-	-	12,973
Chilean Peso	5	9,153	3,137	-	-	12,295
Hungarian Forint	108	7,308	4,790	-	-	12,206
Other currencies (9)	1,018	14,849	25,787	-	-	41,654
<b>Total</b>	<b>\$36,557</b>	<b>\$215,972</b>	<b>\$4,790,207</b>	<b>\$(13,282)</b>	<b>\$364,834</b>	<b>\$5,394,288</b>

<sup>1/</sup>Includes receivables and payables as of December 31 for securities sold and purchased.



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## Notes to Basic Financial Statements

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### Foreign Currency Exposures (2015)

(\$ thousands)

Currency	Short-Term Investments <sup>1/</sup>	Fixed Income	Equity	Real Estate	Private Equity	Total
European Euro	\$1,880	\$21,206	\$1,008,401	\$31,191	\$504,255	\$1,566,933
British Pound Sterling	2,396	28,377	730,571	17,190	13,262	791,796
Japanese Yen	5,037	10,919	651,795	39,893	-	707,644
Swiss Franc	2,586	-	412,539	-	-	415,125
Hong Kong Dollar	558	-	300,638	14,219	-	315,415
Australian Dollar	877	14,837	171,031	17,585	-	204,330
Canadian Dollar	131	10,437	165,488	-	-	176,056
South Korean Won	1,408	-	118,597	-	-	120,005
Swedish Krona	52	10,418	77,525	1,255	29,618	118,868
New Taiwan Dollar	(82)	-	79,443	-	-	79,361
Mexican Peso	191	23,787	27,250	853	-	52,081
Danish Krone	287	246	51,378	-	-	51,911
Singapore Dollar	270	-	46,180	1,827	-	48,277
Brazilian Real	409	7,130	34,206	-	-	41,745
Norwegian Krone	30	5,128	32,677	-	-	37,835
South African Rand	164	5,480	31,680	-	-	37,324
New Zealand Dollar	113	6,589	12,138	-	-	18,840
Indonesian Rupiah	182	7,788	9,577	-	-	17,547
Thai Baht	38	-	17,245	-	-	17,283
Indian Rupee	-	8,657	5,690	-	-	14,347
Turkish Lira	-	-	13,585	-	-	13,585
Chilean Peso	-	11,859	576	-	-	12,435
Malaysian Ringgit	(10)	6,284	6,069	-	-	12,343
Hungarian Forint	108	7,106	4,308	-	-	11,522
New Israeli Sheqel	11	-	11,057	-	-	11,068
Other currencies (6)	1,016	4,072	7,721	-	-	12,809
<b>Total</b>	<b>\$17,652</b>	<b>\$190,320</b>	<b>\$4,027,365</b>	<b>\$124,013</b>	<b>\$547,135</b>	<b>\$4,906,485</b>

<sup>1/</sup>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.

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December 31, 2016 and 2015

As of December 31, 2016 and 2015, 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 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, 2016 and 2015 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, 2016 and 2015 was three days and one day, 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, 2016 and 2015, the fair value of loaned securities was \$429 million and \$628 million, respectively; the fair value of the associated collateral was \$458 million and \$652 million, of which \$274 million and \$371 million was cash, respectively. As of December 31, 2016 and 2015, noncash collateral of \$184 million and \$281 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, 2016 and 2015, 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, 2016 and 2015

At December 31, 2016 and 2015, SERS contracts to purchase and sell by foreign currencies are shown in the following tables:

### 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	-
<b>Total</b>	<b>\$80,515</b>	<b>\$(1,055)</b>	<b>\$76,099</b>	<b>\$957</b>

### Foreign Exchange Contracts (2015)

(\$ thousands)

Currency	Purchases	Unrealized Gain/(Loss)	Sales	Unrealized Gain/(Loss)
Chilean Peso	\$11,859	\$(127)	\$ -	\$ -
Japanese Yen	10,831	199	817	(1)
Swedish Krona	9,477	(228)	1,412	(38)
Indian Rupee	8,657	98	-	-
Australian Dollar	7,960	64	10,948	355
Norwegian Krone	5,128	(464)	-	-
European Euro	2,837	(15)	20,343	(235)
Canadian Dollar	2,343	(22)	1,537	69
British Pound Sterling	1,441	(16)	3,419	70
Swiss Franc	237	(3)	15,414	577
New Zealand Dollar	-	-	1,180	(36)
Mexican Peso	-	-	963	20
Colombian Peso	-	-	817	(38)
Russian Ruble	-	-	789	33
Other (6)	475	(2)	595	(1)
<b>Total</b>	<b>\$61,245</b>	<b>\$(516)</b>	<b>\$58,234</b>	<b>\$775</b>

**Notes to Basic Financial Statements**

December 31, 2016 and 2015

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, 2016 and 2015.

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

SERS makes employer contributions to the pension plan. SERS employees’ contribution requirements and benefits are described in note 1. SERS contributions for the years ended December 31, 2016, 2015, and 2014 were \$2.6 million, \$2.3 million, and \$1.9 million, respectively. The contributions were equal to the statutorily required contributions each year.

SERS also 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 2016, SERS funded REHP benefits by paying \$418 (actual dollars) per pay period from January 1 to June 30, 2016, and \$362 (actual dollars) per pay period from July 1 to December 31, 2016 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
2016	\$1,169,885	\$3,108	\$941
2015	1,136,817	3,020	906
2014	898,330	2,315	536
<b>Three-year cumulative OPEB</b>			<b>\$2,383</b>

In the previous table, the commonwealth’s 2015 biennial actuarial valuation was used for 2016 and 2015 while the commonwealth’s 2013 biennial actuarial valuation was used for 2014. Both valuation reports can be viewed in their entirety on the Office of the Budget’s website at: <http://www.budget.pa.gov/PublicationsAndReports/Pages/ActuarialReports.aspx>.

**(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.

# FINANCIAL SECTION

## Notes to Basic Financial Statements

December 31, 2016 and 2015

### (9) Net Pension Liability

The components of the net pension liability of participating employers at December 31, 2016 and 2015, were as follows:

#### Net Pension Liability

(\$ thousands)

	2016	2015
Total pension liability	\$45,648,214	\$44,238,721
Plan fiduciary net position	26,387,889	26,054,890
<b>Net pension liability</b>	<b>\$19,260,325</b>	<b>\$18,183,831</b>
Plan fiduciary net position as a percentage of the total pension liability	57.8%	58.9%

The total pension liability was determined by an actuarial valuation for financial reporting purposes as of December 31, 2016 and 2015, 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 for 2016, and 7.50% net of manager fees, including inflation for 2015
- Projected salary increases: average of 5.60% with range of 3.70% – 8.90%, including inflation for 2016, and an average of 5.70% with range of 3.85% – 9.05%, including inflation for 2015
- Asset valuation method: fair (market) value
- Inflation: 2.60% for 2016 and 2.75% for 2015
- Mortality rate: projected RP 2000 Mortality Tables adjusted for actual plan experience and future improvement

The assumptions mentioned above are based on the *18th Investigation of Actuarial Experience* study covering the periods 2011 – 2015, which was released in March 2016. The change in investment rate of

return of 7.25% and inflation of 2.60% for 2016 was approved by SERS Board at its April 2017 meeting.

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, 2016 and 2015 (see the discussion of the pension plan's investment policy) are summarized in the following table:

#### 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

#### Long-Term Expected Real Rate of Return (2015)

Asset Class	Long-Term Expected Real Rate of Return
Alternative Investments	8.50%
Global Public Equity	5.40
Real Assets	4.95
Diversifying Assets	5.00
Fixed Income	1.50
Liquidity Reserve	0.00

**Notes to Basic Financial Statements**

December 31, 2016 and 2015

The discount rate used to measure the total pension liability was 7.25% for 2016 and 7.50% for 2015. 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.

The following presents the net pension liability calculated using the discount rate of 7.25% for 2016 and 7.50% for 2015, 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 (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

**Sensitivity of the Net Pension Liability to Change in the Discount Rate (2015)**

(\$ thousands)

	1% Decrease to 6.50%	Current Discount Rate of 7.50%	1% Increase to 8.50%
Net pension liability	\$22,587,745	\$18,183,831	\$14,407,719

**(10) Subsequent Event**

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 the basic financial statements as of and for the years ended December 31, 2016 or 2015. 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.

# FINANCIAL SECTION

## Required Supplementary Information

December 31, 2016 (unaudited)

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

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

Schedule 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, 2016 (unaudited)

**Schedule 2  
Schedule of Employer Contributions**

(\$ millions)

Year <sup>1/</sup>	Actuarially Determined Contribution (ADC) <sup>2/</sup>	Contributions in Relation to the ADC	Contribution Deficiency (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered-Employee Payroll
2016 <sup>3/</sup>	\$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
2007	244	244	-	5,299	4.60

<sup>1/</sup>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 2007 – 2009, 2.75% from valuation years 2010 – 2015, and 2.6% for valuation year 2016
- Projected average salary increases: 7.1% from valuation years 2007 – 2009, 6.2% from valuation years 2010 – 2012, 6.1% from valuation years 2013 – 2014, 5.7% for valuation year 2015, and 5.6% for valuation year 2016
- Investment rate of return (net of manager fees including inflation): 8.50% for valuation year 2007, 8.0% from valuation years 2008 – 2010, 7.50% from valuation years 2011 – 2015, and 7.25% for valuation year 2016

<sup>2/</sup>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.

<sup>3/</sup>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**

	2016	2015	2014	2013
Annual money-weighted rate of return, net of investment expense	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, 2016

### Schedule 4 Schedule of Administrative Expenses

(\$ thousands)

Personnel services	
Salaries	\$8,729
Benefits	5,921
Temporary personnel wages, overtime, and out-service training	45
Total personnel services	14,695
Professional services	
Information technology services	1,731
Treasury department services	1,464
Consultant fees	671
Other commonwealth services	591
Legal fees	31
Total professional services	4,488
Rentals	
Real estate rent	1,707
Other equipment rental	115
Total rentals	1,822
Communication	
Postage	372
Telephone	325
Printing and advertising	184
Total communication	881
Other expenses	
Maintenance	675
EDP and office equipment	183
Supplies	165
Subscriptions and memberships	62
Travel and conferences	28
Total other expenses	1,113
<b>Total administrative expenses</b>	<b>\$22,999</b>

See accompanying independent auditors' report.

**Schedule 5  
Summary of Investment and Consultant Expenses**

(\$ thousands)

**Investment Expenses**

Expense Category	Expenses
Manager investment expenses	
Private Equity	\$69,667
Real Estate	33,889
Global Public Equity	29,221
Fixed Income	13,512
Hedge Funds	13,158
Total manager investment expenses	159,447
Investment consultants	3,629
Investment professional personnel	2,565
Custodian	1,326
Subscription and membership	706
Operational	39
<b>Total investment expenses</b>	<b>\$167,712</b>

**Consultant Expenses**

Firm	Service Type	Expenses
Investment consultant expenses		
StepStone Group	Private equity investments	\$1,975
The Townsend Group	Real estate investments	728
RVK	General investments	576
GCM Customized Investment Group	Investment portfolio management	210
Institutional Shareholder Services	Proxy services	93
Abel/Noser	Transaction cost analysis	47
Total investment consultant expenses		3,629
Administrative consultant expenses		
Korn Ferry Hay Group	Actuary	383
Funston Advisory Services	Governance consultant	256
Other	Miscellaneous	32
Total administrative consultant expenses		671
<b>Total consultant expenses</b>		<b>\$4,300</b>

See accompanying independent auditors' report.

**2016**

**Investment Section**

June 5, 2017

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 State Employees' Retirement System (SERS) Comprehensive Annual Financial Report (CAFR) for calendar year 2016. SERS administers and advises a large public defined benefit investment program with over \$26 billion in assets and a voluntary Deferred Compensation Plan (DCP) which has grown to over \$3 billion in assets.

SERS' investment performance for calendar year ended December 31, 2016 was 6.5%, net of investment management fees. This compares to a 2015 calendar year return of 0.4%. While year-to-year returns are important, as long-term investors a longer time horizon is a more appropriate view of SERS' returns. 2016 marks the eighth consecutive year of positive returns for SERS and returning 9.1% since the economic crisis of 2008<sup>1/</sup>. Over a 20-, 25-, and 30-year period, SERS has returned 7.2%, 8.1%, and 8.6%, respectively.

SERS' funded status as a percentage of total pension liability is approximately 58% or \$19.3 billion of net pension liability as of December 31, 2016. 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 2016, several of which are documented below. The investment section of this report provides further information regarding the investment program.

- Updated the *Statement of Investment Policy*; Private Equity Statement of Investment Policy; Real Estate Statement of Investment Policy; Investment Manager Monitoring Policy; and the U.S. and International Proxy Voting Policy, in accordance with industry best practices.
- Completed the asset class restructure changes for reporting asset allocation and performance as defined in SERS' *2016-2017 Strategic Investment Plan*.
- Recommended nine best-in-class Private Equity funds (approximately \$750 million in total commitments).
- Executed a \$1.1 billion reallocation from active public equity investment portfolios to index strategies.
- Recommended that the Board execute a thematic asset class change from Hedge Funds to Multi-Strategy to generate total returns through a combination of high conviction, opportunistic, and less liquid investment strategies that will aim to improve the risk-adjusted profile of the total fund.
- Recommended emerging manager program criteria and merits of using a manager-of-manager model to implement a successful program.

<sup>1/</sup>April 1, 2009 to December 31, 2016

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 the Townsend Group; and SERS sub-custodian, BNY Mellon. Performance was calculated using the Modified Dietz day-weighted return methodology.*

## Investment Policy and Objectives

December 31, 2016 (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

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## Investment Policy and Objectives

December 31, 2016 (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.

### 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, 2016 (unaudited)

### Calendar Year, Net-of-Fees Returns<sup>1/</sup>

Asset Class	1-Year Total Return	3-Year Total Return	5-Year Total Return	10-Year Total Return
Private Equity <sup>2/,5/</sup>	6.8%	8.7%	10.0%	9.5%
<i>Burgiss All Private Equity Custom Index<sup>3/,5/</sup></i>	7.5	11.1	12.2	10.0
<i>Russell 3000 Index+3%<sup>4/,5/</sup></i>	18.4	13.8	19.8	10.6
Global Public Equity	8.4	3.2	10.3	3.3
<i>MSCI ACWIM Index (Net)</i>	8.4	3.2	9.6	3.8
Real Estate <sup>5/</sup>	3.2	8.0	9.5	3.2
<i>Real Estate Custom Benchmark<sup>5/,6/</sup></i>	9.9	11.4	11.9	5.2
<i>Consumer Price Index+3%<sup>5/</sup></i>	4.5	4.1	4.3	4.8
Hedge Funds	4.2	0.1	2.6	NA
<i>HF Custom Index<sup>7/</sup></i>	-0.1	1.1	6.2	5.1
Fixed Income	5.6	3.0	3.4	5.0
<i>Bloomberg Barclays U.S. Aggregate Bond Index</i>	2.6	3.0	2.2	4.3
Cash	0.6	0.6	0.5	1.2
<i>BofA ML 3 Month U.S. T-Bill Index</i>	0.3	0.1	0.1	0.8
<b>Total Fund</b>	<b>6.5%</b>	<b>4.4%</b>	<b>7.7%</b>	<b>4.3%</b>
<i>Total Fund Custom Benchmark</i>	<i>7.3%</i>	<i>4.9%</i>	<i>7.9%</i>	<i>5.5%</i>
<i>Total Fund Custom Public Market Equivalent Benchmark</i>	<i>8.4%</i>	<i>5.5%</i>	<i>9.4%</i>	<i>6.0%</i>

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

<sup>2/</sup>Historical Private Equity performance includes Buyouts, Special Situations, and Venture Capital.

<sup>3/</sup>Intended to compare the program's performance to its peers.

<sup>4/</sup>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.

<sup>5/</sup>Private Equity, Real Estate, and their corresponding benchmarks are reported on a quarter lagged basis.

<sup>6/</sup>Calculated monthly using beginning of the month asset class weights applied to each corresponding primary benchmark return. The custom benchmark currently consists of the NCREIF ODCE Index (AWA) (Net) (Qtr Lag), the S&P Developed Market Property Index (Qtr Lag), and the Consumer Price Index+3% (Qtr Lag).

<sup>7/</sup>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, 2016 (unaudited)

### Fund Values and Annual Returns

(\$ millions)

Year Ended	SERS Fund Fair Value	Annual Total Fund Rate of Return <sup>1/</sup>
1987	\$7,367	3.3%
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

<sup>1/</sup>Returns were calculated using the Modified Dietz day-weighted return methodology.

# INVESTMENT SECTION

## Largest Assets Held December 31, 2016 (unaudited)

### U.S. Equity

### Non-U.S. Equity

Holding	Fair Value
Apple Inc	\$135,211,627
Microsoft Corp	114,043,056
Johnson and Johnson	82,232,059
Exxon Mobil Corp	80,168,842
Facebook Inc	77,377,683
JPMorgan Chase and Co	66,899,774
Amazon.com Inc	66,493,972
Berkshire Hathaway Inc	65,639,380
General Electric Co	61,939,413
Alphabet Inc Class C	61,315,696

Holding	Fair Value
Nestle SA	\$79,114,656
Roche Holdings AG	63,054,087
Novartis AG	62,607,665
AIA Group Ltd	49,967,594
Reckitt Benckiser Group PLC	42,462,001
British American Tobacco PLC	40,863,486
Toyota Motor Corp	39,751,875
GlaxoSmithKline PLC	39,736,172
BP PLC	39,325,895
Samsung Electronics Co Ltd	38,137,724

### Non-U.S. Fixed Income

Holding	Fair Value
United Kingdom Gilt, 1.250% July 22, 2018	\$11,068,787
United Mexican States, 7.750% November 13, 2042	8,027,464
United Mexican States, 8.500% November 18, 2038	6,444,780
United Mexican States, 8.500% May 31, 2029	5,421,997
Republic of Argentina, 7.820% December 31, 2033	5,178,976
Republic of Slovenia, 5.850% May 10, 2023	5,068,917
Italy Government International Bond, 5.375% June 12, 2017	4,774,918
New South Wales Treasury Corp, 5.000% August 20, 2024	4,673,135
Dexia Credit Local SA, Variable Rate January 11, 2017	4,120,247
Swedish Export Credit, Variable Rate November 9, 2017	4,109,147

Note: A detailed list of SERS investment holdings at December 31, 2016, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

# INVESTMENT SECTION

## Largest Assets Held

December 31, 2016 (unaudited)

### U.S. Government and Government Related Fixed Income

Holding	Fair Value
U.S. Treasury Note, 2.000% November 15, 2026	\$237,633,731
U.S. Treasury Note, 1.500% August 15, 2026	166,195,211
U.S. Treasury Inflation Index Note, 0.125% April 15, 2018	47,362,336
U.S. Treasury Inflation Index Note, 0.125% April 15, 2019	45,339,753
U.S. Treasury Inflation Index Note, 2.375% January 15, 2025	43,678,956
U.S. Treasury Inflation Index Note, 0.625% January 15, 2024	43,654,110
U.S. Treasury Inflation Index Note, 1.375% February 15, 2044	39,411,526
U.S. Treasury Inflation Index Note, 0.125% July 15, 2024	37,423,113
U.S. Treasury Inflation Index Note, 0.375% July 15, 2023	37,219,243
U.S. Treasury Inflation Index Note, 0.125% July 15, 2022	35,080,314

### U.S. Corporate Fixed Income

Holding	Fair Value
Credit Suisse Mortgage Trust, Variable Rate January 15, 2049	\$7,667,208
Goldman Sachs Group Inc, 5.750% January 24, 2022	7,566,001
Cobalt CMBS Commercial Mortgage Trust, Variable Rate May 15, 2046	7,198,932
Goldman Sachs Group Inc, Variable Rate November 15, 2018	6,016,680
Wachovia Bank Commercial Mortgage Trust, Variable Rate December 15, 2043	5,397,148
Credit Suisse Mortgage Trust, 5.416% February 15, 2040	5,371,055
Morgan Stanley, 5.750% January 25, 2021	4,882,152
Verizon Communications Inc, 5.150% September 15, 2023	4,682,809
Morgan Stanley, 4.750% March 22, 2017	4,533,885
Bank of America Corp, 5.000% May 13, 2021	4,356,160

Note: A detailed list of SERS investment holdings at December 31, 2016, may be viewed at [www.SERS.pa.gov](http://www.SERS.pa.gov).

## Schedule of Trading Broker Commissions

December 31, 2016 (unaudited)

Broker commissions on equity and fixed income investment transactions for the year ended December 31, 2016, were \$5.1 million. Below is a list of brokers receiving commissions in excess of \$20,000 during the year.

Broker	Commissions	Broker	Commissions
Fidelity	\$831,888	Jefferies and Company	\$65,976
Merrill Lynch	476,943	Wells Fargo and Company	59,622
Citigroup	327,305	Societe Generale	51,485
UBS	277,581	CL King & Associates	48,900
JP Morgan Chase	268,625	Wedbush Securities	48,397
Goldman Sachs	230,305	Sanford C Bernstein & Company	39,936
Credit Suisse First Boston	220,683	Raymond James & Associates	39,067
Morgan Stanley Smith Barney	181,187	BNP Paribas	38,877
CITIC	121,772	Knight Capital Group	32,876
Liquidnet	119,878	Sturdivant and Company	31,847
HSBC Securities	114,211	Stifel Nicolaus	28,827
Bloomberg Tradebook	110,691	Dexia	28,647
Nomura Group	110,270	Mizuho	26,878
ISI	99,170	Boenning & Scattergood	25,091
Barclays	92,212	Exane	23,645
Investment Technology Group	88,121	Greentree Brokerage Services	23,570
Deutsche Bank	80,711	Daiwa Bank	22,109
Pershing	73,276	Island Trader Securities	21,849
Macquarie Bank	72,123		

# INVESTMENT SECTION

## Investment Summary

December 31, 2016 (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 <sup>1/</sup>	% of Total Fund	Long-Term 10-Year Strategic Target
Private Equity	\$4,183.6	15.9%	16.0%
Global Public Equity	12,188.9	46.3	43.0
Real Estate	2,264.4	8.6	12.0
Hedge Funds	2,057.4	7.8	12.0
Fixed Income	4,311.2	16.4	14.0
Cash	1,316.0	5.0	3.0
<b>Total Fund</b>	<b>\$26,321.5</b>	<b>100.0%</b>	<b>100.0%</b>

<sup>1/</sup>Includes securities, cash, and accruals.

### Number of Investment Managers

Asset Class	Investment Managers
Private Equity	147
Global Public Equity	14
Real Estate	25
Hedge Funds	14
Fixed Income	19
Cash	1
<b>Total Managers</b>	<b>220</b>

### Number of Investment Portfolios

Asset Class	Investment Portfolios
Private Equity	351
Global Public Equity	17
Real Estate	56
Hedge Funds	17
Fixed Income	22
Cash	1
<b>Total Portfolios</b>	<b>464</b>

## Investment Summary - Private Equity

December 31, 2016 (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	\$1,285.0	\$2,438.6	9.3%
Special Situations	379.9	686.0	2.6
Venture Capital	107.7	1,059.0	4.0
<b>Total Private Equity</b>	<b>\$1,772.6</b>	<b>\$4,183.6</b>	<b>15.9%</b>

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Portfolio Exposure

The Private Equity program is well diversified by sub-sector, geography, and industry focus. As of September 30, 2016, based on fair value, the program's exposure was:

<b>By Fund Sub-Sector</b>		<b>By Geography<sup>2/</sup></b>		<b>By Industry<sup>2/</sup></b>	
U.S. Private Equity	35.5%	United States	70.5%	Financials	26.7%
U.S. Venture Capital	23.3	China	5.2	Information Technology	20.5
Non-U.S. <sup>1/</sup>	23.1	United Kingdom	3.3	Consumer Discretionary	15.5
Distressed/Oppportunistic	11.9	Canada	1.7	Health Care	15.1
Pennsylvania-Related	6.2	Germany	1.3	Industrials	9.3
		Italy	1.2	Energy	5.5
		France	0.7	Materials	3.0
		Rest of World	16.1	Consumer Staples	2.4
				Telecommunication Services	1.1
				Utilities	0.9

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

<sup>2/</sup>Geography and industry are determined by the portfolio company.

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Partners IV	Middle	3/30/2001	\$35,000,000	\$25,444,662	\$52,812,428
ABRY Partners V	Middle	7/29/2005	45,000,000	41,670,955	81,798,412
ABRY Partners VI	Middle	3/26/2008	50,000,000	59,696,320	87,237,589
ABRY Partners VII	Middle	8/10/2011	30,000,000	36,469,526	21,141,049
ABRY Partners VIII	Middle	5/5/2015	25,000,000	17,608,802	1,599,680
2. ABS Capital Partners IV	Growth Equity	10/13/2000	35,000,000	30,984,280	66,247,486
ABS Capital Partners V	Growth Equity	11/14/2005	20,000,000	19,704,037	34,309,702
ABS Capital Partners VI	Growth Equity	3/13/2009	40,000,000	38,672,783	16,671,863
3. Advent Latin American Private Equity Fund IV	Middle	8/2/2007	30,000,000	30,797,073	32,090,921
Advent International GPE VI-A	Large	7/7/2008	35,000,000	34,446,330	46,367,504
Advent Latin American Private Equity Fund V	Middle	5/17/2010	15,000,000	13,342,500	2,520,000
Advent International GPE VII-B	Large	12/6/2012	40,000,000	34,140,000	5,299,752
Advent Latin American Private Equity Fund VI	Middle	5/11/2015	25,000,000	4,662,500	375,000
Advent International GPE VIII-B	Large	9/26/2016	50,000,000	1,050,000	0
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	82,402,625
5. APAX Excelsior VI	Small	7/3/2000	35,000,000	34,151,324	56,527,379
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	132,091,952
APAX Europe VII	Mega	6/27/2007	132,170,235	138,620,555	133,692,573
6. Apollo Investment Fund IV	Mega	9/30/1998	75,000,000	74,838,620	124,814,033
Apollo Investment Fund V	Mega	8/23/2001	50,000,000	44,948,713	122,053,240
Apollo Investment Fund VI	Mega	7/19/2006	40,000,000	38,908,796	52,007,933
7. Asia Alternatives Capital Partners	Fund of Funds	6/26/2007	50,000,000	24,938,888	30,097,366
Asia Alternatives Capital Partners II	Fund of Funds	3/7/2008	50,000,000	27,986,027	17,447,596
Asia Alternatives Korea Buyout Investors (Hahn & Co)	Small	7/22/2011	7,000,000	8,177,183	3,409,593
Asia Alternatives Capital Partners III	Fund of Funds	8/3/2012	50,000,000	44,722,762	14,097,110
Penn Asia Investors	Fund of Funds	9/28/2012	83,000,000	57,303,328	9,049,076
8. Asia Pacific Growth Fund III	Growth Equity	9/28/1999	15,000,000	15,337,963	16,708,736
9. Audax Private Equity Fund	Middle	5/25/2000	35,000,000	36,839,098	55,479,437
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	42,168,137	67,213,704
Audax Private Equity Fund V	Middle	1/25/2016	50,000,000	4,979,503	0



# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
10.	Bain Capital Fund VII	Mega	7/6/2000	\$25,000,000	\$25,000,000	\$47,998,008
	Bain Capital Fund VIII-E	Mega	12/15/2004	12,144,000	13,502,825	19,631,405
	Bain Capital Fund IX	Mega	4/10/2006	75,000,000	75,863,618	107,099,750
	Bain Capital IX Coinvestment Fund	Mega	4/20/2006	15,000,000	15,618,923	21,797,333
	Bain Capital Asia Fund	Middle	10/18/2007	12,000,000	11,544,001	10,908,405
	Bain Capital Fund X	Mega	1/15/2008	90,000,000	88,333,867	77,349,313
	Bain Capital Europe III	Mega	7/10/2008	72,432,276	66,079,936	86,318,731
	Bain Capital X Coinvestment Fund	Mega	7/28/2008	5,000,000	1,225,000	708,402
11.	Baring India Private Equity Fund III Limited	Small	10/10/2008	5,000,000	5,058,949	2,333,969
12.	Baring Vostok Private Equity Fund IV	Middle	3/10/2008	30,000,000	30,694,840	12,752,395
13.	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	104,856,917
	BC European Capital IX	Large	9/16/2011	26,472,535	22,363,035	9,207,653
14.	Berkshire Fund VI	Middle	7/11/2002	20,000,000	18,828,770	40,470,269
	Berkshire Fund VII	Middle	11/15/2006	32,000,000	32,118,432	40,109,246
	Berkshire Fund VIII	Middle	8/25/2011	30,000,000	25,983,772	3,946,324
15.	Blackstone Communications Partners I	Mega	8/29/2000	25,000,000	25,114,042	30,981,079
	Blackstone Capital IV	Mega	2/26/2003	75,000,000	68,934,327	173,015,491
	Blackstone Capital Partners V	Mega	5/30/2006	150,000,000	149,729,848	198,822,317
	Blackstone Capital Partners VII	Mega	*	50,000,000	0	0
16.	Brait IV	Small	12/11/2006	25,000,000	22,188,592	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	11,062,989	17,388,065
18.	Capvis Equity IV	Middle	1/30/2014	49,855,591	16,324,648	5,742,363
19.	Carlyle Energy Mezzanine Opportunities Fund	Small	9/5/2012	50,000,000	48,569,692	19,509,985
	Horizon Strategic Fund - Carlyle Group	Small	1/23/2014	100,000,000	59,479,896	8,230,928
20.	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	66,563,400	72,831,664	69,466,398
	Charterhouse Capital Partners IX	Middle	4/28/2009	66,385,000	58,665,385	65,564,824
21.	Chequers Capital XV	Middle	7/5/2006	31,133,996	33,048,083	43,079,896
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	17,687,616	20,490,598
24.	Code Hennessy & Simmons IV	Middle	9/16/1999	100,000,000	100,000,000	156,498,466
	Code Hennessy & Simmons V	Middle	11/10/2005	50,000,000	53,837,905	73,697,969
25.	Denham Commodity VI	Large	4/20/2012	50,000,000	33,175,107	14,218,001
26.	Elevation Partners	Middle	11/10/2005	35,000,000	31,212,376	49,520,850

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
27.	Energy Spectrum Partners V	Small	7/9/2007	\$30,000,000	\$27,492,413	\$51,462,955
28.	Eureka II	Growth Equity	1/30/2006	20,000,000	19,322,987	16,811,369
	Eureka Growth Capital III	Growth Equity	10/21/2013	20,000,000	8,236,154	8,188,885
29.	Excelsior Capital Asia Partners III	Small	8/17/2006	25,000,000	24,958,791	12,595,490
30.	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	37,332,704
	First Reserve Fund XII	Mega	11/19/2008	50,000,000	54,635,687	23,916,611
31.	Francisco Partners	Middle	7/27/2000	50,000,000	47,828,275	59,477,043
	Francisco Partners II	Middle	7/10/2006	30,000,000	28,504,996	35,672,218
	Francisco Partners III	Middle	10/17/2011	20,000,000	18,270,000	3,799,238
	Francisco Partners IV	Middle	4/15/2015	25,000,000	8,500,000	0
32.	FSN Capital IV	Middle	12/19/2013	46,049,703	30,655,921	5,672,225
	FSN Capital V	Middle	*	77,189,328	0	0
33.	Great Hill Equity Partners II	Middle	3/28/2001	35,000,000	35,063,336	77,605,735
	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	24,606,912	25,925,662
34.	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
35.	GTCR VI	Middle	9/30/1998	50,000,000	50,000,000	43,229,799
	GTCR VIII	Middle	7/7/2003	75,000,000	69,393,599	114,671,436
	GTCR IX	Middle	12/1/2006	50,000,000	46,666,718	79,736,269
	GTCR XI	Middle	9/2/2014	25,000,000	11,187,500	337,977
36.	H.I.G. Growth Buyouts & Equity Fund II	Growth Equity	7/20/2011	15,000,000	5,584,431	2,654,945
	H.I.G. Europe Capital Partners II	Small	1/10/2014	27,544,596	345,686	0
	H.I.G. Brazil and Latin America Partners	Middle	8/12/2015	50,000,000	1,256,862	0
37.	Hahn & Company II	Middle	5/29/2015	50,000,000	21,037,815	129
38.	Halpern Denny Fund III	Growth Equity	4/26/2000	25,000,000	24,886,871	28,106,844
39.	HarbourVest IPEP III	Fund of Funds	6/30/1998	40,000,000	39,400,000	60,470,425
	HarbourVest Partners VI	Fund of Funds	5/7/1999	200,000,000	196,586,055	227,369,078
	Harbourvest IPEP IV	Fund of Funds	4/9/2001	40,000,000	39,000,000	64,628,560
	HarbourVest Partners VII	Fund of Funds	3/24/2003	75,000,000	73,687,500	82,621,687
	HIPEP V-Asia Pacific & Rest of World	Fund of Funds	5/9/2006	30,000,000	28,245,316	27,027,474
	HarbourVest Partners VIII	Fund of Funds	10/5/2006	100,000,000	97,500,000	82,364,086
	Horizon Impact Fund - Harbourvest	Small	10/24/2014	50,000,000	20,799,406	1,874,983
40.	Hellman & Friedman Capital Partners V	Large	12/20/2004	80,000,000	71,563,406	191,684,081
	Hellman & Friedman Capital Partners VI	Large	6/5/2007	125,000,000	119,499,471	187,436,259
	Hellman & Friedman Capital Partners VIII	Large	9/1/2016	50,000,000	1,024,742	0
41.	InterMedia Partners VII	Small	1/5/2007	15,000,000	17,745,011	10,807,978
42.	Invemed Catalyst Fund	Small	10/19/1999	25,000,000	14,761,445	11,020,751

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Buyouts Committed, Drawn, and Distributed (continued)

	Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
43.	J.H. Whitney IV	Small	2/1/2000	\$20,000,000	\$17,964,926	\$7,529,485
	J.H. Whitney VI	Small	1/5/2006	50,000,000	49,616,832	40,539,938
	J.H. Whitney VII	Small	10/12/2010	25,000,000	25,181,826	8,890,170
44.	J.W. Childs Equity Partners III	Middle	8/20/2002	40,000,000	41,966,505	76,553,620
45.	JMI Equity Fund V	Growth Equity	6/7/2005	24,000,000	24,009,205	121,989,437
	JMI Equity Fund VI	Growth Equity	6/27/2007	40,000,000	40,000,246	65,090,573
	JMI Equity Fund VII	Growth Equity	2/14/2011	10,000,000	9,780,000	4,631,456
	JMI Equity Fund VIII	Growth Equity	10/1/2015	25,000,000	5,450,000	0
46.	Kelso VII	Middle	10/18/2004	40,000,000	41,169,937	65,656,477
	Kelso VIII	Middle	11/29/2007	150,000,000	143,867,689	88,400,663
47.	Leeds Equity Partners IV	Small	11/12/2004	20,000,000	20,396,199	22,913,831
48.	Lime Rock Partners III	Middle	3/7/2005	15,000,000	15,346,695	7,129,953
	Lime Rock Resources	Middle	12/28/2005	20,000,000	19,290,189	25,249,364
	Lime Rock Partners IV	Middle	11/16/2006	25,000,000	27,545,641	15,449,510
	Lime Rock Partners V	Middle	10/2/2008	42,500,000	44,999,890	22,768,943
49.	LLR Equity Partners	Middle	2/4/2000	25,000,000	24,576,062	52,558,191
	LLR Equity Partners II	Middle	1/29/2004	25,000,000	25,000,000	40,501,146
	LLR Equity Partners III	Middle	7/24/2008	30,000,000	29,108,722	26,263,623
	LLR Equity Partners IV	Middle	3/14/2014	50,000,000	30,542,708	3,157,895
50.	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	71,527,448	93,994,766
	Madison Dearborn Capital Partners VI	Middle	5/27/2008	50,000,000	49,693,369	62,832,669
51.	Meridian Venture Partners II	Small	2/11/2005	10,000,000	10,000,000	12,456,671
52.	Motion II B	Middle	11/2/2005	48,204,998	47,639,871	35,073,212
53.	New York Life Capital Partners III	Fund of Funds	6/30/2006	50,000,000	54,801,227	35,204,198
	New York Life Capital Partners IV	Fund of Funds	4/4/2008	50,000,000	54,230,796	58,558,140
54.	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	20,468,750	2,218,985
55.	Nordic Capital V	Middle	5/7/2004	34,996,500	46,006,701	131,273,683
	Nordic Capital VI	Middle	7/25/2006	54,369,000	64,472,507	66,224,992
	Nordic Capital VII	Middle	5/2/2008	92,519,165	97,955,973	33,021,166
56.	Oakhill Capital Partners	Middle	5/17/1999	50,000,000	53,718,802	93,999,577
57.	OCM/GFI Power Opportunities Fund II	Small	5/9/2005	25,000,000	13,470,852	41,644,215
	Oaktree Power Opportunities Fund III	Middle	10/18/2010	25,000,000	16,537,030	13,173,469
58.	Parthenon Investors II	Small	8/9/2001	20,000,000	22,177,965	35,780,448
59.	Patriot Financial Partners	Small	6/12/2008	25,000,000	25,017,767	25,688,334
60.	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	213,883,495

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Buyouts Committed, Drawn, and Distributed (continued)

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
Permira IV	Large	12/14/2006	\$127,779,198	\$136,060,572	\$172,856,829
Permira VI	Large	*	56,202,000	0	0
61. PNC Equity Partners II	Small	8/30/2007	15,000,000	13,422,972	17,117,700
Incline Equity Partners III	Small	1/14/2013	15,000,000	10,516,535	7,592,775
62. Primavera Capital Fund II	Large	11/17/2015	50,000,000	10,700,437	36,336
63. Providence Equity Partners IV	Large	11/27/2000	25,000,000	23,439,922	55,913,545
Providence Equity Partners V	Large	4/4/2005	45,000,000	42,681,604	48,063,726
Providence Equity Partners VI	Large	3/16/2007	50,000,000	53,171,865	46,191,104
Providence Strategic Growth II	Small	*	60,000,000	0	0
64. Ridgemont Equity Partners II	Small	11/30/2015	50,000,000	7,991,432	0
65. Segulah IV	Middle	9/25/2008	16,705,647	16,759,289	9,664,250
66. Sentinel Capital Partners V	Middle	7/15/2014	10,000,000	4,625,682	162,100
67. SFC Energy Partners I	Small	7/27/2007	25,000,000	24,921,811	22,575,508
SFC Energy Partners II	Small	12/19/2011	25,000,000	16,576,240	2,222,349
68. ShoreView Capital Partners	Small	6/16/2003	38,000,000	32,425,893	53,089,462
ShoreView Capital Partners II	Small	3/27/2008	40,000,000	38,472,684	50,894,320
69. Siguler Guff BRIC Opportunities Fund	Fund of Funds	5/8/2006	10,000,000	9,558,299	7,019,332
Siguler Guff BRIC Opportunities Fund II	Fund of Funds	4/9/2008	25,000,000	24,373,443	9,529,179
70. Sterling Capital Partners I	Middle	10/31/2002	15,000,000	14,979,168	30,587,922
Sterling Capital Partners II	Middle	8/18/2005	30,000,000	29,893,709	27,324,339
Sterling Capital Partners III	Middle	8/13/2007	32,000,000	31,610,435	30,703,208
71. Sterling Group Partners IV	Middle	6/15/2016	20,000,000	2,508,651	249,324
72. 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	124,366,643
Summit Partners Private Equity Fund VII	Middle	2/9/2006	97,134,500	97,134,505	116,319,485
73. TA X	Middle	4/25/2006	70,000,000	69,732,009	84,082,009
74. Thomas H. Lee Equity Fund VI	Large	11/14/2006	50,000,000	53,636,865	44,809,304
75. 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	55,247,338
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	92,327,963
TPG Asia V	Large	2/19/2008	22,500,000	21,885,033	17,857,487
TPG Partners VI	Mega	5/22/2008	45,000,000	48,349,980	40,585,817
76. 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	171,785,140
Vestar Capital Partners V	Middle	1/25/2006	50,000,000	51,501,157	39,320,063

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Buyouts Committed, Drawn, and Distributed (continued)

Active Buyouts Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
77. Vista Equity Partners Fund VI	Large	*	\$150,000,000	\$0	\$0
78. Weston Presidio III	Growth Equity	12/31/1998	35,000,000	31,989,586	30,705,066
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	49,736,928	69,483,635
79. Yucaipa American Alliance Fund II	Middle	1/13/2009	25,000,000	29,699,340	15,650,108
<b>Total Active Buyouts</b>			<b>\$8,414,404,403</b>	<b>\$7,287,117,148</b>	<b>\$9,118,618,613</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

<sup>1/</sup>Commitments as of December 31, 2016.

<sup>2/</sup>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, 2016 (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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. ABRY Mezzanine Partners	Mezzanine	3/15/2002	\$30,000,000	\$26,731,187	\$47,390,286
ABRY Senior Equity II	Mezzanine	7/27/2006	30,000,000	28,019,267	43,788,432
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	26,808,026	(389,528)
3. AG Capital Recovery Partners V	Distressed/Restructuring	4/17/2006	20,000,000	20,000,000	20,922,013
4. Avenue Special Situations Fund IV	Distressed/Restructuring	3/27/2006	50,000,000	50,000,000	68,816,017
Avenue Asia Special Situations Fund IV	Distressed/Restructuring	6/30/2006	50,000,000	31,897,973	28,551,591
Avenue Special Situations Fund V	Distressed/Restructuring	6/4/2007	70,000,000	70,004,050	92,444,416
Avenue Europe Special Situations Fund	Distressed/Restructuring	7/30/2008	38,632,500	25,749,356	37,715,569
Avenue Special Situations Fund VI	Distressed/Restructuring	11/2/2010	20,000,000	20,068,464	13,328,606
5. AXA Secondary Fund III	Secondaries	11/19/2004	26,000,000	21,737,894	35,912,410
AXA Secondary Fund III-2	Secondaries	11/24/2004	14,000,000	11,677,210	18,320,851
AXA Secondary Fund IV	Secondaries	2/26/2007	80,000,000	69,800,706	79,125,243
AXA Secondary Fund V B	Secondaries	6/19/2012	75,000,000	59,396,383	42,715,532
ASF VII B	Secondaries	2/19/2016	100,000,000	8,035,971	(159,597)
ASF VII PA Co-Invest	Secondaries	5/18/2016	50,000,000	5,000	0
6. Centerbridge Capital Partners I	Distressed/Restructuring	2/27/2007	50,000,000	56,623,951	94,381,249
Centerbridge Capital Partners III	Distressed/Restructuring	5/21/2015	30,000,000	7,988,338	316,253
7. Cerberus Institutional Partners	Distressed/Restructuring	3/5/1999	35,000,000	35,000,000	79,906,454
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	46,873,421
Cerberus Institutional Partners Series Four	Distressed/Restructuring	11/27/2006	75,000,000	69,258,215	83,183,729
8. Clearlake Capital Partners IV	Middle	9/1/2015	15,000,000	7,987,561	179,402
9. CVI Global Value Fund	Distressed/Restructuring	2/23/2007	60,000,000	57,151,667	79,498,461

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Special Situations Committed, Drawn, and Distributed (continued)

	Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
10.	Dover Street VII	Secondaries	7/2/2008	\$30,000,000	\$28,745,287	\$32,097,671
11.	H.I.G. Bayside Debt & LBO Fund II	Distressed/ Restructuring	6/17/2008	30,000,000	30,010,001	21,600,649
	H.I.G. Bayside Loan Opp. Fund III	Distressed/ Restructuring	6/12/2013	50,000,000	26,940,680	6,165,019
	H.I.G. Bayside Loan Opp. Fund IV	Distressed/ Restructuring	1/16/2015	25,000,000	5,698,483	2,760,382
12.	JP Morgan U.S. Corp Finance Investors II	Distressed/ Restructuring	1/14/2003	50,000,000	53,232,339	77,920,802
13.	KPS Special Situations Fund IV	Distressed/ Restructuring	5/8/2014	25,000,000	4,273,007	3,379,367
14.	Landmark Equity IV	Secondaries	3/31/1995	14,923,291	12,495,850	18,728,790
	Landmark Equity Partners V	Secondaries	12/31/1995	19,624,113	19,434,947	23,521,627
15.	LBC Credit Partners III	Mezzanine	3/4/2013	50,000,000	47,004,932	25,439,119
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	121,050,013
	Lexington Capital Partners VI	Secondaries	10/21/2005	50,000,000	53,066,325	57,412,866
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	89,378,449
	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	115,463,024
	Oaktree Capital Management	Distressed/ Restructuring	5/28/2004	40,000,000	40,581,778	110,121,820
	OCM Opportunities Fund V	Distressed/ Restructuring	8/12/2004	40,000,000	40,003,507	64,752,116
	OCM Opportunities Fund VI	Distressed/ Restructuring	9/28/2005	40,000,000	40,000,000	61,619,202
	OCM Principal Opportunities Fund IV	Distressed/ Restructuring	1/24/2007	20,000,000	20,400,000	24,556,516
	OCM Opportunities Fund VII	Distressed/ Restructuring	5/16/2007	40,000,000	40,000,000	50,516,068
	OCM Opportunities Fund VIIb	Distressed/ Restructuring	6/3/2008	40,000,000	36,000,000	57,846,712
	OCM Opportunities Fund VIII	Distressed/ Restructuring	9/20/2010	12,500,000	12,583,425	12,078,721
	OCM Opportunities Fund VIIIb	Distressed/ Restructuring	8/22/2011	12,500,000	12,500,000	4,953,369
	Oaktree Opportunities Fund IX	Distressed/ Restructuring	3/26/2013	50,000,000	50,000,000	0

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Special Situations Committed, Drawn, and Distributed (continued)

Active Special Situations Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
19. Platinum Equity Capital Partners III	Distressed/Restructuring	8/5/2013	\$50,000,000	\$40,327,571	\$31,321,510
Platinum Equity Capital Partners IV	Distressed/Restructuring	*	100,000,000	0	0
20. RRJ Capital Master Fund III	Growth Equity	12/10/2015	50,000,000	3,688,889	0
21. Sankaty Credit Opportunities III	Distressed/Restructuring	3/8/2007	50,000,000	50,000,000	46,526,866
Sankaty Credit Opportunities IV	Distressed/Restructuring	7/15/2008	40,000,000	38,000,000	48,313,505
22. Templeton Strategic Emerging Markets Fund III	Distressed/Restructuring	5/29/2009	100,000,000	95,482,762	38,536,354
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	15,754,364	5,867,313
24. W Capital Partners II	Secondaries	8/8/2007	40,000,000	39,034,444	42,874,012
<b>Total Active Special Situations</b>			<b>\$2,503,179,904</b>	<b>\$1,992,760,112</b>	<b>\$2,406,315,194</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

<sup>1/</sup>Commitments as of December 31, 2016.

<sup>2/</sup>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, 2016 (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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
1. Abingworth Bioventures IV	Balanced	9/1/2003	\$20,000,000	\$19,858,273	\$23,353,836
Abingworth Bioventures V	Balanced	1/23/2007	33,775,000	28,200,224	36,338,542
2. Accel Europe	Early Stage	7/2/2001	15,000,000	11,350,000	13,250,330
3. Adams Capital Management III	Early Stage	11/21/2000	30,000,000	30,000,000	7,011,905
4. Advanced Technology Ventures VI	Balanced	3/9/2000	10,000,000	10,000,000	4,320,705
Advanced Technology Ventures VII	Balanced	7/11/2001	27,000,000	27,000,000	27,000,001
5. Alloy Ventures 2000	Early Stage	5/19/2000	20,000,000	20,000,000	5,125,846
Alloy Ventures 2002	Early Stage	7/22/2002	25,000,000	25,000,000	15,448,474
Alloy Annex I	Early Stage	10/31/2003	5,000,000	5,000,000	1,271,247
Alloy Ventures 2005	Early Stage	8/11/2005	25,000,000	25,000,000	8,492,217
6. APEX Investment Fund V	Early Stage	4/19/2002	20,000,000	20,651,307	7,429,304
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	17,810,000	0
8. Atlas Venture Fund VI	Early Stage	8/1/2001	24,800,000	24,800,000	12,864,773
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	24,748,251	44,383,691
Battery Ventures VIII Side Car Fund	Balanced	8/29/2008	9,000,000	6,690,210	17,412,210
11. Birchmere Ventures III	Early Stage	5/5/2005	10,000,000	10,407,708	8,692,184
12. Care Capital Investments III	Balanced	2/8/2006	25,000,000	23,017,590	5,610,747
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	18,420,000	18,303,137
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	32,507,568
17. Devon Park Bioventures	Balanced	12/15/2006	10,842,697	9,589,743	23,545,999
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	9,344,854
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	13,196,647	12,759,958
Draper Triangle Ventures III	Early Stage	1/28/2015	10,000,000	4,515,303	0
20. Fairview Capital	Fund of Funds	9/30/1994	10,000,000	10,000,000	4,543,128
Fairview II	Fund of Funds	3/31/1998	10,000,000	9,870,000	4,028,770

# INVESTMENT SECTION

## Investment Summary - Private Equity

December 31, 2016 (unaudited)

### Venture Capital Committed, Drawn, and Distributed (continued)

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
21. Frazier Healthcare III	Balanced	3/31/1999	\$30,000,000	\$30,000,000	\$12,700,255
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	40,668,626
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 VI	Early Stage	6/19/2000	35,000,000	35,000,000	4,722,059
Healthcare Ventures VII	Early Stage	10/29/2002	35,000,000	35,000,000	16,404,798
Healthcare Ventures VIII	Early Stage	8/22/2005	30,000,000	29,775,000	15,913,398
24. Highland Capital Partners VI	Early Stage	10/25/2001	25,000,000	25,000,000	35,781,431
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	24,263,199	7,358,806
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	12,920,296
IP IV	Balanced	9/21/2007	14,000,000	13,300,000	10,671,872
26. Insight Venture Partners VI	Balanced	8/21/2007	30,000,000	32,244,176	59,033,977
Insight Venture Partners VII	Balanced	4/27/2011	20,000,000	20,781,133	12,590,034
Insight Venture Partners VIII	Balanced	7/10/2013	50,000,000	49,100,000	3,449,743
Insight Venture Partners IX	Balanced	3/24/2015	50,000,000	24,000,000	36,562
27. InterWest Partners VIII	Early Stage	8/25/2000	25,000,000	25,000,000	11,786,981
InterWest Partners IX	Balanced	10/19/2005	20,000,000	20,000,000	19,192,552
InterWest Partners X	Balanced	10/30/2008	30,000,000	27,000,000	2,300,138
28. JP Morgan Venture Capital Investors	Fund of Funds	7/8/1999	100,000,000	107,875,494	69,598,840
JP Morgan Venture Capital Investors II	Fund of Funds	9/8/2000	100,000,000	112,179,832	110,474,398
JP Morgan Venture Capital Investors III	Fund of Funds	6/20/2006	100,000,000	109,799,209	70,596,060
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	11,273,946
31. Lightspeed Venture Partners VII	Early Stage	2/27/2006	18,000,000	17,737,490	6,660,237
Lightspeed Venture Partners VIII	Early Stage	6/27/2008	15,000,000	14,400,000	17,020,129
Lightspeed India Partners I	Early Stage	8/14/2015	15,000,000	5,100,000	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	34,475,000	177,406,870
Meritech Capital Partners IV	Late Stage	2/10/2011	20,000,000	18,700,000	9,325,898
Meritech Capital Partners V	Late Stage	9/3/2014	23,000,000	8,797,500	0
34. Morgenthaler Partners VII	Balanced	7/26/2001	35,000,000	35,143,798	28,717,913
Morgenthaler Partners VIII	Balanced	10/3/2005	35,000,000	35,957,046	37,466,826
Morgenthaler Partners IX	Balanced	11/25/2008	20,000,000	19,200,000	27,486,796
35. 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, 2016 (unaudited)

### Venture Capital Committed, Drawn, and Distributed (continued)

Active Venture Capital Funds Limited Partnership	Strategy/Stage	SERS Initial Funding	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions <sup>2/</sup>
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	53,030,687
New Enterprise Associates 12	Early Stage	6/26/2006	35,000,000	35,631,130	39,693,167
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	34,989,508	15,565,248
Oak Investment Partners XII	Late Stage	7/10/2006	40,000,000	39,968,468	28,154,258
39. Pitango Venture Capital Fund IV	Early Stage	7/19/2004	20,000,000	20,001,534	9,809,664
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	30,006,909
Polaris Venture Partners IV	Balanced	9/30/2002	50,000,000	49,750,000	38,429,448
Polaris Venture Partners V	Balanced	8/8/2006	50,000,000	49,000,000	33,243,318
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	23,250,000	14,298,256
42. SCP Private Equity Partners II	Late Stage	6/15/2000	25,000,000	25,000,000	7,843,446
43. Sofinnova Venture Partners VII	Early Stage	1/18/2007	20,000,000	20,000,000	26,736,522
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	27,059,160
45. T. Rowe Price Stock Distribution Account <sup>3/</sup>	Late Stage	1/3/2005		See Footnote	
46. Three Arch Capital	Balanced	12/20/2000	20,000,000	19,500,000	16,008,488
Three Arch Partners IV	Balanced	6/4/2004	20,000,000	19,050,000	18,242,900
47. TL Ventures IV	Early Stage	5/13/1999	35,000,000	35,000,000	25,582,809
TL Ventures V	Early Stage	10/18/2000	40,000,000	40,048,219	16,100,247
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	30,849,103
49. Weathergauge Venture Capital	Fund of Funds	6/26/2007	25,000,000	22,875,000	18,431,174
Weathergauge Venture Capital II	Fund of Funds	6/29/2010	25,000,000	22,750,000	4,358,292
50. Worldview Technology Partners IV	Balanced	1/31/2001	18,130,023	16,951,175	7,034,048
<b>Total Active Venture Capital</b>			<b>\$2,636,495,593</b>	<b>\$2,572,321,671</b>	<b>\$2,251,511,936</b>

Cash flows as of September 30, 2016.

\*Not funded as of September 30, 2016.

<sup>1/</sup>Commitments as of December 31, 2016.

<sup>2/</sup>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.

<sup>3/</sup>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, 2016 (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, 2016 (unaudited)

### Global Public Equity

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/16 <sup>1/</sup>
<b>Global Mandates</b>		
1. Walter Scott & Partners Limited	Growth	\$687.5
<b>Total Global Mandates</b>		<b>687.5</b>
<b>U.S. Equity</b>		
2. Emerald Advisers	Small-cap Growth	504.7
3. Iridian Asset Management	Mid-cap private business value	394.2
4. Mellon Capital Management Russell 1000 Index	Russell 1000 Index	4,603.0
Mellon Capital Management Russell 2000 Core	Russell 2000 Core	272.2
Mellon Capital Management Russell 2000 Value	Russell 2000 Value	541.5
<b>Total U.S. Equity</b>		<b>6,315.6</b>
<b>Non-U.S. Developed Markets Equity</b>		
5. Artisan Partners - Global ex U.S.	Global ex-U.S. growth	363.8
6. Harris Associates	Small-cap intrinsic value	493.8
Mellon Capital Management MSCI World ex U.S. Index	MSCI World ex-U.S. Index	2,596.6
7. Morgan Stanley Investment Management Limited-developed ex U.S.	EAFE value	379.0
8. Templeton Investment Counsel - Global ex U.S.	Global ex-U.S. value	551.3
<b>Total Non-U.S. Developed Markets Equity</b>		<b>4,384.5</b>
<b>Emerging Markets Equity</b>		
9. Ashmore EMM	Small-cap value	121.3
10. BlackRock/Emerging Markets Index Non-Lendable Fund	MSCI Emerging Markets Index	135.2
11. Delaware Investment Advisers	Mid/large cap value	241.5
12. GlobeFlex Capital	Small-cap - GARP	74.1
13. Martin Currie Investment Management	All-cap	229.0
<b>Total Emerging Markets Equity</b>		<b>801.1</b>
<b>Transition Assets</b>		
14. Northern Trust	Transition	0.2
<b>Total Transition Assets</b>		<b>0.2</b>
<b>Total Global Public Equity</b>		<b>\$12,188.9</b>

<sup>1/</sup>Includes securities, cash, and accruals.

## Investment Summary - Real Estate

December 31, 2016 (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 Fund Index – Open-End Diversified Core Equity, S&P Developed Market Property Index for REITs, & CPI plus a 3% premium for Timber and Agriculture, 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 Real Estate	\$328.7	1.2%
Non-Core Real Estate <sup>1/</sup>	514.8	2.0
Separate Accounts	1,032.2	3.9
Timberland	149.2	0.6
REITs	239.5	0.9
<b>Total Real Estate</b>	<b>\$2,264.4</b>	<b>8.6%</b>

<sup>1/</sup>As of December 31, 2016 unfunded commitments are \$156.7 million.

# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2016 (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 <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Core Real Estate</b>					
1. Heitman America Real Estate Trust	Diversified	2007	\$100,000,000	\$140,702,747	\$40,702,747
2. UBS Trumbull Property Fund	Diversified	1988	25,558,525	25,558,525	66,185,346
UBS Trumbull Property Income Fund	Diversified	1988	33,332,027	33,332,027	86,625,792
<b>Total Core Real Estate</b>			<b>158,890,552</b>	<b>199,593,299</b>	<b>193,513,885</b>
<b>Non-Core Real Estate</b>					
3. AG Asia Realty Fund	Diversified	2007	25,000,000	23,500,000	20,812,500
4. Apollo Real Estate Fund III	Diversified	1998	50,000,000	52,456,214	77,266,237
5. Berwind Investment Partnership V	Diversified	1999	25,000,000	26,809,652	45,513,547
Berwind Investment Partnership VI	Diversified	2002	25,000,000	24,543,712	39,054,058
Berwind Investment Partnership VII	Diversified	2005	25,000,000	25,000,000	2,320,250
Berwind Investment Partnership VIII	Diversified	2007	15,588,238	14,912,018	8,531,721
Berwind Investment Partnership IX	Diversified	2012	25,000,000	32,579,587	19,192,370
6. Blackstone Real Estate Partners IV	Diversified	2003	25,000,000	33,958,442	42,860,641
Blackstone Real Estate Partners V	Diversified	2006	50,000,000	58,307,184	83,883,467
Blackstone Real Estate Partners VI	Diversified	2007	75,000,000	83,702,435	119,891,906
Blackstone Real Estate Partners VII	Diversified	2011	75,000,000	89,413,797	61,458,726
7. Clerestory Small Cap Fund I	Diversified	2010	18,000,000	15,856,712	10,290,687
8. Colony Investors VIII	Diversified	2007	22,500,000	23,905,943	6,692,995
9. Fidelity Real Estate Opportunistic Income Fund <sup>2/</sup>	Debt	2007	35,000,000	35,000,000	-
10. Fillmore West Fund	Diversified	2008	30,000,000	35,374,912	22,343,820
11. Hawkeye Scout Fund I	Diversified	2009	75,000,000	78,038,821	118,663,120
Hawkeye Scout Fund II	Diversified	2016	30,000,000	1,371,009	0
12. LEM Real Estate High-Yield Debt Fund III	Debt	2013	25,000,000	25,000,000	7,694,491
13. Lubert Adler Fund III	Diversified	2000	30,000,000	30,000,000	45,442,098
Lubert Adler Fund IV	Diversified	2004	25,000,000	26,500,000	14,042,774
Lubert Adler Fund V	Diversified	2006	30,000,000	30,621,958	5,187,176
Lubert Adler Fund VI	Diversified	2008	21,945,337	19,880,760	13,771,441
Lubert Adler Fund VI-A	Diversified	2010	3,054,663	3,869,240	5,622,604
Lubert Adler Fund VII	Diversified	2014	25,000,000	17,500,000	0
14. OCM Real Estate Opp Fund III	Diversified	2003	25,000,000	25,000,000	41,778,732

# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2016 (unaudited)

### Real Estate (continued)

Fund / Manager	Asset Type	SERS Initial Funding Year	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>Non-Core Real Estate (continued)</b>					
15. Oxford GSA Fund	Diversified	2006	\$21,369,627	\$27,205,500	\$24,220,211
16. Prudential Latin America Retail Fund I	Retail	2006	25,000,000	28,906,216	34,797,726
Prudential Latin America Residential Fund III	Multi-Family	2008	29,654,968	24,708,749	10,712,767
Prudential Senior Housing Fund III	Senior Housing	2006	35,000,000	36,412,463	60,702,700
Prudential Senior Housing Fund IV	Senior Housing	2011	25,000,000	23,806,811	9,687,513
Prudential Senior Housing Fund V	Senior Housing	2015	50,000,000	11,729,280	0
17. Rockpoint Finance Fund I	Residential Land	2007	50,000,000	4,399,572	1,566,309
Rockpoint Real Estate Fund I	Diversified	2004	25,000,000	25,772,035	31,379,795
Rockpoint Real Estate Fund II	Diversified	2005	35,000,000	37,383,717	27,825,949
Rockpoint Real Estate Fund III	Diversified	2007	50,000,000	50,294,970	63,450,795
Rockpoint Real Estate Fund V	Diversified	2015	50,000,000	7,973,880	134,526
18. Starwood Fund IV	Diversified	1997	37,750,000	37,750,000	81,363,493
Starwood Fund VI	Diversified	2001	50,000,000	50,153,525	37,655,142
Starwood Fund VII	Diversified	2006	35,000,000	35,000,000	15,386,983
Starwood Fund VIII	Diversified	2009	50,000,000	52,975,073	64,232,031
19. ValStone Opportunity Fund V	Diversified	2014	14,663,402	17,511,819	5,304,760
20. Westbrook Fund V	Diversified	2004	25,000,000	27,071,162	44,485,779
Westbrook Fund VI	Diversified	2006	35,000,000	43,154,659	34,568,680
Westbrook Fund VII	Diversified	2007	50,000,000	55,521,338	48,090,909
Westbrook Fund VIII	Diversified	2009	50,000,000	59,326,620	67,808,262
<b>Total Non-Core Real Estate</b>			<b>1,554,526,235</b>	<b>1,490,159,785</b>	<b>1,475,689,691</b>
<b>Separate Accounts<sup>3/</sup></b>					
Heitman I.M.A.	Diversified	1988	NA	919,055,486	1,194,474,873
21. LaSalle I.M.A.	Diversified	1994	NA	801,764,412	964,822,922
22. Lowe I.M.A.	Diversified	1994	NA	1,240,387,758	1,331,415,240
Lowe GTO	Diversified	2012	NA	368,869,212	222,770,000
<b>Total Separate Accounts</b>				<b>3,330,076,868</b>	<b>3,713,483,035</b>
<b>Timberland<sup>3/</sup></b>					
23. Forest I.M.A.	Timberland	1992	NA	124,231,969	108,472,772
<b>Total Timberland</b>				<b>124,231,969</b>	<b>108,472,772</b>



# INVESTMENT SECTION

## Investment Summary - Real Estate

December 31, 2016 (unaudited)

### Real Estate (continued)

Fund/ Manager	Asset Type	SERS Initial Funding Year	Capital Committed <sup>1/</sup>	Accumulated Capital Drawn	Accumulated Distributions
<b>REITs<sup>3/</sup></b>					
24. CBRE Clarion Real Estate Securities	Diversified	1996	NA	\$273,206,464	\$611,774,297
25. CenterSquare Real Estate Securities	Diversified	2002	NA	26,197,305	36,082,862
<b>Total REITs</b>				<b>299,403,769</b>	<b>647,857,159</b>
<b>Total Real Estate</b>			<b>\$1,713,416,787</b>	<b>\$5,443,465,690</b>	<b>\$6,139,016,542</b>

Cash flows as of September 30, 2016.

<sup>1/</sup>Commitments as of December 31, 2016.

<sup>2/</sup>This is an open-end fund. All distributions are automatically reinvested.

<sup>3/</sup>Due to the nature of the investments, there are no capital commitments for Separate Account, Timberland, and REIT managers.

## Investment Summary - Hedge Funds

December 31, 2016 (unaudited)

### Role in the SERS Fund

SERS Hedge Fund program includes investments designed to provide total returns comparable to the total fund return but with lower volatility and correlation to other asset classes. SERS Hedge Fund program is 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.

### Program Structure

Investments in hedge funds are achieved through funds-of-hedge funds and direct investment in hedge funds. SERS 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 Hedge Fund program is to generate annualized net-of-fee returns that exceed its benchmark, the HFRI Fund-of-Funds Strategic Index, over a three- to five-year period.

# INVESTMENT SECTION

## Investment Summary - Hedge Funds

December 31, 2016 (unaudited)

### Hedge Funds

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/16 <sup>1/</sup>
<b>Funds-of-Hedge Funds</b>		
1. Arden Keystone	Fund-of-Funds	\$148.8
2. Blackstone Keystone	Fund-of-Funds	1,046.6
3. Entrust Keystone	Fund-of-Funds	311.2
<b>Total Hedged Strategies</b>		<b>1,506.6</b>
<b>Absolute Return Strategies</b>		
Arden	Fund-of-Funds	20.3
Blackstone - Stable Alpha	Fund-of-Funds	23.3
4. Mesirow Financial	Fund-of-Funds	14.3
5. Morgan Stanley Alternative Investment Partners	Fund-of-Funds	8.5
6. PAAMCO	Fund-of-Funds	8.2
7. Robeco Investment	Fund-of-Funds	0.3
8. Rock Creek	Fund-of-Funds	2.6
<b>Total Absolute Return Strategies</b>		<b>77.5</b>
<b>Direct Investments</b>		
9. Hoplite Partners	Direct Hedge Fund	21.1
10. Luxor Capital Partners	Direct Hedge Fund	15.7
11. MKP Opportunity Fund	Direct Hedge Fund	15.4
12. Pine River Fund	Direct Hedge Fund	20.9
13. Samlyn Onshore Fund	Direct Hedge Fund	15.9
14. Stelliam Fund	Direct Hedge Fund	16.1
<b>Total Direct Investments</b>		<b>105.1</b>
<b>Commodities</b>		
Blackstone Commodities	Commodities	368.2
<b>Total Commodities</b>		<b>368.2</b>
<b>Total Hedge Funds</b>		<b>\$2,057.4</b>

<sup>1/</sup>Includes securities, cash, and accruals.

## Investment Summary - Fixed Income

December 31, 2016 (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, 2016 (unaudited)

### Fixed Income

(\$ millions)

Manager	Investment Style	Market Exposure as of 12/31/16 <sup>1/</sup>
<b>Core Plus Fixed Income</b>		
1. Brandywine Global	Global Sovereign Credit	\$175.4
2. Harvest Fund MLP	Energy Infrastructure	136.6
3. Kayne Anderson MLP	Energy Infrastructure	121.8
4. PIMCO EMD	Emerging Market Debt (liquidating)	0.1
5. Pyramis Global Advisors	Commercial Mortgage-Backed Securities	291.0
6. SEI Structured Credit Fund	High Yield Bank Loans	268.8
7. Stone Harbor	Emerging Market Debt	138.3
Stone Harbor	Global High Yield	175.7
8. W.R. Huff	High Yield (liquidating)	9.8
9. Waterfall Asset Management	Asset-Backed Securities	176.8
<b>Total Core Plus</b>		<b>1,494.3</b>
<b>Core Fixed Income</b>		
10. MacKay Shields Core	Bloomberg Barclays U.S. Aggregate	192.3
11. Mellon Capital Management	Bloomberg Barclays U.S. Aggregate	428.0
PIMCO Core	Bloomberg Barclays U.S. Aggregate ex. Treasuries	243.2
12. Taplin, Canida & Habacht (TCH)	U.S. Credit	173.9
13. UBS Core Bond	Bloomberg Barclays U.S. Aggregate	101.3
<b>Total Core</b>		<b>1,138.7</b>
<b>Global Treasury Inflation Protected Securities (TIPS)</b>		
14. Brown Brothers Harriman	Global TIPS	210.5
15. New Century Advisors	Global TIPS	106.1
16. NISA Investment Advisors	U.S. TIPS	472.8
<b>Total Global Treasury Inflation Protected Securities (TIPS)</b>		<b>789.4</b>
<b>Nominal U.S. Treasuries</b>		
PIMCO U.S. Treasuries	Domestic Treasuries	269.9
17. Wellington U.S. Treasuries	Domestic Treasuries	263.5
<b>Total Nominal U.S. Treasuries</b>		<b>533.4</b>
<b>Short-Term Notes</b>		
18. PNC Short Duration	Short Duration Government Credit	236.4
19. Stone Ridge Short Duration	Short Duration Government Credit	119.0
<b>Total Short-Term Notes</b>		<b>355.4</b>
<b>Total Fixed Income</b>		<b>\$4,311.2</b>

<sup>1/</sup>Includes securities, cash, and accruals.

## Investment Summary - Cash

December 31, 2016 (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.

### 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

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

### 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 12/31/16 <sup>1/</sup>
<b>Cash</b>			
1.	PA State Treasury (STIF)	Cash	\$1,316.0
<b>Total Cash</b>			<b>\$1,316.0</b>

<sup>1/</sup>Includes securities, cash, and accruals.

**2016**

**Actuarial Section**



May 12, 2017

Mr. David E. Durbin  
Executive Director  
State Employees' Retirement System  
30 North Third Street  
Suite 150  
Harrisburg, PA 17101-1716

Dear Mr. Durbin:

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, 2016 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, 2017:

- (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





Mr. David E. Durbin  
May 12, 2017

total employer cost is the average contribution amount that needs to be received from the 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, 2016 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 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 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, 2016 actuarial funding valuation and are included herein.



Mr. David E. Durbin  
May 12, 2017

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, provided that employer contributions are made in accordance with current law, we expect employer contributions to exceed 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, 2016 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, with the passage of Act 120, significant changes were legislated to many key benefit provisions of SERS. This was in response to the significant funding challenges SERS had been facing, and will continue to face in coming years. By reducing pensions for future commonwealth employees and providing funding relief to SERS' employers through the use of contribution collars, Act 120 addressed both SERS' long-term and short-term funding challenges.

Effective with the December 31, 2016 actuarial funding valuation, for the first time since 2010, the required employer contribution level is below the Act 120 collared contribution level, thereby making the Act 120 collars no longer applicable (for commonwealth FY 17/18 or beyond).

### **Actuarial Certification**

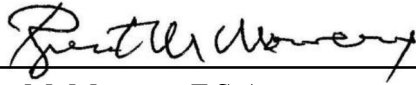
To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in accordance with the applicable actuarial standards of practice and on the basis of actuarial assumptions and methods which are reasonable (taking into account the past experience of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




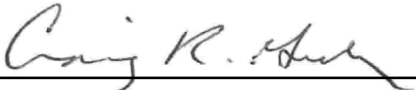
Mr. David E. Durbin  
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The actuaries certifying to this valuation are members of the Society of Actuaries or other professional actuarial organizations, and meet the Qualification Standards of the American Academy of Actuaries for purposes of issuing 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, 2016 (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 (SERC), legislated by the General Assembly and signed into law by the Governor, establishes funding policy. The SERC is administered by the SERS Board. The General Assembly, along with the Governor's signing, has the authority to amend the SERC. 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, which was approved by SERS Board with the recommendation of its actuary at its April 2017 meeting. Last year's valuation for December 31, 2015 used investment rate of return of 7.5% and an underlying rate of inflation of 2.75%
- 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

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## Summary of Actuarial Assumptions and Methods

December 31, 2016 (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 2.60% 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. Based upon annual review, SERS Board with the recommendation of its actuary approved reduction in the investment rate of return to 7.25% and underlying rate of inflation to 2.6% at its April 2017 meeting for December 31, 2016 valuations.

The most recent valuations were based on members of SERS as of December 31, 2016. 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, 2016 (unaudited)

**Table A<sup>1/</sup>**  
**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<sup>1/</sup>**  
**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

<sup>1/</sup>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, 2016 (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, 2016 (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	34	NA	NA	NA	NA	NA	NA	34	\$28,301
20 - 24	1,257	4	NA	NA	NA	NA	NA	1,261	34,394
25 - 29	3,887	570	15	NA	NA	NA	NA	4,472	44,263
30 - 34	2,878	2,338	788	8	NA	NA	NA	6,012	52,725
35 - 39	2,018	1,863	2,136	516	7	NA	NA	6,540	57,711
40 - 44	1,563	1,497	1,660	1,650	547	6	NA	6,923	62,764
45 - 49	1,488	1,363	1,601	1,797	2,299	821	25	9,394	68,416
50 - 54	1,427	1,211	1,354	1,316	1,414	1,486	591	8,799	66,054
55 - 59	1,181	1,102	1,259	1,182	960	1,117	1,215	8,016	63,681
60 - 64	832	901	1,055	923	560	514	564	5,349	63,867
65+	419	494	569	427	225	173	320	2,627	66,902
<b>Total</b>	<b>16,984</b>	<b>11,343</b>	<b>10,437</b>	<b>7,819</b>	<b>6,012</b>	<b>4,117</b>	<b>2,715</b>	<b>59,427</b>	<b>\$60,965</b>

Average Age: 46.15  
Average Service: 11.73

### 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	38	NA	NA	NA	NA	NA	NA	38	\$23,805
20 - 24	1,145	5	NA	NA	NA	NA	NA	1,150	30,487
25 - 29	2,672	426	17	NA	NA	NA	NA	3,115	38,357
30 - 34	2,203	1,479	506	23	NA	NA	NA	4,211	44,155
35 - 39	1,810	1,321	1,303	439	17	NA	NA	4,890	49,230
40 - 44	1,527	1,153	1,139	885	317	31	NA	5,052	51,473
45 - 49	1,553	1,220	1,234	991	886	532	54	6,470	53,609
50 - 54	1,390	1,263	1,173	973	800	821	630	7,050	54,111
55 - 59	1,180	1,180	1,266	1,039	826	797	921	7,209	54,534
60 - 64	644	834	903	768	456	396	404	4,405	53,620
65+	204	297	339	346	147	106	176	1,615	55,010
<b>Total</b>	<b>14,366</b>	<b>9,178</b>	<b>7,880</b>	<b>5,464</b>	<b>3,449</b>	<b>2,683</b>	<b>2,185</b>	<b>45,205</b>	<b>\$50,629</b>

Average Age: 46.51  
Average Service: 10.95



# ACTUARIAL SECTION

## Schedules of Active Member Valuation Data

December 31, 2016 (unaudited)

### Aggregate Active Member Valuation Data

Valuation Year Ended Dec 31	Number of Employers	Number of Active Members	Covered Employee Payroll	Annual Average Pay	% (Decrease)/Increase in Average Pay
2016	103 <sup>1/</sup>	104,632	\$5,912,000,000	\$56,499	-0.6%
2015	104 <sup>2/</sup>	105,025	5,972,000,000	56,858	3.7
2014	104 <sup>2/</sup>	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
2007	108	109,610	5,299,000,000	48,345	4.8

<sup>1/</sup>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.

<sup>2/</sup>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.

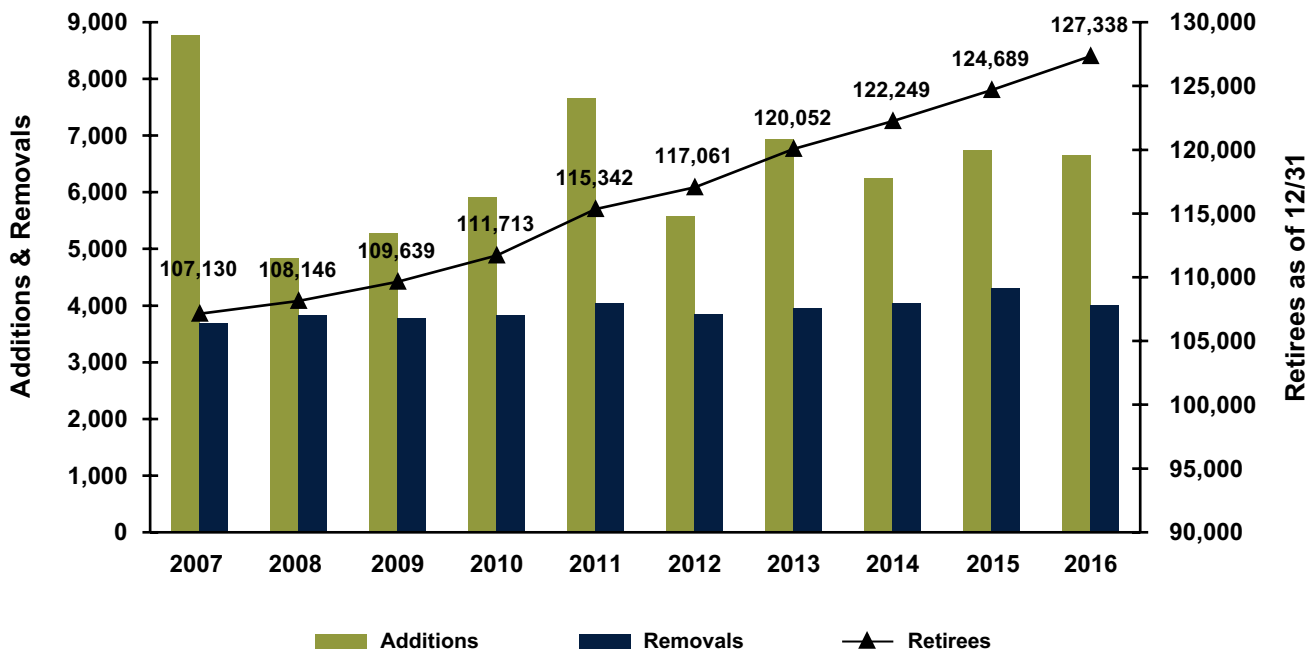
**Schedule of Retirees and Beneficiaries Added to and Removed from Rolls**

December 31, 2016 (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 <sup>1/</sup>	No.	Allowances
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
2007	8,761	234,585,550	3,691	42,238,843	107,130	1,847,681,816	5.0	11.6

<sup>1/</sup>Calculated by multiplying monthly benefit for December 31 by 12 to arrive at an annual amount.



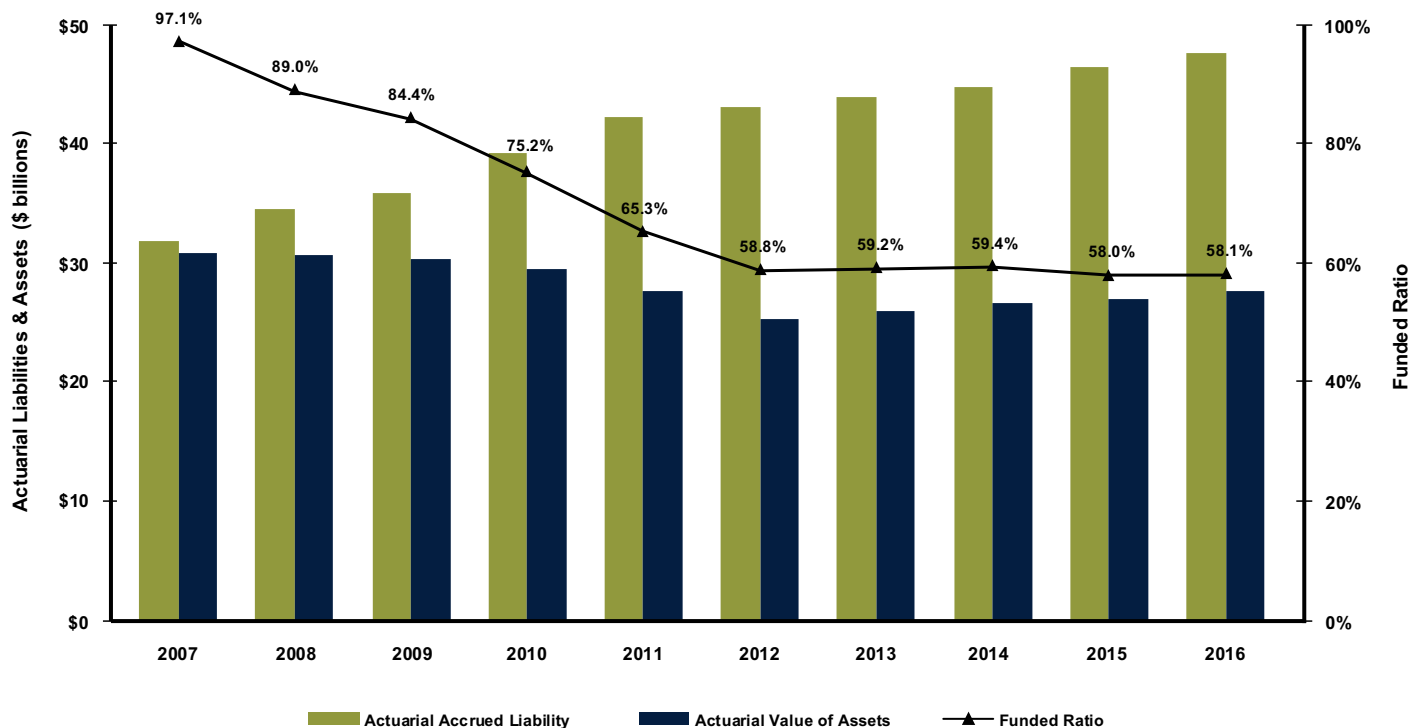
# ACTUARIAL SECTION

## Solvency Test

December 31, 2016 (unaudited)

### Fund Solvency<sup>1/</sup> (\$ 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)						
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
2007	3,849,293	16,255,843	11,648,835	31,753,971	30,839,877	100.0	100.0	92.2	97.1



<sup>1/</sup>Based on statutory funding requirements.

## Analysis of Financial Experience

December 31, 2016 (unaudited)

### Gains and Losses in Accrued Liabilities<sup>1/</sup> Resulting from Differences Between Assumed Experience and Actual Experience (\$ thousands)

Type of Activity	2016	2015	2014	2013
Gain/(loss) from investment earnings <sup>2/</sup>	\$2,982	\$(279,734)	\$237,982	\$559,502
Changes in demographics of new entrants	6,113	(6,055)	(31,582)	(6,131)
Pay increases different than assumptions	613,858	(253,176)	86,914	248,583
Differences between actual and expected demographic experience	33,565	(81,547)	(35,152)	(160,323)
<b>Gain/(loss) during year from financial experience</b>	<b>656,518</b>	<b>(620,512)</b>	<b>258,162</b>	<b>641,631</b>
Non-recurring items				
Changes in assumptions <sup>3/</sup>	(1,021,315)	(366,637)	-	-
Loss due to collar restrictions <sup>4/</sup>	(375,572)	(535,701)	(740,401)	(985,902)
<b>Composite loss</b>	<b>\$(740,369)</b>	<b>\$(1,522,850)</b>	<b>\$(482,239)</b>	<b>\$(344,271)</b>

<sup>1/</sup>Based on statutory funding requirements.

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

<sup>3/</sup>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.

<sup>4/</sup>Act 2010-120 capped the growth of employer contributions at 3.5% for commonwealth FY 12/13 and 4.5% for each subsequent year until no longer needed.

# ACTUARIAL SECTION

## Schedule of Funding Progress

December 31, 2016 (unaudited)

### Funding Progress<sup>1/</sup>

(\$ 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
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
2007	30,839,877	31,753,971	97.1	914,094	5,299,095	17.3

<sup>1/</sup>Based on statutory funding requirements.

**Schedule of Contributions Under Previous Reporting Standards**

December 31, 2016 (unaudited)

**Contributions Under Previous Reporting Standards<sup>1/</sup>**

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

(\$ thousands)

Actuarial Valuation Year Ended December 31	Annual Required Contribution (ARC)	Actual Contribution	ARC as a Percentage of Actual Contribution
2016 <sup>2/</sup>	\$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
2007	617,253	242,337	39.3

<sup>1/</sup>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.

<sup>2/</sup>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, 2016 (unaudited)

### Contribution Rates and Funded Ratios<sup>1/</sup>

(\$ thousands)

For FY Beginning July 1 Following Valuation Year<sup>2/</sup>

Valuation Year Ended Dec 31	Funding Payroll	Member Contribution Rate <sup>3/</sup>	Employer Normal Cost Rate	Unfunded Liability Rate <sup>4/</sup>	Preliminary Employer Contribution Rate <sup>5/</sup>	Final Employer Contribution Rate	Funded Ratio
2007	\$5,529,069	6.25%	8.42%	-9.57%	-1.15%	4.00%	97.1%
2008	5,660,319	6.25	9.51	-5.88	3.63	4.00	89.0
2009 <sup>6/</sup>	5,935,988	6.25	9.53	-3.89	5.64	5.00	84.4
2010 <sup>7/</sup>	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
<b>2016</b>	<b>6,187,427</b>	<b>6.25</b>	<b>4.91</b>	<b>28.31</b>	<b>33.22</b>	<b>33.22</b>	<b>58.1</b>
2017 <sup>8/,9/</sup>	6,366,862	6.25	4.91	27.92	32.83	32.83	58.7
2018	6,551,501	6.25	4.91	27.92	32.83	32.83	58.7
2019	6,741,495	6.25	4.91	27.81	32.72	32.72	58.9
2020	6,936,998	6.25	4.91	27.25	32.16	32.16	59.8
2021	7,138,171	6.25	4.91	26.61	31.52	31.52	60.8
2022	7,345,178	6.25	4.91	25.97	30.88	30.88	61.9
2023	7,558,188	6.25	4.91	25.33	30.24	30.24	63.1
2024	7,777,376	6.25	4.91	24.69	29.60	29.60	64.2
2025	8,002,920	6.25	4.91	24.07	28.98	28.98	65.4
2026	8,235,004	6.25	4.91	23.47	28.38	28.38	66.6
2027	8,473,820	6.25	4.91	22.88	27.79	27.79	67.8

<sup>1/</sup>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.

<sup>2/</sup>Rates and values are for the fiscal year beginning July 1 following the valuation year and do not include Benefits Completion Plan contributions.

<sup>3/</sup>For Class AA and A-3 employees, as they comprise most of SERS membership.

<sup>4/</sup>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.

<sup>5/</sup>Actuarial rate before floor and collar.

<sup>6/</sup>Act 2010-46 amended the Retirement Code to set the employer contribution rate at 5.00% for fiscal year beginning July 1, 2010.

<sup>7/</sup>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.

<sup>8/</sup>Numbers are projected from 2017 - 2027 based on 2016 actuarial funding valuation.

<sup>9/</sup>Act 2010-120 amended the Retirement Code to place a permanent floor at employer normal cost after collars expire.

**Summary of Plan Provisions**

December 31, 2016 (unaudited)

**Benefit and Contribution Provisions**

SERS makes provision 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, 2016 (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.

**2016**

**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, 2016. 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, 2016. 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, 2016. 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, 2016. 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, 2016.

### Revenue Capacity

The **Schedule of Investment Income** presents the details of the total net investment income/loss for the 10 years ended December 31, 2016. 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, 2016.

# STATISTICAL SECTION

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## Statistical Section Narrative

December 31, 2016 (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, 2016.

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, 2016.

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, 2016.

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, 2016.

The **Schedule of Employer/Agency Participation** provides the number of covered members and the corresponding percentage of participation for the 20 largest employers/agencies for the 10 years ended December 31, 2016, as well as a listing of additional employers/agencies participating with SERS as of December 31, 2016.

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, 2016 (unaudited)

Trend Data<sup>1/</sup>

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
<b>Year-End Contribution Rates</b>										
Employer <sup>2/3/4/</sup>	29.51% <sup>7/</sup>	25.01% <sup>7/</sup>	20.53% <sup>7/</sup>	16.05% <sup>7/</sup>	11.59% <sup>7/</sup>	8.01% <sup>7/</sup>	5.01% <sup>8/</sup>	4.01% <sup>9/</sup>	4.04% <sup>9/</sup>	4.04% <sup>9/</sup>
Member	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%	6.25%
<b>Contributions</b>										
Employer <sup>2/</sup>	\$1,622,123	\$1,360,431	\$1,084,104	\$794,911	\$565,621	\$391,749	\$273,083	\$253,250	\$235,288	\$243,936
Member	\$374,570	\$371,624	\$365,923	\$351,968	\$347,937	\$350,852	\$349,049	\$348,805	\$336,833	\$333,818
Average Annual Compensation	\$56,499	\$56,858	\$54,769	\$53,224	\$52,230	\$52,159	\$51,228	\$50,813	\$48,957	\$48,345
Fiduciary Net Position (FNP)	\$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	\$35,516,198
Total Pension Liability (TPL) <sup>5/</sup>	\$45,648,214	\$44,238,721	\$42,195,186	\$41,057,541	NA	NA	NA	NA	NA	NA
FNP as % of TPL <sup>5/</sup>	57.8%	58.9%	64.8%	66.7%	NA	NA	NA	NA	NA	NA
Net Pension Liability <sup>5/</sup>	\$19,260,325	\$18,183,831	\$14,857,408	\$13,663,385	NA	NA	NA	NA	NA	NA
Actuarial Value of Assets <sup>4/</sup>	\$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	\$30,839,877
Actuarial Accrued Liability <sup>4/</sup>	\$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	\$31,753,971
Funded Ratio <sup>4/</sup>	58.1%	58.0%	59.4%	59.2%	58.8%	65.3%	75.2%	84.4%	89.0%	97.1%
Total Benefits and Refunds	\$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	\$2,336,368
Average Pension <sup>6/</sup>	\$27,722	\$27,042	\$26,426	\$25,839	\$25,083	\$24,448	\$23,491	\$22,695	\$21,965	\$21,326
Annuity and Beneficiaries	127,338	124,689	122,249	120,052	117,061	115,342	111,713	109,639	108,146	107,130
Active Members	104,632	105,025	104,431	105,186	106,048	107,021	109,255	110,107	110,866	109,610

<sup>1/</sup>All dollar amounts are in thousands, except Average Annual Compensation and Average Pension.

<sup>2/</sup>Includes Benefits Completion Plan contribution.

<sup>3/</sup>Employer rate represents total contributions as a percent of covered-employee payroll at December 31.

<sup>4/</sup>Based on actuarial valuation for funding purposes as required by statute.

<sup>5/</sup>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.

<sup>6/</sup>Represents average annual pension only for members who have reached superannuation through age or service credits.

<sup>7/</sup>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.

<sup>8/</sup>Act 2010-46 set the employer contribution rate at 5% effective July 1, 2010.

<sup>9/</sup>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

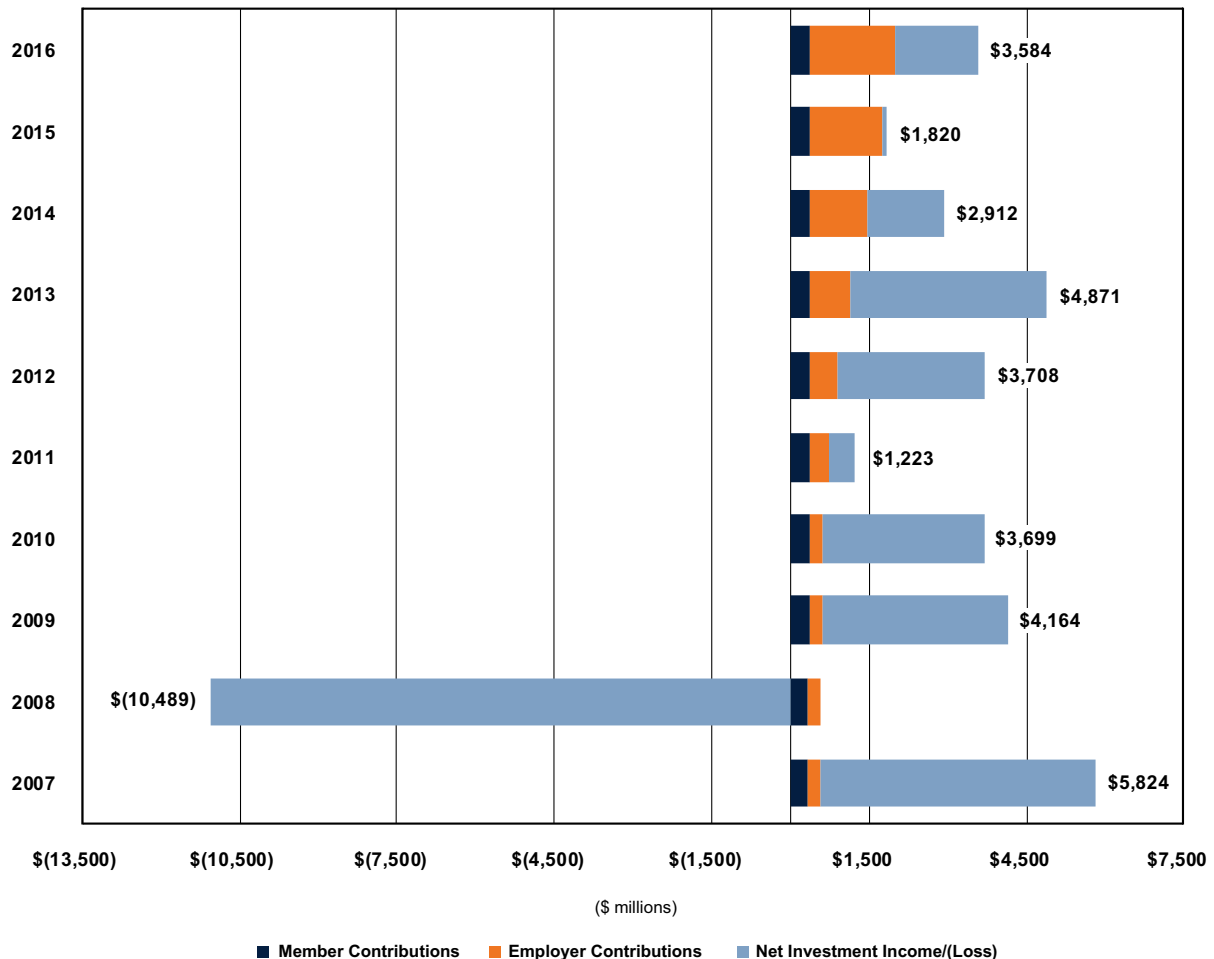
December 31, 2016 (unaudited)

### Additions to Fiduciary Net Position

(\$ thousands)

Year Ended	Member Contributions	Employer Contributions		Net Investment Income/(Loss)	Total
		Dollar Amount	% of Covered-Employee Payroll <sup>1/</sup>		
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)
2007	333,818	243,936	4.6	5,246,730	5,824,484

<sup>1/</sup>Calculated by dividing employer contributions by total annualized compensation (covered-employee payroll) provided by actuary.



Source: Pennsylvania State Employees' Retirement System

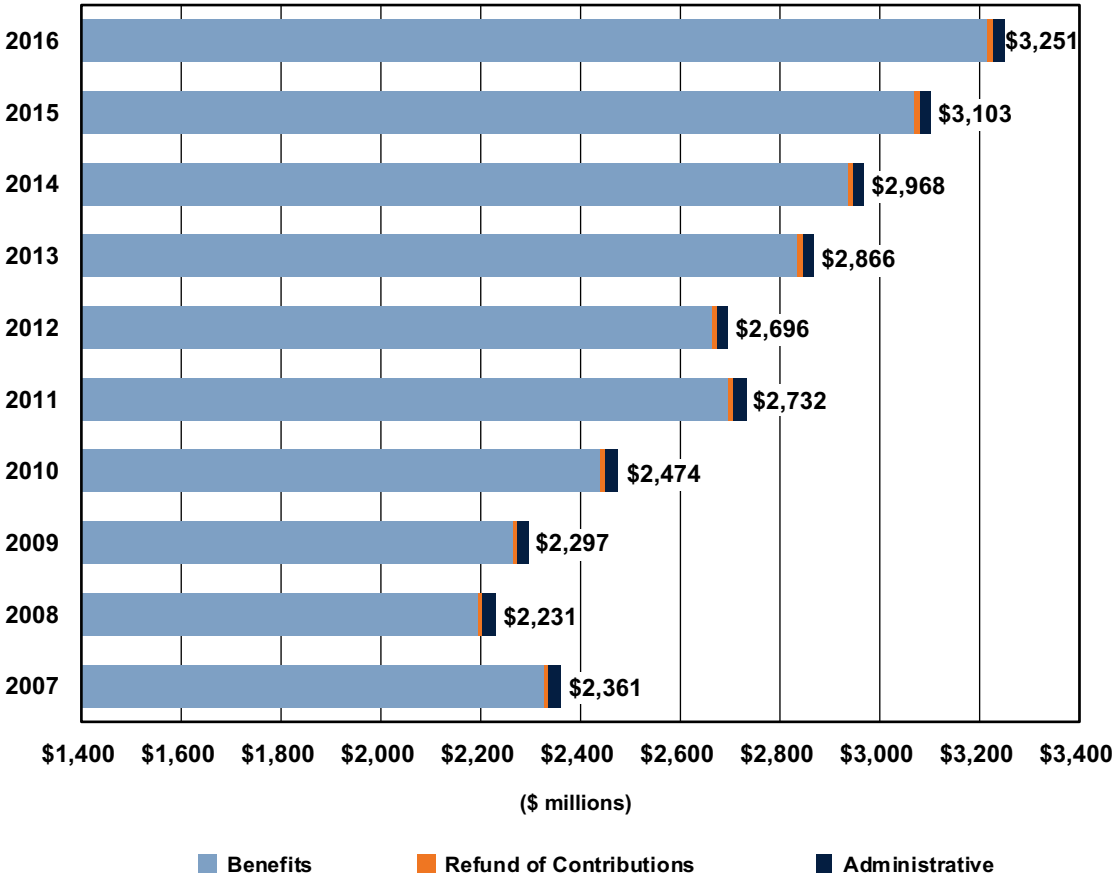
**Schedule of Deductions from Fiduciary Net Position**

December 31, 2016 (unaudited)

**Deductions from Fiduciary Net Position**

(\$ thousands)

Year Ended	Benefits	Refund of Contributions	Administrative Expenses	Total
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
2007	2,328,185	8,183	24,748	2,361,116



Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

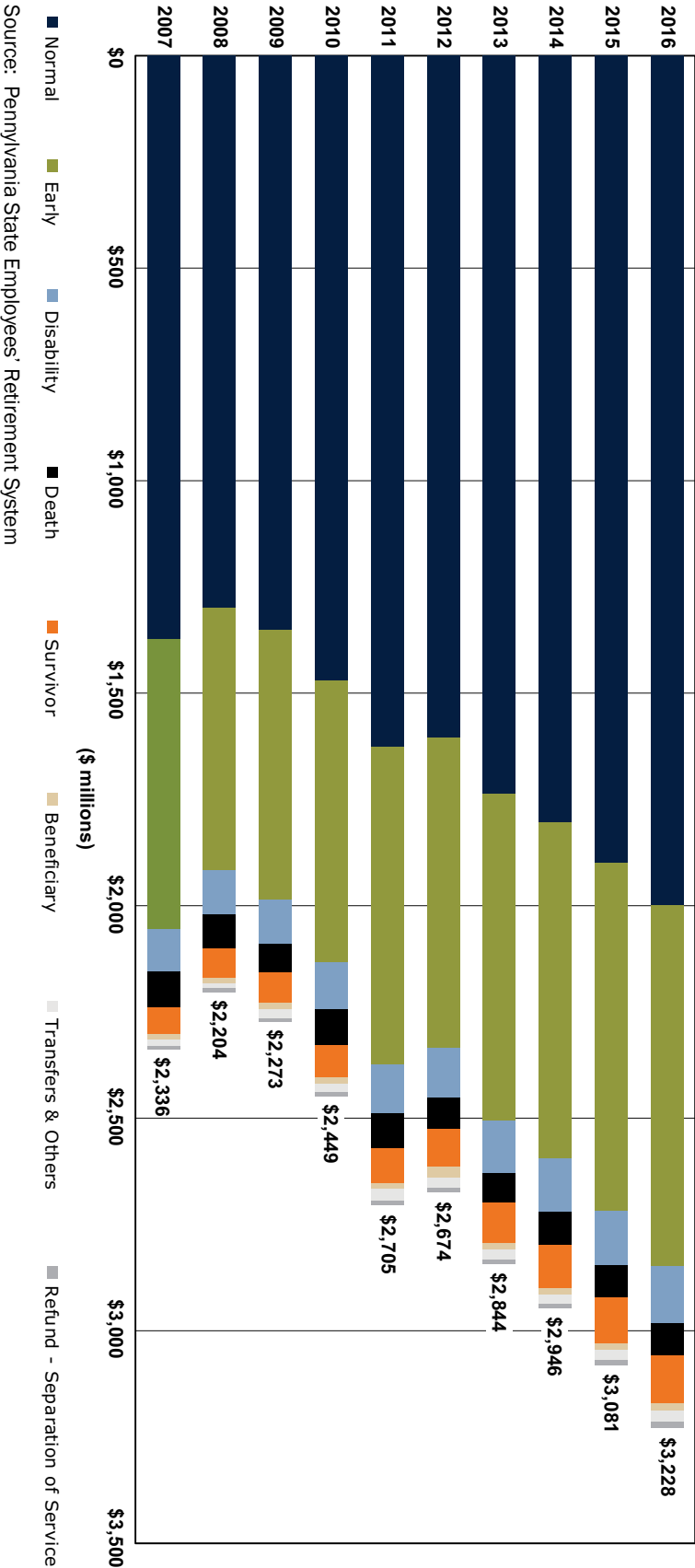
## Schedule of Benefit and Refund Deductions from Fiduciary Net Position by Type

December 31, 2016 (unaudited)

### Benefit and Refund Deductions from Fiduciary Net Position by Type (\$ thousands)

Year Ended	Retirement										Refunds			Total Refunds
	Normal	Early	Disability	Death	Survivor	Beneficiary	Transfers & Other	Total Benefit Deductions	Separation of Service	Death	Total			
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			
2007	1,372,909	683,467	98,605	83,687	62,726	13,949	12,842	2,328,185 <sup>1/</sup>	8,007	176	8,183			

<sup>1/</sup> For most members who retired after July 1, 2007, members must contribute to medical insurance premiums as a result of AFSCME agreement dated July 1, 2007.



Source: Pennsylvania State Employees' Retirement System



Schedule of Total Changes in Fiduciary Net Position

December 31, 2016 (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
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)
2007	333,818	243,936	5,246,730	5,824,484	2,328,185	8,183	24,748	2,361,116	3,463,368

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

## Schedule of Investment Income

December 31, 2016 (unaudited)

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
<b>Investment Income</b>										
(\$ thousands)										
Investment income/(loss)										
From investing activities										
Net appreciation/(depreciation) in fair value of investments <sup>1/</sup>	\$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)	\$4,164,231
Commingled funds appreciation/(depreciation) and income <sup>1/</sup>	NA	NA	NA	NA	275,103	(267,177)	810,147	1,063,673	(1,377,568)	798,941
Interest	126,219	130,616	142,434	120,815	144,431	165,082	146,995	149,040	342,163	347,507
Dividends	273,733	223,927	246,528	204,214	190,733	78,823	61,964	69,400	154,779	149,488
Real estate income	89,327	108,844	93,167	99,314	97,641	82,707	73,355	73,561	109,523	112,148
Miscellaneous income	27,381	3,426	1,799	668	4,583	2,316	6,471	3,499	5,969	6,149
Total investing activities income/(loss)	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)	5,578,464
Investment expenses	(167,712)	(166,610)	(186,527)	(181,042)	(189,722)	(197,505)	(235,826)	(260,376)	(310,454)	(344,707)
Net income/(loss) from investing activities	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)	5,233,757
From securities lending activities										
Securities lending income	4,893	5,105	9,917	4,326	3,953	2,376	2,511	7,092	41,319	155,067
Securities lending expenses	(489)	(501)	(568)	(606)	(512)	(294)	(272)	(572)	(47,253)	(142,094)
Net income/(loss) from securities lending activities	4,404	4,604	9,349	3,720	3,441	2,082	2,239	6,520	(5,934)	12,973
<b>Net investment income/(loss)</b>	<b>\$1,586,853</b>	<b>\$87,990</b>	<b>\$1,462,051</b>	<b>\$3,724,038</b>	<b>\$2,794,940</b>	<b>\$480,445</b>	<b>\$3,076,410</b>	<b>\$3,561,526</b>	<b>\$(11,061,207)</b>	<b>\$5,246,730</b>

<sup>1/</sup>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, 2016 (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	
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
2007	46.11	12.22	51,663	45.95	11.76	43,888	109,610

Source: Pennsylvania State Employees' Retirement System

# STATISTICAL SECTION

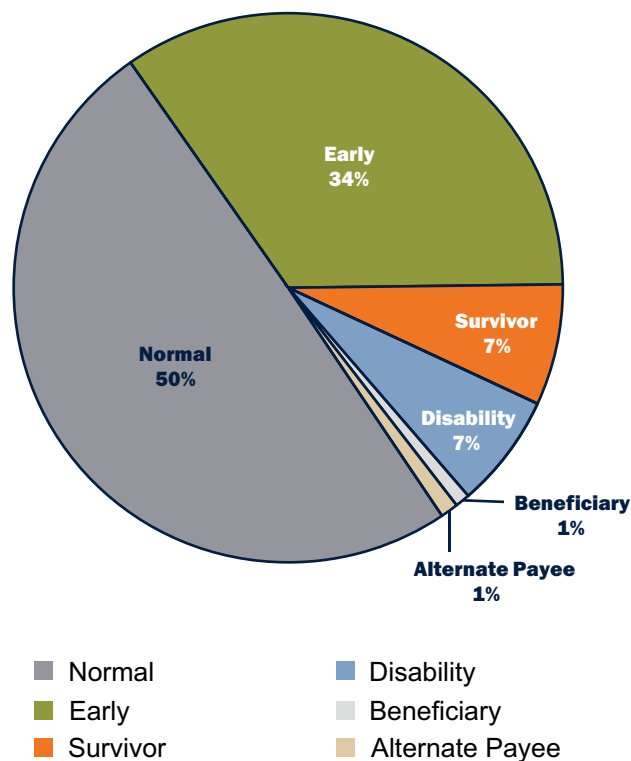
## Schedule of Retired Members by Type of Benefit

December 31, 2016 (unaudited)

### Retired Members by Type of Benefit

Amount of Monthly Benefits	Total Monthly Benefits <sup>4/</sup>	Total Number of Retirees	Type of Benefit					
			Normal	Disability	Early	Beneficiary	Survivor	Alternate Payee
≤ \$500	\$6,706,011	27,714	5,977	537	17,126	449	3,144	481
> 500 to 1,000	16,251,957	21,846	10,111	3,561	5,036	310	2,421	407
> 1,000 to 1,500	21,614,456	17,477	9,243	2,108	4,287	132	1,439	268
> 1,500 to 2,000	24,170,001	13,859	7,427	1,078	4,407	73	775	99
> 2,000 to 2,500	25,974,031	11,588	6,616	586	3,803	42	506	35
> 2,500 to 3,000	25,034,696	9,137	5,643	347	2,830	24	281	12
> 3,000 to 3,500	24,937,018	7,695	5,052	172	2,261	15	184	11
> 3,500 to 4,000	20,152,311	5,399	3,832	90	1,360	14	102	1
> 4,000 to 4,500	16,310,430	3,855	2,880	46	858	9	62	NA
> 4,500 to 5,000	12,377,762	2,615	2,008	24	529	8	44	2
> 5,000 to 5,500	10,039,792	1,917	1,334	14	520	7	42	NA
> 5,500 to 6,000	7,826,251	1,364	934	5	401	3	21	NA
> 6,000	21,520,690	2,872	2,261	3	560	6	42	NA
<b>Totals</b>	<b>\$232,915,406</b>	<b>127,338</b>	<b>63,318</b>	<b>8,571</b>	<b>43,978</b>	<b>1,092</b>	<b>9,063</b>	<b>1,316</b>

<sup>4/</sup>Does not include supplemental payments and transfers.



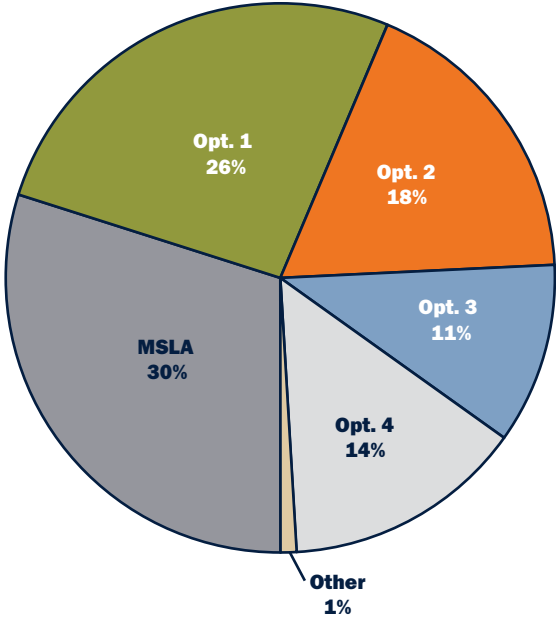
Source: Pennsylvania State Employees' Retirement System

**Schedule of Retired Members by Option**

December 31, 2016 (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	\$6,706,011	27,714	6,349	11,298	5,904	1,724	1,960	479
> 500 to 1,000	16,251,957	21,846	7,493	5,455	4,324	2,100	2,128	346
> 1,000 to 1,500	21,614,456	17,477	5,336	4,234	3,516	1,881	2,360	150
> 1,500 to 2,000	24,170,001	13,859	4,247	3,290	2,424	1,656	2,155	87
> 2,000 to 2,500	25,974,031	11,588	3,398	2,607	1,941	1,458	2,136	48
> 2,500 to 3,000	25,034,696	9,137	2,770	1,955	1,411	1,198	1,772	31
> 3,000 to 3,500	24,937,018	7,695	2,350	1,696	1,101	1,024	1,508	16
> 3,500 to 4,000	20,152,311	5,399	1,869	1,080	661	749	1,024	16
> 4,000 to 4,500	16,310,430	3,855	1,309	702	486	519	829	10
> 4,500 to 5,000	12,377,762	2,615	859	442	316	375	615	8
> 5,000 to 5,500	10,039,792	1,917	622	315	223	226	524	7
> 5,500 to 6,000	7,826,251	1,364	463	218	143	187	350	3
> 6,000	21,520,690	2,872	1,008	423	307	427	701	6
<b>Totals</b>	<b>\$232,915,406</b>	<b>127,338</b>	<b>38,073</b>	<b>33,715</b>	<b>22,757</b>	<b>13,524</b>	<b>18,062</b>	<b>1,207</b>



- 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, 2016 (unaudited)

### Average Monthly Benefit Payments<sup>1/</sup>

Retirement Effective Dates	Years of Credited Service						
	< 5	5-9	10-14	15-19	20-24	25-29	30+
<b>Period 1/1/2016 to 12/31/2016</b>							
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
<b>Period 1/1/2015 to 12/31/2015</b>							
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
<b>Period 1/1/2014 to 12/31/2014</b>							
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
<b>Period 1/1/2013 to 12/31/2013</b>							
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
<b>Period 1/1/2012 to 12/31/2012</b>							
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
<b>Period 1/1/2011 to 12/31/2011</b>							
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
<b>Period 1/1/2010 to 12/31/2010</b>							
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
<b>Period 1/1/2009 to 12/31/2009</b>							
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
<b>Period 1/1/2008 to 12/31/2008</b>							
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
<b>Period 1/1/2007 to 12/31/2007</b>							
Average monthly benefit	\$219	\$322	\$674	\$1,214	\$1,883	\$2,538	\$3,464
Average final average salary	\$31,359	\$37,629	\$42,759	\$45,817	\$53,241	\$58,974	\$60,726
Number of retired members	53	637	476	1,057	759	1,258	3,384

<sup>1/</sup>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, 2016 (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	\$9,231	\$6,763
25-29	NA	NA	\$899	\$670	\$13,761	\$11,297	9,577	7,127
30-34	NA	NA	1,196	934	13,779	12,340	6,661	7,424
35-39	NA	NA	1,591	1,310	14,279	13,962	9,837	9,177
40-44	NA	NA	3,239	1,978	16,375	13,115	15,997	10,134
45-49	NA	NA	24,392	4,322	17,831	14,803	10,157	9,392
50-54	\$46,979	\$34,787	28,724	9,351	18,891	15,930	7,441	12,513
55-59	41,587	41,901	23,548	14,873	19,728	17,168	8,791	12,819
60-64	35,940	33,762	22,547	17,545	17,977	16,331	10,685	13,726
65-69	31,289	27,900	23,439	16,778	15,785	14,556	11,837	15,295
70-74	31,127	23,827	22,160	15,021	12,802	12,548	12,880	15,419
75-79	29,619	20,003	16,603	11,237	9,989	9,379	9,987	14,431
80-84	24,337	15,370	15,229	9,432	8,958	8,484	9,525	12,199
85-89	21,712	12,032	14,684	8,972	9,808	7,481	9,506	10,904
90 and over	17,812	10,129	14,055	7,612	8,484	7,699	7,052	8,305
<b>Total Average</b>	<b>\$30,622</b>	<b>\$23,733</b>	<b>\$21,160</b>	<b>\$13,410</b>	<b>\$16,207</b>	<b>\$14,361</b>	<b>\$10,410</b>	<b>\$12,776</b>

	Normal	Early	Disability	Beneficiary and Survivor
<b>Average Pension</b>	\$27,722	\$17,412	\$15,245	\$12,505
<b>Average Age</b>	72.3	64.3	63.4	74.5

Source: Pennsylvania State Employees' Retirement System

**Schedule of Employer/Agency Participation - 20 Largest**

December 31, 2016 (unaudited)

# - Number of active members

% - Percentage of total active members

Employer/Agency Name	2016 <sup>1/</sup>		2015 <sup>1/</sup>		2014 <sup>1/</sup>		2013		2012		2011		2010		2009		2008		2007	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Dept of Human Services	17,205	16.44	17,085	16.27	16,870	16.15	16,668	15.85	16,764	15.81	17,087	15.97	18,007	16.48	18,201	16.53	18,618	16.79	18,761	17.12
Dept of Corrections	15,752	15.05	15,362	14.63	14,916	14.28	15,529	14.76	15,682	14.79	15,764	14.73	16,133	14.77	16,174	14.69	16,075	14.50	15,523	14.16
Dept of Transportation	12,312	11.77	12,434	11.84	12,325	11.80	12,656	12.03	12,729	12.00	12,826	11.98	12,427	11.37	12,548	11.40	12,494	11.27	12,264	11.19
Pennsylvania State University	6,367	6.09	6,111	5.82	6,123	5.86	6,210	5.90	6,368	6.00	6,532	6.10	6,653	6.09	6,608	6.00	6,468	5.83	6,210	5.67
Pennsylvania State Police	6,219	5.94	6,459	6.15	6,323	6.05	6,084	5.78	6,012	5.67	6,033	5.64	6,084	5.57	6,102	5.54	6,222	5.61	6,266	5.72
State System of Higher Education	4,984	4.76	4,929	4.69	4,977	4.77	5,109	4.86	5,123	4.83	5,138	4.80	5,375	4.92	5,556	5.05	5,521	4.98	5,316	4.85
Liquor Control Board	4,338	4.15	4,313	4.11	4,340	4.16	4,264	4.05	4,141	3.90	4,080	3.81	4,286	3.92	4,303	3.91	4,097	3.70	3,969	3.62
Dept of Labor and Industry	4,235	4.05	4,751	4.52	4,981	4.77	5,113	4.86	5,474	5.16	5,768	5.39	5,919	5.42	5,719	5.19	5,178	4.67	5,234	4.78
Pennsylvania Higher Education Assistance Agency	3,453	3.30	3,443	3.28	3,225	3.09	2,983	2.84	2,776	2.62	2,460	2.30	2,265	2.07	2,230	2.03	2,135	1.93	2,494	2.28
Dept of Military and Veterans Affairs	2,533	2.42	2,534	2.41	2,481	2.38	2,487	2.36	2,385	2.25	2,471	2.31	2,505	2.29	2,478	2.25	2,568	2.32	2,545	2.32
Dept of Environmental Protection	2,420	2.31	2,485	2.37	2,510	2.40	2,571	2.44	2,632	2.48	2,643	2.47	2,623	2.40	2,677	2.43	2,802	2.53	2,767	2.52
Dept of Conservation and Natural Resources	2,083	1.99	2,110	2.01	2,100	2.01	2,063	1.96	2,057	1.92	1,909	1.78	1,913	1.75	2,031	1.84	2,111	1.90	2,080	1.90
Pennsylvania Turnpike Commission	2,066	1.97	2,054	1.96	2,062	1.97	2,108	2.00	2,126	2.00	2,104	1.97	2,132	1.95	2,164	1.97	2,254	2.03	2,232	2.04
Administrative Office of Pennsylvania Courts	2,007	1.92	1,940	1.85	2,009	1.92	1,967	1.87	2,018	1.90	1,977	1.85	2,025	1.85	1,992	1.81	2,015	1.82	1,988	1.81
Dept of Revenue	1,912	1.83	1,948	1.85	1,943	1.86	1,962	1.87	1,994	1.88	2,059	1.92	2,166	1.98	2,170	1.97	2,366	2.13	2,289	2.09
Executive Offices	1,591	1.52	1,640	1.56	1,689	1.62	1,739	1.65	1,851	1.75	1,949	1.82	2,006	1.84	2,155	1.96	2,257	2.04	2,201	2.01
House of Representatives	1,495	1.43	1,568	1.49	1,589	1.52	1,676	1.59	1,590	1.50	1,792	1.67	1,825	1.67	1,779	1.62	1,736	1.57	1,758	1.60
Board of Probation and Parole	1,249	1.19	1,213	1.15	1,210	1.16	1,176	1.12	1,161	1.09	1,096	1.02	1,100	1.01	1,108	1.01	1,098	0.99	1,009	0.92
Dept of Health	1,168	1.12	1,131	1.08	1,119	1.07	1,142	1.09	1,262	1.19	1,333	1.25	1,335	1.22	1,409	1.28	1,473	1.33	1,433	1.31
Dept of General Services	878	0.84	895	0.85	925	0.89	955	0.91	961	0.91	1,022	0.95	1,108	1.01	1,208	1.10	1,270	1.15	1,267	1.16
Active members for 20 largest employers/agencies	94,267	90.09	94,405	89.89	93,717	89.74	94,462	89.80	95,086	89.66	96,043	89.74	97,887	89.59	98,612	89.56	98,758	89.08	97,606	89.05
Total number of active members	104,632		105,025		104,431		105,186		106,048		107,021		109,255		110,107		110,866		109,610	

Numbers may not add due to rounding.

<sup>1/</sup>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.

Source: Pennsylvania State Employees' Retirement System



**Schedule of Employer/Agency Participation**

As of December 31, 2016 (unaudited)

**Remaining Employers/Agencies<sup>1/</sup>**

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

<sup>1/</sup>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.



**State Employees' Retirement System**

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